

Exhibit #3: Equipment Specifications

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GPS Networking Inc.

L1/L2HNRR KIT

Technical Product Data

Features

- **L1/L2 Roof Amplified Antenna**
Gain $\geq 35\text{dB}$
- **Re-Radiating Amplifier with Power Supply**
Gain $\geq 20\text{dB}$
- **Optional Mounting Kit Hardware**
Roof Antenna Mount & Re-Radiating Amp Mount
- **Variable Gain Option Available**
Re-Radiating Amp Gain Varies from -7 to $+20\text{ dB}$

Description

The L1/L2 GPS Hanger Re-Radiating Kit (L1/L2HNRRKIT) is a complete re-radiating system that allows re-radiation of the GPS L1 & L2 signals indoors. The L1/L2HNRRKIT consists of an active roof antenna, a re-radiating amplifier with a wall mount plug-in transformer that powers the entire system, and a passive re-radiating antenna. The GPS L1 & L2 signal from the roof antenna is amplified and radiated indoors. Thus, if a receiver has line of sight with the re-radiating antenna, it can receive the GPS signal indoors up to 100 feet away.

Roof Antenna

Electrical Specifications, $T_A = 25^\circ\text{C}$

Parameter	Conditions	Min	Typ	Max	Units
Frequency	L1 L2	1.575 1.227			GHz GHz
Bandwidth	20				MHz
Output Impedence.	50				Ω
LNA Gain	+/- 3dB	30	33	36	dB
Noise Figure	2.4				dB

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VSWR	1.5:1	-
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Filtering	1277MHz & 1626 MHz		-20	dB
	1177Mhz & 1525 MHz	-10	dB	
Req. DC Input V.	3.5	+24	VDC	
Current	40	60	mA	

DC Grounding – Yes (Lightning Protection)

Mechanical

Size: Diameter 3.50 in. (88.90 mm) Height: .64 in (16.18mm)

Weight: 6.4 oz. (.181 Kg)

Finish: Skydrol Resistant Polyurethane Enamel, Base Iridite per MIL-C-5441

Color: Gloss White #17925 per FED STD-595B

Material: 6061-T6 ALUMINUM ALLOY BASE, THERMOSET PLASTIC RADOME, UV, ABRASION & SKYDROL RESISTANCE

Connector: N-TYPE FEMALE

Environmental

Temperature: -67F to +185F (-55C to +85C)

Altitude: 70,000 Feet

Vibration: 10G's

Leakage: Hermetically Sealed

Federal and Military Specifications

Design to: FAA TSO-C144, DO-160D, MIL-C-5541, MIL-E-5400, MIL-I-45208A & MIL-STD-810

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Re-Radiating Amplifier

Electrical Specifications, $T_A = 25^\circ\text{C}$

Parameter	Conditions	Min	Typ	Max	Units
Freq. Range	Ant – J1	1.0	2.0		GHz
In/Out Imped. ⁽¹⁾	Ant, J1	50			Ω
Gain ⁽²⁾	Ant – J1, Normal Configuration	20	24.5	26	dB
	Variable Gain Option	+3	+23		dB
Input SWR ⁽²⁾	J1 - 50 Ω	1.8:1	-		
Output SWR	Ant - 50 Ω	1.8:1	-		
Noise Figure	Ant – J1	3.3	3.5		dB

Gain Flatness	L1 – L2 ; Ant – J1	0.5	1	dB
Reverse Isolation	J1 – Ant	35		dB
Group delay Flatness	$T_{d,max} - T_{d,min}$: Ant – J1	1		ns

- (1). Input/Output Impedance = 75 Ω for 75 Ω connector option.
(2). For performance plots, see LA20RPDC Data Sheet
Re-Radiating Antenna

Electrical Specifications, $T_A = 25^\circ \text{C}$

Parameter	Conditions	Min	Typ	Max	Units
Frequency	L1		1.575		GHz
	L2		1.227		GHz
Bandwidth		20			MHz
Impedance		50			Ω
Peak Gain	+3		+3.5		dBic
VSWR		1.5:1		-	
Polarization		RHCP		-	

DC Grounding – Yes (Lightning Protection)

Mechanical

Size: Diameter 2.60 in. (66.04 mm) Height: .64 in (16.18mm)

Weight: 4.06 oz. (.115 Kg)

Finish: Skydrol Resistant Polyurethane Enamel, Base Iridite per MIL-C-5441

Color: Gloss White #17925 per FED STD-595B

Material: 6061-T6 ALUMINUM ALLOY BASE, THERMOSET PLASTIC
RADOME, UV, ABRASION & SKYDROL RESISTANCE

Connector: N-TYPE FEMALE

Environmental

Temperature: -67F to +185F (-55C to +85C)

Altitude: 70,000 Feet

Vibration: 10G's

Leakage: Hermetically Sealed

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Design to: FAA TSO-C144, DO-160D, MIL-C-5541, MIL-E-5400, MIL-I-45208A & MIL-STD-810

Available Options

Re-Radiating Amp System Power Supply Options			
Source Voltage Options	VOLTAGE INPUT		STYLE
	110VAC	Transformer (Wall Mount)	
	220 VAC	Transformer (Wall Mount)	
	240 VAC (United Kingdom)	Transformer (Wall Mount)	
	Customer Supplied DC 8-28 VDC	Military Connector	Style
Re-Radiating Amp Gain Control Options			
Normal Gain		Gain ≥ 20 dB	
Variable Gain		+3dB to +23dB	
Re-Radiating Amp RF Connector Options			
Connector Options	CONNECTOR STYLE		CHARGE
	Type N	NC	
	Type SMA	NC	
	Type TNC	NC	
	Type N - 75Ω	Contact Agent	Sales

Part Number

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Gain Option:

VG =Variable ; Blank: Normal

Connector Options:

N: N type; S: SMA; T: TNC; N75: N type -75 Ω

Source Voltage:

110 -Transformer, 220 – Transformer, 240 – U.K. Transformer MC –
Military Conn. (User supplies DV Voltage)