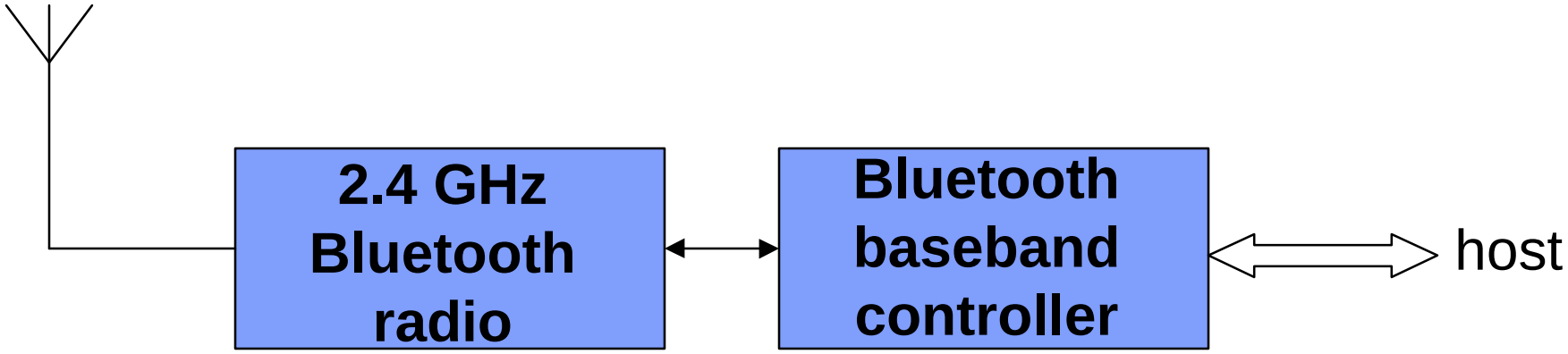
# ATMEL BLUETOOTH

- **Background information on Bluetooth technology**

- **Atmel implementation of Bluetooth spec**

# WHAT IS BLUETOOTH?

- "Bluetooth," promoted initially by Ericsson, IBM, Intel, Nokia and Toshiba, is the code name for an open specification for short-range wireless connectivity. The technology allows users to make effortless, instant connections between a wide range of communication devices. Atmel is a Special Interest Group (SIG) member of Bluetooth.




Bluetooth Device

# PROPOSED APPLICATIONS

- Telephones (cellular, cordless, other)
- Headsets
- Computers (Laptops, desktop, other)
- Computer peripherals (keyboard, mouse, PCMCIA cards, USB dongles, other)
- LAN peripherals
- PDA’s
- Digital cameras
- and … the only limitation is your imagination

# BLUETOOTH FEATURES

- Eliminates the need for numerous, often proprietary, cable attachments for connecting computers, mobile phones and other peripherals (Global Industry Standard)
- Bluetooth operates in a globally available frequency band (2.4GHz) ensuring communication compatibility worldwide
- It is based on a frequency hopping radio link for facilitating fast and secure transmissions of both voice and data (1600 hops/s)
- Supports both point-to-point and point-to-multi-point connections

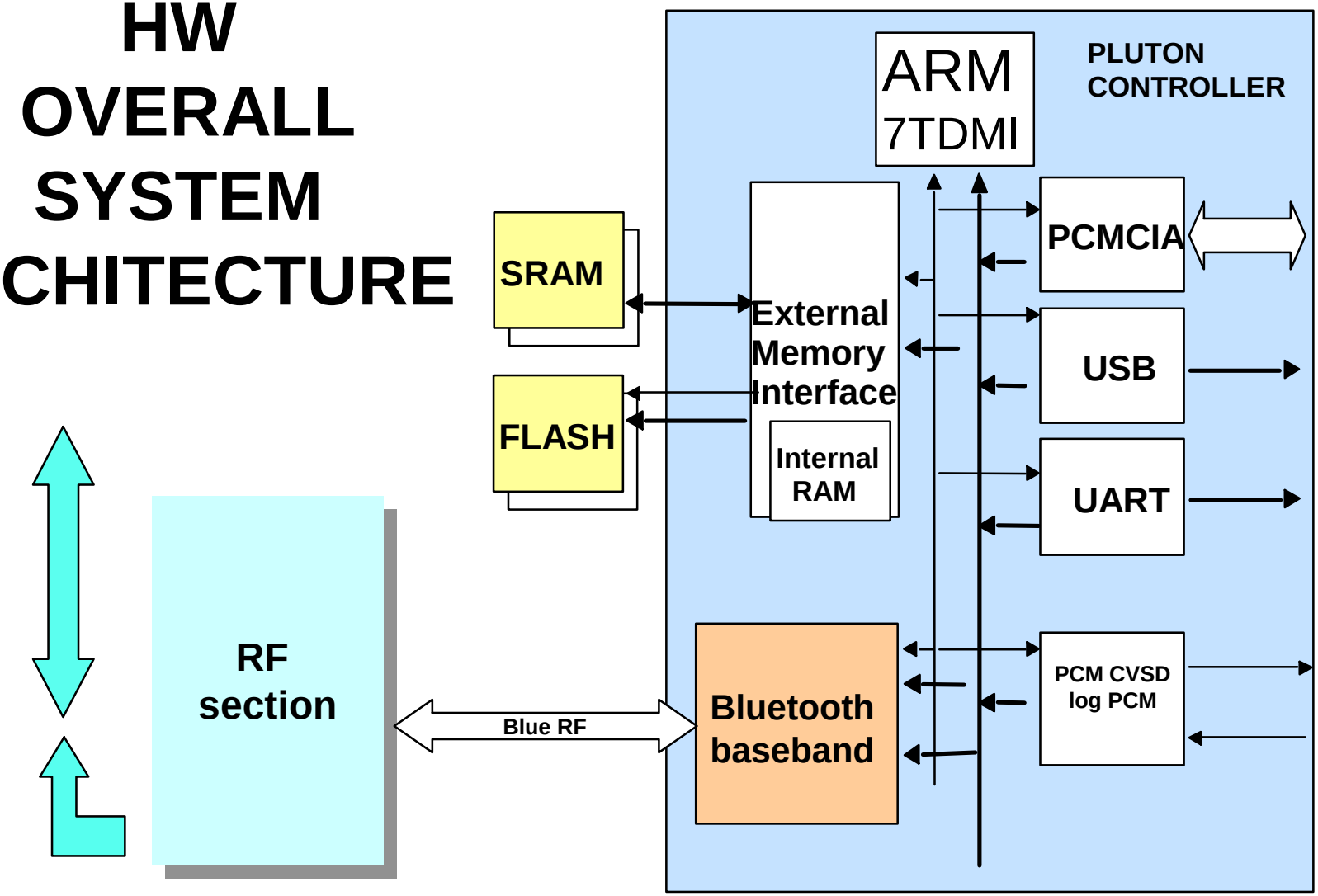
# BLUETOOTH FEATURES CONT'D

- Specification calls for a module with a range of 10m (32.8 ft.) and an option for 100m (328 ft.)
- Maximum data throughout is 1Mbps

# WHAT IS ATMEL DEVELOPING?

- Atmel's current solutions consist of a baseband controller designed by the Multimedia & Communications Group and a single-chip RF front-end from Silicon Wave.
- Integrated BGA packages containing baseband and Flash for embedded applications.
- All firmware up to HCI (Host Controller Interface), with the upper software stacks available through qualified third parties.
- Fully manufacturable reference designs that are capable of obtaining Bluetooth compliance certification and FCC/EU approvals.

# HW OVERALL SYSTEM ARCHITECTURE



# BLUETOOTH CONTROLLER

- **Single chip controller**
  - ARM7TDMI
  - Internal SRAM
  - Bluetooth Baseband low-level processing
  - Voice CODEC interface for log PCM or CVSD (Continuous Variable Slope Delta) Coding
- **Offers following interfaces (available in prototype version):**
  - PCMCIA (PC Card Standard-Feb. 1995) AT76C551 or AT76C552
  - USB Interface (USB standard version 1.1) AT76C551 or AT76C553
  - UART AT76C551 or AT76C554

# ARM PROCESSOR

- Configures and controls Bluetooth Baseband and interface modules of controller
- Allows implementation of high level protocols for Bluetooth and other supported interfaces
- Allows implementation of bridging functions between Bluetooth air interface and USB, UART and PCMCIA

Atmel offers a complete reference design including software/firmware up through HCI

# ARCHITECTURE (BASEBAND)

- Bluetooth packet type processing
- Bluetooth slot delimitation
- Two Frequency Hopping systems support
- Radio interface implemented
- Encryption Engine
- Authentication empowered by hardware

# ARCHITECTURE (INTERFACE)

- Dedicated USB hardware
  - Six endpoints supported, each with double buffered FIFOs
- Dedicated full programmable UART hardware
- Supports multiple reference clock frequencies
- All interfaces have 32-64 byte FIFOs for improved data buffering
- USB/PCMCIA have direct access to internal (external) SRAM for improved throughput

Atmel offers a complete reference design including software/firmware up through HCI

# BLUETOOTH QUALIFICATION

- Atmel's baseband controller is BQB certified. Atmel's BlueRunner is listed under 7-Layers as compliant with the Bluetooth spec. 1.1.
- Atmel's solution offers the best performance at a competitive cost based on the total BOM.
- Atmel's Bluetooth team combines high engineering expertise in RF design, digital design, NV Memory design and firmware development working closely together with the goal of providing an optimum total solution for our customers.
- Atmel supports point-to-point, point-to-multi-point and scatternet capabilities
- Atmel has a clear vision and product roadmap for a single chip solution. This roadmap includes both silicon process development and design infrastructure