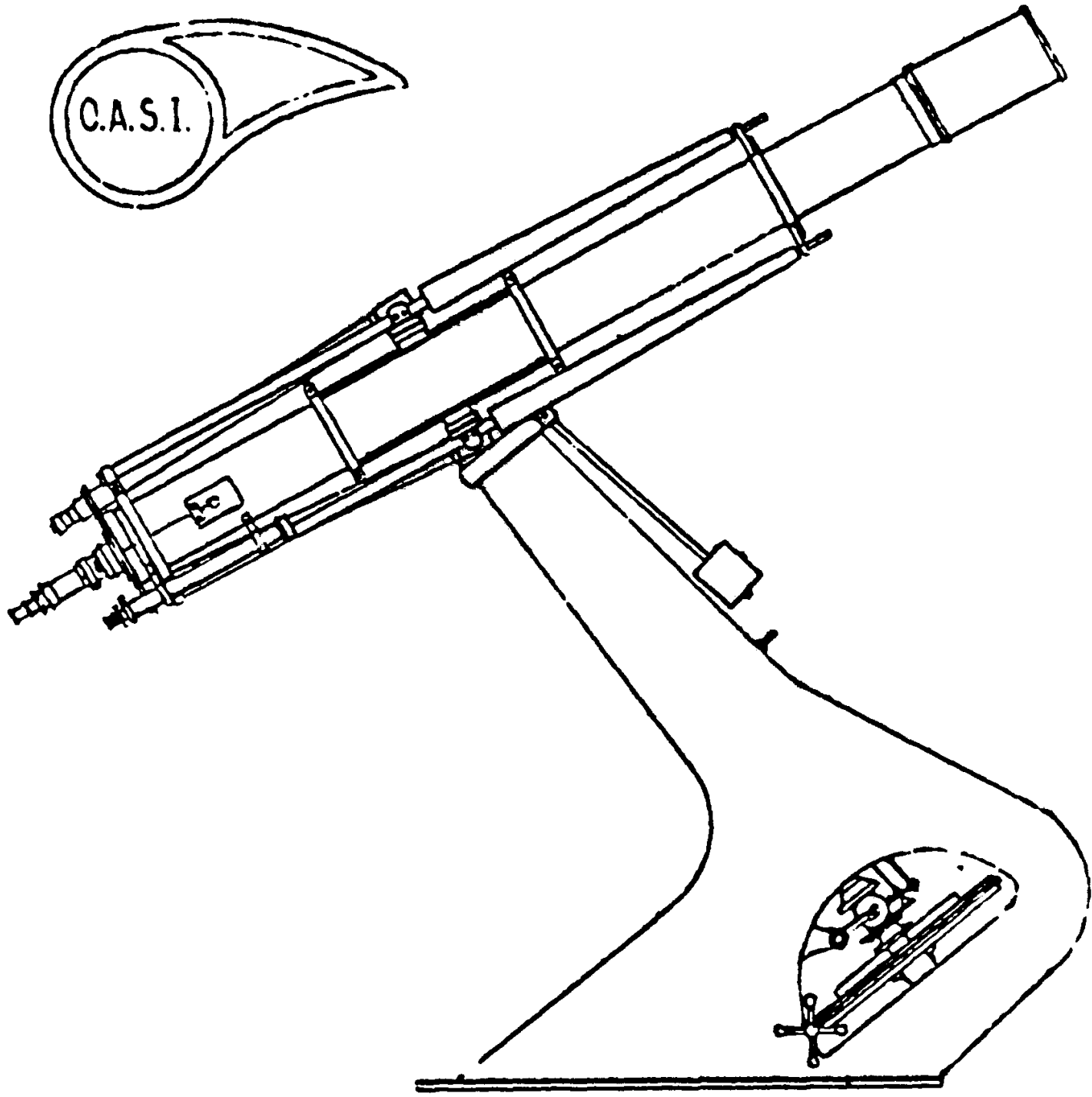
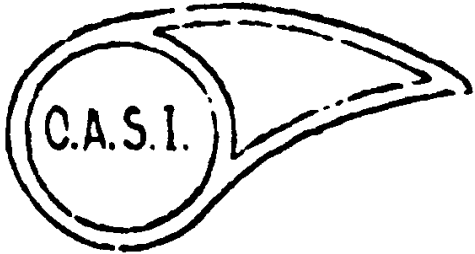


THE JOURNAL OF THE ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

Editor: Mr. Paul Burt, [redacted], Ipswich IP1 6PP Phone Ipswich [redacted]

Producer: R.M. Cheesman, [redacted] West Hanningfield
Your submissions of items for the Journal will be welcome. Chelmsford, Essex.

November 1979



The Orwell Park Observatory 10-inch Astronomical Telescope at Hacton near Ipswich

NOVEMBER JOURNAL

Sorry that we are a little late this month but I had a weeks holiday and then was off work with a touch of the 'flu.

THE NIGHT SKY SEEN FROM ORWELL PARK IN NOVEMBER

In the zenith this month is the magnificent sword-handle double cluster, lying midway between eta Persei and delta Cassiopeiae. The winter constellations of Taurus, Orion, Auriga and Gemini are now filling the eastern sky, but the southern aspect looks quite barren, with a string of faint constellations - Eridanus, Cetus, Pisces and Aquarius - stretching across the southern horizon from south-east to south-west. Triangulum and Aries are on the meridian at midnight in the early part of the month, and west of them lie Pegasus and Andromeda. Still further west Cygnus is still fairly high until midnight.

THE SUN

Sunrise is at 07h00m at the beginning of the month, changing to 07h 50m at month-end. Sunset changes from 16h 30m to 15h 50m. The Sun moves from Libra to Scorpio during the month.

THE MOON

Full Moon 4d 05h 47m New Moon 19d 18h 04m
Last quarter 11d 16h 24m First Quarter 26d 21h 09m

OCCULTATIONS

<u>Star</u>	<u>Phase</u>	<u>Mag.</u>	<u>Time</u>		
			<u>d.</u>	<u>h.</u>	<u>m</u>
635	D	3.9	5	21	51.2
635	R	3.9	5	22	59.0
667	R	5.3	5	3	40.5
669	D	4.0	6	2	48.8
669	R	4.0	6	3	46.6
677	R	4.8	6	4	59.7
*692	D	1.1	6	6	40.2
*692	R	1.1	6	7	21.8
*814	R	5.3	7	4	48.7
934	R	6.4	7	22	04.9
1439	R	5.9	12	3	38.8
**1441	R	6.4	12	4	01.6
*1550	R	5.8	13	4	38.9
2979	D	7.1	24	18	53.1
**3134	D	6.9	25	22	04.9
3267	D	7.2	26	17	04.5
12	D	6.3	28	17	44.2
13	D	6.3	28	18	03.3
15	D	7.3	28	18	39.2

D = Disappearance

R = Reappearance

Stars listed according to Zodiacal Catalog
(ZC) numbers. *Denotes double star

** Denotes time is correct for Latitude
and longitude of Greenwich

THE PLANETS

Mercury reaches inferior conjunction on the 20th, and is too close to the Sun for observation this month.

Venus is an evening object setting about an hour after the Sun at mag. - 3.3

Mars is rising around midnight at mag +1.0 in Leo

Minor Planet Vesta reaches greatest brilliance of mag 7.3 on the 13th, in Cetus. RA 2h 44m Dec +4 54'

Jupiter is rising around midnight in Leo at mag - 1.5

Saturn is also in Leo, rising an hour and a half after Jupiter at mag. + 1.3

MUTUAL PHENOMENA OF JUPITERS SATELLITES

See last months ephemeris for explanatory notes and key to table

<u>Event</u>	<u>Time</u>			<u>S.D. (secs)</u>
	<u>d</u>	<u>h</u>	<u>m</u>	
I E II P	2	01	36	110
I E II P	5	14	14	90
I E II P	9	03	53	60

Source: BAA Handbook 1979. All times are U.T. (= BST - 1 hr)

FROM OTHER JOURNALS

British is Best - On October 10th the United Kingdom Infrared Telescope (UKIRT) was inaugurated on the summit of Maura Kea in Hawaii, 4200 meters above sea-level. It is the worlds largest infrared telescope, with an aperture of 3.8m. It will be working alongside two other telescopes on the mountain, and although it is the largest, it has the smallest support structure and was the cheapest to build. This is due to a bold break from traditional mirror design, whereby the primary mirror normally has a diameter to thickness ratio of 6 to 1. The UKIRT mirror has a ratio of 16 to 1, and instead of being built from glass, it is made of a low-expansion ceramic called 'Cer-Vit', and weighs 6 tonnes as opposed to the 15 tonnes it would have weighed had it been traditionally designed - hence the lightweight support structure.

Another feature of the telescope is the earthquake protection mechanism, necessary because of the close vicinity of active volcanoes. The system comprises a series of brass pins in the underfloor assembly, serving as 'mechanical fuses' which shear under strong horizontal forces. The telescope has already suffered two earthquakes this year, which bodily moved it 4mm. The shear pins worked perfectly, and the structure was jacked back to its original position within the hour on both occasions.

CONTD:

Contd:

The UKIRT telescope is managed from the Royal Observatory, Edinburgh, and is open to any British astronomer who can satisfy a panel of experts as to the importance of his proposals. A team from London is flying out this month to install a receiver allowing the telescope to pick up microwave radiation as well as infrared, enabling the gas clouds from which stars are formed to be looked at in detail. According to the team, UKIRT will without doubt be the best telescope in the world for these observations.

Well Done Britain!

(New Scientist)

ARTICLES TO READ

'Suicide of the Stars' - New Scientist October 4th
A look at the important role of Supernovae in the dispersal of matter and formation of stars in the Universe.

'Saluting Salyuts Space Record' - New Scientist October 11th
An account of the record-breaking Salyut - 6 mission, and a look (or an educated guess) at Russia's future plans for Space as a result of the success of the Space-Station

ADVERT:-

ASTRONOMY QUARTERLY: An independent, wholly amateur produced periodical dealing with all aspects of amateur astronomy. Four principal issues per year, with Supplements. Subscriptions £3.50p.a. made payable to 'Astronomy Quarterly' and sent to: Iain F. McCreight, [REDACTED], Livingston, West Lothian, Scotland.

METALLIZED POLYESTER FILM AS A SOLAR FILTER:

(see report in August's copy of the B.A.A. Journal)

Peter Laycock of the South East Essex Astro. Soc. advises me that his Society has purchased a large quantity of the above film. (It can only be purchased in large rolls costing many pounds)

This film which is very thin can be mounted in a cardboard holder and fixed to any type telescope. The film is being sold in lengths of 1 meter x 1100mm widths for £1 and out of it many filters can be made.

Because the filter is very difficult to handle and costly to post if you would like any please contact Mr. R.M. Cheesman who will get it from Southend and bring it to Ipswich for you.

(Unless otherwise stated, the following News items come direct from the organisation or contractor. To these we are grateful.)

SUMMER '79 PLANS BEING MADE FOR COMETARY PROBE.

If minds can think back that far, over six years ago, the Skylab Astronauts observed what was supposed to be the comet of the century - Kohoutek. Now investigations are being carried out into a mid-1985 launch of a probe first to visit comet Halley, then Tempel 2. On encountering Halley, a probe would be released, plunging into the comets 'coma' relaying to the probe details of composition, pressures, temperatures, particle sizes and so on. Perhaps even more interesting is the fact that the probe will coast alongside Tempel 2, sending back information on the comet as it curves it's way past the Sun.

- 'VECTORS', Hughes Aircraft Company.

AUG 30th INVESTIGATIONS FOR SPACELAB FLIGHT'S.

NASA has selected 33 investigations from U.S. concerns and 7 from foreign, to be studied for the eventual flight on Spacelab missions 1983 to 1985. The investigations are in the fields of Astronomy, atmospheric physics, space plasma physics, solar physics, and high energy Astrophysics.

- N.A.S.A.

AUG 31st NEW MODE OF TRANSATLANTIC MAIL.

For a month period starting in mid-July of this year, electronic mail has been transmitted via an Atlantic region Intelsat IV satellite to and from the U.S. and G.B. Cost of each page sent is presently put at 5 dollars (@ £ 12). The U.S. postal service hopes to lower the price if there is an increase in user service.

- 'HUGHES NEWS', Hughes Aircraft company.

AUGUST '79 ENVIRONMENTAL CONTROL EQUIPMENT CONTRACT AWARDED.

Rockwell International, prime contractors for the Space Shuttle, have awarded Space Systems group of United Technologies Inc, a 28m dollar contract to provide environmental systems for the Shuttle Orbiter. The equipment provides airconditioning, a comfortable temperature and for removal of CO₂.

- 'TODAY', Hamilton Standard Division of United Technologies

SEPT 6th U.S. EXPERIMENTS ON RUSSIAN COSMOS SATELLITE. Inc.

Thirteen U.S. experiments designed to find out more about Physiological affects of animals in space were due to be flown aboard a Cosmos satellite in mid September. Cost of the space -craft and associated activities will be paid for by the U.S.S.

N.A.S.A.

SEP 4th NASA ANNOUNCES LAUNCH OF HEAD-3.

On September 4th NASA put the date of launch of HEAD 3 as September 20th. The observatory, weighing 2,948 Kg, was due to be launched by Atlas Centaur. It carries three scientific experiments, a gamma ray spectrometer, a cosmic ray isotope experiment, and a heavy cosmic ray nuclei experiment. One of the major aims will be to undertake a search for theoretically predicted chemical elements beyond the range of the present periodic table of elements. The observatory will follow a similar line to its previous counterparts, in that it will be analysing particles emitted from the violent bodies of our universe, ie Pulsars, Quasars and Seyfert galaxies. The series of High Energy Astronomical Observatories are all composed of what are termed "off the shelf hardware". The aim of this being to reduce costs. Although their design lifetime is 6 months, experimenters would not be surprised if they exceeded this by another 12.

-NASA and TRW Defense and Space Systems Group, Inc.

SEP 10th NAVSTAR SATELLITES TO PERFORM EXTRA DUTIES.

The U.S.A.F.'s 5 Space Service Division's 24 satellites, due to become operational in the mid 1980's will not only provide a Global Positioning System, but provide advanced warning on atmospheric nuclear blasts. The system will be installed on NAVSTARs No's 6 onwards. The detection equipment, using X-ray techniques, will be switched on as soon as a secondary sensor detects the burst, and switched off once the explosion has finished. At present, NAVSTAR 5 is awaiting launch, while NAVSTAR 6 is in the final stage of construction.

-Rockwell Space Systems Group.

SEP 11th INTELSAT ORDERS ANOTHER INTELSAT V SATELLITE.

In future anticipation of increased transatlantic communication needs, the International Telecommunications Satellite Organisation (INTELSAT), has ordered an extra INTELSAT V satellite from Ford Aerospace & Communications Corp, the contractors. The satellite will be the eighth in the series, and will carry a 'package' allowing Ship/Shore/Ship communications. The satellite will cost 38 m dollars.

-INTELSAT.

SEP 12th VOYAGER STATUS.

At this time a six week Solar occultation period was coming to an end. As a result communications with the spacecraft were poor, and Scientists took the opportunity to study the various effects of the Sun on the craft's radio signals.

-J.P.L./N.A.S.A.

SEP 13th SATELLITES TO THE RESCUE.

NASA and the Canadian communications Department have agreed to work co-operatively on a satellite aided search and rescue system. France will also be participating, various parts of the system being provided by each country. France and Canada will provide spacecraft transponders and receiving equipment, as well as compact distress beacons to be placed on ships. The space based equipment will eventually ride U.S. National Oceanic & Atmospheric Administration satellites from 1982.

-N.A.S.A.

SEP 14th PIONEER SATURN RETURNS DATA.

Images aquired by the Santa Barbara's research centre's Imaging Photopolarimeter aboard Pioneer Saurm, have revealed new rings around the Saturnian globe. Measurements of the radiation intensity around Saturn have indicated that there is very little difference between it and Earth. Prof Tom Gehrels has said that another remarkable discovery is that Saturns poles appear blue. Although the planet has cloud bands similar to those on Jupiter, they are not quite as pronounced.

-HUGHES NEWS.

SEPTEMBER SPACELAB PROTOTYPE UNDERGO'S TEMPERATURE TESTS.

Multilayer insulation blankets are at present surrounding Spacelab 1 in the integration hall at Bremen. 160 sensors record temperature variations-measurments which are to be made if the internal temperature is to be kept at between 18 and 20 degrees celsius. As external and internal temperatures change, the environmental control system must respond to maintain a habitable temperature.

SEPTEMBER MORE POWER FOR SHUTTLE ORBITER.

Under a contract from the Johnson Spaceflight centre, McDonnell Douglas is studying a device called 'power Extension Package' (PEP) which should be able to increase an Orbiters stay in orbit up from 6 to 20 days. The panel essentially consists of a 238 by 13 foot Solar panel to be deployed from the Shuttle cargo bay. The solar cells will provide up to 26 kilowatts of power.

-McDonnell Douglas Spirit.

SEP 20th IN ORBIT REPAIRS OF SHUTTLE HEAT SHIELD.

Studies are going on into Astronauts repairing Shuttle heat shields once in orbit. NASA stress's that they have total confidence in the structural integrity of the shield, but say speedy turnaround times may mean all tiles cannot be checked. The remote manipulator arm would move over the surface of the orbiter, allowing Astronauts to see for any damage by means of a camera attached to the end. An Astronaut would latter spray an epoxy foam in during a 'Space walk'.

-N.A.S.A.

SEP 21 FURTHER ENERGY MODULE PROJECT UNDER STUDY.

Lockheed has received a 272,000 dollar contract from Wright Patterson AFB, Ohio, to study the feasibility of constructing a 10-50 Kw power unit to be carried in the cargo bay of the USAF's Shuttle Orbiter. (See similar NASA awarded study, this journal.

-Lockheed Missiles & Space Company.

OCT 2nd ASTRONAUTS MAY USE MANNED MANEUVERING UNITS.

A manned Maneuvering Unit (MMU) backpack may become standard equipment for all Shuttle Astronaut Extra-vehicular activities. The unit will allow an Astronaut to be free of the Shuttle hull. Little hydrazine gas jets will enable the Astronaut to move in any direction. The main use to which the unit will be put is to repair damaged Orbiter heat shield tiles while in orbit.

-N.A.S.A.

OCT 8th SHUTTLE STATUS - EXCELLENT.

Columbia is now being readied for rollout to the Vehicle Assembly building for mating with an External Tank and two Solid Rocket Boosters. Shuttle facilities at pad 39A should be ready by the 1st of January. Approximately 3000 tiles remain to be fitted, and is continuing at 600 per week. All three SSME's have been installed with the cargo bay radiator doors about to be. Launch date is scheduled for between March and Jul 1980.

-Rockwell Space Systems Group.

OCT 18th SOLAR MAXIMUM MISSION.

A satellite was due to be launched from KSC on October 18th. It will be used to study Solar flares during the 1979-1981 period. In it's 300 mile high (500km) orbit, the satellite will try to answer such questions as; Where do the flares originate, How and where does the energy for the flares originate, and what triggers the release of energy.

-Grumman Aerospace 'HORIZONS'.

For more information on these and other recent news items, contact S.G. Harvey at either, [redacted], Needham Mkt, Nr Ipswich, IP6 8AL, OR School of Maths & Physics, MAP I, University of East Anglia, Norwich, NR4 7tj. Your items for inclusion in this review will be appreciated.

Organisations interested in receiving more up to date News items should contact me at the University address.

METEOR NOTES by David Barnard.

There are three major and one minor meteor showers during this month.

MAJOR SHOWERS:

1. THE TAURIDS

This shower has a double radiant and both radiants are rich in fireballs with the maximum of the shower falling on the 8th November with the normal limits between October 20th and November 30th. The ZHR is about 12 with the radiants at $+14^{\circ}$, 03hrs44mins and $+22^{\circ}$, 03hrs44mins. This shower will this month be seriously interfered with by the Moon.

2. THE CEPHEIDS

This shower is a fairly new stream which badly needs observing. The normal limits are between November 7th and the 11th with the maximum falling on November 9th. The radiant is at $+63^{\circ}$, 23hrs 30mins and has a ZHR of about 8. The Moon also interferes with this stream.

3. THE LEONIDS

The Leonids Meteor Shower has increased its activity during recent years. The normal limits are between November 15th and the 19th with the maximum on November 18th. The radiant is at $+22^{\circ}$, 10hrs 08mins and the ZHR for the last reports for 1978 shew it to be about 10.

THERE WILL BE A METEOR WATCH TO OBSERVE THIS SHOWER ON SATURDAY 17th NOVEMBER. Meet OUTSIDE the Ship Inn, Levington at the earlier than normal time of 8p.m.

EVERYBODY (MEMBERS AND NONMEMBERS) ARE WELCOME

MINOR SHOWER

This month sees the minor meteor shower called the 'Bielids' which is a very weak one with only one meteor being reported every hour or so. The maximum is on November 14th with the normal limits still unknown. The radiant is at $+43^{\circ}$ 23hrs.

DECEMBER JOURNAL: Deadline for articles Nov. 19th, please post direct to R.M.Cheesman at West Hanningfield address

COMMITTEE MEETING AT OBSERVATORY

All members are invited to attend our next Committee Meeting to be held at the Observatory starting at 8p.m. on Friday 23rd November.

My regrets for not having the second part of this article ready for last issue, but as may have been apparent from the Journal's change of typeface, the Author has, like others in this field, found pressure of other work daunting, and has even, for the foreseeable future anyway, had to give up doing the Journal. I'd like to point out that giving up was not what I really wanted, as I enjoyed doing the Journal. But maybe from time to time I will still be able to help out with a page or two - equivalent to two to four of normal type - whoever else does or helps with the production. Let me please assure members that I have not entirely withdrawn myself from the O.A.S.I. scene. (Now, then, there's no need to be like that...)

The Prinz telescope originally came as a standard altazimuth, tripod-mounted type, bought from one of our members who, I understand, had put it to good use. The idea of tilting the normally vertical or azimuth axis of the altazimuth 'scope seemed very desirable if it could be done without impairing the strength and usual fair rigidity of the set-up, and held the possibility further, of fitting some sort of drive which, if not good enough for large image scale photography, would at least (hopefully) keep the telescope pointed for half an hour or so.

At first, finding the vertical axis somewhat stiff, I thought the drive would need a lot of power and even then, some 'jumping' and wobbliness in the existing head would occur. So I decided to take the lot apart and see if I could fit in a roller bearing or two. When I was dismantling it, I found the main bush had a hairline crack almost separating the little casting into two parts. Rather than go back, I still went on, cutting out the cracked part of the bearing bush, and sorting through my 'stock' of odd bearings and parts like special washers, bushes and so on. In the end, I found two ball bearings of the axial-load, outer and inner ring with concentric cage type - one small and one large - and a discarded cage with tiny rollers, of a thrust bearing, which suited requirements.

The rubber compo. original thrust and take-up washer was 'on its way home' and was better replaced, as it did not give enough compression to keep the head from wobbling more than I liked. I found a suitable strong compression spring and new bolt and other chosen bits and with a bit of design, made the head free from any wobble, side- or end-play yet very easily turnable.

I was now in a position to add a drive to the head. I wanted something that could run if need be for several hours at a stretch, had no hanging weights and would work electrically at low voltage so the telescope could be fully worked within new equatorially-angled 'design' limits without mains or extra car battery power. Instead of including the trouble of making an entire motor myself, I plumped for a sample small electronic drive motor with gearhead incorporated, with an output shaft giving 1 revolution every 30 minutes nominally. Previous tests of this motor had shown that the speed could be adjusted reliably, to at least 10% faster or slower by inserting a tiny screwdriver through the casing and into a slotted 'preset' variable carbon track resistor, on the printed-circuit component disk. Also, I had tested the motor for 'speed' accuracy at different temperatures and at different voltages, finding that although rated at 12 V.d.c., it would still start down to 7.5 V.d.c. and was within recommendation to use on up to 14 V.d.c. I had a 10 V.d.c. ex-G.P.O. lead-acid battery, rechargeable in the normal way, and at 10 V, the motor consumed only about 1 watt.

The battery (or accumulator in old parlance) was just the right size to hold a good charge for at least 24 hours' continuous use, with no recharging, was light yet heavy enough to help hold down the southern apex of the tripod base, aided by the weight of a fixed-on-board battery charger, control box and meter. A working and indication light could also be run off the battery, and the battery could be put in

a box matching that of the charger and control unit. The battery box was also made oversize but with location blocks, so air could circulate freely & the battery kept from sliding about. The battery was made easily removable so that for transporting in small vehicles, the whole mount and tripod and boxes could be put on its side with the battery separated, upright somewhere else firmly held in the vehicle.

The tripod leg pointing south being very considerably extended, while the other two legs were kept at their shortest length, made a 3-screw small metal strip-plate seemingly necessary in case normal clamp screws slipped - which might strain the motor and gear department and put it out of mesh adjustment, and out of equatorial angle, though the latter was less important to preserve, being easy to reset. The total dismantleability of the tripod and head has effectively been lost unless one was able to allow much more time for it and reassembly, and is hardly necessary unless one is wanting or forced to pack up into as small a carry-pack as possible. The tripod and head were kept low for better rigidity and viewing while laying down: one can always use a zenith prism - one was provided with the telescope - and with this, viewing can be very comfortable.

The charger unit, I would like to say, should be ventilated while in use (charging). But if one likes to keep the dust out of the unit at other times, a fresh bit of sticky-tape can mask-off the outer row of vent-holes. I fitted a second-hand mains-primary transformer with two intermediate 'taps' on the secondary, with a rotary switch and resistor-variable charge rate. When charging, the motor is automatically switched-out in case of impairment of the motor circuit otherwise. The meter mentioned has a connected switch so this same meter can be used to indicate charging current, or motor current, or charging, motor or battery voltages. The meter is also (very?) second-hand, but was used because it had the correct calibration line intervals and a luminous dial (though I later found this has lost its oomph!) All one does to charge the battery, is unwind the cable and plug-in to mains. About 3 hours' charge sets one up for at least a week or so and with my time restrictions, at least a month's observation.

The telescope tube and any attachment can still easily be removed from the forked 'U' casting of the head - the declination axis undoes (by turning only one screw).

It was a bit of a job to decide whether to use a worm gear and spur gear for the equatorial drive, or a small pinion instead of the worm. Many years ago, I made a Meccano telescope mounting with carefully curved rack strips for the main gears, their radius being 16.3 inches, together with a small (3/8-inch) radius pinion, and decided as this had worked well enough, to use similar on the Prinz. I had a couple of metal disks I had cut from something, and used the larger with some Meccano racks, to make a 3.2-inch radius gear, with a 3/8-inch pinion in mesh from a step-down gearbox also of Meccano. The pinion allows quicker adjustment with an interposed clutch between the motor and the final drive which theoretically allows slippage if the telescope is knocked accidentally. The gear being a pinion also allows slippage of the set-screw for knocks, whereas a worm wouldn't. Variations in drive due to changes in angle of attack of the pinion teeth seem very small - O.K. anyway for this telescope. The gearbox itself is 3:1 in reduction - the pinion does about 1 rev per 15 hours. 15 teeth on the 3/8-inch pinion and 240 teeth on the 6.4-inch main drive gear gives the needed 1 rev per 24 hours. Indication on the main gear was also easily markable using 10-teeth-per-hour intervals.

The clutch was at first composed of 1-inch diam. rubber-tyred pulleys (Meccano) but friction was then inadequate. Slipping-in two discs of industrial sandpaper, back to back, stapled together, between the pulleys, gave enough adhesion. To adjust the pointing of the telescope one either adjusts the original clamp or pulls the clutch shaft. The latter is for when finding by co-ordinates is attempted, the first still being the quickest and simplest, as finding by co-ordinates means accurate basing and setting to sidereal time calculations. It is, however, a useful facility. The Dec. axis is set by original sliding rod, and could be improved. I did add a 4-inch indicator disc,

though, with white rings on black ground, similar to the polar indicator.

The change to equatorial tended to make the fork for the dec. axis a little back-heavy, and to offset this, a fixed 'U'-shaped counterweight bar was added. I also found it necessary to add a lenshood counterweight when using a camera with the telescope - a weight on a single clamp ring quickly slideable, did the trick.

The angle to the horizontal of 38° was marked-off on an A4 sheet of paper and a horizontal reference line behind the head was sufficient in preliminarily adjusting the tripod legs. The tripod legs were measured for splay for an angle of about 34° to the triangular base (or a parallel to it running N-S). The other 4° for the latitude of Ipswich was intendedly made up (or down) to level ground by having a longer foot-adjust screw at the southern apex. '2-by-1' planed timber (finish section 47 x 21 mm) was used for the base. All woodwork was painted with two coats of outside-quality white paint. The charger/control and battery boxes were screwed to the base after priming, and were also fitted with end-hinged lids.

To enable the electronic drive which is effected by charge and discharge of a special circuit based on capacitors and voltage level cycling and switching, to be speed-changed, I took the cover off the motor circuitry and carefully bridged the manufacturer's 'preset' with a pair of thin leads. (Not caring too much for soldering wire-joints with attendant possibility - or inevitability? - of damaging the 'preset' or neighbouring components, I used very small machine screws and washers - a 1-mm diameter drill-hole into the printed circuit board gave the screw-holding and the screws then had a lead each twisted round them, plus washer and nut, just small enough to allow replacement of the proper cover.) The leads through the cover were then kept long enough to allow stretching to any observer position, being fitted with a 35-mm film cassette holder (film removed with cassette) and variable resistance plus knob. Also in this little very hand-holdable black plastic container was a fixed resistor, and screwdriver adjustment of the motor 'preset' through the cover was only necessary in finding the range for the new adjust control. Values of resistance were 'picked' to allow slow lunar rate to a little plus stellar rate to be within the whole 280° turn of the hand-holdable new control.

I have found that this somewhat Heath Robinson arrangement has worked perfectly well since put on about a year ago. I usually use an eyepiece allowing fair eye relief, of 15 mm f.l. and assuming the base is set reasonably, objects remain in view without adjustment for at least half an hour even at the celestial equator. I have fitted a solar projection attachment on occasion, and find the lens-hood counterweight balances that too.

I still hope to make a concrete slab base on my back lawn with three positioning pieces in for the foot-screws. I find it convenient, though, to use several different observing 'stations' about the garden and even from the house. Unfortunately, our terrace blocks run N-S and are fairly close together - making such movement desirable. I am lucky, however, in having an uninterrupted meridian zone, widened somewhat by changing the 'station' of the 'scope.

A photograph of the telescope was included in the August Journal but reproduction was 'a little off' and consequently, anyone interested further should contact the Author for pictorial looks or glimpses of the actual telescope. Circumstances permitting, it may be on show on solar work on Open Day.

I will just add that this size of telescope so mounted can do much useful work, the portability is excellent and setting up takes barely 5 minutes at worst. One minute to carry it out with 'scope on and eyepiece (and/or other equipment) rigged ready is often enough. Keeping inside when not in use is best for the electrics. I am not sure, but the heart of the motor (I'm not going to risk taking it apart) is a pair of solenoid ratchets working at about 8 impulses per second. An article with solar pics taken with this 'scope appeared in the July Journal, camera on a chair for extra rigidity.

OPEN DAY 29th SEPTEMBER, 1979.

After many last minute panics and two or three members having Friday 28th September off work to get everything ready, the 1979 Observatory Open Day was the best we have had so far.

The gym was full of exhibits together with a corner on U.F.O.s by Brenda Butler and another corner by Ron Hebbs from Bretmains, Ltd. We had so many things to exhibit that we overflowed into a nearby class room for slide shows on Space Shuttle and the History of Space Flight. In another part of the gym was a continuous slide show of astronomical things of interest. The refreshments corner was admirably 'manned' by many of our members wives, girlfriends and mothers. The cakes overflowed and special thanks are given to all the many people who cooked these goodies. Our Treasurer, Mrs. P.A. Bearcroft made a celebration cake but as we were too busy throughout the day and could not get enough members together, and when we did we could not find a knife, the cake was put in the deep freeze until the next committee meeting.

The School had arranged a concert for that Saturday which clashed with our Open Day so we could not use the School Hall for our film shows so we moved into one of the new large class rooms near the gym which suited us perfectly.

Over twenty of our members together with their wives, children, and parents turned up for the Day coming from as far afield as Bury St. Edmunds and Botesdale. From the word go at 2^o/clock the visitors arrived and for the next nine hours or so we must have had over three hundred visitors. The weather, although slightly cold, was on our side apart from a little cloud about nine p.m.

My thanks go out to all the people who helped to make this Day such a memorable one. Special thanks go to Mr. Angus and the members of Orwell Park School who made this day possible.

ORWELL ASTRONOMICAL SOCIETY (IPSWICH)
 GRAND DRAW
 HELD AT THE OBSERVATORY OPEN DAY
 SATURDAY 29th SEPTEMBER
 1979.

Ticket No.	Prize	Winner
0156	Binoculars	M.Mann, Matching, Harlow, Essex.
1778	Digital Clock	Clair Finchley, [REDACTED] Woodbridge, Suffolk.
2159	Transistor Radio	M. Ranson, [REDACTED]. Ipswich
3389	£2 Book Token	S.C. Baldwin, [REDACTED]. Ipswich
4540	Milk Tray	G. Skinner, C/o Shell Haven, Essex.
3293	£2 Book Token	N.E.Gauety, [REDACTED], Ingham, Bury St. Edmunds.
0075	Sherry	G. Gill, [REDACTED]. Southend
4362	£2 Book Token	Ron, C/o Thomas Allen, Shell Haven
3158	Cinzano Rosé	P.B. Webb, [REDACTED]. Kesgrave.
4209	Tin of Biscuits	P. Gage, C/o O.A.S.I.
4308	Scotsmac	Sid Green C/o B.P.Oil, Ipswich
3779	Torch	S. Finbow, [REDACTED], Felixstowe
0366	White Wine	J.Gregory, [REDACTED], Ipswich
0224	Red Wine	A. Collier, [REDACTED], Brentwood
0542	Party 4	M. Ling C/o AGI, Woodbridge.
1760	Milk Ass.Chocs	M. Partington, [REDACTED], Woodbridge, Suffolk.
0506	Roses Chocs.	Northam, [REDACTED], Romford.
2943	Tin of Biscuits	P. Eaton, [REDACTED]. Ipswich
0175	Quality Street	Mrs. Hill, [REDACTED], Thundersley Essex.
3772	Pomagne	E. Finbow, [REDACTED], Felixstowe
4596	Tin of Toffees	M.A.D. C/o R.M.C. Shell Haven
3890	Pomagne	A.W.Lay, [REDACTED]. Ipswich
0870	Tin of Mints	M.Goldrich C/o A.Smith O.A.S.I.

R. Chapman
Chairman O.A.S.I.

ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

MEETINGS FOR NOVEMBER.

AT OBSERVATORY, ORWELL PARK SCHOOL, NACTON.

TUESDAYS from 7p.m. Planetary Section.

Directors: Mr. J. Hood, [REDACTED], Ipswich
and Mr. J. Ranson, [REDACTED]. Ipswich, Tel. [REDACTED]

NOVEMBER 6th and 20th

TUESDAYS from 7p.m. Solar & Lunar Section

Directors: Mr. J. Hood, [REDACTED]. Ipswich.
and Mr. M. Barritt, [REDACTED], Ipswich.

NOVEMBER 13th and 27th

WEDNESDAYS from 8p.m. Nebulae & Faint Objects Section

Directors: Mr. D. Payne, [REDACTED]
Wickham Market, Tel. Wickham Market [REDACTED]
and Mr. M. Cook, [REDACTED]. Ipswich Tel [REDACTED]

NOVEMBER 7th, 14th, 21st^{1*} & 28th

FRIDAYS from 8p.m. Variable Stars Section

Directors: Mr. R.S. Manning, [REDACTED]. Ipswich
Tel. [REDACTED]
and Mr. M. Siggers, [REDACTED], Ipswich.

NOVEMBER 9th and 23rd

SATURDAYS from 8p.m. General Observation Section.

Directors: Mr. M. Barriskill, [REDACTED], Ipswich
and Mr. R. Adams, [REDACTED], Ipswich,
Tel. [REDACTED]

NOVEMBER 3rd, 10th and 24th.

SATURDAYS METEOR SECTION

Director: Mr. D. Barnard, [REDACTED], Ipswich,
Tel. [REDACTED]

LEONIDS METEOR WATCH, SATURDAY 17th NOVEMBER

Meet OUTSIDE the Ship Inn, Levington

at 8p.m. (note earlier time)

EVERYBODY & ANYBODY WELCOME

TO JOIN IN THIS WATCH

2 * SATURDAY 24th November. 7.30p.m. Visit to Observatory by
Newmarket Astronomical Society.

1 * WEDNESDAY 21st 7.30p.m. Visit to Observatory Orwell Ventures