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The Carnegie Observatories

Planet Finder Spectrograph

Removal instructions

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1 Introduction

Following are detailed instructions for moving PFS from its storage location and installing it on the nasmyth platform. An abbreviated version of these instructions is available on the last pages of this manual.

Four people are required to complete this procedure.

Execute the following steps deliberately and **slowly**.

If there are any problems or questions, contact a member of the instrument team, in the order listed below. Suggestions or comments concerning these instructions or the procedure described are welcome. Please send them to crane@carnegiescience.edu.

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2 Removal instructions

1. Four people are required for the instrument deinstallation.
2. Turn off the ion pump controller, which can be found on the instrument's wooden shelf just above the gray electronics box.
3. Turn off the iodine cell temperature controller, which sits next to the ion pump controller. The power switch is on the left, rear side of the controller. It can be accessed (with some difficulty) by reaching between the ion pump controller and temperature controller.
4. Turn off the power to the electronics enclosure. The switch is located on the back of the electronics enclosure, near the bottom on the left side.
5. Turn off the Archon CCD power supply. This is attached underneath the wooden shelf beneath the pre-slit assembly next to the telescope rotator.
6. Unplug the instrument's power cable. This is plugged into an orange outlet on the telescope side of the platform near the stairs. Collect the power cable, which is attached to a power strip on the wooden shelf, and put the cable on the shelf.
7. Unplug the ethernet cable from the gigabit switch underneath the drawer in the wooden shelf.



8. Unplug the slit viewer power cord, coil, and attach to the side of PFS using a cable tie.
9. Remove the baffles from the front of the instrument. The baffles are held in place magnetically. One baffle is attached to the telescope guider box cover plate. The other, smaller baffle is attached to the front of the pre-slit assembly. The second baffle contains an AR- coated filter. Take care not to touch it. Place this baffle in a plastic bag located in the wooden drawer on the instrument. Put both baffles in the drawer.
10. Handles for the caster jacks are located in the wooden drawer. The black handle is for the caster jack nearest the telescope guider. Using the handles, raise the instrument off of its hard mounts. Be very careful not to tilt the instrument into the telescope guider. A total of approximately 25 turns of each jack handle will be required to raise the instrument enough. Start by turning the handles closest to the guider 5 turns, followed by the other handle near the telescope. Then cycle around the instrument, turning all of the cranks the same number of turns until the instrument is adequately raised.



11. Collect the spherolinder blocks (the instrument hard mounts) from their base plates on the nasmyth platform. Put these three assemblies and the four caster jack handles in the wooden drawer.
12. Raise the elevator level to the nasmyth platform. Remove the nasmyth platform hand rails and elevator rails nearest the platform.
13. Place steel plates (normally stored on the instrument's wooden shelf) on the threshold between the platform and the elevator, separated by the same distance as that between the instrument casters.
14. Roll the instrument away from the telescope toward the edge of the nasmyth platform.
15. Attach the cover to the aperture on the front of the pre-slit assembly. The cover can be found in the drawer.



16. Remove the telescope guider cover plate. There are bolts holding it in place as well as alignment bolts. Place all bolts in the appropriate plastic bag in the wooden drawer on the instrument. Slide the cover plate onto the wooden shelf along the white plastic skids.
17. Detach the liquid nitrogen stinger from the hose and place it on the wooden shelf. This stinger is dedicated to PFS.
18. Very, very carefully and SLOWLY, and with the combined effort of four people, roll the instrument halfway onto the elevator. Ensure that the casters roll across the steel plates on the threshold. Also, during any instrument move, ensure that the leveling mounts underneath the four corners of the instrument cart will not hit any low profile objects on the ground.
19. Readjust the elevator height as necessary to level it with the nasmyth platform.
20. Very, very carefully and SLOWLY, roll the instrument all the way to the back of the elevator. It must be pushed far enough onto the elevator so that the black pre-slit assembly facing the telescope will not hit the nasmyth platform when the elevator is lowered.
21. Apply the brakes for at least two of the casters.
22. Place the steel plates on the elevator.
23. Lower the elevator. Make sure that the pre-slit assembly does not clip the nasmyth platform on the way down.
24. Lower the elevator to the dome or ground floor, depending on where it is to be stored. Ensure that it is level with the floor. Place the steel plates across the threshold. Roll the instrument off of the elevator, ensuring that the casters cross the steel plates. If the elevator level changes when the instrument is half off of it, adjust the elevator height to level it with the floor before fully removing the instrument.
25. Place the steel plates on foam on top of the guider cover plate on the instrument's wooden shelf.
26. Push PFS to its storage position. If it is to be stored in the auxiliary building, move very SLOWLY out of the elevator door and across the concrete. Four people should handle the instrument, one at each corner. Ensure that no part of the instrument hits anything en route. Pay particular attention to the black pre-slit assembly that extends from the side of the thermal enclosure. Also watch the glycol fill tube above the thermal enclosure.
27. When the instrument is parked, plug an ethernet cable into the first port of the gigabit network switch attached under the wooden drawer. Plug the power cord into the wall outlet. Ensure that the power is on.
28. Check the glycol level. It should be visible in the clear PVC pipe extending upward near the top of the instrument. A target level is marked with tape, about one foot below the top of the pipe. If the level is low, add liquid. The proper mixture is 25% Dowtherm SR-1 glycol combined with 75% deionized water. Pre-mixed solution can be found in labeled plastic bottles in the PFS storage cabinet in the Auxiliary Building.



3 PFS Removal Checklist

Four people are required

1. Remove the small baffles from the guider cover plate and instrument entrance aperture.
2. Turn off the ion pump controller on the wooden shelf.
3. Turn off the iodine cell temperature controller, next to the ion pump controller, using the switch on its rear side.
4. Turn off the CCD power supply under the shelf by the telescope rotator.
5. Turn off power to the electronics enclosure in the lower, back left side.
6. Unplug the instrument power cable from the outlet.
7. Unplug the ethernet cable from the network switch under the drawer.
8. Unplug the slit viewer power cord, coil it, and hang it from the side of PFS.
9. Raise the instrument away from the spherolinder blocks, turning the jack handles about 25 turns.
10. Place the spherolinder blocks and jack handles in the wooden drawer.
11. Raise the elevator to the nasmyth platform and remove the interfering handrails.
12. Roll the instrument away from the telescope.
13. Attach the small cover for the instrument entrance aperture.
14. Remove the guider cover plate and place it on the wooden shelf.
15. Place the liquid nitrogen stinger on the wooden shelf.
16. Roll the instrument onto the elevator with steel plates laid across the threshold.
17. Verify safe positioning of the instrument. Engage at least two caster brakes.
18. Lower the elevator to the ground floor.
19. Roll PFS off of the elevator, using steel plates across the elevator threshold.
20. Place the steel plates on the wooden shelf.
21. Roll PFS to its storage position.
22. Plug in an ethernet cable into the network switch.
23. Plug the power cord into a UPS-supplied wall outlet.
24. Power the instrument on.
25. Fill the glycol in the clear pipe on the side of the instrument.