Operation Description:

Frequency Range:

GSM Band: TX 880.2 MHz to 914.8 MHz
RX 925.2 MHz to 959.8 MHz
DCS Band: TX 1710.2 MHz to 1784.8 MHz
TX 1805.2 MHz to 1879.8 MHz
PCS Band: TX 1850.2 MHz to 1909.8 MHz
RX 1930.2 MHz to 1989.8 MHz

Operation Description:

The MTI3100 (or Diana) will operate using the PCMCIA interface. This card is to be used in conjunction with a laptop to connect to any cellular network that supports GSM data, HSCSD, or GPRS (up to class 10).

The device will be controlled by using a standard set of AT commands as defined in the GSM specification. The MTI3100 will connect to the laptop using a terminal program or custom customer software. The serial connection in Windows will be setup using 115kbps, no parity, 8 data bits, 1 stop bit, and must use hardware flow control.

Circuitry Description:

Baseband:
The core processor used is a proprietary chip manufactured by Mobilink (ML2029B chip). This processor interfaces with the memory (Flash/SRAM) and contains all of the mixed signal processing used to connect with the RF. Also, the ML2029B chip will interface with the PCMCIA interface directly.

TX path:
The TX I and Q is generated in ML2029B and is used to modulate an IF VCO to produce a TX IF frequency of 424 MHz for GSM and DCS bands and 428 MHz for PCS bands. This IF frequency will feed a phase-detector that will compare with the mixed down frequency of the TX VCO. The TX VCO is then input directly into the PA module. Power is adjusted through measurement of the PA current and the output power is adjusted appropriately.

RX path:
The RX is run through a filter, and then input into an LNA. This LNA has a gain adjustment of 20dB and is used to reduce gain for strong input signals. The output of the LNA is input into another filter for reduction of the image. The output of the filter is fed into a mixer for conversion to an IF of 360MHz. This IF frequency is mixed again to I and Q and demodulated by the baseband.

Antenna and Ground System:

The antenna used will be provided with the PCMCIA card. It is a dual band antenna covering GSM and PCS bands in the US.

The ground system is simply devised of two layers in the PCB (layer 2 and layer 5) and will connect throughout the ground of the PCB with vias. This outer casing is stainless steel and through the use of gasket material will form a set of conductive walls that will connect the outer casing to the ground plane of the pcb. Thus the outer casing will be grounded. The system ground will be shared with the host laptop through the 68-pin PCMCIA connector.