

Via Satellite's

Tech Focus REPORT



Progressive Designs for an Ever Demanding Market

Satellite communications in the 21st Century is a rapidly evolving market with tough demands put on manufacturers and system integrators to meet their ever-changing needs. With Transportable Satellite Terminals getting smaller and smaller, the need for a high performance, lightweight, and cost effective spectrum analyzer has been in demand and a challenge. One company has risen to the challenge and has become the benchmark in the industry for embedded spectrum analyzers. Avcom has become a household name in recent years for creative and innovative embedded spectrum analyzer card designs. Avcom has once again listened to their customers and developed the smallest, most rugged embedded spectrum analyzer in the world that will be a tool the industry so desperately needs for years to come.

AVCOM
Of Virginia Inc.

In 2013, Avcom of Virginia will celebrate a milestone Anniversary having 35 years of experience serving a very demanding satellite and telecommunications marketplace. Avcom has been an industry leader and known for having affordable and reliable test equipment, but in recent years have focused their efforts on the small, compact embedded spectrum analyzer card that has been used by almost every big name system integrator that manufactures small, lightweight satellite terminals in the world. Since Avcom introduced the SBS Series Embedded Spectrum Analyzer Card (SBS1) back in 2007 the demands have been to reduce the size, weight, power consumption and cost of the SBS1, and while doing so increase the overall performance to make the product more desirable for other potential customers such as antenna controller manufacturers and other innovative satellite equipment manufacturers that need an embedded spectrum analyzer as a standard feature or an optional accessory. This has been a challenge since the SBS1 was already the smallest card based product at the time, and to add more features would usually mean more complexity to an already compact design. Avcom was up for the challenge but needed some direction and began asking their customers for feedback on what features and requirements would be necessary in their future designs. Avcom was also looking for an anchor partner, one that would provide them with technical direction and specifications, but more importantly one that would give them a home for the product once it was completed. They found just that in Coolfire Solutions. "I was in one of our annual Strategic Planning Meetings where we lock ourselves in a room for 3 days and map out our short and long term goals, and I get a call from Tom Cox, President of Coolfire Solutions. Normally I wouldn't take any calls, but I heard rumor on the street that Tom was working on an idea for a new product

and I wanted Avcom to be in on it so I took the call," says Pat Piper, Director of Worldwide Sales, Avcom. It turned out that Coolfire Solutions was looking to develop a new ultra-modern, all-in-one satellite test kit that would provide a spectrum analyzer, power meter, multimeter, and LNB tester all in one compact ruggedized enclosure and they needed a partner and the rest was history. "Coolfire Solutions has partnered with Avcom and Harris to bring to life the ReconTM Satellite Communications Toolkit. Avcom is supplying the new SBS2-2150C L-band spectrum analyzer as well as a brand new USB-controlled/powered multiband power sensor. Avcom is by far the most important and strategic vendor

harsh environmental conditions in the world.

Need for Embedded Spectrum Analyzers

When developing the SBS2, Avcom had to do a lot of market research and understand the needs of the industry and challenges it faced. "We didn't want to just rush out and design what we thought the industry needed to find out later we missed the mark and wasted a lot of valuable time and money. So we went to some of our key customers and people who are well respected industry to get their feedback as well," says Piper. Everything in Satcom, including the spectrum analyzer, is focused on SWaP (Size, Weight, and Power



Avcom SBS2 Embedded Spectrum Analyzer

in the production of ReconTM units," says Cox. But getting there wasn't easy and the Avcom Engineers were faced with a number of challenges. First, Avcom had to reduce the size of the SBS1 by 40% to fit inside the small enclosure and also, reduce the power draw and heat dissipation significantly since the test set would be totally airtight and thermal operating temperatures were critical to the operation and performance of all of the internal components. The end result was the smallest spectrum analyzer card that would operate in

draw). As terminals get smaller, the trend is to integrate more functionality into components. There is also a big emphasis on ruggedness. As terminals get smaller, there is less mass overall to dampen the shock, so the wear and tear on the individual components is worse than ever. Satellites like WGS present higher dynamic range signals to the analyzer, so the dynamic range that an analyzer can measure on a single sweep is very important. A very fast sweep rate is critical, because more and more Satcom systems are going to

TDMA. In order to accurately detect and display dynamic TDMA signals, a very fast sweep rate is required. The new Avcom SBS2 has taken all of

to exceed its predecessor, the SBS1 and operate over a wide range from -30C to +70C which is the best in the industry," says Piper.

to the next level, while at the same time allow us to diversify and not be just a spectrum analyzer manufacturer, which is what we have been looking to do. As a result we rose to the challenge and ended up with a rock solid USB power sensor that we are proud of," says Evans.



Avcom Tri-Band USB Power Meter Sensor

Future Avcom Products

Just as Avcom took their SBS1 design and made it the foundation for their existing family of products they offer today, Avcom also has a similar roadmap to take the SBS2 design and integrate it into their future family of products. "The SBS1 is the engine that drives all of our existing Portable Spectrum Analyzer (PSA), Remote Spectrum Analyzer (RSA) and Satellite News Gathering (SNG) rack mount display spectrum analyzers. We plan to take the new SBS2 card and make it the engine that drives our future portable, remote, and SNG rack mount display products. By doing this it will take our products to the next level by offering smaller, lighter, and more accurate test and measurement equipment and at the same time allow us to add more features such as satellite ID, which has been desired by many of our customers for years," says Piper.

Another product that will be offered in the near future will be Frequency Extenders, which will allow the existing Avcom products to be used in extended frequency bands such as C, X, Ku, and Ka-Bands. The near term solution will be an external device that will downconvert the higher frequencies down to L-Band where the analyzer can then display the frequency on the Avcom analyzer at the actual frequency. Future designs will be frequency extender modules that will plug into the analyzer.

"Avcom will continue to invest in taking our product designs to the next level and form new partnerships with companies like Coolfire Solutions who are industry leaders that need Avcom to take their ideas and make them reality," says Evans. ■

this into account. Not only did Avcom address the SWaP requirement, but another very important factor is C, or Cost and the new Avcom SBS2 is very affordable and right in line with its predecessor, the SBS1.

The Future of COTS

Another term that is thrown around these days is COTS, or Commercial Off-The-Shelf. Even though Avcom is considered COTS, Avcom would prefer to use IOTS, or Industrial Off-The-Shelf. Many COTS components are designed to operate in a benign environment with little shock or temperature variation. The Avcom SBS2 is truly an industrial product that was designed with industrial grade components and is tested to work in industrial and military environments and is MIL-810F/G Certified. "We hear a lot of talk about how the Military is going to be looking at non-militarized COTS products in future designs to save cost, but at the end of the day we realize these products are going inside small terminals with little or no airflow in extreme hot and cold harsh environments, and the last thing you want is any component to fail due to temperature and compromise the entire system, or even worse put our troops at risk. We designed the SBS2

Optional Beacon Receiver

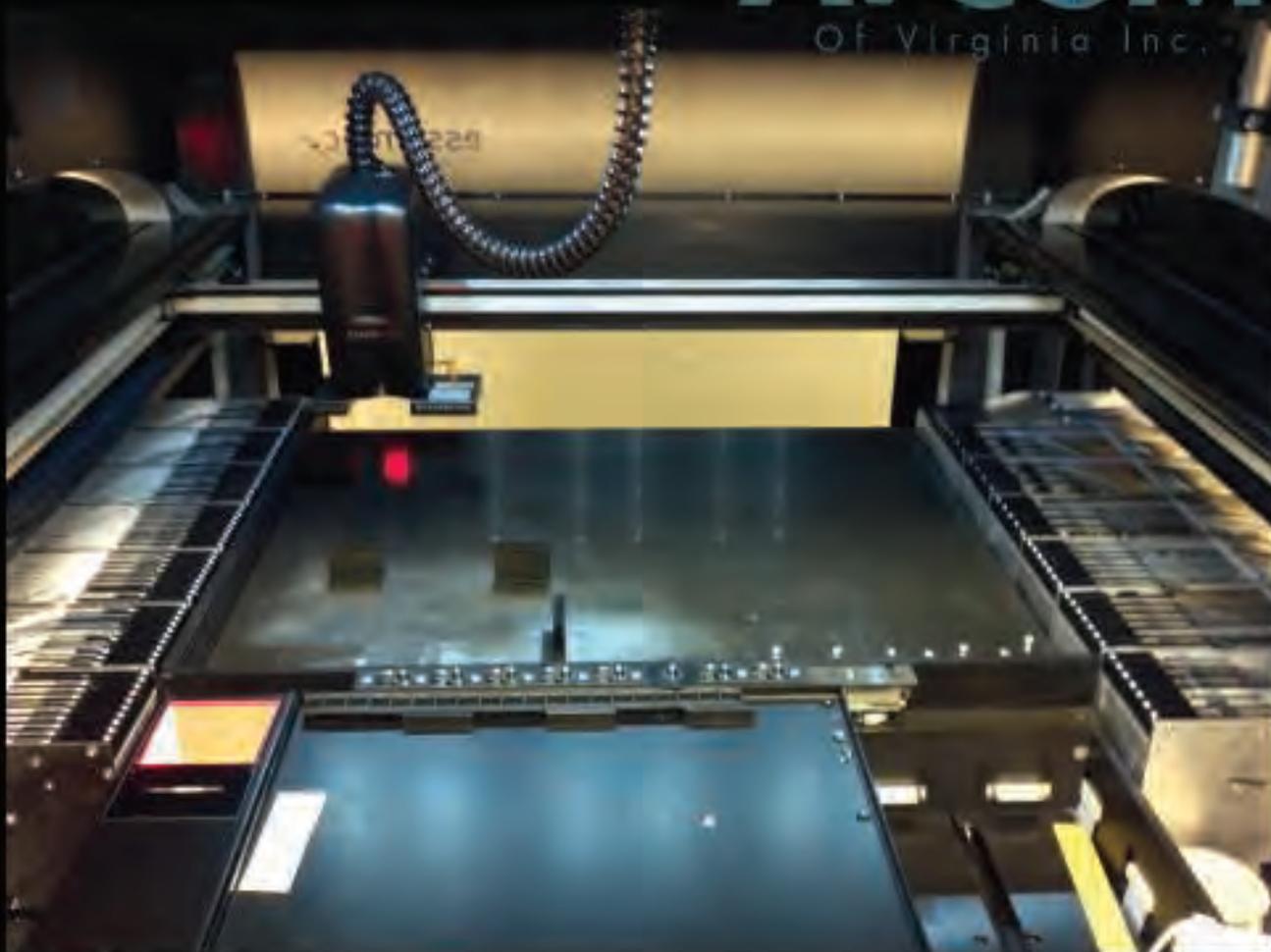
Another key feature of the new Avcom SBS2 is the optional Integral Beacon Receiver. The architecture chosen for SBS2 lends itself well to beacon monitoring and tracking. The SBS2 sweeps fast enough to allow simultaneous beacon tracking and spectrum monitoring on a single satellite. SBS2 can alternate between measuring the beacon and sweeping the spectrum, essentially folding the functionality of two components into one, saving money and SWaP. The cost, SWaP, and ruggedness make SBS2 a viable choice for many customers.

New USB Power Meter

Another product development that came out of the Avcom/Coolfire partnership for the Reconn™ resulted in a new USB-controlled/powered multiband power sensor. "In the past we have been approached to build a power meter power sensor and the spectrum analyzers we offered were not accurate enough for our customer's applications and we could only achieve +/-1dB. When Tom Cox came to Avcom he needed +/- .25dB which was a whole new level of accuracy for us, but it was a good opportunity for Avcom to take our product

AVCOM

Of Virginia Inc.



Avcom's commitment to providing custom, cutting edge solutions include:

- A brand new 11,000 sq/ft building for future growth & expansion
- A new automated SMT Pick-and-Place Machine
- Ability to provide rapid prototyping and quick turn production

Please contact Avcom for all of your spectrum analyzer and carrier monitoring needs.

We have a solution that will work for you.

*Avcom of Virginia
7729 Pocoshock Way
Richmond, VA 23235*

1-804-794-2500

Salesrfq@avcomofva.com