

J & K Communications, Inc.

222 Towerview Dr.
Columbia City, IN 46725
Phone: (260) 244-7975
Fax: (260) 244-3253

**Invoice**Number: **139531**Date: **3/17/2026**Source: **SO No. 259383****Bill-To**

Attn: Todd M. Sattison
Auburn Water Pollution
Control Department
2010 South Wayne Street
Auburn, IN 46706 U.S.A.

Ship-To

Attn: JEFF BICKEL
Auburn Water Pollution
Control Department
2010 South Wayne Street
Auburn, IN 46706 U.S.A.
Phone: (260) 925-1714

<u>Acct. No.</u>	<u>A/R Cust. No.</u>	<u>Customer PO</u>	<u>Reference</u>	<u>Sales Rep</u>	<u>Ship Via</u>	<u>Terms</u>
100658	Auburn Water Pollu	46787		Jon A. Shew II		Net 30

Items Serviced on Service Order No. 259383

<u>Item ID</u>	<u>Description</u>	<u>Serial Number or Quantity</u>
MDS-9710A	MDS-9710A 800-960 MHZ LICENSED TRANSCEIVER	01270839
MDS-9710A	MDS-9710A 800-960 MHZ LICENSED TRANSCEIVER	2242528

Work Requested:

Approximately 10 lift station with SCADA Comm fails
Last preventative maintenance was done in 2023 on SO#246720

Meet at plant between 9 and 9:30am / POC: Jeff Bickel / 260-925-1714

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Work Performed:

03/10/2026:

@ Auburn WPC

- Discussion with Jeff to gather information on issues they are experiencing.

@ Duesenberg Tank Repeater

- Check MPRS master station operating in x710 compatibility mode. TX frequency at -177 Hz, TX power at 36.9 dBm; both good. Antenna system return loss at 16 dB on RX, 22.7 dB on TX; both good. Antenna system return loss trace is good across antenna operating band. Update firmware on MPRS to 9.9.4. Check exterior RX filter cavities, tuning is off by 300 kHz, causing approximately 10 dB of loss at RX frequency. Align RX filter cavities, insertion loss at RX frequency is now 2.1 dB. Reinstall RX filter cavities and power up MPRS. Jeff is reporting that seven sites are now in comm fail vs. original two. Will need to investigate polling remote.

@ Auburn WPC

- Check 9710A polling remote. TX frequency at -210 Hz, TX power at 36.5 dBm; both good. Antenna system return loss at 23 dB on RX, 19 dB on TX; both good. Antenna system return loss trace is good across antenna operating band. Install RS-232 tap on serial cable between Digi One-IAP protocol gateway and 9710A; use Modbus protocol analyzer to check device communication traffic. Modbus poll requests are going out to all sites, however, polling responses from some sites are missing. Need to check a remote site that is in comm fail state to isolate further.

@ Lagoon

- Check 9710A, radio operating within specifications. Install RS-232 tap on serial cable between Modbus RTU and 9710A; Modbus protocol analyzer is showing that the local Modbus RTU is generating responses to polling requests and delivering them to the 9710A. Issue must be either Duesenberg MPRS or Polling Remote at Auburn WPC.

@ Duesenberg Tank Repeater

- Use one of client's spare 9710A to capture serial traffic while onsite, serial Modbus data shows signs of missed data. Hypothesize that RX filter cavities may have issues other than being off frequency. Bypass RX filter cavities. Jeff reported that all sites were now communicating.

@ Auburn WPC

- Return spare repeater to Jeff. Advise Jeff that the purpose of the RX filter cavities was to eliminate strong signal from paging transmitters that were in operation in the late 1990s/early 2000s. Due to advent of smartphones, paging companies no longer exist. MPRS had a 1 MHz bandpass diplexer built in that is probably sufficient for filtering in current RF environment. Jeff to advise if any issues materialize. Jeff also asked me to take back two spare radios to verify operation.

03/11/2026:

Serial #2242528

- Check radio on bench; TX power, TX frequency, TX deviation and RX sensitivity all within specification. Verified transmission of serial data in both directions using serial 1270839 as second radio.

Serial #1270839

- Check radio on bench; TX power, TX frequency, TX deviation and RX sensitivity all within specification. Verified transmission of serial data in both directions using serial 2242528 as second radio.

Qty.	Item ID	Description	UOM	Ea. Price	Total
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8.00	Labor Technician	Labor Technician	HR	\$165.00	\$1,320.00
1.00	Travel Zone 3	Travel Zone 3	HR	\$157.00	\$157.00
1.00	Freight Charge	FREIGHT CHARGE	EA	\$16.03	\$16.03

Item Total: **\$1,493.03**

Total Amount Due: \$1,493.03

Please remit all payments to:

J&K Communications, Inc.

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*All credit card payments are subject to a 2% credit card processing fee.