



**Chapter 24, Inc.
Madison, Wisconsin**

Society of Broadcast Engineers

September 2000

MADISON TOWER ACTIVITIES CONTINUE

By Ken Dixon

The Madison Community Tower DTV addition project continues to move forward as scheduled. The tower crew has been on-site for almost a month and has completed the originally planned tower reinforcement which is 7 panels (21 total) of leg redundant bracing and 6 panels (36 total) of diagonal reinforcing angles. There will be some additional reinforcement installed later in September as a result of the WKOW-TV/DT standby antenna becoming a permanent addition to the tower.

In addition to the reinforcement, the guy cables at levels 2, 4, and 6 will be replaced. The new cables at level 2 will be 2-9/16" dia. x 696 feet, level 4 will be 2-5/8" dia. x 1314 feet, and level 6 will be 2-7/16" dia. x 1626 feet. Regardless of the ruler used, these cables are big! Further, 15 tons of concrete overburden have been added over the three inner guy anchors as encouragement to stay put.

Dielectric has completed the manufacturing and testing of all of the main and standby antennas for the project, with delivery to the site expected by September 15th. Dielectric was selected as the sole source supplier of antennas to insure that the antenna radiation patterns matched the technical studies, and the two stacked antenna assemblies were each designed and constructed to meet the specific electrical and mechanical requirements of a stacked array.

The two 3-1/8 inch diameter transmission lines necessary to feed the channel 3 antenna are routed on the outside of the channel 21 antenna in close proximity to the radiating slots. These transmission lines do affect the channel 21 radiation pattern and have been positioned so as to reduce the pattern distortion to the degree possible. The total length of the channel 3/21 stack is 103.3 feet, consisting of 58 feet for the channel 21 antenna, 39

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Next Meeting:

**Tuesday,
September 19, 2000**

Student Night

**Student Registration
from 5:00 - 5:15PM**

**at WMTV
615 Forward Drive**

**Pizza and Soda will
be provided**

**Meeting
at 6:30 PM**

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HIGH-VOLTAGE SPECIAL EVENT!

By Vicki Kipp

Chapter 24 member Steve Paugh recently called me to share a great idea for a special event. Steve found a rare and interesting opportunity for us to tour an area production facility that manufacturers high voltage equipment.

Resonance Research Corporation, manufacturer of industrial strength high-voltage equipment, has scheduled an open house on Wednesday, September 20th from 6 PM to 10 PM at their production facility between Baraboo and Lake Delton. The facility is located at E11870

Shadylane Road in Baraboo and can be reached at (608) 356-3647. This is a rare opportunity to see their facility. They only hold an open house once every few years.

Established in 1964, Resonance Research Corporation is owned and operated by D.C. Cox of rural Baraboo. Resonance Research Corporation manufactures industrial strength high voltage equipment for displays in science museums and for various research facilities in the U.S. and international arena. Their science education products include the Bridge of Fire© Electrostatic Exhibit,

Resonance (Tesla) Transformers, Van de Graaff Electrostatic Generators, Aurora Borealis Tube Display, Plasma Globes, Coil Gun - Rail Gun, Jacob's Ladder Climbing Arc System, Marx (Impulse) Lightning Generator, and the Electromagnetic Soda Can Crusher. Services provided by Resonance Research Corporation include high voltage engineering, consulting, and custom design.

The journal article announcing the open house showed a picture of what happens when a 100 microfarad capacitor, charged at 20,000 volts, is

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August Business Meeting Minutes

Chapter 24 of the Society of Broadcast Engineers met on Thursday, August 24, 2000 at WISC-TV in Madison, Wisconsin. There were 16 members in attendance, 12 of who were certified, and 2 guests. Chairperson, Kevin Ruppert, called the meeting to order at 7:27 PM. Minutes of the July meeting, as published in the August newsletter, were approved as published.

Secretary and Special Events Coordinator, Vicki Kipp, announced that she is seeking volunteers to staff the SBE booth at the Broadcasters Clinic for one-hour shifts on Tuesday, October 17 from 4:30 PM to 7:30 PM and on Wednesday, October 18 from 10:00 AM to 1:30 PM. If you wish to volunteer for a shift, please email Vicki at vkipp@ecb.state.wi.us. The booth volunteer schedule will be posted on the Chapter 24 web site.

Treasurer, Stan Sarch, reported that the chapter treasury is in the black. Newsletter Editor, Mike Norton, reported the deadline for the next newsletter as midnight on Friday, September 1, with the folding party the following Wednesday, September 6 at WKOW-TV beginning at 5:30 PM.

Membership Coordinator, Paul Stoffel, was not present. Sustaining Membership coordinator, Fred Sperry, announced that Chapter 24 has 23 sustaining members. Pinnacle recently renewed their membership.

Program Committee, Steve Paugh and Fred Sperry, announced that the theme of the September meeting will be Youth Night. Denise Maney is sending notices to area high schools at this time. A follow-up Youth Night meeting will be held in March 2001.

Certification, Jim Hermanson, announced that the SBE is in the middle of an exam period. Jim will be administering one CBNT exam. Jim reported that the next exam period will be November 10 – 20, with an application deadline of September 22.

Frequency Coordinator, Tom Smith, reported positive results from his frequency coordination for Boykin and Associates, the communications provider for an auto race at Madison International Speedway (MIS) in Oregon, Wisconsin. Tom had made bandwidth in the 2 GHz spectrum available to Boykin and Associates, and they used this spectrum heavily during the auto race. Tom anticipates that Boykin and Associates will require frequency coordination for this same event in August 2001.

Tom Smith addressed the need to make a plan for opening up the 7GHz frequency spectrum for special event use. With football season approaching, Tom expects to be approached by Ed Walsh from the UW-Madison Badger Football staff for UHF spectrum for Coach-Com. This frequency assignment is considered "sensitive information," and would be treated accordingly.

Tom Smith has composed a new list of guidelines for wireless microphone use as it relates to DTV.

(continued on next page)

Meeting Minutes (continued)

National Liaison, Leonard Charles, announced that Chapter 24 had received two national awards from the SBE. Editor Mike Norton was honored with the award for "Best Chapter Newsletter." Steve Paugh was recognized with the award for "Best Technical Article, Book or Program" for his "Digital Television Presentation" for organizing a DTV presentation and creating a DTV brochure as a part of the 1999 UW-Engineering Expo. In recognition of Steve's accomplishment, WISC-TV 3 is sending Steve to the 2000 National SBE Meeting in Mars, Pennsylvania to pick up his award in person.

Leonard Charles reminded the group that election ballots for the SBE National Officer and Board positions have been mailed to all voting members. Ballots are due at the SBE National Office by Thursday, September 7. Leonard noted that former Chapter 24 member Fred Baumgartner has been named a SBE Fellow, the most distinguished SBE award that a member can receive.

The upcoming Broadcasters Clinic was discussed. Broadcasters Clinic brochures may be obtained from Leonard Charles. Kevin Ruppert announced that the Combined SBE Chapter meeting will be held on Wednesday evening, October 18, along with a program arranged by Chapter 24. The idea of holding a cookie bake off at the Chapter 24 booth was discussed, but not decided on. Any Broadcasters Clinic presenters that have special audio or video needs should email Tom Smith.

Jim Hermanson's offer of CDs with the newest version of the Adobe Acrobat Reader (to view the new WIEAS Plan) will be ending soon. Please speak up now if you would like a copy.

For Professional Announcements, Fred Sperry announced that Dennis Behr

AMATEUR RADIO NEWS

By Tom Weeden, WJ9H

- Starting Friday, September 1, every US amateur was required to fully comply with the FCC's RF exposure guidelines. The regulations, which went into effect January 1, 1998, require US amateur radio operators to read and understand the rules and, where necessary, perform technical evaluations to determine that their stations are compliant with the new regulations. Up until now, only hams who have had to file an amateur radio application with the FCC have had to certify compliance with the RF exposure rules. As of September 1, all amateurs must comply. Under the regulations, an amateur station must not exceed the maximum permissible exposure limits for transmitter operation. MPEs are both frequency and power-dependent.

- The San Francisco Chapter of the International Television Association has produced a 30-second TV public service announcement designed to assist the amateur community in recruiting more young people to the hobby. Copies of the TV spot are being made available to Amateur Radio clubs for distribution to local television outlets at nominal cost.

Each year ITVA volunteers produce a public service announcement for a charitable or nonprofit organization. This year, they focused on Amateur Radio. ITVA President Ken Alan, K6PSI, said he'd been hearing about the need to recruit "new blood" into ham radio, "so I suggested it to the PSA committee, and everyone loved the idea." The spot steers clear of ham radio stereotypes and shows the hobby as "contemporary, high-tech and fun." A Quicktime movie of the PSA can be viewed at the ITVA Web site, <http://www.itvasf.org>.


- The SBE has elevated amateur radio operator Fred Baumgartner, KG0KI, of Parker, Colorado, to a Fellow in the Society. Baumgartner, who's with the National Digital Television Center in Denver, has been a member of SBE for 27 years. SBE cites his "many valuable contributions to the advancement of broadcasting engineering and the Society of Broadcast Engineers." Baumgartner has authored more than 100 technical articles and several books including "Salvaging Waterlogged Gear" in the March 1999 issue of QST magazine.

(Excerpts from the American Radio Relay League's "The ARRL Letter")

has been promoted to Administrator, Engineering & Operations Division for the Educational Communications Board (ECB) effective July 2, 2000. It was also announced that Neal McLain has relocated to a suburb of Salt Lake City, Utah. Kevin Ruppert adjourned the business meeting at 7:47 PM.

Al Jason of Jampro Antennas presented the evening's program. We learned about types of antennas, antenna mounting options, coverage patterns, and antenna transmission testing.

Submitted by Vicki Kipp, Secretary

	
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Madison Tower Activities Continue (from page 1)

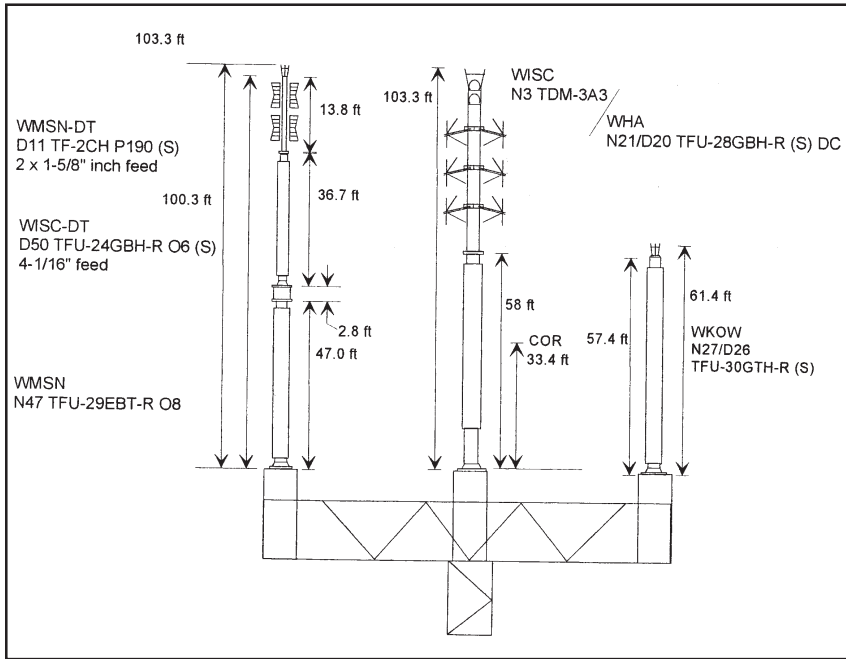


Figure 1. Diagram of the top of the Madison Community Tower following the installation of new NTSC and DTV television antenna.

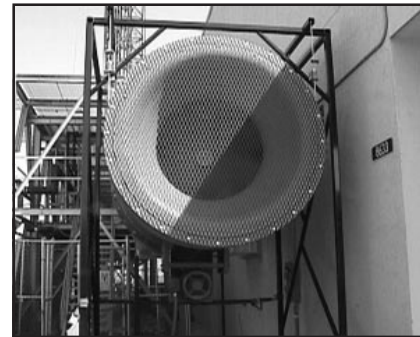


Figure 2. Intake fan installed for WISC-DT transmitter cooling. A second fan for the cooling exhaust is located on the other side of the transmitter suite.

As a further sign of progress, WISC-TV has taken delivery of their DTV transmitter which has been installed, tested, and is resting until the tower work has been completed. The associated intake and exhaust fans are something to behold; they are driven by 50 (that's right, fifty) HP electric motors with variable frequency drives (Figure 2). They come complete with heat sinks for the power meter. The transmitter is a Harris Diamond CD (solid state, four cabinets) with a TPO (transmitter power output) of 30 KW average which after considering the effects of filter loss, transmission line loss, antenna gain, etc. will produce an ERP of 380 KW average.

More next month...

feet for the channel 3 antenna and a little less than 7 feet for the beacon, strobe, and lightning protection (Figure 1).

In order to reduce the bending of the stack due to wind, the channel 21 antenna is constructed from an 18 inch diameter galvanized steel pipe with 2 inch thick walls and weighs 18,600

pounds. The pattern distortion and bending effects due to wind are only two examples of the special considerations encountered while working through the complexities of the candelabra tower environment. The examples also demonstrate the compromises and cooperation necessary in order to realize a successful project.

REPRESENT CHAPTER 24 AT THE BROADCASTERS CLINIC

By Vicki Kipp

Chapter 24 will be hosting an exhibit booth at the 2000 Broadcasters Clinic. We are seeking volunteers to staff the booth in one hour shifts from 4:30 PM to 7:30 PM on Tuesday, October 17th and from

10:00 AM to 1:30 PM on Wednesday, October 18th. Volunteers can sign up on the Chapter 24 web site at <http://www.sbe24.org/>.

Please contact Vicki Kipp at vkipp@ecb.state.wi.us if you have any questions. Thank you!

Chapter 24 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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A DAY AT THE FAIR

By Paul Stoffel

In their display booth at this year's Wisconsin State Fair, the Wisconsin Broadcasters Association (WBA) demonstrated digital television receivers, educating the fair-going public about HDTV. The booth, surrounded by a plethora of food and beverage hawkers, was located in the Wisconsin Products Building, where the foot traffic was heavy. People were given an opportunity to see how good HDTV can look.

The booth was filled with 4 projection TVs that were brought in by a Milwaukee-based, audio-visual company called Sound Investments. WMVS brought a plasma monitor and a computer equipped with a DTV tuner card.

The projection TVs, all with built-in (integrated) DTV tuners, were from Samsung, Hitachi and Zenith, ranging in size from 55 to 61 inches diagonally. The Samsung and Zenith projection TVs were both showing 1080i video, coming from a Sencore HDTV server, meant to simulate reception of an over-the-air 8VSB 1080i HDTV signal.

One of the Hitachi projection TVs was showing a tape of last year's Packers game against Seattle (We lost.) which was originally broadcast in HDTV as part of ABC's Monday Night Football coverage. The tape was

played on a JVC W-VHS deck. The other Hitachi projection TV was tuned to WMVS-DTV, channel 8, which has been on-the-air at full-power since April 21 at 25KW. WMVS-DTV was broadcasting a 1080i satellite feed from PBS. A VHF antenna was mounted outside the metal building to pick up WMVS's DTV signal. (This same Hitachi projection TV model also had a built-in satellite receiver for decoding HDTV programming from DirecTV.)

A Hauppauge WinTV-D 697 DTV tuner card, fitted in a computer, was feeding the HDTV component input of the Sony plasma flat panel monitor. The tuner card was tuned to DTV channel 8. After decoding the 1080i, the tuner card renders the digital TV picture into a 480i format. Even so, the picture looked much better than our current NTSC video.

All of the projection TVs displaying native 1080i looked very good. The W-VHS HDTV tape did not look as sharp (probably because of some dubbing or format conversion processes) but people did get to see, maybe for the first time, what widescreen football looks like. The W-VHS format is an analog component HD/SD format. (Consumer electronics manufacturers will soon release D-VHS player/recorders that include Intel's HDCP (High-bandwidth Digital Content Protection) digital connection for both SD and HD record and playback.)

One limitation of some DTV-ready or DTV-capable television receivers on the market is their inability to display the native 720p DTV format, yet all DTV receivers must be capable of decoding all 18 ATSC DTV formats. The first-generation Panasonic DTV set-top box did not have the ability to send native 720p to the Panasonic projection TV. When buying a DTV set-top box and/or a DTV television receiver, ask whether the products can display native 720p.

There was a demonstration (pseudo 480p SD 4x3) showing how much better a progressive video display can look, without the distortions of interlace scanning. A Pioneer progressive scan DVD player was feeding a Hitachi TV that was also capable of progressive scanning. With progressive scanning, video images are transmitted as complete frames. This is common in computer displays and is also used for digital television broadcasts in the 480p and 720p formats.

There is a lot of consumer confusion out there, especially with the word "digital." A DTV-ready TV means the TV does not have a built-in DTV receiver, but can display an SD or HD signal from a DTV set-top box. A digital cable TV service doesn't mean you can tune to your local DTV broadcast station, at least not yet. A TV may have digital processing circuitry, but it may not be DTV capable.

Broadcasters Clinic 2000 Program Schedule Available

The 2000 Broadcasters Clinic and Upper Midwest Regional SBE Meeting will be held at the Madison Marriott West on October 17, 18, and 19. In addition to the equipment exhibits, there will be numerous presentations which cover audio, video, data, RF, and other topics.


A program schedule and registration form can be found by going to www.sbe24.org and following the link.

Registration fees are \$155 for any two days, or \$180 for all three days. To register by phone call (608) 255-2600.

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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FCC Rulemakings

Compiled By Tom Smith

WT Docket No. 97-82; FCC 00-274 Competitive Bidding Procedures

The FCC has adopted rules that will cover all future auctions. This action will make the rules for each auction consistent from auction to auction. In the past, the FCC has issued a rulemaking for each auction, which created slightly different rules for each auction. These new rules do not cover all aspects of each auction. There will be some rules that differ for each auction.

The FCC adopted rules covering the following issues, which include communication between bidders, definition of small business for bidding credits, size of markets to be bid upon, default of payments, and withdrawal of a bid. There was no discussion of types of auctions or of the determination of up-front payments.

Concerning communication between bidders, no discussion of the auction is to occur between bidders from the time applications are filed until payment is made.

In the definition, of small business, there will be different levels for different services based on amount of revenue and number of employees. Bidding credit levels for different sizes of small business were not set in this action. Size of markets that will be bid upon will also differ by type of service to be auctioned. There are a number of rules concerning what a small business is in the eyes of the FCC and much discussion of the issue was included.

Default of payments made up the

largest amount of the discussion in this notice. The FCC set time limits for missed payments and penalties. This action will affect mainly those who had winning bids in past auctions and who defaulted on installment payments. The FCC allows certain sizes of small business to pay in installments over a period of years. There were a great number of defaults by small companies that overbid for spectrum and were unable to meet the payment deadlines. The FCC does not plan to offer installment plans in the future. Future winners could default by missing the payment after the auction closes.

When the FCC conducts an auction, they have penalties for those who withdraw from bidding when they are the current high bidder. Those who are bidding on more than one market may withdraw their bid for one contest to put their money in another. If they are the highest bidder in the contest they are withdrawing from and the final winning bid does not exceed theirs, they will be responsible for the difference. This is supposed to aid in keeping the auctions honest and prevent misconduct between bidders.

This action was adopted on July 27, 2000 and released on August 14, 2000. It becomes effective on October 30, 2000. This notice was published in the FEDERAL REGISTER on August 29, 2000 on pages 52,323-52,348.

From the FEDERAL REGISTER
(www.access.gpo.gov)

Special Thanks to Denise Maney for arranging the Dutch Treat dinner, and to Steve Paugh for arranging the August program on Broadcast Antennas.

HIGH-VOLTAGE SPECIAL EVENT! (continued from page 1)

discharged through a piece of #26 AWG copper wire in 750 picoseconds. In the photo, there was a circle of bright light with sparks flying out from it. Demonstrations of this nature may be of interest to some of the members of SBE Chapter 24.

For more information on Resonance Research Corporation, please refer to their web page at <http://www.resonanceresearch.com>.

Special Event Itinerary:

(Times are approximate. Please be prompt.)

6:00 PM Meet at WISC-TV parking lot on Wednesday, September 20.

6:05 PM Depart for Baraboo. (1 hour 15 min to 1 hour 30 min).

7:30 PM Tour Resonance Research (Open House runs from 6 PM and 10 PM).

8:45 PM Dinner at Culvers in Baraboo.

9:15 PM Drive back to Madison.

10:30 PM Arrive back at WISC-TV.

There is a sign up sheet for the Resonance Research Corporation Tour at <http://www.sbe24.org>. Please sign up early so that Resonance Research can be notified as to how many people to expect.

When you sign up to attend, please indicate if you would consider driving, and how many engineers your vehicle can comfortably and safely seat. You can also indicate if you would like to meet us at the Resonance Research Corporation production facility.

If you have any questions about this special event, please contact Vicki Kipp at vkipp@ecb.state.wi.us or 273-0889.



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FCC LOCAL LEGALS

Compiled by Tom Smith

PROPOSED

WKPO (FM) Evansville, WI.

Good Karma Broadcasting LLC of Beaver Dam, WI seeks FCC permission to purchase WKPO (FM) from TBK Communications Ltd. (Thomas Kwiatkowski, Pres.) for \$2.85 Million.

Good Karma is owned by Craig Karmazin and owns WBEV (AM) and WXRO (FM), Beaver Dam, WTTN (AM), Watertown, and WTLX, Columbus. Thomas Kwiatkowski is an owner of WLKG (FM), Lake Geneva, WI. WKPO operates with 1.7 KW at 493 ft. at 105.9 MHz.

GRANTED

Various Wisconsin Cities

On July 18,2000, the FCC granted construction permits to Family Worship Center Church Inc. for 12 new translator stations in Wisconsin, and for 22 translator station in all. They include five stations in Southern Wisconsin.

These stations are: W215BK 90.9MHz at Baraboo, W208AX 89.5 MHz at Prairie Du Chien, W208AY 89.5MHz at Portage, W211BM 90.1 MHz at Reedsburg, and W213BJ 90.5 MHz at Spring Green. The construction permits were announced on July 27, 2000.

From *FCC Daily Notices* (www.fcc.gov) and *BROADCASTING & CABLE*

EMPLOYMENT OPPORTUNITY

Maintenance Engineer

Seeking a maintenance engineer at WTMJ-TV, Milwaukee. A minimum of two years experience as a maintenance engineer in a TV broadcast station required.

Maintain and install analog and digital systems. Computers and TV transmitter experience a plus.

Mail or Fax resume to:

Randy Price, VP Engineering,
720 E. Capitol Drive,
Milwaukee, WI 53212
Fax (414) 967-5540

or email
price@journalbroadcastgroup.com
EOE

DO YOU HAVE SBE MEETING PROGRAM IDEAS?

Is there a topic you would like to see covered at one of our local Chapter 24 meetings? Or, better yet, is there a topic that you are qualified to speak on at an upcoming meeting?

Please forward any ideas to one of the Program committee members or to one of the Chapter 24 officers.

CHAPTER 24 SUSTAINING MEMBERS

RECENT RENEWALS:

Pinnacle Systems

THANKS TO ALL OUR SUSTAINING MEMBERS:

- Alpha Video
- Belden Wire and Cable CTI
- Clark Wire and Cable
- Harris Corporation
- maney-logic
- National Tower Service
- Norlight Telecommunications
- Panasonic Broadcast
- Richardson Electronics
- Roscor Wisconsin
- Ross Video
- Scharch Electronics
- Sony Broadcast
- Swiderski Electronics
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- WKOW-TV 27
- WMSN-TV 47
- WMTV-TV 15

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WISC-TV

MADISON





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Belden Wire & Cable Company 4218 South Regal Manor Court New Berlin, Wisconsin 53151

Phone: 414 827 0270 Facsimile: 414 827 0374 Phone Mail: 800 241 7564

Jan Reesman Sales Representative http://www.belden.com



615 Forward Drive Madison, WI 53711

Phone 608-274-1515 Fax 608-271-5193

www.nbc15.com feedback@nbc15.com



http://www.CTIinfo.com email - cti@CTIinfo.com Phone - 608-831-4636 Fax - 608-836-1840

VCR Controllers Character Generators Satellite Antenna Controllers Broadcast / Cable Television Consulting

SCHARCH ELECTRONICS CO.

Small Business Communications 1105 Middleton Street MADISON, WI 53717-1078 (608) 831-2266 (800) 831-2266



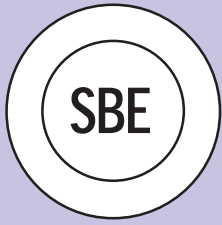
SBE Chapter 24 Newsletter 2029 Greenway Cross #11 Madison, WI 53713-3000

FIRST CLASS MAIL

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

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SEPTEMBER MEETING and PROGRAM



**Society of Broadcast Engineers
CHAPTER 24 MADISON, WISCONSIN
Tuesday, September 19, 2000**

Student Night

During this month's meeting, we welcome area students with an interest in broadcast engineering. In addition to touring the WMTV NBC15 television facility, there will be some time to discuss various aspects of radio and television broadcast engineering with our guests. We hope to see you there!

Registration 5:00 PM - 5:15 PM

**at WMTV NBC15
615 Forward Drive**

**Station tour;
Watch the news live;
The Chapter will provide Soda and Pizza.**

Meeting at 6:30 PM

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

2000 UPCOMING MEETING/ PROGRAM DATES:

Day	Date	Program
Wednesday	October 18	Broadcast Clinic
Tuesday	November 21	To Be Announced

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