

## Interference mitigation filter solutions

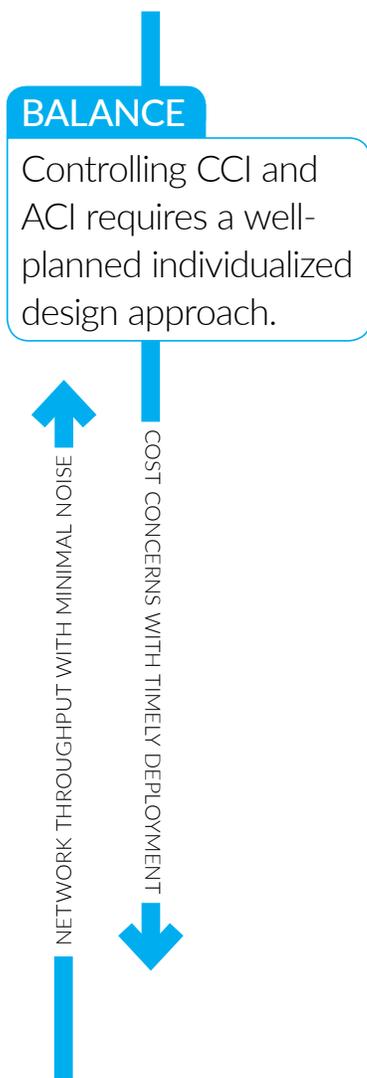
# Damage beyond dollars

## The real cost of network interference

Interference is everywhere—co-channel and adjacent channel—degrading capacity, eroding coverage, dragging down quality of service and wreaking havoc on the bottom line. If you operate near a national border or in frequencies adjacent to other networks such as public safety, air traffic control and digital broadcast television, the complexities and consequences are compounded.

The complexities of wireless networks aren't just daunting, they are unique. Each has its own RF fingerprint based on the transmission environment, performance specifications and link budgets. Controlling co-channel interference (CCI) and adjacent-channel interference (ACI) requires a well-planned and individually designed approach—one that balances network throughput with minimal noise, as well as cost concerns with timely deployment.

**Signal interference—while not the sole cause—severely affects the customer's experience.**



For today's overcrowded, capacity-strained wireless networks, the threat of interference will only get worse. Here are just a few reasons why:

- The use of LTE—which provides key performance benefits but is also interference-limited—continues to grow worldwide.
- As spectrum becomes more valuable, the opportunity cost of using guard bands increases.
- Tightening zoning regulations are fueling a trend toward co-location.
- In an effort to increase capacity, wireless providers are pushing the limits on frequency reuse.

## CommScope interference mitigation filter solutions: a comprehensive and customized approach

CommScope's interference mitigation filter (IMF) products and services can be combined to create a customized interference solution based on the needs of your network. Engineered and supported by RF experts with deep experience in end-to-end network design, CommScope's interference mitigation solutions can help you:

- Support higher data rates, attract more customers, reduce churn and increase revenue
- Take advantage of antenna-sharing opportunities in space-limited areas without compromising throughput and service
- Minimize or eliminate potential international conflicts due to cross-border interference
- Protect your brand by reducing or eliminating interference with critical noncellular systems such as public safety networks, air traffic control and military radar networks.

## Experience. Expertise. Innovation.

CommScope's experience in developing end-to-end RF network solutions gives us a unique perspective when it comes to mitigating interference. As a radio-agnostic provider, we work closely with the majority of OEMs, developing new IMF technology for today's advanced radio systems.

Our work has resulted in innovative designs such as a true band-stop filter that combines separate uplink and downlink filters into one compact, lower cost solution. Our IMF solutions are compact and lightweight, enabling mobile operators to reduce tower loading and leasing costs while increasing spectral efficiency and quality of service.

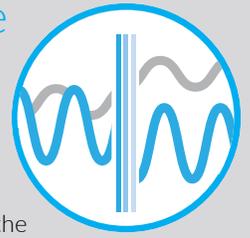
## Proven IMF technology

CommScope's IMF solutions use proprietary technology that effectively suppresses interfering bands while guarding against noise from nearby adjacent frequencies. It can also be designed to prevent your transmissions from CCI and ACI guards against ACI by effectively suppressing adjacent frequencies from nearby transmitters. It can also be applied to prevent emissions of CCI in bands adjacent to your transmissions.

Highly flexible, IMF technology can be incorporated into a variety of filter types and designs, including ceramic, cavity, stripline, crystal, SAW, tubular and adjustable filters. The resulting solutions can then be deployed as standalone filters or integrated into tower mounted amplifiers (TMAs) and combiners.

CommScope IMF solutions include both fully customized designs as well as a complete line of existing solutions that can be adapted for your specific needs.

## Diffusing interference in Northern Iraq



Today, Asiacell serves over 10 million subscribers, including many in Iraqi Kurdistan to the north. Two local carriers, providing CDMA service, also operate in the region—one in the high band and one in the lower band.

Interference caused by the two local carriers threatened Asiacell's spectral efficiency and revenue. They turned to CommScope for help.

CommScope responded swiftly. Two filters were custom designed for use with Asiacell's sites—one high band and one low band. A third filter, custom-engineered for use in the high band, was deployed in two regions where Asiacell operated with a smaller guard band.

The combined solution was an unqualified success, providing excellent interference rejection in both bands. CommScope also worked with Asiacell's team to facilitate implementation. Following initial rollout of the solution, CommScope and Asiacell started working on phase two. [Read More...](#)

## Creating a unique interference solution in Jamaica



As Jamaica's largest mobile carrier, Digicel serves about 76 percent of the island's 2.75 million residents. When engineers detected interference in their 900 MHz band, Digicel immediately contacted CommScope.

The interference was traced to a co-located competitor whose 850 MHz transmissions were leaking into Digicel's 900 MHz receive path. The problem could not be addressed with an off-the-shelf filter. So CommScope proposed a custom 900 MHz band-stop filter to be installed at affected Digicel sites. They would also provide necessary jumpers, weatherproofing kits and installation.

The proposal was accepted and the project shifted into high gear. Within weeks, CommScope engineers had completed the custom filter and delivered a prototype to Digicel for testing. The test results indicated a 40 dB improvement in interference mitigation. Digicel immediately requested that CommScope ramp up production and begin installation.

Today, Digicel's quality of service across Jamaica is back to its usually high standards. Just as importantly the carrier has a dependable partner who can help ensure it stays that way. [Read More...](#)

## A proactive approach to potential interference in Europe



One of Europe's largest wireless providers was awarded the 2600 MHz band for LTE—precariously close to the 2700 MHz frequency used by the country's air traffic controllers. Left unaddressed, the situation presented a potential safety concern and possible media disaster for the operator. They decided to take a proactive approach, enlisting CommScope, a global leader in customized interference mitigation solutions.

Working closely with the customer, CommScope custom-engineered a tower mounted amplifier with an integrated 2600 MHz LTE filter. The prototype performed flawlessly, preventing the customer's transmissions from leaking into the 2700 MHz band.

The filtering TMAs were quickly and strategically deployed across the network where they have continued to prove successful. Additionally, the integrated TMA has enabled the operator to minimize their components, costs, interconnection points and the potential for passive intermodulation (PIM).

As the operator's network evolves, CommScope remains involved, helping to address interference issues in a rapidly changing RF environment. [Read More...](#)

11.6 B

Mobile connections in 2021 exceeding the world's projected population.

78%

World's mobile data traffic will be video by 2021.

49

Exabytes per month mobile data traffic will be reached by 2021.

Source: Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–2021

Everyone communicates. It's the essence of the human experience. *How* we communicate is evolving. Technology is reshaping the way we live, learn and thrive. The epicenter of this transformation is the network—our passion. Our experts are rethinking the purpose, role and usage of networks to help our customers increase bandwidth, expand capacity, enhance efficiency, speed deployment and simplify migration. From remote cell sites to massive sports arenas, from busy airports to state-of-the-art data centers—we provide the essential expertise and vital infrastructure your business needs to succeed. The world's most advanced networks rely on CommScope connectivity.

# COMMSCOPE®

[commscope.com](http://commscope.com)

Visit our website or contact your local CommScope representative for more information.

© 2017 CommScope, Inc. All rights reserved.

All trademarks identified by ® or ™ are registered trademarks or trademarks, respectively, of CommScope, Inc. This document is for planning purposes only and is not intended to modify or supplement any specifications or warranties relating to CommScope products or services. CommScope is committed to the highest standards of business integrity and environmental sustainability, with a number of CommScope's facilities across the globe certified in accordance with international standards, including ISO 9001, TL 9000, and ISO 14001. Further information regarding CommScope's commitment can be found at [www.commscope.com/About-Us/Corporate-Responsibility-and-Sustainability](http://www.commscope.com/About-Us/Corporate-Responsibility-and-Sustainability).

BR-108412.2-EN (07/17)

## Custom-designed or adapted IMF solutions

The unique RF and interference characteristics of each network often dictate a fully customized filtering solution. CommScope is one of the very few IMF providers with the in-house resources and engineering expertise to handle it. More importantly, we work closely with you to ensure your performance specifications, budget and timeline are met.

Each customized IMF solution begins with CommScope's global sales team—RF experts who understand the national interference regulations, current network issues and spectrum allocation requirements in your area. Our engineers work with you during the initial design and prototyping stages to develop, test and fully vet your IMF solution. When it comes to production, our manufacturing capacity and agility mean timely turnaround and expedient return on investment.

CommScope has also developed an extensive line of proven IMF solutions that can be specially adapted for your network's RF environment and interference requirements. These include proven solutions for the most commonly deployed services and frequency bands: 700 MHz (upper and lower), 850 MHz, 900 MHz, 2.1 GHz, GSM, CDMA, UMTS and LTE. Based on your requirements, we can either modify an existing solution or, in some cases, use it as is.

## Minimize interference and put the numbers to work for you

There's no denying the surge in mobile data usage, the adoption of smartphones and the expectation of ubiquitous connectivity. For mobile operators, these trends present both opportunities and challenges.

The industry is fast approaching the capacity limits imposed by Shannon's Law. In order to meet the rising need, operators must focus on increasing network efficiency. Reducing interference goes a long way toward increasing efficiency.

With CommScope's IMF solutions, we can customize an interference solution that saves spectrum, lowers cost, improves service and allows you to launch new services faster—all without sacrificing network performance.

**To learn more, contact a CommScope representative today. Schedule a meeting or a workshop with CommScope's technology experts and let us help you find the right solution to address your interference concerns.**