



# AT THE CENTER FREQUENCY

An e-Newsletter from Anatech Electronics

June 2023

## What's News...

### Aliens Challenged to Decode SETI Message

Rather than sending messages in English or some other language into space and awaiting a response, the SETI Institute is trying a new tactic: sending an encoded message that they hope simulates one from an advanced extraterrestrial civilization that could, after deciphering it, send it back to Earth. So, it would be up to whomever (or whatever) life form gets the message to figure out what it means. The message was sent from the European Space Agency's ExoMars Trace Gas Orbiter (TGO satellite) in a program called A Sign From Space.

The program was dreamed up by Daniela De Paulis, an artist in residence at the SETI Institute, who brought together a team of international experts to work on the program. Its contents remain unknown even to most collaborating partners. The signal was received by astronomers at the Green Bank Observatory, the Allen Telescope Array, and the Medicina Radio Astronomical Station, who removed the telemetry data and posted the remaining encoded message on the project's website for anyone to download. It's now up to the people of Earth to crack the code and interpret the message.



## A Word from Sam Benzacar

### Filters Save the Day

By Sam Benzacar



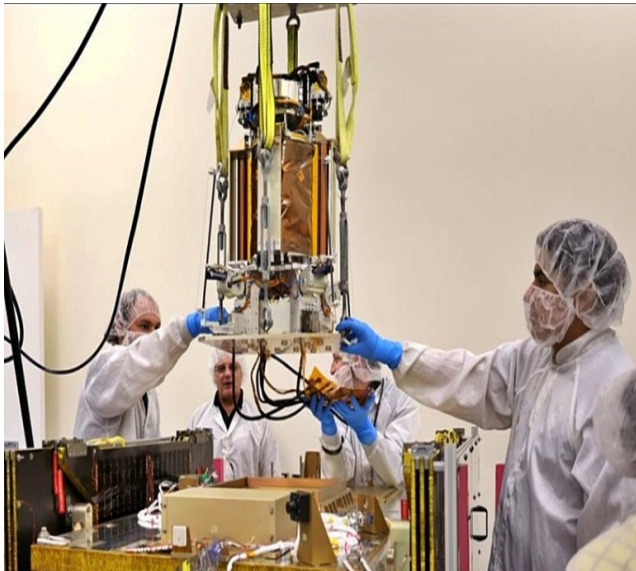
As we've been manufacturing RF filters for more than three decades, we pay attention when something interesting turns up in the news that concerns RF filters. There were two notable instances of this in the last two years. The first, which received massive attention, was the claim that as wireless carriers deployed their new C-band frequencies near airports, they posed a hazard to the airline industry because the signal could degrade the performance of aircraft altimeters when aircraft were landing.

The issue was that the frequencies used by the altimeters and the carriers are so close that the C-band out-of-band emissions could splatter into the band used by the altimeters. The C-band frequencies allocated for carriers are from 3.7 to 3.98 GHz, and radio altimeters operate between 4.2 and 4.4 GHz. Just before carriers were authorized to begin C-band operation, Boeing and Airbus asked the U.S. government to put a hold on the rollout. They were concerned that C-band-enabled base stations close to airports could interfere with radio altimeters on aircraft that are landing, and they were joined by the entire commercial airline industry. This left the FAA and FCC to figure out a solution. After about two years of back-and-forth negotiations, the FCC finally decided that, among other remedies, as some altimeters are more susceptible to interference than others, "certain" aircraft needed to retrofit their altimeters with bandpass filters to reduce interference. This conclusion should not have taken two years because the solution was obvious from the beginning: better bandpass filters.

The second issue arose when BMW, Ford, Mazda, Polestar, Rivian, Tesla, Volkswagen, and Volvo said they would eliminate AM radios from their EVs. Their stated reason was that the noise created by their electric motors would interfere with AM reception, although I suspect there was a cost element to this. The automakers seem to believe that as AM radio is archaic, and the number of listeners has been dropping for years, there's no need for AM receivers in their EVs.

## Caltech Shows Energy Can Be Beamed to Earth

Researchers at the California Institute of Technology (Caltech), using their Space Solar Power Demonstrator (SSPD-1), demonstrated that sending energy from space to Earth might be possible. It uses the Microwave Array for Power-transfer Low-orbit Experiment (MAPLE) that beams the energy to desired locations. The transmitted energy was detected by a receiver on the roof of the Gordon and Betty Moore Laboratory of Engineering on Caltech's campus in Pasadena. The received signal appeared at the expected time and frequency and had the right frequency shift as predicted based on its predicted travel from orbit. When fully realized, SSPP will deploy a spacecraft constellation that collects sunlight, transforms it into electricity, and then converts it to microwave energy transmitted wirelessly to wherever it is needed.



## Wireless Broadband Moves In

The cable industry may be in decline, but 5G wireless broadband delivery to homes is increasing and becoming a viable option. It can deliver speeds comparable to fiber and allows customers to set up their service without a professional installation, which for service providers is a huge benefit as a fiber installation can take the better part of a day. As a result, it's projected to surpass 1 billion users by 2030, an annual growth rate of about 47%, according to Counterpoint Research. However, its performance will vary depending on the location and network coverage, so it's still a work in progress.

While everyone reading this well knows that electric motors cause interference, so does almost everything else in a vehicle that relies on electronic components to perform almost every function. So, the question is, once more and more EVs take to the road, will they effectively be big noise generators on wheels? And if that's the case, RF filters will need to play a big role in keeping their interference in check. The media seems to have missed that, as I found not a single article mentioning the topic.

Fortunately, the automaker's decision brought a big blowback in Congress. A bill introduced by Senator Ed Markey (D-MA) in the Senate called the AM Radio for Every Vehicle Act would mandate to mandate that AM be included in all cars sold in the U.S. as a standard feature without any additional cost to new car buyers. Rep. Josh Gottheimer (D-NJ) introduced a similar bill in the House, and both bills have partisan support.

Their issue wasn't interference but that AM radio is an essential part of America's emergency alert infrastructure and the backbone behind America's National Public Warning System, for emergency-alert info from FEMA to the public during natural disasters, extreme weather, chemical incidents, health emergencies, and domestic threats. That is, the frequencies at which AM radio operates can travel hundreds or even thousands of miles under certain conditions, making it the only way people in rural areas can receive alerts.

While the altimeter issue was a no-brainer, the EV issue isn't so simple, especially considering that no one seems to be discussing it. My guess is that there will be a lot of RF filters in the EVs of the future.

## We can always find a solution!

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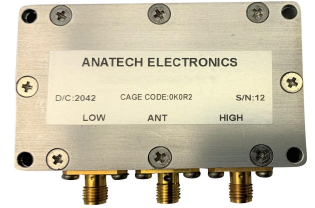
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### Amazon May Add Mobile to the Primes Bundle

According to Bloomberg, although all the major carriers and even Amazon deny it, the e-commerce goliath may be considering adding low-cost mobile service to its Prime bundle. The wireless industry could benefit, as Amazon might attract more traffic to its 5G networks, but it could also eat into its customer base if the cost is low enough and doesn't leave out key features currently available only from the carriers themselves. Mobile virtual network operators (MVNO), which Amazon would become if it offered the service, have been around for years, including Google Fi, Boost Mobile, Mint Mobile, Straight Talk, and Walmart's Family Mobile. The rumor is that Amazon would offer its perk for \$10 a month or even for nothing for Prime members.



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To learn more about Anatech Microwave Company please link to:

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