**Summary of Iridium for Remote GPS Data Telemetry**

Iridium is a satellite communication system that allows users to place voice and data calls from remote locations anyplace in the world using a handset about the size of a cordless home phone. Calls can be made to POTS (plain old telephone system), cell phones, or other Iridium phones.

Internet access is also available through Iridium's ISP or other ISP's, using an L-Band Transceiver (LBT) at the remote site in place of the Iridium phone. An LBT provides an asynchronous data port and is fully Hayes compatible. This means that it can be treated as a standard phone modem.

Iridium access is available to non-DoD government users (i.e., NSF) at reduced rates through a Department of Defense (DoD) contract. The DoD has many security issues and as a result, not all connection options are available to NSF users.

For the purposes of this document, typical system configuration is assumed to be the following:

Remote Site
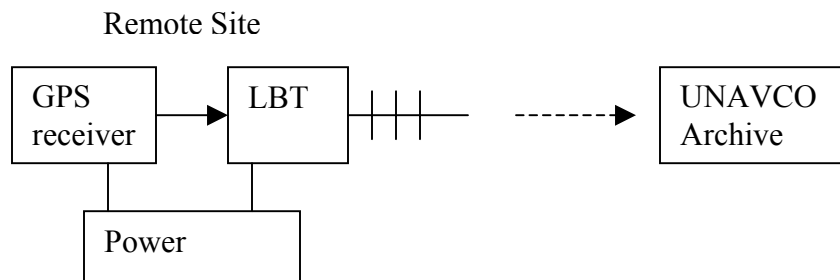
The GPS receiver is connected to the LBT via standard RS-232 connection.

LBT Vital Specifications:
NAL Research is the suggested supplier, and offers 2 models: 9500 and 9505. The 9505 has a more advanced set of AT commands and will support short-burst messaging when it is available from Iridium.

Supplier: NAL Research Corporation
Model: 9505
Bit rate: 2400 bps (~ 1.0 MB per hour)
Input Voltage: 3.6 – 6.5 VDC
Power Draw:
 During Connection: ~3.6 W
 Disconnected: ~0.37 W

During data transmission, LBT will draw ~3.6 W. While it is waiting to make a call, it will draw ~0.37 W. Detailed power plots can be provided on request.

Connection Configurations
Several connection configurations are possible. These are briefly outlined in the table below.

Local access type	Description	Issues	Cost
Internet	The internet is used as the medium of access. The local site communicates with the GPS receiver as if it were connected to the Internet.	Remote site must initiate connection. Therefore, something smarter than a GPS receiver is required, such as a PC-104. Adds complexity and power. Must conform to DoD's security policy.	More info is required
PSTN	A data call is initiated via modem over civilian PSTN from a local computer to the remote LBT.	Technically possible, but not an option for security reasons. Data calls can only be initiated from DoD PSTN network.	NA
Mobile	A data call is initiated via LBT from a local computer to the remote LBT.	Technically simple. Linux ppp service can be used. Currently being investigated by others in USAP	**Capital**: ~$3200 ~$1600 per LBT, including antenna and power supply **Recurring**: $250 per month

Open issues:
- Find out how to start NSF-approved service
- Short-burst messaging (connectionless, ~1,500 bytes per message) to be available soon from Iridium: email out to RPSC for contact at Iridium
- Get more complete info on Iridium Internet access

UNAVCO-specific issues
- Architecturally analogous to many UNAVCO installations. Can use experience from modem-modem links and Manila-Tagaytay Freewave link.
- Can a digi box be used somehow?

Useful notes and links:

L-Band modems, suggested supplier, others are available:
NAL Research Corporation
http://www.nalresearch.com

"Using an Iridium phone with GNU/Linux and PPP"
http://www.phys.unsw.edu.au/~mcba/iridiumLinux.html

In Denver, Raytheon Polar Svcs is setting up a test network consisting of two Cisco routers with an Iridium link between.