

## Scope

In 2020, Filtronic were challenged by a leading critical communications OEM to produce a new Tower Top Amplifier (TTA) supporting public safety networks. Product obsolescence and technological advancements required our client to demand a better performing product. Their existing suppliers were unable to meet their challenging specifications, plus they were looking to add more diversity within their supply chain. Further, our client wanted a range of product enhancements, including more consistent performance site-to-site and critically a reduced time to market, coupled with an easier installation.

## Challenges

Filtronic's extensive track record of producing Tower Mounted Amplifiers and expertise within the critical communications, coupled with agile processes and lean manufacturing philosophy ensured that they were able to accelerate product development.

The client asked Filtronic to develop the new TTA "as fast as you can" as the new specification was released over 12 months prior. The total development cycle took less than six months, from inception through to product qualification. The newly developed TTA was able to meet the modern specification and delivered the performance improvements our client was looking for including "smart redundancy".

In addition to performance enhancements, the client was interested in inventory reduction and increasing the speed of deployment. The target was to reduce the lead time from four weeks to two. Filtronic understood this major driver and were able to architect modularisation into the platform which enabled a significant service level improvement.

## Solution

Filtronic's TTA system delivered smart redundancy and dependable performance, continuously monitoring the health of the balanced quadrature-coupled amplifiers. In the case of a failure in one of the amplifiers, the system will continue to operate using the redundant amplifier. If both amplifiers are incapacitated, the system will function in a bypass mode. This failover system provided comfort to our client and offered them significant whole life cost reductions.

The TTA system provided excellent system flatness across the passband and low system noise figure, retaining linearity and out-of-band rejection. The product delivered best in class performance of 2.5dB for an increased range. Combined with the highest available IIP3 on the market of 18dB, providing much better immunity for strong signals. This gives radio system operators the confidence knowing their mission-critical networks will reliably operate with resilient connections and higher quality audio, especially in congested environments. This solution not only met the performance requirements, but also delivered a lighter weight solution in a smaller footprint, meaning better utilisation of the communication tower.

Another critical requirement for Filtronic's client was to ensure the TTA was manufactured in the USA. Filtronic were able to manufacture the TTA in our state-of-the-art facility in Salisbury, Maryland; a facility with a track record of delivering challenging critical communication solutions. To achieve the challenging order to ship schedule Filtronic simplified the ordering process giving single part numbers for complete systems, rather than individual sub-assemblies.