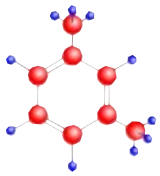
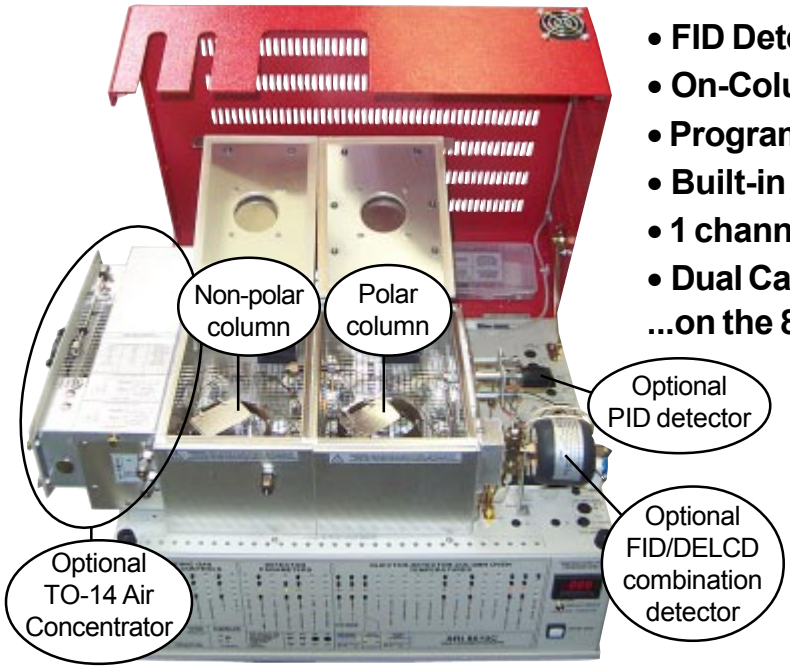
SRI GC Innovations

Tunable Column Selectivity (TCS) GC System

The Standard Model Includes:





NOTE: This TCS GC has extra equipment installed at additional cost. Please refer to the list above for standard TCS GC features.

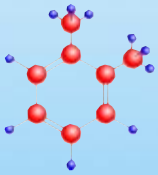
- **FID Detector**
- **On-Column Injector**
- **Programmable Mid-point Pressure Control**
- **Built-in "whisper quiet" Air Compressor**
- **1 channel PeakSimple Data System**
- **Dual Capillary Columns**

...on the 8610D Dual Oven chassis

The TCS GC shown here is customized for ambient air analysis. It is optionally equipped with a PID detector, FID/DELCD combination detectors, a six channel USB PeakSimple data system, and a single trap TO-14 Air Concentrator. SRI can customize the TCS GC for your application!

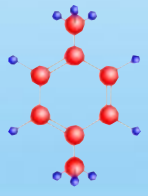
The Tunable Column Selectivity (TCS) GC System allows users to adjust the selectivity of the dual column ensemble by dynamically varying the temperatures of the two series-coupled columns. The column in the first oven is non-polar, which separates compounds according to their boiling point. The column in the second oven is very polar, to aid in separating peaks that are not discriminated by boiling point. Independent temperature programming allows the user to adjust the relative impact of each column on the overall separation.

Applications include:



Environmental Testing: groundwater, ambient air quality, soil gas.

Quality Control: separate co-eluting peaks for optimum quantitation.



Petrochemical: the TCS GC can validate the quality of fuels in process with improved peak separation.

TCS GC System

These two successive PID chromatograms show the separation of BTEX+. In the first chromatogram, Toluene and PCE (tetrachloroethylene) co-elute. In the second chromatogram, Toluene and PCE are separated. The same temperature program was used in both runs for Oven 1, which heats the non-polar column. In the second run, a slightly different temperature program was used for Oven 2 in order to manipulate the polarity of Column 2.

Run 1:

Oven 1 Temperature Program:

Initial	Hold	Ramp	Final
40°C	5.00	5.00	140°
140°	25.00	0.00	140°C

Oven 2 Temperature Program:

Initial	Hold	Ramp	Final
40°C	24.00	10.00	140°
140°	16.00	0.00	140°C

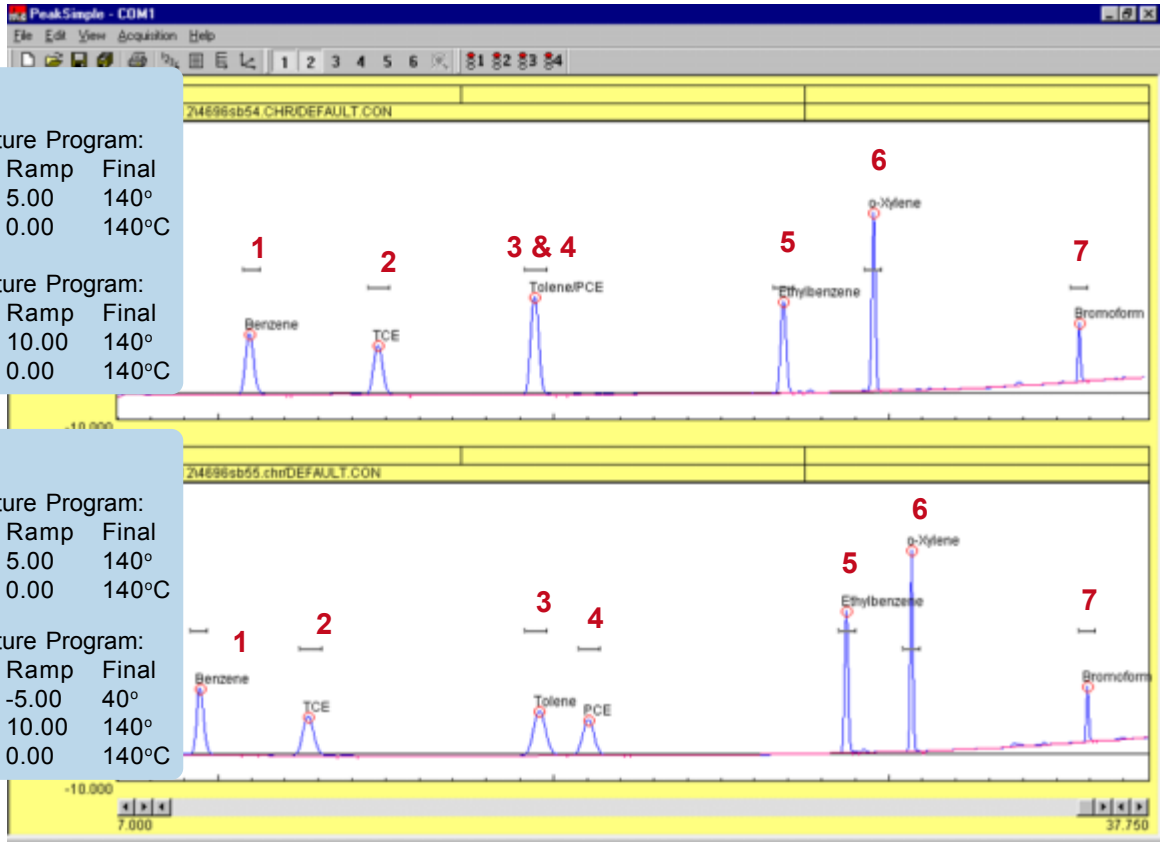
Run 2:

Oven 1 Temperature Program:

Initial	Hold	Ramp	Final
40°C	5.00	5.00	140°
140°	25.00	0.00	140°C

Oven 2 Temperature Program:

Initial	Hold	Ramp	Final
50°C	10.00	-5.00	40°
40°	12.00	10.00	140°
140°	16.00	0.00	140°C



As seen in the Oven 2 temperature program for Run 2, PeakSimple provides negative programming capability in addition to unlimited ramping. Making this slight change in Oven 2's temperature program not only separated Tolene and PCE, it also altered the retention times of Ethylbenzene and o-Xylene. The TCS GC gives you the power to move peaks!

COMPONENTS:

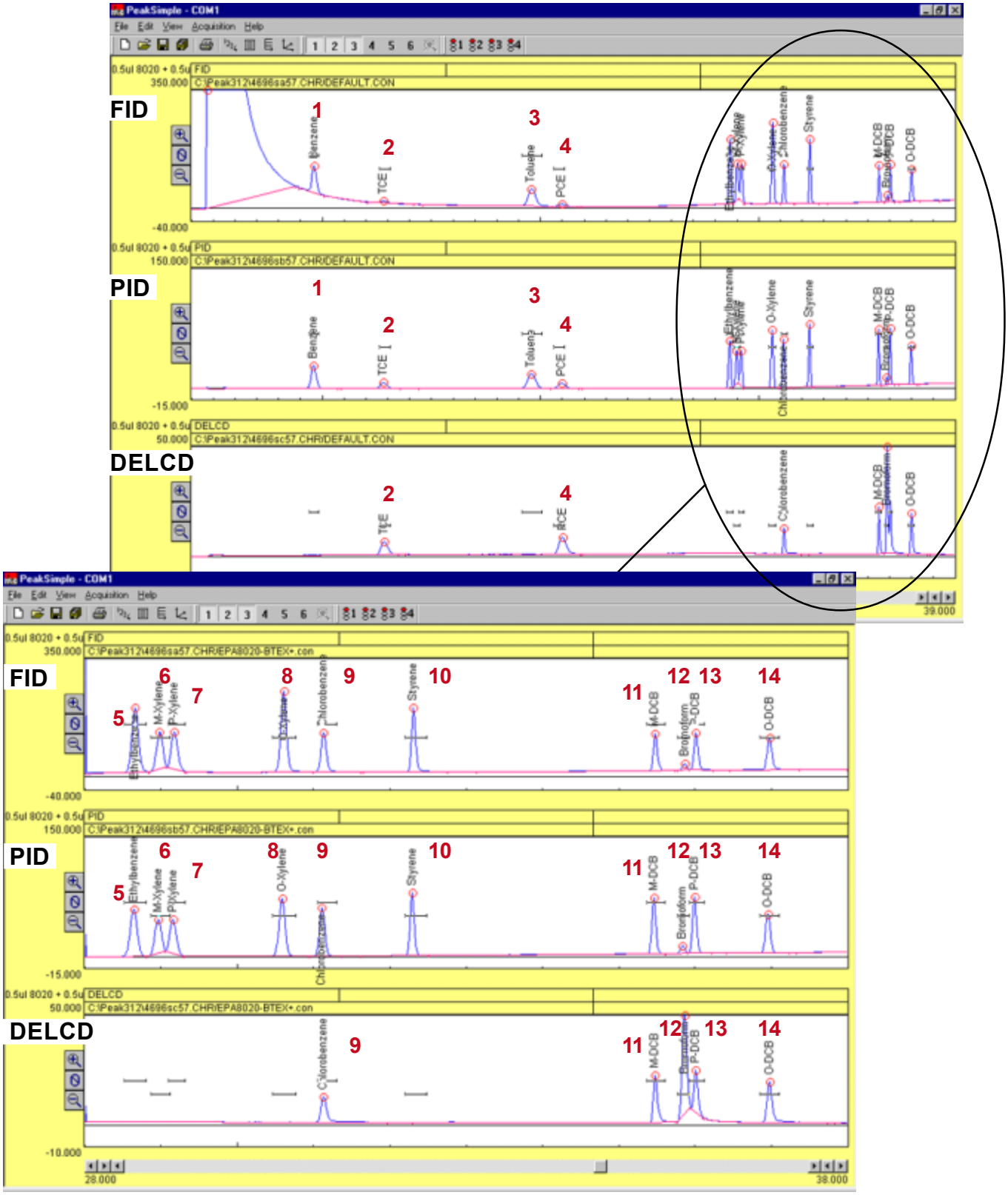
1. Benzene
2. TCE
3. Toluene
4. PCE
5. Ethyl Benzene
6. m-Xylene
7. p-Xylene
8. o-Xylene
9. Chlorobenzene
10. Styrene
11. M-Dichlorobenzene
12. Bromoform
13. P-Dichlorobenzene
14. O-Dichlorobenzene

Listed at left are the components of the samples analyzed in the chromatograms on these pages. The FID responds to all of the listed compounds. The PID responds to the same compounds, but with slightly earlier retention times, because it is plumbed upstream of the FID/DELCD combination detector. The DELCD responds selectively to the chlorinated and brominated compounds, and is protected from hydrocarbon contamination because the FID pre-combusts the sample.

The columns and carrier flow were the same for all the analyses shown on these pages:

Columns:
Oven 1 = 15-meter MXT-1 Carrier = helium @10mL/minute
Oven 2 = 60-meter MXT-Wax

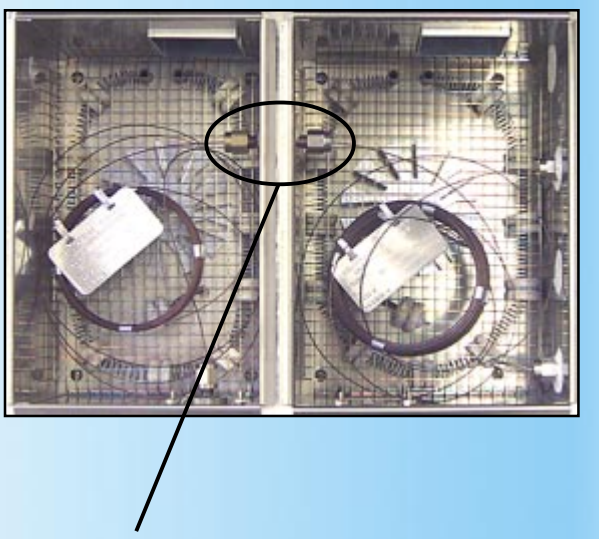
These chromatograms used the same temperature programs listed for Run 2 on the previous page to separate EPA Method 8020 standard mixed with BTEX+. With the TCS GC, the user is able to achieve baseline resolution of all components, including the extremely difficult to separate m- and p-Xylenes. The top set of chromatograms shows the entire run, and the bottom set shows the last 10 minutes.



SRI TCS GC System

Tunable Column Selectivity expands the limits inherent in analytical columns, allowing you to separate traditionally inseparable peaks.

Compact and rugged, the **SRI Tunable Column Selectivity GC** is the only commercially available dual column solution. Dual ovens offer optimum independent temperature control with a minimal increase in analysis times. Compared to conventional GCs, separations with better resolution can be made on shorter, less expensive columns.



In addition to the independent temperature control, a mid-point pressure control adds even further separation capability—for the serious chromatographer:

The programmable mid-point pressure control allows the user to modulate the effluent from the first column onto the second column. The flow may be stopped in the non-polar column while the polar separation is achieved.

When your application requires the separation of co-eluting peaks, take control with the SRI TCS GC System.

8610-5500 **Tunable Column Selectivity (TCS) GC System**

Voltage: for 110VAC, use 8610-5500-1; for 220VAC, use 8610-5500-2
Options and Upgrades: additional detectors with 4 channel serial or 6 channel USB PeakSimple data system, FID Methanizer accessory, H_2-50 hydrogen generator