

## Conferences 1997 ARRL and TAPR Digital Communications Conference

## Upcoming Digital Communications Conference

Reported from PSR November, 1998  
October 10-12, 1997  
Baltimore, MD

## DCC Publications

## Digital Communications Conference

## Conference Listing

## 2016 Saint Petersburg

## 2015 Chicago

## 2014 Austin

## 2013 Seattle

## 2012 Atlanta

## 2011 Baltimore

## 2010 Portland (Vancouver WA)

## 2009 Chicago

## 2008 Chicago

## 2007 Hartford

## 2006 Tucson

## 2005 Santa Ana

## 2004 Des Moines

## 2003 Hartford

## 2002 Denver

## 2001 Cincinnati

## 2000 Orlando

## 1999 Phoenix

## 1998 Chicago

## 1997 Baltimore

## 1996 Seattle

## 1995 SLAPR

## 1994 Hampton

## 1993 SLAPR

## 1992 SLAPR

## 1991 SLAPR

## 1990 SLAPR

## 1989 SLAPR

## 1988 SLAPR

## 1987 SLAPR

## 1986 SLAPR

The Digital Communications Conference was held on October 10-12, just outside Baltimore, MD at the BWI airport. The total attendance count for the conference was over 170 people. This was another nice increase from the previous year. It seemed that the conference was well-rounded in technical content and user-featured topics. A big thanks to AMRAD who co-hosted the conference.

See pictures from the conference.

Proceedings are available.

## Friday

The conference began on Friday with the opening of the hospitality suite, even though the TAPR Board and ARRL Future Systems Committee had already had meetings that day.

The big event on Friday was the APRS Symposium, coordinated by Steve Dimse, K4HG. Anyone who was anyone in APRS seemed to be in attendance, which made for an active and long day of presentations. Over 80 people attended the special national symposium. We hope that this symposium will be held in the coming years and come to represent the APRS developmental community. The following people presented during the symposium: Steve Dimse, K4HG, Ralph Fowler, N4NEQ, Bob Brunnings, WB4APR, Keith Sproul, W0UZZ, Gwyn Reedy, W1BEL, Bill Peatt, Peet Bros), Brad Wiseman (Garmin), Mike Musick, N0GBF, Tony McConnell, N3JLY, Frank Bauer, KA3HDO, Arne Boelen, K2ZQC, Mark Sproul, KB2ICI, and a few others. Thanks to all those who presented and attended.

Also on Friday, Mike Chepkins, K3MC, hosted a seminar entitled "RF Basics for Computer Weenies". The seminar had over 20 people in attendance and the four hour seminar covered a whole lot of different RF related topics. Some of the things covered during the seminar included: Path Loss Considerations, Propagation mechanisms, Ground Reflection (2-ray Model), Path Loss Models, Considerations for Mobile Stations, Relationship between Bandwidth and Received Power, Path measurement Techniques, Antennas and Feedlines at 800Mhz and up, Basic Test Equipment, and more. Like I said, Mike covered a lot of stuff in-depth in a little over 4 hours.

## Saturday

Saturday morning the conference got an early start at a little past 8:00am when Greg Jones, WD5IVD (President TAPR), and Jon Bloom, KE3Z (ARRL) welcomed the conference attendees and kicked off the conference.

The Introductory topic sessions were recorded as well and will also be available for listening to. In addition to the audio, a full page of images from the conference is available for browsing. TAPR would like to thank all the people who did special introductory sessions during the conference. We asked presenters if they would take the extra time to do an in-depth presentation on a topic and they all did a great job. These people include: Jim Neely, WA5LHS (Intro to Digital Communications), Tom Clark, W3WVI (What is GPS? How does it work? and why do I care?), Robert Diersing, N5AHD (Intro to Digital Satellite Operators), Bob Brunnings, WB4APR, Mark Sproul, KB2ICI, and Keith Sproul, W0UZZ (Intro to APRS), John Ackermann, N8UR (ex-AG9V) (Intro to Amateur Radio TCP/IP), Paul Rinaldo, W4RI (Intro to Spread Spectrum), and Barry McLarnon, VE3JF (VHF/UHF/Microwave Radio Propagation: A Primer for Digital Experimenters).

## Introduction to Digital Communications

Jim Neely, WA5LHS

## What is GPS? How does it work? and why do I care?

Tom Clark, W3WVI

## Introduction to Amateur Digital Satellites

Robert Diersing, N5AHD

## Introduction to APRS

Bob Brunnings, WB4APR, Mark Sproul, KB2ICI, and Keith Sproul, W0UZZ

At 9:20am the main paper sessions and the introductory sessions began. The first presentation was Wireless in Ulaan Bataar by Dewayne Hendricks, WA8DZP. Dewayne talked about his experiences installing RF in Mongolia. Next was HamWeb: Rethinking Packet Radio by John Hansen, WA0PTV. John detailed his work regarding the transfer of the UoSAT broadcast protocol to terrestrial usage. John later set up his equipment in the hall and gave a live demo. H. Himda of Canada next presented Management of TNCs by Means of the Simple Network Management Protocol, in which his group of authors had developed an SNMP interface for controlling TNCs. Darryl Smith, VK2TDS, making the conference all the way from Australia, discussed Terminal Node Controllers -- Towards the Next Generation? Darryl presented information that had been collected regarding potential future paths in TNC development. The first paper session concluded with an Update on Digital Voice Technologies by Paul L. Rinaldo, W4RI.

## Welcome to the DCC

Greg Jones, WD5IVD and Jon Bloom, KE3Z

## Wireless in Ulaan Bataar

Dewayne Hendricks, WA8DZP

## Overheads for Wireless in Ulaan Bataar (38K)

## HamWeb: Rethinking Packet Radio

John Hansen, WA0PTV

## Management of TNCs by Means of the Simple Network Management Protocol

H. Himda, VA2HH, and M. Barbeau, VE2BPM

## Terminal Node Controllers -- Towards the Next Generation ?

Darryl Smith, VK2TDS

## Overheads Terminal Node Controllers -- Towards the Next Generation ? (44K)

## Update on Digital Voice Technologies

Paul L. Rinaldo, W4RI

After the break, the next paper session began at 10:30am with the presentation by Greg Jones and Dewayne Hendricks entitled TAPR Status Report on Spread Spectrum Activity in the Amateur Radio Service. Dewayne detailed the current status of the STA and FCC rule making regarding SS. Next Tom McDermott, N5EG and Bob Stricklin, N5BRG presented the TAPR 800Mhz Spread-Spectrum Radio Design. The 30 min session hit the high points, since a more detailed 2 hour presentation was set for the Sunday SS seminar. Lots of questions and lots of answers during the presentation. The second paper session concluded with the two Student Paper Awards, funded again this year by the ARRL Foundation. The DCC committee would like to thank the ARRL Foundation for sponsoring the awards this second year. This year the Student Awards committee decided to fund two Technical Paper awards. Both papers were very good. The first student paper was by Mamdouh Gouda, who had flown in from Cranfield University, England, entitled "Detection and Estimation of Covert DS/SS Signals Using Higher Order Statistical Processing". This was a very technical method in locating DSSS signals without knowing their PN sequence. This theory could be used in the future to actually call CO and have someone find you without them knowing your PN sequence. The second paper was by Matthew Ettus, N2MJU, of Carnegie Mellon University, entitled "An All-Software Advanced HF Modem for Amateur Radio." A very good talk on software HF modems.

## TAPR Status Report on Spread Spectrum Activity in the Amateur Radio Service

Greg Jones, WD5IVD & Dewayne Hendricks, WA8DZP

## An Amateur 900Mhz Spread-Spectrum Radio Design

Tom McDermott, N5EG, Bob Stricklin, N5BRG, and Bill Reed, W0DETZ

## Visit TAPR FHSS Radio Project Page

## Detection and Estimation of Covert DS/SS Signals Using Higher Order Statistical Processing

Mamdouh Gouda (Student Paper Award)

## An All-Software Advanced HF Modem for Amateur Radio

Matthew Ettus, N2MJU (Student Paper Award)

After these papers, the conference broke for lunch and the awards for the student papers were given. The Student Awards committee is made up of Gerald Kirozak, KB5EWV, Robert Diersing, N5AHD, and Greg Jones, WD5IVD. Gerald and Robert will continue as co-chairs for the 1998 awards to be given at next year's DCC. Full details on the 1998 Student Paper Awards are already available on the TAPR web site, under the DCC link. If you have students, give this a look for next year!

After lunch, the third paper session began with a presentation on the North American Digital Systems Directory (NADSD) by Greg Jones, WD5IVD. Greg described the NADSD, its formation, its operations, and activity seen since January. You can visit the NADSD at <http://www.tapr.org/directory>. Following Greg was Bob Brunnings, WB4APR, talking about the potential of AMSAT Mobile TRAKNET. The use of 1200baud LEO satellites for national and international location finding. Steve Dimse, K4HG, then discussed the APRServe: An Internet Backbone for APRS. Steve has been working on this project for a little over a year now and much was reported on the current status and future of the system. Bob Brunnings, WB4APR, then presented a paper on the APRS Vision System. Bob showed off his "APRS Rover" and talked about a very interesting way to transmit pictures with very low loss. The session was concluded by Frank H. Bauer, KA3HDO, presenting his paper on Amateur Radio on Manned Space Vehicles: Improving Amateur Radio's Future Through Enhanced Space Frequencies. Frank talked about the issues with manned space frequencies for amateur radio usage and again proposed the APRS QSY.

## North American Digital Systems Directory (NADSD)

Greg Jones, WD5IVD

## Visit the NADSD Web Pages

## An AMSAT Mobile TRAKNET

Bob Brunnings, WB4APR

## APRServe: An Internet Backbone for APRS

Steve Dimse, K4HG

## APRS Vision System

Bob Brunnings, WB4APR

## Amateur Radio on Manned Space Vehicles: Improving Amateur Radio's Future Through Enhanced Space Frequencies

Frank H. Bauer, KA3HDO

## Visit the APRS QSY Page to see overheads

The last paper session of the conference began with Tom Clark, W3WVI, and Rick Hamby, WB2TNL, discussing the TAPR TAC-2 Project. Tom, the designer of the TAC-2, talked about design issues and real world usage. Also, information on the next element of the project -- TOC -- was discussed. Rick discussed his Windows based TAC-2 software. Randy Gawry, K0CBH, of Timewave Technology, Inc. then concluded the day with a talk about what Timewave was doing and how the acquisition of AEA was happening with product reintroductions. The group broke for the day and got ready for dinner.

## TAPR TAC-2 Project Update

Tom Clark, W3WVI and Rick Hamby, WB2TNL

## Timewave Technology Inc. Update

Randy Gawry, K0CBH

Dinner was held at 6pm. After dinner, several Plaques were awarded. A plaque was given to Keith Sproul, W0UZZ, which read "TAPR Proudly Recognizes Keith Sproul, W0UZZ, for outstanding service to TAPR as founder of the TAPR APRS Special Interest Group in 1994 and dedicated volunteer." Then an award was given to the local hosts of the conference. "ARRL and TAPR are pleased to recognize AMRAD for their participation as local co-host for the 1997 ARRL and TAPR Digital Communications Conference."

After the plaques were presented, Special Guest Speaker Yutaka Sakurai, JF1LZQ who is Vice President of Japan's Packet Radio User's Group (PRUG) gave a presentation entitled, "Japan's PRUG: A look at its history and a view to the future". He discussed the history of the PRUG from its early beginnings in the mid-80's and tracked its development to today. He also discussed some of PRUG's current projects and its goals for the future. It was a very interesting talk hearing about packet radio in Japan and seeing some of the projects they are doing. The entire presentation was sent back to Japan to their CUSeMe server so their members and family in Japan could watch and listen. Great talk! After dinner, the TAPR membership meeting was held.

## Saturday Banquet Speech

Special Guest Speaker Yutaka Sakurai, JF1LZQ who is Vice President of Japan's Packet Radio User's Group (PRUG) gave a presentation entitled, "Japan's PRUG: A look at its history and a view to the future". He discussed the history of the PRUG from its early beginnings in the mid-80's and tracked its development to today. He also discussed some of PRUG's current projects and its goals for the future. It was a very interesting talk hearing about packet radio in Japan and seeing some of the projects they are doing. The entire presentation was sent back to Japan to their CUSeMe server so their members and family in Japan could watch and listen. Great talk! After dinner, the TAPR membership meeting was held.

## Banquet Presentation

Yutaka Sakurai, JF1LZQ

## Questions after Banquet Presentation

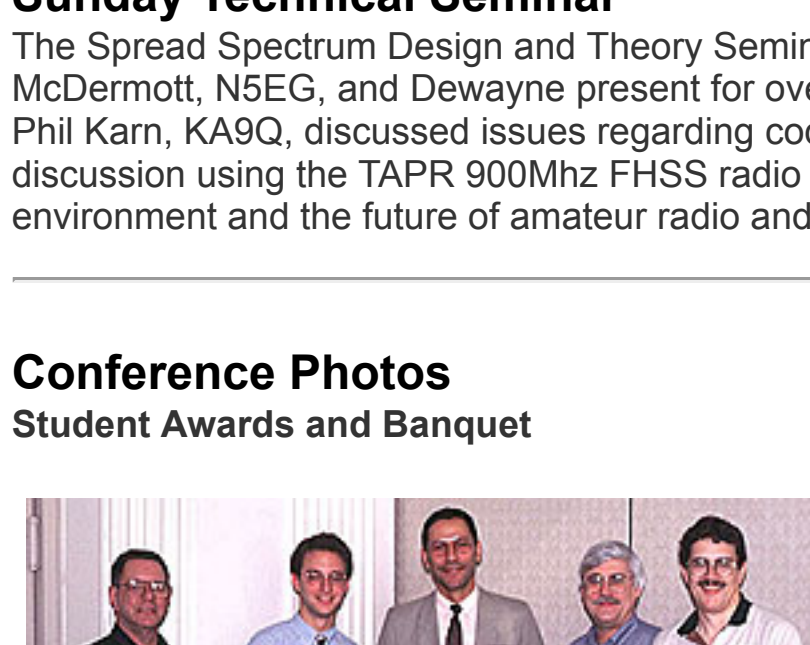
## Sunday Technical Seminar

The Spread Spectrum Design and Theory Seminar started Sunday morning early. Coordinated by Dewayne Hendricks, WA8DZP, the seminar saw Phil Kam, KA9Q, Tom McDermott, N5EG, and Dewayne present for over five hours on Spread Spectrum Theory, Design, and Regulatory issues. The seminar was attended by over 80 people.

Phil Kam, KA9Q, discussed issues regarding coding and other SS theory that is important to cover. Tom McDermott, N5EG, then followed with an in-depth technical discussion using the TAPR 800Mhz FHSS radio project as the focus on the design constraints. The session was concluded by Frank H. Bauer, KA3HDO, presenting his paper on Amateur Radio on Manned Space Vehicles: Improving Amateur Radio's Future Through Enhanced Space Frequencies. Frank talked about the issues with manned space frequencies for amateur radio usage and again proposed the APRS QSY.

## Conference Photos

## Student Awards and Banquet



Paul Rinaldo, W4RI (ARRL), Matthew Ettus, N2MJU, Mamdouh Gouda, Robert Diersing, N5AHD (Student Paper Co-Chair), and Greg Jones, WD5IVD (TAPR). Matthew and Mamdouh with their award plaques and checks for the second annual Student Paper Awards. Matthew received the award for 'best technical/theory-oriented paper by a student' for the paper 'An All-Software Advanced HF Modem for Amateur Radio'. Mamdouh received the award for 'best technical/theory-oriented paper by a student' for the paper 'Detection and Estimation of Covert DS/SS Signals Using Higher Order Statistical Processing'.



Dewayne Hendricks, WA8DZP with the Saturday evening Banquet Speaker, Yutaka Sakurai, JF1LZQ, Vice President of Packet Radio Users Group of Japan (PRUG). Sakurai gave an exceptional talk regarding the future and past of PRUG and packet radio in Japan. The audio from the talk is available.



Yutaka Sakurai, JF1LZQ, Vice President with the President of PRUG Kazuyuki Inoue, JRV1MX. They are showing off some of the goodies they talked about at the banquet.



A photo of the banquet crowd lined up at the buffet.

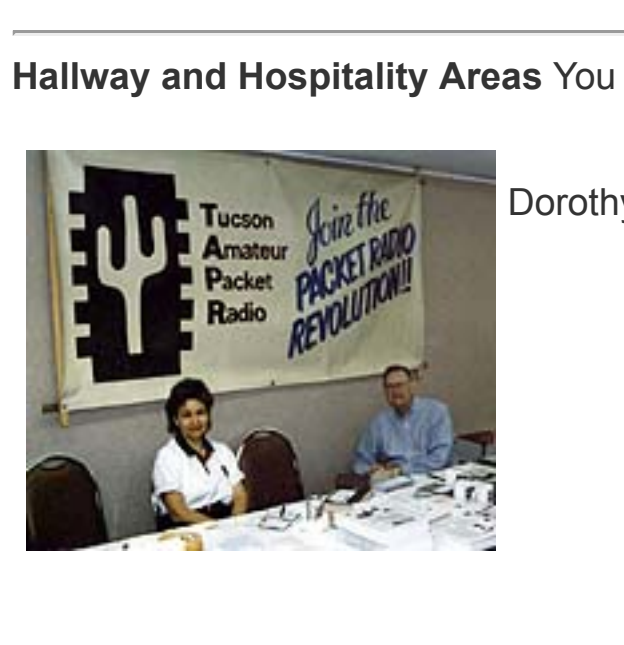
Hallway and Hospitality Areas You never knew who might be lurking in the areas outside the meeting areas.



Dorothy Jones, KASDWR with Bill Jones, N5OIN at the TAPR table in the hospitality area.



Yutaka Sakurai, JF1LZQ, John Hansen, WA0PTV, and Ben Kobb, KC5CW



Dewayne Hendricks, WA8DZP, Yutaka Sakurai, JF1LZQ, and Tom Clark, W3WVI



William Diaz, KC8XG and Darryl Smith, VK2TDS



Jim Krutzler, KB2UOI, Phil Anderson, W0XI, Mark Sproul, KB2ICI, and Don Rotolo, N2IRZ.



Tom Clark's W3WVI 150 calorie GPS antenna!



Tom Clark, W3WVI and Rick Hamby, WB2TNL show off one of Tom's Yogurt GPS antennas.



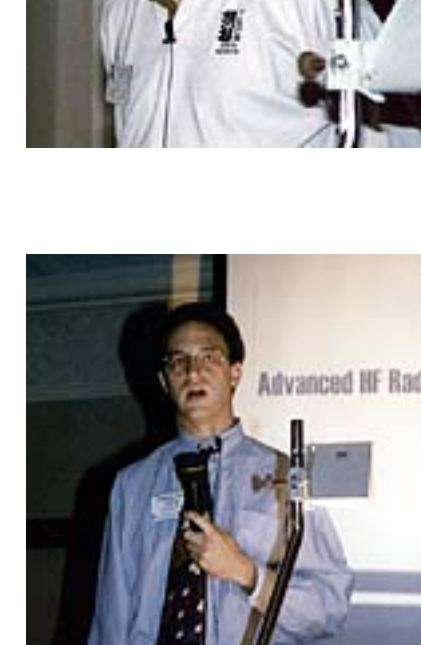
Main Paper Sessions, Introduction Sessions, and SIG meetings



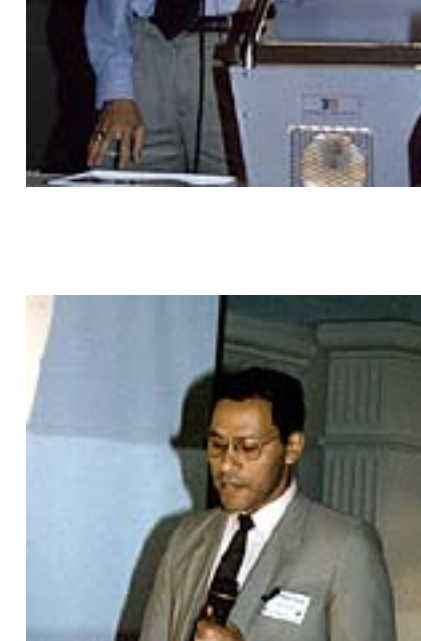
Greg Jones, WD5IVD, DCC Conference Chair, giving a talk on the NADSD (North American Digital Systems Directory)



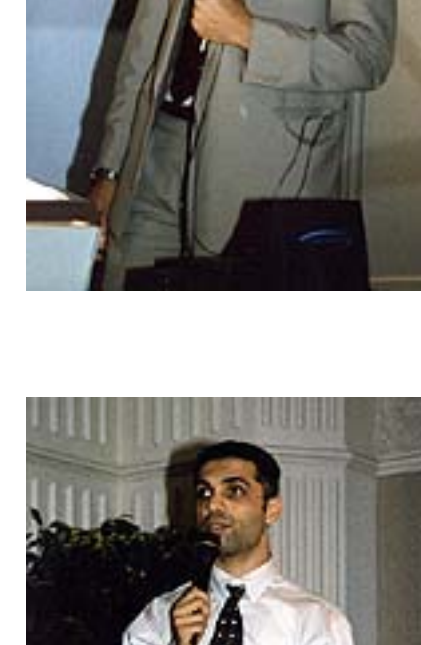
Matthew Ettus, N2MJU, giving his Student Paper talk 'An All-Software Advanced HF Modem for Amateur Radio'.



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Robert Diersing, N5AHD, giving an Introduction to Digital Satellite Communications.



John Ackermann, N8UR, giving an Introduction to Amateur Radio TCP/IP.



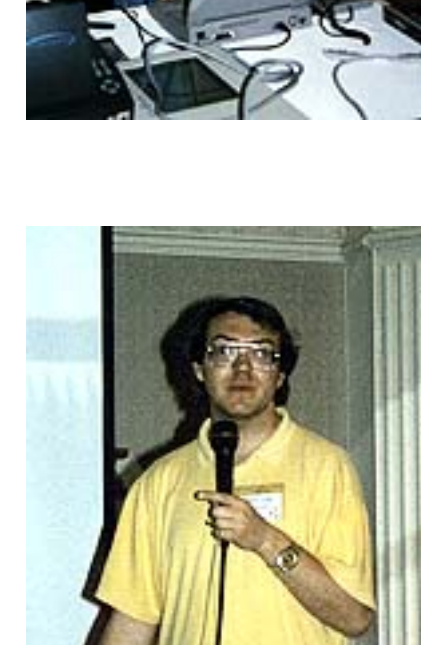
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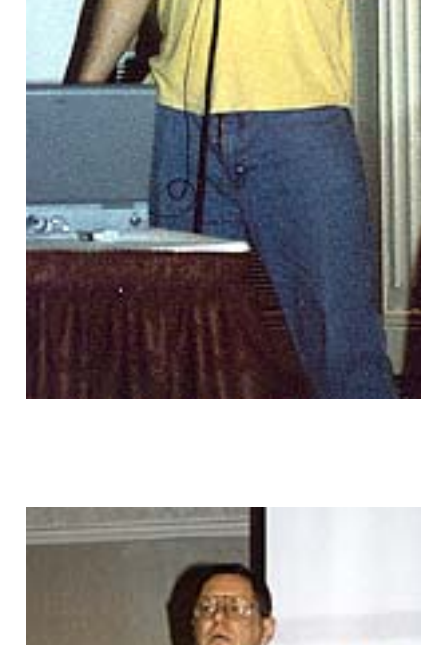
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Paul Rinaldo, W4RI, Local Conference Host, presenting an Introduction to Amateur Radio Spread Spectrum Communication.



John Hansen, WA0PTV, presenting HamWeb: Rethinking Packet Radio. John detailed his work regarding the transfer of the UoSAT broadcast protocol to terrestrial usage. John later set up his equipment in the hall and gave a live demo.



Jim Neely, WA5LHS, giving an Introduction to Amateur Radio Digital Communications.



Seminars and Symposiums / TAPR Member Meeting



Steve Dimse, K4HG, getting his APRS fix.



The big event on Friday was the APRS Symposium, coordinated by Steve Dimse, K4HG. Anyone who was anyone in APRS seemed to be in attendance, which made for an active and long day of presentation. Over 80 people attended the special national symposium. We hope that this symposium will be in the coming years and come to represent the APRS developmental community. Thanks Steve for all the work!



Bob Brunnings, WB4APR, posing with his little mobile friend and doing one of his many presentations. Bob brought several car loads full of neat stuff for people to play with and look at.



Phil Kam, KA9Q, presenting the first segment of the SS seminar on Sunday.



TAPR Board of Directors during the TAPR Membership Meeting.



Phil Kam, KA9Q, Tom McDermott, N5EG, and Dewayne Hendricks, WA8DZP, presenting at the SS seminar on Sunday.