# Operational Description of Ground Penetrating Radar

An impulse ground penetrating radars (GPR) has been developed in the University of Houston. The impulse GPR is a device that is intentionally designed to directionally and locally radiate very small average electromagnetic power downwards into the ground to be detected. It does no harm to other communication devices. However, it needs FCC certificate before being applied to industry.

The developed GPR is composed of a pulse transmitter, a receiver, a transmitter antenna, a receiver antenna, and a laptop computer. Except the computer, all the components are installed in a plastic box. Once a 12VDC power is supplied, the GPR starts to work.
To facilitate the FCC testing (Part 15), the GPR working environment and parameters are described below.

When the air-coupled GPR is in work, it is always mounted on vehicle with its radiation direction towards the ground surface to transmit the microwave energy into ground. The parameters of the developed GPR are given below:

(1.) Dimension: $32 \times 26 \times 19$ $inch^3$;
(2.) Power supply: 12 VDC @ 370mA;
(3.) Center frequency: 900MHz;
(4.) Radiation pulse time duration: 1 ns
(5.) Radiation pulse P-P amplitude: 500mV;
(6.) Radiation repetition frequency: 25kHz