Survey Equipment

- ICS2
- Nemo-Handy
- Nemo Outdoor
- Sagem
- Blackfin I/II
- QRC Autonomous
- DRT 1101B
- DRT 1183B
- DRT 1201C
- DRT 1301C
- DRT 1301B3
- DRT 4411B
IC52

Limitations & Planning Factors

- **ICS2 Equipment Specific:**
  - Data logging on Removable CF card
  - Designed for Mobile or Fixed Operation
  - Software upgradable, with ability to add addition protocols
  - Weight: 9 lbs
  - Each protocol can be activated individually or simultaneously
  - Requires laptop for remote desktop application for connection to survey device
  - Battery provides ~4 hours of operation
  - Requires Decode Pro 4 Software

- **Vendor:** QRC Technologies
- **Protocols:** GSM, CDMA (Band class 0, 1 and 5) WCDMA,
- **BOIP:**
- **Cost:** $195,000.00
- **Approval:** Ground Force Commander pending designation of target

Capabilities

**Description:** Integrated Collection System
- Cellular Survey Tool
- GSM and CDMA
- Combines scanning receiver and computer into a single device
- Capable of being operated remotely
- AC, DC, or battery operation

Vendor: QRC Technologies
Protocols: GSM, CDMA (Band class 0, 1 and 5) WCDMA,
BOIP:
Cost: $195,000.00
Approval: Ground Force Commander pending designation of target
# Nemo Handy (N95)

## Capabilities

**Description:**
- Cellular Survey Tool for testing mobile applications QoS/QoE and measuring the air interface of EGSM/ GPRS/ EDGE/ WCDMA/ HSDPA/ Wi-Fi 802.11/g wireless networks. It is complete with voice and video streaming quality MOS testing, cell and timeslot testing, and full application level metrics on voice and video calls.

## Limitations & Planning Factors

**Nemo-Handy Equipment Specifics:**
- Can only record one network at a time
- Easy to conceal, although HS is not typical size/shape
- When the program is running, easy to see on the HS screen
- Does not give extended BA list

## Vendor

**Protocols:** HSDPA/WCDMA 2100, GSM/EGSM/GPRS/EGPRS 850/ 900/ 1800/ 1900

**BOIP:**

**Cost:** approx $11,500.00

**Approval:** Title 10
Nemo Outdoor

**CAPABILITIES**
- Cellular Survey Tool
- System includes
  - 2 GSM HS
  - 1 CDMA HS
  - 1 TDMA HS
  - Assorted Scanners
  - GPS Receiver
- Records cellular information for download to NEMO Analyze
- Can hook DTI scanners to laptop for simultaneous recording of numerous networks

**LIMITATIONS & PLANNING FACTORS**
- Must be hooked to a laptop
- Using entire system can be cumbersome and difficult to conceal
- Does not give extended BA list
- Capable of running simultaneous multiple protocol survey

**VENDOR:**
**PROTOCOLS:** 900Mhz, 1800, 850, 1900, CDMA
**BOIP:**
**COST:** Approx $80,000.00
**APPROVAL AUTHORITY FOR USE:** Title 10
Sagem OT488, 498

**Capabilities**

**Description:**
- Cellular Survey Tool Cellular Survey Tool for measuring the air interface of GSM/EGSM/GPRS wireless networks.

**Limitations & Planning Factors**

**Sagem Equipment Specifics:**
- Can only record one network at a time
- Easy to conceal when not hooked to laptop
- When the program is running, easy to see on the HS screen
- Does not give extended BA list

**Vendor:**
- **Protocols:** 850, 900, 1800, and 1900Mhz
- **BOIP:** Part of MRT systems
- **Cost:** approx $10,000.00

**Approval:** Title 10
Blackfin I/II

Capabilities
Description: BLACKFIN II adds more performance and capability to the Blackfin system while keeping the same compact package. BF II is designed to body worn or packaged for concealed missions. Can be discretely configured and controlled via blue tooth with the Mobile controller. Quad Band interrogator that can conduct passive monitoring, survey, interception of GSM voice and SMS of a preloaded target lists, blanketed or targeted denial of service, and geo a given GSM handset.

Vendor: Harris Corporation Wireless Products Group
Protocols: GSM 850, 900, 1800, 1900

BOIP:
Cost: $75,000.00

Approval: Title 10

Limitations & Planning Factors
Blackfin Equipment Specifics:
- Supported Bands: Model A (900/1800MHz)
- Model B (800/1900MHz)
- Low power for battery operation
- USB or Bluetooth connection
- Mobile controller provides limited control
- 5-7 hour battery life
QRC Autonomous/Lighthouse

**Limitations & Planning Factors**

<table>
<thead>
<tr>
<th>QRC Autonomous Equipment Specifics:</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSM US 800/1900MHz, GSM European</td>
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<tr>
<td>900/1800MHz, CDMA-2000 850/1900MHz</td>
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<tr>
<td>• Complete Decoding/Encoding of Control Channel Messages</td>
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<td>• Software upgradeable</td>
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<td>• Internal GPS</td>
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<tr>
<td>• Mapping</td>
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<tr>
<td>• Data Logging on Removable CF Card</td>
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<tr>
<td>• Rugged Design; Ethernet enabled</td>
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**Capabilities**

Description: QRC Autonomous is a wireless analyzer designed for wireless network data collection on GSM networks. It automatically detects control channel activity and logs System (GSM, 802.11, etc.) information. It requires no computer during the collection phase and is designed so that literally anyone can collect data and conduct analysis upon retrieval.

**Vendor:** QRC Technologies

**Protocols:** GSM (Multi-Protocol), CDMA-2000

**BOIP:**

**Cost:** $35,995.00

**Approval:** Title 10
**DRT 1101B**

**Capabilities**

*Description:* The DRT 1101B provides a compact, yet powerful, surveillance capability against a variety of analog and digital wireless standards. The DRT1101B can be configured to support DF, digital voice intercept/recording, supports target lists of up to 10,000 entries, and has a flexible tuner configuration which provides frequency coverage of all bands of interest. Up to four tuners can be incorporated in unit.

**Limitations & Planning Factors**

**DRT 1101B Equipment Specifications:**

- Maximum Number of Channels: 90 (part-ceive)
- 48 (full-duplex)
- Compatible with: Windows 2000, XP
- Frequency Coverage: 0.2 MHz - 3000 MHz
- Audio Outputs:
  - 16-Channel Analog
  - 16-Channel Internal Digital Recorder
  - Stereo Headphones
  - E1 Audio interfaces
  - Controlled from PC using Windows 2000/XP
  - Ethernet Interface
  - User-friendly Graphical User Interface (GUI)
  - Integrated spectrum analysis tool

**Vendor:** Digital Receiver Technologies

**Protocols:** Multi-protocol

**BOIP:**

**Cost:** $78,850.00

**Approval:** Title 10/50
DRT 1183B

Capabilities
Description: The DRT 1183 provides a powerful surveillance capability against a variety of analog and digital wireless standards. The DRT1183 can be configured to support DF, digital voice intercept/recording, supports target lists of up to 10,000 entries, and has a flexible tuner configuration which provides frequency coverage of all bands of interest. Up to four tuners can be incorporated in unit.

Vendor: Digital Receiver Technologies
Protocols: Multi-protocol
BOIP:
Cost:

Approval: Title 10/ 50
Description: The DRT 1201C provides a compact, yet powerful, surveillance capability against a variety of analog and digital wireless standards. The DRT1201C can be configured to support DF, digital voice intercept/recording, supports target lists of up to 10,000 entries, and has a flexible tuner configuration which provides frequency coverage of all bands of interest. Up to four tuners can be incorporated in unit.

Limitations & Planning Factors

- Monitors up to 544+ half-duplex channels (32+ channels per WPM3).
- Software configurable to process various wireless standards.
- Processes multiple formats simultaneously.
- DF option available.
- Flexible tuner configuration provides frequency coverage of all bands of interest.
- RFT3: Dual channel transceiver VHF/UHF coverage from 2-3000 MHz; HF from 0.5 - 32 MHz
- HFT1: High performance HF receiver from 0.2-30 MHz
- MUT1: Microwave receiver from 0.2-8.5 GHz
- FPGA based Wireless Processor, WPM3, enables wideband signal processing. Can also generate 32+ narrowband signals.

Vendor: Digital Receiver Technologies

Protocols: Multi-protocol

BOIP:

Cost:

Approval: Title 10/50
DRT 1301C

Capabilities
Description: The DRT 1301C provides a miniature, yet powerful, surveillance capability against a variety of analog and digital wireless standards. It extends the capabilities of previous DRT systems. It incorporates advanced passive cooling technology eliminating the need for a noisy fan.

Limitations & Planning Factors
DRT 1301C Equipment Specifics:
- Software configurable to process various wireless standards. Processes multiple formats simultaneously.
- DF option available.
- INMARSAT software is available
- Provided expanded frequency coverage and bandwidth
- Designed for harsh environments
- 8 full Duplex or 16 half duplex conversations simultaneously
- 20 MHz to 3000 MHz
- Weight: 10.5 pounds

Vendor: Digital Receiver Technologies
Protocols: Multi-protocol
BOIP:
Cost: $100K

Approval: Title 10/50
DRT 1301B3

**Capabilities**

*Description:* The DRT 1301B3 provides smaller/rugged surveillance capability against a greater variety of analog and digital wireless standards than the DRT1101B. The DRT1301B3 can be configured to support DF, digital voice intercept/recording, supports target lists of up to 10,000 entries and incorporates higher performance control processors for increased processing speed and faster boot times.

**Limitations & Planning Factors**

*DRT 1301B3 Equipment Specifics:*
- Processing/Monitoring of up to 24 channels.
- Dual Wideband RF Tuners provide frequency coverage of all wireless bands of interest (20-1150 MHz, 1429-2500 MHz)
- Auto-configuration mode facilitates setup of unit; recognizes and decodes all control and traffic messages
- Small size and light weight
- Low noise signature
- Low power requirement

**Vendor:** Digital Receiver Technologies

**Protocols:** Multi-protocol

**BOIP:**

*Cost:* $100K

**Approval:** Title 10/50
DRT 4411B

**Capabilities**
Description: The DRT 4411B is a miniature receiving system that provides powerful electronic surveillance capability against a variety of analog and digital wireless standards. Utilizing the latest in digital signal processing (DSP) and micro-processor technology.

**Limitations & Planning Factors**

**DRT 4411B Equipment Specifics:**
- RESTRICTED SYSTEM
- Small size and light weight and quiet
- Low noise signature
- Low power requirement

**Vendor:** Digital Receiver Technologies

**Protocols:** 2 MHz – 3 GHz

**BOIP:**
On Hand: 2
Cost: $40K

**Approval:** Title 10/ 50
Fixed Wing Geo-Location (Manned)

- Garuda (G-Box)
- Carman I & II
- Typhon
- Windjammer
- Radiance
- Raven
- Deerpark
- Adder
- Traveler
- Nebula / NGW
- Icarus / Radio Eye (New Development)
  - Near Vertical Direction Finding (NVDF)
Garuda (G-Box)

Capabilities

Description: The G-Box is used as a GSM airborne geo-location system to replicate a GSM network Base Station. They operate by attracting and registering handsets operating on the local commercial network. Each handset's IMSI (International Mobile Subscriber Identity) or IMEI (International Mobile Station Equipment Identity) is compared against the 's target watch list. When a targeted handset is identified and registered to the box, a geo-location solution is calculated. G-Box was specifically designed and built for geo-location missions in fixed wing aircraft (manned/unmanned). Garuda received a software upgrade that modified the algorithm software, which allows the system to take 1000 entries.

Limitations & Planning Factors

G-Box Equipment Specifics:
- Dual band system (900/1800 & 850-1900 MHz)
- RX BAND 880-915 & 1710-1785 MHZ
- TX BAND 925-960 & 1805-1880 MHZ
- System GPS
- Active L1/L2 Band
  - L1 1575.42 +/- 10 MHz
  - L2 1227.00 +/- 10 MHz
- Effective Ranges: Min: 5 miles Max: UKN
- Target List: Max: 1000 targets

Vendor: VIA SEPCOR

Protocols: GSM

BOIP:

Cost: $185,000.00

Approval: Title 10

Vendor: VIA SEPCOR

Protocols: GSM

BOIP:

Cost: $185,000.00

Approval: Title 10
Carman

Capabilities

Description: The C-Box is used as a GSM air & ground geo-location system to replicate a GSM network Base Station. It operates by tracking and registering handsets operating on the local commercial networks. Each handset's IMSI or IMEI is compared against the TF's target watch list. When a targeted handset is identified and registered to the box, a geo-solution is calculated. The Carmen can also be used for target isolation by preventing GSM calls. Carmen has provided tracking of handsets on 50 and 1227 MHz. The G-boxes and Carmen are built on the same core brains but each run different firmware and software. The user GUI on each box is also different which allows for operator manipulation of additional network parameters.

Limitations & Planning Factors

C-Box Equipment Specifics:
- Single band system (850, 900, 1800 & 1900 MHz)
- RX Band: 880-915 MHz
- TX Band: 925-960 MHz
- System GPS Active L1/12 Band
  - L1 1575.42 +/- 10 MHz
  - L2 1227.00 +/- 10 MHz
- Effective Range: Min 5 miles Max UKN
- Target List Max: 500 targets, recommend <400

*CARMEN software includes EA capabilities that the G-Box Series does not have (Deny, Disrupt, Degrade and Deceive).

Vendor: VIA SEPCOR

Protocol: GSM

Cost: $185,000.00

Approval: Title 10

SECRET // NOFORN
DERIVED FROM: DATED: 01 May 2006 DECLASSIFY ON: 07 January 2034
**Carman II**

### Capabilities

**Description:** The C-Box II is a GSM BTS operating in the 850/900/1800/1900 MHz GSM bands that establishes connection with targeting devices. It operates by attracting and registering handsets operating on the local commercial network. Each handset's IMSI or IMEI is compared against the TF's target watch list.

### Limitations & Planning Factors

- **C-Box II Equipment Specifics:**
  - Single band system: 850, 900, 1800 & 1900 MHz
  - Size: 15.5" x 3.5"
  - Weight: 15 lbs (batteries not included)
  - RX Band: 880-915 MHz
  - TX Band: 925-960 MHz
  - System GPS - Active L1/L2 Band
  - L1: 1575.42 +/- 10 MHz
  - L2: 1227.00 +/- 10 MHz
  - Effective Range: Min 5 miles Max UKN
  - Target List Max: 500 targets, recommend <400

- **CARMEN software includes EA capabilities that the G-Box Series does not have (Deny, Disrupt, Degrade and Deceive).**

### Vendor:

- **Key W**

### Protocols:

- **GSM**

### BOIP:

- **Cost:** $130,000.00

### Approval:

- **Title 10**

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DERIVED FROM:
DATED: 01 May 2006
DECLASSIFY ON: 07 January 2034
Typhoon

Capabilities
Description: The Typhon is used as a GSM airborne geo-location system to replicate a GSM network Base Station. They operate by attracting and registering handsets operating on the local commercial network. Each handset's IMSI (International Mobile Subscriber Identity) or IMEI (International Mobile Station Equipment Identity) is compared against the target watch list. When a targeted handset is identified and registered to the box, a geo-location solution is calculated. Typhoon was specifically designed and built for geo-location missions in fixed wing aircraft (manned/unmanned).

Vendor: NSA TAO
Protocols: GSM 850/1900, 900/1800
BOIP:
Cost: $175,800.00
Approval: Title 10/50 (Title 10 only under 5-35)

Limitations & Planning Factors
Typhoon Equipment Specifics:
- 30km+ range in rural areas, 5km in urban areas
- Integrated GPS
- Highly mobile
- Field Upgradable
- Battery or vehicle power capable
- 4-8 hour battery life
- 20 pounds with out the battery
Windjammer

Capabilities
Description: Windjammer is a Thuraya, INMARSAT handheld satellite simulator that can conduct survey, stimulation, denial of service, and geo-location of a given target handset. It presents itself to satellite terminals as the network issuing commands that cause the terminals to communicate with the system directly. The terminal identities are determined at which time they may be actively geo-located. Variants include Portable (pictured), Rack System for simultaneous, multi-network operations, and UAV Systems which include a low bandwidth remote control capability.

Limitations & Planning Factors
Windjammer Equipment Specifics:
Networks: Inmarsat miniM, Thuraya
TX BAND:
- Tuning Range: L-Band (1525-1559 MHz)
- RF Output Power: Selectable from -12 dBm to +37 dBm
RX BAND:
- Full Range Receiver: 1525 - 1665 MHz
- Uplink Receiver: 1626.5 - 1665 MHz
GPS RX:
- Antenna Connector: SMA
- Antenna: External 1575.42 MHz, RH polarization, active 3 V, 20 dBi gain, SWR < 2.5
- Range >2 miles ground, >8 miles air

Vendor: SR Technologies
Protocols: Inmarsat, Thuraya
BOIP:
Cost: $192,000.00

Approval: Title 10/50
Limitations & Planning Factors

Radiance Equipment Specifics:
- Band: CDMA-2000 (single-banded system)
- Requires separate network survey device (ICS2 from QRC Inc.)
- Causes Denial of Service (DoS) during operation to CDMA network for short period
- 27 Jan- 12 Feb - Deployed for two week operational assessment/Combat Evaluation (OIF)
- A/C integration difficult due to size

Capabilities

Description: Radiance is a self-contained portable airborne and ground interrogator system capable of capturing, interrogating, and geo-locating CDMA-2000 and IS-95 mobile devices. Radiance captures, interrogates, and geo-locates the handset by continuously collecting range data on the target and pairing this data with the GPS location of the Radiance system.

Vendor: Vendor West

Protocols: 450, 800, and 1900MHz

CDMA 2000

BOIP:

Cost:

Approval: Title 10
Raven

**Capabilities**

**Description:** Raven is used to interrogate WCDMA phones and to geolocate target phones from the air or from the ground. Interrogation is the process of getting phones to send information such as their unique identifiers (e.g. IMSI and IMEI). Geolocation is the process of determining the geographical location of a target phone.

**Limitations & Planning Factors**

- **Raven Equipment Specifics:**
  - Band: UMTS (single banded system)
  - Requires separate network survey device
  - Causes Denial of Service (DoS) during operation to UMTS network for short period
  - Developmental

- **Vendor:** Vendor West

- **Protocols:** UMTS

- **BOIP:**

- **Cost:** $800K

- **Approval:** Title 10

- **DERIVED FROM:**
- **DATED:** 01 May 2006
- **DECLASSIFY ON:** 07 January 2034
Deerpark

Limitations & Planning Factors

- Ground/Airborne CDMA only
- Does NOT cause denial of service
- 205 lbs w/ Adder & all four Filter Amps
- Requires 28 VDC at ~25 amps for operation, draws 700W for Adder and one Filter Amp
- Can be operated on large wheeled vehicle utilizing 12 to 28 VDC up-converters

Vendor: Rincon IAW NRO

Protocols: CDMA 450, 850, 1900

BOIP:

Cost: $250K

Approval: Title 10

Deerpark Equipment Specifics:

- Targets 450 sub-band A/C, 800, and 1900MHz CDMA-2000 & IS-95 mobile devices
- Multi-banded system
- Unique identifiers include IMSI-S & ESN/MEID
- Passive survey of handsets/base stations
- Passive geo-location of handsets/base stations
- Active stimulation/geolocation of handsets
- Active survey/geolocation of handsets

Capabilities

DERIVED FROM:
DATE: 01 May 2006
DECLASSIFY ON: 07 January 2034
Traveler (EW FoS)

Limitations & Planning Factors

Traveler Equipment Specifics:
- 10 channel, 20MHz to 3GHz airborne software programmable system designed to survey and geo-locate designated signals of interest (SOI).
- Targets the 850, 900, 1800, and 1900MHz GSM bands.
- Traveler is designed so that adding additional SOI is a matter of porting software into the Traveler processing unit.
- The near-term to include CDMA and UMTS
  - Multi-Channel Spatial Processing (Co-Channel Reduction)
  - Covert On-Demand Active Techniques
  - Moveable Between Platforms in Field
  - Multi-Channel Direction Finding (DF)
  - Correlation Interferometer Precision Geo-location (CIGL)

Capabilities

Description: TRAVELER is a developed software defined multi-protocol system capable of active/passive GSM geo-location, passive GSM survey/tower mapping, HPCP/PTT intercept/DF, Thuraya intercept/copy/geo-location. Traveler passive capability reduces network signature/impact on the network. Provides robust airborne network survey capability.

Vendor: BAE Systems

Protocols: GSM 850/1900, 900/1800 passive GSM survey/semi-passive geolocate, HPCP, PTT, Thuraya (Vagrant). Future SOI ports planned include: CDMA (Deer Park), UMTS & TTL

BOIP:

Cost: $750k

Approval: Title 10
Nebula

Capabilities

Description: Nebula is an NSA Developmental airborne multi-protocol box designed for geo-location against GSM (Multi-Band), CDMA, UMTS, and H50PA. Currently can target HPCP, GSM, Inmarsat, Thuraya, CDMA-2000, HSDPA. The NSA is leading system development (NSA lead).

Vendor:

Protocols: GSM (multi-band), CDMA, UMTS, WiMAX, LTE, HSDPA, HPCP, Inmarsat, Thuraya

BOIP:

Cost: TBD

Approval: Title 50

Limitations & Planning Factors

Nebula Equipment Specifications:

- Band: GSM (multi-band), CDMA-2000, UMTS, HSDPA.
- Able to lock and hold traffic from 12 miles away.
- Air/Ground Geo-location ability to within 200m (results often closer to a 10m CEP).
- Able to change channels without dropping locked HS.
- High DC power requirements (Nebula 2C).
- Weight 45 pounds.
- Power requirement: 450 Watts 36VDC.
ICARUS/ NVDF

Capabilities
Description: NVDF provides instantaneous PTT VHF/UHF geolocation capability to support missions where it is possible to fly much closer to targets than traditional stand-off systems. Ideal for rural or remote areas where the density of emitters is low (no inherent interference cancellation, ideal for AFG operations) Signal types for initial system frequency range: 100-500 MHz (Push to Talk Transceivers (PTT), FRS Transceivers, High-Powered Cordless Phones (Handset and Base Station), CW Beacons and RF Tags, Trunk Mobile Radios

Limitations & Planning Factors

NVDF Equipment Specifics:
- Better look-angle, resolution, and accuracy for EO/IR sensors (directly above target, +/- 50 degrees angle, sub 50m accuracy achieved in CONUS testing)
- More favorable intercept conditions for low power emitters (Locate priority talkers vice repeaters)
- Instantaneous Geolocation from a signal measurement due to a 2D look-down antenna array.
- Proto-type (CIA) system designed for general aviation acft. AST Hydrah processor, 4x10 ft array w/ cavity backed circular polarized spiral antennas designed to cover 100-500Mhz range.

Vendor: AST
Protocols: PTT
BOIP:
Cost: $1.5 mil
Approval: Title 10
PGL Payloads on UAVs

- Twister
- S-100 w/ Carman II and Windjammer
- Gauva (G-Pod/STE)
- GarWind (BLOS G-Pod)
- Gilgamesh
- Airhandler
- BLOS
- Radiance (BLOS Rad-Pod)
- Jagged Amber
- Traveler Pod
Twister – Firescout APG

Capabilities
Description: Twister is a multi-frequency band, micro-class Base Station Router. It has a power output of +43dBm, integrated GPS, Voice & High-speed Data capability, GSM security & encryption making system highly mobile and deployable for field use. The system is designed for VBTS GUI Software support which includes full VBTS GUI feature base and applications. The software allows for complete command and control, which provides support for a variety of field applications. The system is optimized for low power consumption, custom installation, and familiarity of use w/ existing VBTS GUI operators.

Specifications:
Physical Dimensions:
- Twister BSR: 9.38”L x 7.75”W x 2.13” H
- Twister Aux Front-End: 8.25”L x 5.75”W x 3.25”H

Weight
- Twister BSR = ~3.5 lbs
- Twister Aux Front-End: ~6.5 lbs

Environmental
- Operating Temp: 0° to + ~50°C [90% humidity non-condensing]
- Storage Temp: -30°C to + ~80°C
- Convection cooled

GSM Frequency Capabilities
- EGSM (900Mhz), DCS (1800Mhz), PCS (1900 Mhz)
- Full-rate Voice Encoder, Basic SMS Messaging

Power:
- Input Power Requirements = 55W (Max) in typical configuration
- Input Voltage Range = 28 VDC

Integrator: Northrop Grumman IS/AS
ICW PMA-266
Protocols: GSM 900/1800/1900 Mhz
Approval Authority: GFC IAW host nation GCC approvals
Boeing/Schiebel S-100

Capabilities
Description: System Provides
- Real Time Land or Sea-based ISR, KPPs
- Maritime Takeoff and Landing 50'x44' Helicopter Pad, Sea-State 2 (T)
- Data Link Range up to 180 km
- 6 Hrs Endurance @ 55 kts @ 25 kg ; (55 lbs) payload
- Unpack/Pack-up in <6 Hr (T)
- Max Air speed: 130 kts (240 km/h) IAS
- Cruise Speed: 100 kts (185 km/h) IAS
- Ceiling: 18, 000 ft in ISA conditions @ reduced GW
- Operating temp: (-40 F to 131 F); winds up to 25 kts (46 km/h)

Limitations & Planning Factors
KATAHDIN Equipment Specifics:
• CAN NOT ARM with weapons
• Internal ST6 maritime requirement

Vendor: Boeing
Protocols: GSM, Thuraya & FMV
BOIP:
On-Hand:
Cost: TBD
Approval: Title 10
GUAVA (G-Pod/STE) -- LOS

Capabilities
Description: The SP1 G-Pod system is a GSM airborne (UAV) geo-location system to replicate a GSM network Base Station. The G-pod (Garuda in an 18 inch pod) is deployed on the MQ-1/9 acft. Once at mission altitude, the Ground Control Data Link (operated from Surface Terminal Element, STE) contacts the G-pod and creates an Ethernet connection for payload command and control as well as data link command and control. The payload operator is then free to perform mission activities while the air to ground control data link tracks and maintains a connection with the UAV sensor pod.

Limitations & Planning Factors
Guava Equipment Specifics:
- G-pod (G-Box in a pod, see G-box specs)
- Data Link: TCDL
- Xmit Power: >10 Watts
- Power Consumption: <600 watts
- Dimensions: 68" X 18"
- Weight: 125 lbs with sensor
- G-Pod Ground Station (Surface Terminal Element, STE)
- Data Link: TCDL
- Xmit Power: 2 watts
- Power Consumption: <2000 watts
- Dimensions: 8 feet diameter
- System Range: 90 NM

Integrator: Northrop Grumman IS ICW
General Atomics
Protocols: GSM 900/1800
Approval: Ground Force Commander
IAW host nation GCC approvals
GarWind/ BLOS Pod

Capabilities

Description: BLOS G-Pod. Garwind is a GSM airborne (UAV) geo-location system to replicate a GSM network Base Station deployed on the Predator UAV. With BLOS capabilities Garwind is able to operate in areas without a Surface Terminal Element (STE) reducing the need for a ground footprint. Garwind allows the transfer of G-Pod and Windjammer sensor data over the BLOS SOCOM Ku-Band SATCOM datalink using the Garwind Ground Control System (GCS).

Limitations & Planning Factors

Garwind Equipment Specifics:
- 31 Mar 09 – 1 Apr: Test POD KU connectivity at Cannon – Successful.
- 4-6 Jun 09: Conduct Test bed Network evaluation and certification at . Successful.
- 18 Dec 09 – Planned completion date for integration.
- Jan 10 – UTC Plan to field first MQ-9 w/ BLOS G-POD and upgrade entire fleet of PODS. Priority first on MQ-9’s and then on the MQ-1’s once integration testing is completed on that platform.

Vendor:

Protocols: GSM (multi-band)

BOIP:

On-Hand:

Cost:

Approval: Title 10
Gilgamesh

Capabilities
Description: Gilgamesh is a Geo-location device designed to conduct BLOS UAV APG operations from MQ-1/9 aircraft. Gilgamesh is controlled via the Air Handler/Predator KU Band data link and does not require a STE to operate. System geo-locates with same accuracy and generally same TTP as other systems. Currently C2 interface via NSA Net.

Limitations & Planning Factors

Equipment Specifics:
- AWR completed for USSOCOM/ACC MQ-1/9 aircraft
- Weight: ~8.5 lbs (LRU), requires modified VSAE including antenna and cable harness on both MQ-1/9 aircraft
- Bandwidth requirements: Typical configuration, 4800 bps uplink, 256 kbps downlink
- Requires Airhandler to operate
- Current Payloads: Gilgamesh LRU
- Payload Vendor(s): Protected, SNC

Vendor: Sierra Nevada Corporation
ICW NSA OTRS/DAED and General Atomics

Protocols: GSM 900/1800 (one band available in flight). Requires separate vertical tailfin antenna assembly (VSAE) per band.

Approval: Ground Force Commander
IAW host nation GCC approvals
Airhandler

**Capabilities**

*Description:* Airhandler is designed to conduct BLOS UAV geo-location operations from MQ-1/9 aircraft primarily used against low-band (PTT) signals-of-interest. Airhandler is controlled via the acft KU Band data link. Currently C2 interface via NSA Net. Requires multiple collection nodes for increased geo-location accuracy.

**Vendor:** Sierra Nevada Corporation ICW NSA OTRS/DAED and General Atomics

**Protocols:** PTT (primary), COMINT 130-180Mhz, 220-475Mhz, freq range 20-3000Mhz

**Approval:** Ground Force Commander IAW host nation GCC approvals

**Limitations & Planning Factors**

**Equipment Specifics:**
- AWR completed for USSOCOM/ACC MQ-1/9 aircraft
- Weight: ~13 lbs (LRU), requires modified VSAE including antenna and cable harness on both MQ-1/9 acft
- Bandwidth requirements: Typical configuration, 4800 bps uplink, 256 kbps downlink
- Current Payloads: Gilgamesh LRU
- Payload Vendor(s): SNC
BLOS Pod

Capabilities
Description: Pod based capability that allows for remote operation of Ethernet payloads removing the requirement for dedicated, line-of-sight (LOS) tactical data link. Ethernet data is routed over the aircraft's serial SATCOM data link using an Asymmetric Ethernet Device (AED). The AED is placed on each end of the aircraft's SATCOM data link (onboard Pod, GCS) and is used to convert Ethernet data to serial for transit across the link.

Equipment Specifics:
- AWR completed for USSOCOM MQ-1/9 aircraft, Warrior Blk-0
- Pod weight: ~123 lbs (with G-Box/WJ payloads)
- Bandwidth requirements: Typical configuration, 4800 bps uplink, 256 kbps downlink
- Current Payloads: Garuda (G-Box), Windjammer-U
- Payload Vendor(s): Protected, SR Technologies

Integrator: Northrop Grumman IS ICW
General Atomics
Protocols: GSM 900/1800, Thuraya/Inmarsat
Approval: Ground Force Commander IAW
host nation GCC approvals
RADPOD (Radiance Pod)

Capabilities
Description: Pod based capability that allows for remote operation of Ethernet payloads removing the requirement for dedicated, line-of-sight (LOS) tactical data link. Ethernet data is routed over the aircraft’s serial SATCOM data link using an Asymmetric Ethernet Device (AED). The AED is placed on each end of the aircraft’s SATCOM data link (onboard Pod, GCS) and is used to convert Ethernet data to serial for transit across the link.

Equipment Specifics:
- AWR completed for USSOCOM MQ-1/9 aircraft
- Pod weight: ~131 lbs (with Radiance payload)
- Bandwidth requirements: Typical configuration, 4800 bps uplink, 256 kbps downlink
- Current Payload (s): Radiance 850
- Payload Vendor(s): Protected

Integrator: Northrop Grumman IS ICW
General Atomics
Protocols: CDMA-2000, 850Mhz
Approval: Ground Force Commander IAW
host nation GCC approvals
Developmental
Jagged Amber – Next Gen BLOS

Capabilities
Description: Pod based capability that allows for remote operation of Ethernet payloads removing the requirement for dedicated, line-of-sight (LOS) tactical data link. Ethernet data is routed over dedicated airborne SATCOM terminal integrated into the pod, removing the requirement to leverage acft KU-Band C2 link and allowing for higher dedicated BW for future IO/TTL/communications requirements.

Integrator: Northrop Grumman IS ICW
Big Safari & General Atomics

Protocols: GSM 900/1800, CDMA 450/800, Thuraya/Inmarsat, TTL

Approval: Ground Force Commander IAW
host nation GCC approvals

Equipment Specifics:
- In development for USSOCOM MQ-9
- Pod weight: ~250 lbs (with payloads)
- Current Payload(s): Twister, Siren, Windjammer, MuRX, Vector
- Payload Vendor(s): Protected, AST, SR Technologies
Traveler Pod – T-Pod

Capabilities
Description: Pod based software defined multi-protocol system capable of GSM survey/map/geo-location, CDMA survey/map geo-location, HPCP/PTT intercept/DF, Thuraya intercept/copy/geo-location. Traveler's less intrusive techniques reduces network signature/impact on the network. Provides robust airborne network survey capability.

Integrator: BAE Systems ICW General Atomics
Protocols: GSM, CDMA, Thuraya, HPCP/PTT, TTL
Approval: Ground Force Commander IAW host nation GCC approvals

Equipment Specifics:
• In development for USSOCOM Warrior Blk-1
• 5-35 awaiting 3U Traveler variant prior to Pod integration
• Pod weight: ~180 lbs (with payloads)
• Current Payload(s): Traveler 6U (Warrior)
• Payload Vendor(s): BAE Systems
Ground Based Geo-Location
(Vehicular)

- GX-200
- Artemis
- Maximus
- Spartacus I/II
- Carman / Carman II
- Cyclone Mx9
- Windjammer
- Buckshot
- Yellowstone
- Kingfish
- Stingray I/II
- PRD-13
- Hayden I/II
- StarGrazer
- Sidewinder
- REBUS
- Radio Eye (In development)
GX-200

Capabilities
Description: Nearly identical to the GX100 Series (Nemesis), the upgraded GX200 series performs the same capacity in the ground-role GSM stimulation; however, the GX200 provides a more robust operator system capable of better physical movement, advanced offset targeting, and higher MHz ranges. System relies on second system, Artemis, for geo-location resolution.

Note: Nemesis current XOB Typhon issued to SIGINT personnel, now being Sec-C level replaced with Maximus.

Limitations & Planning Factors

GX-200 Equipment Specifics:
- 2x Dual band 900/1800 high power receivers
- Air-interface survey, interrogation and release functionality
- High volume registration and covert traffic channel establishment
- High performance custom RF and signal processing hardware
- Advanced smart diversity reverse enhanced receiver
- Largely replaced by the Maximus

Vendor: Martone Radio Technology, Inc.

Protocols: GSM

BOI:
Cost: $2,000

Approval: Title 10

DERIVED FROM:
DATED: 01 May 2006
DECLASSIFY ON: 07 January 2034

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**Artemis**

**Capabilities**

Description: Artemis is a dual band 850/1900 & 900/1800 MHz system that provides a GSM geo-location capability similar to Carmen and G-box. However, it cannot be operated effectively from air platforms and is currently used exclusively as a ground system in coordination with Nemesis/Maximus (or other stimulation device that locks a handset and enables the DF). Mobile antennas can be located with an accuracy of +/- 5 degrees used to create a CEP around the target.

**Vendor:** MRT

**Protocols:** Dual band 850/1900 & 900/1800 MHz GSM

**BOIP:**

**Cost:** $83,333.00

**Approval:** Title 10

**Limitations & Planning Factors**

**Artemis Equipment Specifics:**

- User friendly GUI
- End to End Built in Test
- Fully digital processing of RF signals based on angle resolving techniques
- 6-channel simultaneous wideband DF measurement
- Artemis “T” to be used for Thuraya in development

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**Vendor:** MRT

**Protocols:** Dual band 850/1900 & 900/1800 MHz GSM

**BOIP:**

**Cost:** $83,333.00

**Approval:** Title 10
Artemis II

Capabilities

Description: Artemis is a dual band 850/1900 & 900/1800 MHz system that provides a GSM geo-location capability similar to Carmen and G-box. However, it cannot be operated effectively from air platforms and is currently used exclusively as a ground system in coordination with Nemesis/Maximus (or other stimulation device that locks a handset and enables the DF). Mobile antennas can be located with an accuracy of +/- 5 degrees used to create a CEP around the target.

Limitations & Planning Factors

Artemis Equipment Specifics:
- User friendly GUI
- End to End Built in Test
- Fully digital processing of RF signals based on angle resolving techniques
- 6-channel simultaneous wideband DF measurement
- Artemis “T” to be used for Thuraya in development

Vendor: MRT

Protocols: Dual band 850/1900 & 900/1800 MHz GSM

BOIP:
Cost: $83,333.00

Approval: Title 10
Maximus

Limitations & Planning Factors

Maximus Equipment Specifics:
• Approx ground distance ~ 1-4 Km
• Target Handset must be on & not engaged in a call
• Locking handset into TCH drains battery and raises signal strength
• Use of system requires deconfliction w/other geo elements in AO
• Network can identify rogue BTS
• Improper use can impact network

Capabilities

Description: Ground GSM stimulation & geo-location device
• Replicates BTS to STIM handset into RF TCH allowing for DF
• Provides limited capability to isolate targets utilizing Firewall option
• Sagem HS included to provide network survey
• Incorporates Artemis in system to provide geo-location data from both moving and stationary vehicle (zero baseline)
• System provides extended BA list with commonality chart

Vendor: Martone Radio Technology, Inc.

Protocols: GSM
BOIP: 33
Cost: $365,000.00

Approval: Title 10
Spartacus I

Capabilities

Description: A GSM “Stimulate only” capability to meet the requirement for a portable Geo-location device. This device is a PCS cell GSM radio that will cause GSM handsets to register to it instead of nearby cell towers in order to match handsets against a target list. Targeted handsets can then be directed into a traffic channel (silent call) and geo-located with an “Artemis” device or located with the use of direction finding devices.

Limitations & Planning Factors

Spartacus Equipment Specifics:

- Caution should be used to avoid direct contact with the antenna element while transmitting
- Currently only a single band GSM system to be upgraded to multiband
- 4 hour battery life
- Approx ground distance ~ 1-4 Km
- Use of system requires deconfliction with other geo elements in AO
- Improper use can impact network

Vendor: Martone Radio Technology, Inc.

Protocols: GSM 900/1800 (single band)

BOIP:
Cost: $179,429.00

Approval: Ground Force Commander
**Spartacus II**

**Capabilities**
- **Description:** Standalone, man portable, vehicle and airborne PGL system. Simultaneous dual band/ dual BTS with Receive diversity. Artemis I/II interface for cross border operations. Works in conjunction with Rover software application.
  - Able to go from Airborne or vehicle mount configuration to dismounted operation with no change to system.
  - Grab and go. The smallest dual band/high powered system on the market.

**Limitations & Planning Factors**
- **Spartacus II Equipment Specifics:**
  - 900 & 1800 MHz simultaneous operation
  - 10 watts per BTS
  - Size: 12” x 3.5” x 10”
  - Weight: 12 lbs
  - DF when connected with Artemis I/II, TDOA/TOA in stand-alone
  - 5 hours battery life at 5 watts
  - Improper use can impact network

**Vendor:** Martone Radio Technology, Inc.
**Protocols:** GSM 900/1800 (single band)
**BOIP:**
**Cost:** $180K
**Approval:** Title 10
Cyclone Mx9 (Micro/Macro)

Capabilities
Description: Developmental highly mobile ground GSM stimulation & geo-location device
- Replicates BTS to STIM handset into RF TCH allowing for DF
- GSM security and encryption
- Integrated GPS
- Overlay GSM cellular communications supporting up to 32 Cyclone systems

Limitations & Planning Factors
Cyclone Mx9 Equipment Specifics:
- 15+ km range, Urban range ~ 1.25 km
- Utilizes existing Typhon GUI, no additional training required
- Weight: 6 pounds
- AC, DC, or battery powered
- 70 WH battery provides 90 minutes run time, 800WH battery provides 9-15 hours

Vendor:
- Protocols: GSM
- BOIP: Developmental
- Cost: $106,000.00 estimate
- Approval: N/A
Windjammer (Ground)

See Windjammer under Fixed-Wing (Manned)
Buckshot

Limitations & Planning Factors

Buckshot Equipment Specifics:
- Frequency Coverage: 30MHz to 3GHz
- Capture bandwidth: Programmable up to 200 KH

Capabilities

Description: Project Buckshot is a ground direction finding (DF) system specifically targeting PTT radios. The system is designed as a carry-on system suitable for quick install, low profile passive DF/Geo missions. Developmental item of interest. Not fielded in quantity.

Vendor: Herrick Technical Laboratories

Protocols: PTT

BOIP:
Cost: $40,000.00

Approval: Title 10
CAPABILITIES

Yellowstone

Description:

- Ground GSM stimulation device
- Replicates BTS to STIM handset into RF TCH allowing for DF
- Provides limited capability to isolate targets utilizing wild card or reject cause
- Plots to Falcon View and allows track of dynamic targets
- Optional 5 Watt Amp can be attached
- Backpack version of Carman

LIMITATIONS & PLANNING FACTORS

Yellowstone Equipment Specifics:

- Approx ground distance 200m
- Target Handset must be on & not engaged in a call
- Locking handset into TCCH drains battery and raises signal strength
- Target watch list limited to 500 IMEI & IMSI
- Use of system requires deconfliction w/other geo elements in AO
- Network can identify rogue BTS
- Improper use can impact network

VENOR: OGA provide vendor protected

PROTOCOLS: 900Mhz, 1800Mhz, 850Mhz and 1900Mhz (not multi-protocol and requires antenna)

BOIP:

COST: $38,382.00

APPROVAL AUTHORITY FOR USE:

Ground Force Commander pending designation of target

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DERIVED FROM:
DATED: 01 May 2006
DECLASSIFY ON: 07 January 2034
Kingfish

CAPABILITIES

Description:
- Ground GSM/CDMA stimulation device
- Replicates BTS to STIM handset into RF SDCCH allowing for DF
- Optional 5 Watt Amp available
- Backpack version
- Can lock and DF from same unit

LIMITATIONS & PLANNING FACTORS

**Kingfish Equipment Specifics:**
- Approx ground distance 200 Meters
- Target Handset must be on & not engaged in a call
- Cannot DF with Gjallar or Datong system
- Locking handset into SDCCH drains battery and raises signal strength
- Use of system requires deconfliction w/other geo elements in AO
- Network can identify rogue BTS
- Improper use can impact network
- Can be used by Helo Assault forces

VENOOR: Harris Corporation

PROTOCOLS: 900Mhz, 1800Mhz, 850Mhz, 1900Mhz and CDMA (multi-protocol and requires antenna)

BOIP:

COST: $32,433.00

APPROVAL AUTHORITY FOR USE: Title 10/50

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DERIVED FROM: DATED: 01 May 2006
DECLASSIFY ON: 07 January 2034
Stingray I/II

CAPABILITIES

Description:
- Ground GSM/CDMA stimulation device
- Replicates BTS to STIM handset into RF SDCCH allowing for DF
- Passive and active modes of operation
- Optional 5 Watt Amp available

VENDOR: Harris Corporation

PROTOCOLS: 900Mhz, 1800Mhz, 850Mhz, 1900Mhz and CDMA (multi-protocol and requires antenna)

BOIP:

COST: $134,952.00

APPROVAL AUTHORITY FOR USE: Title 10

LIMITATIONS & PLANNING FACTORS

Stingray Equipment Specifics:
- Approx ground distance 200 Meters
- Target Handset must be on & not engaged in a call
- Cannot DF with Gjallar or Datong system
- Locking handset into SDCCH drains battery and raises signal strength
- Use of system requires deconfliction w/other geo elements in AO
- Network can identify rogue BTS
- Improper use can impact network

DERIVED FROM:
DATED: 01 May 2006
DECLASSIFY ON: 07 January 2034
PRD-13

CAPABILITIES
Description: The PRD-13 is a radio frequency (RF) and direction finding (DF) signals intelligence system that provides signal location and exploitation. The PRD-13 provides Tier 10 EW Operators with the ability to DF any GSM signal of interest; however, the PRD-13 is much larger than other DF systems. This system is part of the Tier EW inventory for certain conditions that require a broad spectrum, large area focus.

LIMITATIONS & PLANNING FACTORS
PRD-13 Equipment Specifics
- Directed Search (Channel scan) 400 channels; 20 priority channels; 9 bands
- Freq Coverage: 2x 2000MHz & Intercept; 2x 2000MHz Monitor; 2x 500MHz DF
- Signal List: Logs up to 400
- Built-in Test (BIT): End-to-end system test

VENDOR: L3 Communications, Linkabit Division
PROTOCOLS: 2MHz – 2GHz
BOIP:
COST: $20,000.00

APPROVAL AUTHORITY FOR USE: Title 10/50

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DERIVED FROM:
DATED: 03 May 2006
DECLASSIFY ON: 07 January 2034
**Hayden I/II**

**Capabilities**

**Description:** Project Hayden is a survey, interrogation, stimulation, denial of service, and geo-location system to track high powered cordless phones (HPCP). Hayden can stimulate handsets to allow direction finding (DF) systems such as EB-200 or Hydra to ground track. Ongoing development will allow Hayden software be ported into Project Traveler.

**Vendor:** BAE Systems

**Protocols:** HPCP

**BOIP:**

**On-Hand:**

**Cost:** $110,000.00

**Approval:** Title 10

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**Limitations & Planning Factors**

**HAYDEN Equipment Specifics:**

- **DEVELOPMENTAL**

- Weight: 30lb

- Initially a 4 channel system to be increased to 12 channels for air operations

- Requires EB200, HIDRA or HEAT for DF
**Stargrazer III**

**Capabilities**

**Description:** Stargrazer is an Army system developed to deny, degrade and/or disrupt a targeted adversary’s command and control (C2) system on the Thuraya Handset (HS) via electronic means. Stargrazer is able to extract IMSI and IMEI data from the handset. STARGRAZER is a flexible and expandable Special Purpose Electronic Attack (SPEA) capability designed primarily to target Mobile Satellite Services communication downlink paths.

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**Limitations & Planning Factors**

**STARGRAZER III Equipment Specifics:**
- Operates in three different phases:
  1. Phase II: Monitor mode.
  2. Phase II: Attack mode: Identify, capture and jam one or more handsets while gaining IMSI, IMEI, TMSI, and geo-location data.
  3. Phase III: “Impersonate” mode: Impersonate actual Thuraya network with SGIII network and requiring the Thuraya handsets in range to register with the impersonated network and transmit their IMSI, IMEI, TMSI and geo-locational data. The phone/phones can essentially be brute force, or surgically jammed.

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**Vendor:**

**Protocols:** Thuraya, Thuraya DSL, ACeS

**BOIP:**

**On-Hand:**

**Cost:**

**Approval:** Title 10
Sidewinder

**Capabilities**

*Description:* Project SIDEWINDER is a compact, software defined ground-based HPCP and GSM geo-location system. Currently in the development phase with the potential to become the replacement for the Carmen geo-location system. SIDEWINDER will employ the core technology of the TRAVELER system with a 4-channel receiver to increase to a 12-channel receiver in the future.

**Vendor:** BAE Systems

**Protocols:** HPCP and GSM

**BOIP:**

**On-Hand:**

**Cost:** TBD

**Approval:** Title 10

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**Limitations & Planning Factors**

**Sidewinder Equipment Specifics:**

- DEVELOPMENTAL
- Much of technology for Sidewinder was transferred from the Traveler program
- Fully ruggedized to permit operations in a variety of ground platforms and for low-altitude rotary wing missions
- Contains both active and passive capabilities
- Frequency range from 20 MHz to 3000 MHz
Limitations & Planning Factors

**REBUS Equipment Specifics:**
- Approx ground distance 200 meters
- Target Handset must be on & not engaged in a call
- Locking handset into TCCH drains battery and raises signal strength
- Use of system requires deconfliction w/other geo elements in AO
- Network can identify rogue BTS
- Improper use can impact network

**Capabilities**

**Description:** Ground GSM stimulation device
- Replicates BTS to STIM handset into RF TCH allowing for DF
- Provides limited capability to isolate targets utilizing Firewall option
- Sagem HS Incorporated to provide network survey
- Backpack version of Series 200 box

**Vendor:** CellXion

**Protocols:** GSM 900MHz

**BOIP:**

**On-Hand:**

**Cost:** $152,000,000

**Approval:** Title 10
RadioEye

Limitations & Planning Factors

RadioEye:

• Power Consumption 3.3V
• Size: 12” x 3.5” x 10”
• Weight: < 10 lbs
• Battery life 6 hrs (1 x 2590)

Capabilities

The RadioEye system is a lightweight, man packable, push-to-talk (PTT) radio situational awareness and DF system intended to provide operators with the capability to monitor PTT activity within range and determine from what direction a given PTT emitter is broadcasting. The system is designed to provide a ground assault force with situational awareness of any PTT activity in their immediate area. Since the majority of PTT radios operate with 50mW of amplification their typical effective range is between 300m and 400m. PTT communications networks are driven by the capability of PTT radios to transmit and receive between one another.

Vendor: Ventis

Protocols: Man packable PTT

BOIP:

Cost: $97 K

Approval: Title 10
Direction Finding Systems

- Gjaller
- Jugular I/II
- Quasimodo
- HEATR
- Thoracic
Limitations & Planning Factors

Gjaller Equipment Specifics:
- Close in GMS Geo-location device
- Handheld size device
- Weight: 2 pounds
- Different handsets used for different bands
- GOTS provided equipment
- GSM band specific direction finding capability

Capabilities

Description: Project Gjaller was initially developed for the CIA as a GSM direction finding (DF) capability. Locks onto HS locked onto an interrogation device. The small size allows for the operator to use the Gjaller in a covert, low-visibility role for both night/day DF operations.

Vendor: Windermere Technology Solutions

Protocols: GSM (multi-band)

BOIP:

On-Hand:

Cost: $4,300.00

Approval: Ground Force Commander
JUGULAR 2

Capabilities
- 6 band GSM, CDMA and UMTS receiver capable of detecting and measuring RSSI
- Uses either internal antenna or external antenna
- Audible alert via Bluetooth or wired ear piece
- Channel scan feature stops at GSM TCH detect
- High and low gain selectable

Limitations & Planning Factors
- COTS - releasable to conventional forces
- Dense environments increase difficulty of DF operations
- Utilized for close in DF operations; difficult to identify targets from distance
- 3-4 hours of operation
- Comes in Black, Green, Tan or Gray

Vendor: KeyW Corporation
Protocols: GSM 850, 900, 1800, 1900, 2100
4 CDMA 450 A-H, 850, 1700 & 1900
BOIP:
On-Hand:
Cost: $5500.00

Approval: Ground Force Commander
QUASIMODO

**Capabilities**
- GSM receiver capable of detecting and measuring RSSI
- 10 Band Radio Receiver
- 850, 900, 1800, 1900 and 2100 MHz capable GSM, CDMA, UMTS
- Rugged, sealed and water resistant

**Limitations & Planning Factors**
- Sunlight and NVG readable
- Internal rechargeable battery, 4-6 hours
- Bluetooth, wired or internal speaker

**Vendor**: KeyW Corporation

**Protocols**: GSM

**BOIP**: 

**On-Hand**: 

**Cost**: 

**Approval**: Ground Force Commander
HEATR

Capabilities

Description:
- Hostile Emitter Angle Tracker Revised is the primary direction finding (DF) tool for locks onto HS locked onto an interrogation device. Standard HEATR systems are now with a Android powered remote for covert operation. Remote allows the user to fully control the HEATR unit and antenna while being hidden.

Limitations & Planning Factors

HEATR Equipment Specifics:
- Vendor: Syndetix, Inc.
- Protocols: GSM, CDMA, Thuraya
- Modified systems can include TTL and PTT
- Requires Multi-Protocol Antennas
- BOIP:
- On-Hand:
- Cost: $48,000.00 (w/ antennas)
- Approval: Title 10

Cost: $48,000.00 (w/ antennas)

Vendor: Syndetix, Inc.

Protocols: GSM, CDMA, Thuraya

Modified systems can include TTL and PTT

Requires Multi-Protocol Antennas

BOIP:

On-Hand:

Cost: $48,000.00 (w/ antennas)

Approval: Title 10

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DERIVED FROM:
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THORACIC

Capabilities

Description:
• Miniature, 8 band radio receiver able to detect and measure the signal strength of any channel in the uplink portions of common cellular communication bands (GSM, UMTS, CDMA & iDen).
• The radio can be controlled via a bluetooth data link to an applet operating on select phone such as Nokia N95.

Vendor: KeyW

Protocols: GSM, UMTS, CDMA and iDen
Cost: $7,500.00 (w/ antennas)
Approval: Title 10

Limitations & Planning Factors

THORACIC Equipment Specifics:
• COTS provided equipment
• USB chargable
• Dual output 12/24 VDC automotive pwr adapter
• 3 x omni directional antennas
• 3 x body worn patch antennas
• Wireless headset
• 2 sets of 3 antennas to cover GSM – CDMA and iDen
• Dimensions: 3.3” x 2.2” x 0.6”
• Weight: < 2 lbs
Battlefield Data Recovery/SSE

- Cyberhawk
- Cellbrite
CYBERHAWK

**Capabilities**

**Description:** These BDR systems serve as a small exploitation system for GSM handsets. Cyber Hawk exploits over 79 cell phones; uses US made software and components and presents a much smaller footprint than CELLTECH. Exploitation includes phonebook, names, SMS, media files, text, deleted SMS, calendar items and notes.

**Limitations & Planning Factors**

**BDR Equipment Specifics:**
- GSM only
- Takes 4-10 mins for download
- Saved and dialed numbers, missed calls, SMS data, pictures, calendar, sound files all consolidated into one report

**Vendor:** NSA-SIGDEV

**Protocols:**
- BOIP

**Cost:**

**Approval:** Ground Force Commander
**Capabilities**

*Description:* Is a portable, handheld, field proven forensic system for the quick extraction and analysis of 95% cell phones, smart phones and PDA devices.

- Extracts information such as phonebook, pictures, video, text messages, call logs, ESN/IMEI, and MSISDN information
- Portable end-to-end solution - battery operated, easy-to-use device that requires no PC or associated phone drivers
- Developed for field use - ruggedized housing offers additional protection in harsh environments
- SIM card extraction and SIM ID cloning

**Limitations & Planning Factors**

**BDR Equipment Specifications:**
- AC 100-240V 50/60Hz; Output DC 15V, 2A
- 217mm x 124mm x 77mm
- Time required to complete data exchange depends on amount of data (approx 1-3 minutes)

**Vendor:** TEEL/ CelleBrite USA Corp.

**Protocols:** GSM, CDMA and selected Thuraya BOIP

**Cost:** $9,920.00 (+ $900/1 yr service support & maintenance)

**Approval:** Ground Force Commander