Model 110-DELCD GC for
chlorinated VOCs in air at ppb level

The Model 110-DELCD GC (0110-1234) configuration is an ultra compact GC for field measurement of chlorinated or brominated VOCs at the ppb level..

8 inches wide and about 30 lbs it operates 24/7 without gases using a built-in air compressor for carrier gas. It is ideal for field deployment in soil vapor intrusion studies where it can automatically sample every 10 minutes and even calibrate itself periodically.

The system is constructed around a small isothermal column and valve oven which operates between 50 and 100C.

A 2 input solenoid selects a sample stream or a calibration bag/cylinder.

A 1/4" diameter adsorbent trap is typically packed with Tenax-GR or other sorbent (Carbopack X, Carboxen 1000 etc).

A syringe injection port allows for syringe injections as well.

A large air blower cools the trap rapidly (250 to 40C in less than 4 minutes) permitting complete cycles times of 10 minutes or less.
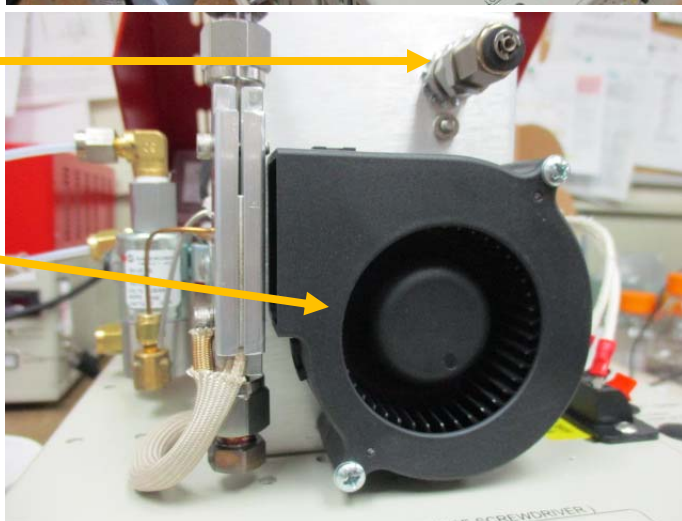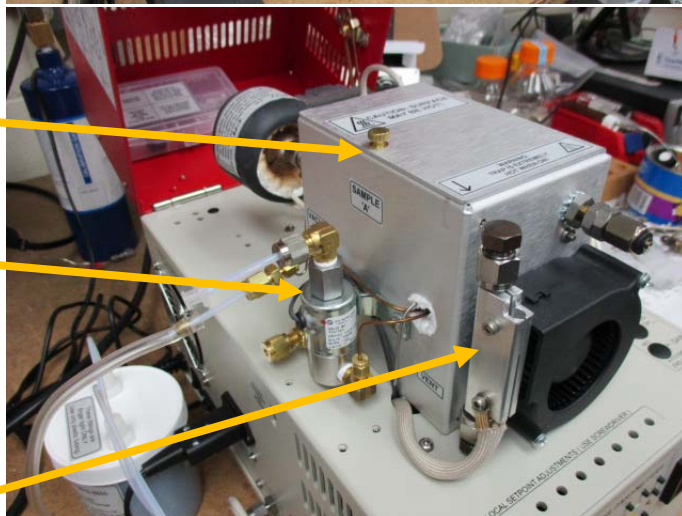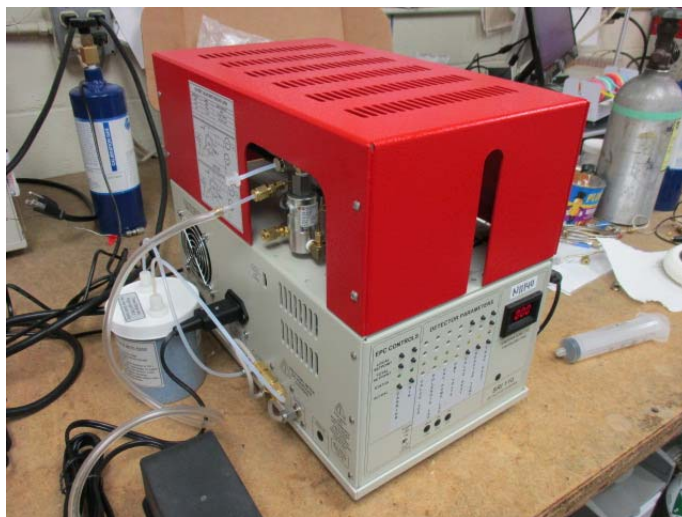
Model 110-DELCD GC for
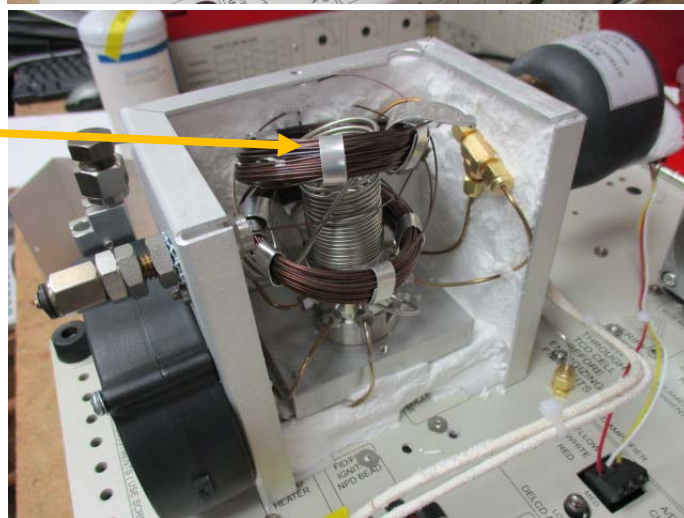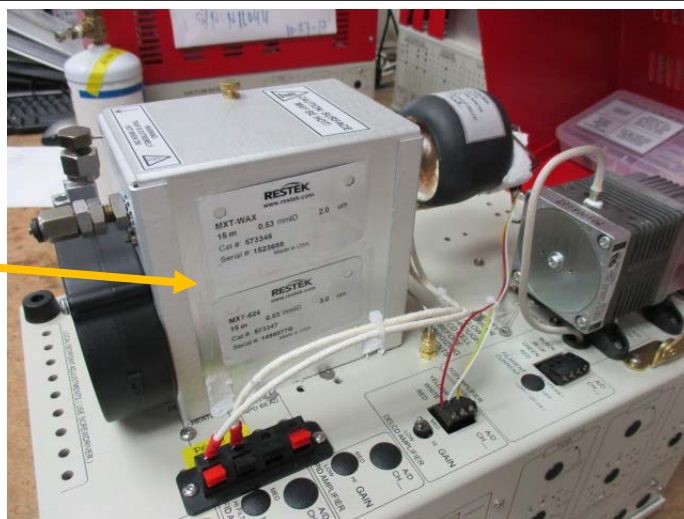
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Two 15 meter .53mm capillary columns are mounted in the oven along with the 10port gas sampling valve.

Typically one column is a pre-column which backflushes at a user-defined time during the analysis to reject water and other high-boiling analytes.

The 2nd column (the analytical column) is chosen depending on the particular analytes which require measurement.

In this particular cases the pre-column is a 15MXT-WAX 2 micron film, and the analytical column is a 15MXT-624 3micron film.

This photo shows the two columns and the 10port valve in the oven with the cover removed.
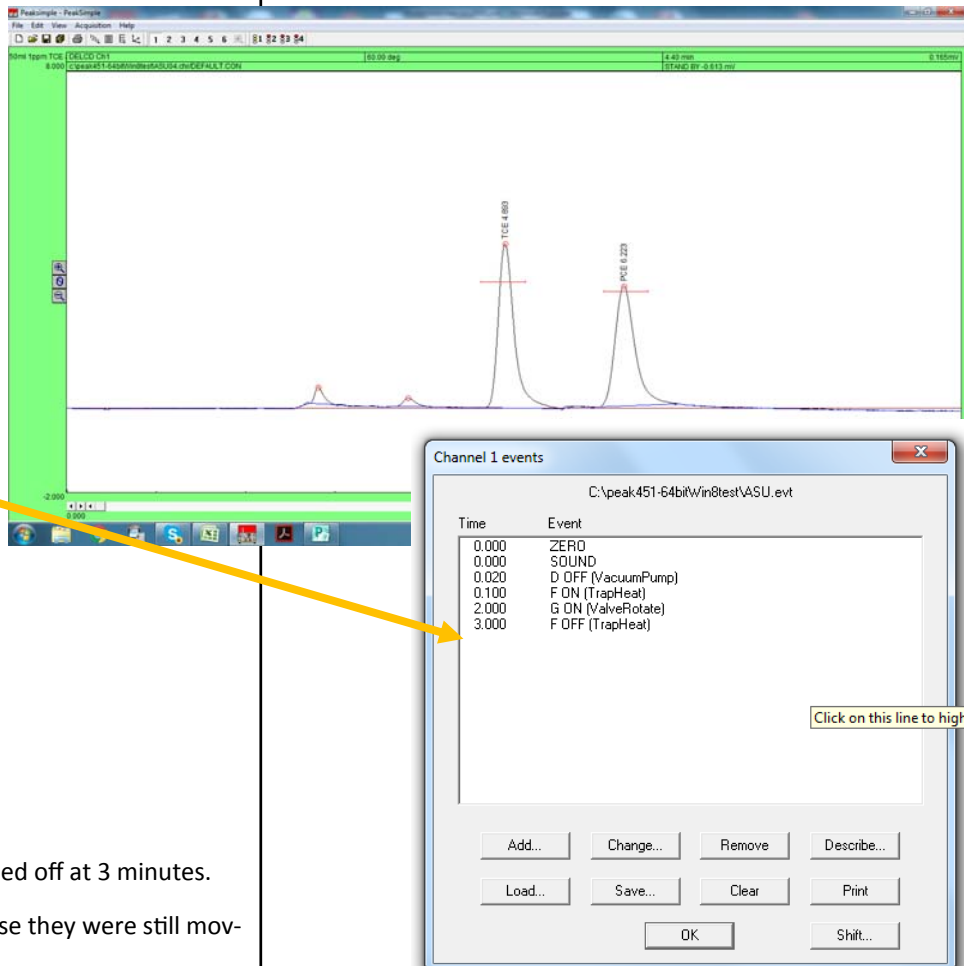
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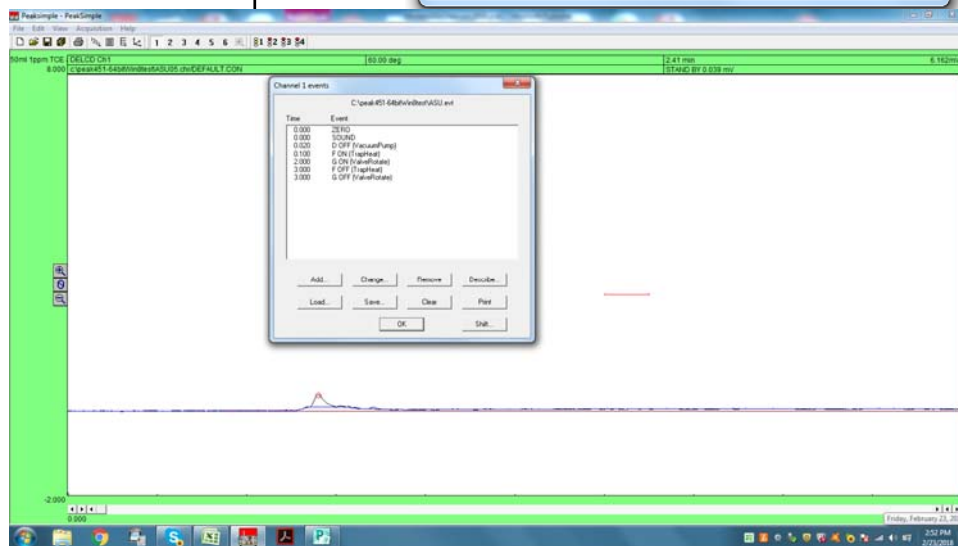A sample containing 50ml of 1ppm TCE and PCE was injected with the Event table on the right.

Notice that Relay G (which controls the 10port valve) is not turned off (so it turns off automatically at the end of the 10 minute run).
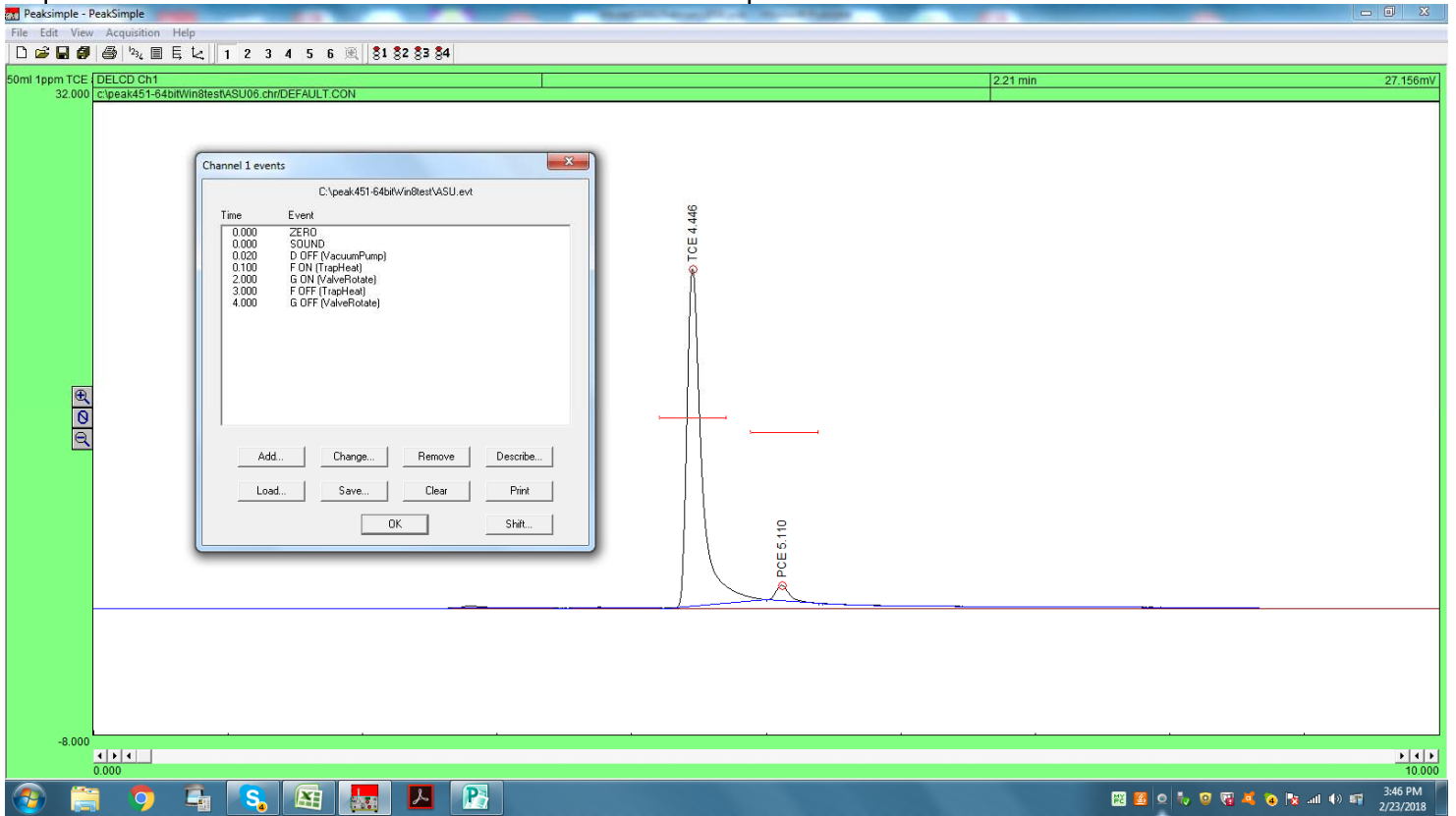
Both TCE and PCE peaks appear.

In the next chromtogram., Relay G is turned off at 3 minutes.

Both TCE and PCE peaks disappear because they were still moving through the MXT-Wax pre-column and had not made it onto the MXT624 analytical column.

Channel 1 events

C:\peak451-64bitWin8test\ASU.evt

Time	Event
0.000	ZERO
0.000	SOUND
0.020	D OFF (VacuumPump)
0.100	F ON (TrapHeat)
2.000	G ON (ValveRotate)
3.000	F OFF (TrapHeat)

Click on this line to high

Add... Change... Remove Describe...
Load... Save... Clear Print
OK Shift...

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In this chromatogram Relay G was turned off at 4 minutes which allowed the TCE to appear but not (or mostly not) the PCE peak. By adjusting the Relay G off time by trial and error you can control which peaks make it onto the analytical column.

Because the oven on the Model 110 GC is isothermal, higher boiling peaks can not be temperature programmed away, but must instead be captured on the pre-column and then back-flushed to vent during the analysis.