Extending Instrument Controls

Updated: October 25, 2023

PLEASE NOTE

This document may have been updated with new information, changes, and corrections.

Be sure to visit my presentation web site and download the latest version of this document. It could make an important difference to your work!

http://aviation.derosaweb.net/presentations

Thank you, John

Extending Instrument Controls

Many modern glider Instruments have control knobs which are used to change settings.

However, with our panel's closely spaced instruments there are times when the knob is too difficult to get to and manipulate.

Or our arms may just too short to conveniently reach the knobs while bouncing along in a thermal.

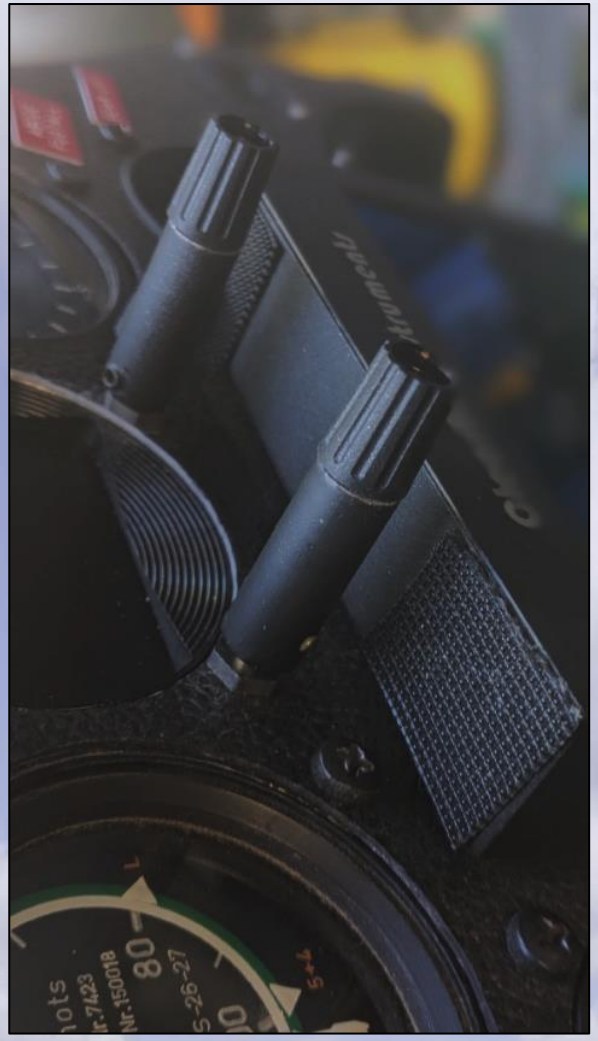
WHAT TO DO?

Extending Instrument Controls

I have seen some pilots placing clear tubing onto their instrument's control knobs.

That works OK but its ugly, flimsy, and prone to falling off.

Extending Instrument Controls



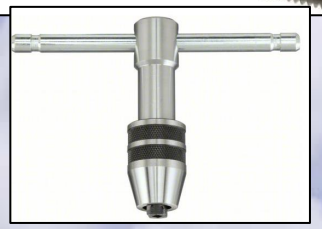
How about making nice rigid metal extensions for those problematic knobs?

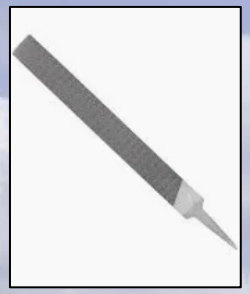
Let’s get started!

Extending Instrument Controls

Step 1 - Gather
The Tools Needed

Drill motor (press)
Drill bit
File
Hack Saw
Allen wrench set
Threading tap & wrench
Calipers
Blue thread locker





Extending Instrument Controls

Step 2 – Gather the following items

All items are available on Amazon

Drill bit that matches the extension rod's diameter.

Extension rod material that matches the instrument's control shaft size. See a following slide to determine the diameter needed.

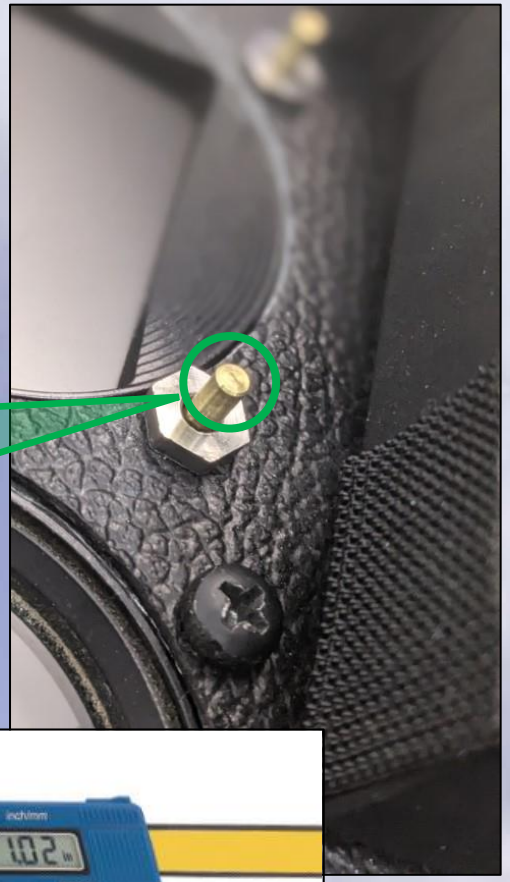
Small **set screw**. (6-32 or M3 screw)

Machine threading **Tap** matching the set screw. (6-32 or M3)

Aluminum **extension barrel** material (3/8" or 9mm). See a following slide to determine the length needed.

Extending Instrument Controls

Instrument control shaft



Step 3 – Measure the size of the instrument's control shaft

3a) Remove the knob by loosing the set screw found underneath the knob's cap.

3b) Measure the instrument control shaft's diameter using a caliper. A ruler is not accurate.

NOTE: Many instrument control shaft's diameter is 3mm while some are 5/32" (~4mm).

3c) Purchase steel rod material of the same diameter. Stainless steel rod is best.

Extending Instrument Controls

Extension Barrel

Step 4 – Cut an extension barrel

4a) Cut a piece of the extension barrel material to the needed height based on your instruments.

4b) File smooth the edges of the extension barrel.

4c) Cut extra rod barrels than needed. The next steps can cause mistakes so you could need a few more!

Extending Instrument Controls

Extension barrel with an instrument control shaft hole drilled through.

Step 5 – Drill a hole thru the extension barrel

5a) Drill a hole all the way through the middle of the extension barrel. The drill bit size used must match the instrument's control shaft size as measured in a previous slide.

5b) Confirm that the extension rod fits snuggly onto the instrument's control shaft and is of the correct length.

***Using a drill press and drill press vise is recommended.**
If you have access to a lathe to drill the hole this will be more accurate.

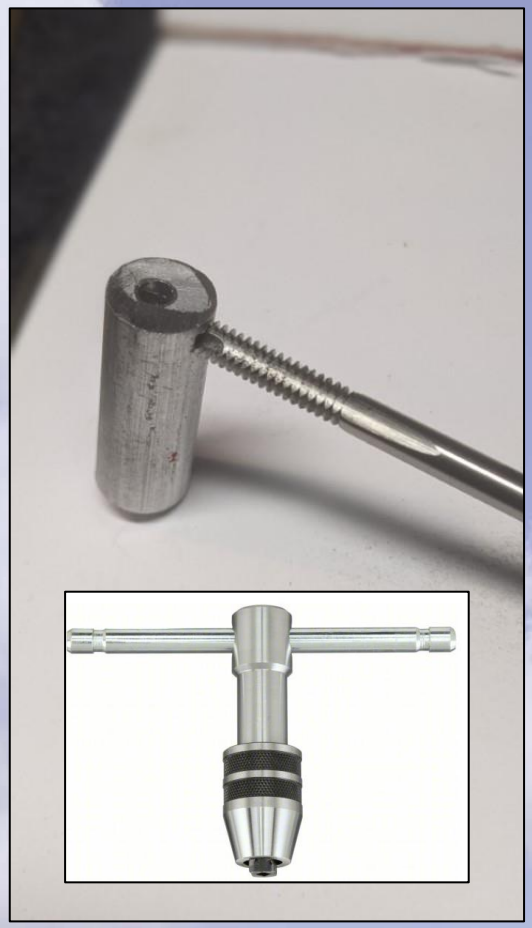
Extending Instrument Controls

Step 6 – Drill and tap a hole for the set screw

6a) Drill a hole for the set screw. The hole should be rather close to one end of the extension barrel.

6-32 set screw uses a #36 drill bit
M3 set screw uses a 3mm drill bit

6b) Tap the hole with the appropriate tap size and handle.



Extending Instrument Controls

Step 7 – Cut a piece of extension rod

7a) Cut a piece of the extension rod material about 1/2“ or 13mm longer than the extension barrel.

7b) This rod will be trimmed to the proper length in a following step.

7c) File smooth the edges of the extension rod

Extending Instrument Controls

Step 8 – Assemble the pieces onto the instrument's control shaft

8a) Assemble the knob extension components together (extension rod, extension barrel, and instrument knob).

8b) Place the assembly onto the instrument's control shaft and tighten the extension barrel's set screw.

Extending Instrument Controls

Step 9 – Trim the Extension Rod

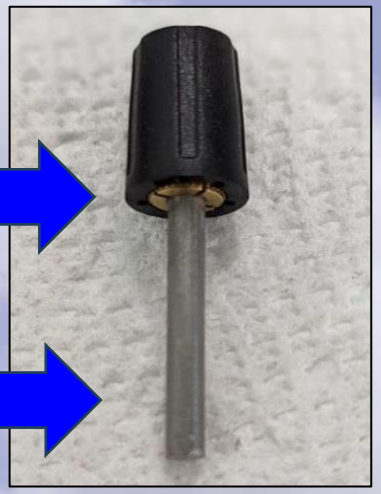
9a) Place the knob onto the top of the extension rod. There will be a gap between the knob and extension barrel.

9b) Trim the extension rod to the appropriate length so that the bottom of the knob fits up against the top of the extension barrel.

Extending Instrument Controls

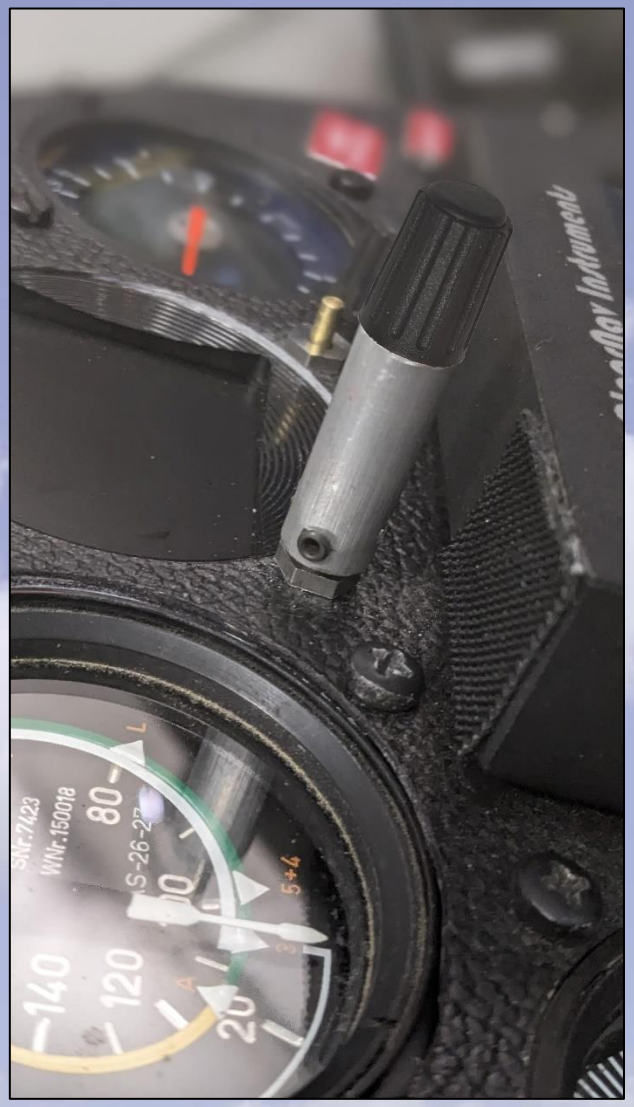
Step 10 – Preparing for gluing the extension rod into the extension barrel

10a) Place the knob onto the extension rod and tighten the set screw under the cap.



10b) Remove the knob + extension rod from the extension barrel.

10c) Remove the extension barrel from the instrument's control shaft. This important step will protect the instrument during the next step.



Extending Instrument Controls

Step 11 – Gluing the extension rod into the extension barrel

WARNING – In this step be very careful to NEVER get any thread locker onto the instrument's control shaft or into the instrument itself!

11a) Put a small amount of **BLUE** thread locker onto the extension rod as shown at right.

11b) Using a twisting motion insert the knob/extension rod back into the extension barrel.

11c) Wipe off any excess thread locker from the assembly and let dry for ~2 hours.

Once cured the **BLUE** thread locker is a very secure way (but not permanent) to join the extension rod to the extension barrel.

NOTE: Use of "permanent" RED thread locker is not required.

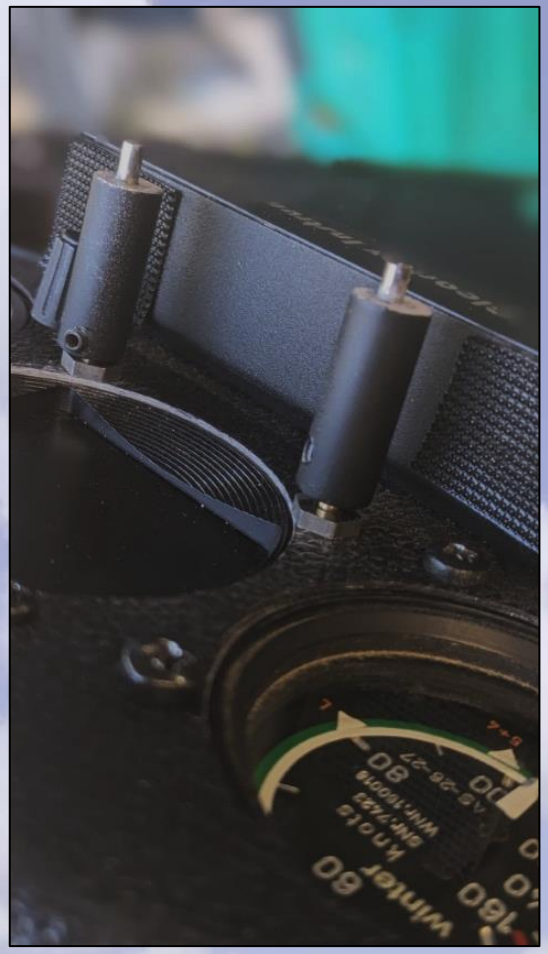
Extending Instrument Controls

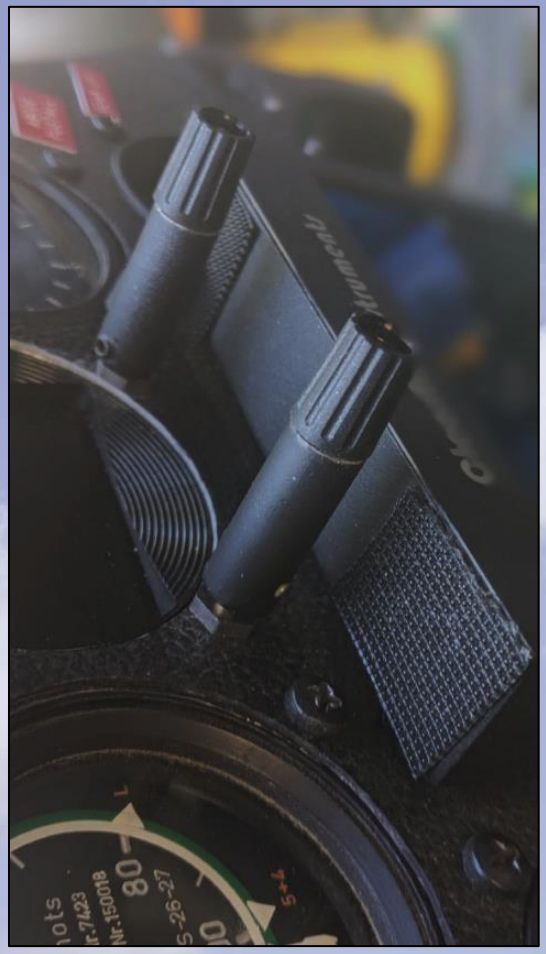
Step 12 – Painting of the Assembly

12a) Remove the knob from the extension assembly.

12b) Paint the extension barrel flat-black.

12c) Replace the original instrument's knob onto the assembly's extension rod.





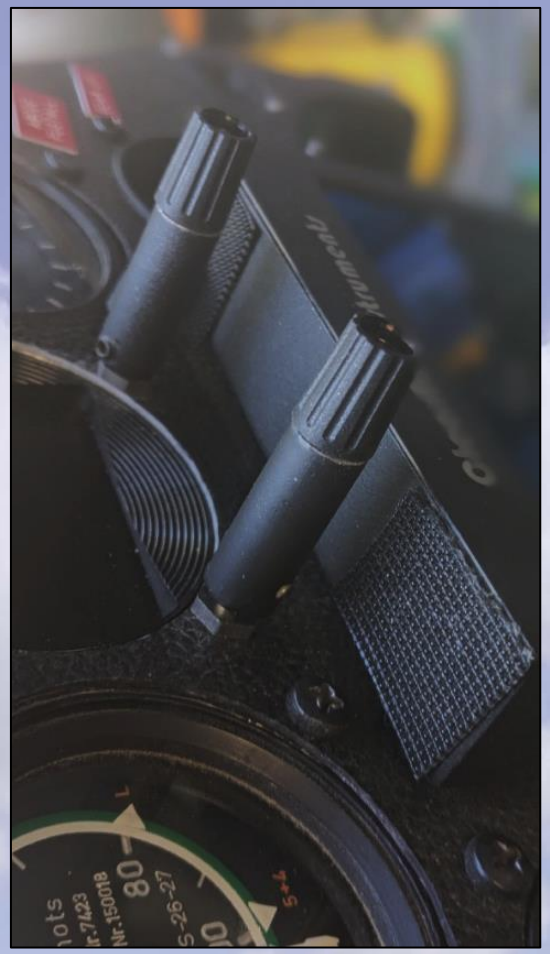
Extending Instrument Controls

Step 13 – Final Assembly

13a) Tighten all set screws on the knob and extension barrel.

13b) VERIFY that required instrument knob rotation and push travel is working properly! Adjust the extension barrel's set screw as required.

Your work is done!
Congratulations!
It looks great!



See My Other Presentations

- Glider Electrical Wiring
- Transceiver Troubleshooting
- Oxygen Systems
- Working with Glider Air Lines
- Trailer Wiring & LED Lighting
- Trailer Chains
- Soaring Pilot Relief Systems
- Battery Testing
- Emergency Location Devices
- Survival Kits
- Spar Alignment Tool
- L'Hotellier Fittings
- Carbon Fiber Panels
- IGC Filename Decoding
- Blanik L-23 Strut Work
- Removing Painted Lettering
- Open Glider Network
- Instrument Knob Extensions
- Landing Gear Warning

http://aviation.derosaweb.net/presentations

Let me know of any comments!