

# **Instrument Network (INET) or Local Area Network (LAN) Communications Interface Board Installation Guide**

**Accessory G1553A (INET)  
Accessory G2335A (LAN)**

## **Overview**

This section reviews the procedure for installing an Instrument Network (INET) or Local Area Network (LAN) communications interface board on an 6890A or Plus Series gas chromatograph (hereafter referred to as the GC). Before following this procedure, refer to the safety information on the inside front cover.

### **Parts List**

- INET interface board or LAN board
- 5-m communications cable (INET)  
*or*
- 8-m coaxial cable and coaxial T (LAN)
- 4 screws
- MIO bracket
- MIO connector assembly
- MIO slot cover
- Standoff



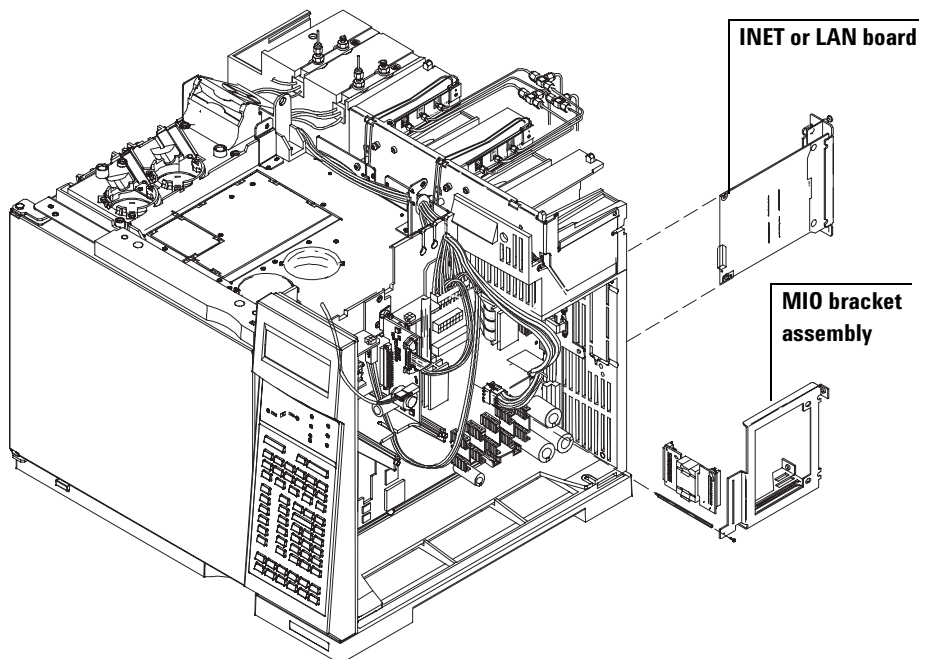
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### Required Tools

- Electrostatic protection such as a grounded wrist strap (Agilent p/n 9300-0969 for large wrists or Agilent p/n 9300-0970 for small wrists)
- T-20 Torx screwdriver
- T-10 Torx screwdriver
- Diagonal cutters

### Steps

- 1 Prepare the GC
- 2 Attach the bracket to the mainboard
- 3 Position and secure the board
- 4 Install the cables
- 5 Restore the GC to operating condition
- 6 Configure your GC (LAN)
- 7 Operate the 6890 Series GC and 3396 integrator (INET)

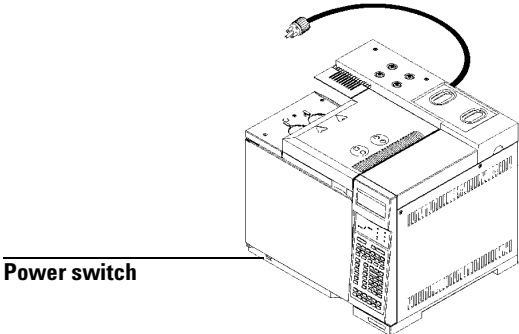


## Prepare the GC

**WARNING**

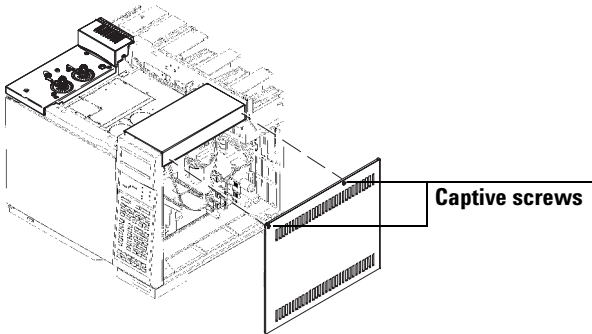
Hazardous voltages are present in the mainframe when the GC power cord is plugged in. Avoid a potentially dangerous shock hazard by unplugging the power cord before removing the side panels.

- 1 Turn off the GC and unplug the power cord.



- 2 Remove the electronics side cover. Loosen the two captive screws with a T-20 Torx screwdriver, slide the cover to the rear, and lift it off.

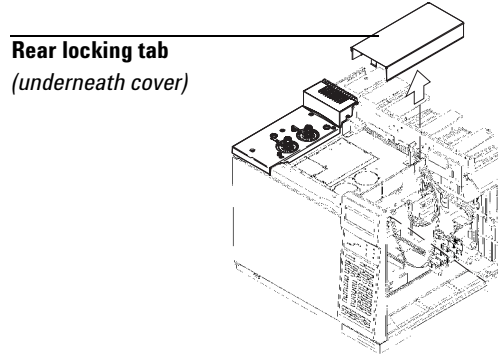
Electronics side cover



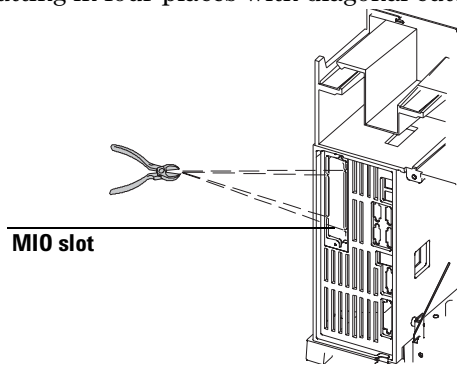
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- 3 Remove the electronics top cover. Press the rear locking tab toward the front of the GC while lifting the back of the cover. Slide the cover back, up, and out of the GC.

**Electronics top cover**



- 4 Locate the MIO slot at the back of the GC. Remove the plastic covering from the slot by cutting in four places with diagonal cutters.

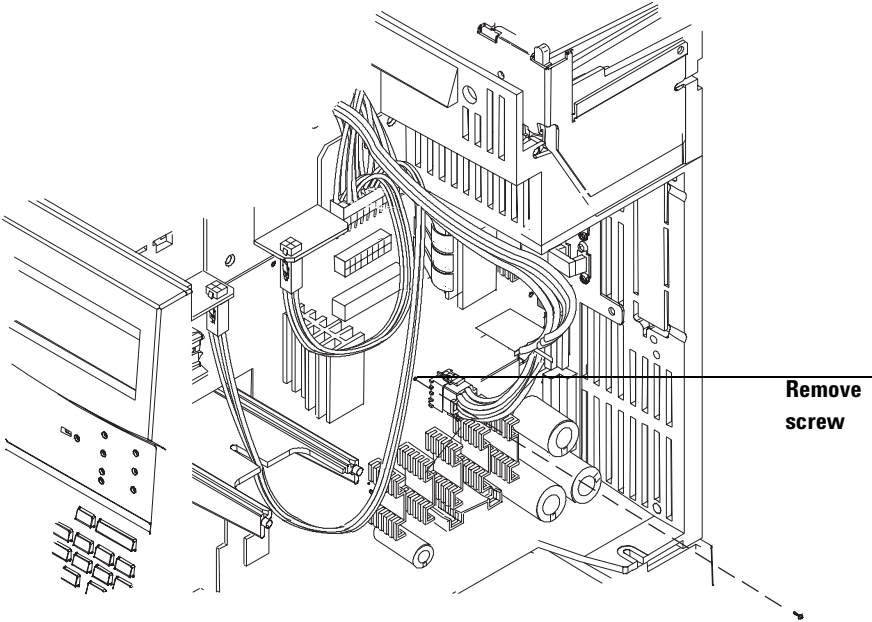


### Attach the Bracket to the Main Board

**CAUTION**

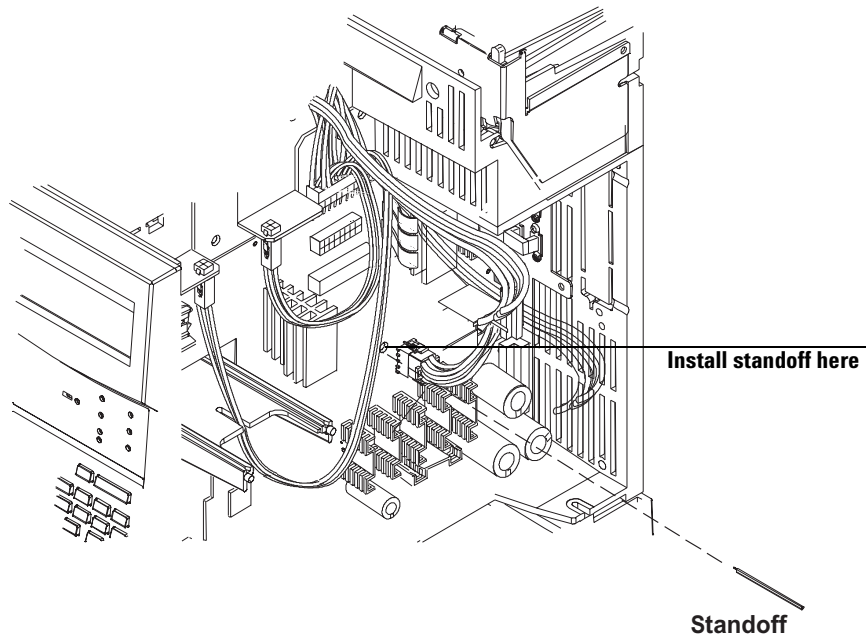
Board components can be damaged by static electricity; use a properly grounded static control wrist strap when handling the board.

- 1 Remove the screw from the mainboard as shown using a T-10 Torx screwdriver. You will use this screw in step 5.

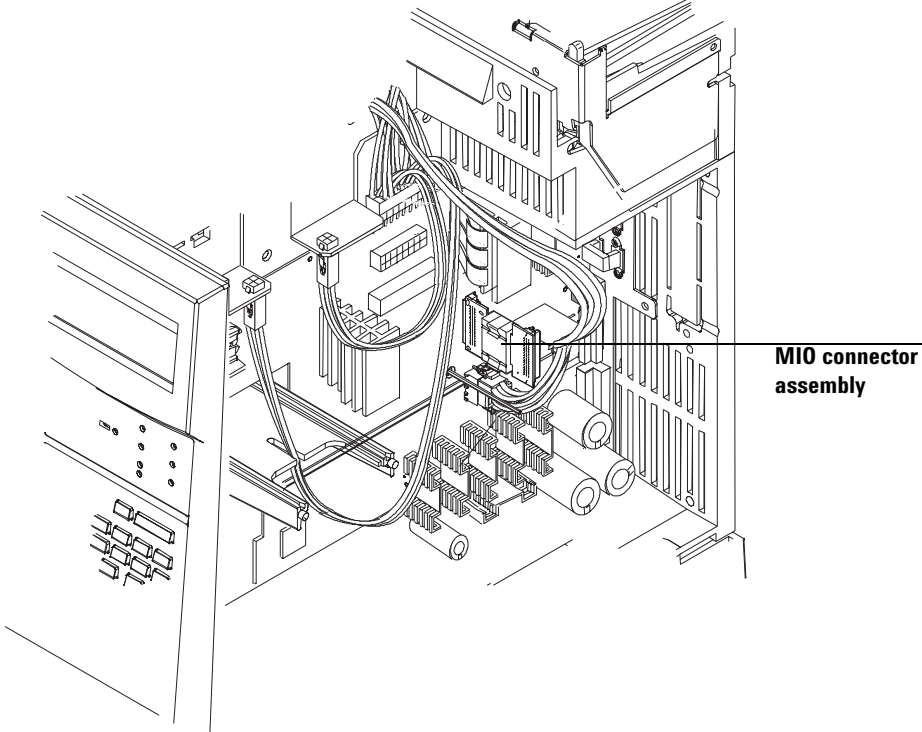


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- 2 Screw the standoff into the location where you removed the screw in Step 1.

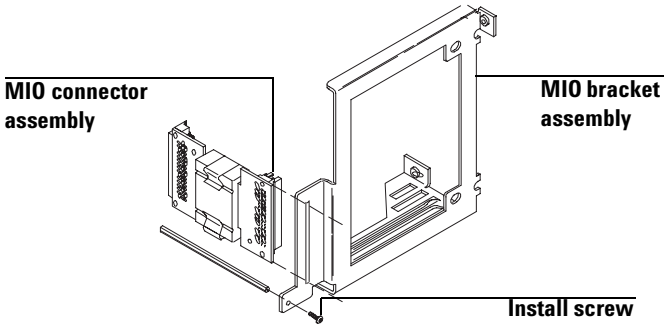


3 Plug the MIO connector assembly into the mainboard.



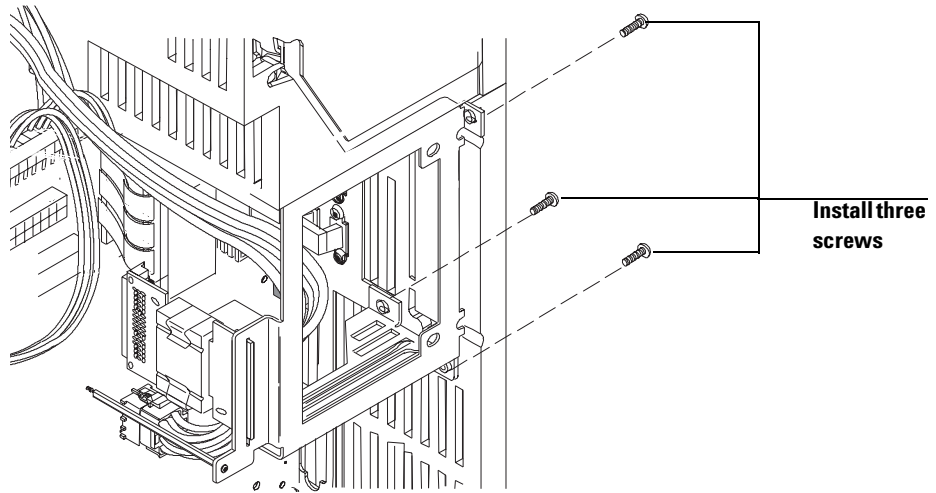
4 Position the MIO bracket assembly so that the slot in the bracket slips over the MIO connector assembly installed in step 3, and the standoff aligns with the hole in the bracket.

5 Locate the screw you removed from the mainboard in step 1. Attach it to the bracket and connect it to the standoff. Tighten the screw with a T-10 Torx screwdriver until snug.



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- 6 Connect the MIO bracket assembly to the GC. Attach a screw to each of the three remaining tabs in the MIO bracket assembly, and tighten with a T-20 Torx screwdriver until snug.



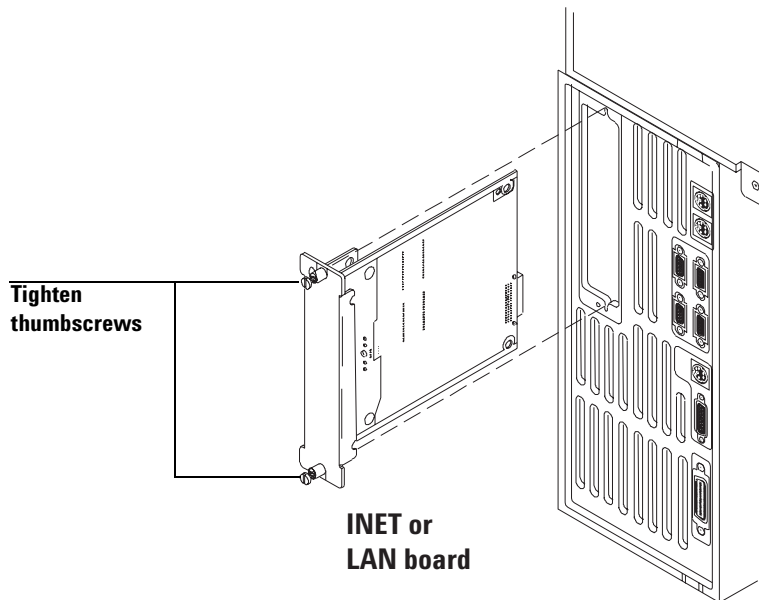


## Position and Secure the Board

### CAUTION

Board components can be damaged by static electricity; use a properly grounded static control wrist strap when handling the board.

- 1 Carefully remove the INET or LAN board from its antistatic bag. Insert the board in the MIO slot so the board connector will join with the MIO slot connectors assembly. Press the board until it is fully seated on the mainboard connector.
- 2 Tighten each thumbscrew by hand a little at a time, alternating between each side until both of the thumbscrews are secure.

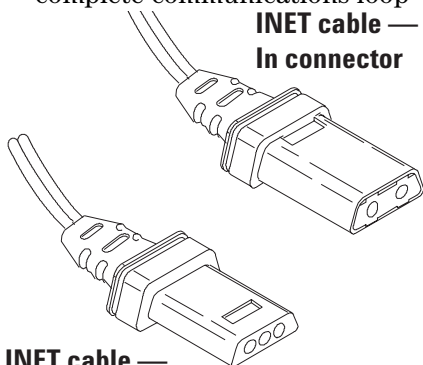


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### Install the Cable (INET)

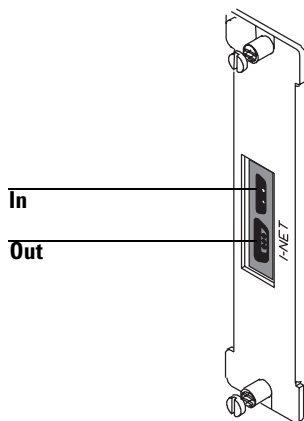
- 1 Examine your INET cables. You will need at least two cables to create a complete communications loop - one for each instrument.

**INET cable —  
In connector**

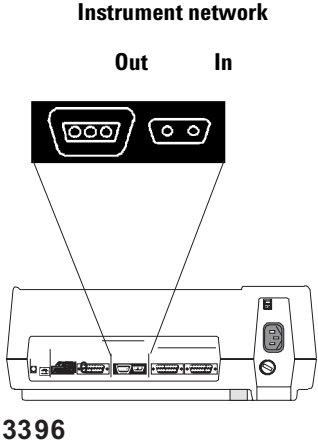


**INET cable —  
Out connector**

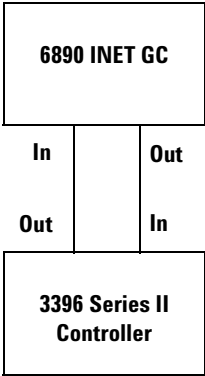
- 2 Network *In* and *Out* receptacles on the INET board.



- 3 Locate the Instrument Network *In* and *Out* receptacles on the other devices to be included in the loop.

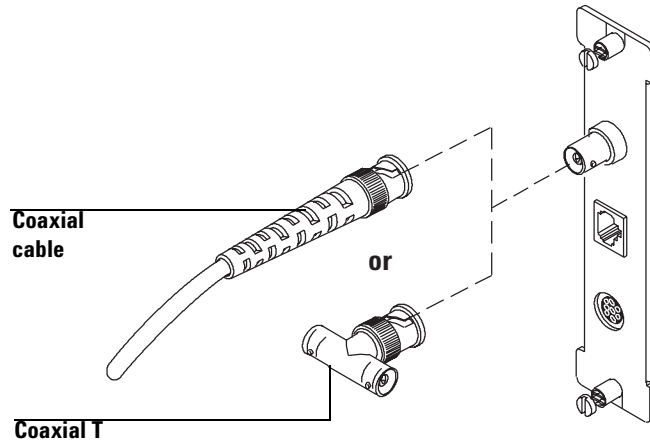


- 4 Install the INET cable between the *Out* receptacle on the INET board and the *In* receptacle on the next device in the loop. The configuration illustrated below uses two INET cables.



**Install the Cable (LAN)**

- 1 Connect the 8-m coaxial cable, the coaxial T, or 10 Base-T cable to the LAN board as shown.



## Restore the GC to Operating Condition

- 1 Reattach the electronics top cover.
- 2 Reattach the electronics side cover.
- 3 Plug in the GC and turn on the power switch.

### NOTE

If you remove the board from the GC, make certain to cover the slot at the back of the GC with the MIO slot cover provided in the ship kit.

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## Operate the 6890 and 3396 Integrator

This section explains how to operate your 6890 Series GC and 3396 Integrator when they communicate with each other over the Instrument Network (INET).

If you have 3396 Series III, operation with the 6890 integrator/series GC is fully explained in the 3396 Series III Operating Manual.

If you are using your 6890 in an INET configuration with the 3396 Series II, this manual contains additions or corrections to the operating manual that came with your integrator. For more information about INET, see the 3396 Networking Manual. See your 6890 GC operating manual for more information about using the 6890.

The changes to the operation of your 3396 and 6890 when they are in an INET configuration can be grouped into the following areas:

- Sequence operation
- Method list options
- Selecting the range
- Forcing a method to load
- Recovery from power failures and INET loop interruptions

### Sequence operation

In a configuration of an 3396 integrator, 6890 GC, and 7673C automatic liquid sampler (ALS), there is an RS-232 connection between the ALS and GC. The GC controls the sampler over this connection. The sequence operates differently from both an 6890 in analog mode and a traditional INET instrument trio.

The integrator has one subsequence plus the priority sequence. Only one GC method can be used within an integrator sequence. You can use the Sequence Chain Application Program to chain sequences with different methods together; see your Using Applications Programs Manual for more information.

The Start Sequence function on the 6890 is inactive; start the sequence with the **[SEQ][START]** keys of the 3396.

Pressing **[STOP]** on either instrument stops the current run and aborts the sequence.

The ALS method parameters are set using the **[Front Injector]** and **[Back Injector]** keys on the GC keyboard. See the 6890 GC operating manual or the ALS's operating manual for detailed information on selecting the ALS parameters.

The sequence content can be prepared either with the **[Seq]** key on the GC keyboard, or during the **[PREP][SEQ]** dialog of the integrator. If you set them at the GC, you do not need to also set them in the sequence preparation dialog. They will appear as the default integrator values in the integrator sequence preparation dialog; press **[ENTER]** at each prompt to retain them. There is only one set of sequence parameters in the active workspace at any time, whether it is selected in the sequence dialog of the integrator, at the GC keypad, or loaded from a stored sequence file.

The integrator method, calibration, and sample information table are prepared on the integrator in the usual manner.

### Method list options

When an 3396 integrator method is stored or listed on the integrator, the current GC method is included in the method. The method is sent to a buffer space before storing or listing. Including the GC parameters greatly increases the size of the method, and GC method files may be too large for the buffer space in the 3396 Series II integrator. (The 3396 Series III was designed to accommodate the method files of the 6890, so there is always enough buffer space.) Two method listing options are available to enable the 3396 Series II to handle 6890 method files.

- **Truncated method listing** - The 6890 GC delivers the method list information in 256-byte blocks. The GC can be instructed to truncate the method listing at the end of any block, from 1 to 255. This ensures that the buffer space in the 3396 Series II is not overfilled. The result of selecting a truncated method listing is that part of the GC method may not be listed as an offline method.
- **Direct listing** - The direct list mode dumps the 6890 method directly onto the integrator paper, bypassing the buffer space entirely. Therefore, it does not matter whether the space is large enough for the method. A method stored while in Direct List mode cannot be listed from a disk; only the integrator portion of the method will be listed. To list the entire method, it must be reloaded into the active workspace. When in direct mode, the GC method is always printed during a method list operation; it cannot be suppressed with the [OP() 4 dialog, and the report cannot be directed to an external device using the [OP() 5 dialog].

To select the truncated or direct list modes, type:

**\*[OP()] 6 [ENTER]**

**DEVICE ADDRESS: 8 [ENTER]**

Select the INET address of your 6890 GC. The address is assigned by the integrator when the configured instruments are turned on. The GC is usually 8 or 9. To determine the address of your GC, use the **SYSTEM** command. For more about INET addressing, see the 3396 Networking Guide.

**COMMAND STRING: LISTMETH DIRECT [ENTER]  
LISTMETH TRUNC [ENTER]  
LISTMETH NORMAL [ENTER]**

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The **LISTMETH DIRECT** and **LISTMETH TRUNC** command strings select the direct or truncated listings, respectively. **LISTMETH NORMAL** returns to the normal mode. The command must be typed in all capital letters.

If you have selected **LISTMETH TRUNC**, you select the size of the truncated method with the **LISTSIZE** command.

**DEVICE ADDRESS:**     **8 [ENTER]**  
**COMMAND STRING:**   **LISTSIZE 125 [ENTER]**

The size can be any integer from 1 to 255. (Most GC methods are entirely listed by **LISTSIZE 25**. Truncating at a larger **LISTSIZE** will ensure that the buffer space is not exceeded but not have a visible effect on the method listing.)

To exit the dialog, press **[ENTER]**.

**DEVICE ADDRESS:**     **[ENTER]**

The method list modes are retained by the GC until they are explicitly changed by the operator; they are not reset during a power failure or a cold start.



**Select the range**

The 6890 GC is capable of producing data points that are 37 bits wide, but the 3396 integrator can accept only 32 bits. The range parameter allows you to select the bits the integrator will use in generating a report. Range 0 starts with the lowest data point and takes the lowest 32 points available; range 1 starts at data point 2 and goes to point 33, and so on. Range 5 takes the data from points 5 through 37. Range 5 includes the data point range that is generated by the 5890, and is the default value.

Selecting Range 5 will result in peak areas similar to those produced by the 5890. Selecting a lower range will result in larger peak areas because the lower data points are more sensitive. Changing to lower ranges may be helpful when working with extremely small or dilute samples.

The buffered channel can accept a range setpoint that may differ from the live (or C1) channel. For more information about the buffered channel, see the 3396 Networking Guide.

The range is selected in the [OP()] 6 dialog.

**\*[OP()] 6 [ENTER]**

**DEVICE ADDRESS: 8 [ENTER]**

Select the INET address of your 6890 GC. The address is assigned by the integrator when the configured instruments are turned on. The GC is usually 8 or 9. To determine the address of your GC, use the SYSTEM command. For more about INET addressing, see the 3396 Networking Guide.

**COMMAND STRING: SIG1RANGE xx**

**SIG2RANGE xx**

where xx is the range value. The range can be from 0 to 5.

### Force a method to load

A stored method is loaded into the active workspace of the 3396 integrator by typing **[LOAD][METH]** *diskspec: method name*. The parameters of the integrator are changed when the method is loaded, as are the electrical parameters of the 6890 GC. However, loading a method cannot change the configuration parameters of the GC, such as type of detector, column size, and injector type. If you attempt to load a method with a different configuration than that in the active method, the GC rejects the download. The following message is printed.

#### **INSTRUMENT AT ADDRESS 8 REJECTED DOWNLOAD METH NOT CHANGED**

The address is the INET address of the GC. When a method is rejected by the GC, an error message indicating why the method was rejected is printed by the integrator. An example message is shown below.

Example:

```
* [LOAD] [METH] A: labmet1
```

#### **INSTRUMENT AT ADDRESS 8 REJECTED DOWNLOAD**

**Back Det Type Mismatch**

**ALS Back Tower**

**Oven Max Mismatch**

**Col Length**

Sometimes, the reason for the method rejection does not affect the current analysis. For instance, a different back detector may be installed than when the method was stored. If you are only using the front detector, the back detector mismatch is unimportant. Another frequent reason for a method mismatch is a change in the column length or diameter. The GC uses the column information to calculate flow rates; the column flow will be different in the actual chromatography if the column dimensions in the stored method do not match those in the active method. The chromatographer can use the error messages to decide whether the GC should load the method anyway or whether the active method should be modified before loading the stored method. You force a best-fit method load using the **[OP() 6]** dialog.

Example:

\*[LOAD] [METH] A: labmet1

**INSTRUMENT AT ADDRESS 8 REJECTED SETPOINTS**

**Back Det Type Mismatch**

**ALS Back Tower**

**Oven Max Mismatch[MJM1]**

\*[OP()] 6 [ENTER]

**DEVICE ADDRESS: 8 [ENTER]**

**COMMAND STRING: LOAD [ENTER]**

**DEVICE ADDRESS: [ENTER]**

The next time you invoke [LOAD][METH], the GC will accept the method. Remember that the method is only a “best fit,” and some parameters will be inaccurate.

### **Recover from a power failure during a sequence**

If the power fails during a sequence, the 6890 GC runs a series of self tests, and then performs a blank run to clean out the column. The INET loop does not recover until after the blank run is finished. The 3396 integrator will remain in an unready state during this time. To abort the blank run, press **[Stop]** on the GC keypad. Pressing **[STOP]** on the integrator will not affect the blank run. After the blank run, the sequence will resume with the last sample injected.



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Agilent Technologies, Inc.  
2850 Centerville Road  
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