

# Pneumatic Tactile Display Components

**Tactile Displays** are a cutting edge technology for improving the interface between man and machine. A tactile display consists of an array of vibrators (often called “tactors”) applied to the user’s skin. Information is transmitted to the user through his sense of touch, by controlling the timing, frequency and intensity of these tactors. Tactile displays can intrude on the user’s consciousness. They convey both directional and quantitative information at once. Tactile displays do not intrude upon the user’s vision or hearing. A number of defense groups are working to apply tactile displays to improve situation awareness and reduce spatial disorientation for flight crew. Prototype tactile displays for aviation have up to 96 tactors distributed over the user’s torso.

## Pneumatic Tactile Displays

- operate at frequencies from 0 to 200 Hz
- offer controllable intensity
- permit simple tactile garments
- allow the more complex tactile display components to be aircraft-mounted

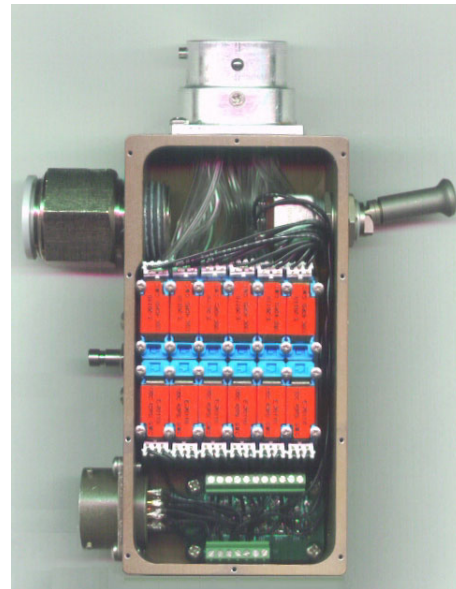
The **P2S** is the world’s smallest and lightest tactor. The P2S is especially suited to large tactile displays. It’s not much larger than a 25-cent coin, and it weighs just 0.8 grams. The P2S tactor is easily stitched into clothing, because it is made from flexible materials only.



*P2S Pneumatic Tactor*

P2S tactors react to digital pneumatic signals generated by sub-miniature solenoid valves. The timing of each single pneumatic pulse can be computer controlled. This results in very quick response, and a uniquely controllable display.

The **V24 Valve Box** incorporates 24 valves, a manifold, controls, and connectors. The rugged, shielded box is suitable for mounting aboard aircraft.



*V24 Valve Box*

The break-free connector at the top of the V24 handles 24 pneumatic signal tubes, as well as low-pressure air to inflate an air vest equipped with P2S tactors. The V24 meets specifications provided by the US Navy’s Naval Aerospace Medical Research Laboratory (NAMRL).

**Driver Circuits** are available for your computer interface. Steadfast also has circuits for signal generation if required.

## Specifications

Operating Frequency	0 to 200 Hz
Tactor Intensity	0.3 Ruperts nominal
Flow (per operating tactor)	0.35 SCFM (1 L/min)
Pressure	20 to 40 psig (138 to 275 kPa)

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