NeXT serial console

The NeXT uses a mini-DIN 8 connector with the following pinout (female view):

```
   8  7  6
  5     4  3
    2  1

      1: DTR
      2: DCD
      3: TXD
      4: GND
      5: RXD
      6: RTS
      7: NC
      8: CTS
```

A standard RS232 9 pin connector has the following pinout (female view):

```
  5  4  3  2  1
    9  8  7  6

      1: DCD
      2: RXD
      3: TXD
      4: DTR
      5: GND
      6: DSR
      7: RTS
      8: CTS
      9: RI
```

You want the NeXT and your terminal emulator to talk. To do this you want a null modem cable configuration. This means that the sender and the receiver have send/receive signals in the opposite positions (RX --> TX, TX --> RX, etc.).

Connect the cable as follows:

```
     NeXT --> RS232
  1: DTR ---> 1: DCD
  2: DCD ---> 4: DTR
  3: TXD ---> 2: RXD
  4: GND ---> 5: GND
  5: RXD ---> 3: TXD
  6: RTS ---> 8: CTS
  7: Not Connected
  8: CTS ---> 7: RTS
```

Enable console access in NeXTstep:

You need to modify the '/etc/ttys' file to allow console access

```
# If you want to enable getty's on the "a" serial port, change the
# "off" entry to "on" in exactly one of the "ttya", "ttyfa", or
# "ttydfa" entries. This same caveat applies for the "b" port.
#
# If you do not want to start the window server by default, you can
# uncomment the first entry and comment out the second.
#
# console "/usr/etc/getty std.9600" NeXT on secure
b/NextStep/WindowServer onoption="/usr/etc/getty std.9600" secure …
-> uncomment this:   ttya "/usr/etc/getty knj.9600" vt100 on secure
ttya "/usr/etc/getty std.9600" unknown off secure
```

NeXT headless setup

Power On: Install a non-locking switch (Taster) plus 470 Ohm resistor to pins 6 (PWR SW) and 15 (GND).

System console output can still be enabled on a local VGA screen, connect with the following pinout on the NeXT monitor/soundbox port:

```
Next Pin 8 <------ Vsync -----> PC Pin 14 (blue)
Next Pin 9 <------ HSync -----> PC Pin 13 (yellow)
Next Pin 10 <----- Video -----> PC Pin 1-3 (red)
Next Pin 13-19 <--- GND ------> Pin 5-10
```

Configuration of a NeXTstation Mono with ROM .66 for operation without a soundbox (use serial terminal and/or telnet via LAN):
- Build a serial cable as described above.
- Do NOT enable serial port A as system console, machine will hang during boot (there will be kernel page faults or similar issues during initial boot process or when the login screen appears).

```
NeXT Mach (blacksun.ganymed.de) (ttya)


blacksun.ganymed.de login: unexpected kernel page fault failure
trap: type 0x410 fcode 5 rw 3 faultaddr 0x0
trap: pc 0x4017252 sp 0x16bdf0 sr 0x2018
trap: cpu 0 th 0x400f690 proc 0x10125268 pid 172 pcb 0x400f81c
traceback: fp 0x1107ee8c
called from pc 0x04085824 fp 0x1107eeb8 4-args 00000a00 040614ba 040e6f14 101242
04
called from pc 0x0407cff4 fp 0x1107eec4 4-args 00000a00 1107eef4 040491c4 00000a
00
called from pc 0x040491c4 fp 0x1107eef4 4-args 00000a00 00000003 1107eef2 000000
03
called from pc 0x040331ac fp 0x1107ef64 4-args 1107ef26 00000003 10117c0c 000000
03
called from pc 0x04031e4a fp 0x1107ef94 4-args 000f9fdc 00000000 00000003 000000
00
called from pc 0x04031da6 fp 0x1107efb4 4-args 000f9fdc 00000003 00000000 000000
ac
called from pc 0x040a562c fp 0x1107eff4 4-args 00000002 00000005 00000000 000000
00
called from pc 0x04001eaa fp 0x0400fd40 4-args 0400fd08 1107d000 040b437a 000000
02
last fp 0x400fd40
panic: (Cpu 0) MMU invalid descriptor during table walk
NeXT ROM Monitor 2.5 v66
panic: NeXT Mach 3.3: Mon Oct 24 13:56:37 PDT 1994; root(rcbuilder):mk-171.9.obj
~2/RC_m68k/RELEASE_M68K


panic> █
```

- Enter the system PROM (press <Right_Command><µ> during initial "Testing System" screen), then enter system configuration mode by pressing <p> and set the following parameters:

```
boot command: sd
DRAM tests: yes
perform power-on system test: no
        sound out tests: no
        SCSI tests: no
        loop until keypress: no
        verbose test mode: no
boot extended diagnostics: no
serial port A as alternate console: no
```

  Actual boot command is: `bsd(0,0,0)sdmach`
- You may connect a VGA screen (pinout as shown above) to see boot messages.

- Use a serial console with 9600bps/7 bit only after boot, i.e. there will be a login prompt as soon as it also appears on the VGA screen. You may then login as regular user. During initial system checks, the console doesn't care about 7 or 8 bits. But when the OS is running, 7 bit mode must be set (otherwise there will be wrong characters as shown below).

```
fc0 at 0x2114100
Sony MPX-111N as fd0 at fc0 slave 0
SCSI 53C90A Controller, Target 7, as sc0 at 0x2114000
IBM     DCAS-32160W Rev S65A as sd0 at sc0 target 2 lun 0
        Disk Label: NextDisk
        Disk Capacity 2063MB, Device Block 512 bytes
Generic SCSI Device as sg0 at sc0 target 7 lun 7
Generic SCSI Device as sg1 at sc0 target 7 lun 7
Generic SCSI Device as sg2 at sc0 target 7 lun 7
Generic SCSI Device as sg3 at sc0 target 7 lun 7
en0 at 0x2106000
en0: Ethernet address 00:00:0f:00:f9:6e
IP protocol enabled for interface en0, type "10MB Ethernet"
dsp0 at 0x2108000
np0 at 0x200f000
sound0 at 0x200e000
root on sd0

▼▼eáM▼▼á▼3á0▼:5▼:▼3áPD▼á▼00▼
                          ▼▼ec▼i▼▼á▼i▼▼▼
                                        ▼▼e▼▼r▼▼0▼:áfileá▼▼▼te▼ácle▼▼:á▼▼i▼▼i▼
▼ác▼ec▼
        ▼▼▼i▼▼árootá▼o▼▼táe▼trie▼
```

- Stopping the system: halt –p (as root).

```
chown@            iftab.orig        nulib/            services
crontab           inetd@            passwd            shells
cshrc.std         inetd.conf        ping@             shutdown@
disk@             inetd.conf.orig   profile.std       snmp.mib
disktab           init@             protocols         swaptab
dump@             kern_loader.conf  rc                syslog.conf
dumpdates         localgateways     rc.boot           syslog.pid
find.codes        localhost         rc.boot.standard  systemTar.Z
fstab             localnetworks     rc.local          termcap
fstab.client      login.std         rc.net            ttys
fstab.fd          logout.std        rc.orig           ttys.installer
fstab.od          mach_init@        rc.standard       ttys.orig
fstab.sd330       map3270           rc.swap           umount@
fstab.sd660       mkfs@             rc.uucp           update@
fstab.sd660.1     mkhosts@          rdump@            utmp
ftpusers          mklost+found@     reboot@           uucp/
gettytab          mknod@            remote            vipw@
group             mkpasswd@         renice@           xtab
halt@             motd              restore@          yp/
hdform@           mount@            rexecd@           zoneinfo/
hostconfig        mtab              rlogind@
hostconfig.orig   netgroup          rmt@
myhost:12# halt -p
```