

# GPS antenna monuments and mounts supported by UNAVCO: Options and Effectiveness (poster for Fall AGU, 2008)

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## GPS antenna monuments and mounts supported by UNAVCO: Options and Effectiveness

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### Abstract

Many different monumentation types and antenna mounts have been used in UNAVCO-supported projects for campaign, semi-permanent and long-term continuous GPS sites. We summarize nine monuments and mounts currently in popular use in UNAVCO-supported projects as options to the greater scientific community. The designs range in height from 0 to 3 meters; substrates into which they are installed include soil, bedrock, and concrete; and costs range from approximately \$30 to \$15000. In many places outside the US, logistical, economical, and material restraints make installation of deep- and shallow-drilled braced monuments at best difficult and at worst impossible. Simpler single-mast or concrete monuments offer less expensive, more portable installation options.



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Monuments				Antenna Mounts	
<b>Deep drilled braced</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).	<b>Concrete pillar</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).	<b>Polar mast</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).	<b>SCIGN mount</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).	<b>SECO 2072-series stainless steel adapter</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).	<b>Cup and brass adapter</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).
<b>Shallow drilled braced</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).	<b>Shallow foundation mast</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).	<b>5/8" all-thread</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).	<b>Custom monumentation and mounts</b> UNAVCO can provide custom design, construction, and installation of monuments and mounts for specific projects. Contact us for more information.		
<b>Shallow braced (non-drilled)</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).	<b>Stainless steel mast</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).	<b>Tech 2000 (for campaign use)</b> A 3" diameter steel pipe is a major configuration connected into the bedrock up to depths of about 40 feet. Mounted together at the top. Pros: - Permanent - Resistant to any disturbance Cons: - Requires equipment and materials intensive - Requires drilling to install in a permanent - Requires high quality Used throughout the Pacific Basin (Hawaii, Alaska, USGS, and Canada).	<b>Things to consider</b> When choosing a monument and mount, consider: - Stability (precision needed) - Portability - Ease of installation - Maintenance (long-term work) - Site accessibility - Site suitability		
<b>Requesting support from UNAVCO</b> UNAVCO can provide assistance with design, construction, and installation of monuments and mounts for specific projects. Contact us for more information.					

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