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C11 & CGE PRO

C11 is our second largest telescope and suitable for mobile use. For this it has to be reconstructed each time. To display and describe the details of this process is the purpose of this article.

Scattered pieces

To protect the sensitive electronics from weathering conditions they are stored in the lab course room. The remaining mechanical parts stay in the, so one must not carry them around every time.

Stored in the dome:

1. the tripod
2. the tube (C11)
3. counterweights + bar

Stored in lab course room:

1. CGE PROs electronic box
2. CGE PRO mounting
3. box containing all 1.4" oculars and small pieces
4. sun filter

Setup

1. The CGE PRO uses a parallactic mount and has to be adjusted to the northern direction. Therefore the tripod (see [figure 1](#)) should be positioned accordingly. To do so it is usually sufficient to point the tripod leg with the carrier for the hand terminal to the south.
2. Now put the electronic box on the tripod (see [figure 2](#)) and fix it using three bolts (see [figure 3](#)).
3. For the next step place the mounting mechanic of the CGE PRO (see [figure 4](#)) on the electronic box and again fix it using three bolts (see [figure 5](#)). Due to the heavy weight of the mounting this step should be performed by two people.
4. Screw the counterweight bar into the mechanic and place the counterweights on it (see [figure 6](#)). When you fasten the screws on them, they are hold in place
5. Connect the electronic box to the engines of the mount. The cables <see [imgref cables](#)> go in the ports on the side of the electronic box [figure 8](#) and have different length. The short one connects to the axis controlling the rec-ascension the longer one is for the declination (see [figure 9](#)). The cable only fit in one position.
6. Now plug in the energy supply (see [figure 10](#)) and the terminal (see [figure 11](#)) into the

corresponding ports (see [figure 12](#)).

7. The placement of the tube should be performed by two people, too. One holds the tube in move is into mounting (see [figure 13](#) and [figure 14](#)) and holds it in place, And the other tightens the screws (see [figure 15](#)).
8. Remove the cover from the tube ([figure 16](#)) and add, if needed, the sun filter (see [figure 17](#)).
9. Now you can attach an ocular, a camera or a spectrograph to the tube. To use 2" oculars or one of the other instruments you need to exchange the 1.4" adapter at the end of the tube by a 2" adapter from the storage container.
10. Usually a focal reducer is already attached. If you don't want to use it, it has to be exchanged and a ocular adapter.
11. Before using the telescope u have to tare the rotation axis. First lose the bolts fixing the rectascension axis, until you can freely move the telescope along this axis. Now adjust the position of the counterweights such that there is now movement along this axis any more. Tighten the bolts again and repeat this procedure for the declination axis. As there are now counterweights now, to taring the declination axis shift the tube in the mounting. Again this should be done by two people
12. Done! ([figure 18](#))



Fig. 1: CGE PRO tripod



Fig. 2: tripod with electronic box (the red circles indicate the three bolts to be fastened)



Fig. 3: One of the electronic box bolts

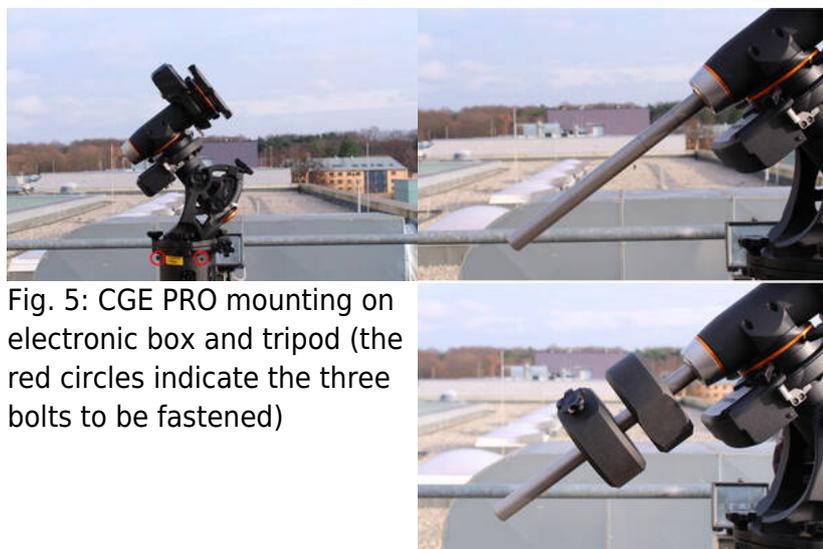


Fig. 5: CGE PRO mounting on electronic box and tripod (the red circles indicate the three bolts to be fastened)



Fig. 4: CGE PRO

Fig. 6: CGE PRO with counterweights on bar



Fig. 7: cable for the connection of electronic box and the engines



Fig. 8: electronic box with ports for the cable to the engines



Fig. 9: CGE PRO with the cable attached



Fig. 12: ports for power supply (left) and terminal (right) at the electronic box



Fig. 10: mobile power supply and cable reel



Fig. 11: terminal



Fig. 13: dove tail on the tube



Fig. 14: CGE PRO clamp on the mounting



Fig. 15: attachment of the C11 at the CGE PRO



Fig. 16: tueb with cover



Fig. 17: tube with sun filter



Fig. 18: completely build up telescope

Start-up

The CGE PRO can simply be switched on and off via the On/Off switch at the electronic box. In contrast to the OST, the CGE PRO does not require any shutdown procedure. It simply can be switched off. After the boot of the mount, it is almost always required to perform an alignment. The following possibilities exist:

- Two Star Align
- One Star Align
- Solar System Align
- Quick-Align
- Last Alignment
- Re-Alignment

Unfortunately, the handling of the hand terminal of the CGE PRO is not as intuitive as the one of the OST. However, after a short settling in period also an inexperienced user can safely handle this mount.

Alignment

Usually it is required to create a new alignment after each setup of the mount. If one wants to use more than one night in a row, there is the opportunity to put the mount into a hibernation mode (see below) that allow to disconnect the mount from the power supply and at the same time to conserve the alignment. If the mount is used at a fixed position, one also can make use of a saved alignment.

General procedure:

1. switch on the mount
2. press *ENTER* to start the alignment procedure
3. press *ENTER* to allow the mount to move to the initial position (the so-called switch position)
4. enter the date
5. enter the time
6. select Daylight Savings time or Standard time
7. select the time zone (+1)
8. select the alignment method

In addition to the above settings one also has to set the location after a reset of the mount to the default settings. This can be done by selecting a location from a list of known locations or by entering the latitude and the longitude.

Solar System Alignment

Das Solar System Alignment ist vor allem bei Sonnenbeobachtungen nützlich. Bei dieser Prozedur kann z.B. direkt die Sonne benutzt werden um ein Alignment durchzuführen. Die in diesem Fall erreichte Qualität des Alignments kommt zwar nicht an ein Alignment heran, welches mittels mehrerer Sterne erzieht wurde, ist für unsere Sonnenbeobachtungen aber in der Regel vollkommen ausreichend. Damit die Sonne für ein Alignment verwendet werden kann muss das Anfahren dieser

zuvor in den Einstellungen explizit erlaubt werden (*UTILITIES* → *SUN MENU* → *ENTER*). Neben den oben genannten Punkten müssen noch folgende Schritte für ein Alignment an der Sonne durchgeführt werden:

1. *Solar System Align* auswählen (mit den ↑- und ↓-Tasten und nicht mit den NSWO-Tasten)
2. Sun im Menü auswählen und mit *ENTER* bestätigen ⇒ daraufhin fährt das Teleskop die vermutete Position der Sonne an
3. Sonne suchen und im Okular zentrieren (nicht wie von der Software empfohlen den Sucher verwenden, da wir für diesen kein Filter haben!)
4. mit *ENTER* bestätigen
5. *ALIGN* drücken ⇒ Fertig!

Two-Star Alignment

Das Two-Star Alignment bzw. dessen Verbesserung durch weitere Sterne ist die Standardprozedur für Nachtbeobachtungen. Neben den oben genannten Punkten müssen noch folgende Schritte durchgeführt werden:

1. *Two Star Align* auswählen, das Teleskop schlägt daraufhin helle Sterne vor, die über den Horizont stehen
2. den ersten Kalibrationsstern auswählen und mit *ENTER* bestätigen
3. Stern im Okular zentrieren (den Sucher zu verwenden bringt in aller Regel nichts, da dieser meist nicht mit dem Tubus align ist)
4. mit *ENTER* bestätigen
5. *ALIGN* drücken, das Teleskop schlägt daraufhin den zweiten Kalibrationsstern vor
6. Stern im Okular zentrieren (sollte man den Stern nicht finden kann über *UNDO* ein neuer Stern ausgewählt werden)
7. mit *ENTER* bestätigen
8. *ALIGN* drücken, das Alignment kann anschließend durch hinzufügen weiterer Sterne verbessert werden (wenigstens 3 werden empfohlen, maximal 6 sind möglich)
9. *UNDO* drücken um das Alignment zu komplementieren

Hibernation

The hibernation modus offers the possibility to use the telescope several nights in a row, while switching off the power supply during the day. The hibernation procedure ensures that the alignment will be conserved. However during hibernation, it is not allowed to move the telescope at all. The following steps are necessary to put the telescope into hibernation:

1. press the *MENU* button
2. select *HILBERNATE* from the *UTILITES* menu
3. move the telescope to the desired park position
4. switch off the telescope
5. disconnect the power supply and arrange for weatherproof cover (**Important:** do not move the telescope anymore!)

Wake up:

1. reconnect the power supply
2. switch on the telescope
3. confirm *Wake up* with *ENTER*
4. confirm the time and the location
5. The telescope is ready for the next observation!

Troubleshooting

Known error sources and their solutions can be found [here](#).

Additional documentation

More details on the CGE PRO and the C11 can be found in the corresponding manuals in the lab course room.

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