



Terrestrial VHF/UHF Comms Protection Solutions

Decodio

About Us

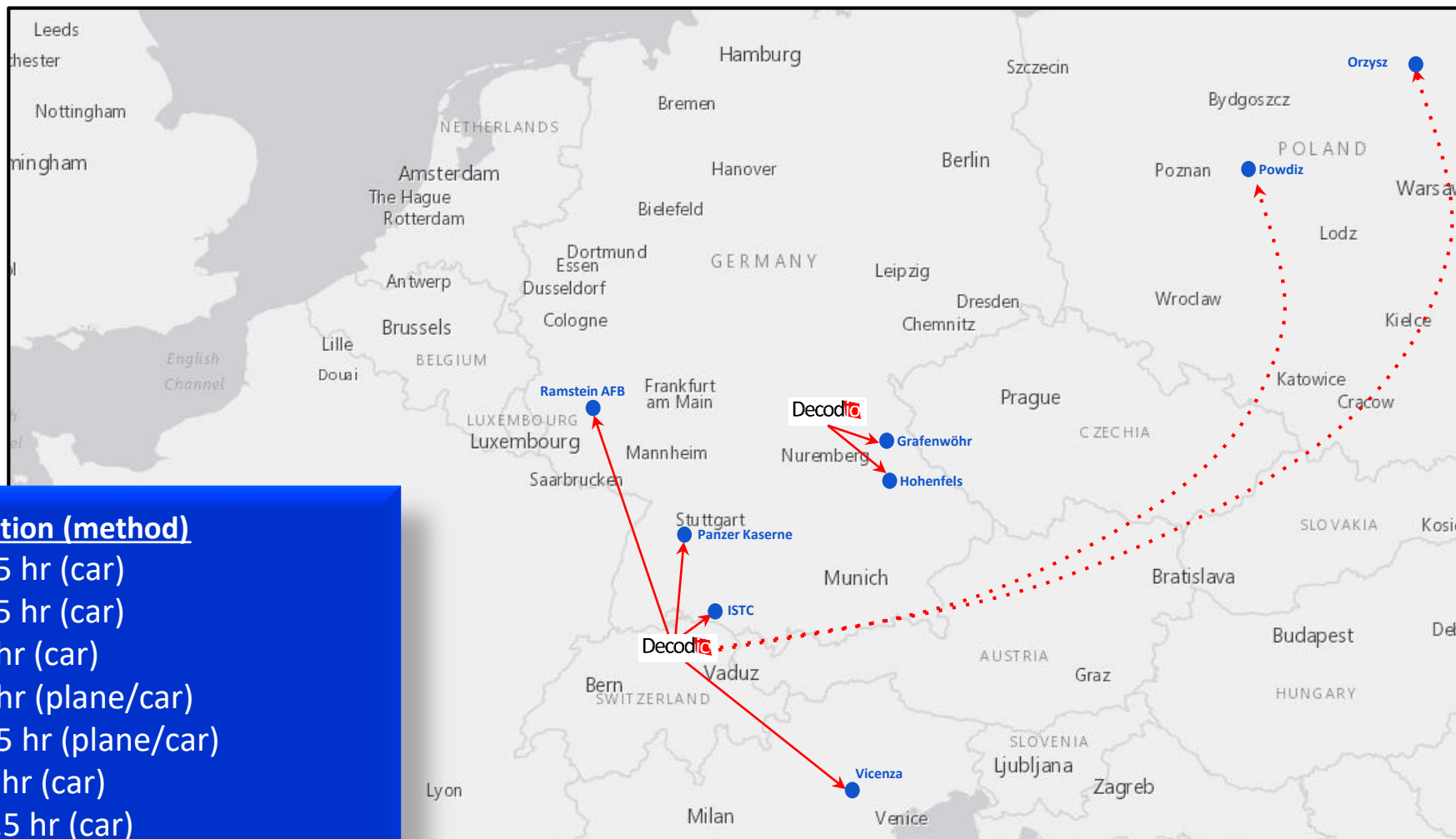
Decodio AG develops systems for spectrum monitoring inside defense, digital radio networks, and regulation markets.

- Our main office is located in Zürich, with a small secondary office in Forchheim, Germany (near Nürnberg).
- Our software is 100% developed in Zürich.
- We have a strong Swiss national business and sell our solutions worldwide in about 15 - 20 countries, including prominent European-based NATO militaries.
- Decodio AG is growing sustainable and is 100% equity financed, executing revenues over 7 figures annually.



Decodio

We are your neighbor, close to US/NATO forces.



| <u>Office</u> | <u>Base</u> | <u>Duration (method)</u> |
|---------------|-----------------|--------------------------|
| ZURICH - | ISTC: | 1.5 hr (car) |
| ZURICH - | Panzer Kaserne: | 2.5 hr (car) |
| ZURICH - | Ramstein AFB: | 4 hr (car) |
| ZURICH - | Powdiz: | 4 hr (plane/car) |
| ZURICH - | Orzysz: | 4.5 hr (plane/car) |
| ZURICH - | Vicenza | 5 hr (car) |
| FORCHEIM - | Grafenwöhr: | 1.5 hr (car) |
| FORCHEIM - | Hohenfels: | 1 hr (car) |

PROBLEM: Europe is a contested spectrum...affects every operation

How do you know where the static comes from?

Military Jamming/SIGINT

The **Barents Observer**

Российский



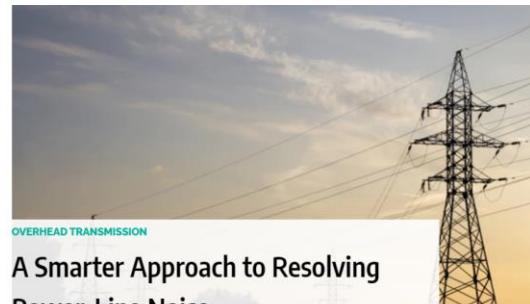
Eight antenna masts and control vehicles were put in place, ready for action, at the abandoned airfield near the village of Pushnoy south of Murmansk. Screenshot from video by Russian Defence Ministry

Russia exercises long-range radio-electronic warfare on Kola

The Northern Fleet's Center of Radio-Electronic Warfare has rolled out and tested its Murmansk-BN complex which are designed to suppress enemy radio signals at distances of up to 5,000 kilometers.

THE WARZONE
Russia Jammed Phones and GPS in Northern Europe During Massive Military Drills
The electronic attacks offer the Kremlin a surprisingly low risk way to harass NATO members and other opponents.

Civilian Industry



OVERHEAD TRANSMISSION

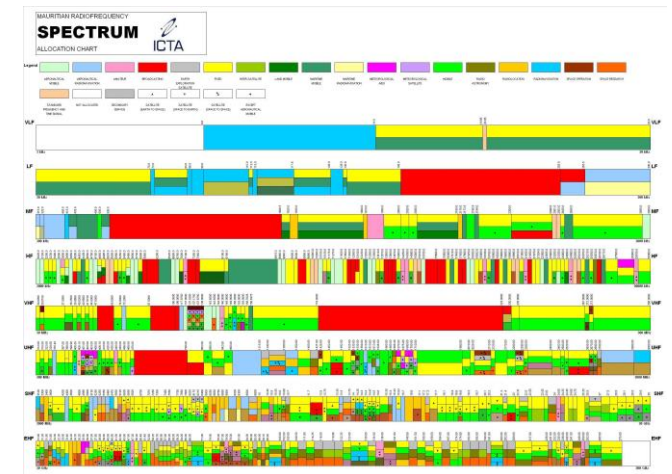
A Smarter Approach to Resolving Power-Line Noise

Although the problem has been around since the dawn of radio communications and broadcasting, power-line noise issues are on the rise.

Mike Martin, RFI Services; Riley Hollingsworth, FCC, and Jody Boucher, Northeast Utilities

SEP 01, 2004

Crowded EU Spectrum



Paper

Wind Farms Influence on Radiocommunication Systems Operating in the VHF and UHF Bands

Krzysztof Bronk, Adam Lipka, Rafał Niski, and Błażej Wereszko

National Institute of Telecommunications, Wireless Systems and Networks Department, Gdańsk, Poland

Decodio

Swiftly mitigate spectrum interference across the force.

4x *Terrestrial VHF/UHF Comms Protection Solutions.*

*further options for trunked systems (P25, DMR, and more)

PROTECT logistical lines and depots from interference/jamming.

RAPIDLY deploy into existing structures and vehicles.

We could protect VHF/UHF radio systems, such as:

PRC-113

PRC-117G

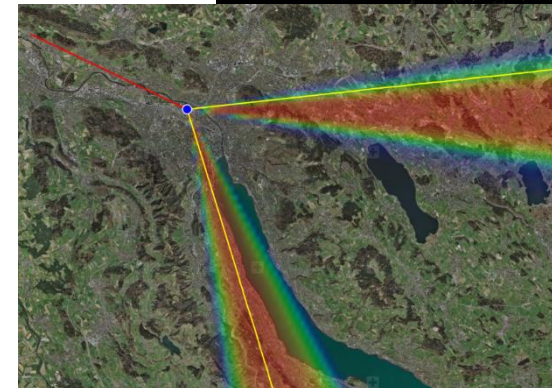
PRC-148

PRC-150

PRC-152

Commerical Trunked PTT Systems (P25, TETRA, DMR, NXDN..and more)

VHF radio broadcasts (civil affairs, MISO)

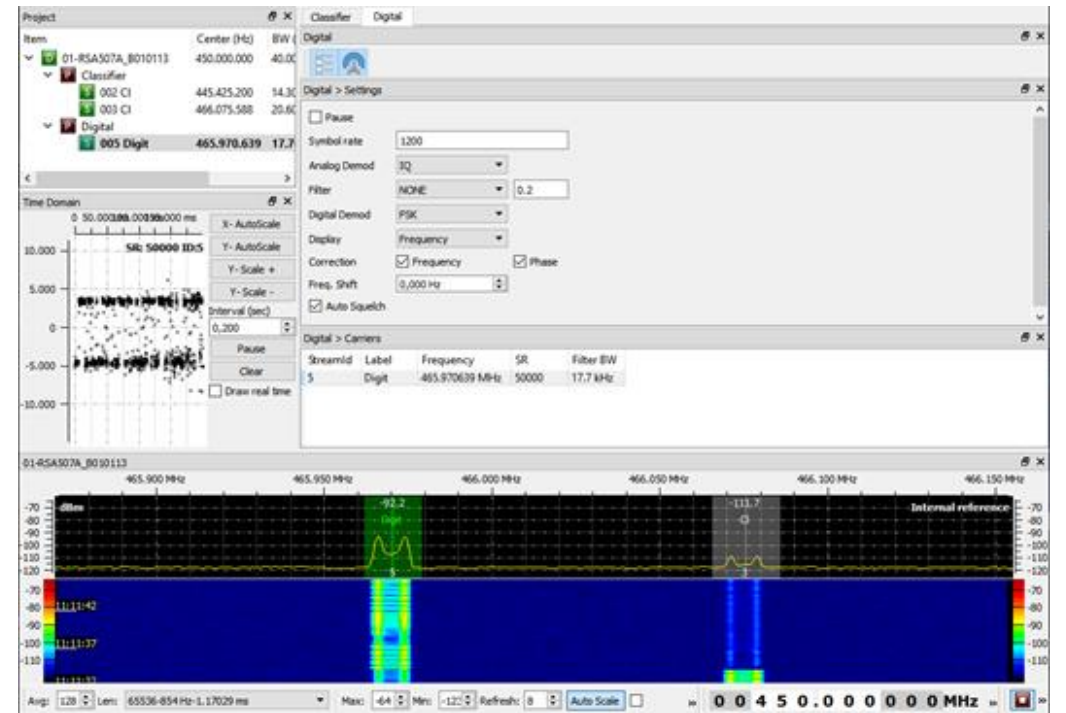


Decodio

Navigate the congested spectrum, mitigate issues FAST.

Decodio Solutions:

- adds more sensors, increase an EW planning tool's fidelity and accuracy.
- help rear guard units, SPODs, and logistical depots mitigate jamming.
- ensure equipment adapts to the warfighter, not the other way around.
- allows Spectrum Managers to receive actionable interference reports
- enables the direct plug in of JRFLE frequency lists inside the spectrum display.



Our software runs on standard PCs and on numerous integrated receivers

- ***We make EMI reporting easier, faster, and more precise.***
- ***We enable all units, vehicles bases, locations to feed the JSIR process.***
- ***We give Commanders and their staffs the EMI info they need to TAKE ACTION.***

Our Solutions Enable:

Alarm users & record events

Load friendly spectrum plans, decrease spectrum fratricide

Preceise reporting. Send not just words... but actual visual recordings

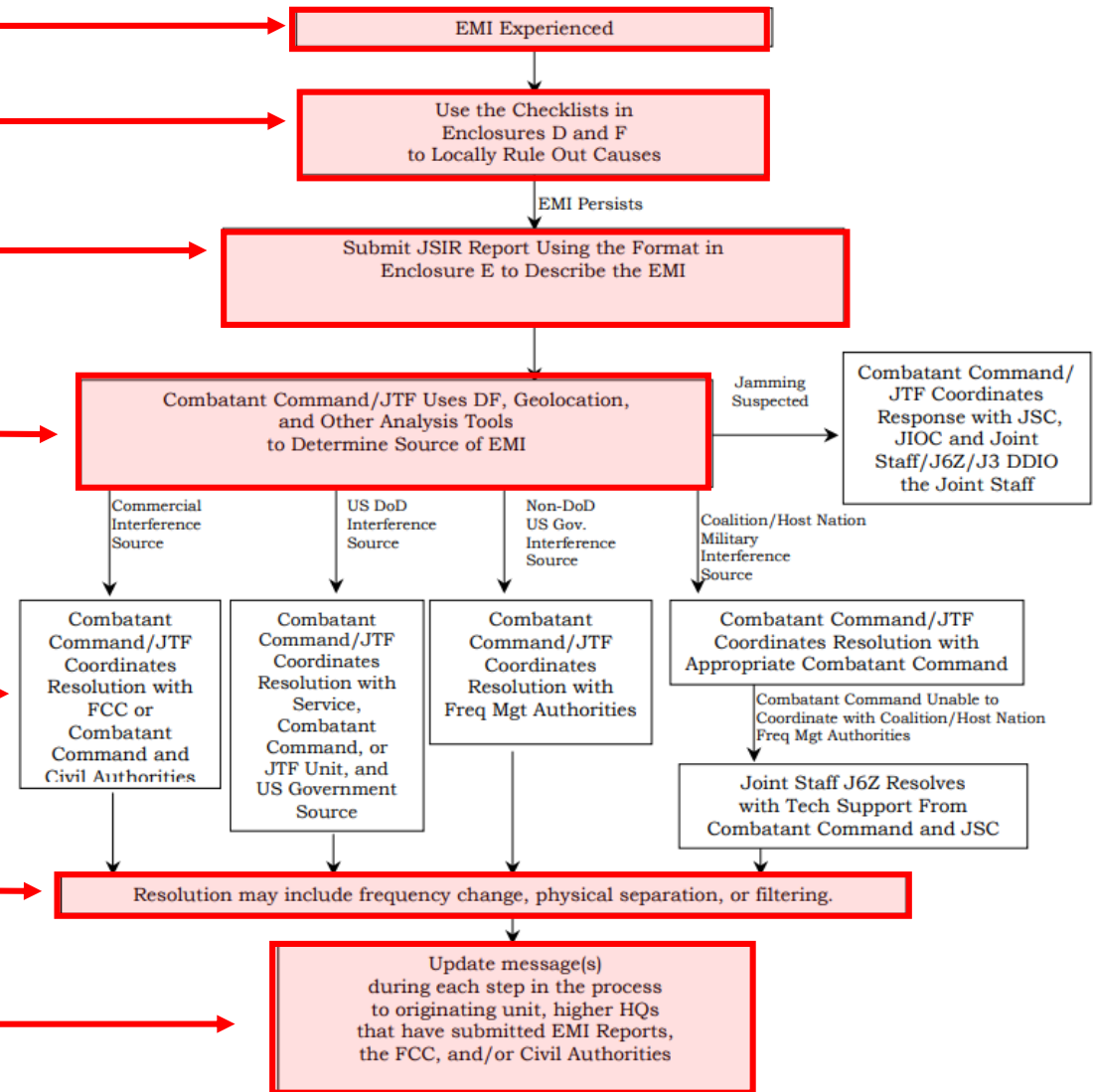
Our TOC and Multi-site systems have DF and Geolocation integrated to pinpoint EMI.

Better reporting leads to efficient mitigation by more specialized EW forces.

Monitor changes and environment after mitigation

Continuous monitoring means precision reporting throughout the process.

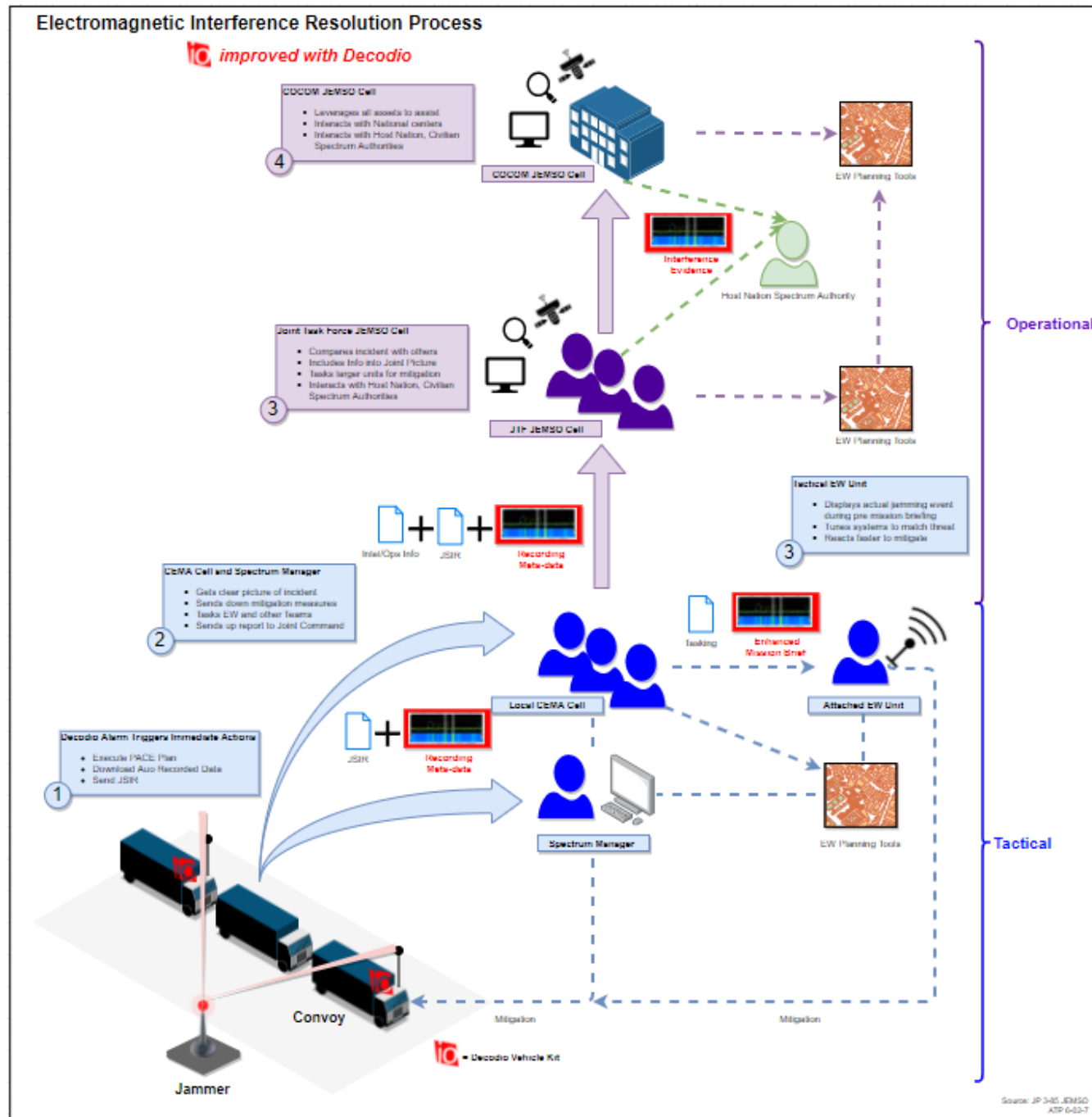
OCONUS Terrestrial JSIR Process:



EMI=Electromagnetic Interference
JSIR=Joint Spectrum Interference Resolution

Figure A-3. OCONUS Terrestrial JSIR Process
Source: JSIR CICSMS 3320.02

- **We make EMI reporting easier, faster, and more precise.**
- **We enable all units, vehicles bases, locations to feed the JSIR process.**
- **We give Commanders and their staffs the EMI info they need to TAKE ACTION.**



EMI=Electromagnetic Interference
JSIR=Joint Spectrum Interference Resolution

We help also leverage a Commander's EMI authorities.

Interference Resolution

1-28. Spectrum managers perform interference resolution **at the echelon receiving the interference**. Interference is the radiation, emission, or indication of electromagnetic energy; either intentionally or unintentionally causing degradation, disruption, or complete obstruction of the designated function of the electronic equipment affected. The spectrum manager should use available near-real time monitoring and analysis capabilities to aid in the interference resolution. **The reporting end user is responsible for assisting the spectrum manager in tracking, evaluating, and resolving interference**. Army ATP 6-02.70 (Oct 2019)

*By helping the **end user**, we help the spectrum managers mitigate faster*

Decodio

4x solutions ready to help you navigate and win.



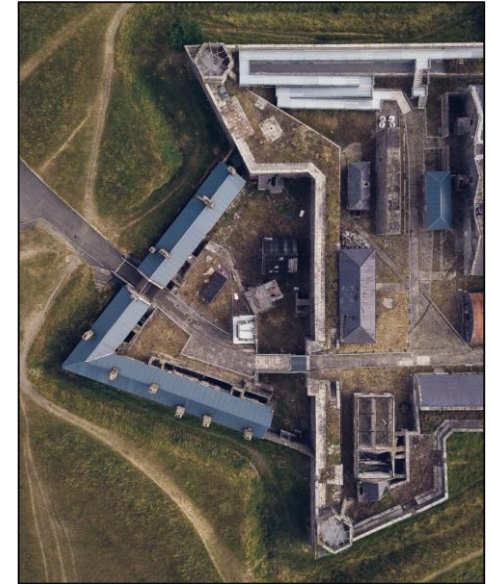
Low Profile



Convoy/Vehicle



TOC/HQ

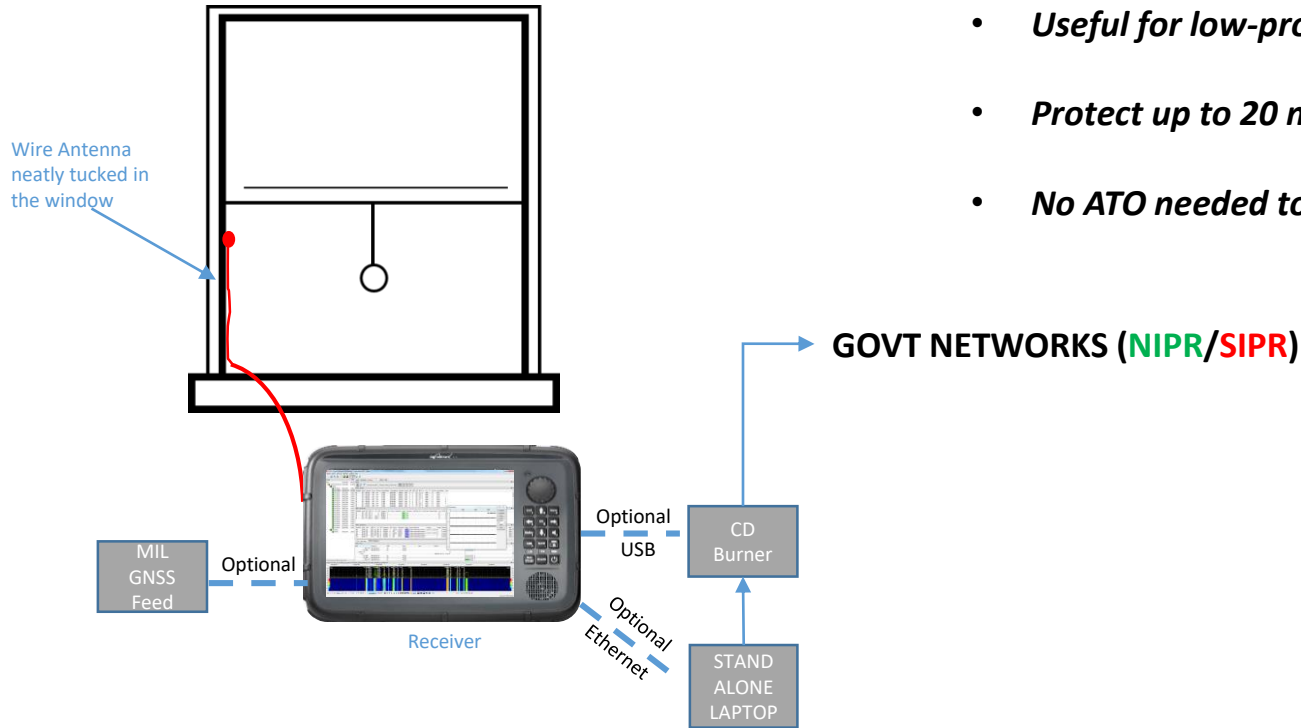


Multi-Site

Developed from PROVEN software and systems deployed across Europe

Decodio

Low Profile



Combine with telescopic antenna for expeditionary locations

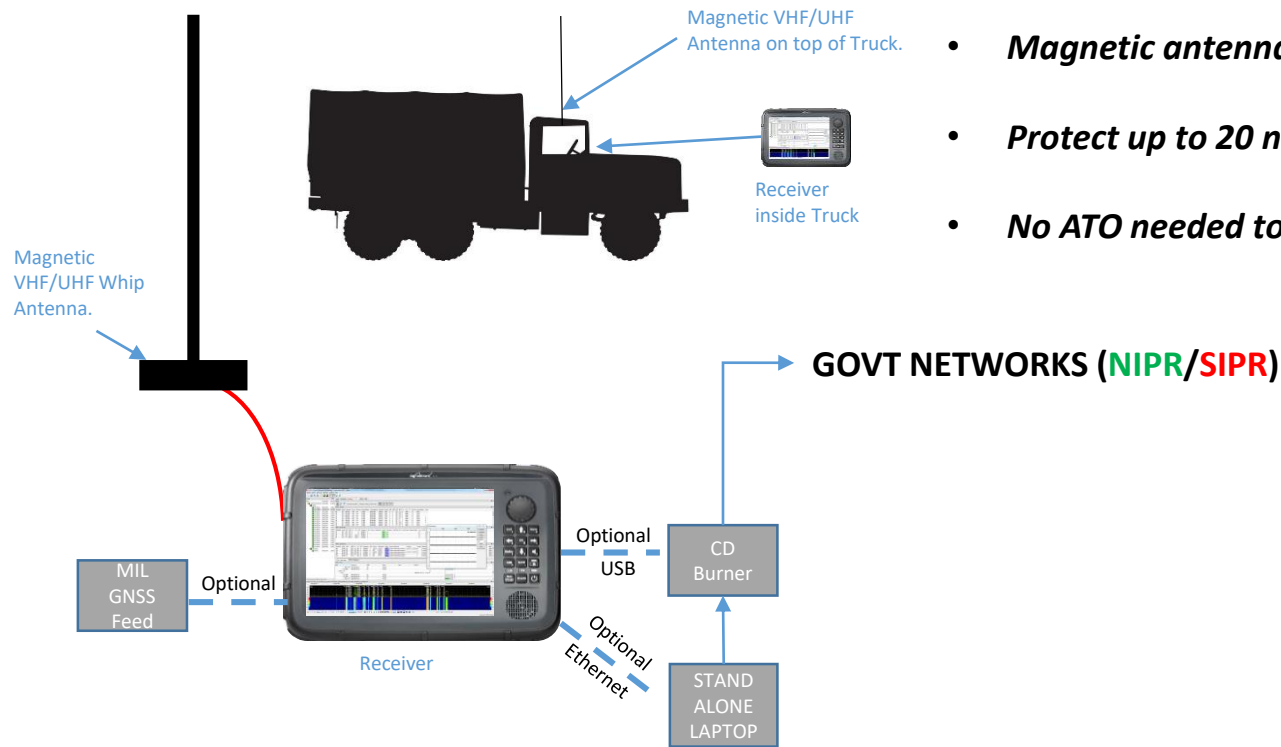
- **Tactical, lightweight, and portable Electromagnetic Interference (EMI) Protection System**
- **Powerful Decodio *ReX* software runs integrated on ruggedized PCs and/or field-tested receivers.**
- **Useful for low-profile or expeditionary locations, perfect for SOF or Recon teams.**
- **Protect up to 20 narrowband channels within 20MHz, set audible alarms and record jamming.**
- **No ATO needed to operate... with CD burner, offload data quickly to Govt Networks.**

| Features | |
|---------------------|--|
| Frequency Range | 8 kHz- 8 GHz |
| Bandwidth | 5 to 20 MHz |
| Narrowband Channels | Up to 20 |
| GNSS | Internal GPS or connection for MIL GPS |
| Power | 12V DC Plug or Battery (swappable) |
| Min/Max Weight | 5.5 lbs to 9.04 lbs |
| Antenna | Telescopic or wire |
| Night Operation | REX night mode standard |
| Data Output | CD burner, USB, ethernet |

Add communication protection to a detachment FP plan.

Decodio

Convoy/Vehicle



- **Tactical, lightweight, and portable Electromagnetic Interference (EMI) Protection System**
- **Powerful Decodio *ReX* software runs integrated on ruggedized PCs and/or field-tested receivers.**
- **Magnetic antenna and vehicle power converter options enable rapid installation and operation.**
- **Protect up to 20 narrowband channels within 20MHz, set audible alarms and record jamming.**
- **No ATO needed to operate... with CD burner, offload data quickly to Govt Networks.**

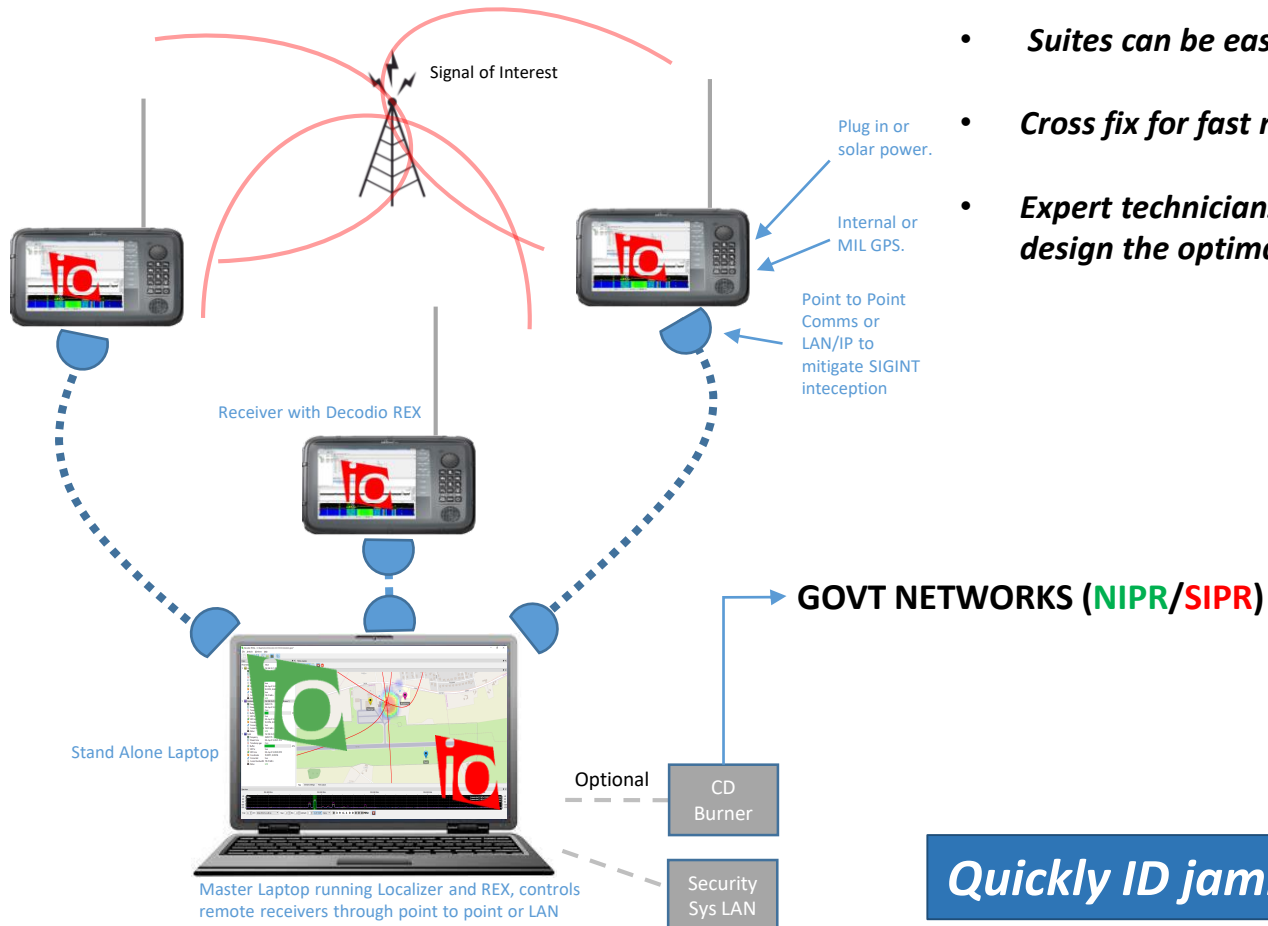


| Features | |
|---------------------|--|
| Frequency Range | 8 kHz- 8 GHz |
| Bandwidth | 5 to 20 MHz |
| Narrowband Channels | Up to 20 |
| GNSS | Internal GPS or connection for MIL GPS |
| Power | 12V DC Plug or Battery (swappable) |
| Min/Max Weight | 5.5 lbs to 9.04 lbs |
| Antenna | Magnetic or installed whip. |
| Night Operation | REX night mode standard |
| Data Output | CD burner, USB, ethernet |

Protect convoy communications without a specialized EW vehicle or troops.

Decodio

TOC/HQ Site



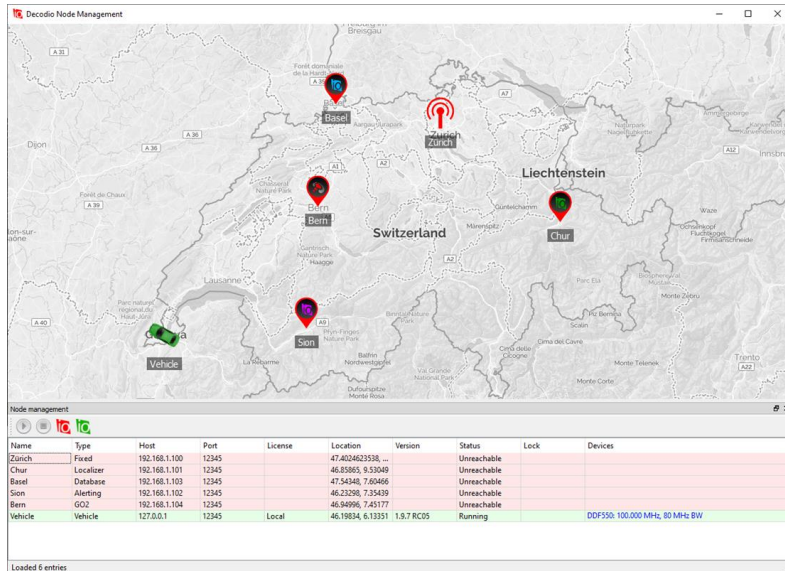
- **3x Site Tactical Electromagnetic Interference (EMI) Protection System**
- **Operate on/near Tactical Operations Centers, forward field HQs, or critical infrastructure**
- **Suites can be easily integrated in to existing structures and are re-deployable as needed.**
- **Cross fix for fast mitigation and EMI reporting.**
- **Expert technicians are prepared to provide an obligation free assessment and site survey to design the optimal suite on facilities anywhere throughout Europe.**

| Features | |
|-------------------------|--|
| Frequency Range | 8 kHz- 8 GHz |
| Bandwidth | 5 to 20 MHz |
| Narrowband Channels | Up to 20 (to monitor) |
| Cross Fix Channel Limit | 1 |
| GNSS | Internal GPS or connection for MIL GPS |
| Power | 12V DC Plug or Battery (swappable) |
| Min/Max Weight | 5.5 lbs to 9.04 lbs (for 1x receiver) |
| Antenna | telescopic antenna |
| Data Ouput | CD burner, USB, ethernet |

Quickly ID jamming, record the event, and pinpoint the location.

Decodio

Multi-Site



- **Custom expeditonary multi-site comms protection system.**
- **Operate on/near critical infrastructure such as bases, airfield, and ammo depots.**
- **Suites can be easily integrated in to existing structures and are re-deployable as needed.**
- **Monitor health and status of deployed systems. Control systems remotely.**
- **Expert technicians are prepared to provide an obligation free assessment and site survey to design the optimal suite on facilities anywhere throughout Europe.**



| Features | |
|-------------------------|--|
| Frequency Range | 8 kHz- 8 GHz |
| Bandwidth | 5 to 20 MHz |
| Narrowband Channels | Up to 20 (to monitor) |
| Cross Fix Channel Limit | Multiple |
| GNSS | Internal GPS or connection for MIL GPS |
| Power | 12V DC Plug or Battery (swappable) |
| Min/Max Weight | 5.5 lbs to 9.04 lbs (for 1x receiver) |
| Antenna | telescopic antenna |
| Data Ouput | CD burner, USB, ethernet |

Protect bases and depots with proven and simple technology.

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Decodio ReX Software View

Standard Demodulators

Set noise jamming alarm

Observe channel parameters

| StreamId | Label | Frequency | SR | Filter BW | Demodulator | Power | Running | Status | Rec IQ | Rec Demod | Network | Sound | SquelchLevel | Tracking | TriggerWB |
|----------|-------|-----------|-------|-----------|-------------|-------|---------|---------|--------|-----------|---------|-------|--------------|----------|-----------|
| 1 | Rec | 104.9980 | 12... | 12500 | Power | -81.2 | true | false | | | | | -130 | false | false |
| 2 | Rec | 93.6000 | 20... | 200000 | WFM | -81.2 | true | ACTL... | | Recording | | | -130 | true | false |
| 3 | Rec | 94.2005 | 20... | 200000 | WFM | -90.7 | true | ACTL... | | Recording | | | -130 | true | false |
| 4 | Rec | 94.6001 | 20... | 200000 | WFM | -83.1 | true | ACTL... | | Recording | LIVE | | -130 | true | false |

| StreamId | Label | Frequency | Status | Demodulator | Length | FileName | Date | SystemDate |
|----------|-------|-----------|---------|-------------|-----------|--|---------------------|---------------------|
| 2 | Rec | 93.6000 | REC END | IQ | 00:03.700 | C:\Users\...\Decodio AG\Output\IQ\2015_07_31\2015... | 2015-07-31T17:47:49 | 2018-01-29T15:24:33 |
| 4 | Rec | 94.6001 | REC | WFM | 00:07.000 | C:\Users\...\Decodio AG\Output\Demod\2015_07_31... | 2015-07-31T17:47:49 | 2018-01-29T15:24:33 |
| 3 | Rec | 94.2005 | REC | WFM | 00:07.000 | C:\Users\...\Decodio AG\Output\Demod\2015_07_31... | 2015-07-31T17:47:49 | 2018-01-29T15:24:33 |
| 2 | Rec | 93.6000 | REC | WFM | 00:07.000 | C:\Users\...\Decodio AG\Output\Demod\2015_07_31... | 2015-07-31T17:47:49 | 2018-01-29T15:24:33 |

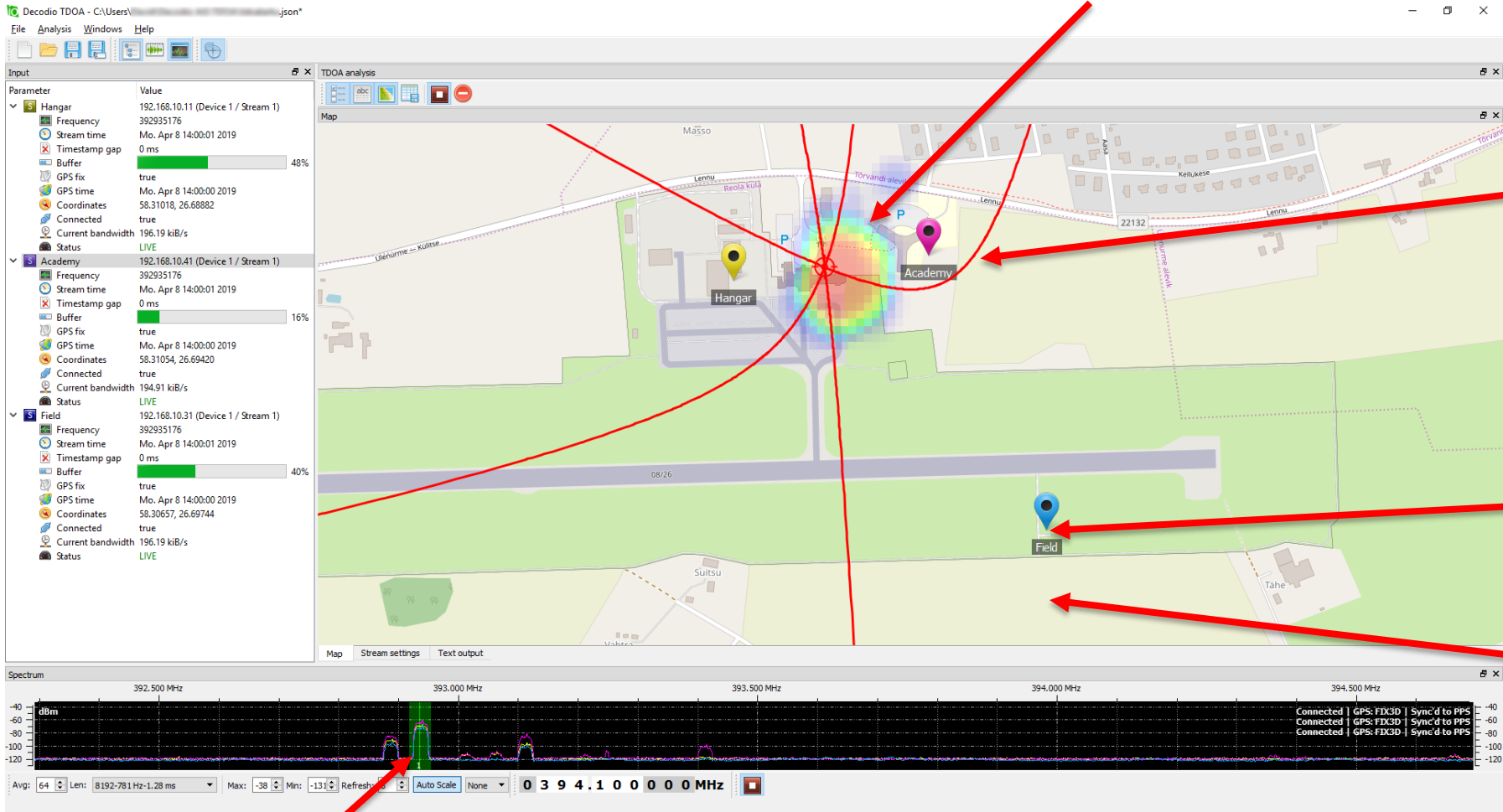
| Item | Center (Hz) | BW (Hz) | Marker | Carrier |
|----------------------|-------------|---------|--------|---------|
| 001 TETRA net | 426 | 500000 | 0 | 5 |
| 002 Tetrapol band XY | 425 | 100000 | 0 | 5 |
| 003 Digital | 424 | 60000 | 0 | 5 |
| 004 Digital Analog | 424 | 200000 | 0 | 3 |
| 005 Unknown | 427 | 100000 | 0 | 2 |

Up to 20 channels

Mark Spectrum, load your plans from excel

Decodio

Decodio Localizer View



Remote ReX site status

Heatmap and Cross Fix displayed

TDOA lines displayed

ReX site displayed on map

Load custom maps

3x ReX streams overlapped within Spectrum Display

Services and Tech Support

Our European-based team of Decodio and US Integrators enable faster troubleshooting and tech support. No more waiting till the afternoon to call CONUS.

Delivery

- Approx Delivery Time: 90 days from purchase.
- Kits are assembled in Switzerland/Germany, then shipped directly to govt end user.

Warranty and Maintenance Policy

- 2 years of regular software updates and tech support included.
- 2 years of hardware support for defective equipment.

Initial Operator Training

- 1 to 3 day course on-site (1-2 person mobile training team)
 - covers basic EMI topics, system overview and operation, basic troubleshooting

Don't hesitate to reach out.



Zac George

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Linkedin: www.linkedin.com/in/zacharygeorge/

We have a network of US intergrators ready to support various acqisition options.

Switzerland defense products are DFARs Buy American exempt.