

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

Service Log			
Site Name:	Inventory	Date:	22-Aug-07
Service Type:	Administration	Technician:	RJN
		Time:	13:11
		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:

Site Notes:

Follow-Up

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

Service Log			
Site Name:	Willow Creek	Date:	23-Aug-07
Service Type:	Installation	Technician:	RJN/RTW
		Time:	11:15
		Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>
TM-3900	2940
TB-01	2940
SP-0708-01	2940
BY-01	2940

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>	5.2
<i>Rev Power:</i>	0.05
<i>SWR</i>	1.22

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-01	13.08	12.94

Problem

Action Taken: Solar Panel 19.49V
 Regulator 13.72

Site Notes:

Follow-Up

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

Service Log			
Site Name:	Spring Valley Road	Date:	23-Aug-07
Service Type:	Installation	Technician:	RJN/RTW
		Time:	13:21
		Status:	OK

Configuration Changes	
Part #	Location
TM-3901	2930
TB-02	2930
SP-0708-02	2930
BY-02	2930

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:	5.5
Rev Power:	0.05
SWR	1.21

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
TM-3901	13.12	12.98

Problem

Action Taken: solar panel 21.04V
 regulator 13.85V

Site Notes:

Follow-Up

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

Service Log			
Site Name:	Inventory	Date:	06-Nov-07
Service Type:	Administration	Technician:	RJN/RTW
		Time:	13:50
		Status:	OK

Configuration Changes	
Part #	Location
TB-03	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:
Rev Power:
SWR

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load

Problem

Action Taken: Inventory from Hayman Gages

{Auto Entry: Item [BY-03] and all references to it were removed from inventory.}

Site Notes:

Follow-Up

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

Service Log			
Site Name:	Tomah Road	Date:	07-Nov-07
Service Type:	Installation	Technician:	RJN
		Time:	10:18
		Status:	OK

Configuration Changes	
<i>Part #</i>	<i>Location</i>
TM-2644	2990
TB-03	2990
BY-03	2990

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>	3.1
<i>Rev Power:</i>	0.05
<i>SWR</i>	1.29

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>
TM-2644	12.60	12.38

Problem

Action Taken:

Site Notes:

Follow-Up

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

Service Log

Site Name: **West Cherry Head** Date: **07-Nov-07** Time: **11:35**
 Service Type: **Installation** Technician: **RJN/RTW** Status: **OK**

Configuration Changes

Part #	Location
TM-2871	2920
TB-04	2920
BY-04	2920

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: **0.01**
 SWR **1.11**

Test Transmission

Port	Time	Count	Measure	Predicted

Battery Tests

Battery #	V Quiescent	V Load
BY-04	12.92	12.72

Problem**Action Taken:****Site Notes:****Follow-Up**

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

Service Log

Site Name: **Highlands Ranch WT** Date: **19-Mar-08** Time: **8:27**
 Service Type: **Start Up** Technician: **RJN/RTW** Status: **OK**

Configuration Changes

Part #	Location
TM-2318	2710
TB-S9807	2710
BY-WET01	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: **4.1**
 Rev Power: **0.01**
 SWR **1.11**

Test Transmission

Port	Time	Count	Measure	Predicted

Battery Tests

Battery #	V Quiescent	V Load
BY-WET01	13.65	13.13

Problem

- Action Taken:**
- early morning, clear, sunny
 - clean bucket and funnel
 - clean solar panel
 - calibrate bucket w/948ml - 12 tips + 16ml = -1.7%
 - wind dir 150
 - psychrometer Wb 38, Db 50 = RH 27%, DP < 33
 - read 27% RH from station
 - Battery Lifetester score 72 - Bad
 - Solar w/o 13.81V, w/I 3.21V, 0.058A, Dark 0.00A
 - Regulator in 20.16V, out 13.82V

Site Notes:**Follow-Up**

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

Service Log			
Site Name:	Salisbury Park	Date:	19-Mar-08
Service Type:	Start Up	Technician:	RJN/RTW
		Time:	10:14
		Status:	OK

Configuration Changes	
Part #	Location
TM-2317	2730
TB-S9805	2730
BY-WET02	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:	4.9
Rev Power:	0.01
SWR	1.1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-WET02	11.92	11.18

Problem

- Action Taken:**
- mid morning, calm, sunny
 - clean bucket and funnel
 - clean solar panel
 - calibrate bucket w/ 948ml - 12 tips + 37ml = -3.9%
 - psychrometer Wb 41, Db 55, RH 23.5%, Dp < 33
 - read 24% RH from station
 - wind direction 255
 - battery Lifetester score 24 - Bad
 - solar w/o 14.24V, w/l 3.39V, 0.061A, Dark 0.00A
 - regulator in 12.76V, out 12.05V

Site Notes:

Follow-Up

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

Service Log

Site Name: **Sulphur Gulch** Date: **19-Mar-08** Time: **11:38**
 Service Type: **Start Up** Technician: **RJN/RTW** Status: **OK**

Configuration Changes

Part #	Location
TM-4398	2840
TB-S0204	2840
BY-WET03	2840

Transducer Calibration

Sensor ID	Slope	Calib Offset	Std Error
2843	0.010	-0.0479	0.0284

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: **0.01**
 SWR **1.09**

Test Transmission

Port	Time	Count	Measure	Predicted
2843	12:01	1977	20.33 ftH2	0
2843	12:02	1493	15.54 ftH2	0
2843	12:03	1061	11.23 ftH2	0
2843	12:05	773	8.22 ftH2	0
2843	12:06	470	5.12 ftH2	0
2843	12:07	181	2.35 ftH2	0
2843	12:08	53	1.07 ftH2	0
2843	12:09	0	0.00 ftH2	0
2843	10:57	7	0.00 ftH2	-36
2843	10:58	2047	21.00 ftH2	2044
2843	10:58	1020	10.50 ftH2	1004

Battery Tests

Battery #	V Quiescent	V Load
BY-WET03	12.47	12.27

Problem

Action Taken: - installed bucket calibrated by OneRain
 - no battery in transmitter, installed a WET battery
 - battery Lifetester score 238 - Good
 - flush riser pipe with several buckets of water
 {Auto Entry: Calibrated sensor 2843 by linear regression. Modified calibration data. New calibration [Slope(0.0103), Calibration Offset(-0.0479), Std Error(0.0284), Calibration Date(3/24/2008 10:59:13 AM)]}.

Site Notes: - no solar panel

Follow-Up - no reports at base, may require a follow-up trip to troubleshoot

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

Service Log			
Site Name:	Castle Rock	Date:	19-Mar-08
Service Type:	Start Up	Technician:	RJN/RTW
		Time:	14:43
		Status:	OK

Configuration Changes	
Part #	Location
TM-2240	2750
TB-S9808	2750
BY-81105	2750

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:	8.1
Rev Power:	0.01
SWR	1.08

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-81105	12.25	11.89

Problem

- Action Taken:**
- clean bucket and funnel
 - clean solar panel
 - wind dir 0
 - calibrate bucket w/ 948ml - 13 tips + 27ml = +2.8%
 - psychrometer Wb 42, Db 61, RH 10.5%, Dp < 33
 - read 18% from station
 - battery Lifetester score 70 - Bad
 - solar w/o 14.24V, w/l 2.98V, 3mA, Dark 0A
 - regulator in 13.05 V, out 12.37V

Site Notes:

Follow-Up

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

Service Log			
Site Name:	Pine Cliff Road	Date:	19-Mar-08
Service Type:	Start Up	Technician:	RJN/RTW
		Time:	16:39
		Status:	OK

Configuration Changes	
Part #	Location
TM-4195	2810
BY-WET04	2810

Transducer Calibration			
Sensor ID	Slope	Calib Offset	Std Error
2813	0.009	-0.1039	0.0412

Tx Maintenance				
Part #	Ref V	Freq Err	Deviation	ROM Batt

Settings and Performance	
Switches:	
Jumpers:	
Eprom:	
Tx Freq:	169.525
Rx Freq:	
Fwd Power:	28.0
Rev Power:	0.05
SWR	1.09

Test Transmission				
Port	Time	Count	Measure	Predicted
2813	17:12	2047	19.95 ftH2	0
2813	17:13	1608	14.28 ftH2	0
2813	17:14	1116	9.89 ftH2	0
2813	17:15	717	6.31 ftH2	0
2813	17:16	379	3.28 ftH2	0
2813	17:17	211	1.76 ftH2	0
2813	17:18	9	0.00 ftH2	0

Battery Tests		
Battery #	V Quiescent	V Load
BY-WET04	12.31	11.90

Problem

- Action Taken:**
- cleaned bucket mounting top
 - replaced silicon at PT conduit entry at standpipe
 - installed bucket calibrated by OneRain
 - battery Lifetester score 249 - Best

{Auto Entry: Calibrated sensor 2813 by linear regression. Modified calibration data. New calibration [Slope(0.0089), Calibration Offset(-0.1039), Std Error(0.0412), Calibration Date(3/19/2008 5:18:40 PM)]}.

Site Notes:

- Follow-Up**
- flushed riser pipe with several buckets of water but could not find PT intake line in the stream??
 - locking mechanism missing on bucket top

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

Service Log			
Site Name:	Tomah Road	Date:	19-Mar-08
Service Type:	Start Up	Technician:	RJN/RTW
		Time:	18:01
		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:	3.9
Rev Power:	0.10
SWR	1.38

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-03	12.78	12.55

Problem

- Action Taken:**
- cleaned bucket
 - fixed military plug for rain gage
 - fixed spring on bucket platform
 - calibrated bucket w/ 948ml - 12 tips + 36ml = -3.8%
 - had to init unit because of strange clock and battery readings
 - battery Lifetester score 220 - Good

Site Notes:

Follow-Up

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

Service Log			
Site Name:	Haskins Gulch Conf	Date:	20-Mar-08
Service Type:	Start Up	Technician:	RJN/RTW
		Time:	8:30
		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

Action Taken: - need key to enter the transmitter enclosure
 - cleaned stage intake

Site Notes: Contact Greg O'Neil from the USGS to gain entry/keys (303) 236-4882 x284

Follow-Up - get key(s) and think about re-establishing the ALERT stream gage at the next maintenance round

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

Service Log			
Site Name:	West Cherry Head	Date:	20-Mar-08
Service Type:	Start Up	Technician:	RJN/RTW
		Time:	9:45
		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:	3.8
Rev Power:	0.01
SWR	1.11

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-04	12.65	12.44

Problem

- Action Taken:**
- cleaned bucket and funnel
 - calibrated bucket w/ 948ml - 12 tips + 45ml = -4.7%
 - adjusted bucket screws up
 - recalibrate - 12 tips + 3ml = -0.3%
 - battery life tester score 225 - Good

Site Notes:

Follow-Up

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

Service Log			
Site Name:	Spring Valley Road	Date:	20-Mar-08
Service Type:	Start Up	Technician:	RJN/RTW
		Time:	10:51
		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:	5.3
Rev Power:	0.10
SWR	1.32

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-02	13.85	13.58

Problem

- Action Taken:**
- partly cloudy
 - clean bucket and funnel
 - clean solar panel
 - calibrate bucket w/ 948ml - 12 tips + 21ml = -2.2%
 - battery lifetester score 248 - Best
 - solar w/o 14.03V, w/l 12.2V, 15mA, Dark 0A
 - regulator in 21.52V, out 14.01

Site Notes:

Follow-Up

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

Service Log			
Site Name:	Willow Creek	Date:	20-Mar-08
Service Type:	Start Up	Technician:	RJN/RTW
		Time:	11:50
		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:	171.100
Rx Freq:	
Fwd Power:	4.5
Rev Power:	0.01
SWR	1.1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
BY-01	13.80	13.36

Problem

- Action Taken:**
- windy, partly cloudy
 - cleaned bucket and funnel
 - cleaned solar panel
 - calibrated bucket w/ 948ml - 12 tips + 24ml = -2.5%
 - battery lifetester score - 248 - Best
 - solar w/o 13.86V, w/l 13.74V, 15mA, Dark 0A
 - regulator in 21.3V, out 13.81V

Site Notes:

Follow-Up

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

Service Log			
Site Name:	Sulphur Gulch	Date:	25-Mar-08
Service Type:	Service Call	Technician:	MLR/RJN
		Time:	10:53
		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:**
- setup test station from service truck parked at the park&ride at Surrey Ridge off Interstate 25
 - setup mock 2840 Site with 4.25W forward and 0.01 Reflected on 169.525 MHz
 - Elevation 6410 at Surrey Ridge
 - Repeater did not pass 2840 ID
 - Repeater did pass 2825 from this location
 - Move to the Sulphur Gulch location and repeat the same test procedure, Same story at Sulphur Gulch.....
 - Markus Ritsch talked with Kevin Stewart
 - Leave station as is

Site Notes:

- Follow-Up**
- OneRain to check repeater pass list at Blue Mountain which handles the radio traffic for Sulphur Gulch

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

Service Log

Site Name: **West Creek Repeater** Date: **09-May-08** Time: **10:12**
 Service Type: **Inspection** Technician: **RJN/RTW** Status: **OK**

Configuration Changes

Part #	Location
TM-2257	3000
R-B7984	3000
BY-001	3000

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: **3.8**
 Rev Power: **0.10**
 SWR **1.39**

Test Transmission

Port	Time	Count	Measure	Predicted

Battery Tests

Battery #	V Quiescent	V Load
BY-001	12.04	11.83

Problem

Action Taken: Changed repeater pass list to 2700 through 3018.
 Radio test: 3.75 Wf; 0.1 Wr
 Battery test without charger 12.04 V without load & 11.83 V with load.

Site Notes:

Follow-Up Replace battery next maintenance trip UB12180

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

Service Log			
Site Name:	Haskins Gulch Conf	Date:	09-May-08
Service Type:	Inspection	Technician:	RJN/RTW
		Time:	12:36
		Status:	OK

Configuration Changes	
Part #	Location
B-R0328	2820

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:	6.0
Rev Power:	0.00
SWR	1

Test Transmission				
Port	Time	Count	Measure	Predicted

Battery Tests		
Battery #	V Quiescent	V Load
B-R0328	12.45	12.19

Problem

Action Taken: - cleaned bucket and funnel
 - calibrated bucket w/ 948ml - 12 tips + 29ml = -3.0%

Site Notes:

Follow-Up