

THE NORTH AMERICAN NUMBERING PLAN PART TWO OF TWO

by Neal McLain
Communication Technologies, Inc.

This is the second in a two-part series of articles about the North American Numbering Plan, or NANP. NANP is the telephone numbering plan used in World Zone 1, which includes the United States, Canada, and part of the Caribbean.

Last month, we noted that the present numbering plan is running out of area codes. By the time you read this, it probably has run out: the last unused area code (710) was scheduled to go into service on September 18, 1994.

A new Numbering Plan will be introduced this coming January. The new plan removes the present restriction on the middle digit of the area code: it will no longer be restricted to 0 or 1. This plan will produce 640 new area codes, for a grand total of 784 possible codes.

Under this plan, area codes and central office codes are interchangeable and indistinguishable. As we noted last month, we'll have to dial the area code for all long-distance calls, including intra-area code calls.

Even though the new numbering plan won't actually take effect until January, this new dialing scheme is already in place. Since September 15, we've had to dial 1-608-xxx-xxxx for long-distance calls inside 608.

This is just the beginning. In the coming years, we're going to see profound changes in the telecommunications industry. One measure of these changes will be a rapid proliferation of new area code assignments.

The remainder of this article will be devoted to a discussion of these changes.

AREA-CODE SPLITS

First and foremost, we'll be seeing a continuation of the past practice of splitting existing area codes. The same forces driving the need for new telephone numbers are still at work, and several current area codes are running out of central office codes.

But assigning new area codes won't be as easy as it might seem. Even though the

total supply of area codes will be much greater, the pool of available codes in any given area will be much smaller. This results from three constraints:

-As we noted last month, the area code and the central office code can't be the same.

-If at all possible, an area code shouldn't be the same as any nearby central office code in any adjacent area code.

-An area code can be used only once.

Consider how these constraints affect the choice of a new area code when an existing area code is split:

-To avoid a conflict with any existing central office code, the new area code must be selected from the list of presently-unused central office codes. That list is likely to be fairly short: if an area code needs to be split, it's already running out of central office codes.

-Avoiding conflicts with nearby central office codes in adjacent area codes makes the short list even shorter.

-Once a new area code is assigned, it must be deleted from the short list of available codes in any other area code in which it may appear. Thus, other short lists may become shorter.

To illustrate this point in an actual situation, consider Alabama. Right now, Alabama has one area code, 205. Next January, 205 will be split; the northern part of the state will retain 205, and the southern part will be assigned a new area code, 334.

Why 334? Because 334 is not used as a central office code anywhere in Alabama. And, with the exception of the small community of Georgetown, Georgia (population 1000), it is not used as the central office code in any nearby community in any adjacent area code.

And once 334 is used, it can't be used again anywhere else in North America, even if it appears on some other short list of available codes.

New area codes, page 4

SEPTEMBER MEETING

Wednesday, Sept. 21
Grassland Media

John Salzwedel of Grassland Media will show us his new production truck, and the computer-based editing system added to the facility recently.

Dinner: 5:30 PM
C.J.'s in Westgate Mall

Meeting at 7 PM
Grassland Media
535 Science Drive, Madison

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Editor's Note:

Last month's article by Neal McClain, North American Numbering Plan, part 1 generated a lot of discussion and recollections on the part of some members of Chapter 24. There were several messages placed on the SBE Member's Message Area on the Chapter 24 BBS system. Perhaps you found it interesting as well. You may wish to read the messages, and add your own. If you haven't been on the BBS lately, you are encouraged to

Sign on Soon!

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

August Business Meeting Minutes



Chapter 24 Regular Meeting 8/23/94

Chapter 24 of the Society of Broadcast Engineers met at Promega in the Fitchburg Business Park at 7:00 PM. The program was held first, and featured a demonstration of some capabilities of the Internet by Greg Carter. After the program, the business meeting was called to order.

There were no minutes from the previous meeting, as it was a family picnic with no business meeting. Next month's newsletter deadline was announced as September 9th at midnight, with the folding party on September 14th at WKOW-TV at 5:30 PM. Newsletter editor Mark Croom also thanked those who contributed to the previous newsletter and invited anyone else who wanted to participate in the newsletter to feel free to do so.

Treasurer Stan Scharch reported the chapter balance, and then Sustaining Membership Chairman Fred Sperry welcomed the newest Chapter 24 Sustaining Member, MRC Telecommunications.

Program Chairman Steve Zimmerman described some of the upcoming programs, and Special Events Coordinator Kevin Ruppert mentioned the upcoming Broadcaster's Clinic, and solicited older equipment to display in the Chapter's booth.

Frequency Coordinator Tom Smith reported that he has sent a letter to users of Broadcast Auxiliary frequencies in the Madison area, asking whether and when they planned to use their frequencies for the Badger home football games. He hopes to use this information to coordinate with out-of-town broadcasters to prevent conflicts on game days, which are likely to be busier this year than they have for quite a while.

Chuck then reported news from the SBE National, mentioning in particular the National Convention/Media Expo coming up.

He also reported that the Chapter has no "big" plans for the Broadcaster's Clinic this year, such as the Teleconference was last year. Chuck also brought up the Chapter booth for the Clinic, and mentioned the need for volunteers.

There was no old business brought up, and the only other business mentioned was the annual Broadcaster's Clinic Scholarship. Vice-President Paul Stoffel will be handling arrangements for the scholarship.

Chuck then dismissed the meeting.

Submitted by
Mark W. Croom
Secretary

**BROADCASTERS CLINIC
Scholarship Announced**

Chapter 24 is offering one scholarship consisting of any two days of the three-day Broadcasters Clinic taking place November 8, 9 and 10 in Madison. The scholarship will be awarded on the basis of the following criteria and maximum number of points accumulated:

- 1) Must be a current member of Chapter 24.
- 2) Attendance at 6 of the 12 meetings prior to the October 5 application deadline.
- 3) Employment in or a student of a broadcast related field.
- 4) Must have SBE National dues paid for the current year.

Points will be assigned as follows:

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

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

Applications should be in the form of a letter which is signed, dated and received no later than October 5, 1994 at the following address:

Paul Stoffel
Wisconsin Public Television
821 University Avenue
Madison, WI 53706

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**IDVS AUCTION
WINNERS DEFAULT**

By Tom Smith

Some of the success of the spectrum auctions in July were tempered by the default of the required down payment by a number of bidders. All of the defaults were by bidders in the Interactive Video Data Services or IDVS.

A total of 27 bidders defaulted including the largest bidder Commercial Realty of St. Pete Inc. They were the winning bidder in 16 of the largest 21 markets including Milwaukee. The first payments were due on August 15. The FCC is planning on legal action against the defaulters claiming market manipulation and fraud against the government.

Many of the defaulters asked for delays in making the payment due to problems in raising the required capital. There are fears that they will not make the required start-up date of serving 10 percent of their market area by March of 1995.

The reason for the fear of not making the required startup date is the lack of equipment that is available. At this point there is only one company that has equipment that has type accepted by the FCC. That company, EON, formally TV Answer, may not be able to supply the needed equipment as they do not have a manufacturer for the set-top boxes that are needed. There also seems to be a lack of interest by other manufacturers in the development of the needed set-top boxes.

The FCC will re-auction the defaulted licenses next spring and hold the defaulters liable for any differences in bids and penalties. The FCC said that 85 percent of the bidders did make their payments on time.

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A Note of Thanks

I wish to acknowledge with deep appreciation the thoughts and expressions of sympathy from the members of Chapter 24 after my father recently passed away.

Jim Hermanson

Don't Forget to Vote

The Society of Broadcast Engineers, Inc. is currently holding elections for 1994/1995 Officers and Board of Directors. Ballots are to be returned by October 6, 1994. Board of Director nominees include Chapter 24's Leonard Charles.

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MADISON, WI 53717-1078
(608) 831-2266 (800) 831-2266

New area codes, continued from page 1

OVERLAY AREA CODES

Splitting existing area codes isn't the only way new area codes will be assigned: some of them will be overlaid on top of existing area codes. Overlay area codes are used to satisfy requirements for new cellular and pager numbers without forcing current landline users to change area codes.

New York City already has an overlay area code (917); it's overlaid on 212 and 718. Two more overlay area codes will appear within the next year or so:

-562 will be overlaid on 213, 310, and 818 in the Los Angeles area.

-630 will be overlaid on 312 and 708 in the Chicago area.

We'll see many more overlay area codes in future years.

ACCESS CODES

Carrying overlay area codes to the logical extreme, some new area codes won't be "area" codes at all; instead, they'll be used as regional or national access codes for specific communications services. Just as today's access codes 700, 800, and 900 can be thought of as "nationwide area codes", we'll see similar codes for all sorts of new communications services.

As of this writing, two such codes have been announced:

-500 will go into service next year as a nationwide access code for "follow me" services. "Follow me" numbers will reach subscribers wherever they are: home, office, cellular, PCS, or the nearest coin phone. Within area code 500, central office codes will be assigned to specific service providers on a company-by-company basis.

-710 was scheduled to go into service on September 18 as a nationwide access code for the United States Government Emergency Telecommunications Service, or GETS.

Codes such as these will be used by cellular, pager, and PCS companies to offer regional or national one-number service. Instead of having a separate number in each city, a portable phone or pager will have the same ten-digit number throughout its specified service area. That service area could be the entire

North American continent.

THE MEXICAN CONNECTION

Theoretically, the new area code plan will make it possible to reach Mexico by dialing 0+ or 1+, instead of using international dialing.

There are two reasons why Mexico can't be reached by dialing 0+ or 1+ right now. One reason is political: Mexico is part of World Zone 5, which includes all of Latin America. The other reason is technical:

-Mexican telephone numbers are not compatible with the present (1975) North American Numbering Plan. Virtually all Mexican telephone numbers are eight digits long (including the clave, or city code); if the country code (52) is added, the result is a ten-digit number beginning with 52. This combination of digits is not compatible with the 1975 Numbering Plan for reasons we discussed last month: the second digit isn't 0 or 1.

-To get around this problem, a few area codes (706, 903, and 905) actually were assigned to Mexico at one time or another. However, these codes weren't really area codes inside Mexico; they were just dummy routing codes which the switching equipment could translate into the equivalent country and city codes (example: a call dialed as 905-207-8944 was actually routed to 52-5-207-8944). This was not an efficient way to use area codes, particularly in view of the fact that the 1975 Numbering Plan was running out of area codes.

Starting next January, when the 1995 Numbering Plan is adopted, these problems will cease to exist. Mexican telephone numbers can be made directly compatible with the Numbering Plan simply by assigning area codes 521 through 529 to Mexico.

According to Garry Benoit, former Manager of the North American Numbering Plan Administration, there are no plans to make this change. But it seems to me that it's inevitable. Consider the following:

-In spite of the differences in language and cultural heritage, there are strong ties binding the United States and Mexico. These ties will surely become more important in the future years, particularly in view of the PRI government's efforts to promote economic development, international cooperation, and free trade.

-As a significant part of these efforts, the Mexican government has

placed high priority on upgrade of the nation's telecommunications infrastructure. It has sold off part of the old government-controlled telephone monopoly, Teléfonos de México (Telmex), to private investors. As part of its participation in NAFTA, it has agreed to reduce or eliminate tariffs on telecommunications equipment. And it has agreed to allow U.S. long-distance companies to operate in Mexico in competition with TelMex.

-Taking advantage of this situation, MCI recently announced a \$450-million joint venture deal to "complete the first integrated North American network capable of providing service with identical features to customers throughout the continent." MCI's competitors certainly have their own plans as well. These companies will surely want to make it easy ("seamless") for their U.S. and Canadian customers to call into Mexico.

NUMBERING PLAN ADMINISTRATION

Area code and central office code assignments are made by an organization known as the North American Numbering

Midwest UHF TV station located in God's Country seeks a Maintenance Engineer. Television maintenance and operation experience is required, UHF transmitter experience is preferred. Please send resume and cover letter to WXOW-TV, P.O. Box C-4019, LaCrosse, WI 56402. ATTN: Chief Engineer. EOE.

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PROJECTIONS

NEWS ABOUT GRASSLAND MEDIA

New Imix™

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Grassland Media, Inc. now offers a third option for on-line editing with the revolutionary Imix Videocube™. Complementing Grassland's BetacamSP and Interformat suites, the Videocube™ offers on-line broadcast-quality images along with non-linear speed and convenience. Video and audio from virtually any format can be imported into the cube for editing as digital signals.

These signals can be quickly "cut and pasted" into any order so that different versions of a segment or program can be easily prepared. Grassland's system provides for two hours of video and four hours of audio storage, allowing longer programs or several programs of varying lengths can be "on-line" at the same time. Other features include built-in fades, wipes, borders, digital effects, keys, and a built-in MacIntosh character generator. An internal audio mixer provides four stereo pairs for sync sound, narration, music, and sound effects.

The Imix™ is perfect for programs with original material on various formats because once digitized, image manipulation is format-independent. Source material from BetaSP, 3/4", Hi-8, 8mm, VHS, and S-VHS can be imported as video clips for editing. And because the system is digital, no mirror tapes are required for achieving dissolves or other "A/B" effects.

The Videocube™ can also import graphics from MacIntosh based graphic systems using PICT files. Visual effects such as color suppression, posterization, and solarization are included and all digital and transition effects happen in real time for added speed and control.

After editing, the completed program can be output to BetacamSP videotape for duplication. For more information or to schedule a personal demo, give us a call.

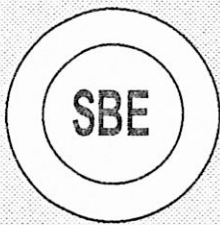
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Fax

608/238-4955

SEPTEMBER MEETING and PROGRAM



**Society of Broadcast Engineers
CHAPTER 24 MADISON, WISCONSIN
Wednesday, September 21, 1994**

Meeting and Program

**7:00 PM at Grassland Media
535 Science Drive, Madison**

John Salzwedel of Grassland Media will show us the new Token Creek Productions mobile production truck. He will also be able to show us the capabilities of the Imix computer-based edit suite added to the Grassland facility.

Dutch treat dinner at CJ's at Westgate Mall at 5:30

Visitors and guests are welcome at all our SBE meetings!

1994/1995 MEETING and PROGRAM DATES

<u>Date</u>	<u>Topic</u>
Oct. 20, 1994	Video Server/Digistore
Nov. 22, 1994	Candelabra Tower Progress Report
Dec. 21, 1994	Disk-Based video/BTS Media Pool System
Jan. 19, 1995	Tour of new facilities at WMGN/WTDY/WJJO

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

Continued from previous page

Plan Administration, or NANPA. Back in the pre-divestiture days, NANPA was part of the old Bell System. After divestiture, NANPA became part of Bell Communications Research, or Bellcore, the research organization owned by the seven regional holding companies (RHCs) that resulted from the breakup of AT&T.

NANPA is in a somewhat awkward position these days. Although it's owned by the seven RHCs, it assigns the area codes and central office codes needed by every telephone entity in the North American Numbering Plan: Bell operating companies, GTE, independent telephone companies, Canadian telephone companies, the U.S. and Canadian governments, municipally- and cooperatively-owned telephone exchanges, paging companies, and cellular companies. No matter who wins the PCS auctions, PCS operators will have to get their code assignments from NANPA. If cable television operators get into the telephone business, they, too, will have to get their assignments from NANPA.

In the view of some, this situation poses a conflict of interest: NANPA is owned by the seven RHCs, yet it is responsible for assigning codes to all telephone entities, owner and competitor alike. Can it do this fairly, without favoring its seven owners?

This question will become more relevant in the future, if area codes are assigned as regional or national access codes. The constraints which apply when an area code is split don't apply to regional and national access codes: any unused code combination is potentially available. There is likely to be a big demand for easily-remembered combinations like 222, 333, and 321, and the seven RHCs are likely to be part of this demand. Can NANPA arbitrate these demands fairly?

While there does not appear to be any evidence that NANPA has abused its position, Bellcore and the seven RHCs are understandably sensitive to the situation. As a result, Bellcore has concluded that it should give up the responsibility for NANPA.

Several months ago, Bellcore formally notified the FCC of its desire to relinquish responsibility for NANPA. The Commission subsequently issued a Notice of Inquiry and a Notice of Proposed Rulemaking. In the NPRM, the Commission proposed to transfer numbering plan administration to a "non-government entity established by the Commission and

subject to its oversight, but also separate from the Commission and not closely identified with any particular industry segment" (1). The NPRM also addressed the "international implications" of the Commission's proposal, in recognition of the fact that World Zone 1 also includes Canada and several Caribbean islands.

Reply comments to the NPRM were due on June 30, 1994. Presumably, the Commission will adopt a Report and Order one of these days.

CONCLUSION

In conclusion, I'm going to stick my neck out and make a couple of predictions about the future:

-Wireless electronic gadgets will continue to proliferate, and many of them will be designed around the availability of regional and national access codes. The wireless PDA, combining the functions of telephone, alphanumeric pager, voice mail box, e-mail box, fax message display, clock, calendar, calculator, caller ID display, personal telephone directory, and interactive game toy, will be the next big whiz-bang consumer gadget.

-What we now call "area codes" will lose significance as indications of geographic location. Just as "LOcust" and "UPtown" dissolved into the regional inventories of seven-digit numbers, area codes will dissolve into the continentwide inventory of ten-digit numbers.

The author wishes to thank the following persons and organizations for information used in this article: Ken Branson, Manager of Corporate Communications, Bellcore; Garry Benoit, former Manager, North American Numbering Plan Administration, Bellcore; MCI Public Relations; and The State Historical Society of Wisconsin.

(1) Federal Communications Commission, Notice of Proposed Rulemaking, CC Docket No. 92-237, FCC 94-79.

SMALL BUSINESS LOANS FOR BROADCASTERS

By Tom Smith

The Small Business Administration announced on July 15 that it is repealing its 40-year prohibition of making loans to media related businesses. The SBA will now be able to make loans to radio and television stations, publishers, book stores and movie theaters. The SBA estimates that the new rule will affect 75,000 businesses. The rules were started to prevent the government from interfering with businesses that engaged in the creation of ideas, values, thoughts and opinions and their dissemination. It was known as the Opinion Molder Rule. It was thought that the government could apply undue influence over a business by financial coercion. The SBA allowed broadcasters to receive loans from them between 1978 to 1986. Broadcasters, totalling 450, received loans during that time. Broadcasters applying for SBA loans will follow the same procedures as all other applicants.

(from *Radio World and Television Broadcast magazines*)

Panasonic



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KEITH EMMONS

CHANGES AT THE FCC SHORT CIRCUITS VIA BBS

By Tom Smith

FCC Chairman Reed Hundt reassigned 18 of the FCC's top 50 officials. He also created 2 new bureaus and a Commission office. The 2 bureaus are the International Bureau to take care of treaty matters and a Wireless Bureau to take care of personal communication services and future PCS auctions. He also established an Office of Workplace Diversity which will take care of internal EEO and harassment complaints within the FCC.


The FCC was also surprised by the General Services Administration's decision to move the FCC from their "M" street location. Previously, the FCC had sued the GSA to keep from being moved. The GSA has signed a lease for the FCC's new office space in the PORTALS office complex. The PORTALS is located 2 miles south of the FCC's current offices which are located in the center of the area occupied by the networks and many of the offices of communication trade groups including the NAB and the NCTA.

(from BROADCASTING&CABLE magazine)

Congratulations!

Recently certified: Broadcast Technologist by license: Steve Paugh, Madison, WI. Broadcast Technologist by June exam, University of Wisconsin-Platteville: Jarrett Liddicoat, Monona, WI; Steven Richter, Oshkosh, WI. Senior Broadcast Engineer TV by June exam: Leonard Charles, Madison, WI. Broadcast Technologist by June exam: Glen Bowman, New Berlin, WI; Kurt Miller, Neenah, WI; Michael Norton, Madison, WI. Recertified Broadcast Engineer Radio: Thomas Lange, Kohler, WI. Recertified Broadcast Engineer TV: Scott Storkel, Madison, WI.

(from SBE's The Signal)



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

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

August 31, 1994

By John L. Poray, CAE
 SBE Executive Director

SEATTLE HOSTS NATIONAL TELECONFERENCE

SBE Chapter 16 in Seattle will be producing a national teleconference on Wednesday, October 5, at 10:00 AM to 11:00 AM, Pacific Daylight Time [12 noon to 1:00 PM, Central Time; see related story in this newsletter for additional information]. A distinguished panel will discuss the future of broadcasting and broadcast engineers. The teleconference will be on Telestar 302, Transponder 10V. The Seattle Teleconference will be taking telephone calls from viewers. Chapters may want to schedule a lunch time meeting at a location that the teleconference can be viewed. Or, tape it for viewing at the next chapter meeting.

SBE ENGINEERING CONFERENCE AND WORLD MEDIA EXPO

Register now for the SBE Engineering Conference and World Media Expo by September 20 to get the pre-registration price. Look for conference registration and hotel reservation information in the August/September issue of the SBE SIGNAL or the conference brochure, both mailed to all SBE members. The Engineering Conference and World Media Expo will be held October 12-15, at the Los Angeles Convention Center. More than 450 exhibitors will be on hand! Updated information and registration forms can also be obtained through the SBE Fax-On-Demand service. Call (301) 216-1853.

ENNES REGIONAL WORKSHOP HELD IN NORFOLK

Norfolk, Virginia was the site of a very suc-

cessful Ennes Regional Workshop, Saturday, August 6. The program included sessions on FCC inspections, computer networks, digital audio and TV and contract engineering. Station tours were conducted by the host facility, WHRO-TV and Radio. A total of 57 people attended the Workshop representing 7 chapters in Virginia, North Carolina, Maryland and Washington, D.C. Thanks to Leitch, Inc. for sponsoring a portion of the Workshop.

REGIONAL CONVENTIONS THIS FALL

Regional Conventions are a good way to keep up with the industry. These are coming up this fall. Arlington, Texas - September 23-25; Syracuse, New York - September 30; Seattle, Washington - October 5-6; Pittsburgh, Pennsylvania - November 2. Call SBE for more details.

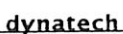
FREQUENCY COORDINATION RECEIVES NATIONAL RECOGNITION

SBE received notice this week that it has been added to the Associations Advance America Honor Roll for its Frequency Coordination program. Associations Advance America, sponsored by the American Society of Association Executives, cited the Frequency Coordination program as "a perfect example of how associations play a vital role in helping the nation adapt to complex and changing times." The letter also stated that, "Contributions such as yours are vital and add real value to society." We will take the opportunity to publicize this national recognition to members and others in the broadcasting industry in the coming weeks. Congratulations to all [including, Tom Smith, Chapter 24, Frequency Coordinator] who make the Frequency Coordination program work on a daily basis.

Edited by Paul Stoffel



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AMATEUR RADIO NEWS

by Tom Weeden, WJ9H

Weather conditions were just right on to allow a reception of amateur television (ATV) signals between Hawaii and California on July 11. Paul Lieb, KH6HME, had his portable ATV station 5600 feet up the Mauna Loa volcano running 100 watts into a 10-element Yagi antenna on 434.0 MHz. His video was received in Costa Mesa and San Clemente, CA, both more than 2500 miles away. Gordon West, WB6NOA, is claiming the first-ever Hawaii-to-California ATV reception.

Key provisions of House of Representatives Joint Resolution 199 have been included in HR 4522, the FCC Authorization Act of 1994. The bill urges the FCC to "continue to enhance the development of Amateur Radio as a public benefit by adopting rules and regulations encouraging the use of new technologies," urges the Commission to make "reasonable accommodations for the effective operation of Amateur Radio from residences, private vehicles and public areas," and urges "all levels of government" to facilitate Amateur Radio as a public benefit. The bill also provides for a one-time "vanity" call sign fee of \$150 rather than an annual fee for amateurs who wish to choose their own call signs.

Madison-area radio clubs which launch radio-equipped weather balloons have been busy this summer. Near Space Sciences (NSS) launches from near Hillsboro, WI (halfway between Madison and LaCrosse), while the High-Altitude Radio Project (HARP) launches from just north of Madison. The balloons will typically include an on-board repeater and tracking beacon to aid in recovery. Other equipment has included a camcorder with ATV transmitter, global positioning system (GPS) receiver, 35 mm still camera, and an indoor-outdoor thermometer. HARP will tentatively launch "HARP-3" on Saturday, September 17, with its repeater output on 447.440 MHz.

(from September 1994 "QST" and "Badger State Smoke Signals" magazines)

Members Invited to View National Teleconference

Chapter 24 invites members to view this year's national teleconference, "New Technologies and their Impact on the Broadcast Engineer," on October 5, 12 noon to 1:00 PM Central Time.

The teleconference, produced by SBE Chapter 16, Seattle, will be downlinked at the Public Broadcasting Center, 3319 West Beltline Highway. The 4th floor conference room has been reserved for this lunch-time viewing; you are invited to bring a bag lunch.

The live teleconference features a distinguished panel discussing the future of broadcasting and broadcast engineers.

Panel participants include:

Chuck Kelly, SBE President

Jerry Whitaker, Technical Writer;

Brian Lay, Engineering Manager for KING Television, Seattle.

The panel will take telephone calls from viewers. For those unable to attend, the teleconference will also be taped for later viewing.

Contact Dennis Behr at the TOC for more information.

SBE HAMS--

Don't forget the SBE Chapter of the Air:

HamNet meets the second Sunday of each month at 0000 GMT on 14.205 MHz. Hal Hostetler WA7BGX is the Control Station.


Don't miss the opportunity to participate!

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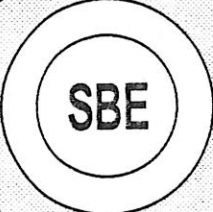
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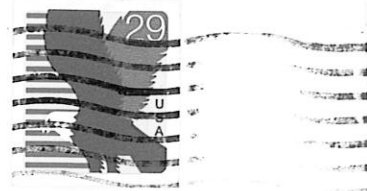

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