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Proves Continuity

Tone Isolated from
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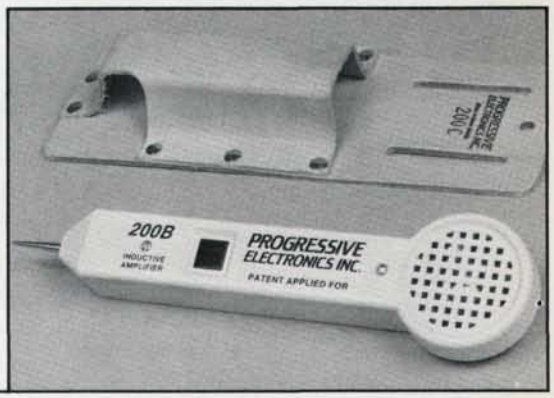
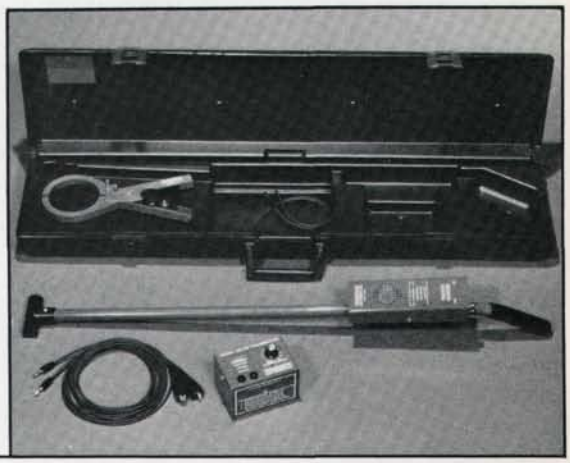


Models 508 and 501

LOCATORS: **508:** Locates wire and depth on shallow and short ranges.

501: Locates wire and depth for long ranges. Will locate active lines.



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Irrigation System Repairs

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resistance readings at different places, depending on the distance from valves. Without going into all the details, let me just say that the greater the distance from the valve, the greater the resistance will be."

For hydraulics, 90 percent of callbacks are for remote-control valves. And I would say that 50 to 75 percent of those RCV callbacks are due to contamination in the valve. "This can be prevented by using contamination-proof valves. They have been around for more than 25 years . . . even though they have only become fashionable in the last four or five years."

Derryberry then confided, "We are so concerned in our industry about running out of pressure, that we overlook the ramifications of *excess* pressure. Yet it will consume more excess *water* if it's not controlled than most people realize!

"That's the reason why so many manufacturers, recognizing this fact, have recently begun to provide pressure-regulating RCVs. I feel that their additional cost generally pays back within one or two years," Derryberry declared.

In discussing flow, he observed, "There is a trend to low-precipitation sprinklers, with shorter radiuses and spaced closer together. Low-precipitation heads do an excellent job of compensating for site conditions, soil, slope, and sun exposure.

"However, another cardinal sin which we too often commit in this industry is not considering the poor devil who must *manage* this system for the next 30 years," Derryberry warned.

"When the Little League lights go out at ten o'clock at night, and the joggers start using the park at five o'clock in the morning, we have only seven hours in which to get the entire site watered. And if these low-precipitation heads don't truly give us *considerable* reduction in flow, then we cannot increase the size of the valve section sufficiently. Consequently our total run time may still exceed the seven hours allotted."

Moving on to the subject of controllers, he observed, "Solid-state controllers are getting quite foolproof. And, as a result, there's not much maintenance to be done there. Keep them clean and keep the bugs out of them, as I said before—and put them in the shade if possible. Heat deteriorates solid-state circuitry quickly."

Derryberry has mixed feelings about sensors. "Most sensors are relatively new, and relatively unproven," Derryberry noted. "When they *are* proven, then we will have the most important tool that the irrigation industry has seen in many, many years."

The reason, he explained, is simple: "Regardless of how many multi-thousand-dollar computerized control systems, weather stations, and peripheral equipment we might want to throw at our turf, that turf could care *less* how we get the water to it—so long as we can provide a soil structure which is 50 percent solids, 25 percent oxygen, and 25 percent water.

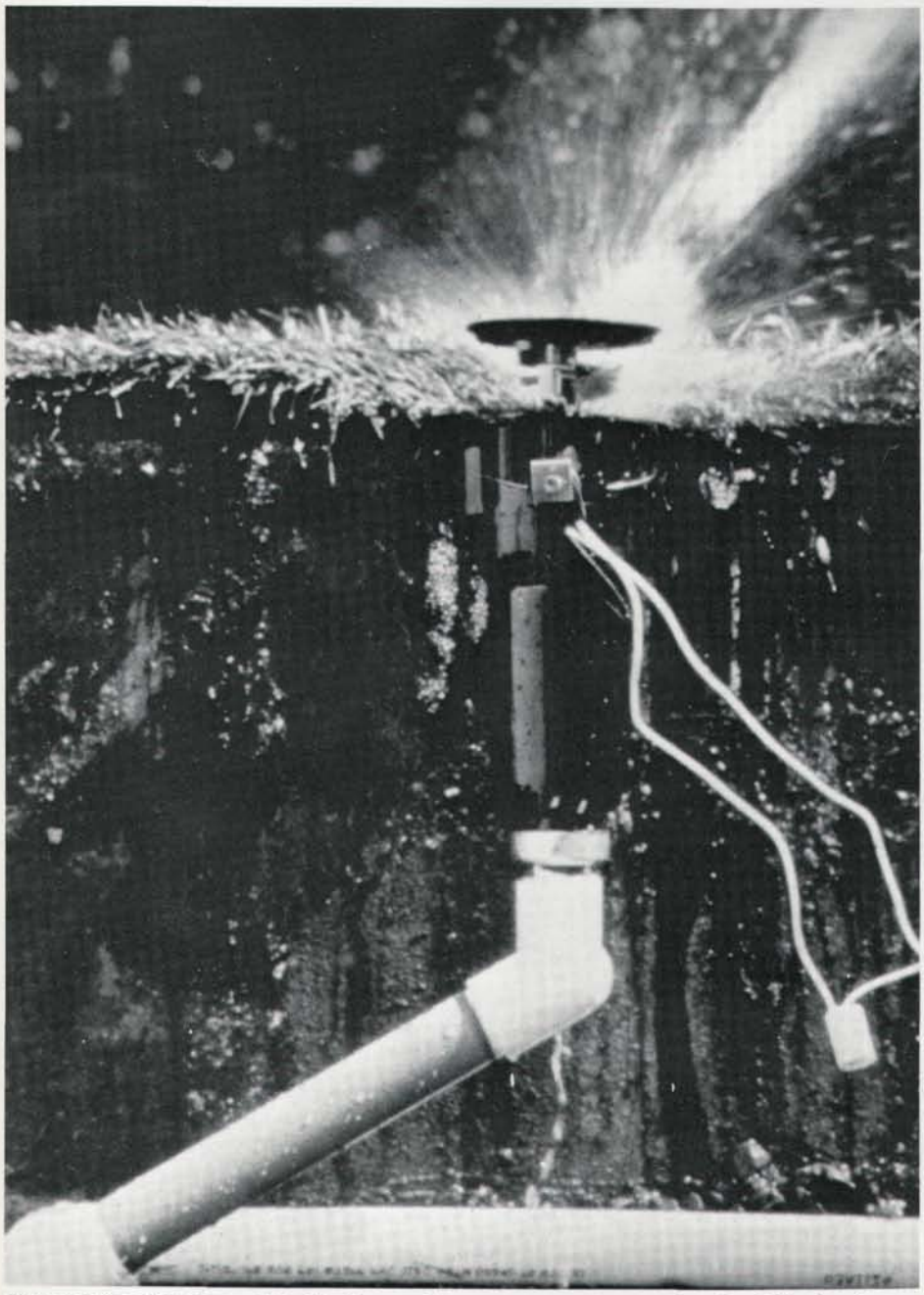
"When we can avoid feast-or-famine watering schedules, our turf will thrive. And that's all that a moisture sensor has to do," Derryberry concluded.

John Skidgell, marketing manager for golf at The Toro Company Irrigation Division in Riverside, CA, has been with the company for 26 years. He began his discussion by focusing on inspection. "Take a look at your pump stations, controllers, and sprinkler heads at least twice a month, at the very outside. You never know when you're going to spring a leak in a pump house, or some control valve is not working properly, or a strainer may be clogged up and getting false readings.

"So inspect the pump station for leaks. In most irrigation systems, the pump is the heart of the whole system, and it needs to be well taken care of.

"Make sure the contacts are not burned. These are the starters for the pumps. If they're arcing, they cause burn spots, and the pump doesn't operate properly if there is a high degree of heat. You need to have a good inspection of the pump station twice a month—the pump panels, regulating valves, and low-level sensors especially. There are a great many things in the pump stations that always need to be checked."

Skidgell continued, "On the electrical end, you should make sure that all the connections are made up properly and nobody has loosened any wires from the controllers and forgotten to replace them. Also look for corrosion. If controllers are in very wet areas, corrosion can cause problems in not making good connections. Therefore you're not getting the power you need to make things work. You should also look for any kind of



Swing joints and waterproof electrical connections assure proper operation of sprinkler heads.

debris that might be getting into the controller unit."

It's difficult to tell whether a hydraulic system is functioning well unless you go through a total irrigation cycle, Skidgell cautioned. Only then can you see how everything works, and that the sprinklers have the correct pressures for proper operation.

In regard to pressure, he added, "These systems are all designed to operate in a certain manner. If someone should decide to change that program and load one side of the system with all the sprinklers he wants to run, he may overload it from a hydraulic standpoint, and cause heavy friction losses on the line from the high velocities. This in turn would reduce the pressure, and the sprinklers would not function properly."

He pointed out, "The question of flow is also included in that last statement. If someone has a six-inch line and tries to flow 800 gallons through it, he loses a lot of pressure and he's in trouble!

"The best way to check out both controllers and sprinklers is to go to each individual satellite controller and step it through each station. That way you can tell whether or not the controller is actually turning the sprinklers on properly. And then you can watch each sprinkler to make sure it's rotating correctly," Skidgell explained.

If someone has a rain sensor on his system, he should keep it clean and make sure it does indeed trip and cause the proper alarm to go off. Debris can keep the sensor from tripping properly, and when it does ring it won't shut the system down.

Turning to valves and sprinklers, he advised, "Check the system for low sprinklers that cause improper coverage because they're too low to perform in the manner they should. These sprinklers are on swing joints. If you happen to have the sprinklers in relatively soft soil, and if you're running over them constantly with tractors, this slowly pounds them down into the ground. So they wind up being an inch or two too low. This blocks the spray coming from them, and that in turn destroys the pattern of the sprinklers."

Skidgell concluded his remarks by stressing the importance of checking the entire sprinkler system on a periodic preventive-maintenance basis. "The irrigation system is a maintenance tool that must be kept in good condition to do the job it was assigned to do," he emphasized.

David Ferron, field product application engineer for Rain Bird's golf division in Glendora, CA, is always on the move, going out on product problems and fixing them. However, he found time recently at his office in Seattle, WA, to review some of the highlights of irrigation system repairs for us.

"For general troubleshooting," he said, "here is how to detect problems: First, isolate the problem. Then look for information leading to the source of the problem. Find the point where good information ends and bad information begins. The industry calls this the Good In-Bad Out Method of

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Irrigation System Repairs
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troubleshooting and repair, or GIBO."

Ferron explained how to recognize that point "where good information ends and bad information begins." His advice: "Maintain a thorough knowledge of the irrigation equipment at your park or golf course. Read repair manuals put out by the manufacturers to assist in your repairs. And attend schools or seminars to stay up-to-date on any new developments."

In other words, it takes instinct based on sound training and thorough information. When you add experience in the field to information and training, you can tell at exactly what point the system goes wrong and the trouble signals—the "bad information"—begin.

Once in possession of the proper data, Ferron discourages delay. He urges, "Repair the problem quickly and effectively. Do not let it go unrepaired for a very long time. If you do, the problem can only get worse; it may very well escalate."

To avoid such problems in the first place if possible, Ferron agrees with our other experts on the necessity for periodic inspection and maintenance. Specifically, he advised, "Inspect your complete irrigation system each spring and make the necessary repairs at that time."

He recommended these specific things be done during spring inspection: "Turn each valve on and inspect the rotors on the heads. Inspect each controller for any winter damage. Clean the insects from the motors, gears, or printed circuit boards."

In regard to that last item, Ferron warned, "When handling a printed circuit board, be sure the power is off." He also advised using a spray-type contact cleaner to clean the controller.

"Repair any wire problems immediately," he stressed. "Do not let power leak to ground, because this may cause the controller to overheat and develop into other problems."

In closing, he repeated the need for preventive maintenance: "Keep to a regular schedule to avoid repair. Spring and fall is the best time to do the system inspection. If you have not done all repairs immediately as I have recommended, or if new problems should arise after spring inspection, then summer is the time to repair the irrigation system and keep it operable. Don't put it off any longer than that."

Tom Lockwood, vice-president of sales and marketing for Valcon Automatic Irrigation Company, headquartered in El Monte, CA, advised that the controller can be useful in handling some problems. Some controllers are specifically designed to detect such irrigation system problems as electrical faults, downstream pressure losses, and excess moisture. Aside from this, he made the following inspection-and-repair recommendations:

To detect electrical problems, check the circuit-breaker lights; the station outputs; the voltage at the valve; and the solenoid coil (for continuity).

In regard to hydraulics, check the remote-control valves for full opening; check for closed gate valves and for plugged sprinkler heads; and be sure to check the backflow device. The same procedures apply for pressure and flow inspection.

On the controls, check the 115 VAC source and the low-voltage output. Check to see if the controller is keeping the correct time of day or is in the backup program. Also check the ground.

On the remote-control valves, check for manual operation; flow control; voltage at valve; and the solenoid coil.

In discussing what is most likely to need regular maintenance to avoid potential problems, Lockwood briefly covered the following system components, the likely troublemakers for each, and some recommended preventatives:

Electrical—provide good grounding at the controls and good waterproof connections; hydraulics—backflow device; flow—backflow device and gate valves; controls—check control cabinet for moistureproof integrity; check grounding; check for insect or rodent encroachment; valves—check waterproof electrical connections; check for leaks at fittings and around diaphragms.

"Do not let power leak to ground because this may cause the controller to overheat and develop into other problems."

Lockwood recommended the following maintenance "musts": Check controls on a monthly basis. Check remote-control valves on an every-other-month basis.

He added a tip on how to achieve electrical savings: "The most costly item in any landscape, as far as electrical consumption, are the booster pumps. Use controls that will selectively utilize the pumps only when they are absolutely needed. Use of flow/pressure sensors on the pump station is very necessary."

Lockwood concluded with a useful list of recommendations for saving irrigation water in today's water-conscious environment, based on his experience in building, maintaining and repairing irrigation systems:

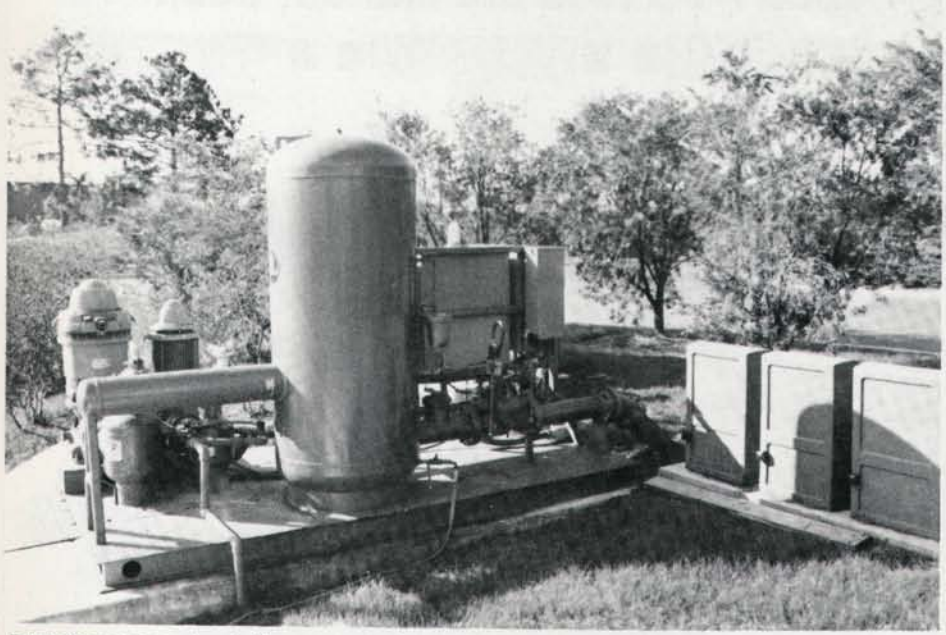
Use anti-drain valves on all heads that are lower in elevation than the remote-control valve.

Program controls so that only enough water is applied at any one time without runoff. Try to water during a time of day when wind or evaporation is minimal.

Use rain sensors to shut off irrigation controls when sufficient rain has fallen and use soil-moisture sensors whenever possible. On slopes, design the irrigation system so that the top, middle and toe of the slope can be irrigated on separate valves.

Use controls that can be programmed for individual stations, so that shade and sun areas can be valved separately. Choose controls that have easy-to-use water-budgeting features, so water reduction can be easily performed.

Each in his own way, on the basis of his own hard-won experience, these irrigation experts have shared their knowledge with us—not only on how to repair irrigation systems, but how to make them work better in a time of growing water shortages. If selectively applied to your own situation, these tips can be true lifesavers—not only for your system, but for your prize turf as well.



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CONGRESS STUDIES GROUNDWATER ACT

One of the most comprehensive bills on groundwater protection was introduced in April by Senator David Durenberger of Minnesota. The Ground Water Protection Act (S. 2091) has been termed the equivalent of the Clean Water Act which addresses surface water protection. Durenberger's bill sets a national policy for groundwater protection and specifies enforcement measures to be taken by the states with the guidance of the U.S. Environmental Protection Agency.

If the Act passes and is signed into law it would require state and local governments to protect groundwater by monitoring all possible sources of contamination. These sources would include septic tanks, cesspools, certain landfills, storage tanks, certain injection wells and application of fertilizers and pesticides. States will have up to eight years to establish contamination control methods for each type of source. Contamination through irrigation will be one source for which control programs would be developed.

The bill requires states to identify wellhead protection areas for public water supplies. It will provide grants to local groundwater management districts for the purposes of managing aquifers and will allot funds for testing and treatment of contamination at private wells. Five parts per billion has been temporarily set as the maximum allowable amount of contaminant in groundwater.

The full impact of the Act on pesticide and fertilizer applicators and to sports facilities irrigating from wells is undetermined at this time.

SAWGRASS TO HOST GOLF SUMMIT '88

David Hueber, president of the National Golf Foundation (NGF), hopes that executives from major golf suppliers, associations and the media can develop a strategic plan of action for the golf industry this coming November during Golf Summit '88. The Marriott at Sawgrass Resort in Ponte Vedra, FL, will host the meeting.

The NGF organized the first Golf Summit held in Rye, NY, in 1986. More than 250 industry representatives attending the meeting agreed that the demand for golf in the U.S. was greater than the rate of new golf course construction. The meeting concluded with a statement that a long-range plan of action, involving all industry forces, was needed. Hueber's goal is for industry representatives to work out and indicate support for such a plan at Golf Summit '88. NGF is utilizing McKinsey & Company, a planning consultant firm, to draft a preliminary plan this spring to circulate to golf organizations prior to the Summit.

Hueber says at the current rate of growth, the golf industry may fall short of demand by 4,000 courses by the year 2000.

DEERE TO ADD SEED TO PRODUCT LINE

John Deere golf and turf distributors will begin marketing a line of commercial turfgrass seed beginning this fall based upon a production and marketing agreement with Turf Seed, Inc., of Hubbard, OR. "The seed line will be introduced over the next two to three years starting this fall," explained Bob Tracinski, public relations manager for Deere's Consumer Products Division. "Only our 55 turf and golf distributors will carry the seed." The company's industrial, agricultural and retail dealers will not be involved in the seed program, at least in the beginning.

Tom Stanley, Turf Seed's sales and marketing manager, said unique blends and varieties of perennial ryegrass, Kentucky bluegrass and turf-type tall fescue have been selected and are being grown for Deere. "The first seed will be available this fall in commercial 50 pound bags," he stated. A new variety of creeping bentgrass is also under development.

Deere created a separate group of turf and golf distributors two years ago and has since introduced a broad line of specialized commercial turf maintenance equipment.

PAT PARK SURVIVES FIRST FLOOD

The PAT team for Del Amo Park was (l. to r.) Don Morgan, Jim Eagle and Dr. Bill Daniel.

Just days after the Prescription Athletic Turf System (PAT) had been completed at Del Amo Park, Carson, CA, nature gave it a test. A downpour sent salt water pouring over the banks of a drainage canal adjacent to the four-acre park, flooding the fields below.

Within hours, the flood water had been pumped off the fields and much of the salt in the foot-deep, sand root zone had been flushed out with fresh water. By the second day, the fields were once again occupied with hundreds of soccer and baseball players.

Until this spring, flooding and salt-water intrusion made it impossible to maintain healthy turf in the busy city park a few miles from the Pacific Ocean. In 1983, Tuto Iglisous, park maintenance supervisor, contacted Dr. William Daniel, coinventor of the PAT System, to see if it could be practical for an entire park. Daniel's company, Turfgrass Services Inc., had never installed a PAT system of that size before, but Daniel and regional licensee Don Morgan put together a plan for the park. After four years of trying, Park Director Howard Holeman gained approval for the system and work got underway last fall.

The job was supervised by Texas licensee Jim Eagle and was completed in February. Del Amo Park was the first PAT system to use submersible pumps in a sealed concrete tank. The new suction system can remove 1,400 gallons of water from the sealed root zone each minute if necessary.

The park has both both subsurface and surface irrigation systems. Moisture sensors located in specific locations around the park automatically turn on or shut down both irrigation systems. The final touch was washed Santa Ana bermudagrass sod.

While the lined subgrade slopes toward the pump system, the fields are perfectly flat. Carson residents now boast of Del Amo Park instead of making excuses for the salt-stressed turf. Power, water, telephone and irrigation components in the soil will be spared the corrosive effects of salt.

Del Amo Park officials are pleased to know that a copy of their pump system is being installed at Soldiers Field in Chicago, IL. For once, a park is setting an example for a professional stadium, instead of the other way around.

Park rough graded prior to installation of drainage, subirrigation and sand.

"The people of Farmington prove a small city can host a national event just as well as a big city."

Both the field and stands were built by volunteers to attract the Connie Mack World Series to Farmington.

City Proves Amateur Baseball Can Be a Major Drawing Card

For a week each August, many of this country's finest baseball players from the ages of 16 to 18, and scouts from more than 50 major and minor league baseball teams, gather in remote Farmington, NM. The oil and gas community, tucked into the northwest corner of the state, is consumed by the sport of baseball — amateur baseball that is. Since 1963, when city volunteers built Orval Ricketts Park specifically for the Connie Mack World Series, the event has drawn more than 70,000 baseball fans each year to the stadium.

That's not bad for a city with only 33,000 residents. The closest large city is Albuquerque, a three hour drive away. It takes fans eight hours to reach Farmington from Denver or Phoenix, the next closest cities. "The World Series is the biggest thing that happens in this city every year," says Park Superintendent Jeffrey Bowman. That makes Ricketts Park the most important facility he maintains during the year. That importance shows. The park is the winner of the Baseball Diamond of the Year Award in the park, municipal and school category.

From the beginning, Ricketts Park has been a community project. Every foot of pipe, every yard of concrete, every bench, press box, scoreboard, concession stands, fences, land, bases and the Kentucky bluegrass seed were donated by community businesses and organizations. During the World Series, families provide room and board for the visiting teams as local hotels swell with scouts and Connie Mack team supporters from Puerto Rico to Seattle. The city has continuously supported the volunteers and managed the facility since its creation.

As the host city, at least one Farmington team gets to play in the World Series every year. Beginning at the age of seven, Farmington youngsters start playing baseball in hopes of one day competing against eight of the best teams in the country and possibly being discovered by a major league scout. Parents, city businesses and community organizations do all they can to preserve the baseball tradition of the city. It's no surprise that it consistently has some of the best out of 9,000 teams in the American Amateur Baseball Congress (AABC) each year.

"The people of Farmington prove that a small city can host a national event just as well as a big city," says Joe Cooper, executive director of the AABC, headquartered in equally small Marshall, MI. "A reporter from *Sports Illustrated* once said that he was looking for Geronimo to come out of the hills as he drove into Farmington." A large Indian reservation happens to be located on the outskirts of the city. In fact, Albert Eaton, whose primary job is to keep Ricketts Park in top condition, is an American indian.

The annual average rainfall for the mountainous region located 5,300 feet above sea level is only seven inches. "All of our precipi-

tation comes from winter snowstorms and late summer thunderstorms," explains Bowman. The rest of our water is taken from three rivers that are fed by the snowmelt in the mountains. We have plenty of water, the problem is the rains come during August, right in the middle of the Connie Mack World Series."

The turnout in Farmington is greater than for any of AABC's six other league championships. In addition to the Connie Mack event, each year AABC sponsors the Stan Musial World Series in Battle Creek, MI; the Mickey Mantle World Series in Waterbury, CT; the Sandy Koufax World Series in San Juan, PR; the Pee Wee Reese World Series in Forest Park, GA; the Willie Mays World Series in Hapeville, CA; and an experimental league series in Fayette, GA.

"The difference is the people in the Farmington Connie Mack League who make sure the event runs like clockwork," said Cooper. "They have made it successful with things like foster parent programs to feed and house the kids, helping pay some of the travel expenses for the other teams with gate receipts and fund raisers, and the quality of Ricketts Park. There is so much support for the World Series in Farmington that they had to add a second deck on the outfield fence to carry all the advertising."

While volunteers do much of the leg work for the event, maintenance of the 8,500-seat Ricketts Park is the responsibility of the Department of Parks, Recreational and Cultural Affairs. "Ricketts is like a second job for us in the department," says Bowman. And it was a big reason why he left Pennsylvania in 1982 to take the job as park supertendent.

Bowman's involvement with sports started when he was a high school student in York, PA. He took a summer job with the city's park department. One thing led to another and he ended up working on Memorial Stadium, the home field for the Triple A York Pirates. He was hooked. For the next four years, he worked at the stadium while he attended Delaware Valley College of Science and Agriculture in nearby Doylestown. His goal was to be a major league groundskeeper so he pursued and obtained a degree in agronomy.

His first job out of college was on the crew at Philadelphia Country Club in Gladwine, PA. When the assistant superintendent of parks job opened up in York, Bowman returned to his hometown and was soon promoted to superintendent. The stadium satisfied his thirst for baseball. The Pirates installed one of the first AstroTurf infields in York before deciding to install one at Three Rivers Stadium. But, then the Pirates closed their franchise in York. Bowman started looking for ways to keep up his association with both baseball and parks.

The opportunity came in 1982, when Bob Hudson, the city's director of Parks and Recreation, was looking for a park superintendent with baseball background. "There was no doubt about Farmington's interest in baseball," Bowman says. "It also had a city golf course, 14 other softball and baseball fields and 900 acres of parks and municipal grounds. But, the best part was I didn't have to hide the fact that my main interest was baseball."

You don't just walk into a strange community and start changing things. You have to prove yourself first. "Knowing how to deal with coaches and parents is a big part of managing fields in a park system," Bowman points out. "You also have to work with the members of the department who have been doing things a particular way. When people have been nice enough to give the ball park fertilizer and supplies, you use them."

The first thing Bowman did was teach the grounds crew how to make sharp edges on the base paths and to set up the mound, batter's box and bull pens to professional standards. He surveyed and aligned the bases, made new patterns for chalking the batter's box, and asked that string be stretched down the base lines before marking the field. "Little things add up to make a big difference," Bowman points out. He has since added a clay stabilizer to the base path dirt that makes the sandy soil pack better and hold more moisture.

The second thing he did was put together a schedule for all cultural practices. "Mowing, fertilizing and irrigation were all assigned to certain crewmembers for certain times each week," Bowman adds. A special ball field crew for the entire park system was created and put under the watchful eye of Jim Henry. The condition of all the fields is now checked each day by the present foreman Jay Wilson.

Since Ricketts Park is busy from January through September with more than 132 games and nearly 200 hours of practices, there is little time to make major repairs. "Our biggest problem at first was just keeping the turf properly fertilized and irrigated," said Bowman. "We have to irrigate the sandy soil heavily. That causes the fertilizer to leach

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"A reporter once said that he was looking for Geronimo to come out of the hills as he drove into Farmington."

A second deck had to be added to the outfield fence at Orville Ricketts Park because of the demand for advertising.

Crew at Orville Ricketts Park during World Series Week.

City Proves

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out quickly. Quick-release nitrogen lasted only a few weeks before it was gone. We also had an old quick coupler irrigation system that needed constant attention."

To correct the problem, Bowman and his new assistant Jim Henry, a turf graduate of New Mexico State University, decided to switch to a 34:6:4 sulfur-coated urea applied monthly beginning in March. They also started spraying the field every month with a solution of chelated iron with micronutrients. As the root structure of the bluegrass improved it was more tolerant of drought stress caused by the sandy soil.

Still, it became clear that the manual quick-coupler system and the labor it required had to be updated. Once again, the community responded and donated the money for an automatic Toro system with 1800 Series pop-up heads in the infield and Super 600 heads for the outfield. "Now we had a handle on water and we could irrigate at night when the field was not in use," Bowman recalls. "Disease isn't really a problem here, except in August, since it is so dry most of the year."

The bluegrass started to respond. The next step was to remove a thatch layer that had built up over the years and to get improved bluegrass varieties into the turf that were more drought tolerant, more disease resistant for August, and a darker shade of green. For that, Bowman needed an aeroblade seeder/thatcher. The community came through with a Jacobsen seeder. The seeder was put to use that fall on both the stadium, the park fields and the golf course.

The other piece of equipment that Bowman and Henry fixed up and put to use was a drum-type aerator. New tines and a complete overhaul gave the old unit the ability to once again relieve compacted soil. Bowman also saw it as a way to keep thatch under control and to provide even penetration of water and nutrients into the soil.

To put a pattern into the turf, the outfield is mowed twice each week with a triplex reel mower followed by a riding rotary mower with a vacuum system. The infield is mowed with a walk-behind rotary mower that collects the clippings. "The teams like the field mowed as short as possible," says Bowman.

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