Tune-up Procedure

The parameters for programming the transceiver synthesizes are stored in a file contained in flash memory on the BTS. This file is configured at the factory and the system user cannot change it. These parameters determine the receiver and transmit frequencies and their separation. The transceiver has a 5 MHz receiver and a 5 MHz transmit bandwidth at this base frequency. The parameters are downloaded to the flash non-volatile memory during BTS installation based on the frequency plan for that particular licensee. The BTS transceiver will automatically tune to these frequencies at power-up. This data, or list of tuning frequencies, is required in order for the base station to transmit; if lost or corrupted the system will not transmit. There is no user accessible way of retuning the BTS.

Means for Frequency Stabilization

The frequency reference for the BTS is an extremely stable 13 MHz signal supplied by the Rubidium Oscillator module. The 13 MHz signal is then used to phase lock a 91 MHz Voltage Controlled Crystal Oscillator or VCXO. The 91 MHz signal is then used by the transmit IF and RF synthesizes to produce the local oscillators required for the upconversion.

Means for Limiting Power

The dynamic range of the wideband digital signal coming to the transceiver from the DSP board is set in an initialization file that is automatically downloaded at system power-up. This value is chosen to give the maximum power out of the transceiver for the desired maximum number of carriers, while preventing the digital output from overflowing and thus clipping the signals. The base station controller has the capability, through software download, of changing the combiner gain value to yield a lower maximum power level out of the transceiver. The level can only be decreased, not increased. The granularity of the control is in 1 dB steps. There are no other methods for a system user to vary the power level.

Per the PCS-1900/850 Air Interface Specification, the system provides 15 levels of dynamic power control in steps of 2 dB each. This variable attenuation is used by the power control algorithm running on the digital signal processor boards to optimize the power level of the signal from the base station to the mobile handset. (Only use as much power as necessary to achieve an acceptable signal to noise ratio (SNR).) When a traffic channel is first turned on, it is at maximum attenuation, i.e., 30 dB below maximum power. The power control algorithm will then continually optimize this level based on the strength of the received mobile signal. This power adjustment mechanism is automatic and implemented in DSP software.

All high power amplifiers that will be used will shutdown if their input signal level is too high, if the VSWR at the output port is too high, if the output power is too high, or if a number of other error conditions occur. This ensures that the BTS will not transmit at power levels higher than authorized should a system equipment failure occur.