



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



Society of Broadcast Engineers

January 1999

BROADBAND NETWORKS PART 27 - HEADENDS I

By Neal McLain

This is Part 27 in a series of articles about broadband networks. In this article, we'll begin a discussion of headends.

INTRODUCTION

Everybody knows what a headend is, right? It's the origination point for all of the signals carried on a broadband network.

That definition is indeed true for most cable television networks. However, many cable networks also incorporate multiple signal-origination points. Modern broadband networks carrying two-way services incorporate hundreds of origination points, one for each subscriber.

Nonetheless, the classic one-way cable television network is a good place to begin our discussion of headends.

TOPOLOGY OF A CATV SYSTEM

As a point of departure, let's review the topology of a cable TV network. We talked about network topology back in Part 1 of this series (April 1996); in that article, we noted that the cable TV distribution network is a "tree": a central stem with many branches:



(continued on page 4)

Next Meeting:

**Wednesday,
January 20, 1999**

**Tour of WKOW
Transmitter Site**

**Madison Community
Tower
8559 Mineral Point Rd**

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

Program at 7:00pm

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SBE Chapter 24 Now Incorporated

By Fred Sperry

I am pleased to announce that Chapter 24 has started the New Year having accomplished one of its long-standing goals. Effective December 10th, 1998, SBE Chapter 24 was officially incorporated.

A Certificate of Incorporation was received from Richard L. Dean, Secretary of the Department of Financial Institutions for the State of Wisconsin which confirms this. The official title for Chapter 24 is now *Society of Broadcast Engineers, Chapter 24, Inc.*

With the exception of some changes in paperwork, operation of Chapter 24 will not change. However, there are some definite advantages for an organization to be incorporated.

The main advantage to incorporating is that our Chapter now has its own legal status. In our case, this means that individual chapter members are protected from legal action that could be brought about due to acts of the Chapter.

As many of you are aware, the National Office has been encouraging

local chapters to become incorporated for some time now.

It is important for all members of Chapter 24 to at least be aware of this legal change to our Chapter. When appropriate, please use the incorporation title noted above when conducting official Chapter 24 business.

I will continue to oversee the area of incorporation for Chapter 24 even after my term as Chapter Chair ends in April. Please don't hesitate to contact me at any time with any questions regarding this issue.

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December Business Meeting Minutes

Chapter 24 of the Society of Broadcast Engineers met on Tuesday December 15 at WKOW-TV in Madison, Wisconsin. There were 22 members, and 3 guests present.

The meeting was called to order by Chair Fred Sperry at 7:00 PM. Minutes of the November meeting as published in the December newsletter were approved as written.

Treasurer Stan Sarch reported the balance of the checking account. Newsletter Editor Mike Norton reported the deadline for the next newsletter is 1-8-99. Chair Fred Sperry reported that we have 25 sustaining members, with WISC-TV and WKOW-TV as recent renewals.

Certification, Jim Hermanson reported that one exam was given in November, that the next exam session would be February 10th-20th, and that December 31 was the deadline for applications.

Frequency Coordinator, Tom Smith reported that the 13 GHz band was now under attack from other interests. Also, the National SBE has filed materials with the FCC in support of retaining the 7 GHz band for broadcasters.

National Liaison, Leonard Charles reported that the NAB will honor SBE members for "Member Rates", that National Car Rental now offers a discount to SBE members. Also, The SBE publication "Short Circuits" will be emailed to members beginning in January. He also reported on the SBE's free "Resume Service" for members. Finally, he relayed our national office's encouragement for broadcast engineers to participate in the "Ground Hog Day Shadow" event, where a young person can "shadow" someone for a day to learn more about that career.

Chair, Fred Sperry, announced that he had received a letter from the State of Wisconsin, announcing our successful incorporation as "Society of Broadcast Engineers, Chapter 24, Inc."

Under New Business, John Salzwedel announced the upcoming ITVA meeting on January 14 at WMSN-TV. This meeting will be a seminar on HDTV production.

To close out the year on a high note, Chair, Fred Sperry, then presented awards: for best Frequency Coordination Effort in 1998 to Tom Smith; a special recognition to Mike Norton, Chapter 24 Newsletter editor; a special recognition to Denise Maney, Chapter 24 Program Committee.

Fred Sperry adjourned the business meeting at 7:14 PM.

The evening's program, presented by Mr. Scott Rogers of Snell and Wilcox, was on DTV equipment planning, options, and implementation. A look inside the DTV system presently in operation at WKOW-TV closed out the evening's activities.

Submitted by Lloyd Berg, Secretary

FCC CHAIRMAN'S 1999 AGENDA

By Tom Smith

FCC Chairman William Kennard issued his agenda for the FCC in 1999. In his statement he noted the growth of the Internet, increased competition in wireless phones, and changes in regulations.

Some of his goals for the new year include a number of broadcast and broadcast-related items. Some of the items include the preservation of free over-the-air broadcasting and ensuring satellite coverage in underserved areas, the opening of low-power radio for local use, closed captioning and video description accessibility, the promotion of alternatives to cable and broadcast TV, and promoting completion and choice in the video marketplace.

Other goals include a number of telephone issues including scrutinizing mergers, allowing the Regional Bell Operating Companies into long distance, completing universal service reforms, 911 wireless compatibility, consumer protection from slamming and cramming, and alternatives to wireline technology in the local telephone market.

Development of the Internet, reducing regulatory burdens, and promoting marketplace competition are also high on the Chairman's agenda.

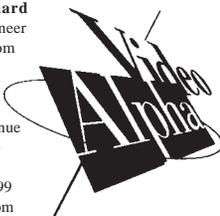
From FCC Press Release
(www.fcc.gov)

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

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

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AMATEUR RADIO NEWS

By Tom Weeden, WJ9H

The American Radio Relay League (ARRL) has petitioned the FCC to create two low-frequency amateur radio allocations below the AM broadcast band. The proposal calls for a narrow 2.1 kHz band from 135.7 to 137.8 kHz and a 30 kHz segment from 160-190 kHz. Transmit power of 200 watts would be allowed, but EIRP (effective isotropic radiated power) would be limited to only 2 watts. ARRL pointed out that poor antenna efficiencies and ground losses would likely keep EIRPs at less than 1 watt. Unlicensed experimenters operating under Part 15 of the FCC Rules can currently operate on low frequencies running transmitter power of 1 watt or less.

Phonex Corporation, a maker of "wireless modems" and TCI, which has been installing the units across the US, are recalling them after reports of interference to amateur HF bands. The ARRL contacted the two companies after receiving reports about 80-meter interference from the devices. The modems operate under Part 15 and may not cause interference to licensed services. "Although the Phonex has complied with required FCC regulations, the ARRL has identified a potential interference problem on the low end of the 80-meter band," said Phonex Senior Engineer Scott Bullock, KK7LC. "We have several hams in our organization, and we do not want to cause any interference to any amateur band." The carrier-current devices impose 3.53 and 8.27 MHz RF on the power line. TCI has been installing these units in some subscribers' homes to make a convenient connection from the cable box to the telephone line to transmit billing information. Phonex says it's made the necessary production changes to move the operating frequency of its units to 3.3 MHz.

(Excerpts from January 1999 "QST" Magazine and "The ARRL Letter")

FCC LOCAL LEGALS

Compiled by Tom Smith

PROPOSED

**WTLX (FM) Columbus, WI
100.5 MHz**

Good Karma Broadcasting LLC. seeks FCC approval to change transmitter location and structure height. Announced on December 16, 1998.

From FCC Daily Notices
(www.fcc.gov)

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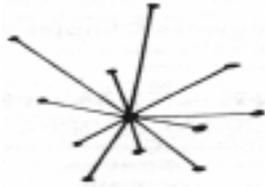
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RICHARD H. WOOD
President

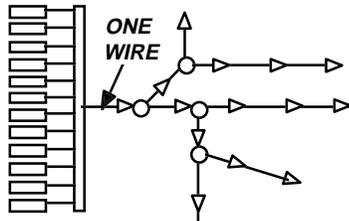
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Broadband Networks Part Twenty-Seven (continued)

The headend is more like a “star”: many branches converging at a common point:

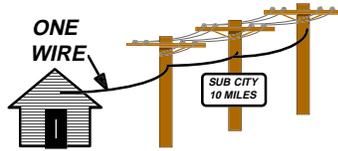


If we hook these two networks together stem-to-stem (and redraw them with standard CATV-industry drafting symbols) we have the basic topology of a cable TV system:



The star network on the left is the headend: signals from several sources are combined to a single point. The tree network on the right distributes these signals to subscribers who may be scattered over hundreds of square miles. The two networks are connected by a single wire; depending on the geographic locations of the headend and the distribution network, this wire

may be only a few inches long, or it may extend for several miles:



Each of those boxes on the left generates one NTSC television channel. There’s all sorts of additional equipment upstream from these boxes (satellite receivers, antennas, switching equipment, etc.) that’s not shown on this drawing. We’ll discuss all this upstream equipment in future articles; for the moment, we’re concerned only with those boxes and the way they are combined into a single wire.

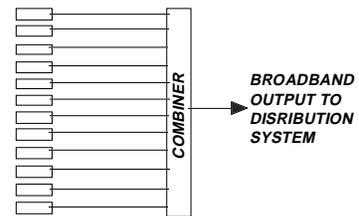
A TYPICAL CATV HEADEND

Figure 1 is a stereotypical cable TV headend: a building, a few off-air antennas to receive broadcast stations, and some earth stations to receive satellite-delivered services. The building is unattended except for an occasional visit by a technician to check picture quality and signal levels.

Of course, the headend doesn’t have to be in a separate building. At many cable systems, the headend shares space in the same building that houses

other functions such as the business office, maintenance shop, warehouse, and production studio. But the basic function is the same: the headend is the point at which all signals are gathered, combined, and sent out over the distribution system.

The equipment located inside the headend building is also called the headend. Figure 2 illustrates the equipment found at our stereotypical headend. Somewhere in these racks of equipment is a device — one of those boxes we mentioned earlier — for every NTSC channel carried on the distribution system:



These are the devices that actually generate the NTSC television signals. These devices fall into three categories: strip amplifiers, processors, and modulators. We’ll discuss each category separately.

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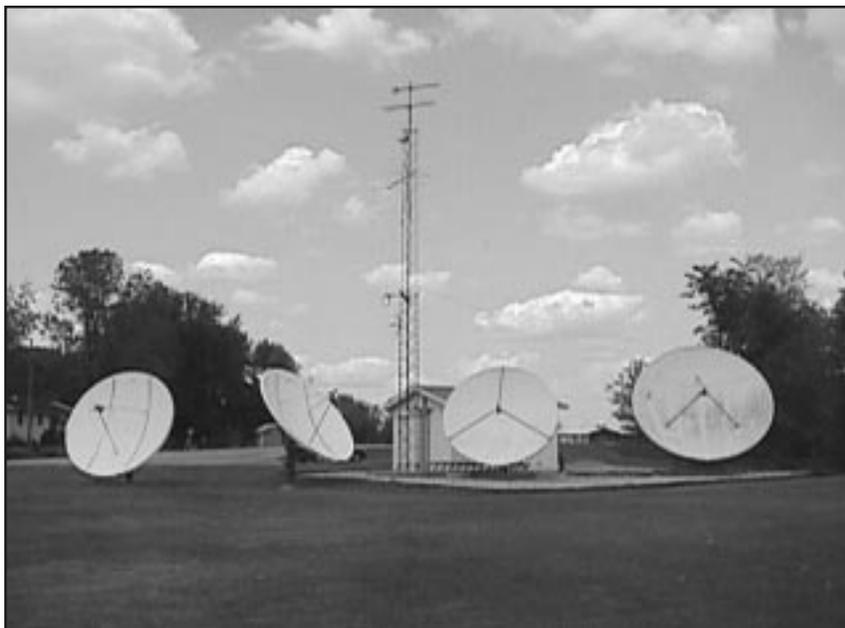


Figure 1. Typical unattended cable TV headend.

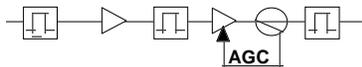


Figure 2. Typical headend equipment racks.

Broadband Networks Part Twenty-Seven (continued)

STRIP AMPLIFIER

A strip amp is the simplest of the three devices: it's simply an amplifier with an AGC circuit, some band-shaping filters, and a trap to remove the lower-adjacent aural carrier. It accepts an NTSC channel at its input and delivers the same NTSC channel at its output. A block diagram looks something like this:



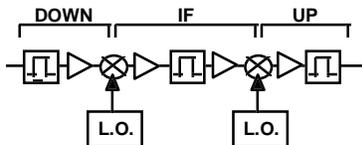
Several manufacturers make strip amps. Virtually all strip amps occupy one rack unit, a fact which probably accounts for the name:



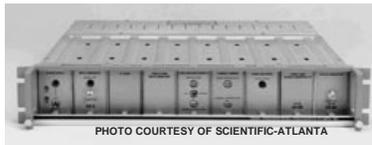
In the most common application, a strip amp is used for an off-air VHF station when the cable channel is the same as the off-air channel. The filters reject out-of-band signals, and the AGC circuit maintains a constant signal level on the distribution system. A strip amp cannot alter the frequency of any carrier; hence, it cannot be used if channel conversion is required.

PROCESSOR

A processor accepts an NTSC channel at its input and delivers an NTSC channel at its output. It converts the input channel to an intermediate frequency (IF) for processing. A block diagram looks like this:



Most processors are rack-mounted, and feature plug-in modules:



Note that a processor incorporates three stages:

- A downconverter to convert the input channel to IF. The downconverter incorporates a bandpass filter at its input to reject out-of-band signals. In most processors, the input channel can be changed simply by swapping downconverter modules.
- An IF strip. This stage does pretty much the same thing that an IF strip in a TV set does: it shapes the bandpass of the desired signal, traps out the lower-adjacent aural carrier, and amplifies the signal. The IF operates at industry-standard frequencies: visual = 47.75 MHz; aural = 41.25 MHz.
- An upconverter to convert the IF to the desired cable channel. The upconverter incorporates an AGC-controlled amplifier to maintain a constant signal level on the distribution network; it also incorporates a bandpass filter at its output to reject out-of-band noise. In most processors, the output channel can be changed by swapping upconverter modules.

A processor is used for a number of applications:

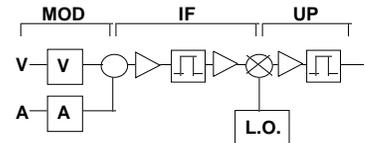
- An off-air broadcast station when the cable channel differs the off-air channel.
- An off-air broadcast station when the cable channel is the same as the off-air channel but a frequency offset is required. This situation could result if the cable channel must fit into an HRC or IRC frequency plan, or if the station's

broadcast frequency is offset.

- To convert a cable-delivered NTSC signal from one channel to another. This situation typically occurs when a signal generated at a distant location (school, city office, cable company office, etc.) is delivered to the headend on a T-channel.

MODULATOR

A modulator accepts baseband video, with accompanying audio, at its input and delivers an NTSC channel at its output. Like a processor, it incorporates an IF stage for processing. A block diagram looks like this:



Like processors, most modulators are rack-mounted, and feature plug-in modules:



Note that a modulator incorporates three stages:

- A modulation stage to modulate the incoming baseband video and convert it to IF. This stage also accepts audio; the audio may be at baseband or it may be a frequency-modulated subcarrier superimposed on the video.
- An IF strip. This stage is identical to the IF strip in a processor. Indeed, many manufacturers' IF modules are electrically and physically interchangeable between modulators

(continued on page 6)

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Broadband Networks Part Twenty-Seven (conclusion)

and processors.

- An upconverter to convert the IF to the desired cable channel. This stage is identical to the upconverter in a processor. Like IF modules, many manufacturers' upconverter modules are interchangeable between modulators and processors. And, of course, the output channel can be changed by swapping upconverter modules.

A modulator is used for any signal which arrives at the headend as baseband video. Common examples include:

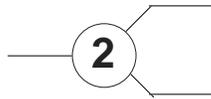
- The output of a satellite receiver. In most cases, both video and audio are baseband signals.
- The video output of a local character generator. In a cable TV headend, a character generator usually runs 24 hours a day to display a continuous sequence of screens. The accompanying audio is frequently obtained from an unrelated source such as an FM broadcast station or a NWS weather station.
- The output of a microwave receiver. Most microwave systems intended to deliver signals to cable TV headends provide video at baseband, but the accompanying audio is carried by an aural subcarrier at 4.5 MHz.

COMBINING THE NTSC CHANNELS ONTO ONE WIRE

The outputs of these devices are all combined together to generate the single signal (the "one wire") that feeds the distribution network. Note that the verb in that sentence is "combine", not "mix": a combiner is optimized to combine many signals without generating any spurious signals. By

contrast, the term "mix" implies a heterodyne mixer or some similar device which is intended to generate sum and difference signals.

Combiners are available in many physical configurations, but they're all based on the same fundamental device — the splitter:



A common rack-mounted combiner is simply a group of several splitters connected backwards (Figure 3). Many manufacturers make rack-mounted combiners, but down inside, most of them are nothing more than strings of splitters.

Next month, we'll continue with the discussion of headends with a description of the equipment located upstream from the strip amps, processors, and modulators.

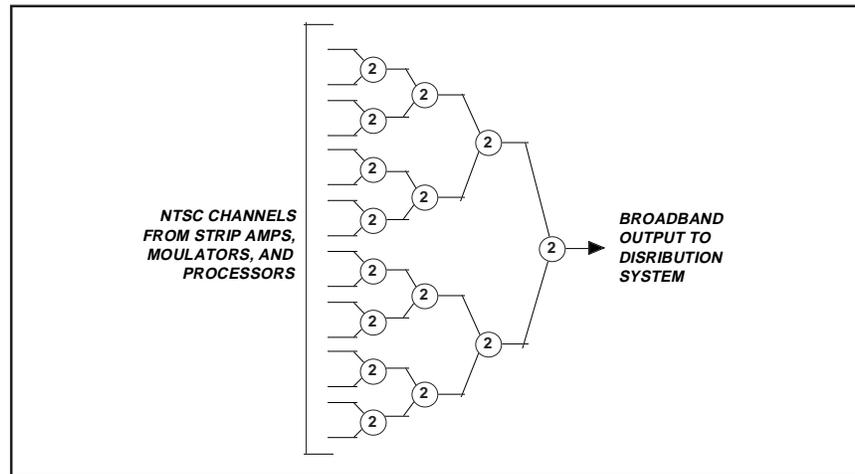


Figure 3. Block diagram of a 16-channel combiner.

Employment Opportunities

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Candidates need to be resourceful, energetic, self-motivated and have a willingness to learn. We will offer great benefits including insurance, 401K, performance bonuses and advancement.

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FCC Rulemakings

Compiled by Tom Smith

FINAL RULEMAKINGS

MM Docket No. 98-98; FCC 98-324 Call Sign Assignments for Broadcast Stations

The FCC has revised its rules concerning the assignment of call signs for broadcast stations. The primary change in this rulemaking is that the FCC will require that any application for either new or changed call signs will have to be filed by electronic methods via the Internet. This system should increase the speed in which call sign changes are granted, as applicants will be able to determine the availability or status of any call sign from the electronic system. Those stations without access to the Internet may request a waiver. Stations will be notified of the grant and the effective date of the new call sign by a postcard from the FCC. The station must request the specific effective date to take place within 45 days of their request.

The rules became effective on December 29, 1998. The rule was adopted on December 8, 1998 and released on December 16, 1998. The notice was published in the FEDERAL REGISTER on December 29, 1998 on pages 71,601-71,604

MM Docket Nos. 98-43, 94-149; FCC 98-281 1998 Biennial Regulatory Review- Streamlining of Mass Media Applications, Rules, and processes; Policies and Rules Regarding Minority and Female Ownership of Mass Media Facilities

The FCC has issued rules that will require the electronic filing of 15 different applications and forms for broadcast stations. They also reduced the number of exhibits required with applications, changed the rules concerning construction permits, and made changes in ownership reports.

The forms that the FCC will require

to be filed electronically include 301, 302-AM, 302-FM, 302-TV, 302-DTV, 314, 315, 316, 340, 345, 346, 347, 349, 350, and 5072, the Children's Television Report which is already in electronic form. The FCC hopes to start the electronic filing of these forms in March of 1999, with electronic filing becoming mandatory in the fall of 1999. Mandatory filing of the Children's Television Report starts on January 10, 1999.

The FCC will reduce the number of required exhibits to be filed with an application. Instead of attaching many exhibits to an application, the FCC will change from exhibits to yes or no questions on the application for some of the information that they require. Worksheets will be available to the applicants to determine how to answer the yes or no questions. The FCC already uses this method for some financial and ownership information. The FCC will extend this method to include information that required drawings, such as maps to show tower location coordinates, co-located antennas, and some interference information. Applications for AM station will require more exhibits due to the nature of AM transmissions.

The FCC will try to insure that applicants will be kept honest by auditing five percent of the applications before granting them and auditing another five percent of the applications after being granted. These audits will be on a random basis.

Applications for transfer of ownership of stations will require that only a single copy of sales contracts and other exhibits be filed and some information be only certified as accurate.

The FCC will insure the security of the application by the use of passwords chosen by the applicants and unique account numbers generated by the application systems. Applicants must also file their tax identity numbers with the FCC, but this number will not be used in the filing of applications.

There are a couple of big changes concerning construction permits. The first is that all construction permits for both radio and TV will be three years and will not be extended except for acts of God or court actions. Also, the FCC will allow construction permits to be sold for a profit. Previously, a CP holder could only collect out of pocket expenses in obtaining the permit.

The FCC will require that all new stations must be built and on the air within three years after the permit is granted. The only exceptions will be when construction is held up due to a natural disasters such as floods or hurricanes or when a permit is subject to FCC action such as a petition for reconsideration or court action due to any government requirements including zoning or environmental requirements. Permits will not be extended due to actions before local zoning boards.

Broadcasters will now need to fill ownership reports every two years and at renewal or time of sale. If there are no changes in the ownership report, the licensee may certify that they have reviewed the form and it is accurate. They must also provide information on the race and gender of the station's owners.

There are so many changes in these rules that anyone filing an application should read the full report and order for this action, which is 281 pages long. The full report and order has copies of the new application forms and the worksheet. The notice in the FEDERAL REGISTER is 11 pages and contains the final rules only.

These rules became effective on February 16, 1999 with the change in the ownership report filing deadlines becoming effective 120 days from publication in the FEDERAL REGISTER. The notice was adopted on October 22, 1998 and released on November 25, 1998. It was published in the FEDERAL REGISTER on December 18, 1998 on pages 70,040-70,051.

(continued on page 8)

FCC Rulemakings (continued)

MM Docket No. 87-268 In the Matter of Advanced Television systems and Their Impact upon the Existing Television Broadcast Service Second Memorandum Opinion and Order on Reconsideration of the Fifth and Sixth Report and Orders

The FCC has issued a report and order in response to a number of petitions for reconsideration concerning DTV channels for applicants pending as of October 24, 1991, Applications for New NTSC stations, DTV power levels, use of channel 6 for DTV, hours of operation, and changes in DTV allocations.

Congress and the FCC set some dates after which applicants for new stations on existing NTSC allocations would not be eligible for a second DTV channel. The FCC said that these stations could convert to DTV at any time before the end of DTV transition timetable. Some of the applicants, saying that this would put them at a disadvantage by not having both a NTSC and DTV station, requested changes that would allow a second channel for them. They requested the right to look and apply for an unused channel, if it meet the DTV allocation rules. The FCC ruled against their proposal saying that it was not an efficient use of the spectrum and "would severely limit the availability of digital channels for new entrants and other potential public interest uses". The FCC went on to state that the Balanced Budget Act of 1997 directs that FCC to auction the recaptured spectrum before September 30, 2002 and giving a second channel to these applicants would delay the use of this channels until the end of the transition.

In order to make enough channels available for DTV in the top 100

markets, the FCC had frozen NTSC applications in those markets. Potential applicants had to get waiver to apply in those markets and were told that the FCC would not protect the channels for NTSC, when making DTV allocations. In the last thirty-day filing period for NTSC applications, a number of applications were made in those markets and some were in conflict with DTV allocations. The FCC will now allow these applicants to request another non-conflicting channel if one is available.

The FCC reconsidered their maximum power limits in response to a petition from Fox Broadcasting Company. The FCC will allow UHF DTV stations to raise their maximum power to 1000 kW for the previous maximum of 200 kW, if an interference analysis demonstrates compliance with FCC rules.

Some educational FM broadcasters requested that FCC limit the use of channel 6 for DTV use because of interference to FM stations in the 88 to 92 MHz reserved band. The FCC denied their request.

The FCC requires that DTV stations operate during the same hours as their NTSC counterpart operates. Some stations asked for relief from these rules until there were sufficient sets in the marketplace. The FCC gave the DTV stations greater flexibility by not requiring DTV stations to match their NTSC counterpart hours before the date that they would be required to be on the air by law.

A number of stations requested a different channel than what was allocated for their DTV channel. The FCC denied some requests, granted others and opened rulemakings on others.

This action will be effective 30 days

after publication in the FEDERAL REGISTER. The notice was adopted on November 24, 1998 and released on December 18, 1998.

IB Docket 97-95 Spectrum Plan for "V" Band at 36.0-51.4 GHz, Facilitating Development of Broadband and other Commercial Services

The FCC reallocated spectrum from 36.0 to 51.4 gigahertz, which included 4 GHz for satellite services, and 5.6 GHz for wireless services. They retained spectrum for amateur service and for vehicular radar. Currently, only 38.6 to 40.0 GHz is allocated to commercial service. The allocations are as follows.

- 36.0-37.0 GHz Fixed Mobile, Space Research
- 37.0-37.6 GHz Wireless Services
- 37.6-38.6 GHz Fixed Satellite Service
- 38.6-40.0 GHz Wireless Services
- 40.0-40.5 GHz Fixed/Mobile Satellite Services
- 40.5-41.0 GHz Fixed/Broadcast Satellite Services
- 41.0-41.5 GHz Wireless Services
- 41.5-42.5 GHz Wireless Services
- 42.5-43.5 GHz Exclusive Government
- 43.5-45.5 GHz Non-exclusive Government
- 45.5-46.7 GHz Mobile/Mobile Satellite Services
- 46.7-46.9 GHz Vehicular Radar (unlicensed)
- 46.9-47.0 GHz Wireless Services
- 47.0-47.2 GHz Amateur Service
- 47.2-48.2 GHz Wireless Service
- 48.2-49.2 GHz Fixed Satellite Service
- 49.2-50.2 GHz Fixed Satellite Service
- 50.2-50.4 GHz Space Research
- 50.4-51.4 GHz Wireless Service

Broadcasters had a secondary allocation for fixed and mobile pick-up

(continued on page 11)



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TELECOM INDUSTRY NEWS

By Neal McLain

BRESNAN SET TO TAKE OVER TCI CABLE TV OPERATIONS

Bresnan Communications is scheduled to take over the management of several of TCI's Wisconsin cable TV operations on February 1, 1999.

As we noted in these pages a year ago (February 1998), Bresnan is a privately-held telecommunications and cable television company headquartered in White Plains, New York. It owns and operates cable TV systems in approximately 220 communities in the United States serving about 213,000 customers. Most of its systems are located in Minnesota and Michigan, although some are in Georgia, Nebraska, and Mississippi. It owns one system in Wisconsin: Superior. It's also active internationally, with operations in Poland and South America.

TCI will retain a substantial ownership stake even though Bresnan will assume management control. Tele-Communications, Inc. (parent of TCI of Wisconsin, Inc., the local operating company) owns 79% of Bresnan's domestic operating company, Bresnan Communications Company, L.P.

Five Wisconsin TCI systems are to be transferred to Bresnan: 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. The Madison system includes about 35 separate franchises, including such obscure places as Elba Township in Dodge County.

There's been surprisingly little mention of this in the local media. I've never seen any coverage in the *Wisconsin State Journal*, and *Madison.com's* search feature never even heard of Bresnan. The *Middleton Times Tribune* mentioned it briefly in a story about Middleton's franchise-renewal proceedings.

It's safe to assume that this will suddenly become a big story on February 1.

TCI/BRESNAN GEARING UP TO LAUNCH @HOME

Meanwhile, the local TCI office is getting ready to launch @HOME service sometime during the next few months.

@HOME is a so-called "cable modem" service for PC owners. The service is connected to the user's PC via two pieces of equipment: an external box (the cable modem) and an ethernet card installed inside the PC (Figure 1). The cable modem is connected to the coaxial cable TV drop through a splitter arrangement just like a TV set.

@HOME, based in Redwood City, California, is a Delaware corporation owned by several cable television companies. TCI is the largest single shareholder; other shareholders include Bresnan, Marcus, Comcast, and Cox. The original founding shareholder

was Kleiner Perkins Caufield & Byers, a major Silicon Valley venture capital firm with a long-standing record of investing in internet-related startups. Its roster of "members" reads like an internet who's who: AOL, Amazon.com, Intuit, Netscape, and Sun Microsystems.

@HOME is building a nationwide data network called the @HOME NETWORK. It's sort of a parallel internet connecting affiliated cable television systems, with connections to the internet at major access points. Each affiliated cable system carries the service to its end customers over its cable network. @HOME claims that the service will provide data transfer at much higher speeds than current technologies, and at comparable cost. According to @HOME's website, download speeds are expected to be 100 times the speed of a dialup modem and 15 times the speed of an ISDN line.

Pricing is set by the local affiliate, although TCI/Bresnan hasn't announced its pricing structure yet. @HOME states that it will fall in the \$30- to \$50-per-month range. That price includes both the service and the connection, so, theoretically at least, a PC owner renting a second phone line for a dialup modem would no longer need to do so.

@HOME also acts as the ISP for its affiliated systems. Or, to use the current buzzword, it acts as a "portal" for its affiliates. That dual role — both as carrier and as portal — has been the cause of a lot of regulatory conflict of late. AOL has petitioned the FCC to require @HOME (and all similar cable-modem service providers) to "unbundle" their networks so that AOL can become the portal itself. Several local franchising authorities have gotten involved as well: the City of Portland, Oregon recently approved the transfer of TCI's cable franchise to AT&T on the condition that it unbundle its data service.

For its part, @HOME refuses to

(continued on page 10)

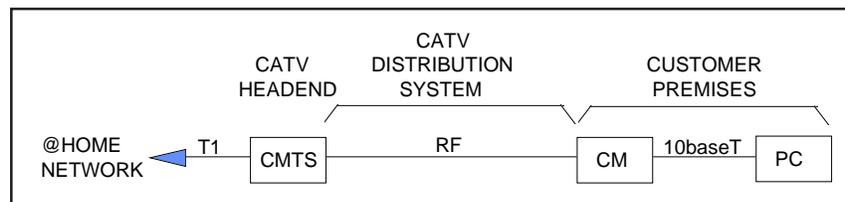


Figure 1. Typical @HOME connection. CMTS = "Cable Modem Termination System," a generic term for the headend equipment required by any cable modem service, including @HOME. CATV = the Cable TV distribution network. CM = the cable modem, typically a single circuit card enclosed in a plastic housing. PC = the user's PC, equipped with an ethernet card.

FCC To Increase EAS Enforcement

From Gary Timm, Broadcast Chair, Wisconsin EAS Committee

FCC Field offices may issue forfeitures to stations which do not meet the EAS requirements. To view the full news release check out: "http://www.fcc.gov/cib/News_Releases/easenf.html"

FCC TO INCREASE ENFORCEMENT OF EAS REGULATIONS

Report No. CI 98-26 COMPLIANCE & INFORMATION ACTION dated November 30, 1998

The Federal Communications Commission today urged broadcasters to come into 100% compliance with the Emergency Alert System (EAS). Following a recent survey of 653 AM, FM, and TV broadcast stations, the

Commission said that stations have improved compliance with EAS requirements, but must increase their efforts to do a better job.

Because EAS compliance is not at 100 percent, the FCC's field offices will conduct inspections of AM, FM, and TV stations to ensure that the stations are meeting the EAS requirements, and may issue forfeitures to stations which do not meet the EAS requirements. To give stations a chance to improve their EAS compliance, the FCC will not begin its inspection program until February 1, 1999.

The survey found that during the past year, the compliance levels of the 653 stations were below expectations in the following categories.

1. EAS equipment installed and operating (87 percent compliance).

Stations must have an EAS encoder and decoder in operating condition.

2. Monitoring the correct station (83 percent compliance). Licensees must monitor two other EAS sources (mostly broadcast stations) for an EAS alert.

3. Maintaining EAS logs (77 percent compliance). Log the weekly tests, monthly test, and any equipment malfunction.

4. EAS Handbook availability (85 percent compliance). The handbook must be readily available.

5. Sending and receiving EAS tests (76 percent compliance). Stations must send and receive weekly EAS tests. They must also retransmit a monthly test. This reflects on how well stations may handle messages during an emergency.

Telecom Industry News (continued)

unbundle its service, claiming that it will "carry" all on-line services, AOL included. Presumably, this means that AOL will appear as an icon on @HOME's opening page, along with CompuServe, Prodigy, and the inevitable Amazon.com button. Of course, AT&T's WORLDNET service will be prominently represented: assuming the TCI-AT&T merger actually closes, AT&T will own a substantial stake in @HOME.

The crux of this argument seems to center on the definition of the term "cable programming." Under federal law (the Communications Act of 1934 as amended):

- Cable television systems are regulated under Title VI. This section of the act specifically recognizes the fact that cable TV operators are "speakers" under the freedom-of-speech clause of the Constitution; as such, they have the exclusive right to select the "programming" they carry.

- Common carriers (meaning telephone companies) are regulated under Title II. This section of the act

imposes on all common carriers the obligation to "carry" any entity that's willing to pay the tariff. All entities have the same right of access, at the same price for the same service.

So is AOL a "cable programming service" subject to Title VI, or is it a "telecommunications service" subject to Title II? Unless Congress acts, the Supreme Court will probably be the final arbiter.

CABLE MODEMS: ALMOST READY

So where are those cable modems, anyway? Weren't Circuit City and Best Buy going to have them on the shelves by Christmas?

Well, one reason is obvious: until cable operators actually launch @HOME or some similar internet-access service, there's no market for the modems.

There's a second reason, however: the "interoperability" testing process wasn't completed in time. The technical standard for cable modem service is known as the DATA OVER CABLE

SERVICE INTERFACE SPECIFICATION (DOCSIS). This standard specifies such things as frequency assignments, modulation requirements, and encryption standards.

The standard itself was finalized and published over a year ago, and the interoperability tests have been going on ever since. These tests are being run at Cable Television Laboratories testing lab in Colorado. The testing procedure is apparently quite extensive: it seeks to ensure that every "DOCSIS-compliant" cable modem will work with every other cable modem. And, of course, they all have to operate in any cable environment.

In spite of the delays, everything finally seems to be coming together. It now appears that the first DOCSIS-compliant modems will reach the retail market within the next few months. This should coincide nicely with @HOME's launch in Madison: according to my contact at TCI's Madison office, TCI/Bresnan plans to launch @HOME service in the Madison area during the first quarter of 1999.

January SBE Short Circuits

By John Poray, CAE
SBE Executive Director

MEMBERS GET DISCOUNTED NAB REGISTRATION

Registration has opened for NAB'99. SBE members will again be able to take advantage of discounts to the NAB Convention this April in Las Vegas. SBE members will get the NAB Member rate off the full conference fee. This is a savings of \$330! Six times the cost of one year of SBE dues!

NAB will mail registration information to all SBE members later in January. If you don't get one by early February, call NAB Conventions at (800) 424-8806 and request that one be sent to you.

MAKE 1999 THE YEAR YOU BECOME SBE CERTIFIED

There are now four SBE Certification exam periods held each year in local chapters, plus, exams may be taken during the NAB Convention in Las Vegas. You have more opportunities to become certified - at times convenient to you. For more information about SBE Certification, see your Chapter Certification Chair or contact Linda Godby-Emerick, Certification Director at the SBE National Office at (317) 253-1640 or lgodby@sbe.org.

FCC Rulemakings (continued)

operations on the 38.6-40.0 GHz band. The FCC has opened this band for auction for wireless service.

This action was released on December 17, 1998

PROPOSED

ET Docket No. 98-237 Allocation of 3650-3700 MHz Band for Fixed Services; Freeze on New or Major Modified Earth Station Applications

The FCC has proposed to allocate 50 MHz from 3650-3700 MHz for fixed services such as point-to-point or point-to-multipoint services for the use of links to supply telephony, wideband data and video services. Some services could be Internet service or video conferencing. These proposed links would be used to provide "local loop" or "last-mile" services to business and homes. The FCC will no longer accept applications for use of this band for earth station use in the fixed satellite service, and will delete existing radiolocation and aeronautical radionavigation service allocations.

Released by the FCC on December 17, 1998.

Compiled from FCC Public Notices and Press Releases (www.fcc.gov) and the FEDERAL REGISTER (www.access.gpo.gov)

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Chapter 24 World Wide Web Site
<http://www.sbe24.org>



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



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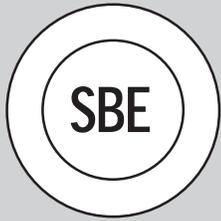
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FIRST CLASS MAIL

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

JANUARY MEETING and PROGRAM



**Society of Broadcast Engineers
CHAPTER 24 MADISON, WISCONSIN
Wednesday, January 20, 1999**

WKOW-TV/DT Transmitter Tour

WKOW staff will give a tour of their transmission facilities, including the NTSC and DTV transmitters, channel combiner, and associated remote control and STL equipment.

**Dutch Treat Dinner and Meeting
at Rocky Rococo Pizza
7952 Tree Lane
(Mineral Point Road near West Beltline Hwy)
at 5:30pm**

**Pizza Buffet - \$7.00
(includes breadsticks and soda)**

**Program at Madison Community Tower Site
WKOW Suite
8559 Mineral Point Road
at 7:00pm**

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

Program Committee:

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