INSTRUCTION MANUAL

Orion[®] IntelliScope[®] Computerized Object Locator

#7880

NTELLISCOPE Computerized Object Locator

TORION



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Figure 1. The IntelliScope Computerized Object Locator.

Congratulations on your purchase of the Orion IntelliScope[™] Computerized Object Locator. When used with any of the SkyQuest XT IntelliScope Dobsonians, the object locator (controller) will provide quick, easy access to thousands of celestial objects for viewing with your telescope.

The controller's user-friendly keypad combined with its database of more than 14,000 celestial objects put the night sky literally at your fingertips. You just select an object to view, press Enter, then move the telescope manually following the guide arrows on the liquid crystal display (LCD) screen. In seconds, the IntelliScope's high-resolution, 9,216-step digital encoders pinpoint the object, placing it smack-dab in the telescope's field of view. Easy!

Compared to motor-dependent computerized telescopes systems, IntelliScope is faster, quieter, easier, and more power efficient. And IntelliScope Dobs eschew the complex initialization, data entry, or "drive training" procedures required by most other computerized telescopes. Instead, the IntelliScope setup involves simply pointing the scope to two bright stars and pressing the Enter key. That's it — then you're ready for action!

These instructions will help you set up and properly operate your IntelliScope Computerized Object Locator. Please read them thoroughly.

Table of Contents

Parts List

Your IntelliScope Computerized Object Locator comes with the following parts:

- Qty. Description
- 1 Object locator (controller)
- 1 Altitude encoder assembly
- 1 Coil cable
- 1 Altitude encoder cable (53" long)
- 1 Azimuth encoder cable (24" long)
- 6 Wire retaining clips
- 2 Hook-and-loop strips (1 "hook" strip, 1 "loop" strip)
- 1 Plastic bumper
- 3 Wood screws
- 2 Nylon washers (1/16" thick)
- 1 9-volt battery

The only tool needed for installation is a Phillips-head screwdriver. Remove the optical tube from the base to begin installation.

Note: The IntelliScope Computerized Object Locator is compatible only with Orion Sky-Quest IntelliScope Dobsonians. For other brands of Dobsonian, or any other telescope, the IntelliScope system will not function properly.

1. Installation

 Install the altitude encoder assembly onto the base's right side panel. This is the side of the base opposite the side with the IntelliScope Computerized Controller Port. Below the 5/8" throughhole in the panel, there are two predrilled starter holes in the inward-facing surface (Figure 2). Take two of the supplied wood screws and push them through the two slotted holes in the bottom of the altitude encoder's computer board. The screw heads should be on the same side as the altitude encoder's modular jack.

Now, with the screws pushed through the encoder board, place a nylon washer on the end of each screw (Figure 3). Then, thread the screws



Figure 2. The two pilot holes used to mount the altitude encoder assembly are located on the interior surface of the right side panel of the base.

into the starter holes in the side panel. The shaft on the altitude encoder assembly should protrude through the 5/8" through-hole in the side panel. It will take a bit of dexterity to keep the washers on the ends of the screws when installing, so don't

get frustrated if it takes a couple tries. The screws should not be fully tightened; they should be tight, but not tight enough to prevent the altitude encoder from moving up and down within the slots in the encoder board.

- 2) There is a pilot hole above the 5/8" through hole in the right side panel's interior surface; this is where the plastic bumper that protects the altitude encoder assembly will be installed. Take the remaining wood screw, push it through the bumper, and thread it into the pilot hole until tight (Figure 4).
- 3) Connect one end of the azimuth encoder cable (the shorter of the two cables to the encoder jack in the top baseplate of the Dobsonian base. Connect the other end to the encoder connector board that should be already installed on the base's left side panel. The cable should plug into the jack on the left side of the encoder connector board (Figure 5).
- Connect one end of the altitude encoder cable to the modular jack on the altitude encoder assembly. Connect the other end of the cable to the jack on the right side of the encoder connector board (Figure 5).
- Use the provided wire clips to secure the altitude and azimuth cables neatly to the base. We recommend using two clips for



Figure 3. Place a nylon washer on the end of each screw after the screws are pushed through the altitude encoder assembly.



Figure 4. Install the bumper into the pilot hole above the altitude encoder assembly.

the (shorter) azimuth cable, and four clips for the (longer) altitude cable (**Figure 6**). The clips have adhesive backing; simply peel the paper off the back of the clip and press the adhesive back to the base where you want the clip to be located.

- 6) Place the telescope optical tube into the base. Be very careful not to hit the altitude encoder with the side bearing on the tube when doing this or damage to the encoder could result. The bumper helps to prevent such contact.
- 7) Reinstall the telescope's tensioning knob (the one with the Teflon and metal washers) through the base's left side panel (the side with the IntelliScope Computerized Controller Port label) and into the threaded hole in the center of the tube's side bearing.
- 8) Reinstall the telescope's retaining knob, inserting the bolt through the altitude encoder's aluminum shaft (now protruding from the right side panel) and threading it into the right side bearing (**Figure 7**). Make sure this knob is fully tightened.
- 9) Insert one end of the coil cable into the larger of the two jacks on the top of the IntelliScope controller (Figure 1). Insert the other end into the "IntelliScope Computerized Controller Port" on the left side of the base.

- 10) Two hook-and-loop strips (one strip of "hooks" and one strip of "loops") have been provided to hang the IntelliScope controller in a convenient location on the base when not in use. Place the "hooks" strip on the back of the controller, and the "loops" strip on the base in a convenient spot. Make certain the location of the strip on the base will not cause the controller to interfere with the motions of the mount.
- 11) Slide the battery cover off the back of the hand control and insert the 9-volt alkaline battery. Make sure the positive and negative terminals of the battery are oriented as shown in the bottom of the battery compartment. Replace the battery cover.

Your IntelliScope Computerized Object Locator is now installed and ready to be used.

2. Alignment

This section will familiarize you with the alignment procedure for the IntelliScope system.



Figure 5. The azimuth cable plugs into the jack on the left of the encoder connector board. The altitude cable plugs into the jack on the right.

Powering the Controller

To turn the controller on, firmly press the **Power** button. The LED lights will activate and the LCD screen will display its introduction message. The intensity of the illumination can be adjusted by repeatedly pressing the **Power** button. There are five levels of LED brightness. Choose a brightness level that suits your conditions and needs. (Dimmer settings will prolong battery life.)

To turn the controller off, press and hold the **Power** button for a few seconds, then release it.

To conserve battery life, the controller is programmed to shut itself off after being idle for 50 minutes. So, make sure to press a button at least once every 50 minutes if you do not want the controller to turn off. If the controller does turn off, you will need to perform the initial alignment procedure again.

If the LCD screen and the button backlighting automatically begin to dim, it's time to change batteries.

Initial Vertical Alignment

After powering up the controller, the top line of the LCD display will read: "POINT VERTI-CAL." If the top line reads "ALIGN DEC MARK", simply press the up arrow button. The top line will now read "POINT VERTICAL", and you are set to use the object locator with your IntelliScope Dobsonian.



Figure 6. Use the wire clips to secure the cables neatly to the base. **(a.)** For the XT6i, XT8i, and XT10i IntelliScopes, the altitude cable can be routed across the top baseplate. **(b.)** For the XT12i, the altitude cable is routed across the front brace.

If the vertical stop you installed on the Dobsonian base during assembly of the telescope is properly adjusted (see below), simply rotate the telescope upward in altitude until the bottom of the tube comes into contact with the vertical stop. Once the telescope tube is in the vertical position, press the **Enter** button to start the two-star alignment procedure.

Adjusting the Vertical Stop

In order for the IntelliScope system to work accurately, the vertical stop must be precisely adjusted so that the optical tube is truly perpendicular to the azimuth axis of the base when the controller says "POINT VERTICAL." For most IntelliScope models, the vertical stop must use the two 1/16"-



Figure 7. The retaining knob goes through the shaft of the altitude encoder assembly before threading into the side bearing on the telescope tube.

thick washers, and the 1/32"-thick washer to achieve this. These parts, plus an extra washer, are supplied with the Dobsonian base. If you do not have access to a carpenter's level, then all three washers will be the best you can do to adjust the vertical stop.

For the most precise adjustment of the vertical stop (which will allow the best pointing accuracy to be achieved), you should use a carpenter's level. Any hardware store will have one. First, make sure the base itself is level. Place the carpenter's level on the top ground board and rotate the base 180° in azimuth (Figure 8). The level should indicate that the base is level through the entire rotation. If it isn't, then reposition the base on the ground, or place shims underneath the feet until the base stays level though a 180° rotation.

Next, place the 1/16"-thick washers and the 1/32"-thick washer on the vertical stop screw, and thread the entire assembly into the insert in the base's front brace. Now, rotate the telescope upwards in altitude until the mirror cell of the telescope comes into contact with the vertical stop. Place the carpenter's level across the top of the telescope as shown in Figure 9, in the direction parallel to the base's side panels, perpendicular to the front panel. (Be sure to remove the dust cover from the front of the telescope before placing the carpenter's level on it.) Is the top of the tube level? If so, you are finished adjusting the vertical stop. If not, add or remove a washer to the vertical stop screw until the top of the tube is level when the mirror cell comes into contact with the vertical stop.

Once the vertical stop is accurately adjusted, it should not need adjustment again. The base does not need to be level for the IntelliScope system to function properly; the base only needs leveling when initially setting the vertical stop.

Simple Two-Star Alignment

After setting the vertical position of the optical tube, a simple two-star alignment process is all that is needed to ready the IntelliScope system for operation. This is a great simplification from other computerized systems, which require you to enter data such as your longitude, latitude, and time zone. For the IntelliScope controller to



Figure 8. Place a carpenter's level on the base as shown. The base should stay level through a 180° rotation in azimuth. Once the vertical stop is set, the base does not need to be level to function properly.



Figure 9. Once the base is leveled, point the tube up until the mirror cell comes into contact with the vertical stop. Then, place the carpenter's level across the top of the tube as shown. If the vertical stop is set properly, the top of the tube should also be level.

accurately find objects, you only need to center two bright stars in your telescope and indicate to the controller which two stars you have centered. This is quite easy to do. For your convenience, we have provided finder charts for the alignment stars in Appendix B. Use the finder chart to locate and identify two bright stars in your current night sky. For best results, choose two stars that are at least 60° apart from each other. (The width of your fist at arm's length is about 10°, so you want the stars to be at least six fist-widths apart.)

So, the optical tube is now in the vertical position and you've chosen two bright stars in the sky to use for alignment. The telescope should have a high power eyepiece, such as the 10mm Sirius Plössl, in the eyepiece holder and the finder scope should be properly aligned with the telescope (these procedures are described in your telescope's manual). The LCD screen will state on its top line "ALIGN STAR 1," with the name of a star flashing on the second line.

Use the arrow buttons to scroll through the names of the alignment stars. The up arrow button scrolls through the stars alphabetically from A to Z. The down arrow button scrolls alphabetically backwards, from Z to A. When you arrive at the name of the star you wish to align on, you can begin to move the telescope so that it is pointing at that star (but don't press the **Enter** button yet).

Note: The controller will not accept Polaris as the first alignment star. This helps prevent the pointing accuracy from decreasing over time. It is OK to use Polaris as the second alignment star, however.

Take hold of the "navigation knob" on the optical tube and move the telescope so that it is pointing in the general area of the alignment star. Aim the telescope so the alignment star appears in the finder scope. Be careful not to confuse the alignment star with other stars in the area when doing this. (It will likely be the brightest star in the field of view.) Now, move the telescope until you have centered the star on the crosshairs of the finder scope. Look into the eyepiece of the telescope, and you should see the alignment star in the field of view of the eyepiece. If it isn't there, then your finder scope is out of alignment with your telescope and will need to be adjusted. Once the alignment star is in the eyepiece's field of view, center it in the eyepiece as best you can by making small movements to the telescope. (If you have one, an illuminated reticle eyepiece is great for centering alignment stars). Once this is done, press the **Enter** button on the controller. You have now completed one-half of the two-star alignment.

The LCD screen will now read "ALIGN STAR 2" on the first line with an alignment star's name flashing on the second line. As before, scroll through the names of the stars with the arrow buttons until you reach your second chosen alignment star. Repeat the procedure described above for your second alignment star. When you have aligned on the second star, press the **Enter** button. The LCD will then briefly display a number. It is the alignment error factor, or "warp" (W) factor.

The Alignment Error (Warp) Factor

The "warp" alignment error factor essentially lets you know if your alignment was accurate or not. Ideally, this number should be as low as possible, but any "W" of 0.5 or smaller is acceptable (regardless of + or - sign). Warp factors of ± 0.3 and ± 0.4 are the most common. Warp factors under ± 0.2 are great, but are less commonly achieved. If you complete an alignment and the warp factor is larger than ± 0.5 (e.g., ± 0.6 , ± 0.6 , ± 0.7 , ± 0.7 , etc.), then you should turn the controller off (by holding down the **Power** button) and begin the alignment procedure again. Otherwise, there is no guarantee that the controller will consistently place objects within the field of view of a medium-low power eyepiece.

An unacceptable warp factor may indicate that you aligned on the wrong star or did not have the telescope initially in a precisely vertical position. If you are having problems getting the warp factor at or below ± 0.5 , see the troubleshooting section in Appendix A.

Your IntelliScope Computerized Object Locator is now ready to find objects. Replace the high-powered eyepiece you used for centering the alignment stars with a low-power, wide-field eyepiece, such as the 25mm Sirius Plössl.

3. Overview of Controller

The IntelliScope Computerized Object Locator has been specifically designed for ease of use. This section will help familiarize you with the basic layout and operation of the controller.

Pushbuttons

Besides the **Power**, **Enter**, **ID**, **FCN**, and up/down arrows, all pushbuttons have letters on them with numbers above them. The letters designate the function of the pushbutton. The numbers above them are used for entering numerical data only; the numbers are never active until a function is first chosen. The numbers are arranged like a telephone keypad for ease of number entry. None of the function buttons will work properly until an initial alignment, as outlined previously, is completed. If you



Figure 10. If you stand to the left of the telescope, and face the direction the tube is pointing, the guide arrows will correspond exactly with the direction you should move the telescope in order to find the selected object.

press a function button before the two-star alignment is completed, the controller will display "MUST STAR ALIGN." Turn the unit off, then on again (by using the **Power** button), to begin the alignment routine again.

The Guide Arrows

The controller leads you to astronomical targets with guide arrows displayed on the LCD screen. After an object is selected to view, you will see two guide arrows, one that points left or right, and one that points up or down. Move the telescope tube in the corresponding direction of the guide arrows. If you are standing to the left of the telescope and facing the same direction the telescope is pointed, the guide arrows will exactly correspond with the direction you should move the telescope **(Figure 10)**. Otherwise, if an up arrow is displayed, move the telescope tube upward, if a down arrow is displayed, move the telescope tube downward, if a left arrow is displayed, rotate the telescope counterclockwise, and if a right arrow is displayed, rotate the telescope needs to be moved to reach the selected object. As you move the telescope toward the object, this number will decrease. When the number goes below ten, the figure will be displayed in tenths; this helps to make small, precise movements to the telescope tube in order to bring the object should appear within the field of view of a medium-low power eyepiece (25mm focal length or longer).

For example, look at **Figure 11a**, which shows an LCD screen for someone trying to locate M51, the Whirlpool Galaxy. The first arrow is pointing right and gives a number of 34. The second arrow is pointing up and displays the number 12. This means that the telescope tube should be moved to the right (clockwise) and up. When you are close to M51, the numbers will be displayed in tenths, as shown in **Figure 11b**. When the numbers reach 0.0 (**Figure 11c**), the telescope will be pointed right at the Whirlpool Galaxy.



Figure 11. This sequence of pictures illustrate how the controller's guide arrows will look as you are finding an object. **(a.)** When you are far away from the object, there will be a number (from 10 to 179) to the left of the guide arrows. **(b.)** When you are close to the object, each guide arrow will display a number on its immediate left (from 0 to 9) and immediate right (from 0 to 9); the number on the left is whole number increments, while the number on the right is in increments of tenths. This helps in making small movements to the telescope to pinpoint the object's location. **(C.)** When the guide arrows display "0.0 0.0", the object will be within the field of view of the telescope (with a 25mm or longer focal length eyepiece).

It is easiest to move the telescope in one direction at a time (say altitude) until the corresponding number reaches 0.0. Then move the scope in the other direction (azimuth) until that number also reads 0.0.

If the object selected to view is currently located below the horizon, the word "HORIZON" will flash before the guide arrows are displayed. Choose another object to view.

4. Locating the Planets

By far the most popular objects for viewing, after the Moon, are the planets. Since the other eight planets in our solar system (we still include Pluto, for the sake of nostalgia!) are also orbiting the Sun, they do not appear in fixed positions in the night sky like deepsky objects and stars do. Because of this, the controller requires you to input the date before it can find the planets.

To find planets with your IntelliScope Computerized Object Locator, use the following procedure:

- 1) Press the Planet button on the controller.
- 2) The LCD screen will display a date similar to the following:

DATE 01 JUN 2012

- 3) The number after the word "DATE" will be flashing and represents the day of the month. Input the two-digit day using the number buttons.
- 4) The three-letter month will now be flashing. Use the arrow buttons to scroll to the present month and then press the **Enter** button.
- 5) Now the year will flash. Input the year using the number buttons.

If you make a mistake while inputting the date, press the **Enter** button at any time while still within the **Planet** button function. The LCD screen will then display the last date input, with the two-digit day after the word "DATE" flashing. Input the correct date as outlined above.

Now, to choose a planet to view, press the arrow buttons and scroll through the planets. The planet's name will be displayed in the upper left section of the LCD screen, with the guide arrows on the upper right of the LCD screen. Move the telescope in the corresponding direction shown by the guide arrows.

The lower left screen shows the constellation that the planet appears in, with its present coordinates given in right ascension and declination. When you are finished viewing the planet, you may scroll to another planet by using the arrow buttons.

The features and details you can see will vary from planet to planet. The following descriptions give a brief overview of what to expect when viewing them:

MERCURY Mercury is often so close to the Sun that it cannot be seen. Sometimes it is visible for a brief period after the Sun sets, and sometimes it's visible in the morning just before the Sun rises. Mercury does not really show any detail, but is quite bright. With your telescope, you will be able to investigate this planet's orange-colored hue. Like Venus, Mercury sometimes appears as a crescent, rather than as a full disk.

VENUS At its brightest, Venus is the most luminous object in the sky, excluding the Sun and the Moon. It is so bright that sometimes it is visible to the naked eye during full day-light! Ironically, Venus appears as a thin crescent, not a full disk, when at its peak brightness. Because it is close to the Sun, it never wanders too far from the morning or evening horizon. No surface markings can be seen on Venus, which is always shrouded in dense clouds.

MARS The Red Planet makes its closest approach to Earth every two years. During close approaches you'll see a red disk, possibly some light and dark regions, and maybe the polar ice cap. To see surface detail on Mars, you will need a high power eyepiece and very steady air!

JUPITER The largest planet, Jupiter, is a great subject for observation. You can see the disk of the giant planet and watch the ever-changing positions of its four largest moons — lo, Callisto, Europa, and Ganymede. Higher power eyepieces should bring out the cloud bands on the planet's disk and maybe even the Great Red Spot.

SATURN The ringed planet is a breathtaking sight when it is well positioned. The tilt angle of the rings varies over a period of many years; sometimes they are seen edge-on, while at other times they are broadside and look like giant "ears" on each side of Saturn's disk. A steady atmosphere (good seeing) is necessary for a good view. You will probably see a bright "star" close by, which is Saturn's brightest moon, Titan.

URANUS Uranus is a faint planet, and requires high powers (at least 100x) before it starts to show any detail that distinguishes it from stars. Uranus will appear as a pale, blue-green disk.

NEPTUNE Like Uranus, Neptune will require high powers before showing anything to distinguish itself from stars. Neptune will appear as a bluish-colored disk, possibly with a very faint moon nearby if you are using a larger-aperture IntelliScope.

PLUTO Smaller than our own Moon, Pluto is very, very faint and shows little more than a point of light similar to a star. Even the Hubble Space Telescope is unable to show much detail on Pluto. Many amateur astronomers note how Pluto moves with respect to background stars (over several nights) in order to confirm their observation of our most remote planet.

5. Locating Deep-Sky Objects by Catalog

Catalogs are groups of deep sky objects of interest that have been assembled and given designations. Very often a deep-sky object will have a catalog number, as well as a "common" name. For example, the Orion Nebula is listed in the Messier catalog as "M42." The controller has three catalogs built-in: The Messier catalog (M), the New General Catalog (NGC), and the Index Catalog (IC). Many of the objects in the Messier catalog also have NGC catalog designations.

The Messier Catalog

The Messier catalog contains 109 galaxies, nebulas, and star clusters identified by the famous French astronomer Charles Messier and his colleagues in the late 1700's. These are some of the most popular celestial attractions observed by amateur astronomers.

To view an object from the Messier catalog, press the **M** button. Then enter the number of the Messier object you wish to view using the numeric buttons and press the **Enter** button. For example, to view Messier 57, also known as "the Ring Nebula," you would press the **M** button, then press the "5" button, then press the "7" button, followed by the **Enter** button. If the number of the Messier object you wish to view contains three digits, it is not necessary to press **Enter** after inputting the third digit.

The object's catalog designation will be shown in the upper left corner of the display screen, with the guide arrows in the upper right. The lower left will display the constellation the object resides in and the object's common name (if it has one) or a brief description of the object. Move the telescope in the corresponding directions shown by the guide arrows to locate the object.

You can get more information about the selected object by pressing the **Enter** button. The second line of the LCD display will then cycle information about the object you are viewing such as its celestial coordinates (R.A. and Dec.), magnitude (brightness), size (in arc-minutes or arc-seconds), and a brief scrolling text description.

When you are finished viewing the selected Messier object, you may scroll to another Messier object by using the arrow buttons, or you can select another Messier object to view by pressing the \mathbf{M} button again.

The New General Catalog

The New General Catalog, or NGC, is a catalog of some 7,840 deep-sky objects compiled by the Danish astronomer J. L. E. Dreyer in the late 1800s. It contains hundreds of excellent examples of each type of deep-sky object and is the most well known and used catalog by amateur astronomers beyond the already mentioned Messier catalog. To be more precise, the version of the New General Catalog used in the IntelliScope Computerized Object Locator is an improved version known as the "Revised New General Catalog"; this version has many corrections from Dreyer's original list.

To view an object from the NGC catalog, press the **NGC** button. Then enter the number of the NGC object you wish to view using the numeric buttons and press **Enter**. For example, to view the Andromeda Galaxy, which is listed as NGC224, you would press the **NGC** button, then the "2" button twice, then the "4" button, followed by the **Enter** button. If the number of the NGC object you wish to view contains four digits, it is not necessary to press **Enter** after inputting the fourth digit.

The object's catalog designation will be shown in the upper left corner of the LCD screen, with the guide arrows in the upper right. The lower left will show the constellation the object resides in, and the object's common name (if it has one) or a brief description of the object will be shown in the lower right. Move the telescope in the corresponding directions shown by the guide arrows.

You can get more information about the selected object by pressing the **Enter** button. The second line of the LCD display will then cycle information about the object you are viewing such as its celestial coordinates (R.A. and Dec.), magnitude (brightness), size (in arc-minutes or arc-seconds), and a brief scrolling text description.

When you are finished viewing the selected NGC object, you may scroll to another NGC object by using the arrow buttons, or you can select another NGC object to view by pressing the **NGC** button again.

The Index Catalog

The Index Catalog, or IC, contains 5,386 objects discovered in the decade or so after the NGC catalog was first published. This list contains objects similar to the NGC, but IC objects are typically fainter and more difficult to observe.

To view an object from the IC catalog, press the **IC** button. Then input the number of the IC object you wish to view using the numeric buttons and press the **Enter** button. For example, to view the Flaming Star Nebula, which is listed as IC405, you would press the **IC** button, then the "4" button, then the "0" button, then the "5" button, followed by the **Enter** button. If the number of the IC object you wish to view contains four digits, it is not necessary to press **Enter** after inputting the fourth digit.

The object's catalog designation will be shown in the upper left corner of the LCD screen, with the guide arrows in the upper right. The lower left will show the constellation the object resides in, and the object's common name (if it has one) or a brief description of the object will be shown in the lower right. Move the telescope in the corresponding directions shown by the guide arrows.

You can get more information about the selected object by pressing the **Enter** button. The second line of the LCD display will then cycle information about the object you are viewing such as its celestial coordinates (R.A. and Dec.), magnitude (brightness), size (in arc-minutes or arc-seconds), and a brief scrolling text description.

When you are finished viewing the selected IC object, you may scroll to another IC object by using the arrow buttons, or you can select another IC object to view by pressing the IC button again.

6. Locating Deep Sky Objects by Object Type

Rather than trying to select objects by catalog numbers, you may wish to simply view certain types of objects. This is where the **Nebula**, **Galaxy**, and **Cluster** buttons come in handy. These buttons will access a selection of the best and brightest nebulas, galaxies, and star clusters in the night sky.

The **Nebula**, **Cluster** and **Galaxy** buttons are organized by constellation. So, before using these buttons, decide in which constellation you would like to view an object. Choose a constellation that is at least 40° high in the sky to get a good view. If you are

unsure of the constellations currently visible in your night sky, consult a planisphere or the monthly star chart at www.oriontelescopes.com.

Locating Nebulas

Among the most beautiful objects in the night sky, nebulas are clouds of dust and gas that are lit by a nearby stellar source. There are several different types: emission nebulas, which are where star systems form; planetary nebulas, which are the result of a star dying; and reflection nebulas, caused by dust reflecting starlight. Most have low surface brightness, so a dark sky free of light-pollution is best for viewing them.

To view a nebula, press the **Nebula** button on the controller. The LCD screen will then display the word "NEBULA" with a flashing three-letter constellation designation after it. Now, select the constellation in which you would like to view a nebula. Use the arrow buttons to scroll through the list of constellations. If you are unsure which constellation the three-letter designation represents, refer to Appendix C. Once you have selected the constellation, press **Enter**. A nebula in that constellation will now appear on the LCD screen, along with the guide arrows to lead you to the nebula. The current constellation is shown in the lower left, and the nebula's proper name or catalog number is in the lower right. For more information about the nebula selected, press the **Enter** button.

To go to the next nebula in the selected constellation, simply press the up arrow button. The guide arrows will now direct you to the next nebula in the constellation. If there are no more nebulas available in that constellation, a nebula from the next constellation (in alphabetical order) will be displayed. To select another constellation in which to view nebulas, press the **Nebula** button again.

Locating Star Clusters

Star clusters are just what their name implies; groupings of stars. Star clusters come in two main types, open and globular. Open star clusters reside within our Milky Way galaxy and usually contain a handful of stars clustered together because they were spawned from the same gas cloud. Globular clusters are more like miniature galaxies, with hundreds or thousands of stars packed into a spherical shape by mutual gravity. Globular clusters reside outside the disk of the Milky Way galaxy and orbit the galaxy's center. It is believed that globular clusters are formed as a natural consequence of galaxy formation. Star clusters, in general, are somewhat bright compared to other deep-sky objects, so many will appear quite spectacular, even in smaller telescopes.

To view a star cluster, press the **Cluster** button on the controller. The LCD screen will then display the word "STAR CLUSTER" with a flashing three-letter constellation designation after it. Now, select the constellation in which you would like to view a star cluster. Use the arrow buttons to scroll through the list of constellations. If you are unsure which constellation the three-letter designation represents, refer to Appendix C. Once you have selected the constellation, press **Enter**. A star cluster in that constellation will now appear on the LCD screen, along with the guide arrows to lead you to the star cluster. The current constellation is shown in the lower left, and the star cluster's proper name or catalog number is in the lower right. For more information about the star cluster selected, press the **Enter** button.

To go to the next star cluster in the selected constellation, simply press the up arrow button. The guide arrows will now direct you to the next star cluster in the constellation. If there are no more star clusters available in that constellation, a star cluster from the next constellation (in alphabetical order) will be displayed. To select another constellation in which to view a star cluster, press the **Cluster** button again.

Locating Galaxies

Nebulas may be beautiful and star clusters impressive, but nothing has quite the breathtaking power of observing a galaxy. Galaxies are collections of billions of stars that come in a variety of shapes and sizes. Viewing a galaxy always gives the observer a revelation of just how vast our universe truly is. Keep in mind, however, that most galaxies are quite faint, and may be challenging to identify, especially in smaller telescopes.

To view a galaxy, press the **Galaxy** button on the controller. The LCD screen will then display the word "GALAXY" with a flashing three-letter constellation designation after it. Now, select the constellation in which you would like to view a galaxy. Use the arrow buttons to scroll through the list of constellations. If you are unsure which constellation the three-letter designation represents, refer to Appendix C. Once you have selected the constellation, press **Enter**. A galaxy in that constellation will now appear on the LCD screen, along with the guide arrows to lead you to the galaxy. The current constellation is shown in the lower left, and the galaxy's proper name or catalog number is in the lower right. If you wish to have more information about the galaxy selected, press the **Enter** button.

To go to the next galaxy in the selected constellation, simply press the up arrow button. The guide arrows will now direct you to the next galaxy in the constellation. If there are no more galaxies available in that constellation, a galaxy from the next constellation (in alphabetical order) will be displayed. To select another constellation in which to view galaxy, press the **Galaxy** button again.

7. Locating Stars

The IntelliScope database contains 837 stars. Stars always appear like tiny points of light. Even powerful telescopes cannot magnify a star to appear as more than a point of light! You can, however, enjoy the different colors of the stars and locate many pretty double and multiple stars. You can also monitor variable stars from night to night to see how their brightness changes over time.

To view a star, press the **Star** button on the controller. The LCD screen will then display the word "STAR" with the word "NAMED" flashing next to it. From this screen, use the arrow buttons to choose from "NAMED," "DOUBLE," "VARIABLE," and "CATALOG."

Named Stars

The named stars are the brightest in the night sky. These are the stars that the ancients gave proper names to, like "Arcturus" or "Mizar."

To select a named star, press **Enter** after selecting "NAMED" from the **Star** button choices. You can now use the arrow buttons to scroll through the list of named stars. The stars are listed in alphabetical order. Once you have found the named star you would like to observe, the guide arrows will direct you to move the telescope to the star's position. The upper left corner of the LCD screen will show the named star's ST catalog number (the IntelliScope's entire ST catalog is printed in Appendix D for easy reference), and the lower left shows the constellation in which the star resides. Pressing **Enter** again will display the star's R.A. and Dec. coordinates, its magnitude, and a brief description.

To find another named star to observe, simply continue scrolling through the list of named stars.

Double (and Multiple) Stars

Many stars in the night sky appear to be single stars, but they are not. They are actually double or multiple star systems. Some of these systems comprise two or more stars gravitationally bound to each other, while others are just two (or more) stars in the same line of sight. At high magnifications, it is possible to "split" many double (and multiple) stars into their individual components. It can also be interesting to contrast and compare the different colors and magnitudes of the stars in the system. Be aware, however, that good seeing conditions are critical for separating close components of a double or multiple star.

To select a double (or multiple) star to observe, press **Enter** after selecting "DOUBLE" from the **Star** button choices. The LCD screen will then display the word "DOUBLE" with a flashing three- letter constellation designation after it. Now, select the constellation in which you would like to view a double star. Use the arrow buttons to scroll through the list of constellations. If you are unsure which constellation the three-letter designation represents, refer to Appendix C. Once you have selected the constellation, press **Enter**. A double star in that constellation will now appear on the LCD screen, along with the guide arrows to lead you to the double star. The current constellation is shown in the lower left, and the double star's name is in the lower right.

Note: Double stars typically have names like "Zeta" (Greek letter designation) or a number like "36" (Flamsteed number). The full names for these double stars are actually linked to the constellation they reside in. For example, in the constellation Andromeda, these stars would be "Zeta And" and "36 And."

For more information about the double star selected, press the **Enter** button. (The "S=" now refers to the separation, in arc-seconds, between the double stars. For multiple stars, the "S=" refers to the separation between the two brightest stars. The "M=" now refers to the magnitude of the brightest star.) To go to the next double star in the selected constellation, simply press the up arrow button. The guide arrows will now direct you to the next double star in the constellation. If there are no more double stars available in that constellation, a double star from the next constellation (in alphabetical order) will be displayed. To select another constellation in which to view a double star, press the **Star** button, select "DOUBLE", and press **Enter**.

Variable Stars

Variable stars are stars that change their brightness, also called magnitude, over time. The period of brightness change varies greatly from star to star; some variable stars change brightness over several days while others may take several months to noticeably change. It is fun and challenging to watch a star's magnitude change over time. Observers typically compare the current brightness of the variable star to other stars around it (whose magnitudes are known and do not change over time).

To select a variable star to observe, press **Enter** after selecting "VARIABLE" from the **Star** button choices. The LCD screen will then display the word "VARIABLE" with a flashing three-letter constellation designation after it. Now, select the constellation in which you would like to view a variable star. Use the arrow buttons to scroll through the list of constellations. If you are unsure which constellation the three-letter designation represents, refer to Appendix C. Once you have selected the constellation, press **Enter**. A variable star in that constellation will now appear on the LCD screen, along with the guide arrows to lead you to the variable star. The current constellation is shown in the lower left, and the variable star's name is in the lower right.

Note: Variable stars typically have names like "Eta" (Greek letter designation) or a letter designation like "R." The full names for these variable stars are actually linked to the constellation they reside in. For example, in the constellation Aquila, these stars would be "Eta Aql" and "R Aql."

For more information about the variable star selected, press the **Enter** button. (The "M=" refers to the mean magnitude of the variable star.) To go to the next variable star in the selected constellation, simply press the up arrow button. The guide arrows will now direct you to the next variable star in the constellation. If there are no more variable stars available in that constellation, a variable star from the next constellation (in alphabetical order) will be displayed. To select another constellation in which to view a variable star, press the **Star** button, select "VARIABLE," and press **Enter**.

Catalog (ST) Stars

The "ST" catalog contains all of the stars in the IntelliScope Computerized Object Locator's database. This catalog has 837 of the most interesting stars to view in the night sky. The full list of stars appearing in the ST catalog is printed Appendix D. Generally, the best way to use the ST catalog to observe stars is first to peruse Appendix D, and then note the catalog number of the star you wish to observe.

To select an ST catalog star to observe, press **Enter** after selecting "CATALOG" from the **Star** button choices. The LCD screen will then display the letter "ST" with three digits blinking after it. Now, input the ST catalog number of the star you wish to observe, and press **Enter**. If the ST catalog number of the star you wish to view contains three digits, it is not necessary to press **Enter** after inputting the third digit.

The object's ST catalog designation will be shown in the upper left corner of the LCD screen, with the guide arrows in the upper right. The lower left will show the constellation the object resides in and the star's name.

You can get more information on the star selected by pressing the **Enter** button. The second line of the LCD screen will then cycle information about the object you are viewing, such as its celestial coordinates (R.A. and Dec.), magnitude (brightness), and a brief description.

When you are finished viewing the selected star, you may scroll to another star in the ST catalog by using the arrow buttons, or you can select another ST catalog star to view by pressing the **Star** button, and pressing **Enter** once "CATALOG" is selected.

8. Tours of the Best Objects

The IntelliScope controller offers guided tours of the best and brightest celestial objects visible in the sky each month. There are 12 monthly tours, each consisting of 12 preselected objects. The tours are an easy and fun way to locate and observe the finest wonders of the heavens. They are a great place to start for a beginner who is unfamiliar with the night sky, or for a more experienced observer who wants to revisit some old favorites or show friends or family "what's up" on a given evening.

Starting a Tour

To start an IntelliScope tour, press the **Tour** button at any time after you have aligned the IntelliScope system. The LCD screen will display "SKY TOUR" and a flashing three-letter designation for the month. Scroll through the months by using the arrow buttons until you reach the present month, then press the **Enter** button.

The LCD screen will then display the first tour object for the selected month in the lower right of the screen, with the guide arrows in the upper right. Use the guide arrows to

point the telescope, and you will soon be observing the first astronomical showpiece of the month.

You can get more information about the current tour object by pressing the **Enter** button. The second line of the LCD screen will then cycle the following information about the object you are viewing: its celestial co-ordinates (R.A. and Dec.), magnitude (brightness), size (in arc minutes or seconds), and a brief text description.

When you have finished viewing the first tour object for the selected month, you can continue the tour by pressing the up arrow button to find the next object. You can exit the tour at any time by pressing any one of the other function buttons on the controller.

Since several months' tour objects are visible in the night sky at one time, feel free to select a month before or after the current month. These tour objects will likely be visible also. Remember, however, that viewing objects below 40° or so from the horizon will not give the best view due to atmospheric distortion (and usually light pollution). If you are finding that objects in the selected tour month are too close to the horizon, you should choose a month following the selected month, or you can wait a few hours for the objects to rise higher in the sky!

9. The Identify Function

There may come a time in your observations when you spot an unidentified deep-sky object or star in the eyepiece and want to know what it is. With the IntelliScope Computerized Object Locator, a simple press of a button will tell you.

Using the ID Button

When you locate an object and center it in the eyepiece, you can identify it by simply pressing the **ID** button. The LCD screen will display "IDENTIFY" with the word "ANY" flashing. You can then use the up/and down arrow buttons to scroll through several more specific options ("STAR", "DOUBLE", "CLUSTER", "NEBULA", and "GALAXY"). If you know which one of these object types you are looking at, selecting the object type will make the identification quicker and more accurate. This is because the computer will search through a shorter list of potential object matches, and will allow proper identification if there are several objects within the same field of view. If you are unsure of the object type you are looking at, simply select "ANY" from the list of choices. Once you have selected the object type (or "ANY"), press the **Enter** button.

The identity of the object centered in the eyepiece will now be displayed in the lower right area of the LCD screen. The constellation in which the object resides is shown in the lower left. As always, to get more information about the object, press the **Enter** button.

An interesting feature of the **ID** function is that once initiated, it is continually active. So, if you press the **ID** button, and choose "STAR", for instance, you can move your telescope from star to star in the sky, and the controller will automatically display the star's identity when you center the star in the eyepiece. This can be a fun and easy way to identify the stars in the sky. In fact, you can even make a "Name That Star" game out of it! Point your finger at a bright star in the sky and see if you can name it. Then, just point the telescope at the star to see if you were correct or not. If the centered star is not in the controller's database, it will display the identity of the closest star that is in its database.

To exit the identify function, simply press any other of the controller's function buttons. If you would like to identify another object type, press the **ID** button again.

10. Adding User-Defined Objects

Not only does the IntelliScope's database contain over 14,000 fascinating objects to view, you can even add your own! Up to 99 user-defined objects can be entered into the database by means of the **User** button. These user-defined objects can be random stars, a faint object not contained in the controller's database, or just a pretty object that you would like to come back to at some point in the future.

To enter a user-defined object into the database, you must have the right ascension (R.A.) and declination (Dec.) coordinates for the object. If you are currently observing an object that is not in the controller's database and you wish to add it, but don't know its coordinates, you can use the **FCN** button to obtain its coordinates (described in next section).

To input a user-defined object, begin by pressing the User button. The LCD screen will display the word "NEW" with a two-digit number flashing after it. Since no user-defined objects currently exist, press Enter to create user-defined ("NEW") object number 01. The LCD will display the R.A. and Dec. coordinates for the "NEW" object selected in the lower left. Since no data has been input yet, these coordinates will be 00:00 +00.0. The first four digits indicate the R.A. coordinate (in R.A. hours and minutes), and the remaining digits (and the ± sign) indicate the Dec. coordinate (in degrees). Now, press the Enter button, and the first two digits of the R.A. coordinate (R.A. hours) will begin flashing. Press the two numerical buttons on the keypad that correspond the hours value of the R.A. coordinate. If the value of the R.A. hours is less than 10, make sure to enter a zero first. Then the second two digits of the R.A. coordinate (R.A. minutes) will begin flashing. Press the two numerical buttons that correspond to the minutes value of the R.A. coordinate. If the R.A. minutes are less than 10, make sure to enter a zero first. Next, the sign of the Dec. coordinate will be flashing. Use the arrow buttons to select "+" or "-"for the Dec. coordinate. Then, the first two digits of the Dec. coordinate will begin flashing. Press the two numerical buttons that correspond to the degrees value of the Dec. coordinate. Then the tenth of a degree value for the Dec coordinate will begin flashing. Press the numerical button that corresponds to the tenths of a degree value for the Dec. coordinate.

You have now input the data for your first user-defined object. Remember that this object is now "NEW01". If you wish to view this object in the future, press the **User** button, and press Enter once "NEW01" is selected. The guide arrows will then tell you where to point your telescope to find the user-defined object.

If you wish to input another user-defined object, select "NEW02" (by using numerical buttons or the arrow buttons) after pressing the **User** button and input the data as outlined previously. If you select a "NEW" object number that you have already entered coordinates for and attempt to input new data, you will lose the data that was input previously. You may find it convenient to keep a written log of the "NEW" objects so that you can easily keep track of them.

11. The FCN Button

The IntelliScope Computerized Object Locator has several other useful functions, a couple of which can be accessed by using the **FCN** (function) button.

R.A. and Dec. Coordinates

By simply pressing the **FCN** button, the controller will give a continuous readout of the telescope's current R.A. and Dec. coordinates. This can be helpful and powerful in

a number of ways. You can easily find any object in the night sky if you know its right ascension and declination coordinates. Grab any star atlas, choose any object you wish to view, be it faint galaxy or random star, and jot down its coordinates. Then, once you have aligned the IntelliScope system, you can point the telescope to that location by simply pressing the **FCN** button and moving the telescope until the R.A. and Dec. coordinates displayed match the coordinates of the object you wish to view. You can also press the **FCN** button at any time to display the current R.A. and Dec. coordinates of whatever you are currently viewing.

A common use for the **FCN** button is to locate "transient" objects, such as comets and asteroids. To find these objects you will need to learn their coordinates from astronomy resources, such as *Astronomy, Sky & Telescope*, or a reliable astronomy website. Comet and asteroid positions will change from night to night, so entering the current coordinates into the user-defined database is generally not useful.

After pressing the **FCN** button, the R.A. and Dec. coordinates corresponding to the center of the telescope's field of view are displayed on the first line of the LCD screen. The lower left of the screen indicates the current constellation the telescope is pointing to. The lower right numbers are the current azimuth ("AZ") and altitude ("ALT") coordinates of the telescope; this information is generally not useful.

The Realignment Function

This function is useful for obtaining a new alignment fix during an observing session to correct for small pointing errors. Use this function only when pointing accuracy for a certain area of the sky appears to be poor compared to other areas of the sky. This is evident when objects in one area of the sky consistently fall at the edge or just outside the field of view (of the 25mm eyepiece) when the numbers on the LCD screen read 0.0 0.0. This can happen if the alignment stars initially chosen during setup are somewhat close to each other (less than 60° apart) or if the area of sky being viewed is a considerable distance away from the alignment stars chosen.

To improve pointing accuracy in a specific area of the sky, select an object in the locator's database from that region, and use the guide arrows to find the object. Precisely center the object in the eyepiece (preferably a high-powered one). Now, press the **FCN** button, and the R.A. and Dec. coordinates of the centered object will be displayed. Then, press the **Enter** button. The LCD screen will now display "ALIGN OBJECT 3" on the first line, and will be flashing the object currently centered in the telescope on the second line. Pressing Enter again then realigns the IntelliScope system to the object centered in the telescope. The LCD screen will display a new "warp factor" associated with the new alignment. If this number is greater than ± 0.5 , you may want to consider resetting the controller to perform another two-star alignment. Turn the controller off, then on again (with the **Power** button), to do this.

If, instead of pressing **Enter** a second time after pressing the **FCN** button, you press one of the arrow buttons, the list of initial setup alignment stars will be displayed. If you wish, you can select one of these alignment stars to realign on. Do this by scrolling to the desired alignment star using the arrow buttons, center the star in the telescope, and press **Enter**.

In general, it will not be necessary to use the realignment function, but it is a handy feature to have at your disposal. Also, be aware that while pointing accuracy will increase in the area of sky around the object realigned on, it may decrease in other areas of the sky.

12. The "Hidden" Functions

All of the active functions of the IntelliScope Computerized Object Locator have been outlined. There are, however, some additional "hidden" functions that may be of some use to you. To access the hidden functions, press the **Enter** button while pressing the **Power** button to turn the controller on. The LCD will display its introduction screen (with software version number) and then show the words "ALT AZM TEST." This is the first hidden function. Scroll to the other hidden functions by using the arrow buttons. The other hidden functions are "ENCODER TEST," "DOWNLOAD," "CHECKSUM," "REWRITE," and "CLOCK." When the hidden function you wish to use is displayed, press **Enter** to select it. To exit the currently chosen hidden functions section of the controller, you will need to hold the **Power** button down until the controller turns off.

The rest of this section gives the details and purpose of each hidden function.

Altitude and Azimuth Test

The altitude and azimuth test ("ALT AZM TEST") is a diagnostic test that gives relative altitude and azimuth positions for the telescope. This test will allow you to easily see if the encoders are "talking" to the controller, and if the encoders are accurately monitoring the telescope's motions. To effectively use this test, make sure the telescope optical tube is in the horizontal position when pressing the **Enter** and **Power** buttons to access the hidden functions.

Once "ALT AZM TEST" is chosen from the hidden function options, the LCD screen will display the telescope's current relative altitude and azimuth position (in degrees); the relative altitude is in the upper right, while the relative azimuth is in the lower right. To begin with, both of these numbers will be +000.0. The first two sets of numbers on the upper and lower lines of the LCD screen are meaningless for the purposes of this test.

If you move the telescope counter-clockwise in azimuth, the number in the lower right should increase, while if you move clockwise in azimuth, the number will decrease. If you rotate the telescope exactly 360° in azimuth, the readout should return to the original +000.0 reading.

If you move the telescope upwards in altitude, the number in the upper right should increase, while if you move downwards in altitude, the number will decrease. If the telescope tube was perfectly horizontal when you enabled the hidden functions of the controller, then the altitude will read +090.0 when the telescope is pointed precisely vertical.

If one, or both, of the encoders are not behaving properly when performing this diagnostic test, there may be a problem with the assembly of the system, or a problem with one of the encoder boards or discs. Also, be sure to check that all cable connections are secure.

Encoder Test

The encoder test is another diagnostic test that gives information about the performance of the encoders themselves. Select "ENCODER TEST" from the list of hidden functions using the arrow buttons and press **Enter**.

The LCD screen will now display two lines of data. The top line of data corresponds to the altitude encoder, while the lower line of data corresponds to the azimuth encoder. The first two digits on each line denote the amplitude of the signal from one of the magnetic sensors on the encoder board, the second two digits represent the amplitude from the other sensor on the encoder board. The numbers are in hexadecimal (base 16) digits. Therefore "A" in hexadecimal represents "11" in decimal, "B" represents "12" in decimal, "C" represents "13," "D" represents "14," "E" represents "15," and "F" represents "16." When moving the telescope in altitude or azimuth, you will note that each of the digit pairs rises and falls. None of the digit pairs should ever go above "F3." If they do, then the encoder disk is too close to the sensors on the encoder board. This will generally not happen in altitude, but can happen in azimuth.

If you notice that the first or second digit pair on the second line of the display goes above "F3," then try loosening the lock nut on the azimuth nut of the base by about 1/16 turn. If this does not work, you will need to disassemble the azimuth encoder (azimuth encoder disk, brass bushing, and azimuth encoder board) and reassemble it carefully according to the instructions that came with the IntelliScope Dobsonian telescope itself.

If you notice that the two digit pairs on the first line are going above "F3," then there is a problem with your altitude encoder assembly. More than likely, the altitude encoder disk is bent.

The three-digit number displayed after the digit pairs on each line is the "radius" for each encoder. This number should not go above about 125 or below about 30. If it does, performance may be compromised for the corresponding encoder. If the number goes above 125, then the encoder disk and magnet may be too close to each other. If the number goes below 30, then the encoder disk and magnet may be too far away from each other. Also, if the radius varies by more than 30 counts in a cycle, encoder performance may not be optimal, and you should contact Orion's Customer Service Department.

The four-digit number at the end of each line is the raw encoder "ticks" in hexadecimal numbers. This information will generally not be useful for diagnostic testing of the encoders.

Download

This function allows downloading of software changes and upgrades available from Orion's website. To use this option, you must have the optional IntelliScope-to-PC cable, available from Orion. Check www.oriontelescopes.com for more information about available software downloads for the IntelliScope Computerized Object Locator.

Checksum

The checksum function is used to make sure that software has loaded into the controller properly. It has no purpose until a new software version is downloaded. Check the IntelliScope download section on www.telescope.com to see what the proper checksum should be for each new software version.

Rewrite

Rewrite is also only used after a new software version has been downloaded. It rewrites the new software into its memory in order to prevent any potential problems from arising after the software transfer.

Clock

This function allows use of the IntelliScope system with equatorial platforms for Dobsonian telescopes. If you are using your IntelliScope with a Dobsonian equatorial platform, press **Enter** when the selection "CLOCK" is displayed from the available "hidden" function choices. The LCD screen will then show the word "ON" blinking. For normal operation of the IntelliScope system, the controller's internal clock should be on. For use with a Dobsonian equatorial platform, use the up or down arrow button to change "ON" to

"OFF," and press **Enter**. The controller is now ready to be used with a Dobsonian equatorial platform. Now, when you press **Power** to turn the controller on, the LCD screen will state "CLOCK IS OFF" on the second line of its introduction screen.

To turn the controller's internal clock back on, access the hidden functions, select "CLOCK," press **Enter**, change the "OFF" back to "ON," and press **Enter** again.

13. Specifications

Objects in database:

- 110 Messier objects
- 7840 New General Catalog objects
- 5386 Index Catalog objects
- 8 Major planets (including Pluto)
- 99 User-defined objects

Computer interface: RS-232 port

Power: Requires one 9V battery

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device nay not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes of modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- · Increase the separation between the equipment and receiver.
- Connect the equipment into an output on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
- A shielded cable must be used when connecting a peripheral to the serial ports.

Appendix A: Troubleshooting the IntelliScope System

This section is intended to help you if you are encountering any problems with your IntelliScope system. If this information is not useful to you in determining the source of the problem, contact Orion Technical Support via phone or email.

Azimuth encoder, in general

- 1. Is the azimuth axis screw's hex lock nut tight enough? Is it too tight? Remember, it should be tightened only 1/4 turn past when the fender washer is no longer loose under the nut.
- Does the brass bushing extend slightly above the top surface of the top baseplate? If not, the bushing or top baseplate may need replacement, or there may be an assembly problem.
- 3. Is the azimuth encoder disk (magnet) bent? If so, you will need to flatten it by bending.
- 4. Is the azimuth encoder board trimmed flush on the side in contact with the top baseplate? If not, the board will not seat flat against the baseplate and this may cause the encoder's sensors to come too close to the encoder disk.
- 5. Is the brass bushing properly registered with the azimuth encoder disk? The feature on the front of the bushing needs to seat into the hole in the disk.

Altitude encoder, in general

6. Is the altitude encoder disk significantly bent? If so, the altitude encoder assembly will need replacement. Also, if the altitude encoder mounting screws are loose, there is an increased chance of the user bending the altitude encoder disk.

Warp factor consistently above ±0.5 but below ±2.0

- 7. Check accuracy of vertical stop. Use a carpenter's level to do this.
- 8. Are alignment stars being centered with reasonable precision? A high-power eyepiece (at least 10mm focal length), or an illuminated reticle eyepiece (preferred) is recommended.
- 9. Check encoders as outlined previously.
- 10. Try to use alignment stars that are well above the horizon. Light from stars is refracted as it travels through the atmosphere and starlight near the horizon has to travel through the greatest amount of atmosphere before reaching your telescope. Stars near the horizon can appear as much as 2° away from their actual position.
- 11. Avoid long delays between aligning on the first and second alignment stars. The stars in the night sky appear to move due to the rotation of the Earth. If you take more than a few minutes to align on the second star, this stellar motion will result in an increase in the warp factor (and decrease the resultant pointing accuracy). This is because the controller does not yet have a frame of reference to tell which way the stars should appear to be moving before the second star is aligned on.

Warp numbers larger than 2.0

12. Are the stars you aligned on actually the stars you selected on the controller? Consult the finder charts in Appendix B if you are unsure.

13. The encoder sensors may be coming into contact with the encoder disks. Check both the altitude and azimuth encoders as outlined above.

Altitude readouts do not change when you move the scope (during "ALT AZM TEST")

- 14. Check the altitude cable's connections.
- 15. Make sure the knob that goes through the altitude encoder is tight.
- 16. Check that the altitude encoder disk rotates as the telescope tube is moved up or down. If it doesn't, then either you need to tighten the retaining knob more, or the encoder is too tight on the encoder board itself (a manufacturing defect), in which case it will need to be replaced.

Azimuth readouts do not change when you move the scope (during "ALT AZM TEST")

- 17. Check the azimuth cable's connections.
- 18. Make sure the hex lock nut on the azimuth axis screw is tight. The fender washer underneath the hex lock nut should not be able to move. Remember, the hex lock nut should be tightened about 3/16 to 1/4 turn beyond the point where the washer cannot move any longer.
- 19. Try disassembling then reassembling the azimuth encoder by disassembling the top and bottom groundboards of the base.

If you need to contact Orion Technical Support, email support@telescope.com or call (800) 676-1343.

Appendix B: Alignment Star Finder Charts







SUMM	ER
Early June	2:00 AM*
Late June	1:00 AM*
Early July	12:00 AM*
Late July	11:00 PM*
Early August	10:00 PM*
Late August	9:00 PM*
Early September	8:00 PM (dusk)*
*Daylight saving time	



AUTOWIN	
Early September	2:00 AM*
Late September	1:00 AM*
Early October	12:00 AM*
Late October	11:00 PM*
Early November	9:00 PM
Late November	8:00 PM
Early December	7:00 PM
*Daylight saving time	



SOUTH

WINTER	
Early December	2:00 AM
Late December	1:00 AM
Early January	12:00 AM
Late January	11:00 PM
Early February	10:00 PM
Late February	9:00 PM
Early March	8:00 PM
-	

Appendix C: Constellation Abbreviations

And	Andromeda	CVn	Canes Venatici	Ori	Orion
Ant	Antlia	Cyg	Cygnus	Pav	Pavo
Aps	Apus	Del	Delphinus	Peg	Pegasus
Aql	Aquila	Dor	Dorado	Per	Perseus
Aqr	Aquarius	Dra	Draco	Phe	Phoenix
Ara	Ara	Equ	Equuleus	Pic	Pictor
Ari	Aries	Eri	Eridanus	PsA	Piscis Austrinus
Aur	Auriga	For	Fornax	Psc	Pisces
Boo	Boötes	Gem	Gemini	Pup	Puppis
Cae	Caelum	Gru	Grus	Рух	Pyxis
Cam	Camelopardalis	Her	Hercules	Ret	Reticulum
Сар	Capricorn	Hor	Horologium	Scl	Sculptor
Car	Carina	Нуа	Hydra	Sco	Scorpius
Cas	Cassiopeia	Hyi	Hydrus	Sct	Scutum
Cen	Centaurus	Ind	Indus	Ser	Serpens
Сер	Cepheus	Lac	Lacerta	Sex	Sextans
Cet	Cetus	Leo	Leo	Sge	Sagitta
Cha	Chamaeleon	Lep	Lepus	Sgr	Sagittarius
Cir	Circinus	Lib	Libra	Tau	Taurus
Cnc	Cancer	LMi	Leo Minor	Tel	Telescopium
СМа	Canis Major	Lup	Lupus	TrA	Triangulm
CMi	Canis Minor	Lyn	Lynx		Australe
Col	Columba	Lyr	Lyra	Tri	Triangulum
Com	Coma Berenices	Men	Mensa	Tuc	Tucana
CrA	Corona	Mic	Microscopium		Ursa Major
	Australis	Mon	Monoceros		Ursa Minor
CrB	Corona Borealis	Mus	Musca	Vel	Vela
Crt	Crater	Nor	Norma	Vir	Virgo
Cru	Crux	Oct	Octans	Vol	Volans
Crv	Corvus	Oph	Ophiuchus	Vul	Vulpecula

	colored double star	red variable star	colored double star	red variable star	emission nebula	double star challenge	star Harible star shallanes	double star challenge	uouble stat citattetige	stat red variable star	red variable star	colored double star	variable star	double star challenge	red variable star	double star	double star	star	star	variable star	double star	red variable star	double star	double star	star	star	colored double star	star	double star challenge	double star	star	colored double star	colored double star	scattered group of stars	double star double star shollongo	uouble stat citatierige star	double star acual macmitude	double star equal magnitude	variable star	double star equal magnitude	double star	double star	star	star	star	double star	double star	star	double star challenge	double star magnitude contrast
Code	5	-	5	-	130	4	7	4	+ c			2	22	4	÷	2	2	21	21	22	2	۲	2	2	21	21	5	21	4	2	21	1 22	2	120	2	4			22	e	2	2	21	21	21	5	2	21	4 0	'n
Con	Cas	Psc	Cas	And	Cep	Cas	And	Cep	200	Cat	Cet	Psc	Scl	Cep	Cas	And	And	Cet	And	And	Cas	And	Tuc	Psc	Cas	And	Psc	Cas	Psc	Cas	Psc	Cas	Psc	Cas	1 uc	Cas	Cat	And	Cep	Psc	Psc	Phe	Cet	Cep	And	Psc	Tuc	Psc	Cet	Cas
Sep	59"	*	15"	*	30'	-9°L	500	0.0	* ٧	1 5°	2. *	12"	*	0.9"	*	39"	5"	*	*	Stellar	15"	*	27"	28"	*	*	6"	*	1.5"	36"	*	12"	4.4	13	12	0.0	26"	2 60	Stellar	30"	33"	6.4"	*	*	*	23"	5.4"	* .	1.6"	25-
Mag	7.6	4.4	5.9	8	7.8	6.6	2.1	0.0	7.0	0.2	4.4	5.8	5.5	7	6	8	7.6	3.5	8	5.8	6.9	6.9	4.4	5.7	3.7	3.3	5.4	2.2	7.8	5.7	4.4	3.4	6.3		0.0	25	8.4		6,8	5.3	6.8	3.9	3.5	4.3	5	5.6	5.1	8.8	6.4	4.7
Dec	+60 21	-06.0	+66 06	+43.5	+67.2	+58.4	CO 67+	+/9./	- 15 00	+ 13.2 8 70-	-18.9	+08 49	-32.1	+76.9	+50.3	+44.0	+26 08	-08.8	+44.7	+38 35	+49 59	+35.6	-63.0	+06.9	+53.9	+30.9	+21 26	+56.5	+04.2	+75.0	+07.6	+57 49	+27.7	+64.1	0.80-	+60.7	+00.47	+44 43	+81 51	+21 28	+04 55	-55.3	-10.2	+86.3	+35.6	+07.6	-68.9	+25.8	-00 31	+68.1
RA	00 01.2	00 02.0	00 02.6	00 04.6	00 04.7	00 00 1	00 00 0	00 00 4	4.00	00 13.2	00 14.6	00 15.0	00 15.4	00 16.2	00 17.6	00 18.1	00 18.5	00 19.4	00 19.9	00 24.0	00 27.2	00 27.6	00 31.5	00 32.4	00 37.0	00 39.3	00 39.9	00 40.5	00 42.4	00 45.7	00 48.7	00 49.1	00 49.9	00 50.0	00 52.4	00 56 7	00 59 4	01 00.1	01 02.3	01 05.6	01 05.8	01 08.4	01 08.6	01 08.7	01 09.7	01 13.7	01 15.8	01 16.2	01 19.8	9.02 IU
Other						AUS 61	Alpria	AUS 102	0,0000		0	"35, UU"	8 8 A 8 8			ADS 246							Lacaille 119	ADS 449	17			Alpha	ADS 588	ADS 624			ADS 683		A DS 755	"Gamma Tsih"	5			74	77	Rumker 2		SAO 181	Beta	ADS 996	h3423		42	AUS 1129
Name	O <u>5</u> ,5254	30	Σ3053	SU	Ced214	23062	Alpheratz	22 Konno	Alconit		7	<u>5</u> 12	n N	Σ13	ST	Groombridge34	Σ24	lota	٨X	ш	Σ30	AQ	Beta	Σ36	Zeta	Delta	55	Schedar	O∑18	HN122	Delta	Eta	65	D013	Lambdal	Navi	V.BO	579 579	, N	Σ88	<u>5</u> 90	Zeta	Eta	Lux Lydiae	Mirach	Zeta	Kappa	Z	2113 D-1	ISI
Number	ST001	ST002	ST003	ST004	ST005	S1006	0100	01000 01000	01000	ST011	ST012	ST013	ST014	ST015	ST016	ST017	ST018	ST019	ST020	ST021	ST022	ST023	ST024	ST025	ST026	ST027	ST028	ST029	ST030	ST031	ST032	ST033	S1034	S1035	01030	ST038	ST039	ST040	ST041	ST042	ST043	ST044	ST045	ST046	ST047	ST048	ST049	ST050	ST051	S 1 U52

Appendix D: ST Catalog

Number	Name	Other	RA	Dec	Mag	Sep	Con	Code	
ST053	н		01 27.0	-32.5	6.1	*	Scl	22	variable star
54	Gamma		01 28.4	-43.3	3.4	4'	Phe	21	star
55	Achernar	Alpha	01 37.7	-57 14	0.5	*	Ēri	21	star
56	51	-	01 38.0	+48.6	3.6	*	And	21	star
57	٨N		01 38.8	-18.0	7	*	Cet	22	variable star
58	b	Dunlop 5	01 39.8	-56.2	5.8	11.5"	Eri	2	double star
59	Nu	106	01 41.4	+05.5	4.4	*	Psc	21	star
50	44	Burnham 1103	01 43.3	+60.6	5.8	1.6"	Cas	2	double star
61	Phi		01 43.7	+50.7	4.1	*	Per	21	star
62	<u>2</u> 162		01 49.3	+47 54	5.8	2"	Per	8	triple star challenge
63	<u>2</u> 174	-	01 50.1	+22.3	9	2.6"	Ari	2	double star
64	<u>2</u> 163		01 51.3	+64 51	6.6	35"	Cas	5	colored double star
65	Baten Kaitos	Zeta	01 51.5	-10.3	3.7	3,	Cet	2	double star
66	2178		01 52.0	+10 48	8.5	3"	Ari	e	double star equal magnitude
67	<u>2</u> 180	Gamma	01 53.5	+19.3	4.5	8"	Ari	e	double star equal magnitude
68	Psi		01 53.6	-46.3	4.4	5°	Phe	-	red variable star
69	Epsilon	45	01 54.4	+63.7	3.4	*	Cas	21	star
70	Σ186	ADS 1538	01 55.9	+01.9	6.8	1"	Cet	4	double star challenge
71	56	ADS 1534	01 56.2	+37.3	5.7	3'	And	2	double star
72	Lambda	ADS 1563	01 57.9	+23.6	4.8	37"	Ari	2	double star
73	Upsilon		02 00.0	-21.1	4	*	Cet	21	star
74	Σ202	Alpha	02 02.0	+02.8	4	1.6"	Psc	4	double star challenge
75	Almach	Gamma	02 03.9	+42.3	2.2	10"	And	5	colored double star
76	Hamal	Alpha	02 07.2	+23.5	2	*	Ari	21	star
7	59		02 10.9	+39 02	5.6	16"	And	5	colored double star
78	lota	ADS 1697	02 12.4	+30.3	5	3.8"	Tri	5	colored double star
6	<u>2</u> 231	66	02 12.8	-02.4	5.7	16.5"	Cet	CN -	double star
0	<u>228</u>	ADS 1709	02 14.0	+47.5	6.6	1.1"	And	4 0	double star challenge
5	2232		02 14./	+30.24	1 00		2		double star equal magnitude
N	2239 Mise	Omieron	02 17.4	+28 44		14"	LI C	N 6	double star
2	Inter Inter	OIIICIOII	1 00 00		7	"C C	200	77 0	valiable stat
14	1018 V260		02 29.1	+0/.4	4 8 0	2.2	Cas	0 0	double star
0	2200		02 23.4	10 00+	0.0	0 ***	In C	v c	double star double stor sound mozaritude
0 1	22/4 Dolorio	0 4 m 1 0	0 10 20	01 D+	0.7	10,	Cel IIVI	0 0	double star equal magnitude
0	Omoco	AIDNA h 3606	0.15 20	+83 10	N L	18	UMI	N C	double star
0 0	20 30		02 33.9	CI 07-	с Ч	30"	Ari	v u	colored double star
	6 ш	B TBI	02 37 0	+24.30	5.4	* 0			convieu uouvie stat variable star
- I	7.000	Gamma	02 07 .0	0.504	4.0	. 2 2.	ta C	37 0	double star
- 0	V305	Camera	02 47 5	+19.22	7.4		Ari	4	double star challence
100	R7		02 48.9	+69.38	6.2	Stellar	Cas	55	variable star
4			02 49.3	+17 28	5.2	3	Ari	9	triple star
5	<u>2</u> 307	Eta	02 50.7	+55 53	3.9	28"	Per	6	double star magnitude contrast
96	В		02 53.9	-49.9	4.7	*	Hor	22	variable star
7	Σ330	ADS 2237	02 57.2	-00.6	7.3	9"	Cet	2	double star
8	Acamar	Theta	02 58.3	-40.3	3.5	8"	Eri	2	double star
6	Σ333	Epsilon	02 59.2	+29.3	4.6	1.4"	Ari	4	double star challenge
00	Epsilon		02 59.2	+2120	4.6	1"	Ari	4	double star challenge
1	S331		03 00.8	+52 20	5.4	12"	Per	2	double star
12	Menkar	Alpha	03 02.3	+04.1	2.5	* •	Cet	21	star
03	Hho	25	03 05.2	+38.8	3.4	* L	Per	- 1	red variable star
14	<u>2320</u>		03 06.2	+79 24	5.8	5"	Cep	2	colored double star
05	n3568	c	03 07.5	-79.0	5.6	15"	Hyi	2	double star
ST106	Algol	Beta	03 08.2	+41.0	2.2	* 1	Per-	22	variable star
27	Alpha	ADS 2402	03 12.1	-29.0	4	<u>م</u>	For	N	double star

	Number	Name	Uther	КА	Dec	INIAY	oeb		0000	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	T108	h3556		03 12.4	-44.4	9	3.5"	Eri	5	double star
	T109	<u>7</u> 362		03 16.3	+60 02	8.5	7"	Cam	۱ m	double star equal magnitude
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	T110	<u>5</u> 369		03 17.2	+40 29	6.7	.°	Per	5	colored double star
	T111	ADS2446		03 17.7	+38.6	7.8	.6.0	Per	4	double star challenge
	T112	Zeta		03 18.2	-62.5	5.2	5"	Ret	2	double star
	T113	Tau4	ADS 2472	03 19.5	-21.8	3.7	*	Eri	21	star
	T114	Toms Topaz	SAO 75871	03 20.3	+29.0	4.5	°6	Ari	21	star
Y Per Z2 Y Per Z2 Y Per Z2 Y Per Z2 Z4 Z4 Y Per Z2 Z4 Z4 <thz4< th=""> <thz4< th=""> <thz4< th=""> <t< td=""><td>T115</td><td>Mirfak</td><td>Alpha</td><td>03 24.3</td><td>+49 52</td><td>1.8</td><td>*</td><td>Per</td><td>21</td><td>star</td></t<></thz4<></thz4<></thz4<>	T115	Mirfak	Alpha	03 24.3	+49 52	1.8	*	Per	21	star
2934 ADS 2644 03 280 $+20.27$ 7.1 7.1 7.1 7.1 7.1 7.1 2.7 Ari 2.2 2389 ADS 2644 03 201 $+90.27$ 7.1 7.1 7.1 7.1 7.1 2.7	T116	>		03 27.7	+44.2	8.1	*	Per	22	variable star
2985 ADS 2844 03 201 +59.2 4.2 2.4 Cam 2 Signa 03 305 +49.0 4.4 1 1 Per 21 Signa 03 305 +49.0 6.3 1.4 1 Per 21 Signa ADS 2812 03 305 +49.0 6.8 1.4 1 Per 21 Signa ADS 2812 03 40.0 6.83 4.4 1.1 Per 21 Vincen ADS 2812 03 40.0 6.83 4.4 1.1 Per 21 Vincen ADS 2816 03 44.3 +27.1 2.4 Cam 2 Vincen ADS 2826 03 44.3 +27.2 AD Cam 2 Size 03 44.3 +27.2 3.4 +4 + Fin 2 Size 03 44.3 +12.1 2.1 2.1 2 2 2 2 Size 03 44.4 +12.1 2.4	T117	Σ394		03 28.0	+2027	7.1	7"	Ari	2	double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	T118	∑385	ADS 2544	03 29.1	+59.9	4.2	2.4"	Cam	2	double star
Signation Constraint Constraint <thconstraint< th=""> Constraint <thconstraint< th=""> Constraint Constraint</thconstraint<></thconstraint<>	T119	Σ389		03 30.1	+59 21	6.5	2.7"	Cam	2	double star
	T120	Sigma		03 30.6	+48.0	4.4	*	Per	21	star
	T121	<u>5401</u>		03 31.3	+27 34	6.4	11"	Таи	e	double star equal magnitude
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	r122	Epsilon		03 32.9	-09.5	3.7	*	Eri	21	star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	123	\$400	ADS 2612	03 35 0	+60.0	6.8	1.4"	Cam	~	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	124	0.736	ADS 2650	03 40 0	163.0	8.9	46"	and and	10	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	105	111	0004 004	03 41 6	5.001	0.0 F 0	P	and and a	20	variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	201-		A D.C. 0706	0.14.00	0.00.	- 0 0		Dov	31	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	071	Omicron	AUS 2/20	03 44.3	+32.3	3.0	,	Ler	7	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	121	L C	07	03 40.1	- 12.1	4.4			- 2	red variable star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	071	Gamma	0	2.14.00	-/4.2	2.5	5	- AL	17	Stat 4
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	621	202	30	03 48.3	2.11+	0	0.0	lau L		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	130	ᇿ	0 10	03 48.0	-3/ 3/	9.4 L	× •	E C	ъ г	double star equal magnitude
Alk Length Constrain $4.31.9$ 5.3 7.7 Fer 2.1 22 2406 03 57.9 -40 07 +12.5 3.3 7.7 Fer 5 2 Lembda 35 04 07 +12.5 3.3 7.7 Fer 5 2 Lembda 35 04 07 +12.5 3.3 7.7 Fer 9 2 Lembda 35 04 07.6 +62.5 0.3 7.4 1.6 9 2 Lembda 35 04 17.7 $6.3.3$ 6.2 4.7 9.6 7.4 1.6 2.1 2 Lengton 04 17.7 $6.3.3$ 6.2 4.7 1.6 6.7 7.4 1.6 2.1 2.1 2 Fei Print ADS 3137 04 22.7 4.27 4.2 4.7 2.1 2.1 2.1 2 Fei Distribut ADS 3137 04 22.7 4.27 4.7 2.1 2.1 2.1	131	BE *#1	SAU 12916	03 49.5	+0.0.0	4.5		Cam	12	star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	132	Attk	2018 A D C 2050	03 54.1	10.00	R.7		Ler Ler	17	Star colored double of c
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	100	Encilon	0007 000	0.4.0	10.01	000	, "U	Dor		double double stat
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	135	Zaurak	Gamma	03 58 0	-13.5	6.9	D *	- - -	21	counte stat inagintade contrast
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	136	Lambda	35	04 00.7	+12.5	3.3	*	Tau	22	variable star
$ \begin{array}{cccccc} \tilde{Y}_{465} & SZ & 04078 & +8220 & 7 & 90^{\circ} & Cam & 2 \\ \tilde{Y}_{465} & 40 & 04152 & -97.7 & 45.5 & 83^{\circ} & Cam & 2 \\ \tilde{F}_{111} & Funker 7 & 04152 & -97.7 & 45.5 & 83^{\circ} & Ret & 21 \\ \tilde{F}_{111} & DSS3137 & 0427.7 & -85.3 & 6.2 & 4.8 & Ret & 21 \\ \tilde{F}_{111} & DSS3137 & 0427.0 & +19.22 & 8.4 & Sellar & Tau & 22 \\ \tilde{F}_{121} & DSS3137 & 0427.0 & +19.22 & 8.4 & Sellar & Tau & 22 \\ \tilde{F}_{122} & Chi & 0422.7 & +15.1 & 7.3 & 1.4^{\circ \circ} & Tau & 22 \\ \tilde{F}_{123} & 0.22.7 & +15.1 & 7.3 & 1.4^{\circ \circ} & Tau & 22 \\ \tilde{F}_{123} & 0.22.7 & +15.1 & 7.3 & 1.4^{\circ \circ} & Tau & 22 \\ \tilde{F}_{133} & 0.22.7 & +15.1 & 7.3 & 1.4^{\circ \circ} & Tau & 22 \\ \tilde{F}_{133} & 0.22.7 & +15.1 & 7.3 & 1.4^{\circ \circ} & Tau & 2 \\ \tilde{F}_{133} & 0.22.7 & +15.1 & 7.3 & 1.7^{\circ \circ} & Eri & 1 \\ \tilde{F}_{133} & 0.22.7 & +16.1 & 7.3 & 1.7^{\circ \circ} & Eri & 1 \\ \tilde{F}_{133} & 0.22.7 & -810.1 & 6.9 & 3^{\circ \circ} & 14.0^{\circ} & Cam & 5 \\ \tilde{F}_{133} & 0.22.7 & -16.1 & 5.9 & 3.9 & 11^{\circ \circ} & Eri & 21 \\ \tilde{F}_{133} & 0.22.7 & -16.1 & 5.9 & 3.9 & 11^{\circ \circ} & Eri & 21 \\ \tilde{F}_{133} & 0.23.5 & 0.435.5 & -14.3 & 3.9 & 11^{\circ \circ} & Eri & 21 \\ \tilde{F}_{133} & 0.436.5 & -14.3 & 3.9 & 11^{\circ \circ} & Eri & 21 \\ \tilde{F}_{133} & 0.436.5 & -14.3 & 3.9 & 11^{\circ \circ} & Eri & 21 \\ \tilde{F}_{133} & 0.436.5 & -14.3 & 3.9 & 11^{\circ \circ} & Eri & 21 \\ \tilde{F}_{133} & 0.436.5 & -14.3 & 3.9 & 11^{\circ \circ} & Eri & 21 \\ \tilde{F}_{133} & 0.436.5 & -14.3 & 3.9 & 11^{\circ \circ} & Eri & 21 \\ \tilde{F}_{133} & \tilde{F}_{133}$	137	O7531	ADS 2995	04 07.6	+38.1	7.4	1.4"	Per	4	double star challenge
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	138	<u>5</u> 485	SZ	04 07.8	+62 20	7	.06	Cam	0	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	139	Omicron2	40	04 15.2	-07.7	4.5	83"	Eri	8	triple star challenge
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-140	Epsilon		04 16.5	-59.3	4.4	*	Ret	21	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-141	Theta	Rumker 3	04 17.7	-63.3	6.2	4"	Ret	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	142	Phi	ADS 3137	04 20.4	+27.4	5	52"	Tau	2	double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	143	F		04 22.0	+19 32	8.4	Stellar	Tau	22	variable star
ADS3169 04 22.7 +15.1 7.3 1.4" Teu 4 43 Upsilon3 04 27.4 -1.5 1.4" Teu 4 552 Upsilon3 04 27.4 -21 30 7.3 1.7" Eri 1 552 04 31.4 -21 30 7.3 1.7" Eri 1 559 04 31.5 -1.601 6.9 3" Teu 5 559 04 33.5 -16.61 6.9 3" Teu 5 559 04 33.5 -16.6 0.9 30" Teu 5 1 04 33.5 -16.6 0.9 3" Teu 5 Aldebaran Alpha 04 36.5 -14.3 3.9 1" 5 Aldebaran Alpha 04 36.5 -14.3 3.9 1" 5 2 53 04 36.5 -14.3 3.9 1" 5 2 2 54 04 36.5 -14.3	-144	<u>Σ528</u>	Chi	04 22.6	+25.6	5.5	19.4"	Tau	2	double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	145	ADS3169		04 22.7	+15.1	7.3	1.4"	Tau	4	double star challenge
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	146	43	Upsilon3	04 24.0	-34.0	4	*	Eri	-	red variable star
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	-147	B 184		04 27.9	-21 30	7.3	1.7"	Eri	4	double star challenge
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-148	<u>5552</u>		04 31.4	+40 01	7	9"	Per	03	double star equal magnitude
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	149	i		04 32.0	+53 55	5.4	10"	Cam	5	colored double star
46 ADS 3305 04 339 -06.7 5.7 4' Eri 2 Aldebaran Alpha 04 35.9 -06.7 5.7 4' Eri 2 Nu 48 04 35.9 -05.4 3.9 11' Eri 21 53 04 36.2 -14.3 3.9 11' Eri 21 572 04 38.2 -14.3 3.9 1' Eri 21 572 04 38.2 -14.3 3.9 1' Eri 21 572 04 40.4 -19.7 4.3 4'' Eri 21 54 04 40.5 -88.2 6.7 9'' Eri 3 550 56 04 36.5 56.7 9'' Eri 3 550 56 12'' 9'' Eri 3 2 7 7 9'' 12'' 9'' Eri 3 7 8 04 51.2 -65.6 3.7''	150	<u> 7,559</u>		04 33.5	+18 01	6.9	3"	Tau	03	double star equal magnitude
Aldebaran Alpha 04 35.9 +16.5 0.9 30° Tau 5 Nu 48 04 36.3 -0.3 3.9 11° Eri 21 53 04 36.5 -14.3 3.9 11° Eri 21 53 04 36.5 -14.3 3.9 11° Eri 21 54 04 36.5 -14.3 3.9 1° Eri 21 54 04 36.5 -19.7 7.3 4" Eri 2 55 04 40.5 -08 4.2 -0.5 7.3 4" Eri 2 55 04 40.5 -08 4.2 -0.8 5.7 9" Eri 2 56 04 40.5 -0.84.2 -0.8 6.7 9" Eri 2 51 RV 04 50.9 -0.3.5 5.6 12" Pic 2 61a 3 -0.41.2 +0.6 0.3.7 0.01 21	151	46	ADS 3305	04 33.9	-06.7	5.7	4'	Eri	2	double star
Nu 48 0.436.3 -0.3.4 3.9 11° Eri 21 53 0.438.5 -14.3 3.9 10° Eri 21 572 0.438.5 -14.3 3.9 1 Eri 21 54 0.438.5 -14.3 7.9 4" Eri 21 54 0.440.5 -19.7 4.3 4" Tau 3 54 0.440.5 -98.2 6.7 4.3 " Eri 1 7 0.440.5 58.2 6.7 9" Eri 3 22 7 0.0100.18 0.450.9 -53.5 5.6 12" Pic 2 61 3 0.451.2 +05.6 3.7 01 21 7 9 0.6451.2 +05.6 3.7 01 21	152	Aldebaran	Alpha	04 35.9	+16.5	0.9	30"	Tau	5	colored double star
53 04 38.2 -14.3 3.9 * Erl 21 572 04 38.5 -14.3 3.9 * Erl 21 54 04 38.5 -19.7 4.3 * Erl 3 54 04 40.5 -98.2 6.7 4.3 * Erl 3 55 04 40.5 -08.8 6.7 9'' Erl 3 559 04 40.5 -55.5 5.6 12'' Pic 22 10ta Dunlop 18 04 51.2 +681.0 9.2 Stellar Pic 2 51 Pi4 3 04 51.2 +681.0 3.7 Orl 21	153	NL	48	04 36.3	-03.4	3.9	110	Ēri	21	star
2572 04 38.5 +26 56 7.3 4" Tau 3 54 04 40.4 -19.7 4.3 * Eri 1 7 04 40.4 -19.7 4.3 * Eri 1 7 04 40.4 -19.7 6.7 9." Cae 22 7590 55 04 43.6 -08 4.8 6.7 9" Eri 3 10ra Dunlop 18 04 50.9 -53.5 5.6 12" Pic 2 17 RV 04 51.2 -65.6 3.7 * Ori 2 18 04 51.2 +05.6 3.7 * Ori 2	r154	53	H -	04 38.2	-14.3	3.9	*	Ēri	21	star
54 04 40.4 -19.7 4.3 * Eri 1 R 04 40.5 -38.2 6.7 * Eri 1 S590 55 04 40.5 -38.2 6.7 9' Eri 22 Dia Dunlop 18 04 50.9 -53.5 5.6 12" Pic 2 S1 RV 04 51.2 +65.6 3.7 * Ori 2 Pi4 3 04 51.2 +65.6 3.7 * Ori 2	T155	S572		04 38.5	+2656	7.3	4"	Tau	03	double star equal magnitude
R 04 40.5 -38.2 6.7 * Cae 22 \$590 55 04 43.6 -38.48 6.7 9" Eri 3 10ta Dunlop 18 04 51.2 -56 10 5.5 10 2 5T RV 04 51.2 +68 10 5.5 16 17 2 61 3 04 51.2 +68 10 5.5 16 1 2 7 HV 04 51.2 +05.6 3.7 * 0ri 21	T156	54		04 40.4	-19.7	4.3	*	Eri	-	red variable star
Σ590 55 04 43.6 -08 48 6.7 9" Eri 3 Ota Dunlop 18 04 50.9 -55.5 5.6 12" Pic 2 ST RV 04 51.2 -65.1 5.6 12" Pic 2 FI 3 04 51.2 +65.6 3.7 * Ori 21	T157	æ		04 40.5	-38.2	6.7	*	Cae	22	variable star
Ital Dunlop 18 0.4 50.9 -53.5 5.6 1.2" Pic 2 ST RV 0.4 51.2 +0.611 9.2 Stuliar Cam 1 Pi4 3 0.4 51.2 +0.56 3.7 * 0ri 21	T158	Σ590	55	04 43.6	-08 48	6.7	.6	Eri	e	double star equal magnitude
ST RV 04 51.2 +68 10 9.2 Stellar Cam 1 Pl4 3 04 51.2 +05.6 3.7 * 0ri 21	T159	lota	Dunlop 18	04 50.9	-53.5	5.6	12"	Pic	2	double star
Pi4 3 04.51.2 +05.6 3.7 * Ori 21	r160	ST	RV	04 51.2	+68 10	9.2	Stellar	Cam	-	red variable star
	T161	Pi4	ю	04 51.2	+05.6	3.7	*	Ori	21	star

Name	Uther	КA	Dec	INIAG	Sep	Con	Code	
Pi5	8	04 54.2	+02.4	3.7	*	Ori	21	star
Omicron2	6	04 56.4	+13.5	4.1	*	Ori	21	star
lota		04 57.0	+33.2	2.7	*	Aur	21	star
Pi6	10	04 58.5	+01.7	4.5	*	Ori	21	star
Omega	ADS 3572	04 59.3	+37.9	5	5.4"	Aur	2	double star
nds Crimson Star	ш	04 59.6	-14.8	5.9	*	Lep	22	variable star
27		05 00.6	+03 36	6.6	21"	Ori	з	double star equal magnitude
<u>5</u> 631	ADS 3606	05 00.7	-13.5	7.5	5.5"	Lep	2	double star
30	ADS 3623	05 02.0	+01.6	6.5	15"	Ori	2	double star
Epsilon		05 02.0	+43 49	2.9	Stellar	Aur	22	variable star
Zeta	8	05 02.5	+41.1	3.8	*	Aur	21	star
		05 05.4	+01.2	8.6	*	Ori	22	variable star
silon		05 05.5	-22.4	3.2	*	Lep	21	star
	10	05 06.5	+41.2	3.2	*	Aur	21	star
O∑98	14	05 07.9	+08 29	5.9	0.7"	Ori	4	double star challenge
		05 09.1	+39.0	8.5	*	Aur	22	variable star
		05 09.8	-05.6	σ	*	i. H	22	variable star
344		05 10 4	+37.17	8.8	.6	Aur	4	double star challence
366 366	Inta	05 12 3	-11 9	4.5	1.3"	len l		double star
2000	IULA	00 12:0	11.3	4.0	2	Cap C	u 14	adarad dauble star
0		00 10.0	20 20+	C. 4	0.4"	50	0 0	concrea double star
Riger	Deta Uhi	0.41 00	- 08.2		4.5	ED.	ימ	double star magnitude contrast
53	14	05 15.4	+32.7	5.1		Aur	9	triple star
Capella	Alpha	05 16.7	+46 00	0.1	*	Aur	21	star
476		05 19.3	-18 30	6.2	39"	Lep	e	double star equal magnitude
750		05 20.5	-21 14	4.7	4"	Lep	6	double star magnitude contrast
UV		05 21.8	+32.5	7.4	*	Aur	22	variable star
ADS3954	ADS 3954	05 21.8	-24.8	5.5	3.2"	Lep	2	double star
96	ADS 3962	05 22.8	+03.6	5	32"	Ori	2	double star
S701	ADS 3978	05 23.3	-08.4	9	6"	Ori	2	double star
Eta		05 24.5	-02 24	3.4	1.5"	Ori	4	double star challenge
Sigma	ADS 3984	05 24.7	+37.4	5	9"	Aur	2	double star
neta	Dunlop 20	05 24.8	-52.3	6.8	38"	Pic	2	double star
llatrix	Gamma	05 25.1	+06.3	1.6	*	Ori	21	star
Y698	ADS 4000	05 25.2	+34.9	6.6	31"	Aur	2	double star
16	118	05 29 3	125.09	8 2		Tau		double star
25	31	05 20 7	-01 1	2.0) *	- inc	- 10	etar
		1.02 00 0		t	0			5101 50404/0m
		0.00 00.0	0.71+	0	.01	Dzi		
Deita	AUS 4134	0.25 00	-00.3	7.7	50	5	7	double star
	CE	2.22.00	+18.6	4./	. 5	lau	1.7	star
2/18		05 32.4	+49.24	c./	20 -	AUr O		double star equal magnitude
		2.55 CU	7.70+	α.		5	77	variable star
2747	ADS 4182	05 35.0	-06.0	4.8	36"	- Cui	2	double star
Lamoda		1.05.00	QC 80+	3.4 · ·	4	5	ומ	double star magnitude contrast
Irapezium		05 35.3	-05 23	5.1	13"	Ori	7	quadruple star
2752	lota	05 35.4	-05 55	2.9	11"	Ori	6	double star magnitude contrast
Alnilam	Epsilon	05 36.2	-01.2	1.7	*	Ori	21	star
Phi2		05 36.9	+09.3	4	*	Ori	21	star
Zeta	123	05 37.6	+21.1	e	*	Tau	21	star
Sigma		05 38.7	-02 36	3.7	11"	Ori	7	quadruple star
Phact	Alpha	05 39.6	-34.1	2.6	*	Col	21	star
Alnitak	Zeta	05 40.8	-01.9	2	2.4"	Ori	6	double star magnitude contrast
U2		05 42.2	+62.5	7.7	*	Cam	22	variable star
Gamma	ADS 4334	05 44.5	-22.5	3.7	97"	Lep	2	double star
		05 45.7	+20.7	7.1	*	Tau	22	variable star

Number	Name	OUNEL	ЦЧ	Dec	IMIAY	och		2000	
T218	Sainh	Kanna	05 47.8	2.60-	~	*	Öri	21	star
T010	V70F	50 50	05 48 0	+06.97	1 4	"1 3"	ōċ	7	double star challende
ST220	Eeta	Wazn	05 51.0	-35.8		<u>·</u> *	Col	24	star
T221	Delta		05 51.3	-20.9	3.8	*	Lep	21	star
T222	Nu		05 51.5	+39.1	4	30"	Aur	21	star
T223	<u>5817</u>		05 54.9	+07 02	8.8	19"	Ori	е	double star equal magnitude
T224	Betelaeuse	Alpha	05 55.2	+07 24	0.5	Stellar	Ori	21	star
T225	n		05 55.8	+20.2	5.3	*	Ori	22	variable star
T226	Theta		05 59.7	+37 13	2.6	3.5"	Aur	6	double star magnitude contrast
T227	Pi		05 59.9	+45.9	4.3	•	Aur	-	red variable star
T228	A23		06 04.8	-48 27	2	2.7"	Pup	0	double star equal magnitude
1229	<u>>855</u>		06 09.0	+02 30	. 9	30"	Ori	0	double star
T230	TII		06 10.9	+26.0	7.5	» *	Gem	22	variable star
F23.1	7845	41	06 11 7	+48.42	6.1 6	"K	Aur	10	double star
1939	N N		06.13.4	+47.0	10		Aur	- 66	variahla star
233	Gamma		06 14 9	-06.3	4	8°	Mon	21	star
1034	Propie	Eta	06 14 0	100 E	5 5) *	Gem	5	etar
-035	V870	ADS 4840	06 15 6	126.0	0.0	7 7 7	Aur	- 0	double star
200	7015	0101 000	20100	-06.9	0.0	-*	Mon	300	uoudie atar voriable star
2007	7040	1	1.51 00		0.0	0 10	IN O	77	vallaure stat
102	Leia	LUIUO	20.02 00	- 20	о ч	c.o *	Mon	12	stat voriable ator
000	Mirzom	Doto	1.22 00	10.01	0 0	*	IN O	24	Vallaule Stal
040	MILZAIII	Dela	0.02 20 0	10.0	4	*	Cilla	4	otor
241	MIG		0.02.00	101.26	0.7	"C F	Mon	- 4	otal Antaria dautata atar
010	on on one of	odal A	0.02.00	F0 40	0.4 P	2 *	No.		culored double stat
243	BI	RI	06.25.5	-14.7	8.5.	*	Öri	50	stat variable star
244	ן גר גר	ţ	06.27.8	+20.47	6.6	"22"	Gem	10	double star
245	Beta		06 28.8	-07 02	3.8	,	Mon	1 9	triple star
246	ADS5150		06 31.8	+38.9	11.5	4.5"	Aur	2	double star
247	<u>5</u> 924	20	06 32.3	+17.8	6.3	20"	Gem	5	colored double star
248	ADS5188		06 34.3	+38.1	6.7	43"	Aur	2	double star
249	CR		06 34.4	+16.1	8.5	*	Gem	22	variable star
250	<u> </u> <i>∑</i> 928	ADS 5191	06 34.7	+38.4	7.6	3.5"	Aur	2	double star
251	ADS5201		06 35.1	+37.1	7.4	2.6"	Aur	2	double star
252	<u> </u> <i>∑</i> 929	ADS 5208	06 35.4	+37.7	7.4	6"	Aur	2	double star
253	<u>7</u> 939		06 35.9	+05.3	8.3	30"	Mon	2	double star
254	ADS5221		06 36.2	+38.0	8.5	1.3"	Aur	4	double star challenge
255	Nu1		06 36.4	-18.7	9	17.5"	Cma	5	colored double star
256	nn		06 36.5	+38.5	5.1	*	Aur	22	variable star
257	ADS5240		06 36.9	+38.2	9.7	2.2	Aur	5	double star
258	ADS5245		06 37.3	+38.4	8.8	10"	Aur	2	double star
259	South529		06 37.6	+12.2	7.6	.02	Gem	2	double star
260	Innes5		06 38.0	-61.5	6.4	2.4"	Pic	2	double star
261	ADS5265		06 38.4	+38.8	9.6	4.6"	Aur	5	double star
262	Innes1156	ADS 5311	06 39.1	-29.1	8	0.7"	Cma	4	double star challenge
263	SA0172106		06 39.5	-30.0	7.8	2.5°	Cma		red variable star
r264	<u> 7.953</u>		06 41.2	+08 59	7.1	7"	Mon	5	double star
r265	M/		06 42.2	+31.5	8.7	*	Gem	22	variable star
r266	Sirius	Alpha	06 45.1	-16.7	÷	.6	Cma	6	double star magnitude contrast
T267	<u>5</u> 948	12	06 46.2	+59 27	4.9	°2"	Lvn	80	triple star challenge
T268	<u> </u> 2958		06 48.2	+55 42	5.5	5"	Lyn	е	double star equal magnitude
T269	Kappa	13	06 49.8	-32.5	4	*	Cma	21	star
T270	2963	14	06 53.1	+59.5	5.7	0.4"	Lyn	4	double star challenge
T271	GY		06 53.2	-04.6	9.4	*	Mon	22	startable ator
								1	
ST273 Omicron1 16 ST274 Theta 14 ST275 397 Mu ST277 097 Mu ST278 997 Mu ST279 070 14 ST279 070 21 ST279 070 21 ST279 070 22 ST281 Dilitota 21 ST283 Munlop28 24 ST284 Ma 23 ST284 Ma 23 ST284 Ma 24 ST284 Ma 26 ST284 Ma 26 ST284 Ma 26 ST284 Ta </th <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>									
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Theta 38 5997 5997 5997 5997 5997 5997 68 60 58 60 58 60 58 60 61 71009 63 63 71037 71037 71037 71037 71037 71037 71037 71037 71037 71037 71037 71037 71039 63 71031 71032 71033 7104 7114 7114 7114 7114 7114 7114 7114 7114 7114 7114 714 714	9	06 54.1	-24.2	3.9	*	Cma	21	star	
2987 2987 2987 869 00280 869 00000 2000000	4	06 54.2	-12.0	4.1	*	Cma	21	star	
997 997 997 997 997 997 9080 90 9101 91 9101 91 9101 91 9101 91 91 91		06 54.6	+13 11	4.7	7"	Gem	5	colored double star	
Construction Co	Iu	06 56.1	-14 02	5.3	2.8"	Cma	6	double star magnitude contrast	
O Seo RV Epsilon Signal Metbuda Metbud		06 56.4	+07.1	9.2	*	Mon	22	variable star	
E PSIION E PSIION Sigma Omitoron2 Dumboron2 Sigma Sigma Sigma Sigma Sigma Sigma Sigma Sigma Sigma Sigma Sigma Sigma Sigma Sigma C O Dumbos Sigma Sigma Sigma Sigma Sigma Sigma C O Dumbos Sigma		06 58.1	+14.2	7.3	2'	Gem	0	asterism	
Signal Betalon Comicon 2 Comicon 2 C		06 58.4	+06.2	7	*	Mon	22	variable star	
Controna Signa Markhuda	-	06 58.6	-29.0	1.5	7.5"	Cma	2	double star	
Duningong Duningong Makkuda Nakkuda Makkuda Makkuda Gamma Gamma Sigma Si	2	07 01.7	-27.9	3.5	*	Cma	21	star	
Merkbuda Merkbuda X1009 X1009 X1005 X1005 X1005 X1005 X1005 X1005 X1063 X1063 X1121 X1121 X1121 X1121 X1121 X1123 X1129	4	07 03.0	-23.8	e	*	Cma	21	star	
Mekbuda Nekbuda V H Amma Amma Amma		07 04.0	-43.6	5.6	20.5"	Pup	2	double star	
Σ1009 N W W W W W W W W Signa	eta	07 04.1	+20.6	3.7	*	Gem	22	variable star	
R W Gamma Gamma Gamma 21037 21037 21037 21037 21033 21033 21033 21149 2		07 05.7	+52 45	6.9	4.1"	Lyn	3	double star equal magnitude	
A M A A A A A A A A A A A A A A A A A A		07 07.4	+22.7	9	*	Gem	22	variable star	
Tau Tau Tau Tau 71035 71035 71035 71035 71035 71035 71037 71032 71037 71032 71037 71032 71037 71033 71121 71121 71138 71138 71149 71149 71149	N	07 08.1	-11 55	6.4	Stellar	CMa	٠	red variable star	
Σ1035 Σ1035 Σ1037 Σ1037 Σ1037 Σ1037 Σ1037 Σ1036 Σ10362 Σ1038 Σ1062 Σ1062 Sigma Sigma Sigma Σ1083 Sigma Σ1083 Sigma Σ1083 Sigma Σ1121 V1739 Σ1128 Sigma Σ1143 Sigma Σ1143 Sigma Sigma Sigma<	unlop 42	07 08.8	-70.5	4	13.6"	Vol	2	double star	
Σ1035 Σ1035 Σ1037 Σ1035 Comega 5945 Nag45 Nag45 Nag45 Sama Sama Sama Sama Sama Sama Sama Sama Sama Sastor Sastor	DS 5846	07 11.1	+30.2	4.4	1.9"	Gem	2	double star	
Σ1037 Σ1037 Σ1037 Σ1037 Π1945 1144 114 Σ1062 Sigma Sigma Sigma Sigma Sigma Σ1082 Sigma Σ1082 Sigma Σ1083 Sigma Γ Natos Γ Sigma Σ Sigma Γ Natos Γ Sigma Σ Sigma Σ Sigma Σ S		07 12.0	+22 17	8.2	4"	Gem	e	double star equal magnitude	
Annos Conega 13945 13045 140 1012 1012 1012 1013 1013 1112 11	DS 5871	07 12.8	+27.2	7.2	1.3"	Gem	4	double star challenge	
13945 13u 13u 1062 Sigma Gamma Gamma Sigma	8	07 14.8	-26.8	3.9	*	Cma	21	star	
Delta Delta 21062 Sigmma Sigmma Sigma Castor Casto		07 16.6	-23 19	4.5	27"	CMa	5	colored double star	
Delta Σ10662 Sigma	3948	07 18.7	-24 57	4.4	15"	CMa	9	triple star	
21062 21062 21063 21083 21093 2100 21121 21127 21128 21149 21141149 2111	5	07 20.1	+2159	3.5	6"	Gem	6	double star magnitude contrast	
Gamma Stamma Standa Standa 7 1083 1083 7 1081 Castlor Castlor Castlor V1121 From V121 From V121 From V121 From V123 V1138 V1149 V1149 V100	6	07 22.9	+55 17	5.6	15"	Lyn	9	triple star	
Sigma Σigma Σ1083 1083 Π Upsilor Coston 05112 V1121 1127 N 05119 N 05119 N 05119 N 05119 N 051149 N 01149 N 1147 N 1149 N 0149 N 0146 N 014		07 28.2	+08.9	4.3	*	Cmi	21	star	
21093 21093 Castor Castor 1121 1127 1128 1129 1129 1129 1127 1128 1127 1128		07 29.2	-43.3	3.3	22"	Pup	2	double star	
Castor Castor Upsilon Viri21 K S1127 Contrast S1139 S1	DS 6117	07 30.3	+50.0	8.8	0.8"	Lyn	4	double star challenge	
Castor Castor X 1121 X 1121 X 1121 X 1127 X 1128 X 1128 X 1128 X 1128 X 1128 X 1128 X 1149 X 1149XX	HN19, h269"	07 34.3	-23 28	5.1	10"	Pup	ю	double star equal magnitude	
V Desilon V 1211 Procyon Procyon N 1138 V 1149 V 1149V V 1149V V 1149V V 1149V V 1149V V 1149V V 114	Ipha	07 34.6	+31.9	5	1.8"	Gem	4	double star challenge	
X 1121 X 1221 X 1227 X 11227 X 11277 X 11277 X 112777 X 1127777 X 11277777777777777777777777777777777777	6	07 35.9	+26.9	4.1	2.5°	Gem	-		
Procyon 2179 M K4 71128 2 71128 2 71128 2 71127 K K 71128 2 71127 K K 71128 2 71128 2 71149 2		07 36.6	-14 29	7.9	7"	Pup	0	double star equal magnitude	
Correction All 05/179 KAl 05/179 KAl 05/179 KAl 01/149 KAl 01/149 KAl 01/149 K 01/149 K 01/149 K 01/149 V 01/149 V 01/149 V 01/149 V 01/149 V 01/149 V 01/1669 K 01/17 K 01/17 <td></td> <td>07 38.8</td> <td>-26 48</td> <td>3.8</td> <td>10"</td> <td>Pup</td> <td>e .</td> <td>double star equal magnitude</td>		07 38.8	-26 48	3.8	10"	Pup	e .	double star equal magnitude	
Σ179 Κ Σ1123 Σ Σ1149 ∨ U U Samo Z Ru R Ru R Camma D Zamma D Zamma R R R Samma R Zamma N Zamma N Zama R Samma N	Ipha	07 39.3	+05 14	0.4	Stellar	CMI	21	star	
2,1138 2 2,1149 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	арра	07 44.4	+24 23	3.7	7"	Gem	6	double star magnitude contrast	
2,112/ 2,112/ 0,149 C.D. C.D. D.Unlop59 B.Unlop59 S.NB65 S.NB65 S.NB65 S.S. C.D. R.D. C.D. R.D. C.C. C.C. R.D. C.C. R.D. C.C. R.D. C.C. R.D. C.C. R.D. C.C. C.C		07 45.5	-14 41	6.1	17"	Pup	0	double star equal magnitude	
2,1149 0,0110959 0,0110959 2,486 2,486 2,486 2,486 2,486 2,480 2,480 2,140 2,140 2,140 2,140 2,140 2,140 2,140 2,149 2,1		07 47.0	+64 03		5"	Cam	9	triple star	
Chi Dunlop59 S-h86 S-h86 S-h86 S-h86 S-h86 S-h86 S-h86 R- R R R R R R R R R R R R R R R R R R		07 49.4	+03 13	7.9	22"	Cm	2	double star	
Dunitop59 Dunitop59 S-N66 S-N66 S-N66 S-N66 Nac R1 Camma Du Camma Du Camma Du Camma R1 Camma R1 Camma Campa Campa Campa Campa Campa Camma Campa		0/ 55.1	+22.00	2 12	Stellar	Gem	77	variable star	
S-he6 S-he6 S-he6 S-he6 Naos RT R R Comma Du Camma Du Camma Du Camma Du Camma Du Camma Du Camma Du Camma Du Camma Du Camma Du Camma Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Campa Du Camma Du Campa Du Cu Campa Du Cu Du Cu Campa Du Cu Du Cu Cu Cu Cu Du Cu Cu Du Cu Cu Du Cu Cu Du Cu Cu Cu Cu Cu Du Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu		07 56.8	-53.0	3.5	4°	Car	51	star	
A contect Nators 26 RU RU RU Epsilon Ru Ru Camma 00 Camma 00 Camma 00 Camma 01 Camma 17 A Cappa A Cappa A Cappa A Cappa		01 59.2	0.06-	6.5 6	16"	dnu	N	double star	
A 1 A 1 A 1 A 1 Camma Du Camma Du Camma Du Camma A A 2 A 2 A 2 A 2 A 2 A 2 A 2 A	oto	0.20 00	+00.1	0 0	40	Call	4		
RU E RU Gamma DR Gamma DR Zeta D1 Zeta 11 R Beta 11 AC AC AC AC AC	פומ	08 05 4	-38.8	, a	t *	dnu	12	star variable star	
Epsilon Ru Gamma Du Zeta Du E c Ru B a 17 ACppa AC AC B 31 B 21		08 07.5	6.00-	0.0	*	dn.	22	variable star	
Gamma Di Zeta Di Zeta R, C Beta 117 Koppa AC AC AC B 31 B 31	umker 7	08 07.9	-68.6	4.4	6"	Nol	•	double star	
Zeta c = R Beta 177 R appa AC 21	unlop 65	08 09.5	-47.3	1.9	41"	Vel	0	double star	
6 8 17 8 8 17 8 8 17 8 8 17 8 4 17 8 17 8 17 9 17 9 17 9 17 9 17	-	08 12.2	+17 39	4.7	0.6"	Cnc	8	triple star challenge	
Beta Rappa AC 21	umker 8	08 15.3	-62.9	5.3	4"	Car	2	double star	
	7	08 16.5	+09.2	3.5	*	Cnc	21	star	
		08 16.6	+11.7	6.1	*	Cnc	22	variable star	
		08 19.8	-71.5	5.4	65"	Vol	2	double star	
		08 22.7	-15.9	8.9	*	Pup	22	variable star	
		08 22.8	+43.2	4.3	15°	Lyn	21	star	
		08 25.7	-66.1	3.8	6°	Vol	21	star	
ST327 h4903		08 26.3	-39.1	6.5		Pup	5	double star	

17.05 7.10 <th7.10< th=""> 7.10 7.10 <th< th=""><th>Number</th><th>Name</th><th>Other</th><th>RA</th><th>Dec</th><th>INIag</th><th>Sep</th><th>Con</th><th>000</th><th></th></th<></th7.10<>	Number	Name	Other	RA	Dec	INIag	Sep	Con	000	
M1223 Pin 05/37 26/36 5/3 5/7 Cin 2 M124 M124 0	1328	\$1224	24	08.26.7	+2432	7.1	.9	Chc	0	double star
M(10) Constrained Constrained <thconstrained< th=""> <th< td=""><td>1320</td><td>V1003</td><td>Dhi</td><td>08 26 7</td><td>+24 56</td><td>6.3</td><td>o "c</td><td>200</td><td>4 0</td><td>double star equal magnitude</td></th<></thconstrained<>	1320	V1003	Dhi	08 26 7	+24 56	6.3	o "c	200	4 0	double star equal magnitude
A/00: A/00: <th< td=""><td>T330</td><td>21220 h4104</td><td>-</td><td>08 29 1</td><td>-47.9</td><td>2.5</td><td>.9 E</td><td>Vel</td><td>0</td><td>double star equal magimuse</td></th<>	T330	21220 h4104	-	08 29 1	-47.9	2.5	.9 E	Vel	0	double star equal magimuse
1410; 1410; <th< td=""><td>T331</td><td>A70</td><td></td><td>08 29.5</td><td>-44 44</td><td>2.0</td><td>2.0</td><td>Vel</td><td>10</td><td>double star</td></th<>	T331	A70		08 29.5	-44 44	2.0	2.0	Vel	10	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	T332	h4107		08 31.4	-39 04	6.4	4"	Vel	9	triple star
Sigme 5 Hva 08 38 8 +03.3 4.4 * Hva 21 Sigme 5 Hva 08 38.2 60.3 4.4 * Hva 24 2 Sigme Fine Fine 66 61.3 7.4 0.6 7 </td <td>T333</td> <td>S1245</td> <td></td> <td>08 35.8</td> <td>+06 37</td> <td>9</td> <td>10"</td> <td>Cnc</td> <td>2</td> <td>double star</td>	T333	S1245		08 35.8	+06 37	9	10"	Cnc	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	T334	Sigma		08 38.8	+03.3	4.4	*	Нуа	21	star
Y154 08 436	T335	h4128		08 39.2	-60.3	6.9	1.4"	Car	4	double star challenge
Alpha Image 10 64:45 5:32 2:17 5: P/N 2:1 21270 101a 1005 013 06:455 5:32 2:1 5: P/N 2: 21280 101a 06:453 7:24 2: P/N 2: 21281 101a 06:453 7:32 2: P/N 2: 21281 0105 06:453 7:32 2: P/N 2: 2138 66 09:055 4:32 5: 4:9 7: P/N 2: 21491 Lambda 09:025 4:32 2: 7: P/N 2: 2131 Lambda 09:025 4:32 2: 0: 2: 2131 Dimer 09:025 4:36 2: 0: 0: 2: 2133 Dimer 09:10 4:3 2: 0: 0: 2: 2134 Dimer 09:10 4:3 0: 0:0 <	T336	<u></u> <i>Σ</i> 1254		08 40.4	+19 40	6.4	21"	Cnc	7	quadruple star
Detat Immerio 0.64.7 54.7 2.1 8.6 9.6 6.4 5.4 7.6 Well 2 2.1280 lots 0.657 0.64.7 5.47 2.1 Well 2 2.1280 lots 0.657 0.64.7 5.64 4.7 5.6 4.7 5.6 5.7 5.6 4.7 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.7 5.6 5.7<	T337	Alpha		08 43.6	-33.2	3.7	*	Pyx	21	star
Yes Model M	T338	Delta	Innes 10	08 44.7	-54.7	2.1	2.6"	Vel	2	double star
	T339	Σ1270	ADS 6977	08 45.3	-02.6	6.4	5"	Hya	2	double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	T340	<u></u> <u> </u> <u> </u> 1268	lota	08 46.7	+28 46	4	30"	Cnc	5	colored double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	F341	Epsilon		08 46.8	+06 25	3.4	3"	Hyd	6	double star magnitude contrast
X 0 0 54 +17.2 5.6 · Chc 22 Flo 0	r342	<u> 7</u> 1282		08 50.8	+35 03	7.5	4"	Lvn	e	double star equal magnitude
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	[343	×		08 55.4	+17.2	5.6	*	Cuc	22	variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-344	∑1298	66	09 01.4	+32 15	5.9	5"	Cnc	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	345	Bho		09 02.5	+67.6	4.8	•	Uma	21	star
Summing Lambda 0000 -43.26 2.2 Stellar Vol 21 Sigmatize Lambda 00010 -43.00 3.4 50' Vol 21 Sigmatize 001104 -61.0 -50.0 3.4 50' Vol 21 N1188 001104 -61.0 -50.0 3.4 50' Vol 21 N1188 001104 -61.0 -50.0 3.4 50' Vol 21 N1188 001104 -61.0 -50.0 3.4 50' Vol 21 N118 001104 -61.0 -50.0 3.4 00' 10 - 10 10 - 10 10 - 10 10 - 10 - 10 10 - 10 10 - 10 10 - 10 10 - 10 10 - 10 10 21 10 21 10 21 10	346	V1311		09 07 5	102 50	6 9	. "R	Che	ie	double star equal magnitude
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	347	Subail	lamhda	09.08.0	-43.26	0.0	Stellar	Vel	24	etar
a a	348	Sirma2	Lationa	00 10 4	+67 08	4.8	4"	Ilma	- 0	double star magnitude contrast
M184 0012.5 45.0 6.7 2.7 Vei 2 M181 014.4 -41.13 6.7 2.7 Vei 2 PT 213.2 -43.13 6.7 2.7 Vei 2 RT 0914.4 -45.15 8.1 16" Vei 2 S13.4 38 0916.2 -57.5 8.3 7 Vei 2 Y1334 38 0914.4 +51.5 8.3 3 1.0 1.0 4 Y1334 0 021.0 +38.4 3.1 1.0 1.0 4 X1336 092.1 +34.4 3.1 1.0 1.0 4 Alpha 40 092.1 +34.4 3.1 1.0 4 X1356 092.1 +34.4 3.1 1.0 4 4 X1356 092.2 45.5 2.1 1.0 2 1.0 2 Y1356 0mega 022.5	349			00 11 0	-59.0	3.4	50'	Car	21	etar
M4191 M4191 <th< td=""><td>350</td><td>h4188</td><td></td><td>09 12 5</td><td>-43.6</td><td>6.7</td><td>2.7'</td><td>Vel</td><td>i ~</td><td>double star</td></th<>	350	h4188		09 12 5	-43.6	6.7	2.7'	Vel	i ~	double star
21321 00143 +32.42 8.1 18" Uma 3 7 7 7 8 09162 -57.5 8.1 18" 10" 3 7 7 8 09162 -57.5 8.3 3 7 Uma 2 7 7334 38 09164 -57.5 4.3 5 Car 21 7 7334 38 09211 +34.4 3.1 1 Lyn 4 7 7336 09221 +35.6 0.2 1.4 4 21 7 7356 09221 +35.0 7.2 21* Lyn 21 7 7356 09237 +0612 7.5 21* Lyn 21 7 7356 09235 -0840 23 400 21 21 7 7356 09235 -0840 23 40 21 21 7 7356 09235 -0511 23 14% Leo 4 7 7356 09236 -0511 23 10% 21 7 7356 09236 -45.5 7.3 14% Leo 21 7 <td>351</td> <td>h4191</td> <td></td> <td>09 14.4</td> <td>-43.13</td> <td>5.2</td> <td>, "G</td> <td>Vel</td> <td>σ</td> <td>double star magnitude contrast</td>	351	h4191		09 14.4	-43.13	5.2	, "G	Vel	σ	double star magnitude contrast
gr 0916.2 57.5 4.3 5' Car 21 T 7338 0018.4 +56.4 3.9 5' Uma 22 71338 40 0918.4 +56.4 3.9 7' Uma 22 71338 40 0921.0 +38.11 6.6 1' Uma 22 71347 Alpha 0 0921.1 +34.41 3.1 ' Uma 22 71347 AD 0922.1 +55.0 2.5 2.1* UMa 2 71356 0922.1 +55.0 2.5 2.1* UMa 2 71357 0922.3 +55.0 2.5 2.1* UMa 2 71356 0mega 0927.3 +0614 7.5 2.3* Uma 2 71356 0mega 0927.5 5.6 5.9 0.7 2 2 71366 0mega 0921.2 7.5 2.1* Uma 2	352	<u>5</u> 1321		09 14.9	+52 42	8.1	18"	Uma	e	double star equal magnitude
RT 09184 +514 86 * Uma 22 1334 38 09210 +3811 66 1 Uma 22 7134 38 09210 +3811 66 1 Uma 21 Xappa 40 09211 +3814 3.1 * Uma 21 Xappa ADS 7351 09217 +3844 3.1 * Uma 21 Xappa ADS 7351 09247 +56.2 2.1* Leo 6 Y1357 OB247 +56.2 2.5 2.1* Leo 6 Y1360 Alpha 09276 -0840 21 21* 14* Leo 21 Y1360 Alpha 09206 -45.5 7.8 6.5* 14* Leo 21 Y1360 Omega 09306 -16.3 5.8 8* Ant 21 Y1361 Lambda 09306 -16.3 -21* 14*	353	10		09 16.2	-57.5	4.3	5'	Car	21	star
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	354	RT		09 18.4	+51.4	8.6	*	Uma	22	variable star
N1338 09 210 +38 11 6.6 1* Lyn 4 Kappa 40 09 21 -5.6 2.5 2 1 1 1 2 Kappa ADS 7351 09 23.3 -6.5 2.5 2 1 1 2 Kappa ADS 7351 09 23.3 -6.5 7.2 2.1* Lyn 2 Kappa ADS 7351 09 27.3 -60 14 7.5 2.3* Hya 2 Y1355 ADRad 09 27.6 09 27.6 5.9 0.5* Hya 2 Y1355 ADRad 09 28.6 -40.5 7.8 0.4* 2 2 Y1360 Omega 09 28.6 -45.5 7.8 0.4* 2 2 Y1360 Omega 09 21.7 -23.0 3.8 2* Um 2 Y1360 Omega 09 31.7 -23.0 3.8 2* Um 2 Y1361 Lambda	355	<u></u> <i>Σ</i> 1334	38	09 18.8	+36 48	3.9	3"	Lyn	4	double star challenge
Alpha 40 09211 +344 31 * Um 21 Xapra 09233 +603 7.2 * Vel 21 Y1347 ADS 7351 09247 +56.2 4.5 21* Hya 21 Y1347 ADS 7351 09247 +66.4 7.5 21* Hya 21 Y1356 Alphaid 0927.6 -094.0 2 S1 Hya 21 Y1356 Omega 0927.6 -094.0 2 S1 Hya 21 Y1356 Omega 0927.6 -094.0 21 Vel 21 Y1356 Omega 0930.6 -1035 5.8 H Vel 21 Y1351 Za 0931.7 +23.0 3.1 Vel 21 21 Y1361 Altert Lambda 0931.7 +23.0 3.1 Vel 21 Y1361 Za 23 Ya Leto 21 Ya <td>356</td> <td>Σ1338</td> <td></td> <td>09 21.0</td> <td>+38 11</td> <td>6.6</td> <td></td> <td>Lyn</td> <td>4</td> <td>double star challenge</td>	356	Σ1338		09 21.0	+38 11	6.6		Lyn	4	double star challenge
Xi Appa Zi Appa Xi Appa Zi Appa <t< td=""><td>357</td><td>Alpha</td><td>40</td><td>09 21.1</td><td>+34.4</td><td>3.1</td><td>*</td><td>Lyn</td><td>21</td><td>star</td></t<>	357	Alpha	40	09 21.1	+34.4	3.1	*	Lyn	21	star
Xapa Kapa Xapa Xapa <th< td=""><td>358</td><td>Kappa</td><td></td><td>09 22.1</td><td>-55.0</td><td>2.5</td><td>*</td><td>Vel</td><td>21</td><td>star</td></th<>	358	Kappa		09 22.1	-55.0	2.5	*	Vel	21	star
Xiappa ADS 7351 09 247 +26.6.2 4.5 2.1* Leo 6 Y1355 Alphard 09 27.6 09 24.7 +0.6.1.2 7.5 2.3* Hya 3 Y1355 Alphard 09 27.6 -08 40 2.5 Stellar Hya 21 Y1356 Alphard 09 28.6 -45.5 7.8 Stellar Hya 21 Y1356 Alphar 09 28.6 -45.5 7.8 61* Velo 21 Y1351 Dunlop76 09 30.6 -110 35 5.3 14* Leo 4 Y1351 23 09 31.5 -57.0 3.1 * Velo 21 Y1351 23 09 31.5 -53.03 3.8 2.7 Velo 21 Y1351 23 09 32.2 -57.0 3.8 2.7 Velo 21 Y1351 23 38 2.7 Yer Velo 22 21 Y1361 Alb	359	S1347		09 23.3	+03 30	7.2	21"	Hya	2	double star
Xi Station Application Operation 0.927.3 +0.614 7.5 2.3" +1yra 3 Application Alpha 0.927.5 +0.614 7.5 2.3" +1yra 3 21366 Omega 0.928.5 +0.91 5.9 0.5" Leo 2 21366 Omega 0928.6 -45.5 7.8 0.1" Vel 2 21360 0.930.6 +0.53 5.8 1.4" Vel 2 21361 0.931.2 -2.15.3 5.8 8" Ant 2 21361 23 0.931.2 -2.23.0 3.8 -3 4" 1.4" 2 21361 23 0.931.2 -2.23.0 3.8 -3 1.4" 2 2 21369 ADS 7438 0.931.7 -6.1.1 3.9 -7 0.9" 2 2 10 ADS 7438 0.931.7 -1.2.3 0.9" 2 2 2 2	360	Kappa	ADS 7351	09 24.7	+26.2	4.5	2.1"	Leo	9	triple star
Alphard Alpha 09.27.6 -08.40 2 Stellar Hya 21 Y1356 Omega 09.27.6 -08.40 2 Stellar Hya 21 Dunlop76 Omega 09.28.6 -45.5 7.8 61" Uen 4 V1356 Omega 09.30.6 -41.03 5.8 8" Alt Leo 3 Y1351 23 09.31.2 -57.00 3.1 * Vel 21 Y1351 23 09.31.7 +23.00 3.1 * Vel 21 Y1361 Lambda 09.31.7 +23.00 3.1 * Vel 21 Y1361 Lambda 09.31.7 +23.00 3.8 2.7 Uma 21 Y1361 Lambda 09.32.2 -67.0 5.8 Vel 21 Y1361 Lambda 09.32.4 +40.0 6.5 Yer Vel 21 Y1366 ADS 7438 09.35.4 </td <td>361</td> <td>Σ1355</td> <td></td> <td>09 27.3</td> <td>+06 14</td> <td>7.5</td> <td>2.3"</td> <td>Hya</td> <td>3</td> <td>double star equal magnitude</td>	361	Σ1355		09 27.3	+06 14	7.5	2.3"	Hya	3	double star equal magnitude
Durlop76 Omega 09.28.6 -45.5 5.9 0.5° Leo 4 Durlop76 Comega 09.28.6 -45.5 5.9 0.5° Leo 4 Vision Comega 09.28.6 -45.5 5.9 0.5° Leo 4 X1300 Comega 09.30.8 +10.35 8.3 14° Vel 2 X1300 0.31.2 -57.0 3.1 8 ° Vel 2 X1310 0.31.5 -53.03 3.8 23° Uma 9 Alterf Lambda 09.31.7 +23.03 3.8 23° Uma 2 X1310 09.32.2 -62.0 5.8 2° Uma 2 X1310 D14.6 11.1 3.9 2° Uma 2 Vert N Vert 11.5 4.4 Stellar 2 2 Vert N Vert 2 2 2 2 2 <td>362</td> <td>Alphard</td> <td>Alpha</td> <td>09 27.6</td> <td>-08 40</td> <td>2</td> <td>Stellar</td> <td>Hya</td> <td>21</td> <td>star</td>	362	Alphard	Alpha	09 27.6	-08 40	2	Stellar	Hya	21	star
Dillop76 0928.6 -45.5 7.8 61" Vel 2 Y1360 0928.6 -45.5 7.8 61" Vel 2 Y1360 0930.8 -1153 5.8 7.8 61" Vel 2 Zeta 0931.2 -57.0 3.1 * Vel 2 X1351 23 0931.7 -53.0 3.1 * Vel 2 X1351 23 0931.7 -53.0 3.1 * Vel 2 X1369 ADS 7438 0931.7 -23.0 3.3 * Vel 2 X104 Ru 0931.7 -23.0 3.3 * Vel 2 Y ADS 7438 0935.4 -40.0 6.5 2 Yer 2 2 Y ADS 741 0937.9 -61.1 3.3 5 Yer 2 2 V N N N N 2 2 2 <td>363</td> <td>Σ1356</td> <td>Omega</td> <td>09 28.5</td> <td>+09.1</td> <td>5.9</td> <td>0.5"</td> <td>Leo</td> <td>4</td> <td>double star challenge</td>	363	Σ1356	Omega	09 28.5	+09.1	5.9	0.5"	Leo	4	double star challenge
Tister District Constraint State	364	Dunlop76		09 28.6	-45.5	7.8	61"	Vel	2	double star
Cata 09 30.8 -31 53 5.8 8" Ant 2 N N 09 31.5 -51 53 5.8 8" Ant 2 N 21351 23 09 31.5 -53 03 3.8 No Vel 21 No 09 31.5 -63 03 3.8 -8.3 No Vel 21 No 09 31.7 -63 03 3.8 -8.3 Vel Vel 21 No 09 31.7 -63 03 3.8 -8.3 Vel 21 21 No 09 31.7 -63 03 3.8 -7.3 Vel 21 21 Upsin Numker 11 09 37.4 -0.1.1 3.9 V N 21 Upsin Ruw 09 47.6 -11 26 4.4 Stellar 26 27 V N 09 47.6 -11 28 9.8 7 Hya 22 V N 09 5.8 -2.30 8.7	365	Σ1360		09 30.6	+10 35	8.3	14"	Leo	3	double star equal magnitude
N 09312 57.0 3.1 * Vel 21 7131 23 09312 -57.0 3.1 * Vel 21 7131 23 09312 -57.0 3.1 * Vel 21 Alterf Lambda 09317 +23.0 3.8 * Vel 21 Alterf Lambda 09317 +23.0 3.8 * Leo 21 Pallor Muker 11 09322 -60.1 3.1 5" Leo 21 Upsilon Ruwer 11 0937.1 -61.1 3.1 5" Car 22 Upsilon Ru 0935.1 -61.1 2.6 9.7 Hya 21 W 0951.0 -2.0 8.3 * Hya 22 W 0951.1 -2.6 8.3 * Hya 22 W 0952.8 12.9 8.7 Hya 22 Hasalas Mu </td <td>-366</td> <td>Zeta</td> <td></td> <td>09 30.8</td> <td>-31 53</td> <td>5.8</td> <td>8"</td> <td>Ant</td> <td>2</td> <td>double star</td>	-366	Zeta		09 30.8	-31 53	5.8	8"	Ant	2	double star
X1351 23 09315 +6303 38 23" Uma 9 Alterf Lambda 09317 +530 3.8 2.3" Uma 9 Alterf Lambda 09317 +5.30 3.8 2.5" Uma 9 P Alterf Lambda 09327 +5.30 3.9 * Leo 21 Dision Abs 7438 09354 -61.1 3.1 5" Lyn 2 Dision Rumker 11 0947.1 -65.1 3.1 5" Hyn 2 V R 0947.6 -11.26 4.4 Stellar Leo 2 W 0947.1 -23.0 8.3 * Hya 2 W 0951.1 -23.0 8.3 * Leo 2 W 0951.1 -23.0 8.7 8.7 1 2 W 0954.5 -12.9 8.7 1 2 2	-367	z		09 31.2	-57.0	3.1	*	Vel	21	star
Allerf Lambda 09.317 +23.0 4.3 * Leo 21 R Allerf Lambda 09.317 +23.0 4.3 * Leo 21 N ADS 7436 09.35.4 +40.0 6.5 25* Lyn 22 Vision ADS 7436 09.35.4 +40.0 6.5 25* Lyn 2 Upsion Runker 11 09.37.9 -61.1 3.1 5* Car 22 Upsion Runker 11 09.47.6 +11.26 4.4 Stellar 2 2 V N 0.95.1 -23.0 8.3 * Hya 22 V N 0.95.2 -12.6.0 8.3 * Hya 22 V N 0.95.2 8.37 8.3 * Hya 22 V N 0.95.2 8.37 8.3 * Hya 22 V N 0.95.2 8.3	-368	Σ1351	23	09 31.5	+63 03	3.8	23"	Uma	6	double star magnitude contrast
X X	-369	Alterf	Lambda	09 31.7	+23.0	4.3	*	Leo	21	star
Y1369 ADS 7438 09 35.4 +40.0 6.5 25" Lyn 2 lota Rumker 11 09 47.1 -65.1 3.1 5" Lyn 21 Upsin Rumker 11 09 47.1 -65.1 3.1 5" Lyn 21 Upsin Rumker 11 09 47.1 -65.1 3.1 5" Car 2 V Nu PV 09 47.6 -11.26 4.4 Stellar Leo 1 V 09 51.1 -23.0 8.3 * Hya 22 V 09 51.1 -23.0 8.3 * Hya 22 Regulus Mu 09 52.6 -26.6 3.7 9.7 21 22 Hage2 ADS 757 09 54.6 -11.66 1.4 8" Hya 22 Regulus ADS 77.04 10.06.4 +11.56 1.4 5" 1.4" 24 27 Stout 10.06.3 +17.7 <	370	œ		09 32.2	-62.8	3.8	*	Car	22	variable star
Iota Dota Deta Deta Deta Plya 21 Upsilon Rumker 11 09.39.9 -01.1 3.9 * Hya 21 Upsilon Rumker 11 09.47.6 -11.26 4.4 Stellar 2e 2 W 09.51.0 -22.0 9 * Hya 22 W 09.51.1 -23.0 8.3 * Hya 22 W 09.51.1 -23.0 8.3 * Hya 22 Masias Nu 09.52.8 +22.6 8.7 8 Hya 22 H4262 ADS 7071 09.52.8 +12.6 8.7 8 Hya 22 Regulus Alpha 10.08.4 +11.58 1.4 Stellar Leo 21 Saturd 10.08.4 +11.6 4.5 5 22 23 Alpha 10.08.4 +11.6 1.4 5 21 21 Alex	-371	Σ1369	ADS 7438	09 35.4	+40.0	6.5	25"	Lyn	2	double star
Upsilon Runker 11 09 47.1 -65.1 3.1 5" Car 2 R RV 09 51.6 -11.26 4.4 Stellar Leo 1 W 09 51.6 -22.0 9.3 * Hya 22 Y W 09 51.6 -22.0 9.3 * Hya 22 Rasalas Mu 09 51.6 -23.0 8.3 * Hya 22 H4262 ADS 7571 09 54.5 -12.9 8.7 8" Hya 21 Feature ADS 7571 09 54.5 -12.9 8.7 8" Hya 23 Regulus Alpha 10.08.4 +11.86 1.4 Stellar Leo 21 Se 1008.4 +11.86 1.4 Stellar Leo 21 ADS7704 10.16.3 +17.7 7.2 1.4" Leo 21	372	lota		09 39.9	-01.1	3.9	*	Hya	21	star
R RV 0947.6 +1126 4.4 Stellar Leo 1 V 0951.1 -23.0 9 * Sex 22 V 051.1 -23.0 8.3 * Hya 22 V 051.1 -23.0 8.3 * Hya 22 Na 095.8 12.60 8.7 * Hya 22 H262 ADS 7571 095.26 +12.6 8.7 * Hya 22 Regulus Alpha 10.08.4 +11.56 1.4 Stellar Leo 21 Sature 10.08.4 +11.56 1.4 Stellar Leo 21 Sature 10.08.4 +11.6 4.5 1.4 Stellar Leo 22 ADS7704 10.16.3 +17.7 7.2 1.4 Leo 4	F373	Upsilon	Rumker 11	09 47.1	-65.1	3.1	5"	Car	2	double star
W 051.0 -02.0 9 * Sex 22 Y 7 0951.1 -23.0 8.3 * Hya 22 Hasalas Mu 0951.1 -23.0 8.3 * Hya 22 h4262 ADS 7571 0954.5 -12.9 8.7 8" Hya 2 Fegulus Alpha 10.08.4 +11.58 1.4 Stellar Leo 21 Fegulus 10.08.4 +11.58 1.4 Stellar Leo 21 ADS7704 10.16.3 +17.7 7.2 1.4" Leo 4	F374	В	RV	09 47.6	+11 26	4.4	Stellar	Leo	-	red variable star
Y Z Z Y Y Leo Z1 Y Y Y Y Y Y Y Z Z Z Z1 Y Z1 Z2 Z1 Z2 Z2 Z2 Z3 Z2 Z3 Z2 Z3 Z3 Z3 Z4 Z4 <thz4< th=""> <thz4< th=""> <thz4< th=""> <t< td=""><td>T375</td><td>N</td><td></td><td>09 51.0</td><td>-02.0</td><td>6</td><td>*</td><td>Sex</td><td>22</td><td>variable star</td></t<></thz4<></thz4<></thz4<>	T375	N		09 51.0	-02.0	6	*	Sex	22	variable star
Masalas Mu Mu <t< td=""><td>T376</td><td>></td><td></td><td>09 51.1</td><td>-23.0</td><td>8.3</td><td>*</td><td>Hya</td><td>22</td><td>variable star</td></t<>	T376	>		09 51.1	-23.0	8.3	*	Hya	22	variable star
h4262 ADS 7571 09 54.5 -12.9 8.7 8" Hya 2 Regulus Alpha 10 084 +11.58 1.4 Stellar Leo 21 S 10 084 -61.6 4.5 - Car 22 ADS7704 10 16.3 +17.7 7.2 1.4" Leo 24	T377	Rasalas	Mu	09 52.8	+26.0	3.9	*	Leo	21	star
Regulus Alpha 10.08.4 +1158 1.4 Stellar Leo 21 S 10.08.4 +11.6 4.5 * Car 22 ADS7704 10.16.3 +17.7 7.2 1.4" Leo 4	T378	h4262	ADS 7571	09 54.5	-12.9	8.7	8"	Hya	2	double star
S 10 09:4 -61.6 4.5 * Car 22 ADS7704 10 16:3 +17.7 7.2 1.4" Leo 4 ADS7704	T379	Regulus	Alpha	10 08.4	+1158	1.4	Stellar	Leo	21	star
ADS/704 10 16:3 +17.7 7.2 114" Leo 4	T380	S		10 09.4	-61.6	4.5	*	Car	22	variable star
	T381	ADS7704		10 16.3	+17.7	7.2	1.4 "	Leo	4	double star challenge

Number	Name	Other	RA	Dec	Mag	Sep	Con	Code	
ST383	D		10 17.1	-61.3	3.4	*	Car	21	star
ST384	h4306		10 19.1	-64.7	5.6	2.1"	Car	2	double star
ST385	Aldieba	Gamma	10 20.0	+19.8	2.5	4.4"	Leo	2	double star
ST386	Tania Australis	Mu	10 22.3	+41.5	e	*	Uma	21	star
ST387	Mu	42	10 26.1	-16.8	3.8	*	Hya	21	star
ST388	Alpha		10 27.2	-31.1	4.3	*	Ant	21	star
ST389	45		10 27.6	+09.8	9	3.8"	Leo	2	double star
ST390	Delta	HN 50	10 29.6	-30 36	5.7	11"	Ant	6	double star magnitude contrast
ST391	d		10 32.0	-61.7	3.3	*	Car	21	star
ST392	Rho	47	10 32.8	+09.3	3.9	*	Leo	21	star
ST393	49		10 35.0	+08 39	5.7	2"	Leo	4	double star challenge
ST394	U		10 35.2	-39.6	8.1	*	Ant	22	variable star
ST395	Gamma		10 35.5	-78.6	4.1	*	Cha	21	star
ST396	U		10 37.6	-13.4	7	*	Hya	22	variable star
ST397	Dunlop95	×	10 39.3	-55.6	4.3	52"	Vel	2	double star
ST398	∑1466	35	10 43.4	+04 44	6.3	7"	Sex	2	double star
ST399	н		10 44.6	+68.8	7.5	*	Uma	22	variable star
ST400	٧Y		10 45.1	+67.4	5.9	*	Uma	22	variable star
ST401	Delta		10 45.8	-80.5	4.5	4.5'	Cha	2	double star
ST402	S1476	40	10 49.3	-04 01	6.9	2.5"	Sex	2	double star
ST403	Nu		10 49.6	-16.2	3.1	*	Hya	21	star
ST404	54	ADS 7979	10 55.6	+24.8	4.5	6.8"	Leo	2	double star
ST405	SA0251342		11 17.5	-63.5	7	7"	Car	6	double star magnitude contrast
ST406	xi	ADS 8119	11 18.2	+31.5	4.5	1.3"	Uma	4	double star challenge
ST407	Alula Borealis	Nu	11 18.5	+33.1	3.5	7"	Uma	2	double star
ST408	Σ1529		11 19.4	-01 38	7	10"	Leo	2	double star
ST409	h4432		11 23.4	-65.0	5.1	2.3"	Mus	2	double star
ST410	lota	ADS 8148	11 23.9	+10.5	4	1.3"	Leo	4	double star challenge
ST411	Σ1540	83	11 26.8	+03 00	6.2	29"	Leo	9	triple star
ST412	Tau	84	11 27.9	+02.9	5.5	1.5'	Leo	2	double star
ST413	Giausar	Lambda	11 31.4	+69.3	3.8	20'	Dra	-	red variable star
ST414	88	×	11 31.8	+1421	6.4	16"	Leo	2	double star
ST415	z		11 32.3	-29 16	5.8	9"	Hyd	з	double star equal magnitude
ST416	Innes78		11 33.6	-40.6	9		Cen	4	double star challenge
ST417	Σ1552		11 34.7	+16 48	9	3"	Leo	9	triple star
ST418	Nu		11 45.9	+06.5	4	*	. Vir	21	star
ST419	Denebola	Beta	11 49.1	+14 34	2.1	Stellar	Leo	21	star
ST420	Beta		11 52.9	-33.9	4.7	0.9"	Hya	5	colored double star
ST421	02112	:	11 54.6	+19.4	8.4	73"	Leo	21	double star
S1422	×1579	65	11 55.1	+46 29	6.7	4"	Uma	2	double star
S 1423	Epsilon	n4486	11 59.6	- /8.2	5.4	.0.	Cha	۰ ۵	colored double star
S1424	21593 7ato	c	12 03.5	-02 20	8./		<pre></pre>	4 c	double star challenge
01400	Dolto	2	10.40	C 121	9	0.0	100	4 C	
01420	Della N1601		10 00 1	1.00-	0.4	0.1	100	4 9	tutude star
0142/ CT400	21004 Encilon		10101	9 00	0.0	0.*	200	0 50	
01420 CT400	Epsiloli Dumbort 4		10 17 10	46.7	0 4	"O C	200		otal doublo otor
ST430	Delta		12 15 1	-58.7	0.0	D-J *	- Ger	24	ctar star
ST421	5 C	ADS 8480	10 16 1	100	2 i u	11 5"	5.0		colored double star
ST432	Encilon	0000	10 17 6	-68.0	- F F	<u>·</u> *	Mile	, -	concreation action and the start
ST433	\$1627		12 18.1	-03.56	6.6	20"	Vir	- 0.	double star equal magnitude
ST434	E C		12 19.6	-19.3	6.7	*	Crv	22	variable star
ST435	<u>∑</u> 1633		12 20.6	+27 03	6.3	9"	Com	0	double star equal magnitude
ST436	Epsilon		12 21.4	-60.4	3.6	*	Cru	21	star
ST437	M40	Winnecke 4	12 22.4	+58 05	6	50"	UMa	2	double star

Number	Name	Other	КA	Dec	INIAU	oeb	2011	COUE	
ST438	17	ADS 8531	12 22.5	+05.3	6.5	21"	Vir	5	double star
ST439	∑1639	ADS 8539	12 24.4	+25,6	6,8	1.6"	Com	4	double star challenge
440	s		12 24.6	-49.4	9.2	*	Cen	22	variable star
ST441	SS	RV	12 25.3	+00 48	9	Stellar	Vir	-	red variable star
ST442	Acrux	Alpha	12 26.6	-63.1	۲	4.4"	Cru	2	double star
443	3C273		12 29.1	+02.0	12.8	*	Vir	0	asterism
444	Algorab	Delta	12 29.9	-16.5	з	24"	Crv	2	double star
ST445	Gacrux	Gamma	12 31.2	-57.1	1.6	10"	Cru	2	double star
446	Σ1649	ADS 8585	12 31.6	-11.1	8	15"	Vir	2	double star
447	24		12 35.1	+18 23	5	20"	CVn	5	colored double star
448	Alpha		12 37.2	-69.1	2.7	*	Mus	21	star
ST449	ADS8612		12 37.7	-27.1	5.5	1.3"	Нуа	4	double star challenge
450	Σ1669		12 41.3	-13 01	5.3	5"	Crv	с	double star equal magnitude
451	Gamma	h4539	12 41.5	-49.0	2.2	1"	Cen	4	double star challenge
452	Porrima	Gamma	12 41.7	-01.4	3.5	3"	Vir	2	double star
453	~	RV	12 45.1	+45 26	7.4	Stellar	CVn	-	red variable star
454	lota	h4547	12 45.6	-61.0	4.7	27	Cru	2	double star
ST455	Beta		12 46.3	-68.1	3.7	1.4	Mus	4	double star challenge
456	Mimosa	Beta	12 47.7	-59.7	1.3	*	Cru	21	star
ST457	∑1694	32	12 49.2	+83 25	5.3	22"	Cam	ę	double star equal magnitude
458	<u><u>5</u>1687</u>	35	12 53.3	+2114	5.1	29"	Com	6	double star magnitude contrast
ST459	Mu	Dunlop 126	12 54.6	-57.2	4.3	35"	Cru	0	double star
460	Delta	-	12 55.6	+03.4	3.4	*	Vir	-	red variable star
161	Cor Caroli	Alpha	12 56.0	+38.3	в	19"	Cvn	2	double star
162	RΥ		12 56.4	+66.0	6.8	*	Dra	22	variable star
163	Σ1699		12 58.7	+27 28	8.8	1.5"	Com	4	double star challenge
64	Delta		13 02.3	-71.5	3.6	8'	Mus	21	star
165	Theta	Rumker 16	13 08.1	-65.3	5.7	5.3"	Mus	2	double star
466	21724	"51, Theta"	13 09.9	-05 32	4.4	7"	۹r	80 ·	triple star challenge
191	Alpha		13 10.0	+17 32	5	0.5"	Com	4 0	double star challenge
00+		6	10 10.4	00 01-	0.0	0	=>	v	
S1469 51470	, crite	7.100 133	13 22.6	-61.0	4./		Cen		double star double star
174	NIL281 Saioo	2 PIG	10 20.9	00 +0+	C.7	* -*	VIIA	v 5	
	opica	Alplia	7.02 01	211-	- 1	.00	= 2	- I J	Sidi
2/	U22123	N	13 27.1	+64 43	4.7	Ctollor	Ura Ura	2 2	colored double star
10	1766		1.02.01	1 0 0 0 0 -	1 4	oleliar 4 4"	nku	77 0	
75	51/33	AUO 0334	0 00 01	+30.0	- 3	+.+	Vir	2 00	uoupre star voriablo ator
0/1	0	A D C 8074	10 00.0	2.10-	0 4	* O *	-	77 0	variaure star derukte eter merenitude sentrest
27	53	ADC 9974	3 2 0 01	0.001	0 1	0'- C	Vir	D C	double star may mude contrast
78	Eneilon	2160 0014	13 30 0	-01.3	6.1	o. *	- P	24	uouvie stat etar
179	V1779	-	13 40 7	+19.57	5.7	5"	Boo	- 0	double star magnitude contrast
80	Dunlon141		13 41.7	-54.6	5.3	5.3"	Cen	0	double star
181			13 41.8	-33.6	5,5		Cen	22	variable star
82	Alkaid	Eta	13 47.5	+49.3	1.9	*	Uma	21	star
183	S1785	ADS 9031	13 49.1	+27.0	7.6	3.4"	Boo	0	double star
ST484	10		13 49.4	-34.5	4.2	*	Cen	21	star
185	Upsilon		13 49.5	+15.8	4.1	*	Boo	21	star
486	e	×	13 51.8	-33.0	4.5	.8	Cen	2	double star
ST487	Zeta		13 55.5	-47.3	2.6	5°	Cen	21	star
ST488	Hadar	Beta	14 03.8	-60.4	0.6	*	Cen	21	star
489	Pi		14 06.4	-26.7	3.3	*	Нуа	21	star
ST490	Карра		14 12.9	-10.3	4.2	*	Vir	21	star
ST491	Карра		14 13.5	+5147	4.4	13"	Boo	5	colored double star
			0 1 7 7	0000					

a Appla 11 0 Seller 0 2 clans 10 2 clans 11 2 clans	Number N	Name	Other	RA	Dec	Mag	Sep	Con	Code	
(a) A059196 1162 513 51 5 60 2 00016 star 71834 A05 8229 1422 51 5 9 50 2 00016 star 71834 A05 8229 1422 51 7 6 7<		rcturus	Alpha	14 15.7	+19 11	0	Stellar	Boo	21	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		ta	ADS 9198	14 16.2	+51.4	4.9	39"	Boo		double star
Y183 ADS 9229 14 20 0 (143) 74 (14) (143) ADS 9229 14 20 0 (14 20 0) 74 (15) (14 20 0) <			0	14 16.6	-59.9	5.3	*	Cen	22	variable star
Nissi Nissi <th< td=""><td></td><td>1834</td><td>ADS 9229</td><td>14 20.3</td><td>+48.5</td><td>8.1</td><td>1.3"</td><td>Boo</td><td>4</td><td>double star challenge</td></th<>		1834	ADS 9229	14 20.3	+48.5	8.1	1.3"	Boo	4	double star challenge
Dimonologie Dimonologie Com C Com C Comol State SHU159 14256 14256 155 155 15 16 2 colone state SHU159 14256 14256 155 157 16 2 colone state SHU159 ASS 14256 157 167 167 2 colone state SHU150 ASS 1430 1430 1432 6 2 colone state 2 colone state SHA N Adva 5 1 1 1 1 1 2 colone state 2 colone state SHA N Adva Adva 1 1 1 1 2 colone state Adva Adva Adva 1 1 1 1 2 colone state Adva Adva 1 1 1 1 1 2 colone state colone state Adv		1833		14 22.6	-07 46	7.6	.9	Vir		double star equal magnitude
(1935) (1233) (1234)		unlop159		14 22.6	-58.5	5	.6	Cen	2	colored double star
SHU179 Fill <		1835		14 23.4	+08 26	5.1	6"	Boo	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		HJ 179		14 25.5	-19 58	6.4	35"	Lib	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				14 27.5	+75.7	4.3	*	Umi	21	star
		roxima		14 29.9	-62.7	10.7	*	Cen	22	variable star
Heigen Heigen 14373 4616 5 197 100 200 <th< td=""><td></td><td>ho</td><td>ADS 9296</td><td>14 31.8</td><td>+30.4</td><td>3.6</td><td>*</td><td>Boo</td><td>21</td><td></td></th<>		ho	ADS 9296	14 31.8	+30.4	3.6	*	Boo	21	
Pill feature April House April House April Condition Condicion Condition Condition		4690		14 37.3	-46 08	5.4	19"	Lup	6	double star magnitude contrast
Pi Pi<		igil Kentaurus	ŝ	14 39.6	-60 50	0	20"	Cen	2	double star
2164 pl 14407 +16.25 +16.26 -16.26			S	14 40.7	+16.4	5	5.6"	Boo	2	double star
Zeta 14.11 +13.4 3.8 1* Bio 4 4 Outbo star challe Apha Dunlop 166 14.42.0 -77.8 3.8 1* Lip Cen 21 star Apha Dunlop 166 14.42.0 -73.6 3.8 17 Cen 21 star Apha Dunlop 166 14.42.0 -73.6 5.4 17 Cen 21 star Apha Dunlop 166 14.42.0 -73.6 6.2 66° Cin 2 doulds star Xin Dunlop 166 14.45.2 -65.6 6.2 67 7 Cen 21 star Xin Dunlop 166 14.45.2 -75.0 3.8 0.7 Vin 7 21 star Xin Soludi star -14.41.9 -14.50 -75.9 -75.9 00016 star colos star </td <td></td> <td>1864</td> <td>pi</td> <td>14 40.7</td> <td>+16 25</td> <td>4.9</td> <td>6"</td> <td>Boo</td> <td>2</td> <td>double star</td>		1864	pi	14 40.7	+16 25	4.9	6"	Boo	2	double star
Apha Dunlop 166 14.419 -7.47 2.3 * Lup 2.1 star Apha Dunlop 166 14.425 -55.0 3.2 16° Cir 2 0.0016 star Ci Dunlop 166 14.425 -55.0 3.2 16° Cir 2 0.0016 star Ci Dunlop 166 14.450 -75.0 4.2 3° Dunlop 166 14.450 -75.0 4.2 3° Dunlop 166 14.450 -75.0 0.016 star Dunlop 166 14.450 -52.6 5.2 8° Dunlop 166 14.450 -75.0 14.45 -75.0 14.45 -75.0 14.45 -75.0 14.45 -75.0 14.45 -75.0 14.45 -75.0 14.45 -75.0 14.45 -75.0 14.45 -75.0 14.45 -75.0 14.45 -75.0 14.75 14.75 14.75 14.75 14.75 14.75 14.75 14.75 14.75 14.75 14.75 14.75		eta		14 41.1	+13 44	3.8		Boo	4	double star challenge
q q cm 21 star Apha Dunlop 166 14.42.0 -57.8 -4 -5 -6 -7 <td></td> <td>lpha</td> <td></td> <td>14 41.9</td> <td>-47.4</td> <td>2.3</td> <td>*</td> <td>Lup</td> <td>21</td> <td>star</td>		lpha		14 41.9	-47.4	2.3	*	Lup	21	star
Alpha Dunlop 166 14 42.5 65.0 3 2 16* Clr 2 0 ouble star Tar Epain 14 42.5 55.0 52 65.0 32 17* Clr 2 0 ouble star 54 54 7 65.0 52 65 2 3 0 7 2 0 ouble star 54 14 45.0 55.26 5.2 8 0.7 14 2 0 ouble star 7 Main 14 45.0 7.5 5.6 5.2 8 0.7 14				14 42.0	-37.8	4	*	Cen	21	star
(1 Epsilon 14437 -55.2 2 17 Cen 21 Instruction of the state of the		lpha		14 42.5	-65.0	3.2	16"	Cir	2	double star
Tart Epsilon 14450 5570 24 37 100 55 60006 star 57 700 4000 57 700 4000 57 700 4000 57 700 4000 57 700 4000 57 700 4000 57 700 400 700 710 71 4100 700 710 71 4100 710 71 4100 710 71 4100 710 71 4100 710 71 4100 710 71 7100 7100 7100				14 43.7	-35.2	4	17'	Cen	21	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		ar	Epsilon	14 45.0	+27 04	2.4	3"	Boo	5	colored double star
54 H 97 14460 $^{-25}$ 26 5.2 0 the star 2 0 touble star Alpma 14479 +4697 +4697 54 0.7" Vir 2 0 touble star N1883 14489 +4657 7.6 0.7" Vir 4 4 0 touble star N1883 14487 +4489 +4657 7.4 0 2 0 touble star 14481 N Koonab Beta 14503 +14.2 2 4 0 touble star 14181 Sim 14503 +14.2 2 4 - 14301 star Sim Nonbest 14503 +14.2 2 4 - 144 - 144 - 144 - 144 - 144 - 144 - - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144		dolun	Dunlop 169	14 45.2	-55.6	6.2	68"	Cir	2	double star
Alpha 14.79 *79.0 3.8 10° Aps 2.1 star Nu X1883 14.893 -14.09 5.4 0.7 Ulb 2 ouble star challe Mu 14.893 -14.09 5.4 2.7 Ulb 2 ouble star challe Si 5 -14.09 5.4 2.1 1.4 0 cuble star challe Si 5 -14.09 5.4 2.1 1.4 0 cuble star challe Si 5 2.1 1.4 5.7 2.1 1.4 0 cuble star challe Xin 37 14.51.4 4.19.06 4.6 2.7 1.0 2.7 star Xin Xin 37 14.55.5 2.1 2.1 star star Xin Xin 14.55.5 5.9 2.7 1.0 2.7 star Xin Xin 14.55.5 5.7 1.8 1.5 0.0016 star Xin Xin 1.6		4	H 97	14 46.0	-25 26	5.2	8"	Hya	2	double star
N1883 11 14.8.9 +05.57 7.6 0.7" VIr 4 double star challe 39 13 14.8.9 +14.8 +14.8.9 +14.8		lpha		14 47.9	-79.0	3.8	10°	Aps	21	star
$ \begin{array}{c ccccc} Mu & Mu & H 48.3 & -14.03 & 5.4 & 2" & Ub & 4 & 0 cuble star challe \\ 39 & 14.9(3) & -14.02 & 2.8(3) & 5.4 & -10 & 2 & 0 cuble star challe \\ 58 & 58 & 14.5(3) & -16.03 & -16.0 & 2 & 0 cuble star \\ 58 & 57 & 2.1 & -1 & 0 & 2 & 0 cuble star \\ 58 & 57 & 14.5(3) & -16.0 & 2 & 0 & -16.0 & 2 & 0 cuble star \\ 59 & 14.5(3) & -16.0 & 2 & -16.0 & 2 & 0 & -16.0 & 2 & 0 cuble star \\ 50 & 14.5(3) & -16.0 & 2 & -16.0 & 2 & 0 & -10.0 & 2 & 0 cuble star \\ 50 & -16.6 & -2.8 & -16.0 & 2.8 & -10 & -2 & 0 cuble star \\ 51 & -17.6 & -17.8 & -16.0 & 2.8 & -10 & -2 & 0 cuble star \\ 51 & -17.6 & -17.8 & -17.8 & -10 & -2 & 0 cuble star \\ 51 & -17.8 & -10.8 & -17.3 & -21.22 & 5.9 & -2.4 & -10 & -2 & 0 cuble star \\ 51 & -16.1 & -15.0 & -47.3 & -27.1 & -15.4 & -1$		1883		14 48.9	+05 57	7.6	0.7"	Vir	4	double star challenge
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Omegat 9 16 66.8 -20.7 4 14' Stoo 21 Vuo Nuo 16 12.0 -30.7 4 14' 500 7 Vid Pic Delia 16 12.0 -33 5.2 5.7 0.00 7 Yid Pic Delia 16 12.0 -33 5.2 5.7 7 0.00 7 No Mo Mo 16 12.0 -33 5.2 5.3 21' 500 2 Sigma H 121 16 21.0 -33 5.2 5.3 20' 0.01 2 Pico Main 064.1 5.25.6 5.1 7 1.7 1.00 2 Pico Main 16 22.0 -24.1 5.3 20'' 100 2 Stoo Main 16 22.1 -22.4 7.7 1.7 1.7'' 1.0'' 2 Antria Motion 16 22.1 -22.4 7.7 1.7'' 1.0'' 2 2 Antrind	564	Graffias	Beta	16 05.4	-19.8	2.5	*	Sco	21	star
Nu Nu Her 5 Nu Nu 19(20) 19/20 5 28" Her 5 Yed Prior Data 161/20 19/20 5 2 7" 0pin 21 Yed Prior Data 161/3 19/3 19/3 27 7" 0pin 21 Yed Prior Data 16/10 16/21 2/3 31.7 7" 0pin 21 Yed Prior ABS1049 16/212 2/3 31.7 7" 0pin 22 Sigma H12.1 16/203 16/214 7.3 20" 7.8 2 Ver Notation ABS10067 16/204 16/212 2/3 31.7 17" 17" 20" 20" 4 Ver Notation ADN 16/2067 16/204 16/203 17" 2" 2" 2" Ver Notation ADN 16/201 16/204 16/203 16/204 16/203 2" 17"	565	Omega1	6	16 06.8	-20.7	4	14'	Sco	21	star
Neur 161.20 -19.2 14.1 500 7 Ved Nu Ved Nu 17. Xigma 161.20 -19.2 2 - 0.00 2 Yead 17. Xigma 161.47 -335.2 5.2 7" 0.00 2 Z032 17. Xigma 161.21 -335.2 5.3 2.1" 0.00 2 Z032 Dimino 165.10 -23.5 5.3 2.1" 0.00 2 Pho Dimino 165.20 -12.4.6 4.8 2 - 0.00 2 V Dimino 162.22 -12.4.6 4.8 2 - 0.00 2 Z052 ADS 1007 16.20 -12.4.6 4.8 2 - 0.00 2 - Amates ADS 10087 16.204 -12.3.5 2.0 0.01 4 - - 2 - 2 - 2 - 2 - 2 - 2	566	Карра		16 08.1	+17 03	5	28"	Her	5	colored double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	567	Nu		16 12.0	-19 28	4	1"	Sco	7	quadruple star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	568	Yed Prior	Delta	16 14.3	-03.7	2.7	*	Oph	21	star
Delta 16 17 1 17 16 17 17 17 16 22 23 16 23 20' 2	569	<u> 7</u> 2032	"17. Siama"	16 14.7	+33 52	5.2	7"	CrB	5	double star
Sigma H 121 16 212 25 35 29 20' 500 9 Nio ADS 10049 16 25/6 -23.5 5.3 3.1" 0ph 2 V V Dunlos 21 16 28/3 -24.1 5.3 3.1" 0ph 2 Jession Dunlos 21 16 28/2 -44.1 5.3 20" Nor 2 Jession Dunlos 21 16 28/2 -46.1 5.3 20" Tra 2 Jession ADS 10087 16 28/3 -41.2 1.7 1.7" Her 2 Anaces ADS 10087 16 28/3 +66.8 6.7 1.2" Nor 2 Anaces ADS 10157 16 38/4 -10.2 1.1" 1.1" 2 Anaces AD 16 36/4 -10.2 1.2" 2 2 Su 16 Anaces -55.5 1.4" 1.4" 4 Anaces -16 -30.6 -30.1	570	Delta	0	16 20.3	-78.7	4.7	*	Aps	2	double star
Rho ADS 10049 16 26.5 23.5 5.3 3.1* Oph 2 Festion M4633 16 28.7 -47.6 4.8 23 Mor 22 Festion M4853 16 28.7 -47.6 4.8 23 Mor 22 Festion M4853 16 28.9 -164.1 5.3 20' Hra 2 Stores ADS 10057 16 28.9 -164.4 7.7 1.7' He 2 Stores ADS 10057 16 28.9 -66.4 1 3'' Scor 4 Lambda ADS 10057 16 28.0 -66.4 1 3'' Scor 4 Lambda ADS 10157 16 28.2 -35.5 5.1 3''' Dra 22 Lambda ADS 10157 16 41.3 -35.5 5.1 3''' Dra 22 Sca ADS 10157 16 41.3 -31.6 3''' 1.4''' Her 2 Sca ADS	571	Sigma	H 121	16 21.2	-25 35	2.9	20"	Sco	6	double star magnitude contrast
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	572	Bho	ADS 10049	16 25 6	-23.5	5.3	3.1"	Onh	~	double star
	573	~		16.26.7	-12.4	7.3	*	Onh	22	variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	574	Ensilon	h4853	16 27 2	-47.6	4.8	23"	Nor	~	double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	575	lota	Dunlop 201	16 28.0	-64.1	5.3	20"	Tra	0	double star
Antares Alpha 16 29.4 26.4 1 3" 500 4 Lambda ADS 10087 16 30.9 -26.1 1.4" Oph 4 H 1 16 1.3 -16.8 6.7 1.4" Oph 4 H 1 16 1.3 -16.8 6.7 -7 0ph 4 H 1 16 1.3 -16.5 5.1 3" 500 21 Zeta 13 16 37.2 -10.6 2.6 -5.1 3" 500 21 Seta Abs 10157 16 41.0 -32.4 8 - 500 21 Seta Abs 10157 16 41.3 -31.4 8 - 500 21 Seta 25.1 19.0 19 - 8 - 500 21 Seta 26 10.43 - 1.4 Dra 21 21 Kap 2 -	576	<u> 22052</u>	ADS 10075	16 28.9	+18.4	7.7	1.7"	Her	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	577	Antares	Alpha	16 29.4	-26.4	÷	3"	Sco	4	double star challenge
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	578	Lambda	ADS 10087	16 30.9	+02.0	4.2	1.4"	Oph	4	double star challenge
I6 16 16 16 16 16 16 16 16 17 16 16 16 21	579	ш		16 32.7	+66.8	6.7	*	Dra	22	variable star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	580	16		16 36.2	+52 55	5.1	3"	Dra	9	triple star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	581	т		16 36.4	-35.3	4.2	*	Sco	21	star
SU 16 40.6 -32.4 8 * 500 22 Zeta ADS 10157 16 41.3 +31.6 3 1.4" Her 5 Aria Apha 16 41.3 +61.0 1.9 * Tae 50 22 Aria Apha 16 43.8 -69.0 1.9 * Tae 5 R Ain 26 16 52.3 -69.0 3.8 * 500 21 Mu 27 16 52.3 -68.0 3.1 * 500 21 Mu 27 16 55.4 -50.6 5.1 1.4" Dra 21 Stata 27 16 57.7 -60.4 3.1 7 500 21 Kapra 27 16 57.7 -61.4 3.1 7 500 21 Kapra 27 16 55.4 -56.0 3.1 1.4" Ara 21 Mu 16 55.6 -55.0 5.1 50.7<	582	Zeta	13	16 37.2	-10.6	2.6	*	Oph	21	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	583	SU		16 40.6	-32.4	8	*	Sco	22	variable star
Atria Alpha 16 48.7 69.0 1.9 * Tra 21 Existion 26 16 43.6 -9.0 1.9 * Tra 21 Epsion 26 16 50.2 -34.3 2.3 * 500 21 Val 2 16 52.3 -54.3 2.3 * 500 21 Yal 20 16 56.2 -30.6 5.1 1.4 500 21 Yal 20 16 56.6 -30.6 5.1 1.4 500 21 Xapa 27 16 56.6 -30.6 5.1 1.4 500 21 Kapa 27 16 56.6 -50.6 5.1 7.5 0ph 21 Kapa 27 16 56.6 -50.6 5.1 7.4 7.6 0ph 21 Kapa 27 16 56.6 -50.6 5.1 7.5 0ph 21 Mu 17 16.5 -4.3 2.	584	Zeta	ADS 10157	16 41.3	+31.6	3	1.4"	Her	5	colored double star
Eta 16 49.8 59.0 38 * Ara 21 Mu 26 16 50.2 38.0 3 * Sco 21 Mu 26 16 50.2 38.0 3 * Sco 21 Mu 20 16 56.4 36.0 5.1 1.4* Sco 21 Xapa 27 16 56.4 30.6 5.1 1.4* Sco 21 Kapa 27 16 57.7 50.94 3.2 75* 0ph 21 Kapa 16 56.6 53.2 4.1 40° Ara 21 Kapa 17 50.3 54.0 3.1 75* 0ph 21 Mu 17 16.6 4.14.4 3 17 3 21 3 Mu 17 16.0 4.14.4 3 17 16 16 3 Mu 17 16.0 4.14.4 3 17 16 17 3 Mu	585	Atria	Alpha	16 48.7	-69.0	1.9	*	Tra	21	star
Epsilon 26 16 50.2 -34.3 2.3 * Sco 21 Xu 20 16 56.3 -36.0 3 * Sco 21 Xu 20 16 56.4 +65.0 7.1 1.4* Dra 2 Xapa 27 16 56.5 -30.6 5.1 1.4* Dra 2 Kapa 27 16 56.6 -30.6 5.1 1.4* Dra 2 Kapa 27 16 56.6 -31 * 5 0ph 21 Kapa 27 16 56.6 -3.1 * 7 9 2 2 Kapa 27 16 56.6 3.1 * 7 9 2 2 Kapa 27 16 56.6 3.1 * 5 0ph 2 2 Kapa 28 -55.2 4.1 40 7 7 2 2 1 3 2 1 3 <t< td=""><td>586</td><td>Eta</td><td></td><td>16 49.8</td><td>-59.0</td><td>3.8</td><td>*</td><td>Ara</td><td>21</td><td>star</td></t<>	586	Eta		16 49.8	-59.0	3.8	*	Ara	21	star
Mu 1652.3 38.0 3 • Sco 21 2118 20 1656.4 -0.6 5.1 1 1.4" Dra 4 R R R 86.0 -0.6 5.1 1.4" Dra 4 R R 7 1.657 -0.9.6 5.1 9.0 21 4 Kapta 27 1657.5 -0.9.4 3.2 75' Dra 2 Cata 1656.6 -53.2 4.1 40' Ara 21 Mu 170.4 -15.7 2.4 0.6" Dra 3 3 Mu 710.4 -15.7 2.4 0.6" Dra 3 3 Mu Alpha 1710.4 -15.7 2.4 0.6" Dra 3 3 Sabik Ela 1716.4 -15.7 2.4 0.6" Dra 3 3 Plan 1716.6 -24.50 3	587	Epsilon	26	16 50.2	-34.3	2.3	*	Sco	21	star
2218 20 15.6.4 +65.0 7.1 1.4" Dra 4 RR 2 16.5.6 -60.0 5.1 1.4" Dra 4 Kappa 27 165.6 -60.0 5.1 7 500 22 Kappa 27 165.6 -60.0 3.1 7 500 22 Kappa 27 165.6 -56.0 3.1 7 500 21 Kappa 165.6 -56.0 3.1 7 0.6 0ph 21 Mu 1 165.3 +54.28 4.9 2* 0.6 0ph 4 Mu Eta 17.10.4 +15.7 2.4 0.6* 0ph 4 Rasignethi Alpha 17.10.4 +15.7 2.4 0.6* 0ph 4 Pelta 715.0 +24.50 3.2 10* Her 3 Pala 67 17.15.0 +24.50 3.2 10* </td <td>588</td> <td>MI</td> <td>D</td> <td>16.52.3</td> <td>-38.0</td> <td></td> <td>*</td> <td>Sco</td> <td>24</td> <td>star</td>	588	MI	D	16.52.3	-38.0		*	Sco	24	star
RR 15 65 30.6 5.1 * Sco 22 Kapla 27 16 57.7 -30.6 5.1 * Sco 22 Kapla 27 16 57.7 -40.94 3.1 * Ara 21 Zeta 16 55.6 -55.0 3.1 * Ara 21 Mu 17 16 55.6 -55.2 4.1 20' Ara 21 Mu 17 16 -15.7 2.4 0.6" 0.0h 4 Sabik Eta 17 10.4 -15.7 2.4 0.6" 0.0h 3 Sabik Eta 17 16.4 -41.4 3 4.6" Her 3 Deta 67 17 16.6 -24.46 3.2 10" Her 3 Se 67 17 16.6 -24.46 3.2 10" Her 3 Opta <td>589</td> <td>\$2118</td> <td>20</td> <td>16.56.4</td> <td>+65.0</td> <td>7.1</td> <td>1.4"</td> <td>Dra</td> <td>4</td> <td>double star challence</td>	589	\$2118	20	16.56.4	+65.0	7.1	1.4"	Dra	4	double star challence
Kappa 27 16 57.7 +09.4 3.2 75' Oph 21 Etai 16 58.6 -56.0 3.1 - Ara 21 Epsilon 16 58.6 -56.0 3.1 40' Ara 21 Epsilon 16 58.6 -56.0 3.1 40' Ara 21 Mu 17 16.3 +54.28 4.9 2'' Dra 3 Sabik Eta 17 10.4 -15.7 2.4 0.6'' 0.0h 4 Basugethi Alpha 17 16.0 +24.50 3.2 10'' Her 3 Pelta 67 17 15.0 +24.50 3.2 10'' Her 3 Pit 67 17 15.0 +24.50 3.2 10'' 9 3 R 36 17 15.0 +24.50 3.2 10'' 9 3 3 3 3 3 3 3 3 3 3 3	590	BB		16 56.6	-30.6	5.1	*	Sco	22	variable star
Zeta 16 58 bit 56 0 3.1 * Ara 21 Epilon1 16 59 6 -56.0 3.1 * Ara 21 Mu 11 16 59 6 -55.2 4.9 2" Ara 21 Mu 17 16 59 6 -55.2 4.9 2" Dra 3 Sabik Eta 17 10.4 -15.7 2.4 0.6" Oph 4 Rasalgethi Alpha 17 16.4 -15.7 2.4 0.6" Her 3 Polta 7 7.15.0 -24.46 3.2 10" Her 3 Polta 67 17 15.0 -24.86 3.2 7" Oph 3 36 17 15.0 -26.36 -3.2 10" Oph 5 39 17 18.0 -24.17 5.2 10" Oph 5 70.00 47.0 2.4 7.0 0ph 5 0ph 5	591	Kanna	27	16.57.7	+09.4	3.2	75'	Onh	24	star
Epsilon1 Epsilon1 16500 -53.2 4.1 40' Ara 21 Mu 1705.3 +54.28 4.9 2" Dra 3 Subix Eta 1705.3 +54.28 4.9 2" Dra 3 Mu 1705.3 +54.28 4.9 2" Dra 3 Abha 1716.4 +14.4 3 4.6" Her 9 Delta 1715.0 +24.50 3.2 10" Her 9 Pi 67 1715.0 +24.56 3.2 10" Her 21 8 1715.0 +24.56 3.2 10" Oph 3 36 1715.0 -24.56 3.2 10" Oph 3 36 1718.0 -24.17 5.2 10" Oph 5 39 17.18.0 -24.17 5.2 10" Oph 5	592	Zeta	ì	16 58 6	-56.0	3.1	*	Ara	24	star
Mu Lower Lower <thlower< th=""> Low</thlower<>	503	Eaclard Eaclard		16 50 6	-53.0	4.4	40,	Ara		etar
Sabik Eta 17.10.4 -15.7 2.4 0.6° 0.0° 4 Rasagethi Alpha 17.16.6 +14.4 3 4.6° Her 3 Data 67 17.15.0 +14.4 3 1.6° Her 3 Deta 17.15.0 +34.6 3.2 10° Her 3 Diff 67 17.15.0 +36.8 3.2 7° Her 2 S6 17.15.0 +36.8 3.2 7° Oph 2 36 17.15.0 -26.36 -26.17 5.2 10° Oph 5 39 17.18.0 -24.17 5.2 10° Oph 5 7.4 7.00 4.77 5.2 10° Oph 5	594	MI		17 05.3	±54.28	4 9		Dra	4 00	double star equal magnitude
Rasalgethi Alpha 17 14.6 +14.4 3 4.6" Her 3 Pila 17 15.0 +24.50 3.2 10" Her 9 Pila 67 17 15.0 +36.8 3.2 10" Her 9 Pil 67 17 15.3 -26.36 3.2 7" Her 21 36 17 15.3 -26.36 4.3 5" Oph 3 39 17 16.0 -24.17 5.2 10" Oph 5 7 how 47 5.2 10" Oph 5 7 0ph 5	595	Sabik	Eta	17 10.4	-15.7	2.4	0.6	hao	4	double star challenge
Delta 17 15.0 +24.50 3.2 10" Her 9 P1 67 17 15.0 +24.56 3.2 10" Her 9 36 71 17 15.0 +24.56 3.2 7" Her 9 36 17 17.5.0 +36.8 3.2 7" Oph 3 39 17 17.18.0 -24.17 5.2 10" Oph 5 39 47 5.2 10" Oph 5 10" Oph 5 12 No. 47.0 2.4.17 5.2 10" Oph 5	T596	Rasalgethi	Alpha	17 14.6	+14.4	03	4.6"	Her	e	double star equal magnitude
Pi 67 17 15.0 +36.8 3.2 7° Her 21 36 17 15.3 -26.36 4.3 5° Oph 3 39 17 15.0 -24.17 5.2 10° Oph 5 39 17 18.0 -24.17 5.2 10° Oph 5 7holm 42 17 20.0 -24.17 5.2 10° Oph 5	T597	Delta		17 15.0	+24 50	3.2	10"	Her	6	double star magnitude contrast
36 17 15.3 26 36 4.3 5" Oph 3 39 17 18.0 -2417 5.2 10" Oph 5 39 17 18.0 -2417 5.2 10" Oph 5 7boin 40 417 5.2 10" Oph 5	T598	Ρ	67	17 15.0	+36.8	3.2	7°	Her	21	star
39 17 18.0 -24 17 5.2 10" Oph 5 Thein 40 17 78.0 -24 17 5.2 10" Oph 5	T599	36		17 15.3	-26 36	4.3	5"	Oph	в	double star equal magnitude
Thoto 40 47.000 -05.0 20 * Oak 01	T600	39		17 18.0	-24 17	5.2	10"	Oph	5	colored double star
11/22/0 -23/0 0/0 2/11 21	ST601	Theta	42	17 22.0	-25.0	3.3	*	Oph	21	star
						5			T	

	Number	Name	Other	RA	Dec	Mag	Sep	Con	Code	
	ST603	Beta		17 25.3	-55.5	2.9		Ara	21	star
Signal Difficient 17.865 -64.1 -61.1 -7 -61.1 -7 -61.1 -7 -61.1 -7 -61.1 -7 -61.1 -7 -61.1 -7 -61.1 -7 -61.1 -7 -61.1 -7 -61.1 -7 -61.1 -7 -61.1 -7 -61.1 -7 -7 -7 -7 -7 -7 -7 -7 -7 -61.1 -7 <th< td=""><td>ST604</td><td>Gamma</td><td></td><td>17 25.4</td><td>-56.4</td><td>3.3</td><td>*</td><td>Ara</td><td>21</td><td>star</td></th<>	ST604	Gamma		17 25.4	-56.4	3.3	*	Ara	21	star
	ST605	Siama	49	17 26.5	+04.1	4.3	4°	haO	21	star
Triation Triation	ST606	h4949	Dunlop 216	17 26.9	-45.9	9	2.2	Ara	2	double star
Learnbal Tig 17307 -2631 24 ·· Her 21 Learnbal Upsilon 17305 -2651 24 ·· Her 21 Alpha Upsilon 17316 -2651 1 - Her 21 Alpha Upsilon 17316 -7315 -5651 1 - Her 21 Alpha Tit 17316 -7315 -5651 1 - Her 21 Napsi Tit 17316 -7326 -5691 23 - - Her 21 Vapsi Tit 1745 -961 24 - - Her 21 Vapsi 17455 -1745 -977 267 267 271 Size -17455 -1743 -1743 - - 1 - 1 - 1 - 1 - 1 - 1 - 1 - -	ST607	<u>52173</u>		17 30.4	-01 04	9	1.1	haO	4	double star challenge
House Upsilon 17316 -273 -5	ST608	Lambda	76	17 30.7	+26.1	4.4	*	Her	21	star
Alpha T/2113 -49,0 -7	ST609	Lesath	Upsilon	17 30.8	-37.3	2.7	*	Sco	21	star
Nu Nu<	ST610	Alpha		17 31.8	-49.9	3	*	Ara	21	star
Shallat Lambda 17.33.6 -37.1 1.6 35. 50.0 21 Stathague 8 17.39.5 -37.0 3.8 - 0.61 21 Yant 5 17.39.5 -37.0 2.8 0.61 2.1 Yant 5 7.39.5 -9.0 2.4 2.5 5.00 2.1 Yant 17.43.5 -9.0 2.4 2.5 5.00 2.1 Yant 17.45.5 -9.6 9.2 - 0.60 2.1 Yant 17.45.5 -17.5 9.6 9.7 0.7 5.00 2.2 Yant 3 17.45.6 -17.43 9.2 5.00 2.1 2.1 Yant 6 - 7.3 2.2 5.00 2.1 2.1 Yant 6 - 7.3 9.1 7.3 9.1 2.1 Yant 6 - 7.3 9.1 9.1 9.1 2.1	ST611	Nu		17 32.2	+55 11	4.9	62"	Dra	с	double star equal magnitude
Rasalhague Alpha 17343 +1234 21 · Oph 21 Y2241 Pai 17413 +7213 577 57 57 57 50 20 21 Y2241 Pai 17413 +723 597 57 57 57 50 20 21 Y2201 Bela 17413 +723 597 57 57 50 20 21 Y2001 Bain 17415 597 557 85 500 21 Y V 17456 +515 22 50 20 21 Y V Minim 17566 +515 22 50 21 21 P6003 40-41 8015 513 42 22 500 21 P1004 517 216 414 21 21 21 P1004 517 513 413 51 51 21 21	ST612	Shaula	Lambda	17 33.6	-37.1	1.6	35'	Sco	21	star
	ST613	Rasalhague	Alpha	17 34.9	+12 34	2.1	*	Oph	21	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST614	lota	85	17 39.5	+46.0	3.8	*	Her	21	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST615	<u> </u>	Psi	17 41.9	+72 09	4.9	30"	Dra	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST616	Kappa		17 42.5	-39.0	2.4	2.5°	Sco	21	star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ST617	~		17 43.3	-57.7	5.7	*	Pav	22	variable star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ST618	Cebalrai	Beta	17 43.5	+04.6	2.8	*	Oph	21	star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ST619	∑2202	61	17 44.6	+02 34	6.2	21"	oph	с	double star equal magnitude
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ST620	SZ		17 45.0	-18.6	6	*	Sgr	22	variable star
G T 1749 770 32 2* 500 21 Gumum Xi 17556 -66.9 38 * Oph 22 Etanim Gamma 17556 -66.9 38 * Oph 21 Etanim Gamma 17556 -66.15 2.2 Dra 22 Barnatics Star 17556 -60.15 5.7 20' Dra 21 55 263 40-41 18 00.1 -60.15 5.7 20' Dra 21 52276 70 18 015 -61.3 3.2 1.4'' Dra 21 72276 70 18 015 -61.3 6.1 -7.2 Dra 22 72280 100 18 07.6 -60.1 -7.3 1.4'' Dra 21 7220 110 18 07.6 -7.3 1.4'' Dra 22 72306 51 1.4'' 1.5'' 0.4'' Dra 2	ST621	SX		17 47.5	-35.7	8.5	*	Sco	22	variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST622	G		17 49.9	-37.0	3.2	2°	Sco	21	star
Gumin Xi 17535 4569 38 * Dra 21 Ramin Gamma 1756 4014 22 * Dra 21 Barnards Star 1756 4014 1551 4014 22 P Dra 21 Parmards Star AD 1756 4315 5 5 7 22 P 23 Sp38 40-41 180015 +2136 43 6" Her 3 Sp36 40 100 18075 -0230 4 15" Oph 4 Sp37 5 43 4 15" A 15" 0ph 4 Sp38 010 18176 -0.29 -2.1 0ph 4 Xeap 11 18176 -0.66 5.9 14" Her 2 Xeap 11 11 11 11 11 15" 0ph 4 Xeap 11 <	ST623	>		17 52.6	-06.2	9	*	Oph	22	variable star
Etanin Camma 17 56.6 +51.5 2.2 * Dra 21 Ramards Star 1 75.78 -01.34 9.5 5'' 0'' Dra 21 155003 40-41 16.00 +80.0 5.7 9'' Dra 3 55003 40-41 16.00 +80.0 5.7 0'' Dra 3 7 70 18.05 +80.1 3.7 '' Dra 3 7 70 18.05 +80.1 3.7 '' Dra 3 7 70 18.05 +52 14'' Her 3 7 7 3 14'' Her 3 7 95 7.3 4 Her 3 7 18 16.2 -56.1 7.3 Her 3 7 19 10 18.17 4.36.7 10'' 10''' 21 7 50 11 <t< td=""><td>ST624</td><td>Grumium</td><td>ix</td><td>17 53.5</td><td>+56.9</td><td>3.8</td><td>*</td><td>Dra</td><td>21</td><td>star</td></t<>	ST624	Grumium	ix	17 53.5	+56.9	3.8	*	Dra	21	star
	ST625	Eltanin	Gamma	17 56.6	+51.5	2.2	*	Dra	21	star
15003 $1759,1$ 5015 5 6° $8gr 5 95 10.41 1801,0 401,0 1801,0 401,0 100,0 100,0 100,0 100,0 100,0 100,0 100,0 100,0 1801,0 100,0 1801,0 100,0 1801,0 100,0 1801,0 100,0 1801,0 100,0 1801,0 100,0 1801,0 100,0 1801,0 100,0 110,0$	ST626	Barnards Star		17 57.8	+04 34	9.5	Stellar	hqO	21	star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ST627	h5003		17 59.1	-30 15	5	.9	Sgr	5	colored double star
13 13 13 13 14 15 16 16 3 16 3 16 3 16 16 3 16 16 3 16 16 3 16 16 16 16 16 16 16 16 16 <th16< th=""> 16 <th16< th=""></th16<></th16<>	ST628	∑2038	40-41	18 00.0	+80.0	5.7	20"	Dra	3	double star equal magnitude
Tau ADS 11005 18 03.1 -08.2 5.2 1.8" Oph 4 Y2276 70 18 07.6 -00.1 3.7 1.5° Oph 4 Theta 70 18 07.6 -50.1 3.7 1.5° Oph 4 Yea 10 18 17.6 -56.1 3.7 5.3 1.4° Her 3 Wate 1 18 17.6 -56.1 3.7 5.3 4.7 2.7 <t< td=""><td>ST629</td><td>95</td><td></td><td>18 01.5</td><td>+2136</td><td>4.3</td><td>6"</td><td>Her</td><td>e</td><td>double star equal magnitude</td></t<>	ST629	95		18 01.5	+2136	4.3	6"	Her	e	double star equal magnitude
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST630	Tau	ADS 11005	18 03.1	-08.2	5.2	1.8"	Oph	4	double star challenge
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST631	Σ2276	70	18 05.5	+02 30	4	1.5"	Oph	4	double star challenge
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST632	Theta		18 06.6	-50.1	3.7	* -	Ara	21	
W 111	S1633	22280	100	18 07.8	+26 06	5.9	14"	Her	e 1	double star equal magnitude
Eta 1	S1634	≥ i		18 14.9	+36.7	7.3		Lyr	22	variable star
Kauspie Transmetia 1	S 1635	Eta	,	18 1/.6	-36.8	3.1		sgr	12	star
X2306 Uerta 18 2/10 -29.6 2.1 * 5gr 21 X306 Gale 2 18 2/10 -59.6 7.9 10° 5gr 21 X306 Gale 2 18 2/10 -59.6 4.4 * Pav 21 X305 Gale 2 18 2/3 -60.5 4.9 4" Pav 21 X10 Gale 2 18 2/3 -50.5 4.9 4" Pav 21 Apha 18 2/1 40.0 5.5 4.9 4" Pav 21 Apha 18 2/1 40.1 5.2 4" 5" 4" 5" 4" 5" 4" 5" 4" 5" 4" 5" 4" 5" 2" 4" 5" 5" 4" 5" 5" 4" 5" 5" 4" 5" 5" 4" 5" 5" 1" 1" 1" 1" 1" 5" 5" 5" 5"	S 1636	Kappa	- 0	18 19.9	+36.1	6.5		Lyr	12	star
Xi. Xi. <td>S163/</td> <td>Kaus Media</td> <td>Delta</td> <td>18 21.0</td> <td>-29.8</td> <td>7.7</td> <td>. 1</td> <td>sgr</td> <td>1.7</td> <td>star</td>	S163/	Kaus Media	Delta	18 21.0	-29.8	7.7	. 1	sgr	1.7	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	01030	22306	000	2722.81	2 F 9	9.1	0.	oci	N	double star
Z1 X05 13.55 12.57.3 2.0.57 4.9 1.8 Dots 4 Z1 ADS 113.25 18.27.0 66.0 3.5 6' Tel 21 Alpha ADS 113.25 18.27.0 -66.0 3.5 6' Tel 21 S Aus Borealis Lambda 18.27.0 -66.0 3.5 6' Tel 21 S S 18.30.4 -16.9 9 * Sgr 21 S Delta 18.30.4 -16.9 9 1.1 Tel 22 T Z 18.31.4 -46.9 5 1.1 Tel 21 A 1 1.2 2.8 4.4 5.9 21" 24 21 A 2.346 5.9 5.17.0 6.8 5.9 1.1 1.6 21 A 2.348 5.9 5.41.50 5.8 5.7 1.6 21 22 A	ST640	V0303	20 20	18 24 0	97 8 3 t	4.4	<i>"V</i>	Dra	5	trinle star
Alpha Contract E.2.70 -6.0 3.5 6' Tel 2 59 59 18.27.0 -6.0 3.5 6' Tel 21 59 53 18.27.0 -6.0 3.5 6' Tel 21 51 18.27.0 -6.0 3.5 6' Tel 27 53 18.20 -16.9 9 ' Sgr 22 55 11 11' 11' 11' 11' 12 7 2348 18.34 -59 5 21' 27 2 7 2348 18.33 -387.0 7.8 11' 11' 12' 2 7 2348 18.33 -387.0 5.9 2'' 5'' 2'' 2'' 7 2348 18.35 -082.3 39.0 5'' 5''' 2'' 2'' 7 2348 18.35 -17.0 6.8 16'' 4'	ST641	21	ADS 11205	18 25 3	2012	01	τ "α	Sq.	0	dauble star challenge
50mm 50mm 18.27.2 +00.12 5.2 4" 5"	ST642	Alnha	07011000	18 27 0	-46.0	0 L T	6	Tel	⁺	counte stat citalienge star
Kaue Borealis Lambda 18.28.0 25.4 2.8 * Sgr 21 SS 18.30.4 -16.3 9 1 78 22 22 Delta 18.30.4 -16.3 9 1 78 21 27 22 T 1 18.32.3 +37.0 7.8 1 1 1 22 Delta 18.33.4 -16.5 5 1 1 1 1 22 Z 18.33.4 -16.5 5 1 1 1 1 2 A 23.4 5.9 2.1 CrA 3	ST643	59		18 27.2	+00.12	5.2	4"	Ser	i .c	colored double star
SS 18 30.4 -16.9 9 * Sgr 22 Delta 11 1 11 11 11 2 T 1 18 31.8 -37.0 7.8 11' 11' 11' 2 T 1 18 32.4 -38.4 5.9 21' 11' 11' 1 7 2234 18 33.4 -38.44 5.9 21' 11' 1 7 2234 18 35.2 -08.2 3.9 5.9 21' 11' 1 7 2344 18 35.5 -10.2 3.9 5.9 10' 1 2 0 2359 AD51433 18 35.5 -17.0 6.8 1.6'' 14'' 4 0 2355 AD51 18 35.5 -17.0 6.8 1.6'' 14'' 4 0 0.355 AD51 18 35.5 +17.0 6.8 1.6'' 14'' 4 1 18 35.5 +17.0 6.8 1.6'' 14'' 4 1 18 35.5 +17.0 6.8 1.6'' 14'' 4 1 18 36.9 +17.0 6.8 1.6'' 14'' 4 <tr< td=""><td>ST644</td><td>Kaus Borealis</td><td>Lambda</td><td>18 28.0</td><td>-25.4</td><td>2.8</td><td>*</td><td>Sar</td><td>21</td><td>star</td></tr<>	ST644	Kaus Borealis	Lambda	18 28.0	-25.4	2.8	*	Sar	21	star
T T	ST645	SS		18 30.4	-16.9	6	*	Sgr	22	variable star
T 1	ST646	Delta		18 31.8	-45.9	5	11'	Tel	2	double star
X222 Kappa 18.33.4 -58.14 5.9 21" CrA 3 Y2348 18.34 -58.44 5.9 21" CrA 3 Y2348 18.35 -08.2 3.9 58 Dra 2 Alpha 18.352 -08.2 3.9 6.8 1.6" Dra 2 O2359 ADS 11433 18.355 +17.0 6.8 1.6" Her 4 O2359 ADF143 18.35 +23.36 6.8 1.6" Her 4 O2359 Alpha 18.36.9 +37.0 6.8 1.6" Her 4 Vega Alpha 18.36.9 +37.0 9.6 1.0" Dra 22 K 18.43 +37.0 9.5 * 0.5 * Dra 22 K 18.43 +33.40 4.7 2" Dra 2 22 Vega 18.43 +39.40 4.7 2" Dra <td>ST647</td> <td>Т</td> <td></td> <td>18 32.3</td> <td>+37.0</td> <td>7.8</td> <td>*</td> <td>Lyr</td> <td>÷</td> <td>red variable star</td>	ST647	Т		18 32.3	+37.0	7.8	*	Lyr	÷	red variable star
Xould 18339 +52.18 6 26" Dra 2 Alpha 1835.2 -08.2 -39 • Sct 21 O.356 ADS 11433 18.35.5 +23 66 -3 0.7" Her 4 O.356 ADS 11433 18.35.5 +23 66 -3 0.7" Her 4 V V 6.8 1.6" Her 4 - 21 V V 18.35.9 +17.0 6.8 1.6" Her 4 V V 18.35.9 +37.0 6.8 5.9 -0.7 21 V V 18.3.3 +0.8.8 5.9 -0.0 21 21 V X 18.4.2.8 +37.0 9.5 -0.0 22 21 X X 18.4.3 +39.40 4.7 2." Urr 22 Double-Double Epsilon 18.4.3 +39.40 4.7 2." Urr	ST648	Δ222	Kappa	18 33.4	-38 44	5.9	21"	CrA	3	double star equal magnitude
Alpha 18 35.2 -08.2 3.9 * Sct 21 O 2369 ADS 11483 18 35.5 +37.36 6.3 0.7" Her 4 O 2369 ADS 11483 18 35.5 +17.0 6.8 1.6" Her 4 O 2356 ADS 11483 18 35.5 +17.0 6.8 1.6" Her 4 V V 18 36.9 +38.47 0 Stellar Lyr 21 V X 18 36.9 +0.8.8 5.9 Stellar Lyr 22 HK 18 42.8 +37.0 9.5 * Lyr 22 Val Epsilon 18 43.0 +59.40 4.7 2" Lyr 2 Double-Double Epsilon 18 43.0 +59.40 4.7 2" Lyr 7	ST649	Σ2348		18 33.9	+52 18	9	26"	Dra	2	double star
O)3350 18 35.5 +23 36 6.3 0.7" Her 4 0)358 ADS 11463 18 35.9 +17.0 6.8 1.6" Her 4 0)358 ADS 11463 18 35.9 +17.0 6.8 1.6" Her 4 Vga Alpha 18 35.9 +17.0 6.8 1.6" Lyr 21 Va 18 38.3 +08.8 5.9 *17.0 0.7 22 HK 18 42.8 +37.0 9.5 * 0ph 22 X2308 18 44.3 +39.40 4.7 2" Lyr 7 Double-Double Epsilon 18 44.3 +39.40 4.7 2" Lyr 7	ST650	Alpha		18 35.2	-08.2	3.9	*	Sct	21	star
O336 ADS 11483 18 35.9 +17.0 6.8 1.6" Her 4 Vega Alpha 18 36.9 +38 47 0 Stellar Lyr 21 X 18 36.9 +37.0 9.5 * Oph 22 HK 18 42.8 +37.0 9.5 * Oph 22 X 18 42.8 +37.0 9.5 * Oph 22 X 18 42.8 +37.0 9.5 * Dph 22 X338 18 42.3 +39.40 8.7 2* Lyr 2 Double-Double Epsilon 18 44.3 +39.40 4.7 2* Lyr 7	ST651	O∑359		18 35.5	+23 36	6.3	0.7"	Her	4	double star challenge
Vega Alpha 18 36.9 +38.47 0 Stellar L/r 21 X 18 36.9 +08.8 5.9 5.9 10 20 21 X 18 36.9 +0.8 5.9 5.9 5.0 20 21 HK 18 42.8 +37.0 9.5 * Lyr 22 238 18 43.0 5.96 8 1.3" Dra 22 2238 18 43.0 4.30 4.7 2" Lyr 2 Double-Double Epsilon 18 43.0 4.7 2" Lyr 7	ST652	O∑358	ADS 11483	18 35.9	+17.0	6.8	1.6"	Her	4	double star challenge
X 18 38.3 +08.8 5.9 * Oph 22 HK 1842.8 +37.0 9.5 * Uyr 22 \$298 1843.0 +59.6 8 13" Dra 2 Double-Double Epsilon 1844.3 +3940 4.7 2" Lyr 7	ST653	Vega	Alpha	18 36.9	+38 47	0	Stellar	Lyr	21	star
HX 18.42.8 +37.0 9.5 * Lyr 22 2388 18.42.8 +37.0 9.5 * Lyr 22 Double-Double Epsilon 18.4.3 +39.40 4.7 2" Lyr 7 Double-Double Epsilon 18.4.3 +39.40 4.7 2" Lyr 7	ST654	×		18 38.3	+08.8	5.9	*	Oph	22	variable star
22398 13.0 +59.6 8 13" Dra 2 Double-Double Epsilon 18 44.3 +39 40 4.7 2" Lyr 7	ST655	Ť		18 42.8	+37.0	9.5	*	Lyr	22	variable star
Double-Double Epsilon 18 44.3 +39 40 4.7 2" Lyr 7	ST656	<u>></u> 2398		18 43.0	+59.6	8	13"	Dra	2	double star
	S1657	Double-Double	Epsilon	18 44.3	+39 40	4.7	2"	Lyr	7	quadruple star

700 700 <th>Number</th> <th>Name</th> <th>Uther</th> <th>RA</th> <th>Dec</th> <th>INIAG</th> <th>oep</th> <th>2011</th> <th>COUE</th> <th></th>	Number	Name	Uther	RA	Dec	INIAG	oep	2011	COUE	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	T658	Zeta		18 44.8	+37 36	4.4	44"	Lvr	2	double star
Yestry Energy S203 5 19456 0.06 5.6 15.7 15.7	T659	<u>52375</u>		18 45.5	+05 30	6,2	2"	Ser	1 00	double star equal magnitude
	T660	<u> </u>	2 2	18 46.5	-00 58	5.8	13"	Agl	9	triple star
	T661	æ	>	18 47.5	-05 42	4.5	Stellar	Sct	22	variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	T662	Beta		18 50.0	+33 24	3.5	47"	Lyr	6	double star magnitude contrast
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	T663	s	ADS 11726	18 50.3	-07.9	6.8	14.3"	Sct	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	T664	Σ^{2404}		18 50.8	+10 59	6.9	4"	AqI	2	double star
	T665	∑2420	Omicron	18 51.2	+59 22	4.9	35"	Dra	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	T666	Delta2	ADS 11825	18 54.5	+36.9	4.5	*	Cyg	21	star
Numbic Signat 1855.3 -76.3 2.9 $^{-2}$	T667	0∑525		18 54.9	+33 58	9	45"	Lyr	5	colored double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	T668	Nunki	Sigma	18 55.3	-26.3	2	*	Sgr	21	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	T669	13	В	18 55.3	+43.9	3.9	4"	Lyr	21	star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	T670	S2417	"63, Theta"	18 56.3	+04 11	4.1	22"	Ser	2	double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	T671	ADS11871		18 57.0	+32.9	5.4		Lyr	4	double star challenge
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	F672	5.2422		18 57.1	+26.1	8	0.7"	Lvr	4	double star challenge
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	F673	N		18 58.6	+14.4	8.6	*	Agl	22	variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	674	\$2426		19 00.0	+12.53	7.1	17"	An	LC.	colored double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	675	BrsO14		19 01.1	-37 03	9.9	13"	Cra	0 00	double star equal magnitude
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	167.6	h5082		19 03 1	-19 14	9		Sor	9	trinle star
15 17 10 057 -0.02 5.4 30^{0000} A_{cll} 5 2449 R N 19 064 -37.0 5 37^{01} Aql 5 22449 N 19 064 -37.0 5 37^{01} Aql 2 22449 19 1051 $+447.0$ 5 37^{01} Aql 2 22436 19 153 $+51.1$ $+497.5$ 57 8^{01} 2^{01} 2 22436 19 153 $+51.1$ $+497.5$ 57^{01} 57^{01} 29^{01} 22^{01} 72178 N 19 153 $+51.4$ 57^{01} 57^{01} 22^{01} 17 V 19 165 $+33.5$ 57^{01} 21^{01} 22^{01} 17 N 19 255 $+43.7$ 57^{01} 59^{01} 22^{01} 17 N 19 255 $+24.7$ 71^{01} 21^{01} 21^{01} 110^{110} <td< td=""><td>677</td><td>V</td><td>BV</td><td>10.04.4</td><td>-05.41</td><td>88</td><td>Stallar</td><td>401</td><td>- -</td><td>red variable star</td></td<>	677	V	BV	10.04.4	-05.41	88	Stallar	401	- -	red variable star
Gamma Figure 1900 5^{-2}_{-1} 5^{-1}_{-1} <td>678</td> <td>× ۲</td> <td>AL</td> <td>10.05.0</td> <td>14 00-</td> <td>0.0</td> <td>38"</td> <td></td> <td>- u</td> <td>reu variaure star colored double star</td>	678	× ۲	AL	10.05.0	14 00-	0.0	38"		- u	reu variaure star colored double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	670	Gamma		10.06.4	-37 00	t u			n «	double star agual magnituda
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	680	a a	BV	10.06.4	+08 14	u v	Stallar		- I	red variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	68.1	V2449		19 06 4	102 00	2.2	0.ena 8"		- ~	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	682	V2474		19 09 1	+34.35	i S	16"	1 vr	10	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	683	<u>52486</u>		19 12.1	+49.51	6.6		CVO	I m	double star equal magnitude
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-684	05178		19 15.3	+15.1	5.7	.06	Agl	2	double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	-685	Tau	60	19 15.5	+73.4	4.5	*	Dra	21	star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	686	ЯΥ		19 16.5	-33.5	9	*	Sgr	22	variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-687	D	>	19 18.8	+19 37	6.6	Stellar	Sge	22	variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-688	V1942		19 19.2	-15.9	6.4	*	Sgr	22	variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-689	UX	RV	19 21.6	+76 34	5.9	Stellar	Dra	-	red variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-690	RR	>	19 25.5	+42 47	7.1	Stellar	Lyr	22	variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-691	∑2525	ADS 12447	19 26.6	+27.3	8.1	2"	Vul	2	double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	692	h5114		19 27.8	-54.3	5.7	70"	Tel	2	double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	693	Alpha	6	19 28.7	+24.7	4.4	*	Vul	21	star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	694	Albireo	Beta	19 30.7	+28.0	3	35"	Cyg	5	colored double star
AQ 1933 16.4 9.1 * Sgr 22 HN84 1938 16.4 9.1 * Sgr 22 HN84 1939 4.6.3 6.1 * Sgr 22 TT 1939 4.6.3 6.4 28 Sgr 5 16 939 4.6.3 6.4 28 Sgr 5 16 1940 4.12 6.3 5.4 38 Sgr 2 16 1941 1940 4.6.3 6.4 28 Sgr 2 16 1941 1941 1940 4.6.3 7 0.9 2000 17 1946 4.4.6.3 8 Sgr 29 2 17 1946 4.4.6.4 1956 5.1 8 2.9 2° 0.9 2560 17 1946 4.4.18.5 6.1 27 ° 0.9 2560 17 1946 4.4.18.6 2.7 ° 0.9 2560 17 1946 4.4.18.6 2.7 ° 0.9 2560 17 1946 4.4.18.6 2.7 ° 0.9 2560 17 1946 2.7 2° 0.9 2561 17 1946 2.7 2° 0.9 2563 191 147 1916 2.7 2° 0.9 2563 191 147 1916 2.7 2° 0.9 2563 191 147 1916 2.7 2° 0.9 2563 191 144 1920 5.2 2° 0.9 2563 191 214 1920 2.3 2.9 ° 0.9 2563 191 214 1920 2.3 2.8 ° 0.9 261 21 214 1920 2.3 2.9 ° 0.0 261 21 214 148 2.4 100 2.3 2.8 ° 0.0 261 21 214 200 2.5 2.8 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 2.3 ° 0.0 20 2.3 ° 0.0 20 2.3 ° 0.0 2.3 ° 0.0 20 2.3 ° 0.0 2.3 ° 0.0 20 2.3 ° 0.0 2.3	695	Mu	38	19 34.1	+07.4	4.5	*	AqI	21	star
R 1936.8 +50.2 6.1 * Cyg 22 HN84 1936.8 +50.2 6.1 * Cyg 22 54 ADS 12767 1940.7 +16.3 5.4 38" Sgr 2 54 ADS 12767 1940.7 +16.3 5.4 38" Sgr 2 17 1941.9 +50.26 7.8 5.4 38" Sgr 2 71 1945.0 +45.08 5.2 6 3" Cyg 2 7 1945.0 +45.08 5.9 2" Cyg 3 2 7 1945.0 +45.08 4.9 6.9 2" Cyg 2 7 1946.1 1945.1 +10.6 2.7 9" Cyg 2 7 1946.3 +10.6 2.7 19" 19" 4 2 7 1947.4 +18.2 +10.6 2.7 2" 5" 2" 2	-696	AQ		19 34.3	-16.4	9.1	*	Sgr	22	variable star
HN84 19 39.4 +16.34 6.4 28" Sge 5 5 17 19.07 -16.3 5.4 38" Sgr 2 71 17 19.40.7 -16.3 5.4 38" Sgr 2 7 19.40.7 -16.3 5.4 38" Sgr 2 7 19.40.9 +32.6 7.8 3" Cyg 2 7 19.41.8 19.41.8 +50.82 6 2" Cyg 3" 7 19.46.3 +13.61 6 2" Cyg 9 5 7 19.46.3 +10.66 2.7 "Aql 21 2 7 19.46.3 +10.66 3.8 "Aql 21 21 7 19.46.3 +10.65 3.8 "Aql 21 2 7 19.46.3 +10.6 3.8 "Aql 21 2 7 19.47.4 +18.5 3.8 <td< td=""><td>-697</td><td>В</td><td></td><td>19 36.8</td><td>+50.2</td><td>6.1</td><td>*</td><td>Cyg</td><td>22</td><td>variable star</td></td<>	-697	В		19 36.8	+50.2	6.1	*	Cyg	22	variable star
54 ADS 12767 19 40.7 -16.3 5.4 38" Sgr 2 17 1 19 40.9 -16.3 5.4 38" Sgr 2 16 1 19.10.9 +50.32 5 7.8 ° Cyq 22 16 19.41.9 +50.32 6 39" Cyq 3 0.2519 116 19.45.0 +45.08 2.9 2.7 2" Cyq 3 0.2519 17 19.45.3 +10.66 2.7 " Aql 21 12rezed 17 19.46.3 +10.66 2.7 " Aql 21 2560 17 19.46.3 +10.66 2.7 " Ser 29 2 2610 7 18 4.13.3.44 5 2.6" 29" 2 2 2610 7 19.47.4 +11.8 6.1 1.4" 4 4 2 2 2 2 <td< td=""><td>F69.8</td><td>HN84</td><td></td><td>19 39.4</td><td>+1634</td><td>6.4</td><td>28"</td><td>Sge</td><td>5</td><td>colored double star</td></td<>	F69.8	HN84		19 39.4	+1634	6.4	28"	Sge	5	colored double star
IT 19409 +32.6 7.8 * Cyg 22 16 18, Delta" 19409 +32.6 7.8 * Cyg 22 2279 18, Delta" 1945.0 +45.08 2.9 2" Cyg 3 2279 HV, 137 1945.0 +45.08 2.9 2" Cyg 3 0.52560 Tarazed Gamma 1945.3 +10.6 2.7 39" Cyg 9 25560 T 1945.4 +33.44 5 2" Cyg 9 25560 T 1946.4 +33.44 5 2" Cyg 9 2610 7 1946.2 +10.6 2.7 " Cyg 9 25580 T 1948.2 +10.6 2.7 " Set" Cyg 9 2613 T 1948.2 +10.6 2.7 " Set" Cyg 9 2613 T 1948.2 +1	6693	54		19 40.7	-16.3	5.4	38"	Sgr	2	double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1700	TT		19 40.9	+32.6	7.8	*	Cyg	22	variable star
S259 H & Delta* 1945.0 +45.08 2.9 2* Cyg 9 0\[2\]\[2\]\[2\]\[2\]\[2\]\[2\]\[2\]\[2\	701	16		19 41.8	+50 32	9	39"	Cyg	e	double star equal magnitude
ΟΣΣ191 Η V 137 19 45.9 +35 01 6 39" Cyg 5 Tarazed Gamma 19 46.3 +10.6 2.7 * Aql 21 Tarazed Gamma 17 19 46.3 +10.6 2.7 * Aql 21 S2650 17 19 46.4 +13.6 2.7 * Aql 21 Delta 7 19 47.4 +18.5 3.8 * Sge 21 Delta 7 19 47.4 +18.5 3.8 * Dra 9 Z563 Pi 19 48.7 +11.8 6.1 1.4" Aql 4 Z61a V 19 48.7 +11.8 6.1 1.4" Aql 4 Z61a V 19 48.7 +11.8 6.1 1.4" Aql 2 Z61a V 19 49.0 +19 06 5 9" Sge 2 Z61a V 19 48.7 +11.8	1702	S2579	"18, Delta"	19 45.0	+45 08	2.9	2"	Cyg	6	double star magnitude contrast
Tarazed Gamma 19 46.3 +10.6 2.7 * Aqi 21 2580 17 19 46.3 +10.6 2.7 * Aqi 21 2580 17 19 46.4 +33.4 5 26* Cyg 9 Delta 7 19 47.4 +18.5 3.8 26* Cyg 9 Epsion 7 19 48.2 +70.16 3.8 3.7 59 2 2583 Pi 19 49.0 +19 09 5 9* 2 <td>F703</td> <td>022191</td> <td>H V 137</td> <td>19 45.9</td> <td>+35 01</td> <td>9</td> <td>39"</td> <td>Cyg</td> <td>5</td> <td>colored double star</td>	F703	022191	H V 137	19 45.9	+35 01	9	39"	Cyg	5	colored double star
Y2580 17 1946.4 +33.44 5 26" Cyg 9 Delta 7 1947.4 +18.5 3.8 * Sge 21 Epsilon 1947.4 +10.6 3.8 * Sge 21 Epsilon 1947.4 +11.6 6.1 1.4" Aql 4 Z563 Pi 1948.7 +11.8 6.1 1.4" Aql 4 Zeta U 1949.0 +1909 5 9" Sge 2 Cita V 1943.0 +1903 5 9" Sqe 2 Altair V 1950.8 +0652 0.8 Aql 21	T704	Tarazed	Gamma	19 46.3	+10.6	2.7	*	Agl	21	star
Delta 7 1947.4 +18.5 3.8 * Sge 21 Epsilon 1948.2 +17.16 3.8 3" Dra 9 Z553 P1 1948.2 +17.8 6.1 1.4" Aq1 4 Zeta 1948.2 +17.90 5 9" Sge 2 Cata V 1949.0 +1900 5 9" Sge 2 Cita V 1949.0 +1900 5 9" Sge 2 Attair V 1950.6 +32.55 3.3 Stellar Cyq 22 Attair 1950.6 +08.52 0.8 * Aq1 21	T705	∑2580	17	19 46.4	+33 44	5	26"	Cyg	6	double star magnitude contrast
Epsilon 1948.2 +7016 38 3" Dra 9 2583 Pi 1948.2 +7016 38 3" Dra 9 2263 Pi 1949.7 +118 6.1 1.4" Aqi 4 2cla V 1949.7 +10.9 5 9" 2 Ciri V 1950.6 +32.55 3.3 Siellar Cyg 22 Altair Apha 1950.6 +32.55 0.8 -8.41 27	T706	Delta	7	19 47.4	+18.5	3.8	*	Sge	21	star
Σ2583 Pi 19.48.7 +11.8 6.1 1.4" Aql 4 Zeta 1 94.9.0 +19.90 5 9" Sge 2 Chi V 19.49.0 +19.09 5 9" Sge 2 Chi V 19.50.8 +0.85.5 3.3 Stellar Cyg 22 Altair Altair 19.50.8 +0.85.2 0.8 - Aql 21	T707	Epsilon		19 48.2	+7016	3.8	3"	Dra	6	double star magnitude contrast
Zeta 19.40 +19.09 5 9" Sge 2 Chi V 19.50.6 +32.55 0.3 Stellar Cyg 22 Altair Alpha 19.50.6 +0.82.5 0.8 Aq1 21	T708	∑2583	Ρi	19 48.7	+11.8	6.1	1.4"	AqI	4	double star challenge
Chi V 19 50.6 +32 55 3.3 Stellar Cyg 22 Altair Alpha 19 50.8 +08 52 0.8 * Aql 21	T709	Zeta		19 49.0	+19 09	5	.6	Sge	2	double star
Altair Alpha 19.50.8 +08.52 0.8 * Aql 21	T710	Chi	>	19 50.6	+32 55	3.3	Stellar	Cyg	22	variable star
	T711	Altair	Alpha	19 50.8	+08 52	0.8	*	AqI	21	star

Number	Name	Other	RA	Dec	Mag	Sep	Con	Code	
ST713	57		19 54.6	-08 14	5.7	36"	Agl	0	double star
ST714	O 7532	Beta	19 55.3	+06.4	3.7	13"	Agl	0	double star
ST715	Psi		19 55.6	+52 26	4.9	3"	Cva	6	double star magnitude contrast
ST716	RR		19 55.9	-29.2	5.4	*	Sgr	22	variable star
ST717	RU		19 58.7	-41.9	9	*	Sgr	22	variable star
ST718	Gamma	12	19 58.8	+19.5	3.5	*	Sge	21	star
ST719	BF		20 02.4	+21.1	8.5	*	Sge	22	variable star
ST720	h1470		20 03.6	+38 19	7.6	29"	Cyg	5	colored double star
ST721	×		20 05.1	+20.7	7	*	Sge	22	variable star
ST722	MZ	:	20 07.6	+17.7		*	Sge	22	variable star
ST723	22675	Kappa	20 08.9	+77 43	4.4	7	Cep	6	double star magnitude contrast
S1/24	22637	I heta	20 09.9	+20 55	6.4	12″	Sge	9	triple star
ST725	RY		20 10.4	+36.0	8.5	* •	Cyg	22	variable star
S1726	FG		20 11.9	+20.3	9.5	. 1	Sge	35	planetary nebula irregular
ST727	22644		20 12.6	+00 52	6.8		Aq	en 1	double star equal magnitude
S1728	HS		20 13.4	+38.7	6.5	. 1	Cyg	22	variable star
ST729	22658		20 13.6	+53 07	7.1	م	Cyg	2	double star
ST730	Omicron1	"ADS 13554, V 695"		+46.7	3.8	*	Cyg	21	star
ST731	RT		20 17.1	-21.3	8.9	*	Cap	22	variable star
ST732	Alpha		20 17.6	-12.5	4.2	44"	Cap	21	star
ST733	RT		20 17.7	-39.1	9	•	Sgr	22	variable star
ST734	٩.		20 17.8	+38 02	3	Stellar	Cyg	22	variable star
ST735	Alpha		20 18.0	-12 32	3.8	7"	Cap	7	quadruple star
ST736	<u>5</u> 2671		20 18.4	+55 23	9	4"	Cyg	2	double star
ST737	D		20 19.6	+47.9	5.9	*	Cyg	22	variable star
ST738	Dabih	Beta	20 21.0	-14.8	3.4	3,	Cap	2	double star
ST739	39	39	20 23.9	+32.2	4.4	*	Cyg	21	star
ST740	Peacock	Alpha	20 25.6	-56.7	1.9	*	Pav	21	star
ST741	pi		20 27.3	-18 13	5.3	3"	Cap	6	double star magnitude contrast
ST742	Omicron	SHJ 324	20 29.9	-18 35	6.1	19"	Cap	5	double star
ST743	<u>2</u> 2716	49	20 41.0	+32 18	5.5	3"	Cyg	6	double star magnitude contrast
ST744			20 41.3	+48.2	7.7	* •	Cyg	22	variable star
S1745	Deneb	Alpha	20 41.4	+45 17	1.3	. 1	Cyg	21	star
S1746	22726	52	20 45.7	+30.7	4.2	.9	Cyg	2	double star
S1747	Gamma		20 46.7	+16 07	4.3	10"	Del	2	double star
S1/48	Lambda	AUS 14296	20 47.4	+36.5	4.4 4 4		Cyg	4 +	double star challenge
01/49 CT760	3 S763		0 48 10	-18 11	4.4 6.7	16"	Adr	- 0	reu variaure star double star
ST761	2000	ADS 11360	20 51 4	-05.6	6.4	.a c	Aar	4	double star challenge
ST752	Omeda	18	20.51.8	-26.9	4.1		Can	21	star
ST753	Ensilon	, 	20.59.1	+04 18	5.2	÷.	Equ	i ∝	triple star challenge
ST754	<u>52751</u>	ADS 14575	21 02.1	+56.7	6.1	1.5"	Cep	4	double star challenge
ST755	<u>5</u> 2742	0	21 02.2	+07 11	7.4	3"	Equ	е	double star equal magnitude
ST756	Dunlop236		21 02.2	-43.0	9	57"	Mic	2	double star
ST757	Lambda	ADS 14556	21 02.2	+07.2	7.4	3"	Equ	2	double star
ST758	12		21 04.1	-05 49	5.9	3"	Agr	4	double star challenge
ST759	xi	62	21 04.9	+43.9	3.7	*	Cyg	21	star
ST760	<u>5</u> 2758	61	21 06.9	+38 39	5.2	29"	Cyg	2	double star
ST761	24	ADS 14632	21 07.1	-25.0	4.5	*	Cap	39	stellar planetary nebula
ST762	- I		21 09.5	+68.5	5.2	* 1	Cep	22	variable star
S1763	Gamma		21 10.3	+10.1	4.7	.9	Equ	24	double star
S1764 ST765	22780 Polto	ADS 14749	21 11.8 21 14 E	+60.0	5.6 4 e	1.0"	Cep	4 c	double star challenge
S1/65 CT766	Thota	heada	C114.0	+10.00	0.4 7	48" 5"	Equ	ה מ	double star magnitude contrast
01/00	l heta	007.0U	21 12.2	-03.0	0.4		ING	2	
51/6/	НҮ		5.02 TS	-10.8	α	*	Aqr	7.7	variable star

TYP Y	Number	Name	Uther	КA	Dec	Iniay	och	201	2000	
Beat FU 21 28.7 79 30 33 14 14	ST768	~			-69.7	8.6	*	Pav	22	variable star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ST760	Beta		01 28 7	+70.33	0.0	1.0"	Can	0	double star magnitude contract
Yagie 21 300 457 30 56 1 12 06 6 Yagie Sister 21 42.0 455 5 56 1 2 0.0 22 Sister Sister 21 42.0 455 7 56 1 2 0.0 22 Filter No 21 43.5 543 1 55 1 0.0 22 0.0 22 Familian No 21 43.5 515 0 422 1 56 1 2 0.0 22 Stati 21 51.0 422 1 54 1 5 3 0.0 2	ST770	v c	RV	21 35 2	+78.37	7.4	Stellar	Cen	C	red variable star
N440 C 1 4 20 14 30 C 1 2 3 3 90 7 1 $C 1$ $C $	ST771	52816		21 39.0	+57 29	2.6	12"	Cen	. g	triple star
SS 21 4.2.7 143.3 143.4 143.3 143.4 <th< td=""><td>ST772</td><td>V460</td><td></td><td>21 42.0</td><td>+35.5</td><td>5.6</td><td>*</td><td>Cva</td><td>22</td><td>variable star</td></th<>	ST772	V460		21 42.0	+35.5	5.6	*	Cva	22	variable star
Fix No 21 43.3 438.0 7.1 5.1 </td <td>ST773</td> <td>SS</td> <td></td> <td>21 42.7</td> <td>+43 35</td> <td>8.2</td> <td>Stellar</td> <td>Cva</td> <td>22</td> <td>variable star</td>	ST773	SS		21 42.7	+43 35	8.2	Stellar	Cva	22	variable star
Fieldentis Garrate Start 143:5 143	ST774	BV		21 43 3	138.0	7 1	*	Cvo Cvo	20	variahle star
Epillon 15142 499 20 25 92 92 94 91 Add h5274 h5142 5193<	ST775	Herschel's Garnet Star		21 43 5	+58.47	3.4	Stellar	Can	1 -	red variable star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST776	Encilon		01 44 0	100 50	0.5	82"	Doc	- 0	double star magnitude contrast
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	01/10		2010	24 50 0	20 204	0.4	0.0	100	D C	double star magimude commast
Part Part <t< td=""><td>51///</td><td>Lampda</td><td>8/7GU</td><td>21 20.9</td><td>- 92.1</td><td>9.4</td><td>n *</td><td>Doc</td><td>N</td><td>double star</td></t<>	51///	Lampda	8/7GU	21 20.9	- 92.1	9.4	n *	Doc	N	double star
$ \begin{array}{c ccccc} & \text{Total III} & \text{Total IIII} & Total IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII$	01110	01000		2017	112.0	5	50 T	6 L	77 0	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	01/18	22840		0.2012	14 0 14	0.0	10	Cep	V 0	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	51/80	22841		21 54.3	+19./	6.4		Peg	.7	double star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	51/81	RX		21 56.4	+22.9	201	. 1	Peg	77.	variable star
Eta $9.2(6)$ 2.208 882 7.8 1.9° 7.84 7.87 7.82 7.95 7.95 7.95 7.95 7.95 7.95 7.95 7.75 $7.$	51/82	228/3		21 58.4	19.28+	1.7	14	Cep		double star equal magnitude
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ST783	Eta	B 276	22 00.8	-28 27	5.8	1.9"	Psa	5	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST784	29	S 802	22 02.5	-16 58	7.2	4"	Aqr	e	double star equal magnitude
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST785	∑2863	"17, Xi"	22 03.8	+64 38	4.3	8"	Cep	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST786	O∑461	ADS 15601	22 03.9	+59.8	6.7	11.1"	Cep	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST787	Lambda		22 06.1	-39.5	4.5	*	Gru	21	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST788	Al Nair	Alpha	22 08.2	-46 58	1.7	Stellar	Gru	21	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST789	<u> </u>		22 10.7	+70 07	5.7	15"	Cep	2	double star
$h1746$ ADS 15758 22139 $+397$ 4.5 28° Lai 2 1 22163 $+31.7$ 4.1 5 104 22 104 22 104 22 104 22 104 22 104 22 104 22 104 22 104 22 104 22 104 22 104 22 104 22 22 104 22 104 22 22 104 22 22 104 22 22 104 216 27° 210 22 22 104 21 216 27° 210	ST790	Zeta		22 10.9	+58.2	3.4	*	Cep	21	star
41 22 14.3 2104 5.3 5'' Apr 5 1 Alpha 22 16.0 37.7 4.1 5 Lac 5 2 18.0 57.7 2.9 5.9 5.0 2.2 2 18.0 57.7 2.9 5.9 5.7 5.0 2.2 2 2 5.6 4.6 5.7 5.0 2.2 53 5.3 2.2261 4.64 $6.$ 7.7 4.0 2.2 53 5.3 2.273 $6.6.0$ 4.5 7.7 4.0 2.7 53 $5.6.0$ 4.5 7.7 4.1 5.7 7.0 2.2 5.912 2.2281 -0.071 3.8 2.7 1.00 2.7 5.00 5.53 3.93 5.5 7.7 4.1 4.7 2.100 2.100 2.100 2.100 2.100 2.100 <	ST791	h1746		22 13.9	+39.7	4.5	28"	Lac	2	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST792	41		22 14.3	-21 04	5.3	5"	Aqr	5	colored double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST793	t		22 16.0	+37.7	4.1	*	Lac	21	star
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ST794	Alpha		22 18.5	-60.3	2.9	5'	Tuc	21	star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ST795	Σ2894		22 18.9	+37 46	6.1	16"	Lac	2	colored double star
S 22 26.1 -16.4.4 6 * 6ru 22 53 53 22 27.3 -16.4.4 6 * 6ru 22 Negrefo ADS 15972 22 28.8 -00.17 9.8 7" Tuc 2 Nuger60 ADS 15972 22 28.9 -00.17 9.8 7" Tuc 2 Delta 22 29.2 +56.5 45.8 7" 7 10" 2 Zeta 22 29.9 +61.7 4.1 15" Cep 5 Delta 22 29.9 +43.7 4.1 15" 6 4 Seta 22 29.6 +49.46 5.8 1.7 9 4 Seta 22 30.0 44.3 5.8 1.8 6 2 1 Delta 22 30.0 46.5 2.1 1.6 4 2 1 Delta 22 30.0 46.5 2.1 1.4 15" 1.4 15" 1.4 <	ST796	Ρi		22 23.1	-45.9	5.8	2.7"	Gru	2	double star
Delta h5334 22 250 -15 7 1 1 7 7 1 1 7 1	51797	so i		22 26.1	-48.4	9	. 5	Gru	22	variable star
Negled No.334 22 27/3 -65/0 4.5 7 1uc 2 Zeta Delta Destave 22 28.8 -00 01 4.5 7 1uc 2 Zeta Delta 22 29.2 +47.7 4.4 5' Loc 2 Delta 22 29.8 -00 01 4.3 2'' Agr 4 Seta 22 29.0 +47.7 4.4 5' Lac 2 Delta2 37 22 29.0 +47.7 4.4 5' Lac 7 Seta 22 29.5 +47.7 4.4 5' Lac 7 Taul 69 22.1 -46.9 2.1 Lac 7 Taul 69 22.1 -46.9 2.1 2.3 Agr Lac 6 1 1 69 2.1 -46.9 2.1 2.1 2.1 2.1 1 1 69 2.1 -46.9 2.1 2.1	21/98			0.02.22	C+ 01-	0.4	0	Adr	۰ ۱	double star equal magnitude
Zenderbou AUS 19972 Z 228.8 -001/1 4.3 2 - qrep 2 Delta 22292 +56.85 3.8 20' Cep 5 S 5 5 5.8 -001/1 4.3 2' - dep 4 Delta 22292 +56.85 3.8 20' Cep 5 Delta2 22293 -43.7 4.1 15' Gru 1 Delta2 22305 +39.46 5.8 1.7 4.1 15' Gru 21 Delta2 22305 +39.46 5.8 4.3' Lac 7 1 Delta 22355 +39.46 5.8 4.3' Lac 7 1 T 22355 +43.3 5.6 2.7' Lac 21 Delta 22 22.7 4.6 2.7 Lac 21 Tau2 Tau2 7.1 6.1 1.7' Cep 22' 21	ST799	Delta	h5334	22 27.3	-65.0	4.5		Tuc	5	double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	51800	Kruger60		22 28.1	/./ 6+	9.8	5	Cep		double star
5 1 1 5 1	ST801	Zeta		22 28.8	-00 01	4.3	2"	Aqr	4	double star challenge
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ST802	Delta		22 29.2	+58 25	3.8	20"	Cep	2	colored double star
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	51803	5		22 29.5	+47.7	4.4	2	Lac	21	star
Total Tit Tit </td <td>ST804</td> <td>Delta2</td> <td></td> <td>22 29.8</td> <td>-43.7</td> <td>4.1</td> <td>15'</td> <td>Gru</td> <td>-</td> <td>red variable star</td>	ST804	Delta2		22 29.8	-43.7	4.1	15'	Gru	-	red variable star
Rest7 22325 +3946 5.8 43' Lac 7 1 1 22325 +39346 5.8 23' Lac 7 11 1 22405 +443 4.5 2' Lac 7 11 22457 -44.3 4.5 2' Lac 7 13u1 69 22427 -44.5 2.1 23' Agr<21	ST805	S2912	37	22 30.0	+04.4	5.8		Peg	4	double star challenge
8 22 35.9 +39.38 6.5 22" Lac 6 11 22 40.5 +43.3 4.5 2." Lac 6 Beta 22 40.5 +43.3 4.5 2." Lac 6 Tau1 69 22 42.7 -46.9 2.1 ." Lac 2 Tau1 69 22 42.7 -46.9 2.1 ." Cap 2 Tau2 71 19.1 5.7 2.3" Cap 2 2 Tau2 71 15.6 4.119 7.1 82" Cap 2 52950 71 82" 1.2 4.119 7.1 82" 2 11823 73 255.6 -29.7 7.1 82" 2 2 11823 73 255.6 -29.7 7.1 82" 2 2 11823 73 255.6 -29.7 7.1 9." 2 2 5	ST806	Roe47		22 32.5	+39 46	5.8	43"	Lac	7	quadruple star
11 22 40.5 +44.3 4.5 * Lac 21 Beta 22 47.7 -44.3 4.5 * Lac 21 Tau1 69 22 47.7 -44.1 5.7 23" Aqr 21 Tau1 69 22 47.7 -14.1 5.7 23" Aqr 21 7u2947 71 22 49.0 -13.6 6.1 1.7" Cep 2 7u2950 ADS 16291 22 51.4 +61.7 6.1 1.7" Cep 2 72950 ADS 16217 22 51.4 +61.7 6.1 1.7" Cep 2 10863 73 22 55.6 -7.1 82" Lac 7 11863 7 22 55.6 -7.17 1.2 * Agr 21 11863 7 22 55.6 -7.16 3.7 * Agr 21 11863 7 28 25.76 -9.937 1.2 * 4.6 <td>ST807</td> <td>8</td> <td></td> <td>22 35.9</td> <td>+39 38</td> <td>6.5</td> <td>22"</td> <td>Lac</td> <td>9</td> <td>triple star</td>	ST807	8		22 35.9	+39 38	6.5	22"	Lac	9	triple star
Beta 22 42.7 -146.9 2.1 * Giu 21 Tault 69 22 42.7 -146.9 2.1 * 6iu 21 Tault 69 22 43.7 -146.9 2.1 * 6iu 21 2947 ADS 16291 22 49.0 +68.6 7 2.3" Guu 21 2926 ADS 16317 22 51.8 +11.9 6.1 1.7" Cep 2 2930 ADS 16317 22 51.8 +11.9 7.1 82" Lac 7 21 22 51.6 -29 37 1.2 * Aqr 21 21 ADS 16317 22 51.6 -29 37 1.2 * Aqr 21 21 ADS 16428 23 57.6 -29 37 1.2 * Aqr 21 25 Femalhaut ADS 16428 23 03.2 +11.7 0.7" Peg 21 5 Formihaut ADS 16428 23 03.2 +11.7	ST808	11		22 40.5	+44.3	4.5	•	Lac	21	star
Tau1 6.7 2.2* Apr 2 71 22.47 -16.1 5.7 22* Apr 2 71 22.49 -13.6 4 4.3* Cep 2 71 22.49 -13.6 4 4.0* Apr 2 71 22.49 -13.6 4 4.0* Apr 2 7393 ADS 16317 22.51.4 +11.7 6.1 1.7* Cep 2 72950 ADS 16317 22.51.6 -97.6 3.7 8.2* Lac 7 1863 7.3 22.51.6 -97.6 3.7 8.2* Lac 7 1883 7.3 22.51.6 -97.6 3.7 8.7 2.4 2 1883 7.3 22.56 -97.6 3.7 8.7 2.4 2 5 5 26.92 +11.7 6.1 0.7* Peg 4 5 5 21.2 2.41.17	ST809	Beta		22 42.7	-46.9	2.1	*	Gru	21	star
Σ2947 DS 16291 22 49.0 +68.6 7 4.3" Cep 2 Tau2 71 22 49.0 +68.6 7 4.3" Cep 2 Tau2 71 22 51.4 +61.7 6.1 1.7" Cep 2 2950 ADS 16317 22 51.4 +61.7 6.1 1.7" Cep 2 18823 ADS 16317 22 51.6 -07.16 7.1 82" Lac 7 Lambda 73 22 55.6 -07.16 7.1 82" Lac 7 Fomalhaut Alpha 22 55.6 -07.16 7.1 82" Lac 7 5 Fomalhaut Alpha 22 55.2 -11.7 6.1 0.7" Peg 4 5 Scheat Bela 23 30.72 +50.7 6.1 0.7" Peg 21 57978 30.72 +50.7 4.5 4.6 1.2" 21 57978 20	ST810	Tau1	69	22 47.7	-14.1	5.7	23"	Aqr	2	double star
Tau2 Tau2 <th< td=""><td>ST811</td><td>Σ2947</td><td>ADS 16291</td><td>22 49.0</td><td>+68.6</td><td>7</td><td>4.3"</td><td>Cep</td><td>2</td><td>double star</td></th<>	ST811	Σ2947	ADS 16291	22 49.0	+68.6	7	4.3"	Cep	2	double star
72950 ADS 16317 22514 +61.7 6.1 1.7" Cep 2 h123 2251.8 +11.9 7.1 82" Lac 7 Lambda 73 2251.6 -07.6 3.7 82" Lac 7 Lambda 73 2257.6 -07.6 3.7 82" Lac 7 Fomalhaut ADS 16428 2257.6 -07.6 3.7 1.2 * Agr 21 52 ADS 16428 22303.8 +28.1 2.4 0.7" Peg 4 57 Scheat Bela 2303.8 +28.1 2.4 Peg 21 57 Duilop246 6.1 9" 61U 2" 2 7978 2307.2 +50.7 +75.4 4.6 1.2" 2 7978 2307.9 +75.4 4.6 1.2" 2 2	ST812	Tau2	71	22 49.6	-13.6	4	40'	Aqr	21	star
Interast 22 51.8 -+11.9 7.1 B2" Lac 7 Lambda 73 22 51.6 -+11.9 7.1 B2" Lac 7 Lambda 73 22 57.6 -29 57 1.2 * Aqr 21 Formathaut Alpha 22 57.6 -29 57 1.2 * Aqr 21 5 Abs 16428 22 59.2 +11.7 6.1 0.7" Peg 4 5 Scheat Beta 23 307.2 -50.7 6.1 9" Gru 2 Dunlop246 Beta 23 307.2 -50.7 6.1 9" Gru 2 7978 20.7 4.5.4 4.6 1.2" Cep 4 7978 207.3 +75.4 4.6 1.2" Cep 4	ST813	S2950	ADS 16317	22 51.4	+61.7	6.1	1.7"	Cep	2	double star
Familya 73 22 52.6 -07.6 3.7 * Aqr 21 Formalhaut Alpha 22 59.6 -07.6 3.7 * Aqr 21 52 ADS 16428 22 59.2 +11.7 6.1 0.7" Peg 4 52 Scheat Bela 23 03.8 +28.1 2.4 * Peg 21 Dullop246 1 23 03.8 +28.1 2.4 * Peg 21 2976 50.7 6.1 9" Gru 2 57978 23 07.2 +50.7 6.1 9" Gru 2 5978 23 07.9 +75.4 4.6 1.2" Cep 4	ST814	h1823		22 51.8	+41 19	7.1	82"	Lac	7	quadruple star
Formalhaut Apha 22 57.6 -29 37 1.2 * PsA 21 52 ADS 16428 22 59.2 11.7 6.1 0.7" Peg 4 52 Scheat Beta 23 03.8 +28.1 2.4 Peg 4 57 Scheat 23 07.2 +36.17 6.1 0.7" Peg 2 579 23 07.2 +36.17 2.4 * Peg 2 7978 23 07.2 +36.17 2.4 6.1 9" Peg 2 7978 23 07.2 +35.4 4.6 1.2" Cep 4 71 0.17 4.6 1.2" Cep 4	ST815	Lambda	73	22 52.6	-07.6	3.7	*	Aqr	21	star
State ADS (6428) 22 59.2 +11.7 6.1 0.7" Peg 4 Stheat Belta 23 59.2 +11.7 2.1 9.7 Peg 2 Dunlop246 Belta 23 07.2 -50.7 6.1 9" 61u 2 Y2978 23 07.2 -50.7 6.1 9" 6u 2 Y2978 23 07.9 +3.4.9 6.3 8" Peg 2 Y1 ADS 16538 23 07.9 +75.4 4.6 1.2" Cep 4	ST816	Fomalhaut	Alpha	22 57.6	-29 37	1.2	*	PsA	21	star
Scheat Beta 23 03.8 +28.1 2.4 * Peg 21 Dunlop246 23 07.5 +30.7 +30.7 9.1 Gru 2 \$2973 307.5 +32.4 4.6 1.2" Peg 2 \$2973 23 07.5 +32.4 6.1 9" Peg 2 \$2973 23 07.9 +75.4 4.6 1.2" Cep 4 Pi 0 23 07.9 +75.4 4.6 1.2" Cep 4	ST817	52	ADS 16428	22 59.2	+11.7	6.1	0.7"	Peg	4	double star challenge
Dullop246 23.072 -30.7 -50.7 -6.1 9° Gru 2 2.2978 2.2072 -32.9 6.3 9° Gru 2 2.2978 -15.4 6.6 1.2° Cep 2 P.1. ADS 16538 2.307.9 +75.4 4.6 1.2° Cep 4 P.1. Cep 4	ST818	Scheat	Beta	23 03.8	+28.1	2.4	*	Peg	21	star
229/8 22 0/5 +32 49 6.3 8" Peg 2 Pi ADS 16538 23 0/9 +75.4 4.6 1.2" Cep 4 Pi c.	ST819	Dunlop246		23 07.2	-50.7	6.1	9"	Gru	5	double star
PI ADS 16538 23 07.9 +7.5.4 4.6 1.2." Cep 4	S1820	22978		23 07.5	+32 49	6.3		Peg	21	double star
	ST821	Pi	ADS 16538	23 07.9	+75.4	4.6	1.2	Cen	4	

	2		
· -		Aqr 2	double star
-	13"	Aqr 5	colored double star
5	27"	Gru 2	double star
*		Aqr 21	star
ŝ	Stellar	And 22	variable star
*		Cep 21	star
4		Phe 2	double star
St	Stellar	Aqr 22	variable star
-2		Aqr 3	double star equal magnitude
St	Stellar	Psc 1	red variable star
5"		And 3	double star equal magnitude
-2		Scl 2	double star
ŝ	Stellar	Cas 22	variable star
ő		Cas 5	colored double star
÷	1.5"	And 4	double star challenge

One-Year Limited Warranty

This Orion IntelliScope Computerized Object Locator is warranted against defects in materials or workmanship for a period of one year from the date of purchase. This warranty is for the benefit of the original retail purchaser only. During this warranty period Orion Telescopes & Binoculars will repair or replace, at Orion's option, any warranted instrument that proves to be defective, provided it is returned postage paid to: Orion Warranty Repair, 89 Hangar Way, Watsonville, CA 95076. If the product is not registered, proof of purchase (such as a copy of the original invoice) is required.

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