NARTE NEWS

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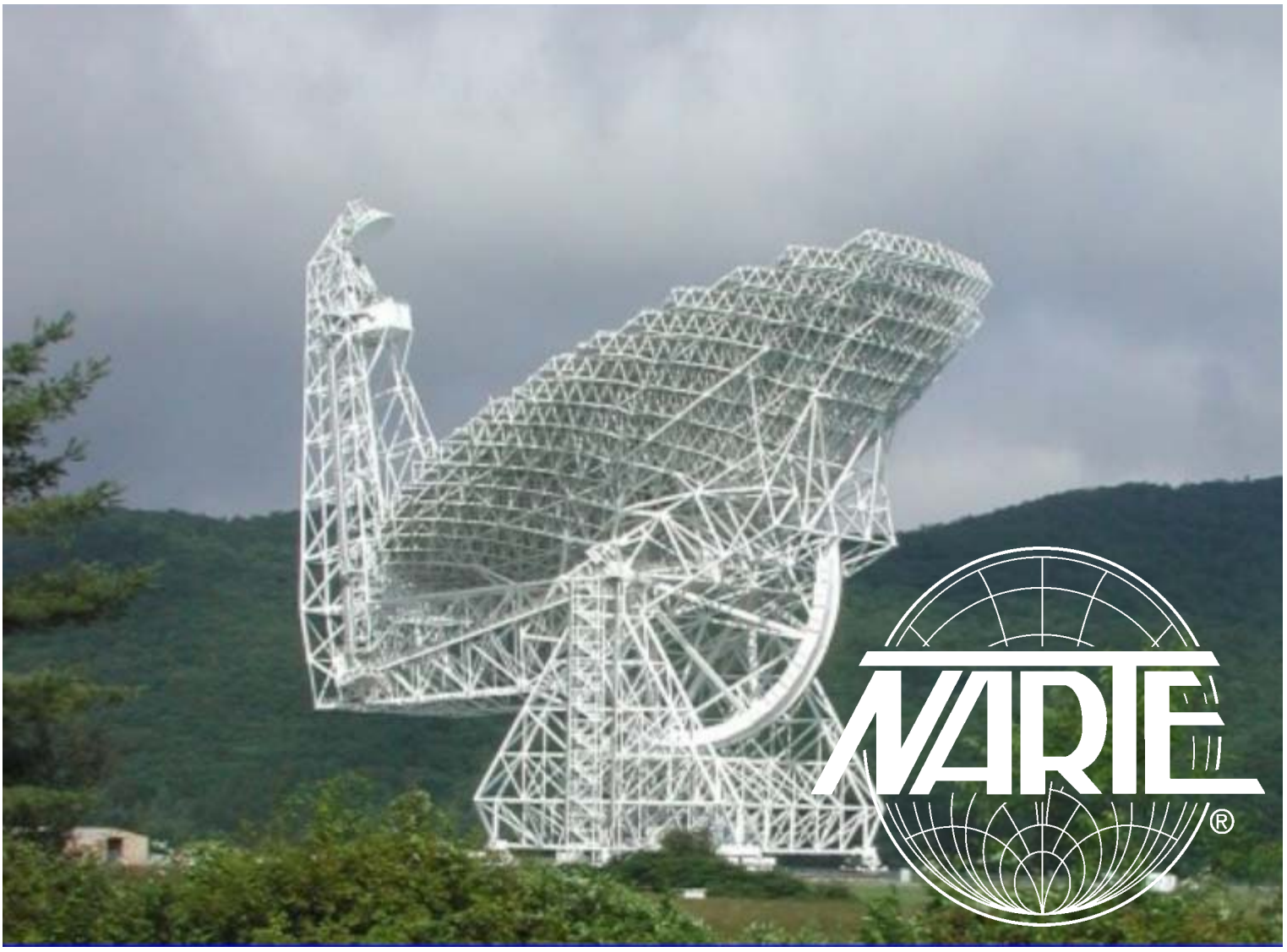
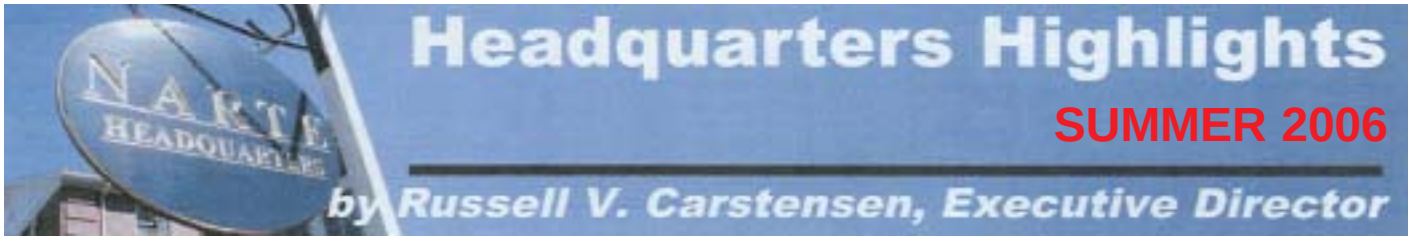


COVER The cover photo is of the Robert C. Byrd Radio Telescope in Green Bank, West Virginia. Thanks to Dave Finley for allowing us to use the photograph which is the property of "National Radio Astronomy Observatory / Associated Universities, Inc. / National Science Foundation".

contents

FEATURES

ARTICLES



Headquarters Highlights

SUMMER 2006

by Russell V. Carstensen, Executive Director

BYOB?

Logically, with gas at $3.00/gallon the best thing to do on a Saturday is to take off on a road trip. Washington State is building a new suspension bridge across the Tacoma Narrows and the wife and I decided that it was time for us to inspect their progress. We decided to stop for lunch in Tacoma at the Cloverleaf Tavern where they serve the absolutely, without question best pizza in the world, then cross the old Narrows bridge to the Kitsap Peninsula and see some old friends. A nice afternoon drive.

The pizza – a monster without anchovies – was outstanding and filling as usual. We then hopped on Highway 16 to cross the narrows. The new bridge is being built alongside the old one. We got to inspect the new one as we drove onto the bridge approach. Traffic on the old bridge is thick and fast. My wife was examining the new bridge as I merged onto the old one. I noticed a classic Rolls Royce Silver Cloud about two cars ahead of us. As I mentioned to her that I think it is the same one that was used at her cousin's wedding, the Rolls changed lanes and smashed into a "dually" pickup alongside of us. The drive at that point became a game of roller derby as I shot past the Rolls and the pickup as blockers to a clear lane.

We no sooner hit the highway than nature called. There are no rest stops on Highway 16 but we knew of a store that had a restroom. While we were there I bought a bunch of bananas. On the drive back we had the choice to go back across the bridge or take the long way around the Narrows through Shelton. When we got to Shelton, we decided to stop for supper. My wife mentioned that her brother had a relative that operated a diner in Shelton and we decided to stop there. As we studied the menu I mentioned that I was not too hungry from all the pizza we ate earlier and was going to hold to a slice of pie and a glass of milk. My wife opted for a banana split. The server took our orders and went off. She returned shortly to announce that she could not make a banana split because she was out of bananas.

Some of you are probably wondering what Russ is doing now that he has retired. He's going to sea or is that to seed?

Trying to be helpful I mentioned that I had bananas in my car and she could use one of mine. "Great", she said. I got up to get it. Apparently, when she discovered she did not have bananas she dispatched one of the kitchen staff to go buy a bunch of bananas. I returned about the same time as the other person. Applause erupted in the dining area as I walked my banana back to the kitchen. Shortly, the server came to us with our pie and a banana split. I asked her if I

could see the menu again. I told her I wanted to see where it said BYOB – bring your own banana.

Welcome Stephanie Fraser

Stephanie Fraser has joined the NARTE headquarters staff as our administrative assistant. She is probably the first voice you will encounter when you call us. She comes to us from Fraser Fish Ltd. where she did general office work, including delivery of fish to various restaurants in the Boston area. Stephanie studied criminal justice at Massachusetts Bay Community College and worked for several years at the Oklahoma County Sheriff's Office.

KEC Japan Product Safety

On June 23, we held the first-ever product safety examination in Japan. We had 12 applicants – 11 engineers and 1 technician. All examinees passed. We would like to express our sincere appreciation to Mr. Jeff Soga for his diligent work in translating the examination into Japanese in time for the examination. Please keep in mind that he had to translate 192 questions along with up to four possible answers. The problem was further complicated by the original author writing the questions and distracters in British English that we translated into American English for Jeff to translate again into Japanese.

Dayton Ohio Hamvention

This was our second year of participation in the Dayton Hamvention in partnership with the American Radio Relay League. Our thanks to Garry Gorr for his assistance in staffing the booth. Our purpose was twofold: to conduct FCC commercial license testing and to expand awareness of NARTE amongst the radio amateur community. We had excellent traffic by our booth. We gave away a bunch of maracas, pencils and pens. We also sold FCC examination study guides. We had 10 people pre-register for examinations and three sign up on site. We had six sign up at the Hamvention. Of those, two did not make it to the examination and 13 passed.

Installation of Computer Upgrade Complete

NARTE has been limping along for years with an antiquated DOS-based computer system. We purchased an update to Sales Control and began installation. This upgrade got us away from DOS and the cumbersome and inefficient processes. We now have up-to-date workstations with high speed Internet access. We do have one Neanderthal holdout. Our membership card printer does not have a driver compatible with the Terminal Services. We have to mechanically transport label lists to a stand-alone machine that still has the old driver on it and print from there. Replacement of the printer is a bit pricey so we are waiting a while to do it.

NARTE Should Advocate Full Utilization of Technicians

by Glen W. Spielbauer

While some technicians are fully utilized in "quasi-engineering" roles in the more progressive companies, other technicians may be limited to simple testing, assembly or repair.

Associate degree programs in electronics now cover a lot of the same high level math and theory as engineers have (just in a more applied manner). Many programs have an introductory applied calculus class, and some programs even cover Fourier and Laplace transforms as applied to circuit analysis. The following was submitted to the Electronics Technicians Association, International (ETA) and can serve as guidelines for NARTE and companies who employ telecommunications technicians:

The recognition and full utilization of technicians must be the top priority of all managers and engineers. Community colleges and technical institutes are the institutions of the future, not the elitist four-year universities. This is what congress stated when it passed the $125 million Tech Prep bill in the 1990s.

The role, status, pay, educational qualifications, and expertise of electronic and telecommunications technicians have soared during the past 20 years. They are the "gold collar" workers of the future who are propelling our nation's high tech industry to first place in the world economy. While technicians were in the past regarded as just "assistants" with inconsistent recognition, they are now regarded more and more as full professionals, along with engineers and computer specialists.

For example, most technicians today are graduates of advanced two-year associate degree programs from community colleges and technical institutes. These programs provide much of the high level theory and math as in four-year engineering degree programs – just in a more applied manner. For example, Eastfield College in Mesquite, Texas (a suburb of Dallas) offers an associate degree in Electronic Telecommunication and Wireless. Topics include digital and analog electronics, RF circuits, microprocessors, and software. Other related associate degree programs in community colleges cover advanced topics, including amplifier design, digital logic, microprocessor design and programming, and laser systems.

What you must do

When hiring technical people, first consider a technician. They often have special expertise beyond many traditional four-year degreed engineers, especially in advanced manufacturing, robotics, CNC programming, and quality assurance. Technicians from a two-year associate degree program that specializes in Telecommunications and RF electronics are especially suited for field service.

Involve technicians in high level design, not just testing, repair and troubleshooting. (Design work may need review by a registered professional engineer, depending on state requirements.) If your group does not do much design, technicians should play an active role in sales, training customer support, applications assistance, and technical writing.

They are also ideal in defining test procedures, supervising production workers, and as a vital link between manufacturing and marketing.

Explore the technical programs at your local community college or technical school. Talk with the instructors and visit the training labs. You may be surprised by the advanced level of the program. Your company can provide money, advisors, or part-time instructors.

Be involved with technician development. Give your technicians high level challenging assignments that overlap with engineers. Be involved with ETA (www.eta-i.org) and the National Coalition for Electronics Education (www.ncee-edu.org).

Technicians are your company's greatest asset

You as a technology manager or engineer enable your enterprise to soar to new heights when you give your technicians the highest level of professional recognition and utilization.

BLUETOOTH

Bluetooth is a system by which electronically connected equipment can communicate. The system is wireless and operates using RF receivers and transmitters in the industrial, scientific and medical devices (ISM) band between 2.402 to 2.480GHz. Each set of equipment is given a set of addresses by its manufacturer or which are set locally and will automatically connect with other devices in the vicinity which have the proper addresses to form a piconet.

Once the devices have recognized each other and formed a piconet, they can take turns, one-way at a time communication (half-duplex) at 432.6Kbps or form an asymmetrical link where one device uses 721Kbps and the slower one uses 57.6Kbps. If the devices need to transmit at the same time (full-duplex), Bluetooth can be used to send data both ways at 64Kbps.

Since many devices use the ISM band (some cell phones, paging systems, garage door openers, etc.), it is necessary to take measures to conserve spectrum usage and discriminate against interference. Bluetooth transmits using 1mW which effectively limits the communication range to about 10m – thus limiting its effective interference to other spectrum users and protecting other piconets of equipment with the same addresses. Bluetooth uses spread spectrum, frequency hopping at 1600 frequency changes per second to produce a spread spectrum signal that effectively discriminates against fixed frequency interference. In addition, the psuedo orthogonal signals of other adjacent Bluetooth systems cause little interference. That is, the likelihood of two signals randomly hopping in frequency 1600 times a second trying to use the same frequency at the same time is negligible. In addition, simple error-correcting software can take care of any short period of interference.

So Bluetooth has several advantages over most other wireless communications systems. It requires no operator intervention or adjustment. It will connect any compatible equipment together if they are in close proximity. It is local, adaptable to a wide range of equipment and data transfer requirements. And it is relatively immune to interference and causes little or no interference to other systems operating in the same area.

Brian Lawrence Appointed NARTE's New Executive Director

Brian Lawrence, the former managing director of ETS-Lindgren in the United Kingdom, takes over from Russ Carstensen as the executive director at NARTE in August this year. Russ announced his intention to retire earlier this year, and will hand the reins to Brian after a short transition period to help him get oriented.

Brian has a career spanning more than 40 years in the electromagnetic compatibility field. He has lived and worked in both the U.K. and the U.S. and has developed many contacts throughout Asia and Europe.

"Although I started my career as a scientist and engineer, I quickly found myself more and more involved in marketing after moving to the U.S. in 1973," Brian told NARTE NEWS. "I have known of NARTE's excellent work for many years and am delighted to now be a part of the organization. I am confident that my experience can make a significant contribution to their future growth."

"Russ has led us very well for seven years and brought NARTE to the place it is today," says Stephen Berger, president of NARTE. "With his retirement, we started an international search and are very pleased to bring someone of Brian's talent and experience to lead NARTE into its future."

"Brian joins the association at a pivotal time," Stephen says. "Given the rapid changes in technological innovation in telecommunications, NARTE is challenged to stay current and relevant to the needs of the industry".

Brian currently lives with his wife Kathy in a small village about 30 miles north of London. Before relocating back to the U.K. in 2000, Brian and Kathy had lived in the Chicago area, San Diego and Connecticut.

"We will be staying here for the immediate future," says Brian, "but we intend to move back to the U.S. within the next year or two. Meanwhile, modern telecommunications and the

Internet will allow us to maintain and develop contacts and ensure that all our commitments are met.

"While we are here, I believe there are a number of interesting opportunities for NARTE to introduce certification programs to Europe, and I will be starting right away with some leads that have developed in the U.K. Once programs are running in the U.K., it will be easier to expand into other Western European countries.

"With the globalization of industries, it is more and more important that engineers appreciate what is going on in the different global markets. By introducing NARTE to Europe, we can act as a conduit for the exchange of ideas and information between the communities."

Brian ends by saying, "We have active certification programs running in Japan and there has been an initial interest in Singapore that needs to be fostered. The longer term goal in Asia will be to get NARTE programs up and running in China, Korea and Taiwan, then we will have a truly global presence".

What is a Telecommunications Engineer?

by Russell V. Carstensen, PE, NCE

Over the years I have been drawn into numerous debates over wired and wireless systems. The debates seem to consistently follow two themes: that wired telecommunications are dead and that wireless technology is different. Both technologies employ telecommunications engineers but claim that there is the "true faith." Even though the same degree titles are awarded, technology has changed substantially in the 40 years I have been practicing as an engineer. This leads me to raise the point that if the degrees are the same, what is different? The following paragraphs reflect what I know to be correct about telecommunications engineering. The question is whether this reflects your reality. Please read my thoughts and let me know if I am on track.

Telecommunications Defined

In my research for this article, I looked first at what telecommunications is. The definitions currently in use seem to follow my old logic. For example, telecommunications engineering focuses on the transmission of information across a channel such as a coax cable optical fiber or free space. Transmissions across free space require information to be encoded in a carrier wave in order to shift the information to a carrier frequency suitable for transmission. Popular analog modulation techniques include amplitude modulation and frequency modulation. The choice of modulation affects the cost and performance of a system and these two factors must be balanced carefully by the engineer.

Once the transmission characteristics of a system are determined, telecommunications engineers design the transmitters and receivers needed for such systems. These two are sometimes combined in a single transceiver. A key consideration in the design of transmitters is their power consumption as this is closely related to their signal strength. If the signal strength of a transmitter is insufficient, the signal's information will be corrupted by noise.

Educating A Telecommunications Engineer

Society relies on telecommunications engineering for breakthroughs in applications such as satellites, next-generation mobile phones, air-traffic control, the Internet and much more.

A telecommunications engineer is involved in the planning, design, commissioning and monitoring of complex telecommunications networks and associated broadcasting equipment. Many telecommunications engineers work for major carriers, both wireless as well as telecommunications and IT service providers.

A portion of their education is targeted to core units for electrical engineering: mathematics, physics, electrical and computer systems engineering, digital logic systems, computer organization and programming.

Another portion is targeted to include telecommunications, information transmission, electromagnetic theory, signals and systems, electronics and control systems, advanced programming techniques, mathematics and management. Level three and four students concentrate on engineering management, telecommunications electives and group and individual projects.

Throughout the course, students choose from a range of electives, including antennas and propagation, advanced electronic and phonic devices, microwave/RF devices, circuits and communications, optical communication systems, Internet architecture and protocols, ATM and ISDN networks, mobile systems and networks.

They learn about the planning and design, commissioning, performance monitoring, optimization and management of both small scale and complex telecommunications systems.

Electrical engineers, on the other hand, design, develop and supervise the manufacture, installation, operation and maintenance of electrical systems. They work on systems for the generation, distribution, utilization and control of electric power. They also work on electronic systems used for computing, communications and other industrial applications. The point being that there is a lot of similarity between educational development for both.

Work Requirements

What then do telecommunications engineers do? Typically, a telecommunications engineer will:

- Manage engineering teams
- Design telecommunications equipment, including modems, switches, routers and radio links
- Develop real-time computer systems, including imbedded computer systems and their software
- Build and test prototypes of new equipment, including integrated circuit components
- Predict telecommunications system performance
- Optimize the performance of telecommunications systems
- Provide technical support to marketing or customer service staff and telecommunications technicians
- Train technical and engineering staff once new systems have been installed
- Supervise special research projects on next generation telecommunications systems.

Career In Telecommunications Engineering

Employment opportunities for telecommunications engineers are growing rapidly. The list of employers is long and includes manufacturers of radio, television, and other audio/visual, broadcasting and receiving equipment, and developers of hardware and

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associated software, including computer systems, interfaces, security devices, data concentration, data transmission, signaling, satellite and radio communications and telephone equipment. Graduates also work in service organizations that provide broadcasting, consulting, data communications, entertainment, custom manufacturing, research and development, and telecommunications system support.

Multimedia services are establishing communications and employment opportunities not dreamed of even a few years ago, for example video conferencing, interactive video on demand, Internet broadcasting of conferences and training programs and the real-time transfer of vast amounts of information.

So, what I have tried to show is that the field of telecommunications engineering still exists as a separate discipline and that telecommunications engineers do real engineering work for which there is a constant and (believed by some) a growing demand. The question is – am I correct? I await your confirmation. I can be reached through narte@narte.org or directly by email at writeme@tss.net.

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