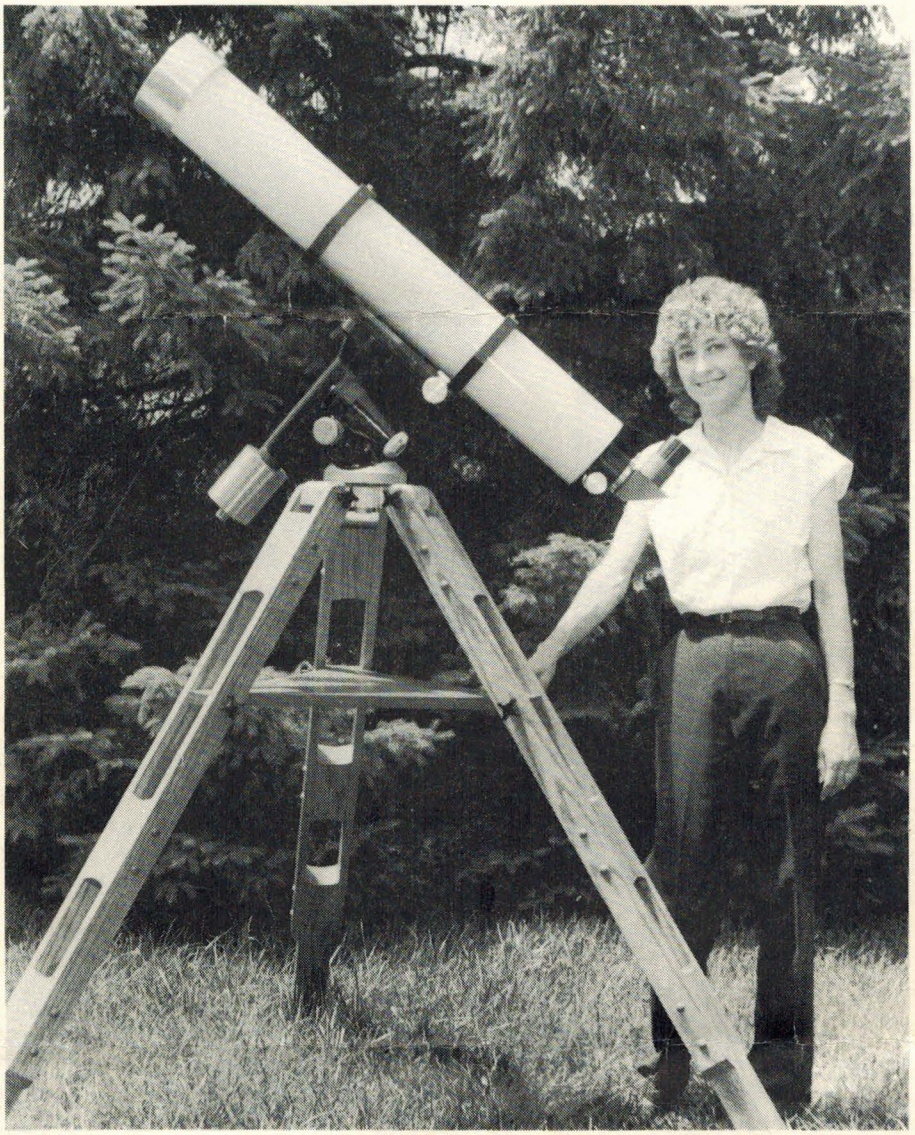
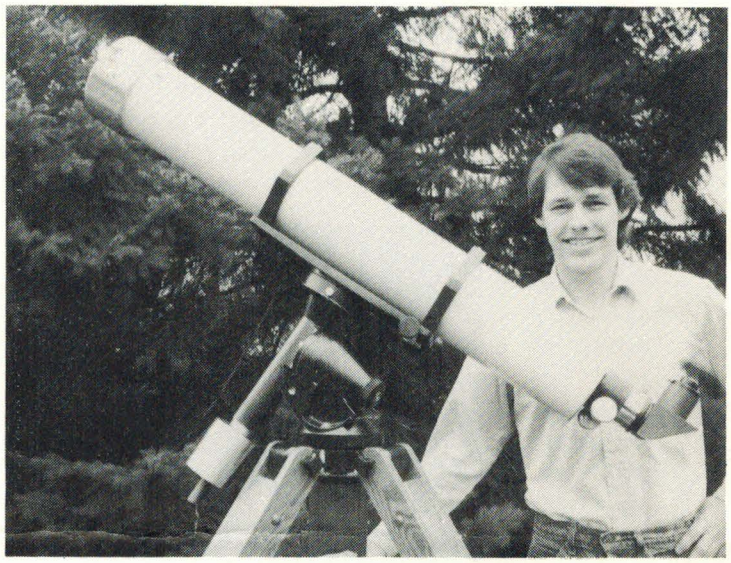
Astro - Physics

ASTRO - PHYSICS
839 BraeBurn Lane
Rockford, IL 61107



ASTRO-PHYSICS proudly announces a modern Refractor Telescope for serious amateurs. Our new 6 inch F9 Apochromat uses the award winning CHRISTEN TRIPLET design. The objectives are computer optimized for high power as well as wide field photo-visual work. A host of accessories is available to enhance the versatility of this powerful instrument. The result is a limited production telescope with magnificent optical performance, second to none in its class.

6 INCH F9 TRIPLET APOCHROMAT REFRACTOR



Based on the CHRISTEN TRIPLET design, our 6 inch Refractor uses three matched optical glasses to combine the colors of the visual spectrum into intense, sharp, concentrated images. Only the highest quality glass, free of striae and imperfection is used in our lenses. The result is a clean optical system with superior resolution, contrast and light gathering power.

The lenses are pitch polished and hand corrected on an interferometer to better than 1/16 wave peak in the yellow-green visual range. Powers up to 600X are practical for lunar/planetary and double star work. Color correction is essentially flat from C to F wavelengths, with the violet g and h secondary spectrum much reduced. Visually, no false color is seen even on the Moon at high powers.

The wide-field performance of this design is truly outstanding. The object glass is completely free of coma, and at F9 will cover a $2\frac{1}{4}$X$2\frac{1}{4}$ format. Images on color film are crisp and sharp, with no annoying blue halo around bright stars. Wide-field 2 inch oculars will show up to 2 degrees of sky at once. The F9 focal ratio and fully baffeled tube causes deep sky objects to stand out in high contrast against velvet black skies. If you are looking for a versatile telescope for visual or photographic work, you will be proud to own this unique and beautiful instrument.

F18 PHOTO-VISUAL BARLOW AMPLIFIER

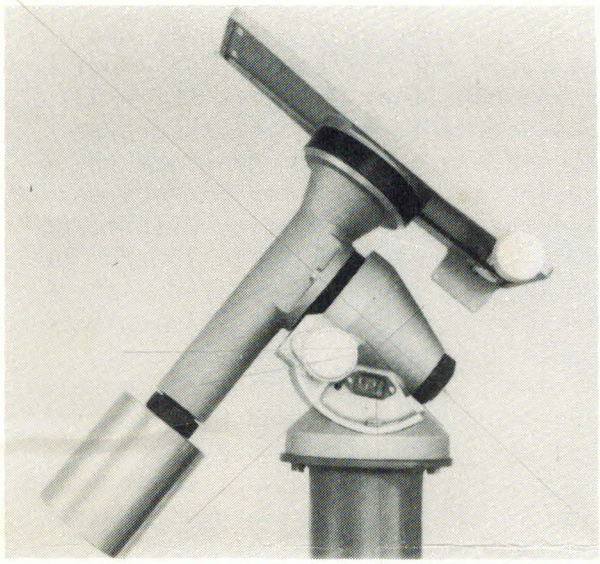
This custom made accessory doubles the focal length of the objective for high power photo-visual observations. The 2 element design uses special glasses to preserve the fine color correction of the main objective. The optical elements are hand corrected and precision centered to insure that no aberrations are introduced into the system. The large optics are designed for 2 inch and 1.25 inch oculars, and will cover a 2 inch (1 degree) photographic field.

F6 FLAT FIELD TRIPLET TELECOMPRESSOR

Three elements of special optical glass are used to match the characteristics of the 6 inch objective in this F6 design. The result is a telecompressor with diffraction limited performance and no vignetting over the entire 35mm format. The field is absolutely flat with no coma, astigmatism or distortion. At F6 deep sky objects are recorded in a fraction of the time it takes at F9. This well corrected accessory lens preserves the high contrast and superb color correction of the main objective. A must for the serious Astro-Photographer.

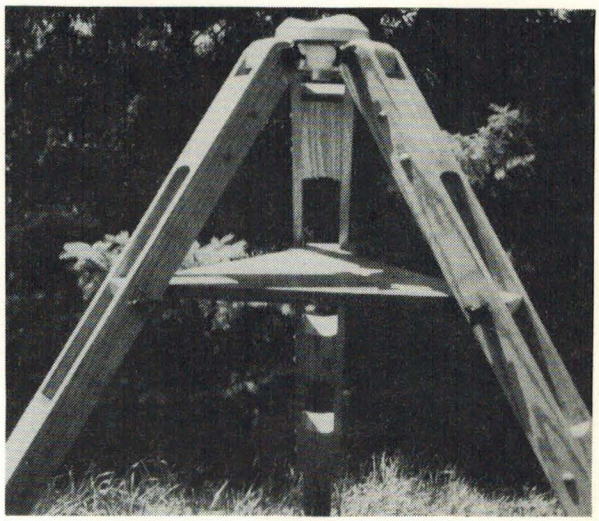
PRICES

6 INCH F9 OPTICAL TUBE ASSEMBLY, with giant focuser, 1.25 inch adapter	1695.00
MATCHING DEWCAP, slides over objective cell	35.00
F18 PHOTO-VISUAL BARLOW AMPLIFIER, in 2 inch barrel	165.00
F6 FLAT FIELD TRIPLET TELECOMPRESSOR, with T adapter for 35mm cameras	165.00
8X50 FINDERSCOPE, with mounting rings	65.00
35mm CAMERA ADAPTER, state your camera model	39.00
1.25" PRISM DIAGONAL, magnesium fluoride coated	28.00
2" MIRROR TYPE DIAGONAL, in precision aluminum housing	160.00



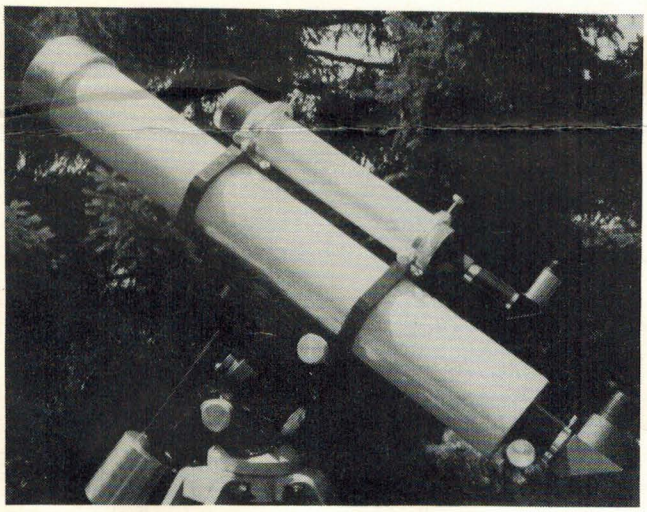
6 INCH EQUATORIAL MOUNT

A good mounting is equally as important as the optics in a telescope system. Our mounting features thrust surfaces to transfer the telescope's mass to the tripod, thereby achieving maximum rigidity at minimum weight. Designed for astrophotography and high power visual work, this mount is steady even in gusting winds. Stainless ball bearings are used throughout, and solid stainless shafts guide the R.A. and Dec. axes. The declination features a precision tangent arm slow motion adjustment. The R.A. axis is driven by a synchronous motor and bronze worm for error free tracking. Both axes respond to fingertip pressure with no hint of backlash. Built in clutches can be disengaged for ultra-smooth sweeping, or locked for astrophotography. The entire mount disassembles quickly for easy transport and storage.



SOLID OAK TRIPOD

This handsome tripod is built for ASTRO-PHYSICS by American craftsmen from solid oak. The hand made legs feature laminated bracing for high stiffness and strength. The tripod is finished with a beautiful protective lacquer. A sturdy shelf provides more stiffness, and will hold all your observing accessories. The shelf removes easily with large hand knobs and the entire tripod collapses for transport and storage.



GUIDING TELESCOPE

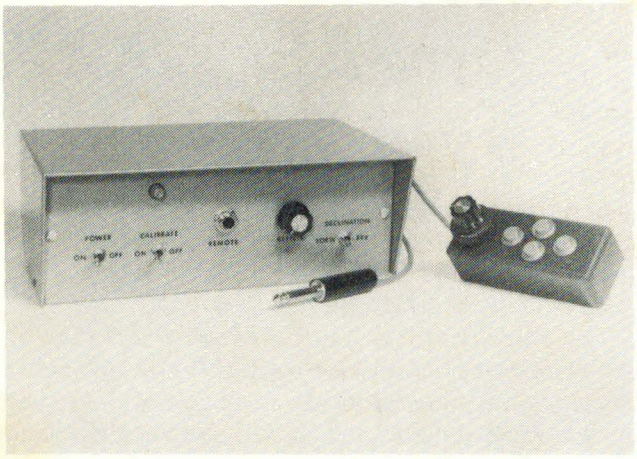
Our new guide scopes use the highest quality American made lenses for error free astrophotos. The 3 inch lens shows a clean Airy disc without objectionable color aberrations. A built in 6X barlow increases the effective focal length to 3000mm. Overall length is kept to only 25 inches. Differential tube flexure is absent, assuring pinpoint star images on long exposures. The guide scope comes complete with 12mm double crosshair illuminated ocular and power supply. Large mounting rings allow 5 degrees of motion for acquiring suitable guide stars, a real advantage over off-axis schemes. A 1.25" Prism diagonal is supplied with the guider.

PRICES

6 INCH EQUATORIAL MOUNT, with worm gear drive and stainless counterweight 795.00

SOLID OAK TRIPOD, custom made, with removable shelf 475.00

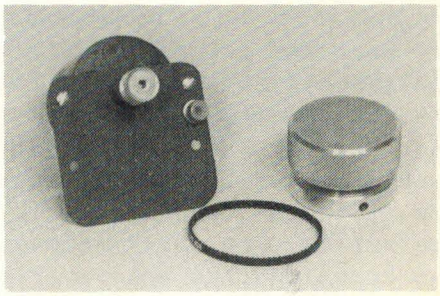
3 INCH GUIDING TELESCOPE, with 6X barlow, diagonal and illuminated reticle 375.00



DUAL AXIS DRIVE CORRECTOR

A must for astrophotography, this unit was specially designed for our equatorial mount. Input power can be either 12 volts DC or 115 volts AC house current. Advanced integrated circuit components are used to generate the precise frequencies required for perfect astrophotos. Components are selected to withstand temperature extremes from -50 F to 160 F. The fiberglass printed circuit is treated with a moisture resistant coating which eliminates drift and erratic operation, even in heavy dewing conditions. The remote control features 4 push buttons for full R.A. and DEC. control. A fine adjust potentiometer is provided for trimming the R.A. frequency,and the front panel light can be used for exact calibration against the power line. The 24 watt output is enough to drive even the largest amateur instrument, yet this unit draws only 1/2 amp when operating our equatorial mounts from a 12 volt battery. The declination output is 12 volts DC for operation with our Declination Drive. All necessary cords are included.

ELECTRIC DECLINATION DRIVE FOR EQUATORIAL MOUNT



This accessory attaches quickly into pre-drilled holes to allow hands- off guiding in DEC. The fine driving rate matches the R.A. correction rate which makes guiding a breeze. The 12 volt motor plugs into our Dual Axis Drive Corrector, and can also be driven from 9 volt transistor batteries. A built in clutch allows electric and manual operation of the DEC. axis simultaneously. A special non slip belt eliminates the troublesome backlash commonly found in commercial units.

PRICES

DUAL AXIS DRIVE CORRECTOR, with 12 volt DC and 115 volt AC	175.00
FOR FREQUENCIES AND VOLTAGES OTHER THAN ABOVE, add	25.00
ELECTRIC DECLINATION DRIVE, with clutch and timing belt	68.00

ORDERING INFORMATION - When ordering by mail, be sure to include your complete street address. We cannot ship to P.O. box numbers. Illinois residents must include current state sales tax. Domestic orders are shipped UPS. Shipping charges will be collected COD.

METHOD OF PAYMENT - A check or money order included with your order is required for prompt handling. CANADIAN ORDERS must be paid in U.S. funds. In case of long delivery times, we require 1/3 down with the balance due prior to shipment. Personal checks require an extra 2 weeks to clear.

DELIVERY TIMES - Delivery will vary from item to item. Please inquire for current delivery. Our telescopes are custom made and hand corrected. They take time to produce.

6 INCH REFRACTOR SPECIFICATIONS

TUBE ASSEMBLY:

Focal length - 54 ± 2 inches
Objective - Three element, apochromatic oil spaced
Coatings - Single layer mag-fluoride, 450-650 nm.
Light transmission - 96.5% over the visible spectrum
Secondary spectrum - Less than ± .005" variation in focal length from C to F
Spot diameter, C to F - 0.6 mils
Light gathering power - 460 times unaided eye
Tube type - Aluminum, white epoxy coated, fully baffeled, flat black inside
Tube assembly weight - 19.5 lb.
Dimensions - 6 inch dia. x 51 inch length.
Focuser type - Rack and pinion, 2½"dia., 2" and 1¼" adapters, 4" travel

6 INCH GERMAN EQUATORIAL

Polar axis size - 5" dia. at bearing, 1" dia. at rear
Dec. axis size - 4" dia. at bearing, 1" dia. at rear
R.A. gear size - 6" dia. precision bronze worm, ± .0002" backlash
Motor type - 115 VAC. 60 HZ. 3 watts
Dec. slow motion - Tangent arm
Cradle plate - 6" x 15"
Approximate weights - Polar axis .. 16 lb.
Dec. axis ... 9 lb.
Counter weight - Solid stainless steel, threaded for Dec. shaft

CUSTOM TRIPOD

Construction - Solid Oak with cast aluminum head
Height - 55 inches
Shelf dimension - Triangular, 8 inches on a side
Folded dimensions - 11" x 63"
Tripod weight - 37 lb.
Shelf weight - 6 lb.

To my fellow Amateur:

"Why a Refractor?" A good question considering the abundance of low priced large diameter telescopes on the market today. Dobsonians with their large mirrors promise high performance for all observational needs, and the Catadioptrics with their short tube lengths and countless accessories are hard to pass up. However, no telescope can be an all purpose instrument. The Dobsonian is an excellent light bucket, but its thin mirror can never achieve the full definition and resolution that its size should produce. The Catadioptric with its unavoidably large central obstruction is severely limited in the ability to show fine low contrast detail.

It is in these areas where a good Refractor really shines. Certainly a clean aperture devoid of diagonals, spiders and other secondary obstructions will show the highest possible contrast. Add to that a properly baffled tube with high transmission optics, and a small aperture can be very efficient in showing faint objects against a dark sky background. Even a mirror used without obstructions shows less contrast than a lens because its metallic coating inevitably contains thousands of pinholes and microscopic defects, each one serving to scatter light and lower contrast. It is for good reason that coronagraphs have always used refractive optics. These instruments need to deliver the maximum attainable contrast to separate the faint coronal detail from the solar glare.

Contrast is even more important in lunar/planetary work. Here secondary obstructions, zonal irregularities and poor baffeling can lower the contrast drastically and destroy delicate detail. A good 6 inch Refractor will show many bands and festoons on Jupiter, will show the Cassini Division all the way around Saturn's rings, and will show a wealth of detail on Mars at opposition. On the Moon, at least 6 craterlets can be discerned on Plato's floor, the Alpine Valley shows craterlets embedded in its sheer walls, and jagged mountains are seen in stark contrast against the dark terminator. For lunar/planetary work, a 6 inch Refractor can shame mirror telescopes twice its size.

"Why a Christen Refractor?" Until recently the refractor was always a poor choice for a primary instrument. The large color error of the doublet achromat restricts its design to small apertures and large "f" ratios. The long cumbersome tubes were difficult to mount and transport. What is needed is a short tubed Refractor with a high degree of color correction and negligible spherical aberration for high resolution and definition. The new Japanese Refractors using Calcium Fluoride lenses seem to be the answer. But do these instruments really offer performance worthy of their high prices? Calcium Fluoride is a soft water-soluable crystal with a temperature expansion co-efficient some 5 times that of Pyrex. It is doubtful that it can be worked to a high optical tolerance, or that it can hold a good figure under actual observing conditions. In fact, all the new Japanese 35mm Supertelephoto Fluoride lenses have provisions for focusing past infinity because their focal lengths change so drastically with temperature.

The traditional triplet apochromat designs had very steep internal curvatures, and were sensitive to de-centering and other misalignment. This made them difficult to manufacture and thus were priced out of reach of the average amateur budget. The Christen Triplet design with its gentle surface curvatures eliminates most of these alignment difficulties. The cost of the glass materials, even in Objective Grade "P" quality glass, is a fraction of that of Calcium Fluoride. Therefore this design can be manufactured and sold at a reasonable price to the amateur community. The high color correction of the triplet design eliminates the necessity for long "f" ratios. The entire scope and mounting system can be lighter and more transportable. 6 inch refractors will no longer be long and spindly, perched atop their towering mounts.

The time has come for the Refractor to take its rightful place next to the Reflector as a viable instrument for the study of the heavens.

Roland Christen

Astro - Physics

839 Brae Burn Lane
Rockford, Illinois 61107
Phone (815) 226-1471

3-22-85

L. Fulham
P.O. Box 1556
Mt. Isa, 4825
Australia

Dear Sir,

To answer your questions:

1. I usually supply 2 - 10lb counterweights with each system. Extra counterweights are available in 5lb or 10lb sizes.
2. The latitude adjustment goes from zero to approx. 85°.
3. The motor can be installed on either side of the casting for northern or southern hemisphere operation.
4. 220 Volt 50 HZ is not available at this time.
4. We don't have setting circles for our mounts yet, but plan to introduce them in the near future.
5. The pier flange is a 6¼" diameter steel plate with 2 holes on a 5⅛" diameter.
6. The 6" f9 is very similar to that described in Oct. 81.
7. Delivery time of a scope tube assembly and mounting will take 3 to 4 months.
8. We normally require ⅓ down.

Sincerely,

Rw Christen.

Astro - Physics

839 Brae Burn Lane
Rockford, Illinois 61107
Phone (815) 226-1471

Dear Mr. Fulham,

Thank you for your order. Although we have the necessary parts on hand for the refractor, the mounting will take a little longer. Our Machinist is going on vacation until the end of June. Hopefully, if all goes well, we will be able to ship towards the end of July.

It is hard to estimate the freight charges accurately. I figure it will be close to $100.00. I will bill you for the exact amount after all items are shipped.

Thanks.

Sincerely

R W Christ

Astro - Physics

839 Brae Burn Lane
Rockford, Illinois 61107
Phone (815) 226-1471

8-25-85

Len Fulham
P.O. Box 1556
Crn. Ryan Rd + Barnes
Mt. Isa, 4825
Australia.

Dear Mr. Fulham,

I have finished your 6" f9 lens and it will be going out to be mag-fluoride coated tomorrow. I made two lenses, one airspaced and one oilspaced objective. You have your choice of either one. Both lenses are optically very highly corrected. I have been oil-spacing the objectives to get the highest contrast and light grasp. The oil-spaced objectives also settle down faster in changing temperature conditions. The drawback is that sudden thermal shock or high temperatures can cause the thin oil film to separate, leaving a bubble between the elements. Since you live in Australia, it would be a real inconvenience to send the objective back to have it fixed. In the last 6 years, I have had 3 objectives returned because of separation problems, out of 150 lenses.

The 706 equatorial mount will be finished at about the same time that the lenses are returned from coating. Your mounting will have a specially ordered 220V, 50Hz motor installed in it. The drive corrector will also be 220V, 50Hz. This will allow you to use the mount either with house power or with the drive corrector. The rest of your order will also be ready in 2 weeks. The total due on your order is $2187.00. The shipping charges will be billed to you after shipment.

Sincerely, RW Christie

Astro - Physics

839 Brae Burn Lane
Rockford, Illinois 61107
Phone (815) 226-1471

Dear Mr. Fulham,

I'm sorry it is taking so long to ship your order. We ran into some unforseen snags in the focuser and mountings. We have corrected the situations and I am presently packing up your telescope system for shipment.

The lens will be sent in a separate box to prevent damage. All you will have to do is slip the lens assembly into the end of the tube and secure it with the three set screws that are taped to the focuser. Please be sure to orient the lens so that the end containing the retaining ring faces rearward (toward the focuser).

The mount will also be sent partially disassembled. It takes only a few moments to put together. The long skinny Dec axis is attached to the R.A. by means of two bolts. The cradle plate is then attached to the Dec. axis with the four flat head screws. R.A. tension is adjustable by means of the large knurled nut in the rear. Dec. tension is adjusted by the tangent arm thumb screw. Everything should be quite straight forward on this mounting.

As I informed you before, the motor drive is 230V, 50Hz. You can therefore plug the mount into your outlets. You will have to modify our cord to make it compatible with your outlets. The drive corrector will also be 230V, 50Hz.

Sincerely RW Christen.