

# Brain Boxes Competitive Advantages

## Brain Boxes Compact Flash Bluetooth Card Reference Design

Version: 1.1



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# 1. General

## The CF Reference Design

Brain Boxes and CSR's CompactFlash reference design provides +4dBm class 2 power output, giving 40m line of sight Bluetooth range. The design represents the lowest bill of materials and parts count on the market, allowing manufacturers to rapidly move products from the drawing board to the market place. Brain Boxes also provide consultancy and design services alongside pre-qualification test equipment facilities to accompany the reference design.

Two versions of the reference design are available from Brain Boxes.

The first version is available for free and contains a schematic of the circuit, datasheets on both CSR's BlueCore chip and Brain Boxes BB16CF950+ ASIC, along with design notes.

The second, which can be purchased from Brain Boxes contains all the above in addition to:- 20 sample Brain Boxes chips and BlueCore2 chips, gerber plots of the four layer pcb layout, Bill Of Materials, CNC drill data, solder paste masks, and two assembled and working CompactFlash cards. A CD containing all the information is also included.

## The ASIC

A key component of the Brain Boxes and CSR's CompactFlash reference design is the new CompactFlash interface ASIC, the BB16CF950+, that shrinks the active parts count of Bluetooth CF and PCMCIA cards to two chips, enabling glueless interface (no extra components needed) to both CompactFlash/16 bit PCMCIA bus and CSR's BlueCore Bluetooth chips. It marks a major step for Brain Boxes in their ongoing strategy of in-house development of key hardware and software components, and is the first in a series of announcements from Brain Boxes' new partnership with CSR, whose BlueCore chips power 70% of the world's Bluetooth designs.

The new BB16CF950+ ASIC will be used in various Brain Boxes products, and will be made available to third parties allowing them to build boards with the lowest cost bill of materials for a CompactFlash Type I/II BlueCore design. The new chip has a wide operating tolerance of 3.3V to 5V, making it suitable for a large range of portable devices, from PDAs and cellular 'phones to laptops and point-of-sale terminals. Working closely with CSR, Brain Boxes have engineered the chip for a glueless interface to BlueCore01 and BlueCore2 chips, with several specific features built in such as power shutdown control, SPI interface for flash programming and auto reset on power up. All of which hold advantages to system designers, maintaining flexibility and minimising power consumption levels in the finished design.

Brain Boxes designed the ASIC as a low profile single chip interface to CompactFlash/16 bit PCMCIA bus, making the chip and reference design ideal for CompactFlash type I and II slots as well as PCMCIA type 2 and 3 slots. Providing a 128 byte send and 128 byte receive FIFO, with a 1.5MBaud serial interface to the BlueCore chip, the new ASIC ensures efficiency, reliability and utmost performance in the Bluetooth connections of new electronic devices.

## About Brain Boxes

Established in 1984, Brain Boxes is one of the leading PC communication card developers and manufacturers in the World. Headquartered in Liverpool, UK, it has a team of highly qualified software and hardware designers, matched by a world-class volume manufacturing facility.

The company develops and owns all of its own technology, including USB, CompactFlash, PCMCIA, and PCI products. It is at the forefront of developments in Bluetooth wireless technology since 1999 and is an Associate member of Bluetooth SIG.

Brain Boxes has achieved official approval of three Bluetooth communication cards and its own Bluetooth software stack.

Brain Boxes has been accredited to ISO9001 status since 1994 – covering the design, manufacture, and supply of its whole product range. This accreditation was upgraded to the new, more demanding ISO 9000:2000 standard in November 2001.

Brain Boxes are in the unique position of being a provider of a complete Bluetooth solution. Software development, hardware design, pre qualification testing, hardware manufacturing and technical support are all carried out from the same site. Full consultation facilities are available.

## **2. Brain Boxes Compact Flash card reference design**

### **2.1. Benefits:**

- ✂✂ Compact Flash card reference for CSR Bluecore02 single chip Bluetooth
- ✂✂ Glueless interface to BlueCore 01 and 02 chips. BlueCore power shut down. BlueCore auto reset power up
- ✂✂ Lowest part count, Lowest BOM cost. Shortest time to build.
- ✂✂ Rapid time to market.
- ✂✂ Glueless interface to Compact Flash and 16 bit PCMCIA bus. Designed for Compact Flash type 1 and type 2 slots and PCMCIA type 2 and type 3 slots.
- ✂✂ Design based on Bluetooth qualified products, proven design – IP accredited April 2001. Most widely accepted solution in the market place.
- ✂✂ Design works with Microsoft Windows CE.Net and forthcoming Windows XP Bluetooth stack. Consultancy available on achieving Microsoft Logo approval for products using this reference design.
- ✂✂ Full pre qualification test equipment facilities and consultancy available on achieving Bluetooth accreditation for products using this reference design. Brain Boxes can also offer “Design In” of the chip for embedded solutions. Hardware, software, and RF development expertise all in-house.
- ✂✂ No cost antenna integrated onto the PCB

### **2.2. ASIC Chip highlights:**

- ✂✂ Compact Flash 5v – 3.3v tolerant design.
- ✂✂ 128 Byte send and receive FIFOs.
- ✂✂ High speed serial interface to Bluecore chip – up to 1.5M Baud.
- ✂✂ Automatic hardware flow control.
- ✂✂ 48 pin TQFP package.

## Version History

| Version | Date       | Author | Checked By | Comments                              |
|---------|------------|--------|------------|---------------------------------------|
| 1.0     | 04/07/2002 | Owen   | Name       | First Draft                           |
| 1.1     | 08/07/2002 | Gav    |            | Reformat. Comments and clarifications |
| 1.2     | 08/07/2002 | Eamonn |            | Approved                              |