Chapter 24
Madison, Wisconsin

Society of Broadcast Engineers *February 1998*

BROADBAND NETWORKS
PART 18 - SYSTEM POWERING

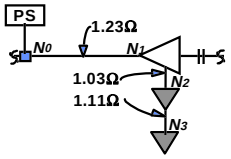
By Neal McLain

This is Part 18 in a series of articles about coaxial broadband networks. In this article, we continue our discussion of powering.

A QUICK REVIEW

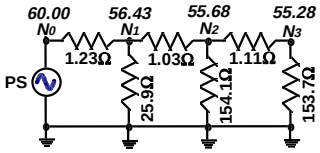
In last December's article, we noted that a broadband network is divided into "zones." A power supply located in each zone supplies a 60-volt 60-Hz square wave. This square wave is distributed, over the same cable that carries the broadband RF signal, to all amplifiers within the zone. Each amplifier contains a "power pack" which rectifies and filters this square wave to produce the DC operating voltages required by the amplifier circuitry.

To illustrate how this works, we calculated the power requirements for a simple three-amplifier network, consisting of one trunk amplifier and two line extenders:



In this example, the broadband RF signal flows from right to left, but the amplifier operating power flows from left to right. Note that the trunk amplifier receives operating power through its output port.

The equivalent circuit for this network can be represented as follows:



Equilibrium node voltages and DC resistance values are indicated in this diagram. Note that:

• Node voltages decrease as distance from the power supply increases. This simply confirms the fact aluminum-sheathed cables obey Ohm's Law: the longer

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Next Meeting:

**Tuesday,
February 17, 1998**

Test and Measurement Equipment

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

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

**Meeting & Program
at 7:00pm**

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WHAT TO DO WITH EBS EQUIPMENT?

***By Leonard J. Charles,
SBE EAS Committee Chairman***

As of January 1st, 1998, your old EBS equipment can be discarded. The "shakedown" year of EAS development is over as far as broadcasters are concerned.

A great suggestion on what to do with the old EBS equipment came from the SBE email list server. SBE member Glenn Finney suggests donating your decoder to a school, hospital, or local government that may not have any warning system at all. Remember, that EBS equipment will still de-mute on the 8 second attention tone within the EAS message.

Perhaps you can work through your local SBE Chapter, Emergency Management Agency, or Amateur Radio Club. It's a great idea.

SBE PREPARES TO FILE FOR UNATTENDED OPERATION CLARIFICATION

The SBE FCC Liaison Committee is in the final stages of preparing a filing to ask the FCC to clarify the rules adopted last year allowing unattended station operation. SBE has been aware of concerns from the field (and from many NPR stations) noting some variation in interpretation by local FCC inspectors.

Especially critical is clarifying the difference among stations utilizing true "unattended" operation, those stations utilizing ATS, and those stations using some type of call-out remote control system to notify off-premise personnel, which may or may not be a true ATS device.

(from the Milwaukee/Chapter 28 February Newsletter)

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January Business Meeting Minutes

Chapter 24 of the Society of Broadcast Engineers met on Thursday, January 22, 1998, at the studios of WNWC-FM, in Madison, Wisconsin. There were 20 persons in attendance, including 19 members (16 certified) and one guest. The meeting was chaired by Chapter 24 Vice Chair Kevin Ruppert.

Call to order: 7:19 pm. The minutes of the previous meeting were approved as published in the January Newsletter.

Treasurer's Report (reported by Chapter Treasurer Stan Scharch): the Chapter balance is in the black.

Newsletter Editor's Report (reported by Newsletter Editor Mike Norton): (1) The deadline for the February Newsletter is midnight 2/6/98; the folding party is 5:30 pm 2/11/98 at WKOW-TV. (2) It appears that some submissions e-mailed for the January Newsletter were not received; in the future, all e-mailed submissions will be acknowledged by return e-mail. (3) Leonard Charles (speaking in his capacity as editor of the on-line version of the Newsletter) asked for volunteers to assist with, or take over, said duty.

Membership Report (reported by Paul Stoffel): The Chapter membership currently stands at 69 members, of which 38 are certified. The Chapter mails 136 Newsletters each month.

Sustaining Membership Report (reported by Ruppert in Fred Sperry's absence): Recent renewals include Scharch Electronics. One former Sustaining Member did not renew. The Chapter now has 24 sustaining members.

Program Committee (reported by Steve Zimmerman): The February meeting will be announced in the February Newsletter.

Certification and Education (reported by Jim Hermanson): Future certification exam dates and locations are as follows: (1) April 7, 1998 at the NAB Convention in Las Vegas; application deadline is 2/20/98. (2) June 12-22, 1998 at Local Chapters; application deadline is 4/24/98.

Frequency Coordination Report (reported by Tom Smith): Several new wireless microphones have been added to the coordination database. A portion of these were related to the recent opening of the new Kohl Center at the University of Wisconsin-Madison.

National Liaison Report (reported by Leonard Charles): (1) A number of SBE activities will take place at the NAB Convention; the final schedule has been published. (2) Chuck plans to attend an upcoming National Administrative Committee meeting.

National News (reported by Ruppert): (1) A new publication, "Introduction to DTV RF," is now available from SBE Headquarters. (2) SBE members are reminded that they can

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January Minutes (continued)

register for the NAB convention at the NAB member rate.

Old Business: Ruppert reminded members of the planned equipment demonstration by Discreet Logic on 2/17/98.

New Business: (1) Paul Stoffel noted two engineering openings at WHA-TV. (2) Tom Smith reported on pending FCC matters. (3) Leonard Charles noted that planning meetings will take place shortly for two regional meetings scheduled during 1998: Broadcasters Clinic and the Wisconsin Broadcasters Association Convention.

The meeting was adjourned at 7:30 pm. The program featured a presentation about the collapse of the WOLX broadcast tower, and the subsequent efforts to replace it, presented by Richard Wood, president of Skyline Communications of Cottage Grove.

Submitted by Neal McLain, Secretary

FREE AIRTIME

By Tom Smith

President Clinton in his State of the Union Address requested that the FCC issue rules to allow for free or reduced cost airtime for political campaigns. FCC Chairman Willam Kennard endorsed the proposal and said that he would start an inquiry in the next couple of months. Three Commissioners also have issued statements on the proposals. Republican Michael Powell issued a statement stating that such rules were not up to the FCC, but for elected representatives to decide. Democrats Susan Ness and Gloria Tristani stated that the FCC should look at the issue, with Ness saying that Congress should provide guidance. Comments from Congress were that it was up to Congress itself to decide on such policy.

From FCC Web Site (www.fcc.gov) and BROADCASTING and CABLE

AMATEUR RADIO NEWS

By Tom Weeden, WJ9H

Two Wisconsin radio clubs are planning to operate special events stations for the state's sesquicentennial in May. The Wisconsin Valley Radio Association of Wausau will operate station W9W from the intersection of 45 degrees north latitude and 90 degrees west longitude near Wausau. The Four Lakes Amateur Radio Club will operate a station from Madison. Another operation may take place near Belmont, site of the first territorial capital.

A new club devoted to amateur television (ATV) in southern Wisconsin has been organized. The Badgerland Amateur Television Society is a group of amateur radio operators planning to set up an ATV repeater in the 420-440 MHz band from the Baraboo Bluffs.

The future International Space Station (ISS) will have amateur radio operators among its first crew members. Russian cosmonaut Sergei Krikalev, U5MIR, will be aboard along with US astronaut William Shepherd who is studying for his ham license, and one other cosmonaut. The three-man crew, all of whom have previous space flight experience, is training for an early 1999 launch for a planned five-month mission on the ISS. The second crew will include two hams. Amateur radio will play a significant role on the ISS, with repeater payloads scheduled to arrive in early 2002. NASA says the ISS won't be fully assembled until the end of 2003.

Excerpts from February 1998 "Badger State Smoke Signals" and "QST" Magazine

Broadband Networks Part Eighteen (continued)

the cable, the higher the DC resistance, and hence, the greater the voltage drop in the cable.

• The equivalent DC resistances of the amplifiers *decrease* as distance from the power supply increases. This results from the fact that the amplifier power packs do not obey Ohm's Law: they are constant-power devices, and they draw more current as voltage drops.

ADDING ANOTHER AMPLIFIER

What happens to the equilibrium power situation if we add another amplifier to a network?

To study this question, we will continue using the same example. Figure 1 shows us what happens if we add an extra line extender or two to the feeder (of course, in a real network, we wouldn't want to do this because it would cause higher distortion levels at RF; however, we will ignore that fact for the moment in order to illustrate what's happening at 60 Hz).

Note that:

• Every additional amplifier causes all node voltages to drop even further. Again, this just confirms Ohm's Law: the more amplifiers we add, the greater the total current, and hence, the greater the voltage drop in the intervening cable.

• Every additional amplifier causes the equivalent resistances of other amplifiers to decrease. This confirms the constant-power characteristic of amplifier power packs: as voltage drops, each amplifier draws more current.

At this point, we should recall that amplifier power packs are designed to operate satisfactorily at any voltage in the range 45-60 volts. So even with four line extenders in the cascade, the last one still receives adequate voltage.

But it's easy to see that we can't continue this process indefinitely. In every network design, there's a point at which adding just one more line extender drags the AC voltage below 45 volts at one or more amplifiers.

And when that happens, a disastrous chain of events takes place. The DC regulator circuits in the amplifier power pack no longer produce ripple-free DC operating voltage; instead, the operating voltage contains a 120-Hz component (the rectified 60-Hz square wave):

Since the gain of the RF amplifier circuits varies as a function of the DC operating voltage, the amplifier literally amplitude-modulates the entire broadband spectrum with this 120-Hz component. I leave it to the reader to consider how this affects amplitude-modulated NTSC video signals.

POWER BLOCKING

A typical broadband network is composed of many power supply zones. Within each zone, a single power supply, located near the center of the zone, provides power for all amplifiers within the zone (Figure 2).

When a trunk cable passes across a zone boundary, a "power block" blocks AC power but passes the broadband RF signal. A power block may be a discrete physical device spliced into the cable, or it may be (and usually is) incorporated into a trunk amplifier housing.

Figure 3 illustrates the typical power circuitry within a trunk amplifier which incorporates a power block. Note the "power plug" in this figure. A technician can place a power block in any desired location simply by inserting a jumper plug in the proper orientation. There are four possible orientations for the jumper plug:

(continued on next page)

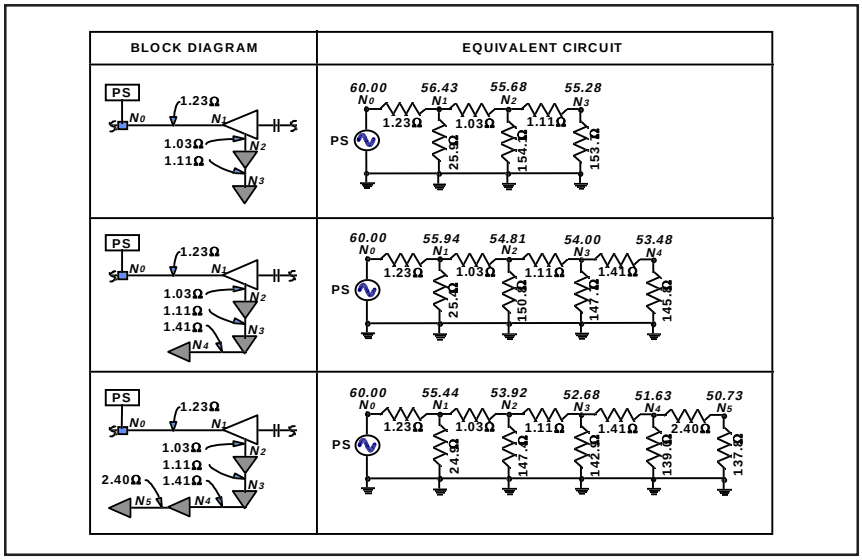


Figure 1. Effect of additional amplifiers. Note that as amplifiers are added to the network, two things occur: node voltages decrease, and the equivalent DC resistances of the amplifier power packs decrease.

Broadband Networks Part Eighteen (continued)

• POWERED FROM INPUT PORT: Amplifier power arrives through the input port, and is blocked from passing out the output port.

• POWERED FROM OUTPUT PORT: Amplifier power arrives through the output port, and is blocked from passing out the input port.

• POWERED THROUGH: Amplifier power may arrive through either port, and it passes through the amplifier and on out the other port to provide power to other amplifiers beyond. A typical trunk amplifier can safely pass as much as ten amperes at 60 volts.

• POWER OFF: Power is blocked at both ports, and the amplifier is not operating. Obviously, this configuration would not be used under normal operating conditions; however, it's sometimes used during the construction phase of a new broadband system. As amplifiers are installed, they are powered "off" until construction is completed and system is ready to be placed in service.

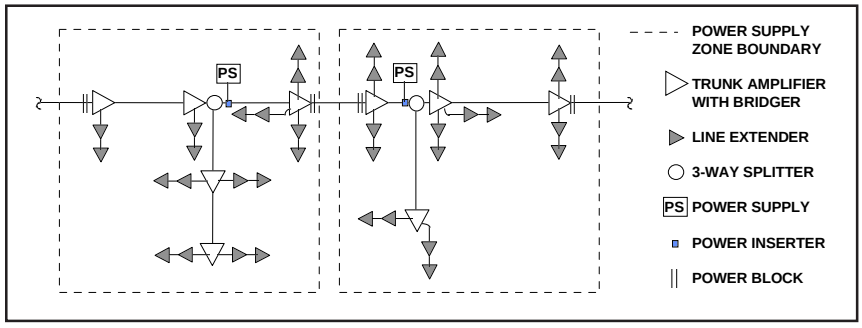


Figure 2. Typical power supply zones. Note the power blocks in the trunk amplifiers adjacent to the zone boundaries.

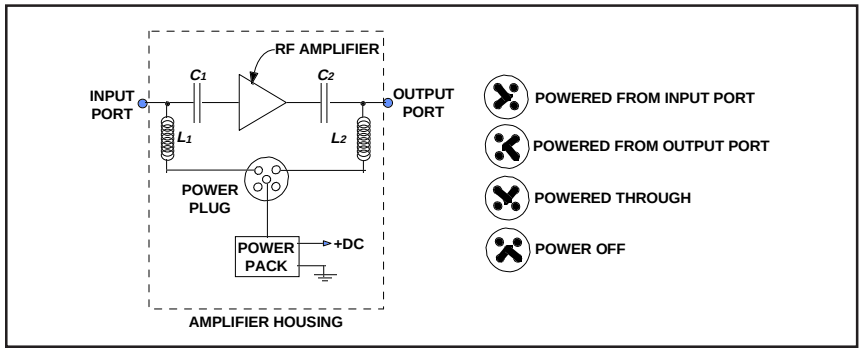


Figure 3. Typical broadband amplifier power circuitry. A technician can set the amplifier to any of four powering configurations by proper orientation of the jumper plug. C1, C2 = capacitor (passes RF; blocks AC). L1, L2 = inductor (passes AC; blocks RF).

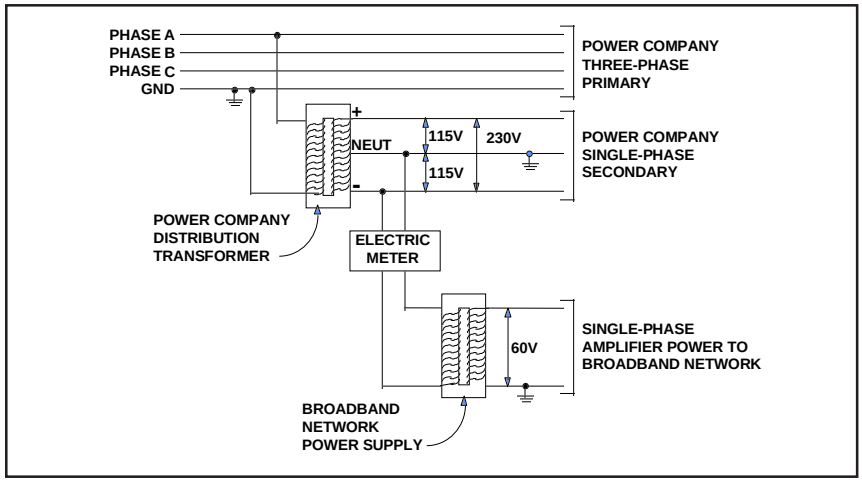


Figure 4. Typical power company distribution circuitry.

When the power plugs are properly inserted, there are actually two power blocks between zones, one at each of the two amplifiers adjacent to the zone boundary. The intervening section of cable carries the broadband RF signal only, but no AC power. This arrangement provides an extra margin of safety: even if one of the two power blocks is inadvertently omitted, the other one still exists.

POWER BUCKING

This leads to an obvious question: what happens if both power blocks are omitted and the two power supplies are connected in parallel?

This is a condition known as "power bucking." Depending on the phase relationship between the two power supplies, the result can vary from no-affect-whatever to complete system failure.

To understand why this is so, we have to back up ahead of the power supply and consider how the power company distributes power (Figure 4). Note that:

• The power company distributes power over three-phase "primary" circuits operating at several thousand volts. The phase conductors are typically identified A, B, and C.

• Distribution transformers, placed throughout the distribution system, step the primary voltage down to "secondary" voltage. A typical distribution transformer has a center-tapped secondary winding capable of providing 115 and 230 volts. This is the standard voltage supplied to residential and small commercial customers. Within the customer's premises, most loads (lighting; small appliances) are connected at 115 volts;

(continued on page 6)

Broadband Networks Part Eighteen (conclusion)

larger loads (water heaters; electric dryers) are connected across the full 230 volts.

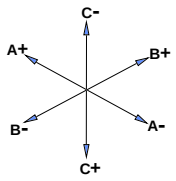
• The broadband network power supply is connected to one of the 115-volt secondary circuits.

But the broadband network operator has no control over which circuit the power supply is connected to. Depending on how the power company connects the distribution transformer, the power supply can be connected in any of six ways:

• The distribution transformer primary can be connected to either phase A, phase B, or phase C.

• The power supply can be connected to either half of the distribution transformer center-tapped secondary.

These six combinations can be represented by a vector diagram as follows:



Now suppose two adjacent power supplies are "bucking"; i.e., connected in parallel without a power block. Depending on how the power company has connected things, the phase relationship between these two power supplies can be any of the following: 0°, 60°, 120°, or 180°.

So now what happens? There are several possible results; here are three:

• Phase relationship 0°. If the two power supplies are exactly in phase, the network will probably operate normally. Amplifiers along the line between the two power supplies will receive voltage from both power supplies. However, if one of the power supplies should happen to fail, the remaining power supply would be subjected to an overload; this would probably trip a circuit breaker, thus causing the remaining power supply to fail as well.

• Phase relationship 60°. In this case, the system might continue to operate, especially if there's a long cable (large DC resistance) between the two power supplies. Amplifiers along the line will continue to receive voltage; it may be lower than normal, but as long as it exceeds 45 volts, the amplifiers will continue to operate. The real problem here is that each power supply acts as a load on the other, resulting in increased load on both supplies. And, of course, if one of the power supplies should fail, the other one will be subject to overload.

• Phase relationship 180°. In this case, the network would almost certainly fail. Each power supply would load the other, probably causing at least one circuit breaker to trip. Even if this didn't happen, one of the amplifiers along the line would fail to receive sufficient operating voltage.

BACKUP POWER SUPPLIES

Like any other electronic components, power supplies are subject to failure. Such failures can be catastrophic; indeed, the failure of a single power supply at a critical location can disrupt the operation of an entire network.

Power supply failure can be caused by a number of factors: tripped circuit breakers, component failure, power outages, vandalism. Most of these factors can be controlled and managed by the network operator; however, power outages are usually beyond the operator's control.

As a hedge against power outages, a number of manufacturers offer "backup" power supplies. A backup power supply is equipped with a bank of batteries and appropriate circuitry so that it will continue to operate during a power outage.

Assuming it's maintained properly, a backup power supply can provide power for several hours. That's sufficient to cover most power outages. Indeed, a network operator might not even know that an outage has occurred: if an outage is of fairly short duration, the network will continue to operate with no service interruption.

Unfortunately, no backup power supply can provide sufficient backup power to cover an extended outage. For this reason, it's desirable to have some sort of alarm system to notify the operator whenever a backup power supply kicks in.

Over the years, many types of alarm systems have been devised. One early system used in cable television networks incorporated an automatic telephone dialer in each power supply: if the power supply switched to backup status, the dialer would dial a specified number and report the situation with a series of tones. Of course, this was an expensive system to operate because each power supply required a telephone line.

Modern two-way networks are usually equipped with "status monitoring" systems which provide extensive reporting capabilities: power supply status, battery condition, total current draw, even ambient air temperature. We'll discuss status monitoring further in a future article.

Next month, however, we'll take up a new topic: two-way transmission.

SBE Short Circuits - February 1998

SBE MEMBERS GET DISCOUNT FOR NAB'98

SBE Members save $300 on the Full Conference Registration for NAB'98 in Las Vegas. SBE members get the NAB member rate. Check the appropriate member box on the NAB'98 registration form.

NAB'98 is April 4-9 at the Las Vegas Convention Center and Sands Convention Center. On April 4, special workshops and tutorials, including the "Radio Bootcamp," presented by SBE's Ennes Educational Foundation Trust will be held. The exhibit floor will open on Monday, April 6. The SBE Membership Meeting will be held on Tuesday, April 7 at 5:15 pm, Room N111/112 at the Las Vegas Convention Center.

SBE "INTRODUCTION TO DTV RF" NOW AVAILABLE

SBE members receive a discounted price on the new "SBE Introduction to DTV RF." Cost to SBE Members is $49, while non-members will pay $65. For all orders, add $2.00 for shipping per book. Orders with Indiana addresses add 5% sales tax to your order. To order your copy, call the SBE National Office at (317) 253-1640 or fax your request to SBE at (317) 253-0418 and pay by Mastercard, Visa or American Express. Send mail orders to: DTV RF, Society of Broadcast Engineers, 8445 Keystone Crossing, Suite 140, Indianapolis, IN 46240.

YOUTH MEMBERSHIP CATEGORY PROPOSED

Comments are being accepted through February 28 on a proposal to create a Youth Membership category within the Society. At the September 25, 1997 meeting of the SBE Board of Directors, a proposal was introduced by Membership Chairman Robert Hess outlining a program that would involve high school-aged youth in SBE for the first time. The goal is to educate young people about broadcast engineering and careers in the field with the hope that it will help stimulate the flow of young people into broadcast engineering.

By offering high school age students Youth Membership in SBE, the Society can provide information and resources to help develop interest, enthusiasm and knowledge in the science and art of broadcast engineering, and thereby, increase the number of students who go into post-secondary education with interest in entering broadcasting's technical fields. More details about the Youth Membership proposal can be found in the November/December issue of the SBE SIGNAL.

E-mail your comments to Executive Director, John Poray at jporay@sbe.org or mail them to Youth Membership, SBE, 8445 Keystone Crossing, Ste. 140, Indianapolis, IN 46240. The Membership Committee will review all comments and make a recommendation to the Board for action during its April 1998 meeting in Las Vegas. If approved, the program could begin as early as September of 1998.

SBE RECOGNIZES MORRIS BLUM WITH LIFETIME ACHIEVEMENT AWARD

The Society of Broadcast Engineers will recognize a 67-year veteran of broadcasting when it presents Morris H. Blum with its Lifetime Achievement Award. The award will be presented to Blum at the SBE Membership Meeting held during the NAB Spring Convention in Las Vegas, April 7.

Blum's broadcasting career has included 50 years as builder, owner, general manager and technical director of WANN-AM in Annapolis, Maryland. Prior to WANN, he served in the Merchant Marine and the US Navy in communications. He has been recognized for his record in civil rights, as well as broadcasting. Look for the special article on Morris Blum in the February/March issue of the SBE SIGNAL in early March.

All SBE members attending the NAB Convention are encouraged to be present for the SBE Membership Meeting to help recognize Mr. Blum. The Membership Meeting will be Tuesday, April 7, 5:15 p.m. to 6:00 p.m. in Room N111/112 of the Las Vegas Convention Center.

1998 SBE CERTIFICATION EXAM DATES

The Deadline to take an SBE Certification exam during the NAB Spring Convention in Las Vegas is February 20. See the chart below for all of the exam registration deadlines and exam dates for 1998. For more information about SBE Certification, see your Chapter Certification Chairman or contact Linda Godby-Emerick, Certification Director at the SBE National Office at (317) 253-1640.

Exam Date	Location Application	Deadline
April 7, 1998	NAB-Las Vegas	Feb 20, 1998
June 12-22, 1998	Local Chapters	April 24, 1998
Nov. 13-23, 1998	Local Chapters	Sept. 25, 1998

Discreet Logic Presentation

Chapter 24 members have been formally invited by Steve Olson of Discreet Logic to the Tuesday February 17th Chapter 28 SBE meeting in Milwaukee. The program will feature a demonstration of two products and technologies from Discreet Logic.

Discreet Logic will demonstrate "Smoke," their non-compressed non-linear editing system, and "Frost" a real time 3D graphics renderer.

Unfortunately, this meeting and presentation coincides with our Chapter 24 meeting; however, this program may be of special interest to the production staff at your facility. Please pass this information along to them.

For anyone interested in attending this event, the meeting will start at 6:30 PM at the following location:

General Electric Medical Systems Television
N16W22419 Watertown Road
Waukesha, Wisconsin 53186

Please contact Fred Sperry at 264-9806 or via e-mail at fsperry@mail.state.wi.us if you have any questions or need further details.

TELECOM INDUSTRY NEWS

By Neal McLain

TCI AND BRESNAN ANNOUNCE JOINT VENTURE TO ACQUIRE WISCONSIN CABLE TELEVISION SYSTEMS.

TCI Communications, Inc., Bresnan Communications, Inc. and Keystone, Inc. have announced plans to form a joint venture to acquire a number of cable television systems presently owned by TCI, including TCI'S five systems in Wisconsin. Under the terms of the agreement, Bresnan will manage the systems while TCI and Keystone will be passive investors.

Bresnan is a privately-held telecommunications and cable television company headquartered in White Plains, New York; it owns and operates cable systems in approximately 220 communities in the United States serving 213,000 customers. Keystone is a privately-held investment firm based in Texas. Under the terms of the proposed agreement, TCI will own 50% of the new venture; Keystone will own about 39%; and Bresnan will own the remainder.

The new entity, tentatively known as the "Bresnan Partnership," will continue to provide cable television service for Bresnan's existing customers in addition to the customers it plans to acquire from TCI. Once the acquisition is complete, the partnership will serve approximately 660,000 customers in six states: Georgia, Michigan, Minnesota, Mississippi, Nebraska, and Wisconsin. A complete list of systems to be acquired by the partnership accompanies this article.

Five TCI systems located in Wisconsin are included in this acquisition: Baraboo, LaCrosse, Madison, Richland Center, and Walworth. As used here, the term "system" includes all individual franchises operated as a single business from a single office. Most systems include several franchises; for example, the Baraboo system includes Baraboo, Greenfield Township, Lake Delton, Reedsburg, West Baraboo, and Wisconsin Dells. Similarly, the Madison system includes about 35 separate franchises.

Cable television franchise transfers generally must be approved by local franchising authorities. Accordingly, Bresnan will have to obtain the approval of every local franchising authority before the proposed acquisitions can take place. This process may turn out to be quite contentious in certain larger cities (like Madison, for instance).

Bresnan is already preparing its case. According to a recent article in *Multichannel News*, Bresnan has prepared a 13-minute video tape featuring testimonials by franchising officials in communities Bresnan presently serves. According to the article, these officials are "virtually raving" about Bresnan's service record.

Sources: TCI Press Release, 9/30/97. Multichannel News, 2/2/98, p. 37.

The following cable systems, presently owned by TCI, will be transferred to the Bresnan Partnership:

Alpena, MI
Big Rapids, MI
Muskegon, MI
Petoskey, MI
St. Charles/Saginaw, MI
Albert Lea, MN
Austin, MN
Alexandria, MN
Crookston, MN
Faribault, MN
Fergus Falls, MN
International Falls, MN
Rochester, MN
St. Cloud, MN
Wadena, MN
Willmar, MN
Winona, MN
Alliance, NE
Grand Island, NE
Hastings, NE
Ogallala, NE
North Platte, NE
Scottsbluff, NE
Sidney, NE
Baraboo, WI
LaCrosse, WI
Madison, WI
Richland Center, WI
Walworth/Fontana, WI

The following cable systems, presently owed by Bresnan, will be managed by the Bresnan Partnership:

Hinesville/Jesup, GA
Bay City, MI
Escanaba, MI
Houghton, MI
Iron Mountain, MI
Ironwood, MI
Marquette, MI
Midland, MI
Sault St. Marie, MI
Brainerd, MN
Duluth, MN
Mankato, MN
Marshall/Montevideo, MN
Grenada, MS
Superior, WI

FCC Rulemakings

Compiled by Tom Smith

PROPOSED

MM Docket No. 95-176; FCC 98-3
Closed Captioning of Video Programming

The FCC is seeking comment in a further notice of rulemaking on the use of closed captioning of emergency programming. Issues that are raised in this notice include the real time captioning of special reports concerning emergency situations, including unscripted reports and the availability of caption providers on short notice. Other issues include cost burdens and how various video providers should be covered under these rules.

Comments are due on February 25, 1998 and replies on March 27, 1998. This notice was adopted on January 9, 1998 and released on January 14th. It was published in the FEDERAL REGISTER on January 21, 1998 on pages 3,070-3,075.

MM Docket No. 97-247: FCC 97-414
Fees for Auxiliary or Supplementary Use of the Digital Television Spectrum, Pursuant to Section 336 (e) (1) of the Telecommunications Act of 1996

This rulemaking concerns fees that the FCC is required to collect from broadcasters who offer subscription services on their DTV stations. Comments are due March 3, 1998 and replies are due on April 2, 1998.

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

LOCAL LEGALS

Compiled by Tom Smith

GRANTED

New FM; Soldiers Grove, WI

The FCC has allocated a new FM channel to Soldiers Grove at the request of Lyle R. Evans. The channel allocated is 290A (105.9 mhz) with a site restriction of 7.3 miles northeast of Soldiers Grove. The filing window will not be opened until the FCC issues its rules for broadcast auctions.

Adopted on December 17, 1997 and released on January 9, 1998

From the FEDERAL REGISTER

Congratulations!

Congratulations to Chapter 24's Certification Chair Jim Hermanson, for recently obtaining his Professional Broadcast Engineer certification. Way to go Jim!

CHAPTER 24 SUSTAINING MEMBERS

WELCOME TO OUR NEW SUSTAINING MEMBER:
Ramaker & Associates
Tektronix

RECENT RENEWALS:
Harris Corporation

THANKS TO ALL OUR SUSTAINING MEMBERS:

Alpha Video
BCS Wireless
CTI
Clark Wire and Cable
Comark Communications
Fuji Film
Hewlett-Packard
Louth Automation
maney-logic
Niall Enterprises
Norlight Telecommunications
Panasonic Broadcast
Richardson Electronics
Roscor Wisconsin
Scharch Electronics
Skyline Communications
Sony Broadcast
Teleport Minnesota
Video Images
WISC-TV 3
WKOW-TV 27
WMSN-TV 47
WMTV-TV 15

SBE
SBE Chapter 24 Newsletter
5174 Anton Drive #15
Madison, WI 53719-4201

FIRST CLASS MAIL

Newsletter edited on Pagemaker 5.0 by: Mike Norton
Contributors this month: Leonard Charles, Neal McLain, Tom Smith, and Tom Weeden.
Thanks to Chris Cain for his work on the Chapter 24 WWW page.

FEBRUARY MEETING and PROGRAM

Society of Broadcast Engineers
CHAPTER 24 MADISON, WISCONSIN
Tuesday, February 17, 1998

Test and Measurement Equipment

This month's meeting will feature a presentation on test and measurement equipment for broadcast. Representatives from Heartland Video Systems and Tektronix will be on hand to explain current testing systems, as well as applications for radio and television facilities.

Dutch Treat Dinner at 5:30pm
J. T. Whitney's
647 S. Whitney Way

Meeting and Program at 7:00pm
J.T. Whitney's
(in meeting room)

Visitors and guests are welcome at all our SBE meetings!

1998 UPCOMING MEETING/PROGRAM DATES:

Day	Date	Program
Wednesday	March 18	ATM Technology
Thursday	April 16	Elections and NAB Review
Tuesday	May 5	Telephone Company Tour

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