

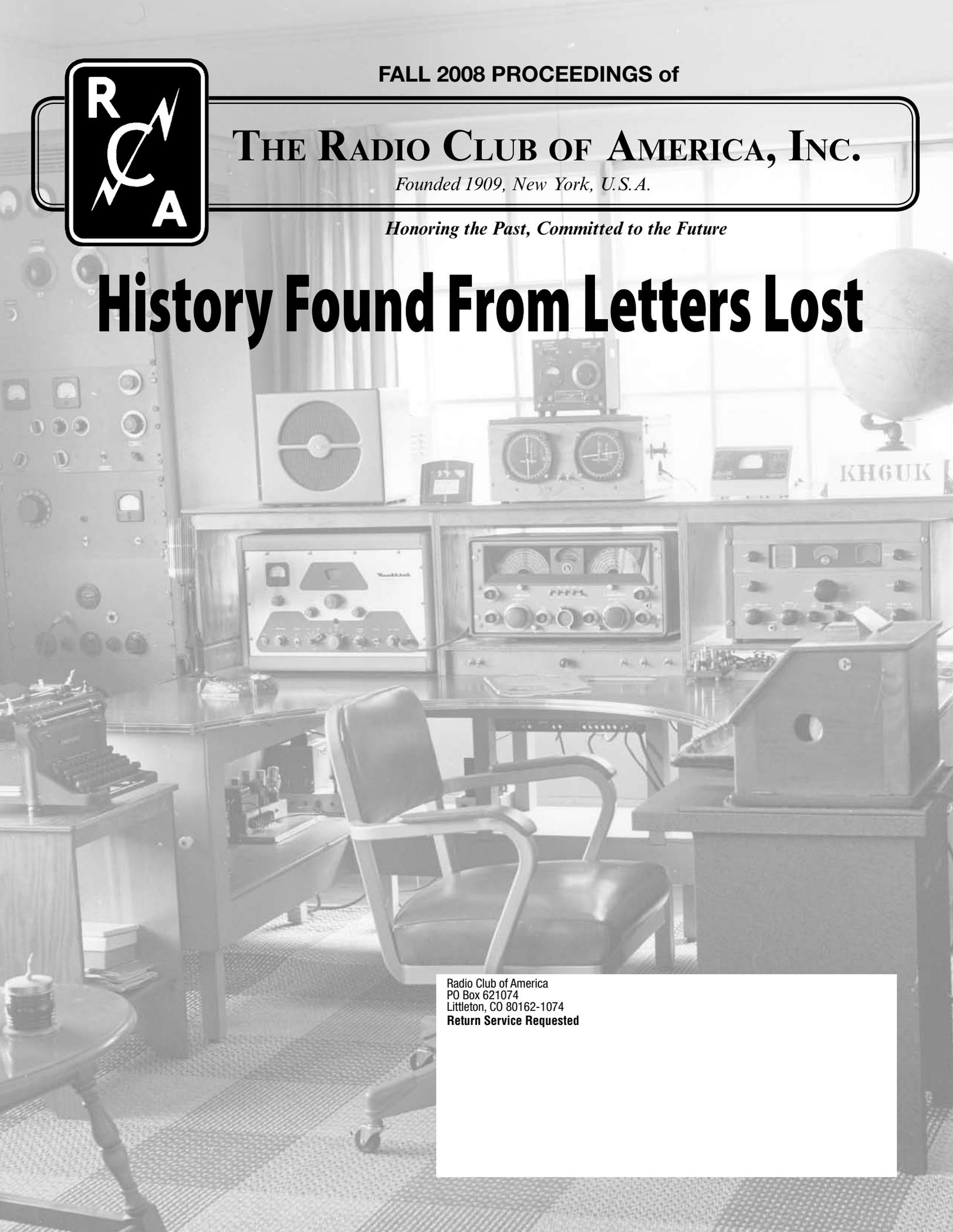
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A Message From Phil

“Committed to the Past, Dedicated to the Future” is more than a Radio Club of America tag line. Your board, officers and standing committees live these words on an ongoing basis. Looking back over the past two years, I realize how privileged I have been to work with many outstanding people who are doing incredible work on behalf of our beloved Club.

I can only mention a few here so I apologize to those of you who go unmentioned. Let's begin with the *Proceedings*. Many thanks to Debra Baker who -- twice a year, regardless of what's going on in her life at work or in the world -- publishes this important journal. And kudos to Karen Clark, who compiles the Club's new monthly e-letter and the quarterly *Aerogram*. Then there's our Historical Committee, which has collected and continues to store many past issues of the *Proceedings* as well as other valuable RCA history. Ken Hoagland, June Poppele and Jerry Minter have worked long hours cataloging these historical treasures and seeking a permanent home for them.

Many members look forward to our annual Awards banquet. It has become our flagship event, and we owe many thanks to Mal Gurian and Connie Conte for all their hard work to make it a success each year. I also want to recognize Rich Reichler, who has taken over the leadership of the Technical Symposium and continues to elevate that event.

Elaine Baugh Walsh is chairman of the Finance Committee. She and her committee, with considerable help from Roger Madden, our treasurer, have addressed budgets and expenses, and they now are looking at new ways of fundraising for our scholarship and operating funds. Our newest committee is the vision of Carole Perry. The Education Committee is co-chaired by Carole and Rich Biby, each looking from different perspectives on how the Radio Club can foster young people interested in radio while continuing the wireless education of our adult members.

It's important that our members meet with each other as often as possible. Many thanks to Mercy Contreras and Karen Clark for organizing our RCA breakfasts at several of the major industry trade shows, and to Stan Reubenstein for having a RCA tabletop at the Dayton Ham Fest and our two relatively new regional Radio Club events. Two years ago, Carroll Hollingsworth saw a need for a RCA event in the Southwest. He invested countless hours and his own dollars to get this event up and running in Texas, modeling it on our very successful West Coast event started by Carolyn Servidio and Mercy Contreras four years ago. These events provide our members with many opportunities to visit with each other and to share our common bonds.

I'd like to thank Craig Jorgensen for his hard work with the Membership Committee, which has brought us many fine new members and continues to strengthen us for our second hundred years. Bruce McIntyre continues to improve our Web page and to make it more user-friendly for our members.

Last, but not least, is our important Scholarship Committee. Many thanks to John Dettra and Bill Endres for their leadership roles. A special thanks to member Bernie Brownson who, after reading my message in the last issue of the *Proceedings*, was moved to start a new scholarship in honor of his recently deceased wife Rita. Thanks to all of you who continue to contribute to these funds. You are making a difference in young peoples' lives and the future of wireless communications.

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Project 25 Responds to GAO Criticisms

In April, the General Account Office (GAO) released a scathing report criticizing the Project 25 (P25) standards process, along with the Department of Homeland Security (DHS) Safecom program, which has a goal of furthering public-safety communications interoperability. In this interview with *MissionCritical Communications*, Craig Jorgensen, co-chair of the P25 steering committee, responds to the GAO's report findings. *Photo courtesy EFJohnson.*

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TOP NEWS

Bay Area Plans Regional Network

Bay Area officials are putting \$32.5 million in Department of Homeland Security (DHS) funding to use for a new communications network that will use 700 MHz and VHF spectrum. *Photo courtesy San Francisco CVB.*

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Narrowbanding: Will You Be Ready?

There are options to help radio-communications managers meet the upcoming mandate.

By Klaus Bender

The last several years have marked some of the biggest regulatory issues facing a normally calm land-mobile industry in quite some time. Licensees in the 800 MHz band are reconfiguring their systems to eliminate interference with public-safety operations — a multiyear process that will not be completed as originally scheduled. The FCC, partially because of 800 MHz reconfiguration, has frozen frequencies in the 900 MHz land-mobile band. Now the rest of the land-mobile community is preparing for the next big thing: the mandatory equipment reconfiguration for users of frequencies between 150 and 512 MHz using older, wideband equipment. This process, once referred to as re-farming, is now generally known as narrowbanding the land-mobile channels.

Narrowbanding impacts all industry segments. The Utilities Telecom Council (UTC) recently completed a research project surveying members about their plans to comply with the narrowband directive. UTC asked small- and large-sized firms a series of questions related to the technology they use now, what they would like to upgrade to and the importance of mobile data in the process of radio dispatch. UTC also asked about the direct migration to 6.25 kilohertz, nontraditional solutions and the use of commercial carriers. The following survey results provide some insight into the land-mobile industry's progress toward the upcoming federal mandate.

Mandate Details

The FCC's effort to increase spectrum efficiency for users of frequencies licensed under Part 90 began in 1992. The FCC created channels with available bandwidths of 12.5 and 6.25 kilohertz and allowed licensees to use existing channels with the smaller bandwidths to relieve spectrum congestion. Early in the process, the FCC elected not to

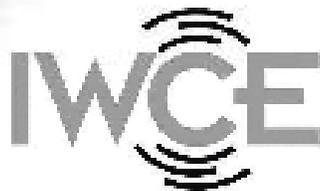
fix a mandatory migration date from 25 kilohertz voice operations down to 12.5 kilohertz. In late 2004, the FCC set dates associated with the transition process with the final deadline of Jan. 1, 2013, which is now less than five years away.

To comply with the new rules, voice radio systems must be able to provide one voice conversation in 12.5-kilohertz bandwidth or less. Data systems must have a channel efficiency of 4.8 kilobits per second (kbps) per 6.25-kilohertz bandwidth. Licenses for the systems that aren't converted by the 2013 deadline will be cancelled, with the licensees subject to whatever fine the FCC chooses to impose. The FCC elected not to identify a specific date for further migration to 6.25-kilohertz technology, but encouraged licensees to migrate directly from 25 to 6.25 kilohertz prior to 2013 if suitable equipment is available. Three manufacturers offer 6.25-kilohertz-compliant equipment. The regulatory uncertainty associated with narrowbanding to 6.25 kilohertz has impacted the progress of 12.5-kilohertz migration; licensees must weigh their options in case their investments in new technology become stranded assets in 10 years if the market moves in a different direction.

Thousands of land-mobile licensees need to upgrade their equipment, and potentially millions of radios need replaced or modified. Large licensees will spend millions of dollars bringing their systems into compliance. Many firms are already slowly updating radios as older units need to be repaired or replaced. The challenge for the land-mobile industry is informing small licensees that have been using the same radio systems for 20 years that they must now replace the radios with a more efficient

► *Continued on p. 8*

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Narrowbanding Deadlines

Milestone	Date
No new wideband (25 kilohertz) applications or major modifications to existing systems to increase coverage will be accepted	Jan. 1, 2011
End of manufacturing or import of wideband equipment	Jan. 1, 2011
Mandatory certification of equipment capable of 6.25-kilohertz operation	Jan. 1, 2011
Mandatory 12.5-kilohertz conversion	Jan. 1, 2013

technology. Like the 800 MHz rebanding effort, these small companies or agencies often don't believe the FCC will enforce the new standards. However, delaying addressing this issue could create significant financial pressure in the future.

Industry Survey Results

The capital costs of upgrading radio equipment can be significant and require management approval. The approval may come from the management of a utility company, a state budget committee or a group of county commissioners. One of the first questions asked during the budget approval process is "What is everyone else doing?" The following addresses concerns of critical-infrastructure providers and the land-mobile industry:

>> **Technology.** Firms looking at a complete system replacement are also seeking new or improved functionality. Channel-efficient trunking technologies and digital modulation are evaluated when the system size justifies such consideration. More efficient use of the radio spectrum ultimately means fewer base station radios and dollars. Owners of small systems with one base station and a handful of mobiles are more likely to do a radio-for-radio upgrade. Consider that some of the systems replaced are more than 20 years old. There are more bells and whistles on current LMR equipment, and users want access to those enhancements. Desired functionality includes backhaul over broadband networks to reduce the cost of multiple base stations and wide-area deployments. "Man down," or emergency override calling capability, is as much a concern for utilities as it is for public safety. Integration of IP into voice-communications systems makes the radios addressable from the corporate backbone network, facilitating text messaging and instant messaging to groups of users. The enhancements improve workforce productivity

and may justify the cost of a system upgrade.

>> **12.5 or 6.25 kilohertz.** The survey showed companies that have already committed to, or are planning, a narrowband equipment change are using 12.5-kilohertz bandwidth, either in analog or digital mode. While 6.25-kilohertz equipment is available in various forms (see "Two 6.25-Kilohertz Modulations" Page 32), these systems use proprietary modulation. The prices for 6.25-kilohertz radios and infrastructure are competitive with other technologies, and further competition will continue to drive pricing down.

System interoperability plays a major role in this decision, and firms that need to talk to their neighbors — whether public-safety systems or those in the energy sector — want to make sure radios will communicate with each other during an emergency. Early adopters of 6.25-kilohertz modulation will be small, stand-alone systems. Further standardization of 6.25-kilohertz modulation will occur as the 2011 deadline for dual-mode equipment approaches.

>> **Voice vs. Data.** The use of data for workforce management is increasing in the critical-infrastructure industry. Routine work assignments are often displayed on computer screens with graphics and other necessary information. Voice communications remains critical for emergency situations, but an increasing percentage of workforce vehicles are equipped with both voice and data communications, impacting the spectrum requirements for advanced systems. Unfortunately, the pieces of bandwidth available to land-mobile licensees are squeezed into smaller chunks, resulting in shrinking data rates in an era when bandwidth is critical to providing up-to-date information to workers in the field. A data rate of 9.6 kbps is no longer sufficient for workforce data communications.

Some utilities are solving these problems by installing Wi-Fi hot spots in substations so that work crews can pick up necessary data throughout the day. Firms with high-data-rate requirements are likely to look toward the following mixed solutions.

>> **Frequency Bands.** Lower frequencies, those in the VHF 150 MHz band, remain the favorite of licensees with rugged, mountainous terrain. New trunked VHF systems are being designed and

▶ *Continued on p. 10*

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Two 6.25-Kilohertz Modulations

There is a story that says a train track was built through the Alps to connect Venice, Italy, and Vienna, Austria, long before a train existed that was capable of making the trip. In the same way, the FCC sought to drive the development of narrowband technology by creating 6.25-kilohertz bandwidth channels before equipment was commercially available to meet the standards.

Creating the capability of carrying an intelligible voice conversation in 6.25-kilohertz bandwidth is no small engineering feat. It necessitates advanced digital modulation techniques where standard land-mobile analog modulation techniques are insufficient. Capable modulation schemes have been used by the military and commercial systems and are now being applied to LMR systems. Two systems currently on the market meet the FCC requirements for 6.25-kilohertz bandwidth. The Motorola MotoTrbo solution uses time division multiple access (TDMA) to allow two voice conversations to be carried in a 12.5-kilohertz-compliant signal, essentially providing one voice path per 6.25-kilohertz bandwidth. A system developed by Icom and Kenwood uses frequency division multiple access (FDMA) and advanced voice encoding to fit a voice conversation in 6.25-kilohertz bandwidth. Each 6.25-kilohertz-compliant modulation is a proprietary solution, and to date, no standards exist for this bandwidth in the United States.

Motorola's MotoTrbo digital two-way radio platform was designed to the European Telecommunications Standards Institute (ETSI) Digital Mobile Radio (DMR) Tier 2 standard, a globally recognized digital radio standard for professional applications in high-power, licensed bands. MotoTrbo also meets U.S. and Canadian regulatory 6.25-kilohertz efficiency goals.

MotoTrbo is based on a two-slot TDMA technology that supports voice and data, allowing customers to determine whether a given time slot is used for voice calls or data calls in a manner that best fits their needs. TDMA can be used to divide a 12.5-kilohertz channel into two alternating time slots. In this way, two-slot TDMA can provide 6.25-kilohertz equivalent efficiency in an existing 12.5-kilohertz channel with no changes to licensing requirements. Two-slot TDMA allows for two simultaneous conversations within a 12.5-kilohertz channel with a single repeater.

The Icom/Kenwood solution is an FDMA air interface technology currently offered by Kenwood under the NEXEDGE system trade name and Icom under the IDAS system trade name. The NXDN technology used in both products is openly licensed to all communications equipment manufacturers. NXDN uses the DVS1 AMBE+2 enhanced full- and half-rate vocoders, offering improved forward error correction (FEC) and noise reduction for digitized voice. Kenwood NEXEDGE radio systems support analog conventional and logic trunked radio (LTR) at 25 and 12.5 kilohertz and NXDN digital conventional and NXDN trunked IP network modes.

NXDN digital modulation is a four-level frequency shift keying (FSK) technique with the following frequency offsets:

- ± 1.05 kilohertz and ± 350 hertz for 2,400-dibit symbols/sec rate (4,800 baud on 6.25 or 12.5 kilohertz channels)
 - ± 2.400 kilohertz and ± 800 hertz for 4,800-dibit symbols/sec rate (9,600 baud on 12.5 kilohertz channels) NEXEDGE equipment
- FCC-compliant emissions are:
- 4K00F1E, 4K00F1D, 4K00F7W, 4K00F2D (4,800 baud NXDN digital at 6.25- or 12.5-kilohertz channels)
 - 8K30F1E, 8K30F1D, 8K03F7W (9,600 baud NXDN digital at 12.5-kilohertz channels)
 - 16K0F1E (analog 25-kilohertz channels)
 - 11K0F1E (analog 12.5-kilohertz channels)
 - 14K4F1D (analog nonvoice data)

— Klaus Bender (with product information from the vendors)

implemented, primarily in the western part of the United States by public-safety agencies and utilities. UHF remains crowded, but some firms are looking at trunked system designs in this band. The 900 MHz band is an opportunity for the few licensees that already have some licenses in this range — a concession by the FCC on the freeze on activity here. FCC officials say they are “closer to the finish line than the starting line” related to the 900 MHz rulemaking, so perhaps a decision will be released soon. The cost of a wide-area 900 MHz network may be double that of a lower frequency design because of the band's propagation characteristics, which weighs heavily in the return on investment (ROI) calculations.

>> Alternative Spectrum Options. These solutions provide frequencies for land-mobile use outside the normal site-by-site licensing process. Large enterprise systems create a financial challenge to licensees faced with narrowbanding. Many industries have seen consolidation through mergers and acquisitions. The narrowbanding challenge is increased when the communications systems of large firms are made up of disparate, smaller systems. The existing equipment environment often includes combined VHF and UHF systems, pieced together into a working system at the time of a merger. The FCC comes along and says these radios all need to be replaced, and now the licensee

has a significant radio design project on its hands.

Alternative spectrum solutions, such as leased or purchased spectrum, are attractive for firms that can afford it, because buying or leasing spectrum allows the agency to build a systemwide, ubiquitous solution with less regulatory uncertainty. Firms committed to their land-mobile systems will consider the increased costs associated with purchasing or leasing spectrum in their planning for system upgrades. The 217 – 222 MHz band, as well as other channels below 1 GHz sold at auction, are leased and sold.

>> Commercial Solutions. The financial impact of an industrywide equipment replacement on land-mobile licensees hasn't escaped the attention of commercial carriers, who are targeting public safety, utility and other traditional land-mobile markets with products that combine voice and data services. The carriers are agreeing to service-level agreements (SLAs) to convince land-mobile licensees that commercial services have the reliability associated with private land-mobile operations. Large contracts will make carriers consider modifying buildout

schedules for rural areas and even consider access to infrastructure when pricing their services. Firms with towers, poles and building rooftop space available for cellular or PCS antennas are assets to the carriers, and these firms can reap financial benefit.

Some firms are retaining their private-fixed and mobile-data networks and using commercial providers for voice communications. Others are using commercial 3G and 4G solutions from carriers for data to workers or vehicles and using the least-costly solution for land-mobile dispatch. Clearly, small firms with a few radios will evaluate the cost of replacing these radios with their narrowband equivalents or just signing up with a commercial carrier. Business cases can be made for either option. Public safety and critical infrastructure will lean toward maintaining private-radio systems, while others will opt for the nearly universal coverage of commercial networks. But for the most part, mission-critical communications will remain on private-communications networks, according to survey data.

► *Continued on p. 12*



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>> **Costs.** Interview respondents who have completed system upgrades were often reluctant to discuss what they paid for their new systems. Those who did were large utilities with service territories of more than 1,000 square miles and more than 1,000 handheld and portable radios, with a hundred or more base stations. Some utilities moved out of the frequencies below 512 MHz and went to 800 MHz. All in all, survey respondents say their system costs averaged between \$14 million and \$30 million. While pricing for commercial systems wasn't revealed, there is recognition that the financial savings with commercial providers has to be balanced against the reliability, coverage and capacity losses.

For rough calculations, mobile and portable radios for the land-mobile bands can cost between \$600 and \$3,000 each. Base station radios will cost from \$3,000 to more than \$10,000 each. Including trunked operations will add controller costs to the base station, as will any of the 6.25-kilohertz compliant solutions available now. If you want radios that communicate through the corporate IP network, you will add costs associated with switches and other network hardware.

What Now?

The challenge for the FCC and land-mobile trade associations is getting the word out to small companies and agencies that don't follow FCC rules as much as they should. The general consensus is that the FCC will not look favorably on requests for relief because a licensee didn't know about the narrowbanding mandate. By 2013, this rulemaking will be 21 years old; there is no excuse for not knowing about it. Noncompliant systems will be cancelled; the time to get equipment upgrades into the budget cycle is now.

The business frequency coordination agencies and public-safety coordinators are good resources for licensees who need help. Law firms specializing in land-mobile

communications can help with complex issues, and companies that provide land-mobile licensing services are resources as well. Manufacturers' sales representatives will let you know your options. E-mail groups have formed to discuss the issue.

The process of complying with the narrowbanding rules is similar to what firms are doing to comply with the 800 MHz reconfiguration efforts. FCC licenses need to be reviewed and brought up to date. Radios need to be inventoried to develop an exact count to budget for the process. Good planning and the support of management will assure the timely completion of a project. The land-mobile industry continues to be dynamic, and the next few years will be no less exciting than those we have just completed. The time frame for this effort is now on the same order as 800 MHz rebanding and will involve significantly more radios. A look to lessons learned during 800 MHz reconfiguration will certainly streamline the narrowbanding effort for the rest of the land-mobile community.

Showing company and agency management that narrowbanding issues impact everyone using land-mobile equipment may ease the process of getting budgets approved. The fact that alternatives are available may complicate the planning process. The outcome the FCC and industry seek is spectrally efficient communications using the best technology available. We also hope that spectral efficiency can translate into workforce efficiency. We have less than five years to figure out how to do it.



Klaus Bender, P.E., is UTC's director of engineering. He provides technical expertise for UTC's spectrum services, FCC license management and research efforts. Bender is a professional engineer with more than 25 years of experience in telecommunications engineering matters.

(Editor's note: This story appears courtesy of *RadioResource MissionCritical Communications*, which delivers wireless voice and data solutions for mobile and remote mission-critical operations. It first appeared in the June 2008 issue. The magazine covers business, public safety, and regulatory news; case studies; in-depth features; innovative applications; product information and comparisons; emerging technologies; industry reports and trends; and technical tips. In addition, each issue contains Public Safety Report, a special section devoted solely to the needs of the public safety community. Editorial content targets organizations in the United States and Canada with mobile and remote communications needs, including public safety, government, transportation, manufacturing, utility/energy, business, and industrial entities. To request a FREE subscription or to get more information, go to www.mccmag.com.)

Dr. P. Samuel Christaldi, Life Member and past Director of the The Radio Club of America

Dr. P. Samuel Christaldi, a television-industry pioneer known to his friends and colleagues as “Sam” or “Doc,” died June 28, 2008, of natural causes in his apartment at Gayton Terrace, a Richmond, Va., retirement community. He was 93.

He was born in Philadelphia Nov. 26, 1914, and moved with his family to Haddonfield, N.J., where his father, an Italian immigrant, became a foreman and unofficial interpreter for the John B. Stetson hat company. As a boy in Haddonfield, he assembled and operated crystal-set radios, and he developed a keen interest in electronics that was to last a lifetime. After graduating from Haddonfield High School, he went on to receive an Electrical Engineering degree and a Ph.D. in Physics from Rensselaer Polytechnic Institute.

Dr. Christaldi joined Allen B. Dumont Laboratories in Passaic, N.J., in 1938, where he soon became chief engineer, responsible for the design and development of cathode ray tubes, oscillographs, TV receivers, and transmitting equipment and military electronic equipment. He also was technical liaison with TV station WABD and the Dumont Network. He later became engineering manager, then division manager of the Instrument Division and, in 1955, he was named manager of the Technical Products Division.

While at Dumont, Dr. Christaldi contributed to the design of a radar-based “speed gun” that was used by TV station WABD to clock the speed of pitches thrown in at least one broadcast of a Brooklyn Dodgers baseball game. To the best of his son’s recollection, a 90 mph fastball thrown by Joe Black was the fastest pitch registered in that game.

During World War II, his work included development of an early delayed and expanded-sweep circuit for precision radar ranging, military applications of cathode ray oscillographs and others displays as well as radar-related technology application and development assignments at various locations in connection with the Manhattan Project. He also taught a basic electronics course for draftees headed for the Signal Corps.

Dr. Christaldi joined Curtiss-Wright Corporation in 1956 as product manager of Electronic and Nuclear Equipment, where he developed a naval reactor control products

program. He subsequently joined GV Controls as engineering manager for its lines of electronic control equipment. In 1963, he returned to the field of cathode ray tubes with Constantine Engineering Laboratories (CELCO), based in Mahwah, N.J., as its director of research.

In announcing in 1980 that Dr. Christaldi would be the recipient of its second Dumont Certificate of Achievement award in memory of Allen B. Dumont, the Radio Club of America noted his major contribution to the television industry and stated that, without his early work in perfecting oscilloscopes, television, radar, computers and many other modern electronic developments would not have been possible.

Dr. Christaldi was a member of Sigma Xi and a Life Member and past Director of the Radio Club of America and a Life Fellow and past Chairman of the Northern New Jersey Section of the Institute of Electrical and Electronics Engineers. He held many patents related to cathode ray tubes, and he contributed the chapter on Oscilloscopes and Electronic Switches in the *McGraw-Hill Industrial Electronics Handbook*.

Dr. Christaldi lived in Montclair, N.J., for more than 60 years. He was a member of the executive board of Eagle Rock Council, Boy Scouts of America; a past president of the Montclair Society of Engineers; and a member of the Union Congregational Church where he served as a deacon. His wife, Helen, died in 1993. He is survived by a son, Brian Christaldi of Chevy Chase, Md.; a daughter, Karen Christaldi Clendenin of Richmond, Va.; and five grandchildren.

Harry Mills (F), Centenarian Award Winner

One-hundred-year-old Harry Mills (K4HU) died Aug. 9, 2008, at the Cardinal Care Center in Hendersonville, N.C. Mills, a Radio Club of America Fellow, was presented with the Club’s Centenarian Award in 2007. He retired from RCA after a 30-year career, and he also was a member of the ARRL and the Quarter Century Wireless Association.

The Lost Letters Of KH6UK (Part One)

Although much has been written about that historic QSO of the International Geophysical Year in 1957, very little information has been added since. In this first part of a four-part series, we learn about what one well-known amateur was up to.

By Mark Morrison (WA2VVA)

Ralph “Tommy” Thomas was an accomplished radio operator whose “can do” attitude and excellent operating skills brought notable success on more than one occasion. First, in 1926 (as 2UK), he exchanged messages with the George Miller Dyott expedition in the jungles of Brazil when commercial operators had failed to get through. Then, in 1938, he was one of three radio amateurs to provide weather reports to aviator Howard Hughes on his record setting flight around the world. In 1953, Tommy provided reports to George Rose (K2AH) during the first use of a transistor in amateur radio. In 1954, Tommy and Paul Wilson (W4HHK) were credited with the first Meteor Scatter QSO ever made on 144Mc.



As impressive as these feats were, however, none won the acclaim of Tommy’s 1957 QSO with John Chambers (W6NLZ), arguably the greatest amateur achievement of the International Geophysical Year (IGY). Some may think this accomplishment had nothing to do with the scientific purpose of the IGY but, in 1960, the General Electric Company awarded both Tommy and John the prestigious Edison Award, the only time ever awarded for scientific achievement. The judges of this award are said to have compared this accomplishment to the first radio transmissions across the Atlantic in the early 1900s. Even today, this event remains a hallmark of amateur cooperation, skill and determination.

Tommy lived in New Brunswick, N.J., where he worked for RCA Communications (RCAC), formerly Marconi America. In 1955, RCAC relocated Tommy to Hawaii to be engineer-in-charge of its Trans-Pacific radio station at Kahuku, Oahu. This historic station was one of the original Marconi stations spanning the globe in the 1914, completing the link between Japan and California.

Once settled in Hawaii, Tommy received a new call sign (KH6UK) and put together this beautiful station. Note the greetings on the right side of the picture (*next page*).

To keep in touch with his friends back home, Tommy wrote or typed letters, including many to Walt Morrison (W2CXY). The typewriter used for many of those letters can be seen in the photo above. When Walt passed away in 2002, these letters were discovered in a basement filing cabinet where they hadn’t been

Amateur’s Home-Made Set Got Dyott by Radio in Brazil

The operator of amateur radio station 2UK, who exchanged messages with the George M. Dyott expedition in the Brazilian wilderness last Oct. 27, was revealed yesterday as a young clerk who, with an apparatus he had made himself, has had wireless communication with stations in Australia, South Africa, Germany, Italy, Finland and other distant countries. His set is of 50 watt power and cost him \$125 to \$150 to make, he said last night.

The young operator is Ralph E. Thomas of 421 Dennison Street, New Brunswick, N. J. He is 23 years old and is employed in the offices of the International Motor Company. He has been experimenting with radio for six or seven years and has had no technical training other than that he has been able to pick up himself.

“I talked for about an hour with Bussey, the operator with the Dyott expedition,” said Mr. Thomas, “and his signals came through quite clearly. He is a crackerjack operator.”

The New York Times

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Originally published December 28, 1926



Tommy had his own radio room, situated just off the lanai, with large glass doors that opened to fresh air and the sights of Hawaii.

seen in nearly 50 years!

Although much has been written about that historic QSO of the IGY, very little information has been added since. With the 50th anniversary of this event right around the corner, and Tommy's lost letters to guide us, what better way to celebrate than through the words of Tommy himself? Here then is the untold story of the most famous QSO of the IGY.

By April of 1956, Tommy and Helyne had settled into their new home in Hawaii. It took about a year to get in shape, including patching a leaky roof and replacing window panes etched by years of salt air, but once that was done, they were quite happy. Located on the North shore of Oahu, their house was close to the RCAC facility and a short walk to the beach.

Tommy had his own radio room, situated just off the lanai, with large glass doors that opened to fresh air and the sights of Hawaii. Although an operator's dream, its proximity to the high power transmitters of the RCAC station made for terrible interference, especially on 6m and the lower-frequency TV stations out of Honolulu. Nonetheless, the location had a relatively good shot to the

West Coast, thanks to Marconi engineers who surveyed this spot years earlier.

Tommy's first project was to build a VHF array for 144Mc. At the time, the greatest distance spanned on 2m was about 1100 miles, and because the nearest place with any significant 2m activity was California, some 2,500 miles distant, Tommy was none too optimistic about the DX possibilities.

In a taped letter to Walt, he said it this way:

"As far as 2-meter operation is concerned out here on the island there's not a great deal of it. There's some CD work and attempts to work island to island but necessarily so I suppose, if you can't work anywhere else then why even try. Just about the closest place you could expect any activity is the West Coast and that's 2,500 or 3,000 miles away. So I suppose that has a damping effect on the long haul stuff out here."

Tommy's first real challenge was to work the local hams on the other side of the island, near Honolulu. A large mountain stood in their way but Tommy convinced them

that they could work each other, and they did. After that, he set his sights on the West Coast.

As with most VHF enthusiasts of the era, Tommy thought a lot about moonbounce, which was only natural, considering the lack of other stations within the range of a typical meteor scatter or Sporadic-E contact. His letters to Walt (W2CXY) mention the need for “25 db minimum” and multiple “Long Johns,” a name that describes the “long, long Yagis” popularized in *QST* magazine by Jim Kmosko (W2NLY) and Swan founder Herb Johnson (W6QKI). In one letter, Tommy mentions that Herb and Jim are “set for Moon deal tests around July” and comments to Walt that “they might beat us to the punch!”

By May of 1956, Tommy had found someone interested in running 2m schedules with him. In his letters to W2CXY, he mentions for the first time that John Chambers (W6NLZ) “might be a good man to have on tests” and that “John wants to attempt 2m across the Pacific.” Although the distance was about twice that of the best DX of the time, Tommy was ready for serious weak-signal work. Tommy would later describe his new partner this way:

“John is a very fine man to work with. He’s always on the ball, and I’ve certainly enjoyed my many contacts with him. He certainly is a VHF man of high caliber and high interest.”

By this time, Tommy was talking about “Big Bertha” antennas, such as those used by W6QKI and Ed Tilton (W1HDQ). At the time, Ed was editor of *QST* magazine’s popular VHF column “The World Above 50 Mc,” and any recommendations from him would have carried significant weight.

Back on the East Coast, the growing number of high power VHF stations was causing interference problems for weak signal operations. A group of amateurs, including W2CXY, petitioned the American Radio Relay League (ARRL) to request the FCC to reserve the low end of the 2m band exclusively for CW work. Although Tommy didn’t have to worry about such interference, due to his remote location, his proximity to the RCAC station brought many of the same challenges. As such, he was quite interested in this matter. In a taped letter to W2CXY, Tommy mentions that both he and his MARS

director are interested the exclusive CW segment. Tommy also mentions that sideband splatter on 6m and 2m are particularly bad, due to station interference. If Tommy were to do any serious DX work on 2m, he would have to get around this interference somehow.

By the summer of 1956, Tommy began construction on his VHF array. Work was slowed due to the summer heat but, by October, the beam was finally in position. Tommy sent Walt pictures to share with his friends back home. Upon seeing the pictures, John (W9WOK) commented that the antenna hardware, including the utility pole, looked quite similar to Tommy’s setup in New Brunswick.



This picture shows Tommy (on the left) monitoring a crew of men ready to hoist the 56 element beam to the top of a 90’ utility pole. The others in the picture are “riggers” from RCAC.

This picture on page 17 shows the beam in final position. Note that it could be rotated but not elevated, thus ruling out any serious moonbounce work. Tommy later commented to W2CXY that he would replace this with a “first rate job” for moonbounce work if he had the time. Tommy’s stay on the island was supposed to last only three years and, because he was uncertain if RCAC would ask him to stay longer, he hesitated to build something bigger from the start.

By the fall of 1956, Tommy continued to exchange moonbounce ideas with Walt (W2CXY) and confirmed

that Jim and Herb had not made moonbounce contact yet. They discussed plans for circularly polarized “monster antennas,” and Tommy mentions interest in contacting Dr. Kraus (W8JK) regarding his work in this field.

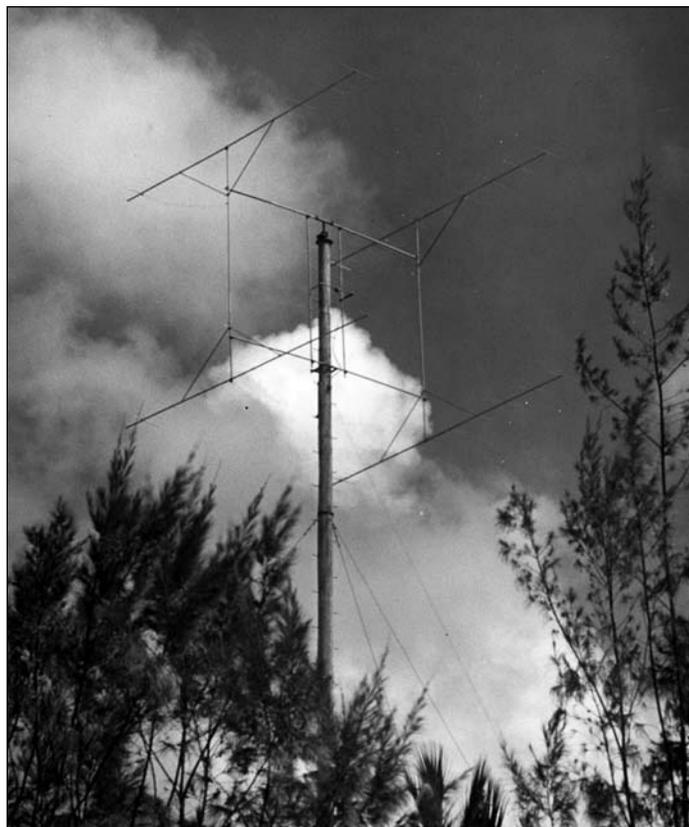
In November of 1956, Tommy began 2m tests with John. He also started to experiment with 6m. In an audio taped letter, he mentions to Carl Scheideler (W2AZL) his plans for 6m this way:

“I had hoped, Carl, to make use of that very fine converter you sent me for 6 meters. I had hoped to do some work on 6 in conjunction with 2m experiments as I thought maybe if I could pick out the periods when 6 was open from Sporadic-E we might be able to do something on 2 at that time. Just might. That, of course, was my intention but it didn’t materialize, mainly for the reason that the interference is so bad here on 50Mc from the station that it’s practically impossible to do anything through it.”

Tommy wondered what it was like back in New Jersey, with all the big 2m stations. Still concerned about interference, he would ask “Has anyone figured a way to reduce crosstalk caused by overload in converters?”

The first half of 1957 was a busy one for Tommy. First there was a tidal wave that nearly swamped his shack. He described the ocean as slowly receding before rising slowly up to the level of the dunes, at which point it spilled over and into his yard. They had 18 inches of water all around the house and, if not for the fact that it was low tide, his radio room might have been flooded. Then there were serious manpower shortages at the station and the lack of qualified workers to fill the openings. There was also a steady stream of visitors to the RCA station, including several top brass from RCA. On one occasion, the legendary David Sarnoff visited Tommy’s shack and showed a great deal of interest in his Meteor Scatter operations.

Tommy kept schedules with John practically every night from May into June of 1957 without success. They even tried daytime meteor-scatter work, but this was abandoned when John reported poor results with other stations he had schedules with. In a tape sent to W2CXY just weeks prior to the record-breaking QSO, Tommy explained that because John lived in an exclusive neighborhood of Los Angeles (Palos Verdes Estates) and was only using a single Long John, he was not too hopeful a contact would be possible. Tommy put it this way:



In taped correspondence to Walt Morrison, Tommy said, “I don’t have too much time Walt, or too much energy either for that matter, when I do have the time, to build bigger and better antennas for moon reflection work.”

“John unfortunately lives in a very exclusive neighborhood and cannot put up a big beam. He has one long john, which as you well know is not sufficient. We’re going to need everything we can get up in the air, and also all the power and the best receivers and converters we can get if we’re going to do anything at all. Starting out with the limitation of such a small antenna, it’s almost a forgone conclusion we’re not going to get anywhere.”

By June of 1957, Tommy must have been thinking the only DX possible from his QTH would be moonbounce but even that was something of a disappointment. In a taped letter to W2CXY, he put it this way:

“I don’t have too much time, Walt, or too much energy, either, for that matter, when I do have the time, to build bigger and better antennas for moon reflection work. I’m a little disappointed along those lines but I don’t know, weekends come along and when I’m not working, I’m trying

to catch up on a little rest and preparing for the upcoming week. It's been rather rough over here. A lot more work than I had anticipated and a lot less leisure. Whether I will still find time before we return to put up a bigger beam or not, I don't know. I'll have to get some energy and ambition from somewhere if I'm going to do it. I don't seem to have it now. Over here on the islands, you get so after a while, you're contented to just sit and reflect. In the summer time, it's rather warm and not conducive to a lot of occupations and activities that require expenditure of energy. Most people around here just sit!"

In the following weeks, however, all that would change. Using techniques that Tommy and Paul (W4HHK) no doubt refined prior to their first 2m meteor-scatter QSO, Tommy and John used the HF band for liaison work. Once contact had been established on HF, they would regularly switch to 2m to see if anything could be heard. They did this night after night until finally, on July 8, 1957 at 6:30 p.m. Hawaiian Standard Time (HST), Tommy's 2m signals were picked up by John Chambers in California. The signals lasted until 7:35 p.m. HST, at which point W6NLZ left the air. After John confirmed his QSO with Tommy, John's wife (W6NTC) took the controls and also had a QSO with Tommy. Tommy says he then called CQ for the next three hours to see if anyone else would reply but no one did.

Tommy made three reel-to-reel copies of the QSO. One was sent to Ed Tilton (W1HDQ), another to John Chambers (W6NLZ) and the third went to Walt Morrison (W2CXY). Here is an excerpt of what Tommy reported on his tape to Walt:

"The recording was fairly good, in spite of the fact that I was so excited I didn't want to change any of the tuning controls, and there was quite a bit of overloading at times. Also, my signal sounded sad, as you probably know by now. The signal sounds much better on a pair of cans than it does on a loudspeaker. It always does.

We had been running this schedule, as you know, since last November, and I had never even heard a peep of any kind during that time. I had one report from 7, I think it was VVJ, that he copied the letter U out of my call but I could never get him to verify it. So I'm not sure that he actually heard it. Maybe he just thought he did.

This thing came as a complete surprise to us. I

was listening on 20, and 144 at the time, it's a usual procedure for me to transmit on 14.095 and 144 Mc. And John would listen to 144 after working me on 14.095, and telling me how conditions were and how long he wanted the schedule. So this started the same as any other. When I said bye after 5 minute transmissions, John was calling me like mad and gave me a report of 559 I believe it was, on 2m. I thought he was suffering from the heat. But he insisted such was the case, so I dashed madly for the 2m converter and turned it on and hooked the antenna on it. And low and behold there he was. The signal was in more or less the whole hour. He was very much excited. So was I. And I believe we would have stayed on much longer if John had wanted to stay on but he was anxious to get off and call up Ed, and I was anxious to see how long it would stay in.

The call from W6NTC was a complete surprise, also. I thought it was a second station calling. Well, I guess it was in a way. And thought possibly it was someone in the same town. When they said Palos Verdes Estates, I thought it was somebody with a 522, probably one mile further than John! And I referred to him as "OM." I guess John's wife felt anything like an OM because she's eight months pregnant. It finally dawned on me what it was all about a little later, after the excitement had subsided. I really didn't know that John's wife was a ham. I don't believe she's active.

The tape is on its way to Tilton. I sent one to John, and this is the next one to go off and I guess this will be the last one. It takes quite a while to make them up, as you well know, and I know that you will circulate it there in the East.

There's quite a bit of interest shown in the results over here in the newspapers and on radio. I just finished listening to a broadcast on ARRL, and I see it's on there. So this will give you fellows something to shoot at. Maybe if you'll take time out from ping pong, you can see if you can work some stuff. I guess you're doing OK, though. QST reports more and more states in the "states worked column" all the time. I look them over with envy and wonder how I'm ever going to catch up. I guess I never will. I have one now! I guess that's it."

Interest in this QSO was a highlight of the 7th U.R.S.I. conference held in Colorado that year. Scientists from around the world, who had gathered to discuss radio propagation issues, showed considerable interest in this record achievement.

In the years that followed, Tommy and John would continue their schedules, first on 220Mc, where they found success in July of 1959, and later on 432Mc, where John would hear Tommy but not the other way around. Tommy would also find a way to get around the station

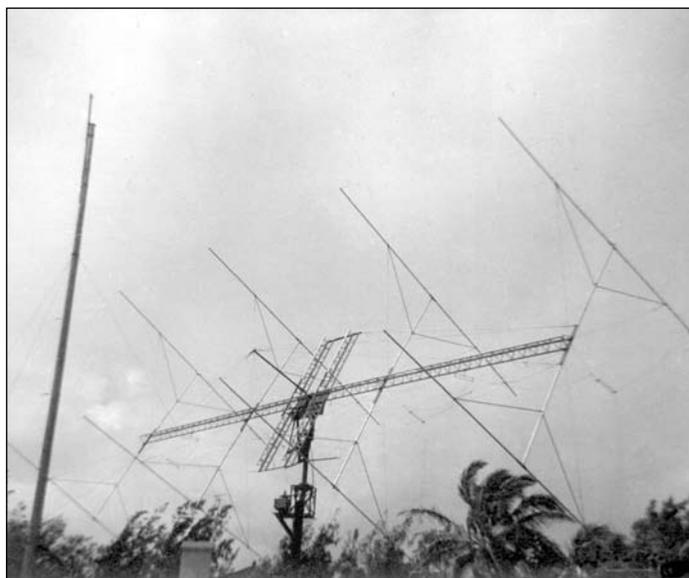
interference as this excerpt from “The PRP News” shows.

Tommy once commented to W2CXY that a new DX record could be established on 6m by working South Africa from his location. However, there just wasn't time to do everything, so this plan was abandoned in favor of serious moonbounce work on 144Mc. This is a picture of Tommy's “2 x 4” moonbounce array poised for testing. The story of Tommy's moonbounce activity will be the subject of Part Two of this article (scheduled for the Spring 2009 *Proceedings*).

On Into February

Hawaii-east coast contacts are ordinary events now judging by your reports. Quite a few of these QSOs took place on February 1st around 1500 EST. W1PHR worked KH6UK and KH6NS, and was hearing W6s at the same time. The Hawaii signals didn't extend much beyond Vermont, however, because W1QCC/VE1 in Pictou, N.S., heard only W6s and W7s at this time. Californians worked KH6s and W1s simultaneously on F2 on February 1st and their nearby neighbors and W7s were coming through on back scatter. Around 1530 PST (still on the 1st) K6RNQ worked ZL4GY in New Zealand. It's the first time that we have come across this particular path on any of your reports. K6RNQ repeated the performance on the 7th when he worked ZL2ABX at 1615 PST.

PRP News MArch 1958



Tommy's “2 x 4” moonbounce array, poised for testing.

(Editor's note: This upcoming series of stories first appeared in CQ-VHF Magazine, and we have its permission to re-use them. Contact Mark Morrison at mark1home@aol.com)

The Radio Club's Centennial Event — Next Year In Washington, D.C!

The Radio Club of America's 100th Anniversary Celebration will be held at the Marriott Georgetown University Conference Center, Nov. 20-21, 2009, and you won't want to miss a minute. Promotional material, sponsorship information and travel tips will be in the mail to you starting in January 2009, and we promise a program like no other. The nation's capital will be in excitement mode next year, and you can be part of it!

Even With New FNPRM, Will The Nationwide Broadband Public-Safety Network Get Built?

According to one commissioner, a network that is too expensive for first responders to use is little better than no network at all.

By Debra Baker, *Proceedings* editor

At its monthly open meeting last September, the Federal Communications Commission (FCC) adopted a Third Further Notice of Proposed Rulemaking (FNPRM) that proposes licensing the 700 MHz D-block spectrum as part of a revised 700 MHz public/private partnership. In doing so, the commission believes it can “maximize the public-safety and commercial benefits of a nationwide, interoperable broadband network in the 700 MHz band.”

However, the FNPRM raises more questions than it answers.

“Let us be clear about what is at stake; without the partnership, there are no other viable tools for the commission to ensure that this network can be built in a timely manner, with a maximum level of interoperability for use by all public safety entities small and large, rural and urban,” said Chairman Kevin Martin. “The overriding consideration in all of the proposals in the Third Further Notice is ensuring the maximum level of interoperability on a network that is built out to as many public-safety entities as possible. In this respect, the Further Notice proposes to

use the auction mechanism itself to select a single air interface, which is the best way to ensure full interoperability. While there is a valid use for bridges and gateways to connect disparate networks, without a single air interface, full interoperability cannot be achieved.”

Here’s the background: Because the D block did not meet its \$1.3 billion reserve price in the 700 MHz auction held earlier this year, the FCC sought comment in May on whether it should revise the 700 MHz public/private partnership and to re-auction this spectrum. These rules included the creation of a 10-megahertz license in the D block to be part of a public/private partnership with the adjacent 10 megahertz of spectrum dedicated to a public-safety broadband license. To help ensure that all aspects of this critical initiative are given careful consideration, the FCC now seeks additional public comment on this latest proposal, which was largely developed from the input, ideas and recommendations received from public-safety organizations and officials, government representatives,

► *Continued on p. 18*

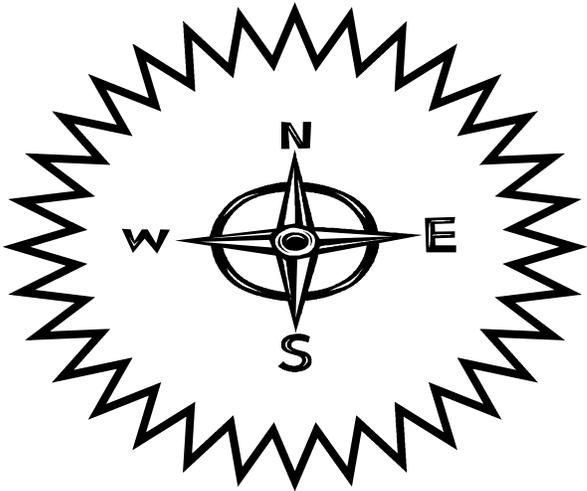


“The overriding consideration in all of the proposals in the Third Further Notice is ensuring the maximum level of interoperability on a network that is built out to as many public-safety entities as possible”
– *FCC Chairman Kevin Martin*

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“In a better world, Congress would have appropriated funding for construction of a nationwide interoperable public safety network suitable for 21st century challenges – either way back in 1997, as part of its original allocation of 24 megahertz of the 700 MHz band for public safety use or in early 2006, as part of the DTV Act”

– Commissioner Robert McDowell

wireless carriers and manufacturers across the country.

The Commission's Modified Rules

“A primary goal of the commission is to promote the deployment of a broadband network that provides maximum coverage to first responders across the country. Today’s notice proposes to retain a public/private partnership framework for the 700 MHz band absent other sources of funding,” the agency said. “(The) notice proposes a modified set of rules to govern the D block and a revised auction plan for assigning D-block licenses. Specifically, the FCC proposes to use the competitive bidding process to determine whether, based on greatest population coverage and highest bid(s), the D-block spectrum would be licensed to a single licensee on a nationwide basis or to regional licensees on the basis of 58 public-safety regions.”

If the D block eventually is licensed on a regional basis, the auction results also would determine the particular air interface technology that would be deployed across the nation by the D-block licensee(s) when building out the interoperable broadband network(s), which would facilitate the ability of public safety entities to communicate outside of their home regions. And with specific regard to the D-block license term and performance requirements, the notice proposes to extend the license term to 15 years and to adopt performance benchmarks applicable at the fourth, tenth, and fifteenth years under the life of the license(s).

The notice also proposes, and seeks comment on, rules involving “significant clarifications and revisions of the respec-

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tive obligations of the D-block licensee(s) and the public-safety broadband license regarding the construction and operation of the shared wireless broadband network.” These clarifications and revisions address, among other things:

- >> The use of spectrum in the shared wireless broadband network (including requirements regarding public safety priority access to commercial capacity in emergencies),
- >> The technical requirements of the shared wireless broadband network (including detailed proposals relating to interoperability, robustness, capacity, quality of service, and security),
- >> The coverage requirements of the broadband network(s), and
- >> The respective operational roles of the D-block licensee(s) and the public-safety broadband licensee.

Commissioners Agree To Disagree

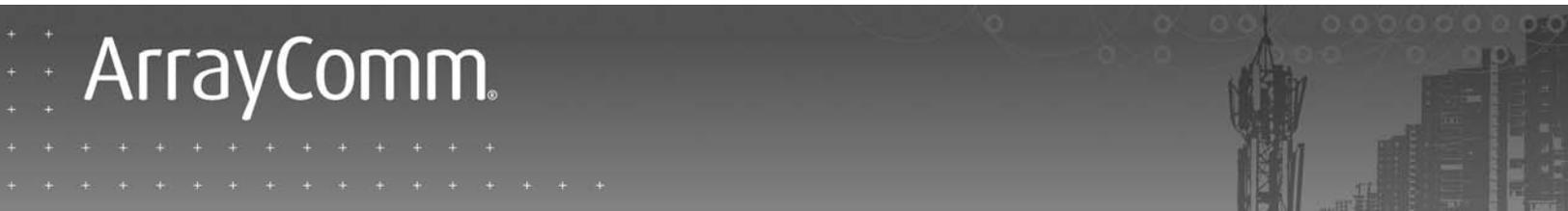
Even though Martin’s fellow Republicans backed him 100 percent on this further notice, they did forward some questions. While Commissioner Deborah Taylor Tate pretty much rubber-stamped Martin’s words, but in a much-shorter statement, Commissioner Robert McDow-

ell handed out a little criticism as to timeframe, builder incentive and the huge number of public-safety entities out there that still aren’t unified.

“In a better world, Congress would have appropriated funding for construction of a nationwide interoperable public safety network suitable for 21st century challenges – either way back in 1997, as part of its original allocation of 24 megahertz of the 700 MHz band for public safety use or in early 2006, as part of the DTV Act,” he said. “First, at this stage, there is no critical mass behind any commercial proposal. Further, the lack of consensus among public safety-entities appears to be only getting worse. Perhaps I should not be surprised by these circumstances since there are thousands of public-safety jurisdictions in the United States, each with unique personnel, deployment, topography, network, and RF propagation issues. Nonetheless, this lingering discord makes completing our task more difficult.”

And deciding only to “concur” on the D-block issue was Commissioner Michael Copps, one of two Democrats, who admitted “we have a still-inadequate grasp of the precise contours of what it is that we propose to build;

► *Continued on p. 24*



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“It is irresponsible for an expert agency to pull numbers out of thin air that generate revenue for the Treasury but deprive the private sector of the means to accomplish our ultimate goal of a viable public-safety network”

– Commissioner Jonathan Adelstein

how to incent its construction and operation; how to make sure public safety can afford to use whatever is built; and how exactly, or even generally, the safety of the American people will be enhanced. Indeed, some believe the network envisioned in this item may not be substantially more robust than existing commercial networks—and for which public safety users may be asked to pay a significant fee (\$48.50 per user, per month) that many of them may be unable to afford. A network that is too expensive for first responders to use is little better than no network at all.”

He ticked his questions and concerns off one by one:

>> The proposal does not precisely specify what services and rights public safety users get in return for their per-user, per-month fee.

- >> Does it allow a user to stream high-quality video? How often and how high-quality?
- >> Does it allow them to use VoIP applications (which some commercial wireless providers today do not allow)? How often and at what quality of service?
- >> Is a single police officer with a mobile device on his or her hip and a laptop computer in the police car one user or two for the purposes of the \$48.50 fee?
- >> Technical questions regarding speed, building penetration, and the functionalities of the network for public safety users are not precisely defined, and the FCC does not know how these factors and the degree of “hardening” it requires compares to the standards of existing commercial—let alone public safety—networks.



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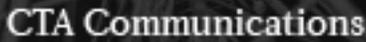
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And the original idea that the nationwide public-safety broadband network would be “national” apparently has gone out the window, Copps added. “In fact, the rules we propose today specify that even if bidders appear for as few as 11 of the country’s 58 geographic regions, we will go ahead and build a network in those limited areas without any firm plan for how to create coverage in the rest of the country,” he said. “So if a few big states and metro regions get ‘sold,’ all the rest of this spectrum could lie fallow.”

But he also acknowledges that linked regional systems may be the way to go. “We also have to deal with the reality that, in light of the failure to attract a single nationwide bidder in the last auction, the best way to serve public-safety users may be through a number of regional networks that use a common technological standard,” he said. “Indeed, it is possible that regional carriers may in some areas be the best partners for public safety—with better coverage and the ability to tailor their networks to local needs. So I am also concerned that our rules allow the possibility that one company could win a single national license for a relatively low bid, even if other companies were willing to pay far more, in the aggregate, for regional licenses.”

Copps pointed out that the FNPRM said “we will always go with a national licensee over regional licensees if even one of the 58 regions (no matter how small) fails to receive a bid. This could tilt the balance too far in the other direction. While I recognize this is certainly one of the most difficult questions before us, I am not sure we’ve arrived at an acceptable solution.”

One of the reasons the D block didn’t sell at auction earlier this year is that there was no business reason attractive enough to lure anyone into the game. “Many months later, we still don’t have a clue about what it will take to attract the \$10, \$15 or \$20 billion to actually deploy a public safety network,” Copps lamented. “The wreck and ruin left in the wake of last week’s financial melt-down only make matters worse—perhaps infinitely so. Lack of certainty on top of lack of funding will not a public-safety network make. Before we set an auction process into motion—before we even design the incentives necessary—the FCC simply must get a firm fix on what the rough costs of the public safety network are going to be. I would just as soon take my chances passing a tin cup on Wall Street as put my faith in plunging financial markets finding a way to pony

► *Continued on p. 26*

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up billions for a network whose design and business case the FCC doesn't fully understand and has not, to my mind, sufficiently investigated."

Having said that, Copps basically got down on his knees to beg for help regarding real network specifications and real network costs.

"Even at this late juncture, I think it would be prudent for the FCC to engage some sort of outside consultant to assess the cost of the network specifications we propose today and the business case (or lack of a business case) for the public-private partnership described in the item," he said. "At least their insights could inform the final rules. But it does not appear this is going to happen... We need as many experts and organizations and stakeholders to step up to the plate and give us their help as we can find. I am asking, I am pleading, for this level of participation."

And then, one more time, he asked for input from the most important beneficiary of a D-block effort. "I am especially eager to see the reaction to our proposal from public-safety users, our expert national organizations as well as the states and local jurisdictions that must decide whether to pay to use any network that is built," he concluded. "It is time for you to tell us what you really think—up or down, yes or no, move forward or go back to the

drawing board."

As an aside, testifying in front of the U.S. House of Representatives Committee on Homeland Security in September, President Elect Richard Mirgon of the Association of Public-Safety Communications Officials (APCO) International reaffirmed the group's support for a public-safety broadband network that meets the needs of first responders during mission-critical incidents.

"Again, APCO International strongly supports the formation of a national, interoperable, broadband public safety communications network," he told the congressmen. "We firmly believe that the most viable means of creating such a system is through a network-sharing agreement between a national public safety broadband licensee for the 700 MHz public-safety broadband spectrum and the winner of the adjacent D block of commercial spectrum. Absent extraordinary and unprecedented federal grants, no other available approach can provide the funding for a nationwide public safety broadband network."

In addition, he highlighted the importance of and their commitment to a partnership among all of the interested parties to create a national public-safety broadband

► *Continued on p. 28*

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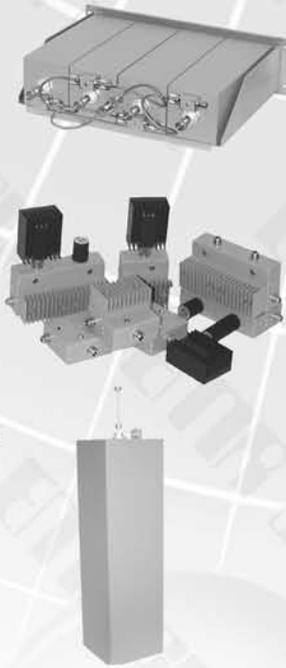


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“Lack of certainty on top of lack of funding will not a public-safety network make. Before we set an auction process into motion—before we even design the incentives necessary—the FCC simply must get a firm fix on what the rough costs of the public safety network are going to be.”
– Commissioner Michael Copps

network. “APCO International remains committed to working with all the interested parties to make sure that the construction, maintenance and management of such a national broadband network in the 700 MHz spectrum meets the needs of public-safety today and into the distant future,” Mirgon added.

Adelstein Says FNPRM ‘Falls Short’

The other Democratic commissioner, Jonathan Adelstein, concurred in part and dissented in part with the FNPRM, but he backed colleague Copps to the hilt.

“Unfortunately, this attempt falls short. It is not based on a solid economic or technical analysis that gives me sufficient confidence that we have assembled the elements for a successful auction,” he said. “Without this basis, we have no way to determine, for example, whether such a large upfront minimum bid requirement of \$750 million permits a sustainable business model, or dooms this enterprise to failure from the outset. There is no analysis provided in the item to explain this number. We are offering for sale a valuable asset, but not one of unlimited value...I would have preferred to see much of the amount that will go to the minimum bid to go to building out the network rather than paying for the spectrum.

Citing today’s shaky economic environment, Adelstein continued, “It is irresponsible for an expert agency to pull numbers out of thin air that generate revenue for the Treasury but deprive the private sector of the means to accomplish our ultimate goal of a viable public-safety

network. Our first priority should be helping our first responders, not raising money.”

Pointing to the minimum bid the FCC wants for the D block, Adelstein said the commission has done no analysis to see “whether \$750 million or \$100 million or any other number would have been sufficient.” And he doesn’t support any of the suggested tiered benchmarks for performance requirements, saying, “The proposal is taken out of whole cloth from the suggestion of one interested party, with no independent analysis on our part.”

Adelstein believes this approach relegates rural America to “second class status” based on “the preferences of one commercial company that presumably wants to bid and minimize its costs to maximize its profits. While that is perfectly rational behavior for a private company, it is an abdication of its duty for a federal agency to adopt one company’s agenda, no questions asked, when the public safety of Rural America is at stake,” he added.

And hammering his final nail, Adelstein says, “It is hard to have confidence that this plan will succeed, since we did not do the analysis to see if the cost-benefits are met for any private-sector partner. These barriers to a successful auction, in conjunction with a less than meaningful comment cycle, cause me considerable pause.”

(Editor’s note: For those who want to read the entire FNPRM, go to http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-230A1.pdf.)

Ready for a good read?

The Radio Club’s own Maurice H. Zouary’s self-published book, *The New History of Motion Picture Sound*, recently was touted in no less than industry standard *Variety* magazine, which said in part, “In 1957, Zouary discovered proof (Lee) DeForest was processing sound on film during the early 1920s – at least seven years before ‘The Jazz Singer.’ Since then, he has tirelessly crusaded on behalf of DeForest. This tome chronicles his findings about the early sound era and the advent of talkies.” For more information on how to buy a copy, write to Zouary at 56 Marlborough Road, Brooklyn, NY 11226-2606.



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The U.S. Now Tops Europe In The 3G Take-Rate Battle

According to new numbers compiled by comScore, the United States has finally caught up to Western Europe in the adoption of 3G, the result of a 80.1-percent surge during the past year in the number of users who own 3G wireless devices.

comScore, whose specialty is “measuring the digital world,” says there were 64.2 million 3G devices in use in the United States by the end of June, up from 35.6 million a year earlier. The U.S. total just edged past 63.4 million for Germany, Spain, France, Italy and the U.K. combined. A year ago, the United States had trailed those five.

In terms of population penetration, the United States also has surpassed the top five countries in Europe, but just barely, at 28.4 percent versus 28.3 percent. But a year ago, the Europeans had held a healthy edge, with a penetration rate of 20.3 percent compared with only 16.7 percent here. Still, some countries on an individual basis outscore the

United States by a healthy amount. Italy, topping the list, has a penetration rate of 38.3 percent, and Spain comes in at 37.2 percent.

“For years, the American mobile industry has aspired to the level of sophistication of the European market,” comments Mark Donovan comScore’s senior analyst and senior vice president. “Today, Americans have finally caught up with Europeans in adoption of 3G. The advancements in 3G network technology and the introduction of sleek devices into the U.S. market have paid off as adoption of mobile media continues to grow at a rapid pace.”

One metric that’s still to be calculated, though, is not just ownership of 3G-capable handheld devices, but the level of actual use of them – best measured in minutes or bytes transferred or, preferably, both.

Percent of Subscribers With 3G Devices (3-Month Average)			
	Penetration		Change
	June 2007	June 2008	
Germany	15.1 %	23.9 %	8.1%
Spain	22.5 %	37.2 %	14.7%
France	12.6 %	17.1 %	4.5%
Italy	32.1 %	38.3 %	6.2%
United Kingdom	19.9 %	27.6 %	7.7%
European Total (5 countries)	20.3 %	28.3 %	8.0%
United States	16.7 %	28.4 %	11.7%
Source: comScore			

Total Subscribers With 3G Devices (3-Month Average, in 1000s)			
	Penetration		Growth (YoY)
	June 2007	June 2008	
Germany	7,021	11,732	67.1 %
Spain	7,207	12,640	75.4 %
France	5,616	7,958	41.7 %
Italy	14,462	18,008	24.5 %
United Kingdom	8,964	13,100	46.1 %
European Total (5 countries)	43,270	63,437	46.6 %
United States	35,651	64,207	80.1 %
Source: comScore			

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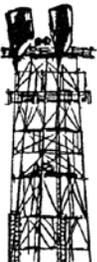
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Steven J. Shaver, Director

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Steelton, PA 17113



DAUPHIN COUNTY
EMERGENCY MANAGEMENT AGENCY

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The Radio Club of America, Inc.



Founded 1909, New York, U.S.A.
WORLD'S FIRST RADIO COMMUNICATION SOCIETY

The mission of The Radio Club of America is to provide a forum for the exchange of knowledge, recognize outstanding achievement, provide financial assistance to deserving students and preserve the history of wireless communications.

APPLICATION FOR MEMBERSHIP

TO: THE EXECUTIVE COMMITTEE

I hereby apply for Regular Retired Student (*please check one*) membership in THE RADIO CLUB OF AMERICA and certify that I meet the requirement for the grade selected. I further agree that, if elected, I will be governed by the Club's Constitution and By-Laws as long as I continue to be a Member.

Date: _____ Signature: _____

Full Name: _____
(FIRST) (MIDDLE INITIAL) (LAST) (CURRENT AMATEUR CALL)

Home: _____
(STREET) (The above information is used for mailings and your membership directory listing)

(CITY) (STATE) (ZIP CODE)

(PHONE) (FAX) (EMAIL)

Please complete REVERSE SIDE as well.

ENTRANCE FEE AND DUES

REGULAR.....\$185includes \$135 for 3 years of dues (required at initiation) + a \$50 initiation fee
[After your initial 3 years, you will have the option to pay the annual dues rate (currently \$50) or a discounted 3-year dues rate (currently \$135).

RETIRED.....\$100includes \$75 for 3 years of dues (required at initiation) + a \$25 initiation fee
QUALIFICATION: *At least 65 years of age and fully retired.*
[After your initial 3 years, you will have the option to pay the annual dues rate (currently \$32) or a discounted 3-year dues rate (currently \$75).

STUDENT\$30includes \$20 for 1 year of dues + a \$10 initiation fee
QUALIFICATION: *A full-time student at an accredited academic institution.*

*For Non-U.S. Mailing Address

REGULAR & RETIRED: Please add \$45 surcharge (\$15 per year of dues) **STUDENT:** Please add \$15.

Check enclosed International Money Order enclosed Traveler's Check enclosed Credit Card

Visa M/C Amex Card number _____ Exp. date _____ Amt. \$ _____

Cardholder Name _____ Signature _____ Date _____

Billing address for credit card _____

All monies to be issued in U.S. funds, drawn on an U.S. bank. International money orders and traveler's checks are accepted in U.S. funds, payable in the U.S. Checks should be made payable to **The Radio Club of America, Inc.**

Mail this application with the applicable ENTRANCE FEE (as indicated above) to:
The Radio Club of America, Inc., PO Box 621074, Littleton, CO 80162-1074
303-948-4921 ▪ Fax 303-972-1653 ▪ karen@radioclubofamerica.org ▪ www.radioclubofamerica.org

The Radio Club of America was founded in 1909 by a group of the industry's pioneers, and is the first active electronics organization in the world. Its roster of members is a worldwide Who's Who that includes many who founded and built the radio industry.

The Club's objectives include promoting cooperation among individuals interested in electronic communications and in preserving its history. The Club administers its own Scholarship Fund to provide educational scholarships from tax-deductible contributions of the Club's members and business organizations.

The Club publishes and distributes its *PROCEEDINGS* twice a year.

Business: _____
(ORGANIZATION) (DIVISION)

(STREET) (CITY) (STATE) (ZIP CODE)

(PHONE) (EXT.) (FAX) (EMAIL)

IF APPLYING FOR STUDENT MEMBERSHIP: School _____ Graduation Year _____

Birthplace: _____ Date of Birth: _____

Education and memberships in other clubs and societies: _____

Present occupation _____

Previous experience, indicate approximate dates (a current resume may be attached to the application):

In what particular branch of the communications art are you most interested? _____

In what year did you become interested in electronic communications? _____

SPONSOR (optional) Please list the name of a member to whom you are personally known: _____

Recommendation of sponsor: (optional)

Sponsor Signature: _____

Date: _____

The Radio Club of America, Inc.



Founded 1909

WORLD'S FIRST RADIO COMMUNICATION SOCIETY

APPLICATION FOR SENIOR GRADE MEMBERSHIP

Date: _____

TO: THE EXECUTIVE COMMITTEE

I hereby apply for the Grade of Senior Member of THE RADIO CLUB OF AMERICA, INC. and agree, if advanced to this level, that I will be governed by the Club's Constitution and By-Laws.

Full Signature

Full Name: _____
(LAST) (FIRST) (INITIAL)

Home Address: _____
(STREET)

(CITY) (STATE) (ZIP CODE)

(PHONE) (FAX) (EMAIL)

PRESENT OCCUPATION

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Letters of recommendation are required from two or more members (any grade) for sponsorship of Grade of Senior Member. Letters must be sent by each sponsor directly to The Radio Club of America, Inc., PO Box 621074, Littleton, CO 80162-1074. List Sponsors below:

1. _____
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Mail this application with the \$40 initiation fee to cover the cost of the Senior Grade Certificate and Pin (which will be mailed to the address indicated above).

Check enclosed International Money Order enclosed Traveler's Check enclosed Credit Card

Visa M/C Amex Card number _____ Exp. date _____ Amt. \$ _____

Signature _____ Billing address for credit card _____

(The charge will appear on your statement as Radio Club of America)

All monies to be issued in U.S. funds, drawn on a U.S. bank. International money orders and traveler's checks are accepted in U.S. funds, payable in the U.S. Checks should be made payable to **The Radio Club of America, Inc.**

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EDUCATION

Institution

Level Achieved

Date

Field

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Other Professional Society Affiliations & Grade of Membership _____

Current Amateur Radio Call Sign _____

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REV-042007

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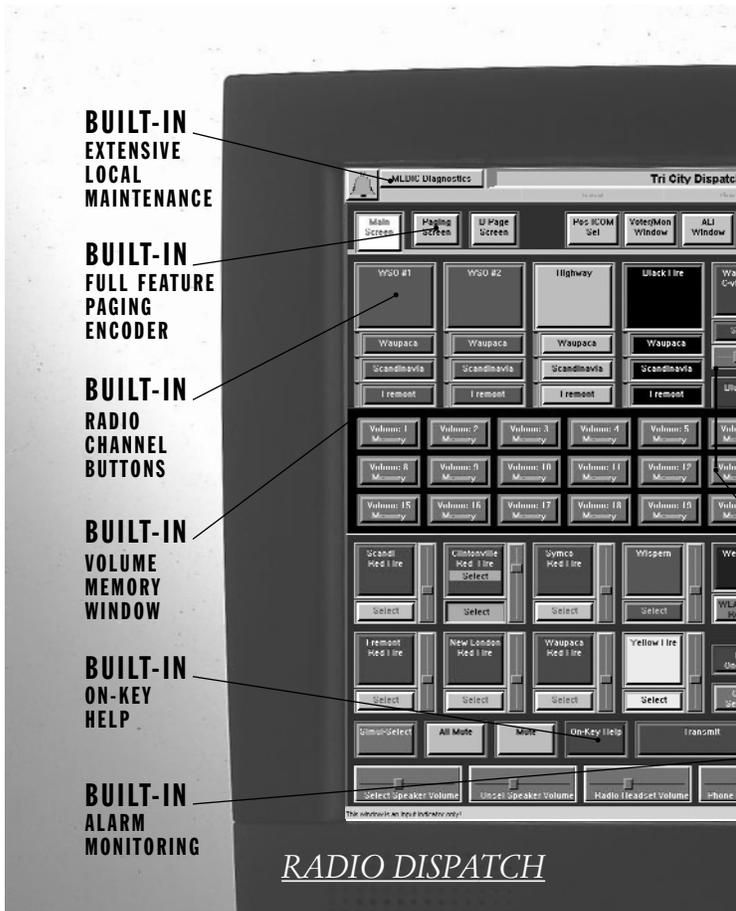
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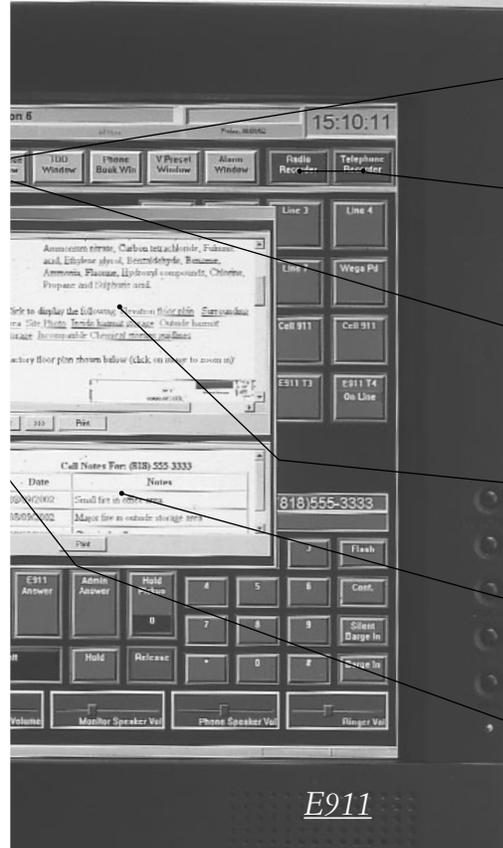
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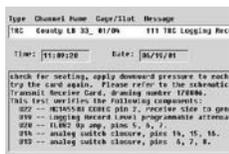
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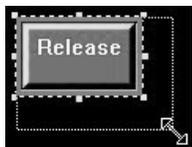
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