WORLDCAST SYSTEMS

POWERFUL PERFORMANCE CONTROL SAVINGS SERVICES

TECH NOTE

Highest spectral purity & quality:
A study of the Audemat RDS Encoder

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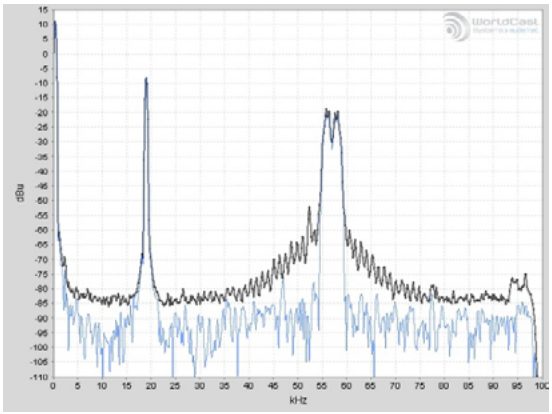
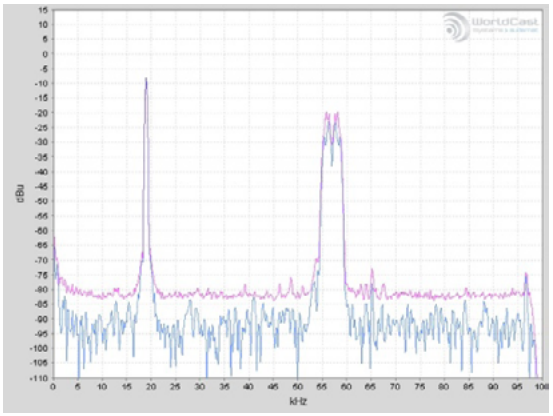
When adding RDS data to the MPX signal one of the most important criteria for choosing the encoder is the spectral purity of the unit. Nobody wants to alter the station audio content with generated noise by the RDS encoder. The old Audemat FMB80 was clearly the best unit on the market in terms of RDS encoding but also impressive for the generated signal spectral quality and purity.

If we look to date MPX spectrum of RDS encoders on the market, the FMB80 is obviously notable by the purity of the signal and the low level of noise on the all spectrum.



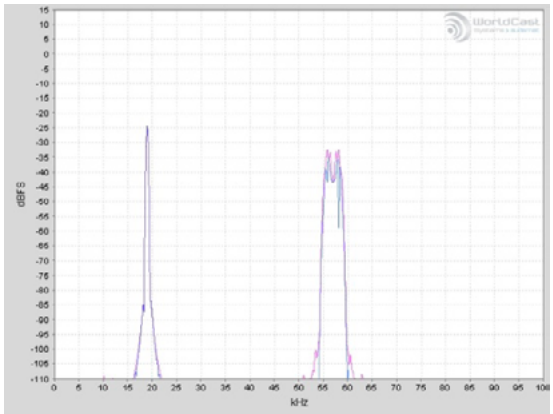
Competitors encoder MPX spectrum



Audemat FMB80 MPX spectrum

Today we are utterly convinced that an Audemat's new RDS encoder needs to comply with this level of signal generation. With the Audemat RDS Encoder we've met our target to follow this level of excellence from the FMB80 legacy.

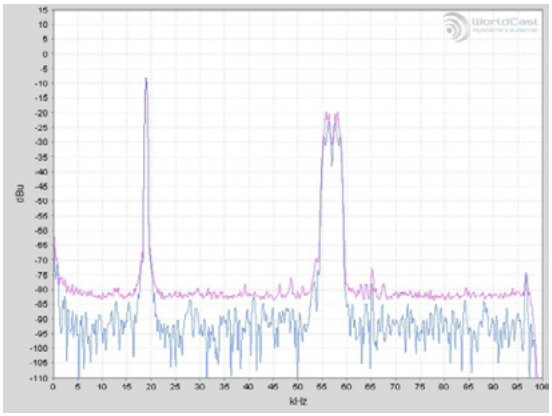
But still more significant is the new MPX over AES feature which gives the best purity and signal quality ever achieved on an RDS encoder. This new feature - explained in the following documents – provides a new level of quality and reliability among the global broadcast chain totally in phase with WorldCast Systems' expectations and products.



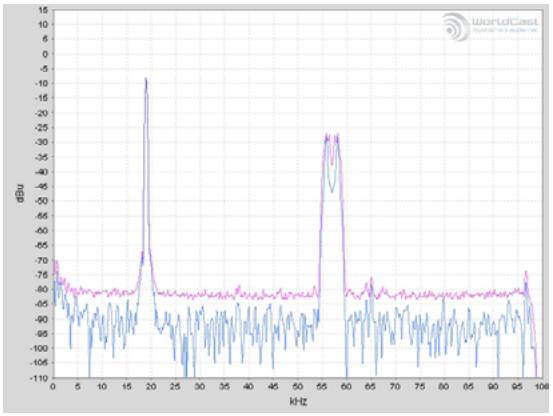
Audemat RDS Encoder MPX over AES Spectrum

Audemat RDS Encoder vs Audemat FMB80

The Audemat FMB80 only has analog outputs so we will compare both units based on analog then we'll do a focus on the Audemat RDS Encoder digital's features.
To perform this set of tests we've used the Audemat FM MC5, the WorldCast Systems' expert FM measurement unit. With its internal generator we produce a pilot only signal to go through the FMB80 and the Audemat RDS Encoder.



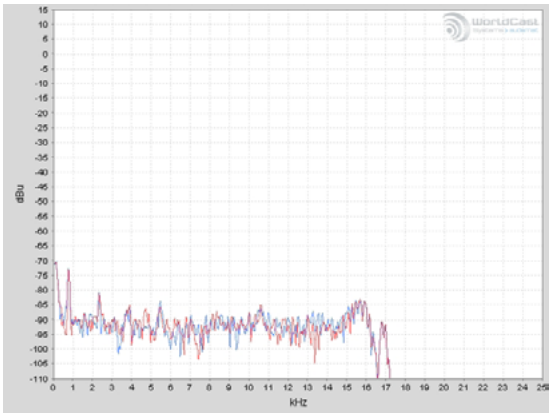
Audemat FMB80 MPX spectrum



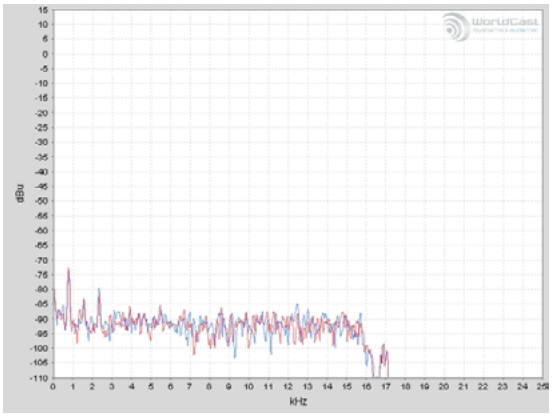
Audemat RDS Encoder MPX spectrum

With the FMB80 we can reach an awesome spectral purity as we can see on the FM MC5 measurement on the left. What is also considerable here with the Audemat RDS Encoder is the signal purity and quality near the 57kHz subcarrier and no additional noise frequencies.

Here we've met the result of our RDS encoding on the MPX spectrum but what if we concentrate now on the Audio Spectrum. Most of the time disturbance by RDS encoders can be seen at the end of the Audio Spectrum coming from a bad frequencies management in the RDS part; this is what we want to avoid with our Audemat equipment to always deliver the best signal we can.



Audemat FMB80 audio spectrum



Audemat RDS Encoder audio spectrum

Highest spectral purity & quality:
A study of the Audemat RDS Encoder

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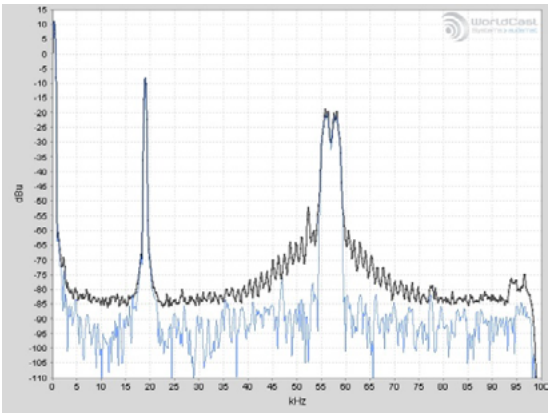
Good results from our previous measurements are confirmed by the Audio Spectrum above which is not perturbated by any RDS resultant frequencies coming from the Audemat RDS Encoder where we have some little disruption on the FMB80 but still below -80dBu. This improvement comes with the signal purity generated by the Audemat RDS Encoder, we have considerably increased the signal smoothness while reducing the noise to limit all impacts on the audio.

The last measurement is a noise measurement on the audio. The FM MC5 measure the L+R, L-R, L and R parts of the signal. As we generate only the 19kHz pilot only the resultant noise after going through the RDS encoder.

	L+R	L-R	L	R
Audemat FMB80	-76.72 dBr	-79.8 dBr	-74.97 dBr	-75.00 dBr
Audemat RDS Encoder	-80.14 dBr	-81.77 dBr	-77.94 dBr	-77.9 dBr
Gap	**3.42 dBr**	**1.97 dBr**	**2.97 dBr**	**2.9 dBr**

As we can expect the new Audemat RDS Encoder produces less noise than his predecessor. Conclusion of all the tests we've made is that we clearly improve the quality and purity of outputs signals on the Audemat RDS Encoder compare to the FMB80 even though it wasn't an easy task to make it happened. This new unit is today the best RDS encoder on the market thanks to its level of signal quality. In terms of comparison we've done the same tests on a competitor encoder

Figure speaks by itself and show how the Audemat RDS Encoder is performing well compare to his competitors. And we didn't stop here in the quest to offer the best signal ever to our customers on their Audemat RDS Encoder. Let's look to MPX over AES and what it brings to our RDS encoder.



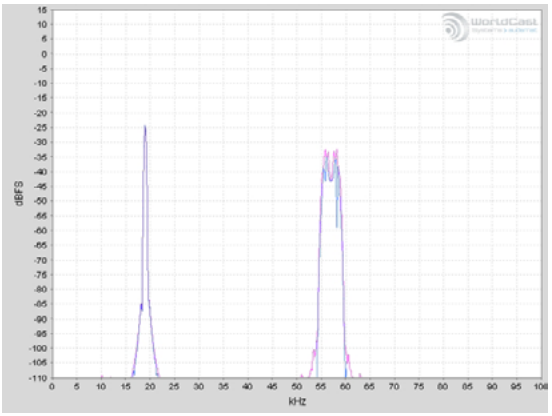
Competitor encoder MXP spectrum

MPX over AES

The Audemat RDS Encoder is the first full RDS encoder to offer MPX over AES feature allowing customers to have the purest signal with an outstanding quality while eliminating D/A and A/D conversions over the broadcastings chain to reduces all kinds of disruptions on the signal. But what exactly is MPX over AES?

The MPX over AES technic consists to transform the analog MPX/Composite signal to a digital signal sampled at 192kHz with the MPX/Composite signal inside. The Audemat RDS Encoder can take in input a digital MPX signal and add RDS into it.

For the MPX over AES feature of the Audemat RDS Encoder we've done the same tests as we've done in analog mode. Results are outstanding and then we can be sure that the signal is the best in terms of purity and quality. The generated signal is perfect, no frequencies which shouldn't be and no additional noise.



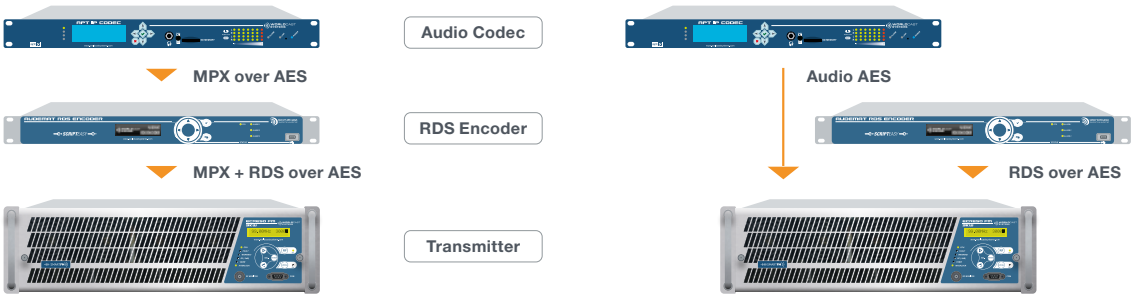
Audemat RDS Encoder MPX Spectrum

But adding MPX over AES into our RDS encoder has not been an easy task because of technical complexities of both MPX over AES and RDS. One of the major challenges was to synchronize both stream which are, at the beginning, in two different frequency domains. Now we can see the added value of this feature with the ability to filter incoming RDS signal in the AES stream. Impossible task with traditional analog signal but possible with WorldCast Systems's expertise of digital signal processing and utilisation of sharp digital filters.

This new feature will allow our customers to have a full digital broadcast chain from studio to FM transmitter with a perfect signal quality and purity. A wider dynamic range gives the user very low noise and distortion over all MPX bandwidth. Thanks to digital encoding of the signal - and professional AES/EBU circuitry inside the unit - the data transmission is none-sensitive to perturbations during transport or to cable length. Moreover, digital environment is insensible to aging and never moves during times in contrary to analog components which lose performance over time and over temperature variations. This is another benefit of a full digital chain in terms of reliability.

Highest spectral purity & quality:
A study of the Audemat RDS Encoder

All those improvements and benefits are now available on the WorldCast Systems' new Audemat RDS Encoder. With MPX over AES capabilities the Audemat RDS Encoder is today the RDS encoder which reach the best spectral purity and quality on the market with a high-level of reliability to give the best RDS experience to your full audience of listeners. Fully compatible with APT MPX over IP and Ecreso Transmitters MPX over AES inputs; the Audemat RDS Encoder combined with the WorldCast Systems' broadcast equipment will allow broadcasters to offer an outstanding quality of signal.



The Audemat RDS Encoder is full of new features and innovations. If you want more information about it check out on our web site or contact us for further information.

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