



**BROADBAND NETWORKS  
PART 21 - OUTSIDE PLANT: AERIAL**

*By Neal McLain*

This is Part 21 in a series of articles about coaxial broadband networks. In previous articles, we've discussed how broadband networks work; in this article we'll take a look at what they actually look like.

**OUTSIDE PLANT**

"Outside Plant" or OSP, is a catchall term for everything in the network that's outside of any building. The term originated in the telephone industry, but it applies to broadband networks as well.

We've discussed outside plant in detail in these pages before: see "Fiber Optic OSP," *Newsletter*, January-July 1994. In that series of articles, we described the design and construction of an all-fiber network. In an all-fiber network, the fiber is routed from building to building, to connect electronic equipment located inside buildings. Except in rare circumstances, no electronic components are installed outside of any building, and even in those circumstances, a weatherproof (and often temperature-controlled) enclosure is usually required.

An example of an all-fiber network would be a network constructed by a group of local broadcast stations to interconnect studio buildings, transmitter buildings, and local news venues (the construction of such a network here in Madison has been a recurring topic of discussion within Chapter 24 for several years).

Unlike an all-fiber network, a broadband network (as the term is used in this current series of articles) utilizes coaxial cable. Although fiber optic links are often used to transport signals over long distances, the majority of the network consists of coaxial cable carrying modulated RF carriers.

(continued on page 4)

**Next Meeting:**

**Monday,  
June 15, 1998**

**WKJG-TV/NBC 33  
Remote Truck Tour**

**Dutch Treat Dinner  
and Meeting  
at 5:30pm**

**Houlihan's  
1262 John Q. Hammonds Dr.**

**Program at 7:00pm  
Marriott - Madison West  
1313 John Q. Hammonds Dr.  
(formerly Holiday Inn West)**

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**AN UPDATE FROM THE CHAPTER CHAIR**

*By Fred Sperry*

I'd like to start off by expressing my appreciation to the membership of Chapter 24 for electing me to a second term as Chapter Chair. I'm honored to have had the opportunity to serve this exceptional SBE Chapter as Chair this past year and look forward to the doing the same this coming year. I'd also like to express my gratitude to the other Chapter Officers and the Committee Appointees who are the individuals who really make Chapter 24 one of the best in the country.

This year's Officers are incumbent

Treasurer Stan Scharch, newly elected Secretary Lloyd Berg, incumbent Vice Chair Kevin Ruppert and Past Chair Paul Stoffel. Thanks to Neal McLain for his past (and many) years of service as Secretary. I'm pleased to announce that all Committee Appointees have agreed to serve another year in their committee positions. These dedicated individuals are too numerous to list, but the committees and those who serve on them are listed on page two of the newsletter. Although everyone has agreed to continue serving on these committees, this doesn't mean that there aren't opportunities to get involved with Chapter 24. Please feel

free to contact me if you have any interest in volunteering in Chapter activities.

Speaking of Chapter activities, the Chapter 24 nominations for the annual national awards have been submitted to the National Awards Committee. The nominations and categories submitted were as follows: The 43rd Annual Broadcast Clinic and "DTV Planning" program presented by Chapter 24 and the Upper Midwest Region SBE Chapters as the *Best Regional Conference or Convention*; editor Mike Norton and contributing

(continued on page 3)

## CHAPTER 24 OFFICERS

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## COMMITTEE APPOINTEES

### Program Committee:

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<b>Denise Maney</b>	277-8001
<b>Kerry Maki</b>	833-0047
<b>Steve Zimmerman</b>	274-1234

### Membership and Past-Chair:

**Paul Stoffel**  
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### Sustaining Membership: Fred Sperry

### Special Events: Kevin Ruppert

### Certification and Education:

**Jim Hermanson** 836-8340  
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**Tim Trendt (UW-Platteville)**

### Frequency Coordination:

**Tom Smith** W - 263-2174  
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### SBE National Board Member & Chapter Liaison:

**Leonard Charles**  
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lcharles@wisctv.com

## May Business Meeting Minutes

Chapter 24 of the Society of Broadcast Engineers met on Tuesday, May 19, 1998, at the Grand China Buffet restaurant in Madison, Wisconsin. There were 14 persons in attendance, including 12 members (10 certified) and two guests. The meeting was chaired by Chapter 24 Chair Fred Sperry.

The meeting was called to order by Chair Fred Sperry at 7:00 pm. Minutes of last meeting were approved as written in the May newsletter.

Jim Hermanson presented the election results and congratulated the newly elected officers. Sperry reported that all of the committee appointees have agreed to serve another term, but anyone who is interested in helping by serving on a committee should let an officer know.

Treasurer Stan Scharch presented the treasurer's report. The Chapter's account balance stands in the black.

Sperry presented the newsletter report. The deadline for June is the 5th. The folding party will be on June 10th, but members should check the web site to make sure that this information has not changed.

Sperry announced that Alpha Video and Roscor have renewed their sustaining memberships.

Program committee report was given by Kerry Maki. Kerry said that the committee is welcoming ideas for program topics and is in special need of radio related topics. Sperry added that the Program Committee membership was going to stay intact with the beginning of a new chapter electoral year.

Jim Hermanson reported on the Certification and Education committee. Next exam period will be June 12 to 22. Jim said that he was looking for a place to give the next exams here in Madison. Kerry volunteered to let the committee use the WMSN conference room. Jim reported that the TV Operators book was now available from National.

Tom Smith reported on Frequency Coordination. He has been busy with the move of the Woodward radio stations to their new location. Tom coordinated many wireless microphone frequencies on TV channel 68 for the NCAA golf tournament for ESPN at University Ridge Golf Course. Tom reminded everyone to fill out the frequency forms that he has sent out to the stations to help him coordinate for the market. Outdated frequency data has caused many headaches for him lately. Tom also wanted to remind everyone that channels 68 and 69 would not be usable soon due to reallocation of these frequencies.

National Liaison Leonard Charles reported that the membership drive is still on until May 31. Application for national awards will close on July 1. Charles also reported that SBE has filed the EAS comments. These comments take a more

(continued on next page)

## May Minutes (continued)

radical stance compared to what has been done before.

Sperry added that National has initiated a youth membership program to try to get more young people involved in SBE. They have been encouraging chapters to invite high schoolers to a meeting sometime during the year. Sperry also announced that the chapter was going to nominate the Broadcasters' Clinic as the seminar of the year, Leonard Charles as Engineer of the Year, the Chapter 24 Newsletter for newsletter of the year, and (after much discussion on the topic) Leonard Charles articles on EAS as Technical Article of the year.

Kevin Ruppert presented a letter from Steve Paugh suggesting the chapter participate in the University of Wisconsin Engineering Expo in 1999 by producing a demonstration of Digital Television. Those attending the meeting agreed that it sounded like a good idea to participate in this manner.

Sperry then introduced past member David Willow who was in attendance.

The official meeting was adjourned at 7:20 pm and was then turned over to Kerry Maki who introduced the program for the night, which was a tour of TDS Metrocom across the street from the restaurant.

*Submitted by Kevin Ruppert, Vice Chair*

### SONY

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## AMATEUR RADIO NEWS

*By Tom Weeden, WJ9H*

- New York City taxi operators who have been illegally using the 10 meter amateur band are beginning to move off the band and back to the 11 meter Citizens Band. Cabbies are allowed to have CB radios, but over the past decade, radios have been modified to operate outside the 40 allocated CB channels, and some drivers wound up in the 10 meter band. A crackdown by the New York City Taxi and Limousine Commission and the FCC is credited for the exodus from 10 meters. During mandatory quarterly inspections, the FCC visited and warned drivers with illegal radios that future violations could result in hefty fines. Initial inspections found that 98% of all taxi CB radios were illegal.

- The FCC has amended its rules to allow the public to file comments electronically via the Internet in many rulemaking proceedings, beginning in June. The Commission says its new Electronic Comment Filing System will allow the public to file, review and print documents on-line through the Internet, rather than having to rely on paper copies accessible through the FCC reference room or copy contractor.

- The Amateur Radio vanity call sign fee would drop under the FCC's proposed fiscal year 1998 fee schedule. When the vanity call sign program began, applicants paid \$30. The fee jumped to \$50 in September 1997. If the proposal is adopted, the new fee will be \$12.90 for the ten-year license term.

*(Excerpts from June 1998 "QST" Magazine)*

## Chapter Chair Update (continued)

authors for *Best Chapter Newsletter*; Tom Smith for *Best Frequency Coordination Effort*; Leonard Charles for *Broadcast Engineer of the Year* and Leonard Charles series of seven EAS articles in 1997 as *Best Technical Program or Article*. Thanks go out to Kevin Ruppert for writing a narrative to support Leonard Charles nomination for Broadcast Engineer of the Year and to Tom Smith for supplying support documentation for the nomination for Best Frequency Coordination Effort.

I look forward to the year ahead and the many projects that are ahead of us. For example, we plan to showcase

Chapter 24 and other area Chapter's history at this year's Broadcast Clinic SBE exhibit. So if you have any old pictures or correspondence from past years of the Chapter, please contact Kevin Ruppert. Another less enjoyable project is getting Chapter 24 incorporated which is at the top of my list. I promise this will get done before too long!

As always, please feel free to contact me if you have any suggestions or comments about the Chapter. I can be reached by e-mail at [fsperry@ecb.state.wi.us](mailto:fsperry@ecb.state.wi.us) or feel free to call me at (608) 264-9806.



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## Broadband Networks Part Twenty-One (continued)

As we've noted many times before in this series, coaxial cable exhibits much higher signal attenuation characteristics than fiber. As a result, amplifiers must be installed throughout the distribution system. Moreover, most broadband networks are designed to serve thousands of customers. These systems incorporate numerous passive devices — splitters, directional couplers, and taps — to generate the thousands of drops necessary to feed signals to the entire customer base. Although these devices are passive, they too contain electronic components.

In short, a broadband network contains thousands of electronic devices located outside of any building. All of these devices, along with the cable itself and the various structures which support it, collectively make up the "outside plant" of a broadband network.

### AERIAL PLANT

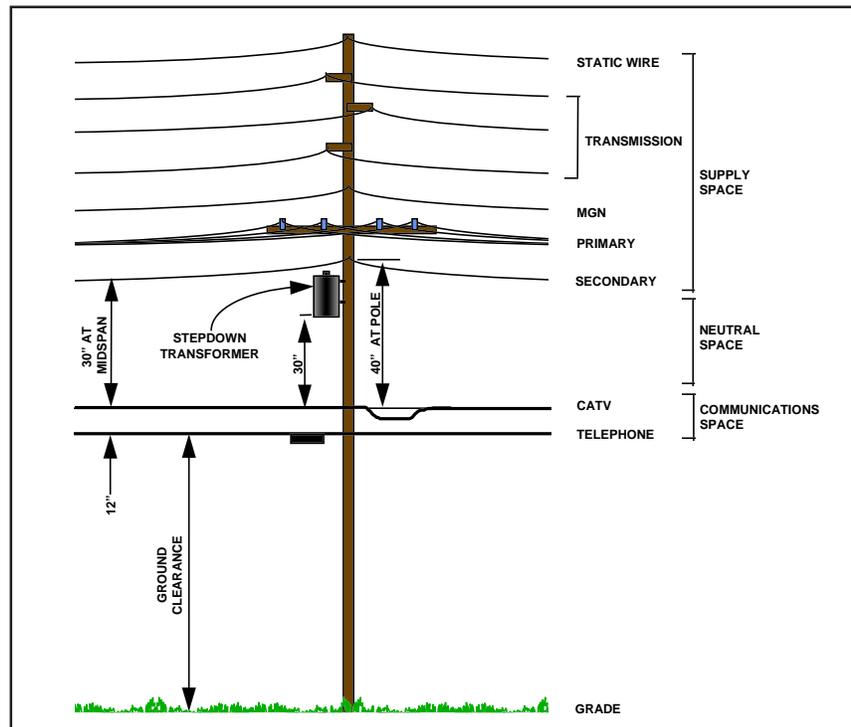
Outside plant falls into two broad categories: aerial and underground. Aerial plant is installed overhead, usually on utility poles. Underground plant is installed below ground level, either buried in direct contact with the soil or installed in some sort of protective structure such as plastic or concrete ductwork. In this article we'll take a look at aerial plant.

Most aerial OSP is supported on utility poles. Most poles are constructed of wood, although other materials are sometimes used. Steel poles are common in areas such as Pittsburgh where steel is produced locally (and steelworkers' unions have political clout). Concrete poles are often used in coastal areas, primarily because they are more resistant to heavy (hurricane-force) winds.

### ALLOCATION OF SPACE ON UTILITY POLES

A utility pole which supports multiple facilities is called a "joint" pole. Figures 1 and 2 illustrate the typical placement of facilities on joint poles within the United States.

(continued on next page)



**Figure 1.** Typical allocation of space on utility poles within the United States. Facilities located on this pole (starting at the top and working down) are:

- **Static wire:** a grounded wire at the very top of the pole intended to protect lower conductors from lightning.
- **Transmission:** three uninsulated conductors which carry 3-phase high voltage (typically 69 to 113 kilovolts) circuits among substations.
- **MGN (multi-grounded neutral):** a single uninsulated grounded conductor. The currents in the three phases of the transmission line are never quite equal; the MGN carries the residual unbalance current. At many poles, the MGN is physically grounded to a groundrod at the base of the pole.
- **Primary:** one to four uninsulated conductors, usually supported on a crossarm, which carry power from substations to pole-mounted stepdown transformers. Primary circuits may be single-phase or three-phase, and operate at 4 to 15 kilovolts.
- **Secondary:** one or two insulated conductors, accompanied by an uninsulated grounded neutral conductor. The secondary circuit (so named because it is fed from the secondary winding of the stepdown transformer) provides the standard 3-wire 115/230-volt electric service for residential and small commercial customers. Secondary conductors are usually twisted together in a bundle called "triplex," although older secondary lines may consist of three separate conductors.
- **Stepdown transformer:** an oil-cooled transformer which converts the primary voltage to the secondary voltage. Most stepdown transformers are designed for single-phase operation; if a three-phase secondary circuit is required, three physical transformers are mounted on the same pole.
- **CATV:** cable television facilities supported by steel strand. An expansion loop at each pole absorbs expansion and contraction caused by temperature variations.
- **Telephone:** copper telephone cables supported by steel strand. Each telephone cable contains several individual wire pairs; a large cable may contain as many as several hundred pair.

# Broadband Networks Part Twenty-One (continued)

The allocation of space on utility poles is governed by the National Electrical Safety Code (see Sidebar, page 7). The NESC divides a joint pole into four "spaces":

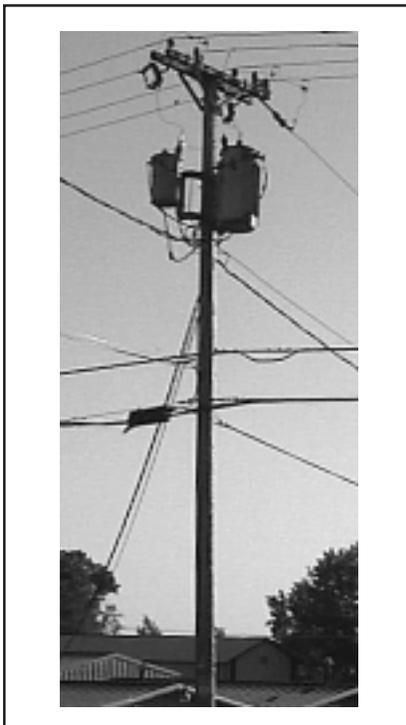
- The "supply space" is reserved for electric power transmission and distribution facilities. This space contains all devices related to the transmission and distribution of electrical energy: conductors, transformers, capacitor banks, and supporting devices. The supply space may contain several sets of conductors operating at different voltages; as a general rule, the higher the voltage, the higher the conductors are placed on the pole.

• The "communications space" is reserved for all communication facilities without regard to ownership or purpose. The most common facilities located here are telephone and cable television cables, although other circuits, such as municipally-owned communications and alarm circuits, may be present.

• The "neutral space" is the unused space between the lowest device in the supply space and the highest device in the communication space. This space is a safety zone: it provides clear headroom for communications workers working on communications facilities from ladders or bucket trucks. The neutral space must be maintained at each pole, and throughout the span of cables between poles. The exact dimensions of the neutral space are governed by the NESC and vary widely depending on the circumstances which prevail at any given pole. In general, the higher the voltage of the lowest electrical conductor, the wider the neutral space.

- Ground clearance is the space between the lowest communications device and ground level. The required clearance depends on the use of the underlying land; it varies from 9.5 feet for "spaces and ways subject to pedestrians or restricted traffic only" to 23.5 feet over railroads. Like other clearances, this clearance must be maintained at each pole and throughout the span of cables between poles.

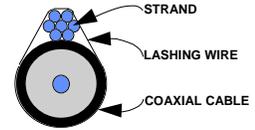
Broadband networks are always located in the communications space. The NESC does not specify the order in which various communications services are to be placed within the communications space; however, for historic reasons (it was there first), telephone networks are usually at the bottom and other networks are placed above it.



**Figure 2.** A real-world joint utility pole illustrating the typical placement of primary, secondary, cable television, and telephone facilities.

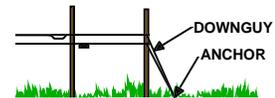
## STRAND

Most communications cables are "lashed" to steel supporting cables called "strand" or "messenger."

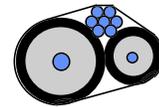


The strand is high-tensile steel, typically 0.25 or 0.375 inches diameter. It is placed under tension to control sag; tensions of several hundred pounds are typical, but may approach thousands of pounds for large multipair telephone cables.

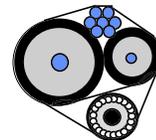
Tension is maintained at the ends of the strand, and at all corners, by "downguys" anchored into the ground:



It's possible for two or more cables to be lashed to a single strand:



It's also possible to "overlash" another cable onto an existing strand. Indeed, it's quite common these days for cable television operators to overlash a fiber optic cable onto an existing strand, resulting in a bundle that looks something like this:



Communications cables owned by different parties are usually spaced about 12" apart; this separation allows

(continued on page 6)

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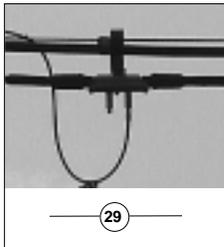
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# Broadband Networks Part Twenty-One (continued)

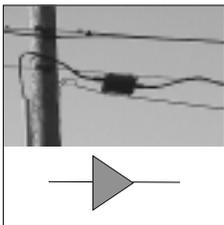
room for the lashing equipment used to lash the cable to the strand.

## ELECTRONIC EQUIPMENT

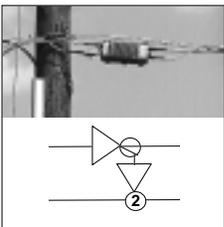
Most electronic equipment utilized in a broadband network is also supported by the strand. Amplifiers, line extenders, passive devices, power inserters, and taps are clamped directly to the strand (Figure 3). Seen in silhouette against the sky, a tap with one drop looks like this:



A line extender:



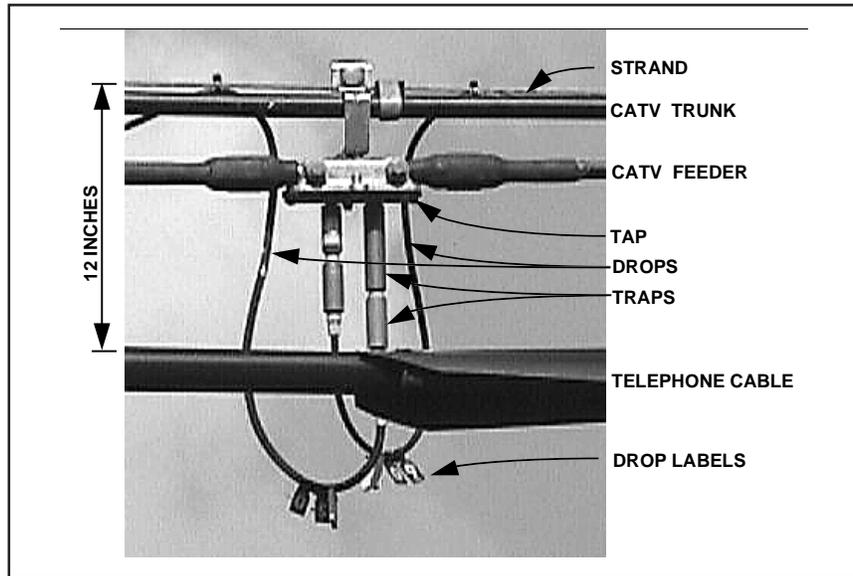
A trunk/bridger amplifier equipped with an internal two-way splitter to generate two feeder output ports:



Note that amplifiers and line extenders are always placed near poles. This placement makes it possible for technicians to reach them by climbing the pole or by placing a ladder against the pole.

## POWER SUPPLIES

Unlike other electronic devices, power supplies are not supported by the strand: they are simply too large



**Figure 3.** A typical tap. Note that the drops are connected to the tap through “traps.” Traps are notch filters used to control access to premium video services such as HBO and Showtime.

and too heavy. Instead, they are installed on the side of the pole, in the ground clearance space below the communications space (Figure 4).

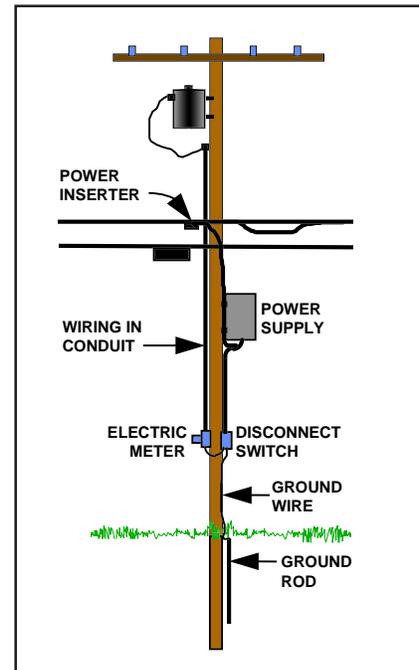
Power supplies are also unique in another respect: since they consume electricity, they must be electrically connected to the power company’s secondary power wiring. The wiring for this connection is subject to the National Electrical Code as well as the NESC; accordingly, it must comply with all requirements that would apply to the wiring in buildings. In many jurisdictions, this wiring is even subject to the same permitting and inspection requirements that apply to building wiring (on more than one occasion, I’ve had to delay turning on a cable TV system until the local building inspector could inspect the power supplies).

From the point of view of the electric utility company, a power supply is just another customer hookup. Some utilities (Alliant; Sun Prairie Water & Light) require an electric meter at each power supply; other utilities (MGE; Columbus Water & Light) charge on a flat-rate per-hookup basis.

Power supplies aren’t the only devices subject to these requirements however: any device located on a pole

anywhere below the supply space must comply with NEC if it is wired to the secondary conductors in the supply space. Thus, such devices as streetlights, traffic signals, and outlets

(continued on next page)



**Figure 4.** Typical power supply wiring. All wiring between the power transformer and the power supply is subject to the National Electrical Code.

# Broadband Networks Part Twenty-One (conclusion)

for Christmas decorations must comply with NEC. Figure 5 illustrates an extreme example: a pole with three devices in the ground-clearance space.

Next month we'll take a look at underground OSP.

## TWO CODES: NESC AND NEC

Outside plant located in the United States is governed by two codes: the National Electrical Safety Code (NESC) and the National Electrical Code (NEC). Despite the similarity in names, they are distinct codes, each with a different purpose.

The National Electrical Safety Code is published by the Institute of Electrical and Electronics Engineers (IEEE), and governs all electrical facilities placed in public rights-of-way. Its primary concern is the safety of workers working near electrical facilities, as well as the safety of the general public.

With minor changes, the NESC is incorporated into the Wisconsin Administrative Code as Wisconsin Electrical Code Volume I, and is enforced by the Public Service Commission.

This code applies to all electrical facilities placed on public roadway rights-of-way without regard to ownership or purpose. It also applies to electrical facilities placed

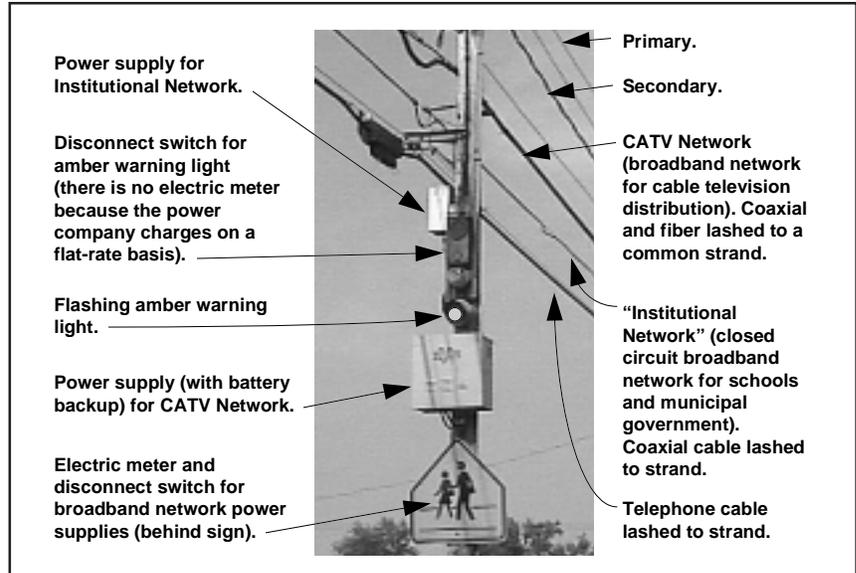


Figure 5. A pole with three electrical devices in the ground-clearance space: a power supply for the cable television network, a power supply for an institutional network, and a traffic warning signal.

on utility poles located on private property.

The National Electrical Code is published by the National Fire Protection Association (NFPA), and governs all electrical facilities placed inside buildings. Although it deals extensively with electrical safety issues, its original purpose was fire prevention, and that remains its primary purpose today.

With minor changes, the NEC is incorporated into the Wisconsin Administrative Code as Wisconsin Electrical Code Volume II. It is enforced jointly by the Department of Commerce and by local county and municipal governments as part of their normal building permitting and inspection procedures.

Electrical wiring installed on utility poles below the supply space must comply with the requirements of both the NESC and the NEC.

## LAST U.S. TV MAKER GONE

By Tom Smith

The New York Stock Exchange suspended the trading of Zenith Electronics Corp. stock on May 22nd. Zenith's assets fell below that required by the NYSE for its stock to be traded. Zenith said it planned to file for bankruptcy and become part of LG Electronics of South Korea. Zenith has been profitable for only one quarter since 1985, but they hold a number of patents for the VSB modulation system for the U.S. DTV system.

From the WISCONSIN STATE JOURNAL

### Chapter 24 World Wide Web Site

<http://www.sbe24.org>



Steve Paugh is the editor for the HTML Version of this Newsletter, available monthly on the SBE Chapter 24 web page.



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## **Emergency Alert System Firsthand**

*Compiled by Paul Stoffel*

- Kirk Wesley wrote a Windows software program called EAS Watch which allows the user to keep both electronic and printed logs detailing the events that have been received and transmitted by the Sage Endec. The program has a fixed baud rate of 9600. I am using the Endec's serial port #6. The one way data arrives at Vilas Hall to my office computer via a spare microwave subcarrier from the TOC. The EAS Watch program is available for free.

- An e-mail on the Wisconsin SBE listserver: "Harris said the Sage Endec planned ahead and is year 2000 compliant." A TFT's News Release, dated May 18, announced the EAS911 series will accommodate the rollover to the year 2000.

- SBE EAS Committee Chair Leonard Charles and Neal McLain, Communications Technologies Incorporated, are scheduled to speak at the Wisconsin Broadcasters Association Summer Engineering Workshop on July 15 in Green Bay. Chuck and Neal will be discussing EAS and Cable Television issues.

Additional Cable-TV EAS information can be found at the SBE's EAS Committee web site: "SBE Comments to Second Further Notice of Proposed Rulemaking concerning Cable EAS Issues" and "Cablevision Systems Corporation Submits Comments to Second Further Notice of Proposed Rulemaking concerning Cable EAS Issues" and "Small

Cable Business Association (SCBA) Submits Comments to Second Further Notice of Proposed Rulemaking concerning Cable EAS Issues."

- I downloaded the updated ENDEC manual which was in PDF format from the Harris web site (1.7MB, 110 pages). It has all of the commands, through version 5.88 included. I also ordered from Harris the Endec Technical Reference Manual and Receiver Service Manual.

- From Harold Price: For what it is worth, here are my comments on logging requirements. First, I think the issue of logging will be fully addressed in the upcoming 3rd Report and Order. Second, people have made two good cases, one to log everything, and the other to log the required items. The required items are the "tests" (weekly and monthly), EAN and EAT, and anything you transmit.

The ENDEC allows both interpretations. If you have "menu.config.print all alerts" set to yes, you'll print anything that comes in that you have a filter for, and by default you have the "others" filter that will include everything. If you have print all alerts set to NO, you'll print receiving EAN, EAT, RWT, RMT, and anything you transmit.

- The Madison-area Radio Shacks say their SAME compatible Weather Radios (\$80) are sold out and won't be available until later this summer. (This seems to be true nationwide.) So much for my Father's Day present!

### **SBE SHORT CIRCUITS**

*By John Poray,  
SBE Executive Director*

#### **RESUME SERVICE OPENS JULY 1**

The Board of Directors recently approved the creation of a resume service for members. Beginning July 1, SBE members, at no charge, will be able to submit five copies of their resume to the SBE National Office. These will be placed on file, noting individual preferences for job location and type. Prospective employers, for a fee of just \$25 to help cover

administrative costs, can request resumes from SBE that meet the qualifications for the position they have available. From that point, the job search and selection process is between the candidate and the employer. SBE members are invited to submit their resumes before July 1. Completing a simple fact sheet is required. Just contact Teresa or Scott at the SBE National Office and one will be sent to you.

For Sale: Two 8' Andrew Solid parabolic dishes with radomes. Make an offer. Dennis Baldrige, Baldrige Communications 608-489-3999

## **WBA Scholarship Offered**

Chapter 24 is offering one scholarship to the Wisconsin Broadcasters Association Engineering Workshop, taking place July 15 at the Radisson Hotel in Green Bay, WI. The scholarship will be awarded on the basis of the following criteria and maximum number of points accumulated:

- 1) Must be a current member of Chapter 24.
- 2) Attendance at 6 of the 12 meetings prior to the July 2 application deadline.
- 3) Employment in or a student of a broadcast related field.
- 4) Must have SBE National dues paid for the current year.

Points will be assigned as follows:

- a) 5 points for each month applicant has at least one article published in the Chapter 24 newsletter spanning the 12 issues prior to the July 2 application deadline.
- b) 5 points for certification, any level.
- c) 2 points for each monthly meeting attended in excess of the 6 required.

In the case of a tie, final selection will be by the elected officers of Chapter 24 or by a committee appointed by those officers, excluding any whom may have applied. If more than one applicant, an alternate will also be selected based on the second highest number of points. The scholarship winner will be required to write a summary article to be published in the chapter newsletter.

The scholarship recipient will receive \$150 to cover the conference registration fee along with one night lodging at the hotel.

Applications should be in the form of a letter which is signed, dated and received no later than July 2, 1998. Please send the application to Kevin Ruppert at the following address:

Kevin Ruppert  
WISC-TV  
7025 Raymond Road  
Madison, WI 53719

## TELECOM INDUSTRY NEWS

By Neal McLain

### RECENT POLE-ATTACHMENT CASES: GENERALLY FAVORABLE TO COMMUNICATIONS COMPANIES

In recent months, several legal cases have come before various governing bodies which seek to alter the existing relationships between pole owners (typically electric utility companies) and the communications companies which attach facilities to utility poles. These cases have resulted from attempts by pole owners to extract more revenue from the attaching companies, or to restrict their operations.

The decisions in these cases have generally been favorable to the communications companies. In this article, we'll review the current situation, take a look at some of the issues raised by these cases.

#### BACKGROUND

Communications facilities owned by cable television operators and telecommunications (telephone) carriers are frequently attached to joint utility poles. A related article in this issue of the Newsletter (BROADBAND NETWORKS PART 21) describes the physical appearance of these facilities.

The legal and business relationships behind such joint-use arrangements are often as complicated as the poles themselves.

In the most common situation, the poles are owned by the electric power company, and the owners of other facilities rent attachment space. Rental rates are usually regulated by some agency of government. In most cases, the regulating agency is the state

government's utility-regulatory commission (such as the Wisconsin Public Service Commission); however, the FCC itself regulates cable television attachments in states which do not choose to do so.

Under FCC regulations, rental rates are based on factors which are directly attributable to the attachment. These factors include the power company's actual costs for owning and maintaining the pole, the total amount of usable space on the pole, and the percentage of the usable space actually occupied by the communications facilities. Typical rental rates range from \$4 to \$8 per pole per year.

These rental fees are supposed to reimburse the power company for costs which result from the presence of the communications attachments. There's no question that communications attachments actually do increase a power company's costs:

- **Physical load:** Communications attachments place an additional physical load on the pole, and may lead to premature failure of the pole.

- **Access restrictions:** Communications attachments clutter the airspace around the lower part of the pole, making it more difficult for power company workers to reach power distribution facilities. Imagine the difficulty of maneuvering a bucket truck through a thicket of cable television and telephone drops leaving the pole in many different directions.

- **Insurance:** Power companies often face increased liability insurance rates simply because employees of other companies are working on their poles near their electrical facilities.

- **Administrative costs:** Communications attachments require the time and attention of power company OSP engineers on an ongoing basis. Simply keeping track of which communications carriers are attached to which poles is a nightmare in itself. Moreover, every change to the facilities on any pole must be coordinated with the owners of all communications attachments.

- **Tax consequences:** The rental fees themselves must be booked as revenue on the power company's books. As such, they cascade through the power company's entire financial accounting system, and may result in higher income tax obligations.

Note that an underlying principle is evident here: the pole-attachment rental rates paid by communications companies to power companies are based on costs which are directly attributable to the physical attachment. Significantly, the rental rates are not in any way tied to the type of signal being carried by the communications carrier, or to the revenue which the communications company derives from its facilities.

In recent years a number of power companies and other pole owners have tried to alter this arrangement in an attempt to extract additional revenue from communications companies or to restrict their operations. Following is a summary of three significant cases.

#### **MARCUS CABLE ASSOCIATES V. TEXAS UTILITIES ELECTRIC COMPANY**

Texas Utilities Electric Company (TUEC), an electric utility company based in Dallas, has attempted to impose a number of new requirements on cable television companies which provide (or

(continued on page 10)

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## Telecom Industry News (continued)

plan to provide) telecommunications services such as telephone service or internet access. TUEC has attempted to require, among other things, the following:

- Cable operators may not lease fiber capacity to other telecommunications companies without TUEC's permission.
- Cable operators must disclose to TUEC the identity and location of customers subscribing to non-video services.
- Cable operators must pay an additional pole-attachment rental fee (above and beyond the rate derived from the FCC's pole-space formula) based on the revenue received from the provision of non-video services.

Marcus Cable Associates, a cable television operator owning facilities attached to TUEC's utility poles, appealed the matter to the FCC. The FCC's Cable Services Bureau ruled against TUEC, and invalidated all provisions of TUEC's pole attachment agreements which seek to regulate Marcus' non-video business or to extract additional fees based on Marcus' non-video revenues.

In its order, the FCC noted that TUEC was planning to enter the telecommunications business itself. The FCC noted the requirements "appear to be an attempt by TUEC to interfere with the provision of telecommunications services by a potential, or actual, competitor."

### GULF POWER V. UNITED STATES

Gulf Power, an electric utility company based in Pensacola, Florida, challenged the government's authority to require pole attachments in the first place. This case has just started making its way through the courts; it will probably go all the way to the United States Supreme Court before it's finally resolved.

The first round has been heard in the United States District Court for the Northern District of Florida. In its argument, Gulf asserted that Section 224(f) of the Communications Act (enacted as part of the Telecommunications Act of 1996) constituted a "taking" of Gulf's property and was, accordingly, in violation of the so-called "takings" clause of the Constitution ("...nor shall private property be taken for public use without just compensation." Amendment V, United States Constitution).

The government, supported by the telephone and the cable television industries, argued that utility poles are a "unique form of property that would not exist but for the power of eminent domain borrowed from the government. Because of their unique origin through government cooperation, the poles, conduits, and rights-of-way carry a heavy public interest obligation for the utility owners, including the obligation to make those poles and rights-of-way available to others."

The court rejected Gulf's arguments and ruled for the government. It noted that the takings clause includes the words "... without just compensation," and agreed that the law provides for just compensation through the FCC rate formula.

### VARIOUS CABLE COMPANIES V. AMERITECH NEW MEDIA

Ameritech New Media (ANM), a division of Ameritech, is engaged in the business of providing cable television service within Ameritech's telephone service territory in Illinois, Indiana, Michigan, Ohio, and Wisconsin. ANM provides this service under Title VI of the Communications Act of 1934 as amended, the portion of the Act which governs cable television service generally.

ANM has constructed several cable

television systems in Illinois, Michigan, and Ohio. Most of these systems are "overbuilds": they are franchised cable television systems operating within the same franchise territories as existing ("incumbent") cable television operators.

In many of ANM's franchise areas, it attaches its video distribution facilities to poles which already support the cable facilities of incumbent cable television operators and the telephone facilities of Ameritech-the-telephone-company.

A number of Ohio incumbent cable television operators have complained to the Public Utilities Commission of Ohio (PUCO) alleging that Ameritech (the telephone company) has treated ANM more favorably than it has treated incumbents. Among the allegations:

- Ameritech allows ANM to attach its video distribution cables below Ameritech's telephone cables.
- Ameritech allows ANM to use "standoff" brackets which offset ANM's cable horizontally (thus saving the cost of rearranging other facilities on the pole).
- Ameritech allows ANM to install its cables with less midspan clearance.
- Ameritech has allowed ANM to install its facilities in violation of NESC requirements.
- Ameritech charges ANM lower attachment rental fees.

PUCO ruled in favor of the incumbents on all of these issues. It found Ameritech's pole attachment practices "unjust and unreasonable and discriminatory" under the Ohio pole-attachments law. It also ruled that any unaffiliated Ohio cable operator attaching its facilities to Ameritech's poles must be charged the same rate that Ameritech charges ANM.



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 **LOCAL LEGALS**

Compiled by Tom Smith

**PROPOSED**

**WDDC (FM) 101.1 mhz  
Portage, WI.**

Kramer Broadcasting Inc. seeks a construction permit to change height above average terrain and effective radiated power. Announced on April 24, 1998

**WMSN (TV) Channel 47  
Madison, WI.**

Sullivan Broadcasting Company Inc. seeks to voluntary transfer of control to Sinclair Broadcasting Group Inc. Announced on June 3, 1998

**WZEE (FM) 104.1 mhz  
Madison, WI.**

Central Star Communications Inc. has filed an application to change effective radiated power, height above average terrain and transmitter location. Announced on June 4, 1998.

**GRANTED**

**WHPN (TV) Channel 57  
Janesville, WI.**

TRP Communications Inc. has been granted a change in it's construction permit to change antenna location to 5.6 km NNW of Footville, WI at the coordinates of 42-43-40 / 89-13-55. The station is authorized to operate with 5000 kw ERP with a HAAT of 340 meters and a tower height of 340 meters. The antenna is a Dielectric TRU 35 EBT-R08. Action was approved on May 28, 1998.

From FCC notices ( [www.fcc.gov](http://www.fcc.gov) )

**Employment Opportunity**

**UW-Platteville; Television Services**

Wisconsin Residency is not required for this position. Starting pay is \$12.99 per hour plus excellent fringe benefits. This position is included in the Technical Bargaining Unit.

**Job duties:** Perform technician and maintenance engineer duties for the campus FM radio station, CATV system, video/audio equipment; perform electronic maintenance on audiostudios, related professional audio equipment, FM transmitter, and audio broadcast chain; maintain broadband RF CATV distribution system, amplifiers, underground and building wiring, and related equipment; perform electronic maintenance on VHS and SVHS format video camcorders, U-matic and U-matic SP videotape recorders, VHS and SVHS recorders, video monitors, audio and video distribution equipment, public address/classroom audio systems, high-resolution video projectors and related equipment, maintain records necessary to the needs of the job.

**Knowledge Required:** Proven repair skills and component level troubleshooting; FCC General Class license and/or Society of Broadcast Engineers (SBE) certification. Well qualified candidates will have a BS in Radio/TV Broadcasting/Engineering, advanced computer skills, and experience performing similar duties.

To request special application materials, contact Kathleen Kelley, Personnel Director, UW-Platteville, 1 University Plaza, Platteville, WI 53818; (608)342-1176. Completed applications and examination materials must be received by June 19, 1998 to be considered for this position. Materials will be evaluated and the most qualified individuals will be invited to participate in the next step of the hiring process.

**CHAPTER 24  
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**RECENT RENEWALS:**

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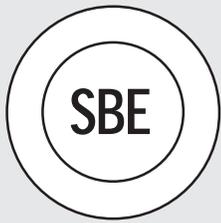
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Contributors this month: Neal McLain, Kevin Ruppert, Tom Smith, Fred Sperry, Paul Stoffel, and Tom Weeden.

Thanks to Chris Cain for his work on the Chapter 24 WWW page.

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# JUNE MEETING and PROGRAM



**Society of Broadcast Engineers  
CHAPTER 24 MADISON, WISCONSIN  
Monday, June 15, 1998**

## **WKJG-TV/NBC 33 Remote Production Truck Facility Tour**

**This month's program will feature a tour of the WKJG-TV remote truck. Stephen Buyze, Operations Director for WKJG-TV (Ft. Wayne, IN), will be on-hand to give us a tour of the NBC 33 mobile facility.**

**Dutch Treat Dinner and Meeting  
at Houlihan's at 5:30pm  
1262 John Q. Hammonds Drive**

**Program at 7:00pm  
at the Marriott - Madison West  
1313 John Q. Hammonds Drive  
(formerly the Holiday Inn West)**

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

### **1998 UPCOMING MEETING/PROGRAM DATES:**

<b>Day</b>	<b>Date</b>	<b>Program</b>
Thursday	July 23	Annual Chapter 24 Picnic
Tuesday	August 18	To Be Announced

Program Committee:	Kerry Maki 833-0047	Denise Maney 277-8001	Steve Zimmerman 274-1234	Mark Croom 271-1025
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