

Caterpillar
Experimental License Application

EXHIBIT 1

In this Exhibit, Caterpillar presents an explanation of the spectrum which is proposed to be used under this experimental license.

The Global Positioning System (GPS) currently broadcasts on two frequencies (1575.42 MHz and 1227.60 MHz). These are known as the L1 and L2 frequencies, respectively. A third frequency (1176.45 MHz), known as L5, has been approved for future use. Caterpillar requests an experimental license to broadcast signals at the L-1 frequency to be used by GPS receivers of current design to improve their navigation accuracy and reliability.

The existing GPS satellite signals are spread spectrum signals occupying a band 24 MHz wide centered on each of the above frequencies. The signal from each satellite occupies essentially the entire band. Signals from individual satellites are distinguished using Code Division Multiple Access (CDMA) techniques.

Caterpillar intends to experiment with signals identical to the existing GPS satellite signals, occupying the same bandwidth. Caterpillar also intends to experiment with signals slightly different than the existing GPS satellite signals, with the goal of minimizing interference with the satellite signals. Exhibit 2 describes these signals in detail.

Because the intent of this experiment is to broadcast signals identical or similar to the existing GPS satellite signals, Caterpillar requests an experimental license covering the same spectrum as those existing signals (i.e. 24 MHz centered on 1575.42 MHz).

In an experimental license application filed in spring 1999, file number 0097-EX-PL-1999, IntegriNautics Corporation applied for experimental use on the same spectrum, in conjunction with the same tests Caterpillar will be involved with. Attached as Attachment A to IntegriNautics application is information from the FAA regarding the project that led to the experiments with pseudolites. The current experiments will continue research into the uses of pseudolites for precision positioning of vehicles and other machines to preserve resources, save lives, and expand the utility of the GPS satellite constellation. This experiment will use only pulsed signals, and the power level proposed has been greatly reduced from the level authorized to IntegriNautics.