

 Leica Geosystems	SR20 V2.0 - Brief Theory of Operation	File:SR20-freq.doc
Prepared by: Tom Plesko	Document Purpose: Describe basic theory of operations of the SR20 V2.0 hardware, and basic frequency plan	Date of version: 25/02/2005

SR20 Theory of Operation

The SR20 GIS hand held receiver consists of a computer board, GPS receiver engine with its own antenna, and Bluetooth radio with its own antenna. User interface features include a 240x240 pixel, 16 grayscale display, and a 20 key keypad. The SR20 uses the GPS engine to acquire a position to within 1 meter of accuracy. The position is then processed by DSP software, which resides on the computer board. Data correction may optionally be received by the SR20 using the Bluetooth module, which allows the device to derive its position to sub-meter accuracy. Once the data is processed, the computer board hosts a variety of applications, and drivers, which allow the position data to be used, and displayed in a variety of ways. The device is capable of storing vast amounts of data onto a compact flash card, allowing for post-processing at a later time.

SR20 Frequency plan

The SR20 hosts a 12 channel L1 only GPS receiver. The module receives, and decodes standard GPS satellite data. The L1 band is centered at 1575.42 MHz. The GPS module RF & digital sections share a single 43.4775 MHz clock source. There is also a 32.768 KHz clock for the RTC on board

The computer board does not contain RF systems, though it does contain high speed digital components. The main source of clocking is a 20MHz XTAL, which is multiplied up to 30 MHz, and 240 MHz inside the CPU. The CPU core runs at 240 MHz, while the peripherals run at 30 MHz. A 32.768 KHz XTAL is used to clock the Real Time Clock. Finally a 14.74 MHz XTAL is used to clock a DUART RS232 communications chip.

The Bluetooth module is a Class 2 (~10 meter range) module, meaning it has a maximum output power of 4 dBm. The Bluetooth module utilizes a frequency hopping scheme, operating in the range of 2.4 GHz to 2.4835 GHz.