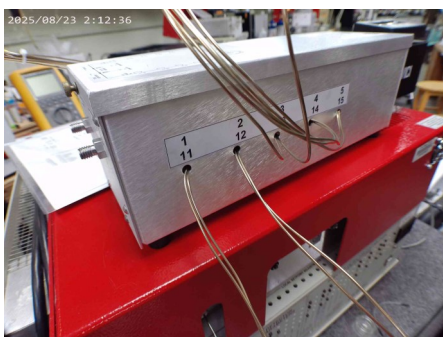


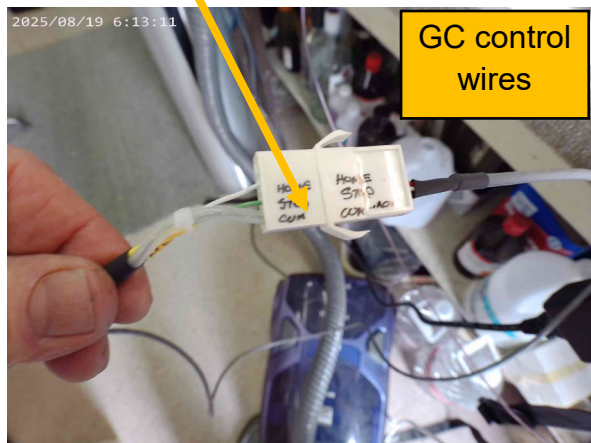
Silicone Tube Autosampler July 2026

The SRI Silicone Tube 10 position Autosampler (STAS) is a useful way to extract most gases and liquid molecules from water. It can not work with organic liquids, only with water.

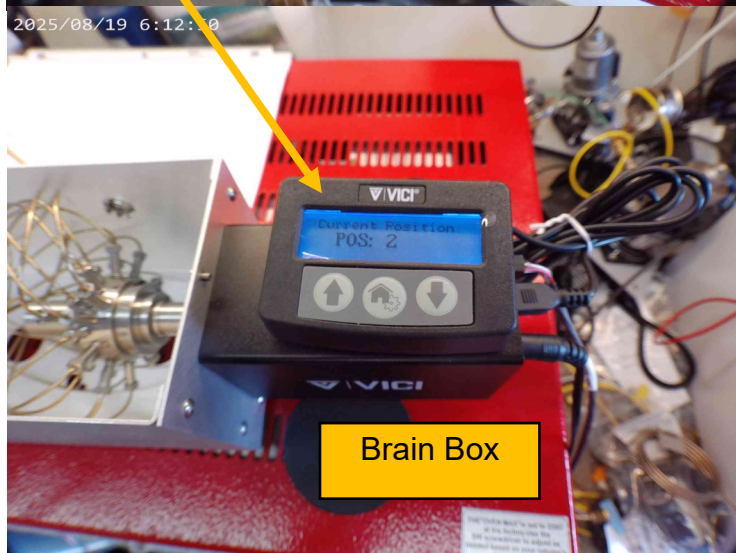
The STAS is constructed from a 22port 10 position stream selector valve and has 10 sets of two tubes exiting the chassis the valve is mounted in.



The valve position is controlled by the “brain” box attached to the actuator or by the cable from the GC.



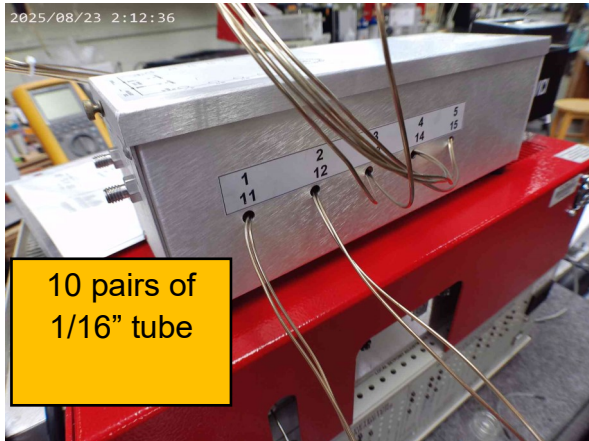
The “brain” box lets you manually move the STAS from one position to the next or go all the way back to the “home” (position 1) by pushing the buttons. The cable from the GC lets PeakSimple index or home automatically



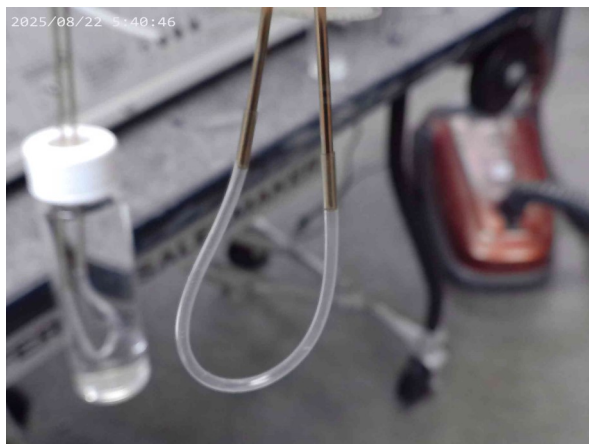
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Each pair of stainless steel 1/16" tubes is pushed through the septum on the top of a common 40ml vial. It does not have to be a perfect gas tight seal, just tight enough that water does not spill out.



We use a special thin wall silicone tube which slides over 1/16" stainless tubing and grips tightly, but other silicone tubing could also be used.



Cut the silicone tube to about 4 inches. Longer is better but harder to fit into the vial.

Massage the tubing about 1 cm. onto the stainless tubing with your fingers.

Be careful that the tube does not kink inside the vial and block the flow.



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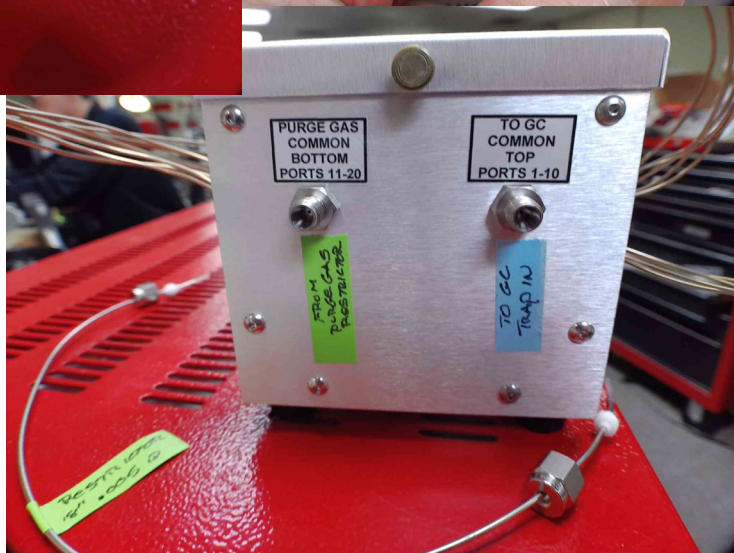
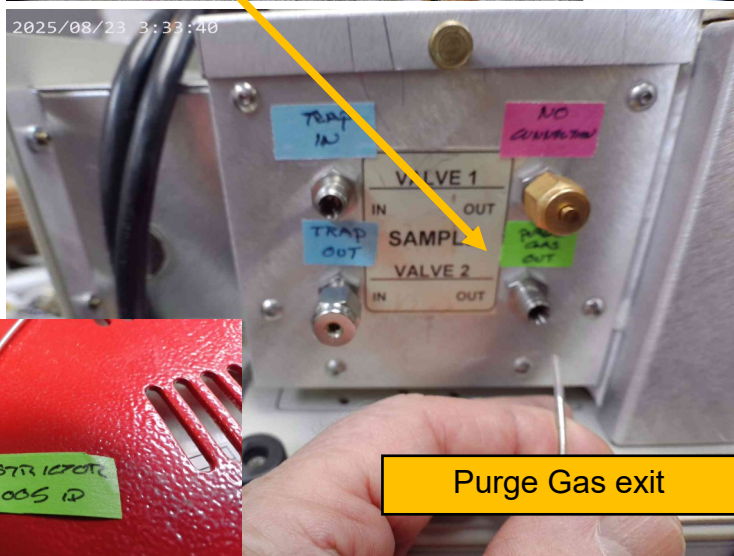
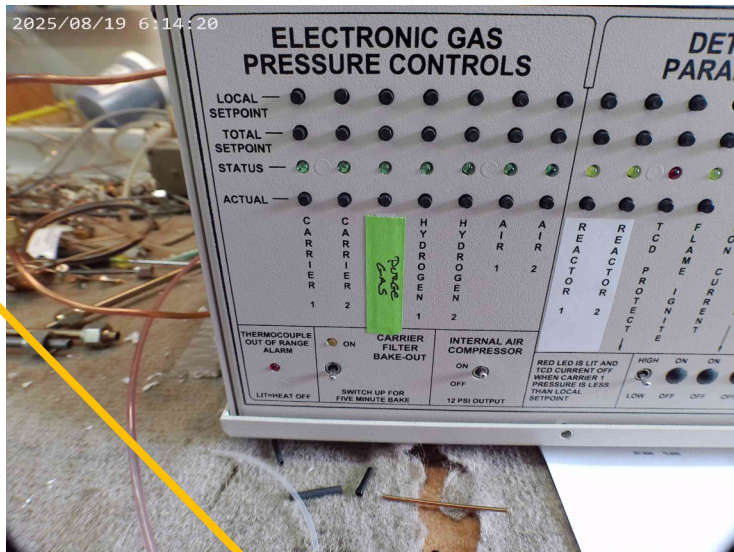
Silicone Tube Autosampler July 2026

There needs to be a PeakSimple controlled "Purge Gas" control on the GC that the STAS is connected to.

The Purge Gas exits this particular GC from one of the 1/8" swagelok bulkhead fittings on the front of the GC's valve oven.

The tube which connects the Purge Gas to the STAS needs to be a small diameter "restrictor" tube so that when the Purge Gas control on the GC is set to some pressure between 2 and 15 psi, the Purge Gas flow rate is roughly 5ml/minute. In this case we used 18" of .005" id stainless tube, but the actual tube diameter is not critical so long as the Purge Gas flow can be adjusted to somewhere in the 5ml range. Since the rate that the target molecules permeate through the silicone is limited, a higher flow rate than required risks blowing the collected molecules through the trap prematurely (called breakthrough volume).

The trap we used in this case was half Tenax and half Carboxieve SII, but other trap materials (adsorbents) might be used depending of the type of target molecule in the water sample.



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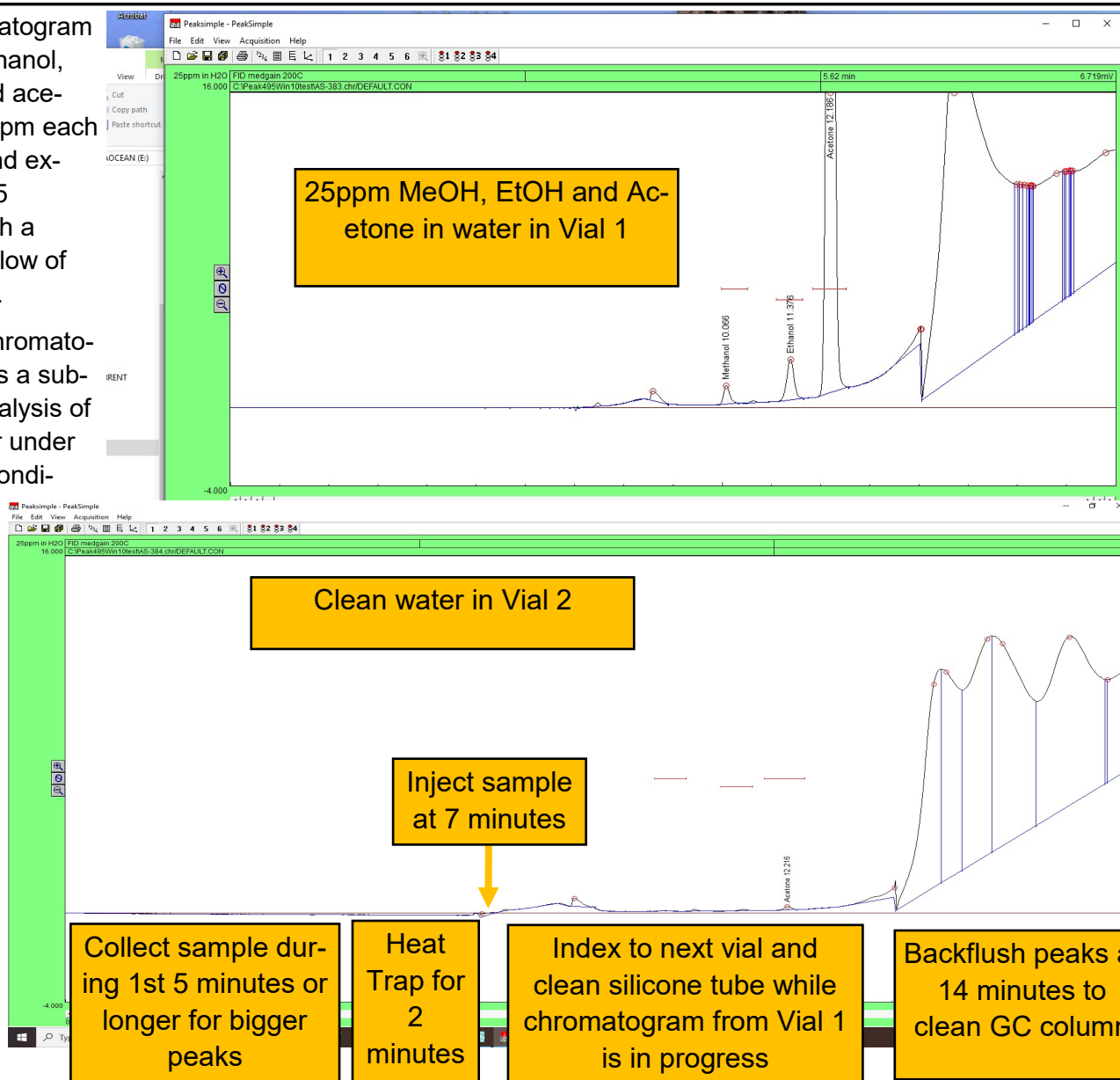
Silicone Tube Autosampler July 2026

This chromatogram shows methanol, ethanol and acetone at 25ppm each in water, and extracted for 5 minutes with a purge gas flow of 5ml/minute.

The next chromatogram shows a subsequent analysis of clean water under the same conditions. Its important that each silicone tube be cleaned prior to extracting the next sample to avoid carryover from the previous extraction.

The silicone tube is cleaned by

turning on the purge gas while the gas sampling valve is in the "Inject" position. In the inject position the purge gas flows through the gas sampling valve (GSV) internally but not through the GCs trap. So the "carryover" molecules are extracted from the silicone tube but are not collected on the trap. So immediately that the GSV is moved to the Inject position, the autosampler is indexed to the next vial, the purge gas is turned on, and the silicone tube in that vial is cleaned for however many minutes the valve is in the "Inject" position.



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Silicone Tube Autosampler July 2026

This is an example event table. Depending on your particular GC, the events may be different. This assumes the silicone tube has already been cleaned in the first Vial.

0.00 (Zero) This zeros the detector signal

0.02 (H on) This turns on the Purge Gas in this particular GC. It could be a different Relay on other GCs.

5.00 (H off) This turns the Purge Gas off. The purge gas must be off before the trap is heated.

The purge gas flow is adjustable from the GC's control but is normally set to about 5 ml/minute. The longer the purge time the bigger the peaks as long as the trap has not reached its breakthrough volume at which point the most volatile peak will not increase in size. So since the rate which the target molecules permeate through the silicone tube is limited, it make sense to adjust the purge gas flow to the minimum required to keep the inside of the silicone tube clear of the permeated molecules.

5.00 (F on) This heats the trap. It takes about 2 minutes for the trap to heat to its setpoint of 200C.

6.00 A on. This indexes the STAS 22port valve to the next vial position. This time is not critical as long as its after Vial 1 has been extracted.

6.1 (A off) this releases the Index command which has to be an "on and off" function, like a momentary pushbutton.

6.9 (Zero). This zeros the detector signal again in case the signal drifted during the first 7 minutes.

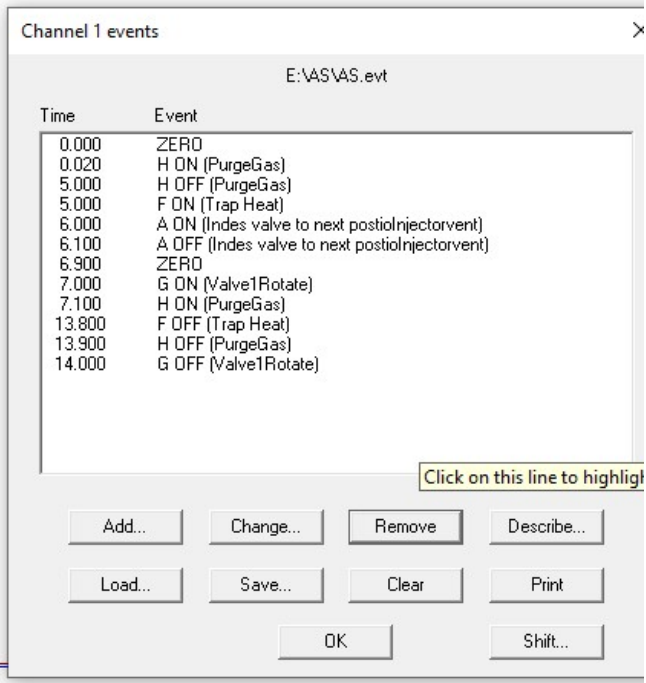
7.00 (G on) This causes the Gas Sampling Valve (GSV) inside the GC to backflush the now hot trap onto the column. Since the trap is now hot, the collected molecules come off the trap in a short burst.

7.1 (H on) This turns the Purge Gas on to clean the silicone tube which is in the next vial. Since the GSV is in the "inject" position, the Purge Gas flows through the GSV's internal passage, but not through the trap which is currently in series with the GC column. So no molecules are collected on the trap during this time.

12.9 (F off) This turns the trap heat off well before the end of the analysis so it will be cooled already by the time the run is over.

13.9 (H off) This turns off the Purge Gas before the GSV returns to the Load position. The silicone tube has been cleaned by the purge gas since Minute 7.1. The longer the cleaning time the better, but it has to be turned off before the GSV is returned to the Load position.

14.0 (G off) This returns the GSV to the Load position. In this position any Purge Gas flow will extract molecules from the water and transport them to the trap. The extraction will occur once the next analysis is initiated during the first 5 minutes just like in Position 1.



Time	Event
0.000	ZERO
0.020	H ON (PurgeGas)
5.000	H OFF (PurgeGas)
5.000	F ON (Trap Heat)
6.000	A ON (Index valve to next postinjectionvent)
6.100	A OFF (Index valve to next postinjectionvent)
6.900	ZERO
7.000	G ON (Valve1Rotate)
7.100	H ON (PurgeGas)
13.800	F OFF (Trap Heat)
13.900	H OFF (PurgeGas)
14.000	G OFF (Valve1Rotate)



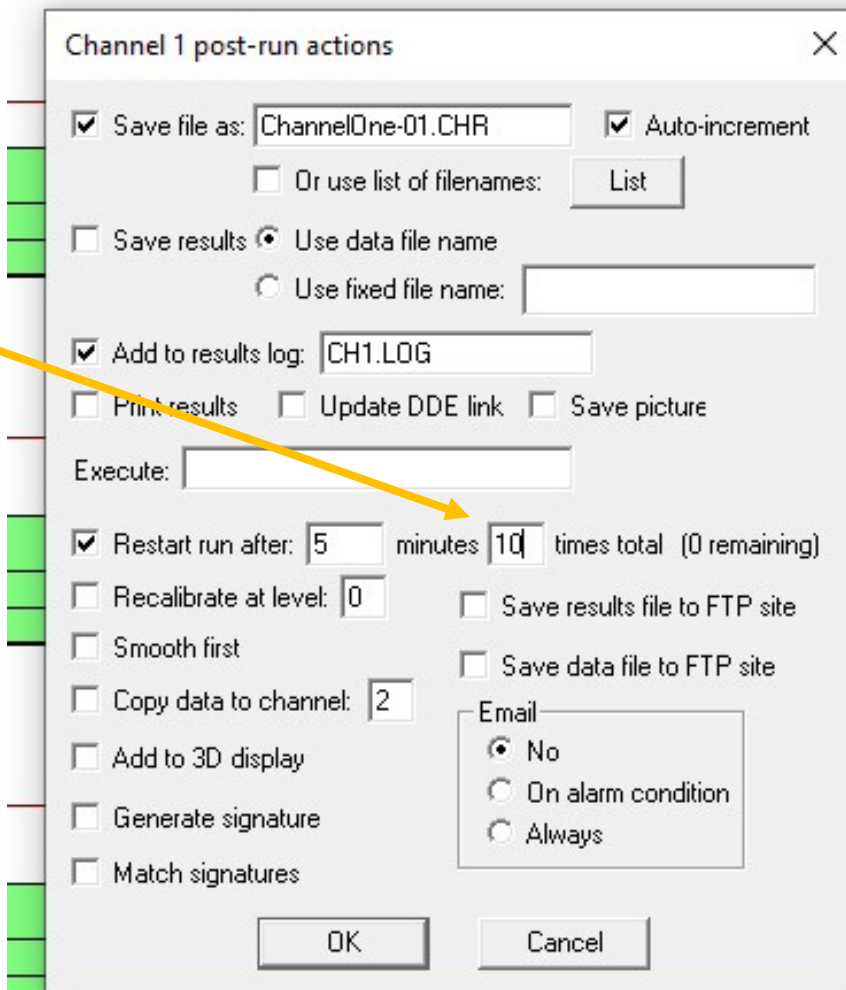
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Silicone Tube Autosampler July 2026

In PeakSimple software's Postrun screen you can specify how many times PeakSimple run the analysis.

In this case the number of repeat has been set to 10 with a 5 minute delay between run to allow time for the GC to cool down and stabilize between analyses.



Channel 1 post-run actions

☒ Save file as: ChannelOne-01.CHR ☒ Auto-increment

☐ Or use list of filenames: List

☐ Save results ☒ Use data file name ☐ Use fixed file name:

☒ Add to results log: CH1.LOG

☐ Print results ☐ Update DDE link ☐ Save picture

Execute:

☒ Restart run after: 5 minutes 10 times total (0 remaining)

☐ Recalibrate at level: 0 ☐ Save results file to FTP site

☐ Smooth first ☐ Save data file to FTP site

☐ Copy data to channel: 2

☐ Add to 3D display

☐ Generate signature

☐ Match signatures

Email

☒ No ☐ On alarm condition ☐ Always

OK Cancel



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