

## Staying at the cutting edge

Comtech Xicom Technology is a Silicon Valley based division of Comtech Telecommunications Corp leading the global satcom amplifier industry across commercial and military markets. Vice President of Business Development, Heidi Thelander talks about some of the company's most exciting new technologies and business strategies which have ensured success, and how Comtech Xicom will stay at the cutting edge in the world of tomorrow.

Laurence Russell, News & Social Editor, Satellite Evolution Group

**Question: What makes Comtech Xicom's BUCs and SSPAs unique? Who are the target customers?**

**Heidi Thelander:** Xicom's emphasis for our Block Upconverters (BUCs) and Solid State Power Amplifiers (SSPAs) is in attaining high-performance while also prioritising a very compact, rugged, and efficient design.

The new lines we've been promoting include the Bobcats, which are small but powerful. These address the compact, mobile and man-portable terminals where weight really matters. The Ka and Ku-band models weigh in at about 4.5lb, while the X-band models are 5.3lb, boasting a lot of power for their weight.

We also have the larger Pumas which are higher power-density, AC-powered amplifiers or BUCs intended to be part of a compact terminal. The higher-powered models at the



Heidi Thelander, Vice President of Business Development, Comtech Xicom Technology ●●●

100W linear and up level are more for fixed and transportable case-based platforms. They range from 20-50 lb depending on the power level and are available in X, Ku, or Ka-bands. They also feature built-in redundancy switching to support high availability satcom links.

The Bobcat and Pumas are both optimised for commercial and military customers that are prioritising size, weight, and power (SWaP) to speed up their links.

In addition, we've introduced the Falcon Ka and Ku-band systems which are in-cabin airborne products providing satellite communications from an aircraft for inflight communications for a variety of sectors. These units are DO-160 certified for commercial aviation, and we started shipping the Ku-band Falcon several years ago. We now have it in an Aeronautical Radio, Incorporated (ARINC) form factor.

We've received great feedback across all these models, and we're extending our capacity to serve demand including high-quality technology capable of working with MEO/LEO applications.

Our team has also shown remarkable ingenuity in customising products. We have the capability to do almost any Ka-band frequency translation that a customer needs. For instance, we've delivered a 27.5-30GHz tri-band switchable BUC with overlapping bands which handles all the calibrations and supports Inmarsat's Open BMIP standard. Whatever your frequency scheme within Ka-band, we can support it with conversion.

**Question: Comtech Xicom is the world leader in millimetre wave Traveling Wave Tube Amplifiers (TWTAs). How did Comtech Xicom assume that edge?**

**Heidi Thelander:** What's really giving us the edge in millimetre wave TWTAs is twofold. We committed fully to millimetre wave; every one of our test sets works up to 50GHz and we are increasing from there. And we've been on the cutting edge in increasing both power level and frequency at every chance with TWTAs.

We were the first to have the Ka-band 250W, the first to



Bobcats, which are small but powerful. These address the compact, mobile and man-portable terminals where weight really matters. ●●●

ship the Ka-band 500W, the industry leader in Q-band, and the first to develop a 250W Q/V-band, so we've always been pushing the envelope. We're also ready to deliver our technology in high volume when needed.

**Question: How would you describe the competitive landscape for faster delivery?**

**Heidi Thelander:** Fast delivery can be challenging but is easier if you communicate well with your customers to know what's coming. Maybe you need items with a long lead time, or models which we don't sell very frequently.

For the most common commercial products, we're able to get lead times down by understanding the market and maintaining strong communication with customers to forecast demand accurately. We certainly devote resources to getting our delivery times down and offering quick delivery where possible.

**Question: You've recently made strategic investments to see quality and reliability increased across your product line. What did that entail, and did it pay off?**

**Heidi Thelander:** I would say it's more than a set of investments and more of an effort to adapt our own internal culture. One of the things Mark Schmeichel, Xicom's President, likes to say is that "nothing is below the radar."

We've gone to a quality and reliability model where every single failure is addressed, even if it seems like a one-time affair, including things at very early stages, during manufacture.

In addition, we've implemented a lot of screening processes, taking us to an Aerospace Basic Quality System Standard (AS9000) quality level, which was driven by our airborne activity but spread across our entire manufacturing group. Ultimately that drove up the quality of all our products.

**Question: How do your products compare with others in our industry?**

**Heidi Thelander:** The new Bobcats are industry-leading in size and weight, and also in efficiency, which is why so many integrators are requesting quotes on these.

On the Puma side, we're even more feature-rich. There are people out there producing similar power levels, or comparable size and weight, but a lot of them are barebones.

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The Pumas support a wide range of systems, including redundant and power combined, such as our proprietary Variable Phase Combined (VPC) system that offers soft-fail and hot-swapping at a very reasonable cost.

We have a lot of experience working with integrators of these larger systems from our TWTA products, which has all gone into our process in designing the new higher power SSPA products. Competitors experienced in SSPAs who started using Gallium nitride (GaN) to get to higher power levels don't have the same experience with the more complex larger terminals that we have.

We also have specific expertise in X-band in reducing and eliminating leakage, which is extremely important for multi-carrier terminals. Any leakage from the units can result in problems when they're amplified by the antennas. That's always been a hard problem, but we've developed a series of techniques in manufacture and design that reduce and eliminate a lot of leakage, which has eliminated that particular problem.

**Question: What are some of the new developments in your multi-amp redundancy systems and controllers?**

**Heidi Thelander:** One of the developments with our multi-amp systems is the Continuous-Phase System (CPS), where we're combining the outputs of multiple amplifiers that all normally operate below their maximum linear power level so that if you have a unit go out, the system automatically increases the remaining units power levels to make up for the loss in output power from the failed unit, over a very short transition period.

So, you're buying a little bit more power than you need, but you don't need redundancy switching, you're just running economically in a safer method. It's like an alternative to those big racks which have high maintenance costs, which often require replacement modules every month.

This is more for highly reliable amplifiers, in which you get to keep operating at your desired linear power level with just a short drop in the case of a unit shutdown. That's pretty appealing for some of the larger ground stations where availability is everything. Usually, you can mount this system right up on the hub of an antenna, which allows you to buy a lower power amplifier by eliminating a long cable run from a rackmount location. For those reasons and more we think this solution is very competitive.

We've also developed liquid-cooled systems. We've had quite a few customers wanting liquid-cooled amplifiers for various reasons, including reduced acoustic noise, elimination of high-maintenance hub-mount air conditioners, and improved long-term performance and lifetime. Some of the locations where our amplifiers are installed are in urban environments where this is a huge issue. Liquid cooling eliminates the need for fans, which can be a major source of acoustic noise.

Another advantage to liquid-cooling over air-cooled is that air-cooled amplifiers in antenna hubs usually require air



Falcon Ka-band system ●●●

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conditioners which are typically your number one maintenance item. If you can get rid of that, you can make it a lot easier to maintain overall, and therefore reduce operating costs. There’s also the matter of tight temperature control provided by liquid-cooling which reduces variation in output power and gain and can extend the life of the amplifier. The benefits are quite numerous.

**Question: Where do you see the future of Q-band and V-band going?**

**Heidi Thelander:** We’re really excited about Q and V-band. People look at it different ways; there’s phase one, which is sort of a replacement for Ka-band feeder links, which is the most urgent application and what’s being addressed first. We think that’s going to generate plenty of additional business for V-band amplifiers.

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Comtech is right there at the forefront with all the millimetre wave products. We have the first V-band 250W peak TWTA shipped last year and which we’re continuing to supply. We’re going to continue innovating with higher power, lower power, and solid-state technology.

So, we’re well aware of what is happening with this technology, and we’re working hard to stay at the forefront of an exciting new market



A few customers want liquid-cooled amplifiers for certain applications ●●●

# Introducing New Families of SATCOM SSPAs & BUCs

## **Puma™ GaN SSPAs/BUCs**

- **Powerful & Efficient**
- **Ideal for Fixed & Transportable Applications**

**NEW!**



## **Bobcat™ SATCOM BUCs**

- **Compact**
- **Interchangeable Bands**
- **Ideal for Fixed & Man-Portable Applications**

**NEW!**



## **Falcon™ GaN SSPAs & BUCs**

- **DO-160 Certified**
- **Ku and Ka-Bands**
- **In-Cabin and Tail-Mount**

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