ANATECH ELECTRONICS INC

AT THE CENTER FREQUENCY

An e-Newsletter from Anatech Electronics

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What's News...

Next: Flying 5G Base Station in Japan

Aerial telecommunications base stations, developed by Airbus subsidiary AALTO and a consortium led by NTT Docomo, are expected to be operational above Japan in about two years. The consortium, which includes Space Compass, Mizuho Bank, and the Development Bank of Japan, will invest $100 million in AALTO. The Zephyr High Altitude Platform Station (HAPS) manufactures solar-powered, fixed-wing drones designed for operation in the stratosphere. The technology behind Zephyr has been under development for over two decades, evolving from a flight endurance of approximately six hours at an altitude of 9,000 meters to maintaining operations at 20,000 meters for up to 90 days.

Source: **Airbus**

Starlink Plans Direct-to Smartphone Access In the Fall

SpaceX is set to launch its Starlink system for phones this fall, contingent on receiving approval from the FCC. The system aims to transmit internet data directly to unmodified smartphones on the ground, providing a

A Word from Sam Benzacar

The Vital Role of Microwave Technology in Quantum Systems

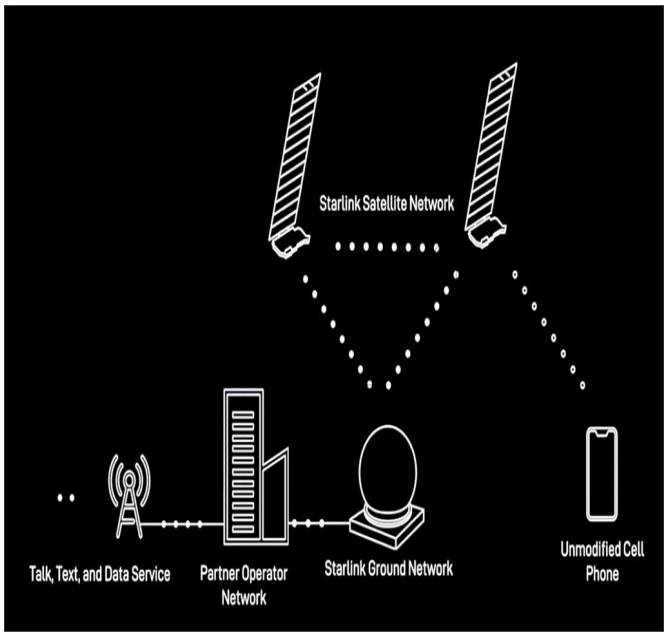
By Sam Benzacar

We've all heard about quantum systems, which are hard to miss, as stories about "quantum" appear daily in the media. But one thing we've found odd is that any mention of microwave technology in these systems is entirely absent, even though without it, many types of quantum systems couldn't work. In fact, microwave devices and quantum systems range from mixers, power amplifiers, attenuators and isolators, directional couplers, several types of antennas, cavities and resonators, waveguides, coaxial cables, and connectors, and finally – filters.

As a manufacturer of RF and microwave filters, we decided to investigate why these devices are used in quantum systems. In superconducting quantum circuits that typically operate at frequencies up to a few gigahertz, microwave filters control and manipulate the electromagnetic environment around the qubits, reducing noise and unwanted interactions. In quantum communications, filters remove unwanted interference, ensuring that only the desired signal reaches the quantum detectors or receivers. In trapped-ion quantum computers, where RF and microwave signals control and manipulate the internal states of trapped ions (that function as qubits), filters make sure control signals have the correct frequency and are not affected by noise, which would render them inoperable.

Another application is quantum sensing, which includes quantum magnetometers or quantum radar. RF and microwave filters enhance the signal-to-noise ratio and improve the devices' sensitivity. In addition, quantum hybrid systems that combine several types of quantum devices, such as superconducting circuits and spin

valuable service to consumers in areas without cellular coverage. Initially, SpaceX plans to offer text, voice, and web browsing through this supplemental coverage network, with the potential for future advancements to enable more comprehensive coverage and additional features. SpaceX has requested that the FCC relax the limit on frequencies for cellular satellites, arguing that the current restrictive limit would force satellite operators to either diminish network coverage and capacity or significantly weaken their signals to comply with the regulations.



Source: Starlink

J.D. Power: 5G FWA Fixed Wireless Has Best Customer Satisfaction

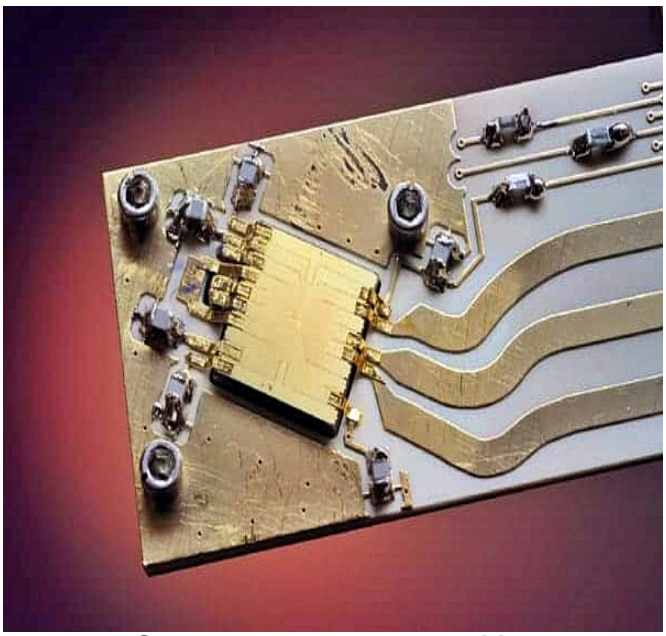
According to a recent study by J.D. Power, 5G-based fixed wireless access (FWA) boasts the highest customer satisfaction among five internet technologies. It surpassed fiber, cable broadband, DSL, and 4G LTE-based fixed wireless in the rankings. Satisfaction scores for 5G FWA varied between 775 and 825 on a 1,000-point scale, depending on the service provider. The primary factor contributing to the high satisfaction with 5G FWA was its cost-effectiveness. Other technologies that received relatively high satisfaction scores included fiber broadband, with scores ranging from 750 to 760, and 4G LTE-based fixed wireless, with scores between 725 and 775. DSL ranked lowest with scores just above 700.

qubits, use microwave filters to create a compatible interface between the different components.

In short, filters isolate these systems from environmental noise, ensure that control signals have the desired frequencies, and enable efficient coupling between different components of the quantum setup. The use of RF and microwave filters is not just crucial, it's the key to maintaining the coherence and fidelity of quantum operations in these systems.

Quantum systems are hostile operating environments because most of them must function at extraordinarily low temperatures, which means that microwave components used in these areas must be able to withstand them. However, not every type of quantum system is identical, nor is the temperature within them the same from top to bottom. For example, in trapped-ion quantum computers the ions themselves don't require low-temperature operation. Nitrogen-vacancy (NV) centers in diamond can operate at room temperature, making them attractive for certain applications, such as quantum sensing.

So, in short, microwave technology is not only used in quantum systems but also an essential technology that allows them to work. With any luck, the media may someday become up to speed and recognize its contribution.



Quantum computer on a chip.
Source: Physics World

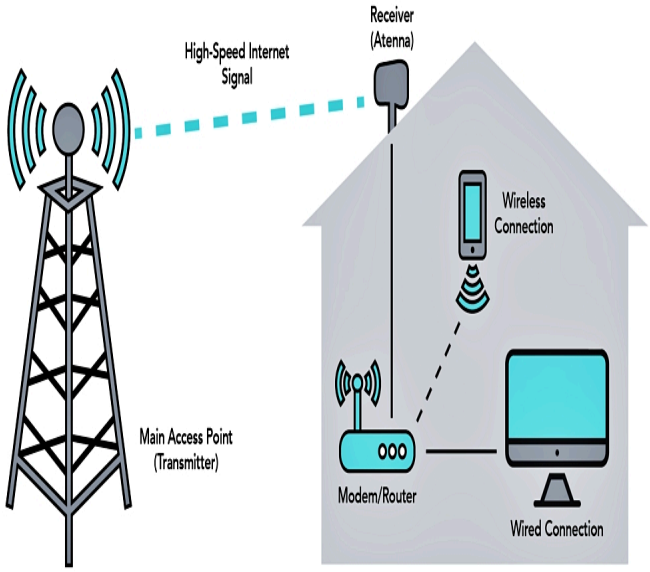
We can always find a solution!

Standard Band Pass Filters library

Standard Low Pass Filters Library

Standard High Pass Filters Library

Standard Band Stop/Notch Filters Library



Souce:Wikipedia

Air Force to Reduce EW Update Time

The Air Force says it can swiftly update its electronic warfare systems with new battlefield data within hours, according to Col. Josh Koslov, commander of the 350th Spectrum Warfare Wing. Koslov says that more than half of the 70 EW systems his team manages across the Air Force can now be updated in under 3 hours. "Data is the weapon that will allow this to happen, and data processing is the way to do that," Koslov noted. To achieve this, data will have to be integrated from various sources, such as Army units on the ground, naval ships in the Pacific, and airborne platforms, with the data then analyzed to identify new threats.

Source: U.S. Force Force

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