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Broadcast Audio Platform

FM & HD Digital Audio Processors

FM MPX Stereo Encoder

FM RDS Encoder

FM RDS Content Programmer

FM Broadcast Analyser

Streaming HD Encoders

Emergency Failover Program Player

IP-STL True Digital with Redundancy

Remote Management

BAP104 / BAP208

Local TX *Remote/Translator TX*

Distributed by

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Broadcast Audio Platform

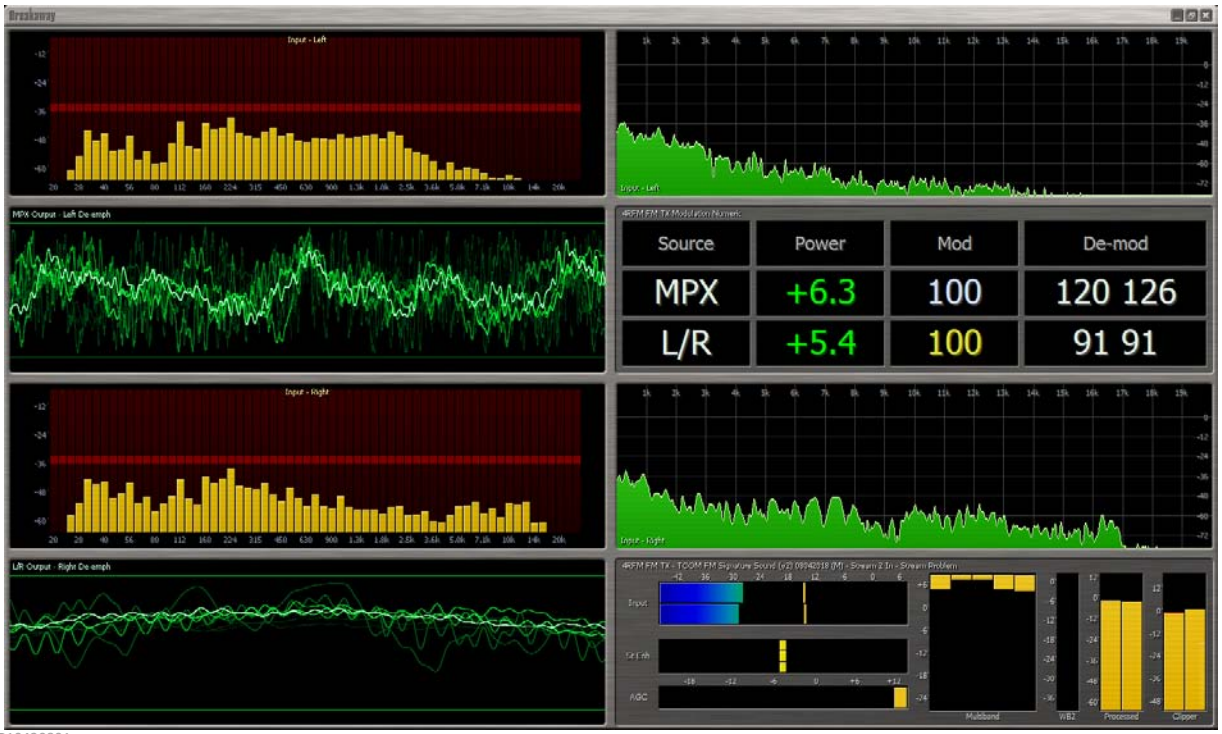
The TCOM Broadcast Audio Platform is an advanced computing system featuring the latest and outstanding European technologies for true wideband digital audio processing, designed specifically for FM and Streaming requirements of radio broadcasters.

FM and Streaming broadcasters need *Punchy*, *Clear* and *Bright* audio that is consistent over the varying music types and the ability to enhance the quality from varying sources such as PCM and MP3.

With steady and consistent audio modulation by the TCOM BAP featuring Breakaway One and Stereo Tool audio processors, your listeners are kept in tune with a professional confident sound that they will enjoy day in and day out, greatly improving your stations reputation with a true professional quality sound.

KEY BENEFITS:

- **Easy to Use** - *Plug in a local Ethernet Internet connection and obtain immediate secure local or remote access from your PC or even your Smart Phone via a App, the BAP is designed to run completely headless.*
- **Fix & Process the Audio** - *with 3 powerful functions of Thimeo (Stereo Tool); from Declipper, Delossifier and Natural Dynamics, then into Breakaway One with 5 powerful functions of Input conditioning, Sound Enhancement, AGC, Bass, advanced clipping & limiting now embedded into Breakaway One natively, this is one outstanding system with a sound warmth like nothing you have heard before.*
- **Modulate** - with *FM MPX including Stereo Generation and advanced RDS encoding directly into the TX or STL without clipping and overshoots, and ITU-R SM-1268 Stokkemask clipper & ITU-R BS-412 limiting options.*
- **Extend your Coverage** - *as much as 30km without increasing TX power through true noise cutting loudness controls.*
- **Analyse your TX** - *to ensure regulatory compliance for deviation, RF shoulders, MPX levels and more.*
- **Stream your Audio** - *of the separately processed sound directly out to a icecast or shoutcast server in high quality AAC+ encoding.*
- **Warranty & Support** - *with 1 year back to base warranty and remote support ensures on-going confidence with your purchase.*

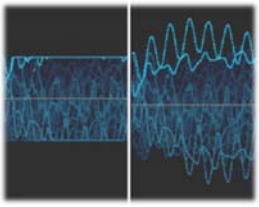


FEATURES IN DETAIL:

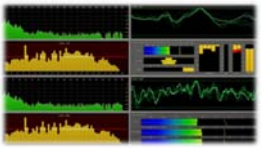
Operating System

The BAP runs upon the tried, proven and very reliable Microsoft Windows operating system. This operating system was chosen because of ease of maintenance and ability to control patching, as Internet connectivity capabilities existing within the system. No complex knowledge or training is required to handle this operating system as it's widely used and accepted globally.

Not One but Two Digital Audio Processor Engines



Award winning European software author Hans van Zutphen with over 15 years experience in digital audio processing, brings technology oddly learnt from the medical world into a powerful real-time audio repair processor, correcting clipped audio, repairing damaged MP3 audio and adding natural dynamics to give that extra flare and importantly, clean sound in preparation for audio processing.

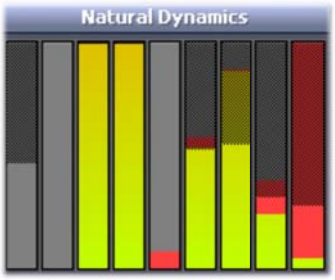


Award winning European software author Leif Claesson with over 20 years in digital audio processing business brings technology from over 1000 commercially deployed units across the world into a single & very powerful user control domain, with incredible loud crisp audio and simple platform management capabilities.

So lets go through the features in just a little detail:

REPAIR

- **Declipper** improves the audio quality of too loud recordings of **most modern CD's** and **MP3's**. A patent pending unique algorithm dynamically learns to calculate the missing information from the audio and repair in real time. No other digital audio processor widely available has this capability. Numerous tuneable functions.
- **Delossifier** filter removes compression artifacts by removing the 'ringing' sound heard in some MP3 audio sources. A small set of tuneable functions.
- **Natural Dynamics** increases the dynamics for music that lacks it. Beside unwanted clipping distortion, modern music may also lack dynamics. With up to 9 bands, Natural Dynamics boosts transients in music, while attempting to avoid boosting other sounds or to not boost punch in already very dynamic music.



PROCESSING

- **Input Conditioning** prepares the audio by setting the noise gates to remove unwanted or inaudible sounds that when audio processed, produced unwanted side affects. Where possible reduce noise levels in the incoming source prior sending into the audio processing complex stages.
- **Enhance** lets you sweeten the audio with simple controls (Deep Bass, Warmth, Presence and Brilliance), which internally adjusts a multitude of audio parameters based on algorithm logic, to let you easily dial in your perfect sound.
- **Gain Riding** is effortlessly unobtrusive, ensuring consistent cut-to-cut levels and keeping your audio in the sweet spot for the rest of the processing chain.
- **Multiband** re-masters your audio in real-time, yielding consistent spectral balance between songs of vastly different eras, sounding great no matter what you throw at it.
- **Final** calculates the peaks and applies adjustments for bass and loudness control, ensuring no clipping and overshoot, all whilst keeping that loud crisp sound. This ballet of sound magic is what happens when you put two of the worlds smartest audio processing programmers into a room together, sharing ideas and cutting software code concurrently.

FEATURES IN DETAIL:

CONFIGURATION, MISC, COMMON, CLIENT AUDIO, OTHER

- **I/O** function within Breakaway One providing the ability to select a internal source and adjust the silence controls. TCOM has taken care of all the complex stuff here, its simply works for you.
- **Stream Receiver** function allows the incoming of remote sourced audio streams from either Breakaway One or other 3rd party platforms, again for local program, emergency failover or remote program source. Again TCOM simplified integration.
- **VST Plug-ins** function is where you can include other audio processing modules to provide other sounds and effects. This is were we embed the Thimeo Stereo Tool DSP to repair the audio, all under the control of Breakaway One. TCOM simplified.
- **Watchdog** function provides four triggers to execute local scripts or server functions. Smarts like restart the service or restart the server, or even your own customised scripts to send you emails before taking a watchdog again and again later when returned. TCOM simplified.
- **Label** function allows the system cores to be named in a smart way that you understand. Again TCOM simplified.
- **TCP Link Status** function is an important live reporting tool of what is happening with the Breakaway One platform, showing how TCP traffic specific to this core is configured and is running.
- **Display Settings** function set the display meters on what you wish to see of the audio through the various stages of the audio processing. TCOM simplified.
- **System Information** function provides information on software version, server status, uptime and configuration backup.
- **License Information** function provides information on software licensing as setup. TCOM simplified.
- **System Information** function provides information on software utilisation on the server.
- **Network Information** function provides information on network connectivity options for the server. TCOM simplified.
- **Audio I/O Status** function provides information on how the system cores are handling audio through statistical analysis and allows you to clearly identify the early warning signs in a networked deployment.
- **Outbound Connection** function provides the availability to connect to a remote support agent, thus typically bypassing limitations of network firewalls, only if and when you configure this capability.
- **Outbound Connection** function provides the http whitelisting of local or remote IP addresses allowed to connect to the advanced interface. This may include BA Remote and playout systems wishing to update songs playing, etc.
- **Stream Access** function provides the http incoming access control for any LAN or WAN client. Where allowed from a Internet source, the option of a static key of up to 16 octets is possible. TCOM simplified.
- **Maintenance** function provides the ability to remotely upgrade the Breakaway One software via the BA Remote application. For example the station engineer can from a authorised and password controlled workstation, remotely upgrade the BAP-STUDIO and BAP-TX, with just a few seconds audio interruption.

Plus many more *features, functions and tools to maintain your successfully operating platform.*

FEATURES IN DETAIL:

BAP-TX Monitoring

BAP-STUDIO Monitoring

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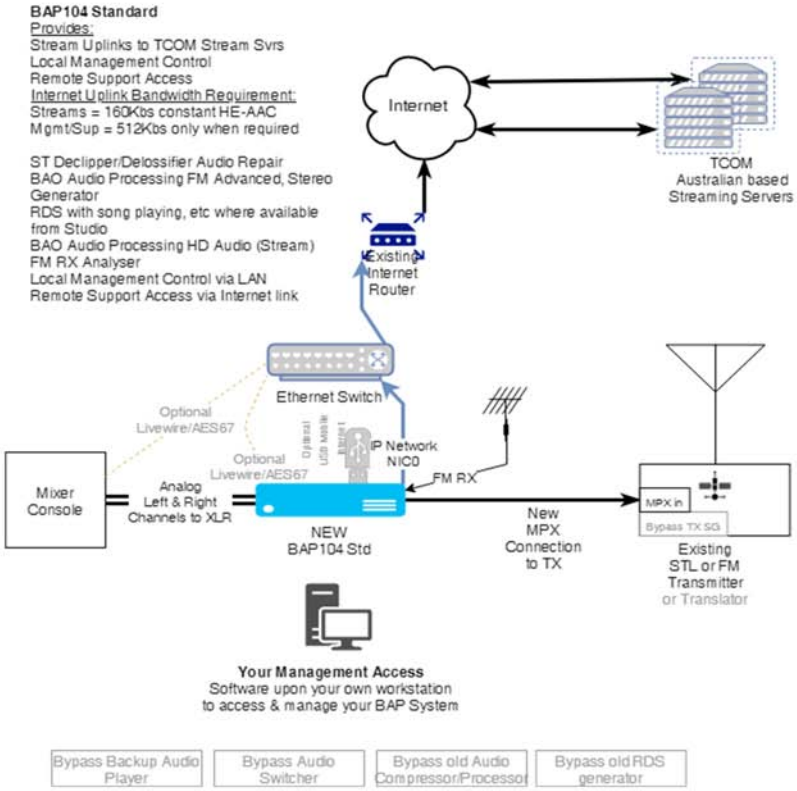
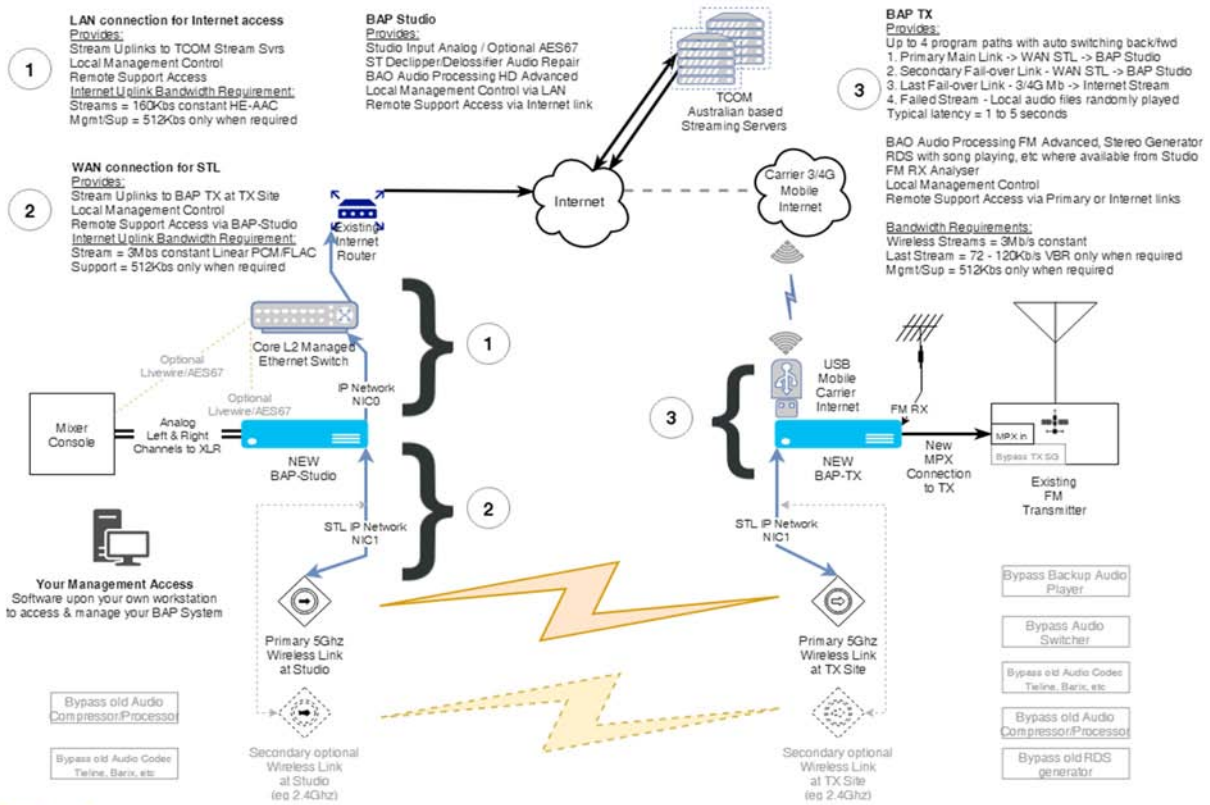
DEPLOYMENT OPTIONS:

BAP104
TCOM'S DIGITAL STUDIO/TRANSLATOR AUDIO PROCESSOR FOR TX MPX & STREAM



Name : BAP104 – Typical Installation Diagram		Drawn:	
Project # :	Drawing # :	Revision : 1	Date :

BAP208
TCOM'S TRUE DIGITAL AUDIO PROCESSOR STL HEADENDS SYSTEM WITH REDUNDANCY CAPABILITY



Name : BAP208 – Typical Installation Diagram		Drawn:	
Project # :	Drawing # :	Revision : 1	Date :

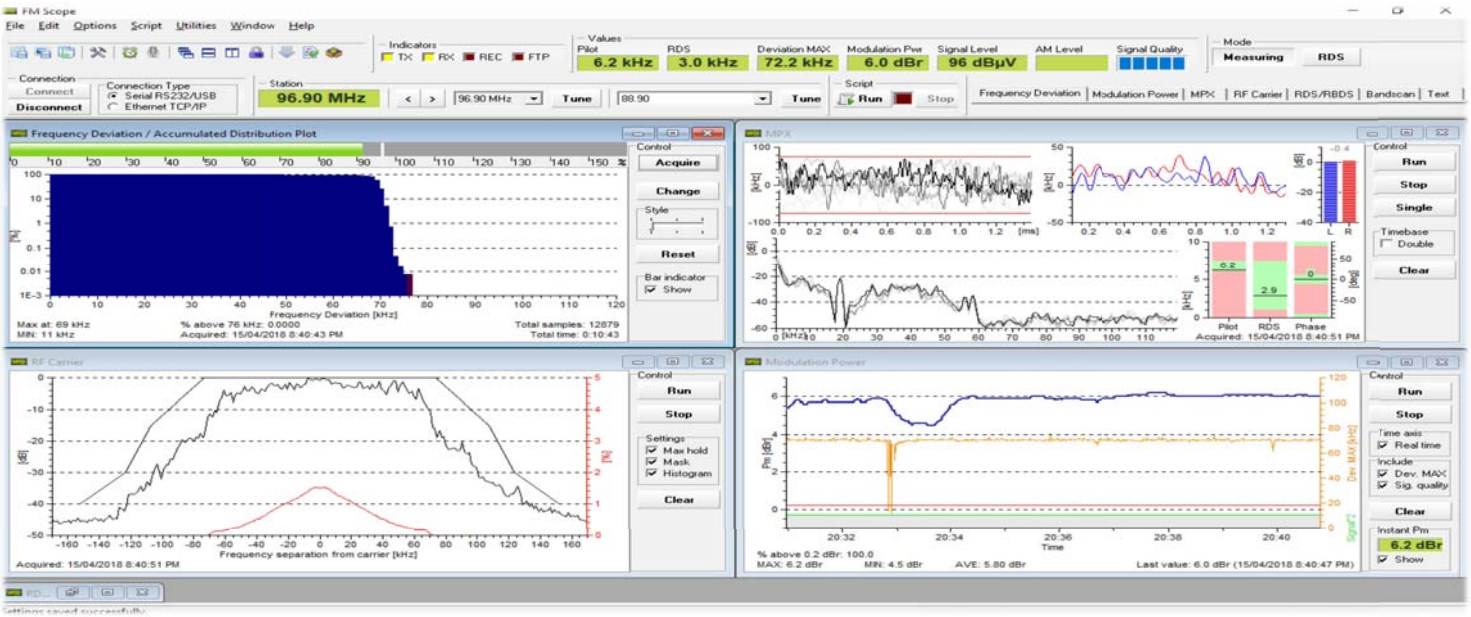
FEATURES IN DETAIL:

FM Broadcast Analyser

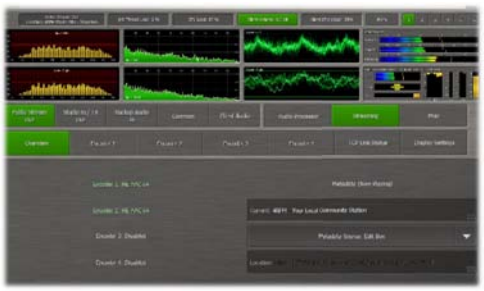
The FM broadcast analyser provides complete FM modulation and AF spectrum measurements in the FM band 88 to 108Mhz. The BAP104 or BAP-TX is fitted with a front of system real-time monitoring display and remote control with advanced features with the analyser software FM Scope. An external antenna is required to be installed to the BAP104 or BAP208 TX with at least 70dBuV of signal to be monitored to achieve the full set of monitoring functions. Ultimately, this allows the BAP104 or BAP208 TX to be locally or remotely configured whilst ensuring the transmission is being kept within regulatory requirements.

ANALYSIS

- **Overall Frequency Deviation** function provides the complete analysis of the deviation, including a histogram function.
- **Modulation Power** function provides a report on the overall peak modulated audio, including a histogram function.
- **MPX** function provides a report on the audio, 19Khz Pilot, RDS and Phase shift through the baseband.
- **RF Carrier** function provides RF carrier spectrum and histogram of its instantaneous frequency.
- **Bandscan** function provides the ability to report on your adjacent broadcasters, and their power level (sound), FM deviation and signal quality.



Streaming HD Encoder



The streaming encoder obtains a separate processed audio feed at the Studio from Breakaway One and passes this into built in MP3, OGG or AAC encoders. This is then sent out to output connectivity clients, with up to 4 different remote servers possible. This ensures the same listener sound and feel of your FM and Stream program feeds.

- **Icecast and Shoutcast** version 1 and 2 client streams out to 4 different external stream servers.
- **Audio encoding MP3** at 24Kbs stereo to 320Kbs stereo.
- **Audio encoding AAC –LC** at 24Kbs to 320Kbs.
- **Audio encoding HE-AACv2** at 24Kbs to 160Kbs. Known as AAC+ or the common name High Definition audio, this is now the global standard.

FEATURES IN DETAIL:

The BAP104 / BAP208 System

The **BAP 104** is a single server combination of all functions, BAP-STUDIO & BAP-TX, with Analog/Digital Input, MPX Output, FM Analyser & Streaming. This model is suited for single sited Transmitters, such as FM TX, Analogue STL's TX or Translator TX sites via IP-STL or permanent 3G or xDSL Internet connectivity.

The **BAP 208** is a dual server combination of 1 x BAP-STUDIO with Analog/Digital Input & streaming out, 1 x BAP-TX with Digital Input, MPX Output, & FM Analyser. This model is the more cost effective method for stations wishing to implement their first IP-STL installation.

The BAP system is housed within a standard 19 inch 1RU computer service rackmount case, with the required depth of just 350mm required to fit with existing racking. Thus a traditional 'radio rack' style will accommodate the BAP very easily. The system is mounted to the rack only from the front, with no requirement for a slide kit. This The BAP system requires a UPS feed at 120-240VAC 50-60Hz supply source and utilises a typical quiescent power utilisation of 80 watts. The actual demand depends upon Audio Processor configurations and the amount of computing power required by the configuration, with significant demand occurring only upon the fast start up, with the supply requiring to deliver up to 650VA of AC supply. Short answer, UPS of 650VA minimum required.

FEATURES UP FRONT

- **Local Indicators and Controls** provide traditional computing functions, such as Power On, Soft Switch power on/off, Hard reset, Power supply on and Internal solid state drive communication.
- **Modulated Orange Lights** driven from the FM MPX or HD Streamer provide a visual indicator of the system output operational status.

BAP-STUDIO

BAP-TX

SPECIFICATIONS

Primary Analogue Audio Input (BAP104 or BAP208 STUDIO)	
Configuration	Stereo or Mono
Connectors	XLR Female Balanced
Impedance	600Ω or 10KΩ Switchable
Nominal Input Level	+0dBu
Maximum Input Level	+8dBu
A/D Sampling Rate	192Khz
Frequency Response	20Hz to 20Khz
SNR AD	> 100dB
Crosstalk	> 100dB
Filtering	DC filtered
Primary Digital Audio Input	
Configuration	1. Stereo IP Stream via Icecast/Shoutcast supplied URL Stream 2. Internal Breakaway or 3rd party VSC to Breakaway digital input pipes 3. Optional – Livewire/AES67 AoIP available
Connector	Ethernet
Input Voltage	NA
Sampling Rate	IP Stream at source codec rate

1. Specifications may change depending upon available versions and capabilities from respective vendors at the time of ordering.
2. The BAP system utilises numerous software within, including Free, Open source and Licenced, from various vendors, and is used to integrate and produce the BAP system. Software and Hardware is copyright of the supplying vendor.

SPECIFICATIONS

Core Functions	
Digital Signal Processor	Thimeo Stereo Tool v8 Declipper Breakaway One v3.19 Advanced FM, HD, PT & Remote Management single station instance. Multi-core, Multi-threaded, remote GUI Display and Interactive HCI
FM Stereo Encoder	Mono, 19Khz Pilot, Stereo L-R, ITU-R SM.1268 Stokkemask selectable, ITU-R BS.412 Head & Bass selectable, fully software driven
FM RDS Encoder	RDS 58Khz fully software driven RadioText via text file or via HTTP. Comes configured with a working MagicRDS Content Delivery service, providing where available, local weather and national broadcaster news feeds. Integration with modern Playout system in most cases fully possible.
FM SCA	No SCA capability
Stream HD Stereo Encoder	Icecast, Shoutcast version 1 & 2 supported client
Stream Input	Breakaway One Stream Output Core processed audio
Stream Codecs	HE-AACv2 at 12Kbs to 128Kbs AAC –LC at 16Kbs to 448Kbs, HE-AAC 16Kbs to 128Kbs MP3 at 8Kbs mono to 320Kbs stereo
FM Receiver	87.5-108Mhz FM, 75Ω, 70dBuV nominal, 110dBuV maximum, no ESP.
FM Analyser Interface	GUI driven via remote access terminal
FM Analyser Freq. Dev.	Graphical display of spectrum frequency deviation of the selected carrier, with long term accumulated distribution plotting
FM Analyser Mod. Pwr.	Graphical display of MPX power modulation and frequency deviation, with time duration plotting
FM Analyser RF	Graphical display of RF carrier with near real time shoulder display, with time duration plotting
FM Analyser MPX	Graphical display of decoded MPX baseband, including left & right channel decode & levels, 19KHz Stereo Pilot level, 58Khz RDS sub-carrier level and Phase shift across the MPX baseband (nice STL check)
FM Analyser RDS	Graphical display of decoded RDS signal, very useful for comparing other broadcaster inclusions
FM Analyser Bandscan	Graphical display of results found from bandscan, displaying results in a single display. Useful for comparing other broadcasters and FM transmission specification compliance
FM Analyser Advanced	Ability to write and run advanced automated scripts, for example, email notification of transmitter off-air.

SPECIFICATIONS

Primary Analogue Audio Output	
Configuration	MPX1 only
Connectors	BNC Female. Cable to TX MPX to be fitted with ferrite RF protection.
Impedance	75 Ohm Unbalanced
Nominal Output Level	1.2vPP
Maximum Output Level	1.5vPP
D/A Sampling Rate	192Khz
Frequency Response	20Hz to 96Khz
SNR DA	> 70dB
Crosstalk	> 70dB
Filtering	DC filtered
Mains Power	
Voltage	1 x 110-120VAC or 220-240VAC 50Hz / 60Hz. UPS Required.
Input Connector	IEC C13
Grounding	AC Common Chassis and Electrical Grounding
Safety Standard	CE
Computing	
Processing	3.9GHz+ dual core
Storage	120 GB Solid State Disk. Other options available upon request.
Operating System	Microsoft Windows 10 Professional, hardened implementation
Networking	2 x Ethernet 10/100/1000Mbs Internet Protocol IPv4 and/or IPv6
Local/Remote Security	Transparent Screen Saver auto locking with password control
Local Display	None. Option to connect rear DVI or HDMI monitor but designed to run headless.
Remote Control	Secure Encrypted UDP/TCP TeamViewer Host. Others available upon request
Typical Availability	99.99% per year
Environmental	
Equipment Dimensions	240d x 430w x 44.5h (mm), 1RU High
Equipment Weight	6KG
Equipment Mounting	Front rackmount only, 4 points
Operating Humidity	0-95%, non-condensing
Operating Temperature	0° to 45 °C supply voltage independent
Shipping Dimensions	560 x 385 x 120 (mm)
Shipping Weight	7KG
Warranty & Support	
Warranty	1 year from shipping date
Support	1 year from shipping date

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Integrated By:

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Technology Communication Solutions

Paul Thompson

Powered By:

Breakaway

Leif Claesson

STEREO TOOL
BROADCAST AUDIO PROCESSING

Hans van Zutphen