



Chapter 24, Inc.
Madison, Wisconsin

Society of Broadcast Engineers December 2001



TOWER INDUSTRY PART 12 – LEARNING TO CLIMB SAFELY

By Vicki W. Kipp

While writing this series, I attended a course called ‘Certified Tower Climbing Safety and Rescue Training’ at ComTrain. Headquartered in Monroe, Wisconsin, ComTrain (Figure 1) is a training company that specializes in tower safety and tower technology training. Run by tower industry veteran Winton W. Wilcox (Figure 2), ComTrain got its name and logo from Wilcox’s fondness of trains. ComTrain was created to respond to the lack of standards for tower safety training. They offer courses at their facility in Monroe, and on request at locations around the US and the world. ComTrain offers two courses for tower technicians: ‘Tower Climbing Safety and Rescue’ and ‘Basic Tower Technology.’ Each course includes a textbook authored by ComTrain.

INTRODUCTIONS

Broadcasters have a friend in Winton Wilcox. He started his career as a radio disc jockey, and had his first climb when his boss told him to ascend the station’s tower.

My class contained students from all over: Alabama, Iowa, Illinois, New Hampshire, Missouri, Indiana, and Wisconsin. Although I was the only woman in this class, women comprise about 3% of ComTrain students overall.

LEGACY

The course began with an acknowledgment of those who work as tower technicians. Winton Wilcox likes to call them “the last true cowboys.” He admired the independent and strong-willed nature of the tower technician. When a tower technician reveals what they do for a living, there is a standard reaction from the general population: “You’re crazy!”

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Next Meeting:

Wednesday,
December 19, 2001

UW-
Communications
Expert

Dutch Treat Dinner
at 5:30 PM

at J.T. Whitney's
674 S. Whitney Way

Meeting and Program
at 7:00 PM

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SATELLITE RADIO DEBUTS

By Fred Sperry

What might be considered the next competitor to over-the-air broadcasters, satellite radio, made its debut on November 12 when one of the two providers, XM Satellite Radio, launched its service nationwide. The other satellite radio service, Sirius, plans its service launch in Denver, Houston and Phoenix on February 14, 2002 with nationwide service beginning by the third quarter of 2002. Sirius had originally planned to launch its service at the end of 2000 ahead of XM, but apparent delays in the delivery of receiver chipsets delayed getting

receivers into stores which has pushed back the launch date. Despite the delays, Sirius has its delivery infrastructure in place.

STUDIOS

Both Sirius and XM offer 100 channels of programming. To accomplish this, both have built impressive studio facilities. The Sirius studios are located in the Rockefeller Center area of New York City. Their 100,000 square foot facility has 22 studios within it. The main XM studios are located in the technology corridor of Washington D.C. This facility

occupies 155,000 square feet and is currently the largest radio facility in North America with 82 studios. XM also has two additional studio facilities located in New York and at the Country Music Hall of Fame in Nashville. Both Sirius and XM facilities also house satellite operations centers, centers for monitoring signal quality and even a studio for live performances.

SIGNAL DISTRIBUTION

Sirius and XM accomplish nationwide signal distribution by using a combination of satellite delivery and

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November Business Meeting Minutes

Chapter 24 of the Society of Broadcast Engineers met on Tuesday, November 27, 2001 at WKOW-TV in Madison, Wisconsin for the chapter's monthly meeting. There were 17 members in attendance, 11 of whom were certified, and no guests.

The meeting was called to order at 7:14 PM by chairman Tom Smith. Minutes of the October meeting as published in the newsletter were approved. Treasurer Stan Sarch reported that the chapter's bank balance was in the black.

Denise Maney of the Program Committee reported that the list of upcoming programs was in the newsletter and there were no changes. Sustaining membership chair Fred Sperry and membership chair Paul Stoffel were absent. Newsletter editor Mike Norton was absent. Denise Maney reported for Mike that the deadline for December articles was December 7th, and folding would take place December 12th at WKOW-TV.

Special Events Coordinator Lonnie Cooks reported no changes, but there may be some possible special events next year.

Certification chair Jim Hermanson reported that recent local exam sessions took place at WMTV and WBEV. The next local exams will be held February 8-18, 2002, with a registration deadline of December 28. National Liaison Leonard Charles reported that SBE disbursed funds raised for the families of engineers killed in the September 11th attacks. \$50,000 was raised and distributed in October. National meetings were rescheduled to November 27-28. SBE National will hold a strategic planning day in Indianapolis January 12th. Chapter chairs are encouraged to attend. Another leadership skills seminar will be held June 5-7 and August 7-9, 2002. The National office's address has changed. Tom Smith added that the September 11th relief fund is now at \$90,000, with \$60,200 in donations and a 50% match by the McCormick Tribune Foundation.

In a financial statement from the National office, overall cash operations (dues, book sales, certification) are positive, but there was some loss in investments this year. Frequency Coordinator Tom Smith reported that he was in contact with ABC Wednesday for the upcoming UW football game. Tom is flagging frequencies in use for UW football at away games for Ed Walsh at UW for Coach-Com use. About half the Big Ten teams are licensed for Coach-Com. Tom has received no other coordination from other teams yet. There was no old business.

In new business, Denise Maney showed an example of an HDTV T-shirt being sold by Vicki Kipp. In professional announcements, WHA-TV is currently installing its DTV transmitter. The meeting adjourned at 7:28 PM.

For this month's program, Tom Harle, Harris's district manager for radio systems, spoke on in-band on-channel digital radio.

Submitted by Tom Weeden, Secretary

SBE Short Circuits – December 2001

By John L. Poray, CAE
SBE Executive Director

2002 LEADER SKILLS SEMINARS SET

SBE has scheduled the two-part Leader Skills Seminar for June and August, 2002. Course I will be held on June 5-7 and Course II on August 7-9. Both courses will be held in Indianapolis at the Marten House Hotel and Conference Center. Dick Cupka, who has instructed management training and leadership skills specifically designed for broadcast engineers for more than 30 years, will be our seminar leader. To register or for more information, call Angel Bates at the SBE National Office at (317) 846-9000 or e-mail Angel at abates@sbe.org. The seminar fee for each course is \$475.

HELP CONTINUES FOR FAMILIES OF 9-11 VICTIMS

Donations continue to be received for the relief fund benefiting the families of the six broadcast engineers killed at the World Trade Center on September 11. Donations have greatly exceeded our expectations. Contributions to date now exceed \$113,000. Including matching gifts, the total will grow to more than \$163,000!

By November 1, all six families had received their first check. A second check was sent to each family on December 3 and at least one more check will be sent to all six. Every penny contributed is going to benefit these families. SBE and the Ennes Trust are absorbing any expenses related to the fund.

It's not too late to make your tax-deductible contribution. Make your
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AMATEUR RADIO NEWS

By Tom Weeden, WJ9H

- Volunteers from the Tulsa Amateur Radio Club helped to restore police and fire dispatching service in Collinsville, Oklahoma, after flames destroyed the city's radio gear and disrupted 911 service December 1. The early-morning fire badly damaged the 88-year-old Collinsville City Hall, which housed the Collinsville police and fire departments and other city offices. "The city's communication system was functioning, but 911 calls were re-routed to a nearby city, because all the dispatch equipment was lost in the fire," said Oklahoma ARRL Public Information Coordinator Mark Conklin, N7XYO. "Consequently the city had to find a temporary home for police and fire dispatch." The fire also toppled the dispatching center's radio tower. Collinsville, a community of some 4000 people, is located about 12 miles north of Tulsa. Conklin explained that volunteer Tom Roininen, KB5HMZ, brought along the club's portable repeater system, which was built with commercial radio equipment converted for amateur use. Conklin says the amateurs reprogrammed the "commercial" radio equipment--which had served as the club's portable repeater--for the police and fire departments to use as an emergency dispatch radio. In addition, new telephone lines were run, and individual telephones were installed for the 911 system to receive calls. "By 9 o'clock that evening all systems were totally operational and police and fire dispatching was being handled though the club's loaned radio equipment," Conklin said. Established in 1924, the Tulsa Amateur Radio Club is the state's oldest ham radio club. It operates the W5IAS linked repeater system and its members are active in public service.

- Anyone filing an amateur radio application now will be asked to supply a 10-digit FCC Registration Number (FRN) issued by the FCC's new Commission Registration System, or CORES. The requirement applies to FCC applications filed on-line or on paper. The FCC also has supplanted Universal Licensing System (ULS) registration with "CORES/Call Sign" registration, so applicants no longer need to register separately in both systems. Most, if not all, hams who registered previously with the ULS already have an FRN, although they may not know it yet. The FCC just completed another cross-registration to include those already on the ULS books within the CORES "entity registration" database, and another is scheduled. Amateurs can learn their FRNs by doing a license search on the FCC's Universal Licensing System page <<http://wireless.fcc.gov/uls/>>.

- Several ham radio clubs will operate special event stations during the month of December. The stations will mark the 100th anniversary of the reception of the first transatlantic radio signal--the Morse code letter "s"--received by Marconi at Signal Hill in Newfoundland on December 12, 1901. Marconi used a kite-supported antenna to hear the signal, which was transmitted from his station in Poldhu, Cornwall, England.

(Excerpts from "The ARRL Letter")

Thanks to WKOW-TV for providing
copying and folding facilities for
the Chapter 24 newsletter!

Thanks to WISC-TV for
maintaining the web server for the
Chapter 24 Web page!



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TOWER INDUSTRY PART 12 (continued from page 1)



Figure 1. ComTrain tower training company.

Addressing the 'rowdy' reputation of some tower technicians, Wilcox told of small hotels that still have wall plaques warning, "No tower crews." There was a Canadian tower company who initially recruited roughnecks from the oil industry to do tower work. This company developed an interesting technique for recruiting tower technicians for their US jobs. After arriving at the location of the tower assignment, the job leader would hang out in a local bar on a weeknight. He would hire whoever was still in the bar and standing at 1 AM, rationalizing that the bar patrons must be both unemployed and tough. Rumor has it that this particular Canadian company enforced the rule, "No vomiting below 300 feet." Reportedly, the tower crew was known to go straight from the job to the tavern at the end of the day. Needless to say, this type of performance is not acceptable in today's increasingly professional tower industry.

MOTIVATION

Outsourcing tower safety training is not cheap. Between the cost of safety equipment for each technician, the cost of taking a course or hiring a skills trainer, and time spent away from a paying tower job, tower safety training costs add up. But the cost for tower safety training seems quite

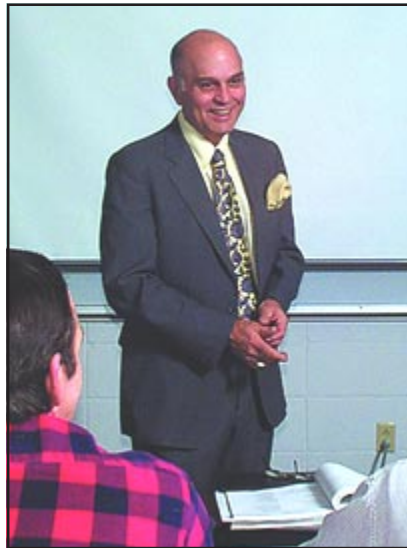


Figure 2. Winton Wilcox. Photo by ComTrain

reasonable compared to the cost of a serious injury or death, an OSHA fine, and safety gear which must be retired after one fall. Besides lowering the risk of worker injury or death, tower safety training can save companies from the time-consuming project of evaluating safety equipment to purchase and developing safety policies. Staying abreast of the latest safety techniques and equipment is a demanding responsibility. A tower safety course uses techniques and equipment that have been tested and proven effective for tower jobs. Companies can receive assistance in installing an internal training program to comply with contractually specified client safety demands and government regulations.

When we finished the course, if we had successfully completed our written exam and field test, we received a certificate and wallet card from ComTrain documenting that we had completed safety training. This proof of training reassures clients and is

an attractive feature when competing for contracts.

Prior to this course, some of my classmates had completed 'RF Safety Awareness' training with Radio Frequency International (RFI) and also OSHA 500 'OSHA Standards for the Construction Industry' training. Manufacturers of Tower Safety Equipment such as DBI/Sala, ROSE manufacturers, and Trachtl offer training schools.

SERIOUS BUSINESS

Bringing an aura of tranquility to the classroom, Wilcox reeled off a staggering list of tower technicians who have died on the job during the past few years. The examples were upsetting to me, and perhaps more so for my fellow students who spend most of their days up on a tower. On December 23, 2000, a man working in West Virginia bled to death while hanging at 250 feet after a fall. A tower technician, his 17-year old son, and 19-year-old friend fell to their death on December 3, 1999 in Statesville, North Carolina because of a capstan winch accident. The men were being hoisted up the side of the tower by an electric winch. The tower technician's wife was guiding rope through the winch when it became slack and jumped off the winch, causing the rope and the men to fall to the earth. A man or a piece of equipment getting tangled in the tower probably caused the slack. The wife sustained serious permanent rope burns while attempting to stop the rope. Sadly, capstan-winch related deaths occur at a rate of about four per year. The fatality rate for tower technicians is 11% while the overall fatality rate for construction workers is 4%. The list of tower fatalities goes on.

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TOWER INDUSTRY PART 12 (continued)

WHY THE MORTALITY?

The tower industry is driven by the potential for large profits. The wireless carriers have \$17 billion in deposits with the FCC for carrier licenses. The work demand is significantly higher than the supply of workers. The pool of people who want to work on towers is somewhat limited. The fact that one in three applicants for tower technician jobs don't pass drug-screening test, even with six weeks advance notice, does not make hiring any easier. If applicants pass that test, they are hired. Often, they are sent out on a job without any training.

In the past, it was common for the same crew of tower technicians to work together for several years. The technicians knew what to expect from each other. With today's rapid growth and frequent turnover in the tower industry, tower technicians don't have that luxury. During the class, the students received multiple phone calls from their bosses about jobs requiring immediate attention. Although the class was only two days, the tower technicians acknowledged that they had a hard time being out of the field that long due to their workload.

MEDICAL ATTENTION

Often, a tower technician will initially survive the injuries caused by falling from the tower, only to bleed to death while hanging suspended in their safety harness. Medical attention often cannot be administered until the injured tower technician can be lowered down to emergency medical personnel waiting on the ground. Rescue crews may struggle to get a person down a few hundred feet to the ground. Although fire departments with ladder trucks can sometimes retrieve an injured party hanging off a

tower, the height limit for the ladders is usually ten stories.

Given training in tower rescue and the necessary equipment, a trained tower technician can lower an injured tower technician to the ground very quickly. Speed is of the essence when you are hanging off a tower in a safety harness, since a harness fits tightly around the body and can cut off circulation if you're suspended in it. Although a well-designed harness that fits well is tolerable when climbing, it will soon become uncomfortable if you're hanging suspended by your back D-ring.

OSHA

OSHA is watching the tower industry very closely. The agency has dictated some rules that tower technicians must follow. At least two tower technicians must be present for any tower job. OSHA requires technicians to assess workplace fall hazards before beginning to climb. If you are 6 feet or more off of the ground or working within 6 feet of an edge, you must be 100% fall protected. The only exception to this requirement is a situation where being 100% fall protected would be more dangerous than not being fall protected. A formal documented safety meeting must be held at least once a week, according to CFR 1926. Before entering a known hazardous work situation, all employees present must agree on an emergency plan. An employer is obligated to provide emergency medical attention to an employee within a reasonable proximity of an injury. This means that the tower technician must have access to a medical care facility within a limited distance from the job site. Failure to follow these safety rules can result in a significant fine.

SITE SAFETY MEETING

At the beginning of each workday, a tower crew should have a site safety meeting. This meeting must be documented. In the words of a classmate, "If it isn't written down, it didn't happen." At this meeting, there are topics that must be discussed:

- where the first aid kit is
- where emergency rescue equipment is stored
- phone number for and location of nearest emergency medical facility
- driving directions to the site so that you can tell emergency responders how to find you
- emergency response plan for that specific job
- site hazard assessment
- pre-climb inspection of equipment and tower
- goals and tasks to be completed that day

SITE HAZARD ASSESSMENT

Before climbing, the tower technician needs to observe the weather conditions, and determine if it is safe to climb. Weather hazards for tower climbing include snow, wind, rain, lightning, ice, moisture, sun, heat, and very high or very low humidity. In some climates, storms occur daily in the summer. While climbers can't stop work based on the possibility of a storm, they may be able to predict a storm by monitoring the AM radio band from 540 – 580 kHz. If static is heard, it indicates that a storm is approaching. If a technician hears thunder, they need to get off the tower. Lack of daylight, as in night climbing, is another environmental condition that is especially hazardous for technicians.

Live natural hazards such as birds, snakes, scorpions, and bees can

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TOWER INDUSTRY PART 12 (continued)

threaten the safety of a tower technician. Birds, for example, are possessive of their tower space. Songbirds will dive at a tower technician's face, possibly causing the technician to lose their balance and fall. Ospreys build large nests on towers. Since ospreys are a protected species, tower technicians must take great care to avoid the nest while working. In one case, ospreys resented the tower climbers climbing up the tower so much that the ospreys caught and dropped large bass fish on the climbers. The besieged tower technicians collected the fish and fried them for dinner. Predatory birds such as hawks and eagles pick up snakes and fly off, become distracted or threatened by the snake, and deposit them on the tower. Wasps swarm to radiating antennas.

Humans can be just as dangerous to a tower technician as are forces of nature. Drunks, unhappy neighbors, and disgruntled hunters sometimes shoot at towers, creating a dangerous situation for any technician who is climbing that tower at the time.

Structural hazards are a serious concern when climbing a tower. Although the EIA/TIA 222F standard describes the minimum requirements for a tower structure, the 222F standard is not legally enforced. Compliance is voluntary. Tower technicians must ensure that the structures they ascend are safe to tie off to and won't collapse. It is up to the individual technicians to visually inspect a tower before climbing to look for signs of weakness. I was quite surprised to learn that the government doesn't regulate the structural safety of towers. While tower owners are required to provide a safe working environment to their employees, that requirement does not apply to any subcontractors that they hire to work on their tower. As long as

the tower owners don't allow their own employees to climb on the tower, they are off the hook. Many tower insurance policies state that the tower owners cannot allow their own employees to climb their towers.

The electrical lines that power tower lights and appurtenances can be a hazard. Tower technicians should avoid climbing on electrical lines. Exposure to RF energy also needs to be considered.

Wilcox concluded by advising us to adapt the mindset "Something at this site is trying to get me. I need to find it before it finds me."

SAFETY EQUIPMENT

We learned that we must maintain 100% fall protection while climbing a tower. If we are not using fall restraint equipment (such as a positioning lanyard, or safety climb device), then we must have 100% fall arrest attachment (such as a shock-absorbing lanyard or self-retracting lanyard). We don't have to have both fall restraint and fall arrest equipment - one or the other is fine. Although their names sound similar, we learned that there is a critical difference between fall restraint and fall arrest equipment. Fall restraint, such as a safety railing, prevents you from falling in the first place. Fall arrest equipment won't prevent a fall, but it will save your life if you fall. While it won't necessarily prevent injury, fall arrest equipment will give you a chance of survival.



Figure 3. Lanyard, carabiner, rope terminator, and kern mantle rope.

Since ComTrain has no ties to any manufacturer, they have safety equipment from various manufacturers available for students to use. For most pieces of equipment, they have versions of a particular item from several different manufacturers so students can try it out and determine which version is best for them. I tried on several climbing harnesses before finding one that would work for me.

During class, we passed around various pieces of equipment (Figure 3) such as a carabiner, rope terminator, Roll-Gliss, and lanyards. Lanyards come in several types: shock-absorbing lanyard, Y-lanyard, positioning lanyard, self-retracting lanyard. The self-retracting lanyard limits your fall to 3 1/2 feet. We discussed using and caring for climbing ropes, concentrating on kern mantle rope. Kern mantle rope is similar to co-axial cable in design, and can lift thousands of pounds. If using a safety climb device, we learned to attach it to a ring on the center of our body - chest, not waist. We learned that a carabiner, which is capable of withstanding many kiloNewtons of

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TOWER INDUSTRY PART 12 (continued)

force, has consistent material and can be side hooked.

Under the heading of 'what not to do', we learned not to over-bend or choke a rope, not to side load a hook, and not to intentionally jump off the tower. Rope can be bent up to ten times its diameter before it loses strength. Choking a rope will reduce its rated strength by 25%. Side loading a hook can cause its clasp to open up unintentionally. After seeing a demonstration of how the shock absorbing material inside a lanyard absorbs the energy of a fall, students might be tempted to bungee jump off the tower to experience the absorption first hand. It may be tempting, but it's an expensive learning experience. An impulsive jump to test the equipment will be a \$400 - \$800 jump since all of the equipment that has been exposed to an impact will have to be taken out of service.



Figure 4. Ed Van Ness demonstrates how to properly insert kern mantle rope through a Fisk descender.

TYING OFF

Winton Wilcox told us two stories that illustrated the importance of choosing wisely the anchor points that you tie off to. During a discussion of how to attach a personal fall arrest system (PFAS) to a sterile roof, a roof with no structures to connect your PFAS equipment to that is, Wilcox discussed a job at a roof antenna site in New Jersey. The crew tied off by running a rope over a sterile roof to the bumpers of two trucks that were parked on opposite sides of the building. The trucks used did not belong to the tower crew, but to individuals who happened to have parked there. Without asking permission to use the trucks or communicating to the owners, the trucks were tied on to. Unfortunately, one of the truck owners didn't notice the rope tied to his back bumper, and started driving away. I'd venture a guess that the tower crew asked first

before tying on to another vehicle. In a separate incident, at a tower in the Burlington Northern Rail yard, a tower technician tied his or her tagline, a restrictive line used to control the position of a mass during ascent or descent, to a train engine. It was assumed that the train would remain parked, and so there was a bit of a problem when the train started chugging down the rail. The tagline survived for about 50 yards until the pulling force of the train caused it to snap. The tower, which had been pulled to the side with great force, reverberated back and forth when the tagline broke.



Figure 5. My ANSI-approved ComTrain climbing hard hat.

RESCUE TECHNIQUES

We learned about five different rescue techniques: winch, boom truck supplied by an outside service provider, suspension by a Fisk descender (Figure 4), suspension by a Roll-Gliss descender, and manual rescue. The most chilling rescue story we heard involved a manual rescue. Before the 100% attachment initiative was even an idea, two tower technicians were working high off the ground on the inside perimeter of a steel-lattice tower. Out of the corner of his eye, the technician who was working at a lower height saw something falling. An involuntary reaction caused him to reach out and grab on to the falling object. He grasped a jacket, and held on tight. He pulled the jacket, which contained the other technician who had fallen, to the tower face. This is an example of a manual rescue. The technician who saved his friend reportedly still has nightmares about this event.

THE CLIMB

The morning of the climb, we were all concerned that the cold gray sky and rain sprinkles would prevent our rescue exercises. But we just piled on more layers of clothes to our mandated climbing outfit—hard hat (Figure 5), hard-soled boots, sturdy pants, long sleeved shirt with collar, and gloves—and carried on. First, we had a site safety meeting. We all noted where the first aid kit was placed at the base of the tower. Wilcox pointed out the Monroe Hospital and gave us driving directions. We talked about our rescue plan for the

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TOWER INDUSTRY PART 12 (conclusion)

self-supporting tower that we would climb. We discussed site hazards, and glanced with trepidation at the birds perched on the tower top.

To pass our tests, we needed to perform one rescue and one exercise of being rescued. Starting with the rescue exercise, I attached a carabineer between my front D-ring and the safe climb device mounted on the tower. If I slipped from a climbing peg as I was ascending, the safe climb would lock to stop my fall within two feet.

The climb was a thrill! Resting for a moment at height, hanging hands-free off the side of tower, enjoying the view and the fresh air, it wasn't too hard to understand why people choose this career. Some technicians claim that climbing is addictive.

Using the rescue methods that ComTrain taught me, a Fisk descender, a rope, and a carabineer, I was able to lower (Figure 6) other students who were bigger and heavier than I to the

ground safely by attaching their harness to mine and walking down the side of the tower.

CONCLUSION

"The worse thing that I deal with is tokenism," exclaimed Winton Wilcox as he urged us to integrate our new knowledge and skills into how we do our jobs. Earlier in the course, Wilcox had told us "You're never going to do something because someone tells you to. You're going to do it because you believe in it." Not only had he dispensed the safety training that we needed to comply with OSHA rules, but he had made a point of explaining why tasks needed to be completed so that we were sold on doing them that way.

Next month, we'll conclude our discussion of the tower industry with a discussion of what to expect from the industry during the next five years.

Information for this article came from ComTrain.



Figure 6. I'm using a Fisk descender to lower an injured technician to the ground. Photo by ComTrain.

Short Circuits (continued from page 3)

check payable to, "Ennes Educational Foundation Trust" ("Relief Fund" on the memo line) and send to: SBE, 9247 N. Meridian Street, Suite 305, Indianapolis, IN 46260.

ATSC SEMINAR RESCHEDULED

The ATSC DTV Standards Seminar originally scheduled for October 23-24 in St. Louis, MO, has been rescheduled for February 20-21. To register, go to www.atsc.org. Co-sponsored by SBE.

STRATEGIC PLANNING DAY SET BY SBE

The Board of Directors of SBE will be holding a day-long strategic planning session to help identify Society objectives for the coming years. The aim is to continue to develop services and programs that are important to the individual member. Each SBE Chapter is encouraged to send their chairman or other representative to participate. The event will also involve the entire national

Board of Directors and SBE staff. Tom Zoss, an independent facilitator from Bloomington, Indiana, will lead the session.

The Strategic Planning Day will be held at the Holiday Inn Select at the Indianapolis International Airport on Saturday, January 12 from 9:00 am to 4:30 pm. Lunch will be provided. Participants will be responsible for their own transportation and lodging. Chapters that have the financial means are encouraged to cover the travel costs of their Chairman for this important event. Reservations for overnight accommodations at the Holiday Inn can be made by calling (317) 244-6861. Ask for the special SBE group rate of \$85.

For more information, contact Ray Benedict, SBE Vice President and Strategic Planning Chairman, at rcbenedict@cbs.com or (202) 457-4518 or SBE Executive Director, John Poray at the National Office at jporay@sbe.org or (317) 846-9000.

FCC RAISES WIRELESS LIMITS

By Tom Smith

The FCC took action on November 6th that will raise and then end ownership limits on cellular and PCS spectrum. Currently, the FCC restricts any one provider to 45 MHz of spectrum in a market. On January 1, 2002, that limit is raised to 55 MHz. On January 1, 2003, all limits will be removed. With the current ownership restrictions, there are currently as many as eight providers in many markets. At this time, no one knows how few providers may exist after the limits are removed. The ruling will no doubt decrease competition amongst providers as buyouts and mergers occur.

From FCC Releases (www.fcc.gov)

Thanks to Fred Sperry for arranging the November program on IBOC digital radio.

Satellite Radio (continued from page 1)

terrestrial repeaters. Each system has taken a different approach to accomplish this.

Sirius has three satellites in orbit. Sirius 1, 2, & 3 are positioned in a highly elliptical orbit, unlike most communications satellites which are in geostationary orbits. In the elliptical orbit, the Sirius satellites maintain a specific longitude of 100 degrees while moving across latitudes. In this scenario, the satellites actually rise and set every 16 hours allowing two of the three satellites to be visible at all times in the Northern Hemisphere. In an elliptical orbit, the satellites have a higher elevation of about 60 degrees as compared to the approximately 45 degrees of geostationary satellites, meaning the signal is less likely to be blocked by obstructions.

There is a technical challenge with this system however since satellite radio has only been licensed to use two satellite frequency bands. Because of this, the signal needs to be handed off between two of the three satellites as they rise and set. Two satellites can't be transmitting on the same frequency or they would interfere with each other. This hand off is likely to cause a brief interruption of service (on the order of milliseconds) while one satellite ceases to transmit and the other initiates transmission. It is unlikely though that the listener will be aware of this switch since the third satellite is at its highest elevation at this time and will have its greatest coverage.

XM has taken a more conventional approach to satellite delivery of its signal. XM has two satellites in geostationary orbit that they have aptly named "Rock" and "Roll." In a geostationary orbit, the satellites always appear at the same spot above earth. XM's satellites are located at 85 and 115 degrees West longitude, which allows for optimum coverage of the United States. This and the fact that according to XM "these are the most powerful satellites in the entertainment industry" allows for nationwide coverage. Even if one satellite's signal is blocked, the receiver should still be able to receive the signal from the other

satellite. Both satellites transmit on different frequency bands to avoid interfering with each other.

Both Sirius and XM have a network of terrestrial repeaters throughout the country to rebroadcast their signal in areas the direct satellite signal may be blocked. Most of the repeaters are located in metropolitan areas where tall buildings may impair the satellite signal. For example, in Wisconsin, XM has terrestrial repeaters located in Milwaukee according to XM's director of repeater hardware Michelle Tortolani. Unlike the satellites, which use QPSK modulation, terrestrial repeaters use the COFDM modulation technique since it is more optimized for terrestrial transmitters.

As with satellite delivery, both Sirius and XM use different approaches as to how they feed their terrestrial repeaters. Since the received S-band satellite signal at the repeater is close in frequency to the much higher level signal being rebroadcast by the repeater, interference between the transmit and receive circuits is a concern. To deal with this, XM uses a high gain (directional) antenna at the repeater to receive the incoming satellite signal. In the case of Sirius, they would be required to have receive antennas that track their satellites in order to provide the necessary receive/transmit signal isolation. This would be quite an expensive proposition, so Sirius has elected to use Ku-band VSAT receive dishes at the repeater sites to receive the uplinked signal.

SATELLITE RADIO IS HERE

Even though Sirius has yet to launch their service, they have literature and displays at electronics stores throughout the country and plan to relaunch a full-featured web site at this year's Consumer Electronics show in

early January. XM, whose service is up and running, has a complete web site where you can listen to their service, order satellite radio service, and purchase receive equipment. I did a dealer search for Madison on the XM web page and it listed eleven different stores in the area carrying satellite radio equipment for their service.

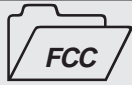
Since most radio listening is done in vehicles, it is no surprise this is the target market for satellite radio. Most of the units currently available are mobile satellite radios or conversion units that will allow you to receive satellite radio on your current car stereo. However, Sony has come out with an innovative "plug and play" receive unit that can be transported between the car and home. The receiver itself can also run stand-alone with powered speakers. Auto manufacturers have been slow to offer vehicles equipped with satellite radios, but several automakers plan to provide satellite radios in some of their luxury vehicles in 2002 models. Both Sirius and XM have signed exclusive agreements with some automakers, but for those without an exclusive agreement, both Sirius and XM have an interoperability agreement where radios will be made that can receive either service.

Will consumers be willing to pay a 10 to 13 dollar a month subscription fee for the satellite radio service? Only time will tell, but with the investment both Sirius and XM have made in this technology, I expect they will do everything possible to make this new service work.

Sources: BE Radio: Nov. 2000 article by Conrad Trautmann, and Oct. 2001 article by Chriss Scherer; IEEE Article: Digital Radio takes to the Road by David H. Layer; National Association of Broadcasters.



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FCC Rulemakings

Compiled By Tom Smith

PROPOSED RULEMAKINGS

**MM Docket No. 01-31,
MM Docket No. 00-244**

Rules and Policies Concerning, Multiple Ownership of Radio Broadcast Stations in Local Market, Definition of Radio Markets

The FCC has issued a notice of rulemaking concerning the concentration of ownership in individual markets. A number of Commissioners, past and present, have expressed reservations as they approved the sale of additional stations to some group owners. The Department of Justice has blocked a few stations sales due to anti-trust concerns. Currently groups cannot own more than 50% of the stations in a market or control 50% of the radio revenue in a market without being in violation of anti-trust policies. The current rules limit the number of stations one can own to less than 50% in all but the smallest markets, but due to the way the FCC figures ownership limits, the final number can reach 50% or greater of the stations.

In markets of 45 stations or more, a group can own 8 stations with a limit of 5 of any one service (AM or FM). In markets with 30 to 44 stations, a group can own 7 stations with a limit of 4 of any one service. In markets of 15 to 29, the limit is 6 stations with 4 from any one service. In markets of 14 stations or less, the limit is 5 stations with 3 from any one service and the total number must be reduced if the 5 stations make up more than 50% of the stations in the market.

The problem that the Commission has with the current system is that the number of stations is figured on signal overlap of all stations city grade contour with each other. That means that if there is a station in an adjacent area that puts a city grade contour over market, it will count as a signal in the market and raise the count, even if it has little or no impact in the

market. The second problem with this system is that signals are counted only with the stations they overlap with. That means that one can increase the number of stations owned in a market by counting the non-overlapping stations against the rest of the stations separately. An example would be that if your limit is six stations and five of the stations cover all of the metropolitan area and there are two non-overlapping suburban stations, the total number would be six stations in each suburb for the limit, but, the total ownership number would end up as seven stations. Geography has become more important than market impact, when computing ownership limits.

Because of these issues, the FCC is considering limiting the number to all the area of the market as defined by the rating service as one of the options. If the market is listed as covering three counties, then a group could not own more than the number of stations the FCC has decreed for that size market, even if some of the stations did not overlap with others. Other options the FCC is considering is the effect of other media on the concentration of ownership. They want to know if the number of stations or percentage of media ownership should be counted against the total number of media outlets, which could give larger increases of radio ownership in a market by one entity. Other media outlets would include newspapers (dailies and weeklies), TV stations, and cable systems.

Comment is also being sought on other ownership issues such as diversity of programming and ownership, joint marketing agreements, and the impact on ownership limits on the purchase of dark or failing stations. The FCC started this notice with a history of the ownership limits.

This notice was adopted on November 8, 2001 and released on November 9, 2001. Comments are due 60 days after the notice is published

in the FEDERAL REGISTER with replies due 30 days later.

EB 01-66; DA 01-2775 Emergency Alert System

The FCC is taking comments concerning the requirement that low-power FM stations and some cable systems must install EAS decoders. The FCC has gotten a request from the Media Access Project that LPFM stations be allowed to use temporary alternatives to the required EAS decoder. They note that EAS decoders currently do not exist, and if they did, their cost would be nearly the same as an EAS encoder/decoder. The National Cable & Telecommunications Association, National Association for the Deaf, and the Telecommunications for the Deaf requested the FCC allow small cable systems with under 5000 Subscribers to install an EAS decoder instead of an EAS encoder/decoder.

Comments are due on December 24, 2001. Published in the FEDERAL REGISTER on December 7, 2001 on Page 63,544

FINAL RULEMAKING

MM Docket No. 00-39 Review of the Commission's Rules and Policies Affecting the Conversion To Digital Television

At the November 8th meeting, the FCC adopted a number of actions to aid the DTV transition. The FCC has now released the full text of the notice which gives the specifics of the changes in the rules.

The actions include delaying the deadline for replication of analog coverage areas. This will allow stations to get on the air with lower power facilities and retain the right to expand their coverage as the DTV transition continues. The original dates that DTV stations had to replicate their analog coverage was December 31, 2004 for commercial stations and a year later for non-commercial stations. The FCC deferred its requirement for stations granted construction permits to maximize their coverage and retain protection from interference from the

(continued on next page)

FCC Rulemakings (continued)

initial build-out date requirements. Stations must still meet their city grade signal strength requirements with commercial stations deadline of December 31, 2004 and the non-commercial deadline of December 31, 2005.

The FCC also deferred its requirements for stations with both analog and digital stations in the channel 2-51 core to make their election of which channel they would use for their DTV channel at the end of the transition. The original dates were December 31, 2003 for commercial stations and December 31, 2004 for non-commercial stations.

The FCC will set new dates for replication, maximizing and channel selection in the next periodic review of the transition. The new dates will be no later than December 31, 2006.

This notice is 60 some pages long and contains information on changes to deadlines concerning the transition to DTV that every station needs to be aware of. Because of the increase in the length of the deadlines concerning power increases and final channel selection, stations should be able to make decisions with time to gain more experience with DTV.

From FCC Releases (www.fcc.gov)

SBE CHAPTER OF THE AIR:

HamNet meets the second Sunday of each month at 0000 GMT on 14.205 MHz. Hal Hostetler WA7BGX is the Control Station.



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Employment Opportunity

Director of Media Technology

Wisconsin Public Broadcasting's services consist of a statewide Public Television network, two Public Radio networks, production centers, and a network operations center. These services are provided through a partnership of the WI Educational Communications Board and University of WI Extension. With our award winning services, 45 years of Public Television and 80 years of Public Radio leadership, quality programming, and innovative technologies, we are proud of our creative environment and reputation for excellence. The Educational Communications Board is recruiting for a Director of Media Technology. This position will be headquartered in Madison, WI, a city rated as one of the most livable cities in the nation.

The primary responsibilities for the Director of Media Technology will be designing and transitioning the current analog network operations center to a contemporary, multi-service, automated digital facility. A successful candidate will demonstrate proven knowledge, skills or experience with digital broadcast technologies and media asset management systems. As a member of the senior management team this position will lead and participate in other challenging projects and initiatives.

The Educational Communications Board offers an attractive salary and excellent benefit package. Please send a resume and detailed project overviews of digital design and construction projects you've completed such as: master control, production facilities or related facilities. To learn more and acquire application details, please visit our web site at www.ecb.org or call Larry Dokken, 608-264-9669. Applications must be received by December 19th.

Send resumes to:

Educational Communications Board
Media Technology Director Search
3319 W. Beltline Hwy
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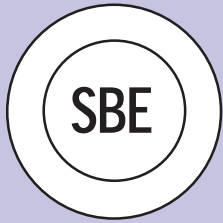


FIRST CLASS MAIL

Newsletter edited on Pagemaker 5.0 by: Mike Norton
Contributors this month: Vicki W. Kipp, Tom Smith, Fred Sperry, and Tom Weeden.
Thanks to Leonard Charles for his work on the Chapter 24 WWW page.

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DECEMBER MEETING and PROGRAM



**Society of Broadcast Engineers
CHAPTER 24 MADISON, WISCONSIN
Wednesday, December 19, 2001**

UW Communications Expert

This month's guest speaker will be famed UW Telecommunications Professor, Dr. Barry Orton. Dr. Orton is a national consultant to local governments helping them deal with the cable behemoths. This month he will turn his attention our way with the engaging topic – *Narrowcasting on Broadband: American Mass Media and The Future of the AOLTimeWarnerDisneyFoxComcastMicrosoft Corporation*. This will be a thought-provoking meeting on a topic of interest to us all.

**Dutch Treat Dinner
at 5:30 PM**

**at J.T. Whitney's
674 S. Whitney Way**

**Meeting and Program
at 7:00 PM**

Visitors and guests are welcome at all of our SBE meetings!

2002 UPCOMING MEETING/PROGRAM DATES:

Day	Date	Program
Thursday	January 17, 2002	Security Systems
Tuesday	February 19, 2002	Sonic Foundry software
Wednesday	March 20, 2002	FCC Rules and Q&A

Program Committee:	Denise Maney 277-8001	Steve Paugh 277-5139	Fred Sperry 264-9806	Steve Zimmerman 274-1234
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