Opting for the iOptron

Olly Penrice took time to test iOptron's new GOTO mount under the dark skies of his Les Granges Astronomy Holidays farmhouse.

It is easy to see the design objectives behind the iOptron IEQ45 German equatorial mount; portability, speed and ease of setup, imaging-friendly accuracy in pointing and tracking, plus a 20 kilogram payload.

Lifting it from its box I realised that it certainly is a very light mount for its claimed payload and much less of a lump to move about than our EQ6 and Takahashi EM200. The whole thing fitted together effortlessly, the main bolts combining Allen key heads with nylon finger knobs. There are synthetic washers, in many places, which are likely to get lost or crushed by over tightening, but they are not really necessary. The declination cable is external, probably because the svelte design has little internal room.

With the mechanical side of the setting up done very sweetly I turned to polar alignment, something mobile imagers want to be quick and accurate. The alignment routine on the iOptron is both. First, switch on the mount and handset as soon as you can because the GPS can take minutes to orientate itself. While it is doing so, set the mount level with the built-in spirit level and use a compass to set it roughly north. A clear latitude scale allows you to have prepared a rough latitude setting at home.

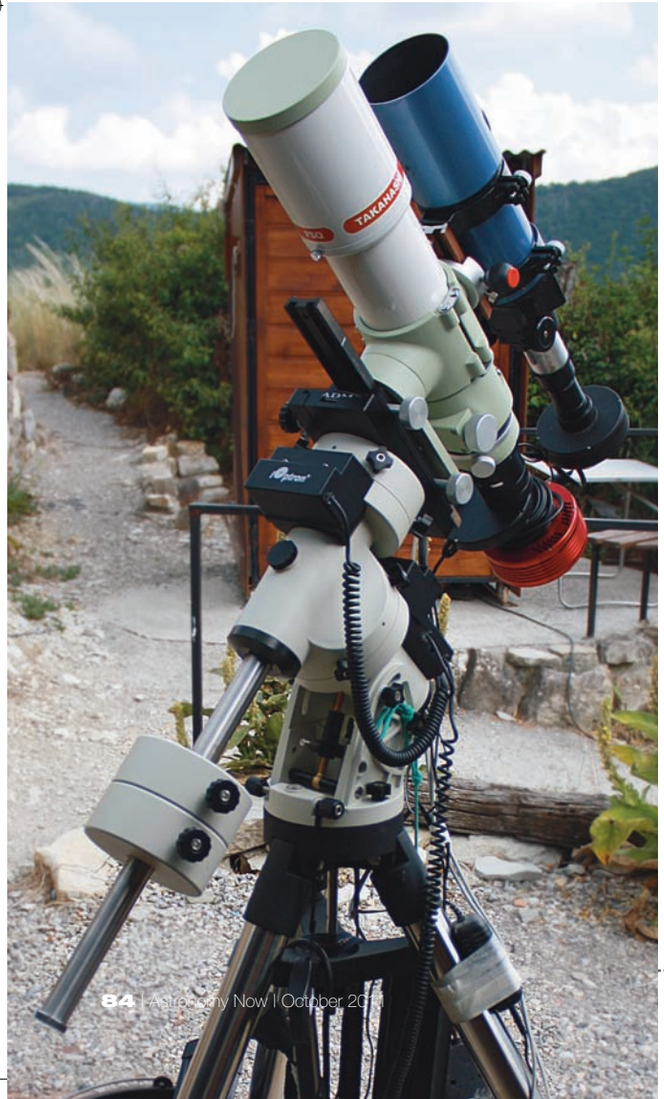
Once locked on, the GPS gives the mount everything it needs to know (though if it fails you can type in your co-ordinates) and you ask it to show you the 'Polaris Position' which it does by presenting what looks like the hour hand of a clock in a circle. This shows you where to put the North Star on a clock-like reticle seen in the polarscope, though screwing in the separate polar illuminator is a niggle when an integrated one would have been more in keeping with the very slick alignment routine on offer.

Moving the mount to bring Polaris into position was easy with the altitude adjuster being far better than some. It's a splendid system, but with one small caveat.

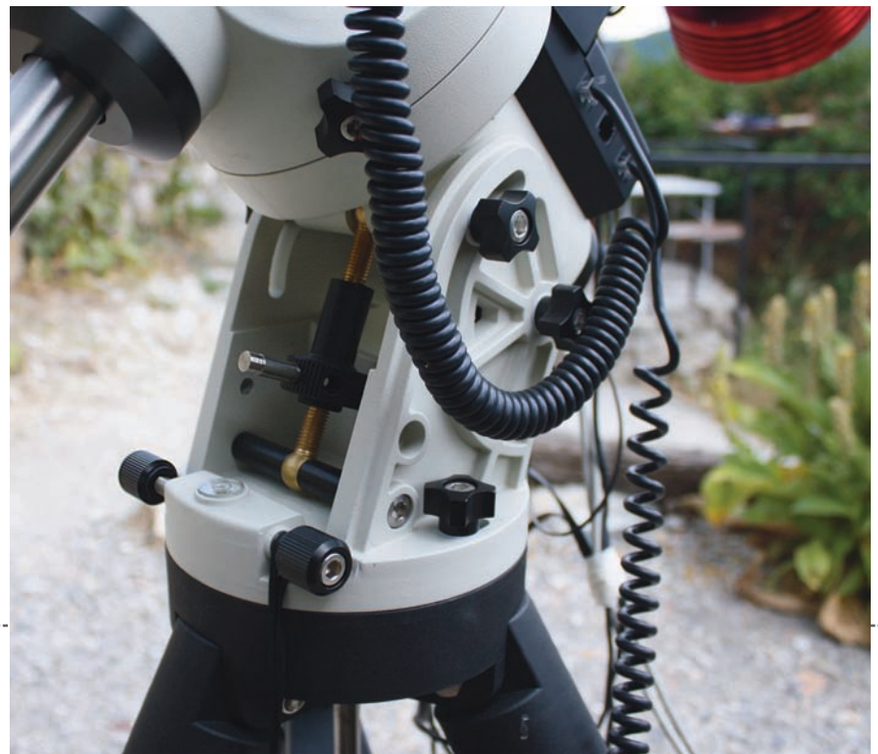
Yves, a guest who also had his own IEQ45 operating during the test, initially found that his polarscope was imperfectly aligned, with nothing in the manual to advise on adjustment. The iOptron helpline provided instructions and he sorted it out easily. I did not check 'my' mount but the standard routine allowed me to take ten-minute sub exposures and several hours of data free of serious field rotation so I was very happy with it.

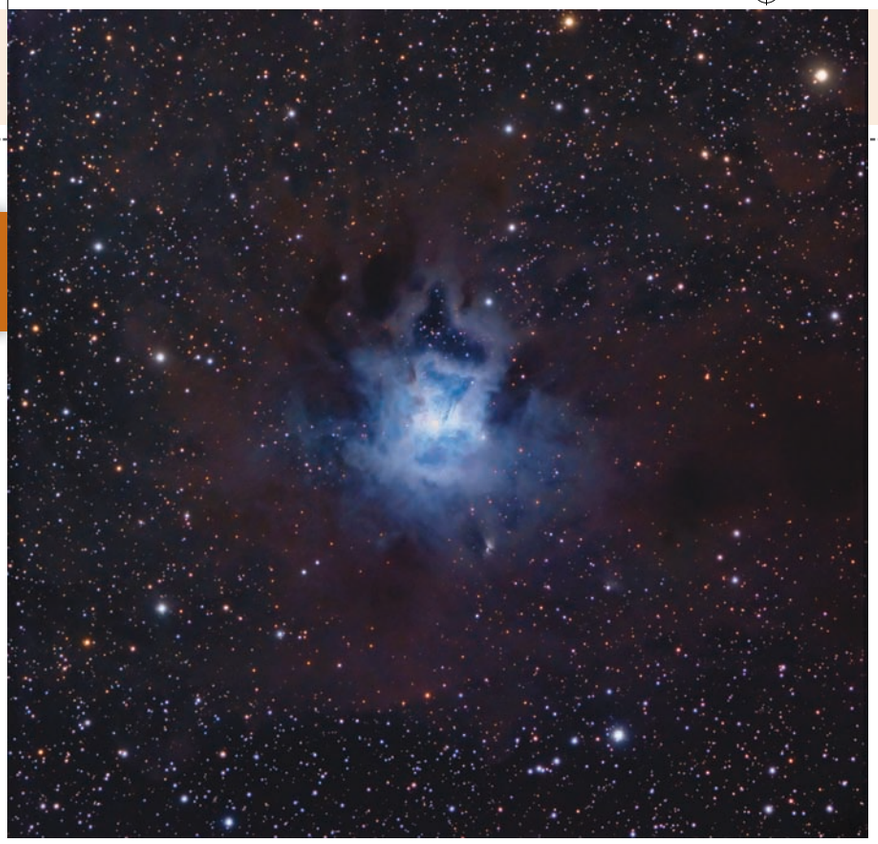
When putting on the telescope for balancing I encountered some iOptron idiosyncrasies. Although the manual runs through the balancing procedure as if the mount had conventional clutches, it doesn't. It has four clamp bolts per axis and never becomes free enough to let the payload and counterweights pivot easily for balancing. The manual's stony silence on the matter was patently disingenous. For declination you could always balance your telescope/camera/guider across a pencil on the kitchen table and mark the mid point but for right ascension you will just have to guess

▼ **The iOptron IEQ45 with optional extended counterweight shaft and a Takahashi FSQ on board. The standard shaft, designed to fit snugly inside the mount for transport, is too short to balance heavier payloads.**



▼ **The iOptron's excellent altitude and azimuth adjustors.**





▲ The Iris Nebula, taken on the iOptron IEQ45 mount with an Altair Astro 115 triplet refractor, over 12 hours of exposure time using both colour and monochrome Atik 4000 cameras. All images: Olly Penrice.

as best you can, which I did.

Aware of the issue, iOptron have discontinued the present version and introduced a new clutch on the declination axis that promises to be fully free.

With the telescope attached, peculiarity number two appeared. I'm used to giving the OTA and counterweight bar a 'wiggle' to see that they can't easily move, but on the iOptron they can, to some extent. The motors and their gears are spring loaded into mesh so that pushing against the spring pressure does allow the payload to move a little against moderate resistance. Once driving, however, this seemed to have no ill effect on performance. I mention it in case, as I did, you were to find this a little disconcerting at first. However, the spring loaded drives do make the mount less sensitive to balance which probably accounts for my having no problems arising from the rough estimate with which I worked.

With assembly and polar alignment dealt with very efficiently indeed we turn to the handset for star alignment. This is conventional, offering one or two star routines which work fine. I found the GOTO remarkably accurate even when slewing past the meridian and would single out for praise the easy way in which you can input RA and Dec co-ordinates for obscure objects, or the centre point of a picture you have already 'framed' in your software at home. Less satisfactory was the action of the handset buttons themselves, both on the test mount and Yves' own example. They need a very deliberate press and often don't obtain a response from the electronics. This means that scrolling through the named star catalogue is numbingly slow. It might be dawn before you got to Zosma!

For a first run I used the Altair Astro 115 refractor with a focal length of 805mm, enough to need reasonable autoguiding but not a huge challenge either. Without paying any attention to setting either backlash compensation or guide speed I just plugged in my autoguider (an Atik 16ic and ST80 guidescope) and imaged for the next three hours in ten-minute sub exposures showing nice round stars. On subsequent nights, when the hated meridian flip was needed, the mount put the object back on the chip. *AstroArt* showed that the guider was producing an average error of about 0.1 pixel, good enough for the telescope in question. Given my casual approach to setting up the guider (just plugging it in!) I thought the performance impressive. An owner paying attention to balance, backlash, guide-speed and, perhaps, PEC training should have no trouble in improving on my values. Yves uses his successfully for his 203mm (eight inch) Ritchey–Chrétien with a focal length of 1,624mm and also reports excellent pointing accuracy. Use of the Park Position allows very fast restarts on successive nights with the alignment star landing close to the camera crosshair every time. I wish I'd noticed that you must disable Meridian Protection, though, because otherwise it stops dead on reaching south. D'oh!

▲ The very accurate GOTO on the mount is a boon for tracking down faint and obscure targets, such as the dark nebulae LDN 673 and 684, taken over a 2.5 hour exposure in ten-minute subs using the iOptron IEQ45 with an Altair Astro 115 and an Atik 4000 CCD.

As ever, the 20.5 kilogram payload claim is optimistic and the real value hard to quantify. I see this as an imaging mount for a 127mm (five-inch) refractor or 203mm catadioptric and not more, but at that it is very competent and I'm a notorious 'payload pessimist.' For visual observing the quoted payload is far more realistic. Note, though, that the compact counterweight shaft is too short for anything approaching the upper limit and so a longer one is available.

This mount is neat, efficient and appealing and comes ready for Vixen or Losmandy dovetails.

Olly Penrice is proprietor of Les Granges Astronomy Holidays – see www.sunstarfrance.com for more details.

At a glance: iOptron IEQ45 German equatorial GOTO mount

Mount weight:	11.4 kilograms
Payload:	20 kilograms
OTA attachment:	fits 89mm (3.5-inch) Vixen dovetail and 203mm (eight-inch) Losmandy mounting plates
Power:	12V DC (car plug adaptor included)
GOTO:	130,000 object database
Accessories:	Heavy duty stainless steel tripod, polarscope, two 5 kilogram counterweights
Price:	£1,599
Available from:	Altair Astro, www.altairastro.com, tel: 01263 731505.