

### **8.3.28 Use of Fixed Devices that Re-Radiate Signals Received from a GPS Antenna**

8.3.28 Use of Fixed Devices that re-radiate signals received from 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.

1. Individual authorization is for indoor use only and is required for each device at a specific site.  
**YES**
2. Applications for frequency assignment should be applied for as an XT station class with a note indicating the use 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.  
**YES**
3. Approved applications for frequency assignment will be entered in the GMF.  
**YES**
4. The maximum length of the assignment will be two years, with possible renewal.  
**YES**
5. The area of potential interference to GPS reception. (e.g. military or contractor facility) has to be under the control of the user.  
**YES**
6. The maximum equivalent isotropically radiated power (EIRP) must be such that the calculated emissions are no greater than -140dBm/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 addition attenuation (e.g., building attenuation.).  
**SEE EXHIBIT 2.**
7. GPS users in the area of potential interference to GPS reception must be notified that the GPS information may be impacted for periods of time.  
**YES**
8. The use is limited to activity for the purpose of testing RNSS equipment/systems.  
**YES**
9. A “Stop Buzzer” point of contact for the authorized device must be identified and available at all times during GPS remediation operation of the device under any condition.

Stop Buzzer point of contact: (586)484-6053  
Christine Kirbitz

General Motors Company, LLC.  
3300 General Motors Road, Building #70,  
Milford, MI 48380

## Exhibit 2

### Power calculations per NTIA 8.3.28.f

|                                                                  |                   |                                                    |                                                            |
|------------------------------------------------------------------|-------------------|----------------------------------------------------|------------------------------------------------------------|
| GPS L1                                                           |                   | 1575.42 MHz                                        |                                                            |
| $P_{Tmax} = P_R + 20 \log_{10} f + 20 \log_{10}(30 + d) - 27.55$ |                   |                                                    |                                                            |
| $P_R =$                                                          | -140 dBm          | <i>Power at 30 meters (100') from the building</i> |                                                            |
| $f =$                                                            | 1575.42 MHz       |                                                    |                                                            |
| $d =$                                                            | 9.14 meters       | <i>Radiator distance from nearest outside wall</i> |                                                            |
| <b><math>PTmax =</math></b>                                      | <b>-71.75 dBm</b> | <b><i>EIRP</i></b>                                 |                                                            |
| <b><math>PTmax(pW) =</math></b>                                  | <b>66.85 pW</b>   | <b><i>EIRP</i></b>                                 | $P_{Tmax(pW)} = 10^{\left(\frac{P_{Tmax}}{10} + 9\right)}$ |
| <b><math>pW ERP =</math></b>                                     | <b>40.76 pW</b>   | <b><i>ERP</i></b>                                  | $pW ERP = pW EIRP / 1.64$                                  |

|                                                                  |                   |                                                    |                                                          |
|------------------------------------------------------------------|-------------------|----------------------------------------------------|----------------------------------------------------------|
| GPS L2                                                           |                   | 1227.6 MHz                                         |                                                          |
| $P_{Tmax} = P_R + 20 \log_{10} f + 20 \log_{10}(30 + d) - 27.55$ |                   |                                                    |                                                          |
| $P_R =$                                                          | -140 dBm          | <i>Power at 30 meters (100') from the building</i> |                                                          |
| $f =$                                                            | 1227.6 MHz        |                                                    |                                                          |
| $d =$                                                            | 9.14 meters       | <i>Radiator distance from nearest outside wall</i> |                                                          |
| <b><math>PTmax =</math></b>                                      | <b>-73.92 dBm</b> | <b>EIRP</b>                                        |                                                          |
| <b><math>PTmax(pW) =</math></b>                                  | <b>40.59 pW</b>   | <b>EIRP</b>                                        | $P_{Tmax(pW)} = 10^{\left(\frac{P_{Tmax}}{10}+9\right)}$ |
| <b><math>pW ERP =</math></b>                                     | <b>24.75 pW</b>   | <b>ERP</b>                                         | $pW ERP = pW EIRP / 1.64$                                |

|                                                                   |                   |                                                    |                                                            |
|-------------------------------------------------------------------|-------------------|----------------------------------------------------|------------------------------------------------------------|
| GPS L5                                                            |                   | 1176.45 MHz                                        |                                                            |
| $P_{Tmax} = P_R + 20 \log_{10} f + 20 \log_{10} (30 + d) - 27.55$ |                   |                                                    |                                                            |
| $P_R =$                                                           | -140 dBm          | <i>Power at 30 meters (100') from the building</i> |                                                            |
| $f =$                                                             | 1176.45 MHz       |                                                    |                                                            |
| $d =$                                                             | 9.14 meters       | <i>Radiator distance from nearest outside wall</i> |                                                            |
| <b><math>PTmax =</math></b>                                       | <b>-74.29 dBm</b> | <b>EIRP</b>                                        |                                                            |
| <b><math>PTmax(pW) =</math></b>                                   | <b>37.28 pW</b>   | <b>EIRP</b>                                        | $P_{Tmax(pW)} = 10^{\left(\frac{P_{Tmax}}{10} + 9\right)}$ |
| <b><math>pW ERP =</math></b>                                      | <b>22.73 pW</b>   | <b>ERP</b>                                         | $pW ERP = pW EIRP / 1.64$                                  |