Compliance with NTIA Criteria, Drawing of Symbol Floor plan with repeater location and link budget.

1. Individual authorized is necessary for each device at a specific location.
Symbol is applying for a authorization to use GPS re-radiation for demonstration GPS acquisition and use inside Symbol vendor integration lab.

2. Applications for frequency assignments should be applied for as an XT station with a note indicating the is to be used as an "Experimental RNSS Test Equipment for the purpose of test GPS Receivers"

Symbol has filed for a STA through the FCC's experimental licensing system. The purpose it to demonstrate the Symbol GPS and integrating since the integration does not allow this work to be done outside.

3.Approved application for frequency assignment will be entered in the GMF.

Symbol requests assistance of the FCC and NTIA to ensure that this frequency assignment is added to the master file.

4. The maximum length of the assignment will be two years with possible renewal.

Symbol will apply for a renewal as required.

5. The operation must be at specified location and mobile operation is not authorized.

The re-radation equipment is wall mounted and fixed and cannot be moved without disconnecting the system and making it unusable.

6. The area of potential interference to GPS reception (e.g., military or contractor facility) has to be under the control of the user.

No area of interference exists.

7. The maximum equivalent isotropically radiated power must be such that the emissions are no greater than -140 dBm/24 MHz 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 building attenuation.

Symbol Technology has supplied the calculation supplied by NavTechGPS showing the power at 100 feet. (See attachment A)

The building layout with the location of the repeater shows what part of the building is affected. (See attachment B)

8. GPS users in the area of potential interference to GPS reception must be notified that GPS information may be impacted for periods of time.

Information on a displayed message screen will indicate that GPS demonstration is in session.

9. The use is limited to activity for the purpose of testing RNSS equipment/systems.

The use is only for demonstating GPS within the Symbol Plaza.

10. 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.

The Stop Buzzer point contact is Pat Brown at 631 738 3523. The cellular number is 631 880 1188/

Attachment A:

Link Budget - ERP - ***With respect to an isotrope***
Link Budget - EIRP - ***With respect to a dipole***

GPS L1 Link Budget ERP

GPS L1 Link Budget

Satellite Tranmitter

Transmitter Power (25 Watts)	14	dBW
RF Losses in trasmitter path	-1.25	dB
Antenna Gain (with respect to a dipole)	11.35	dBd
Satellite ERP	**24.10**	**dBW**

Propagation

Atmoshperic and Polarization Losses	-0.5	dB

$$Free\ Space\ Path\ Loss = -10 \times \log_{10}\left[\left(\frac{4\pi d}{\lambda}\right)^2\right]$$

where d = distance (25236 km)
lambda = wavelength = c/f
c = speed of light (3x10^8 m/sec)
f = frequency (1.57542 GHz)

$= -10 \log [317.125 \times 10^6 / 190.425 \times 10^{-3}]^2$

$= -10 \log [1.665 \times 10^9]^2$

= -184.43 dB

Received Power on Earth	**-160.83**	**dBW**
	-130.83	**dBm**

Gain of Receive Antenna	38	dBic
RF losses in LMR400 cabling and connectors from Receive Antenna to Line Amplifier	-6.7	dB
Gain of Line Amplifier	20	dB
Gain of Passive Radiating Antenna	3	dBic

$$Free\ Space\ Path\ Loss = -10 \times \log_{10}\left[\left(\frac{4\pi d}{\lambda}\right)^2\right]$$

where d = 100 feet distance (30.48m)
lambda = wavelength = c/f
c = speed of light (3x10^8 m/sec)
f = frequency (1.57542 GHz)

$= -10 \log [383.023/190.425 \times 10^{-3}]^2$

$= -10 \log [2011.41]^2$

= -66.07 dB **100 foot distance**

RF power level at 100 ft distance -142.60 dBm

GPS L1 Link Budget

Satellite Tranmitter

Transmitter Power (25 Watts)	14	dBW
RF Losses in trasmitter path	-1.25	dB
Antenna Gain (with respect to an isotrope)	13.5	dBi
Satellite EIRP	**26.25**	**dBW**

Propagation

Atmoshperic and Polarization Losses	-0.5	dB

$$Free\ Space\ Path\ Loss = -10 \times \log_{10}\left[\left(\frac{4\pi d}{\lambda}\right)^2\right]$$

where d = distance (25236 km)
lambda = wavelength = c/f
c = speed of light (3x10^8 m/sec)
f = frequency (1.57542 GHz)

= -10 log $[317.125\text{x}10^{6}/190.425\text{x}10^{-3}]^2$
= -10 log $[1.665\text{x}10^{9}]^2$
= -184.43 dB

Received Power on Earth	**-158.68**	**dBW**
	-128.68	**dBm**

Gain of Receive Antenna	38	dBic
RF losses in LMR400 cabling and connectors from Receive Antenna to Line Amplifier	-6.7	dB
Gain of Line Amplifier	20	dB
Gain of Passive Radiating Antenna	3	dBic

$$Free\ Space\ Path\ Loss = -10 \times \log_{10}\left[\left(\frac{4\pi d}{\lambda}\right)^2\right]$$

where d = 100 feet distance (30.48m)
lambda = wavelength = c/f
c = speed of light (3x10^8 m/sec)
f = frequency (1.57542 GHz)

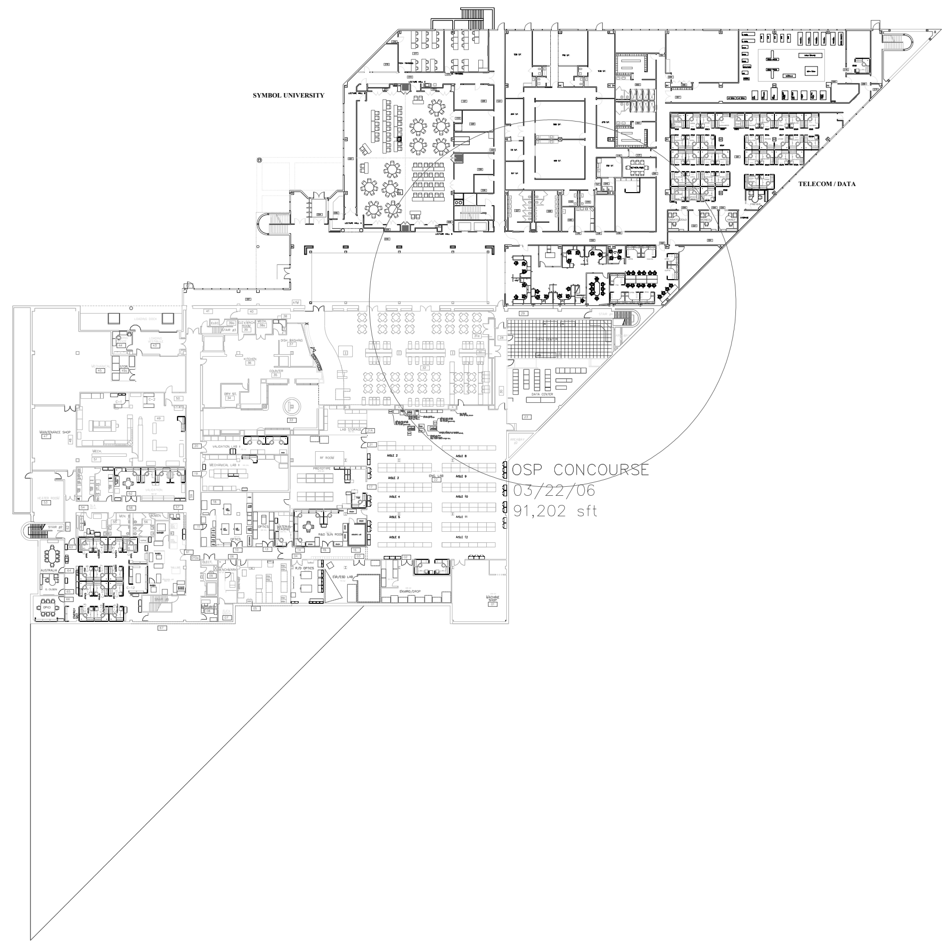
= -10 log $[383.023/190.425\text{x}10^{-3}]^2$

	=	$-10 \log [2011.41]^2$		
	=	-66.07	dB	**100 foot distance**

RF power level at 100 ft distance **-140.45** **dBm**

Attachment B:

The following picture illustrate the placement of the repeater centered with a 100 foot drawing arc for the maximum repeater output of -142.60 dBm.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