



Irrigation System Maintenance Check Sheet

| Maintenance Description | Frequency | | | |
|-------------------------------------|--|---|--|---|
| | Weekly | Monthly | Annually | Other |
| Central Control Systems | | | | |
| Database Back-up | Back-up current program and map databases. | | Back-up all historical log and weather data files. | Contact GSP for back-up on Rain Bird servers. |
| Programming | Fine tune program water budgets and station runtimes to account for micro-climates, seasonal, and daily changes. | | | Follow weather station maintenance schedules to ensure accurate ET data when operating automatically. |
| Station Data Accuracy | Update station data tables to match hardware changes in the field. | | | Verify that all sprinkler, precipitation and default run time data is accurate. |
| CPU Housekeeping | Reboot computer every 1-2 weeks. | Delete temp files, and perform scan disk and defragmentation utilities. Remove any unused programs. | Remove dust from CPU tower. (Don't use shop compressor. Use air duster cans. Stay clear of microprocessor) | Keep serial cables and components labeled for ease of troubleshooting. |
| Battery Back-up | | | Run battery runtime test to ensure long lasting operation. Replace batteries as needed | Install smart application shutdown software for batteries that are so equipped. |
| Earth Ground Testing | | | Check earth ground resistance during dry periods. Use clamp on tester. (< 5 Ohms) | Physically check all connections. Enhance grounding as needed. |
| Central Grounding Grid | | | Check wire splice connections. Repair as needed. | Clean valve box of debris. |
| Rain Bird Global Service Plan (GSP) | | | Renew Rain Bird GSP subscription, or check status and verify expiration date. | Ensures factory support, hardware warranty, and up to date software to take advantage of latest features. |

| Maintenance Description | Frequency | | | |
|-------------------------|--|--|--|---|
| | Weekly | Monthly | Annually | Other |
| Sprinklers | | | | |
| Operation | Visually inspect operation on 6 holes per week. Clear clogged nozzles, and replace non-working sprinklers or components. | | | Maintain spare parts inventory. |
| Leveling | | | Level heads that have settled over time. | |
| Locating & Trimming | | | | Continually locate and Trim around sprinklers throughout the growing season. |
| Pressure Testing | | | Pressure test a percentage of sprinklers across the golf course. | |
| Replacements | | Check and replace any damaged sprinklers. | | Check after aerification |
| Rotation Testing | | Check rotation and proper ARC adjustments. | | Check during spring start-up in climates that winterize. |
| Troubleshooting | | | | See "Rotor Troubleshooting Guide D37420A" for further details. |
| Irrigation Field Audit | | | | Every 3 – 5 years Conduct water distribution audit of the same 6 areas (2 greens, 2 tees and 2 fairways) to verify rotor performance and compare individual year test results. |

| Maintenance Description | Frequency | | | |
|-----------------------------------|---|---|--|---|
| | Weekly | Monthly | Annually | Other |
| Valves | | | | |
| Combo Vacuum / Air Release Valves | | | Open, close and flush to verify proper operation. (Spring, after start-up) | |
| Electric Valves | Visually inspect operation on 6 holes per week. | | Check pressure regulators for proper settings and operation. | Maintain spare parts inventory. |
| Mainline Gate Valves | | | Exercise valves twice per year to reduce seizing. (spring / fall) | Do not lock valves open: Fully open, then turn one revolution toward closed position to prevent valve stem from being "locked". |
| Lateral Isolation Valves | | | Exercise valves twice per year to reduce seizing. (spring / fall) | Do not lock valves open: Follow guidelines above for Mainline Gate Valves |
| Drain Valves | | | Exercise valves twice per year to reduce seizing. (spring / fall) | Do not lock valves open: Follow guidelines above for Mainline Gate Valves |
| Quick Coupling Valves | | | | |
| Locating & Trimming | | | | Continually: Locate and trim around QCV valves throughout the growing season. |
| Maintenance | | | Inspect hose and hose end fittings and replace/repair as needed. | Replace QCV keys, and broken QCV lids as needed. |
| Valve Boxes | | | | |
| Leveling | | | Level boxes that have settled over time. | |
| Locating & Trimming | | | | Continually: Locate and Trim around boxes during the growing season. |
| Cleaning | | | Clean out dirt and debris from wash-ins, animals, and insects. | |
| Replacements | | Inspect and replace any damaged valve box lids. | | |

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|---|---|---|---|--|
| | Weekly | Monthly | Annually | Other |
| Satellite Controllers | | | | |
| Satellite System Field Interface Devices - MAXI® Interface Module (MIM 2-Wire & (MIM-LINK) | Check visual indicators - Status LED blinks every second - Wire path LEDs flicker | | Inventory spare fuses - Incoming power fuse (5x20mm, 1.25 Amp fast acting). - CPU Board fuse (0.5 AMP Slo-blow) | Daily: Check communication to field satellites for proper feedback. (See MIM/LINK troubleshooting manuals for further information) |
| Station Testing | | Verify station operation and solenoid activation. (Check operation after electrical storms) | | Station output should be 26.5 VAC. Single solenoid circuit resistance should be 20 – 60 Ohms. |
| Earth Ground testing | | | Check earth ground resistance during dry periods. Use Clamp on tester. (< 10 Ohms) | Physically check all connections. Enhance grounding as needed. |
| Physical Inspection | Inspect for damage. Check for component corrosion (circuit/terminal boards, ribbon cables, and connectors). | Clear debris from the pedestal base so doors shut and seal properly, and moisture is not “wicked” inside. | | Keep lids locked for protection. Check latches, and gaskets for seal. |
| Infestations | Inspect for insect, reptile, and rodent infestation | Maintain insecticides, and rodenticides to reduce infestation. | | Keep satellites clean and free from rodent nests, droppings, and debris. |
| Link Satellites | | | Inspect antenna, and cable connections. | Check LINK Diagnostics. Use radio scanner to troubleshoot non responding controllers. |
| Programming | | | Establish standalone back-up programs in case Central Com fails. | |
| Winter Programs (Northern Climates) | Run short programs to activate solenoids and verify proper operation and communication. | | | Keep satellites powered on during winter to minimize condensation, and corrosion. |
| Installation / Maintenance & Troubleshooting | | Check for bent locking guides and jammed door latches. Lubricate and repair as needed. | | See “Par+ ES Installation & Operation Manual” & “Par+ ES Controller Troubleshooting Guide D37421” for further details. |

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|--|---|---------|--|---|
| | Weekly | Monthly | Annually | Other |
| Decoder Systems | | | | |
| Decoder System Field Interface Devices - MAXI Decoder Interface (MDI) - Large Decoder Interface (LDI) - Small Decoder Interface (SDI) | | | Maintain spare fuse inventory. Contact Rain Bird GSP for fuse specifications. | Daily: Check communication to field decoders for proper feedback. (See "Decoder System Manual" for further information) |
| Decoder diagnostics | Verify proper Milliamp current draw on each wire path. Run decoder diagnostic ON/OFF test to determine decoder or solenoid failures. (Perform tests after electrical storms) | | | (See "Decoder System Manual" for further troubleshooting information) |
| Solenoids | Observe system current draw during programmed irrigation. High current that exceeds decoder interface capacity can result in intermittent communication to field decoders and zeros in "Course Log". | | Perform solenoid health checks by activating stations and monitoring wire path current. Individual solenoids should draw between 20-40 mAs during operation. Higher drawing solenoids should be checked for proper resistance (20-60 ohms). | Tip: Use the historical Decoder Current Graph log to identify and verify areas or stations that may be causing high current on the system during operation. |
| Earth Ground testing (LSP-1 locations) | | | Check earth ground resistance at sample of 10 ground rods during dry periods. Use 3-point Biddle type tester. (< 50 Ohms) | Physically check all connections. Enhance grounding as needed. |
| Installation / Maintenance & Troubleshooting | | | | See "Decoder System Manual" for further information. |

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| IC System™ | | | | |
| Integrated Control Interface (ICI) | Daily: Check the ICI Current Graph to inspect system health. | | Maintain spare power fuse inventory. (1.5 amp (1/4 x 1 ¼) Slo-blo fuse). | Requires clean power. Power ICI with APC Smart-UPS Series UPS |
| ICI Communication Status | | | | Daily: Check front cover LED. Solid green indicates communication to driver boards. |
| ICI CPU & Driver Board | CPU board LED blinks during ICM operation, programming, operation, and diagnostic testing. | | | Daily: Check driver board data LED. Intermittent flicker if communicating to ICM(s). Wire path LED should be solid red. |
| ICI Diagnostics | Verify proper Milliamp current draw on each wire path. | | | During installation, check current draw to verify proper field wire splices. |
| ICM Diagnostics | Run the "Voltage Measurement" test of internal ICM voltages to indicate field issues. < 20 volts will cause intermittent operation. | | Run "QUICK CHECK" test during spring start-up to verify failures and also physical operation of ICM(s) in the field. | Daily: Run a "System Poll" test to check for proper ICM response. (See "IC System Operation and Troubleshooting Guide" for further information) |
| Earth Ground testing – Integrated Control Surge Device (ICSD) | | | Check earth ground resistance during dry periods. Use 3-point Fall of Potential tester with optional shielding wire disconnected (< 50 ohms) | Physically check all connections. Enhance grounding as needed. |
| Installation / Maintenance & Troubleshooting | | | See "IC System Installation Guide" | See "IC System Operation and Troubleshooting Guide" |

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| Wire Splice Boxes | | | | |
| Check Splices | | | Verify proper splice connections. Repair as needed. | Use approved Rain Bird DB connectors for waterproofing. |
| Label Wires | | | Label incoming and outgoing maxi cable legs, and record proper Milliamp draw for decoder systems. | |
| Cleaning | | | Clean out dirt and debris caused by wash-ins, animals, and insects. | |
| Replacements | | Inspect and replace any damaged valve box lids. | | |
| Color Coded Lids | | | | Use color coded lids (gray) to identify wire splice boxes versus green valve boxes. |
| FREEDOM SYSTEM™ & LINK Systems | | | | |
| FREEDOM SYSTEM Radio Battery | | | | Note: Deep cycle to extend battery life. Remove from charger when complete. |
| Antenna, Cables, and Connections | | Visually inspect antenna and mount for damage especially after high winds and storms. | Check connections to ensure waterproofing. Apply waterproof mastic tapes as needed. | |
| Grounding | | | Check earth ground resistance during dry periods. Use clamp on tester. (< 5 Ohms) | Check antenna mast and Polyphaser surge arrestor ground wire connections. |
| Installation / Maintenance & Troubleshooting | | | | See "FREEDOM Installation 634505 RevA" & "FREEDOM Owners / Operation Manual GT27166" for details |

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|---|--|--|---|---|
| | Weekly | Monthly | Annually | Other |
| Weather Station (WS-Pro / Pro2) | | | | |
| Tower & Structure | | | Check for structural integrity, level, and plumb. | Concrete pad may heave in frost prone climates. |
| Battery | | | | Note: Replace when voltage drops below 11V. Check charging circuit. |
| Internal Humidity / Enclosure Gasket | Check internal humidity of station. If above 35%, install 2 new desiccant packs. | | Every 2 years: Check enclosure gasket for seal or damage. Replace as needed. | Every 5 Years: Replace internal humidity chip. Remove enclosure cover for 10 minutes, compare to outside humidity, and replace if >10% off. |
| Rain Gauge | Check funnel and bucket for debris. | | Field calibrate for accuracy. (spring) | |
| Solar Panel | Check for debris covering solar panel. Keep snow/ice off panel during winter months. | | Clean with mild soapy water. | Note: Mount panel south facing. Output voltage typically 10 Watts at 18VDC. |
| Solar Radiation Sensor (Pyranometer) | | Check level. Clean debris from sensor with soft camel hair brush. Keep drain hole at sensor clear. | | Every 2 Years: Recalibrate solar radiation sensor. |
| Temperature / Relative Humidity Sensor | | Every 3 months: Clean radiation shield by removing, clean paper filter on RH sensor in distilled water only. | Check calibration of RH sensor probe. Readings tend to drift above 100% over time. Replace if necessary. | Note: Make sure sprinklers do not throw water / spray into this sensor. |
| Wind Speed Sensor (Anemometer) Wind Direction Sensor (Wind Vane) | Inspect sensor for physical damage. | Visual / Audio inspection at low wind speeds. Verify that cup assembly and wind vane rotate freely without grinding noise. | Replace wind speed bearings annually in high wind environments, and bi-annually in low wind environments. | Every 2 Years if needed: Replace direction potentiometer. |
| Cabling - sensors / power / communication | | | Check splices on phone and direct connect stations. | Every 4-5 years: Check for cracking/deterioration. Replace as needed. |
| Earth Ground Testing | | | Check earth ground resistance during dry periods. (< 10 Ohms) | Physically check all connections. Enhance grounding as needed. |
| Installation / Maintenance & Troubleshooting | | | | See "GTB 27176 WS-PRO2 Manual" for details. |

| Maintenance Description | Frequency | | | |
|---|--|---|--|--|
| | Weekly | Monthly | Annually | Other |
| Weather Station (WSPRO-LT) | | | | |
| Battery | | | Every 2 years: Replace internal 0.8 amp hour battery in northern climates, or remove and store indoors for winter. | Note: Replace when voltage drops below 10 VDC. Install optional 7 amp hour external battery pack for extended use. |
| Rain Gauge | Check funnel and bucket for debris. | | Field calibrate: (100 ml within 5 minutes should equal 20 tips). | Replace every 3- 5 years |
| Solar Panel | Check for debris covering solar panel. Keep snow/ice off panel during winter months. | | Clean with mild soapy water. | Note: Mount panel south facing. Output voltage typically 5 watts at 17VDC. |
| Solar Radiation Sensor (Pyranometer) | | Check for debris on sensor, clean with soft camel hair brush. | | Replace every 3-5 years |
| Temperature / Relative Humidity Sensor | | | Replace every 18-24 months. Constant Max or Min value indicates sensor failure. | Note: Make sure sprinklers do not throw water / spray into this sensor. |
| Wind Speed Sensor (Anemometer) Wind Direction Sensor (Wind Vane) | Inspect sensors for physical damage. | Check that sensors spin freely. | | Replace when units fail. |
| Cabling - sensors / power / communication | | | Check splices on phone and direct connect stations. | |
| Radio Communication | | | Check line of site for foliage growth and obstructions that may reduce signal strength. | |
| Earth Ground Testing | | | Check earth ground resistance during dry periods. (< 10 Ohms) | Physically check all connections. Enhance grounding as needed. |
| Installation / Maintenance & Troubleshooting | | | | See "WSPRO LT Installation Manual" for further details. |

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|-----------------------------------|---|-----------------------|---|--|
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| Rain Watch™ | | | | |
| Rain Can | Check for debris covering funnel opening, and bee and insect infestation inside rain can. | | | Cover the drain outlet holes in can with screen to reduce infestation. |
| Tipping Bucket | Verify free movement of mechanism, and proper switch closure. If not operating check pulse decoder operation. | | | Check stability of attached magnet to tipping bucket. Re-adhere with epoxy to secure if necessary. |
| Pulse Decoder | | | | Check operation by touching rain can input leads to trigger a tip in the incremental rain counter. |
| Pump Station | | | | |
| Visual Inspection | Visit the pump station weekly to check for any leaks or abnormalities and to verify proper operation. | | Check condition of the bladder expansion tank if so equipped. A tank that is in poor condition can explode under pressure causing serious injury. | |
| Alarm Check | | | | Daily: Check alarm history. |
| High Pressure Relief Valve (HPRV) | | | Verify the setting for the HPRV. (after spring start-up in northern climates) | |
| Annual Logs | | | Record annual station flow totals, and pump hourly usage totals. (fall) | |
| Fertigation Equipment | Inspect tanks for leaks. Check hose condition and connections. | | | |
| Filter Maintenance | Check Pressure differential, and back flush settings. | Grease shafts on ABS. | Clean wye strainers, basket strainers, and pressure wash stainless steel screen filters. | |
| Lake Screen | | | Check for debris build-up and clean if necessary. (spring) | |

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| Foot Valves | | | Inspect foot valve and flappers for proper seal. | |
| Main Pumps | | | Check packings and oil reservoir. (spring) | |
| Motor Diagnostics & Maintenance | | Check oil level. | Change oil in Hollow Shaft motors and grease motors per manufacturer recommendations. | Note: Diagnostic tests can be done to determine reduced motor efficiency. (Megging, Amperage tests) |
| Panel Temperature | | | | Note: Temperature should remain below 90 degrees. |
| Pressure Maintenance Pump | Check # of starts per hour. (6 / hour or less) | | | |
| Pump Service | | | Schedule a professional pump service at least once per year in the fall or spring. | See "Pump Station Preventative Maintenance Report" for further maintenance checks. |
| Winterization | | | In Northern Climates: Drain all water in the pumps, piping, valves and the heat exchanger if so equipped. Protect the pressure transducer from freezing. Use RV antifreeze on top of diaphragm type pressure control valves and high pressure relief valves. | See "Pump_Station_Manual_E1071_GOT1000" for further details. |
| Transfer Pump | | | Check and service in fall or spring. | |
| Earth Ground Testing | | | Check earth ground resistance of select ground rods during dry periods. (< 10 Ohms) | Physically check all connections. Enhance grounding as needed. |
| Wet well Inspection | | | Clean and Inspect wet well for debris that could damage pump impellers or pass through to the piping network. (spring) | |

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|-------------------------------------|---|---------|----------|-------|
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| Spring Start-up | | | | |
| Communication Test | Verify proper communication between computer and field interface devices (MIM, LDI, SDI, and MDI), communication to all satellites, decoders, and/or ICMs. This ensures that sprinkler and valve testing can be initiated directly after the slow fill procedure. | | | |
| Open Air Release Valves | Open all air release valves to help evacuate air before filling the lines. | | | |
| Open Drain Valves | Open drain valves to help evacuate air. | | | |
| Open Quick Coupling Valves | Open quick coupling valves to help evacuate air. | | | |
| Slow Fill | Slowly fill irrigation system (over a 1-2 day period depending on system design, compressor sizing, and point of connection) to alleviate any undue stress on pipes. Do not exceed over 100 -150 GPM. Make sure to close drain valves and quick coupling valves overnight. Filling an irrigation system too quickly will cause damage to PVC piping, fittings and sprinkler heads. If it is a booster pump station, consider filling the system with "city pressure" typically 50-75 PSI. With pump stations with VFD, consider operating the pump manually with VFD at a slow speed that will produce 50 -75 PSI. Activate all sprinkler heads until the air is out of the system. | | | |
| Fall Winterization | | | | |
| Communication Test | Verify proper communication between computer and field interface devices (MIM, LDI, SDI, and MDI), communication to all satellites, decoders, and/or ICMs. | | | |
| Sprinkler and Valve Station Testing | Verify proper operation of all valves and sprinklers to ensure that water is evacuated from the entire system during winterization. | | | |
| Draining Lines | Open all drain valves a few days before blowing out the system. Drain valves that empty to atmosphere such as ponds, creeks etc, are good places to push most of the water out of the system before the sprinkler heads are activated. Drain valves should be left in the closed position after the system is blown out. Quick coupler valves are also good places to push water out of the system. | | | |
| Air Release Valves | Keep combo vacuum / air release valves open to help siphon water out during the draining process. Close air release valves before compressing the system. | | | |

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|-------------------------|--|---------|----------|-------|
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| Sizing Compressor | Air Compressor sizing should be determined based on compressor sizing chart. | | | |
| Pressure Regulation | Regulate the compressor to 50 PSI. Excessive air pressure can cause damage to the irrigation system due to air and water pockets in the piping network. Monitor the pressure in the system in the field with a pressure gauge mounted to a Quick Coupler Valve key. This device can be installed in any QCV throughout the golf course to monitor the system pressure. Irrigation systems should be winterized at 50PSI maximum. This method will give an accurate reading of the PSI in the system. | | | |
| Sprinkler Activation | Activate sprinkler heads through Handheld Radio Operation, Field Satellite Controllers or the Central Control System until water is evacuated. Operate all sprinklers at least two cycles for approximately two minutes each. The water settles in the low spots between cycles. Adjust GPM setting of Central Control to air compressor size. It is not recommended to operate gear drive rotors completely dry. Blow rotors out until they are "misting". | | | |
| Quick Coupling Valves | Open quick coupling valves at higher elevations to help siphon water out during the draining process. | | | |

