

HDTV

What's in it for Us?

by Kevin Ruppert, WISC-TV

Over the last few months, I have been reporting from articles in the broadcast trade press on the development of what is commonly referred to as HDTV, or High Definition Television. There have been many stops and starts along the road to a standard, specifically a terrestrial broadcast standard, for HDTV.

By now, we were supposed to have a standard selected. At the writing of this article, we do not. What we do have, however, is a better understanding of what broadcast HDTV will be like, and a much better understanding of how it can be implemented in an economical fashion.

Many people in the industry believe that NTSC will be around for a long time. The sets in use, and the rest of the broadcast infrastructure, will not be turned obsolete overnight.

While so much was being said about "high end" HDTV production, what about those of us who are not at that "high end." What about the small and medium market TV stations? What can we be doing now to prepare for HDTV? With the NAB convention coming up soon, what can we be looking for to make sure that we are ready for the future of broadcast television?

Attendees to the NAB convention will see hardware that can be used for NTSC now and can be used later for 525 widescreen recording. You will see a trend towards component digital recording that will enable a local station get its feet wet in high definition if they choose to while still using the same equipment to generate income in NTSC.

Dick Strauss of Sony Electronics told me that his company believes small stations will not be able to afford to originate true HDTV production at first because it will be too costly. Sony

Continued on page 3

FIBER OPTIC OSP

Part 2 - ROUTE SELECTION FOR OVERHEAD FIBER OPTIC OSP

by Neal McLain
Communication
Technologies, Inc.

This is the second in a series of articles about Fiber Optic Outside Plant. This article will be devoted to the process of selecting the best route for fiber OSP to be installed in the "communications space" of existing utility poles.

THE COMMUNICATIONS SPACE OF A UTILITY POLE

As we noted in the previous article, the "communications space" of a utility pole is the portion of the pole devoted to communications facilities. Communications facilities include telephone and cable television; in some cases, additional facilities for fire alarm, police alarm, traffic-signal control, or general-purpose data transmission may be present.

The communications space may occupy the entire pole or a portion of the pole. If supply (electric power) and communications spaces are both present on the same pole, it's called a "joint" pole, and the communications space is below the supply space.

New fiber facilities can be placed in the communications space of existing poles if three conditions are met:

- There must be sufficient space on the poles along the desired route.
- Permission must be obtained from the owner of the poles
- Permission must be obtained from owner of the underlying land.

Selecting the best route involves consideration of all of these conditions. We will discuss the first issue — space on the poles — in this article. The remaining issues—permission of the pole owner and the landowner — will be discussed in future articles.

FEBRUARY MEETING

Wednesday, February 23

DINNER: Shakey's West
714 Gammon Road
(5:30p.m.)

MEETING (7:00 p.m.)
and
PROGRAM (7:30 p.m.)
at WISC-TV
7025 Raymond Road

"Phone System
Maintenance"
Presenter:
Stan Scharch

IN THIS ISSUE

January Meeting Minutes.....	page 2
Amateur Radio.....	page 4
Radio News.....	page 4
National News.....	page 5

ALLOCATION OF SPACE ON POLES

The allocation of space on utility poles is governed by the National Electrical Safety Code (NESC). The NESC governs all electrical facilities installed in public rights-of-way (*). It is published by the Institute of Electrical and Electronics Engineers, and is recognized as an American National Standard. The NESC is revised every three years; the most recent edition is dated 1993. With minor changes, the NESC is incorporated into the Wisconsin Administrative Code as Section PSC-114.

Figure 1 shows a hypothetical (but not unusual) situation involving two joint poles and the intervening cable span, as it would exist before attempting to add a new fiber cable.

Continued on page 6

CHAPTER 24 OFFICERS

CHAIR:

Leonard Charles (WISC-TV)
W - 271-4321
H - 274-0041

VICE-CHAIR:

Fred Sperry (WI Public TV/TOC)
W - 264-9600
H - 833-6074

SECRETARY:

Kerry Maki (WMSN TV)
W - 833-0047
H - 835-5195

TREASURER:

Paul Stoffel (WI Public TV)
W - 263-2175
H - 241-4621

COMMITTEE APPOINTEES

Program Committee:

Mark Croom	271-1150
Denise Maney	277-8001
Kerry Maki	833-0047
Steve Zimmerman	274-1234

Membership: Leonard Charles

Sustaining Membership: Stan Sarch

Strategic Plan: Dennis Behr

Special Events: Kevin Ruppert

Certification and Education:

Jim Hermanson (Past-Chair)
Tim Trendt, Platteville

Freq. Coordinator: Tom Smith
work 608-263-2174
home 608-837-2729

Chapter Liaison: Steve Peck 608-246-9797

SBE National Vice-President & Liaison:

Terry Baun (Chapter 28 Milwaukee)
414-449-5300 (voice)
414-449-5380 (fax)
414-873-7807 (BBS)

January Business Meeting Minutes



Chapter 24 of the Society of Broadcast Engineers met on Tuesday January 18, 1994 at the studios of WMTV-TV in Madison for its regular monthly meeting. The total attendance of the meeting was 18. All 18 were SBE members, 15 who were certified.

Chair Leonard Charles called the meeting to order at 7:20 PM. Leonard announced that this year is the 25th anniversary for Chp. 24. The minutes from the December meeting were approved as printed.

Treasurer Paul Stoffel reported the Chapter's account balance. Sustaining Membership Chair Stan Sarch welcomed Mark Ross of Dynatech Video Group as the newest Chapter 24 sustaining member. This brings the total sustaining membership to 24.

Program Committee Chair Steve Zimmerman and Special Events Coordinator Kevin Ruppert had nothing new to report.

Frequency Coordinator Tom Smith reported that frequency coordination activity had increased this past fall due to Badger Football. In other local activity, Tom mentioned that he recently coordinated a STL frequency for a new FM station due to go on the air in Adams-Friendship. Tom also mentioned that he had received a copy of a FCC Public Notice from the National regarding Grants for Broadcast Auxiliaries. This notice is available on the National BBS.

Chair Leonard Charles mentioned that the Chapter 24 Executive Committee had recently met with Don Borchert regarding the Chapter's future involvement with the Broadcaster Clinic. Leonard then mentioned that the program committee for this year's WBA Summer Conference and Engineering Seminar met recently. Anyone interested in becoming involved in this event can contact Chris Cain at WISC-TV who is Chapter 24's representative on the WBA Planning Committee.

There was no old business.

In new business, Chair Leonard Charles mentioned that he was in the process of forming the 1994 Nominations Committee for this April's elections. Contact Leonard if you would be interested in serving on this committee.

The meeting adjourned at 7:30 PM. At this time, Program Chairman Steve Zimmerman presented Tom Weeden from WMTV-TV and Rich Wood from Skyline Communications who gave a presentation on the recent antenna change-out at WMTV-TV.

Following the program, Certification and Education Chair Jim Hermanson presented Chapter member Mike Kulis with a Television Broadcast Engineer Certificate.

—Fred Sperry, Vice Chair



Chapter 24 BBS
608-277-5239
Chris Cain, Sysop

Leonard Charles is the editor for the Electronic Version of this Newsletter uploaded monthly onto the Chapter 24 BBS.

dynatech

MARK ROSS
General Project Manager
D²S²DigiStore

6400 Enterprise Lane
Madison, WI 53719

Phone: 608-276-4680
Fax: 608-276-4684



HDTV*Continued from page 1*

thinks that locals will start their origination on the 525 widescreen format. Sony now has the equipment needed to do this kind of origination. Their Digital Betacam machines are digital component recorders and can be used now for NTSC production as well as being able to play back existing Betacam analog recordings. Later, they can be used for 525 widescreen production.

The direction that the major networks are heading often gives stations a direction for their future planning. PBS is in the middle of a major facilities upgrade with a goal of all digital distribution by the middle of 1995. In order to do this, they are constructing an "inter-format" room that will allow them to dub C, D-2 and D-3 tapes to D-3. PBS is also purchasing a large number of Panasonic D-5 machines which they say will help them phase in their all digital satellite transmission plan. D-5 is a component digital format. The D-5 machines also have composite outputs, and play back D-3 tapes as well.

On the "high end" of video recording, the latest entry into the "format wars" is the DCR6000 gigabit recorder from BTS. It is called the first high-definition cassette recorder to comply with the brand-new SMPTE D6 standard. According to the trade press, the main reason for buying a D-6 machine would be for archiving film masters to an HD digital format, although the DCR6000 can also be used for applications in post production and other areas.

Lastly, in video recording news, we have heard that the last manufacturer of 2 inch quad video tape, Ampex, has finally pulled that product from its line. It is, indeed, the end of the longest dynasty in video recording history!

Next month, more on bit reduction techniques and how to come to terms with the video quality.

(excerpts from **TV Technology** and **Broadcast Engineering** magazines)

Tower Erectors Antenna Specialists

SKY LINE
Communications Ltd. Madison, WI

RICHARD WOOD
PRESIDENT

BROADCAST
MICROWAVE
LAND MOBILE

1965 WEST RIDGE ROAD P.O. BOX 51
COTTAGE GROVE, WI 53527 (808) 839-4075

2nd Annual Platteville Symposium

The Department of Communications at the University of Wisconsin at Platteville is finalizing plans for the second annual symposium on "The Future of Broadcast Entities" scheduled for April 13, 1994.

The symposium steering committee has targeted the following five areas for this year's "talk and chalk" sessions:

1. Interactive TV
2. Multimedia
3. Corporate Communication Delivery Systems
4. Resource Management
5. Post Production Direction

Look for a program brochure and registration package in late February/early March. It is also not too late to offer suggestions for this year's program or ideas that might expand the scope of the symposium.

—Jack O'Neill
Professor of Communications

Milwaukee
Madison
Chicago

**VIDEO
IMAGES**

Jim Braun
District Sales Manager

Video Images, Inc.
2137 S. Stoughton Road Madison, WI 53716-2851
(808) 221-8888

**CTI
COMMUNICATIONS
TECHNOLOGIES INC.**

8213 MIDDLETON SPRINGS DRIVE
MIDDLETON, WISCONSIN 53562-2773

808/831-4636
FAX 808/836-1848

CONSULTING ENGINEERING FOR THE BROADCASTING
AND CABLE TELEVISION INDUSTRIES

DICK GALL NEAL McLAIN

Ned White
Branch Manager

ROSCOR

Roscor Wisconsin
11350 W. Theodore Trecker Way
West Allis, Wisconsin 53214
Phone: 414-478-2800
FAX: 414-478-4949



Local Legals

compiled by Tom Smith

Transfers:

Applications

WHIT (AM)/WWQM-FM Madison, WI, 1550 Khz, 5Kw daytime only/106.3 Mhz, 4.5 Kw at 380 ft. Sold by Media Capital of Madison Inc. (Thomas J. Buono, Michael B. Hesser, P. Richard Zitelman and John Sandvig) to Enterprise Media Partners Inc. (Edward G. Rogoff) for \$5.625 million. Sellers have no other broadcast interests. Buyers are waiting for the FCC to approve their purchasing of WMRV-AM/FM Binghamton and WBNR (AM)/WSPK-FM Beacon, both in New York State.

Actions:

Facilities Changes

WTMJ-AM Milwaukee, 620 Khz. FCC granted application to increase power to 50 kw day, 10 kw night and move transmitter to South Raynor Avenue and Church Road in the Town of York in Racine County near Union Grove. Announced Dec. 1, 1993.

COMARK

Jim Rogers
Western Regional Sales Manager

Western Office TEL: (619) 748-2151
12612 Araban Way FAX: (619) 748-1879
Poway, CA 92084 C-Serve: 70410,2032

a THOMSON - CSF Company

BTS

A PHILIPS AND BOSCH COMPANY

Steve C. Peck
Regional Sales Manager

Broadcast Television Systems, Inc. Direct (808) 246-9797
10600 W. Higgins Rd., Suite 500 Main (708) 803-6060
Rosemont, IL 60018 FAX (808) 246-8283

AT&T - PANASONIC - S.W. BELL
TELEPHONE SYSTEMS

Scharch Electronics Company

1105 Middleton Street
Madison, WI 53717-1078
608-831-2266

Stan Scharch

AMATEUR RADIO NEWS

by Tom Weeden, WJ9H

● After a five year hiatus, amateur radio operator licenses will again be expiring. In 1989, the FCC extended the license term from five years to ten. Because of this, no licenses have expired between 1989 and 1994. FCC suggests that amateurs file renewal applications at least 60 days prior to expiration. Timely filed applications allow operation past the expiration date, even if the renewed license is not issued in time. Operators who file renewals after the expiration date must stop operating until the new license is issued, although the "grace period" to renew is two years after expiration.

● The New Jersey Department of Environmental Protection and Energy (DEPE) issued a proposal in late December to register and assess fees for sources of non-ionizing radio-frequency radiation. The new rule would allow the state to assess fees on RF sources such as satellite earth stations, navigation and radar sources, and commercial microwave heaters. The February edition of QST Magazine doesn't mention if broadcast stations would be affected, but amateur stations would not be assessed at this time. The proposal does say that "at some point in the future, the Department may study the feasibility of requiring the registration of Amateur Radio sources." American Radio Relay League General Counsel Chris Imlay (also SBE General Counsel) said that "Section 301 of the Communications Act assigns the FCC exclusive jurisdiction in the licensing of radio transmitters; that leaves no room by law for a state licensing program of amateurs." A public hearing on the proposal had been scheduled for January 11.

● A local radio show on Amateur radio went nationwide on November 28. "Ham Radio and More" on KFNN/Phoenix is nontechnical and intended to appeal to both licensed amateurs and the general public. Well-known amateurs are guests on the show, which runs two hours locally, but lasts one hour on the national version. The program airs Sundays at 6 PM EST and can be heard via Satcom C5, transponder 19, audio 6.0 MHz.

(from February 1994 QST Magazine)

Radio News

Mark Croom, WNWC-FM

● On December 3 the Federal Communications Commission released, by public notice, a list of AM stations showing the order in which the FCC will attempt to find expanded band frequencies for those stations. The stations have been ranked in order of their interference improvement factors. The improvement factor defines the reduction of interference in the existing AM band if the station migrates to the expanded band.

● The NRSC's high-speed FM Subcarrier Committee is seeking proposals for a national FM data broadcasting standard. Such a standard would expedite the development of data broadcasting services by existing stations. The proposed high-speed subcarrier standard will be compatible with the recently adapted U.S. RBDS standard and should provide broadcasters, equipment makers, and data service providers with a transparent data pipeline suitable for data broadcasting to both fixed and mobile environments, including automobile and hand-held receivers.

● On January 13, NAB hosted a forum on AM directional performance verification with a view to arriving at a consensus on the best ways to improve AM directional antenna performance verification based on new or revised FCC rules. The existing AM directional rule structure has been in place since 1939. Potential benefits for broadcasters of changes in FCC rules on proofs might be reduced burden and expense in the performance of antenna field measurements, or proofs. In 1993, the Commission issued a Notice of Inquiry into policies and rules regarding antenna performance verification in AM arrays. NAB has filed comments in this proceeding, and is continuing to seek ways to bring consultants and broad-

casters together to influence the FCC on this matter. The NAB forum produced a consensus on two matters: (1) The Commission's AM directional rules should be updated; and (2) the techniques of computerized antenna modeling are viable for certain directional arrays. If a policy were adopted allowing the use of computer modeling to replace some or all field measurements of AM directional arrays, then it is likely that more stringent rules would be applied for AM antenna monitoring devices and sampling systems. Stay tuned... It should get interesting!

(Information from NAB Radio TechCheck, RadioWeek, and Radio World)



Odetics BBS On-line

Odetics Broadcast, Anaheim, CA, has started a computer bulletin board service (BBS). The BBS offers technical support to Odetics customers and can be reached by calling 714-772-7738.

27
WKOW
 MADISON
 (608) 274-1234
 Fax# (608) 274-9514
 5727 Tokay Boulevard, Madison, WI 53719

T E C T A N

High Performance
 Audio Transmission Products
 For Video Microwave Systems
 STL Composite Stereo (TV or FM Radio)
 STL Discrete Audio Channels (90dB+S/N)
 Satellite Up- and Down-Link Audio Channels

For your local representative call: (800)TECTAN1

HARRIS
ALLIED
 BROADCAST EQUIPMENT

MITCH MONTGOMERY
 District Manager - RF Sales
 8418 NW Beech
 Kansas City, MO 64153
 (816) 891-7300 FAX: (816) 891-8323

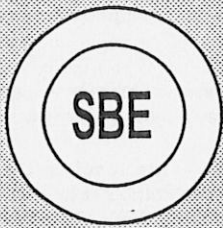
HARRIS CORPORATION Broadcast Division
 P.O. Box 4290, Quincy, Illinois 62305 217/222-8200

SONY Kevin Peckham
 Account Manager
 Broadcast Products Division

Sony Communications Products Company
 1200 North Arlington Heights Road
 Itasca, Illinois 60143
 Telephone (608) 271-3778
 (708) 773-8048

Service Center (708) 773-6037
 Emer. Tech. Assist. (201) 833-9533
 National Parts Center (800) 538-7550

FEBRUARY MEETING and PROGRAM



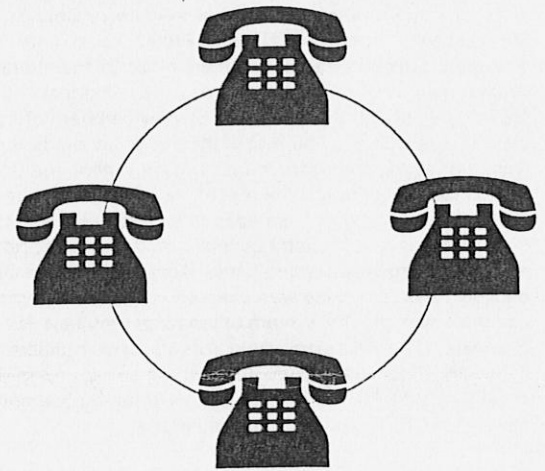
Society of Broadcast Engineers
CHAPTER 24 MADISON, WISCONSIN
Wednesday, February 23, 1994

5:30 p.m. Dinner at Shakey's Pizza & Buffet, 714 South Gammon Road
7:00 p.m. Meeting and Program at WISC-TV, 7025 Raymond Road

TELEPHONE SYSTEM MAINTENANCE

Many Broadcast Engineers today are responsible for anything that stops working around the station. More often that includes the telephone system.

Stan Scharch of WISC-TV will be presenting a program to assist you in understanding your telephone system and what to do when it has a problem, or when the GM wants you to change the way it works. This will include an overview of the different types of telephone systems - Key and PBX, along with examples of changes that WISC-TV has made to their PBX.



Visitors and guests are welcome at all our SBE meetings!

1994 MEETING/PROGRAM DATES

<u>Date</u>	<u>Topic</u>	<u>Presenter</u>
Mar. 31, '94 Thurs.	NAB Review	Members
Apr. 26, '94 Tues.	Elections and Vender Program	Roscor
May 25, '94 Wed.	Advanced Electronics	T.B.A.

Program Committee:	Mark Croom 271-1150	Kerry Maki 833-0047	Denise Maney 277-8001	Steve Zimmerman 274-1234
--------------------	------------------------	------------------------	--------------------------	-----------------------------

Al Gore Kicks-off the Info Highway

submitted by Tom Smith

Vice-president Al Gore, in a speech before the Academy of Television Arts and Sciences on January 11, gave the Clinton administration's view on the information highway. His speech called for the deregulation of both the telco and cable industries so that they both can provide phone, video and data services. Also, they would allow the entry of the "Baby Bells" into the long distance and equipment manufacturing businesses. The major restriction to the telcos would be that they would be prohibited from acquiring cable systems within their service areas for five years from the passage of the TITLE VII of the Communication Act.

Both the telco and cable companies will be required to provide access to unaffiliated video program suppliers. Other regulations will be for the insurance of universal service and to control rates in noncompetitive situations.

There was no mention of broadcasting in the proposed Act. Yet, Gore's speech mentioned that broadcasting reaches nearly 100 percent of the nation's homes. Secretary of Commerce Ron Brown announced a National Information Infrastructure Advisory Council. It is chaired by Delano Lewis, President, National Public Radio, and Ed McCracken, President, Silicon Graphics. Of the other 25 members, cable is represented by John Cooke of the Disney Channel and Bob Johnson of BET. The only broadcaster was Stanley Hubbard of Hubbard Broadcasting and USSB. The rest of the council is made up of members from the telcos, computer industry, government and education. The motion picture industry, the record industry, newspaper, television networks and cable system operators were missing from the council.

The broadcast industry council would like to get rid of the cable and newspaper crossownership bans. Also on the list is lifting of the duopoly rules for TV as was done for radio. The council would like to use the advanced TV system to broadcast multiple NTSC grade channels. The networks would like to provide multiple over-the-air networks. The text of Gore's speech can be found in the Jan. 17 issue of BROADCASTING&CABLE along with an outline of the proposed new TITLE VII of the Communication Act.

(Information from BROADCASTING&CABLE magazine)

News Bits

compiled by Tom Smith

DELAYED

TCI has delayed the purchase of one million digital set-top converters for a year due to the failure of the Moving Picture Experts Group to establish standards for the set-top boxes.

The set-top boxes are part of a plan to create 500-channel cable systems through the use of video compression.

DBS UPDATE

USSB and DirecTV have set subscriber rates for their programming. USSB will have program packages from \$7.95 to \$34.95. DirecTV will have a basic rate of \$21.95 with a larger \$29.95 package.

Dow Jones and Co. signed on to USSB as a provider of business and financial news from the WALL STREET JOURNAL and its other business publications.

MICHIGAN CONFERENCE

The Michigan Association of Broadcasters, along with SBE Chapter 91 and the Michigan Public Broadcasters, will hold the 1994 Great Lakes Broadcasting Conference and Expo in Lansing, MI, on Feb. 21-23, 1994. The conference will hold both management and technical sessions on Tuesday and Wednesday, Feb. 22 and 23.

The cost is \$110 for both days or \$60 for Tuesday only and \$50 for Wednesday only. If you did not get a mailing for the conference and desire more information, contact the Michigan Association of Broadcasters, 819 N. Washington Ave., Lansing, MI, 48906.

THE END USER *by Richard Jones* SBE WAVEGUIDE Chapter 16 Seattle

Last month we discussed the means by which computer data are transmitted to another computer by modem. Another important aspect of the modern desktop PC is the storage media used in order to retain information in a semi-permanent way. New forms of storage are being invented all the time, but current standards have settled on a few basic types of magnetic media.

For portability the floppy disk is the means by which software is sold or otherwise physically transferred from one computer to another. Of this type of storage there are two types of floppy disk. They are usually referred to by their size in diameter as either a 5 1/4 inch disk or 3 1/2 inch.

These break down even further as double density or the newer high density, which can store more information. So, ultimately, when you go to the computer store to buy floppy disks, you need to specify any one of four basic types that your computer must be able to accommodate.

Most newer computers can support the 5 1/4 inch high density, which will hold over a megabyte of information. The smaller 3 1/2 inch disks will hold almost one and a half megabytes. In both cases the disks must be formatted with operating system information allowing the computer to read and write to them. It's a way of priming them for use and is usually needed to be done only once.

Commercial software disks contain new programs which you may wish to install on your system and have already been formatted with applications ready to use. Once you get home with your new software package, there is someplace you must put it in order to use it effectively: the hard drive.

A hard drive is something besides a Monday morning commute. It's a high capacity storage medium that is the basic source of software that your computer will use. Instead of having to plug in floppy disks for each and every program you may wish to use you instead copy the floppy disks to your hard drive—which can hold far more information than can your floppies.

Hard drives, or hard disks, now come capable of holding anywhere from 80 megabytes (Mb) to 500 Mb, or more. Many people will add hard disks to their systems as their requirements increase for extra space.

Since the hard disk is capable of holding a great deal of information it is necessary to perform a little organization to keep important files separate from each other. That's where directories come in. Each application program should find a home in its own directory allowing you the ability to go right where you need to be in order to execute the program you're interested in. The directory is created prior to "filling" it with the program.

The above is a simple overview of the most common forms of storage for computers and does not address the more complex issues of hard disk management such as defragmentation, batch files, memory management and many other aspects.

One other item that is fast gaining popularity is CD ROM technology. The Compact Disk Read Only Memory is quickly gaining a foothold among computer users due to its ability to store large amounts of data, allowing for complicated and highly graphic programs to execute on the newer faster computers. Although the CD ROM will not record from the PC, it will allow for interactive use and even animation.

This brief tutorial is intended to help orient the non-user to the world of the personal computer and help provide an understanding of what makes it work.

National SBE News

from SHORT CIRCUITS

● The SBE Job Line appears on the SBE Headquarters BBS. Updated weekly, the Job Line lists 30 to 40 broadcast engineering openings across the United States and occasionally, overseas. Other than the cost of your phone call, this MEMBER service is FREE. The BBS number is 317-253-7555. You can still call the recorded message at 317-253-0474.

● SBE members on the island of Saipan have organized a new SBE chapter. Saipan is a part of the U. S. Commonwealth of the Northern Mariana Islands, located in the western Pacific. They are Chapter 126!

National SBE News

From SHORT CIRCUITS

● SBE will hold a membership drive, March 1 through May 31. Details will be forth coming in February, including information on great prizes you can win for sponsoring just one new member.

● SBE earned net income of \$24,156.03 on revenue of \$470,497.85 and expenses of \$446,341.82. The SBE Convention held in Miami Beach, lost \$18,902.67, which is included in the overall results listed above. SBE's participation in World Media Expo, beginning this year, will minimize the chance for financial loss while still providing the opportunity to present a quality broadcast engineering conference and exhibition for members.

● The deadline to submit an abstract for papers to be presented during the SBE Engineering Conference is approaching. The Conference will be held in conjunction with World Media Expo in Los Angeles, Oct. 12-15, 1994. For details, check the back cover of the November/December SIGNAL, or call the SBE National Office. Deadline for submission of abstracts to the SBE National Office is March 1.

● SBE Day at NAB will be Tuesday, March 22 in Las Vegas. A full day of sessions is planned. A membership meeting will be held at 4:00 PM at the Convention Center. SBE members can register for the NAB Engineering Conference at NAB member rates. A savings of \$300! Be sure to check the SBE member box on the registration form. NAB requires that SBE Day attendees must be registered for the Engineering Conference.

From the THE BROADCAST NEWSLETTER

● A new level of certification will be inaugurated with the Radio Operator level. A booklet

and written exam is designed to replace the old 3rd class license/broadcast endorsement exam is offered in response to industry requests for a means of insuring that operators have at least the minimum required working knowledge of their FCC-mandated duties in transmitter and station operations. More details will be forthcoming in the next SIGNAL.

● Developments continue in the search for affordable liability insurance for contract engineers. John Poray has been in contact with two different underwriters. We hope to keep moving forward on this very important project. We may need to establish some sort of group of contract engineers willing to make a presentation to the insurance companies about what [contract engineers] do. (These insurance guys just don't have a clue!) If you are interested in helping, contact John Poray.

● SBE Board Member Paul Montoya is working on a revised CHAPTER MANUAL for chapter chairs which should be available later this year. This extensive rewrite is the first in about ten years. Plans are to issue a new copy EACH YEAR to the chairs so that there will be no confusion about things.

● There were 565 new members in 1993, with our total membership right at the 4,700 mark as of 12/31/93. This compares with 4,572 at the end of 1992.

"Short Circuits VIA BBS" is published by the Society of Broadcast Engineers, Inc., 8445 Keystone Crossing, Suite 140, Indianapolis, Indiana. For information about SBE, contact John L. Poray, CAE, Executive Director, by calling 317-253-1640. SHORT CIRCUITS offers current news and announcements on SBE activities and programs and appears the last Wednesday of each month.

"The Broadcast Newsletter" is edited by Terry Baun, Chapter 28, Milwaukee. Baun, National SBE Vice-President, recently returned from a SBE Executive Committee meeting in Washington, DC.

CHAPTER 24 SUSTAINING MEMBERS


Welcome new
sustaining member:
Mark Ross, Dynatech Video

Tectan, Inc.
Maney Logic
Electronic Industries
The Tape Co.
WMTV 15
Clark Wire and Cable
Teleport Minnesota
Emmons Associates
CTI
Panasonic Broadcast
Comark Communications
WMSN 47
Broadcast Communications
BTS
Skyline Communications
Harris Allied Broadcast
Video Images
Fuji Film I&I
Roscor Wisconsin
WKOW-TV 27
Scharch Electronics
WISC-TV 3
Sony Broadcast

"35 Years of Devotion to the Broadcast Industry"
Broadcast Communications
Turn-Key Tower Installation
24-Hour Emergency Repair
AM/FM Broadcast Consulting
Tower Management Services
Antenna and Line Installation
Tower Maintenance & Service




CALL 608/527-5670
98 Highway 99 North P.O. Box 730 New Glarus, Wisconsin 53574

Panasonic 

Panasonic Broadcast Systems Company
Division of Matsushita Electric Corporation of America

1707 N. Randal Road, #1-C-3
Elgin, IL 60123-7847
(808) 493-2619
(708) 488-5180
(808) 493-2519(fax)

HERB VAN DRIEL
Central District Sales Manager


 **GORDY DAILEY
BROADCAST SALES**

ELECTRONIC INDUSTRIES INC.
19 E. IRVING AVE • P.O. BOX 286 • OSHKOSH, WI 54902
distributors of electronic equipment and supplies

PHONES: 414-235-8930
414-739-8900
FAX: 414-235-4233

IN-STATE WATS: 1-800-445-0222
OUT OF STATE WATS: 1-800-558-0222

4155 SIBLEY MEMORIAL HWY.
EAGAN, MN 55122-1904
(612)890-8920 • FAX (612)890-7009



EMMONS ASSOCIATES, INC.
DISTRIBUTORS AND REPRESENTATIVES • TELEVISION EQUIPMENT

KEITH EMMONS

record
stop
play
fwd
rewind
custom1
custom2
custom3
custom4
custom5

18 pin dip

RS422 VTR CONTROL
RS422
or
RS232

10 COMMANDS, ONE CHIP!
Many custom commands.

maney-logic
608-277-8001 Madison, WI

 **The
Tape
Company**

Tim Galassini
801 Sivert Drive
Wood Dale, Illinois 60191
708-595-3113 Phone
708-595-0052 Fax

ORDERS: Contact
Order Processing

Quality People... Quality Service

Fiber Optics

Continued from page 1

Note:

1. The supply space contains all electric power conductors and related devices such as power transformers, capacitor banks, and streetlights. The supply space extends from the lowest electrical conductor to the top of the pole.

2. The supply space may contain separate sets of conductors operating at different voltages. In such cases, lower voltages are placed below higher voltages. Figure 1 shows three sets of conductors: a "transmission" line at the top, a "distribution" line below it, and a "secondary" line below that.

3. The secondary line (so named because it is fed from the secondary windings of pole-mounted stepdown transformers) typically 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.

4. The communications space contains all communications circuits. Figure 1 shows a common situation: telephone facilities at the bottom of the space, with cable television facilities above telephone. If additional communication circuits are present, they are likely to be above telephone, although there is no standard order.

5. Most communications cables, including telephone and cable television, are lashed to steel strands for mechanical support. The strand is placed under tension to control sag; tensions of several hundred pounds are typical, but may approach several thousand 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.

6. Communications cables owned by different parties are usually spaced about 12" apart. This separation allows room for the lashing equipment used to lash the cable to the strand.

7. The space between the supply space and the communications space is called the "neutral space". This space

provides clear headroom for communications workers working on communications facilities from ladders or bucket trucks.

8. All cables and conductors sag; maximum sag occurs at midspan. Sag is always measured vertically, even if the end supports are not in the same horizontal plane. The amount of sag is a function of several factors: span distance, weight, tension, modulus of elasticity, permanent inelastic deformation ("creep"), coefficient of thermal expansion, conductor temperature, wind, and ice loading.

9. The dimensions shown in Figure 1 are the typical minimum clearances, in inches, permitted by recent editions (1990 and 1993) of the NESC (although they may be increased or decreased in special circumstances). These clearances must be maintained at all times under all conditions of wind, air temperature, ice loading, and conductor heating.

10. The required ground 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 under all sag conditions.

Calculations to determine worst-case sag clearances must be made for each span under two sets of conditions:

- The maximum design temperature. This condition typically occurs on hot summer days when high ambient air temperature, sunlight, and peak electrical load (maximum I^2R loss) all combine to heat the conductors. Since only the electrical conductors are affected by I^2R loss, they tend to sag more than the communications conductors.

- Specified ice and wind loading. Wisconsin falls in the "heavy loading district"; the specified loading for this district is 0.5" of radial ice at a wind pressure of 4 psf.

- A number of software packages are available for making these calculations. Simplified standardized tables are also available; although less accurate than actual calculations, they accommodate most situations.

ADDING ANOTHER CABLE ON EXISTING POLES

Now comes the big question: if we want to add a fiber cable to an existing pole line, where to do we put it?

Figure 2 shows the most common answer: the new fiber is placed in the communications space about 12" above cable television.

Provided, of course, that there is sufficient space: that 30" midspan clearance between the lowest electrical conductor and the highest communications cable is now measured to the fiber.

This problem is exacerbated by the fact that fiber cables are very light, and do not sag as much as adjacent conductors.

If space is not sufficient, it is possible to rearrange existing facilities to make room. This process is called "makeready", and includes such changes as moving existing pole attachments up or down, replacing old 3-wire secondary with triplex, removing abandoned facilities, offsetting one or more communications facilities horizontally on "sidearms", or complete replacement of poles.

Makeready can be very expensive: the last party on the pole has to deal with all current occupants.

Rearrangement may require the cooperation of as many as three other parties: the power company, the telephone company, and the cable company.

Each company will require reimbursement for its time and material costs. If pole replacement is required, costs exceeding \$2,000 per pole are not unusual.

To make matters worse, the sag requirements noted above were first instituted with the 1990 edition of the code. Plant constructed before 1990, when code requirements were less stringent, was grandfathered by the 1990 code.

But if extensive makeready changes are required to accommodate a new cable, the pole owner (typically, the power company) may require upgrade of the entire pole to current code standards.

The allocation of costs in this situation varies widely depending on the nature of the work required and the policies of the companies involved.

But makeready has a bright side, too.

Two factors have actually made it easier in recent years:

- Telephone companies have been constructing most new facilities underground. In the process, they have removed many old overhead cables. Sometimes it's possible to construct a new line along the exact route of an old telephone cable, reusing the old bolt holes.
- Thousands of older poles have been replaced during the past decade, either because of power company upgrades to accommodate increased electrical loads, or to accommodate cable television construction.
- Selecting the best route for a new fiber cable requires careful study of each pole along all possible routes to determine the route with the fewest makeready requirements. Isolated problem poles may have to be replaced, or they can be bypassed by "dipping" — placing the new cable underground for two or three spans.

OTHER CONSIDERATIONS

Route selection also requires careful attention to two other factors:

1. Identification of the location of all downguys and anchors which will be needed to maintain tension in the strand. Failure to provide proper guying may place a horizontal load on a pole, causing internal stress. Severe stress can lead to pole failure.
2. Identification of fiber cable splice points, and the measurement of distances between adjacent splices. Fiber cable is generally ordered in specific lengths; each length is pre-cut by the manufacturer, and shipped on a separate reel. Manufacturers typically guarantee each length to an accuracy of -0% to +10%, but they charge for the actual length shipped. Obviously, accurate distance measurements are important. Splice point locations are dictated by several factors: the maximum continuous cable length available from the manufacturer, the maximum continu-

ous length which can be installed safely in one "pull", accessibility from public roads, and off-road parking for service vehicles.

Future articles in this series will deal with the process of getting permission from pole owners and landowners. It should be noted, however, that the process of getting permission is not independent of the route-selection process, even though we discuss them separately in these articles. Ideally, the two processes should proceed concurrently. Indeed, close coordination with pole owners and landowners can often shorten the route-selection process.

(* *The National Electrical Safety Code should not be confused with The National Electrical Code (NEC). The NEC is published by the National Fire Protection Association, and governs the installation of electrical facilities inside buildings. Although NEC deals extensively with electrical safety issues, its fundamental purpose is fire prevention.*

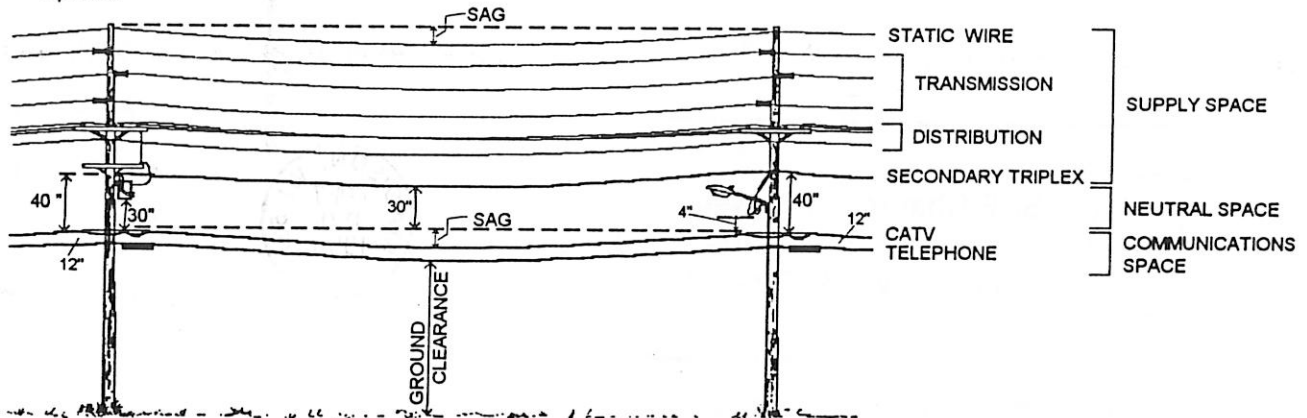


Figure 1. BEFORE: A hypothetical pole line on which a new fiber cable is to be installed. The dimensions shown are the minimum permissible clearances (in inches) permitted by the National Electrical Safety Code.

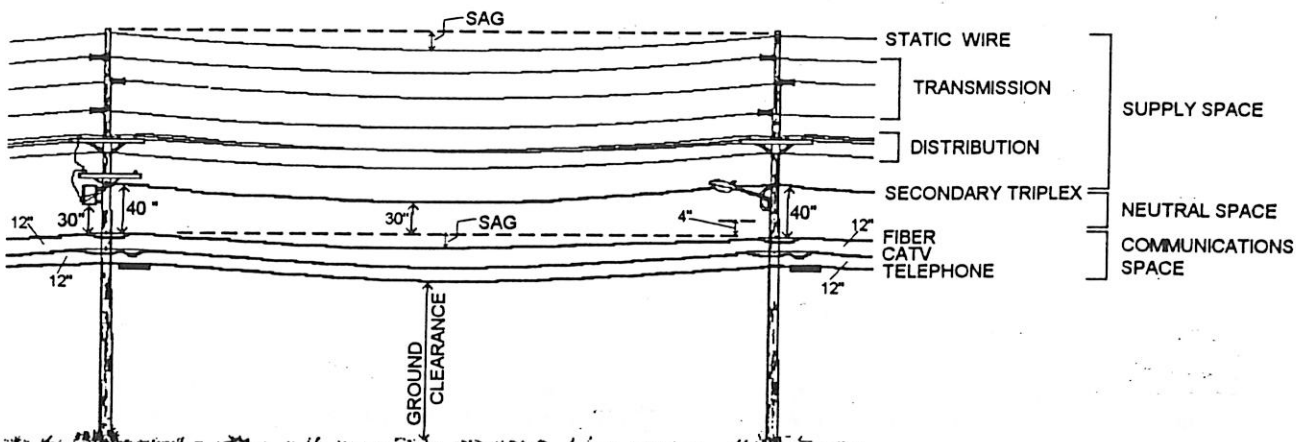


Figure 2. AFTER: The same pole line after the new fiber has been installed. Note that the minimum-permissible clearances are now measured to the fiber. Also, note three examples of relatively simple makeready changes: moving the streetlight, tightening the streetlight driploop, and moving the power transformer.

**SBE
NATIONAL**



**Society of Broadcast
Engineers, Inc.**
8445 Keystone Crossing
Suite 140
Indianapolis, IN 46240



Office (317) 253-1640
Fax (317) 253-0418
Job Line (317) 253-0474
BBS (317) 253-7555

 **FUJIFILM I&I**
Imaging Information

SEDATE HOLLAND
ACCOUNT REPRESENTATIVE
PROFESSIONAL PRODUCTS
MAGNETIC PRODUCTS DIVISION

FUJI PHOTO FILM U.S.A., INC.
1785 HAMILTON PARKWAY
ITASCA, IL 60143
(708) 773-7200 • (800) 877-0555

 **CLARK WIRE & CABLE**
(708) 272-9889
Fax (708) 272-9564
1-800-CABLE-IT!
Susan Clark
151 S. Pfingsten Road #B
Deerfield, IL 60015

**15
WMTV**

615 Forward Drive, Madison, Wisconsin 53711
Phone: 608-274-1515 
Fax: 608-274-2737

Everybody knows it's on...

**FOX
47
WMSN
MADISON**

7847 BIG SKY DRIVE MADISON, WI 53719
(608)833-0047 FAX(608)833-5055

WISC-TV
CBS

MADISON
3

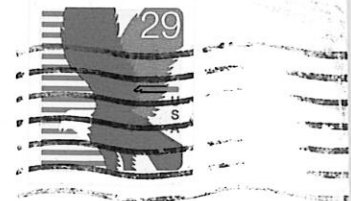
**TELEPORT
MINNESOTA**

A communication service of Midwest Cable & Satellite, Inc.

Mark Durenberger
Director of Technical Operations
11th on the Mall
Minneapolis, MN 55403-2450
FAX (612) 330-2401
(612) 330-2433

SBE

SBE Chapter 24 Newsletter
3538 Concord Avenue
Madison, WI 53714-1237



FIRST CLASS MAIL

Tom Weeden
6802 Putnam Road
Madison, WI 53711-3959

Newsletter edited on Pagemaker 5.0 by: Paul Stoffel Typist: Joanne Stoffel
Contributors this month: Fred Sperry, Tom Weeden, Mark Croom, Stan Scharch, Tom Smith, Neal McLain
Steve Zimmerman, Kevin Ruppert, Chris Cain for downloading information from CompuServe®