Microwave Filter Company

High Quality Specialized Filters

Made in USA

Carl Fahrenkrug is Microwave Filter Company's President and CEO

Satellite systems receive not only the TV, radio and data channels that you actually want, but also unwanted signals that may cause interference. How do you get rid of these interfering signals? MFC, a manufacturing pioneer of satellite filters based in the USA, produces a variety of filters that eliminate such interference.

Always on the phone with customers: Sandy Nelepovitz is Senior Marketing Associate and manages the sales team.

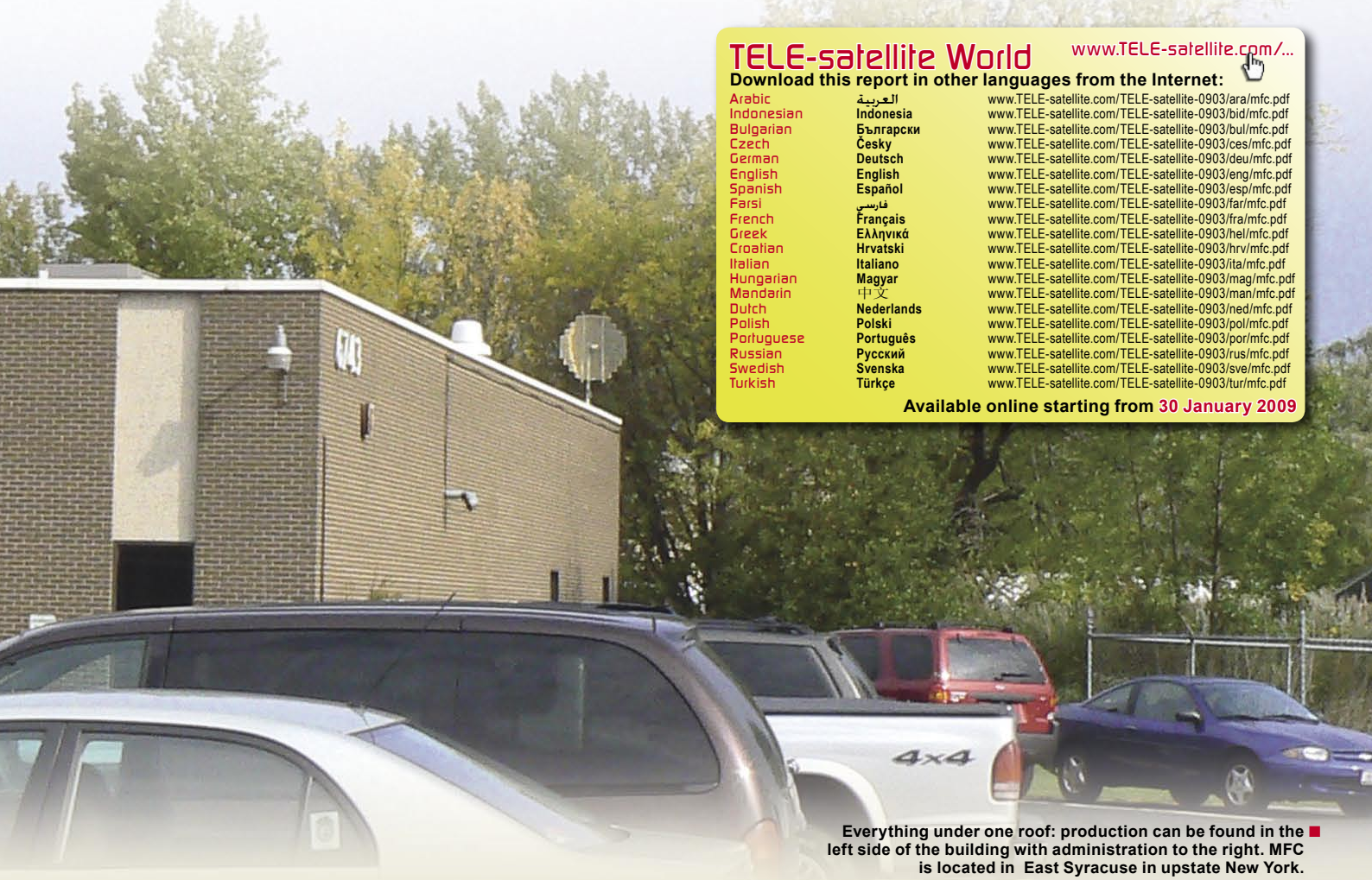
Scott Parsell, Director of Sales, manages MFC's network of domestic and international sales representatives who continually seek out new opportunities for the company.

"The company was founded in 1967, here in upstate New York", explains Sandy Nelepovitz, MFC's Senior Marketing Associate and to some extent, the heart and soul of the company. Having been with MFC for 30 years now, she readily offers some company history, "Glyn Bostick, the founder of MFC, actually started the business in a garage, producing filters for amateur radio use. In 1973, we moved to our current location. At that time, we were only renting a portion of the facility, while sharing it with other companies. In 1983, as business continued to grow, we were able to purchase the entire 3700 square meters facility."

Scott Parsell, Director of Sales, who has been with MFC for almost 20 years, further explains, "Despite the economic downturns and technological shifts that have occurred in the telecom industry over the years, MFC's business remains solid – in large part due to the fact that we offer a wide variety of filter products – serving, virtually, all telecom market segments (Satcom, CATV, Broadcast, Wireless, etc.). This product diversity means that our success is not dependent upon the success of one specific market segment." Additionally, lean manufacturing techniques, implemented some years ago, have increased production efficiency - allowing MFC to be more competitive.

Consequently, 1st & 2nd stage IF filters are useless and the only solution is to eliminate these signals with a bandpass filter at the feed before downconversion.

Scott continues, "We offer standard band (500 MHz), extended band (600 MHz) and super-extended band (800 MHz) bandpass filters. We also offer custom-tuned filters for special applications. So, we can provide the right model filter for C-band operations in any corner of the world."



Everything under one roof: production can be found in the left side of the building with administration to the right. MFC is located in East Syracuse in upstate New York.

Eric Logan is one of the engineering technicians. He can configure filter designs exactly to customer requirements directly on his PC. MFC also offers many filters for military use (e.g. - X-band).

When do you need a filter like this? Scott gave us a few examples, "Altimeter signals bouncing between commercial aircrafts and airports were recognized as one of the earlier types of out-of-band interference to C-band operators. However, that problem is usually limited to C-band dishes located near airports. Then along came the high-powered radar signals used in military surveillance (e.g.- AWACS planes) which caused problems to many more C-band dishes. This surveillance increased sharply after the 9/11 attacks and it seemed as though every C-band dish in the US was being affected, along with many other dishes around the world. As a result, radar continues to be the # 1 cause of interference to C-band operators."

"More recently," Scott adds, "a new source of C-band interference has surfaced - Wimax". In various parts of the world, Wimax operates within the (3.3-3.8) GHz range. These Wimax signals can disrupt

Although these undesired signals are out-of-band, their power level is so high, they essentially saturate the LNB and create intermittent or continuous interference patterns across the entire C-band.

■ **If it becomes complicated, the engineering team gets together and develops special solutions. Paul Mears (left) is Vice President of Engineering, Bob Paul (center) is Chief Engineer and Mike Wise (right) is Mechanical Engineer.**

C-band satellite reception of the super-extended C-band (3.4-4.2 GHz) – due to the common band of frequencies they share. In those instances, the C-band operator must install a C-band bandpass filter to reject the undesired Wimax signals. However, since the filter is rejecting same frequency Wimax signals, some of the lower C-band is also rejected (sacrificed).

Nonetheless, C-band operators are willing to sacrifice some of the C-band, if the result is good, clean reception of the remaining portion of the C-band. Since Wimax is relatively new, Scott sees a potentially-growing need for filters for C-band operators to solve this problem worldwide.

Compared to C-band operations, Ku-band operators face much less interference from other sources, since they operate in a less-congested, higher frequency band than the crowded C-band.

"Nonetheless, TRFs (Transmit Reject Filters) are needed on many Ku-band transceiver applications - where uplink and downlink takes place through the same antenna. The TRF is mounted on the receive side (10.7-12.75 GHz) of the feed to eliminate the strong transmit signals (13.75-14.5 GHz) that are present", explains Scott.

While MFC also manufactures bandpass filters for the Ka-band, "the demand for Ka-band filters is still quite low", concedes Scott, "since operations in this frequency band have been limited to this point."

Sandy Nelepovitz provided further company insight, "Our largest customer base is domestic - since MFC also continues to be a leading provider of CATV filters to cable TV operators within the US". Sandy continues, "Export sales have been between 5% - 7% since 1992. However, we expect those sales to increase further with the rising demand for satellite filters outside of the US."

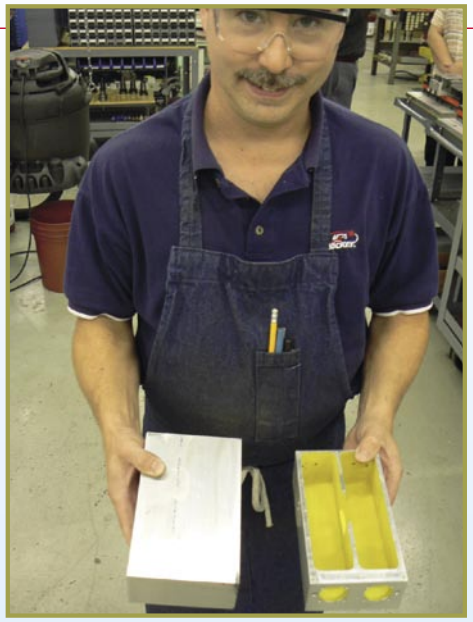
Anyone can order from MFC, whether it's a large number of filters or just a single one. "We even offer a 30-day money-back guarantee on standard filters", comments Sandy, "the customer only has to pay for the shipping costs, if that filter is not the solution." However, since customers usually know in advance what type of filter they need, they do not usually need to take advantage of the money-back guarantee.

Of course, what happens when they do not know what type of filter to choose? Sandy explains, "Our sales staff includes technical associates who are familiar with most of the problems that face our customers. So, given the application, they can assist the customer in selecting the appropriate filter for that job." But for those customers that are still not sure if a filter will even solve their problem, this guarantee allows them to simply buy and try a standard filter, thus avoiding the high cost of hiring a consultant to determine their solution.

Over the years MFC has built itself an interesting and sophisticated niche market in the world of satellites. With their combined knowledge and their commitment to high quality, MFC can easily accommodate the special wishes of any customer. If you're looking for a way to fight interference, you've found the right solution in MFC's line of filters.

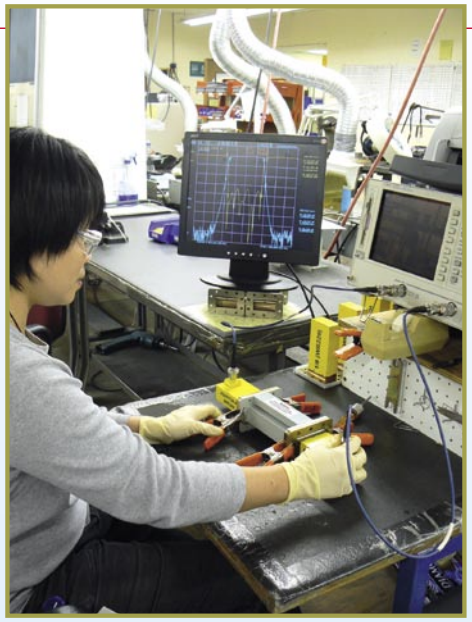
■ **Ruth Arace is Human Resources Manager and provides us a glimpse of MFC's employees: "We have 6 engineers, 36 production and 11 administrative associates."**

At the CNC milling machine with Bruce Sentoff (left) and Dale Newton (right). The bodies of many filter models are produced here out of solid blocks. "We program the machines in the evening after which they run automatically overnight", explains Bruce Sentoff. ■



■ Dale Newton shows us the production sequence: out of a solid block of aluminum (left) a complete filter body is milled with all the openings for connectors and screws (right).

■ The reception probe in the filter is put in place by Vertell Brantley. The glue that is used needs to set for three hours; the filters are stored in this chamber protected from the surrounding air. Thereafter, the filters are fixed with a weather-tight seal.



■ Did everything run correctly during production? Thuy Naylor performs a final test to determine if the filter lives up to it's specifications by connecting it to a network analyzer to confirm performance.

■ Here a filter is mechanically assembled. MFC employee Melissa Bench prepares a filter for the soldering oven…

■ Bill Adamo is Quality Control Group Leader and shows us how the weather-tight seal of a filter is pressure tested: "The filter is placed here and pressurized with air at 5 PSI." In this way they can check if the inside of the connector, as well as its mounting to the housing are air tight. "The smallest leak can let moisture in over time and could alter the characteristics of the filter", says Bill Adamo, "We test 100% of our filters!" Every customer can be sure that each and every MFC filter lives up to its high-quality specifications.

■ MFC virtually does it all by themselves: the completed filters are sprayed here with a protective color coating.

■ …the actual soldering process takes place in this soldering oven through which the filters pass.

■ En route to the customer: the completed and fully tested filters are packed and shipped from here to customers around the world.