No-Solder CPO a Hit for Kalamazoo Club and Big Project Kids

By Dave Hassler, K7CCC
Former ARRL News Editor
February 15, 2004

The Kalamazoo Amateur Radio Club (KARC) of Michigan recently used a simple, no-solder code practice oscillator designed by former ARRL Education &Technology Program Coordinator Mark Spencer, WA8SME, to bring some Morse code fun to one of ARRL's Big Project/Education & Technology Schools.

At Winchell Elementary School in Kalamazoo, teacher Dave Clark, W8DO, is in his second year using the curriculum of the ARRL Education and Technology Program in his classroom. Last year, KARC president Jim Gorka, N8JG, came up with a little code practice oscillator that proved to be a big hit in Clark's radio class. But when the time came to put the kits together for this year's class, Gorka said, a problem cropped up.

"We couldn't locate all of the parts that we used last year and we needed something new," he said. "Then, someone in the club remembered seeing a simple project on the ARRL Web site. We found it and it was like, 'Eureka! This is it!' We switched in some added capacitance to bring down the pitch of the generated tone and added a real key, but that was it."

KARC member Dennis Fitzpatrick, KR8U, collected the parts and kitted up the project for the 14 radio students at Winchell Elementary. [all photos by Jim Gorka, N8JG]

With the wood screws and washers mounted, the process of connecting the components begins.

The code practice oscillator starts to take shape.

"This project is not brain surgery," Spencer stated. "It's an old circuit that uses discrete components, which provides more learning opportunities than a circuit that uses an integrated circuit. I knew from my experience [as a former teacher], and from the feedback I've received from both the schools and hams, that there is a real need and desire for small, easy-to-construct and understand projects that engage kids and others with a minimum of time and money."

The parts list for the project is minimal: a pair of capacitors, a pair of common NPN transistors, five 1/4 W resistors, 18 wood screws and washers, a 9 V battery connector, a small speaker of 4 to 16 ? and some hookup wire. Complete details for the project, including a parts layout diagram, can be found on the ARRL Web site.

Club member Dennis Fitzpatrick, KR8U, rounded up the parts and kitted up the project for Clark's 14 radio students. "Dennis isn't even one of our club instructors that goes over to the school each Tuesday, but he volunteered and stepped right in," Gorka said. "Once the kits were put together, Jim Keesler, K8EXF, and John Tucker, WB8ZVV, ran the CPO construction

station with the kids." Other current KARC instructors include David Watt, WA8TT; Bill Beverly, WG8J, and David Schneider, AB8DS, Gorka added.

He said that both kids and KARC members "had an absolutely fun time" putting the kits together. "Most of the club instructors are back for a second year," Gorka said. "With four to six hams helping, it keeps the student-teacher ratio very low." Each Tuesday, Clark's class gets a visit from the KARC instructors. Morse is sent to the children for about 15 minutes at the start of the session, and then they break into groups for work on projects, time on the air from the class HF station, or other activities, Gorka noted.

Spencer, noting the success folks seems to be having with the no-solder CPO project, has more of the same up his sleeve. One of the projects he has on the drawing board is a small one-octave organ that teaches a remarkable number of Amateur Radio-related concepts.

First a little troubleshooting...then the sweet sound of Morse...followed by the pride of accomplishment.

"It's designed around a simple 555 timer IC using the same no-solder technique as the code practice oscillator," Spencer said. "An instructor can use the organ to teach IC concepts, oscillation, frequency and wavelength (and how they're related), amplitude and pitch. But the best part of the project is that it's fun. Kids can play with it and still learn a lot of valuable concepts."

For more information about ARRL's Education & Technology program, email the Education Services Department etp@arrl.org.