

## Broadband Antenna Design Using a Tapered Double Balun (#4149)

*A tapered double balun that provides for a four terminal balanced feed line*

Inventors at the Georgia Institute of Technology have invented a tapered double balun that provides for a four terminal balanced feed line. The feed line is constructed in such a way that it is particularly useful for rotationally-symmetrical frequency independent antenna implementations. The invention allows for extending the taper to reduce the low-frequency end of the response to an arbitrarily small value. This design can be used for spiral, sinuous or other four-arm antennas. The balun design is comprised of two outer ground planes and a center conductor that is dielectrically separated from the ground planes. The ground planes are constructed in manner to taper off at one end from a wide dimension to a narrow dimension.

### Benefits/Advantages

- Inexpensive alternate antenna design to conventional stripline antennas
- Improves gain and is compact in size/shape
- Enables improved bandwidth response by changing the length of the taper
- Easily designed and manufactured using PCB (print circuit board) technology
- Overcomes current technology limitations for producing circular polarized omni-directional antenna patterns

### Potential Commercial Applications

- Wireless devices
- Devices or systems that require broadband transmission capability
- WiFi devices, routers, cellphones and portable devices capable of handling streaming video
- Network equipment
- MIMO (multiple input multiple output) type antenna systems

### Background/Context for This Invention

Antennas using balun design are intended for applications that require broad bandwidth data transmissions. An enhancement to the conventional balun design is the tapered balun, which enhances the broadband width data transmission from the devices. The key benefit of using a tapered balun is to allow a balanced transmission to become unbalanced without the use of striplines.

**Victor K. Tripp**

Principal Research Engineer – Georgia Tech Research Institute

## **More Information**

### **Publications**

**For more information about this technology, please visit:**

<https://licensing.research.gatech.edu/technology/broadband-antenna-design-using-tapered-double-balun>

Images:

The automated sequential delivery of multiple fluids. A varying number of delay gates imprinted in the branches are shown in the figure.

COVID-19 and flu saliva test on paper: (A) The automatic sequential delivery of multiple reagents required for virus test; (B) Water pouring into the device triggers the virus assay, allowing the presence of SARS-CoV-2 and influenza A & B viruses to be visually identified by the color changes in the corresponding detection spot

