

**Public Safety Stays Charged
with Battery Equipment**

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The San Antonio Police Department dispatched officers to over 740,000 calls in 1995. Currently numbering over 1900 officers, SAPD has seen a steady increase in service calls as civilian reliance on public safety professionals continue to rise. One could argue about which piece of equipment is the most critical to an officer who doesn't know if the day's calls will take him to crime scenes, animal control problems, accident scenes, civil disputes or security escorts.

One piece of equipment that truly is critical to both the officer in the field and the one in the precinct is the two-way radio. In fast-growing San Antonio, the current radio system is being stretched to its limits from age, metropolitan growth and channel crowding, so the full-service department has proactively begun the process of establishing a new state-of-the-art radio communications system to replace it. Bids are out for a comprehensive system that will keep up with the rapid growth of the city and be able to synchronize with the industry-wide technical standards for public safety communication systems proposed by the Association of Public Communications Officers (Project 25). By APCO's 1998 conference, SAPD plans to award a bid and begin implementing a new communications network during the forthcoming 12 to 18 months.

Although it may seem only a small part of a big overall budget, batteries and chargers are already being evaluated for the current and new systems. The goal is to improve efficiency and safety at every step in the process.

Officers in the Radio Systems Management Unit have carefully calculated many of the hidden costs in such a system. One officer in the Radio Systems Management Group explains: "The tangible costs of our current battery budget are the dollars and cents associated with it -- we're talking about 10s of thousands of dollars per year that are measurable. The unmeasurable costs include about 300 man hours per month, and vicarious liability involved when an officer goes downtown from the six substations, satellite offices and investigative units to swap out a battery when it causes radio problems. [it takes an officer an average of 30 - 45 minutes to go downtown, which occurs up to 45 times per month per substation, at an average cost of ~\$20/hour, not including car costs.] "Its nice to save the city 18-30K in measurable costs on batteries. But the real issue is the public safety. By maintaining batteries in good condition, we alleviate the officers of any vicarious liability incurred from coming downtown to replace batteries. It's always the one call that you didn't need to make that ends up being the liability.

"We can't be careful enough about reliable equipment," he continues. "As an overall view of public safety, that's what the officers are looking for. If we can eliminate memory from the batteries, the officers will feel better about their radios and their equipment. They'll walk into a situation with more confidence. By improving the system, we're going to alleviate the police department, the city and our officers of any liability that could occur because of defective merchandise. The San Antonio Police Department has an annual budget of more than \$200 million. It's important to save the city money on chargers and batteries, but what we really want to save is liability -- those are the intangible costs."



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San Antonio was looking for a charger that will condition and improve the reliability of the batteries currently in service as well as migrate to the new radio system when it is implemented. They completed successful field tests with the **ACT**ivators from Advanced Charger Technology (**ACT**).

The **ACT**ivators incorporate patented Dynamic Electrochemical Waveform™ (DEW) technology. This cutting-edge technology operates with an intelligent chip and charges a 1200 mAh NiCd battery to full charge in about 30 minutes. DEW technology “reads” the chemistry of each battery and adjusts charging algorithms accordingly, providing an efficient, maximum-capacity charge every time. Charging with DEW prevents the build-up of memory effect and extends battery life up to three times the usual number of cycles (over 2000-2500 in cycle tests). Batteries are conditioned with every charge.

DEW technology works on a completely different principal than other chargers -- which is why the company chose the name **ACT**ivator to describe the combination of conditioning and charging that occurs when DEW technology is at work.

A typical constant-current fast charger will bring a battery to ~80% capacity in 2-3 hours and then slowly “trickle charge” it for a couple more hours before it is ready for service. Batteries left in the charger will continue to “cook” slowly until they are removed. This can cause serious battery deterioration and buildup of the memory effect, which ultimately causes the demise of batteries. When the **ACT**ivator indicates charged, the battery is fully charged to peak condition and ready to go. The unit terminates charging and maintains the charge until the battery is removed from the **ACT**ivator for use.

The **ACT**ivator was designed in response to public safety demands for a more simple, dependable way to charge batteries. Don't believe the people who claim that the problem lies in NiCd batteries. Problems result from poor charging which results from the inability for many departments to run a labor-intensive battery maintenance program. The **ACT**ivator eliminates the need for maintenance programs. Batteries placed on the **ACT**ivator without being fully charged or discharged will not suffer any kind of damaging memory effect.

“We're real happy with the **ACT**ivators right now. They're doing what we should expect as a customer. We want to be able to know that when the officer is getting a battery out of a charger, they're getting a good battery,” concludes the radio systems management officer.

“You've got to appreciate a company that will send their high level management out to say ‘tell me what your needs are,’” says Bob Waller, Communications Technician for the Orange County, California Fire Authority.

Waller's experiences with the **ACT**ivators in field tests as well as his feedback and suggestions have been used by **ACT** to refine the **ACT**ivators and expand the product line. He has become both customer and partner to **ACT** sales and engineering professionals. In less than one year on the market, **ACT** has gone from one simple charger to a line featuring four products designed to support the demands of public safety portable radio users.



Firefighters have unique safety requirements as well as usage habits which tax portable radios and batteries more than most applications.

“When we design any kind of system here, we look at the worst possible circumstances -- a firefighter that isn’t in his usual unit who is woken up in the middle of the night after a long day of calls. He needs to be able to operate everything on that vehicle in spite of it all. If we can do that, we’re successful. So we research our products very carefully.”

The medically retired firefighter knows what it’s like to be in the trenches, 100% dependent on radio contact for guidance and safety. “We go from zero to sheer terror in 60 seconds,” he explains.

“Firefighters can be sitting in an Advanced Medical Procedures training class at the station and within five minutes, find themselves in the middle of a fully-embroiled structure fire. We have to be sure that our equipment can support them at that level -- that it’s ready to go and it will last as long as they need it to if they can’t get back. In a brush fire, someone can be away from any source of power for 8-10 hours. That radio is a critical lifeline. A firefighter needs a battery to be dependable at the worst possible time. We’re hoping to extend the life of the battery so it’s available when he needs it.”

The average firefighter or officer doesn’t have time to concern himself with “battery management.” Firefighters in particular are known for being tough on batteries, as they tend to “store” their batteries in chargers whenever they are in the station or vehicle. Constant in/out charging as well as charging a battery for many hours when it doesn’t need it are extremely destructive practices. In-vehicle and stationary chargers which don’t self-terminate are commonly referred to as “roasters and toasters,” as the steady stream of heat overcharges and “cooks” batteries to death. Waller encourages his firefighters to practice simple management to minimize problems.

“I tell them to have one battery in the charger, one on the radio and one in the glove box at all times. We want them to avoid charging continuously and causing the dreaded ‘memory effect.’”

“There’s a definite need for an intelligent charger on the market. Most chargers I’ve worked with operate on the ‘cooking’ philosophy -- a lot of batteries get way too hot way too soon. With the **ACT**ivator, batteries don’t overheat. Since I began using the **ACT**ivator, my portable battery will last me a full 10-hour day, whereas in the past, it would be giving me problems towards the end of my shift.”

Like San Antonio, Waller is still testing the **ACT**ivators before bringing them into service across all of the precincts in Orange County. In addition to safety and convenience, one benefit of the **ACT**ivator which is of particular concern to the OCFA is the environmental savings.

“When we extend the life of the battery, we definitely save on battery purchase and disposal costs. But more importantly, we can save the amount of hazardous waste that we put into the system. Nickel Cadmium is not good for the environment. We reduce battery costs to the department, we remain environmentally friendly, and we get a battery that lasts longer, so our users are safer.



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“A complete charge that will give us full capacity of the battery for our operating period is paramount. Reliability is the most important consideration when we look at new equipment. We’re not only talking about a rock solid product that we can depend on, we’re concerned about the support that’s required to keep it working. We like to have a partnership with the companies that develop the product. You can get a vendor anywhere, you can’t always find a partner. But we have a real partnership with the team at **ACT**. And so far, you’re adapting really well.”