Software Guide of "EZ PUSH TO fusion" on Android

2019.7.09 Ver1.0

1. Handsets must run Android 6 or later models
2. Search "EZ PUSH TO" and Install the app from Google Play
   Install "EZ PUSH TO" when handset display is 2160x1080 (new display)
   Install "EZ PUSH TO 1080P" when Handset display is 1080P or 720P (traditional)

3. Turn ON "Bluetooth" in settings, and pair the Bluetooth device named "Romer Optics".

4. Power On the EZ PUSH TO Kit installed on your Dobsonian
5. Run the app "EZ PUSH TO"

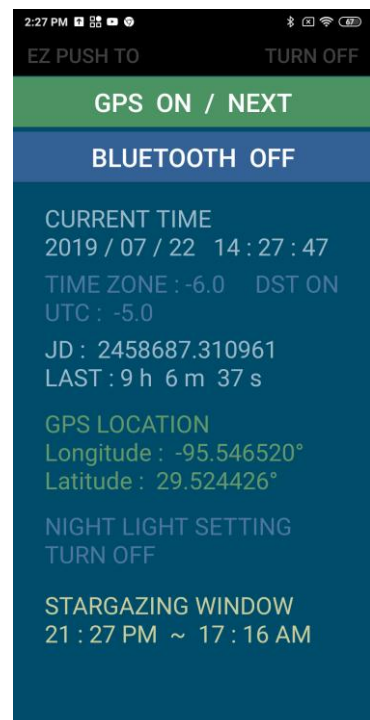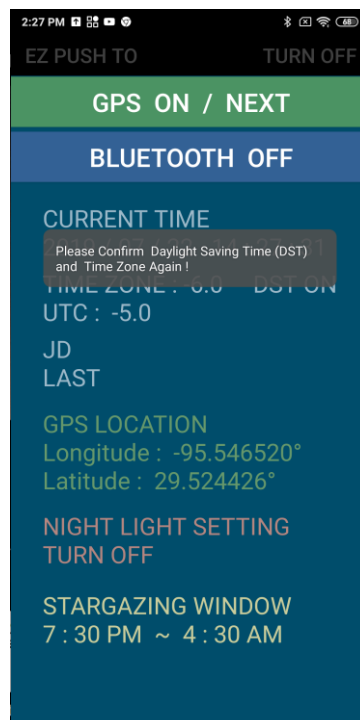1. Please wait seconds to load star database

2. Click "BlueTooth OFF", to connect "Romer Optics" in the devices list

   Activate "GPS ON" to confirm UTC / Longitude / Latitude

   *UTC = Time Zone + DST (daylight saving time)

   *click "Time Zone" to turn ON/OFF DST if the default is wrong. And, "Night Light Setting" to change display style at night.

3. "Restore Previous Alignments" does not show up in your first time.
   "NO" encoder offset to start a new stargazing. or
   "Restore" to restore previous encoders alignments data.
   *"Restore" causes faulty az/alt output when your Dob's base was slightly moved
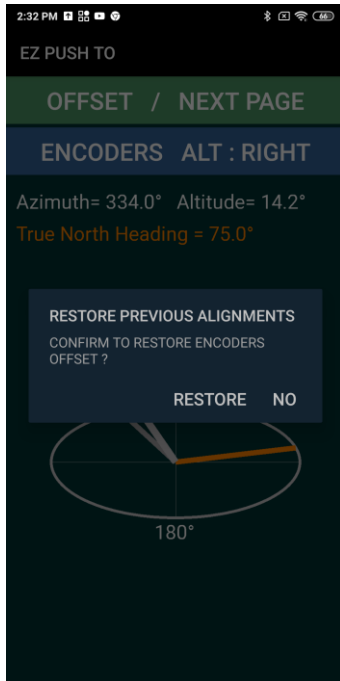
4. Set the ALT encoder installed at LEFT/RIGHT(default) hand side
   *wrong side makes altitude encoder readout reversely.
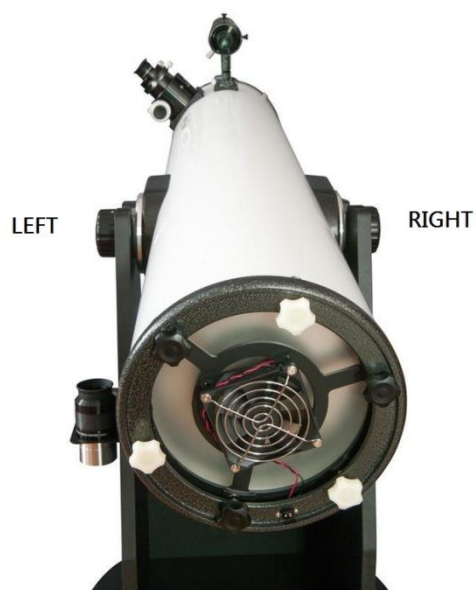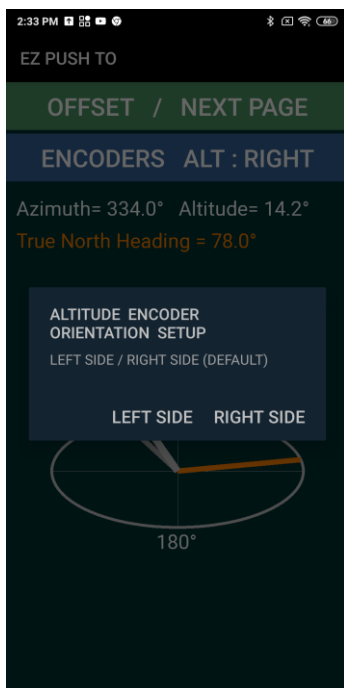
5. Pre-Offset Encoders

Find and Locate Polaris in your Dobs's eyepiece

Click "POLARIS" to complete it

*avoid Compass Offset except when stars are invisible at daytime. Compass offset may be faulty without calibrated compass in the handset.

*when Polaris is invisible at your location, find one bright star from "Bright Star Table".   Read 8. Deep Sky Outlook
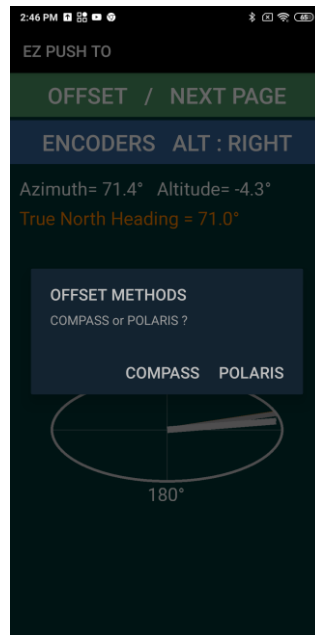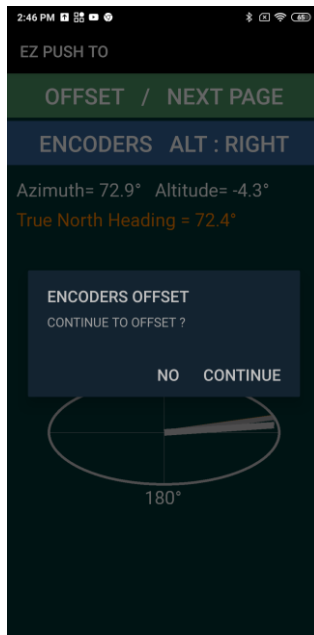
*After Pre-Offset Encoders, check and confirm az/alt displayed correctly.
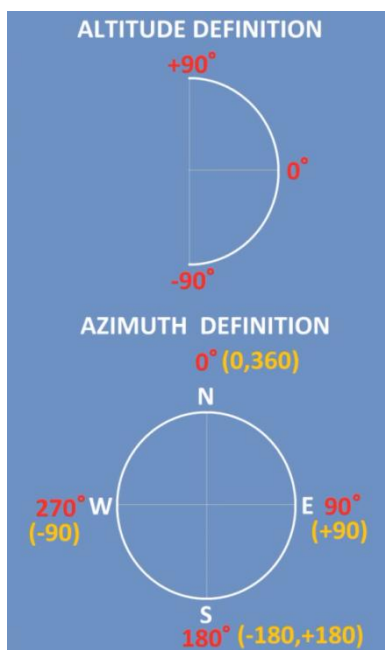
6. Menu and Settings

"long press "Turn Off" to turn off app

Setting is on the top right of sky map.

*data format azimuth/altitude or RA/DEC

*"High Frame rate" probably causes handset showing fewer stars and narrower FOV on slower or outdated handset.

*"NGC ON": All NGC objects only appear in the Starry Roaming when FOV is less than 12°.

*"Asteroids OFF": 700+ asteroids appear in roaming when asteroids roaming is active (see solar system 9).

*"reset Encoders" to remove previous encoder offset you have done.
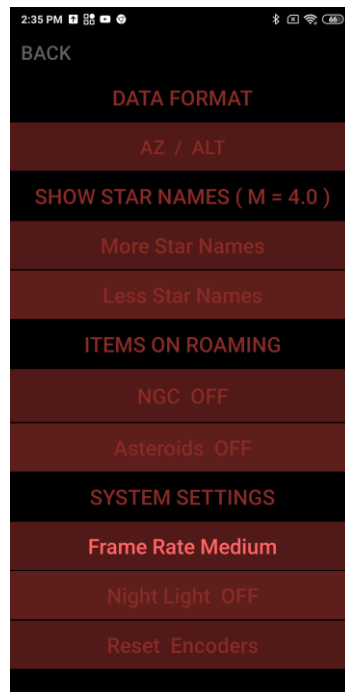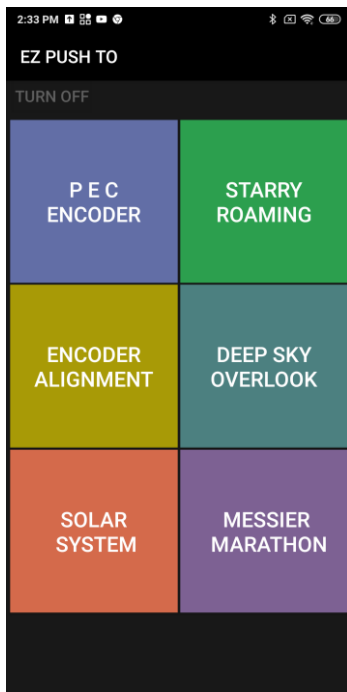
7. Roaming

Push Dobsonian to browse popular objects (for example : Venus)

app helps to select the closest target. Click the top "Green Label" to push to

*popular objects: 110 Messier / Herschel 400 List / NGC (enable it in settings) / double and binary star / asteroids (enable it in solar system)

*NGC shows only when FOV<12° and "NGC ON" in settings

*700+ asteroids appear in roaming when asteroids roaming is active (see solar system 9).
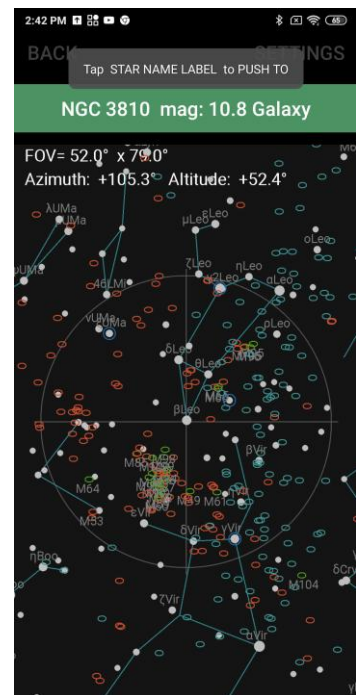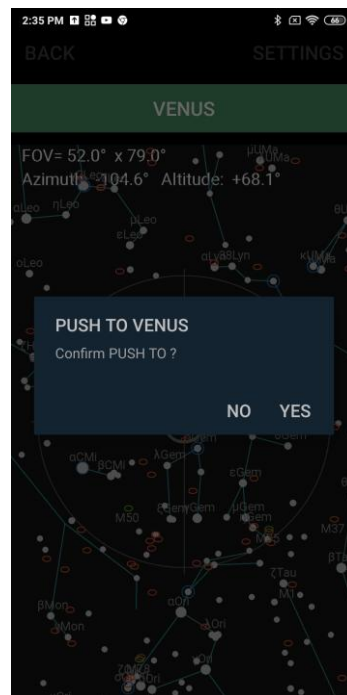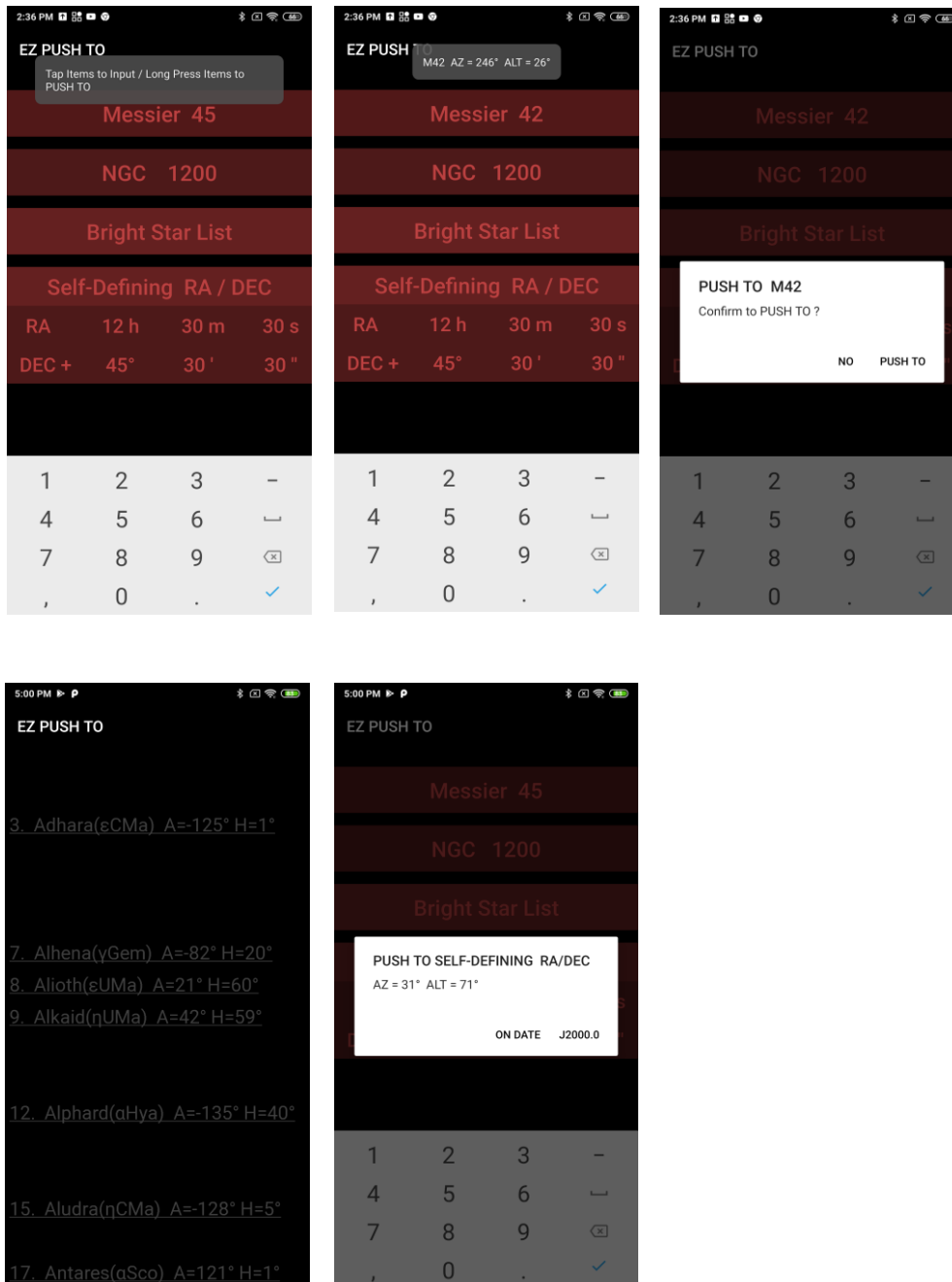
8. Deep Sky Outlook
   Click "number" to set Messier or NGC object
   LONG PRESS "Messier" or "NGC" to push to the target

   Input self-defined RA/DEC / Select a star in 88 Brightest Star Table
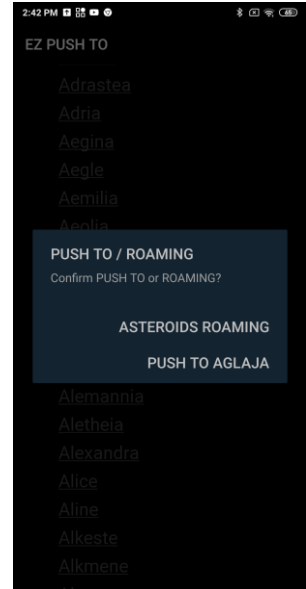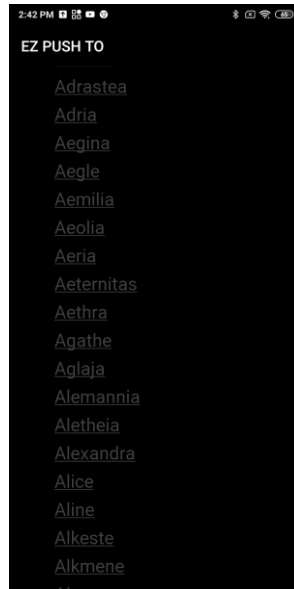   *Self defined RA/DEC could be On Date or installed based on J2000.0
   * Selecting 88 brightest star, only visible stars are shown on the list.

9. Solar System

    Click the picture to select planet / coming comets / Asteroids

    *Asteroid includes more than 700 brighter objects which could be visible. You
    may select one or "Asteroid Roaming" to browse them at the same time.

10. Push To

Orange numbers on the sky map (up/down/left/right) indicate how far the selected target is from your Dob.

*"Encoder Offset" is used to improve system accuracy when the selected target is not displayed consistently.
Locate the target in your eyepiece, click "Encoder Offset" to complete the calibration. The more calibration you did, the more accurate your Dob could be.
You can reset encoders offset in settings when you did wrong calibration.
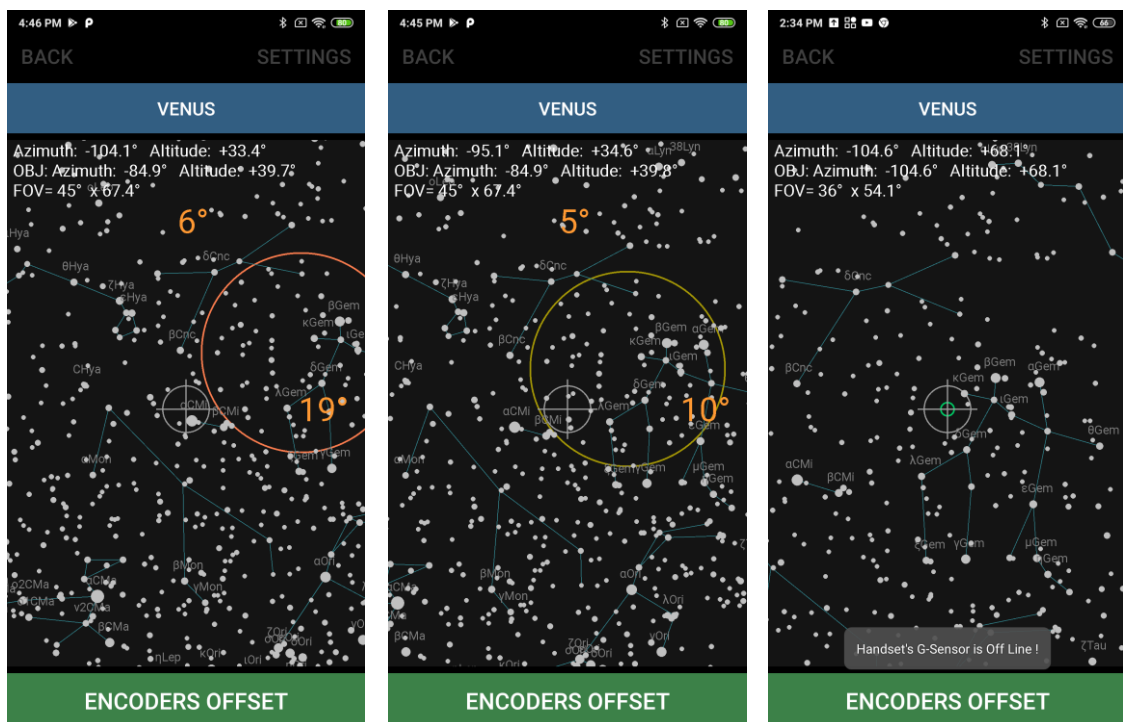
11. Messier Marathon

Train yourself to search Messier Object for fun

Push you Dob to search Messier objects.   The app helps you to record whether you find the object successfully or not.

*click "BACK" on the top left to go back Menu

Click "Messier Check" when ready.   Update your record if the objects are found.

*click "back button" on your handset to show your records.   Long press the records cell to delete one or all data.
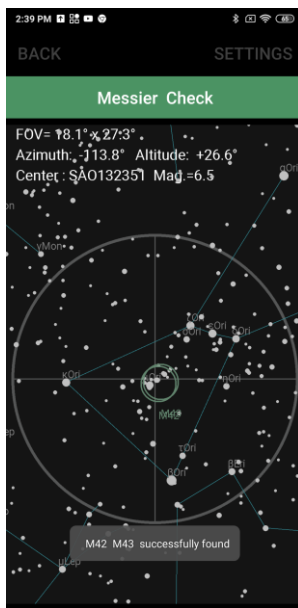
12. Multi-Star Alignment

Polaris / One star alignment provide acceptable accuracy for quick stargazing. More stars are selected to calibrate system, more accurate your Dobsonian could be.

a. Please level your Dob as perfect as possible by 3 bubbles level meter.
b. Push Dob to browse targets.   Click "Green Label (Encoder Offset)" at the bottom to select the aligned target.
c. Locate the selected aligned target in your eyepiece.
d. Click "Green Label" again to offset the encoder when ready.
e. Choose another target for next calibration.

*At least 3 star alignments are required. The spacing between selected aligned stars must be as wide as possible (for example az = 0 / 120 / 240 degree, alt is about 45 degree)
*At most 12 stars (12 zones, one star every 30 degree) are applied for alignments. The later replaces the previous star when they are at the same zone.
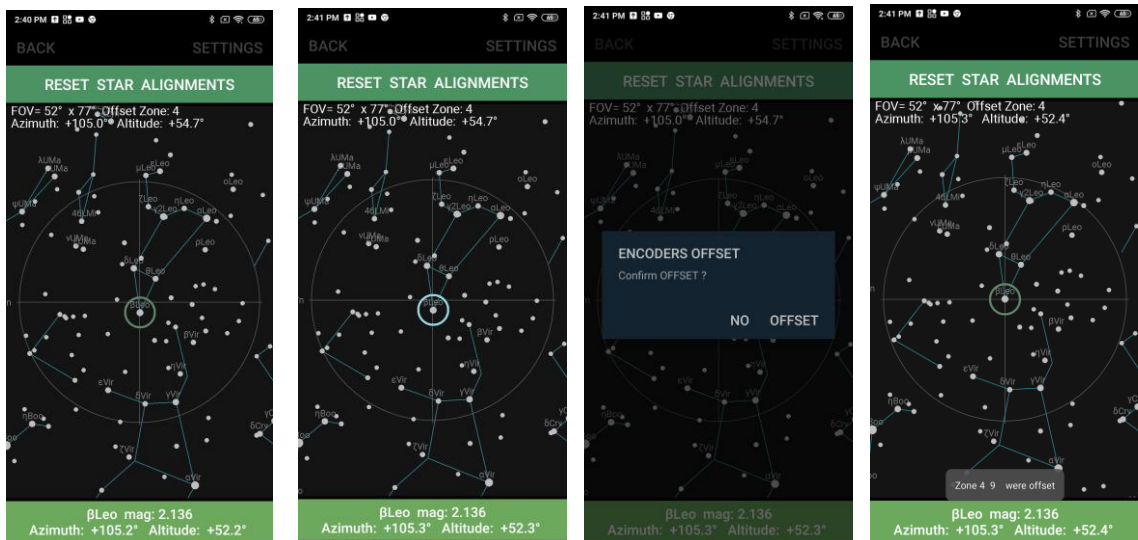
13. PEC

Periodic Error Correction is easily explained in text document.　Please watch the [clips on Youtube](#).

14. Tips to observing faint objects

*Find a bright star close to your target.　Use the bright star to offset encoder. The az/alt within $45°$ around the bright star is very accurate ($\sim 0.1°$).

*If system is not accurate, check repeatability again to make sure all parts fixed properly.