

UDFCD ALERT Network 2010 End of Year Report



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December 2010

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1. INTRODUCTION

This report summarizes the field maintenance activities conducted in 2010 by Water and Earth Technologies, Inc. (WET) under contract to the Urban Drainage and Flood Control District (UDFCD) for the Real-Time Flood Detection System in Douglas County.

A single maintenance database is used to track all fieldwork conducted by WET. Provided at the end of this report are the individual maintenance records for work performed at each site throughout the year. The maintenance records are generated from the maintenance software and should be appended to the records already on file with UDFCD.

2. MONITORING NETWORK

The UDFCD operates a network of twenty-one stations in Douglas County (County) that collect rainfall, water level, weather and battery information at the following locations (Figure 2-1):

- Highlands Ranch (ID 2710)
- Salisbury Park (ID 2730)
- Castle Rock (ID 2750)
- Pine Cliff (ID 2810)
- Haskins Gulch (ID 2820)
- Sulphur Gulch (ID 2840)
- Cherry Creek at Bayou Gulch (ID 2850)
- Cherry Creek at Stroh Road (ID 2860)
- Cherry Creek at Cottonwood (ID 2870)
- Russelville Gulch (ID 2900)
- East Cherry Creek (ID 2910)
- West Cherry Head (ID 2920)
- Spring Valley Road (ID 2930)
- Willow Creek (ID 2940)
- DC Public Works (ID 2950)
- Indian Creek (ID 2960)
- Rampart Range Road (ID 2970)
- Dakan Road (ID 2980)
- Tomah Road (ID 2990)
- West Creek Repeater (ID 3000)
- West Creek (ID 3020)

Information is transmitted using the Automated Local Evaluation in Real-Time (ALERT) radio telemetry protocol. Data is transmitted to West Creek Repeater (ID 3000) where it is rebroadcast to the County base station located at Skyview Weather and to the UDFCD base station in Denver (Figure 2-2).

The system is inspected and activated in March. The entire monitoring network is operational from April 1 to October 15. The rain and water level stations are shut-down and winterized in late October. The weather stations and repeaters remain operational throughout the entire year.

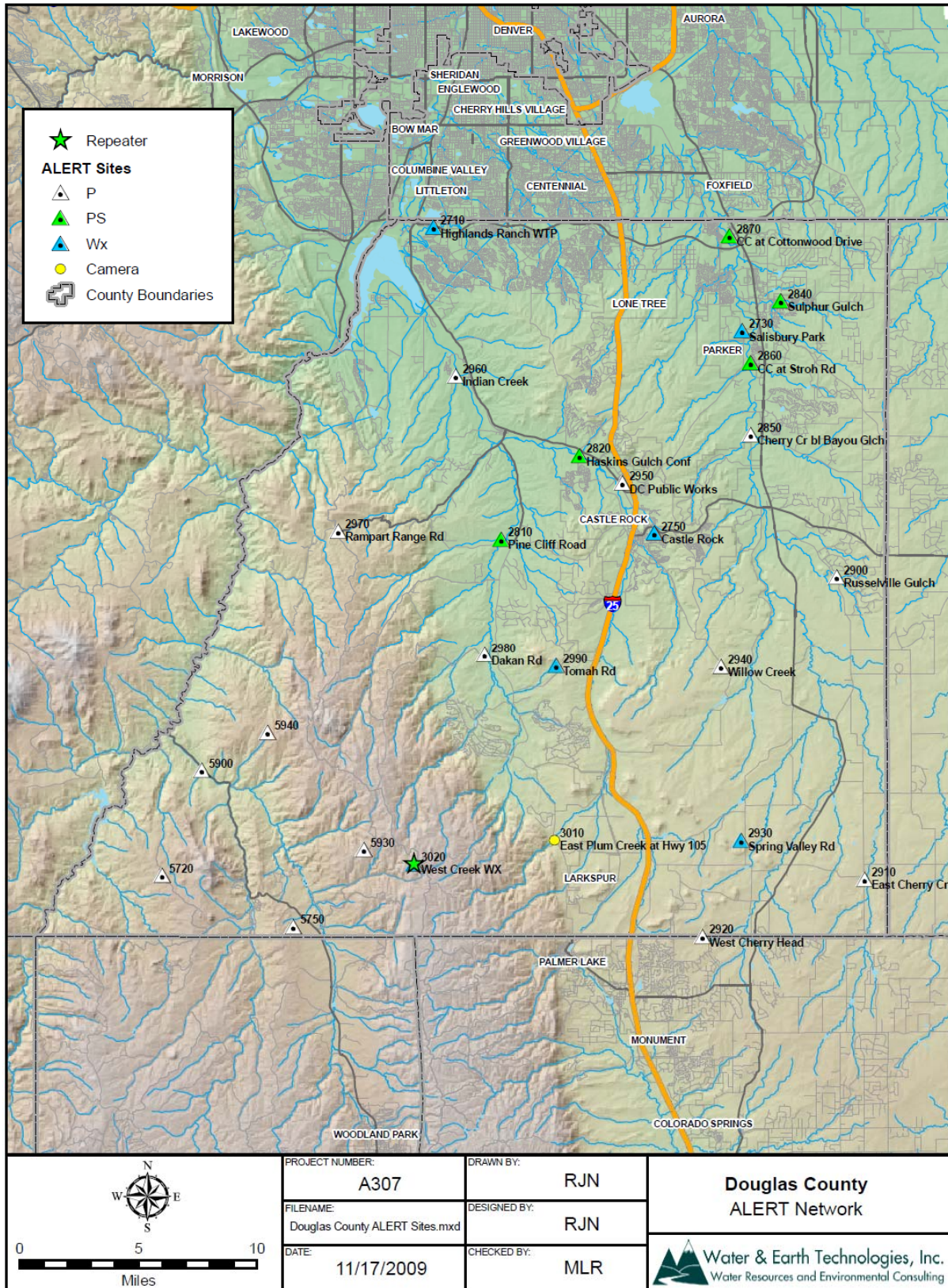


Figure 2-1. Douglas County ALERT Sites

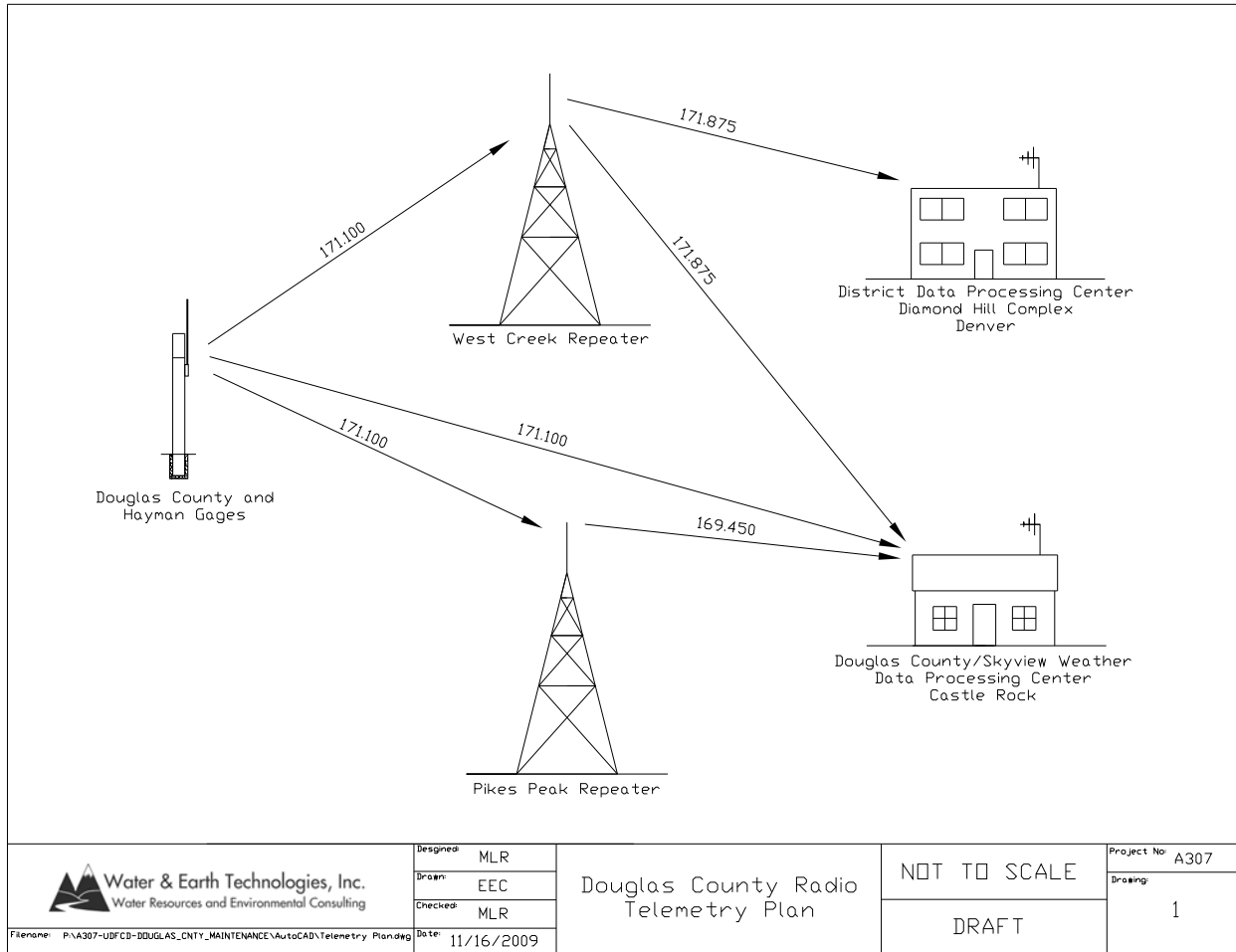


Figure 2-2. Douglas County Telemetry Network

3. MAINTENANCE ACTIVITIES

Scheduled routine inspection trips were conducted to each station throughout the year. Table 3-1 below shows the schedule of maintenance trips. Each station is designated as either a full weather station (Wx), precipitation only station (P), precipitation and stage station (PS) or repeater (R).

Table 3-1. ALERT System Preventive Maintenance Schedule for 2010

Site ID	Station Name	Type	Apr Round 1	Jun Round 2	Jul Round 3	Aug Round 4	Oct Round 5
2710	Highlands Ranch	Wx	F	F		F	F
2730	Salisbury Park	Wx	F	F		F	F
2750	Castle Rock	Wx	F	F		F	F
2810	Pine Cliff	PS	F	F		F	F
2820	Haskins Gulch	P	F	F		F	F
2840	Sulphur Gulch	PS	F	F		F	F
2850	Cherry Creek at Bayou Gulch	PS	F	F		F	F
2860	Cherry Creek at Stroh Road	PS	F	F		F	F
2870	Cherry Creek at Cottonwood	PS	F	F		F	F
2900	Russelville Gulch	P	F		L		F
2910	East Cherry Creek	P	F		L		F
2920	West Cherry Head	P	F		L		F
2930	Spring Valley Road	Wx	F	F		F	F
2940	Willow Creek	P	F		L		F
2950	DC Public Works	P	F		L		F
2960	Indian Creek	P	F		L		F
2970	Rampart range Road	P	F		L		F
2980	Dakan Road	P	F		L		F
2990	Tomah Road	Wx	F	F		F	F
3000	West Creek Repeater	R	F	F		F	F
3020	Douglas County Base Station	B	F				F

The type of preventive maintenance performed during each visit is designated as either full service (F) or low impact (L). The **full service** inspection includes removal of the top section of each ALERT rain gage standpipe assembly to clean the screen, funnel, and tipping bucket. Tipping buckets are leveled; standpipes and other appurtenances are painted to protect against corrosion and vandalism; antenna mounts, clamps, cables and conduits are secured; and each site is inspected to meet the terms of existing license agreements or varying field conditions. The radio and antenna system are tested. The battery is checked. Test transmissions are performed to assure that gage reports are being received by ALERT base stations. Pressure transducer (PT) orifices and protective housings are checked and maintained free of mud and debris. Pressure tests are performed on all accessible PTs. Transmitted data are recorded and compared with calibration tables. All defective equipment is repaired or replaced as needed using available spare parts. Calibration adjustments are made as needed.

The **low impact** inspection is conducted on rain only sites and includes a non-penetrating assessment of the general condition of the site and a tipping bucket performance test using water. If the low impact inspection indicates possible problems, a full service inspection is conducted.

A summary of maintenance work performed at each location is provided in the following sections. Detailed maintenance records are provided under cover of this report.

3.1. Highlands Ranch Wx (ID 2710)

The weather station at Highlands Ranch Water Treatment Plant was visited for a full service inspection on March 23, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

The mid-season inspection was conducted on July 1, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

A second mid-season inspection was conducted on August 13, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

On December 9, 2010 a final inspection was performed. Since this is a weather station, it is operational throughout the winter so the transmitter was not removed. All equipment was checked, cleaned and tested. The wind direction sensor needs replacement. All other equipment was in working order.



Photo 3-1. Highlands Ranch Wx

3.2. Salisbury Park Wx (ID 2730)

The weather station at Salisbury Park was visited for a full service inspection on March 16, 2010. All equipment was checked, cleaned and tested. All other equipment was in working order.

The mid-season inspection was conducted on June 30, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

A second mid-season inspection was conducted on August 12, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

On December 9, 2010 a final inspection was performed. Since this is a weather station, it is operational throughout the winter so the transmitter was not removed. All equipment was checked, cleaned and tested. All equipment was in working order.



Photo 3-2. Salisbury Park Wx

3.3. *Castle Rock Wx (ID 2750)*

The weather station at Castle Rock was visited for a full service inspection on March 16, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.



Photo 3-3. Castle Rock Wx

The mid-season inspection was conducted on July 1, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

A second mid-season inspection was conducted on August 13, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

On December 9, 2010 a final inspection was performed. Since this is a weather station, it is operational throughout the winter so the transmitter was not removed. All equipment was checked, cleaned and tested. All equipment was in working order.

3.4. Pine Cliff PS (ID 2810)

The station at Pine Cliff Road was activated for the season on March 18, 2010. All equipment was checked, cleaned and tested. All equipment was in working order. The PT was recalibrated.

The mid-season inspection was conducted on July 1, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

A second mid-season inspection was conducted on August 13, 2010. All equipment was checked, cleaned and tested. All equipment was in working order. The Hydrolynx bucket on top of the High Sierra standpipe had a poor fit. To improve the fit, the top of the standpipe was modified with new holes and rivets.

On October 29, 2010 winter shut-down activities were performed. The transmitter was removed and the PT was pulled up into its winter location. All equipment was in working order.



Photo 3-4. Pine Cliff PS

3.5. Haskins Gulch P (ID 2820)

The station at Haskins Gulch Confluence was activated for the season on March 18, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

The mid-season inspection was conducted on July 20, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

On October 29, 2010 winter shut-down activities were performed by removing the transmitter.



Photo 3-5. Haskins Gulch P

3.6. Sulphur Gulch PS (ID 2840)

The station at Sulphur Gulch was activated for the season on March 16, 2010. All equipment was checked, cleaned and tested. All equipment was in working order. A solar panel was installed and the PT was recalibrated.

The mid-season inspection was conducted on June 30, 2010. All equipment was checked, cleaned and tested. All equipment was in working order. The PT required recalibration.

A second mid-season inspection was conducted on August 12, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

On October 29, 2010 winter shut-down activities were performed. The transmitter was removed and the PT was pulled up into its winter location. All equipment was in working order.



Photo 3-6. Sulphur Gulch PS

3.7. *Cherry Creek at Bayou Gulch PS (ID 2850)*

The pre-season inspection was conducted on March 16, 2010. All equipment was checked, cleaned and tested. The PT required recalibration. All equipment was in working order.

On June 15, 2010 a service call was made because PT values were transmitted every minute. The PT was disconnected from the transmitter to alleviate the problem.



Photo 3-7. Cherry Creek at Bayou Gulch PS

The mid-season inspection was conducted on June 30, 2010. All equipment was checked, cleaned and tested. The faulty PT was pulled for repair. All other equipment was in working order.

On August 20, 2010 a troubleshooting call with High Sierra revealed that the problem was not with the PT, but rather with the transmitter. The transmitter was sent to High Sierra for repair. A spare transmitter was deployed at the site.

On October 29, 2010 winter shut-down activities were performed. The transmitter was removed and the PT was pulled up into its winter location. All equipment was in working order.

3.8. *Cherry Creek at Stroh Road PS (ID 2860)*

The precipitation and stage gage on Cherry Creek at Stroh Road was installed by OneRain on June 17, 2009. WET started maintenance in 2010.

The pre-season inspection was conducted on March 16, 2010. All equipment was checked, cleaned and tested. The PT required recalibration. All other equipment was in working order. It was noted that the riser pipe and intake line were not set in concrete and had loosened over the winter months.

The mid-season inspection was conducted on June 30, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.



Photo 3-8. Cherry Creek at Stroh Road PS

A second mid-season inspection was conducted on August 12, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

On October 29, 2010 winter shut-down activities were performed. The transmitter was removed and the PT was pulled up into its winter location. All equipment was in working order.

3.9. *Cherry Creek at Cottonwood PS (ID 2870)*

The precipitation and stage gage on Cherry Creek at Cottonwood was installed by OneRain on September 11, 2009. WET started maintenance in 2010.

The pre-season inspection was conducted on March 16, 2010. All equipment was checked, cleaned and tested. The PT required recalibration. All other equipment was in working order.

The mid-season inspection was conducted on July 1, 2010. All equipment was checked, cleaned and tested. The PT required recalibration. All other equipment was in working order. The ½” conduit connection to the riser pipe sheared when the cap was removed. Everything still works, but the ½” connection will have to be repaired.

A second mid-season inspection was conducted on August 12, 2010. All equipment was checked, cleaned and tested. The PT required recalibration. All other equipment was in working order.

On October 29, 2010 winter shut-down activities were performed. The transmitter was removed and the PT was pulled up into its winter location. All equipment was in working order.



Photo 3-9. Cherry Creek at Cottonwood PS

3.10. Russelville Gulch P (ID 2900)

The station at Russelville gulch was activated for the season on March 16, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

The mid-season low impact inspection was performed on June 30, 2010. All tested equipment was in working order.

On October 29, 2010 winter shut-down activities were performed by removing the transmitter.



Photo 3-10. Russelville Gulch P

3.11. East Cherry Creek P (ID 2910)

The station at East Cherry Creek was activated for the season on March 18, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

The mid-season low impact inspection was performed on June 30, 2010. All tested equipment was in working order.

On October 29, 2010 winter shut-down activities were performed by removing the transmitter.



Photo 3-11. East Cherry Creek P

3.12. West Cherry Head P (ID 2920)

The station at West Cherry Head was activated for the season on March 18, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.



Photo 3-12. West Cherry Head P

The mid-season low impact inspection was performed on June 30, 2010. All tested equipment was in working order.

On October 29, 2010 winter shut-down activities were performed by removing the transmitter. This gage would benefit from a solar panel.

3.13. Spring Valley Road Wx (ID 2930).

The pre-season inspection was conducted on March 18, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

The mid-season low impact inspection was performed on June 30, 2010. All tested equipment was in working order.

A second mid-season inspection was conducted on August 12, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

On December 9, 2010 a final inspection was performed. Since this is a weather station, it is operational throughout the winter so the transmitter was not removed. All equipment was checked, cleaned and tested. All equipment was in working order.



Photo 3-13. Spring Valley Road Wx

3.14. Willow Creek P (ID 2940)

The station at Willow Creek was activated for the season on March 16, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

The mid-season low impact inspection was performed on June 30, 2010. All tested equipment was in working order.

On October 29, 2010 winter shut-down activities were performed by removing the transmitter.



Photo 3-14. Willow Creek P

3.15. DC Public Works P (ID 2950)

The station at the Douglas County Public Works was activated for the season on March 18, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.



Photo 3-15. DC Public Works P

The mid-season low impact inspection was performed on June 30, 2010. All tested equipment was in working order.

On October 29, 2010 winter shut-down activities were performed by removing the transmitter.

3.16. Indian Creek P (ID 2960)

The station at Indian Creek was activated for the season on March 5, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.



Photo 3-16. Indian Creek P

The mid-season low impact inspection was performed on June 30, 2010. All tested equipment was in working order.

On October 29, 2009 winter shut-down activities were performed by removing the transmitter.

3.17. Rampart Range Road P (ID 2970)

The station at Rampart Range Road was activated for the season on March 5, 2010. All equipment was checked, cleaned and tested. All equipment was in working order. Replaced the omni antenna with a Yagi directional antenna to improve reception at West Creek repeater.

The site was visited on April 28, 2010 to point the directional antenna direction. An amplifier was added on June 23, 2010.

On October 29, 2010 winter shut-down activities were performed by removing the transmitter



Photo 3-17. Rampart Range Road P

3.18. Dakan Road P (ID 2980)

The station at Indian Creek was activated for the season on April 28, 2010. All equipment was checked, cleaned and tested. All equipment was in working order. This site was converted to a Campbell Scientific ALERT gage/repeater site to repeat transmissions from the gage at Highway 105 (3010).

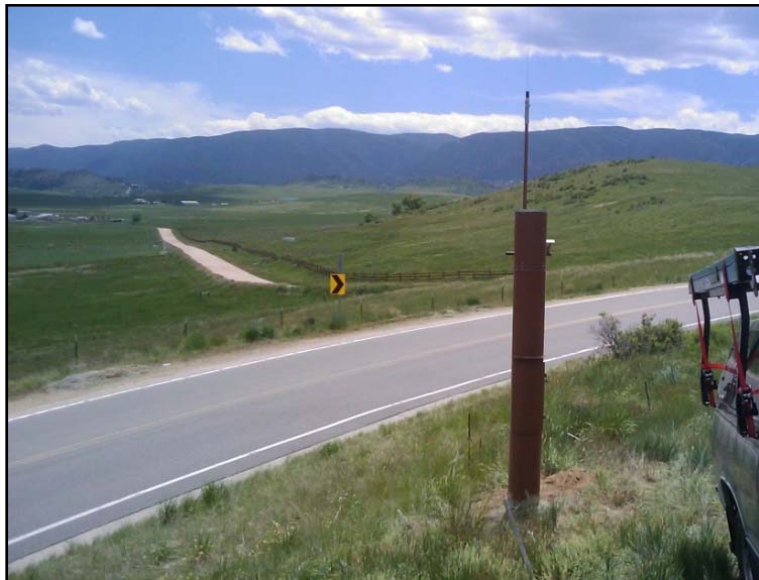


Photo 3-18. Dakan Road P

The mid-season low impact inspection was performed on June 30, 2010. All tested equipment was in working order.

On October 29, 2010 winter shut-down activities were performed by removing the transmitter.

3.19. Tomah Road Wx (ID 2990)

The pre-season inspection was conducted on March 18, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.



Photo 3-19. Tomah Road Wx

The mid-season inspection was performed on June 23, 2010. All tested equipment was in working order. The funnel at this site always requires extensive cleaning. A bird of prey likes to dismantle its freshly caught prey while sitting on the rain bucket funnel.

On June 30, 2010 a service call was made to replace the transmitter because it was not processing the analog response from the RH sensor correctly. The faulty transmitter was shipped to Hydrolynx for repair.

A second mid-season inspection was conducted on August 13, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

On December 9, 2010 a final inspection was performed. Since this is a weather station, it is operational throughout the winter so the transmitter was not removed. All equipment was checked, cleaned and tested. The transmitter was reporting the 2993 ID with no defined sensor, so the 2993 ID was turned off. All equipment was in working order.

3.20. West Creek Repeater (ID 3000)

The mid-season inspection was conducted on July 7, 2010. All equipment was checked, cleaned and tested. All equipment was in working order.

A mid-season inspection was conducted on August 24, 2010. The battery charger was replaced to provide a higher voltage charge to the battery.

The end-season inspection was conducted on November 3, 2010. All equipment was checked, cleaned and tested. All equipment was in working order. Don van Wie installed a newer version of the ALERT2 Firmware.



Photo 3-20. West Creek Repeater

3.21. Highway 105 at East Plum Creek (ID 3010)

On January 13, 2010, the solar panel mount was changed to point the panel due south.

On May 21, 2010 a PT was added to the site. The PT conduit runs under the bridge deck onto one of the supports in the creek next to the painted staff gage.

On June 23, 2010 the site was visited to replace the 12V sealed battery.

On August 24, 2010, the site was visited to remove a spider web from the pavement IR sensor.

On October 29, 2010 winter shut-down activities were performed. The transmitter was removed and the PT was pulled up into its winter location. All equipment was in working order. During the winter months, the site will continue to provide webcam images and temperature data to <http://www.wunderground.com/weatherstation/WXDailyHistory.asp?ID=KCOLARKS11>.



Photo 3-21. Highway 105 at Plum Creek

3.22. West Creek Wx (ID 3020)

The mid-season low impact inspection was performed on June 23, 2010. All tested equipment was in working order.

The mid-season inspection was performed on August 24, 2010. All tested equipment was in working order.

On November 2, 2010 a final inspection was performed. Since this is a weather station, it is operational throughout the winter so the transmitter was not removed. All equipment was checked, cleaned and tested. All equipment was in working order.



Photo 3-22. West Creek Wx

4. SUMMARY OF SERVICE CALLS

- Pine Cliff PS (ID 2810)
 - Tipping bucket
- Bayou Gulch PS (ID 2850)
 - PT/Transmitter
- Rampart range Road P (ID 2970)
 - Antenna System
- Dakan Road P/RP (ID 2980)
 - Change to ALERT/Repeater configuration
 - Changed CR200 program
- Tomah Road Wx (ID 2990)
 - Transmitter
- West Creek Repeater (ID 3000)
 - New battery charger
 - Update ALERT2 software
- Highway 105 at East Plum Creek P (ID 3010)
 - Battery
 - Pavement IR sensor

Table 4-1. Table of Service Calls

Site ID	Station Name	SERVICE/ISSUE								
		Transmitter	Radio/ Amp	Antenna	Battery	Tipping Bucket	Solar Panel	Grounding	PT	Sensor
2710	Highlands Ranch									
2730	Salisbury Park									
2750	Castle Rock									
2810	Pine Cliff					X				
2820	Haskins Gulch									
2840	Sulphur Gulch									
2850	Cherry Creek at Bayou Gulch	X							X	
2860	Cherry Creek at Stroh Road									
2870	Cherry Creek at Cottonwood									
2900	Russelville Gulch									
2910	East Cherry Creek									
2920	West Cherry Head									
2930	Spring Valley Road									
2940	Willow Creek									
2950	DC Public Works									
2960	Indian Creek									
2970	Rampart Range Road		X	X						
2980	Dakan Road	X								
2990	Tomah Road	X								
3000	West Creek Repeater				X					
3010	Highway 105 at E Plum Creek				X					X
3020	West Creek									

5. SPARE EQUIPMENT

5.1. Inventory on Hand

- 2x Hydrolynx tipping bucket
- 1x High Sierra tipping bucket
- 1x Hydrolynx top section
- 1x High Sierra top section
- 1x Hydrolynx 5096 Rain/PT
- 2x Hydrolynx 5096
- 1x Hydrolynx 5096 Full Weather
- 1x High Sierra 3206
- 2x Hydrolynx full PT setup (100')
- 1x High Sierra PT signal conditioning box with signal cable
- 1x Hydrolynx 50386 repeater in Nema enclosure

5.2. Recommendations

WET recommends the purchase of the following spare equipment:

- 3x Maxon VHF radios
- 3x polyphasers
- 2x omni antennas
- 2x solar panels
- 5x batteries

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	CC at Cottonwood	Date:	19-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	9:24
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem 2010 System Startup

Action Taken: Weather: Cloudy and cold: 30 F. No wind.
 Replaced desiccant
 Cleaned tipping bucket
 Calibrated tipping bucket

Site Notes: Tipping bucket had a considerable amount of ice in one bucket that had to be chipped out to perform calibration

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	CC at Cottonwood	Date:	19-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	12:21
		Status:	OK

Configuration Changes	
Part #	Location
BY-002	2870

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	
Rx Freq:	
Fwd Power:	3.5
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-002	12.98	12.83

Problem 2010 System Startup

Action Taken: Weather: cloudy & cold (30 F), no wind
 Cleaned tipping bucket
 Cleaned funnel
 Cleaned solar panel
 Unable to calibrate tipping bucket because of freezing weather
 Replaced desiccant
 Replaced battery (220-Good, 13.39 V)
 Tested solar panel
 Tested radio - low forward power
 Tested battery
 Test transmissions were received by base station

Site Notes: Radio had a low forward power of 3.5 W. Continue to watch.

Follow-Up Calibrate tipping bucket
 Calibrate PT

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Sulphur Gulch	Date:	19-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	12:33
		Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>
BY-2850	2840
795	2840
BY-WET03	9000

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance	
<i>Switches:</i>	
<i>Jumpers:</i>	
<i>Eprom:</i>	
<i>Tx Freq:</i>	169.525
<i>Rx Freq:</i>	
<i>Fwd Power:</i>	4.9
<i>Rev Power:</i>	0.0
<i>SWR</i>	1

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>
BY-2850	12.78	12.45

Problem 2010 System Startup

Action Taken: Weather: cloudy & cold (25 F) and breezy
 Installed solar panel (SN: 795)
 -unregulated voltage = 21.36 V
 Replaced desiccant
 Replaced battery (248 - Best, 13.37 V)
 Tested radio
 Tested battery
 Tested solar panel

Site Notes:

Follow-Up Calibrate tipping bucket
 Calibrate PT

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Salisbury Park	Date:	19-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	14:16
		Status:	OK

Configuration Changes	
Part #	Location
BY-003	2730

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	4.3
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-003	12.83	12.52

Problem 2010 System Startup

Action Taken: Weather: cloudy & cold (30 F) & breezy
 Replaced battery (231 - Good, 13.8), Old battery: (77 - Bad, 11.7 V)
 Replaced desiccant
 Tested solar panel: unregulated = 12.98 v - regulated = 12.83 v -check solar panel next time
 Tested radio & tipping bucket
 Sling PS: Dry bulb: 32 F -Wet bulb: Below freezing - DP: freezing

Site Notes:

Follow-Up Check solar panel, calibrate tipping bucket, replace 3 rivets

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	CC at Stroh Road	Date:	19-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	15:21
		Status:	OK

Configuration Changes	
Part #	Location
BY-004	2860

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	
Rx Freq:	
Fwd Power:	4.1
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-004	12.89	12.65

Problem 2010 System Startup

Action Taken: Cleaned funnel
 Cleaned solar panel
 Replaced desiccant
 Replaced battery (229 - Good, 13.37 V, BY-004)
 Tested battery
 Tested solar panel
 Tested radio
 Tested tipping bucket

Site Notes:

Follow-Up Clean funnel better

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Bayou Gulch	Date:	19-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	15:59
		Status:	OK

Configuration Changes	
Part #	Location
BY-005	2850

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	
Rx Freq:	
Fwd Power:	4.9
Rev Power:	0.1
SWR	1.33

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-005	12.95	12.65

Problem 2010 System Startup

Action Taken: Weather: cloudy and cold (30 F)
 Replaced desiccant
 Replaced battery (BY-005, 237 - Good, 13.41 V)
 Cleaned funnel
 Tested battery
 Tested radio
 Tested solar panel
 Tested tipping bucket
 Data received by UDFCD

Site Notes:
Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Russelville Gulch	Date:	19-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	16:52
		Status:	OK

Configuration Changes	
Part #	Location
BY-006	2900
BY-DC02	9000

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	
Rx Freq:	
Fwd Power:	20.0
Rev Power:	0.5
SWR	1.38

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-006	12.49	12.22

Problem 2010 System Startup

Action Taken: Weather: cloudy and cold (30 F) and breezy
 Replaced desiccant
 Replaced battery (BY-006, 358 - Good, 13.43 V)
 Old Battery (224 - Bad)
 Tested solar panel
 -unregulated: 15.2 V
 Tested battery
 Tested radio
 Tested tipping bucket
 Received by base station

Site Notes:
Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Willow Creek	Date:	19-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	17:45
		Status:	OK

Configuration Changes	
Part #	Location
BY-007	2940

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	3.3
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-007	12.91	12.72

Problem 2010 System Startup

Action Taken: Weather: cloudy and cold (25 F) and breezy
 Replaced desiccant
 Replaced battery (BY-007, 330 - Good, 13.40 V)
 Tested battery
 Tested radio
 Tested solar panel
 Tested tipping bucket
 Received by base station

Site Notes:
Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Spring Valley Road	Date:	20-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	11:34
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	4.0
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-02	13.02	12.78

Problem 2010 System Startup

Action Taken: Weather: cloudy and cold (30 F)
 Replaced desiccant
 Cleaned solar panel
 Tested battery (229 - Good, 13.21 V)
 Tested solar panel
 Tested radio
 Tested tipping bucket
 Received by base station

Site Notes:

Follow-Up Calibrate tipping bucket

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service LogSite Name: **East Cherry**Date: **20-Feb-10**Time: **11:39**Service Type: **Start Up**Technician: **EEC/RTW**Status: **OK****Configuration Changes**

Part #	Location
BY-008	2910
BY-DC03	9000

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error
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Tx Maintenance

Part #	Ref V	Freq Err	Deviation	ROM Batt
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Settings and Performance

Switches:

Jumpers:

Eprom:

Tx Freq:

Rx Freq:

Fwd Power: **4.4**Rev Power: **0.0**SWR **1****Test Transmission**

Port	Time	Count	Measure	Predicted
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Battery Tests

Battery #	V Quiescent	V Load
BY-DC03	12.82	12.59

Problem 2010 System Startup

Action Taken: Weather: cloudy and cold (30 F) and breezy
 Replaced desiccant
 Replaced battery (BY-008, 343 - Good, 13.60 V)
 Tested solar panel
 Tested radio
 Tested battery
 Tested tipping bucket
 Received by base station

Site Notes:**Follow-Up** Calibrate tipping bucket

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	West Cherry Head	Date:	20-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	12:24
		Status:	OK

Configuration Changes	
Part #	Location
BY-009	2920

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	Low
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	4.0
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-009	12.88	12.79

Problem 2010 System Startup

Action Taken: Weather: cloudy and cold (30 F) and breezy
 Replaced desiccant
 Replaced battery (BY-009, 320 - Good, 13.34 V)
 Tested radio
 Tested battery
 Tested tipping bucket
 Received by base station

Site Notes:

Follow-Up Calibrate tipping bucket
 Needs solar panel

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Castle Rock	Date:	20-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	15:02
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	8.9
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-2240	13.21	12.86

Problem 2010 System Startup

Action Taken: Weather: cloudy and cold (25 F). Breezy and light snow.
 Replaced dessicant
 Tested battery (228 - Good, 13.83 V)
 Tested radio
 Tested solar panel
 Tested tipping bucket
 Received by base station

Site Notes:

Follow-Up Calibrate tipping bucket

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Tomah Road	Date:	20-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	15:21
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	3.2
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-03	12.97	12.60

Problem 2010 System Startup

Action Taken: Weather: Cloudy and cold (25 F), light snow
 Gate locked, had to walk in
 Replaced battery (240 - Good, 13.40 V)
 Old battery: 180 - bad
 Tested solar panel
 Tested radio
 Tested battery
 Tested tipping bucket
 Received by base station

Site Notes:

Follow-Up Calibrate tipping bucket
 Get gate code

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service LogSite Name: **Indian Creek**Date: **20-Feb-10**Time: **16:06**Service Type: **Start Up**Technician: **EEC/RTW**Status: **OK****Configuration Changes**

Part #	Location
BY-011	2960
BY-DC04	9000

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error
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Tx Maintenance

Part #	Ref V	Freq Err	Deviation	ROM Batt
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Settings and Performance

Switches:

Jumpers:

Eprom:

Tx Freq:

Rx Freq:

Fwd Power: **4.0**Rev Power: **0.1**SWR **1.38****Test Transmission**

Port	Time	Count	Measure	Predicted
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Battery Tests

Battery #	V Quiescent	V Load
BY-011	12.89	12.55

Problem 2010 System Startup

Action Taken: Weather: cloudy, cold (30 F) and light snow
 Replaced desiccant
 Replaced battery (BY-011, 280 - Weak, 13.34 V)
 Tested solar panel
 Tested radio
 Tested battery
 Tested tipping bucket

Site Notes:**Follow-Up**

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Rampart Range Rd	Date:	20-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	18:14
		Status:	OK

Configuration Changes	
Part #	Location
BY-012	2970
BY-DC07	9000

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	q
Jumpers:	
Eprom:	
Tx Freq:	
Rx Freq:	
Fwd Power:	3.5
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-012	12.73	12.65

Problem 2010 System Startup

Action Taken: Weather: Cloudy, cold (25 F), light snow
 Replaced desiccant
 Replaced battery (BY-012, 310 - Weak, 13.02 V)
 Old battery: 27 - Bad
 Tested solar panel
 Tested battery
 Tested radio
 Tested tipping bucket
 Received by base station

Site Notes:

Follow-Up Calibrate tipping bucket

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service LogSite Name: **Pine Cliff Road**Date: **21-Feb-10**Time: **10:32**Service Type: **Start Up**Technician: **EEC/RTW**Status: **OK****Configuration Changes**

Part #	Location
BY-013	2810
BY-WET04	9000

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error
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Tx Maintenance

Part #	Ref V	Freq Err	Deviation	ROM Batt
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Settings and Performance

Switches:

Jumpers:

Eprom:

Tx Freq: **171.100**

Rx Freq:

Fwd Power: **3.1**Rev Power: **0.0**SWR **1****Test Transmission**

Port	Time	Count	Measure	Predicted
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Battery Tests

Battery #	V Quiescent	V Load
BY-013	12.60	12.33

Problem 2010 System Startup

Action Taken: Weather: cloudy, cold (25 F) and breezy
 Replaced desiccant
 Replaced battery (BY-013, 356 - Good, 13.55 V)
 Tested solar panel
 Tested radio
 Tested battery
 Tested tipping bucket
 Received by base station

Site Notes:

Follow-Up Calibrate tipping bucket
 Calibrate PT

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Dakan Rd	Date:	21-Feb-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	11:19
		Status:	OK

Configuration Changes	
Part #	Location
BY-014	2980
BY-DC05	9000

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	
Rx Freq:	
Fwd Power:	3.1
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-014	12.77	12.57

Problem 2010 System Startup

Action Taken: Weather: cloudy, cold (20 F) and light snow
 Replaced desiccant
 Replaced battery (BY-014, 285 - Weak, 13.38 V)
 Tested solar panel
 Tested radio
 Tested battery
 Tested tipping bucket
 Received by base station

Site Notes:

Follow-Up Calibrate tipping bucket
 Install directional antenna
 Convert transmitter to repeater

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Rampart Range Rd	Date:	05-Mar-10
Service Type:	Maintenance	Technician:	EEC
		Time:	10:30
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem Omni antenna not consistently received by base station

Action Taken: Replaced omni antenna with a yagi 9dB directional antenna from Maxon
 Initially pointed antenna to UDFCD base in Denver, but poor reception persisted
 Changed frequency of radio to 171.100 MHz and directed antenna towards West Creek Repeater
 This seemed to improve reception
 Will watch reception quality for the rest of March
 Calibrated tipping bucket (13 tips -20 ml = 2.6% Error = Good)

Site Notes:
Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name: Indian Creek	Date: 05-Mar-10	Time: 15:00	
Service Type: Start Up	Technician: EEC	Status: OK	

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem 2010 System Startup

Action Taken: Calibrated tipping bucket (13 tips -0 ml = 0.0% error = excellent)

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	CC at Cottonwood	Date:	16-Mar-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	11:21
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error
2873	0.014	-0.0542	0.0191

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted
2873	12:22	866	12.17 ftH2	0
2873	12:23	675	9.47 ftH2	0
2873	12:24	483	6.76 ftH2	0
2873	12:25	279	3.88 ftH2	0
2873	12:26	113	1.53 ftH2	0
2873	12:27	3	0.00 ftH2	0

Battery Tests		
Battery #	V Quiescent	V Load

Problem 2010 System Startup

Action Taken: Weather: sunny, warm (55 F) - Calibrated tipping bucket (12 tips + 3 mL = 0.3% error = Good) - Calibrated PT
 {Auto Entry: Created new sensor definition. Sensor 2873, Site 2870. New calibration [Slope(1), Calibration Offset(0), Reference Level(0), Calibration Date(3/16/2010 12:04:27), Max Count(2047), Min Count(0), Pos Delta(2047), Neg Delta(2047), Rating Shift(0)]}.
 {Auto Entry: Modified calibration for sensor 2873. New calibration [Slope(1), Calibration Offset(0), Reference Level(0), Calibration Date(3/16/2010 12:04:27), Max Count(2047), Min Count(0), Pos Delta(2047), Neg Delta(2047), Rating Shift(0)]}.
 {Auto Entry: Modified calibration for sensor 2873. New calibration [Slope(1), Calibration Offset(0), Reference Level(0), Calibration Date(3/16/2010 12:04:27), Max Count(2047), Min Count(0), Pos Delta(2047), Neg Delta(2047), Rating Shift(0)]}.
 {Auto Entry: Calibrated sensor 2873 by linear regression. Modified calibration data. New calibration [Slope(0.0141), Calibration Offset(-0.0542), Std Error(0.0191), Calibration Date(3/16/2010 12:28:45)]}.

Site Notes:
Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log

Site Name: Sulphur Gulch

Date: 16-Mar-10

Time: 13:21

Service Type: Start Up

Technician: EEC/RTW

Status: OK

Configuration Changes

Part # Location

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error
2843	0.01	0.1355	0.0363

Tx Maintenance

Part # Ref V Freq Err Deviation ROM Batt

Settings and Performance

Switches:

Jumpers:

Eprom:

Tx Freq:

Rx Freq:

Fwd Power:

Rev Power:

SWR

Test Transmission

Port	Time	Count	Measure	Predicted
2843	13:35	1213	12.22 ftH2	1263
2843	13:42	1240	12.58 ftH2	1299
2843	13:43	868	8.83 ftH2	920
2843	13:44	590	6.05 ftH2	639
2843	13:45	305	3.20 ftH2	352
2843	13:46	121	1.35 ftH2	165

Battery Tests

Battery # V Quiescent V Load

Problem Spring 2010 Start Up

Action Taken: Sunny 55 degrees, light wind
 Checked Rain Bucket Calibration (13 tips - 12mL, 1.3% error)
 Calibrated PT & Flushed Riser Pipe

{Auto Entry: Calibrated sensor 2843 by linear regression. Modified calibration data. New calibration [Slope(0.0100), Calibration Offset(0.1355), Std Error(0.0363), Calibration Date(3/16/2010 13:49:21)]}.

Site Notes:**Follow-Up**

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Salisbury Park	Date:	16-Mar-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	14:18
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem 2010 System Startup

Action Taken: Weather: sunny, breezy and warm (55 F)
 Calibrated tipping bucket (13 tips +0 ml = 0.0 % error)
 Sling psychrometer - dry bulb = 57 F - wet bulb = 40 F

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	CC at Stroh Road	Date:	16-Mar-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	14:52
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error
2863	0.014	-0.0805	0.029

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted
2863	15:28	886	12.48 ftH2	0
2863	15:29	685	9.63 ftH2	0
2863	15:30	478	6.71 ftH2	0
2863	15:31	262	3.64 ftH2	0
2863	15:32	120	1.60 ftH2	0
2863	15:33	5	0.00 ftH2	0

Battery Tests		
Battery #	V Quiescent	V Load

Problem Spring Start-Up 2010

Action Taken: Sunny 60 degrees light wind
 Cleaned rain gage funnel & tested rain gage calibration - Calibrated PT
 {Auto Entry: Created new sensor definition. Sensor 2863, Site 2860. New calibration [Slope(1), Calibration Offset(0), Reference Level(0), Calibration Date(3/16/2010 14:54:16), Max Count(2047), Min Count(0), Pos Delta(2047), Neg Delta(2047), Rating Shift(0)]}.
 {Auto Entry: Modified calibration for sensor 2863. New calibration [Slope(1), Calibration Offset(0), Reference Level(0), Calibration Date(3/16/2010 14:54:16), Max Count(2047), Min Count(0), Pos Delta(2047), Neg Delta(2047), Rating Shift(0)]}.
 {Auto Entry: Calibrated sensor 2863 by linear regression. Modified calibration data. New calibration [Slope(0.0142), Calibration Offset(-0.0805), Std Error(0.0290), Calibration Date(3/16/2010 15:34:08)]}.

Site Notes:

Follow-Up Flush out intake better next trip

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Bayou Gulch	Date:	16-Mar-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	15:55
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error
2853	0.01	-0.8064	0.1751

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted
2853	16:10	1349	12.40 ftH2	1369
2853	16:11	1073	9.69 ftH2	1092
2853	16:12	761	6.65 ftH2	782
2853	16:13	460	3.70 ftH2	481
2853	16:14	231	1.45 ftH2	251

Battery Tests		
Battery #	V Quiescent	V Load

Problem 2010 System Startup

Action Taken: Calibrated tipping bucket (12 tips +12mL = 1.2% error)
 Calibrated PT
 Flushed PT riser pipe

{Auto Entry: Calibrated sensor 2853 by linear regression. Modified calibration data. New calibration [Slope(0.0098), Calibration Offset(-0.8064), Std Error(0.1751), Calibration Date(3/16/2010 16:16:48)]}.

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Russelville Gulch	Date:	16-Mar-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	16:43
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem Spring 2010 start up
Action Taken: Checked rain gage calibration (12 tips + 11mL, 1.2% error)
Site Notes:
Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Willow Creek	Date:	16-Mar-10
Time:	17:23	Service Type:	Start Up
Technician:	EEC/RTW	Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem 2010 System Startup

Action Taken: Weather: sunny, breezy and warm (50 F)
 Calibrated tipping bucket (12 tips +23mL = 2.4%)

Site Notes:
Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Castle Rock	Date:	16-Mar-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	18:08
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem 2010 System Startup

Action Taken: Calibrated tipping bucket (12 tips + 1mL = 0.1% error)

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service LogSite Name: **Spring Valley Road**Date: **18-Mar-10**Time: **10:33**Service Type: **Start Up**Technician: **EEC/RTW**Status: **OK****Configuration Changes**

Part #	Location

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance

Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance

Switches:

Jumpers:

Eprom:

Tx Freq:

Rx Freq:

Fwd Power:

Rev Power:

SWR

Test Transmission

Port	Time	Count	Measure	Predicted

Battery Tests

Battery #	V Quiescent	V Load

Problem 2010 System Startup

Action Taken: Weather: sunny, breezy and warm (50 F)
 Calibrated tipping bucket (13 tips -12 mL = 1.3% error)
 Sling psychrometer: dry bulb = 52 F , wet bulb = 37 F

Site Notes:**Follow-Up**

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name: East Cherry	Date: 18-Mar-10	Time: 11:31	
Service Type: Start Up	Technician: EEC/RTW	Status: OK	

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem Spring 2010 start up
Action Taken: Calibrated tipping bucket (12 tips + 5 mL, 0.5% error)
Site Notes:
Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	West Cherry Head	Date:	18-Mar-10
Time:	12:05	Service Type:	Start Up
Technician:	EEC/RTW	Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem 2010 System Startup

Action Taken: Weather: sunny, breezy, warm (55 F)
Calibrated tipping bucket (13 tips -14mL = 1.5% error)

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Tomah Road	Date:	18-Mar-10
Service Type:	Start Up	Technician:	EEC/RTW
			Time: 12:50
			Status: OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem Spring 2010 start up

Action Taken: Calibrate tipping bucket (12 tips + 1 mL, 0.1% error)
 Collect wet/dry bulb data from sling psychrometer & compare with station data. (Dry bulb 67.1, Wet 44.6)
 (Dry 2 68.0, Wet2 44.6)

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Pine Cliff Road	Date:	18-Mar-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	14:13
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error
2813	0.101	-0.1007	0.0655

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted
2813	14:46	120	12.14 ftH2	124
2813	14:47	94	9.26 ftH2	95
2813	14:48	65	6.35 ftH2	65
2813	14:49	37	3.61 ftH2	38
2813	14:50	17	1.59 ftH2	17
2813	14:51	0	0.00 ftH2	1

Battery Tests		
Battery #	V Quiescent	V Load

Problem 2010 System Startup

Action Taken: Weather: sunny, breezy and warm (65 F)
 Calibrated tipping bucket (13 tips -4mL = 0.4% error)
 Calibrated PT
 Flushed PT

{Auto Entry: Calibrated sensor 2813 by linear regression. Modified calibration data. New calibration [Slope(0.1008), Calibration Offset(-0.1007), Std Error(0.0655), Calibration Date(3/18/2010 14:51:26)]}.

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Operations Center	Date:	18-Mar-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	15:18
		Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>
BY-015	2950
BY-DC01	9000

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance	
<i>Switches:</i>	
<i>Jumpers:</i>	
<i>Eprom:</i>	
<i>Tx Freq:</i>	
<i>Rx Freq:</i>	
<i>Fwd Power:</i>	4.8
<i>Rev Power:</i>	0.1
<i>SWR</i>	1.34

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>
BY-DC01	12.93	12.80

Problem Spring start up 2010

Action Taken: Installed transmitter
 Tested Solar Panel
 Tested Radio
 Calibrated rain gage (12 tips + 3 mL, 0.3% error)
 Tested battery - Battery Score 325 Good
 Replaced Desiccant

Site Notes: Sunny, 65 degrees F

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Haskins Gulch Conf	Date:	18-Mar-10
Service Type:	Start Up	Technician:	EEC/RTW
		Time:	15:58
		Status:	OK

Configuration Changes	
Part #	Location
BY-016	2820

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	HSE radio, cant re-progra
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	4.8
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-016	12.94	12.79

Problem Spring start up 2010

Action Taken: Installed transmitter
 tested battery (score 258 best)
 calibrated rain gage (12 tips + 6 mL, 0.6% error)
 tested radio
 replaced desiccant

Site Notes:

Follow-Up Replace rain gage military connector

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Highlands Ranch WTP	Date:	23-Mar-10
Service Type:	Start Up	Technician:	EEC
		Time:	11:38
		Status:	OK

Configuration Changes	
Part #	Location
BY-017	2710

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	5.5
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-017	12.55	12.36

Problem 2010 System Startup

Action Taken: Cleaned tipping bucket and solar panel
 Replaced desiccant
 Replaced battery (232 - Good, 13.32 V)
 Calibrated tipping bucket (13 tips -16mL = 1.7% error)
 Tested solar panel
 Tested battery
 Tested radio

Site Notes: Weather: partly cloudy, breezy, and cool (45 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Dakan Rd	Date:	28-Apr-10
Service Type:	Start Up	Technician:	RJN/EEC
		Time:	10:32
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem

- Action Taken:**
- replaced 5096 with CSI repeater in same can.
 - changed the solar panel to bypass regulator
 - need full voltage for built-in regulator of CR200
 - changed out tipping bucket to work with CR200
 - site now has CR200, RF500M, and Maxon SD125
- send two tips, received both through West Creek

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Rampart Range Rd	Date:	28-Apr-10
Service Type:	Start Up	Technician:	RJN/EEC
		Time:	12:24
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	q
Jumpers:	
Eprom:	
Tx Freq:	
Rx Freq:	
Fwd Power:	5.0
Rev Power:	0.3
SWR	1.58

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem

Action Taken: -changed directional antenna configuration
 -only gets repeated by West Creek sporadically
 -needs amp

Site Notes:

Follow-Up -needs amp

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name: Bayou Gulch	Date: 15-Jun-10	Time: 8:17	
Service Type: Start Up	Technician: EEC	Status: OK	

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem PT is transmitting every minute

Action Taken: Unplugged PT from transmitter

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Rampart Range Rd	Date:	23-Jun-10
Service Type:	Service Call	Technician:	RJN
			Time: 10:09
			Status: OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: -added amplifier, left directional antenna
-replaced battery

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name: Hwy 105	Date: 23-Jun-10	Time: 12:35	
Service Type: Service Call	Technician: RJN	Status: OK	

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem Batteries are not charging

Action Taken: -checked regulator
 -voltage from solar panel - 20V
 -drops to 12V when connected to the regulator.....

Site Notes:

Follow-Up try new regulator

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Tomah Road	Date:	23-Jun-10
Service Type:	Maintenance	Technician:	RJN
		Time:	13:26
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	5.0
Rev Power:	0.3
SWR	1.58

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-03	13.65	13.37

Problem

Action Taken: -cleaned solar panel
 -cleaned bucket and funnel - very dirty as usual
 -calibrated bucket w/ 948ml - 12 tips + 6ml = -0.6%
 -replaced dessicant

Site Notes: gate code 0912

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Tomah Road	Date:	30-Jun-10
Service Type:	Maintenance	Technician:	RJN/EEC
		Time:	9:20
		Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: -replaced transmitter to fix RH issue
-need to send old transmitter back to check analog response

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	West Cherry Head	Date:	30-Jun-10
Service Type:	Low Impact Check	Technician:	RJN/EEC
			Time: 10:26
			Status: OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem

Action Taken: -tipped bucket twice - received 2 through repeater

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name: East Cherry	Date: 30-Jun-10	Time: 10:46	
Service Type: Low Impact Check	Technician: RJN/EEC	Status: OK	

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: -tipped bucket twice - received 2 through repeater

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Spring Valley Road	Date:	30-Jun-10
Service Type:	Maintenance	Technician:	RJN/EEC
		Time:	11:04
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	4.8
Rev Power:	0.2
SWR	1.52

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-02	13.84	13.65

Problem

- Action Taken:** -sunny, windy
 -cleaned solar panel
 -cleaned bucket/funnel
 -calibrated tipping bucket w/ 948ml - 13 tips + 16ml = +1.6%
 -tipped bucket twice - received 2 through repeater

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Willow Creek	Date:	30-Jun-10
Time:	12:03	Service Type:	Low Impact Check
Technician:	RJN/EEC	Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: -tipped bucket twice - received 2 through repeater

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Russelville Gulch	Date:	30-Jun-10
Time:	12:41	Service Type:	Low Impact Check
Technician:	RJN/EEC	Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: -tipped bucket twice - received 2 through repeater

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log		
Site Name: Bayou Gulch	Date: 30-Jun-10	Time: 13:45
Service Type: Maintenance	Technician: RJN/EEC	Status: OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	
Rx Freq:	
Fwd Power:	7.0
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-005	13.56	13.41

Problem

- Action Taken:** -sunny, windy
 -cleaned solar panel
 -cleaned bucket/funnel
 -calibrated bucket w/ 948ml - 12 tips + 12ml = -1.2%
 -tipped bucket twice - received 2 through repeater
 -removed PT for repair/replacement

Site Notes:

- Follow-Up** -install new PT

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	CC at Stroh Road	Date:	30-Jun-10
Service Type:	Maintenance	Technician:	RJN/EEC
		Time:	15:11
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error
2863	0.014	-0.3791	0.1994

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	
Rx Freq:	
Fwd Power:	6.0
Rev Power:	0.3
SWR	1.51

Test Transmission				
Port	Time	Count	Measure	Predicted
2863	15:43	1332	18.31 ftH2	1295
2863	15:44	806	10.85 ftH2	770
2863	15:45	545	7.12 ftH2	507
2863	15:46	298	3.65 ftH2	263
2863	15:47	135	1.32 ftH2	99
2863	15:48	3	0.00 ftH2	6

Battery Tests		
Battery #	V Quiescent	V Load
BY-004	13.71	13.49

Problem

- Action Taken:** -sunny, windy, hot
 -cleaned solar panel
 -cleaned bucket/funnel
 -calibrated bucket w/ 948ml - 12 tips + 24ml = -2.4%
 -tipped bucket twice - received 2 through repeater

{Auto Entry: Calibrated sensor 2863 by linear regression. Modified calibration data. New calibration [Slope(0.0140), Calibration Offset(-0.3791), Std Error(0.1994), Calibration Date(6/30/2010 15:49:21)]}.

Site Notes:

- Follow-Up** -needs new riser pipe and intake pipe.

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Salisbury Park	Date:	30-Jun-10
Service Type:	Maintenance	Technician:	RJN/EEC
		Time:	16:09
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	6.0
Rev Power:	0.1
SWR	1.3

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-003	12.62	1.44

Problem

Action Taken: -sunny, hot
 -cleaned solar panel
 -cleaned bucket/funnel
 -calibrated bucket w/ 948 ml - 13 tips + 12ml = -1.2%

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Sulphur Gulch	Date:	30-Jun-10
Service Type:	Maintenance	Technician:	RJN/EEC
		Time:	17:21
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error
2843	0.01	-0.6031	0.2451

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	5.5
Rev Power:	0.1
SWR	1.31

Test Transmission				
Port	Time	Count	Measure	Predicted
2843	17:23	1592	15.04 ftH2	1490
2843	17:24	1244	11.56 ftH2	1142
2843	17:25	910	8.25 ftH2	811
2843	17:26	607	5.22 ftH2	508
2843	17:27	376	2.88 ftH2	274
2843	17:28	201	1.19 ftH2	105
2843	17:29	24	0.00 ftH2	-14

Battery Tests		
Battery #	V Quiescent	V Load
BY-2850	13.29	13.06

Problem

- Action Taken:** -sunny, hot
 -cleaned solar panel
 -cleaned bucket/funnel
 -calibrated bucket w/ 948ml - 13 tips + 16ml = -1.6%
 -tipped bucket twice - received 2 through repeater

{Auto Entry: Calibrated sensor 2843 by linear regression. Modified calibration data. New calibration [Slope(0.0098), Calibration Offset(-0.6031), Std Error(0.2451), Calibration Date(6/30/2010 17:30:00)]}.

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log

Site Name: **CC at Cottonwood** Date: **01-Jul-10** Time: **10:25**
 Service Type: **Maintenance** Technician: **RJN/EEC** Status: **OK**

Configuration Changes

Part #	Location

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error
2873	0.014	-0.3438	0.0883

Tx Maintenance

Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance

Switches:
 Jumpers:
 Eprom:
 Tx Freq:
 Rx Freq:
 Fwd Power: **4.8**
 Rev Power: **0.2**
 SWR **1.51**

Test Transmission

Port	Time	Count	Measure	Predicted
2873	11:27	1110	15.52 ftH2	1105
2873	11:28	1105	15.34 ftH2	1092
2873	11:29	822	11.32 ftH2	807
2873	11:30	555	7.57 ftH2	541
2873	11:31	287	3.79 ftH2	273
2873	11:34	1160	16.03 ftH2	1141
2873	11:35	908	12.51 ftH2	891
2873	11:36	639	8.68 ftH2	619
2873	11:37	323	4.22 ftH2	303
2873	11:38	135	1.56 ftH2	114

Battery Tests

Battery #	V Quiescent	V Load
BY-002	13.44	13.26

Problem 2010 Mid Season Maintenance

Action Taken: Applied silicone to loose connection between standpipe and PT conduit
 Tested radio
 Tested battery
 Tested solar panel
 Calibrated tipping bucket (12 tips +3 ml = 13 tips = 0.3% error)
 Calibrated PT
 1/2 in. conduit exiting riser pipe sheared while trying to remove cap: replace part in future visit

{Auto Entry: Calibrated sensor 2873 by linear regression. Modified calibration data. New calibration [Slope(0.0141), Calibration Offset(-0.3438), Std Error(0.0883), Calibration Date(7/1/2010 11:41:08)].}

Site Notes: Weather: Hot (80 F) and sunny

Follow-Up Replace 1/2 in. conduit at riser pipe because it sheared while attempting to remove cap

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Highlands Ranch WTP	Date:	01-Jul-10
Service Type:	Maintenance	Technician:	EEC
		Time:	12:44
		Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	7.0
Rev Power:	0.3
SWR	1.47

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>
BY-017	13.83	13.49

Problem 2010 Mid Season Maintenance

Action Taken: Tested radio
 Tested battery
 Tested solar panel
 Calibrated tipping bucket (exactly 13 tips = 0% error)

Site Notes: Weather: hot (90 F) and sunny

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service LogSite Name: **Pine Cliff Road**Date: **01-Jul-10**Time: **17:13**Service Type: **Maintenance**Technician: **EEC**Status: **OK****Configuration Changes**

Part #	Location

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error
2813	0.098	-0.1454	0.0731

Tx Maintenance

Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance

Switches:

Jumpers:

Eprom:

Tx Freq: **171.100**

Rx Freq:

Fwd Power: **5.9**Rev Power: **0.0**SWR **1****Test Transmission**

Port	Time	Count	Measure	Predicted
2813	17:30	168	16.38 ftH2	163
2813	17:31	130	12.64 ftH2	126
2813	17:32	90	8.67 ftH2	87
2813	17:33	47	4.40 ftH2	45
2813	17:34	19	1.62 ftH2	17
2813	17:35	0	0.00 ftH2	1

Battery Tests

Battery #	V Quiescent	V Load
BY-013	13.72	13.54

Problem 2010 Mid Season Maintenance

Action Taken: Tested radio
 Tested battery
 Tested solar panel
 Calibrated tipping bucket (13 tips -6 ml = 0.6 % error)
 Calibrated PT

{Auto Entry: Calibrated sensor 2813 by linear regression. Modified calibration data. New calibration [Slope(0.0982), Calibration Offset(-0.1454), Std Error(0.0731), Calibration Date(7/1/2010 17:35:35)].}

Site Notes: Weather: Hot (95 F) and sunny**Follow-Up** Tipping bucket base needs new rivets

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Castle Rock	Date:	01-Jul-10
Service Type:	Maintenance	Technician:	EEC
		Time:	18:35
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	10.3
Rev Power:	0.1
SWR	1.22

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-2240	13.08	12.80

Problem 2010 Mid Season Maintenance

Action Taken: Tested radio
 Tested battery
 Tested solar panel
 Calibrated tipping bucket (13 tips -6 ml = 0.6% error)

Site Notes: Weather: hot (80 F) and partly cloudy

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	West Creek	Date:	07-Jul-10
Service Type:	Maintenance	Technician:	EEC
		Time:	10:17
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	5.1
Rev Power:	0.1
SWR	1.33

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-DC06	14.01	13.82

Problem

- Action Taken:** -cloudy, cool
 -cleaned solar panel
 -cleaned bucket/funnel
 -calibrated bucket w/ 948ml - 13 tips + 5ml = +0.5%
 -tipped bucket twice - got two reports through repeater

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	West Creek Repeater	Date:	07-Jul-10
Service Type:	Maintenance	Technician:	EEC
		Time:	10:56
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	171.100
Fwd Power:	4.0
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem

Action Taken: -added battery ID (3008) to report every 6 hours
 -checked the "receiver on during transmit" box in scadalynx toolbox
 -battery low, but probably because the charger only puts out 12V

Site Notes:

Follow-Up -get a charger that charges at 13-13.5V

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Bayou Gulch	Date:	20-Jul-10
Service Type:	Maintenance	Technician:	EEC
			Time: 12:55
			Status: OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem PT may be bad - frequent transmits of incorrect numbers

Action Taken: Tested PT calibration

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Haskins Gulch Conf	Date:	20-Jul-10
		Time:	13:07
Service Type:	Maintenance	Technician:	EEC
		Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken:

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service LogSite Name: **Bayou Gulch**Date: **20-Jul-10**Time: **13:08**Service Type: **Maintenance**Technician: **EEC**Status: **OK****Configuration Changes**

Part # Location

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error
2853	0.01	-0.9272	0.3275

Tx Maintenance

Part # Ref V Freq Err Deviation ROM Batt

Settings and Performance

Switches:

Jumpers:

Eprom:

Tx Freq:

Rx Freq:

Fwd Power:

Rev Power:

SWR

Test Transmission

Port	Time	Count	Measure	Predicted
2853	14:21	1749	15.93 ftH2	1708
2853	14:22	1333	11.88 ftH2	1295
2853	14:23	938	8.04 ftH2	903
2853	14:26	525	4.04 ftH2	495
2853	14:27	328	2.09 ftH2	296
2853	14:28	77	0.00 ftH2	82

Battery Tests

Battery # V Quiescent V Load

Problem PT may be bad - frequent transmissions and incorrect values**Action Taken:** Tested PT calibration

{Auto Entry: Calibrated sensor 2853 by linear regression. Modified calibration data. New calibration [Slope(0.0096), Calibration Offset(-0.9272), Std Error(0.3275), Calibration Date(7/20/2010 14:28:52)]}.

Site Notes:**Follow-Up**

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log

Site Name: **CC at Cottonwood** Date: **12-Aug-10** Time: **9:51**
 Service Type: **Maintenance** Technician: **EEC** Status: **OK**

Configuration Changes

Part #	Location

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error
2873	0.014	-0.3073	0.0746

Tx Maintenance

Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance

Switches:
 Jumpers:
 Eprom:
 Tx Freq:
 Rx Freq:
 Fwd Power: **5.0**
 Rev Power: **0.1**
 SWR **1.33**

Test Transmission

Port	Time	Count	Measure	Predicted
2873	10:24	1180	16.32 ftH2	1182
2873	10:25	877	12.07 ftH2	880
2873	10:26	598	8.14 ftH2	602
2873	10:27	331	4.35 ftH2	333
2873	10:28	183	2.27 ftH2	185

Battery Tests

Battery #	V Quiescent	V Load
BY-002	13.76	13.51

Problem

Action Taken: 2010 Mid Season Maintenance
 Tested solar panel
 Tested battery
 Tested radio
 Cleaned tipping bucket
 Calibrated tipping bucket (13 tips - 7ml = 13 tips = 0.7% error)
 Calibrated PT

{Auto Entry: Calibrated sensor 2873 by linear regression. Modified calibration data. New calibration [Slope(0.0141), Calibration Offset(-0.3073), Std Error(0.0746), Calibration Date(8/12/2010 10:30:17)]}.

Site Notes: Weather: Partly cloudy and warm (75 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Sulphur Gulch	Date:	12-Aug-10
Service Type:	Maintenance	Technician:	EEC
		Time:	11:01
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	6.5
Rev Power:	0.1
SWR	1.28

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-2850	13.88	13.56

Problem

Action Taken: 2010 Mid Season Maintenance
 Tested solar panel
 Tested battery
 Tested radio
 Cleaned tipping bucket
 Calibrated tipping bucket (13 tips - 12 ml = 13 tips = 1.3% error)
 Calibrated PT

Site Notes: Weather: Partly cloudy and warm (80 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Salisbury Park	Date:	12-Aug-10
Service Type:	Maintenance	Technician:	EEC
		Time:	12:52
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	6.0
Rev Power:	0.1
SWR	1.3

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-003	12.71	12.49

Problem

Action Taken: 2010 Mid Season Maintenance
 Replaced broken rivet
 Cleaned tipping bucket
 Calibrated tipping bucket (12 tips + 5 ml = 13 tips = 0.5% error)
 Tested solar panel
 Tested radio
 Tested battery
 Test transmissions were received by base station

Site Notes: Weather: partly cloudy, breezy and hot (90 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	CC at Stroh Road	Date:	12-Aug-10
Service Type:	Maintenance	Technician:	EEC
		Time:	14:06
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	
Rx Freq:	
Fwd Power:	6.1
Rev Power:	0.3
SWR	1.51

Test Transmission				
Port	Time	Count	Measure	Predicted
2863	14:35	1186	16.14 ftH2	1180
2863	14:36	899	12.08 ftH2	890
2863	14:37	615	8.07 ftH2	604
2863	14:38	332	4.08 ftH2	319
2863	14:39	196	2.13 ftH2	179

Battery Tests		
Battery #	V Quiescent	V Load
BY-004	13.82	13.55

Problem

Action Taken: 2010 Mid Season Maintenance
 Tested solar panel
 Tested battery
 Tested radio
 Cleaned tipping bucket
 Calibrated tipping bucket (12 tips + 7 ml = 13 tips = 0.7% error)
 Calibrated PT

Site Notes: Weather: Cloudy, breezy and warm (90 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service LogSite Name: **Bayou Gulch**Date: **12-Aug-10**Time: **15:10**Service Type: **Maintenance**Technician: **EEC**Status: **OK****Configuration Changes**

Part #	Location

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance

Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance

Switches:

Jumpers:

Eprom:

Tx Freq:

Rx Freq:

Fwd Power: **7.0**Rev Power: **0.3**SWR **1.47****Test Transmission**

Port	Time	Count	Measure	Predicted

Battery Tests

Battery #	V Quiescent	V Load
BY-005	14.11	13.48

Problem

Action Taken: 2010 Mid Season Maintenance
 Tested battery
 Tested radio
 Tested solar panel
 Cleaned tipping bucket
 Calibrated tipping bucket (12 tips + 10 ml = 13 tips = 1.0% error)
 Test tips were received by base station

Site Notes: Weather: stormy, windy and warm (80 F)

Follow-Up Check to see if transmitter is over reporting

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Spring Valley Road	Date:	12-Aug-10
Service Type:	Maintenance	Technician:	EEC
		Time:	17:08
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	4.9
Rev Power:	0.2
SWR	1.51

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-02	13.69	13.50

Problem

Action Taken: 2010 Mid Season Maintenance
 Tested solar panel
 Tested battery
 Tested radio
 Found that cable from transmitter was bad and replaced it with spare
 Cleaned tipping bucket
 Calibrated tipping bucket (13 tips - 25 ml = 13 tips = 2.6% error)
 Test tips were received by base station

Site Notes: Weather: stormy, breezy and warm (75 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Tomah Road	Date:	13-Aug-10
Service Type:	Maintenance	Technician:	EEC
		Time:	7:41
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	5.0
Rev Power:	0.2
SWR	1.5

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-03	13.01	12.79

Problem

Action Taken: 2010 Mid Season Maintenance
 Tested radio
 Tested battery
 Could not test solar panel because no direct light
 Cleaned tipping bucket
 Calibrated tipping bucket (13 tips - 5ml = 13 tips = 0.5% error)
 Test tips were received by base station

Site Notes: Weather: sunny and cool (70 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Pine Cliff Road	Date:	13-Aug-10
Service Type:	Maintenance	Technician:	EEC
		Time:	10:05
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error
2813	0.099	-0.0584	0.0357

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	5.1
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted
2813	10:35	164	16.18 ftH2	166
2813	10:36	124	12.14 ftH2	125
2813	10:37	83	8.18 ftH2	85
2813	10:39	43	4.13 ftH2	44
2813	10:40	22	2.09 ftH2	23
2813	10:41	0	0.00 ftH2	1

Battery Tests		
Battery #	V Quiescent	V Load
BY-013	13.44	13.22

Problem

Action Taken: 2010 Mid Season Maintenance
 Cut off 1" off top of stand pipe to fit HydroLynx tipping bucket mount to top of High Sierra standpipe - Drilled new holes and installed new rivets
 Noticed that there is some water in the bottom of the standpipe
 Maybe from poor fit between tipping bucket and standpipe. Keep an eye on it next time
 Tested radio, battery and solar panel
 Cleaned tipping bucket - Calibrated tipping bucket (13 tips - 11ml = 13 tips = 1.1% error) - Test tips were received by base station
 Calibrated PT
 {Auto Entry: Calibrated sensor 2813 by linear regression. Modified calibration data. New calibration [Slope(0.0988), Calibration Offset(-0.0584), Std Error(0.0357), Calibration Date(8/13/2010 10:41:45)]}.

Site Notes: Weather: sunny and warm (80 F)

Follow-Up See if there is still water in bottom of standpipe

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service LogSite Name: **Castle Rock**Date: **13-Aug-10**Time: **11:33**Service Type: **Maintenance**Technician: **EEC**Status: **OK****Configuration Changes**

Part #	Location

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance

Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance

Switches:

Jumpers:

Eprom:

Tx Freq: **169.525**

Rx Freq:

Fwd Power: **11.0**Rev Power: **0.1**SWR **1.21****Test Transmission**

Port	Time	Count	Measure	Predicted

Battery Tests

Battery #	V Quiescent	V Load
BY-2240	13.77	13.45

Problem

Action Taken: 2010 Mid Season Maintenance
 Tested radio
 Tested solar panel
 Tested battery
 Cleaned tipping bucket
 Calibrated tipping bucket (13 tips - 4ml = 13 tips = 0.4% error)
 Test tips were received by base station

Site Notes: Weather: sunny and hot (85 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Highlands Ranch WTP	Date:	13-Aug-10
Service Type:	Maintenance	Technician:	EEC
		Time:	13:33
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	6.8
Rev Power:	0.2
SWR	1.41

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-017	13.83	13.49

Problem

Action Taken: 2010 Mid Season Maintenance
 Tested solar panel
 Tested radio
 Tested battery
 Cleaned tipping bucket
 Calibrated tipping bucket (exactly 13 tips = 0% error)
 Test tips were received by base
 Able to replace one rivet but may need to replace all rivets on standpipe at next visit

Site Notes: Weather: sunny and hot (90 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Bayou Gulch	Date:	17-Aug-10
Service Type:	Maintenance	Technician:	EEC
		Time:	13:23
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error
2853	0.01	-0.8053	0.2772

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted
2853	13:26	1738	16.34 ftH2	1799
2853	13:27	1332	12.32 ftH2	1380
2853	13:28	926	8.31 ftH2	962
2853	13:29	529	4.36 ftH2	551
2853	13:30	328	2.38 ftH2	345
2853	13:31	74	0.00 ftH2	97

Battery Tests		
Battery #	V Quiescent	V Load

Problem PT is over reporting, possibly bad PT

Action Taken: PT was pulled from station for bench testing at shop
 Connected PT to spare transmitter at shop
 Tested PT calibration

{Auto Entry: Calibrated sensor 2853 by linear regression. Modified calibration data. New calibration [Slope(0.0099), Calibration Offset(-0.8053), Std Error(0.2772), Calibration Date(8/17/2010 13:31:39)]}.

Site Notes:
Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name: Bayou Gulch	Date: 20-Aug-10	Time: 13:01	
Service Type: Maintenance	Technician: EEC	Status: OK	

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: Called High Sierra technical assistance about unwanted IDs being reported
Determined that the transmitter has some programming issues and will be sent to High Sierra for troubleshooting

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	West Creek	Date:	24-Aug-10
Service Type:	Maintenance	Technician:	RJN/EEC
		Time:	10:42
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	4.6
Rev Power:	0.1
SWR	1.35

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-DC06	13.79	13.60

Problem

Action Taken: -cloudy, chilly
 -cleaned bucket/funnel
 -cleaned solar panel
 -calibrate bucket w/ 948ml - 13 tips + 10ml = -0.1%

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	West Creek Repeater	Date:	24-Aug-10
Time:	11:21	Service Type:	Maintenance
Technician:	RJN/EEC	Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: -changed the charger out, now charges at 13.5V
-unchecked "receive on during transmit" box for repeater

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name: Hwy 105	Date: 24-Aug-10	Time: 14:08	
Service Type: Service Call	Technician: RJN/EEC	Status: OK	

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: -cleaned IR sensor lens, was reading too low

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Dakan Rd	Date:	24-Aug-10
Time:	14:08	Service Type:	Service Call
Technician:	RJN/EEC	Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: -changed CR200 program to transmit rain and battery as seperate packets 30 seconds apart - CSI is working on their multi-packet transmissions to fix the problem

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Rampart Range Rd	Date:	29-Oct-10
Service Type:	End of Season	Technician:	EEC
			Time: 8:15
			Status: OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem

Action Taken: 2010 System Shut Down
-Removed battery and transmitter for winter storage

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name: Indian Creek	Date: 29-Oct-10	Time: 8:55	
Service Type: End of Season	Technician: EEC	Status: OK	

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: 2010 System Shut Down
-Removed battery and transmitter for winter storage

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Haskins Gulch Conf	Date:	29-Oct-10
		Time:	9:15
Service Type:	End of Season	Technician:	EEC
		Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: 2010 System Shut Down
-Removed battery and transmitter for winter storage

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Operations Center	Date:	29-Oct-10
Time:	9:35	Service Type:	End of Season
Technician:	EEC	Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: 2010 System Shut Down
-Removed battery and transmitter for winter storage

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Pine Cliff Road	Date:	29-Oct-10
Service Type:	End of Season	Technician:	EEC
		Time:	9:50
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem

Action Taken: 2010 System Shut Down
 -Removed battery and transmitter for winter storage
 -Pulled PT up in riser pipe

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name: Dakan Rd	Date: 29-Oct-10	Time: 10:17	
Service Type: End of Season	Technician: EEC	Status: OK	

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: 2010 System Shut Down
-Removed battery and transmitter for winter storage

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name: Hwy 105	Date: 29-Oct-10	Time: 10:37	
Service Type: End of Season	Technician: EEC	Status: OK	

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: 2010 System Shut Down
 -Pulled PT up in riser pipe

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	West Cherry Head	Date:	29-Oct-10
Time:	10:54	Service Type:	End of Season
Technician:	EEC	Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: 2010 System Shut Down
-Removed battery and transmitter for winter storage

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log		
Site Name: East Cherry	Date: 29-Oct-10	Time: 11:12
Service Type: End of Season	Technician: EEC	Status: OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: 2010 System Shut Down
-Removed battery and transmitter for winter storage

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log		
Site Name: Willow Creek	Date: 29-Oct-10	Time: 11:31
Service Type: End of Season	Technician: EEC	Status: OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: 2010 System Shut Down
-Removed battery and transmitter for winter storage

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Russelville Gulch	Date:	29-Oct-10
Time:	11:42	Service Type:	End of Season
Technician:	EEC	Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: 2010 System Shut Down
-Removed battery and transmitter for winter storage

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Bayou Gulch	Date:	29-Oct-10
Service Type:	End of Season	Technician:	EEC
			Time: 13:10
			Status: OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem

Action Taken: 2010 System Shut Down
 -Removed battery and transmitter for winter storage

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	CC at Stroh Road	Date:	29-Oct-10
		Time:	13:40
Service Type:	End of Season	Technician:	EEC
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem

Action Taken: 2010 System Shut Down
 -Removed battery and transmitter for winter storage
 -Pulled PT up in riser pipe

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Sulphur Gulch	Date:	29-Oct-10
Service Type:	End of Season	Technician:	EEC
			Time: 14:13
			Status: OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem

Action Taken: 2010 System Shut Down
 -Removed battery and transmitter for winter storage
 -Pulled PT up in riser pipe

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	CC at Cottonwood	Date:	29-Oct-10
Service Type:	End of Season	Technician:	EEC
		Time:	14:42
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem

Action Taken: 2010 System Shut Down
 -Removed battery and transmitter for winter storage
 -Pulled PT up in riser pipe

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Bayou Gulch	Date:	01-Nov-10
Service Type:	Inspection	Technician:	EEC
		Time:	11:49
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance
Switches:
Jumpers:
Eprom:
Tx Freq:
Rx Freq:
Fwd Power:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem Transmitter was over reporting when connected to PT

Action Taken: Set up transmitter for bench testing
 Did not notice any unusual reports
 Transmitter seems to be running correctly
 Station should be monitored next season for over reporting issues

Site Notes:

Follow-Up Monitor over reporting in 2011 season

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	West Creek	Date:	02-Nov-10
Service Type:	Maintenance	Technician:	EEC
		Time:	10:43
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	4.4
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-DC06	14.00	13.74

Problem

Action Taken: 2010 End of Season Maintenance
 Tested radio
 Tested solar panel
 Tested battery
 Replaced desiccant

Site Notes: Cool (55 F) and partly cloudy

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	West Creek Repeater	Date:	03-Nov-10
Time:	10:46	Service Type:	Maintenance
Technician:	EEC	Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: Don Van Wie and Chris Roark installed newer version of software onto ALERT2 portion of the repeater

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Operations Center	Date:	30-Jun-10
Service Type:	Low Impact Check	Technician:	EEC
			Time: 15:04
			Status: OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>

Transducer Calibration			
<i>Sensor ID</i>	<i>Slope</i>	<i>Calib Offset</i>	<i>Std Error</i>

Tx Maintenance				
<i>Part #</i>	<i>Ref V</i>	<i>Freq Err</i>	<i>Deviation</i>	<i>ROM Batt</i>

Settings and Performance
<i>Switches:</i>
<i>Jumpers:</i>
<i>Eprom:</i>
<i>Tx Freq:</i>
<i>Rx Freq:</i>
<i>Fwd Power:</i>
<i>Rev Power:</i>
<i>SWR</i>

Test Transmission				
<i>Port</i>	<i>Time</i>	<i>Count</i>	<i>Measure</i>	<i>Predicted</i>

Battery Tests		
<i>Battery #</i>	<i>V Quiescent</i>	<i>V Load</i>

Problem

Action Taken: -tipped bucket twice - received 2 through repeater

Site Notes:

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log

Site Name: **Indian Creek** Date: **30-Jun-10** Time: **14:05**
 Service Type: **Low Impact Check** Technician: **EEC** Status: **OK**

Configuration Changes

Part #	Location

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance

Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance

Switches:
 Jumpers:
 Eprom:
 Tx Freq:
 Rx Freq:
 Fwd Power:
 Rev Power:
 SWR

Test Transmission

Port	Time	Count	Measure	Predicted

Battery Tests

Battery #	V Quiescent	V Load

Problem

Action Taken: -tipped bucket twice - received 2 through repeater

Site Notes:**Follow-Up**

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Salisbury Park	Date:	09-Dec-10
Service Type:	Maintenance	Technician:	EEC
		Time:	9:01
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	5.0
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-003	12.18	11.93

Problem

Action Taken: 2010 End of season maintenance
 Cleaned tipping bucket
 Calibrated tipping bucket (12 tips + 5ml = 13 tips, 0.5% error)
 Tested radio
 Tested battery
 Tested solar panel

Site Notes: Weather: sunny and cool (35 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Spring Valley Road	Date:	09-Dec-10
Service Type:	Maintenance	Technician:	EEC
		Time:	11:00
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	4.7
Rev Power:	0.2
SWR	1.52

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-02	13.98	13.71

Problem

Action Taken: 2010 End of season maintenance
 Cleaned tipping bucket
 Calibrated tipping bucket (13 tips -4ml = 13 tips, 0.5% error)
 Tested radio
 Tested battery
 Tested solar panel

Site Notes: Weather: sunny and cool (50 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Tomah Road	Date:	09-Dec-10
Service Type:	Maintenance	Technician:	EEC
		Time:	12:01
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	171.100
Rx Freq:	
Fwd Power:	5.2
Rev Power:	0.2
SWR	1.49

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-03	14.34	13.86

Problem ID 2993 is transmitting even though there is no sensor defined for ID

Action Taken: 2010 End of season maintenance
 Cleaned tipping bucket
 Noticed level bubble is cloudy and no longer able to see bubble
 Calibrated tipping bucket (12 tips + 17ml = 13 tips, 1.8% error)
 Tested radio
 Tested battery
 Tested solar panel
 Connected 5096 to laptop to determine 2993 ID problem
 Determined that 2993 ID is being transmitted by the Tomah Road transmitter
 Reprogrammed transmitter 2993 ID so that it no longer transmits

Site Notes: Weather: partly cloudy, breezy and cool (50 F)

Follow-Up Order new bubble level from HydroLynx

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Castle Rock	Date:	09-Dec-10
Service Type:	Maintenance	Technician:	EEC
		Time:	14:24
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	10.2
Rev Power:	0.1
SWR	1.22

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-2240	13.01	12.51

Problem

Action Taken: 2010 End of season maintenance
 Cleaned tipping bucket
 Calibrated tipping bucket (12 tips + 14ml = 13 tips, 1.5% error)
 Tested radio
 Tested battery
 Tested solar panel

Site Notes: Weather: partly cloudy, breezy and cool (50 F)

Follow-Up

MAINTENANCE RECORD
Douglas County/UDFCD
Water & Earth Technology, Inc.

Service Log			
Site Name:	Highlands Ranch WTP	Date:	09-Dec-10
Service Type:	Maintenance	Technician:	EEC
		Time:	15:43
		Status:	OK

Configuration Changes	
Part #	Location

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	5.9
Rev Power:	0.0
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-017	13.23	12.91

Problem

Action Taken: 2010 End of season maintenance
 Cleaned tipping bucket
 Calibrated tipping bucket (12 tips +25ml = 13 tips, 2.7 % error)
 Tested radio
 Tested battery
 Tested solar panel

Site Notes: Weather: cloudy, breezy and cool (45 F)

Follow-Up Wind direction sensor seems to have no lubrication and is stuck in one direction, order new sensor from HydroLynx