CHAPTER 24 MADISON, WI.

CHAPTER 24 - MADISON, WISCONSIN
DECEMBER NEWSLETTER 1988

Edited by: Leonard Charles

Articles Welcome!! Send them to:
Chapter 24 Newsletter
5714 Modernaire St.
Madison, WI 53711
(hard copy or text files on 360K disk)

MEETING ANNOUNCEMENT

DATE: Mon - Dec 12, 1988

!### NEW PLACE ###!

ALEXANDERS of Madison
5614 Schroeder Road
Across from Vitense mini golf

Optional Dinner 5:45pm
Meeting 7:00pm (at Alexanders)
Program 7:30pm (at Colorgraphics)

Program: Tour of Colorgraphics Systems
6400 Enterprise Lane

UPCOMING MEETING DATES
Wednesday January 11 (lunch)
Tuesday February 7
Wednesday March 8
Tuesday April 11
Wednesday May 3

UPDATE....

WD5BD low power Channel 5 in Madison is still awaiting a lease approval for their operation on the city owned Larkin Street tower. As the result of interference tests conducted by Channel 5 technicians and TCI cable techs, the interference to cable subscribers near the site appears to be a cable problem however the Dane County Telecommunications Commission wants to hear from the TCI people before approving the lease. To date only Channel 5 management/attorney has bothered to show up to the Commission meetings. The TCI people will be formerly invited to speak before the commission at an early January meeting.

THE LEGALS....info by Doug McDonell

Family Stations Inc. CP has been tendered for a new FM translator to serve Sun Prairie, WI on Channel 207 (89.3 MHZ) from a transmitter location 3 miles south of Morey Airfield, Dane, WI with 1 Watt. Primary Station WMWK, Milwaukee on channel 201 (88.1 MHZ)

New application of Jamie Lee Westpfahl granted for new FM station on channel 233A (94.5 MHZ) in Tomah, WI.

An application for CP to make changes by WJVL FM (99.9 MHZ), Janesville, WI has been granted. ERP 11 KW at 153 M (502 ft.) H&V. TL 3.1 KM W of Leyden, 2 KM S. of Hwy 14.

In a November 15 notice of selection by lottery, LPTV Channel 63 was awarded to American Television Network, Inc., Madison, WI.

An application has been tendered for filing to the FCC for a new Educational FM service by Joy Public Broadcasting Group of Sun Prairie, WI. The frequency to be is 91.1 MHZ with an ERP of .1047KW at 39.5 Meters (130 ft) HAAT from a site just northeast of Sun Prairie.

An application has been granted for a new FM on 100.5 MHZ (Channel 263) in Columbus WI to Columbus Radio Company. The facility will operate at 3 KW and 100 Meters (328 ft.) HAAT.

FCC NEWS

Citing the explosion of new stations in all sized markets offering great diversity of program choices, the FCC modified the radio duopoly rule. The rule had prohibited ownership of two or more commercial radio stations if their signals 1mv/m contour overlapped. The rule is relaxed to the principal city contour standard (5 mv/m contour for AM and 3.16 mv/m contour for FM)

The FCC has decided not to amend rules to authorize the use of Multiple Transmitters by AM stations. The Commission says that current transmitter synchronization technology does not warrant amending rules to authorize use of multiple synchronous transmitters by Am broadcast stations at this time.

CHANNEL 27 GOES DOWN....

At 7:52 PM on November 15, during the much publicized War and Remembrance, WKOW Channel 27 went down. The problem was a complete transmission system failure of startling proportions. According to TV 27 Chief Engineer Steve Zimmerman, an apparent lightning strike to the antenna triggered a

transmission line insulator flashover. The resulting high VSWR caused 'hot' spots up and down the transmission line eventually resulting in a breakdown of the line in the form of arc overs and junction dielectric burnouts. To make matters worse, extremely high winds and heavy rain made climbing the tower very difficult. Rich Wood and crew of Skyline Communications and Jim Crooks and crew of Broadcast Communications braved the elements and began removing sections of the transmission line and repairing the damage. Meanwhile Madison's Complete Channel Cable system was fed with a hard line and microwave systems were set up to feed Jones Intercable of Fitchburg and the Horizon Cable system. The station continued to run programming to the Cable systems while work to restore the terrestrial system progressed. About 48 hours later, a reduced power transmitted signal was restored however the system could not deliver full power. A temporary antenna was side mounted at the 400 foot level of the tower and with pieces of line and various connectors from WHA, WMTV, WIBA, and WMSN, power was delivered to it. The resulting signal now is about 3db down from normal operating power according to Zimmerman. At the time of this writing, 1400 feet of all new 6 1/8" rigid transmission line had been ordered to completely replace the existing line. Experts are on site and are evaluating the top mounted main antenna to determine if it needs to be replaced also. And a structural evaluation of the tower itself is being performed. No time estimate could be given at this point as to when all the repairs would be finished.

Steve Zimmerman wishes to extend thanks to all of broadcasters in the market that pitched in with various parts and needs of he and his crew to get them back on the air. Steve says they are all mentioned in the stations sign on and sign off.

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PCB HAULING....

A former Utility employee has recognized a need and has gotten into the business of PCB disposal at what appears to be a very reasonable rate. Chuck Bikford of New Lisbon, WI, is licensed and bonded to do the hauling and is using a Texas firm to incinerate the PCBs. The charge is $35.00 per barrel to load and haul the components, and then $1.85 per pound to have the materials shipped and incinerated in Texas. (the barrel gets incinerated also) You will get papers certifying the disposal. Mr. Bikford can be reached at 608-562-3720. For additional information, call SBE member Cliff Groth at WFAW in Fort Atkinson. Cliff has talked with Mr. Bikford and provided this publication with these details. Cliff's number is 251-5656.

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EPA TOO BUSY....

The Environmental Protection Agency has suspended work on proposed standards for exposure to radio waves. Rich Guimond, the head of the EPA's radiation programs said that the science is not strong enough right now to justify further work on broadcast waves when his agency is swamped with other environmental problems. He cited growing concerns of radon contamination of homes, and the scheduled redraft of regulations for an underground nuclear waste repository as pending projects keeping his staff of 150 people spread pretty thin. The FCC and NAB expressed disappointment but hope that congressional intervention might result in resumption. Except where local governments enforce stricter guidelines, the FCC has been using the ANSI standard of radiation limits as its guideline since early 1986. The NAB is pushing for Federal adoption of that standard.

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1988 PROCEEDINGS....

A copy of the papers presented (The Proceedings) at this years SBE national convention in Denver is available for purchase by contacting the National Office in Indianapolis.

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CONVENTION UPDATES....

Here are the dates and locations for the SBE National Conventions through 1994:

1989 Kansas City, MO - October 5-8
1990 St Louis, MO - October 4-7
1991 Houston, TX - October 3-6
1992 Minneapolis, MN - October 1-4
1993 Nashville, TN - October 7-10
1994 Cincinnati, OH - October 6-9

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HOME SATELLITE BOOST....

Congress passed copyright legislation authorizing transmission of broadcast television signals via satellite to backyard dish owners. Independent television signals can now be transmitted to any of more than two million backyard dish owners but network affiliate signals can only be delivered to those dish owners in "white areas". White Areas are areas not able to receive network programming off air and not choosing to receive it via cable.

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TAPE....
(from Chapter 28, Milwaukee)

3M has decided to cease manufacture of two-inch quad videotape at the

end of this year, although AMPEX claims it has no plans to do the same.

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NEW TEST CD....
(from Chapter 28, Milwaukee)

The NAB has announced that it will offer a test CD designed specifically for radio, featuring such specialized broadcast test signals as a Bessel null tone for calibration of mod monitors, NRSC noise and reference signals, precise pilot frequencies, and pre-emphasis/de-emphasis curve sweeps. The CD should be available in early 1989 directly from NAB.

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MORE AM STEREO....
(from Chapter 28, Milwaukee)

Chrysler has announced that all of its 1989 model radios will be stereo-only and will include the C-Quam AM stereo decoder. Ford has also announced that its 1989 models will offer the C-Quam radio as an option.

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TV STEREO UPDATE....

According to the Networks, here is the latest tally of affiliates able to transmit stereo audio to viewers:

CBS TV reports that 65 of its affiliates have installed stereo transmitting equipment. The network says all of its programming is now distributed in "stereo" although it admits that most of it is in synthesized stereo separation with only a few specials produced in true stereo. The network plans to begin producing stereo programming in the fall of 1989.

NBC TV is still the leader in stereo with all of its prime time schedule except for 'Night Court" being produced in true stereo. The networks daytime serials, game shows and news programs are not in stereo and there are no plans at this time to expand them. NBC says 146 of its affiliates are transmitting stereo.

ABC TV reports that 59 of its affiliates now broadcast stereo audio. Last June the network made a request of its program producers to begin submitting stereo programs for distribution however the network says about 40% of its program schedule is in stereo.

PBS says that 81 of its 332 affiliates are broadcasting in stereo with 215 expecting to convert within five years. PBS distributes about 72 hours of stereo programming per month.

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NEW CD TECHNOLOGY....
(from Chapter 28, Milwaukee)

Chesky Records, an audiophile label, has produced the world's first CDs made with a new oversampling technology. The process involves an 18 bit, 64-times oversampling A/D converter developed by DBX, which features an input sampling rate of almost 6 MHz and an output rate of 44.1 kHz (the CD standard). The unit includes a precisely linear-phase digital lowpass filter at 20 kHz. The system is claimed to offer a sonic transparency equal to the finest analog recordings, with none of the digital artifacts that many audiophiles claim are detrimental to the sound of CD.

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CHANNEL 6 GETS ZAPPED....
(from Chapter 43, Sacramento)

On Friday morning, November 11, Channel 6 turned on the transmitter for the usual 6:15 AM sign-on. The operator expected to see color bars but instead saw a modulated stairstep signal from an unknown source.

A Channel 6 engineer was dispatched to the transmitter site and noticed two Department of Defense vehicles on the Consumnes River levee near Twin Cities road very close to the Walnut Grove antenna farm. The D.O.D. contingent consisted of two armed sergeants and a few civilians. One of the trucks had a trailer which was supporting a tripod mast with a microwave dish pointed in the general direction of Mount Diablo. The same trailer also supported a pneumatic telescoping mast with a UHF yagi antenna backed up by a solid corner reflector pointed in the direction of Sacramento. The D.O.D people said they were transmitting on "channel 9." KVIE operates on its STL on the broadcast auxiliary 2 GHz band, channel 1 (Channel 9 of this band is used for ENG purposes by KOVR). The armed guards would not let the KVIE engineer near the D.O.D. vehicles.

The interference lasted about an hour and went away about 10 minutes following the encounter with the D.O.D trucks. Whatever it was, "pegged" the signal strength meters on Channel 6's Farinon STL receivers and completely captured Channel 6's 20 watt STL signal, transmitted with a 15 foot dish from the Garden Highway studio.

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Propagation Basics for the Broadcaster
By Tom Weeden

Once the RF leaves your antenna, it is pretty much out of your control. What factors influence the propagation of the signal from your station to your listeners/viewers? If you're an AM broadcaster, you'll be concerned mostly with the "ground wave" or "surface wave." These waves travel in contact with the earth's surface as a result

of earth currents induced by the signal's magnetic field. The interaction of the induced currents with the waves tend to move the waves parallel with the surface of the earth. Propagation of this type occurs up to around 10 MHz or so, as attenuation of the signals increases with frequency. Stations running moderate power can be heard via groundwave out to 160 km or more during the daytime.

Another component of AM signal propagation is the "sky wave," or a wave which leaves the surface of the earth and is reflected (actually refracted) by the ionosphere back to earth. Since the ionosphere's lowest layer (the "D" layer) is very dense during the daytime, low-frequency (long-wavelength) signals are almost completely absorbed before they can be refracted back to earth via the higher ("E" and "F") layers. However, as the sun goes down on your portion of the ionosphere, the "D" layer disappears. The "F" layer, which is slower to respond to changes in solar energy, can then refract the skywave back to earth. Depending on the angle at which the wave approaches the ionosphere, the signal can propagate several thousand km.

Problems can occur at the receiver at night in at least two respects. First, since signals are not attenuated as much as in the daytime, co-channel interference between stations increases. For this reason, many stations must reduce power, beam their signal away from other stations using directional antennas, or sign off altogether at local sunset. The second problem occurs when the receiver is picking up both the groundwave and the skywave from the same station. As the ionosphere changes density and height above the earth, the skywave can arrive at the receiver out of phase with the ground wave. This can cause the carrier to cancel itself out, greatly distorting the received audio.

Other AM-related problems which will occur more frequently as we approach the peak of the 11-year sunspot cycle are the Sudden Ionospheric Disturbance and geomagnetic storms. A major solar flare can cause the "D" layer of the ionosphere to become very dense, almost completely absorbing skywave signals. A SID can last a few minutes to a few hours. A geomagnetic storm, which can last several days, can also cause adverse effects in the ionosphere, and are caused by eruptions on the sun.

For FM and TV broadcasters, skywaves are the exception rather than the rule, and groundwave propagation is nonexistent at VHF and above. The predominant means of signal propagation here is known as the "space wave," mainly consisting of "line-of-sight" transmission plus any waves which have been reflected off the ground before reaching the receiver.

RF "line-of-sight" is not quite the same as optical line-of-sight. The density of the atmosphere decreases with altitude, and this gradient causes the wavefront of a VHF/UHF signal to tilt forward slightly, curving toward the earth. Depending on atmospheric conditions, the RF horizon is about 25-35% farther away than the optical horizon for a given antenna height. For example, someone atop a 300-meter (1000-foot) tower would see the horizon 64 km away, but an antenna radiating on this tower would put a signal on the horizon 76 km away.

VHF and UHF propagation tends to remain much more consistent than medium-wave AM propagation, but there are a few anomalies that can cause broadcasters headaches.

One condition which occurs frequently is tropospheric refraction. This is the weather-related condition which can bend short-wavelength signals back toward the earth out to distances of several hundred km. The most common cause of this is a temperature inversion, where the wave bends downward at the boundary of two different air masses. Microwave STLs and terrestrial network feeds can experience problems when a wave which normally would travel out into space is bent downward to arrive at the receive antenna out of phase with the direct signal, causing cancellation and a temporary outage.

Another condition is known as "sporadic E-layer propagation." The exact cause for this is unknown, but mainly during the early summer months, the "E" layer of the ionosphere develops patches of very dense ionization, which can refract VHF signals as high as 220 MHz (TV channel 13) back to earth more than 1000 km away, or halfway across the country! The condition is most pronounced on the low VHF TV channels and sometimes into the FM band (88-108 MHz).

"F"-layer propagation, responsible for AM skywave reception, can extend as high as 60 MHz or more (TV channels 2 and 3) during the peaks of the 11-year sunspot cycle. This phenomenon can also bounce signals several thousand km under the right conditions. For example, it would not be unusual for someone on the east coast to hear audio from BBC Television just below our channel 2 when conditions were right. (They could probably see it too, if they could convert the video to NTSC!)

For the local FM or TV broadcaster, these abnormal conditions would probably not affect listeners/viewers in their metro coverage area. Co-channel and adjacent-channel interference could cause problems to people in or near their fringe areas when the "skip" comes in.

On the other side of the coin, when a hobbyist sends you a letter after picking up your station on the other side of the country, you'll probably feel good that you were "getting out" better than usual that day!

(References for this article taken from "The ARRL Antenna Book," (c)

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