The Keyboard and Display

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The status board
The keyboard
Instant action keys [Start], [Stop], and [Prep Run]
Function keys
Short-cut keys [Temp], [Pres], [Flow], [Det Control], [Ramp #]
[Temp], [Pres], and [Flow]
[Det Control]
[Ramp #]
[Info]
[Status]
The Ready/Not Ready status table
The setpoint status table
Procedure: Configuring the setpoint status table
Miscellaneous keys
[Time]
Procedure: Setting time and date
Procedure: Using the stopwatch
Procedure: Setting up [Post Run]
[Run Log]
[Options]
[Config]

Modifier keys
[Mode/Type]
[Clear]
[Delete]
[.]
[–]

Storage and automation
Default parameters
Procedure: Loading the default parameters
The Keyboard and Display

Display
The title and three lines of a control table are visible at one time.

Status board
Flashing or solid display LEDs show information about the current state of the instrument.

Keyboard
Press a key to view a control table or to enter setpoints.

Figure 2  The GC controls
The display

Think of this as a window through which you view the control tables. The top line is a title—the other lines show the table content. If the table is more than three lines long, use the scroll keys to see the additional lines.

Scroll keys (▲,▼)

Move the control table up or down in the display window.

The cursor (<)

Points to the line that is in editing position. Changes that you make using the keyboard apply to the “cursored” line.

Asterisk (*)

A blinking asterisk prompts you to press [Enter] to store a setpoint or [Clear] to abort the entry. You cannot perform any other task until this is done.

If this asterisk blinks, you cannot perform any other function until you press [Enter] or [Clear].

The asterisk on the left of a Mode/Type table indicates the current selection.
Beeping instrument

If a gas flow cannot reach setpoint, you hear a series of beeps. The flow shuts down after 1 or 2 minutes.

If a hydrogen flow is shut down or a thermal shutdown occurs, a continuous beep sounds. Cancel the beep by pressing [Clear].

Any other type of fault, warning, or shutdown is accompanied by one beep.

Blinking setpoint

If a gas flow, multiposition valve, or the oven is shut down by the system, Off will blink at the appropriate line of the control table. This helps you identify where the problem occurred.

The detector On/Off line blinks if there is a pneumatics shutdown or a failure in another part of the detector, such as a TCD filament.

Actual and setpoint values

When there are two values in one line of a control table, the left value is always actual and the right value is always a setpoint. When there is only one value, it is either an actual or setpoint, depending on the table. On some control tables—such as those controlling columns—the far right number is both actual and setpoint.
Messages

Cautions are reminders that your instrument may be configured incorrectly. You see this message when:

- [Column 1] and [Column 2] are configured to one inlet or one detector.
- An auxiliary flow channel is used as an inlet, and the auxiliary carrier gas type is configured as air. You cannot use air as a carrier gas.

Caution message:

Errors mean that:

- The setpoint you’ve entered is out of the allowable range.
- You do not have the hardware on your instrument to support the operation you have requested.

Error message:

Popups appear when a Shutdown, Fault, or Warning occurs. They contain the type and number of the error and a brief description. See "Warning".

Popup message:

Press [Clear] to remove the message.

Press [Clear] to remove the message. You can then reconfigure the instrument, if desired, or continue with your current configuration.

Press [Clear] to remove the message.

You must enter a new setpoint, change that hardware, or reconfigure the instrument before continuing.

Press [Clear] to remove the message.
The status board

![Diagram of the status board]

**Figure 3** The status board

**Table 4** The Display LEDs

<table>
<thead>
<tr>
<th>LED</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Run</td>
<td>Lit when the GC is in the Pre Run state (after [Pre Run] is pressed). See page 285 for more information.</td>
</tr>
<tr>
<td>Oven Ramp LEDs</td>
<td>Show the progress of the oven temperature program. The Rate LED blinks if the oven is unable to follow the program.</td>
</tr>
<tr>
<td>Post Run</td>
<td>Lit when the instrument is executing a post run.</td>
</tr>
<tr>
<td>Not Ready</td>
<td>Lit when the GC is not yet ready to make a run. Blinks when the instrument has one or more fault conditions. Press the [Status] key to see which parameters are not ready or what faults have occurred.</td>
</tr>
<tr>
<td>Run</td>
<td>Lit when the instrument is executing a chromatographic run.</td>
</tr>
<tr>
<td>Remote</td>
<td>Indicates that communication with a remote device has been established.</td>
</tr>
<tr>
<td>Clock Table</td>
<td>Indicates that the clock table has entries.</td>
</tr>
<tr>
<td>Gas Saver</td>
<td>Indicates that the front or back gas saver is on.</td>
</tr>
<tr>
<td>Run Log</td>
<td>Indicates that the run log has entries. This information can be used for Good Laboratory Practice (GLP) standards.</td>
</tr>
</tbody>
</table>
The keyboard

![The keyboard diagram]

**Figure 4** The keyboard
Instant action keys [Start], [Stop], and [Prep Run]

These keys cause the instrument to do something now.

[Start] and [Stop]
Start and stop any type of run. [Stop] cancels a Pre Run, Post Run, or power fail recovery and aborts a local sequence.

[Prep Run]
If you are using one or more of the following functions, you must press [Prep Run] to prepare for a run:

- Gas saver—cancels gas saver flow and brings inlet flow to its setpoint value.
- Splitless injection—closes the purge valve.
- Pulsed split or splitless injection—increases inlet pressure to the pulse setpoint.
- Solvent vent injection—changes inlet pressure to the vent pressure setpoint and split vent flow to the vent flow setpoint.

Pressing [Prep Run] turns on the Pre Run LED. When the LED is blinking, the instrument is preparing for a run and waiting for instrument setpoints (other than the ones associated with Prep Run) to be reached. Once these setpoints are ready, the LED remains on and the Prep Run events occur. After a 6-second equilibration time, the instrument is ready for a run and the Not Ready light goes out.

If you press [Prep Run] while the Pre Run LED is blinking, the LED stops blinking before all setpoints are ready. At this point, the gas saver and purge valve portions of your split/splitless inlet are ready for a run.

With most automatic injection systems, you do not need to use the [Prep Run] key. If your sampler or automation controller (for example, an integrator or workstation) does not support the Prep Run function, you must set the instrument to Auto Prep Run. See the example “[Config] on page 56.”

Function keys

Table 5 lists the function keys, a brief description of their use, and where to find detailed information.
### The Function Keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Use to:</th>
<th>For more information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Oven]</td>
<td>Set oven temperatures, both isothermal and temperature programmed.</td>
<td>See &quot;The Column Oven&quot;.</td>
</tr>
<tr>
<td>[Aux #] [1] and [Aux #] [2]</td>
<td>Control extra temperature zones such as a heated valve box, a mass selective detector, an atomic emission detector transfer line, or an “unknown” device. Can do temperature programming.</td>
<td>See &quot;Valve Control&quot;.</td>
</tr>
<tr>
<td>[Aux #] [3], [Aux #] [4], and [Aux #] [5]</td>
<td>Provide auxiliary pneumatics to an inlet, detector, or other device. Can do pressure programming.</td>
<td>See &quot;Flow and Pressure Control&quot; and &quot;Valve Control&quot;.</td>
</tr>
<tr>
<td>[Signal 1] and [Signal 2]</td>
<td>Assign a signal, usually to the front or back detector.</td>
<td>See &quot;Signal Handling&quot;.</td>
</tr>
<tr>
<td>[Col Comp 1] and [Col Comp 2]</td>
<td>Create a column compensation profile.</td>
<td>See &quot;Signal Handling&quot;.</td>
</tr>
</tbody>
</table>
Short-cut keys [Temp], [Pres], [Flow], [Det Control], [Ramp #]

Quickly access a setpoint from within a table.

[Temp], [Pres], and [Flow]

If no control table is open, pressing these keys gives you:

[Temp]  Oven temperature
[Pres]  Front inlet pressure (back or auxiliary pressure channel if front inlet is not installed)
[Flow]  Column 1 or 2 flow if EPC inlet. If not EPC, front detector or back detector flow.

If the parameter is in the open control table, the cursor jumps to that line:
If the parameter is not in the open table, the key opens an appropriate table. For example, if the oven control table is open and you push [Pres], the front inlet control table opens with the cursor on the Pressure line.

**[Det Control]**

When viewing a detector control table, [Det Control] moves the cursor to the on/off control for that detector.
With a nondetector control table, [Det Control] opens the front detector control table (or back, if a front detector is not installed). The cursor is at the on/off control for that detector.

[Ramp #]

With a control table open that has no temperature, flow, or pressure ramps, [Ramp #] plus a number opens the Oven control table. If no ramps are specified, the cursor is on the Rate 1 (off) line.

Press [Ramp # 2]

Oven control table opens. Because no temperature ramps are set on this table, cursor is on the Rate 1 (off) line.

With a control table that contains temperature, flow, or pressure ramps, [Ramp #] (1-6) moves the cursor to the first line of the ramp number specified. If the ramp
number does not exist, the cursor goes to the highest ramp number in the control table.

[Col 1] table open, cursor on Pressure line.

Press [Ramp #] [2]

Cursor moves to Rate 2 line.

[Info]

This is a context-sensitive help that provides information about an active parameter (line with the cursor).

These info messages may be in several different forms,

• Definitions
• Setpoint ranges
• Actions to perform
The following examples are possible, depending upon the control table you are in. Press [Info].

**Definition:**

```
SPLIT RATIO INFO
Split flow divided by column flow.
0.1 to 7500
```

**Setpoint ranges:**

```
ERROR: Out of range
0 to 999.99 minutes
```

**Perform an action:**

```
MODE/TYP INFO
* is present mode.
Move cursor to new mode and press ENTER
```
[Status]

The [Status] key has two tables associated with it. You switch between them by pressing the key.

The Ready/Not Ready status table

This table lists parameters that are *Not Ready* or gives you a *Ready for Injection* display. If there are any *faults*, *warnings*, or *method mismatches* present, they are displayed here. See page 202 and page 242 for detailed information about the not ready, fault, and warning status displays. The method mismatch displays are discussed on page 202.

**Ready for injection display**

```
STATUS
Ready for Injection
WARNING(S):
Sig 1 buffer full
```

Ready display—check for warnings.

**Not ready display**

```
STATUS - Not Ready
  Oven temp
  Back det shutdown
  FAULT(S):
    B TCD filament short
  WARNING(S):
    Sig 1 buffer full
    METHOD MISMATCH(ES):
    Oven maximum temp
```

Not ready—items that are not ready. If you have a *not ready* display, check for faults or warnings.

Fault—a hardware problem requiring user intervention.

Warning—problems that user should be aware of but that will not prevent instrument from executing a run.

Method mismatch—message appears if hardware or user-entered configuration has changed after loading a method or power on.
The setpoint status table

This table lists setpoints compiled from the active control tables on the instrument. This is a quick way to view active setpoints during a run without having to open multiple control tables.

<table>
<thead>
<tr>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oven temp 250</td>
</tr>
<tr>
<td>Sig 1 Back 30</td>
</tr>
<tr>
<td>Column 2 flow 0.8</td>
</tr>
<tr>
<td>B inlet Pt 10.0</td>
</tr>
<tr>
<td>Time left 9.50</td>
</tr>
</tbody>
</table>

Procedure: Configuring the setpoint status table

You can change the order of the list. You might want the three most important setpoints to appear in the window when you open the table.

1. Press [Config] [Status].
2. Scroll to the setpoint that should appear first and press [Enter]. This setpoint will now appear at the top of the list.
3. Scroll to the setpoint that should appear second and press [Enter]. This setpoint will now be the second item on the list.
4. And so on, until the list is in the order you wish.

Press [Config][Status]

a. Scroll to Signal 1 and press [Enter].

b. Signal 1 is now the first item on the list.
Miscellaneous keys

[Time]

The time control table does not have a title. The first line always displays the current date and time, and the last line always displays a stopwatch. The two middle lines vary as shown.

**Time display between runs**

<table>
<thead>
<tr>
<th>Time display between runs</th>
<th>Actual time and date</th>
<th>Static display of last and next runtime in minutes</th>
<th>Stopwatch</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00:29  18 Mar 95</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Last runtime 18.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Next runtime 80.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t=0:00.0  1/t= 0.00 &lt;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Time display during a run**

<table>
<thead>
<tr>
<th>Time display during a run</th>
<th>Counts time elapsed during run</th>
<th>Counts down time remaining in run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elapsed time 18.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time left 71.95</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Time display during Post Run**

<table>
<thead>
<tr>
<th>Time display during Post Run</th>
<th>Static display of last runtime</th>
<th>Counts down time remaining in Post Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last runtime 20.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post time 8.77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Procedure: Setting time and date
Press [Config][Time]

Enter new time.
Enter new date.

Procedure: Using the stopwatch
In the stopwatch mode, both the time (to 0.1 second) and reciprocal time (to 0.01 min⁻¹) are displayed. The stopwatch is useful when measuring flows with a bubble flowmeter.

1. Scroll to the stopwatch line of the Time Control Table.
2. Press [Enter] to start the stopwatch.

You can access other functions while the stopwatch is running. Press [Time] again to view the stopwatch display.

Procedure: Setting up [Post Run]
Use this key to program the instrument to clean out a column after a run. To set up a Post Run:

1. Press [Post Run]

When Time is set at 0.00, other lines of the control table are not available.
2. Enter the post-run (column cleanout) Time, in minutes.

Once a setpoint for Time is entered, other lines of control table become available.

3. Enter Oven temp and Column pres.

The instrument is now programmed to maintain the oven temperature at 250°C for 10 minutes following a run, with column 2 head pressure at 15.0 psi.

The Post Run LED on the status board is lit during a Post Run.

If you press [Time] while in a Post Run, you can view the amount of time remaining.

[Run Log]

Deviations from the planned method (including keyboard intervention) during the most recent run are listed in the run log table. Up to 50 run log entries can be stored. The run log information can be used for Good Laboratory Practice
The Keyboard and Display

Miscellaneous keys

(GLP) standards. The run log can be uploaded to a workstation or printed out on an integrator.

Press [Run Log]

The Run Log LED is lit if there are any entries in the run log for the run in progress. The run log is cleared at the start of a new run.

If no run deviations have been logged, the display is:

[Options]

The option key accesses instrument parameter setup options.

Press [Options]

OPTIONS
| Service Counters |
| Calibration |
| Communication |
| Keyboard and Display |
| Diagnostics |

Scroll to the appropriate line and press [Enter] to access the associated control table.
The Keyboard and Display

Miscellaneous keys

Calibration

Lists the parameters that can be calibrated. The calibration displays are discussed in the Agilent 6890 Service Manual.

A useful calibration option is Auto flow zero. When it is on, after the end of a run the GC shuts down the flow of gases to an inlet, waits for the flow to drop to zero, measures and stores the flow sensor output, and turns the gas back on. This takes about two seconds. The zero offset is used to correct future flow measurements.

To activate this, select Calibration on the OPTIONS menu, then choose either Front inlet or Back inlet, and turn Auto flow zero on.

Communication

Allows access to the communications setpoint parameters. The communication displays are discussed on "Installation".

Diagnostics

The diagnostic parameters are for use by your Service Representative. Diagnostics are discussed in the Agilent 6890 Service Manual.

Keyboard and display

User interface setpoints are accessed in the keyboard and display control table. The following parameters are turned on and off by pressing the [On] or [Off] keys.

- **Keyboard lock**—the following keys and functions are operational when the keyboard lock is ON:
  - [Start], [Stop], and [Prep Run]
  - [Load][Method] and [Load][Seq]
  - [Seq]—to edit existing sequences
  - [Seq Control]—to start or stop sequences.
- **Key click**—click sound when keys are pressed, can be turned on or off.
- **Warning beep**—allows you to hear warning beeps.
- **Method mod beep**—turn [ON] for high pitched beep when method setpoint is modified.

Press [Mode/Type] to change the pressure units and radix type.

- **Pressure units**
  - psi—pounds per square inch, lb/in²
bar—absolute cgs unit of pressure, dyne/cm²
kPa—mks unit of pressure, 10³ N/m²

• Radix type—determines the numeric separator type—1.00 or 1,000

Service Counters
Tracks syringe, septum, and liner usage by counting each injection (regardless of Front/Back or INJ type).

1. At keyboard, press [Options].

2. From the open control table, select Service Counters. Press [Enter].

3. Scroll to desired counter. Press [Clear] to reset counter to 0.
[Config]

The [Config] key sets up configurations for instrument control. The column mode and dimensions, inlet, and makeup gas type configurations are critical to proper operation of EPC.

Use [Config] with other keys for infrequently changed parameters.

Press [Config] [Oven]

<table>
<thead>
<tr>
<th>CONFIGURE OVEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum temp 450</td>
</tr>
<tr>
<td>Equib time 3.00</td>
</tr>
<tr>
<td>Cryo (N2) Off</td>
</tr>
<tr>
<td>Quick cryo cool Off</td>
</tr>
<tr>
<td>Ambient temp 25</td>
</tr>
<tr>
<td>Cryo timeout Off</td>
</tr>
<tr>
<td>Cryo fault Off</td>
</tr>
</tbody>
</table>

Press the [Config] key to obtain a listing of configurable parameters:

<table>
<thead>
<tr>
<th>CONFIG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oven</td>
</tr>
<tr>
<td>Front inlet</td>
</tr>
<tr>
<td>Back inlet</td>
</tr>
<tr>
<td>Column 1</td>
</tr>
<tr>
<td>Column 2</td>
</tr>
<tr>
<td>Front detector</td>
</tr>
<tr>
<td>Back detector</td>
</tr>
<tr>
<td>Signal 1</td>
</tr>
<tr>
<td>Signal 2</td>
</tr>
<tr>
<td>Aux #</td>
</tr>
<tr>
<td>Status</td>
</tr>
<tr>
<td>Time</td>
</tr>
<tr>
<td>Valve #</td>
</tr>
<tr>
<td>Front injector</td>
</tr>
<tr>
<td>Back injector</td>
</tr>
<tr>
<td>Sample tray</td>
</tr>
<tr>
<td>Instrument</td>
</tr>
</tbody>
</table>

Scroll to the Instrument parameter. Press [Enter] to access the Config Instrument control table. Types shown depend on the installed equipment.
Modifier keys

Modifier keys extend the functions of some setpoint control keys.

[Mode/Type]

Use this key to access a list of possible modes or types associated with nonnumeric setpoints. To change mode or type, scroll to the desired line and press [Enter]. An asterisk (*) marks the present mode or type.

The following are several examples of Mode/Type functions.

Mode:

Press [Mode/Type]

Type:

Press [Mode/Type]

Examples of instances when the words “Mode” or “Type” do not appear. When in doubt, press [Info] to find out if [Mode/Type] is to be used.
The Keyboard and Display
Modifier keys

[Clear]
The [Clear] key is used to:

- Clear mis-entered setpoints in a control table before pressing [Enter] (when the * is still flashing).
- Back out of Mode/Type select before pressing [Enter].
- Return to upper level in nested control tables (config, option).
- Clear the stopwatch to zero.
- Clear info message and return to previous display.
- Clear error messages (popup messages, errors on setpoint entries, etc.).
- Cancel a function during a sequence, method, clock table, or run table and loading or storing sequences and methods.

Press [Clear] to cancel

[Delete]
Deletes methods and sequences or run table and clock table entries.

[Delete] aborts the adjust offset process for the nitrogen-phosphorus (NPD) and electron capture (ECD) detectors, without interrupting other detector parameters.
The Keyboard and Display

Modifier keys

[ ]
The radix is a decimal place holder. This parameter can be changed from the decimal point to the comma in the Keyboard options control table, which is nested under the Options control table.

Press [Options]

Press [Mode/Type]

[–]
The dash key is used to denote ranges of numbers (inclusive).

Bottle # range: 1 to 10, press [1] [–] [1] [0]
This key is also used as a minus sign for negative values.
For –5, press [–] [5]
Storage and automation

Table 6 lists the storage and automation keys, a brief description of their use, and a place to find detailed information.

Table 6  Method and Sequence Storage and Automation Keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Use to:</th>
<th>For more information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Load]</td>
<td>Load up to nine stored methods and five stored sequences.</td>
<td>“Analytical Methods”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Analytical Sequences”</td>
</tr>
<tr>
<td>[Store]</td>
<td>Store up to nine methods and five sequences. Stored methods and</td>
<td>“Analytical Methods”</td>
</tr>
<tr>
<td></td>
<td>sequences are labeled and dated.</td>
<td>“Analytical Sequences”</td>
</tr>
<tr>
<td>[Method]</td>
<td>Review a table of stored methods. You can load, store, delete, or</td>
<td>“Analytical Methods”</td>
</tr>
<tr>
<td></td>
<td>set default method.</td>
<td></td>
</tr>
<tr>
<td>[Seq]</td>
<td>Review a table of stored sequences. The [Seq] key toggles between</td>
<td>“Analytical Sequences”</td>
</tr>
<tr>
<td></td>
<td>the stored sequences control table and sequence definition control</td>
<td></td>
</tr>
<tr>
<td></td>
<td>table.</td>
<td></td>
</tr>
<tr>
<td>[Run Table]</td>
<td>View a table of events and the run time at which they occur.</td>
<td>“Instrument Automation”</td>
</tr>
<tr>
<td>[Clock Table]</td>
<td>Display the clock time table of events in the order that they occur</td>
<td>“Instrument Automation”</td>
</tr>
<tr>
<td></td>
<td>based on a 24-hour clock. You load, store, or delete.</td>
<td></td>
</tr>
<tr>
<td>[Front Injector]</td>
<td>Edit injector control parameters such as injection volumes, sample</td>
<td>“The Automatic Sampler”</td>
</tr>
<tr>
<td>or [Back</td>
<td>and solvent washes, etc.</td>
<td></td>
</tr>
<tr>
<td>Injector]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Valve#]</td>
<td>Turn GSV and selection valves 1 to 8 on or off. Sets multiposition</td>
<td>“Valve Control”</td>
</tr>
<tr>
<td></td>
<td>valve position.</td>
<td></td>
</tr>
<tr>
<td>[Sample Tray]</td>
<td>Display the tray status.</td>
<td>“The Automatic Sampler”</td>
</tr>
<tr>
<td>[Seq Control]</td>
<td>Start, stop, pause or resume a sequence, and view sequence status.</td>
<td>“Analytical Sequences”</td>
</tr>
</tbody>
</table>
Default parameters

The GC software supplies default values for most parameters if you do not specify them. These values are reasonable operating parameters for inlets and detectors. Once you change a parameter, the default value for that parameter is erased.

At some time, you may find it desirable to reload the default parameters. Doing this erases all current parameters except any methods you have stored and replaces them with the default set.

Procedure: Loading the default parameters

1. Press [Method]
2. Scroll to the Set default method line and press [Enter].

3. This message will appear:

   SET DEFAULT METHOD
   ENTER to load default method.
   CLEAR to cancel.

4. Press [Enter] to load the default parameters.