**EO C440.07 – OPERATE A TELESCOPE**

1. **Performance**: Operate a Telescope
2. **Conditions**:
   a. Given:
      (1) Telescope,
      (2) Supervision, and
      (3) Assistance as required.
   b. Denied: Nil.
   c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard**: The cadet shall operate a telescope by:
   a. setting up a telescope;
   b. operating a telescope; and
   c. dismantling a telescope.
4. **Teaching Points**:

| TP | Description | Method | Time | Refs |
|---|---|---|---|---|
| TP1 | Identify the parts of a telescope, to include:<br>a. optical tube,<br>b. optical tube mounts, to include:<br>1. equatorial (one axis of movement) mount, and<br>2. altazimuth (two axes of movement) mount;<br>c. finderscope,<br>d. eyepiece,<br>e. lens cover,<br>f. mirrors,<br>g. lenses,<br>h. focus knob,<br>i. tripod, and<br>j. specialty computerized telescope parts, to include:<br>1. control panel,<br>2. on / off switch,<br>3. computer interface port, and<br>4. power cord. | Interactive Lecture | 10 min | C3-286 (pp. 5–14) |



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| TP | Description | Method | Time | Refs |
|---|---|---|---|---|
| TP2 | Describe telescope theory, to include:<br>a. safety, to include:<br>1. never looking at the sun through a lens; and<br>2. careful handling of fragile equipment;<br>b. what the numbers represent, to include:<br>1. light gathering of main lens or mirror (aperture),<br>2. focal length, and<br>3. focal ratio;<br>c. seeing, to include:<br>1. image shaking, and<br>2. shimmering (atmospheric turbulence); and<br>d. the three main types of telescope optical systems, to include:<br>1. refractors,<br>2. Newtonian reflectors, and<br>3. Schmidt-Cassegrains. | Interactive Lecture | 10 min | C3-179 (pp. 60–81)<br>C3-286 (p. 4, pp. 30–37) |
| TP3 | Explain, demonstrate and have the cadets:<br>a. set up a telescope by:<br>1. removing all parts from their containers, ensuring that the optical tube is placed on a sturdy level surface;<br>2. setting up the tripod;<br>3. attaching the telescope to the tripod;<br>4. attaching the finderscope (if required);<br>5. attaching the eyepiece (if required);<br>6. aligning the finderscope; and<br>7. aligning the telescope; and<br>b. operate and dismantle a telescope by:<br>1. adjusting the right ascension;<br>2. adjusting the declination;<br>3. removing the eyepiece (if required);<br>4. removing the finderscope (if required);<br>5. removing the telescope from its tripod;<br>6. collapsing the tripod; and<br>7. returning all parts to their containers. | Demonstration and Performance | 30 min | C3-286 (pp. 6–14) |

5. **Time**:

a. Introduction / Conclusion: 10 min

b. Interactive Lecture:



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| | | |
|---|---|---|
| c. | Demonstration and Performance: | 20 min |
| d. | Total: | 30 min |
| | | 60 min |

6. **Substantiation**:

   a. An interactive lecture was chosen for TPs 1 and 2 to orient the cadets to telescope theory and generate interest in the subject.

   b. A demonstration and performance was chosen for TP 3 as it allows the instructor to explain and demonstrate the telescope-handling skills the cadets are expected to acquire while providing an opportunity for the cadets to practice the skill under supervision.

7. **References**:

   a. C3-179 ISBN 1-55209-302-6 Dickenson, T. (2001). *Night watch: A practical guide to viewing the universe*. Willowdale, ON: Firefly Books.

   b. C3-286 11073-INST. Celestron. (2006). *CPC series instructional manual*. Torrance, CA: Celestron.

8. **Training Aids**:

   a. Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area, and

   b. Telescope.

9. **Learning Aids**: Telescope.

10. **Test Details**: Nil.

11. **Remarks**: Cadets who are qualified Advanced Aerospace may assist with this instruction.



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