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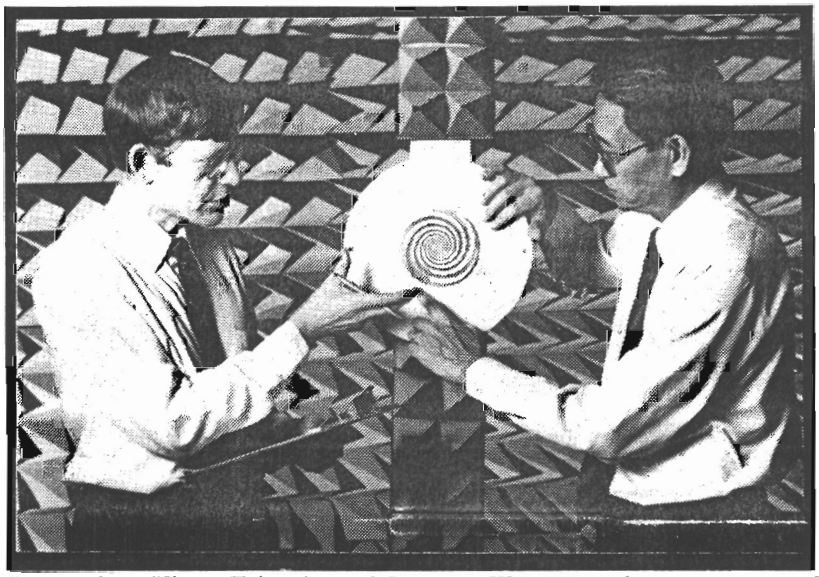
PLAYING A ROLE IN THE WIRELESS REVOLUTION: COMPANY FORMED TO MARKET NEW CLASS OF BROAD-BAND "PASTE-ON" ANTENNA

A new type of small and inexpensive broad-band antenna could play an important role in the ongoing "wireless revolution" in personal, office and mobile communications, say two Georgia Institute of Technology inventors who have formed a company to market the device. Their firm, Wang-Tripp Corporation, holds an exclusive license from the Georgia Tech Research Corporation to market the innovative spiral-mode microstrip antenna the two engineers developed.

"We are at the beginning of a revolution in which many wires and fiber optic cables in telecommunication systems will be replaced by wireless systems," said Dr. Johnson J.H. Wang, co-inventor of the device. "This antenna could be a key component of that revolution."



Researchers Victor Tripp (l) and Johnson Wang examine a new type of microstrip antenna in Georgia Tech's compact range test facility. (B&W/Color Photography Available)

The antenna developed by Wang and Victor K. Tripp combines the broad-band frequency performance typical of cavity-backed spiral and sinuous antennas with the surface mount capabilities, size and efficiency of flat microstrip patch antennas. Because it can be manufactured using conventional printed circuit board technology, the new antenna can also be relatively inexpensive.

Its small size, low cost and ability to receive a wide range of frequencies make the antenna desirable for many uses, including personal

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communications systems, inter and intra-office communications, wireless local-area networks (LANs), cellular telephones and other mobile systems, global positioning system (GPS) receivers, intelligent highway systems, direct broadcast satellite systems and many other applications, the inventors say.

Because the antenna is less than a third of an inch thick at frequencies above 1 GHz, it can be placed onto vehicles such as automobiles and aircraft without cutting into their skins. Traditional spiral or sinuous antennas are two or more inches thick, requiring a cavity to be cut into the surface where they are mounted.

The antenna's diameter is a function of the desired frequency, but for most applications will be between two and six inches. That would allow it to be "pasted" onto many surfaces.

While most microstrip antennas offer a bandwidth of less than 10 percent, the Wang-Tripp antenna offers bandwidths of as much as 900 percent. When compared with cavity-backed spiral antennas, the new design offers advantages of low profile, low cost and high efficiency.

A subclass of the Wang-Tripp antenna has its size reduced to one-half or one-third the normal size, which reduces frequency bandwidth to 300 percent or less. For most practical systems, however, the reduced bandwidth still provides a significant advantage over the bandwidth of the conventional microstrip patch antenna.

Because of its broadband capabilities, a single antenna could serve several systems operating on the same vehicle. That would allow an automobile radio, cellular telephone or other communications equipment to share a single antenna, Wang noted.

Tripp and Wang believe the growing use of global positioning systems (GPS) to provide precise location information for delivery vehicles and other needs will expand the market for their antenna. Such devices require antennas with high enough gain to receive signals from satellites in space, yet they must be small and inexpensive enough for widespread use.

"There is a need for GPS antennas on all kinds of vehicles, and our antenna is particularly well-suited for vehicle mounting because it is conformable, small and can suppress interference in a multi-mode operation," said Tripp.

The antenna could also be used over much shorter distances to replace cables in local-area networks for computer systems, and in communication systems within and between buildings. Such applications are now limited by existing antenna technology, he added.

"Ten years ago, it would have been hard to imagine what was going to happen with the personal computer revolution," he noted. "I think we are going to see similar things in the wireless communications industry."

Tripp and Wang, both faculty members at the Georgia Tech Research Institute, started the company under a new licensing program designed to help researchers commercialize technology developed at Georgia Tech.

In exchange for reduced licensing fees, Georgia Tech retains partial ownership in the company through the Georgia Tech Research Corporation and will receive royalties from products that are sold.

"We feel that Georgia Tech has been far-sighted in granting this license to the inventors," said Tripp. "There are a lot of other ways they could have gotten this technology into the marketplace. We intend to show them that this was a good choice."

The corporation has an agreement from a seasoned executive in the microwave industry to serve as its president. The company's first level of financing came from its inventors and the management team, but a second level is expected to involve external investment, Wang noted. He projects $60 to $90 million in sales during its fifth year of operation if adequate financing is available.

Small quantities of the antenna are now being manufactured for evaluation by potential customers. The company expects to soon make available a line of products in the 2-18 GHz frequency range.

The research was originally sponsored by the U.S. Air Force's Wright Laboratory. Two patents to protect the technology have been applied for by the Georgia Tech Research Corporation.

EDITOR'S NOTE: The antenna research was originally reported in a February 21, 1991 news release, "Engineers Develop a New Class of Microstrip Antenna Which Offers Broad Bandwidth, Low Cost & High Efficiency."

Further information can be obtained from the Wang-Tripp Corporation, 1710 Cumberland Point Drive, Suite 17, Marietta, Georgia 30067. (404) 955-9311.