Operational Description

The AirNet Model BTS-4000 Broadband Transceiver System (BTS-4000) provides the radio transmission and reception functions of a wireless telecommunication system operating in the PCS1900 frequency band. The BTS is a high capacity base station incorporating the widely used GSM protocol. The BTS provides radio communication links to and from mobile subscribers and wireline (T1) connections to a base station controller or (BSC) which provides connections to the public switched telephone network via the mobile system controller (MSC).

The BTS consists of three primary components:

1) The Broadband Processor Unit (BPU) chassis, which provides control, status, and alarm functions, call processing functions, an interface for network (T1/E1) connections, RF channel baseband processing including RF channel combining (downlink path) and channelization (uplink path) between baseband signals and a composite wideband signal, DC power, and GPS functionality.
2) The Multi-Carrier High Power Amplifier (MCPA), which amplifies RF signals from the BPU.
3) The RF Filters/Duplexers

These components will be discussed in detail in the following section.

The main components of the BPU are a processor card which provides integrated CPU, FLASH and T1/E1 functionality, DSP cards which provide digital signal processing and broadband digital transceiver cards.

The data to transmitted by the BTS is first processed by the DSP cards. This processing creates a composite digital baseband signal. This baseband signal is sent to the broadband digital transceiver card. Here the signal is converted to an analog signal and upconverted to the appropriate transmit frequency. The signal consists of multiple GMSK modulated carriers within a 5 MHz bandwidth.

The output of the broadband digital transceiver is connected to an extremely linear multi-carrier high power amplifier. The MCPA amplifies the signal for transmission over the air. The output of the MCPA is connected to a duplex filter which combines the Rx and Tx signal into a single antenna port.

The signal received by the BTS at the antenna port is connected to the digital broadband transceiver. Here the signal is downconverted and digitized. This digital composite signal is channelized using digital filters and then sent to the DSP card to be processed for connection to the T1/E1 network.