

JHU/APL Bldg 12 GPS Reradiator

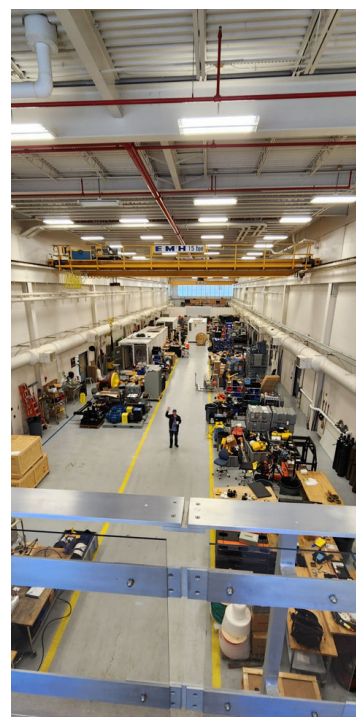
- Reradiator will be used to test equipment with GPS receivers while in development in an indoor high bay area



JHU/APL Bldg 12

- Setup
 - GPS receive antenna/preamp is mounted on roof of building
 - 150-ft coax cable connects preamp to reradiator transmit antenna in center of high bay area

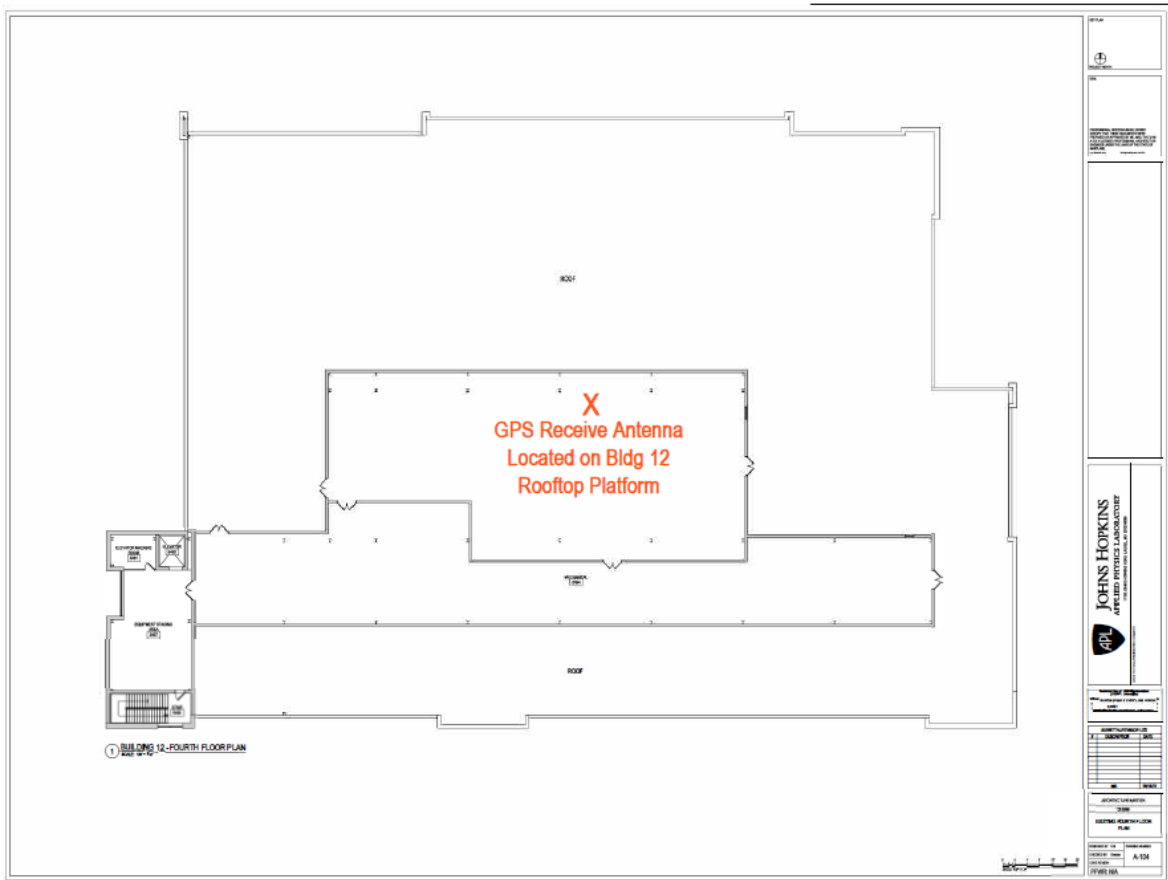
Bldg 12
High Bay Area



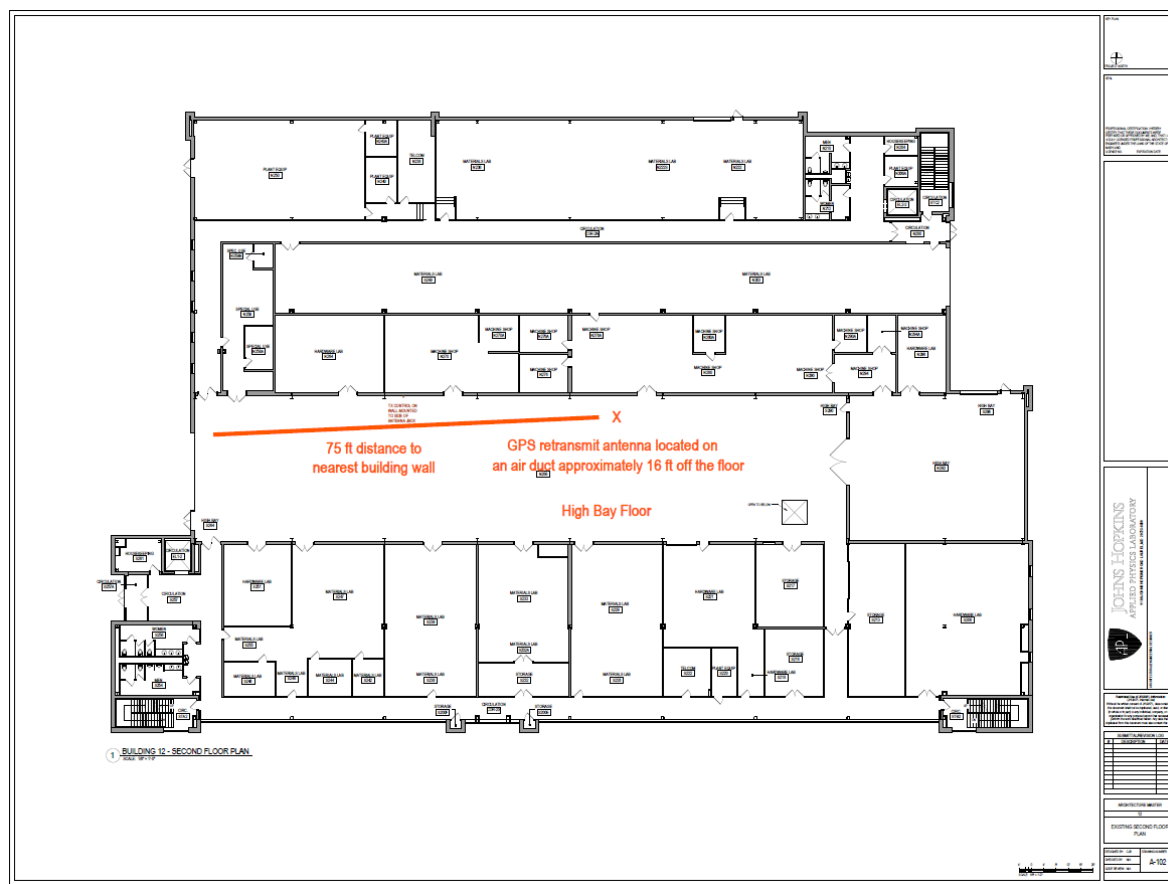
- Reradiator system
 - GPS Networking Model HNRRKIT
 - 30 dB Gain



Floor Plans



JHU/APL Bldg 12 Rooftop Plan showing location of Proposed GPS Reradiator Receive Antenna



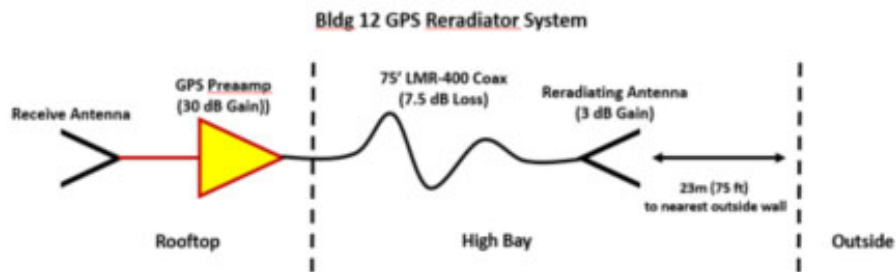
JHU/APL Bldg 12 High Bay Plan showing location of Proposed GPS Reradiator Transmit Antenna

GPS Reradiator Compliance Calculations

Power Density Compliance Calculations

$$P_{Tmax} = P_R + 20 \log_{10} f + 20 \log_{10}(30 + d) - 27.55$$

Pr. Max Pwr Density 100 ft from Bldg.	-140.0	dBm/24 MHz
f -----	1575.42	MHz (L1)
d -----	22.9	m. (75 ft.) Distance from reradiating antenna to building
PT(max). Maximum Allowed Transmitter Power Density, Pt(max)	-69.1	dBm/24 MHz from Application Guidance Equation



GPS Repeater Parameters

Electronic Gain, Maximum -----	30.0	dB
Noise Figure -----	2.75	dB
LMR-400 Cable Loss -----	5.1	dB/100 ft at L1
Cable Length -----	150.0	ft
Total Cable Loss -----	7.7	dB
Reradiating Antenna Gain -----	3.0	dB
Noise Bandwidth -----	24.0	MHz
Noise Power (kT) -----	-174.0	dBm/Hz
Noise Power input to LNA (kTB) -----	-100.2	dBm/24 MHz
Calculated Reradiated Noise Power Density -----	-72.1	dBm/24 MHz
	61.7	pW/24 MHz
Additional Attenuation Required for Compliance	-3.0	dB
<i>(If negative, system is compliant without attenuation.)</i>		