



# Experience with Iridium OpenPort in Greenland

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## ***Iridium OpenPort***



**Above Deck Unit (ADU)**

- ❑ No moving parts
- ❑ Height: 9.1 in (230 mm)
- ❑ Diameter: 22.5 in (570 mm)
- ❑ Weight: 24.3 lb (11 kg)
- ❑ Single CAT-5 cable POE



**Below Deck Unit (BDU)**

- ❑ IP-based 9.6 – 128 kbps
- ❑ Per megabyte pricing
- ❑ Ethernet port
- ❑ 3 independent RJ11 phone jacks simultaneous w/ data
- ❑ 7.8 x 9.8 x 2.2 inches
- ❑ 3 lbs (1.35 kg)
- ❑ 120/220 V, 50-60 Hz

## ***Greenland Inland Traverse***

- ❑ **OpenPort mounted on roof of Tucker Sno-Cat**
- ❑ **Replaces Inmarsat BGAN used in 2008**
  - **Needed pointing to geostationary satellite each night**
  - **Inmarsat broadband satellite constellation move causes loss of coverage in large portions of Greenland**
- ❑ **Use on-the-move; omnidirectional**
- ❑ **IP-based; easy interface**
- ❑ **Next deployment to Baffin Island, Canada, in May '09**



## Enhanced Bandwidth

- Utilizes adjacent channels with enhanced modem
  - 16 channels provide 128 kbps; 8 channels provide 64 kbps
  - Modulation efficiency of 3.33 compared to bonded modems
  - 9.6 kbps is minimum data rate

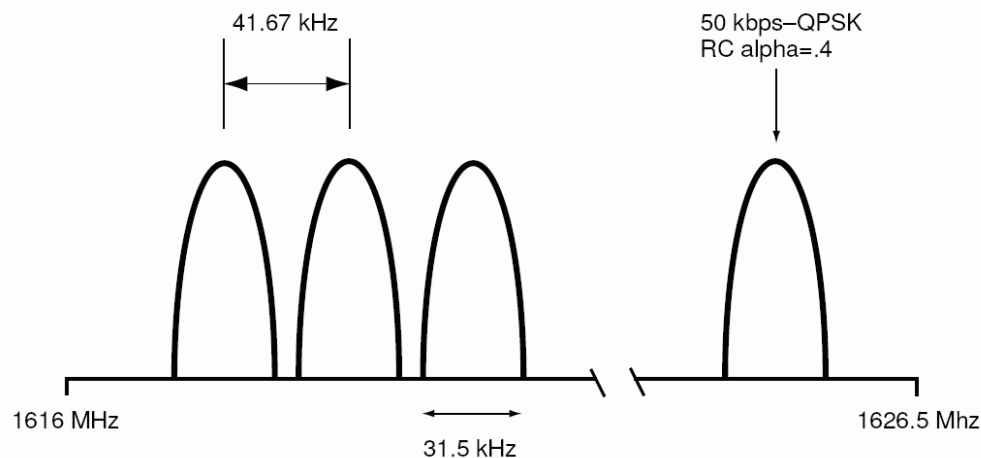


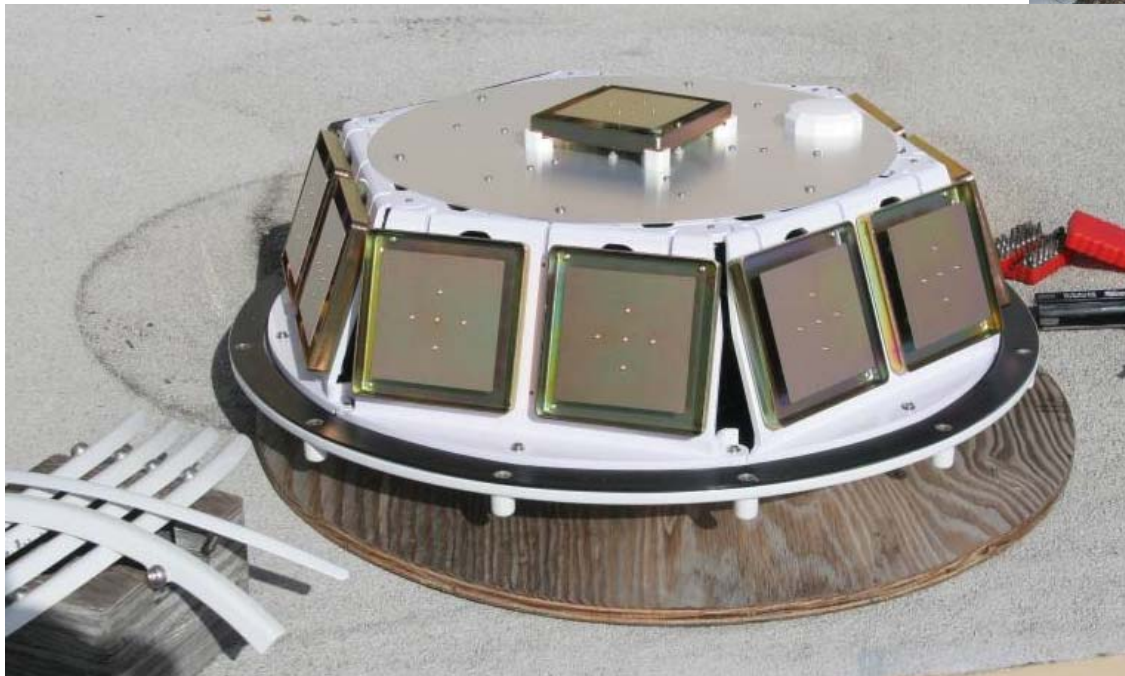
Figure 2-6 FDMA Frequency Plan

Table 1-1 Sub-Band Frequency Allocation

| Sub-band | Lower Edge (MHz) | Upper Edge (MHz) |
|----------|------------------|------------------|
| 1        | 1616.000000      | 1616.333333      |
| 2        | 1616.333333      | 1616.666667      |
| 3        | 1616.666667      | 1617.000000      |
| 4        | 1617.000000      | 1617.333333      |
| 5        | 1617.333333      | 1617.666667      |
| 6        | 1617.666667      | 1618.000000      |
| 7        | 1618.000000      | 1618.333333      |
| 8        | 1618.333333      | 1618.666667      |
| 9        | 1618.666667      | 1619.000000      |
| 10       | 1619.000000      | 1619.333333      |
| 11       | 1619.333333      | 1619.666667      |
| 12       | 1619.666667      | 1620.000000      |
| 13       | 1620.000000      | 1620.333333      |
| 14       | 1620.333333      | 1620.666667      |
| 15       | 1620.666667      | 1621.000000      |
| 16       | 1621.000000      | 1621.333333      |
| 17       | 1621.333333      | 1621.666667      |
| 18       | 1621.666667      | 1622.000000      |
| 19       | 1622.000000      | 1622.333333      |
| 20       | 1622.333333      | 1622.666667      |
| 21       | 1622.666667      | 1623.000000      |
| 22       | 1623.000000      | 1623.333333      |
| 23       | 1623.333333      | 1623.666667      |
| 24       | 1623.666667      | 1624.000000      |
| 25       | 1624.000000      | 1624.333333      |
| 26       | 1624.333333      | 1624.666667      |
| 27       | 1624.666667      | 1625.000000      |
| 28       | 1625.000000      | 1625.333333      |
| 29       | 1625.333333      | 1625.666667      |
| 30       | 1625.666667      | 1626.000000      |

## ***Above Deck Equipment (ADE)***

- ❑ 13 Iridium antenna
- ❑ Antenna combiner and logic under modular cover
- ❑ GPS antenna





# User Interface

- Simple DHCP network setting
  - Specific IP addresses can be set manually

status

**LEDs**

|                                      |                                       |                                      |                                      |                                      |                                      |                                      |                                      |
|--------------------------------------|---------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Power                                | Status                                | Signal                               | GPS                                  | Data                                 | Handset 1                            | Handset 2                            | Handset 3                            |
| <span style="color: green;">●</span> | <span style="color: orange;">●</span> | <span style="color: green;">●</span> | <span style="color: green;">●</span> | <span style="color: green;">●</span> | <span style="color: green;">●</span> | <span style="color: green;">●</span> | <span style="color: green;">●</span> |

**Signal Strength**

Signal Strength ▬▬▬▬

**SIM**

Installed: yes  
Errors: no

**GPS**

Status: GPS SPS mode, fix valid  
Latitude: 37.27.281  
Longitude: -122.10.563

**Satellite Connection**

Connected: False  
Access denial cause: none

**Voice Lines**

| Type       | Number       | Voice Mail |
|------------|--------------|------------|
| #1 Normal  | 881677705495 | no         |
| #2 Normal  | 881677705496 | no         |
| #3 Captain | 881677705497 | no         |

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iridium

01/02/09 03:32:33 guest Sign In

counters

**Voice Calls**

|                           |          |
|---------------------------|----------|
| Total calls               | 3        |
| Calls in progress         | 0        |
| Line 1 last call duration | 00:00:09 |
| Line 2 last call duration | 00:00:00 |
| Line 3 last call duration | 00:00:04 |
| Total call duration       | 00:00:23 |
| Average call duration     | 00:00:07 |

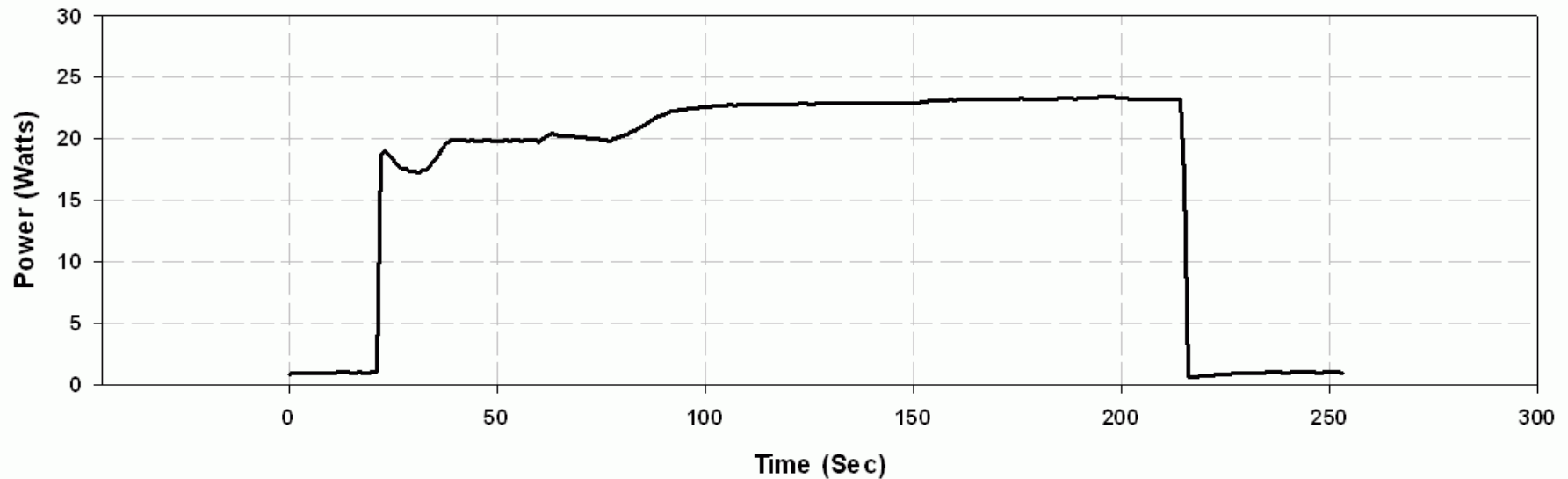
**Data**

|                      |       |
|----------------------|-------|
| Session established  | False |
| MB Received          | 0     |
| KB Received          | 0     |
| B Received           | 870   |
| MB Transmitted       | 0     |
| KB Transmitted       | 0     |
| B Transmitted        | 725   |
| Total MB Received    | 0     |
| Total KB Received    | 283   |
| Total B Received     | 295   |
| Total MB Transmitted | 0     |
| Total KB Transmitted | 74    |
| Total B Transmitted  | 349   |

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## 103 kB FTP Upload Power Profile

- ❑ 50-60 second startup period
- ❑ 20 Watt quiescent power (AC)
- ❑ 23 Watt peak power (AC)
- ❑ 103,101 Byte JPEG image
  - 223 seconds total
  - FTP transfer in 51.92 seconds => 1.99 kBps (32 kbps service)
- ❑ 1.17 Watt-hours (4.32 Wh for 1.05 MB file)

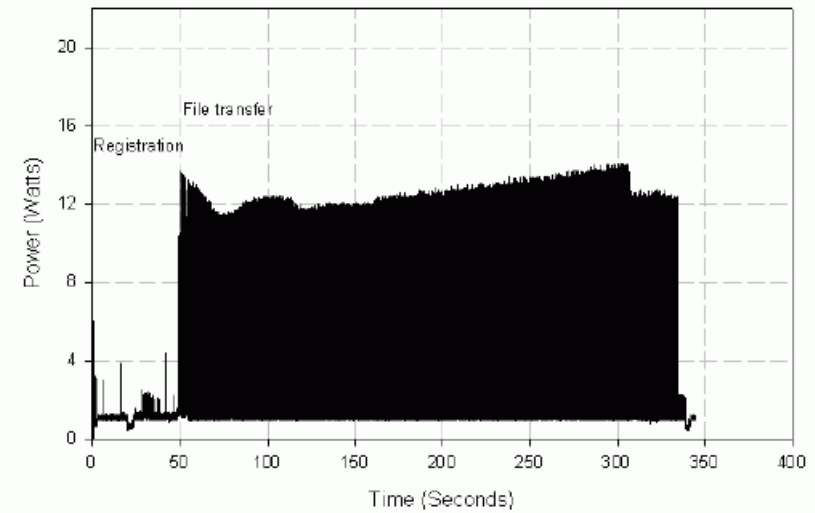


# Communications Equipment Energy Consumption

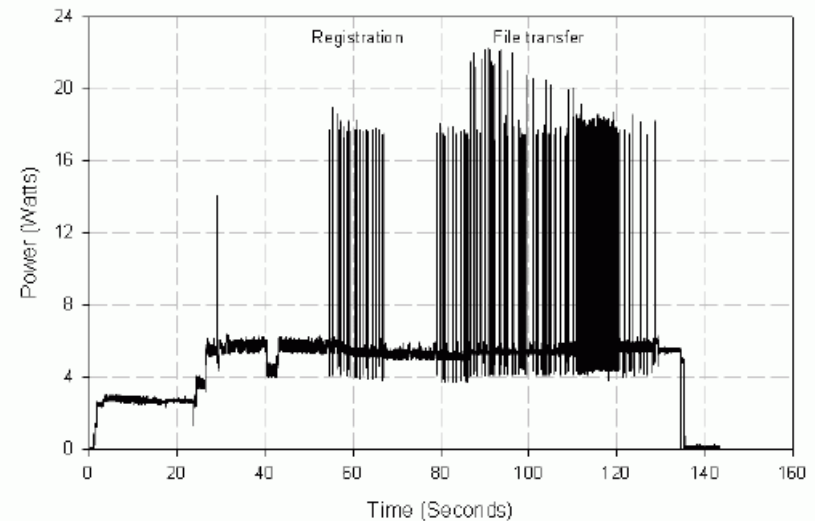


**103 kB FTP file transfer**

**Iridium 9505**  
**0.461 W-hr**  
**340 sec**



**Nera WorldPro 1000**  
**0.214 W-hr**  
**134 sec**

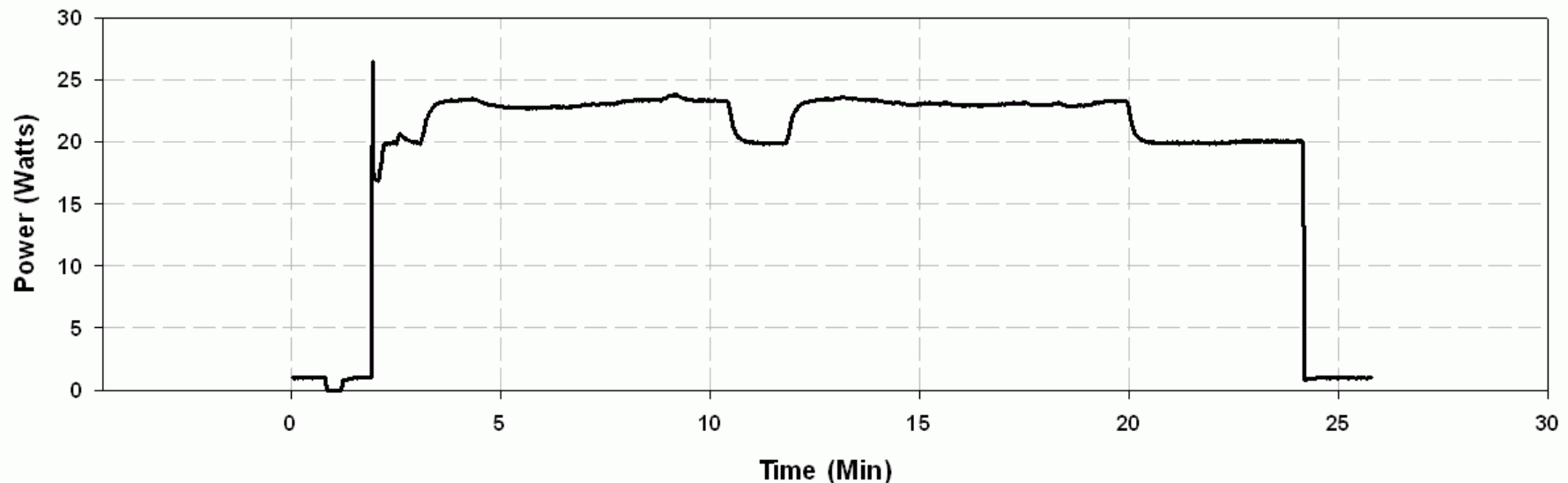


High power, high speed communications systems can use less total energy



## ***OpenPort Transmits “Keep Alive”***

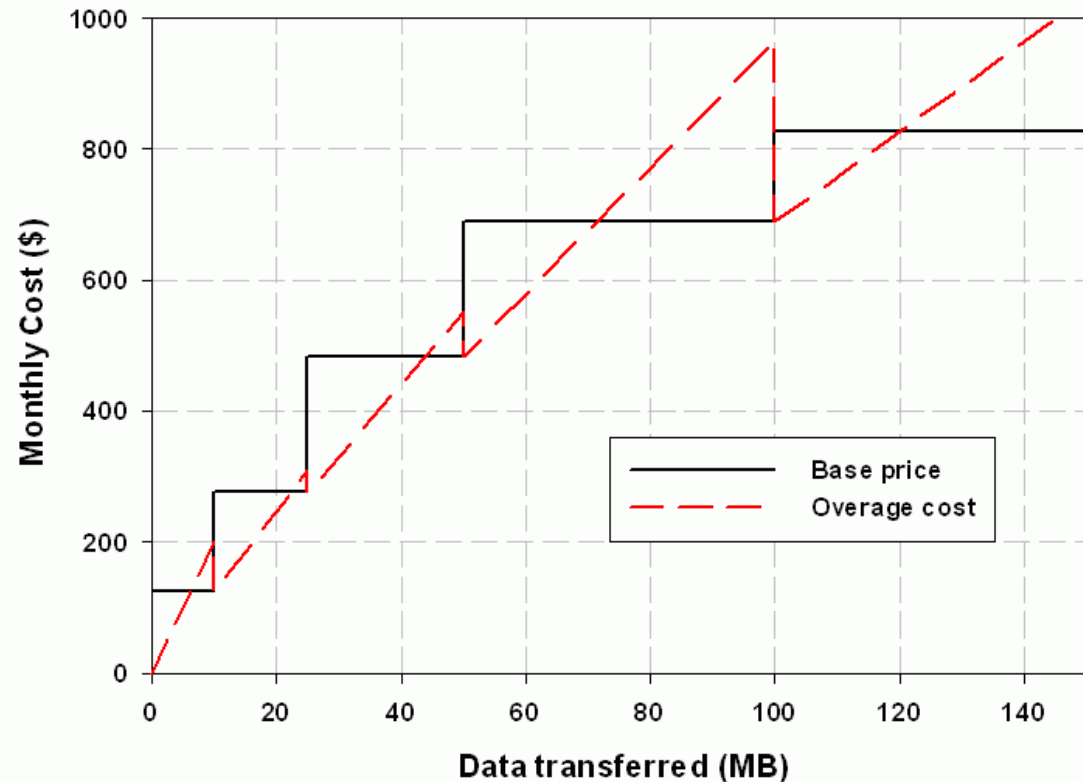
- ❑ Unit goes into higher power state to stay registered with the Iridium system
- ❑ Unit will “sign off” from system and need reacquisition after a time out
  - Web browsing: Resubmit page request
  - Automated transfers would get loss of connection info
  - Requires > 4 pings before reconnecting
  - Ping time averages 800 – 1000 ms



## Monthly Costs

- ❑ Included MB + Overage cost
- ❑ Plans changes possible each month
- ❑ No DOD Agreements

Hardware Cost  
\$4,477



## ***Iridium 9555 Satphone***

- ❑ **Newest model**
- ❑ **Made in Malaysia**
- ❑ **Weak construction in extendable antenna**
- ❑ **“Mickey Mouse” external antenna adapter**
- ❑ **Speakerphone**
- ❑ **USB interface**

