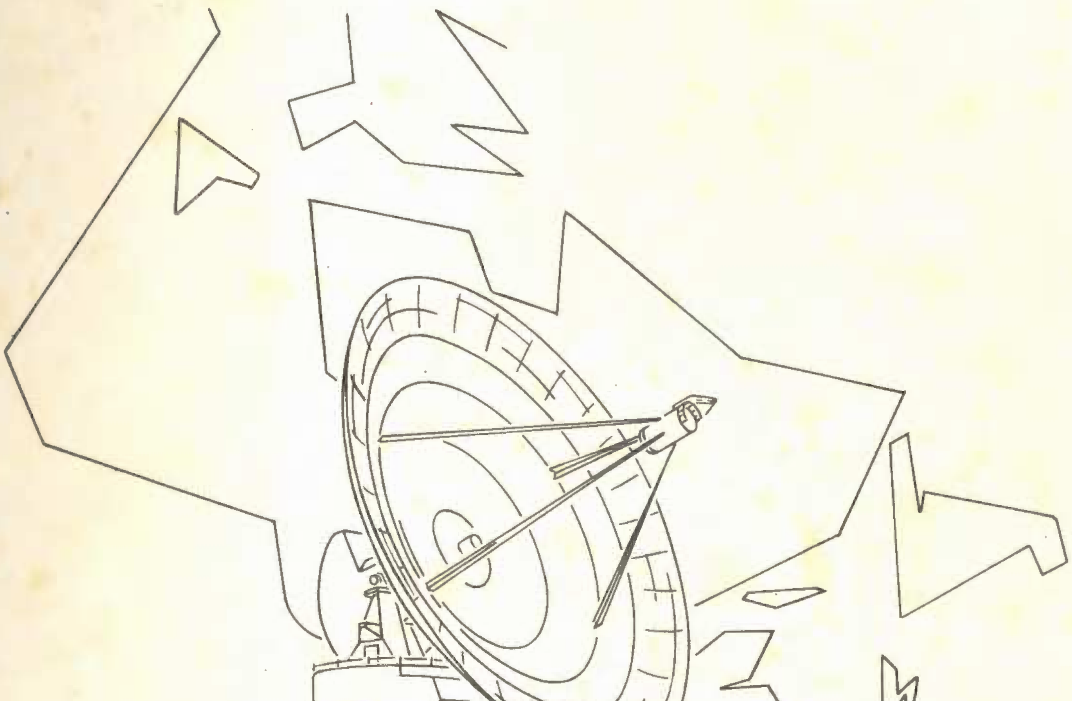
# The A.R.0. observer, issue no. 1

# The A.R.O. OBSERVER



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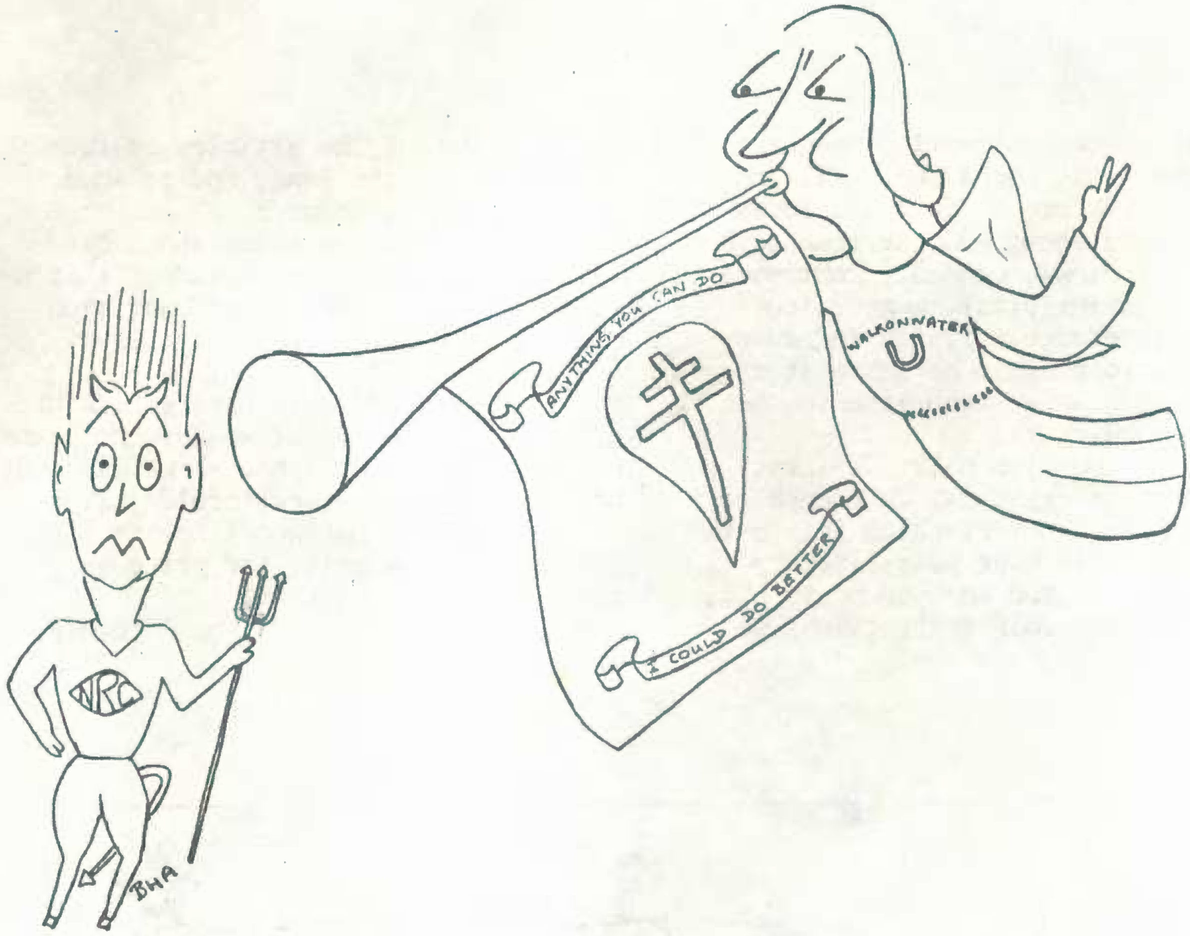


YOU MAKE THE NOISE, WE GET THE HEADACHE

This is the first issue of the ARO Observer. Its publication, and the choice of opening headline, are both due to a somewhat acrimonious but nonetheless productive meeting of Eastern radio astronomers in Kingston in December of 1972.

At that time it became clear that there was a considerable lack of communication among the users of the Algonquin Radio Observatory, and it was specifically requested that a newsletter be established. What you see is what you get.

The original intention was to provide a means for ARO observers to find out what is going on there, a not inconsiderable feat in itself, but your friendly editor has taken a somewhat more liberal view of his mandate.

Articles on subjects of general astronomical interest will be encouraged. Indeed, on the dubious grounds that astronomers are a lively-minded group with wide horizons, we will publish articles on topics which have no astronomical relevance at all.

So this, our currently indescribable journalistic endeavour, will consist of a hard core of facts, information, and news about ARO, surrounded by a coating of views, comment, controversy, blast and counter-blast, humour, outrageous irreverence, trivia, and downright bull droppings. We leave it to the reader to assign each item to the appropriate category.

This is your journal. We invite your letters or articles, in French or English, on any subject which interests or riles you. Indulge your literary aspirations. If you want to mouth off, do it here. The only restrictions we impose are that the articles conform to the law of the land, and to some minimal moral standards.

If you want to write about bird watching in the Outer Hebrides, that's fine. If you prefer 'The Generation of Noxious Gases by Rotating Binary Systems', that's fine too.

You can send drawings, caricatures, or graphs. At present we have no means of printing photographs, so we will not be incorporating a centrefold just yet.

You may or may not like the end product, but by gosh, the price is right. You get it free.

B.H.A.

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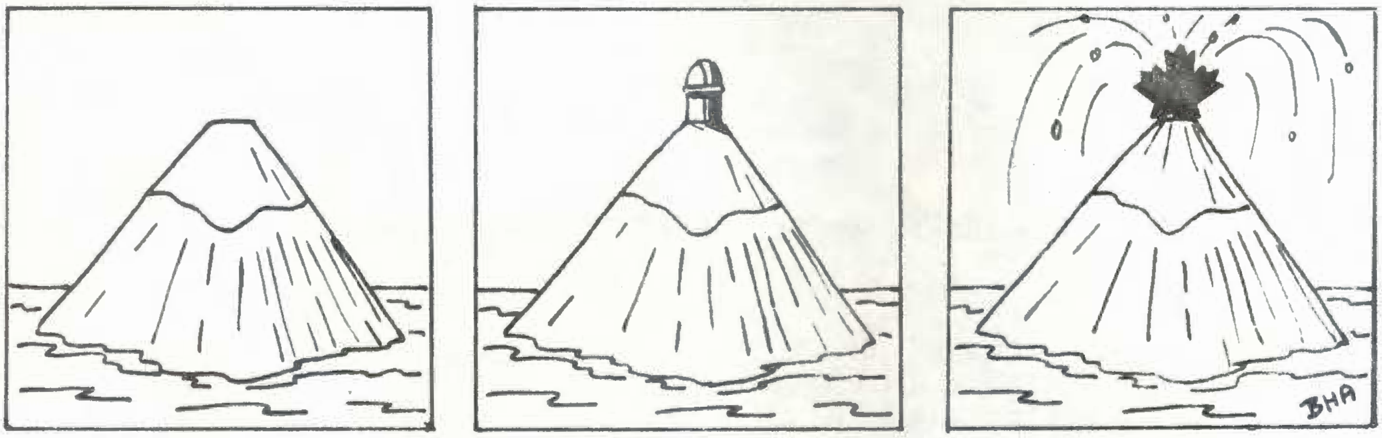


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*HELP IS AT HAND*

The Astrophysics Branch is currently advertising for a computer tamer for the radio astronomy section.

The successful applicant will be required to write data processing routines for both the IBM 360 in Ottawa and the SEL 840 at ARO. He will, in addition, produce a number of control packages for the 150' telescope's computer control system.

These packages will be available for general use.

Some of his time will be devoted to helping the solar radio astronomers with their computing problems.

# FINDING OUT WHERE IT'S AT

The pointing of the 150' telescope is a matter of interest to many astronomers at ARO, and a matter of some consequence to those who are studying sources too weak to be detectable with a single scan.

The pointing is usually accurate to within a minute of arc, which is sufficient to find easily the majority of sources studied. However if it could be safely assumed that the telescope's pointing were accurate to within a tenth of a beamwidth, then a considerable saving in time would result even for programmes dealing with strong sources, and there would be a very large improvement in observing efficiency for programmes involving weak sources.

A computer programme has been written which may prove useful in analysing the causes of telescope pointing errors. It is basically an expanded version of the existing ARO pointing analysis programme, and is specifically, though not exclusively, designed to work with the monthly variable source observations.

The input data consists of the measured positions of a number of standard sources selected from a list of about ninety. The choice of sources is left to the observer. Each source can be measured at several hour angles. The measured positions are then compared in the computer with the known true positions of the standard sources.

The pointing errors of the telescope are calculated, first on the assumption that they are constant over the whole sky, then secondly on the assumption that the zenith angle error may be a function of zenith angle. In each case the residual errors of the independent measurements are also given.

Some further calculations are made with the second, zenith angle dependent solution. A curve of the form $a + b\,(za) + c\,(za)^2$ is fitted to the data points. Theoretically any zenith angle dependence related to gravitational distortion should have a sin(za) form, but the polynomial curve has proved adequate in all cases, and a better fit in most.

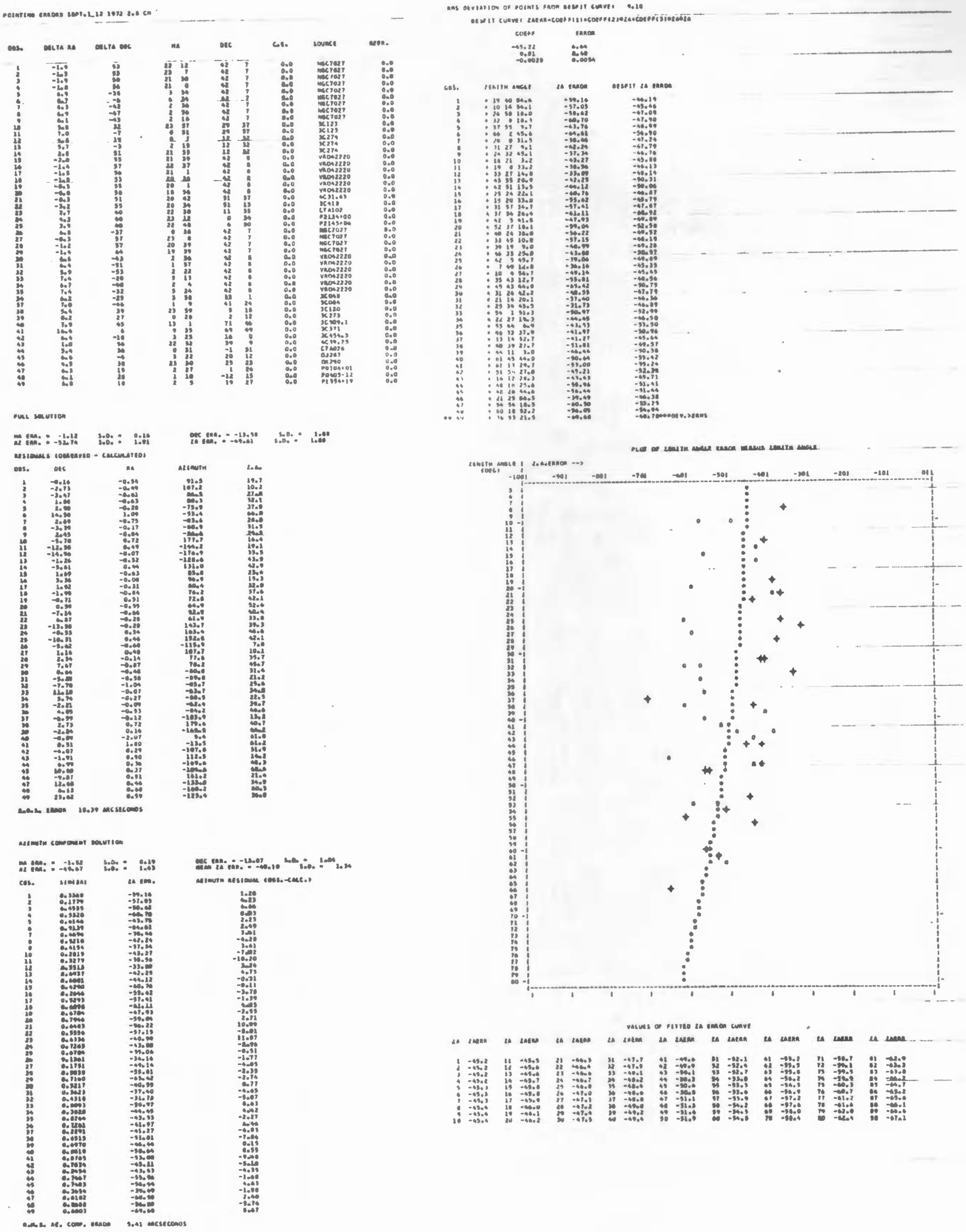
At this point all the data points are listed giving their zenith angle, zenith angle error, and the zenith angle error expected on the basis of the polynomial curve. Those observations which deviate by more than two standard deviations from the expected zenith angle error are indicated on the print out.

A plot is then given of the zenith angle error as a function of zenith angle for all zenith angles between 5° and 80°. It includes both the data points (circles) and the fitted curve (stars).

Lastly, the zenith angle error curve is given in tabular form.

The computer analyses have revealed two significant features of the pointing of the telescope.

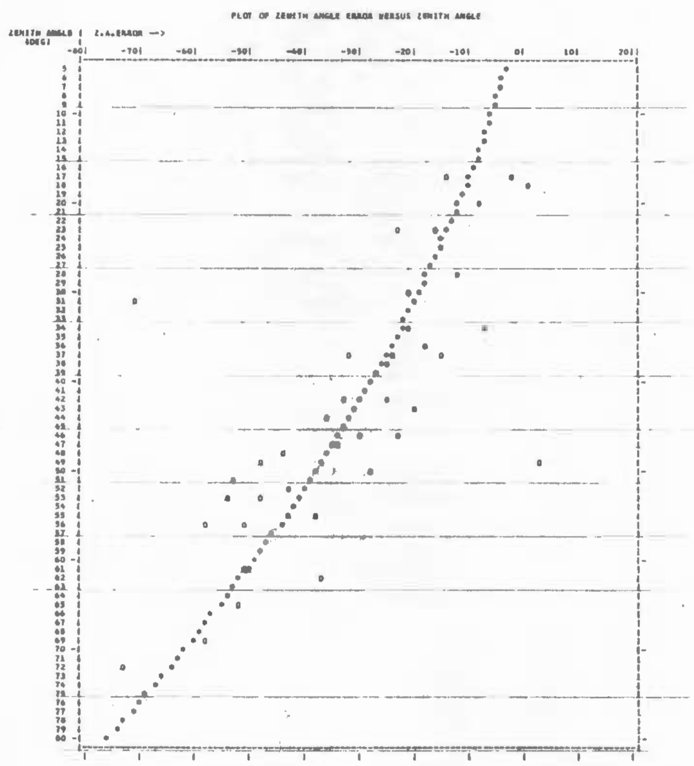
First, there are rarely more than one or two sources which have deviations greater than twice the r.m.s. deviation. Thus the scatter of the measurements is clearly not Gaussian in character. Sometimes this effect can be attributed to one




*A sample output from the pointing error analysis programme using data obtained during September 1972 with the 2.8 cm. paramp at the focus* or two anomolous measurements contributing most of the r.m.s. error.

However the results obtained at 2.8 cm in September 1972 (shown in the diagram) demonstrate that it is not correct to assume that the pointing errors are constant over the sky, or that they change only in zenith angle.

In the diagram, measurements made at positive hour angles are marked by a cross, those made at negative hour angles have been left as circles. The difference between the two sets of data is obvious.




*The zenith angle dependence of the pointing using the Gregorian system. The data were obtained at 4.5 cm in September 1972.*

Second, there is a large zenith angle effect in the pointing when observations are made at the hub (see the second diagram), but the zenith angle dependence of observations made at the focus is either absent or comparatively small.

This different behaviour in the two locations has been a consistent feature of all data obtained to date.

The variable source observations are analysed each month, and copies of the results are kept both at ARO and in Ottawa, where they are available for inspection.

At the moment the programme is compatible only with the IBM 360 in Ottawa. However it could be readily adapted for use with the SEL computer if there is sufficient interest in using it on-site. The plot would have to be omitted or reduced in scale because there is no line printer or wide paper output at ARO.

For anyone who wishes to use this programme with their own data, it is very easy to add more sources to the list of standard sources. One useful feature is the indication of deviations greater than twice r.m.s. which serves as a simple check for anomalous position measurements in a large body of data. These anomalous positions may be the result of incorrect positioning of the telescope, and may lead, in turn, to the calculation of low values for the flux densities of the sources in question.

B.H.A.

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## How's That Again?

An article in a recent issue of *Scientific American* began, "The basic dilemma.......is simply stated:". The sentence which followed contained eighty-six words, twenty-three of which had three or more syllables.

# THE FLAT EARTH SOCIETY OF CANADA

by

Dr. Leo C. Ferrari, President

The story of the Flat Earth Society of Canada dates back to the evening of November 8th, 1970. It was the product of a very spirited discussion at the Fredericton residence of the well-known Canadian author and poet, Dr. Alden Nowlan. Present on that grand historic occasion besides Dr. Nowlan and his wife Claudine, were Mr. and Mrs. Raymond Fraser and myself.

Right from the very beginning the existence of the Society was deemed a matter of great urgency. It was seen as an effective means of combatting the malevolent influences which, especially since the so-called Enlightenment, have conspired together to undermine man's traditional confidence in the validity of his own sensations. Nowhere is this deception perpetrated on a grosser scale than in the case of the true nature of the earth itself, which contrary to all testimony of common sense, has come to be depicted as spherical in shape. Only by deeply ingrained cultural paranoia could western man simultaneously see the earth as undeniably flat, yet be thoroughly convinced that it is a sphere. It can therefore be appreciated that an important objective of the Society is to combat the fallacious deification of the sphere, which ever since the deceptions of Eudoxus has thwarted western thought.

The theory of the supposed spherical earth has been so thoroughly propagated by the globular heresiarchs that it has come to be all but identified with the western mentality. Rather than subscribing to this popularized fallacy of reification, the Society insists that all science, like all philosophy and all religion, is essentially sacramental and therefore that all reality, as we conceive and verbalize it, is ultimately metaphorical.

Failure to recognize this fundamental principle can only lead to the grossest distortions in man's view of reality. George Sylvester Viereck has expressed the consequences well, in the case of the supposed spherical earth, in his book *Seven Against Man:*

> When man permitted himself to be persuaded that he was only an earthworm crawling on a seventh-rate planet that circles around a sixth-rate sun in a fifth-rate universe, he suffered a psychic shock from which, unless he rejects the interpretation, he can never recover.

Since its inception, just over two years ago, the Flat Earth Society of Canada has shown a steady increase in membership, which presently stands at fifty-four. Believing in quality, rather than quantity, the executive carefully screens all applicants to exclude those judged unworthy of full membership. Commonly rejected are applications from eternal triflers on the one hand and a small but persistent lunatic fringe on the other. Profile-testing of applicants is based (among other things) on an essay which each would-be member is asked to write, stating his (or her) personal reasons for wishing to become a member of the Flat Earth Society of Canada. Upon payment of the annual membership fee (one dollar), the successful applicant is issued with a personalized membership card and is sent free of charge all non-classified documents issued by the Society.

While members are for the most part spread out across Canada from coast to coast, the Society also counts devoted plano-terrestrialists in the United States and in Europe. Its membership includes an editor, a university president and several professors of varying disciplines, the vice-president of a large publishing company, a medical doctor, housewives, students, laymen and a sizeable group of Canada's leading literary figures. All these and more are united in the common cause of plano-terrestrialism.

Notwithstanding its mini-minority status in the world's eyes, the Society's esprit de corps is excellent. Members share a basic trust and honesty which is well expressed by one of the Society's mottos: "We're on the level." They are all convinced that one fine day the Cause of Truth will finally triumph, when common sense will return to the face of the earth and man will once more be able to trust his own sensations.

The growth of the Society since its inception in 1970 is all the more surprising in that it does not indulge in vulgar proselytising, but depends for the diffusion of its ideas upon the dedication of its members and the ageless testimony of common sense. Notwithstanding its renunciation of the lime-light, the Flat Earth Society of Canada finds itself continually being dragged into the public's vision. Members of the executive have had to find time for television appearances, radio broadcasts and newspaper reporters. TV appearances include Paul Sole's *Take Thirty*, *Spectroscope*, *W5*, and a guest appearance on Newfoundland television. Many radio broadcasts have been made across Canada, as also with newspaper features. Thus, in spite of popular prejudice and the modesty of the Society's members, the cause of Truth is spreading. Meanwhile one can dream that in the distant future the day will dawn when the whole world will be able to repeat with conviction, the Society's chief motto:

The earth is flat
Anyone can <u>see</u> that!

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Dr. Leo Ferrari, who wrote the previous article, is President of the Flat Earth Society of Canada. Despite his onerous duties in this post he finds time for many hobbies, one of which is being a professor in the Philosophy Department of St. Thomas University at Fredericton, N. B.

Dr. Ferrari supplied us with a number of the Society's publications.

The Official Chronicle of the Society contains this hair-raising account of one of the intrepid President's adventures:-

"*<u>The President Visits the Edge:</u>* While in Newfoundland, the President succeeded in reaching Fogo Island after two hazardous attempts. There he was greeted with rare warmth by the Society's Official Observer at the Edge, Mr. Alphonsus J. Pittman, his wife, Marilee and their daughter, Kyran."

"On the unforgettable night of June 13th, 1971, guided by Mr. Pittman, the President succeeded in scaling the heights of Brimstone Head and gazing down into the Horrifying Spectacle of the Abysmal Chasm. Upon being rescued from the Edge by Mr. Pittman, the President was still clutching a rock."

"This, the Sacred Stone, is now in the Society's Archives and may be seen by members in the presence of at least two members of the Board of Governors of the Society."

The Official Chronicle is devoted largely to notes and news about the Society and its members.

The Society's main propaganda vehicle is The Official Organ of the Flat Earth Society of Canada. (Those of you interested in symbols will be delighted to learn that The Official Organ looks like a memorandum.) The first issue sets out the Society's raison d'etre as follows:-

> "A man should always question the strongest convictions of his age, for those convictions are invariably too strong."
>
> *Chesterton*

"We are members of a culture in which it is possible to assert without fear of ridicule that God is dead. The atheist may shock a few, and outrage still fewer, but not even the most devout will accuse him of being mad."

"It has become almost the fashion to question the necessity for the existence of the nation-states that H.G. Wells called the modern counterparts of the classic gods. The anarchist may indeed be ridiculed; he may even be imprisoned, but it is only in a rhetorical sense that he's ever said to be insane."

"But if a man has the temerity to believe that what his senses tell him is true -- namely, that the earth under our feet is not globular but flat -- his friends will laugh in embarassment and strangers will assume that he is a fool."

"We of the Flat Earth Society have elected to dispute the one thing that our culture regards as indisputable. We openly proclaim that THE EARTH IS NOT ONLY FLAT BUT MAY WELL BE SQUARE."

B.H.A.


*"This is an automatic recording. I am out of the office at present. At the sound of the blip your telephone will self-destruct. The blip follows........."*

## MUCH ADO ABOUT NODDING

by

C.R. Purton, York University

When beam-switching was introduced at ARO, the possibility arose of improving the signal/noise ratio for flux density measurements of sources which are small compared to the beam size, by using both beams in an ON-OFF fashion.

This technique was not new, and has been practised at Nancay and Jodrell for some years. At ARO, however, the idea fitted in nicely with the control system.

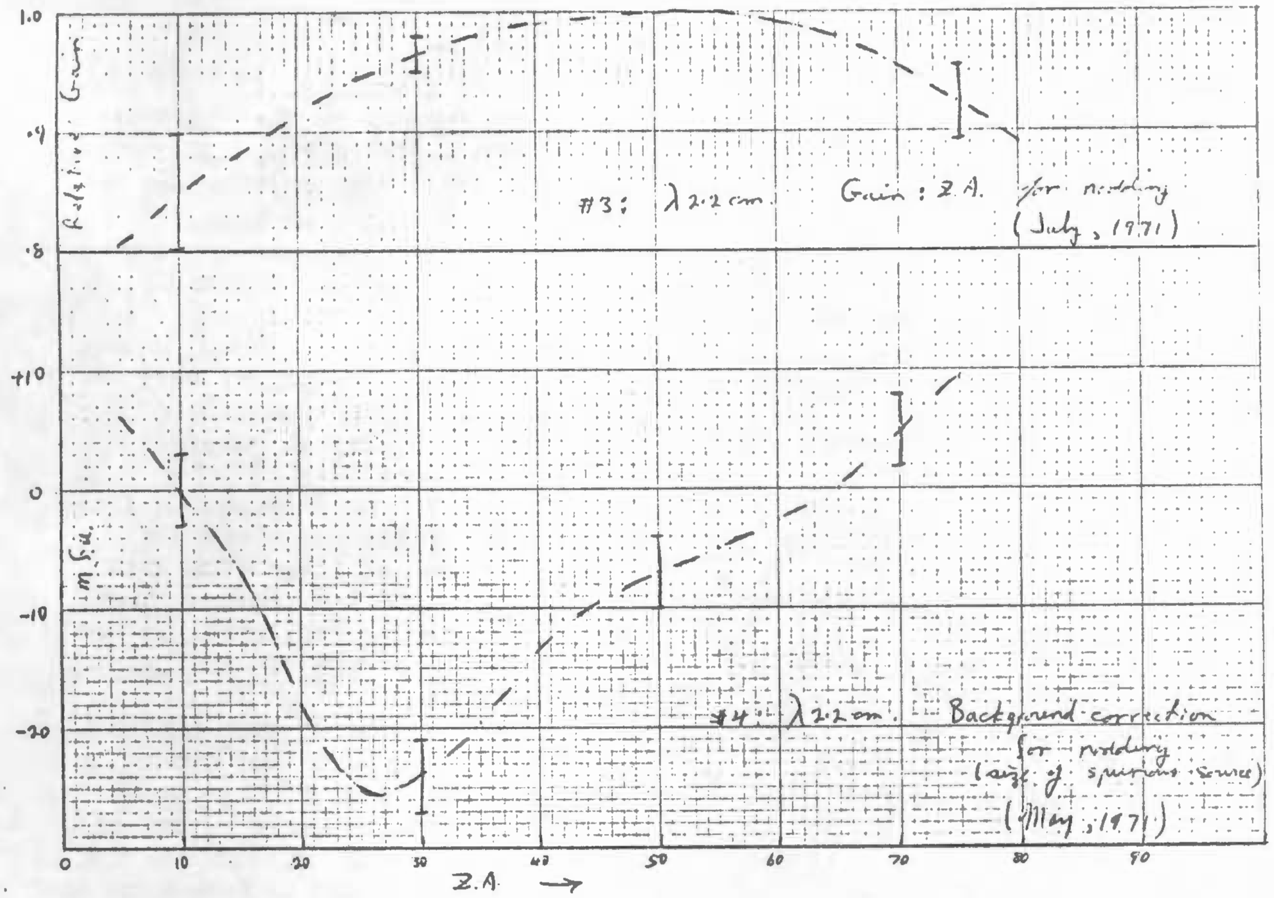
Given that the main feed is mounted slightly below the telescope axis in order to reduce the coma lobe at high zenith angles, then the reference feed was mounted above both the axis and the main feed for ease of cramming it into the available space.

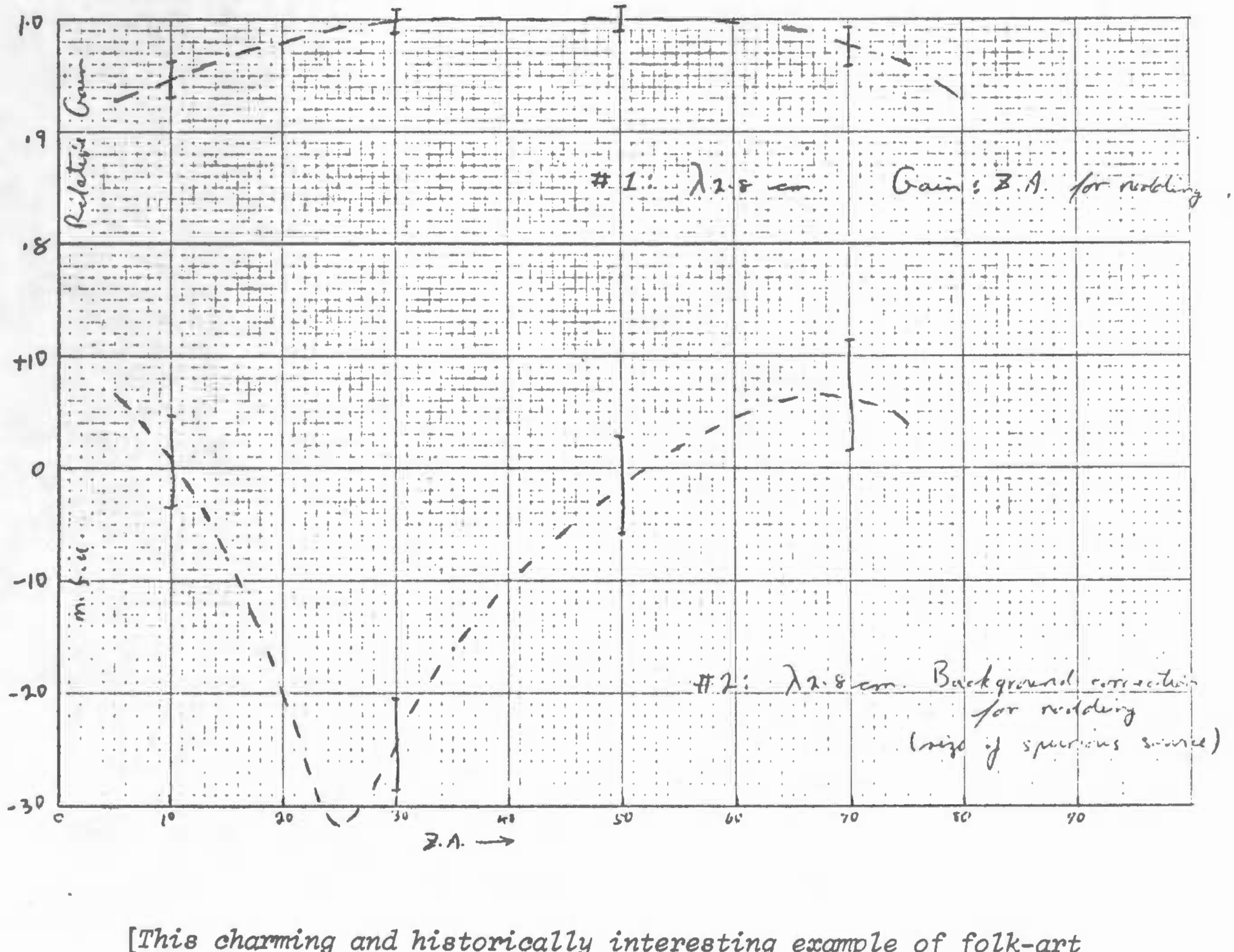
The reference beam, then, lies below the main beam, and the telescope motion required to plop the reference beam on the source is a decrease in zenith angle, the same sort of motion required for refraction compensation. As a result, the term nodding arose, and the nodding control was integrated with the refraction compensator.

The nodding control has become incredibly sophisticated*, the necessary Δ Z.A. being achieved through a pair of push buttons which tilt the refraction compensator plate, while the Raksyn provides the position of the corresponding beam, since the M.E. does not move.

The extent of the nod may be preset via a potentiometer, so that different receivers and observers may be accommodated. The optimum setting of the pot. can be determined fairly

*phraseology by request of J. Zelle




*[This charming and historically interesting example of folk-art was supplied to us by Christopher Purton of Erin, Ont. - Ed.]*

easily using any decent point source, but if this is done by using the standard position - finding routines to measure source position for both main and reference beam (switch 13 down, etc.), the beam separation so found will be 10" - 15" larger than the actual separation between beam peaks (for the 2.8 cm. receiver), because the reference beam is noticeably non-Gaussian to anyone except the SEL.

The separation between peaks can be found by positioning on the main beam, nodding, and then peaking on the reference beam by adjusting the potentiometer.

Two telescope corrections apply to nodding measurements.

The first, allowance for change in gain as a function of zenith angle in the standard manner, is proportionate in nature, and concerns mostly the measurement of medium and strong sources.

The relevant function is a linear mixture of the individual functions for the main and reference beams, the proportion in which they are mixed depending on the losses through the respective feeds.

The function is believed to be known for the old 2.8 cm feed (ropey sketch #1). Slight differences could be expected for the new low-loss feed, but to date no significant difference has been found, although new tests are in progress (by the Queen's/U. of T./York radio star types).

The second correction, allowance for changes in background level during a nod, is additive, and so becomes important for the weak sources.

The intensity of the "spurious" source produced by this effect is a function of zenith angle, and can be as large as -30 mfu.

This function was also believed known for the old 2.8 cm. feed (ropey sketch #2), with a strong indication of weather effects producing a deviation of ± 5 mfu on any particular day.

The new low-loss feed apparently provides a substantially different function: the main feed is design #3, as before, but the reference feed has been changed from #1 to #3. Because the effect depends on the difference with zenith angle of the difference between beams, it is perhaps not unreasonable to expect a change.

The function for the new feed is not at all well known at present, greatly discordant results (not to mention the lunch-box effect) having been obtained by the indomitable team of Woodsworth/Gregory/Purton. These tests are also in progress - Watch this space.

The equivalent corrections for the 2.2 cm. system are shown in ropey sketches #3 and 4, taken from data which is both old and spotty. Much better data may be available, as well as information on the 4.6 cm. beam-switching system.

Anyone harbouring such useful information might consider producing it in a future issue of this newsletter.

The most troublesome aspect of nodding is the background correction: troublesome in trying to determine what the function is, and how it varies with time of day/day of week/time of year/weather/hockey scores/sale of petroleum to the U.S.A.

The Woodsworth/Gregory approach is to determine the correction after each source measurement, analysing short zenith angle scans with a programme written by A.W. With computer control looming, it might be reasonable to think of feeds mounted in azimuth, rather than zenith angle, which would probably reduce the correction.

The computer control system would then make the telescope wag, rather than nod.

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## His Money Where His Mouth Is

At the Kingston meeting of Eastern radio astronomers Paul Feldman strongly advocated that a place be found on the ARO Programming Committee for a theoretical or optical astronomer. Such a place has now been found. Rumour has it that Paul Feldman will be asked to fill it.

## UN ASTRONOME A-T-IL UNE RESPONSABILITÉ SOCIALE?

par

Jacques Vallée
Universite de Toronto

Est-ce qu'un astronome ou un radio astronome possède une responsabilité vis-à-vis de la société qui l'héberge et le fait vivre? Est-ce suffisant pour lui de savoir qu'il paie ses impôts chaque année, et ses taxes l'annee durant? Concrètement, c'est quoi, cette responsabilité envers la société? Par exemple, lorsque la société elle-même nourrit un malaise social qui va en s'aggravant, comme c'est le cas pour l'accroissement rapide des actes criminels et l'impuissance de la police à les contenir?

Le public se pose des questions de plus en plus sur l'utilisation pratique de ses impôts, et il existe une certaine récession économique en astronomie et dans les sciences en général. Et pourtant, ce même public dépense de l'argent pour se faire dire le futur par des astrologues et des charlatans de tous les genres. Chaque quotidien qui se respecte croit devoir offrir à ses lecteurs une colonne sur l'astrologie! Peut-être devrait-il exister un Comité de surveillance, formé en grande partie d'astronomes, pour protéger le public des fausses représentations commerciales, des interprétations astrales qui n'ont jamais été prouvées scientifiquement. Pour beaucoup de monde, les mots Astrologue et Astronome sont du pareil au même. Peut-être faudrait-il a ce comité d'aller souvent en cours, devant un juge n'ayant pas de formation scientifique, pour demander au public d'être moins credule.

En tant qu'astronomes, faut-il appuyer fortement l'enseignement de l'astronomie au grade primaire? Ne serait-ce que pour opposer le côté "esprit de clocher" de l'éducation scolaire, pour y substituer une pensée à l'échelle de notre planète? Par exemple, si on s'imagine que nous vivons tous sur un seul et meme bateau - la terre - , il semble plus facile d'accepter que chacun de nos efforts personnels comptent dans la bataille pour le maintien de la qualite de l'environnement, la diminution de la pollution, peu importe ou nous nous trouvions. Peut-être des conflits majeurs comme au Vietnam seraient plus faciles à résoudre si on se sentait tous partie d'un même habitat. Peut-être qu'un gouvernement mondial serait désiré et désirable, pour les problèmes qui ne connaissent pas de frontières?

Les gains matériels et pratiques qui decoulent directement de l'astronomie ne sont pas aussi nombreux qu'en d'autres sciences (physique et chimie, par exemple). Aussi les astronomes possèdent peut-être un climat des plus propices pour favoriser une participation complète de tous et chacun dans les decisions d'ordre scientifique et administratif, sans égard à notre statut et peu importe ou nous nous trouvons. Ceci résulterait en une meilleure organisation, en un plus grand esprit-de-corps. Un tel exemple pourrait être suivi par d'autres groupes, qui sait? Ainsi, on combattrait la tendence actuelle à la dépersonnalisation humaine dans les grands centres, c'est-à-dire: personne ne connait vraiment plus personne, personne n'aide pratiquement plus personne, c'est chacun pour soi, comme dans une société de rats et non d'êtres humains.

Une dernìere question pour conclure: à quand un astronome ou un radio astronome comme premier ministre du pays?

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## YOU FIND THEM EVERYWHERE

A recent article in the Globe and Mail bore the headline 'U of T Hand in Mars Shot.' We can only hope that no one takes such drastic action against the U of T hired help at ARO.

# Going into Receivership

*with Bill McLeish*

## NEW RADIOMETER HARDWARE AT ARO

Recent observers will have noticed the fancy console which combines continuum and spectrometer controls. Part of the benefit of the new hardware to observers is indirect in that it makes the job of servicing, modifying and adding new equipment easier for the ARO staff. But beneath that glossy exterior are a few goodies for the astronomer.

The old system had a narrow band filter in the synchronous detector preamplifier which increased $\Delta T$ by a factor of $\frac{\pi^2}{8}$ (23%). This loss in sensitivity has been almost eliminated by using a filter which passes the 103 Hz fundamental plus the 3rd and 5th harmonics.

A narrow blanking pulse at the switching point in the Dicke waveform helps to remove the spike which is quite prominent on some receivers. It cleans up the scope picture making balancing easier but probably doesn't do much for $\Delta T$.

On the new receivers, noise power balancing may be added to either the signal or the reference arms of the input so we can now avoid the old situation of always having to run the system at its highest temperature, that is, when the dish is at the horizon.

Total power output is available in parallel with the normal output and a separate LP filter is provided. Its output is of course the mean of the signal and reference temperatures while Dicke switching. True total power records can be made by holding the Dicke switch on "Ant".

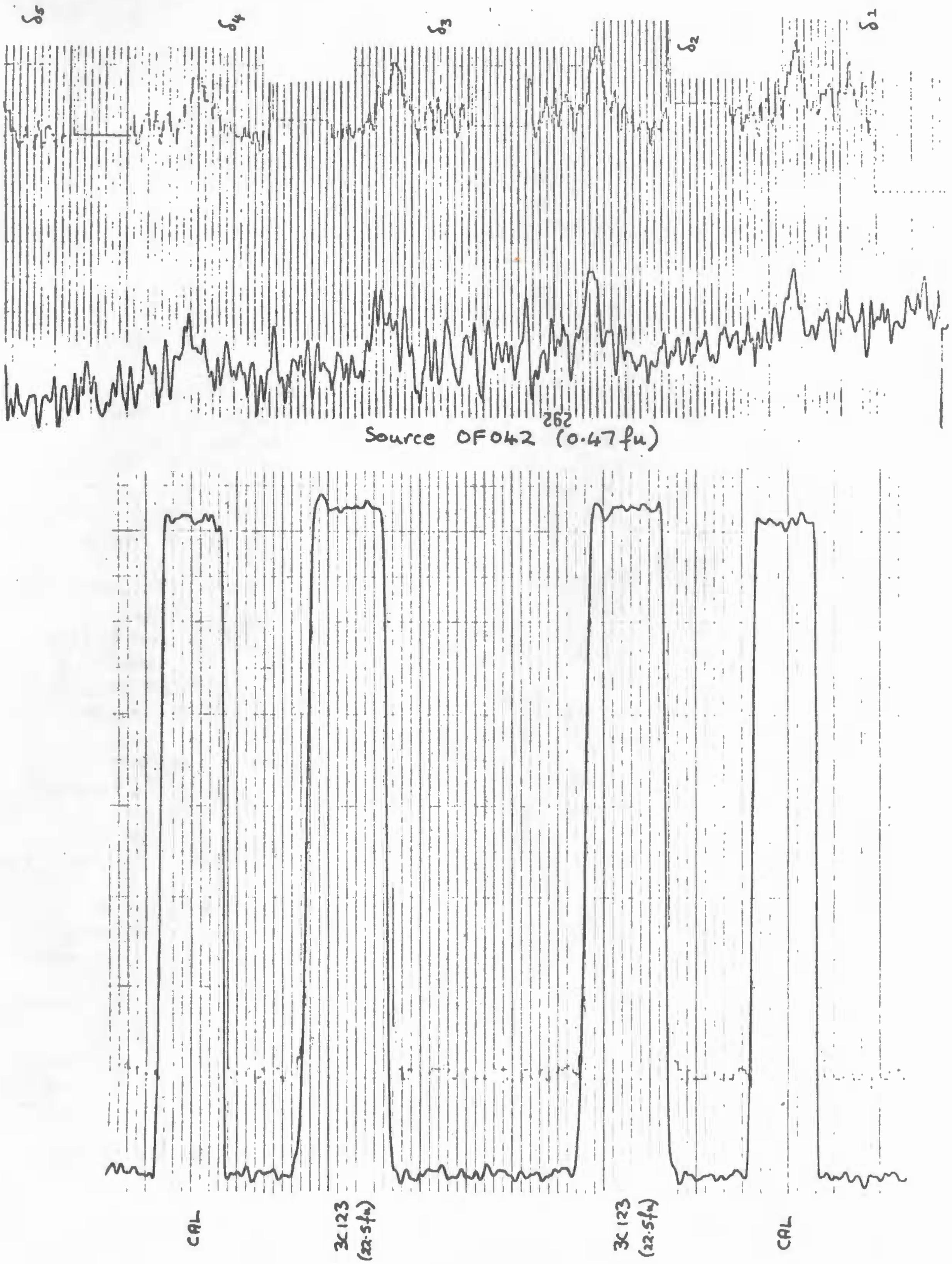
The original intention was that Total Power should be simply a monitoring channel, but some surprisingly good records have been made with it. Perhaps it can be useful in some programs where slow gain drift is not a severe limitation.

The new L.P. filters are calibrated in terms of noise bandwidth rather than 3 dB bandwidth. Delays are therefore slightly different than those used on the old filters. Changes are needed in the filter tables used in the data acquisition programs to accommodate new bandwidth and delay figures.

Astronomical leg work should be reduced by placing commonly used switches at the console, e.g., Dicke switch mode selector. Changeover from continuum to line observations is done by P/B.
Both the Dicke rate and the calibration command are changed to suit the computer programs. Monitoring of the first L.O. will also be done at the console, eliminating those frequent sprints to the receiver room.

Suggestions and comments from observers are welcome. Although the rise time may seem a bit long sometimes, more feedback works in the right direction!

C.W.McL.




*Typical examples (honest, they were picked at random) of the performance of the new 9.3 cm. paramp. These diagrams represent Xerox*$^3$ *(by the time you get them, Xerox*$^4$*) so the quality is poor. The top diagram shows the output from a series of scans at 0.75°/min. The fainter upper trace is the integrated output. The bottom diagram shows the output from on-off observations of 3C 123. The filter setting was 0.25 Hz in both cases.*

# THE DECAMETRIC RADIO TELESCOPE PROJECT

by

Dave Routledge
University of Alberta at Edmonton

For several years Canadian radio astronomers with an interest in low frequencies have felt the need for a successor to the DRAO 10- and 22- MHz arrays. This feeling has perhaps not been shared by their colleagues with high-frequency interests, but if it is remembered that 10 MHz is as many octaves below the 3CR survey as S-band is above, the importance of better decametric observations becomes clear. Such observations would provide insight into the phenomena producing low-frequency radiation in discrete nonthermal sources and would also be invaluable in studies of galactic structure and the interstellar medium.

The last two topics have been the special purview of the DRAO arrays in that they were designed to possess "background capability" while other decametric telescopes were "point-source" instruments only. The DRAO arrays provide 2°.5 resolution at the zenith at 10MHz, and 1°.1x1°.7 resolution at zenith at 22MHz.

Besides the usual radio-telescope design considerations, such as resolving power, available bandwidth, adequate collecting area, low sidelobe levels, and a radio-quiet location, there is the necessity at decametric wavelengths of multibeaming. This necessity is imposed by ionospheric difficulties. Besides reflecting interfering terrestrial signals at low frequencies, the ionosphere causes strong refraction at large zenith angles, produces appreciable attenuation of incoming radiation, and sometimes distorts the incident wavefront sufficiently to produce severe scintillation effects on the ground.

All these effects are best dealt with by multiple beam formation. At present a matrix of 5 beams in right ascension by perhaps 32 beams in declination is anticipated, together with subsidiary broad-beam formation for monitoring smooth and "patchy" absorption. The possibility of source tracking is also being considered.

Since system noise would be dominated by the galactic background contribution, multibeaming would result in no degradation of signal-to-noise ratio in the new decametric array. Design of the array becomes primarily a matter of designing the feeder system and signal-processing equipment.

Preliminary work on this topic has been underway in the Electrical Engineering Department of the University of Alberta for some time, with much attention being given to the desirability of bringing as many element outputs directly back to the processing building as possible. Various forms of signal multiplexing are being examined, in view of the potentially large cable costs in such a design and the difficulty of maintaining phase stability in the large array.

The new telescope as presently envisaged would produce a 5x32 matrix of pencil beams 30 arcmin in diameter at the zenith and would comprise approximately 2000 half-wave horizontal dipoles above a T-shaped reflecting screen. The north-south arm would be 2.5 km long and the east-west arm would be 5 km long. The operating frequency is 12.4 MHz.

A suitable site has been located in the Alberta foothills and preliminary swept-frequency interference monitoring and interferometric observations have been undertaken on the site. The two interferometers employ 0.8- and 5-km baselines.

Each arm in the new array is expected to be physically tapered to economize on the required number of elements per arm. Computer studies of the resulting antenna pattern are currently being carried out to investigate the sidelobe levels of such an array in the presence of amplitude and phase errors in array excitation.

A program of riometer measurements and interferometric measurements of strong sources is also planned to enable the output of the large array to be calibrated for source surveys and galactic background mapping. It is anticipated that the new array would resolve about 3000 sources and map the galactic background with a 5-percent contour interval. Its cost would be in the neighbourhood of one million dollars.

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The present state of the 12.4 MHz T could best be described as a desperate need of manpower to keep a remote station operational.

"Even one full time technician would make a whale of a difference" says Routledge.

However, the application for funds to carry out the feasibility study (i.e. site testing and etc.) was turned down last spring, and the operation has been on a shoe-string basis since.

Another aspect of the feasibility study, included in the same application for funds, is the necessity of measuring reasonable flux densities for sources other than Cas A and Cyg A (e.g. Tau A and Vir A), to get a reasonable spread over zenith angle. Considering the state of low frequency calibrations, these measurements would stand on their own merit, independent of the 12.4 MHz T.

A more detailed description of the state of the project reveals:-

-graduate student McLarnon is studying the feeder system, including the problem of multiplexing, as an M.Sc. project, and seems to have it reasonably well in hand.

-graduate student Wynn is computing the main beam and complete side-lobe pattern as a function of different tapers, also as an M.Sc. study, and apparently this aspect of the design has become a gigantic project.

-site-testing includes two interferometers, a 1/2 mile and 3 1/2 mile. At present, both are off the air (the former struck by lightning, the latter for redevelopment of the phase-lock loops which had become problematic), and D. Routledge is performing his well-known one-armed-paper-hanger trick to get them operational again.

-the lease of the land for the T (strips 600 ft. wide, 5 km and 2 1/2 km long) is being negotiated with the provincial government: a 15-year lease is being sought, and the negotiations are (D.R. hopes) entering their final states.

-application for funds for the complete T has not yet been drafted, and Routledge made no mention of their expectations.

C.R. Purton

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CAN THIS REALLY BE ME?

'Science community dissected--warts and all--in Govt. report'. So read the headline above an Ottawa Citizen article by Peter Calamai on a "Science Council-sponsored probe of Canadian scientific societies" by a Dr. Allen West.

'In the process Dr. West washes some scientific dirty linen in public for the first time', reports Calamai breathlessly.

Among the revelations we learn that "Scientists have all the human frailities (sic) of other segments of our population. They may be bigoted, lazy, ambitious, introverted, extroverted, fundamentalists, atheists, or given to petty jealousies."

Well, golly gee whiz, that really damages my psyche. I always thought I'd been put together on an assembly line and sold to my parents in an appliance store.

B.H.A.

## PROBLEM OF THE MONTH

The new LBI playback process divides the telescope beam into fringe-frequency/time delay cells, the size of each cell being, at best, 1 milli Hz by 160 nanoseconds. Using the usual ARO, Chilbolton and cosmological parameters, what is the chance of detecting a source in any cell chosen at random, for an hour's observing time?

Send replies to K. Marsh, CRESS, York University. A magnificent prize is offered for the best solution from any individual who is not associated with the LBI group.

C.R.P.

[Answer to be given in units of $10^{-3}$ = 1 m.f.c. = 1 milli-fat-chance - Ed.]


## APPLICATIONS FOR TELESCOPE TIME

In recent months there has been an increase in requests for observing time to be used in conjunction with other observatories, either for cooperative or long baseline programmes. Often the only warning your programming committee receives is a cryptic note on the request form stating that the time must be allotted for the same period as has been or will be allotted at X and U Observatory. Sometimes the notification comes in the form of a request from the programme chairman at the second observatory for specific dates for the experiment-in-common. On at least two instances lately not only have the notifications come from the second observatory, but the programmes involving the Algonquin Radio Observatory have not even been submitted to the ARO Programming Committee for approval and rating. Yet investigation revealed that written requests had been submitted to the other observatory some weeks earlier.

Approval of a programme at a second observatory does not automatically ensure approval by the ARO Committee. You are reminded that an observing programme involving ARO and other stations simultaneously can only receive the consideration you think it deserves if it is submitted in writing to the Programming Committee for ARO at the same time as it is submitted to other observatories.

N.W. Broten
Chairman
Programme Committee

# Dear Blabby

DEAR BLABBY, I'm writing to you about this kid who is bugging me. I'll call him George, because that's his name.

George is in this class I give in Introductory Astronomy. So far this term he has invented three new cosmologies, two new interpretations of the red-shift, reversed the arrow of time, and reported that God lives in a black hole. This kid spends so much time thinking and asking questions that he'll never learn anything. When I asked in the exam what p-spots are, he wrote 'Mexican urinals.'

Blabby, this kid is driving me nuts. How do I get rid of him?
Sign me PROF

BLABBY SAYS - *Dear Prof, write to your friendly local Education Department and ask them to raise the fees again. Then you won't have* <u>*any*</u> *students to worry about.*

DEAR BLABBY, I did like you said. I wrote to the Minister of Education, and told him about George and the p-spots, and asked him to jack up the entry fee, and he wrote back and said no, a dime seemed fair enough to him, and how much did they charge in Mexico anyway.

Blabby, George is really starting to get to me. Now he's trying to make out with this cute little chick with the legs that I've been eyeing up in the front row. What's more, she seems to be responding.

Blabby, I know she likes me. She never takes her eyes off me, and she's mentioned how inspiring she finds my lectures, and how much she would like to do well in my subject, yet today George whispered something in her ear, and she looked at me and giggled.

Please help me, Blabby, I have to get rid of him. PROF.

BLABBY SAYS - *Dear Prof, take George aside and tell him that someone of his undoubted intellectual ability is obviously wasting his time in an introductory class. Suggest that he might find a more rewarding outlet for his creative talent with another professor.*

*Cheer up, things could get worse.*

DEAR BLABBY, How the hell do you think I got stuck with him in the first place?

Blabby, I did like you said, I cheered up, and sure enough, things got worse. Now the cute little chick with the legs has gone off suddenly for a holiday in New York, and I'm left with undiluted George. Why would anyone want to go to New York in mid-winter?

Blabby, that's not all. Yesterday I found a very personal comment about me on the lavatory wall, and I'm sure it was in George's handwriting. What does he think I am, a pygmy? What's more, it was on the wall in the <u>girl's</u> lavatory (I was in there because I'm on the Safety Committee, and there had been reports of strange gurgling noises). Now the girls look at me funny-like, and what's worse, so do the boys.

George is out to get me, I know it. I'm afraid I'll do something desperate. Come on, dammit, you're not much help. PROF.

BLABBY SAYS - *Don't you swear at me, you* *snit. You've got a pygmy intellect if nothing else. Who are you to say I'm no help? Do you realise I have a private correspondence with the President?*

*Here's my last advice. If you can't get rid of George, get rid of yourself. Quit.*

DEAR BLABBY, I'm sorry, I'm sorry. Listen, you've got to help me. George has disappeared without a trace. Blabby, I swear I had nothing to do with it. For all I know he went to New York too. Or maybe Mexico, what with his tastes. But everybody knew how I felt about him, and now the police are asking me questions.

I have to find George in a hurry, Blabby. Please help me. PROF.

DEAR ANN SLANDER, *I'm writing to you about this guy who keeps bugging me with anonymous letters. I'll call him Prof, because...........*

B.H.A.

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## U OF T REPORT: RADIO STAR OBSERVATIONS

by

Phil Gregory and Ernie Seaquist

We are continuing to moniter Cygnus X-3 to learn more about its variability. Together with Vic Hughes and Andy Woodsworth at Queen's we now have a total of forty-five days of observations. In total there have been four major outbursts. Except during the times of the outbursts the observations consist usually of one or two measurements per day. If anyone has additional fragmentary data on Cygnus X-3 we would be happy to receive a copy along with a brief description of how they were obtained.

We recently obtained flux density measurements of the new radio star MWC 349 at 2.8 and 4.5 cm. We hope to publish a short note on the spectrum of the star combining our data with the Dutch measurement at 21 cm and measurements in the infra red.

In the course of measuring the background correction for nodding observations we found evidence for a glitch in the receiver output while carrying out zenith angle scans. The glitch occurred regularly but not always at the same zenith angle. The Z.A. at which it was observed on four different occasions are 30°, 43°, 23°, 48°. A glitch takes the form of a sudden step in the receiver output when scanning in Z.A. from horizon to zenith or the reverse. Chris Purton and Andy Woodsworth have also reported similar glitches. Is there something loose in the feed?

Now that the telescope can be computer controlled it would be very nice for those of us who grovel in the noise if a program were available plus necessary hardware to enable us to nod in azimuth. This would completely eliminate the need for a nodding background correction.

# GETTING IT UNDER CONTROL

by

Jim Wolfe

At last you too can control the whole thing! That's right, computer control is finally finished - we hope. The last version of the Data Acquisition and Control System (let's call it DACS) is the Dec '72 version. System tapes can be obtained at ARO.

The major differences between DACS and the earlier data acquisition system have been outlined and sent to most users. A new user's manual is being prepared and should be ready in about one month.

New users should start with DACS and old users should convert over to DACS as soon as it is convenient. Although the rules for using the data acquisition part of DACS have not been changed the observer's modules between the two systems are in no way compatible. You must generate each module again.

Rather than repeat some aspect of DACS let's consider what the users can do to share resources in this system.

The operational environment at ARO dictated the type of system that evolved. Since this is a national facility and since it is an open shop operation we tried to achieve the following features:

(a) the system must be capable of providing a wide range of services with minimal training and no additional programming;
(b) it must not severely limit those who are willing to develop on-line processing programs;
(c) it must permit the users to share programs.

One of the most important features of the ARO system is the ability to share software resources. A new observing sequence (sample lists and event schedules) can be generated in a matter of minutes by invoking a command that loads a two stage generator from the system tape.

When all processing subroutines are loaded and the event schedules have been completed the user can preserve this combination as an observing module by dumping the core image on the system tape. He may later recall this module by name, modify the event schedule if necessary and dump the new version as another module.

It is also possible to move modules from one system tape to another; that is, users can share modules. They can also share processing subroutines.

There are in effect three types of users with three learning levels in the ARO system. They are

(a) the module user who learns how to use modules that someone else has generated and thereby needs to be familiar with only a subset of the full operational capabilities. He escapes programming by sharing modules.
(b) the module generator who can combine subroutines from the library along with scan specifications and observing procedures to create relatively simple or very complex observing modules. He escapes programming by sharing AA & QL processing subroutines.
(c) the subroutine generator who can write his own processing subroutines which can again be very simple or can be complex enough to require a detailed knowledge of the monitor programs. He must program, either in Fortran or Assembler language.

Level (c) users already have a vehicle for disseminating information about their AA and QL processing subroutines - the AQ library. When your subroutine is operational (don't let someone else do all your debugging) it should be documented and submitted.

No formal method of publicising individual modules exists. Possibly this newsletter is as good a means as any.

The users should also consider setting aside a separate binder in the computer room for descriptions of the modules.

The leverage that can be obtained by sharing software is substantial and is improved by good documentation and communication amongst the users.

Let DACS put you in the driver's sea

# *In the Feed Bag*

*with Bill Laurench*

This report lists the various feeds and feed attachments which have been built for use on the 150-foot ARO radio telescope. The text contains a brief description of each item. Following this, some feeds are de- scribed which are still to be completed or are planned.

22 MHz

This feed consists of a pair of cross-polarized two element YAGIS. It was built for LBI experiments with DRAO. The two outputs of the YAGIS are brought separately into the focus cabin where they are combined in a hybrid to produce right- and left-hand circular outputs. The dipole assembly is mounted in the dish by strapping the dipole supports to the feed legs. The feed has been used twice.

150 MHz

Linearly polarized. Two parallel dipoles over a ground plane. A sleeve assembly on the back of the ground plane is provided to mount the device on the end of the feed tube. A hole has been cut in the center of the ground plane to allow simultaneous use of a second feed inside the focus tube.

448 MHz (Linear Polarization)

Built for an occultation experiment in 1966. Two parallel dipoles over a ground plane mounted on the end of the focus tube. Edge illumination in the E-plane was -15 dB; in the H-plane, -14 dB.

448 MHz (Circular Polarization)

Similar to the above except that two orthogonal pairs of dipoles are used. The outputs of these are cobmined behind the ground plane to give left-hand circular polarization with an axial ratio of about 1.2. This feed was used in the early LBI experiments with DRAO and PARL.

408 MHz (Circular Polarization)

A change in LBI frequency led to a new feed. The design is identical to the 448 MHz feed above. The first version used RG-58 cable in the matching and combining section. At a later date two new feeds were built using RG-213 to reduce losses.

The latter feeds were used in LBI experiments with Green Bank. One of the feeds was subsequently modified to produce simultaneous right- and left-hand circular outputs for DRAO.

408 MHz (Linear Polarization)

Similar to the 448 MHz linear feed previously listed. This feed was required when an LBI experiment with Australia led to an off-center mounting of the regular 408 MHz circularly polarized feed in order to increase the amount of common sky. A hole was provided in the ground plane to allow concurrent use of a feed in the focus tube.

430 MHz (Circular Polarization)

An LBI experiment with Arecibo necessitated the introduction of this new frequency. The design is identical to the 448 MHz and 408 MHz circular polarization feeds.

1420 MHz (Linear Polarization)

A waveguide horn with a short length of waveguide and a transition to a type-N coaxial cable connector. The flare of the horn has been selected to give approximately equal patterns in two planes - 15 dB edge illumination in the H-plane and 17 1/2 dB in the E-plane. VSWR is less than 1.2 from 1370 MHz to 1460 MHz and 1.025 at the design frequency. The feed has never been used.

9.4 cm Transition

A two section transition from rectangular waveguide to the circular end of the hub horn. VSWR is less than 1.07 from 2.9 GHz to 3.5 GHz. The primary purpose of this transition was to provide a calibrating noise signal for a feed in the focus tube; it can, of course, also be used as a feed for Gregorian operation at 9.4 cm.

9.4 cm Polarization Rotator (Focus)

A polarization rotator for use at the prime focus. A waveguide horn feeds a length of standard rectangular waveguide which terminates in a loop transition to coaxial transmission line. The entire length of waveguide rotates. Choke joints are located in the coaxial line. Edge illumination is -13 dB in both planes.

9.4 cm Polarization Rotator (Hub)

Essentially similar to the feed above except that it is meant for use in the hub. The coaxial-to-waveguide transition was shortened considerably because of space limitations. A right angle bend was put into the coaxial portion to facilitate side mounting of the receiver. A tapered section joins the rectangular waveguide to the S-band portion of the hub horn. VSWR is less than or equal to 1.05 from 3.0 to 3.4 GHz.

9.4 cm (Dual Circular Polarization)

A square waveguide is used. Pins are used on the edge of the horn to equalize the E- and H-plane patterns. A teflon quarter-wave plate in the waveguide converts the two circularly-polarized signals into two orthogonal linearly polarized waves which are picked up by two probes feeding coaxial lines. In operation a diode switch is used to switch alternately between the two probes. Average axial ratio is better than 0.99. VSWR is of the order of 1.05 and isolation between probes is 46 dB. All of the above figures are for the band 3.1 to 3.4 GHz.

9.4 cm (Variable Polarization)

This feed was intended for use with a maser in the vertex. A coaxial line feeds a rotatable half-dipole in the end of a circular waveguide. This automatically produces a rotating linear polarization. If either of the circular polarizations is required, a length of elliptical waveguide is inserted between the dipole and the vertex horn. The elliptical waveguide has a 90° differential phase shift which, when combined with the appropriate setting of the dipole, produces the required circular polarization.

Further details are given in ERB-834.

4.97 cm (Variable Polarization)

The design is identical to the 9.4 cm feed above. Again further details are available in ERB-834.

4.61 cm Polarization Rotator

Designed to be used either at the prime focus or in the hub. Considering the device as a transmitter, the signal from a rectangular waveguide is fed into a circular waveguide through a long tapered section. A fixed quarter-wave plate made from a Teflon vane converts the linear signal to a circularly-polarized one.

The signal next passes through a rotatable quarter-wave plate where it is converted back to linear polarization but with an orientation that is a function of the quarter wave plate position. At this stage the signal passes either into the hub horn for Gregorian operation or into a small horn for prime focus use.

Full details can be found in ERB-774. A rectangular waveguide with a suitable horn was later added to this feed for beamswitching.

## 2.8 cm Transition

This is a very short transition (about an inch long) which matches standard rectangular waveguide to the X-band end of the hub horn. Two quarter wave transformers are used which, combined with a single tuning screw, produce a VSWR better than 1.05 from 10.3 to 11.1 GHz. This item was meant for use with the line receiver.

## 2.8 cm (Circular Polarization)

A circularly polarized feed was required for LBI work in the Gregorian mode. It was achieved by using a transition as outlined above followed by a quarter-wave plate made from a squeezed section of circular waveguide. Locating pins and holes have been included so that either of the circular polarizations can be used. The axial ratio is .97.

## 2.8 cm Polarization Rotator

The design is similar to that of the 4.61 cm polarization rotator listed earlier. The 2.8 cm device was however designed to be used solely at the prime focus. Four different horns were supplied to provide a choice of dish illumination. Details are to be found in ERB-735. As before, a rectangular waveguide and horn were later added for beamswitching.

## 2.8 cm (Dual Beam Variable Polarization)

Consists of two identical channels of over-size circular waveguides for reduced losses. A quarter-wave plate in each channel permits the choice of either two orthogonal linear polarizations or two circular polarizations of opposite sense. The quarter-wave plates are geared to a single motor which is operable from the control room. The loss in each channel is estimated to be about 0.2 dB. VSWR is less than 1.05 from 10.4 to 10.9 GHz. The axial ratio is 0.98 at 10.68 GHz.

## 2.22 cm Polarization Rotator

The design is similar to that of the 4.61 cm polarization rotator except that elliptical waveguides are used for quarter wave plates instead of Teflon vanes. The feed may be used either on the Ku band conical section horn in the hub room or, with a small horn, in the focus tube.

Additional details may be found in ERB-774.

An over-size circular waveguide (1" I.D.) has since been added for beam-switching.

## 2.2 cm

This feed is quite different from any of the previous ones. A short rectangular to circular waveguide transition is followed by a single rotatable quarter wave plate (elliptical waveguide). On transmitting, this feed will produce a field which goes from linear through elliptical to circular then back to linear as the plate is rotated.

Order is made out of chaos by sampling the received signal at several angular positions of the quarter wave plate and then processing the results with a computer to provide the four Stokes parameters. As before a second fixed over-size circular waveguide has been included for beamswitching.

## Summary

The feeds and modifications outlined above were produced in the period from 1966 to 1972. During this time feeds were also produced for other antennas but these are not listed here. The largest share of these were for DRAO in the form of nine different horns - both linearly and circularly polarized and ranging from 1 GHz to 4 GHz.

## Future Components

Considerable interest has been expressed in the production of a polarization rotator which will simultaneously receive two orthogonal linear polarizations. This device has been requested both for 2.8 cm and 4.6 cm. Most of the work to date has been at the latter wavelength.

The plan is to produce a polarizer

essentially the same as the existing one but with two rectangular waveguide outputs to give the two orthogonal components required. Polarization measurements can then be made by switching the two outputs against each other as the polarizer is rotated. This procedure results in an increase by a factor of two in signal to noise ratio, and a substantial rejection of atmospheric noise.

The first attempt at producing a dual output transition was only half successful. One of the outputs was OK; the other suffered from spurious resonances owing to higher modes in the main waveguide. A change in waveguide size and shape has resulted in a dual output transition with VSWR less than 1.1 over a band of 260 MHz centered on 6520 MHz.

At this stage there remained only the apparently simple step of mating the transition to the end of a pair of quarter-wave plates - one fixed and one rotating. This unfortunately turned out to be anything but straightforward.

The design of the polarizer calls for a fixed quarter-wave plate to be positioned at 45 degrees with respect to the outputs. An experimental check on this is obtained by plotting polarization patterns for various settings of the plate with the aim of getting a circular plot. This was done using one of the outputs and an axial ratio of 1.03 was obtained.

The taste of success turned to ashes, however, when it was discovered that the orthogonal output had an axial ratio of 1.4. The reason for this unexpected behaviour is still a mystery. At the present time the antenna range on which this work was being done is having a face-lift and progress (loose terminology) is at a standstill.

No work has been done on a similar device for 2.8 cm. It is felt that once the 4.6 cm feed is completed, the results should be readily applicable to the 2.8 cm feed.

## WE STAND ON GUARD

*The following was part of a news item which appeared in the Ottawa Citizen of 4 January 1973.*

"Some of this stuff is out of this world," the official said in response to questions about a Toronto report about restrictions on pornographic literature.

The official said customs is not "cracking down" on such literature.......

He did say, however, that because of the "changing character" of pornographic literature more time now is spent on studying printed matter than in the past.


*"...three...two...one...lift off, we have lift off..."*

# The Comet's Tail

## HEADS WE WIN, TAILS YOU LOSE

I recently had a salutary lesson in the workings of the insurance business, as a result of which I have lost any lingering doubts about the need for no fault automobile insurance.

No fault insurance is, of course, the type of insurance which applies to almost every other insurable commodity. If you burn your house down you col ect without question as long as you did not set the fire deliberately. If you kill yourself (accidentally) your wife collects your life insurance. No fuss, no assignment of blame, no penalty clauses, no legal fees adding to the costs.

The accident was a simple one. I was involved in a minor collision with another car. I claimed, and still do, that the driver of the other car was completely at fault. He claimed that I was. There were no independent witnesses. The insurance company decided that under the circumstances they had no choice but to assign the blame equally. All of which seems fair enough at first glance.

But let's look into the facts a bit more closely. My car sustained damage estimated at almost exactly $100. The other car was not damaged at all. Because the cost of my damage was less than my deductible of $250, and because there was no question of my being liable under the third party section of my insurance, my own insurance company declined to become involved.

They were very polite and understanding, and if I encountered any difficulties, please call back, etc., etc., but I would have to deal with the other driver's insurance company on my own.

The other company was then in the happy position of being the sole arbiter of its own financial liability, and so their offer of a fifty-fifty settlement might seem generous. But if they pay a claim on behalf of their client, which implies some fault on his part, he loses his no-claim bonus, and his premiums go up by an amount which usually comes to about $100 spread over three years, with about half of that sum payable in the first year.

The insurance company therefore had the following choices:-

(i) they could have decided that I was at fault. In that case I would have had to pay my own damages of $100 and the other driver and the company would have paid nothing.

(ii) they could have decided that their client was at fault. Then they would have paid me $100 for my damages, and collected $100 from their client in increased premiums. The other driver would be minus $100, the insurance company and I would break even.

(iii) the choice which was actually made. The other driver and I were judged to have been equally at fault. The insurance company paid me $50, or half my damages, I paid the other $50, and the company will collect $100 in increased premiums from the other driver. I am out $50, he is out $100 and the company is $50 ahead.

It was probably due to a combination of circumstances, but with all these possibilities isn't it funny how the insurance company never came up holding the tarry end of the stick?

B.H.A.

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## HEROES SMALL

Over the years most of us collect our own personal galleries of minor heroes, people who inspire us in some small way, or who seem to epitomise some quality which we particularly admire.

I do not include in this category a Churchill or a Boadicea, who cut much too grand a figure ever to be classed as minor heroes and who in any case make mind-boggling bedfellows. Rather I am thinking of the lesser lights of history, now largely forgotten, who have few claims to fame and fewer to distinction.

One of my own favourite persons is Dante Gabriel Rossetti, the nineteenth century English painter and poet.

I do not respect him for his poetry, which in truth I have never read, nor have I any great desire to do so. His attractiveness lies in his reaction to the death of his young wife after two years of marriage.

The grief-stricken Rossetti, beset no doubt by the usual guilty knowledge of wrongs unrighted and promises unfulfilled, made an impetuous and sentimental gesture. He buried with his wife the only manuscript of a volume of poetry which he considered to be his masterpiece.

His extravegant romanticism is admirable enough in itself. But I cherish him most for his prudent afterthoughts Rossetti, the English born son of an Italian patriot, was a Scotsman through and through.

Seven years after the burial he disinterred the body, recovered the poems, and published them.

B.H.A.

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## DIM-LIB

I read with interest a recent article in Science on ending discrimination against women in university faculty appointments in the United States. I was heartened to find that significant progress is being made. Equally encouraging are the efforts to ensure that Canadians are given proper consideration when competing for posts in Canadian universities.

However, the field of human rights has not yet been completely ploughed in either country, though one might guess that most of the fertiliser has already been spread.

Now that ethnic minority groups such as Canadians are achieving their goal of equal treatment, and now that women are well on their way to getting what is coming to them, it is surely time to turn our attention to the plight of another disadvantaged section of our populace which has so far been overlooked. Discrimination against these people is particularly rampant in universities, and yet they are not a minority group in society at large.

Half the population of the country is below average intelligence, yet how many of them are university presidents?

Surely this elitist attitude of the universities must be seen for what it is, simply another manifestation of the intellectual conspiracy to keep dullards in their place, subservient to the lordly intelligentsia. Dimwits are from birth brainwashed by society into unconsciously accepting an inferior status, so that they grow up psychologically unprepared to take their rightful place. They believe, for example, that there are only certain jobs which are suited to them, or that important decisions can only be made by the knowledgeable.

Even the school system, paid for equally by the dim, has been carefully designed so that only the highly intelligent and hard-working pupils can hope to emerge with any semblance of an education.

Yet a clod is a human being, and as such has much to offer, for he sees things in a different way from the rest of us.

I know that university administrations will protest that there are a number of stupid university presidents, and I grant that there are some encouraging signs of progress in this respect, but I submit that an examination of the facts will show that it is mainly in the lower ranks of the faculty that any significant number of fools is to be found. Even then their pay is likely to be less and their tenures shorter than those of their more gifted colleagues.

The incidence of doltishness in university faculties, though increasing, at present constitutes mere tokenism. As usual it is left to the student body to lead the way in ensuring the adequate representation on campus of stupidity and clownish behaviour.

Of course the universities will claim that they try to hire suitably qualified chuckleheads but that there are none to be found. How can there be when society has up to now prevented their obtaining posts where they could acquire the necessary experience? And of course the administrations' excuse begs the very point I am raising. It is clearly discriminatory that an applicant's qualifications should be considered relevant at all.

The inferior mind is simply not proportionately represented in universities. If the ignorant, the dumb, and the incompetent are to find roles other than their traditional ones in politics and the military, only a strict quota system will suffice.

At least half of the important posts in university heirarchies should be reserved for the unintelligent. Crassness must not only seem to be done but must actually be done. Current university presidents may pretend to be unenlightened, but the continued existence of the established order makes it clear that underneath that drab exterior there lurks a very shrewd cookie indeed.

In our struggle for equality we cannot succeed alone. We will have to call upon our female colleagues to help us increase the number of prominent boobs on campus. Studies of a number of movements have shown that they tend to flop without firm support. This conclusion has been borne out by a close examination of the relevant figures.

Today's emancipated women have seized the opportunity to try for many new and exciting positions in which they have had little previous experience, and indeed they are performing remarkably well, to their own and everyone else's satisfaction. Surely we cannot do less than grant the intellectually underprivileged of this country an equal chance to make it. At the moment they are merely being had.

B.H.A.

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It is only fitting that in this, our first issue, we express our gratitude to Mrs. Vera Ablack for designing the cover and several of the captions, to Mrs. Mary Saver for her ~~immacul imaccu~~ good typing, and to Mrs. Ethel Swail for her advice on the mechanics of the operation.

The editor is Bryan Andrew. You can blame him for everything else.

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