GBA Technical Data

CPU Modes

```
ARM Mode     ARM7TDMI 32bit RISC CPU, 16.78MHz, 32bit opcodes (GBA)
THUMB Mode   ARM7TDMI 32bit RISC CPU, 16.78MHz, 16bit opcodes (GBA)
CGB Mode     Z80/8080-style 8bit CPU, 4.2MHz or 8.4MHz  (CGB compatibility)
DMG Mode     Z80/8080-style 8bit CPU, 4.2MHz (monochrome gameboy compatib.)
```

Internal Memory

```
BIOS ROM     16 KBytes
Work RAM     288 KBytes (Fast 32K on-chip, plus Slow 256K on-board)
VRAM         96 KBytes
OAM          1 KByte (128 OBJs 3x16bit, 32 OBJ-Rotation/Scalings 4x16bit)
Palette RAM  1 KByte (256 BG colors, 256 OBJ colors)
```

Video

```
Display      240x160 pixels (2.9 inch TFT color LCD display)
BG layers    4 background layers
BG types     Tile/map based, or Bitmap based
BG colors    256 colors, or 16 colors/16 palettes, or 32768 colors
OBJ colors   256 colors, or 16 colors/16 palettes
OBJ size     12 types (in range 8x8 up to 64x64 dots)
OBJs/Screen  max. 128 OBJs of any size (up to 64x64 dots each)
OBJs/Line    max. 128 OBJs of 8x8 dots size (under best circumstances)
Priorities   OBJ/OBJ: 0-127, OBJ/BG: 0-3, BG/BG: 0-3
Effects      Rotation/Scaling, alpha blending, fade-in/out, mosaic, window
Backlight    GBA SP only (optionally by light on/off toggle button)
```

Sound

```
Analogue     4 channel CGB compatible (3x square wave, 1x noise)
Digital      2 DMA sound channels
Output       Built-in speaker (mono), or headphones socket (stereo)
```

Controls

```
Gamepad      4 Direction Keys, 6 Buttons
```

Communication Ports

```
Serial Port  Various transfer modes, 4-Player Link, Single Game Pak play
```

External Memory

```
GBA Game Pak max. 32MB ROM or flash ROM + max 64K SRAM
CGB Game Pak max. 32KB ROM + 8KB SRAM (more memory requires banking)
```

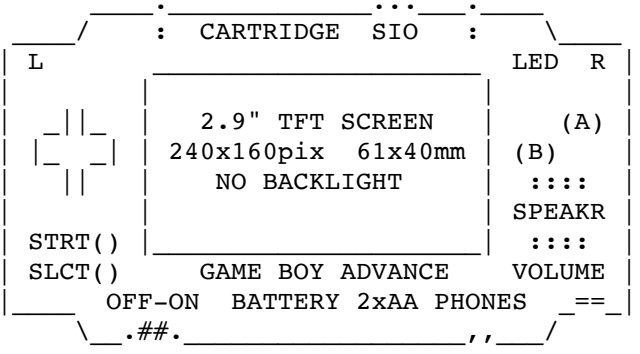
Case Dimensions

```
Size (mm)    GBA: 145x81x25 - GBA SP: 82x82x24 (closed), 155x82x24 (stretch)
```

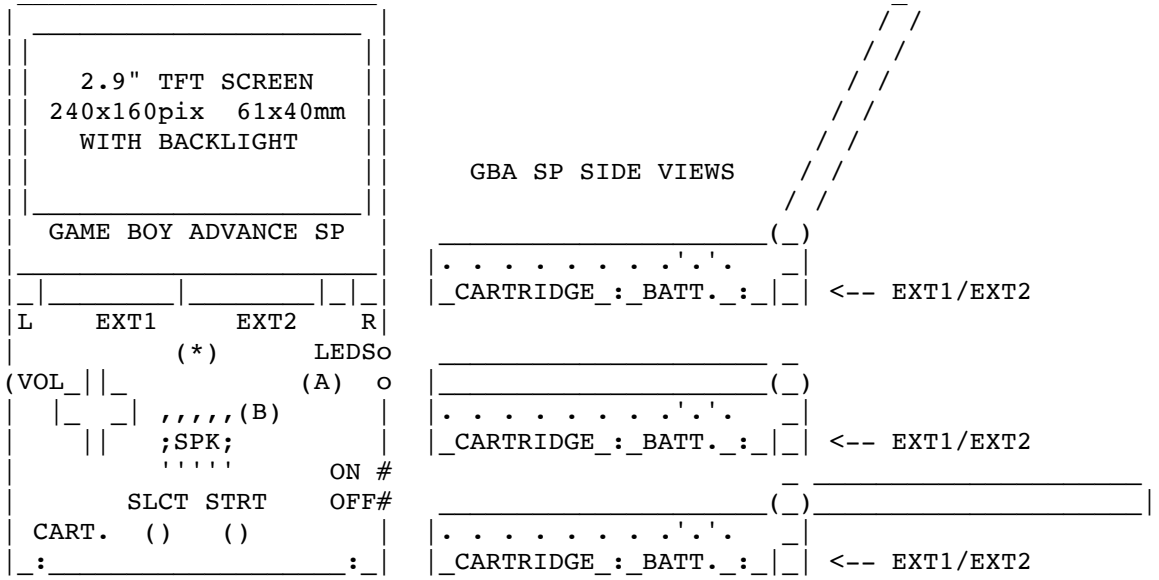
Power Supply

```
Battery GBA  GBA: 2x1.5V DC (AA), Life-time approx. 15 hours
Battery SP   GBA SP: Built-in rechargeable Lithium ion battery, 3.7V 600mAh
External     GBA: 3.3V DC 350mA - GBA SP: 5.2V DC 320mA
```

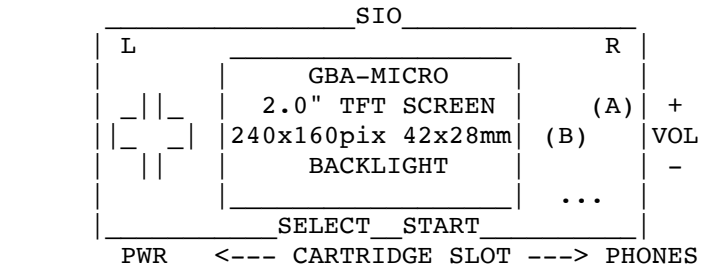
Original Gameboy Advance (GBA)



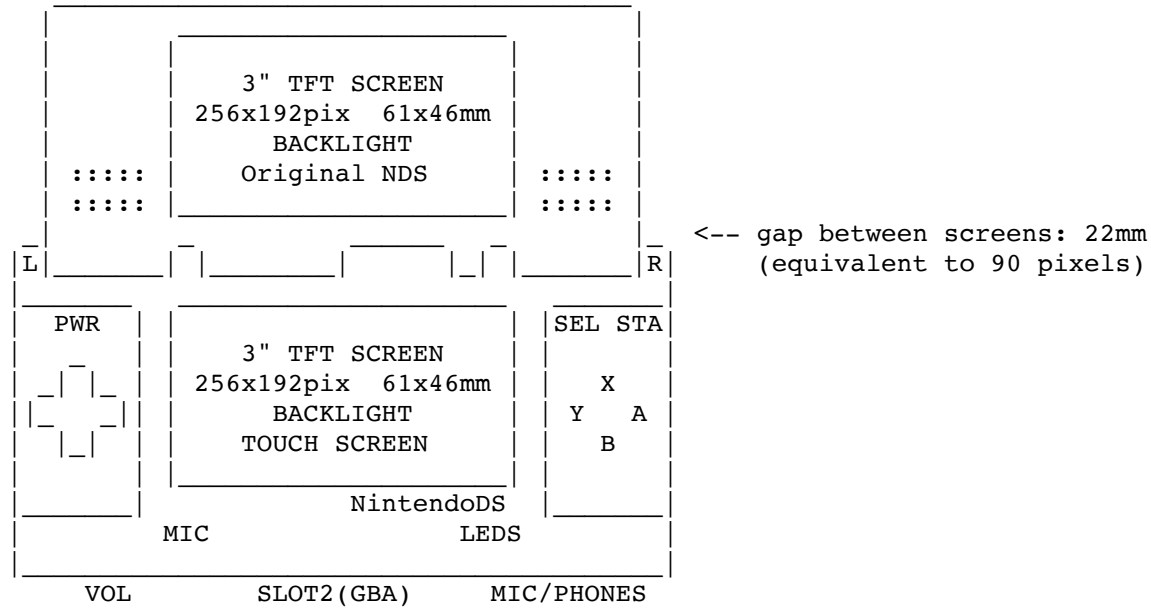
GBA SP (GBA SP)



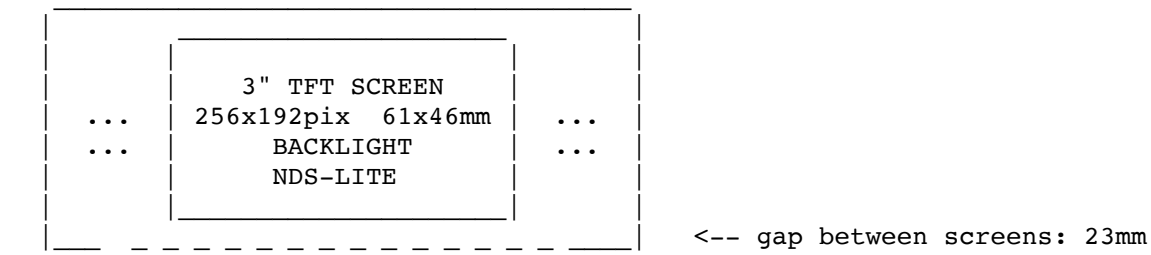
Gameboy Micro (GBA Micro)

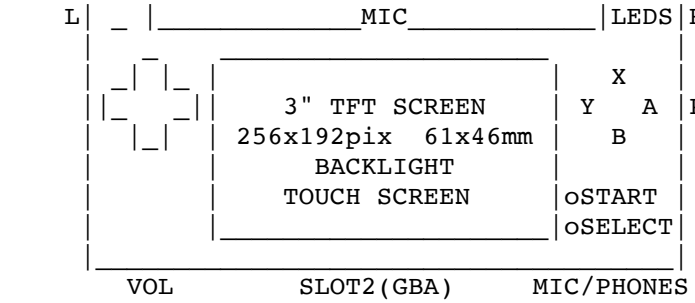


Nintendo DS (NDS)

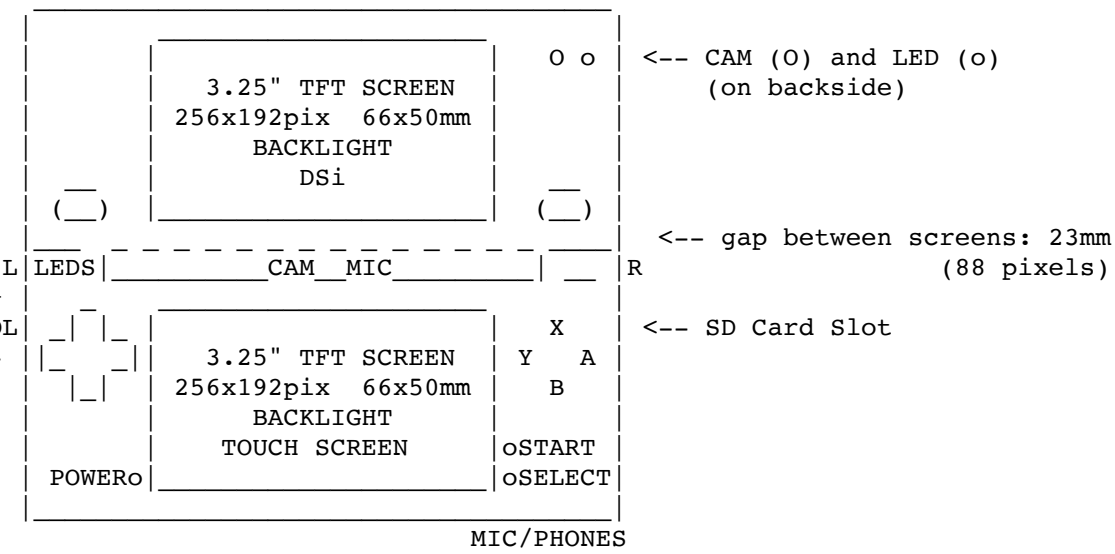


Nintendo DS Lite (NDS-Lite)





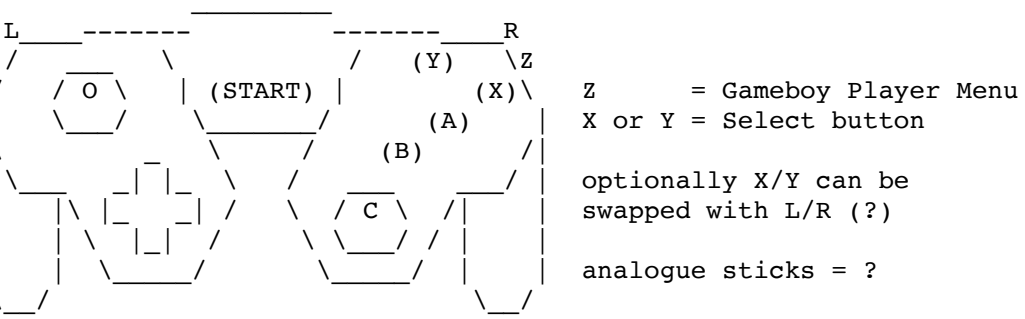
Nintendo DSi (DSi)



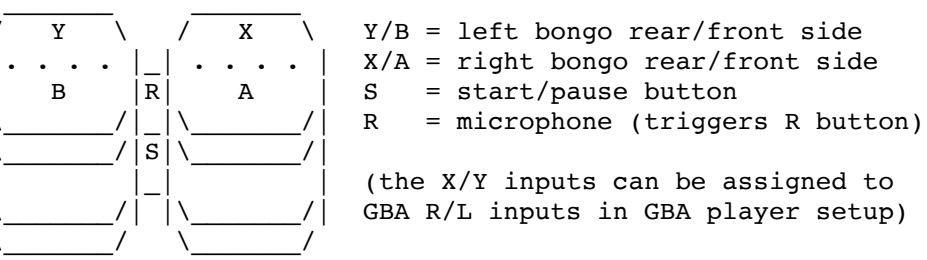
Nintendo DSi XL

As DSi, but bigger case, and bigger 4.2" screens

Gameboy Player (Gamecube Joypad) (GBA Player)



Gameboy Player (Gamecube Bongos) (GBA Player)



The GBA's separate 8bit/32bit CPU modes cannot be operated simultaneously. Switching is allowed between ARM and THUMB modes only (that are the two GBA modes).
This manual does not describe CGB and DMG modes, both are completely different than GBA modes, and both

cannot be accessed from inside of GBA modes anyways.

Gameboy Player
An GBA Adapter for the Gamecube console; allowing to play GBA games on a television set.
GBA Gameboy Player

GBA SP Notes
Deluxe version of the original GBA. With backlight, new folded laptop-style case, and built-in rechargeable battery. Appears to be 100% compatible with GBA, there seems to be no way to detect SPs by software.

Gameboy Micro (GBA Micro)
Minituarized GBA. Supports 32bit GBA games only (no 8bit DMG/CGB games). The 256K Main RAM is a bit slower than usually (cannot be "overclocked via port 4000800h).

Nintendo DS (Dual Screen) Notes
New handheld with two screens, backwards compatible with GBA games, it is NOT backwards compatible with older 8bit games (mono/color gameboys) though..
Also, the DS has no link port, so that GBA games will thus work only in single player mode, link-port accessoires like printers cannot be used, and most unfortunately multiboot won't work (trying to press Select+Start at powerup will just lock up the DS).

iQue Notes
iQue is a brand name used by Nintendo in China, iQue GBA and iQue DS are essentially same as Nintendo GBA and Nintendo DS.
The iQue DS contains a larger firmware chip (the charset additionally contains about 6700 simplified chinese characters), the bootmenu still allows to select (only) six languages (japanese has been replaced by chinese). The iQue DS can play normal international NDS games, plus chinese dedicated games. The latter ones won't work on normal NDS consoles (that, reportedly simply due to a firmware-version check contained in chinese dedicated games, aside from that check, the games should be fully compatible with NDS consoles).