EXHIBIT B

[FCC Ref. 2.1033(b)(4)]

"Description of Circuit Functions"

Exhibit B(1)-1 to B(1)-3 - Circuit Description
Exhibit B(2) - Statement of Digital Security Code

27936B CIRCUIT DESCRIPTION:

The following circuit description for model 27936B base on the circuit diagram and block diagram of 27936B.

*1. RADIO RECEIVING SECTION (**BASE**)*

a. LNA, mixer, LO and IF amp

The received frequency from ANT1 will pass through a band pass filter (F16). A low noise amplifier (Q18) will amplify this signal and will be mixed with 2nd LO(local oscillator) frequency derived from the second harmonics of the 1st LO. The mixer (Q23) will amplify the output signal which is the difference between the received frequency and the 2nd LO and will pass through a band pass filter (F18) . It will be mixed with the 1st LO signal to attain the IF(10.7Mhz) signal. This IF will be filtered further by CF1. The Filtered IF will be amplified inside the built-in LNA of the COMBO chip IC (U1) and filtered by F2 before demodulation. The LO frequency is generated by the PLL circuit of the combo IC and the VCO circuit (Q20). VCO frequency is programmed to U1 by MCU serial interface.

b. Demodulator, Expander, Audio Amp

The demodulated signal will be filtered by a low-pass filter to remove residual IF frequency. The filtered audio will pass through a built-in expander in U1 then amplified by a built in amplifier.

c. Final Audio amplifier, Hybrid, Relay

The audio output from the module will be amplified by the Final amp (Q7, Q9, Q8). This will also amplify the DTMF signal of the system before sending it to the PSTN. Hybrid provides isolation and a line match to the PSTN. This would also couples the audio to the network and provide the desired sidetone signal to the near-end party. Q13, and RL1 provide the line switch. This also provides the line break (flash) and Pulse dialing.

2. *RADIO TRANSMITTING SECTION (**BASE**)*

a. Compressor, Splatter, Modulator

The received line audio and side tone signal from the hybrid will go to the audio input of the combo chip. It will pass through a compressor. From the output of the compressor, it will go to the splatter circuit. The audio will then modulate the TXVCO(Transmit Voltage controlled Oscillator) frequency of the modulator (Q13) which is controlled by the PLL of the combo IC. By the same sense selection of frequency is performed by serial data from MCU to the combo IC.

b. Pre-amp, Final amp

The 3rd harmonics of the TXVCO frequency is extracted by pre-amp (Q11) and amplified by Q7. the Final Tx signal is then passed through a filter F15 to reduced unwanted harmonics. It is then transmitted through the antenna ANT2.

3. RADIO RECEIVING SECTION (HANDSET)

a. LNA, mixer, LO and IF amp

The received frequency from the antenna will pass through a band pass filter F16 . A low noise amplifier (Q18) will amplify this signal and will be mixed with 2nd LO(local oscillator) frequency derived from the second harmonics of the 1st LO. The mixer (Q23) will amplify the output signal which is the difference between the received frequency and the 2nd LO and will pass through a band pass Filter(F18) . It will be mixed with the 1st LO signal to attain the IF(10.7Mhz) signal. This IF will be filtered further t by CF1. The Filtered IF will be amplified inside the built-in LNA of the COMBO chip IC(U1) and filtered by F2 before demodulation. The LO frequency is generated by the PLL circuit of the combo IC and the VCO circuit (Q20). VCO frequency is programmed to U1 by MCU serial interface.

b. Demodulator, Expander, Audio Amp, Receiver

The demodulated signal will be filtered by a low-pass filter to remove residual IF frequency. The filtered audio will pass through a built-in expander in U1 then amplified by a built in amplifier and finally to the Receiver.

4.RADIO TRANSMITTING SECTION (HANDSET)

a. Compressor, Splatter, Modulator

The received line audio and side tone signal from the hybrid will go to the audio input of the Combo chip. It will pass through a compressor. From the output of the compressor, it will go to the splatter circuit. The audio will then modulate the TXVCO (Transmit Voltage controlled Oscillator) frequency of the modulator (Q13) which is controlled by the PLL of the combo IC. By the same sense selection of frequency is performed by serial data from MCU to the combo IC.

b. Pre-amp, Final amp
The 3rd harmonic of the TXVCO frequency is extracted by pre-amp (Q11) and amplified by Q7. The Final Tx signal is then passed through a filter F15 to reduced unwanted harmonics. It is then transmitted through the antenna ANT2.

5. TELEPHONE LINE INTERFACE

The Telephone line interface circuit is established by following sections:

a. Audio power amplifier

Q7, Q8 and Q9 are built as a power amplifier, according to high current output requirement of line interface.

b. Telephone line relay and isolation transformer

T4 is the line isolation transformer, both audio input and output are passing through this transformer. RL1 is the reed relay for line seize, which is controlled by Q13.

c. Ring-detect circuit

IC6A and IC6D are used as differential amplifier for picking up the ring signal, which input from two 20M resistors (R77 and R78) as an isolation from the telephone line.

d. Caller ID circuit

The CAS tone and the FSK signal are detected by IC5 TCC112, it has the interface with the base MCU IC3.

e. Extension in use

IC6-B and IC6-C form the comparator circuit for detection of the telephone line voltage. If the line voltage is less than or equal to 19V, it will be identified as extension in use. R183, R184 of both 10Mohm resistors are used as isolation from the line.

f. Hold release circuit

This circuit comprises of Q18, Q19, Q10, Q11. Optocoupler U5 provides isolation from line interface and is used to couple the hold-release signal to MCU when parallel phone is off-hook.

6. OTHER CIRCUIT:

a. DTMF generator:

DTMF signal is generated by MCU IC3 pin48 and after filtering it is coupled to amplifier Q7, Q8 & Q9 before transmitting to telephone line.

b. Speakerphone circuit:

Speakerphone circuit is implemented on a separated module interfacing with CN4 & CN5. The core of this module is the IC U1 that provides half-duplex speakerphone function. Level detectors, background noise monitor, amplifiers and attenuator control unit are built inside the IC. Volume control is also provided. For audio receive path, the output of speakerphone IC is connected to an audio power amplifier U3 on base main board to drive speaker. For audio transmit path, mic signal passes U1 and then transmitted to handset or telephone line.

c. Liquid crystal display (LCD):

Both handset and base unit have liquid crystal display. The LCD is driven by a die-bond LCD driver IC. Information to be displayed is sent to the driver from MCU via serial interface.