

# Tri Band Duplexed Antenna Kit with GPS 108-174 450-520 746-870 MHz NMO Mount/N Type Connectors



## Antennas Technical Data Sheet

PE51AK1002

### Features

- Duplexer (VHF/UHF 108-174MHz/450-520MHz/746-870MHz) with integral N-Type (m) Connectors (3 ea.)
- Low Loss PE51GPS1000 NMO Combination mount with integrated GPS antenna (1 ea.)
- RG-58/U NMO mount (1 ea.)
- PE51MP1011 multiband antenna (1 ea.)
- PE51MP1000 tunable VHF/UHF antenna (1 ea.)
- RG-58/U Feed Cable (1 ea.)

### Applications

- Service Vehicles
- Public Safety
- Public Transportation
- Mining & Construction

### Description

Combined with a GPS antenna, this Tri-band duplexed mobile antenna kit is ideally suited for multipoint mobile applications including service vehicles, public transportation, public safety, mining and construction vehicles, as well as numerous other commercial and industrial applications where mobility and wide coverage is desired. The antenna kit features a Tri-band duplexer, a pair of mobile antenna, and a GPS antenna. This gives users the flexibility to operate radio transceivers in any VHF and UHF band with optimum performance. The kit allows the user to upgrade/switch to any NMO-type antenna.

### Configuration

Design	Duplexer
Application Band	VHF/UHF
Band Type	Tri
Cable Length	204 in [518.16 cm]
Connector Type	NMO Mount
Interface 2	N

### Duplexer Electrical Specifications

Description	Minimum	Typical	Maximum	Units
Frequency Range (VHF)	100		180	MHz
Frequency Range (UHF)	380		870	MHz
Input VSWR (All Ports)			1.6:1	
Impedance		50		Ohms
Isolation (VHF↔UHF-870)	50			dB

Electrical Specification Notes:  
Electrical specifications data applies to Duplexer

### Duplexer Specifications by Band

Description	Band 1	Band 2	Band 3	Band 4	Band 5	Units
Range	100-180	380-520	746-870			MHz
Insertion Loss	0.2	0.3	0.5			dB
Maximum Input Power	150	100	75			Watts

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [Tri Band Duplexed Antenna Kit with GPS 108-174 450-520 746-870 MHz NMO Mount/N Type Connectors PE51AK1002](#)

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### GPS Electrical Specifications

Description	Min	Typ	Max	Max
Frequency Bandwidth (L1)		1575.42±3		MHz
Gain @ 5VDC		30		dBi
VSWR (In/Out)			2:1	
Impedance		50		Ω
Operational Voltage	3		5	V
Current Drain	6		20	mA
Filter Type		SAW		
Attenuation wrt L1 (L1±50 MHz)	35			dB
Attenuation wrt L1 (L1±100 MHz)	45			dB
Input Power		10		W

### GPS Passive Element Specifications

Description	Min	Typ	Max	Max
Center Frequency		1575.42		MHz
Antenna VSWR			1.5:1	
Impedance		50		Ω
Polarization		RHCP		

### NMO Combination Mount Electrical Specifications

Description	Min	Typ	Max	Max
Frequency Band	30		1000	MHz
VSWR			1.5:1	
Impedance		50		Ω
Cable Type		RG58/U		
Insertion Loss			2.5	dB
Power Rating			150	W

### NMO Combination Mount Mechanical Specifications

Height	0.88 in [22.4 mm]
Width	2.2 in [55.9 mm]
Length	4.5 in [114.3 mm]
Mounting Application	Bulkhead, ¼ in. Thru-Hole
Cable Length NMO	17 ft. [5.1 m]
Cable Type	RG174/U
GPS Connector	SMA Plug
Color	Black
GPS Radiator	Ceramic, Silver
Operating Temperature	-40°C to 85°C
Corrosion	Salt Fog
Humidity	95%
Vibration	AAR & MIL-STD-810E

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**PE51MP1000 Field Tunable Antenna Electrical Specifications**

Description	Min	Typ	Max	Max
Frequency Band (Tunable Range)	108		520	MHz
VSWR (15 MHz Bandwidth @150MHz)			2.0:1	
VSWR (50 MHz Bandwidth @450MHz)			1.5:1	
VSWR (100 MHz Bandwidth @450MHz)			2.0:1	
Impedance		50		Ω
Gain		2		dBi
Power Rating		150		W
Polarization		Linear, Vertical		
E-Plane		50		Degrees
H-Plane		Omnidirectional		
Groundplane		Required		

**PE51MP1000 Field Tunable Antenna Mechanical Specifications**

Overall Length	(@108 MHz) 29 in [737 mm] (@150 MHz) 19.75 in [502 mm] (@450 MHz) 7.75 in [197 mm]
Whip Material, Finish	17-7 SS, Black Chrome
Spring Material	Black Molded Polymer Alloy
Base Material	Xenoy™ w/TPV over mold grip ring
Mounting Application	¾ inch Thru-Hole NMO Mount
Operating Temperature	-40°C to 85°C
Humidity	95%

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**PE51MP1011 Field Tunable Antenna Electrical Specifications**

Description	Min	Typ	Max	Max
Frequency Band 1	450		520	MHz
Frequency Band 2	746		960	MHz
Impedance		50		$\Omega$
Gain (450-520 MHz)		2		dBi
Gain (746-960 MHz)		2		dBi
Power Rating		150		W
Polarization		Linear, Vertical		
E-Plane		50		Degrees
H-Plane		Omnidirectional		
Groundplane		Required		

**PE51MP1000 Field Tunable Antenna Mechanical Specifications**

Height	4.95 in [125.8 mm]
Diameter	1.6 in [40 mm]
Color	Black
Radiator Material and Finish	SS and Brass w/Black Chrome
Radome Material	Xenoy™
Flexible Housing	Elastomeric Polymer, Proprietary
Operating Temperature	-40°C to 85°C
Corrosion Resistance	Salt Fog and Automotive Fluids
Vibration	AAR & MIL-STD 810E

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### Duplexer Mechanical Specifications

**Size**

Overall Length

3.27 in [83.06 mm]

Width

2.1 in [53.34 mm]

Height

1.1 in [27.94 mm]

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**Installation Instructions**

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**TRI-BAND DUPLEXED ANTENNA SYSTEM w/GPS**  
**108-174 MHz / 450-520 MHz / 746-870 MHz**

*Congratulations on your selection of another quality antenna product from Pasternack. Pasternack is committed to continually provide the greatest antenna VALUE for your wireless applications.*

**IMPORTANT: PLEASE CAREFULLY READ ALL INSTRUCTIONS BEFORE BEGINNING THE INSTALLATION PROCESS.**

Caution: Radio output power cannot exceed rated power for each band of the duplexer

- > **150W, max:** (100-180 MHz)
- > **100W, max:** (380-520 MHz)
- > **75W, max:** (746-870 MHz)

**Parts (Figure 1):** Verify all parts are included. Reference items in Figure 1:

1. (1 ea.) Multi-Band Duplexer
2. (1 ea.) PE51MP1000, Field Tunable, VHF ¼ Wave Antenna
3. (3 ea.) Type N Connectors, RG-58/U & 195 Type
4. (1 ea.) PE51GPS1000 NMO/GPS Combination Mount
5. (1 ea.) 195 Low Loss NMO Cable Mount
6. (1 ea.) RG-58/U Feed Cable, 17 ft. (5.1m) length
7. (1 ea.) PE51MP1011 Multi-Band UHF/700-800 MHz Antenna

**Tools/Materials Required:**

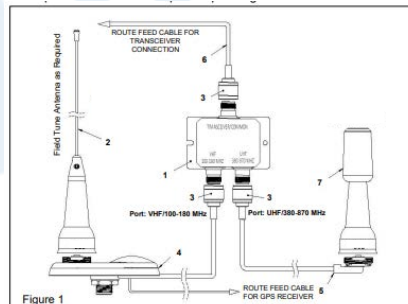
- Drill and Hole Punch, 3/8" (19.05mm) Diameter – NMO Cable Mount Installation
- #8 Self Tapping or Machine Screws (2 ea.) – Duplexer Installation
- Cable Stripping Tools for RG-58/U & 195 type cable – Connector Installations
- Coaxial Connector (sold separately) for attaching Feed Cable (RG-58/U) to radio transceiver

**Pre-Installation Checklist and Tips:**

- ✓ Locate a suitable mounting location for the Duplexer providing the shortest cable lengths for installing both antennas.
- ✓ **Important:** Duplexer intended for interior or environmentally protected installation only. Do not install with direct exposure to outdoor environment.
- ✓ Follow all instructions provided with each NMO Cable Mount and Field Tunable Antenna to be installed.
- ✓ **Best Performance Recommendations:**
  - > Minimize all cable lengths during installation to reduce unnecessary cable insertion loss.
  - > Feed the UHF of 700/800 MHz Antenna using the 195 Low Loss NMO Cable Mount.
  - > Separate antennas by largest distance possible to prevent VSWR mismatch or radiated obstruction. (**Note:** Duplexer provides >50 dB isolation between VHF and UHF/700-800 MHz antenna ports, maximizing cross-talk rejection.)

**Installation:**

1. Refer to figure 1 for antenna/duplexer system configuration.
2. Install Duplexer to a suitable mounting surface using #8 screws. Mounting Hole spacing: 2-15/16" (74.6mm).
3. Install NMO Cable mounts for each antenna according to the individual instructions.
4. Verify antenna cable routing. Cut excess cable. Strip ends of the NMO cable mounts according to the N Type Connector instructions provided with the connectors. Attach N Type connectors to the cables. Crimp and verify operation.
5. Repeat Step 4 for one end only of RG-58/U Feed Cable. Attach radio transceiver connector (sold separately) to the opposite end of the RG-58/U Feed Cable.
6. Install antennas according to the individual antenna instructions provided. Verify operation.
7. Install all remaining connections according to the system diagram in Figure 1.
8. Verify radio transceiver performance for all required operating bands or channels.



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**Environmental Specifications**

**Temperature**

Operating Range

-40 to +85 deg C

**Compliance Certifications** (see [product page](#) for current document)

**Plotted and Other Data**

Notes:

Tri Band Duplexed Antenna Kit with GPS 108-174 450-520 746-870 MHz NMO Mount/N Type Connectors from Pasternack Enterprises has same day shipment for domestic and International orders. Our RF, microwave and millimeter wave products maintain a 99.4% availability and are part of the broadest selection in the industry.

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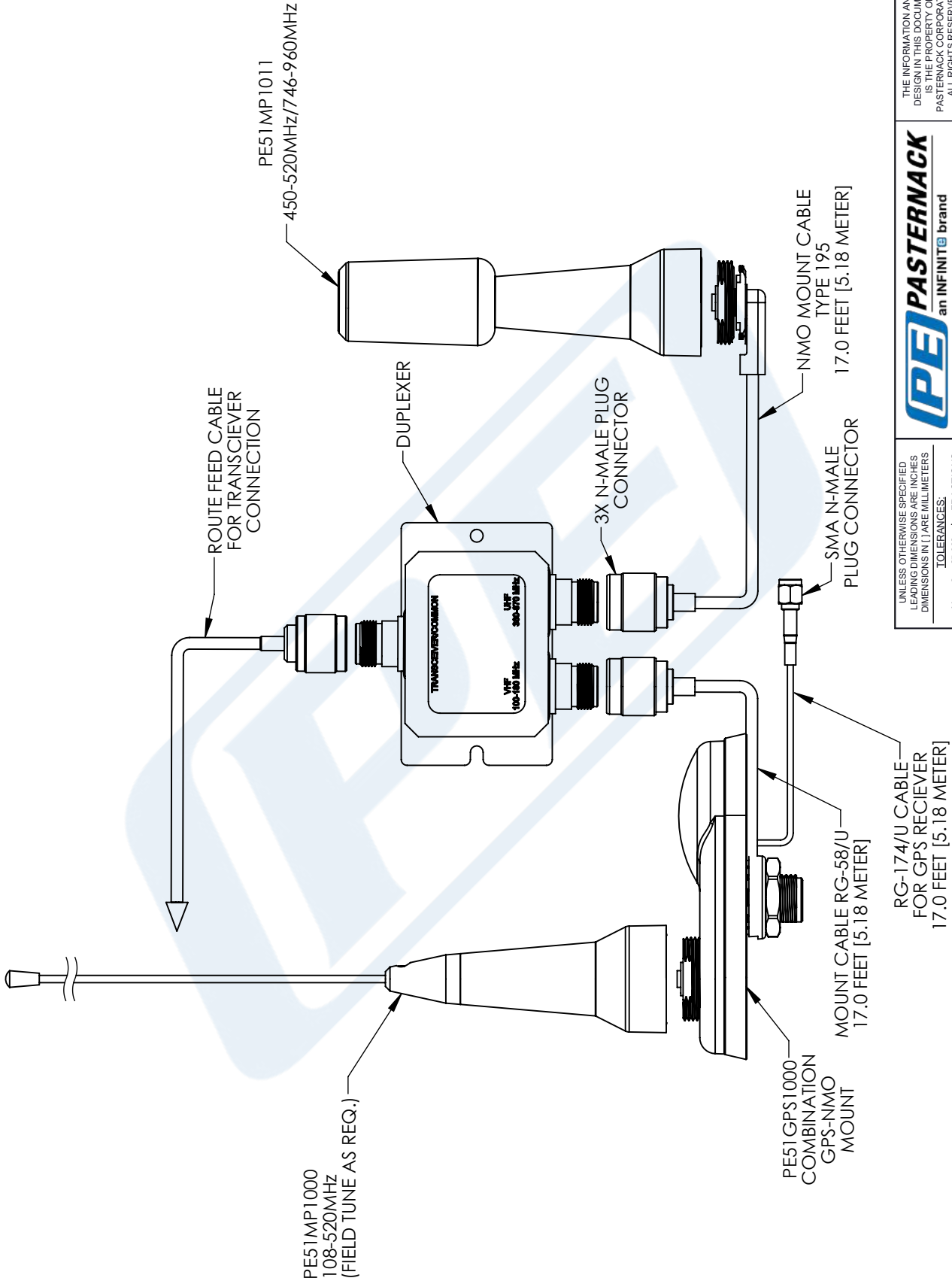
URL: <https://www.pasternack.com/tri-antenna-0-gain-nmo-mount-pe51ak1002-p.aspx>

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# PE51AK1002 CAD Drawing

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NMO Mount/N Type Connectors

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	08/08/2019	MMILLER



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LEADING DIMENSIONS ARE IN INCHES  
DIMENSIONS IN [ ] ARE MILLIMETERS

TOLERANCES:	FRACTIONS	ANGLES ± 1°
X±± 2	[5.08]	+1/32
XX±± 01	[.25]	
XXX±± .005	[.13]	

ALL DIMENSIONS SHOWN  
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