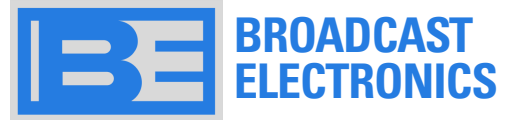


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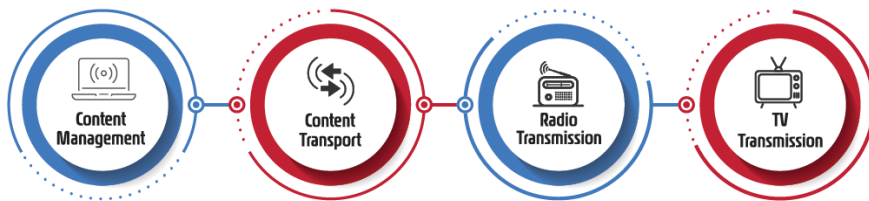
# STX 1k Series Compact High Efficiency FM Transmitters

# Overview



Broadcast Electronics has an over 67-year legacy of providing innovative technology to enable radio and TV broadcasters to deliver compelling content to their audiences and create revenue-generating business opportunities. Supporting global innovation and next-generation content delivery, Broadcast Electronics embodies a customer-first approach to the market from the company's headquarters in Quincy, Illinois in the United States.

Customer-focused solutions from Broadcast Electronics are built on four technological areas:



**AudioVault** is BE's award-winning suite of Content Management software enabling live and automated program creation and playout, news solutions, and digital logging as well as data management.

The Marti range enables content Transportation, powering audio contribution and distribution for point-to-point (STL) wireless connectivity.

**Radio Transmission** is the heart of Broadcast Electronics with multiple product lines to support AM and FM transmission. The BE STX line of HD Radio® ready FM transmitters provides superior sonic quality and low operating cost. The BE ETX analog FM transmitters deliver compact, efficiency in a redundancy-equipped package. The BE AMX line of transmitters provides rugged, reliable, energy-efficient peace of mind for your AM radio station.

Broadcast Electronics' complete line of **low and high-power TV transmitters** are designed around a software defined core exciter that can cover all the global analog and digital TV standards. With solutions covering UHF and VHF frequency bands and air-cooling configurations, BE can craft the right solution to meet your technical, budgetary, and operating requirements.

Broadcast Electronics is a global technology company dedicated to driving innovation in broadcast technology providing market leading solutions for software-based content management, Radio & Television transmission, and scientific applications of radio frequency devices.

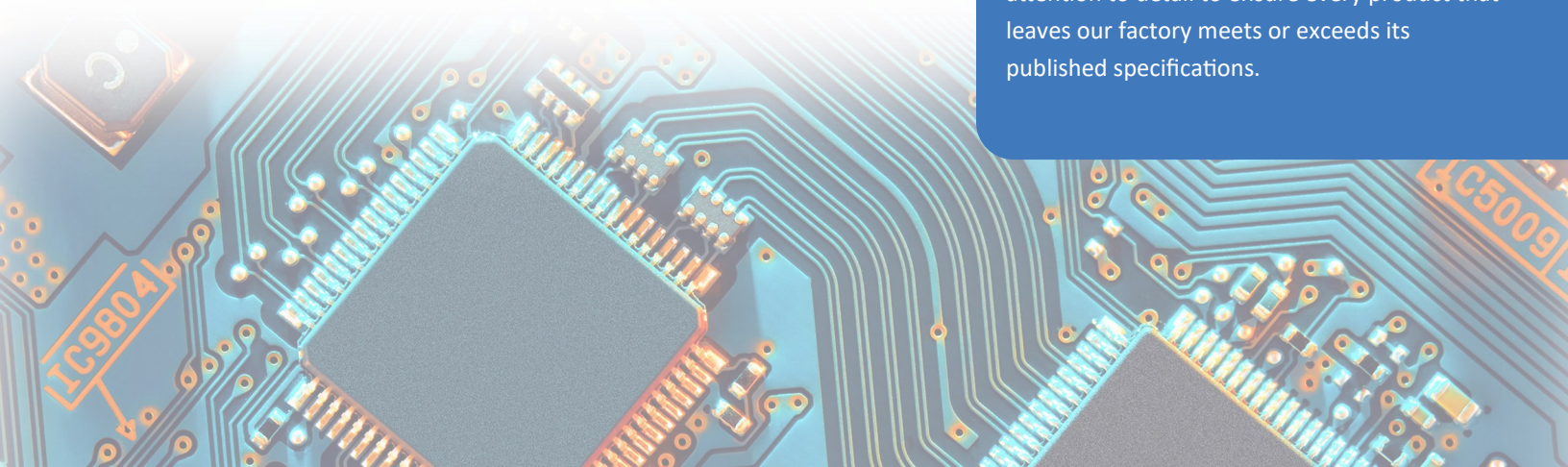
Broadcast Electronics, has been providing high-tech solutions for broadcasters for more than 67 years in over 170 countries. All of our products and services come from a heritage of creativity and innovation unmatched in the industry, focused on developing innovative solutions for customers problems.



Every major innovation that shaped modern radio originated in Quincy, and it is here that BE products are designed, supported, and manufactured today.

Our facility in Quincy employs the latest instruments for research, new product design, prototype fabrication and testing.

We take advantage of the best practices of automated production, adding human attention to detail to ensure every product that leaves our factory meets or exceeds its published specifications.



# STX 1k FM Transmitter Series

The Broadcast Electronics STX continues the legacy of reliable, efficient, and performance-leading FM and the new STX 1k takes it to the next level. The STX 1k combines the best sounding exciter with higher efficient ultra reliable RF amplifiers and energy efficient power supplies to provide rock solid operation all backed by BE's US based service and support. Analog—HD Radio® - DRM+ the STX 1k has you covered!

## The Best Audio Quality—Ultimate Reliability

The STX 1k is designed to deliver a high-performance, cost-effective solution with powers up to 1,00 watts. Leveraging the highly efficient and compact RF technology of the latest ruggedized LDMOS RF devices the STX provides the efficiency, compactness, and reliability you have come to expect.

We didn't stop there, drawing from BE's decades of providing the best-sounding FM exciter on the market, we incorporated a digital direct-to-channel FM modulator and ultra-reliable highly efficient power supplies to deliver the maintainability and robustness our customers have come to expect with the performance and reliability BE is known for.

STX 1k's powerful control system provides extensive monitoring, logging, and control capabilities with fast-acting protection for maximum reliability. A front panel LCD screen, navigation buttons, and bright LED indicators allow easy review, setup, and diagnostics. The RJ-45 port allows you to connect to the all new HTML5 responsive display, intuitive and powerful GUI and SNMP from anywhere in the world. The standard parallel GPI/O interface provides connectivity to a traditional remote-control system.

## Powerful Software Options

STX 1k boasts an all new optional processing platform that can host a wide range of software tools to help you streamline and simplify your operations.

**Stereo Tool Audio Processing:** BE and Themio teamed up to deliver a proven powerful FM audio processor which provides a simple low-cost way to add world class Stereo Tool audio processing and HLS streaming input to any STX 1k transmitter. With a wide array of options Stereo Tool can give you as little or as much control as you want to tailor the sound of your station in even the most competitive markets. Stereo Tool also enables the ability to transport the audio to your STX 1k transmitter using the robust HLS streaming delivery protocol, ideal for leveraging cost effective IP connections with solid performance—lowering your program distribution costs.

**Micro MPX IP Codec :** Simplify your distribution keeping the processor at the studio, and send the FM composite baseband signal over low cost IP networks. Micro MPX breaks the bandwidth barrier by supporting low—320 kbps and even lower transport for FM composite signal with full fidelity. Micro MPX is the defacto standard for composite distribution—Stereo Tool and most major audio processor have options for Micro MPX encoder built inside to eliminate costly outboard IP codecs.

**Flexible Expansion :** The STX 1k processing platform is designed to integrate with market leading workflow tools so you can take advantage of innovation and interoperability with out getting locking in to brand specific protocols.

## Put these powerful capabilities to work for you

- Ultra compact size and low weight
- Direct-to-channel digital modulator
- HD Radio & DRM+ operation
- Outstanding Audio performance
- High efficiency delivers up to 75% AC to RF Efficiency
- Shippable via UPS or Fed Ex for fast low cost delivery
- Optional Stereo Tool for powerful cost effective audio processing
- HLS Streaming input via Stereo Tool
- Optional Micro MPX for robust IP STL transport
- Built in digital Stereo Generator
- Built in RDS Generator built-in with Dynamic text capability
- Removable front panel grill and washable filter for clean operation
- Multiple Program Inputs with silence sensor and auto failover
- Single Frequency Network capable with built-in Audio delay
- N+1 Capable, Main/Alternate Capable
- Integrated modulation metering eliminates outboard modulation monitor
- Seamless operations over a wide range of voltages and power stability
- Low noise super cooling system
- Run at maximum power up to 1.5:1 VSWR w/proportional foldback
- IP Connectivity with HTML5 GUI for anytime, anywhere access
- Comprehensive event log stores 5000 events—simplifies troubleshooting
- FSK Identifier for translator operation

# Digital Modulator—The Heart of the Transmitter

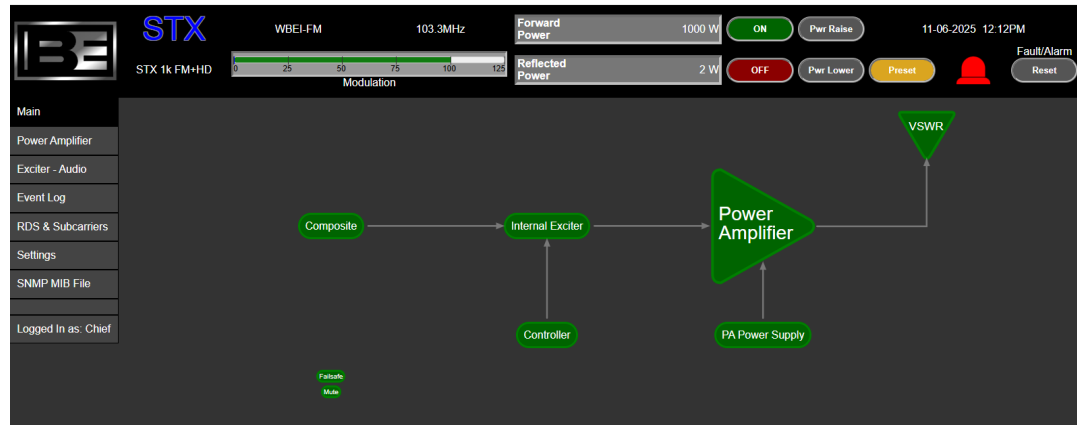
Building on BE's long legacy of superior-sounding FM exciters, STX 1k continues the tradition with a state-of-the-art Digital Direct to Channel (DTC) modulator of unrivaled precision and sonic clarity inside every transmitter.



The STX 1k features a digital exciter that can produce the best AES audio but is also capable of broadcasting in HD or DRM+. Flexible audio input options including Analog, AES composite AES 192 digital compose all with configurable automatic switch over to a back up source. STX 1k boasts plenty of inputs for SCA's, RDS plus integrated digital stereo generator and an RDS generator. There is even built in switching to support dual exciters.

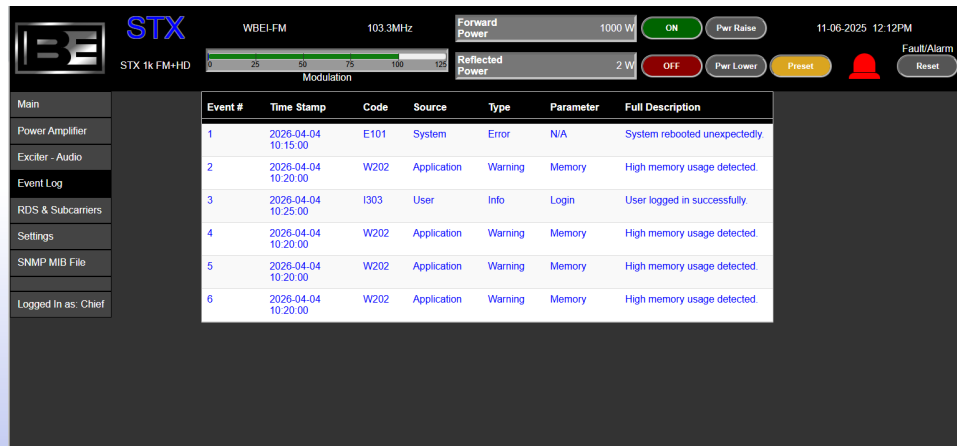
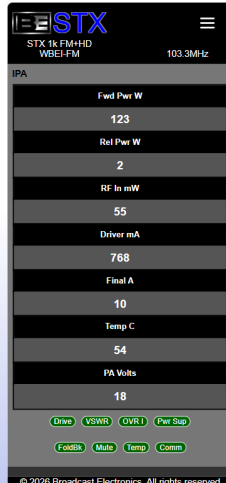
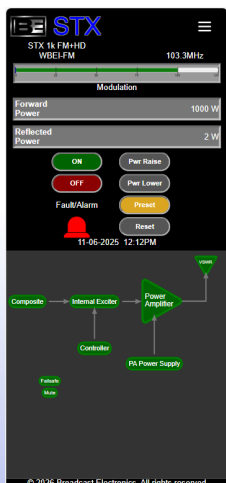
## Advanced Monitor and Control Capability

STX 1k features an all new powerful yet simple-to-use browser-based HTML-5 graphical user interface for control and monitoring of the transmitter anywhere in the world. Responsive design ensures it is easy to read and use on a wide range of devices tailoring the display to best match your device—large PC monitor to a smart phone. Extensive TCP/IP network connectivity via integrated RJ-45 connection allows the transmitter to be securely connected



to any IP network. Integrated multiuser multilevel password protection ensures only authorized operation on your network.

STX also supports a robust SNMPv3 – (Simple Network Management Protocol) interface for easy connection with a wide array of powerful software network manager systems and popular transmitter remote controls. The entire transmission system can be controlled and monitored using the standard published MIB protocols.



# Audio Software Options

## Stereo Tool—Powerful Audio Processing, Pleasing Price

Stereo Tool is a software-based audio processor which offers outstanding audio quality and comes with many unique features. It is used by over 3000 FM stations ranging from small local stations to 50 w to 100 kW stations and major nationwide networks.

Complete FM processing including AGC, compression, equalization, limiting, clipping, high performance stereo generator, composite clipping and much more. Complete details at StereoTool.com

Stereo Tool on your STX 1k transmitter simplifies the workflow allowing you to take full advantage of the great sounding STX exciter technology for a competitive edge in your market. Complete control with presets, and expert level adjustment all via the HTML5 browsers interface with security. Stereo Tool can even accept HLS streaming input to simplify your distribution.



## Micro MPX—simplifies transporting audio over standard IP networks

MicroMPX is our STL (studio-to-transmitter link) codec. It transports a full FM composite MPX signal, including pilot and RDS, at bitrates from 320 kbit/s, with perfect peak control. Using MicroMPX you can generate your signal completely in your studio and easily distribute it to all your transmitters

MicroMPX is a codec that is specifically designed for FM. It doesn't cause typical lossy codec artifacts (pre/post ringing, watery sound), and perfectly maintains peak control, even when using composite clipping. This eliminates the need to have an expensive high end audio processor or stereo/RDS generator at the transmitter site.

MicroMPX has built-in error correction for connection drops, and supports dual paths (you can send the same data over multiple connections, as long as any of them arrive the audio keeps playing). If everything fails, there's a built-in backup audio player.

You can originate your distribution with Micro MPX by simply using the software based encoder at your studio, or you can directly output MicroMPX from many popular audio processors as well as Stereo Tools used at your studio.

SFN: GPS synchronization: Identical MicroMPX receivers that are fed by the same encoder in a Single Frequency Network (SFN) with multiple transmitters that are broadcasting at the same frequency with overlapping reception areas and use GPS synchronization of the decoders and STX 1k transmitters to delivery audio synchronized to within less than 1  $\mu$ s.

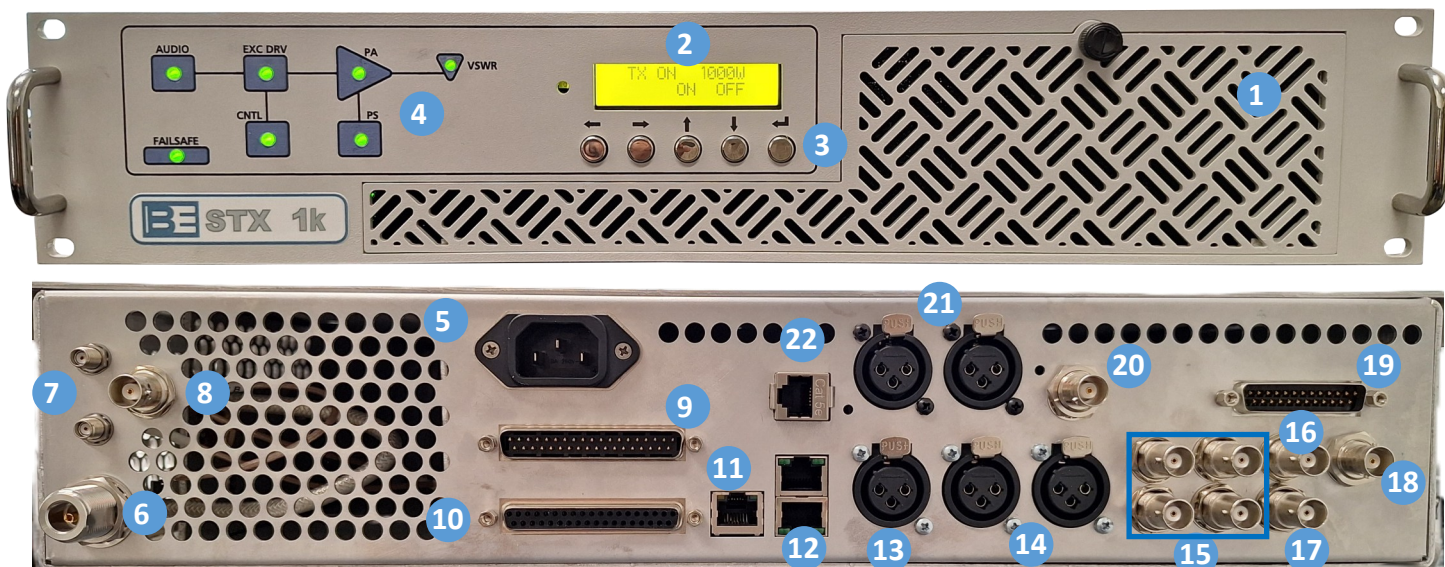


BE STX 1k transmitters are designed with digital radio in mind, supporting both HD Radio and DRM+ operation. We provide the flexibility of changing transmission between analog only mode and analog+ HD, all digital or even DRM broadcasts.

Digital Ready – just add an external HD Radio or DRM signal generator when you are ready to make the change.



# STX 1k Front & Rear Panel



1. Cover for removable washable air filter
2. LCD display
3. Menu navigation and select
4. Signal flow status—OK, Warning, Fault
5. AC power supply input
6. RF output connector (Type N female)
7. 10mHz & 1PPS inputs
8. RF Sample—Mod Monitor
9. Remote Control—GPIO
10. BE expansion interface
11. LAN (RJ45) for management (Web server, SNMP, etc.)
12. CAN Bus
13. AES/EBU -& AES 192 input (XLR connector)
14. Analog input L/R (2 XLR connectors)
15. Composite, SCA 1&2, RDS inputs
16. 19kHz out
17. Exciter RF out
18. PA RF in
19. Extended I/O
20. Stereo Tool Input
21. Stereo Tool & MicroMPX composite out
22. LAN (RJ45) for Audio— Micro MPX

## Specifications

General	
<b>Modes</b>	Analog FM, HD Radio, DRM
<b>Analog Input</b>	2x XLR female (Balanced impedance 600Ω/10KΩ selectable)
<b>AES</b>	XLR female (Balanced impedance 600Ω/10KΩ selectable)
<b>MPX/SCA/RDS input</b>	2x BNC female (Unbalanced impedance 50Ω/10KΩ selectable)
<b>AC Input Voltage</b>	185—264Vac, single or three phase, 47 Hz to 63 Hz
<b>Dimensions (W x H x D)</b>	19 x 2 RU (3.5) x 22 inches 48 x 9 x 56 cm
<b>Weight (LBS / Kgs)</b>	25 / 11
Environmental	
<b>Temperature</b>	-10°C to +50°C
<b>Altitude</b>	10,000 ft (3,048 M) at 60 Hz; 7,500 ft (2,286 M) at 50 Hz
<b>Humidity</b>	0% to 95% (non-condensing)

RF Specifications	
<b>Transmitter Type</b>	Solid State VHF FM transmitter for analog FM: 87.5 MHz to 108 MHz; 10 kHz increments
<b>Output Power</b>	100 W to ~ 1,100W 50 ohms—Type N female
<b>Efficiency</b>	Up to 75% typical AC to RF
<b>Modulation Type</b>	Direct-to-channel digitally generated FM (no analog up-conversion)
<b>Modulation Capabilities</b>	Standard: $\pm 75$ kHz peak deviation – Max: $\pm 300$ kHz peak deviation
<b>Spurious and Harmonic</b>	Compliant with ETSI and FCC specification—85dB or better; low pass filter standard
<b>Asynchronous AM S/N Ratio</b>	Better than -65dB (-75dB Typical) referenced to average peak-to-peak carrier amplitude. 75uSec de-emphasis)
<b>Synchronous AM S/N Ratio</b>	Better than 60dB referenced to average peak-to-peak carrier amplitude. 75kHz deviation @400Hz
<b>VSWR</b>	Normal operation up to 1.5:1 Integrated Proportional Fold-back and Fast Protection
<b>Regulatory</b>	FCC; IC; CE; BETS-6; IEC 215 Safety
Audio Specifications	
<b>Audio Inputs</b>	AES, L&R analog, composite, SCA/ RBDS/RDS external generator input, SCA audio inputs (2)
<b>Amplitude Response</b>	Composite/ AES: +/-0.03dB, 30 Hz to 53 kHz; +/- -0.1dB, 53kHz to 100kHz Analog L&R: +/-0.25, 30Hz to 53kHz
<b>Total Harmonic Distortion + Noise</b>	Composite: 0.005% or less @400Hz, 10-22kHz bandwidth, 75uSec deemphasis. AES/ Analog L/R Stereo: -0.01 typical @ 400 Hz, 10-22kHz bandwidth 75uSec deemphasis
<b>Composite Intermodulation Distortion</b>	0.13% SMPTE (60/7000 Hz, 1:1 ratio), DIM-B: 0.008% (14kHz)
<b>S/N Ratio</b>	AES: 95dB typical below 100% modulation @ 400Hz-22kHz bandwidth, A-weighted filter 100dB typical below 100% modulation @ 400Hz, 10Hz-22kHz bandwidth, CCIR-468 filter Analog: 93dB typical below 100% modulation @ 400Hz, 10Hz-22kHz bandwidth, A-weighted filter 98dB typical below 100% modulation @ 400Hz, 10Hz-22kHz bandwidth, CCIR-468 filter Stereo: 80dB or better below 100% modulation @ 400Hz, unweighted
<b>Stereo Separation</b>	AES: -74dB below 100% modulation @400Hz. Analog L/R: -70dB, 30Hz to 15kHz
<b>IMD Distortion</b>	SMPTE: 0.01% or less (60/7000Hz; 1:1 ratio) DIM-B: 0.005% typical (14 Hz)

## Service and Support

We know that having the right support behind a product is every bit as important as the features and capabilities it delivers. At Broadcast Electronics we are committed to provide you with not only great products and software, but a dedicated team of service experts to help you keep your station running smoothly for years to come.

## Training

Broadcast Electronics has long provided training programs for our products to educate and prepare users to operate and maintain them in the most effective possible manner. Training is offered for all styles of transmitters and Audio Vault systems, featuring a mix of instruction with hands-on operation and troubleshooting. Training programs can be crafted to meet your local needs, offered in our facility, at your location, or online. Many of our programs can provide SBE ongoing educational credits.

## Warranty

You can rest assured that Broadcast Electronics stands behind its products and services to provide complete satisfaction.

Our products offer a standard set of warranty services that exceed others in the industry.

## Repair Service

As a leader in providing innovative products and solutions to broadcasters around the globe, Broadcast Electronics understands the need for long life and years of trouble-free service. You can feel secure that if disaster strikes and your products need service, we offer complete repair and refurbishment service to get you back on the air delivering your high-quality programming quickly.

## On-Site Service and Installation

Whether you need assistance troubleshooting an existing transmitter or Audio Vault system or require a complete installation of a new one, the global service team at Broadcast Electronics is here to help you get everything up and running quickly. We also offer support for commissioning, on-site set-up and testing, or simply providing an extra pair of hands. Whatever your needs, we can assist you.





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