



WBU-ISOG FORUM
Los Angeles, CA

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Synopsis

- From SW to MW to Satellite to Internet to Mobile
- Satellite Occurrences
 - Increasing
 - Collateral Damage
- Coping strategies
 - Saturation
 - Uplink footprint
 - Co-Location with perpetrators
 - Avoiding other targeted broadcasts
- Geo-Located and Identified
 - Now what?
- Consequences
 - Cost
 - Audience loss
 - Restriction of Commerce (Intellectual Property)
 - Iron curtain against free information



From SW to MW to Internet to Mobile

- Cold War jamming of VOA, RFE/RL Broadcasts
- Present day jamming of SW, MW into China, Cuba
 - Every frequency (as many as 13 simultaneous), 24/7
 - Co-channel Interference (Great, wrong signal)
- Iran – Prime hours jamming
- Internet
 - GFW, Similar systems popping up everywhere
 - Mostly Huawei equipment but some Western too!
 - Recent step-up on all commercial VPN traffic
- Mobile
 - Even more insidious – State controls entire stack
 - Telecom, network, phones, billing, apps, back doors
 - Functionality ergo no security (GPS, location, search, etc.)
- Privacy in West, life and death in dictatorships

Increasing Frequency

- 2003 – Telstar 12 for 1 month
- Intermittently since June, 2009
 - HB, ArabSat, NileSat and others
 - Targeting mostly Persian programming
 - Some Arabic content
 - Some Ethiopian content
 - Other targets – Often difficult to identify
 - Collateral damage
 - Relatively quiet January-October, 2012
 - Bazaar video related jamming in Oct.
 - Removal of content from Eutelsat spacecrafts
 - Veritable explosion of incidents
- Al-Hurra Iraq (2 hours) NileSat this weekend

Extensive Collateral Damage

• [VoA DVB 16300-3/4 1-101](#)

[VoA TV Europe](#) 1 4260 4220 E

[Alhurra Europe](#) 190 4560 4520 A

[VOA Persian](#) 295 4760 4720 Fa

[VoA TV](#) 340 5060 5020 E

[Voice of America](#) (HB 3) 101 4222

[RFE/Radio Liberty](#) (HB 4) 101 4222 R

[Voice of America](#) (HB 5) 102 4230 Uk

[RFE/Radio Liberty](#) (HB 6) 102 4230 Ar

[Voice of America](#) (HB 7) 103 4232 Ge

[RFE/Radio Liberty](#) (HB 8) 103 4232 Bel

[VoA Music Mix](#) (HB 9) 104 4320 E

[Voice of America](#) (HB 11) 105 4322 Ro/Es

[RFE/Radio Liberty](#) (HB 11) 105 4322 Ro/Es

[Voice of America](#) (HB 12) 105 4322 Bu

[RFE/Radio Liberty](#) (HB 12) 105 4322 Bu

[Voice of America](#) (HB 13) 106 4330

[Voice of America](#) (HB 14) 106 4330

[RFE/Radio Liberty](#) (HB 14) 106 4330

[VoA News Now](#) (HB 15) 107 4332 E

[IBB Pristina](#) (HB 16)

[Radio Farda](#) (HB 17) 108 4420 Fa

[Voice of America](#) (HB 18) 108 4420

[Voice of America](#) (HB 19) 109 4422 Al

[RFE/Radio Liberty](#) (HB 20) 109 4422 Tur/Li

[Voice of America](#) (HB 21) 110 4430 Uz/Tat

[RFE/Radio Liberty](#) (HB 21) 110 4430 Uz/Tat

[Voice of America](#) (HB 22) 110 4430 Kir

[RFE/Radio Liberty](#) (HB 22) 110 4430 Kir

[VoA Eastern Europe](#) (HB 23) 111 4432 Cz/SI

[RFE/Radio Liberty](#) (HB 23) 111 4432 Cz/SI

[VoA Eastern Europe](#) (HB 24) 111 4432 Kz/Az

[RFE/Radio Liberty](#) (HB 24) 111 4432 Kz/Az

[RFE/Radio Liberty](#) (HB 25) 113 4522

[RFE/Radio Liberty](#) (HB 26) 113 4522

[Radio Sawa Levant](#) (HB 29) 114 4530 A

[Radio Sawa Iraq](#) (HB 31) 115 4532 A

[Radio Sawa Egypt](#) (HB 33) 116 4620 A

[Radio Sawa The Gulf](#) (HB 35) 117 4622 A

[Radio Sawa Morocco](#) (HB 37) 118 4630 A

[Radio Farda](#) 119 4.32 Fa

[Voice of America](#) 121 4722 A

[Radio Sawa Sudan](#) 122 4.30 A

[Radio Sawa Lebanon](#) 123 4732 A

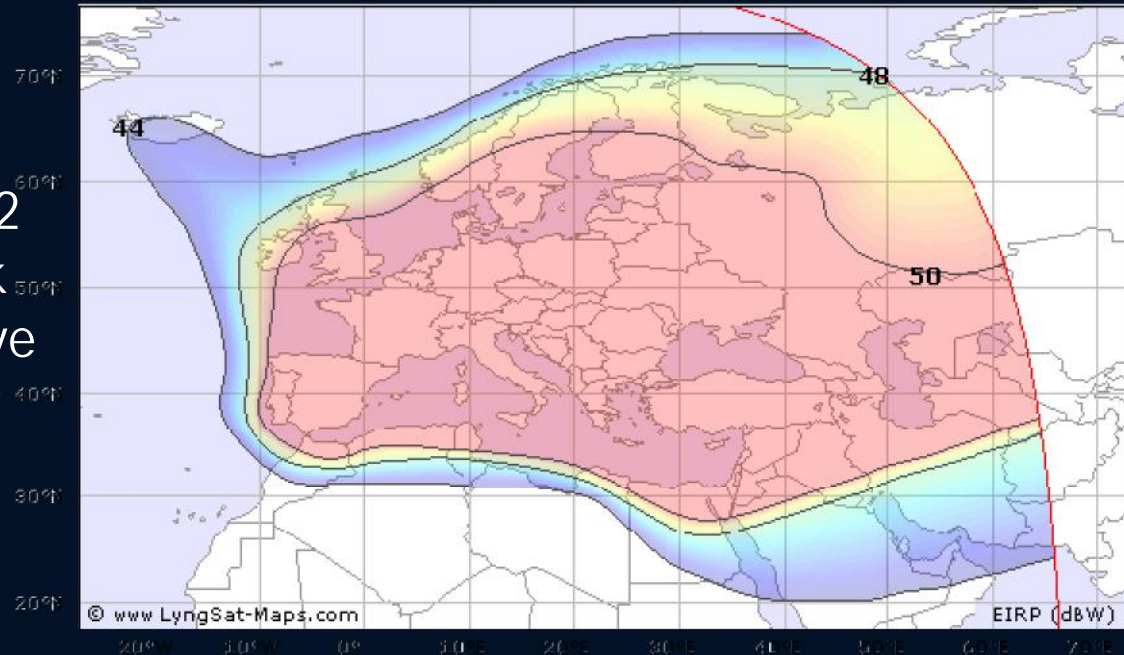
[Voice of America](#) 310 5032 Ur

Coping Strategies - 1

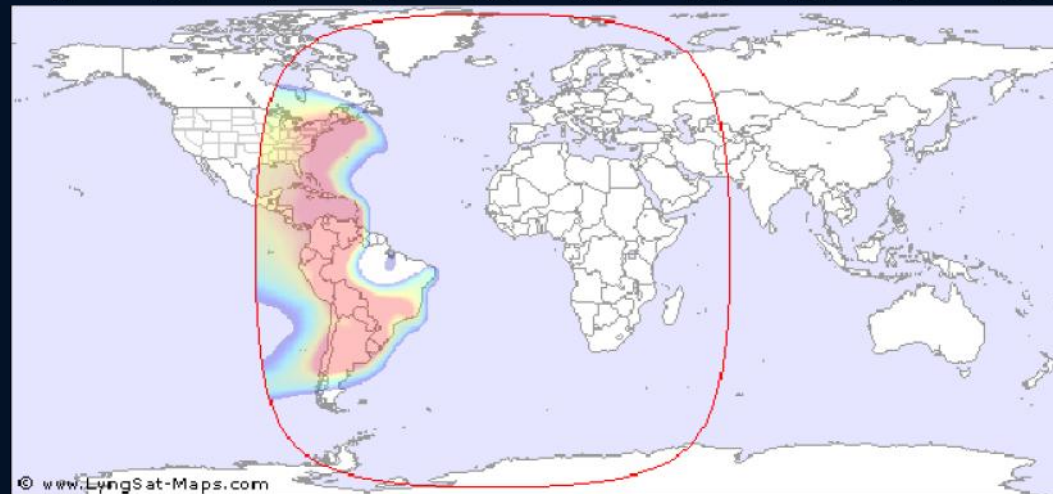
- Frequency Saturation
- VOA Persian News Network (PNN)
 - Eutelsat Hotbird 13B
 - Telstar 12
 - AsiaSat 3
 - Eutelsat 7A
 - Eutelsat 25A
- RFE/RL Radio Farda
 - Eutelsat Hotbird 13A
 - Telstar 12
 - AsiaSat 3
 - Eutelsat 7A
 - NileSat
 - ArabSat
 - NSS 12

Uplink Footprint (T-12 & W3A)

Telstar 12
Downlink
or Receive
Footprint



Telstar 12
Transmit
or Uplink
Footprint



Collocation with Perpetrators

- VOA PNN on ArabSat in 2009
- SCPC on same transponder as IRIB
- Unforeseen retaliation!
- 7-10 frequencies intermittently jammed 1 month until PNN was removed
- Logical but not necessarily useful
- Acculturation hubris?

Avoiding other targeted broadcasts

- **Avoid proximity to:**
 - BBC Persian (Government)
 - Deutsche Welle Persian (Government)
 - New Channel TV (Private)
 - Channel One (Private)
 - PARS TV (Private)
 - AFN Farsi Net (Private)
 - National Iranian Television - NITV (Private)
 - Simaye Azadi Iran (Private)
 - Radio Sedaye (Private – Radio Only)
- **Avoid multiple scores with one jammer**

Geo Location

satID - 172.16.61.10 - Remote Desktop

Map - Microsoft MapPoint Europe

File Edit View Data Route Tools Help

Type place or address Find Road Map

Legend and Overview

- Pushpins
 - My Pushpins
- Populated Places
- Boundaries
- Transportation
- Miscellaneous

World Asia Countries-

0 km 500 1000 1500

start satID Clean Shutdown... satID Location V2.5.3... 20091229_HB8-76_1... Map - Microsoft MapP... 18:08

Jamming Station Locations



Jamming Station – 12/27-30/09



Jamming Station – January 2010



Downlink Jamming Transmitters?



Consequences

- **Cost**

- Much like with SW, MW and Internet
- BBG spending millions in counter-measures
- Proactively and reactively

- **Audience loss**

- Hotbird far and away the #1 platform

- **Restriction of Commerce (IP)**

- How is this different from a Suez blockade?
- Where does it end?

- **Electronic curtain against free information**

- Shortwave, Medium Wave, Satellite, Internet



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