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Amazing Adaptable AM Radio

Nov. 12. 2013 by Lou Frenzel in Communiqué

Do you listen to AM radio? I do. And as it turns out millions of others do to, despite the growing number of competitors to conventional broadcast radio. AM radio used to be the only entertainment we had and it provided music, ball games, serials (Lone Ranger, Captain Midnight, etc.) and drama shows (The Shadow). Amplitude modulation radio is the oldest form of electronics there is. It is not like it used to be but it is still around thanks to an interesting mix of technology and market factors.

The first AM radio broadcast was from station KDKA in Pittsburgh in 1920. The number of stations grew steadily over the years but tapered off when FM became popular in the late 1950s and beyond. Today there are still roughly 4700 U.S. AM stations broadcasting. That number has remained pretty constant over time but it is down 4% from 1992 to 2012. As for FM stations, there are about 6300 and that does not include the 2800 or so educational FM stations or the 800+ low power FM stations. FM dominates broadcast radio in the U.S.

The question is, why is AM still around? This ancient analog technology has staying power. It works well, it is simple technically, inexpensive and serves a useful purpose. Besides broadcasting, AM is still used in citizens band radio (AM and SSB) and aircraft radio. Marine radio uses FM except for long range marine that uses SSB a derivative of AM. And SSB is still the main transmit mode choice by a huge population of amateur radio operators. And most shortwave (SW) broadcasting is still AM.

AM radio is talk radio, that is, news, weather, traffic, sports and opinion. There are still some AM music stations around but mostly the music moved to FM. AM and FM radio is primarily listened to in the car or truck. Coverage is predominantly local as the range of most AM and FM stations, during the day, is only a maximum of about 100 miles, depending on the geography. FM is VHF (88 to 108 MHz) line of sight (LOS) and AM is mainly ground wave during the day. At night with the sun down the ionosphere layers come into play. AM signals can travel hundreds even thousands of miles on the AM band (530 to 1710 kHz) because of the skip conditions where signals are refracted from the ionosphere layers.

It is amazing what you can hear at night on the AM band with a good radio and a wire antenna. You can hear coast to coast AM stations with ease and even some foreign stations. As for SW (3 to 30 MHz), broadcasts are world-wide. Most SW stations are in the 5 to 19 MHz range and the coverage varies depending on ionosphere conditions, sun spots, time of day, noise environment, and of course your radio and antenna.

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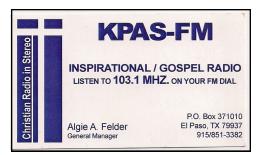
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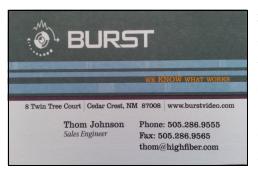
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President

tvcowboy@marsand.com PO Box 485 * 6100 IH-35W Alvarado, TX 76009 www.marsand.com Office: 817-783-5566 FAX: 817-783-5577 Despite the lingering popularity of analog radio, the transition to digital radio is already occurring. In the U.S., HD Radio now broadcasts simultaneously on the same frequencies as the analog AM and FM stations. HD Radio is a digital version of the analog content overlaid on the same analog carriers. You will hear it referred to as in-band on channel (IBOC). It uses OFDM and voice compression to minimize bandwidth but at the same time give greater fidelity to the audio. Noise and fading are less of a problem as well.

Nevertheless, HD Radio has been available for years but it has not become mainstream. Few actually know about it. HD radios are rare devices. Some high-end cars have HD Radio and some table top HD radios are available but they are rare. Furthermore, HD radio quality is less than expected as it is barely a noticeable improvement over the standard quality of FM and AM. There are very few HD AM stations but the majority of FM stations do broadcast in HD. HD offers the benefit of being able to multiplex one or two additional program sources on the same frequency giving stations several additional programming and advertising choices.

More popular than HD Radio is digital satellite radio. The original two U.S. satellite services merged a while back to form Sirius XM. This is a paid subscriber service available in most vehicles today. There are table top satellite radios but generally they are rare as they do require a special antenna that must "see" the satellites to work.

Shortwave broadcasting is also going digital, or at least some of it. A new digital technology called Digital Radio Mondiale (DRM) is now used in dozens of SW stations. It uses coded OFDM and digital compression to keep the bandwidth down to that required for SW broadcast (<10 kHz).

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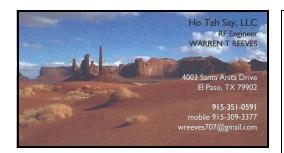
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100 Stanton Tower - Downtown 100 N. Stanton Suite 700 El Paso, TX 79901 EL PASO, TX CHAPTER 38 MEETING MINUTE DATE 11/12/2013 LOCATION: KTSM TV STUDIO

MEETING CALLED TO ORDER: 12:20 PM, BY ANTONIO CASTRO, THERE WERE 16 MEMBERS.

REPORT OF THE SECRETARY: MINUTES ACCEPTED BY GLENN LEFFLER, 2nd BY NORBERT MILES.

REPORT OF THE TREASURER: CURRENT BALANCE OF \$ 5832.89. ACCEPTED BY NORBERT MILES, 2nd BY GLENN LEFFLER.

REPORT OF THE CERTIFICATION COMMITTEE: MARVIN HANLEY ASKED FOR CTO CERTIFICATION TESTS FOR HIS STUDENTS. DAVID HALPERING WILL CONTACT MARVIN.

REPORT OF THE MEMBERSHIP COMMITTEE: NO REPORT.

REPORT OF THE FREQUENCY COORDINATOR COMMITTEE: NOTHING TO REPORT

REPORT OF THE SCHOLARSHIP COMMITTEE: WAITING FOR VILARDELL TO BRING APPLICANTS FOR NEXT MEETING

REPORT OF THE WEBSITE COMMITTEE: 1483 HITS LAST REPORT, NOW 1500 (17 MORE FROM LAST MONTH).

REPORT OF THE EAS CHAIRMAN: TWO MONTHLY TESTS FROM NEW MEXICO RECEIVED AND WENT TROUGH REPORT OF THE PROGRAM COMMITTEE: ANOTHER PRESENTATION ABOUT NETWORK ROUTERS, THIS TIME WITH WARREN REEVES. IT WENT VERY WELL.

UNFINISHED BUSINESS: NONE

NEW BUSINESS OR ANY ITEMS FOR THE CHAPTER INTERES: MICHAEL GIERE FROM KTSM OFFERED A TRAINING COURSE FOR CERTIFICATION ON HARD DRIVES. TALKED ABOUT ENNES WORKSHOP 2014.

NEXT MEETING DATE AND LOCATION: MONDAY DECEMBER 9, 2013, 7 PM, A VERY SHORT ONE, BECAUSE AFTER IT, WILL BE THE CHRISMAS PARTY. PLACE: THE OLIVE GARDEN, SUNLAND PARK DR.

MEETING ADJOURNED: AT 13:30 PM.

Note from the EDITOR: !!

LET'S HAVE A GOOD TIME AT THE HOLIDAY PARTY ON DECEMBER 9. BUT, IF YOU MISS IT, HAVE A WONDERFUL CHRISTMAS AND THAT 2014 BE THE BEST YEAR, FULL OF HEALTH AND BLESSINGS....!!



WE HAD ANOTHER
GREAT PRESENTATION:
THE CONTINUATION OF
"NETWORK ROUTERS,
SWITCHES AND MODEMS"
THIS TIME WITH WARREN
REEVES AS THE
PRSENTER.

NOW, THE LAST MEETING OF THE YEAR 2013 IS THE HOLIDAY PARTY HOSTED BY DAN GEISLER, DAN SESSLER, JOHN SCHAAB & ELLIS TERRY.

WHEN:

MONDAY DECEMBER 9, 2013.

TIME: 7 **P.M.**

WHERE: OLIVE GARDEN REST.,

SUNLAND PARK DR.

PLEASE, RSVP TO DAN GEISLER AND ANTONIO CASTRO BY













A VHF version is also available now. A special receiver is needed or you can get a generic PC-based software-defined radio (SDR) and get the DRM software for demodulation.

And don't forget, broadcast TV is already digital; the analog version was phased out in 2009. U.S. digital TV uses 8VSB (8-coding level vestigial sideband), an AM digital modulation method.

Other countries have already made the conversion from analog to digital radio broadcast. The UK and most European countries use Digital Audio Broadcast (DAB) based on a digital standard called Eureka147. It usually operates in the 174 to 240 MHz range or the L-band from 1452 to 1492 MHz. It uses OFDM and MPEG compression to keep the data rate and bandwidth to a minimum. Japan has a similar digital radio called ISDB-T. And let's not forget Internet radio. That's another story.

There have been rumors about phasing out AM and eventually FM radio in the U.S. I don't see any immediate action on this but keep it in mind. There is still time to enjoy the benefits of AM radio. Get a good receiver like a SW radio or one like those from CC Crane. And add an antenna. Then check out your local stations. You will be amazed at what you can hear at night on AM. A real listening experience. And try SW if you can.

Finally, if you have never built and tested a crystal radio, you had better get to it. Once AM broadcast stations go away, the crystal set will be history too. I built one recently just for the fun of it. I used the traditional oatmeal box inductor and a 1N60 germanium diode with ear phones. I had to use 100 feet of antenna to get any signal. I tuned only three local AM stations and they were weak but very listenable.

Anyway, may AM have a long prosperous life.



Chairman Antonio Castro going over our meeting topics,

Engineer Warren Reeves discussing how I.P. Routers and Switches operate and how to configure them.