

# A Hundred Kids a Day

## W7ASC brings ham radio to life at Arizona Science Center.

### Steve Warford, WB4ZSC

At 9:30 AM, the rigs have been powered up and I run the shack startup checklist. The shack is quiet now, but soon will bustle with activity and enthusiasm.

At 10:00 AM, a long string of yellow buses drops off today's young visitors. Noise and energy begins to fill the building and will not abate until mid-afternoon, when the kids and their chaperones return to their schools.

This scenario repeats 363 days a year and has been going on for nearly 2 decades at Arizona Science Center (ASC),<sup>1</sup> under the direction of ARRL® affiliate club W7ASC.<sup>2</sup>

ASC's daily visitor load ranges from a couple of hundred to over 2000 kids, combined with a good number of adults, who tend to come later in the afternoon. Being located across the street from the Phoenix Convention Center, we also get a substantial number of out-of-state and international visitors.

### Our Ham Shack

The center of ham radio at ASC is W7ASC (see Figure 1). It is located within an exhibit gallery called "My Digital World." A mix of live equipment and visual media draws in visitors. There they can either interact with the operators, or just peruse the displays. The static displays and video screen allow visitors to learn about Amateur Radio in the absence of a live operator.

Our HF antennas, located on the roof, include a three-element beam, two slopers, and a vertical dipole. For VHF/UHF work, we have a vertical dipole and a pair of dual-band beam antennas for satellites, sharing an azimuth-elevation rotator with the Amateur TV (ATV) beam.

The inside walls of the shack display a world map and an annotated chart of the electromagnetic spectrum. Large digital clocks for various time zones, a bulletin board, award certificates, literature racks, and a QSL card display case round out the visitor experience.



Figure 1 — Volunteers Mike, KG7OSR (left), and Peter, KD7OIW, at the Harkins Ham Shack.

On the outside walls, facing the open gallery, we have a large-format video display and the station dedication to the memory of Dwight "Red" Harkins (SK), W7EAQ. Harkins, the founder of a regional movie theater chain by the same name, was instrumental in the development of FM stereo multiplexing for radio. His son and successor, Dan Harkins, WA7EEO, and Harkins Theatres are corporate sponsors of W7ASC. Other funding and donations came from JVC Kenwood USA, West Valley ARC, the ARRL Foundation, and individual hams.

There are two independent operating positions in the shack — one on each side of the wide portal leading into the station. The operating positions (see Figure 2) are essentially identical in function, with some minor differences in equipment. Each side has an HF transceiver, a VHF/UHF transceiver, a desktop computer, and a practice key. Additionally, one side has a dual-band transceiver for satellite work, and the other side has an ATV setup.

The station is staffed by licensed amateurs from the Phoenix metropolitan area. We

maintain a pool of 30 – 40 operators who have, over the years, ranged in age from 10 – 90, logging nearly 4000 volunteer hours each year. Bob Burleson, KG7QJ, coordinates the staffing, keeping our exhibit open each day ASC is open. Bob also teaches the licensing classes.

### Real Live Radio

While not every visitor interacts with a W7ASC operator, each day anywhere from a handful to more than a hundred kids will learn to send their name in Morse code (see Figure 3). For first-time visitors, who might be too shy to speak with an operator, a quick CQ on the practice key usually gets their attention. If that fails, an invitation to "push a button and make a noise" often sparks their curiosity.

After hearing the history of Morse code, visitors are taught to send their first name. Then, we date-stamp and initial their code sheet, as well as attach an "I sent my name in Morse Code" sticker, which includes a bit of code for them to decipher as homework. Some of them will accept our offer to talk with a ham on one of the many local repeaters or on EchoLink. Even in an age

of instant, worldwide communications, guests are captivated by this process; especially if the contact involves participants from multiple states via linked repeaters. The guests leave the shack with broad smiles — and their Guest Operator certificates.

Ten years ago, Christopher Trimble was one such guest. Now, Chris is KG7FEG and a regular volunteer at W7ASC, thanks to the efforts of our educational arm, the Center for Amateur Radio Learning (CARL). CARL periodically offers weekend licensing classes on site, making ASC a one-stop shop for the advancement of Amateur Radio. Over the last decade, on average, 35 students have attended these classes annually with 60% earning a new ticket or an upgrade. Of course, we vigorously recruit and Elmer volunteers from this pool of new operators.

### Beyond Field Trips

Afternoon visitors are not generally on the tight schedules of the morning school groups, and tend to spend more time at the shack. These extended visits allow us to field more questions and further demonstrate the diversity of ham radio. Many young adults — and even some older adults as well — have not heard of Amateur Radio. We take the opportunity to educate them about the hobby, especially its public service aspects.

We also take time to showcase the digital aspects of Amateur Radio, including the benefits of linking our radio operations with the Internet. This goes a long way toward dispelling the myth that Amateur Radio lacks relevance in today's world. We proudly proclaim it as another tool for communicating around the world or across town. We also present the benefits of citizen ownership and control of modern communications equipment.

### Partners in Education

Every visiting school group is an outreach opportunity. Because we cannot cover the entire spectrum of ham radio topics during these short encounters, John O'Neal, K7JP, created a teacher's packet, which provides Amateur Radio print and electronic media



**Figure 2** — Detail of one of the operating stations. A clear panel protects the equipment when an operator is not present.



**Figure 3** — Mike, KG7OSR, with a young visitor sending her name in Morse code.

for enrichment activities back in the classrooms.

Additionally, periodic live presentations are made in an auditorium setting where visitors can focus on a topic without the distractions of the exhibit galleries.

### On-Air Action

While our primary mission is to interact

with visitors, we take every opportunity to reach out to the world. Our HF logs contain over 8000 contacts — every state, every continent, and over 170 countries. Our VHF/UHF logs are approaching 2000 contacts. We are grateful to all the local and DX operators who have taken time to answer our calls and talk with our guest operators. They contribute greatly to our presentation of Amateur Radio as both a hobby and a public service.

Due to the nature of visitor interaction and crowd noise in the exhibit gallery, we work a lot of digital modes but also routinely log CW and phone contacts. Satellite and ATV contacts are less frequent, but they are in the log as well, and we are currently exploring ways to increase the use of these modes.

### Future Directions

For nearly 20 years, W7ASC has served as a learning lab for the future of the public view of Amateur Radio. We have attempted to honor the heritage of Amateur Radio while embracing its future — especially its position, dependency on, and potential within the contemporary sphere of science in general, and the digital and wireless revolutions specifically. In the future, we hope to be active participants in maintaining Amateur Radio's place in the public's perception among emerging technologies.

### Notes

- <sup>1</sup>Arizona Science Center, [www.azscience.org](http://www.azscience.org).
- <sup>2</sup>W7ASC, Center for Amateur Radio Learning (CARL), [www.w7asc.org](http://www.w7asc.org).

All photos by Steve Warford, WB4ZSC.

Steve Warford, WB4ZSC, an ARRL member, earned his Novice class license while attending the University of Kentucky, but let his license lapse. In 2008 he became licensed again, eventually obtaining his original call, and advancing to Amateur Extra class. Now, he enjoys working the digital modes and can be found every Wednesday promoting Amateur Radio, and science in general, at ASC. He can be reached at Box 5323, Scottsdale, AZ 85261-5323, [wb4zsc@arrrl.net](mailto:wb4zsc@arrrl.net).

