

Navlogix Testing Requirements

Version 1.0

Rev. A

Change Control

Who	Date	Version	Description
Frank Calvo	02/12/07	1.0	Initial Draft

Distribution List:

- Electronic file
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Printed on 4/12/2007 – Page 1 of 5

Prod. Mgr. Approval ____

Mfg. Engr. Approval ____

1. Required Equipment

- a. **GPS Antenna Re-radiation Kit** – Due to indoor limitation a Re-radiation kit is needed to connect to GPS satellites.

- i. Supplier – Navtech GPS (<http://www.navtechgps.com>)
 ii. GPS Re-radiating Bill of Materials

Item	Qty	Supplier	Part Number/Description	Price
1	1	Navtech	HNRRKIT / L1 Hanger re-radiation kit	\$570.00
2	1	Navtech	WRUMT / Indoor swivel mount	\$75.00
3	1	Navtech	RAMB L1 / Roof mounting bracket	\$25.00
4	1	Navtech	SURGE-PRO / GPS-Surge Protector	\$150.00
4	1	Navtech	LMR400-100-NM / 100' Cable	\$174.00
5	2	Navtech	TC-400-NMH-PL Male connector	\$24.00
				Total: \$1018.00

- b. **Computer Test System** – Provides the software tools and interface used to test Navlogix LMU's and antennas.

- i. Supplier – GE Security IT/Mfg Test Departments
 ii. Computer Test System Bill of Materials

Item	Qty	Mfg	Part Number/Description	Price
1	1	Dell	Optiplex PC	\$500
2	1	Dell	LCD	\$200
3	1	Dell	Keyboard	\$10
4	1	Dell	Mouse	\$10
5	1	GE	Navlogix LMU with Power Supply Gold Unit	N/A
6	1	GE	Navlogix Window Mount Antenna Gold Unit	N/A
7	1	GE	Navlogix Roof Mount Antenna Gold Unit	N/A
				Total: \$720.00

2. Facility Setup

Note: All GPS installation is to be coordinated with Facilities, please see Chris Kerber.

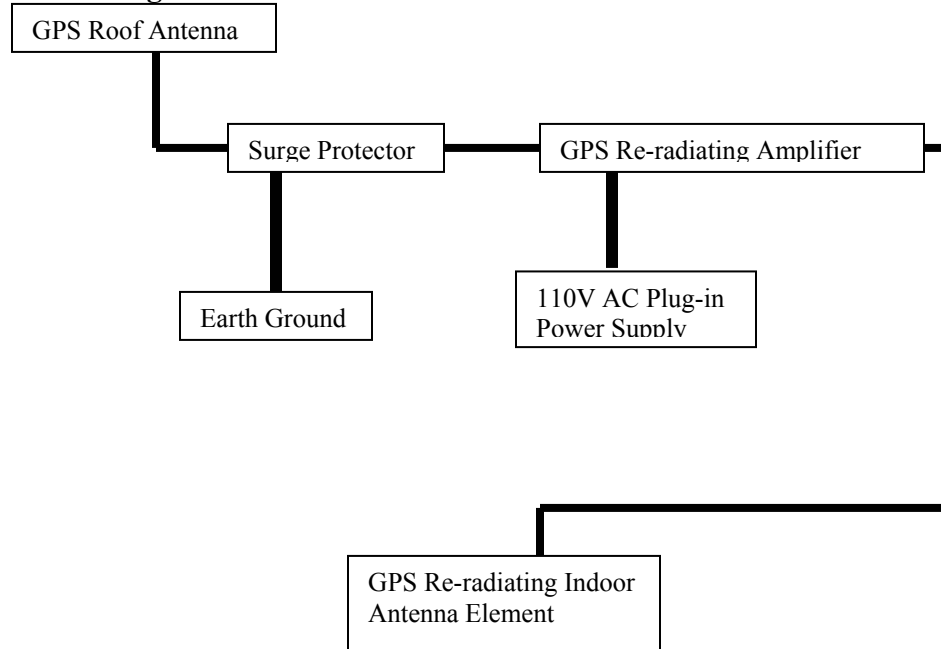
- a. **GPS Roof Antenna Outdoor** – To be mounted on roof. A conduit is needed for running the antenna cable from the roof antenna to the re-radiating amplifier, which will be located inside.
- b. **GPS Re-radiating Amplifier** – To be mounted inside the manufacturing facility with the use of a surge-protector.



Last Revised: 02-12-07

- c. **GPS Re-radiating Antenna Indoor** –
To be mounted inside the manufacturing facility.

- d. **Block Diagram**



3. Bench Setup

Note: Location to be determined or use one of the RMA or re-work technician's benches.

- a. **Workbench** - 1 bench is needed to perform product testing for units going back into stock.
- b. **Network Access** – Network access is needed for running GPS applications.
- c. **Power** – 110v source is needed for powering the units under test and any test equipment.

4. Software Setup

Software needed for testing Navlogix. User access for software listed below will need to be setup by David Nark.

- a. Navlogix web based GPS application
- b. MIDAS software from CalAmp

5. GPS License from FCC/NTIA

Note: License is required before any GPS products can be sold to GE. Application form 442 must be used. <<https://gulfoss2.fcc.gov/prod/oet/cf/els/index.cfm>>

NTIA Requirements

8.3.28 USE OF FIXED DEVICES THAT RE-RADIATE SIGNALS RECEIVED FROM THE GLOBAL POSITIONING SYSTEM

Except as otherwise authorized under Part 7.14, federal agencies and departments may, under the following conditions, operate fixed devices that re-radiate signals received from the Global Positioning System (GPS).

1. Individual authorization is for indoor use only, and is required for each device at a specific site.
2. Applications for frequency assignment shall be applied for as an "XT" station class with a note indicating the device is to be used as an "Experimental RNSS Test Equipment for the purpose of testing GPS receivers" and describing how the device will be used.
3. Approved applications for frequency assignment will be entered in the GMF.
4. The maximum length of the assignment will be two years, with possible renewal.
5. The area of potential interference to GPS reception (e.g., military or contractor facility) has to be under the control of the user.
6. The maximum equivalent isotropically radiated power (EIRP) must be such that the calculated emissions are no greater than *140 dBm/24MHz as received by an isotropic antenna at a distance of 100 feet (30 meters) from the building where the test is being conducted. The calculations showing compliance with this requirement must be provided with the application for frequency assignment and should be based on free space propagation with no allowance for additional attenuation (e.g., building attenuation).
7. GPS users in the area of potential interference to GPS reception must be notified that GPS information may be impacted for periods of time.
8. The use is limited to activity for the purpose of testing RNSS equipment/systems.
9. A "Stop Buzzer" point of contact for the authorized device must be identified and available at all times during GPS re-radiation operation of the device under any condition.

These changes essentially provide editorial corrections or clarifications with the exception that we clarify that this is for indoor use only. Nobody is really aware of any need for testing and

Last Revised: 02-12-07

experimentation using re-radiators outdoors.
Also we clarified the terms of the limit.

We have also approved the following for federal mobile re-radiators:

8.3.29 USE OF MOBILE DEVICES THAT RE-RADIATE SIGNALS RECEIVED FROM THE GLOBAL POSITIONING SYSTEM

Except as otherwise authorized under 7.14, federal government agencies and departments may, under the following conditions, operate mobile devices that re-radiate signals received from the Global Positioning System (GPS) at 1575.42 $\pm$ 12 MHz (L1).

1. Use is restricted to inside armored ground vehicles operating within a federal government controlled range/facility/installation or cordoned zone.
2. Applications for frequency assignment shall be applied for as an "NR" station class with a note describing how the device will be used.
3. Approved applications for frequency assignment will be entered in the GMF.
4. The maximum length of assignment will be two years, with possible renewal.
5. The application for frequency assignment shall indicate the agency or department controlled range/facility/installation or cordoned zone of operation and the number of vehicles equipped with these devices.
6. The entire area of potential interference to GPS reception (e.g., military/federal range/facility/installation or cordoned area) must be under the control of the Federal user.
7. The maximum equivalent isotropically radiated power (EIRP) must be such that the calculated emissions are no greater than -88 dBm/24 MHz at the output of GPS re-radiator antenna (*144 dBm/24 MHz at 10 meters as received by an isotropic antenna) from an armored ground vehicle.
8. GPS users within the area of potential interference to GPS reception must be notified that GPS information may be impacted for periods of time.
9. A "Stop Buzzer" point of contact for the authorized device must be identified and available at all times during GPS re-radiation operation.
10. Any airborne use of these devices is not authorized.
11. These devices operate on a non-interference, unprotected basis.