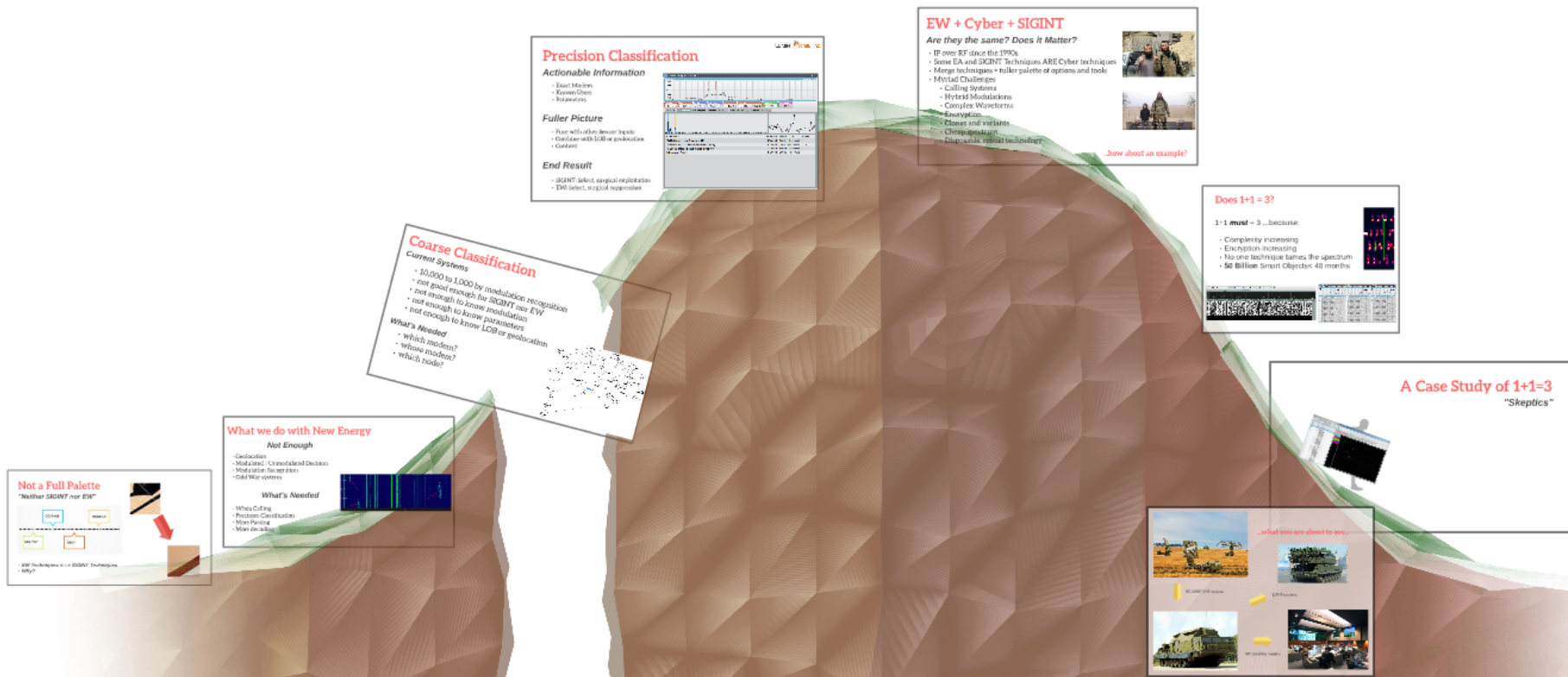
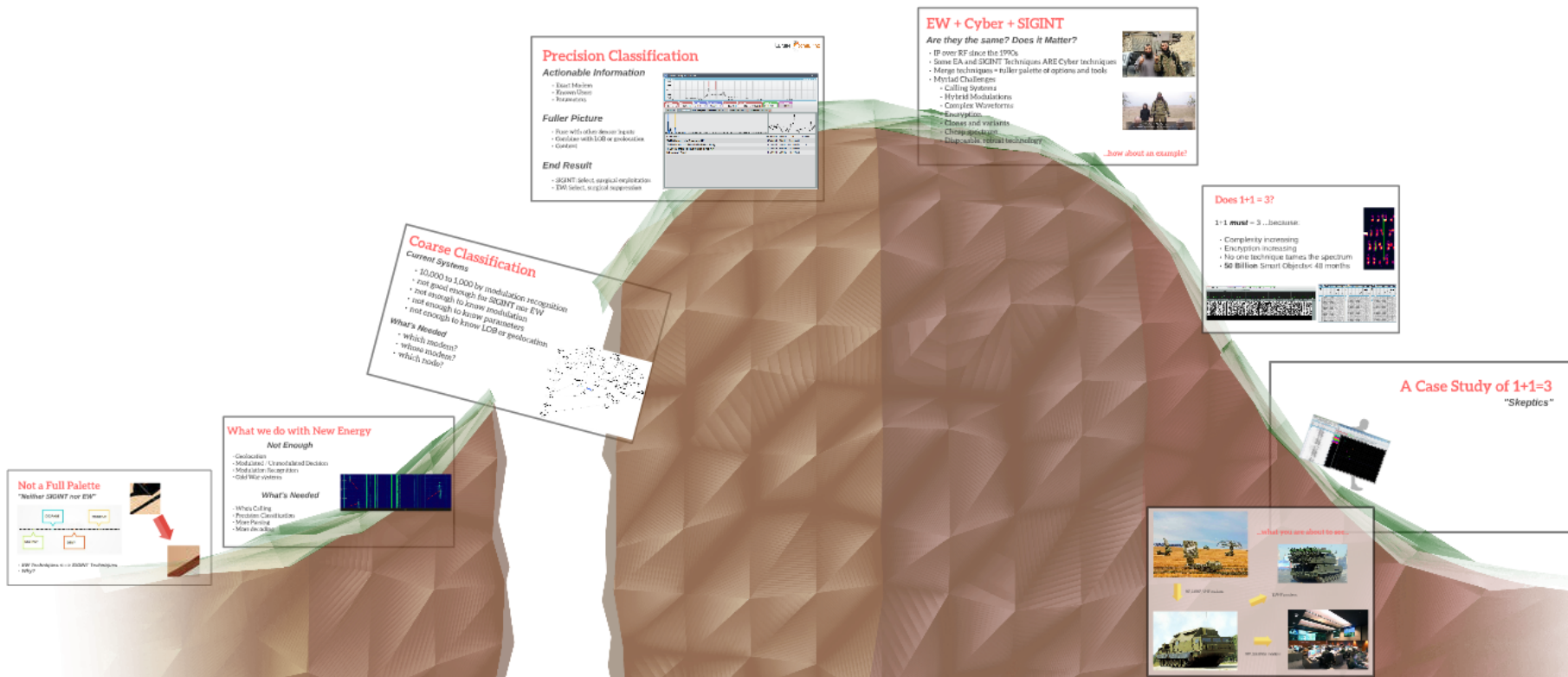


1+1 = 3 The Role of SIGINT in Modern EW

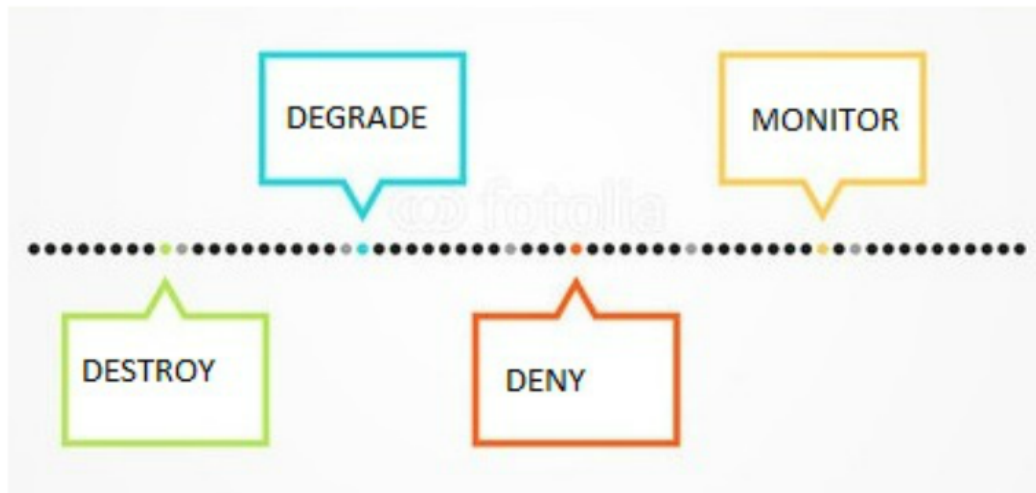


1+1 = 3 The Role of SIGINT in Modern EW



Not a Full Palette

"Neither SIGINT nor EW"



- *EW Techniques <---> SIGINT Techniques*
- *Why?*



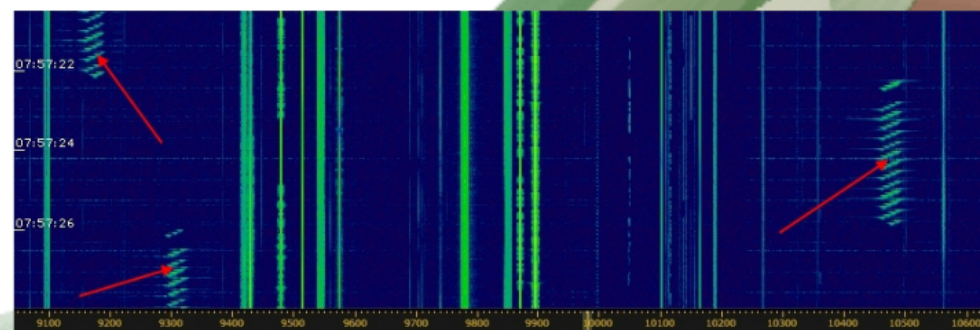
What we do with New Energy

Not Enough

- Geolocation
- Modulated / Unmodulated Decision
- Modulation Recognition
- Cold War systems

What's Needed

- Who's Calling
- Precision Classification
- More Parsing
- More decoding



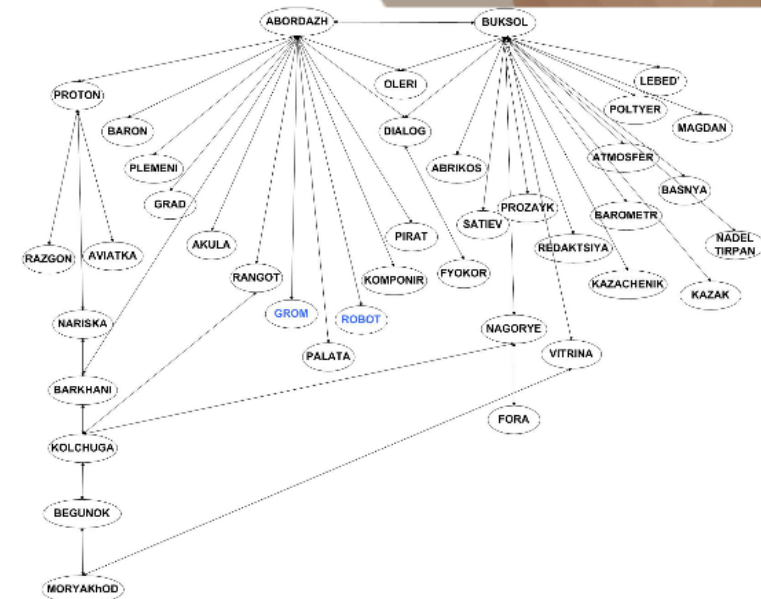
Coarse Classification

Current Systems

- 10,000 to 1,000 by modulation recognition
- not good enough for SIGINT nor EW
- not enough to know modulation
- not enough to know parameters
- not enough to know LOB or geolocation

What's Needed

- which modem?
- whose modem?
- which node?



Precision Classification

Actionable Information

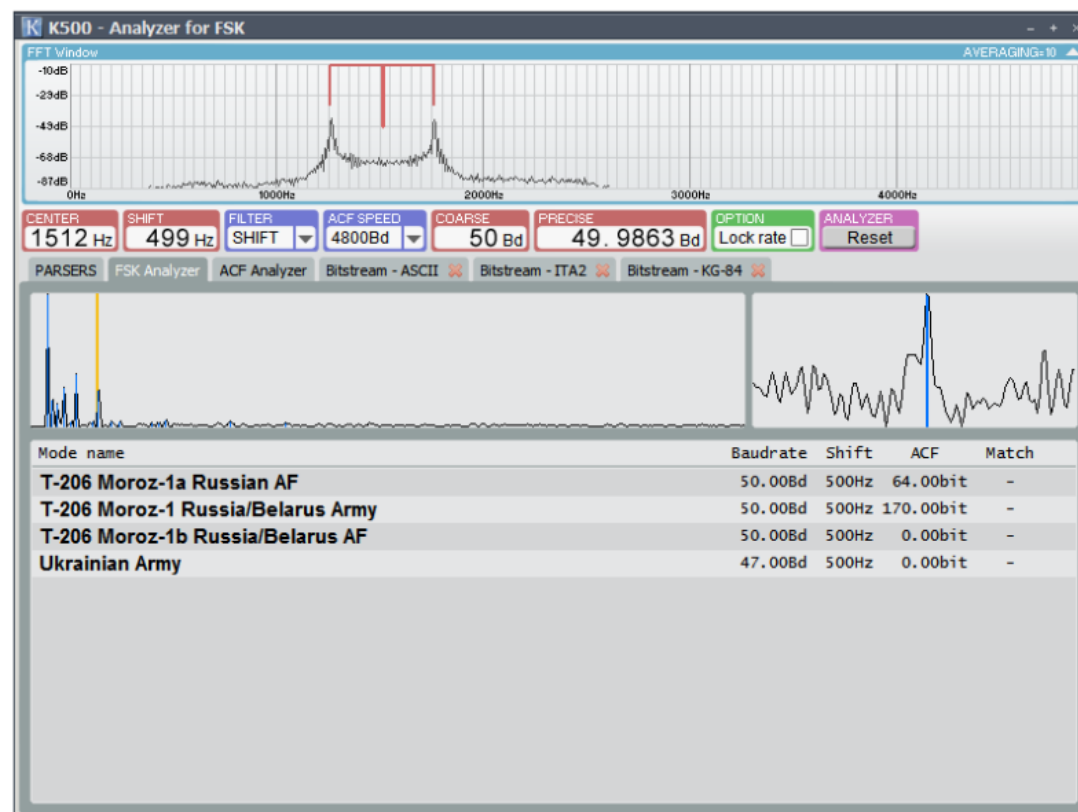
- Exact Modem
- Known Users
- Parameters

Fuller Picture

- Fuse with other Sensor inputs
- Combine with LOB or geolocation
- Content

End Result

- SIGINT: Select, surgical exploitation
- EW: Select, surgical suppression



EW + Cyber + SIGINT

Are they the same? Does it Matter?

- IP over RF since the 1990s
- Some EA and SIGINT Techniques ARE Cyber techniques
- Merge techniques = fuller palette of options and tools
- Myriad Challenges
 - Calling Systems
 - Hybrid Modulations
 - Complex Waveforms
 - Encryption
 - Clones and variants
 - Cheap spectrum
 - Disposable, robust technology



...how about an example?

...what you are about to see...



HF, LVHF, VHF modem

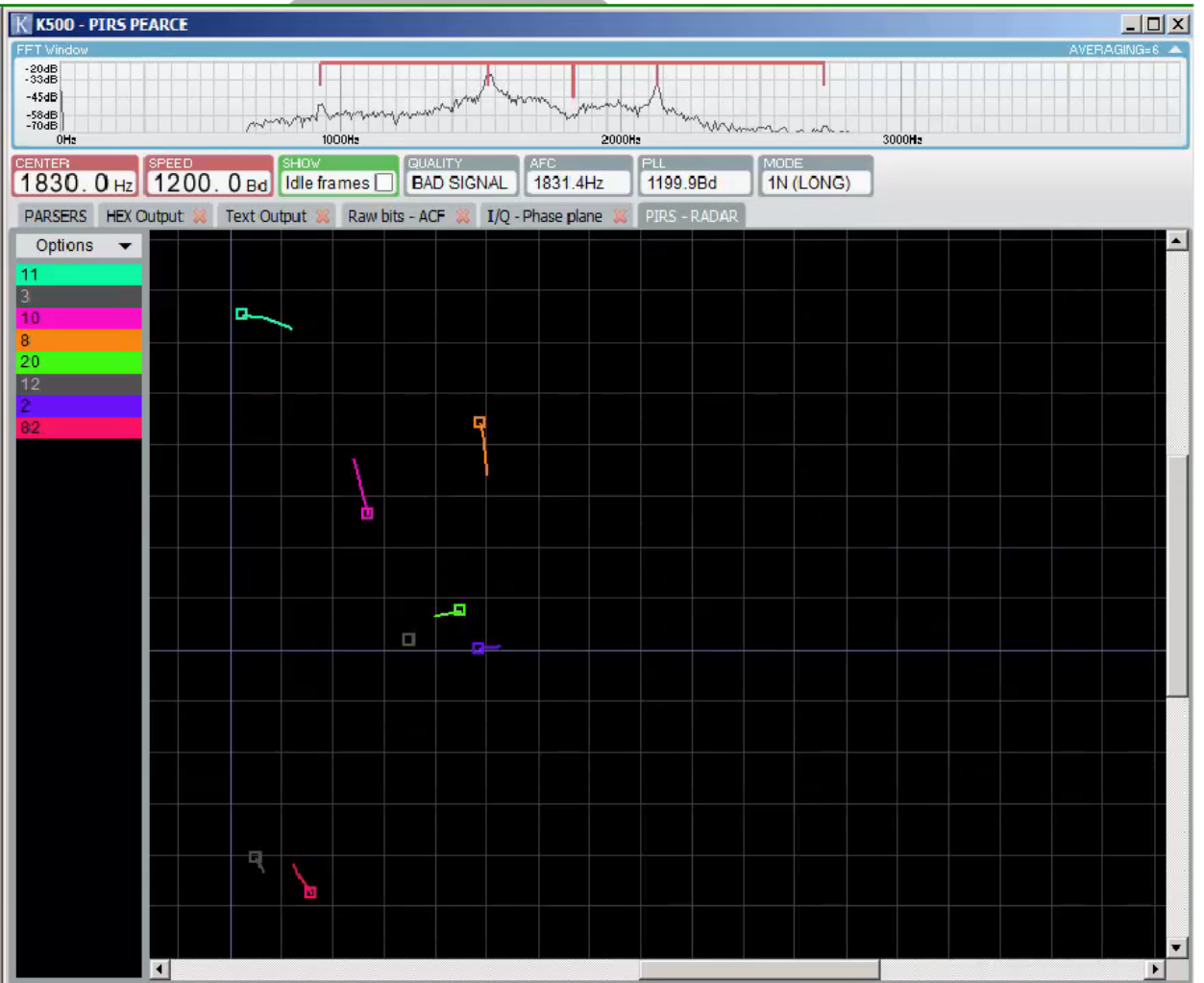
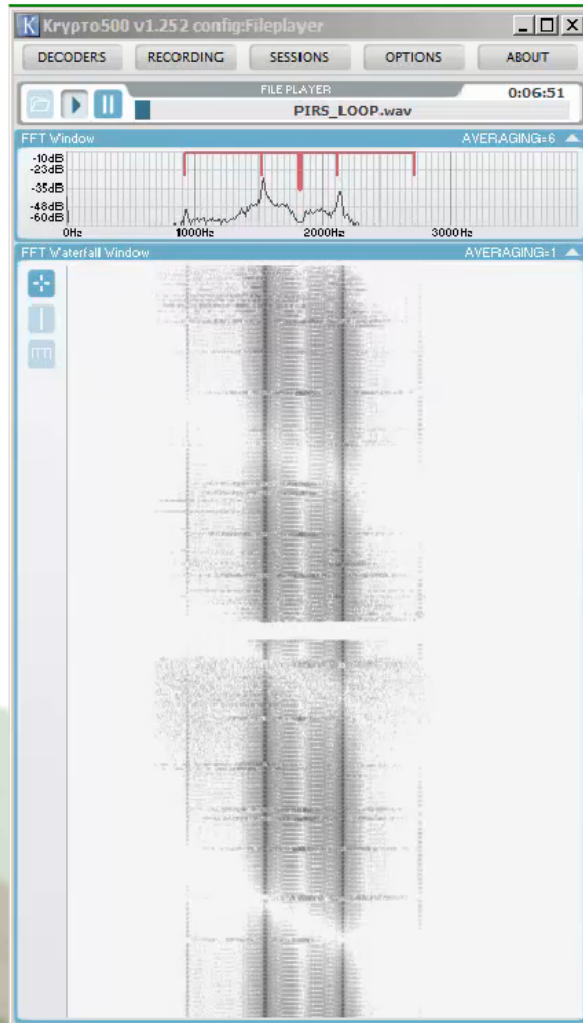


LVHF modem



HF, Satellite modem

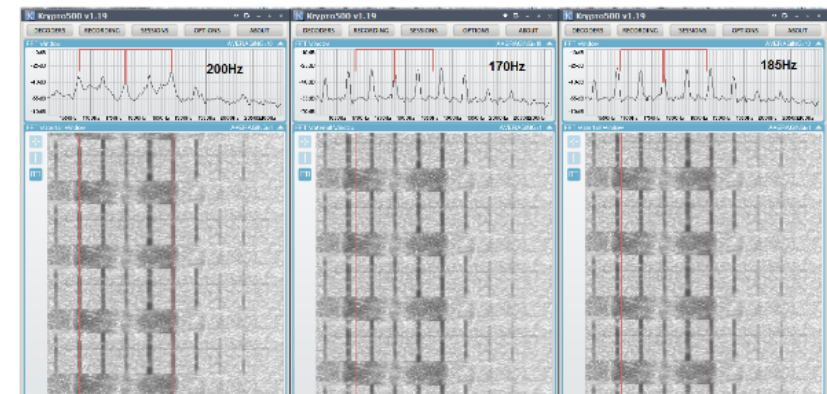
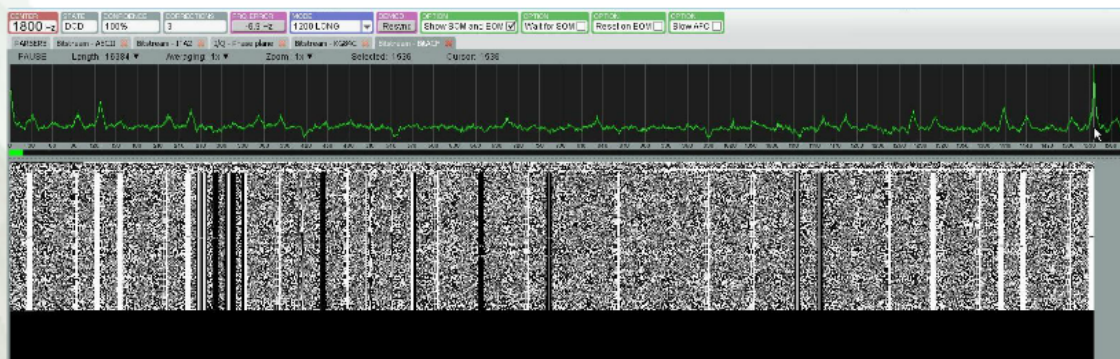
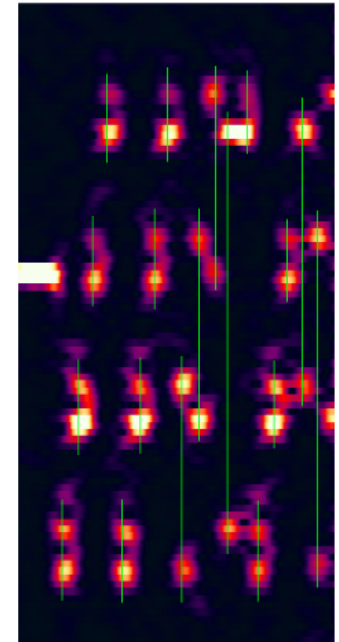




Does $1+1 = 3$?

$1+1$ **must** = 3 ...because:

- Complexity increasing
- Encryption increasing
- No one technique tames the spectrum
- **50 Billion** Smart Objects < 48 months



1+1 = 3 The Role of SIGINT in Modern EW

