UNCLASSIFIED

NAVAL UNDERSEA WARFARE CENTER DIVISION
UNDERWATER SOUND REFERENCE DETACHMENT
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USRD DRAWING 62785
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COORDINATE SYSTEM FOR TRANSDUCER OR PANEL ORIENTATION

The left-handed coordinate system in the sketch below is affixed to the transducer or panel and moves with it, regardless of its physical position. The angle (θ, ϕ) denotes the direction of sound propagation. Measurements are made with sound propagated parallel to the positive X axis $(\theta=90°, \phi=0°)$ unless otherwise specified.

For some measurements, the position of an auxiliary transducer may be specified in terms of cartesian coordinates X, Y, and Z.

Transducers and panels are oriented as follows:

ACOUSTIC SURFACE	ORIENTATION
Cylinder	The cylindrical axis is the Z axis; a reference mark for the +Z direction and for another axis is specified.
Plane	The plane or piston face is the YZ plane, with the X axis normal to the face at the geometric center. A reference mark in the YZ plane is specified.
Sphere	Points on the surface for any two of the three axes are specified.
Other	A sketch of non-conforming configurations is provided.

Directional Response Patterns: Unless otherwise specified, the following apply:

SPECIFIED PLANE	AXIS OF ROTATION	POSITION OF AXES OR DIRECTIONS ON POLAR PLOTS				
		+X AXIS	+Y AXIS	+Z AXIS	$\theta=45°$ $\phi=90°$	$\theta=45°$ $\phi=270°$
XY	Z	0°	90° CW	Upward	--------------	--------------
XZ	Y	0°	Downward	90° CW	--------------	--------------
YZ	X	Upward	0°	90° CW	--------------	--------------
ROLL	$\theta=45°$ $\phi=270°$	0°	--------------	--------------	90° CW	Upward

Origin is at assumed acoustic center of transducer or panel.