

Using JMI Digital Setting Circles with Astro-Physics Mounts

INSTALLATION OF ENCODERS AND ENCODER HOUSINGS

Please refer to separate chapter describing procedures for your mount.

SETUP MOUNT TYPE AND ENCODER RATIO IN DIGITAL SETTING CIRCLE COMPUTER

The JMI Digital Setting Circles were developed to be used with a wide variety of mounts and encoder arrangements. In order for the unit to work properly, information regarding the type of mount and the encoder ratio must be entered into the computer software.

If you purchased your JMI Digital Setting Circles from Astro-Physics, the mount setting ("GQ" for NGC-microMAX, "GP" for NGC-miniMAX and NGC-MAX) and the correct encoder ratios have already been installed for your convenience. These settings will remain in nonvolatile memory and you probably will not have to enter them again. Nevertheless, we do suggest that you verify the settings and make a few additional choices regarding some of the other functions. Select the instructions for the JMI unit that you are using. Note that instructions are included for several version numbers. When you turn your unit on, the version number will display. Proceed with the appropriate instructions.

If you purchased your JMI Digital Setting Circles from another vendor, you must follow the procedures below for your Astro-Physics mount. If you use the JMI Digital Setting Circles for another mount you own, consult the JMI instruction booklet for further information.

NGC-microMAX (version lower than 1.00)

The only German Equatorial mount setting available is "GQ" (German Equatorial). The mount will not need to be polar aligned when you are observing.

1. Turn on the hand held computer read-out unit. Adjust DIM for the desired brightness level. The unit will read briefly "JMI" and the version number of the software. The display will stop when it reaches "DEC=0."
2. Press the MODE button. Display will read "STAR FIX."
3. Press the UP or DOWN button several times until the display reads "SETUP." Press ENTER.
4. Press the UP or DOWN button several times to scroll through choices. Stop when display reads "EQ." Press ENTER
5. The display now reads "SCROLL " and a flashing number from 0-9. This indicates the rate of speed of the scrolling messages. "0" is very slow, "5" is about right, and "9" is very fast.
6. Press the UP or DOWN button several times until the desired scroll rate appears. Press ENTER
7. A number appears. It must be "1+0.5120" which is the correct encoder ratio for our right ascension encoder. To confirm this number push the ENTER button 6 times which stores each digit. If this number does not appear in the display, use the UP and DOWN buttons for each digit, then press ENTER to confirm.

8. After step 7, the number "2+0.5120" should appear. This is the correct encoder ratio for our declination encoder. Press ENTER another 6 times to store this number. Follow the same procedure as step #7 if you need to change the number.

9. The setup is now complete for Astro-Physics German Equatorial Mounts. Remember that if you want to use to Digital Setting Circle for your Dobsonian or fork mounted telescopes, the settings will need to be changed. Consult the JMI instruction booklet.

10. Refer to the JMI instruction sheet entitled "The Importance of "Set Dec=0" for the next step.

NGC-microMAX (version 1.04)

The only German Equatorial mount setting available is "GQ" (German Equatorial). The mount will not need to be polar aligned when you are observing.

1. Turn on the hand held computer read-out unit. Adjust DIM for the desired brightness level. The unit will read briefly "JMI" and the version number of the software. The display will stop when it reaches "DEC=0."

2. Press the MODE button. Display will read "STAR FIX."

3. Press the UP or DOWN button several times until the display reads "SETUP." Press ENTER.

4. Press the UP or DOWN button several times to scroll through choices. Stop when display reads "EQ." Press ENTER

5. The display now reads "SCROLL " and a flashing number from 0-9. This indicates the rate of speed of the scrolling messages. "0" is very slow, "5" is about right, and "9" is very fast.

6. Press the UP or DOWN button several times until the desired scroll rate appears. Press ENTER

7. A number appears. It must be "R +04000" which is the correct encoder ratio for our right ascension encoder. To confirm this number push the ENTER button 6 times which stores each digit. If this number does not appear in the display, use the UP and DOWN buttons for each digit, then press ENTER to confirm.

8. After step 7, the number "D +04000" should appear. This is the correct encoder ratio for our declination encoder. Press ENTER another 6 times to store this number. Follow the same procedure as step #7 if you need to change the number.

9. The setup is now complete for Astro-Physics German Equatorial Mounts. Remember that if you want to use to Digital Setting Circle for your Dobsonian or fork mounted telescopes, the settings will need to be changed. Consult the JMI instruction booklet.

10. Refer to the JMI instruction sheet entitled "The Importance of "Set Dec=0" for the next step.

NGC-miniMAX (version 2.81)

You can choose either the "GQ" (German Equatorial, not polar aligned) or the "GP" (German Perfect, polar aligned). After trying both of these settings ourselves, we have concluded that it is much easier to use the "GP" setting which requires polar alignment (with a polar axis telescope or using the polar align mode of the NGC-miniMAX) rather than go through the "DEC=0" procedure as described in the JMI instruction manual.

This setup is only done once, then remains correct for a given telescope. This one time operation stores the setup information in non-volatile memory. If you are planning to use the NGC-

miniMAX to help you find the planets, you will have to enter the correct date by using steps 1-4 below, then press the MODE button to exit SETUP.

1. Turn on the hand held computer read-out unit. Adjust the DIM button for the desired brightness level. The unit will read briefly "JMI" and the version number of the software. The display will stop on one of the mode settings.
2. Press the UP or DOWN button several times until the display reads "SETUP." Press ENTER.
3. A date will be displayed. If any digits are incorrect, you can select the correct digit by pressing the UP or DOWN buttons to scroll through the choices. Press ENTER to confirm each digit of the date. Unless you plan to find the planets during your observing session, the accuracy of the date is not important.
4. After you have finished step 3, the display will read "SCOPE" and will flash a two letter abbreviation for a type of mount. Press UP or DOWN buttons several times to scroll through choices. Stop when display reads "GP" or "GQ." depending on whether you plan to be polar aligned or not. Press ENTER
5. The display now reads "ENGLISH" or one of the other language choices. Press ENTER to confirm or change using the UP or DOWN buttons. (Other choices are German, Italian, French, and Spanish)
6. The display now reads "SCROLL" and a flashing number from 0-9. This indicates the rate of speed of the scrolling messages. "0" is very slow, "5" is about right, and "9" is very fast.
7. Press the UP or DOWN button several times until the desired scroll rate appears. Press ENTER
8. A number appears. It must be "1+0.5120" which is the correct encoder ratio for our right ascension encoder. To confirm this number push the ENTER button 6 times which stores each digit. If this number does not appear in the display, use the UP and DOWN buttons for each digit, then press ENTER to confirm.
9. After step 7, the number "2+0.5120" should appear. This is the correct encoder ratio for our declination encoder. Press ENTER another 6 times to store this number. Follow the same procedure as step #7 if you need to change the number.
10. The setup is now complete for Astro-Physics German Equatorial Mounts. Remember that if you want to use to the Digital Setting Circle computer for your Dobsonian or fork mounted telescopes, the settings will need to be changed. Consult the JMI instruction booklet.
11. If you chose the "GQ" option, refer to the JMI instruction sheet entitled "The Importance of 'Set Dec=0'" for the next step.

NGC-miniMAX (version 2.87)

You can choose either the "GQ" (German Equatorial, not polar aligned) or the "GP" (German Perfect, polar aligned). After trying both of these settings ourselves, we have concluded that it is much easier to use the "GP" setting which requires polar alignment (with a polar axis telescope or using the polar align mode of the NGC-miniMAX) rather than go through the "DEC=0" procedure as described in the JMI instruction manual.

This setup is only done once, then remains correct for a given telescope. This one time operation stores the setup information in non-volatile memory.

1. Turn on the hand held computer read-out unit. Adjust the DIM button for the desired brightness level. The unit will read briefly "JMI" and the version number of the software. The display will stop on one of the mode settings.

2. Press the UP or DOWN button several times until the display reads "SETUP." Press ENTER.

3. The display will read "SCOPE" and will flash a two letter abbreviation for a type of mount. Press UP or DOWN buttons several times to scroll through choices. Stop when display reads "GP" or "GQ." depending on whether you plan to be polar aligned or not. Press ENTER

4. The display now reads "SCROLL ." Press ENTER.

5. The display will read "SCROLL" and a flashing number from 0-9. This indicates the rate of speed of the scrolling messages. "0" is very slow, "5" is about right, and "9" is very fast. Press the UP or DOWN button several times until the desired scroll rate appears. Press ENTER

6. The display now reads "ENGLISH" or one of the other language choices. Press ENTER to confirm or change using the UP or DOWN buttons. (Other choices are German, Italian, French, and Spanish).

7. A number appears. It must be "1+04000" which is the correct encoder ratio for our right ascension encoder. To confirm this number push the ENTER button 6 times which stores each digit. If this number does not appear in the display, use the UP and DOWN buttons for each digit, then press ENTER to confirm.

8. After step 7, the number "2+04000" should appear. This is the correct encoder ratio for our declination encoder. Press ENTER another 6 times to store this number. Follow the same procedure as step #7 if you need to change the number.

9. The setup is now complete for Astro-Physics German Equatorial Mounts. Remember that if you want to use to the Digital Setting Circle computer for your Dobsonian or fork mounted telescopes, the settings will need to be changed. Consult the JMI instruction booklet.

10. If you chose the "GQ" option, refer to the JMI instruction sheet entitled "The Importance of 'Set Dec=0'" for the next step.

NOTE: To enter the date in preparation for locating the planets, follow these steps:

1. Turn on the hand held computer read-out unit. Adjust the DIM button for the desired brightness level. The unit will read briefly "JMI" and the version number of the software. The display will stop on one of the mode settings.

2. Press the UP or DOWN button several times until the display reads "CATALOG." Press ENTER.

3. Press the UP or DOWN button several times until the display reads "PLANETS." Press ENTER.

4. The word "DATE" will display. Press ENTER twice.

5. A date will be displayed. Press ENTER to confirm each digit of the date. If any digits are incorrect, you can select the correct digit by pressing the UP or DOWN buttons to scroll through the choices.

6. "DATE" will appear. Press UP or DOWN buttons to scroll through the list of planets. Select the planet by pressing ENTER.

7. A sequence of numbers will appear (4 digits - 3 digits).

8. Press MODE to select next function.

NGC-MAX (version 3.13)

You can choose either the "GQ" (German Equatorial, not polar aligned) or the "GP" (German Perfect, polar aligned). After trying both of these settings ourselves, we have concluded that it is much easier to use the "GP" setting which requires polar alignment (with either a polar axis telescope or using the polar align mode of the NGC-MAX) rather than go through the "DEC=0" procedure as described in the JMI instruction manual.

This setup is only done once, then remains correct for a given telescope. This one time operation stores the setup information in non-volatile memory. If you are planning to use the NGC-MAX to help you find planets, you will have to enter the correct date by using steps 1-4 below, then press the MODE button to exit SETUP.

1. Turn on the hand held computer read-out unit. Adjust the DIM button for the desired brightness level. The unit will read briefly "JMI" and the version number of the software. The display will stop on one of the mode settings.
2. Press the UP or DOWN button several times until the display reads "MODE ALIGN STAR." Press ENTER.
3. Press the UP or DOWN button several times until the display reads "SETUP." Press ENTER.
4. A date will be displayed. If any digits are incorrect, you can select the correct digit by pressing the UP or DOWN buttons to scroll through the choices. Press ENTER to confirm each digit of the date. Unless you plan to find the planets during your observing session, the accuracy of the date is not important.
5. The display will read "SCOPE" and will flash a two letter abbreviation for a type of mount. Press UP or DOWN buttons several times to scroll through choices. Stop when display reads "GP" or "EQ." depending on whether you plan to be polar aligned or not. Press ENTER.
6. The display now reads "SCROLL" and a flashing number from 0-9. This indicates the rate of speed of the scrolling messages. "0" is very slow, "5" is about right for us, and "9" is very fast.
7. Press the UP or DOWN button several times until the desired scroll rate appears. Press ENTER.
8. "CHART" and a two letter abbreviation appears on the display. Select one of two sky atlases that you are most likely to use either "SA" (Sky Atlas 2000.0) or "UA" (Uranometria) by pressing the UP or DOWN buttons.

Users with these references can press the ENTER button any time during the "MODE RA DEC" function (when actually observing) to find the appropriate chart number for that region of the sky displayed.

9. A number appears. It must be "1+0.5120" which is the correct encoder ratio for our right ascension encoder. To confirm this number, push the ENTER button 6 times which stores each digit. If this number does not appear in the display, use the UP and DOWN buttons for each digit, then press ENTER to confirm.

10. After step 7, the number "2+0.5120" should appear. This is the correct encoder ratio for our declination encoder. Press ENTER another 6 times to store this number. Follow the same procedure as the previous step if you need to change the number.

11. The setup is now complete for Astro-Physics German Equatorial Mount. Remember that if you want to use the Digital Setting Circle computer for your Dobsonian or fork mounted telescopes, the settings will need to be changed. Consult the JMI instruction booklet.

12. If you chose the "GQ" option, refer to the JMI instruction sheet entitled "The importance of 'Set Dec=0'" for the next step.

NGC-MAX (version 3.52)

You can choose either the "GQ" (German Equatorial, not polar aligned) or the "GP" (German Perfect, polar aligned). After trying both of these settings ourselves, we have concluded that it is much easier to use the "GP" setting which requires polar alignment (with either a polar axis telescope or using the polar align mode of the NGC-MAX) rather than go through the "DEC=0" procedure as described in the JMI instruction manual.

This setup is only done once, then remains correct for a given telescope. This one time operation stores the setup information in non-volatile memory.

1. Turn on the hand held computer read-out unit. Adjust the DIM button for the desired brightness level. The unit will read briefly "JMI" and the version number of the software. The display will stop on one of the mode settings.

2. Press the UP or DOWN button several times until the display reads "MODE SETUP." Press ENTER.

3. The display will read "SCOPE" and will flash a two letter abbreviation for a type of mount. Press UP or DOWN buttons several times to scroll through choices. Stop when display reads "GP" or "EQ." depending on whether you plan to be polar aligned or not. Press ENTER.

4. The display now reads "SCROLL" and a flashing number from 0-9. This indicates the rate of speed of the scrolling messages. "0" is very slow, "5" is about right, and "9" is very fast. Press the UP or DOWN button several times until the desired scroll rate appears. Press ENTER.

5. "CHART" and a two letter abbreviation appears on the display. Press UP or DOWN button several times to scroll through the choice of two sky atlases "SA" (Sky Atlas 2000.0) or "UA" (Uranometria). Press ENTER to select.

Users with these references can press the ENTER button any time during the "MODE RA DEC" function (when actually observing) to find the appropriate chart number for that region of the sky displayed.

6. A number appears. It must be "AZ +04000" which is the correct encoder ratio for our right ascension encoder. To confirm this number push the ENTER button 6 times which stores each digit. If this number does not appear in the display, use the UP and DOWN buttons for each digit, then press ENTER to confirm.

7. The number "AL +04000" should appear. This is the correct encoder ratio for our declination encoder. Press ENTER another 6 times to store this number. Follow the same procedure as previous step if you need to change the number.

8. The setup is now complete for Astro-Physics German Equatorial Mounts. Remember that if you want to use the Digital Setting Circle computer for your Dobsonian or fork mounted telescopes, the settings will need to be changed. Consult the JMI instruction booklet.

9. If you chose the "GQ" option, refer to the JMI instruction sheet entitled "The importance of 'Set Dec=0'" for the next step.

NOTE: To enter the date in preparation for locating the planets, follow these steps:

1. Turn on the hand held computer read-out unit. Adjust the DIM button for the desired brightness level. The unit will read briefly "*JMI*" and the version number of the software. The display will stop on one of the mode settings.

2. Press the UP or DOWN button several times until the display reads "*MODE CATALOG*." Press ENTER.

3. Press the UP or DOWN button several times until the display reads "*PLANETS*." Press ENTER.

4. The word "*DATE*" will display. Press ENTER twice.

5. A date will be displayed. Press ENTER to confirm each digit of the date. If any digits are incorrect, you can select the correct digit by pressing the UP or DOWN buttons to scroll through the choices.

6. "*DATE*" and a sequence of numbers will appear (4 digits - 3 digits). Press MODE to select next function.

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VERIFICATION THAT YOUR ENCODERS ARE WORKING PROPERLY

- a. The following test may be done indoors.
- b. Do not have your R.A. drive on for the following test. **WHAT DOES THIS MEAN**
- c. If you purchased your JMI Digital Circles from Astro-Physics, the correct mount information and encoder ratios have already been installed for your convenience. Please refer to the procedures in the section entitled "**-----**" to verify the settings and make your choices regarding other features.
- d. Connect the shorter lead of the **-----** to the R.A. encoder body and the longer lead to the Dec. encoder body. The other end of these leads are connected to the JMI computer (black box). The plugs should be pushed in with light pressure as far as they will go until you hear the click of the snap latch ("**a**" in installation drawing). To remove simply depress completely the latch "**A**" with your thumb nail and gently withdraw the lead & plug.
- e. Point your telescope to the zenith (directly overhead position) or as near as you can to the zenith.
- f. Switch on your J.M.I. computer

NOTE: You cannot damage your computer by pressing any of the buttons in the wrong order accidentally - If you make a mistake simply switch the unit off, wait 5 seconds or so, and switch on again.

The messages "*JMI*", then the version number of the software in your unit will display. then one of the following statements will display:

<u>NGC-microMAX</u>	"DEC=0"
<u>NGC-miniMAX</u>	"STAR FIX"
<u>NGC-MAX</u>	"MODE ALIGN STAR"

At this stage you may wish to adjust the display brightness using the DIM button. The dimmest setting may be too faint to be seen easily with indoor or daylight lighting.

g. NGC-microMAX. Unit displays "*DEC=0.*" Press MODE button. - "*STAR FIX*" will display. Press the UP or DOWN buttons to run through the available modes on this unit. Take time to familiarize yourself with these (UP and DOWN) buttons and the modes displayed. Select "*encoder*", then press ENTER - "*000 +000*" will display.

NGC-miniMAX. Unit displays "*STAR FIX.*" Press UP or DOWN to select "*encoder*" display. Press ENTER - "*000 +000*" will display.

For NGCMax. Unit displays "MODE ALIGN STAR." Press UP or DOWN button to select "encoder" display. Press ENTER- "ER=000 ED=+000" will display.

In each case above, the first block of digits will represent Right Ascension (R.A.) movement in degrees and the second block will represent declination (Dec.) movement in degrees but with the sign "+" or "-". in dec. movement only.

h. You will now check that the encoders function in the right "direction" sense and will be repeatable, to a predetermined start or finish point.

To do this you must have your mount to the front of you and you must be facing "south". i.e. You will be able to "look into" the polar axis (at the ground) if you were outside at night then Polaris (North star) would be behind you) maybe a drawing here

"Looking into" your polar axis move your telescope in R.A. only, smoothly and slowly (if you move "incorrectly" an "ENC ERR" message will flash on) in a clockwise direction - the first block of digits (R.A. in degrees) should increase i.e. "001", "002", "003" etc. If it decreases, double check your position and the movement of your R.A. axis. If you are certain it is decreasing, you will have to correct the SETUP mode. Follow the procedure below for your unit:
NEED TO EXPLAIN HOW TO GET TO - PROBABLY VARIES. Then

NGC-microMAX
COPY PART OF PREVIOUS INFO
ETC

To do this, press MODE, select "SETUP" (use UP or DOWN button) press ENTER. Keep pressing ENTER (slowly) until you have a display - "1-0.5120". The "-" will be flashing press UP to change it to "+" (still flashing) it may be that you had "+" sign flashing, so press UP to change to "-". Direction count is now reversed. Keep pressing ENTER until you reach "SETUP" (if you "overshoot" keep pressing enter until you reach set up again!)

Now press UP or DOWN until "encoder" mode displays. Then press ENTER. Now recheck rotation of R.A. axis (clockwise) to get an increasing display "001", "002", "003" etc.

You will now check Dec. movement direction slowly and smoothly, in a dec only move point your telescope towards the direction you are facing. The reading should decrease in value. Note a sequential "001", "002", "003" etc. is decreasing because it is a negative "-" signed value. If your values are increasing then:

Press MODE, select "SETUP" (use UP and DOWN buttons) press ENTER keep pressing ENTER (slowly) until you have a display - "2-0.5120" - the "-" will be flashing, press UP to change it to "+" (still flashing). It may be that you had "+" sign flashing, so press UP to change to "-". Direction count is now reversed. Keep pressing ENTER until you reach "SETUP" (if you overshoot etc. - etc.).

Now press UP or DOWN until "encoder" mode displays. Then press ENTER now recheck rotation on dec axis to get a decreasing display. "001", "002", "003", for example. Ok?!*X

i. Now, you are in the encoder check mode, you may move your scope in RA or Dec (or both together) and you will be able to return (repeatedly) to a previously indexed point - you may (if possible) rotate a full 360° turn. If you have analog (disc, or Drum engraved circles) then you can check directly against these for repeatability of your computer circles against a known point i.e. 0 hours to 6 hours (90°) Back and forth - but watch out for a possible "ENC ERR" message. If there is no analog circle (for example 800 mount on dec) use two pieces of tape to form a simple pointer - one on the dec axis telescope plate and one on the dec housing. Once you have "convinced" yourself you are getting correct R.A. and Dec incremental responses and

repeatability, (remember the resolution of this mode is only one degree in this mode), you may proceed to use your computer to find "things"!

A sample of how to use your computer to find celestial objects

a. INITIALIZATION - Having established that all is correct with the mechanical and electrical set up (encoder mode check in section one) You must now "tell" your computer where your mount is initially starting from "initialization" this is called. There are , basically, only two ways of doing this:

1) Assume you have a good (even precise) polar axis alignment of your mount (a polar axis finder scope will do this for you) and point your scope to a star of known R.A. and Dec. Coordinates. Center the star in your eyepiece, then tell the computer the known (starting point) coordinate of the pointing direction. All telescope movements will now be calculated and displayed by the computer from this known starting points.

2) Assume you do not have a good polar axis alignment - but tell your computer a known definitive value for declination on your mount. This is $dec=0$ (on a perfectly aligned mount $dec=0$ means you "look" at the celestial equator) see separate sheet. With this one setting and two know coordinates (R.A. and Dec) all further telescope movement will now be calculated from these two known starting points.

3) The NGC-microMAX does not have a "SETUP", "score" option for a precisely aligned polar axis the minimum & & NGC-MAX do have a "SETUP", "score" option for a precisely aligned polar axis "GP". (German, Precise) and these two units have "GP" , under "scope" options "set up" mode, set by. Astro-Physics - You may still change this "SETUP" to "GQ" German Equatorial - not aligned and use a two star (co-ordinate) fix, if you wish.

IMPORTANT: ALL ASTRO-PHYSICS MOUNTS ARE OF THE GERMAN EQUATORIAL TYPE. (This is a unique mount - it is possible to view any object, in the sky, from two unique positions - E.G. an object in the eastern part of the sky should be viewed with telescope in the west (to the west of the local meridian, defined by the N-S direction of your polar axis. However this object in the east can be viewed with the telescope in the east. (both R.A. and Dec rotated through 180° will result in this second position)

Thus for a German equatorial mount, your computer must know which, of the two possible unique positions is being used for initial star fix(es). The convention (rule?) is that all initial star fixes must be done on objects in the eastern part of the sky and the telescope must be in to the west. (drawing may be needed.) Also you should not choose your star fix(es) too near (within 50°) the meridian. (the line from, directly overhead to, the north and south horizons).

4) The NGC-microMAX will not allow an accurate trial run to be made indoors - you cannot "lie" to it - it must be given two real star fixes to function accurately. So you must now go on the night sky to proceed further.

If you have (with a pole scope) correctly aligned your mount, then only one star fix will be required but you must set $dec=0$. With your dec axis counter weights in the east (your telescope to the west) now:

Switch ON - after a few seconds "*DEC=0*" displays. Set $dec=0$ as 4 above, on your telescope (it does not matter where your R.A. axis position is for this move)

Press ENTER - "STAR FIX" displays

Press ENTER - "ACHERNAR" displays

use UP or DOWN buttons to select a star you know (remember it must be in the east and not too close to the meridian). For this example we select "VEGA" - (press DOWN button once)

Press ENTER "w---" flashes then "VEGA" displays.

Press MODE - "STAR FIX" displays - press UP or DOWN button to display "RA DEC" (actually one press up!) press ENTER - "1837 + 384" displays this is the right ascension. Coordinate 18 hours 37 min.. and the declination coordinate +38.4° (or +30° 24°) of where your telescope is actually pointing.

If you have your R.A. motor drive running (on) then this display will not change. If you do not have your drive on the R.A. coordinate will advance. Roughly one min. for each min. of time that passes (18, 37, 18, 38, 18, 39 etc..).

Now if you move your telescope smoothly and slowly you will see the displays change indicating the real pointing position of your telescope. If a Star "*" flashes on your display during position movements of your scope then you have exceeded the maximum speed at which your encoders will correctly count position increments: If this happens re "fix" on VEGA

Press MODE use UP or DOWN buttons to display "STAR FIX".

Press ENTER , "VEGA" displays - now re-center Vega in your telescope eyepiece (use highish power if available/possible).

Press ENTER - "VEGA" displays. After "w---" flashes

Press MODE - "STAR FIX" displays - select "RA DEC"

Press ENTER - "1837 -384" displays - if you have an R.A. Drive running or with out a drive running you may see an increase in R.A. readout (18, 38, 18, 39 etc. for example) if you were not too quick in selecting the "RA DEC" display!

You now have "real" access to the sky. For other functions (catalogues of objects and means of finding them) refer in detail to your JMI operating manual.

If you are not (or are unsure of) polar aligned then a second "STAR FIX" will be required:

Select your first "STAR FIX" as above (in the east - tel in the west) then select another star in the east at least 60° away from your first "STAR FIX".

Press MODE select "STAR FIX"

Press ENTER - "VEGA" displays from first "STAR FIX" about

Press UP or DOWN to select your other known star in the east.

Enter "OTHER STAR" your choice!

Press ENTER "OTHER STAR" displays. after "w---" the "w---" display is a "warp" factor. and is an indication of your "DEC=0" initial procedure. (your J.M.I. manual will tell you more of this feature)

Press MODE select "RA DEC"

Press ENTER - the RA & Dec of your second "STAR FIX" will display.

When you move your telescope a real read out of where your scope is will display , but if you are not correctly polar aligned - movement of your scope in R.A. will (may) give rise to a changing Dec. readout - this is exactly what will happen with an unaligned mount it is quite normal.

5) If you have purchased an "NGC-miniMAX" or "NGCMax" computer directly from Astro-Physics, they will be "set up" for "GP" precisely - aligned German equatorial mount. Note these two units also have a polar align mode which maybe used to align your mount if you do not have a polar axis finder scope - see your JMI Manual for further information. (this is a simple procedure!)

It is possible to "play" indoors with your scope on an imaginary night sky with both of these units:

NGC-miniMAX

Switch on: "STAR FIX" - displays

Press ENTER "ACHERNAR" - displays NGC-miniMAX

in Press UP or DOWN to select your "STAR FIX" (must be in the east, your scope the west) as in the previous example, we select "VEGA"

Press ENTER, "VEGA" displays

Press MODE, select "RA DEC"

Press ENTER, "1838 + 384" displays

NGC-Max

"MODE ALIGN STAR" displays

"ALIGN ACHERNAR " displays

in Press UP or DOWN to select your "STAR FIX" (must be in the east, your scope the west), as in the previous example, we select "VEGA"

"ALIGN VEGA" displays

Press MODE, select "RA DEC"

Press ENTER, "1838 + 384" displays

You are now able to "play" indoors with a real readout of telescope positions. You will be able to check out all modes (guide catalogue etc.) indoors in comfort on your own imaginary night sky! Remember, if at any time you make (or think you make) a mistake you can switch off your unit wait 5 seconds, switch on and start again.

Imagine it is a summer evening VEGA is in the east, with your scope to the west, point at your "imaginary" VEGA (it will help to set the declination near +38° (Vega Dec= +38.6) To make your simulation as real as possible)

POLAR ALIGN MODE (Mini & NGC MAX)

For correct use of "Polar Align Mode", the alignment star you use must be in the Eastern half of the sky, and must be "viewed" with your counterweight below the horizontal line of your dec axis [counterweight not higher than your scope (balance point)].

Drawing

GUIDE MODE (ALL UNITS)

The guide function shows the shortest route to your selected object, however, for a German Equatorial Mount this may mean that with this shortest route you could "violate" the "counterweight not higher than your scope" rule, and could also cause your telescope to "foul" your pier or tripod.

In the guide mode (something like 80V or 29V will display), first move your R.A. to reduce your reading towards "0 x 0". If your counterweight will obviously end up higher than your scope, then do the following:

1. Move back to near your starting position for R.A.
2. Move your scope in "dec." through the north celestial pole until you see a "sudden" change to the R.A. distance. (Remember when moving in dec. only this figure normally stays constant.) You may see a sudden change in dec. distance as well. Once you reach this sudden change position, you may proceed to reduce each R.A. and dec. value to zero (0x0). This will give you a more acceptable scope orientation with a German Equatorial Mount.