

## APPENDIX A: WebTech 5000 GPS Vehicle Operation

The WebTech 5000 unit can easily be assembled and ready for operation on a long-distance coach or school bus in less than 5 minutes from configuration to power-up to establishing a lock onto a satellite constellation. The GPS unit reports its position (lat./lon. coordinates) and speed (mph) every 30 seconds. The GPS unit uses a cell modem to communicate with AT&T cell towers to report the GPS locations. If the route happens to fall outside the area of cell tower coverage, the unit will store its records until line-of-sight communication is reestablished with the next available cell tower. Thus, a complete record of groundtrack locations will be transferred to the University of Texas Center for Space Research enterprise tracking server in the Texas Advanced Computing Center.

Vehicle tracking tests with GPS units that communicate through cell modem transmissions have been successfully conducted in many parts of the state, including along all major evacuation routes.

### Configuration and Initial Operation

The WebTech 5000 kit consists of four components: 1) a GPS receiver and cell modem with stub antenna for EDGE and GPRS communication via AT&T Mobility, 2) a GPS antenna (puck) with long cable, 3) a power/data cable assembly with 12v AC cigarette adapter for plugging into a 12v cigarette outlet, and 4) a 12v/12Ah battery with 12v AC cigarette receptor for use when the vehicle does not have a working 12v outlet.

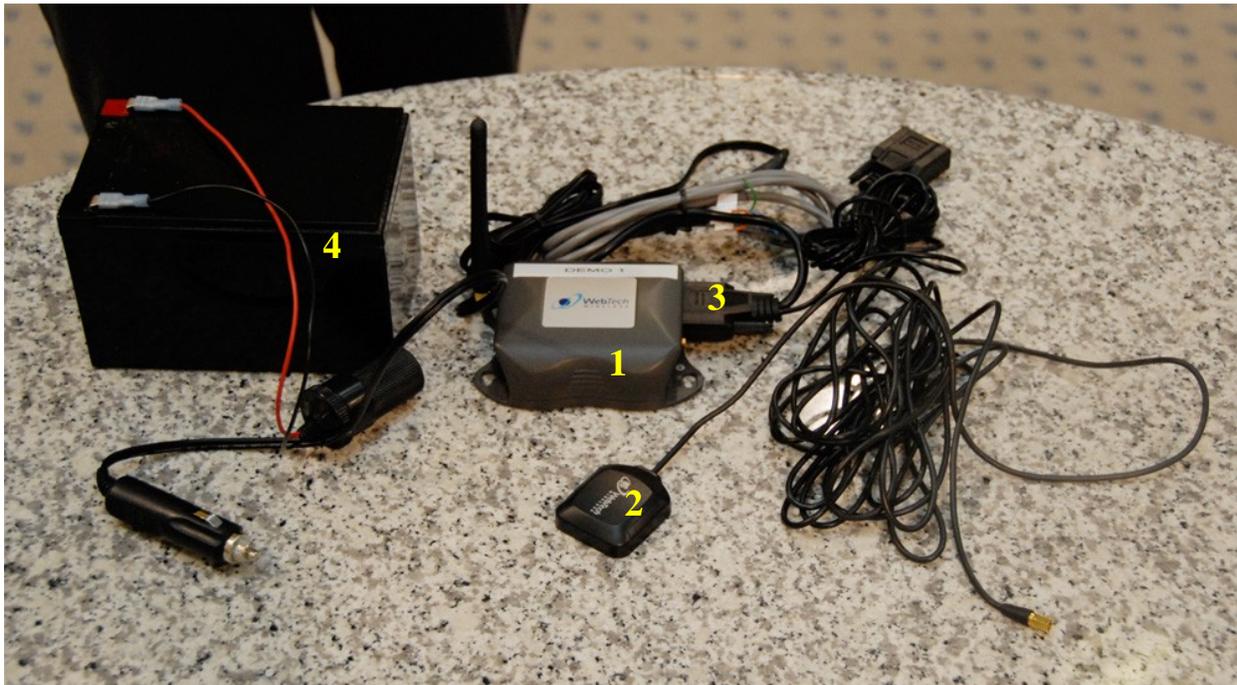


Figure 1. WebTech 5000 kit components.



Figure 2. Connecting the 12v/12Ah battery.

**Step 1.** With the ignition turned on, connect the 12v/12Ah power adapter to a working 12v outlet. [Note: If a functional 12v outlet cannot be located, connect the 12v/12Ah battery to the power/data cable assembly.] A red light will flash intermittently on the trailing edge of the GPS receiver/cell modem, when the unit is first connected. The light will remain solid red once the cell modem begins to transmit to a cell tower.



Figure 3. The indicator light on the GPS receiver/cell modem.

**Step 2.** Ensure that the GPS antenna cable is connected tightly to the receiver/modem assembly.



Figure 4. Check the connection of the GPS antenna to the receiver/cell modem assembly.



Figure 5. Place the GPS antenna puck in a flat, unobstructed area on the dashboard behind the windshield.

**Step 3.** Place the GPS antenna puck in a relatively flat location near the windshield, preferably in a forward area free from obstruction. The puck should lie as flat as possible. It is not necessary to place the antenna outside of the vehicle to obtain good reception. When the GPS receiver acquires a sufficient number of satellite signals to establish a reliable position, the receiver/modem indicator light will turn solid green.

**Step 4.** Place the receiver/modem assembly with extended stub antenna in an adjacent location near the windshield with the container (or bag) holding the battery and connectors on the floorboard in a forward area.



Figure 6. WebTech 5000 receiver/modem and GPS antenna resting on a dashboard behind the windshield.

**Step 5.** Once the components are properly situated and the LED light turns solid green, the unit is ready to track the vehicle. From power-up to GPS lock often takes less than 2 minutes. In rare circumstances, the system may require 4-6 minutes to establish an initial GPS location.

**Step 6.** When GPS telemetry is transmitted to a cell tower, the indicator light briefly flashes green (once approximately every 30 seconds). The preferred mode of operation is to keep the unit plugged into a 12v outlet. Each time the vehicle ignition is turned on or off, the unit sends a special signal that indicates its readiness. If power from the vehicle is unavailable, then the unit can remain attached to the battery for continuous operation for several days, if necessary. When stationary, the unit will report its position once every thirty minutes, so long as the GPS antenna remains attached. An internal battery in the receiver/modem assembly will continue to report static locations without the external 12v/12Ah battery so long as the GPS antenna is attached.

## LED Signals

### Uninterrupted Green Light

The locator has both a GPS position fix and GPRS/EDGE cell network coverage.

### Flashing Red Light

The locator has neither a GPS fix nor GPRS/EDGE cell service.

### Uninterrupted Red Light

The locator can communicate through the GPRS/EDGE cell network, but cannot establish a GPS position fix. [Try moving the unit to a different location.]

### Flashing Green Light

The locator has obtained a GPS position fix, but cannot establish GPRS/EDGE cell service. [Try moving the unit to a different location.]

### Momentarily Fluttering Green Light

The locator is transmitting its GPS position via the GPRS/EDGE cell network. [This will occur briefly every 30 seconds during normal operation, when cell towers are available.]

### Flashing Green and Orange Lights

The SIM card is not operating correctly. [Open the modem cover and try to reset the SIM card.]

### Flashing Red and Orange Lights

The SIM card is not operating correctly, and the unit cannot establish a GPS position fix.

