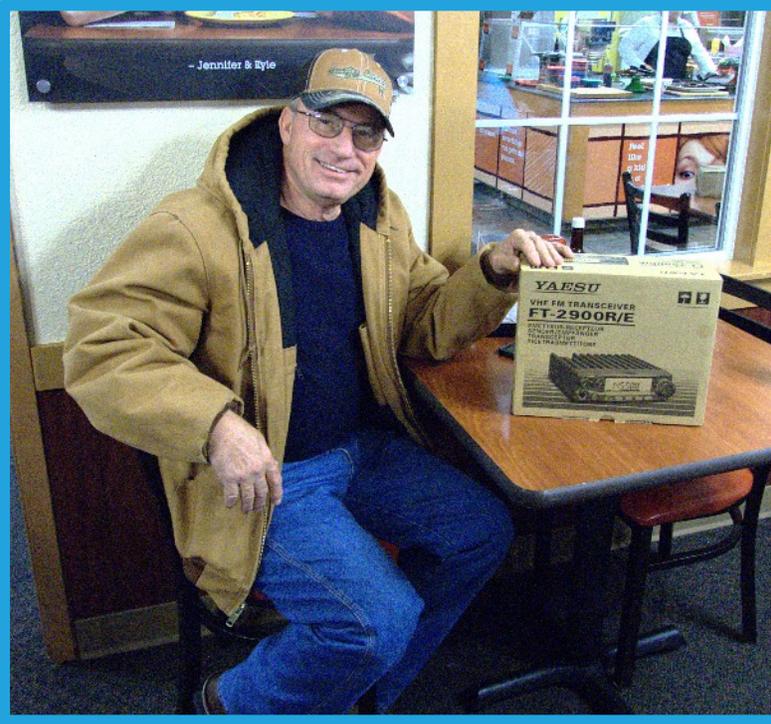


K7MPR.NET

January 2017



# NewsLetter



## Christmas Party Attendee Norm Rowden Wins 2 Meter Rig

A smiling Norm Rowden, KG7ZRC shows off the new Yaesu FT2900 R/E that he won during the Christmas Party held at the Kingman Golden Corral on Monday, Dec. 5.

The Club made a few dollars on the raffle, and I am told that the raffles will be an on-going feature of the future meetings as well.

In addition to a couple of hand crafted signs by Skip O'Brien / KG7YLK, "Cari" the ever genial Asst. Manager of the Golden Corral, contributed some VIP passes that went to Pam Tadd / KI7GOG. Quite a number of the other members got a variety of smaller gifts contributed by Bill and Tammy Smith, but in reality, the best gift of the evening was by far, the fellowship and good time had by all.



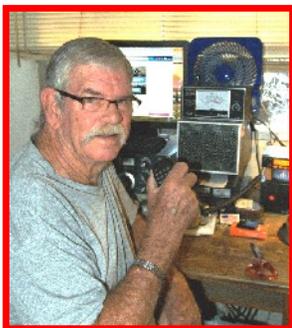
## The Editors' Voice

by Jamie West

### A Small Investment That Pays Big Dividends

As we head into a brand new year, we all have renewed hopes for prosperity in 2017, not just for the nation, but for this Club as well. Before we even realize it, the time will be upon us to start planning for the 2017 Field Day activities, more antenna building parties and yet another HamFest. These activities are fun for us and great educational opportunities for the community at large, but in order to get these events done, requires a tremendous amount of hard work by a lot of dedicated people. In years past, the majority of the work has been done by a relatively few members, and this brand-new year is an ideal time to make a New Years Resolution to be a truly active and participatory member of the Mohave Amateur Radio Club. We are the biggest and most active Amateur Radio organization in Mohave County, so why not make the effort to become one of the top clubs in the entire State of Arizona? We have terrific people, and great knowledge in this Club, so let's all try in the upcoming year to really increase both membership numbers and the level of participation. Your ideas are more than welcome, as it is ultimately YOUR Club that will benefit the most.

# The Helping Ham



by Skip, KG7YLK

## You Finally Got Your Tech Ticket, But Now What?

You studied, you sweated, maybe you even swore a bit, but Examination Day came and went, your heart beat a bit faster when you were told that you passed the Technician Exam, and finally, after an *eternity* (10 or 12 days) your name appeared in the FCC database. OK... so now what do you do? Well, the easy answer is to find something that really grabs your interest and start to get involved with that. Sure, easy enough to say this, but what exactly was it that made you want to get into Ham radio in the first place? A good number of folks want to "get their Ticket" and get started in one or another particular aspect of Ham radio, and for them the path is really clearly defined. Be it HF or satellite operations, they have the advantage of knowing their primary area of interest. Others, tho' have a fuzzier idea that they just wanted to get into amateur radio, without a real clue of where they want to go from there. Well for these folks, the news is good indeed, as there are many facets of this hobby to take a look at, and certainly there's something out there for every taste and ambition. One of the most useful steps is to get in touch with one of the local amateur radio clubs, as they are filled with folks who would just love to explain their particular part of this hobby. The field is wide open for the new ham, and the range of potential activities is vast.

(Continued on Page 6)



# DXPEDITIONS

### **KENYA 5Z4/AK0SK**

Sila, AK0SK will be active from Kenya 22 December 2016 - 6 January 2017 as 5Z4/AK0SK.

He will operate on 80 - 10m SSB.

QTH - Taveta.

QSL via home call, LOTW, ClubLog.

Ads for direct QSL:

Jacob S Kissuu, 11101 N. McGee St, Kansas City, MO 64155, USA.

### **CURACAO ISLAND PJ2/KH0UN**

Steve, KH0UN/PJ4DX will be active from Curacao Island (IOTA SA-099) 28 - 31 December 2016 as PJ2/KH0UN.

He will operate on HF Bands.

QSL via LOTW only.

### **MEERU ISLAND 8Q7AZ**

Rolf, DL8AZ will be active from Meeru Island, (Meerunfushi), IOTA AS - 013, 2 - 11 January 2017 as 8Q7AZ.

He will operate on 40 - 10m SSB.

QTH Locator - MJ64uk.

QSL via home call.

Ads for direct QSL:

Rolf Sauter, Gartenstr. 14, Baerenthal 78580, Germany.

### **Dumont d'Urville Station, Adelie Land, Antarctica FT3YL**

FT3YL. Francois, F4HLT will be active from Dumont d'Urville Station, Geology Archipelago, IOTA AN - 017, Adelie Land,

Antarctica starting December 2016 as FT3YL.  
He will operate on 10 - 15 and 20m SSB and digital modes.

He will use Icom IC-706 transceiver with ACOM 1010 Amplifier and GPA 30 antenna.  
QSL via F6KPQ, ClubLog OQRS, LOTW.

### 8Q7ND Maldiv Islands

Neven, LZ1COM will be active from Maldiv Islands 29 Dec. 2016 - 5 Jan. 2017

as 8Q7ND. He will operate on HF Bands using Icom IC - 7100 100 watt transceiver.

He will be active also as 8Q/LZ1COM, 8Q/LZ20N, 8Q/LZ20NET.

Before the trip he will operate from Bulgaria as LZ/8Q7ND.

QSL via home call.

Ads for direct QSL:

Neven Dilkov, 20A, Andrey Saharov Blvd, Sofia 1784, Bulgaria.

### *Fascinating Facts:*

What is Dr. Owen K. Garriott famous for? He was the first Amateur Operator to operate from space.

Dr. Owen Garriott (PhD) W5LFL has flown on Skyab-3, spending 60 days (a record at the time, doubling the previous record) in space in 1973. His next space mission was aboard Spacelab-1 for 10 days in 1983.

During this mission (STS-9) Dr. Garriott, an amateur radio operator for over 40 years, was the first astronaut to take a ham radio into space.

Garriott said. "In my spare time only, I managed to hold up an antenna to the window and to talk to amateurs on Earth." Since that time, Amateur Radio has been included on almost every American spaceflight, and is currently in use on the International Space Station.

# Upcoming Ham Events



**Thunderbird Hamfest** - January 14, 2017  
Hosted by Thunderbird Amateur Radio Club  
Northwest Community Church,  
16615 N 43rd Avenue, Phoenix, AZ  
Email [hamfest@w7tbc.org](mailto:hamfest@w7tbc.org) for more details.

**2017 Az. Sect. Convention/Yuma Hamfest**  
February 17-18 2017

Hosted by the Yuma Amateur Radio Hamfest Organization  
Yuma County Fairgrounds  
Website at [www.yumahamfest.org](http://www.yumahamfest.org)  
Email at [info@yumahamfest.org](mailto:info@yumahamfest.org) for details.

**SpringFest - March 18**

Hosted by Scottsdale Amateur Radio Club  
Mountain Valley Community Church,  
17800 North Perimeter Drive  
Scottsdale, AZ

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# A Brief History of the Transistor



This brief introduction outlines personalities and organizations involved in the history of the transistor.

Bell Laboratories, one of the world's largest industrial laboratories, was the research arm of the giant telephone company American Telephone and Telegraph (AT&T). In 1945, Bell Labs was beginning to look for a solution to a long-standing problem.

## 1907 - The Problem

AT&T brought its former president, Theodore Vail, out of retirement to help it fight off competition erupting from the expiration of Alexander Graham Bell's telephone patents. Vail's solution: transcontinental telephone service.

In 1906, the eccentric American inventor Lee De Forest developed a triode in a vacuum tube. It was a device that could amplify signals, including, it was hoped, signals on telephone lines as they were transferred across the country from one switch box to another. AT&T bought De Forest's patent and vastly improved the tube. It allowed the signal to be amplified regularly along the line, meaning that a telephone conversation could go on across any distance as long as there were amplifiers along the way. But the vacuum tubes that made that amplification possible were extremely unreliable, used too much power and produced too much heat. In the 1930s, Bell Lab's director of research, Mervin Kelly, recognized that a better device was needed for the telephone business to continue to grow. He felt that the answer might lie in a strange class of materials called semiconductors.

## 1945 - The Solution

After the end of World War II, Kelly put together a team of scientists to develop solid state semiconductor switch to replace the problematic vacuum tube. The team would use some of the advances in semiconductor research during the war that had made radar possible. A young, brilliant theoretician, Bill Shockley, was selected as the team leader.

Shockley drafted Bell Lab's Walter Brattain, an experimental physicist who could build or fix just about anything, and hired theoretical physicist John Bardeen from the University of Minnesota. Shockley filled out his team with an eclectic mix of physicists, chemists and engineers. The group was diverse, yet close knit. Walter Brown, a physicist who joined the group in 1951, recalls hearing about exuberant parties and good lunches. Betty Sparks, Shockley's secretary, recalled the group's high spirits at her wedding to Morgan Sparks. They called their lab "Hell's Bells Laboratory."

In the spring of 1945, Shockley designed what he hoped would be the first semiconductor amplifier, relying on something called the "field effect." His device was a small cylinder coated thinly with silicon, mounted close to a small, metal plate. It was, as University of Illinois Electrical Engineer Nick Holonyak said, a crazy idea. Indeed, the device didn't work, and Shockley assigned Bardeen and Brattain to find out why. According to author Joel Shurkin, the two largely worked unsupervised; Shockley spent most of his time working alone at home.

Ensnconced in Bell Labs' Murray Hill, N.J.

facilities, Bardeen and Brattain began a great partnership. Bardeen, the theoretician, suggested experiments and interpreted the results, while Brattain built and ran the experiments. Technician Phil Foy recalls that as time went on with little success, tensions began to build within the lab group.

In the fall of 1947, author Lillian Hoddeson says, Brattain decided to try dunking the entire apparatus into a tub of water.

Surprisingly, it worked... a little bit.

Brattain began to experiment with gold on germanium, eliminating the liquid layer on the theory that it was slowing down the device. It didn't work, but the team kept experimenting using that design as a starting point. Shortly before Christmas, Bardeen had an historic insight. Everyone thought they knew how electrons behaved in crystals, but Bardeen discovered they were wrong. The electrons formed a barrier on the surface. His breakthrough was what they needed. Without telling Shockley about the changes they were making to the investigation, Bardeen and Brattain worked on. On December 16, 1947, they built the point-contact transistor, made from strips of gold foil on a plastic triangle, pushed down into contact with a slab of germanium. When Bardeen and Brattain called Shockley to tell him of the invention, Shockley was both pleased at the group's results and furious that he had not been directly involved. He decided that to preserve his standing, he would have to do Bardeen and Brattain one better.

His device, the junction transistor, was developed in a burst of creativity and anger, mostly in a hotel room in Chicago. It took him a total of four weeks of working pen on paper, although it took another two years before he could actually build one.

The Shockley device was more rugged and

more practical than Bardeen and Brattain's point-contact transistor, and much easier to manufacture. It became the central artifact of the electronic age. Author Michael Riordan says Bardeen and Brattain got "pushed aside." That insult broke the team apart, turning a once cooperative environment into one that was highly competitive. The problems of whose names should be on the patent for the device, and who should be featured in publicity photographs, sent tensions higher still. Bell Labs decided to unveil the invention on June 30, 1948. With the help of engineer John Pierce, who wrote science fiction in his spare time, Bell Labs settled on the name "transistor"-- combining the ideas of "trans-resistance" with the names of other devices like thermistors.

The invention got little attention at the time, either in the popular press or in industry. But Shockley saw its potential. He left Bell Labs to found Shockley Semiconductor in Palo Alto, California. He hired superb engineers and physicists, but, according to physical chemist Harry Sello, Shockley's personality drove out eight of his best and brightest.

Those "traitorous eight" founded a new company called Fairchild Semiconductor. Bob Noyce and Gordon Moore, two of the eight, went on to form Intel Corporation. They (and others at Texas Instruments) co-invented the integrated circuit. Today, Intel produces billions of transistors daily on its integrated circuits, yet Bardeen, Brattain, and Shockley earned very little money from their research. Nonetheless, Shockley's company was the beginning of Silicon Valley. Bardeen left Bell Labs for the University of Illinois, where he won a second Nobel Prize. Brattain stayed on for several years, and then left to teach.

Shockley lost his company and taught at Stanford for a while, and then got involved in a notorious controversy over race, genetics and intelligence that destroyed his reputation. In the 1950s and 1960s, most U.S. companies chose to focus their attentions on the military market in producing transistor products. That left the door wide open for Japanese engineers like Masaru Ibuka and Akio Morita, who founded a new company named Sony Electronics that mass-produced tiny transistorized radios. Bell Labs' President Emeritus Ian Ross said that part of their success lay in developing the ability to quickly mass-produce transistors.

The transistorized radio changed the world, opening up the information age. Information could quickly be scattered to the ends of the Earth, to the point that historian Charles Stewart heard about the assassination of Martin Luther King Jr. from Bedouin tribesmen in the Sahara shortly after it happened. The original three met several times after their breakup: once in Stockholm, Sweden, to receive the 1956 Nobel Prize for their contributions to physics, and once again at Bell Labs in 1972 to commemorate the 25th anniversary of their inventions. They were celebrating something that they could not know when they first began working on the transistor -- that they were going to change the world forever.

*This article courtesy of [www.PBS.org](http://www.PBS.org)*



*(Continued from Page 2)*

If community service is an interest of yours, then good news for you, as many community organizations regularly call on local amateur groups to provide communication services for events such as marathons, auto rallies, parades and the like. This can be a very pleasant and satisfying way to spend a day while doing something for your community.

Occasionally, when severe weather moves into your area, this too offers an opportunity to serve, as the National Weather Service has a program called Skywarn that is national in scope, has over 350,000 volunteers, and is a program dedicated to the reporting of any localized severe weather events to the NWS. The training is free, the service is crucial, and best of all, your participation can really make a huge difference.

Of course, public service is but one aspect of amateur radio, and to the newly licensed amateur, the entire range of activities and interests are open. If talking to others in far away lands is your cup of tea, well then HF beckons you. The opportunity to make friends with amateurs in far-flung lands is the forte of High Frequency operations, and it is not at all difficult or expensive to get started in this field. Technicians have limited privileges on a few of the HF bands, but this should act as an impetus to buckle down and get that General ticket.

There's still plenty to hold your interest on the 2 meter and 70cm. bands, tho'. Local repeater clubs such as M.A.R.C. offer the opportunity for the newest hams to get in on "the Action".

Daily conversations between friends offer perfect learning opportunities to get the terms and protocols down, and to make new and lasting friendships, that often times will last for years, and sometimes for a lifetime.

**6** As a first step, key up that mic, and say Hi!

# Radio Waves by Jamie West

