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Press Release

Bonneville Using Audemat for Measurement and Quality Analysis

"We have run campaigns in all of our major market areas and have acquired a wealth of information."

by Talmage Ball

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Bonneville International Corporation is a major national and international firm engaged in the commercial broadcast and media communications business. Bonneville is a leader, innovator and pioneer in broadcast communications, and we take pride in our mission to provide valued service to the communities in which we operate. We are continuously exploring new technologies that will enhance our services and in turn enhance our ability to support individuals, communities, and society as a whole through quality broadcast.

In March of 2000 we made another investment toward this end. We purchased an Audemat FM-MC3.2 with Goldenear software. The FM-MC3.2 is a mobile RF field-strength meter that can automatically measure up to 99 stations simultaneously. It's Goldenear software performs precision base-band analysis, audio and modulation analysis of individual stations. So, we now had the capability to measure a specific parameter of many stations in our target area, up to 99. Plus, we had the capability of measuring multiple parameters of an individual station including composite signal, pilot, RF, RDS, left channel, right channel, L+R, L-R, even multi-path.

Investing in the future

We made this investment for a couple of reasons. Our overall goal was to attain a record of what the contours of our stations looked like. We wanted to archive this information so we could compare signals and go back and check them from time to time. We also had a few antennas that we considered to be suspect and wanted to take a look at them, make some adjustments and then look at them again. The Audemat equipment allows us to do all of this.

Since purchasing the equipment, we have run campaigns in all of our major market areas, Chicago, Washington, DC, and San Francisco and have acquired a wealth of information.

Chicago

In Chicago we share a community antenna with several other stations. It appeared that we were having transmission problems, more so than the others on the same tower, so we wanted to investigate this. Using the FM-MC3.2 we dialed in all of the stations in question and ran a campaign around major interstates and various areas of complaint. This first campaign documented field-strength. We discovered that our signal strength was comparable to other stations on the same antenna. Using the FM-MC3.2 equipment we discovered that we had interference problems instead of the transmission problems we suspected.

We then ran a campaign using Goldenear software. We measured and recorded a number of parameters including the composite signal, pilot, RF, RDS, left channel, right channel, L+R, L-R. We even got a measurement from the multi-path and made some comparisons; made a few adjustments went back and checked it again.

The Audemat multi-path study is interesting to observe. The machine takes the first signal and then, as I understand it, counts the number of reflections coming in and calculates a multi-path percentage for you. The multi-path and interference on this station were the major contributors to the problem we were trying to solve. We can now focus on ways to reduce these instead of wasting time on new antenna configurations.

I found this to be an extremely interesting piece of equipment. As we drove along we could actually watch how the signal strengths ebbed and flowed. Afterward we took it back to the studio and watched the playback. Because the audio and data had been recorded, we could listen to the audio, watch the playback and analyze what high multi-path and low RF, for example, did to the audio. We analyzed modulation characteristics including all components of the composite signal, and checked various components of the audio signal. We could actually qualify and quantify the results and compare ours to others to see where it stacked up.

Washington, DC

We ran similar tests in Washington, DC. With our transmitter sitting on the outskirts of town, 23 miles from downtown Washington, we wanted to find out how well it was doing. So, we ran a campaign around the beltway in the DC area and in the city. We've driven that one several times. With the FM-MC3.2 and Goldenear we determined what our weaknesses really were before spending time and money on solutions that would only provide marginal improvements.

We did another interesting thing. We wanted to see how well our backup was functioning and to see how well our main is functioning compared to the backup. So, during the daytime we did a loop around the beltway and a loop around the downtown area. Then we traced our exact same steps with Goldenear. We got back to the station and played one campaign over the top of the other and looked at the difference.

San Francisco

We've examined the contours of our stations in San Francisco many times. Currently, we are working on a proposal to move a transmitter from one site to another to see if that would improve our signal. We identified stations in each of these areas that are comparable to ours in signal level and we've taken readings using the FM-MC3.2. We drove the entire route around the Bay, down I5, 101, to the other side to the Oakland area clear up around the north end of the Bay where all of these stations were broadcasting simultaneously. We even drove right down Market street, through the financial district, up and over the top of Point Hill to determine just how well which transmitting tower seemed to do the best in those areas. Then we overlaid the results and took a look at them.

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Real-World Data

In the past we were using the FIM 71 to get readings. We would have to stop set up the antenna take a reading go a few feet take another reading go a few more feet take another reading put it all back in the vehicle drive to another point and do it all over again. If you do it this way you may be able to take 25 readings (points) in a day. With Audemat, you can do 25 points every few minutes. You literally put the equipment in your vehicle, program in your information and drive.

The wealth of information delivered by the Audemat equipment is magnitudes more than what our traditional and FIM 71 can deliver. We recently did over 900 measurements on 17 stations - more than 15,300 field-strength readings - in the Washington, D.C., area in less than four hours.

In summary: We are using the Audemat equipment to compare our signal against our auxiliary, our competitors, and ourselves. We are using it to compare our signal against competitors on other sites that we may want to entertain as a future site of ours. We will also use this equipment in the consideration of purchasing additional stations to verify published contours. Audemat gives you real-world contours, not theoretical contours. Nothing compares to real world figures.

Exciting Technology

The biggest thing that this box tells you: more than anything else it tells you in no uncertain terms what a listener can hear. It is interesting to get back to the station and play the hard drive, listen to the programming on the station and visually distinguish in graphics form what is happening. This is the most exciting part of the Goldenear function; to be able to listen to the programming while you are actually visualizing the graphic form of RF, multi-path, modulation levels, and everything else.

The data that is recorded and can be manipulated in many ways. GPS results which display as color values can be turned into numerical values and sorted as required. Visualization filters allow you to filter out anything over or below specific criteria; for example anything below 50 db (city grade signal) or anything over 61 - 1 db representation. If you get a crowd around of engineers in the room with you, they get very excited about being able to see that including all components of the signal.

What I have found in using the Audemat FM-MC3.2 equipment is that it is a stand-alone product. There is nothing on the market that can give me this kind of analysis and real-world data. It performs to everything they say it will perform to. It meets every expectation.

AUDEMAT Company profile:

Audemat (<http://www.audemat.com>) is a pioneer in developing and manufacturing high performance products for radio and television broadcast networks worldwide. Since its inception in 1980, Audemat has revolutionized and maintains the standard for RF measurement equipment for broadcasters and regulation authorities in the world. Audemat offers a complete range of AM, FM, and TV sound measurement equipment that allow radio and television broadcasters, and regulation authorities the ability to control and optimize an entire broadcast transmission chain. Audemat products include mobile radio measurement units, remote monitoring in FM, AM, and TV and world-class RDS and DARC encoders.

Audemat is headquartered in Bordeaux-Mérignac, France. Audemat Inc. The US subsidiary, is located in Sterling Virginia. For more information please contact Sophie LION at 33 557 928 934 or 1 866 AUDEMAT or s.lion@audemat.com.

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