



By Al Pepling, LS

Al Pepling works for Monaloh Basin Engineers in Pittsburgh. He is licensed as a professional land surveyor in Pennsylvania, as a professional planner in New Jersey, and is a past president of the New Jersey Society of Professional Land Surveyors (NJSPLS).

Topcon HiPer Lite+ with TopSURV

This product has been on the market for quite awhile now and its acceptance by the land surveying community has been swift. Topcon's HiPer Lite+, or simply HiPer Lite+ for short, is an RTK GPS system that uses both the GPS and GLONASS satellite systems, user selectable of course, consisting of a base and a rover.

The FC-100 data collector is equipped with TopSURV software. The basic operating system is WinCE from Microsoft and file transfers; uploads and downloads are accomplished via MS Activesync. It can be as simple as drag and drop. Simple buttons operate the software.

The keyboard employs a touch-screen method. One very big improvement that TopSURV has over the standard Pocket PC or WinCE device is an enlarged keypad called "input panel", a feature that I'm sure will be quickly emulated in the industry.

Switching between ABC, abc, or 123 is easy just by tapping on one of those keys. The single sheet instructions reveal that it should withstand one-meter drops. So, do not play catch with it.

The FC-100 battery, housed on the bottom of the unit, is user replaceable and accessible by removing the cover. A flexible rubber gasket is embedded in the unit's housing to seal out contaminants. Of course there are hooks for a

tripod leg, and for a hand strap. The rear of the housing also contains a place for storage of the stylus when not in use.

The display screen is backlit and was quite readable in a variety of light conditions. It has 64MB RAM and an internal 64MB/a28MB flash disc. Speed in additive, especially in electronic data collection. This device has it! A 400 MHz Xscale PXA micro-processor running MS Windows CE.NET 4.2 is as they say, "on the inside". For techno-geeks like myself, this is the coming operating system. Most new pocket PCs and WinCE devices released in the last six months use the *.net software. Programs that do not upgrade will soon be out of date. It will operate from -4°F to

+122°F. The battery is lithium-ion at 2200mAh and 7.4 volts.

Operating time is 20 hours of "normal" use and 45 hours with no

display backlight or touch-screen use.

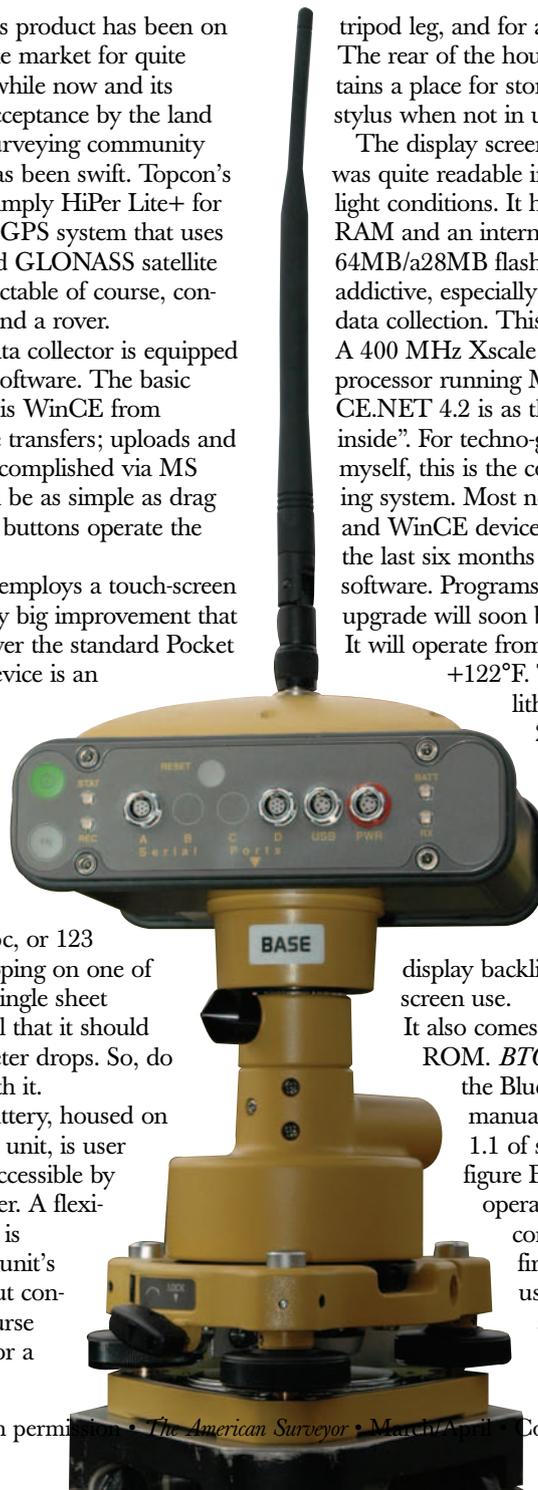
It also comes with a CD-ROM. *BTConf* contains the Bluetooth user's manual and version 1.1 of software to configure Bluetooth operation. *Floader* contains the firmware loader user manual and the firmware load-

ing software. Mission Planning includes *MPSSetup020917* which is the software to use for mission planning. A sample log is included to learn from before you go out and do your first job. *Modem-TPS* has a modem user's manual, some sample data files, and *Setup* version 7.10.12 to allow users to configure the HiPer's embedded radio modems. *PC-CDU Lite* contains the software for up loading and downloading and USB driver support software. *TPS2RIN* contains the RINEX conversion software. You get the complete package.

Attention to Details

It comes in a well-designed case that seems sturdy enough to "pound stakes" with it. The thermoplastic case has metal bands around the joint, making it much more robust than a totally plastic unit. Instead of the usual two hinges in the back, there is a "piano" hinge, known for longevity under rugged use. The handle and fasteners are metal, and four rubber feet cushion any jolts to the equipment when setting the case down on the floor.

Additional details show that the system was designed with the surveyor in mind. The units came with a charger for each one and included an alligator clip cable and an automotive-type extension for connection to an accessory or an automobile battery. There are cables for communication with the FC-100 for each unit so you can leave it plugged in and you can go with Bluetooth for cableless operation. Even better is the case has room for all the communication cables, charger cables, and chargers right along with the GPS receivers. It saves "overnighting" the chargers to the hurried field crew that left without them or losing some hours for a return trip to pick them up. (I speak from experience on this subject!)



My favorite part of the case design is that the unit pockets are designed such that you can charge them while they are in the case. This arrangement saves office space and offers more protection of the rover and base units. There is also a pocket for another nifty device, the 2-meter HI Pocket Tape (like a Keson) marked with metric measurements along one edge and standard measurements on the other.

A pocket-size, plasticized card contains all the information you need to get up and running as well as an explanation of the four LEDs. A similar sized, spring-bound booklet with twelve plasticized pages expands on the card with step-by-step instructions to get you up and running as well. If you still have some issue on start-up and need more detail,

the 87-page operator's manual is also included. It has plasticized covers, is spring bound, to lay flat when opened, and is printed on heavy paper stock to withstand repeated use. The instructions are expanded upon, well written and liberally illustrated. Pay particular attention to the icon for "NOTICE" and avoid wasting a call to tech support.

The receivers are about 6.5" square and have a "hefty" feel to them. They are not real heavy, nor are they feather light. The tribrach or pole mount thread is on the bottom and the radio antenna threads unto the top. Panels are on each end with one panel being blank and the other being the business end of the unit. It has an on-off key, a function key, and a reset key plus the



four LEDs to indicate status, records, battery, and reception information. There are four serial ports, a USB port, and a power port. This is known as the MINTER. MINTER is an acronym for the Minimum INTERface. You can operate the HiPer with these if you like. But like any GPS minimal control interface, a separate controller, like the FC-100, for example will increase your capability, productivity, flexibility, and enjoyment of your system and data collection efforts.

The antenna is noteworthy all by itself. The GPS+ units I had have an internal micro-strip antenna that handles both GPS and GLONASS L1/L2 signals. Communications between the base and rover use a rubber "whip" antenna that attaches via the modem antenna connector on the top of the unit. The modem "whip" has a joint that allows the antenna to be "bent" almost horizontally to the unit. There is even a port for connection to an external antenna.

Once charged, a blinking green light on the battery power LED allows you to monitor your unit's need for charging at a glance. Pages 4-20 and 4-21 of the manual explain the Zero Power Mode and you can turn off the blinking green LED. The "reset" button must be pushed and held for a second or so to shut down the Zero Power Mode so that you can charge the batteries again. Just remember to check them when you return to the office. If





you don't look at them until the next morning, you may have to charge them up on the way to the job or use the cable connected to the car battery. According to the manual, the batteries are non-removable.

I set up on the bank of the Allegheny River across from my home and started pushing buttons. My mistake! Saved by the reset button! Still doing my usual and avoiding the manual, I resorted to the TopSURV Quick Setup

Card and followed the step-by-step instructions. I should mention that I also had the Topcon FC-100 data collector. Bluetooth does work! I collected some points, by tapping the "accept" box. It was easy to see how someone could be a very productive "one man crew" with this setup. Let the base unit sit for the time you're collecting data with the rover and then post-process the base data to get good positions on your job site.

So, what you get from Topcon is a complete, capable, cost effective RTK package that really works, both literally and figuratively. If you've spent any time on surveyors' message boards, no doubt you've seen many positive comments on the HiPer Lite+ system. Check them out for yourself. Usually I recommend that you get your own demonstration and form your own opinion. This time I will say, read the message sites, talk to other users and jump on the band wagon! *As*