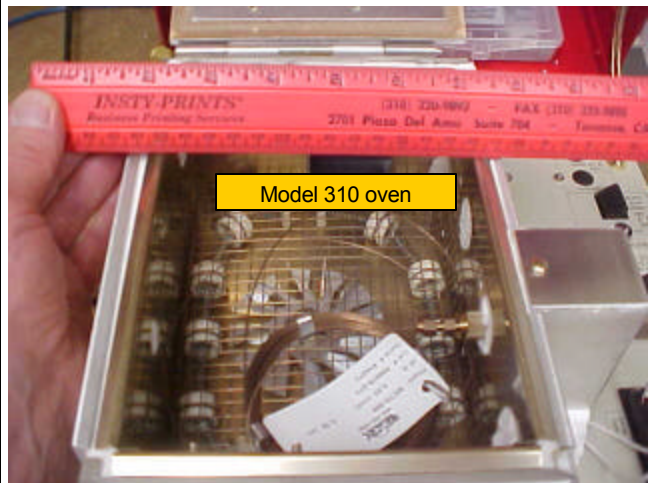
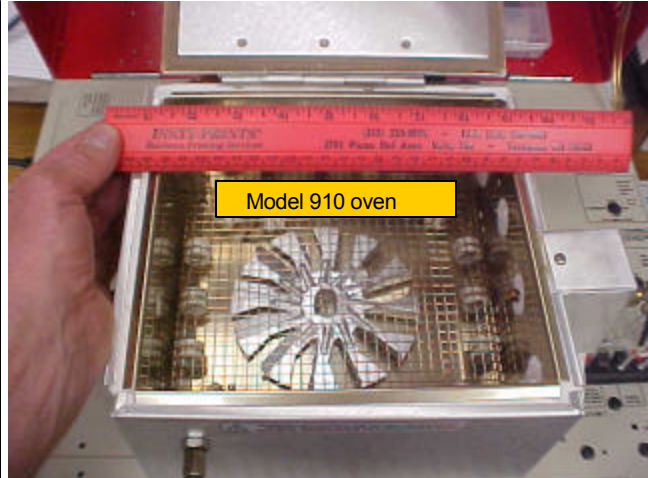


# Column Installation in the Buck Model 910 and Model 310 Gas Chromatographs equipped with the on-column injector

Buck Gas Chromatographs are designed to use both packed and capillary columns. The Model 910 has an oven which allows for columns coiled on a 7" (17.5 cm) diameter or smaller, while the Model 310 GC (which has a smaller oven) can fit columns coiled on a 5" diameter or smaller. The column installation procedure is identical on either GC since both GCs use the same injector and detector hardware. Only the oven size is different.

The most common type of column used with Buck GCs is the MXT type. This is a fused silica lined stainless steel capillary column which is very durable and easy to use. It is available in many different coil diameters, lengths and tubing diameters. Buck typically suggests using the .53mm internal diameter tubing size (sometimes called a "megabore" or "wide bore" capillary column. We normally have the columns coiled to a 3.5" (9cm) diameter so they fit easily in either the 910C or 310 column oven.

.53mm wide bore MXT metal capillary on 3.5" bundle



1/8" Packed Column



.25mm capillary on 7" cage



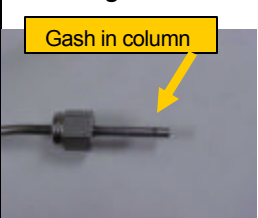
# Column Installation in the Buck Model 910 and Model 310 Gas Chromatographs equipped with the on-column injector

Buck GCs can be factory equipped with several types of injectors. The most common is the “on-column” injector which is suitable for .53mm capillary, 1/8” packed and ( in some cases ) narrow-bore capillary columns ( where the sample does not require splitting ).

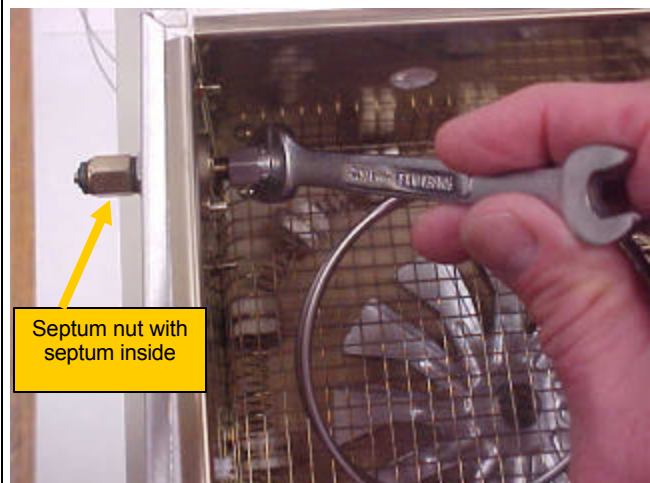
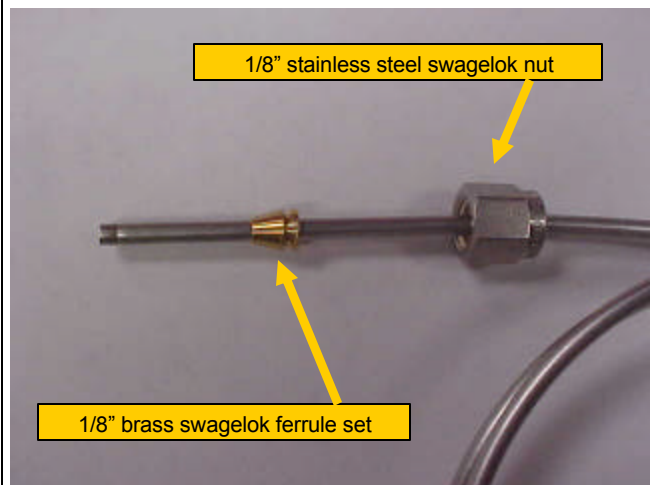
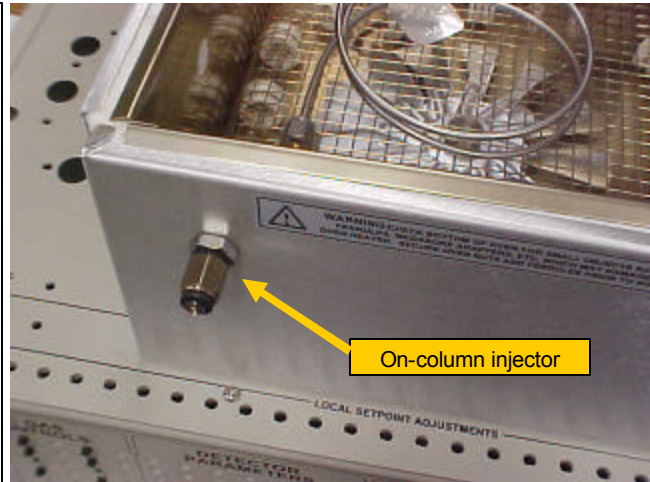
To install a 1/8” packed column in the on-column injector, slide a 1/8” swagelok nut and brass ferrule set ( front and back ferrule ) on one end of the column. We like to use a stainless steel nut because at temperatures over 200C a brass nut discolors and starts to become very soft. We like brass ferrules because they seal better than stainless ferrules especially the second or third time they are removed and re-tightened.

Slide the column into the on-column injector from the oven side until it bumps up against the septum. Pull the column back about 1 centimeter and tighten the nuts and ferrules using a 7/32” wrench. If you tighten the column with the end of the column touching the septum, this could stop the carrier gas flow since the septum would seal the end of the column.

*Some packed columns purchased from Buck have a gash near one end of the column*



*specifically to provide a path for the carrier gas in the event it is installed with the end of the column jammed up against the septum*



# Column Installation in the Buck Model 910 and Model 310 Gas Chromatographs equipped with the on-column injector

Bend the column gently so it lines up with the detector bulkhead fitting. Attach a stainless swagelok nut and brass ferrule set to the end of the column. It's a

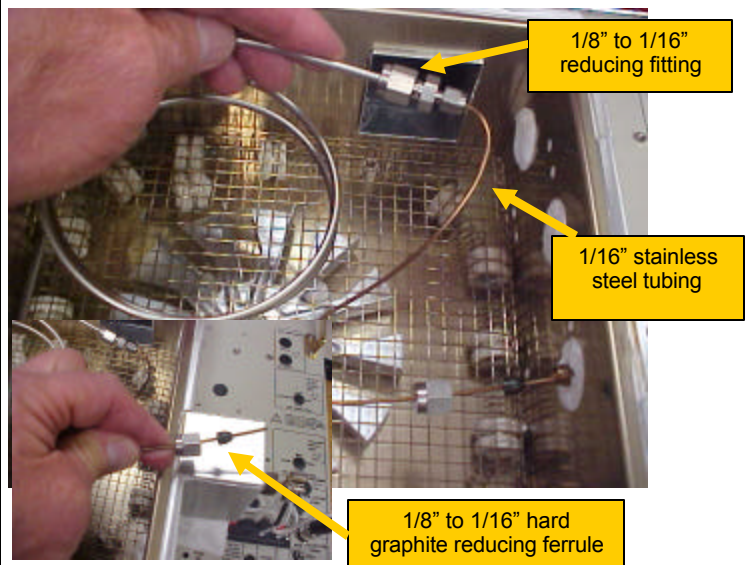
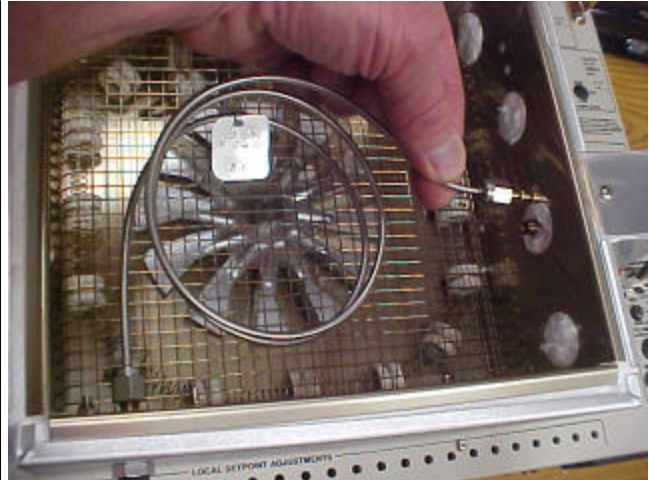


good idea to first tighten the nut and ferrule into a standard swagelok fitting so the ferrule is positioned at a

standard depth from the end of the column tubing.

Then tighten the end of the column into the detector bulkhead fitting using a 7/32" wrench. The detector shown in the photo is an FID detector mounted in detector location #2 along the right hand side of the column oven. Other available detectors may appear slightly different or be mounted in positions #1, #3 or #4 along the right hand side of the column oven but all detectors will have 1/8" swagelok connectors to attach the column to.

Some packed columns may be made of glass or may be packed with fragile packing material and it is not possible to bend the column. In this case, attach some empty tubing to the end of the column and bend the empty tubing to connect to the detector. 1/16" stainless tubing is ideal for this. Use a hard graphite reducing ferrule to connect the 1/16" tubing to the 1/8" detector bulkhead.



## Column Installation in the Buck Model 910 and Model 310 Gas Chromatographs equipped with the on-column injector

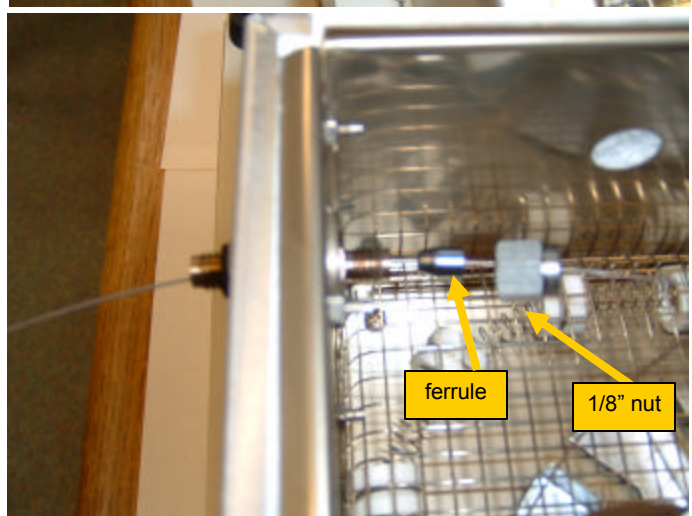
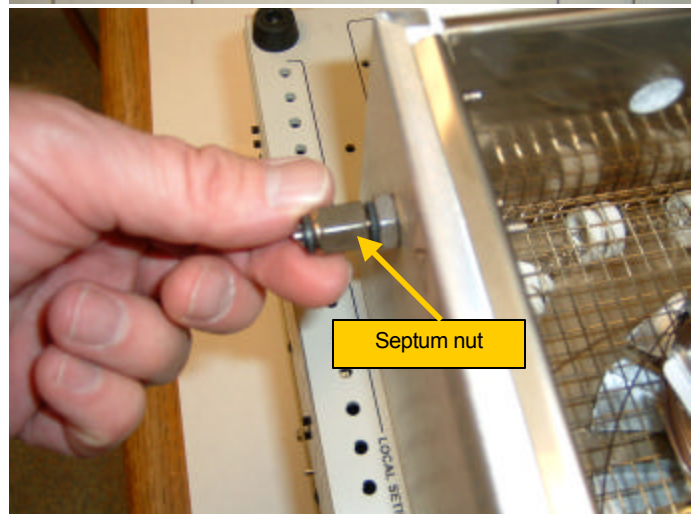
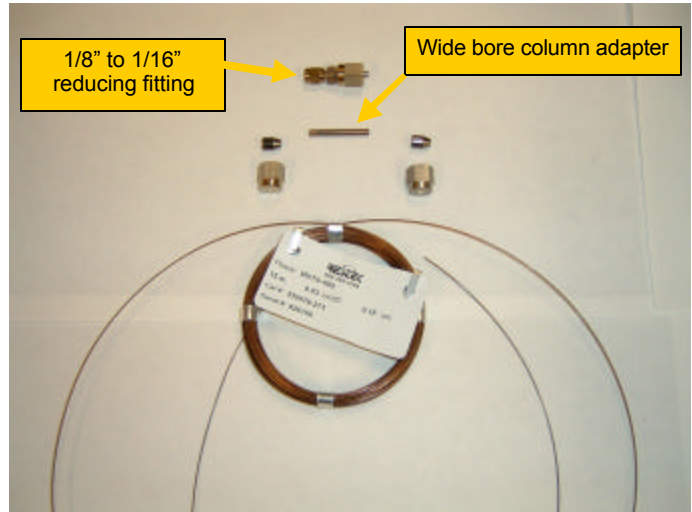
To install a .53mm capillary column in the on-column injector you will need two 1/8" swagelok nuts, two 1/8" to .8mm soft graphite reducing ferrules, the Buck wide bore column adapter, a triangle file to cut the column and a 7/32" wrench.

You have the option of using a swagelok 1/16" to 1/8" reducing fitting and 1/16" ferrule instead.

*You can use MXT type metal ( strongly preferred ) capillary columns as shown, or regular fused silica columns. The regular fused silica columns are more likely to break especially in the injector due to the syringe fracturing the fragile fused silica.*

Remove the septum nut from the outside of the oven. Now is a good time to inspect and change the septum if it is worn.

Slide a 1/8" stainless steel swagelok nut and 1/8" to .8mm soft graphite reducing ferrule onto the column. Then slide the column through the injector so it pokes out the front of the oven.



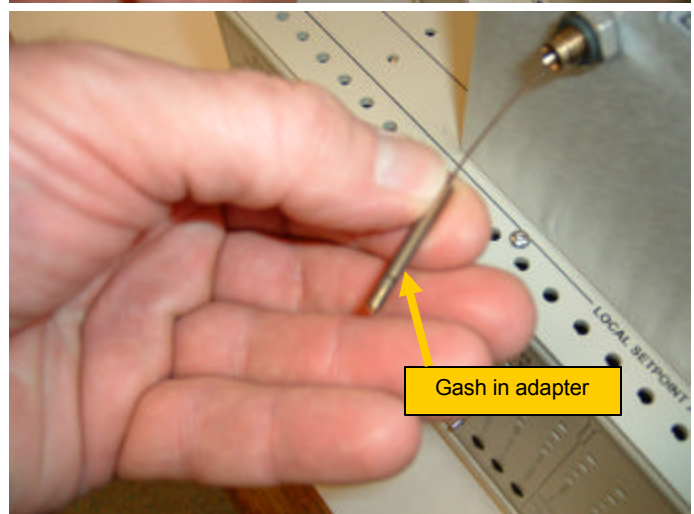
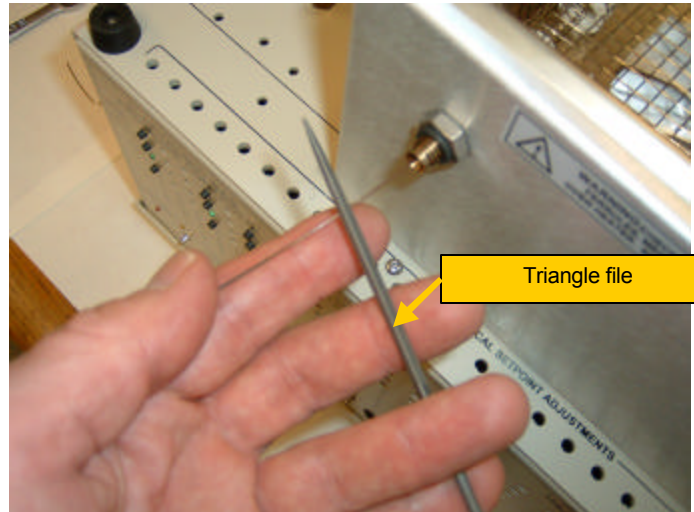
## Column Installation in the Buck Model 910 and Model 310 Gas Chromatographs equipped with the on-column injector

Use a sharp triangle file to cut a few centimeters from the end of the MXT column. It is a good idea to ALWAYS trim the end of the column anytime you run it through a graphite ferrule as the sharp edge of the column can shave graphite off into the bore of the column where it can cause the peaks to tail. Support the column with your fingertips and drag the file firmly across the tubing in one swift motion.

Place your fingernail under the file cut and bend the column. It will break cleanly at the file cut.

Slide the wide bore adapter onto the column and position the end of the column about halfway in the adapter.

**Notice the adapter has a gash at one end. The end with the gash should face out towards the operator.**



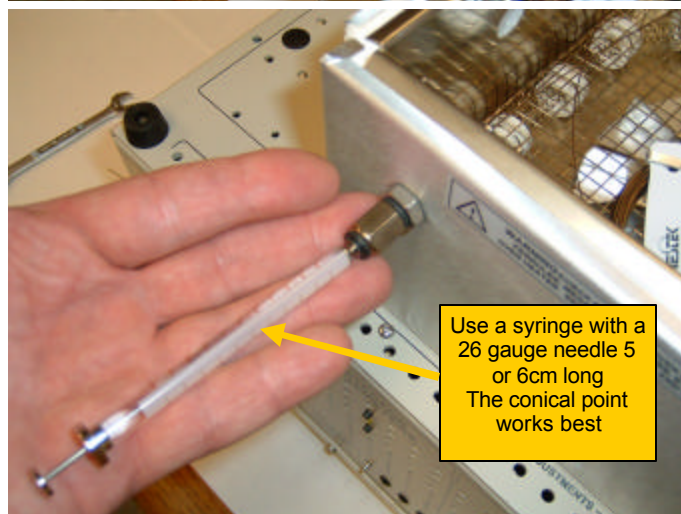
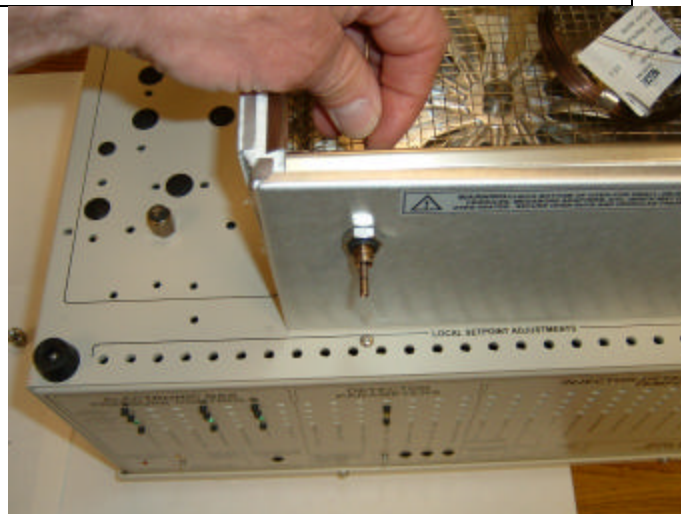
## Column Installation in the Buck Model 910 and Model 310 Gas Chromatographs equipped with the on-column injector

Pull the adapter back into the on-column injector.

Tighten the nut and ferrule securely so that the column will not move even if you pull on it with your fingers. Do not over-tighten the ferrule unnecessarily. You want to feel the ferrule compress a little bit but not tighten so much that the ferrule becomes distorted.

*Replace the septum nut. Be careful not to over-tighten the septum nut. If the septum is too tightly compressed, the syringe needle will make a hole in the septum. If the septum is lightly compressed, the silicone septum cleaves and re-seals permitting hundreds of injections before failure and will not clog the syringe or column with septum particles.*

Insert an empty syringe through the septum and onto the column to verify that the syringe slides smoothly into the column without catching or snagging. If it feels like the syringe needle catches on the end of the column, then reposition the column 1 cm closer to the center of the oven.



## Column Installation in the Buck Model 910 and Model 310 Gas Chromatographs equipped with the on-column injector

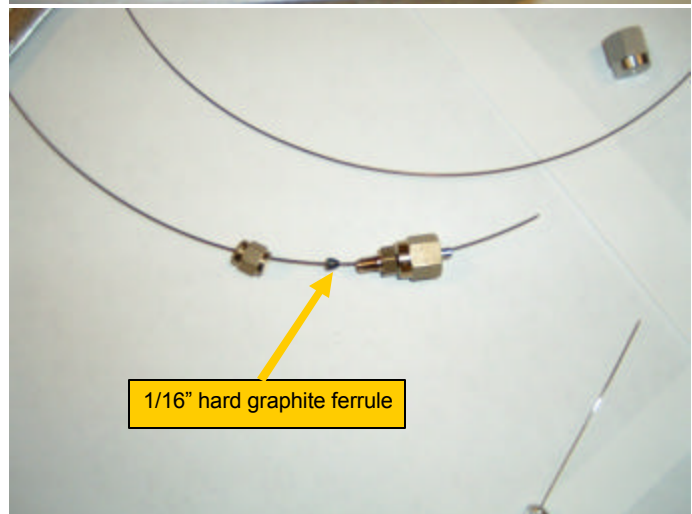
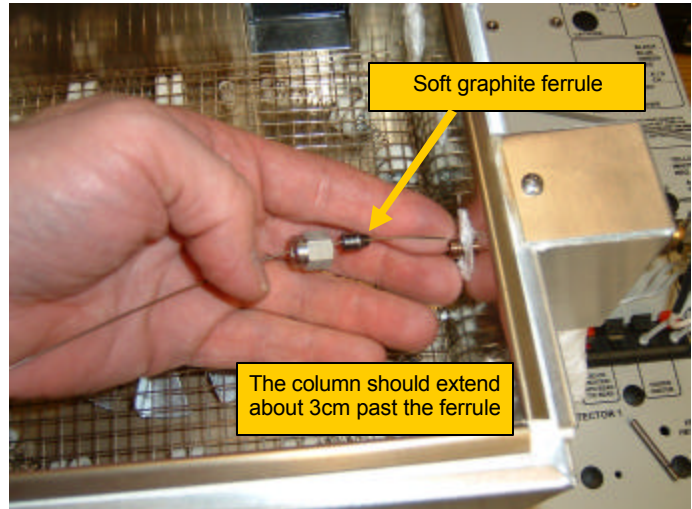
Connect the other end of the column to the detector. The simplest way is to use a 1/8" swagelok nut and a second 1/8" to .8mm soft graphite reducing ferrule. The detector shown in the photo is the FID detector. The end of the column should be positioned about 3cm past the ferrule or about halfway from the inlet fitting to the tip of the FID jet.

Because the soft graphite ferrule can sometimes outgas contaminants which contribute to baseline bleed at high temperatures, we sometimes prefer to connect the column to the detector using a swagelok reducing fitting and a 1/16" hard graphite ferrule. The hard graphite ferrule does not release as much contaminant and it is physically much smaller as well so the baseline shift due to temperature is sometimes much less using this type of connector.

Position the end of the column about halfway between the inlet fitting and the tip of the jet and then tighten the fitting.

### Note:

**Each type of detector ( PID, ECD, NPD ,TCD etc ) may require a different position for the end of the column. Consult the detector instructions for positioning details.**



## Column Installation in the Buck Model 910 and Model 310 Gas Chromatographs equipped with the on-column injector

To install a narrow-bore capillary column in the on-column injection port, connect the narrow-bore to a 5 meter length of .53mm MXT pre-column. The pre-column is de-activated MXT tubing but there is no phase coated on the inside of the tubing like a normal column, so analytes are not retained.

The narrow-bore column fits inside the .53 for a low dead volume connection. Make the connection leak-tight by securing the connected columns with a 1/16" swagelok union and soft graphite reducing ferrules.

Then install the .53mm pre-column in the on-column injector just as if it were a .53mm analytical column.

Connect the narrow-bore column to the detector using the appropriate hard graphite reducing ferrule.

