RC8
COLLIMATING FRUSTRATION

RITCHEY CHRETIEN
Guan Sheng Optical
8 Inch f/8 203mm FL1624

---------- LET'S GET IT RIGHT ----------

27/06/2019
Revision 1.4

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RC8 COLLIMATING FRUSTRATION

My Pet Hate is my Ritchey-Cretien GSO RC8 Telescope, a pain of all pains, to say the least. A Telescope that has given me no joy and just sits on the shelf after hours of collimating abuse. Are you wanting to eliminate this sort of frustration when it comes to collimating your RC8, this is the solution: One very large #@##$%# Hammer. Just kidding, the following instructions should help smooth the path to the RC8 Imaging experience.

The RC8 can be extremely difficult to collimate and requires a lot of patience to get it right as many factors can interfere with its success. This is why a lot of owners move on their RC8, which is a shame as it is an excellent imaging Scope, or though in my opinion is one poor design mechanically that is, and could have been improved on. As for the optics, I don't know of any problems.

Please don't follow this procedure if you don't feel confident in doing so.
This is my procedure, the way I understand it, the way I do it.

You need the Takahashi Collimating scope 'TATKA00443'. Expensive, YES, over priced, absolutely, worth it, every cent. Lets face it you bought an RC8 right! And it cost enough, so why wouldn't you pay the extra to get the Takahashi collimator and get the most out of your Telescope.

Out of the two Takahashi collimating telescopes that have been around the 'TKA00443' is the one you need.

New Takahashi Part Number: TKA00443

I believe the Old Takahashi Part Number: TCE0100 was this scope.

Some suppliers Quote the new 'Part Number: TKA00443' but show the above image. So I'm not sure what's going on or why this is the case.

Required Adapters

You will need the '***RC8 Tak/Laser M90mm Adaptor***'; it's reasonably priced, and is required in achieving correct collimation of your Ritchey-Cretien 8".

https://www.rafcamera.com/adapter-m90x1f-to-m36-4x1f

RC8 Tak/Laser M90mm Adaptor

M90x1 to M36.4x1 thread adapter (use Takahashi Collimator on GSO RC8 Telescope

Also purchase the ***"2inch Multi purpose Adapter"*** This allows connection of the Takahashi Collimator as well as a laser for the purpose of collimating the GSO supplied Focuser or 48mm threaded focuser. Threaded Focusers are more precise than non-threaded.

https://www.rafcamera.com/adapter-2inch-to-m36-4-x1f-m48x0-75m

2" Multi Purpose Adapter

2" telescope port to M36.4x1 female (M48x0.75 male) thread adapter

A 1.25 to 2" with 48mm 0.75mm thread adaptor can be attached for the use of a cheap Laser Collimator

A 1.25 to 2" with 48mm 0.75mm thread adaptor.

Any adjustable Laser Collimator will do for the final Image Train Checking.

Cheap Laser Collimator

A small bright Torch is required for the Takahashi collimator

Bright Torch

LASER COLLIMATOR

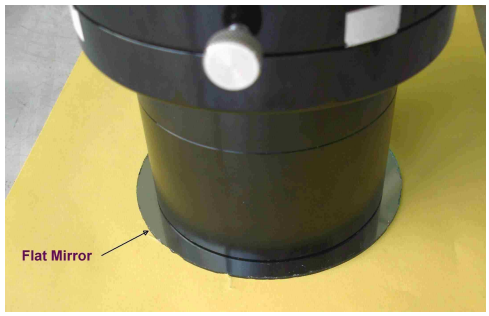
The cheap laser Collimator **CAN NOT** be used for collimating the RC8, other then check if there are some weird anomalies through the image train.

Even though you can, and maybe get away with it. Don't collimate through the focuser. The focuser needs to be removed from the Telescope completely, regardless of the type of focuser. The focuser needs to be collimated as an individual unit.

My Moonlite shows collimation issues

Modified Laser providing Pin Point accuracy

Laser Return



Flat Mirror to help with Collimation

In the above image the focuser is out of collimation. If you were to collimate the telescope with the focuser in place, you would add this error into the collimation, causing incorrect collimation of the telescope.

TIP: A flat mirror is a great tool to do a focuser collimation using a laser.

Lasers need to travel a long path to get more accuracy, the higher you can get the laser above the mirror the more precise the adjustments would be.

The distance between the Primary and Secondary should be correct before carrying out any collimation of your RC8 telescope

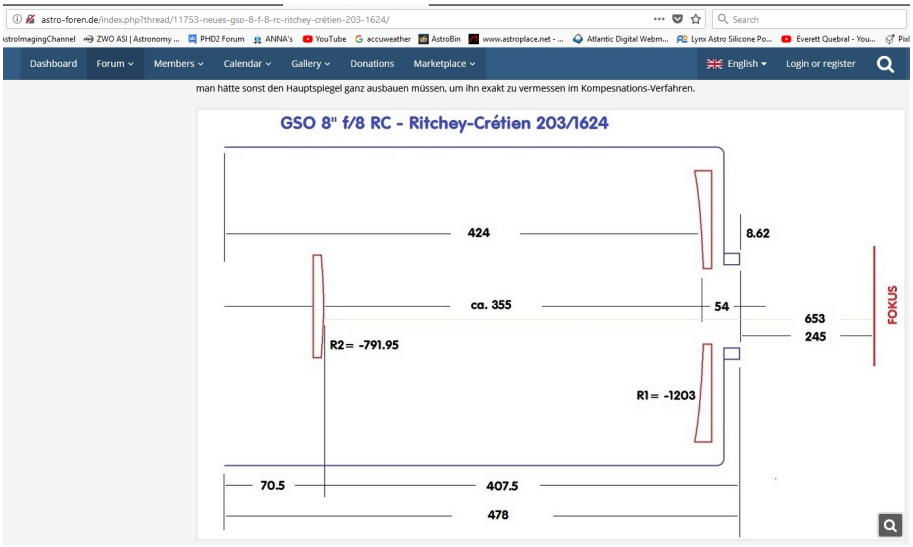
If you haven't already, **DO NOT** adjust the centre screw or the Secondary Mirror position unless you absolutely need to. The distance between the Secondary and the Primary is critical. This is why in the instructions if you got any. Mentions 'Do Not Adjust.

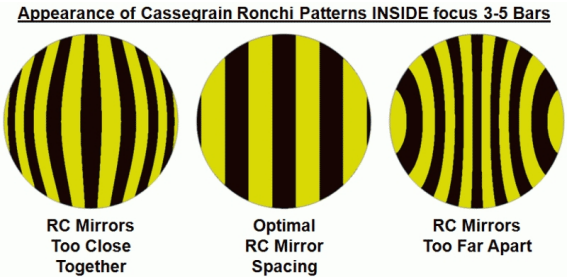
Caution has to be applied here, restabilising the correct position between the Primary and Secondary can be tedious. Dismantling the telescope is required and measurements of the secondary need to be calculated as well as the Primary Mirror.

Using the chart below has all the information needed, it does not include mechanical part such as the secondary baffle, distance between the top of the secondary mirror to the top of the secondary baffle etc, to help with calculations. The measurement of 478 includes the spider in place.

If your secondary has not been tampered with, then one would assume the spacing is correct.

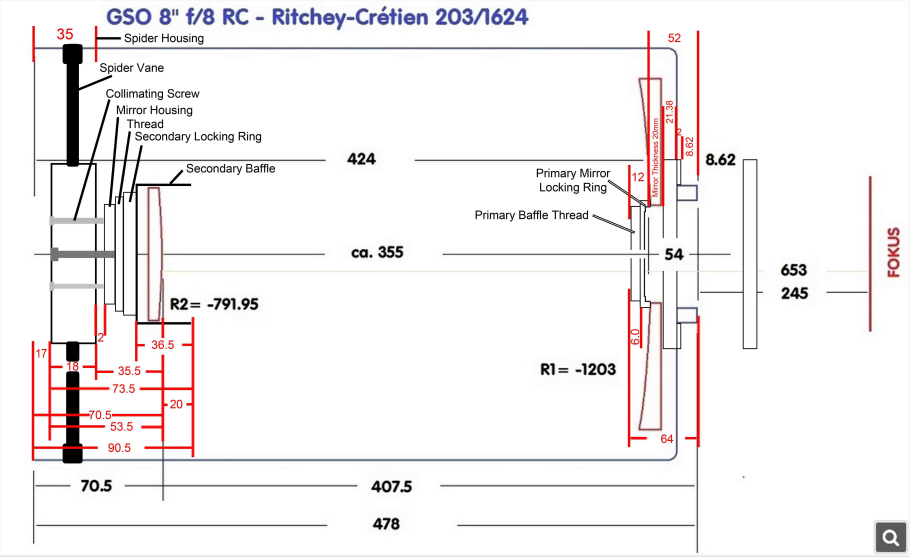
The following information may assist in getting the correct distance from the secondary to the primary.



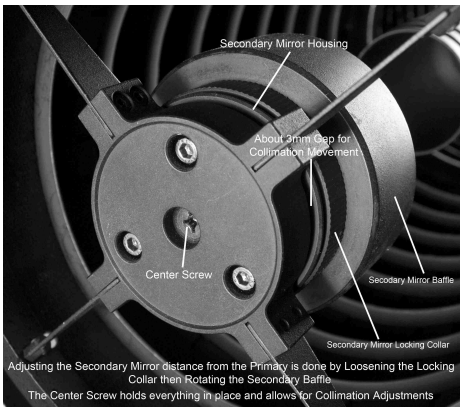


References to the above can be found here
http://astro-foren.de/index.php?thread/11753-neues-gso-8-f-8-rc-ritchey-cr%C3%A9tien-203-1624/

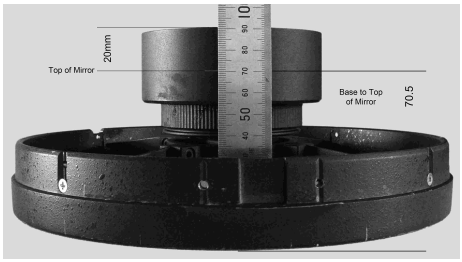
The following Chart Information shows settings on my Telescope these may vary slightly from scope to scope and should only be used as a guide. I have a separation of ca.355.5 Millimetres.



My settings for example purposes only



Location of Components



The Measurement from the base to the top of the Secondary Mirror is 70.5mm which is 20mm below the top of the Baffle.

If you are at a stage you have to readjust the secondary then the space between the Spider block and the Mirror Housing should be no more then 2mm. This may not seem much but it is quite adequate for adjustments. To get the Mirror to its correct distance rotate the secondary baffle to achieve the height then lock in place.

So let's delve into some what if's and stuff

Q - Why is the RC8 so difficult to collimate.
A – The RC8 has very little tolerance for error. This is why the correct collimating tools are required and precise alignment is paramount.

Q - Should I only adjust the Secondary mirror and forbid adjusting the Primary.
A - The adjustments of the Secondary and Primary work together both need to be adjusted if needed. The Issue is; how does one know what to adjust.

Q - By looking down the front of the telescope, and adjust the secondary, lining up the spider reflections would achieve perfect collimation.
A - NO, if your telescope is in perfect collimation and you look down the scope you will see from all sides, the spider reflections are lined up and straight.

However, if your telescope is out of collimation either the Primary or Secondary, and you have no idea where the errors is, make adjustments of Secondary and it's the Primary that is out, you will have added to the collimation error.

FOR THE COLLIMATION TO BE SUCCESSFUL THE FOLLOWING IS IMPORTANT

A - Is the primary mirror secure! by this I mean is it loose. If the Primary is loose then the collimation will not work as this is critical to the whole collimation.

To check this, put your hand inside the front of the scope put your fingers on the side of the mirror and see if it moves. Also check to see if the primary centre baffle is loose; the baffle should be finger tight only.

B - If the mirror is loose the scope needs to be dismantled and the locking ring needs to be adjusted to secure the mirror correctly in place.

Dismantling your RC8 is no big deal and not to be feared. Care is needed like everything of course. Besides, if you need to clean the primary or secondary then dismantling needs to be carried out. Just don't touch the centre screw on the secondary. Mark the side before dismantling the telescope so every thing goes back into the same position

Add Mark before dismantling

As far as I am aware the secondary and primary mirrors are not matched to each other as a set, due to the secondary can be rotated to achieve the correct distance. The mark is purely for alignment of the original screw position. Mark both ends of the scope.

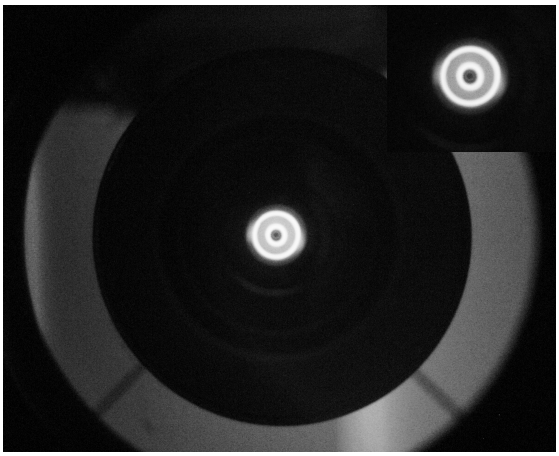
C- The distance of the Secondary and Primary must be correct otherwise collimating the telescope will serve no purpose.

D - The secondary mirror must have a centre (*Ring/Donut*) spot on the mirror to carry out the following collimation procedures.

Centre spot on secondary

E - Why remove the Primary Centre Baffle for collimating? If the centre Baffle is not removed you will not be able to collimate the telescope correctly.

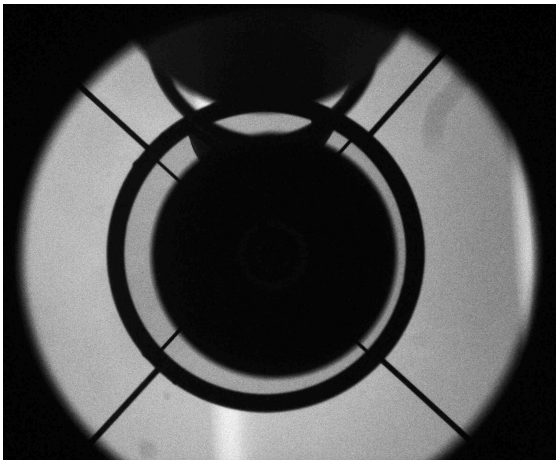
The following Image shows collimation has been done successfully, everything lines up as you would expect. You couldn't get it more perfect then this.



Zoom in for a closer view
LOOKS PERFECT

However, this telescope is not in collimation, it only appears to be. The Primary Baffle was left in place through out the collimation process. So there was no reference of error of the Primary Mirror, even though the collimation screws for the front and rear were adjusted.

If we were to remove the Primary Baffle we would see very clearly the problem.



Primary Mirror Out of Collimation

As you can see the Spider vanes do not line up correctly, and shows the Primary is incorrectly aligned. This is a typical trap people fall into when the collimation is carried out with the Primary Baffle in place.

F - There is this debate whether you collimate the Secondary first or the Primary. In my experience I found it doesn't seem to matter too much and I have tried both, as you need to make adjustments of both mirrors. **I prefer the Primary first.**

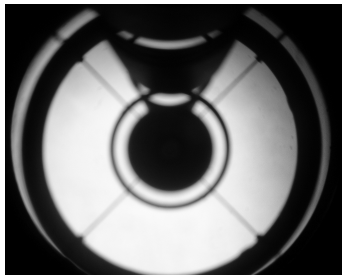
There are two methods to consider here. Let's call them the *Short focal Train* and *Long Focal Train*.

A - The short focal train is where the collimator is connected directly to the telescope. *Short focal train displays a magnified view.*

Direct connection

B - The long focal train is where extensions have been added to the telescope. *Long focal train displays a wider view, allowing you to see beyond the edge of the Primary Mirror. This can be handy in getting precise alignment of the Primary.*

Extensions added about 300 to 320mm



Collimation Issues beyond the edge of the Mirror

The image shows slight misalignment of collimation around the mirror edge. This would not be picked up in Method "A" as it would not be visible.

Either "A" or "B" will work but if you want to be very precise and have some spare extensions, Method "B" first then complete with Method "A" would be the best choice. Otherwise use Method "A".

PART 1
TELESCOPE ALIGNMENT PEPERATION
Collimating the Primary
Method "A"

1 – Attach the 'RC8 to Tak Adaptor' to the rear of the telescope, then the Takahashi Collimator.

Direct Connection to the Telescope

2 - Lay the telescope on its side and point the front towards some even light not to bright. The baffle attached to the Primary Mirror needs to be removed before any collimating adjustments can be carried out. The baffle will need to remain in side the telescope due to its size therefore cannot be removed.

3 - Be **VERY CAREFUL** removing the baffle, so it does not hit the primary mirror. You will need to put your arms in both sides of the telescope to do this successfully. The baffle has some weight. If you are not careful as it dislodges, it will drop down and hit the primary mirror. Pull back slightly while unscrewing the Baffle to prevent mirror collision.

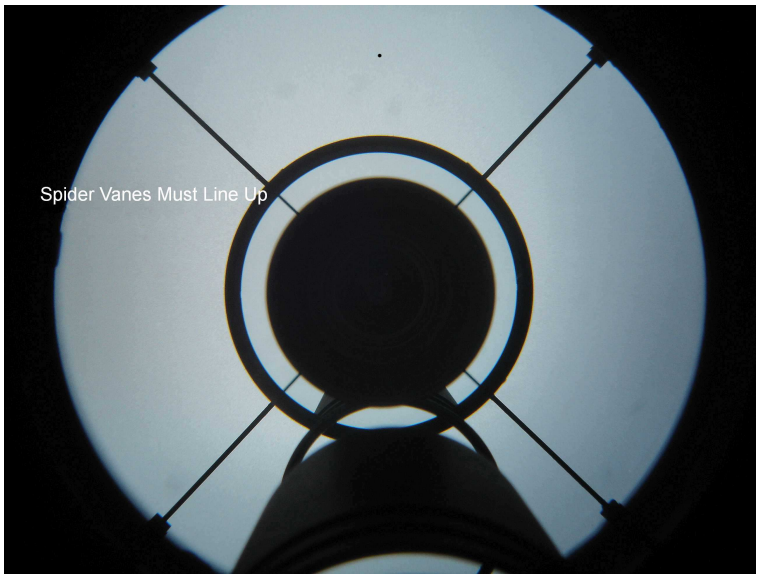
4 - When the baffle is dislodged, slide it back towards the secondary mirror. The secondary is protected by the secondary baffle, so leave it there for now. It will obstruct the secondary slightly but this is not a problem.

5 – Care has to be taken '**NOT TO LIFT OR MOVE THE SCOPE'** while the baffle is detached. Other wise it will slide towards the primary damaging it.

PART 2
CHECKING THE PRIMARY ALIGNMENT
Collimating the Primary

-- Does the Primary line up with the Spider Vanes --

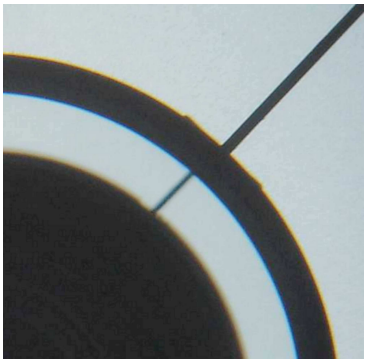
A - Focus the Takahashi collimator until you can see the Spider Vanes clear and sharp.
B - You will see eight parts to the vanes FOUR OUTER and FOUR INNER broken by a circle.
C - All the individual vanes must be inline with its apposing vane that is broken by the circle.
D - If all the vanes are lined up, no adjustment of the primary is required. This would be ideal and what needs to be achieved. Adjustments of the primary maybe required at a later stage of the collimating process.



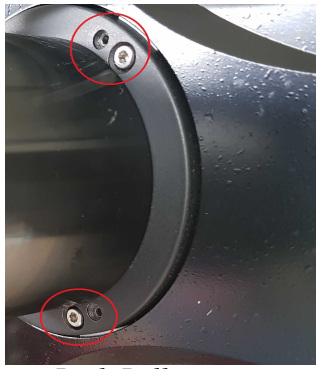
Perfect Spider Vane Alignment

SPIDER VANES OUT OF ALIGNMENT

If the Vanes are out of alignment, the three sets of push pull screws at the back of the Scope need to be adjusted, until correct alignment is achieved.



Spider out of alignment



Push Pull screws

Spider Vane aligned

The inner vane will appear smaller then the outer vane, so insure you line up the vane as close as possible to the centre of the outer larger vane.

PART 3
PRIMARY MIRROR ADJUSTMENT
Collimating the Primary

The Silver and Black screws correct term is known as Push/Pull collimating adjustment screws. Black screws Push and the Silver screws pull on the mirror housing. The silver screws are attached to the back of the primary mirror housing which prevents the mirror becoming dislodged.

The following collimation procedure will rely on the weight of the mirror tilting for the required adjustments. The black screws are for locking purposes only.

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1 - Loosen both the Black and Silver Push Pull screws.

2 - The black screws need to be out far enough so not to interfere with the adjustments of the silver screws.

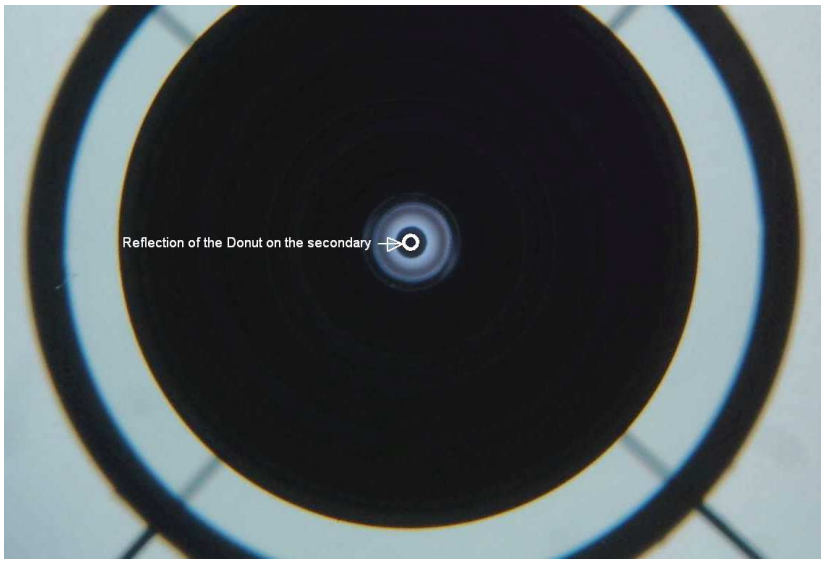
3 - Adjust the three silver screws to align the spider vanes.

4 – Leave the black screws loose for now as you will need to do more adjusting with the silver screws later on.

If you are using method B an then method A to complete collimation, leave the black screws loose until all adjustments have been made then secure on completion.

PART 4
DOES THE DONUT LINE UP IN THE CENTER
Collimating the Secondary

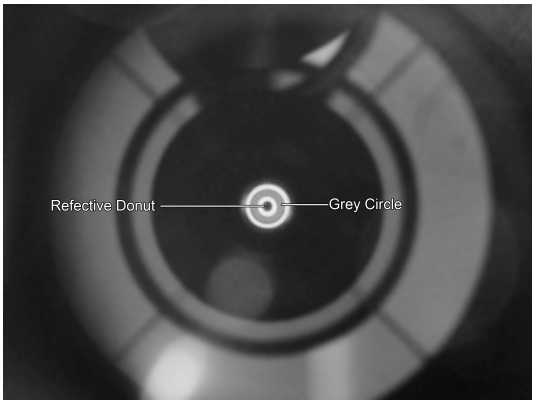
Shining a light in the side of the Takahashi collimator is required to obtain a clearer view. Focus the Takahashi collimator until you can see a reflection of the donut and grey circle, both should be in the centre. This would be the ideal alignment scenario.



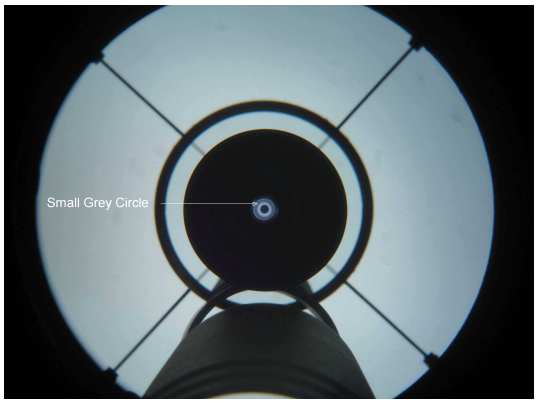
This is the ideal scenario and how it should look

There are two factors to consider, both the Grey circle and the Donut are equally as important as each other, and need to be in the centre.

When it comes to collimating the secondary, the ***Grey circle*** is the key and the one you need to concentrate on in the collimation process.



Grey circle and Donut Perfect line up
Zoom in to see Donut

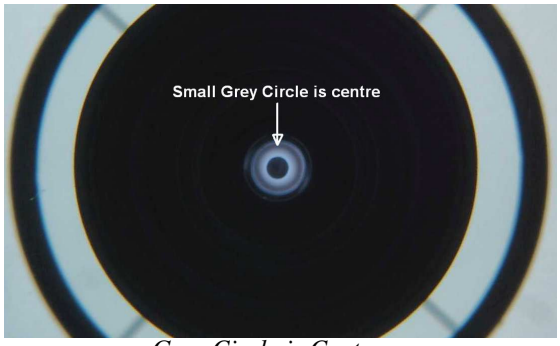


Grey Circle is the key

PART 5
ADJUSTING THE SECONDARY COLLIMATING SCREWS
Collimating the Secondary

Adjust either one of the front collimating screws on the secondary and move the small Grey circle into the centre.

Three Secondary Collimating Screws



Grey Circle is Centre

If your RC8 is way out of collimation, due to previous collimation attempts then the grey circle may be hard to see or not visible at all, as it would have blended itself into the large dark circle. You may see the donut, but the donut is not important right now, the grey circle is. So make larger adjustment to the Secondary until the grey circle becomes visible and if the donut disappears this is not a problem. We need to see the grey circle to begin the finer adjustments of the collimation.

If the donut does not appear in the centre with the grey circle, would mean the primary is still out of collimation and more adjustment of the primary is required.

SO BACK TO THE PRIMARY

Refocus the Takahashi to bring the spider vanes into view. You will notice the spider vanes slightly out of alignment.

Re-adjust the silver primary collimating screws as required until the spider vanes are once again realigned.

NOW BACK TO THE SECONDRY

Focus the Takahashi collimator until you can see a reflection of the donut and grey circle. Adjust either one of the front collimating screws on the secondary and move the small Grey circle back into the centre.

LET'S REPEAT

It is just a matter of repeating the required adjustments of the Secondary and Primary as necessary, until everything lines up. The Donut will eventually move into place as you get closer to completing the collimation.

Note: *On your last adjustment of the primary you will need to tighten the black screws, keep and eye on the spider to ensure it has not moved out of place through the tightening process. Take care **NOT** to over tighten. But they do need to be firm.*

PART 6
COMPLETION

DON'T FORGET TO <u>REATTACH</u> THE BAFFLE BACK ONTO THE PRIMARY MIRROR
<u>Look down the scope while you are doing this so you can guide the baffle onto the thread avoiding collision with the mirror.</u>

Collimation completion check list.

A - The Spider Vanes are lined up.
B - The Spider vane holders on the outside will appear the same size.
C - The small grey circle is centre.
d - The donut is in its correct position dead centre inside of the little black circle.
E - In the large black circle you will notice all the reflective rings are equal.
F - Every thing looks round and concentric.
G - Now the Primary baffle is in place, look in the front of the Telescope. The reflective spider vanes line up and straight from all sides of the scope.
h- Don't forget to collimate the focuser before attaching it to the Telescope.

Reflective Spider Rings line up from all sides

Finally, attach the collimated focuser with the laser collimator still in place; check the whole image train for errors. The laser return should be in the centre of the collimator.

Checking Image Train through Focuser

Laser return dead centre
Perfect collimation

---THIS COMPLETS THE COLLIMATION OF YOUR RC8 TELESCOPE ---

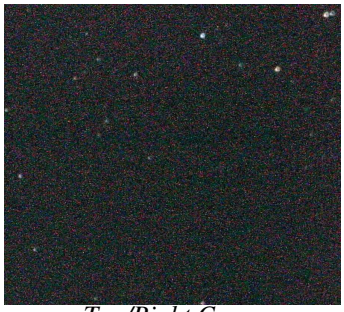
PART 7
COMA-ASIGMATISM CORRECTER

The RC8 telescope is considered Coma free and produces a flat field. However the RC8 do suffer from Astigmatism. This would be considered just as bad as coma because the effect is much the same. To fix this issue a corrector is required.

Once your telescope is collimated correctly then the Corrector needs to be connected. The distance form the sensor of your camera to the flattener needs to be correct.

Images taken with a Canon DSLR 60D

Astigmatism present all around the perimeter of the Image



Top/Right Corner
Astigmatism *present*

To resolve this problem a corrector is required. There are several suppliers that now have correctors available for the RC8. Telescope supplier ***TS Optics*** supply a corrector "***TSRCFlat2***" for the sole purpose of correcting the above problem, without altering the focal length of the telescope.

https://www.teleskop-express.de/shop/product_info.php/info/p4006_TS-Optics-2--corrector-for-GSO-Ritchey-Chr-tiens-w-o-focal-reduction.html

TSRCFlat2

Image taken with DSLR Canon 60D

Top/Right Corner
Round stars

Note: The above image was not taken with the above corrector; I used a Baader MPCC Mark III corrector/flattener designed for a Newtonian Telescope to achieve the same results. I wouldn't recommend getting this adapter other then if you have one give it a go.

PART 8
CONCLUSION

STAR TEST, *You might think at this stage it would be advisable to do a* ***Real Time*** *star test and make some* ***final*** *adjustments.*

Here, is the issue, you will have no idea where the problem is, even if you where to use the focuser inward/outward blur method on a bright star will not help. If you start adjusting anything, all you will achieve is to make the collimation worse.

Problems can be tributed by the focuser alignment or possibly too much weight on the image train can cause flexing. Locking bolts on the rear of the scope not tight enough.

Remember, if all the collimation checks you have done PASS, then you should have no issues.

The RC8 Telescope collimation is done on the bench not on a star.

FINAL NOTE

There is plenty of information on the internet providing various ways of collimating your telescope, and I don't claim for one instant that my method is the correct one. My method is the way I do it, and the way I understand it, and derived from months of frustration getting nowhere. If my method helps in successful collimation of your RC8, then at least I have contributed something to the Astronomy community.

So remember the Primary Baffle needs to be removed for the whole collimation process, other wise you will not be able to adjust the Primary mirror successfully. It is the combination of the Front and Rear collimating procedures to achieve a successful collimation of your Ritchey-Cretien Guan Sheng Optical 8" telescope. The focuser must be removed and collimated separately. Then use a Laser to check the Image train if you wish or attached the Takahashi Collimator.

My advice for what it is worth. Would I recommend this telescope! Absolutely not, they are more trouble then there worth. Sure you may get some great images out of them but at the cost of frustration and disappointment. There is no real support for theses telescopes, very little information from the suppliers and in most cases the information is not really valid and just guesses. If you want a flat field pinpoint stars to the edge, then a Triplet Refractor with its own dedicated flattener is the way to go. An 80mm Triplet would be a good start, it has a wider field and you will get great images at 480fl rather then 1624fl for the RC8. Don't buy one.

Happy Imaging

MY RIG READY FOR IMAGING

This is my telescope setup. Only two cables going to it, one for 12v Power and one for the USB2 connection. The power box at the back of the scope, distribute 12v to the mount and other devices like the Heater control. I also have inside the power box, a 5v converter to power USB3 Hub. I purchased smaller data cables and made up the power cables to fit. New addition an ASI-1600MM-C camera and ZWO filter wheel.

Therefore, doing away with all the messy cables.

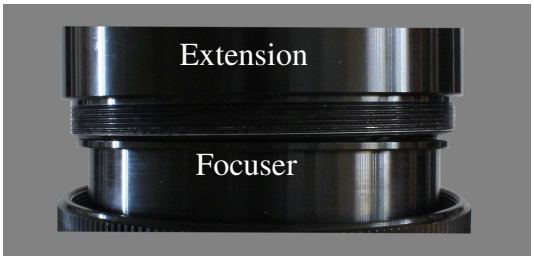
PROBLEMS WITH THE GSO SUPPLIED CRAYFORD FOCUSER

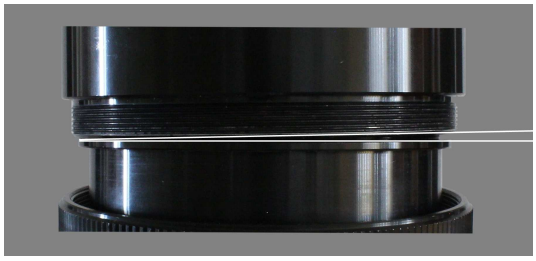
Bonus Section

The GSO supplied focuser is a Crayford design with a build in linear rail, and overall is a good focuser. Also supplied are three Extensions, a 50mm extension and two 25mm Extensions. Each one of these extension has a bevel incorporated into them. The bevel is to ensure precise Image Train alignment.

GSO Supplied Focuser

Now I guess this is where the problem starts, the extensions do not sit flush on the focuser due to the bevel mismatch as well as the focuser connected directly to the scope.





Extension on focuser shows the mismatching of the bevel prevents flush connection

Now one could argue, when the focuser locking ring is applied this would alleviate the non alignment problem, I might agree, but not likely. On securing of the locking Ring, the Focuser and Extension will grab and prevent the two pieces lining up correctly.

Collimating Ring

Why not use a Collimating Ring; sure, this is what the ring is for aligning everything. But this is not the point the Focuser and the Extension should be compatible with each other and not having to rely on the purchase of a collimating ring that also has the same bevel problem.

COLLIMATING THE TAKAHASHI COLLIMATOR

Bonus Section

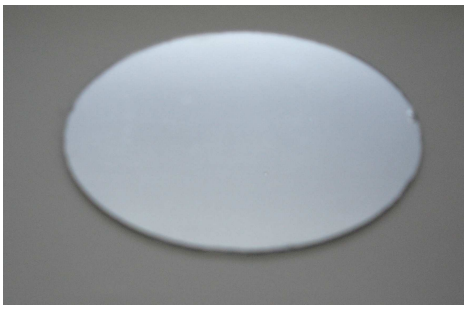
M48x0.75 female to M36.4x1 female (M48x0.75 male) thread adapter
https://www.rafcamera.com/adapter-m48x0-75f-to-m36-4x1f-m48x0-75m

This adapter allows you to connect to any standard 48mm thread. It has an internal thread of M36.4x1F, so you can attach a Takahashi Collimator. It has an external M48 thread for attaching laser collimator.

Takahashi TKA00443

CHECKING THE COLLIMATION OF THE TAKAHASHI COLLIMATOR

To check the collimation of the Takahashi you will need a thin flat mirror the flatter the better. Mine is about 1.2mm thick. Do not use a mirror that shows any sort of magnification as this will not work very well.



Thin flat Mirror 1.2mm thick

I purchased the mirror from Daiso it was a cosmetic mirror and I removed it very carefully by cutting away the plastic, the mirror was held on by double sided tape.

You will need some extensions to raise the collimator a minimum of 250mm above the mirror to get focus of the collimator. I used some 90mm and 48 mm extenders, also the *RC8 to Tak/laser M48 adaptor* to get the height. If you just use 48mm extensions that will work as well.

The Takahashi Collimator would have been aligned at the factory so it is unlikely to be out of collimation.

Adjust eye piece to focus Donut

Slide tube to focus interior of telescope

Takahashi Collimator

Tak / Laser M48 Adapter

M48 Extensions

M90 Tak Adapter

M90 Extensions

250 minimum above Mirror

SO WHAT ARE WE LOOKING FOR?

We are checking to see if the reflective circles are Concentric and the little black spot is dead centre.

Looking through the Tak Collimator

Place the collimator onto the mirror. You will need to shine a torch in the side of the Tak to get a clear view. Focus the Tak until everything looks sharp. If the circles look round and concentric and the black spot is in the centre then you can feel confident that the Takahashi will perform as intended and is still in collimation.

TAKAHASHI OUT OF COLLIMATION

If the circles are not concentric or the black dot is not centre, then the Tak is out of collimation and adjustments are required for it to preform correctly. There are three areas in the Takahashi where this could happen.

1 The eye piece is not square due to play in the thread or lens is loose.
2 The prism is offset, not set correctly.
3 The focusing barrel, lack of gel lubricant

1 - The eye piece can be adjusted and has a very small screw on the locking ring to fix it in position. What can happen is the small screw when tightened is compressed against the thread causing the eye piece to tilt ever so slightly due to the play in the thread. This will cause the black dot to be off centre. If you have difficulty seeing the donut reflection adjust eye piece until in focus.

2 – The prism misaligned slightly, the silver screw can be loosened and this will allow you to lift or lower the prism to align it into the correct position. You would need to do this while looking through the eye piece.

3 – The focusing barrel is lubricated with a sticky gel type substance and serves two purposes, smooth operation when focusing and to remove any play from moving slightly side ways which will interfere with the collimation and cause the black dot to be off centre

Tak Eye Piece locking screw

Prism Adjustment screw

Step 1 *Push the focus barrel all the way down then realign the eye piece.*

Step 2 *Refocus, and then adjust the Prism if required.*

Now the Takahashi has been checked, it is ready for collimating your RC8 Telescope.

RC8 Takahashi / Laser M90 Adaptor
Required Adapters

https://www.rafcamera.com/

Rafcamera also makes up custom adapters to order

The ***RC8 Tak/Laser M90 Adaptor*** sole purpose is to allows you to connect a *Takahashi collimating Telescope* directly to a *Ritchey Chretien 8 Inch f/8 203mm Fl1624 Telescope*, for the purpose of collimating. Its advantage is to ensure a direct connection eliminating collimating errors.

RC8 Tak/Laser M90 Adaptor
M90x1f to M36.4x1f (M48x0.75M)

Tak connected to the
RC8 Tak/Laser M90 Adaptor

It also has standard 48mm external thread which gives the advantage for attaching a cheap laser collimator using a *1.25 to 2" with 48mm 0.75mm thread adaptor.*

1.25 to 2" M48 threaded Adaptor

Laser connected to the
RC8 to Tak/Laser M90 Adaptor

The M48x0.75F to M36.4x1F (M48x0.75M) allows connection to any 48mm adapter or focuser and connection to a Takahashi collimator for collimating your RC8 telescope.

M48x0.75F to M36.4x1F (M48x0.75M)

Takahashi attached for
M48 Treaded Focusers

2” Multi Purpose Adapter
Required Adapters

https://www.rafcamera.com/

Rafcamera also makes up custom adapters to order

The following adapter can be used for 48mm threaded direct connections to your focuser or extensions attaching the Takahashi Collimator. It was my first design and works in all cases unless the focuser does not have the 48mm thread, then the *2”Multi Purpose adapter* is required for non threaded focusers.

48mm threaded Focuser Connecter

M48x0.75 female to M36.4x1 female (M48x0.75 male) thread adapter

https://www.rafcamera.com/adapter-m48x0-75f-to-m36-4x1f-m48x0-75m

The ‘***2” Multi Purpose Adapter***’ is my second design, it is for the purpose of assisting in the collimation of the ***GSO Ritchey Chretien 8 Inch f/8 203mm Fl1624***, which does not have a M48 thread on the focuser, requiring compression ring to secure in place.

The adapter can be slotted into the standard 2” GSO focuser for the purpose of collimating or checking the Image train. It can be connected to any 48mm threaded focuser or extension. The male thread allows for connection to a 1.25 to 2” adapter for the purpose of attaching a Laser collimator. It also allows direct connection of the Takahashi collimator.

This adapter replaces my first design, the “48mm threaded Focuser Connecter”.

2” Multi Purpose Adapter

2" telescope port to M36.4x1 female (M48x0.75 male) thread adapter

https://www.rafcamera.com/adapter-2inch-to-m36-4-x1f-m48x0-75m

Standard 2” GSO Focuser ***Takahashi Connected*** ***Laser Connected***

BAADER LASER COLLIMATOR ADAPTERS

There are two new adapters I designed for the attachment of the Baader Laser Mark III Collimator.

Baader Mark III Laser Collimator #2450343

The interesting thing to note, the Mark III although designed to insert into a 1.25 adapter, has an internal filter thread. This can be very handy when one want's to have a direct threaded connection to do a final image train check with the focuser in place. The Mark III Laser has a very fine laser beam and works extremely well for this purpose, eliminating any error of alignment from the laser return of the secondary mirror, as you may get relying on the compression ring or locking screw for correct alignment with the following adapter.

1.25 to 2" with 48mm 0.75mm thread adaptor

The *2" Baader Laser Mark III Adapter* totally eliminates the alignment issues and can be attached to any 48mm thread and allows a direct threaded connection to the *RC8 Tak/Laser M90 Adapter.*

2" Baader Mark III Laser Adapter
M48x0.75 female to M28.5x0.6 male Threaded Adapter

https://www.rafcamera.com/

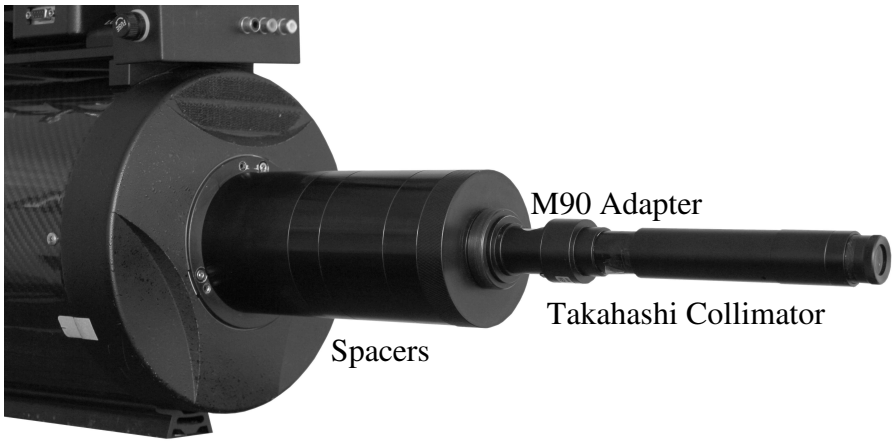
Baader Mark III Laser Collimator #2450343

2"Baader Mark III Laser Adapter

RC8 Tak/Laser M90mm Adaptor

Example: ***2" Baader Mark III Laser M48x0.75 female to M28.5x0.6 male Threaded Adapter*** **i**s connected directly to the Moonlite Focuser.

EXAMPLES OF THE M90 ADAPTER



Checking image train through all Spacers, M90 Adapter

Takahashi Collimator Direct connection, M90 Adapter

Laser Return of collimation alignment M90 Adapter

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