INTERFERENCE

New Threats and New Solutions

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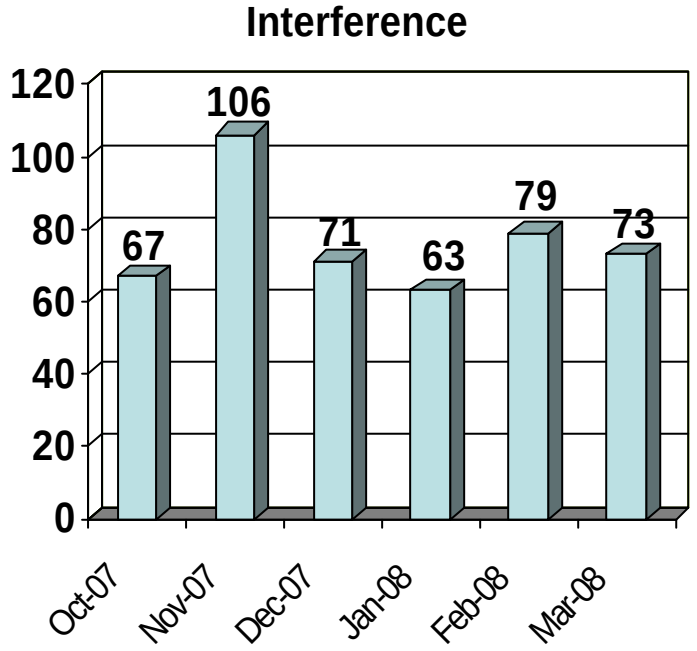
INTERFERENCE

Come in all sizes and shapes

- 459 in the past 6 months
- Steady
- Sweeping
- Bursting
- Narrow or broadband span
- Even very low level interference can be very disruptive



THREATS

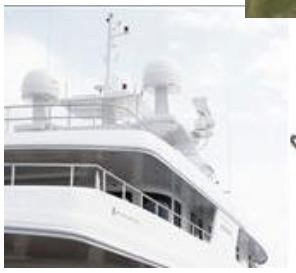
Current

- VSATs
- SNG trucks
- Radar
- Military activity
- Human error
- Equipment malfunction

THREATS

Emerging

- Mobility (ships/planes)
- Automation
- Wi-Fi
- New military activity
- Less savvy RF operators
- Pressure of lower and lower cost equipment



TOOLS

Current

- Spectrum analyzers
- TLS
- FM demodulators

Emerging

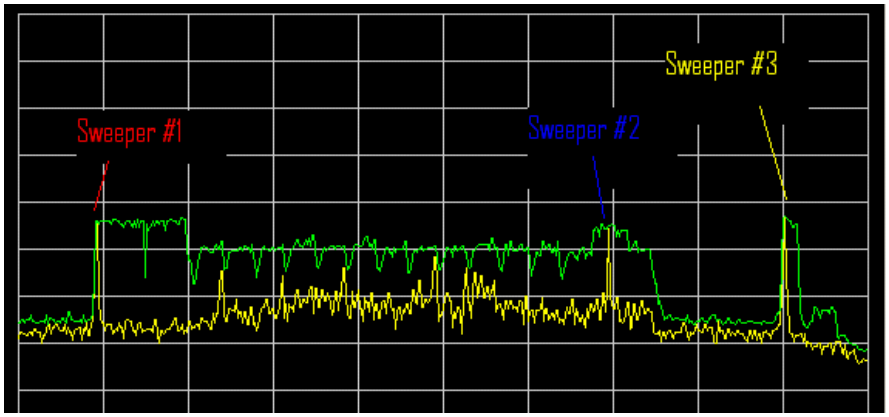
- Digital Signal Processing (DSP)
- Glowlink and other geo-locator (case study to follow)
- Signal UNder CARrier (SUNCAR) detection
- Mass amounts of storage

EMERGING TECHNIQUES

- Changing (VSAT) network configuration and correlating to interference (case study follows - TSSM)
- Storing many hours of continuous spectrum plots and using software to detect changes
- Correlating signature of interference with vendor model of equipment
- Collaboration between different satellite operators, customers, FCC, and military (case study)

CASE STUDY #1

TSSM

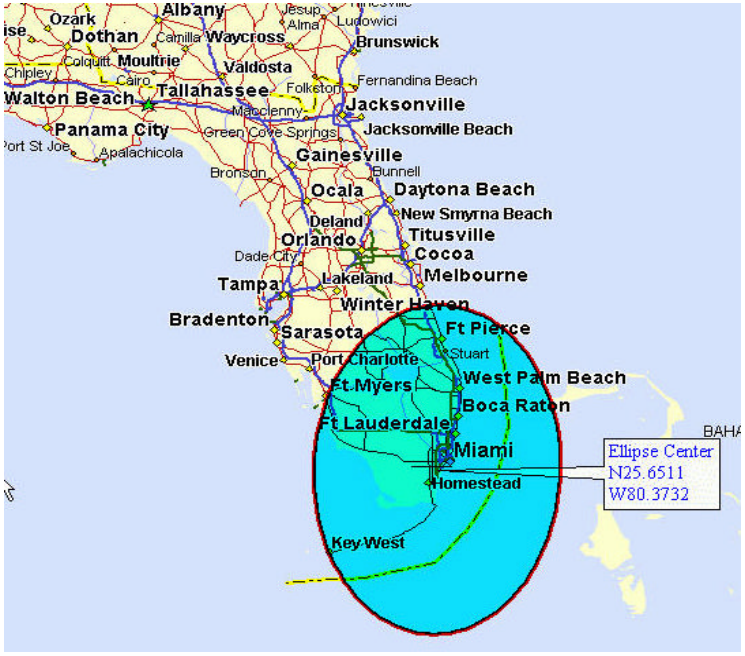


- **Financial VSAT network in Africa**
- **Characterized sweepers**
- **ID them to manufacturer's equipment**
- **Disabled hub carrier transmit**
  - Forced in-routes to cease data stream bursts
  - RFI reacted by not frequency hopping
- **Continued cooperation with equipment vendors to isolate causes is key.**
  - The impact of temperature change, aging equipment, etc.

CASE STUDY #2

Errant Broadcaster

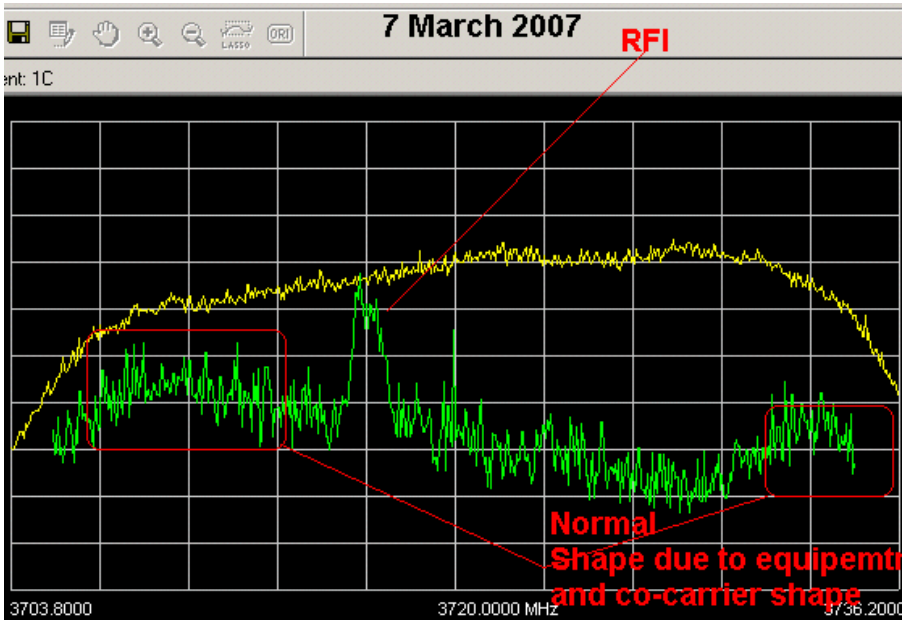
- Interference on G26
- Geolocation utilized
- Geolocation ellipse over Miami, FL.
  - SNG trucks covering Anna Nicole
- Source: Equipment fault in SNG truck



CASE STUDY #3

AOR Arc Interference

- Interference at 3714 MHz
- Across AOR satellites from 72°W to 139°W
- DSP – SUNCAR Detection Utilized
- Collaboration efforts by US military, FCC, and other satellite providers



WHAT'S NEXT

- **Carrier ID**
- **Network Diagnostics Improvements**
  - Capability to shut down sites
  - Capability to detect bad hardware
- **Geolocation Advances**