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# Hardin Optical 12” Deep Space Hunter

[Tom Trusock](#)

Available from: [DBA Astronomy Products and Services](#)

Base Price: \$895 plus shipping



## Cheap Aperture.

Two words guaranteed to set almost any amateur astronomer salivating. With the advent of inexpensive dobsonians out of Taiwan and China, it's only been a matter of time till someone broke the 10 inch barrier.

Guan Sheng and Hardin Optical have done so by combining forces to bring you the Hardin Optical 12” Deep Space Hunter.

But is it worth your hard earned cash? CloudyNights.com set out to find out.

12” DSH Hots	12” DSH Nots
<ul style="list-style-type: none"><li>• Breaks the 10” cheap dob barrier</li><li>• 4 included eyepieces</li><li>• very serviceable 2” focuser</li><li>• DBA’s “nice” little touches – pulling rings, extra hardware, fan</li><li>• 12” is some serious aperture</li><li>• Smaller than I expected for a 12” telescope</li></ul>	<ul style="list-style-type: none"><li>• Rocker box a little flimsy</li><li>• Not fond of the 32mm modified kellner (but it makes a handy finder eyepiece)</li><li>• Might be a little large for some folks</li></ul>

The 12” was on loan from [DBA Astronomy Products](#) of Auburn, MI, and this review will reflect their version of the scope. I emphasize that because DBA owner Dale Penkala has several improvements included with the scope that aren't available as standard options from other dealers.

## Getting to Know You

For the review, the scope was shipped directly to my house from Hardin Optical along with a box of upgrades direct from DBA.

The scope comes in two boxes; assembled OTA, eyepieces and accessories in one extremely large box, and disassembled base in the other. In a surprising twist (at least to me) the mirror is shipped already installed in the OTA, and to my amazement was fairly well collimated right out of the box. Assembly was straight forward, (due in part to the excellent instructions/directions Hardin supplies as to assembly and collimation) and took about 40 minutes to complete – since most of the screws are allen heads, I recommend taking a hacksaw to the included allen wrench and using it as a drill bit to get some power behind the assembly. Assembly could be done by one sufficiently motivated person, but two certainly made the job easier, quicker and also gave me someone to blame mistakes on <g>. The only real glitch in the assembly process came when we went to mount the eyepiece rack, and found that we were short one screw.

### Specifications

- 12-inch parabolic mirror
- 1500mm focal length
- 2-inch aluminum rack-and-pinion focuser
- Compression ring 1.25 to 2" adapter
- Metal tube with enameled finish
- OTA cap
- 8x50mm finderscope
- 32mm 2" Astrola Wide Field eyepiece (Modified Kellner)
- Three 1¼" Astrola Plössl eyepieces:
  - 9mm
  - 15mm
  - 25mm
- DBA Astronomy Pulling Ring Kit (not included in base price)
- DBA Astronomy Cooling Fan Kit\*
- DBA Astronomy Replacement AZ Lock Kit\*
- 9-point flotation mirror cell
- eyepiece rack
- Weight of components:
  - Swivel base = 28 lbs.
  - Telescope tube = 48 lbs.

\*Included in the price of the scope when you order from DBA

I was simultaneously impressed at how big and yet how compact the 12" DSH is. It is indeed much larger than a standard 8" f5 or f6, but my 15" f5 dwarfs it. At a recent star party, many folks remarked on just how small the OTA seemed for a 12" scope.



Additionally, I just couldn't believe how much you get for your money these days. Basic dobs have come a loooooonngggg way since the last one I owned.

Picking my jaw up from the floor, I then proceeded to give the scope a once over, and almost immediately, discovered that simply slewing the scope in AZ brought about an undesired response. The standard nut that secures the ground board to the rocker box kept unscrewing as I rotated the scope. Then, as the pressure on the roller bearings was lightened; the scope began to spin like my old Nissan 200sx in the winter snows – way too easily. Tightening the nut solved the problem till the next time you turned the scope. This is where the first of DBA's seemingly minor upgrades came into play – the thin lock nut DBA supplied (included

free with scope) was just the right size, and worked perfectly to secure the two pieces.

The benefits of the second DBA upgrade (\$5.95) – the pulling rings were immediately evident when I went to attach the springs to the base – there was no worry of the Velcro strap splitting. Furthermore, I was able to attach the ring to the post instead of the spring to the post, thus giving me a little more latitude in adjusting my range of tension. For more information on the DBA Pulling Ring Kit (available separately), see [Jason Blaschka's review](#).



**DEEP SPACE HUNTER®**

DBA/Hardin supplies four eyepieces with the 12" scope: a 2" 32mm (modified kellner), and 25, 15, and 9mm 1.25" Astroia plossls. While I wasn't fond of the 2" 32mm eyepiece, which was soft across the field and displayed moderate astigmatism in a fast scope, I was pleasantly surprised with the Astroia plossls and found them to be on a par with most of the other decent Taiwanese / Chinese eyepieces with good coatings and fit and finish. I particularly liked the performance of the 26 and 9mm. Personally, I'd recommend keeping the plossls and swapping the kellner for something like the GSO 30mm SuperView.

The focuser is a 2" rack and pinion model (lubricated with – well I can't call it "syntaglu" because it's a Guan Sheng product, but it sure acts like it – call it GSglue) whose motions were very smooth in warm weather, but left something to be desired when the temperature dropped. While the drawtube uses setscrews, the included 2" to 1.25" adapter is a low profile style that uses a compression ring, AND has filter threads on the inside – Kudo's Guan Sheng! It's nice to see these features are starting to make it into all sections of the market.



In addition to the nicely sized 8x50 finder that comes standard with the scope, DBA also supplied an optional (\$39.95) Rigel QuikFinder unit finder. I highly recommend you use a unity finder of some sort on any scope, but you really (IMO) need both the 8x50 and the reflex unit on a scope this size. Personally, I think the Rigel is one of the nicest units out there, as it will sit on just about any scope without throwing the scope out of balance and has a very small footprint.

*Note the cooling fan is standard only when purchasing from DBA*

Finally, yet another benefit of buying from DBA is the included cooling fan. This is a rather significant upgrade for this size of a scope.

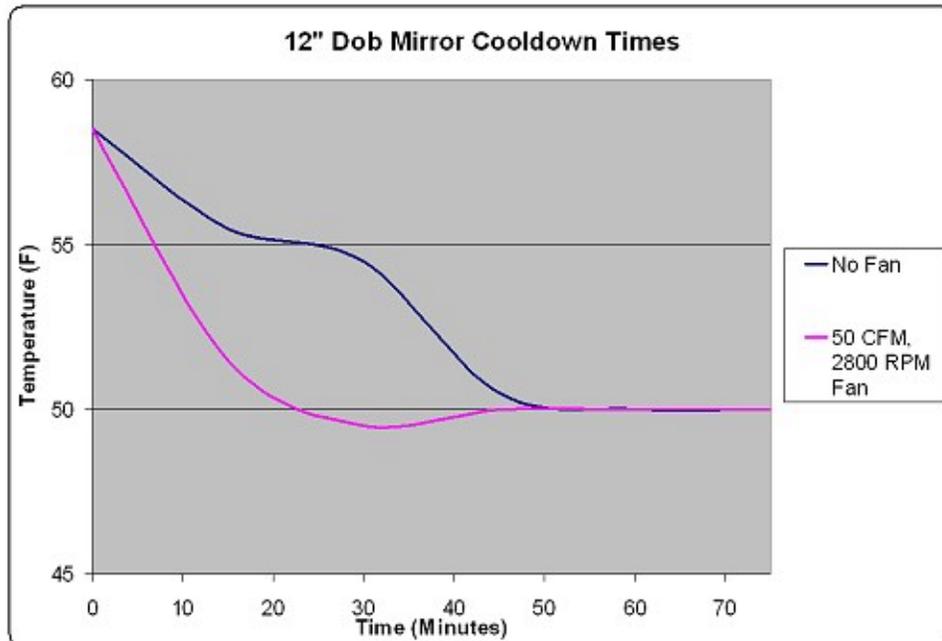
At 12", it is rather substantial aperture, but it's still easily transported in two pieces by one person or in one piece by two people. Personally, if you can keep the scope in your garage, I'd recommend fabricating a platform with casters on the bottom for rapid deployment (roll in, roll out).

Overall, I thought the fit and finish was very good. It's well constructed and looks quite sharp. No, it's not a Starmaster, but it's less than 1/3 the cost.

So how well does it work? Let's find out.

## Optics

I found the optics to be quite nice for a mass produced scope. The star and ronchi tests showed (surprisingly) little spherical aberration. I was expecting some amount of under correction, as is typical with many of the mass produced optics I've seen in the past, but



optics or astigmatism. A star test showed some very minor zones and dog biscuit (rough optical surface). Even so, most nights the mirror still supported magnifications of 250+ .



*The roller bearing is one item that differentiates the Hardin scopes from traditional designs*

was pleasantly surprised. There was no evidence of turned down edge, and diffraction rings were nice and symmetrical on both sides of focus. There was no evidence of pinched

Cool down was something of an issue and without a fan took 50 minutes to drop about 8 degrees F. With the fan turned on this time was cut to around 20 minutes. I don't recommend high power planetary viewing while the fan is running with the initial setup DBA supplied – vibrations were evident in the image. But, please note that simply turning the fan on while setting the scope out to cool, or letting the fan run while observing DSO's made a huge difference in cool down time. I should further note that after experimenting with a number of fans, DBA has settled on a ball bearing fan blowing 35 CFM (Cubic Feet per Minute) while running at 2400 RPM to further reduce vibration. This is a different fan from the one that shipped in my test scope.



While the mirror's surface roughness was a factor in planetary viewing, it wasn't an issue when pulling out DSO's.

Unfortunately, I don't have ronchi pictures of this mirror. Due to its size, the artificial star would have had to be placed a minimum of 170 feet away to avoid contributing  $\frac{1}{4}$  wave spherical aberration in the test, and to be blunt, I just couldn't find enough space. Given this, I tried to take pictures using Polaris as the test star, but after three unsuccessful hours (and a couple hundred blank pictures) it was pretty clear that I was getting nowhere fast.

## *Under the Stars*

I had use of the scope from early March to early May, and had opportunity to get it out on a number of occasions. Visually, 12" is a lot of scope, and after spending so much time with 3" refractors (see the ["4-Way 80mm Shootout"](#)) it was a pleasure to work with an



*Note the mirror is center spotted for easier collimation*

aperture that actually allowed me to get a good look at some of my favorite spring targets: galaxies. In fact, if you are used to using a 6-8 inch scope, you may think you've died and gone to heaven.

Consider: While star hopping to M81/M82, Keith (my observing partner) got confused – he'd thought he'd found M81 but couldn't locate M82. On closer inspection, it turned out he had actually latched onto magnitude 10.6 NGC3077 – not M81 at all! It was bright enough that I could easily see how he had mistaken the two – especially after all that time with 80mm scopes.

Every night I looked, M51/NGC5195 sported

arms – often with direct vision.

I had a blast in Virgo. If you're a DSO fan, hopping down Markarians chain with a 12" scope is definitely an experience I recommend (unless of course, you can do it with an 18" <g>).

And with this much aperture, make sure you bring some good charts - it's all too easy to get lost in the Virgo-Coma cluster.

Planetary performance was adequate. The mirror's surface roughness meant that there was some degradation of contrast, but overall the DSH was capable of delivering a pleasing view. On good nights, I found myself using 200x – 250x power when studying Jupiter and Saturn. (This was more a measure of the limitations of the mount than of the optics.) On Saturn multiple divisions in the rings were visible as well as a subtle banding on the surface of the planet.

Simply put, this scope is a fantastic value. I can hardly believe the buying power \$900 has today.

### ***Complaints?***

So what's wrong with it? Anything? If so, can it be fixed? Or are the issues deal breakers?

As you read the following section, keep in mind the DSHs intended use; it's inexpensive aperture for those who have contracted that dreaded disease - aperture fever. As such, it really excels at low to moderate magnifications (up to 150x or so) for those deep sky excursions.

I have a small problem with the undersized bearings common to imported dobs.

Frequently the amount of force required to move in AZ is different from the amount of force needed to move it in ALT. This makes things a little awkward for high power tracking.

I've never understood the logic (other than the obvious financial issues) behind deliberately under sizing the bearings, and then using a tension spring to add enough force to allow it to stay put. When using a dob, I give it my highest ratings when I can hand track by simply using the gentlest pressure so nudge the scope along at



high powers. If there is too much friction, high power mobility becomes an issue. I found I could track comfortably up to around 300x with this scope – and for most folks that’s about all you may ever need. Sometimes, however, you may want to go higher yet, and then the ALT bearings may present a problem. For comparison, I’ve hand tracked premium dobbs at 800x and 900x when digging the central star out of planetary nebulae even when not under the best seeing conditions, and to be blunt, I just can’t see someone doing that with this scope.

The best motions in altitude were achieved when a sole pulling ring (not the spring) was hooked over the post.

On the flip side, I should say that using the springs in various combinations virtually eliminated the need for a traditional counterweight system when loading up on heavy eyepieces, and that’s a plus for this system.

On the Az axis – well, I’ve also got to admit I’m not really fond of the roller bearing approach. It’s just too smooth, and if you tighten the bolt with the roller bearings, you get a grab and release sensation that is evident in AZ motion. You have two options here, both of them fairly simple and inexpensive; 1) you can attach pieces of soft Velcro to poster tape and locate 3 - 4 pieces between the ground board and the rocker box at 90 – 120 deg from each other – this takes some of the weight off the bearing and allows the scope to move a little more normally (and I can attest from experience that it works great) or 2) it would also be an exceedingly simple matter to just get rid of the roller bearing entirely and purchase a set of super sliders at your local K-mart/Wal-Mart/what-have-you to convert this scope to more “typical” AZ bearings.



But in reality, my only serious complaint with the scope concerns the rocker box. From where I sit, it looks like Guan Sheng simply scaled the size of the rocker box up from what’s found on their smaller dobbs. The problem is, a scope that’s twice the aperture is significantly more than twice as heavy. There’s only so far you can scale, and I think the 12” is hitting the limits. I found that at 200x, it took the OTA a good 4-6 seconds to settle down after I’d adjust the focus. The major source of this shake/shimmy comes from flex in the sides of the rocker box. Ironically, one of the causes is directly related to the use of undersize bearings. If GS had used larger bearings, they would have been able to keep the rocker box sides shorter and thus less potential for flex. The fix for this involves rebuilding or strengthening the sides of the rocker box – a rather easy repair job, and something that I’m told DBA is working on.

## ***The Bottom Line***

If you are looking for a lunar and planetary scope you are reading the wrong review. While it can provide decent lunar and planetary views, that's not really what it's intended as. This is first and foremost a deep sky scope – and at that it succeeds. There's plenty of light gathering power here to satisfy all but the most severe cases of aperture fever. Everybody who has looked at it has been absolutely floored by what's included for the price.

If you are a smaller person or have back problems, you may want to think long and hard about the sheer size of this scope. I did manage to transport the OTA and rocker box at one time, but wouldn't recommend it. Most users will find it far easier to either place the scope on a wheeled platform or simply carry the 28lb rocker box and 48lb OTA separately. While I can (very) easily carry the OTA, (I found it more awkward than heavy) I'm a bit on the large side. But this is going to be a concern for any big scope.

I had a chance this last weekend to take a very quick look *at* the 10" DSH as well, and I suspect that more than a few folks are trying to decide between the 12" and 10", and to those folks I offer the data in the table below.

Finally, consider why you are thinking about the 10" instead of the 8". Is it because you want the largest aperture your money can buy? I suspect that for many of you, it probably is.

Yes, there are a few design warts, but in general they are all easily

fixed. When you consider what you are getting for your money today in comparison of what it would have bought you 10, 15 or 20 years ago, it's truly an amazing value.

If this scope had been around when I was getting into the hobby, I would have bought one – warts and all.

<b>Why buy a 12"Hardin</b>	<b>Why buy a 10"Hardin</b>
<ul style="list-style-type: none"><li>• Better mirror cell – true 9 point flotation</li><li>• 12 has 145% of the light gathering area vs the 10"</li><li>• 12" penetrates .4 mag deeper</li><li>• 4 standard eyepieces instead of two</li><li>• extra 2" helps to delay the onset of more advanced stages of aperture fever</li><li>• .380 Dawes Limit vs .456 for the 10"</li><li>• resolution difference is small but noticeable on targets like globular clusters</li></ul>	<ul style="list-style-type: none"><li>• Less expensive</li><li>• Not as large or heavy</li><li>• Shipping costs are slightly lower</li></ul>

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