

# SPOT

## Your Motorcycle



**SPOT 2**  
Personal Tracker

By Walter Debus

Little did I know when I invented the SPOT Tracker in 2006 how well it would be accepted as a device for both emergency notification and recreational tracking. As Vice President of Engineering at Globalstar, Inc., I built the very first SPOT prototype and my motorcycles have been equipped with a tracking device of one form or another ever since. Hence, it is fair to say that while SPOT is now widely used in many different applications, it was first used as a motorcycle-tracking device.

Many in the long-distance motorcycling community have already integrated the SPOT into their ride. A few examples noted in the *Iron Butt Magazine* are: Bill Shaw's editorial "Connectivity" (Spring 2010) and how the SPOT tracker is being adopted by LD riders; Alan Rider's article "Pint-Sized Peace-of-Mind" (Summer 2010) where he writes about the versatility of the SPOT2; and Jason Jonas' excellent article "Secure Personal Location Management" (Fall 2010) on how he developed the SpotWalla program using available SPOT data.



**Prototype**

SPOT is ideal for sending out live location-based information while riding around town, the remote backcountry, or on a long, lonely road in Montana where cell phone coverage doesn't exist. Since its inception, SPOT has undergone changes in both its physical appearance and its functionality; the latest SPOT2 is a far cry from its infant prototype beginnings shown above. Although the initial SPOT1 device still works as designed, it is larger in size and has fewer features than the latest SPOT2. The adjacent chart compares the features of these two devices.

|    | <b>SPOT Satellite GPS Messenger™ (SPOT 2)</b>       |   | <b>SPOT Satellite Personal Tracker (SPOT 1)</b>     |
|---|---|---|---|
|  | Notifies emergency responders of your GPS location. |  | Notifies emergency responders of your GPS location. |
|  | Ask for Help or Request SPOT Assist.                |  | Ask for Help or Request SPOT Assist.                |
|  | Let contacts know you are OK.                       |  | Let contacts know you are OK.                       |
|  | Send a custom message                               |   | • Tracking  |
|   | • Improved GPS Sensitivity                          |   |   |
|   | • Improved Tracking                                 |   |   |

I am often asked how SPOT works and how it differs from a hand-held GPS unit. Let me first explain the primary features on the SPOT2.

### SOS:

Use this function in the event of a life threatening or other critical emergency to notify emergency services of your GPS location and that you need assistance. The GEOS International Emergency Response Center alerts the appropriate agencies worldwide — for example contacting 911 responders in North America and 112 responders in Europe. This button has the highest priority over all others buttons and transmits an SOS signal every five minutes until the unit is either turned off or the batteries die.



**HOW IT WORKS:** Once activated, SPOT will acquire its

exact coordinates from the GPS network, and send that location along with a distress message to the GEOS International Emergency Response Center every five minutes until cancelled or until the batteries are depleted. The Emergency Response Center notifies the appropriate emergency responders based on your GPS location and personal information—which may include local police, highway patrol, the Coast Guard, our country's embassy or consulate, or other emergency search and rescue teams—as well as notifying your emergency contacts about the receipt of a distress signal.

**IMPORTANT NOTE:** Even if SPOT cannot acquire its location from the GPS network it will still attempt to send a distress signal—without exact location—to GEOS, which will still notify your contacts of the signal and continue to monitor the network for further messages.

## HELP:

In the event of a non-life threatening emergency, this function notifies your personal contacts that you need assistance. Additional SPOT Assist services can be purchased and programmed to your Help button as well. When activated with SPOT Assist, the Help button will notify professional services such as a motorcycle equipped tow truck agent. This button has the second highest priority over all buttons except SOS. It transmits every five minutes for one hour or the unit is turned off.

**HOW IT WORKS:** Once activated, SPOT acquires your location from the GPS network and routes it along with the HELP message through the SPOT satellite network every five minutes for one hour or until cancelled. Your contacts will receive an SMS text message including coordinates, or an email with a link to Google Maps™ showing your location.

**IMPORTANT NOTE:** Even if SPOT cannot acquire its location from the GPS network it will still attempt to send a HELP message—without exact location—to your personal contacts.



## CHECK-IN/OK:

This feature lets your friends and family know that you are OK by a pre-programmed message you set up, along with your GPS location. The message is sent via email or SMS to up to 10 pre-determined contacts and your waypoint is stored in your account for later reference. Your stored waypoints can be easily integrated into a SPOT Shared Page or SPOT Adventure account. This button press transmits 3 times over a 20-minute interval or until the unit is turned off and is a great way to create a record of specific stops on a long ride for personal use. The OK button and the following Custom Message button will override each other and they both will override the below Track button.

**HOW IT WORKS:** Once you have activated your SPOT Messenger and set up your account, you can change your contacts and customize your message at any time. When you push the Check-in/OK button, you send one pre-programmed message to your contacts. Your contacts will receive an SMS text message including coordinates, or an email with a link to Google Maps™ showing your location.



## CUSTOM MESSAGE:

This feature sends a custom message, along with your GPS location, to your friends and family. This feature is used as a secondary OK message or you can transfer your personal help alert to this message function if you are using a SPOT Assist service on your Help button. This button has the same transmit sequence as the above OK button.

The Custom Message functions exactly like your Check-in/OK message. You can also have access to your waypoints in your SPOT account so you can review your route at a later date. Or link your SPOT account to SPOT Adventures and save a map of your adventures using your SPOT waypoints, and enhance the story with photos and a blog.

**HOW IT WORKS:** Once you have activated your SPOT



# WALTER DEBUS — The Man Behind SPOT

**AT THE TIME** SPOT was invented I was working as the Director of Engineering for a small company named Axonn. This company designed and manufactured tracking devices for commercial applications, which are typically large and not suited for carrying on a person.

Having worked on the design and manufacturing of very small covert surveillance devices in an earlier job, I recognized there was a need for an affordable, personal tracking device. Working with a lab technician, we constructed the very first prototype SPOT unit. Once this initial engineering model demonstrated the principle of a personal tracking device, the project took on a much larger scope and involved the entire engineering development group under my supervision, resulting in first the SPOT1 and then the SPOT2. Subsequently, Globalstar bought Axonn.

Over the last few years SPOT has received a number of awards and recognition, including from TIME Magazine, which named it as one of the 100 greatest and most influential gadgets invented since 1923—the year TIME started publishing. We are understandably proud of these achievements.



# SPOT Your Motorcycle

Messenger and set up your account, you can change your contacts and customize your message at any time. When you push the Check-in/OK button, you send one pre-programmed message to your contacts. Your contacts will receive an SMS text message including coordinates, or an email with a link to Google Maps™ showing your location.

## TRACK PROGRESS:

This function allows you to send and save your location and allow contacts to track your progress in near real time using Google Maps. With your SPOT account you have the ability to set up a SPOT Shared Page, which allows you to show your SPOT GPS locations to others on a Google Map. I use this feature a lot while riding my motorcycle and I save my trips using the SPOT Adventure feature. The track button transmits every 10 minutes for 24 hours. The 24-hour clock can be reset at any time during a tracking session by pressing the Track button again. All other button presses mentioned above will override the Track button. In the case of an OK or Custom Message button press, tracking will resume after the 20-minute OK or Custom Message transmit time.

## SYSTEM DESCRIPTION:

Two different satellite constellations are used; the government maintained GPS system and the privately owned Globalstar system. The GPS system consists of approximately 24 satellites that orbit 12,000 miles up in space. The Globalstar system consists of approximately 40 satellites, considered to be in Low Earth Orbit (LEO), that are 850 miles up in space.

When the OK button is pressed, for instance, the internal SPOT GPS receiver starts the acquisition process to locate at least 3 different GPS satellites (GPS frequency is 1575.42 MHz). Once acquisition has been obtained, the on-board SPOT microprocessor combines the GPS information with other internal information such as the type of button that was pressed. The combined signal is then modulated onto a Radio Frequency (RF) carrier and transmitted up to the Globalstar satellites that are in RF view of the SPOT unit. There



are two frequencies predominately used in the LEO band to transmit information up to the Globalstar constellation. In North America 1611.25 MHz is used and in all other countries 1616.25 MHz is used. (There are some exceptions such as in North America when the SPOT determines it is in the vicinity of a Radio Astronomy Site (RAS) it will automatically switch over to the 1616.25 MHz transmit frequency.)

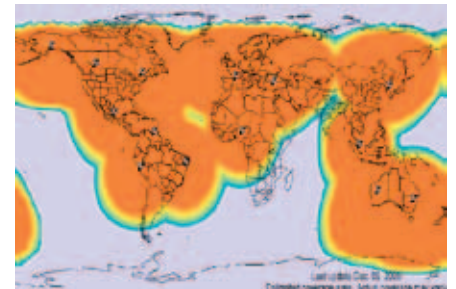
Once a Globalstar satellite has received the signal, it is amplified. The frequency is translated to a C-band frequency and is re-transmitted back down to one or more Globalstar earth stations. This type of satellite architecture is referred to as a bent pipe system. The term is derived from the fact that only RF analog functions are performed in the satellite — no digital processing is performed. The received earth station signal is then deciphered to determine what type of button was pushed on the SPOT unit and where to send the button information. All button presses, with the exception of the SOS, are sent to the SPOT user's designated friends, family, and/or social media.

The SOS button information is directed to the GEOS International Emergency Response Center. This Center cross-references the location of the SOS-activated SPOT unit with the closest emergency rescue service located around the world. A few examples of available rescue services are: U.S. Coast Guard, Canadian Mounted Police, Swiss Ski Patrol, Alaskan State Police, etc. Once the appropriate rescue service is determined, that service is given the location information of the person in distress and a rescue operation is initi-

ated. To date, over 1800 rescue operations worldwide have been performed as a result of SPOT usage.

The adjacent global map shows the location of the Globalstar earth stations that are spread around the world. Each station covers a geographical area with many overlapping areas. The current global areas not covered are the polar caps, the tip of South America, and portions of South Africa. There is also reduced coverage in India. However, with the exception of the polar caps, Globalstar has plans to establish more earth stations to eventually cover all global areas.

So, how does SPOT differ from a hand-held GPS device? In brief, a GPS device tells *you* where you are located,



whereas a SPOT device can tell the *world* where you are located.

The performance of SPOT is dependent on its placement and orientation. The ideal performance placement is in an open area with no overhanging obstacles and with the unit facing directly up at the sky. The three best performance rules-of-thumb are:

SPOT needs a clear view of the sky to obtain a GPS signal and provide the most accurate location information. It is not reliable indoors, in a cave, or in very dense woods.

Orient your unit so that the SPOT logo is facing up toward the sky, as the antenna is located under the logo.

Keep your SPOT at least 12 inches away from other GPS devices.

Although these guidelines are recommended for *optimal* performance, there are no absolutes for *good* performance. I often place a SPOT in my bike's fiberglass luggage compartment with the unit secured so that it remains pointing skyward and there are no metal objects on top of it. The performance is close

**Wild HOGs Ride - July 2011 - Jul 18, 2011**

**Adventure Story**

I and my two sons, Andy and Tucker, along with their close childhood friend Sean went on a 3-day Wild HOGs ride. The boys flew in from New Hampshire on Sunday. After landing and before we started riding on Monday I computed them in traditional New Orleans style by taking them to Bourbon Street. On Monday morning they rented Harley MC's, at which point we started riding with only a general idea as to where we would wind up. My goal was to see the Dix' corner of Louisiana, an area that I had not yet visited. This adventure page documents our travels with pictures attached at different points along our ride.

Rate this adventure: ☆☆☆☆

Adventure name: 82 (3 votes)

Share

to optimal. In addition, I often hang a SPOT vertically from my vest. In this position I typically receive 85% of all my tracking points, which is more than adequate to follow a breadcrumb trail from my trips. My suggestion is to experiment with different SPOT placement locations and mounting positions to see what works best for you.

I and a few other Iron Butt riders use the SPOT Adventures feature to document, with pictures and verse, our rides that we want to share with friends and preserve these rides in a permanent manner for future viewing. There are four social media methods with which you can share your LD motorcycle travels — Facebook, Twitter, YouTube, and Spot Adventures. I will use one of my rides entitled “Wild HOGs Ride” to explain the SPOT Adventure Feature. You can find this ride by going to the SPOT Adventures page and searching on the title.

A SPOT Adventure starts by putting the unit into the tracking mode. The 10-minute tracking data then appears on the user’s web account page. The data are stored in a 30-day revolving FIFO memory file (which means that data over 30 days old is lost). However, the SPOT Adventure feature allows the user to take the existing tracking data and build a permanent file of a trip. Easy-to-use site features provide a variety of ways to

enhance a LD motorcycle trip. Each user has a custom profile, which contains a live-feed on Google Maps™ for displaying route waypoints. Users can turn their waypoints into “Adventures” by uploading geo-tagged pictures and writing a trip blog or allow friends to comment on recent trips.

Each SPOT Adventure can be saved and archived for later reference as a personal online adventure diary. Integration of the latest social network tools allows users to instantly exchange information with other sites, including Facebook, Twitter, Digg, and Flickr. Shown at the bottom of my Wild Hogs Ride page, for instance, are the tagged pictures I took along the way. Viewing the pictures in the slide show mode advances the pictures and shows where each picture was taken (with the associated map pin being highlighted). Commentary was added to each picture to explain its location and make the trip routes come alive.

Ride safely — with the hope you never have to press the SOS button. 🏍️

*This is the first of three articles written by IBA member Walter Debus to explain how the SPOT tracking device may be of value to IBA members on their long distance rides. These articles will go into some technical detail for those riders who have an interest in how the SPOT tracking system works.*

**JCMOTORS.COM**

**Where Riders Get Deals**



**Find out how.**

**UP TO 53% OFF**

| BRIDGESTONE |             | METZELER     |             | PILOT ROAD 3 |             |
|-------------|-------------|--------------|-------------|--------------|-------------|
| BT-023      | Z8 INTERACT | PILOT ROAD 3 | FRONT PRICE | FRONT PRICE  | FRONT PRICE |
| 120/60ZR-17 | 89.86       | 120/60ZR-17  | 112.48      | 120/60ZR-17  | 123.64      |
| 120/70ZR-17 | 95.26       | 120/70ZR-18  | 112.48      | 120/70ZR-17  | 126.75      |
| 120/70ZR-18 | 95.86       | 120/70ZR-17  | 115.68      | 120/70ZR-18  | 128.51      |
| REAR PRICE  | REAR PRICE  | REAR PRICE   | REAR PRICE  | REAR PRICE   | REAR PRICE  |
| 150/70ZR-17 | 110.12      | 150/70ZR-17  | 134.96      | 150/70ZR-17  | 145.57      |
| 160/60ZR-17 | 110.12      | 160/60ZR-17  | 134.96      | 160/60ZR-17  | 154.13      |
| 180/55ZR-17 | 122.21      | 180/55ZR-17  | 148.50      | 180/55ZR-17  | 162.61      |
| 190/55ZR-17 | 138.40      | 190/55ZR-17  | 169.84      | 190/55ZR-17  | 182.94      |

**SIGN UP FOR MORE DEALS**  
JOIN RIDERSMIX AT JCMOTORS.COM

**HELMETS (SHOE)**

Schuberth, NOJAN

**FREE SHIPPING**

**GEAR**

FIRSTGEAR

**NO HASSLE RETURNS**

**ELECTRONICS**

SENA, GARMIN, SPOT

**LIFE RETURNS® - SEE JCMOTORS.COM FOR DETAILS**

**MAINTENANCE**

AG, EBC

**UP TO 25% OFF**

**SEE YOU AT THE IBA NATIONAL MEET**

**OVER 42,000 PRODUCTS ONLINE**

Some Brands Excluded from Discounts. See Website for Details  
**JCMOTORS.COM**  
**800.706.9476**

