

1 Introduction

The BlueT is an add-on device for the Palm500/505 that enables your PDA to communicate over Bluetooth with other Bluetooth devices.

The BlueT uses pre-qualified components to implement lower layers of the Bluetooth stack, that is the radio, baseband, link manager, HCI, L2CAP, SDP and RFCOMM. It supports the Bluetooth profiles GAP, SDAP, SPP and DUN. These profiles are implemented by Tactel as software running on the BlueT unit. Tactel also presents software running on the Palm, which enables the Palm to control mobile phone functions over the Bluetooth link.

2 Architecture

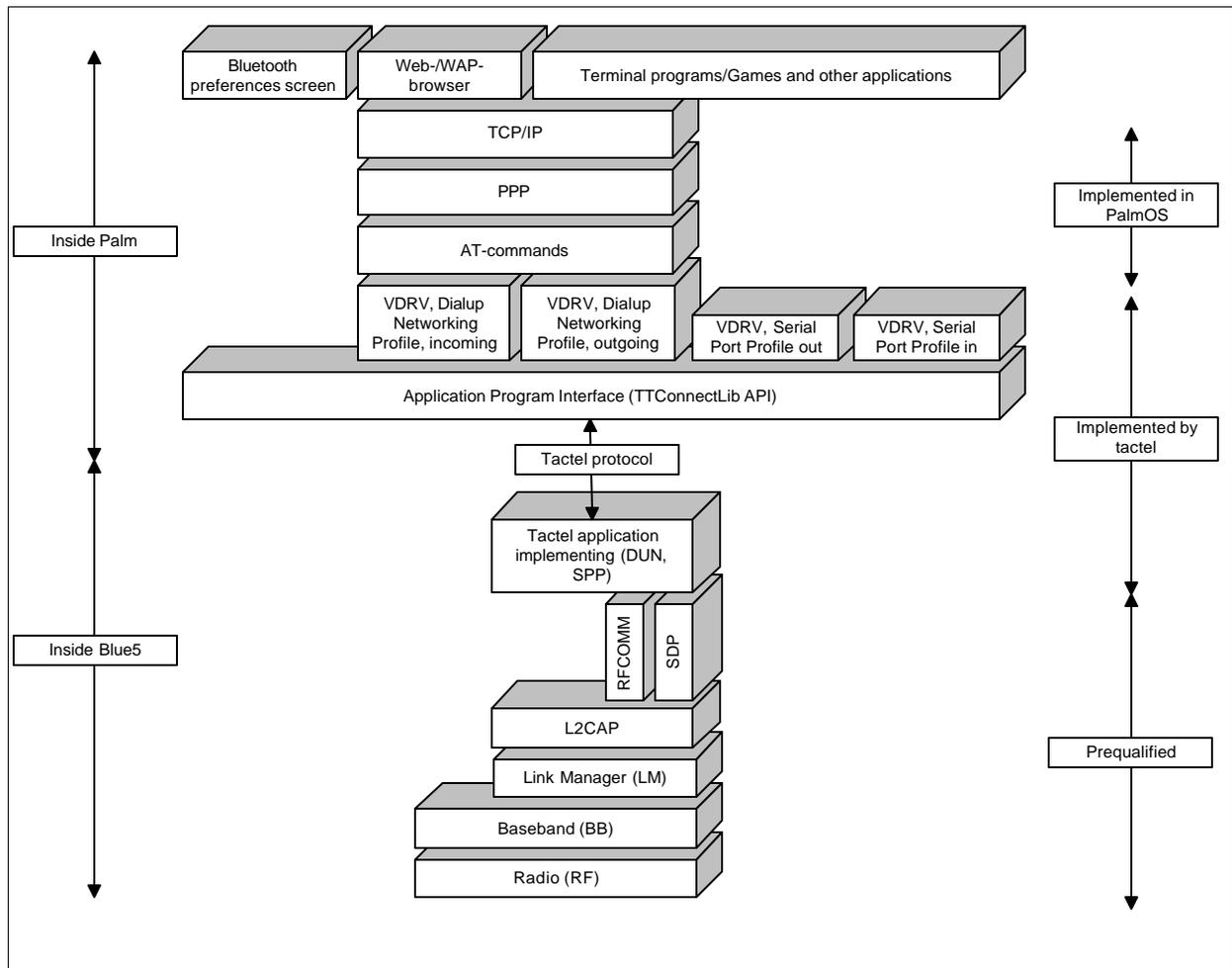


Figure 2-1 The architecture of the BlueT

2.1 Radio

The BlueT radio is implemented by the “Ericsson Bluetooth Radio ROK 101 002/1”. This component is a Bluetooth pre-qualified component.

2.2 Baseband and Link Manager

The BlueT baseband and Link Manager are implemented by the Bluetooth pre-qualified Ericsson component “IrmaB HCI R1A” (BB Controller: ROP 101 1112/C P5A and LM FW: P11A). This component is unchanged and the functionality of the BlueT for those layers is the same as for the Bluetooth pre-qualified component.

2.3 L2CAP, SDP and RFCOMM

The L2CAP, SDP and RFCOMM layers are implemented by the Bluetooth pre-qualified Ericsson component “Bluetooth HOST Stack CNX 901 184” compiled for the ARM7TDMI processor that is used inside the BlueT. The BlueT functionality of these layers is the same as for the Bluetooth pre-qualified component.

2.4 GAP, SDAP, SPP and DUN

As seen in figure 2-1 (page 4) there is a Tactel application inside the BlueT. This application implements the supported profiles GAP, SDAP, SPP and DUN. It also handles the communication protocol with the software inside the Palm. This protocol is a packet-based protocol developed at Tactel to be optimized for the special environment. The protocol supports multiplexing of data flowing from other Bluetooth devices and simultaneous control of Bluetooth links. This enables several RFCOMM Bluetooth connections between two devices and in future versions easy support for multipoint connections. The protocol is designed so that most critical Bluetooth functions are implemented inside the BlueT. The electrical interface is RS232 with ESD protected drivers ($\pm 15\text{KV}$ Human Body model, $\pm 15\text{KV}$ IEC1000-4-2 Air Discharge, $\pm 8\text{KV}$ IEC1000-4-2 Contact Discharge).

2.5 The applications inside the Palm

The software written by Tactel inside the Palm consists of three layers. The lowest layer is the TTConnectLib, which is a Palm OS library (see appendix-API reference for TTConnectLib section 2.6). This library allows other applications to take advantage of Bluetooth. The library implements the Tactel protocol and also handles multiplexing with several applications. The next layer is “virtual drivers”. The following “virtual drivers” are implemented:

Dialup networking, outgoing: This is used to establish a normal dial-up networking connection to a dial-up networking gateway.

Dialup networking, incoming: This is used to establish a dial-up networking connection to a dial-up networking gateway, when an incoming call is expected.

Serial Port Profile Out: This is used to establish a Serial port profile connection when (Role Device A).

Serial Port Profile In: This is used to wait for an incoming Serial Port Profile connection (Role Device B).

These “virtual drivers” uses the TTConnectLib to establish connections with other Bluetooth devices. The “virtual drivers” is a Palm OS 3.3 and later concept that enables existing applications, like dialup networking, to work with Bluetooth without modifications.

The third layer is the “Bluetooth preferences screen” which uses the TTConnectLib directly to search for other Bluetooth devices and configure the behavior (passkey mode, Bluetooth device address) of the virtual drivers.

3 Hardware Description

3.1 General Hardware Description

The hardware is based on Ericsson Bluetooth chipset. The main components are the Bluetooth Radio (U2, see section 3.5 Component Placement-Top and section 3.7 Bill of Material), the Baseband processor (U1) and flash memory (U3). A reset component (U12) is used for reset the Bluetooth components when needed.

The RS-232 Transceiver (U4) handles the connection to the Palm, i.e. translates the signal to meet the RS-232 standard.

The power supply to the device is taken from the Palm and is regulated to 2.8 and 3.0V, this is done by the Dual LDO (U11). The 2.8V is used to power the Bluetooth components (U1, U2 and U3) and the switch regulator (U9) which provides the necessary voltage for the Blue LED (D2). All other components are supplied with the 3.0V voltage.

The voltage is shut of when no RS232 signals are detected on the Palm connector (J1).

The antenna is integrated with the PCB (U8).