Contents

Introduction 2
Forthcoming Meetings 3
Meeting Report- Standard Urban Measurements 6
Article- Progress in Upper Air Data Collection- Personal Aspects 11
Meeting Report- Summer Visit 2007 15
Photos- Summer Visit 2007 17
Minutes- Annual General Meeting 2007 18
Minutes- Committee Meeting 17th September 2007 21
Group Officers 24

Front Cover Photo- (see article on page 11) Vanessa O'Brien launching a radiosonde at Halley Base, Antarctica, circa 2006. Photo- ©BAS (Editor's Note-it has not been possible to establish the identity of the photographer. I would be happy to give credit for the photo in a subsequent edition of the Newsletter if information were to be forthcoming.)

Introduction

Since our last Newsletter the Group's activities have continued apace with a successful meeting at The University of Birmingham and our AGM and Summer Visit to CEH at Wallingford. Reports are included in this edition. Our next meeting is Climate Measurements for the Future on the 7th November 2007 at The University of Reading. Full details are included and as it is expected that this will be a very popular meeting with limited places please do book NOW if you wish to attend.

The Group Email Discussion Forum has not proved popular so far with only a handful of members registering. There have been items of general interest discussed within the Committee email list over the last 6 months or so which we would have liked to have opened up to general opinion. At present your Committee are unsure of the next move with the Forum so we would ask that if you do wish to have this facility, please register as described in the Spring 2007 Newsletter. It is the intention to review interest in the Forum when the Committee meets in March 2008 and if numbers have not increased significantly by then we shall assume that this is a facility which is not wanted and close it down. If you have any opinions on this initiative please do let us know.

Please note that my email address has changed since the last edition of the Newsletter so if you are sending material be sure to contact me on the new address, as below. As ever, contributions are always welcome.

Andy Overton, Newsletter Editor
Members are encouraged to regularly check the Group's pages on the RMetS website at http://www.rmets.org/groups/SIG/detail.php?ID=10 for details of meetings and booking information, including on-line registration for meetings. Whilst every effort is made to publicise meetings via the inserts in Weather magazine and the Newsletter the website is the quickest medium of communicating with you.

Have Your Say

This is your Group and your Officers are always happy to receive feedback about what is being done on your behalf. If you have any comments or suggestions on matters relating to the Group and our activities please do not hesitate to get in touch with any Officer. Contact details are shown on the last page of the Newsletter. Suggestions for future meetings and speakers are always very welcome.

Material For Publication

Written material must be in electronic format, preferably in MS Word or Excel, although PDF format can be accepted. Short news items as email are acceptable. Material can be sent as email attachments to andrewkoverton@tiscali.co.uk on floppy disk, CD or DVD. Please note that large email attachments (>1MB) cannot be accepted and should be sent on disk to 58 Zetland Road, Town Moor, Doncaster, South Yorkshire DN2 5EJ. Please say if you would like disks returning. In all cases please include your name, address and email or telephone number with submissions.

Whilst every effort is taken to ensure accuracy, responsibility for the accuracy of material published and opinions expressed lies with individual authors. The Editor is always pleased to receive correspondence on published items which provides correction, clarification or additional detail. This may be included in future editions of the Newsletter.

Forthcoming Meetings

Climate Measurements for the Future

Wednesday 7th November 2007 at the University of Reading

A meeting to examine the impact of new technology on climatology – the challenge of improving measurement techniques whilst maintaining continuity.

Programme

1230  Registration and lunch (room 1L61, Department of Meteorology)

1315 – 1325  Welcome and Introduction

1325 – 1400  The importance of homogeneity -Global Climate Observing System principles and their application – Matthew Palmer, Climate Variability Group, Hadley Centre

Assessment of climate change requires us to be able to detect small persistent changes in temperature and other climate variables, and these changes take place slowly compared to the evolution of observing
networks and technologies. Changes to how, where, and when observations are made, and changes in the instruments used, can sometimes introduce false climate signals - biases in the observed records. Data homogenisation is the process by which such biases are quantified and accounted for, to achieve more accurate climate records. Examples of the need to correct data biases are given for the subsurface, surface and upper air temperature records. The Global Climate Observing System (GCOS) principles for climate monitoring provide guidelines to ensure that today’s observations can be combined with historical measurements in a homogeneous data record. Applying these principles will provide the accurate climate observations that will be vital for monitoring, detecting and attributing climate change, assessing the impacts of climate variability and change, and for supporting research toward improved understanding, modelling and prediction of the climate system.

1400 – 1435  Men or machines -automation and its effect on data series  - Mike Molyneux, Surface Sensor Development, Met Office
If we want to make observations of the weather over an extended period and in a range of environments it is necessary to change, due to cost pressures and technical opportunities. On top of this networks will always be in a state of flux, even if there are no headline changes. Of course this must impact on data series, since every process in measurement carries some risk of change. Some of these are clear and controllable while others are less obvious and can be difficult to predict or identify. This talk will describe some features of automatic measurements, where they are likely to be robust and how they mix with human observations. Techniques for measuring some parameters will be discussed in more detail, including cloud amount and height, temperature, present weather, visibility and snow depth.

1435 – 1515  To change or not to change? -a new network for precipitation and temperature data – Ian Strangeways, TerraData Ltd
This talk will show that our ability to measure past and present climate change is much poorer than is generally realised and that immediate and widespread changes are necessary. The majority of measurements used to estimate past climate change over land originate from manual instruments designed in the 19th century, mostly operated by National Weather Services, and most measurements today continue to come from the same type of instrument. Yet these instruments are poorly suited to detecting small changes over long periods and much adjustment of their data has been necessary in an attempt to compensate for their many shortcomings, although it is difficult to be sure how effective this has been. The many sources of error in the measurement of temperature and precipitation will be described. From across the oceans, measurements are even more problematic. While drifting buoys now provide a valuable addition to ship observations they do not measure precipitation and only the larger ones measure air temperature. They are also expendable, short-lived and expensive. Proposals will be made for a completely new network of instruments over land and sea, to one standard design worldwide.

1515 – 1545  Tea

1545 – 1610  Coping with change, Example 1: Sunshine – burns to bytes  - Matthew Perry, National Climate Information Centre, Met Office.
The last 7 years has seen a change in the way the duration of bright sunshine is measured at some UK stations. The long-established Campbell-Stokes sunshine recorder has been replaced by the Kipp and Zonen automatic sensor, providing durations based upon the WMO solar radiation threshold of 120 W/m². Typically, using the automatic sensors and the WMO threshold gives durations that are some 10% less than those provided by the Campbell-Stokes method, but the differences depend upon weather type and time of year. An analysis carried out in 2003 by Kerr and Tabony provided monthly factors to convert sunshine totals from one method to the other. Recent work has repeated the 2003 analysis, using over twice the quantity of overlap data, and included a method to take weather type into account. This has provided a more reliable method for adjusting monthly totals of sunshine duration. Kerr, A and Tabony,

1610 – 1635  **Coping with change, Example 2: Soil temperatures – tubes to thermistors – Stephen Burt, FRMetS**
Earth temperatures have been measured as part of the standard climatological routine in the United Kingdom for over 120 years. Standard methods have changed little in this time, but are now increasingly being superseded by modern methods using electronic sensors and automated logging equipment. The results from an 18 month single-site side-by-side comparison of both means of measuring earth temperatures at the standard depth of 30 cm are presented. Significant differences were identified between the two methods of measurement, the magnitude of which would be sufficient to disrupt the climatological homogeneity of long-period records. An approach to minimise the risks to long-period record homogeneity is suggested, particularly for sites where automation may represent the only means to ensure future continuity of record.

1635 – 1700  **Coping with change, Example 3: Measuring temperature globally – Phil Jones, Climatic Research Unit, University of East Anglia**
The talk will summarise the various steps in the development of the HadCRUT3 dataset, which combines anomalies of land temperatures and sea surface temperatures globally. One of the important aspects is the assessment of errors, which result from biases, sampling (areas missing from the analysis) and land station homogeneity issues. The most important of these are the biases which result from changes to the way SST has been measured (buckets to engine intakes) and possible urbanization effects. Both these are much more important than individual station homogeneity, as they are pervasive over large fractions of the input data. The way the HadCRUT3 dataset is put together is contrasted with the other two groups who develop similar records (NCDC/NOAA and NASA/GISS). The furore about their minor ‘mistake’ discovered by a blogger in August is reviewed, together with the NCDC work on possible biases to the SST dataset since about 2000 due to the recent dominance of buoy measurements as opposed to those taken by voluntary ships. Developments in CRU are somewhat more mundane, but time consuming and involve the incorporation of homogenization work undertaken nationally in a number of countries. It is likely these improvements to the data will enhance our input station data, but it isn’t always that straightforward adding them to the basic station dataset. They also barely make a difference to the hemispheric and global temperature series, illustrating why associating errors with the estimates is important.

1700 – 1730  **Discussion & Close**

The meeting will be held in room 1L61 at the Department of Meteorology, Reading University, Whiteknights Park, Reading. For directions see [http://www.reading.ac.uk/about/find/about-findindex.asp](http://www.reading.ac.uk/about/find/about-findindex.asp).

Registration is £9 for members of the Observing Systems Group and students of the University of Reading and £14 for others and includes a buffet lunch and mid-afternoon refreshments.

Registration forms may be obtained from the Royal Meteorological Society at 104, Oxford Road, Reading, Berks. RG1 7LL, Tel: 0118 956 8500, Email susan.drew@rmets.org, or you can download a form from the Observing Systems Group website [http://www.rmets.org/groups/SIG/detail.php?ID=10](http://www.rmets.org/groups/SIG/detail.php?ID=10)  It is possible that on-line registration may be introduced by RMetS before the meeting but to guarantee a place it is recommended that you book as soon as possible by cheque using the registration form.

There is a limit of 50 places for this meeting, so priority will be given to Observing Systems Group members until 1 October. The closing date for registrations is 1 November. In view of the limited capacity and expected popularity of this meeting it is strongly recommended that members book NOW to avoid disappointment.
Further information about the meeting can be obtained from the Meeting Organiser, John Prior, Email: john.prior@metoffice.gov.uk

Meeting Report- Standard Urban Measurements
A discussion meeting held at the Department of Civil Engineering, University of Birmingham on 19th March 2007

Forty-seven people assembled on a sunny, cold March day at the University of Birmingham to hear a series of presentations concerning experiences with siting sensors in urban environments for a wide range of applications. The sub-text of the meeting was to see if it would be possible to establish a 'standard exposure' for instruments in the urban environment which would meet the needs of those gathering data throughout these fields, so enabling the interchange of data.

The meeting was opened by Prof. Sue Grimmond (King's College, London) who spoke on The Scale and Criteria for Siting Equipment and the New WMO Guidelines for Urban Areas. Sue gave a very thorough appraisal of the factors which influence measurements in the urban environment and made it immediately clear that the area of influence of urban factors is very much a fluid function of meteorological conditions, time of day and seasonality for most parameters. For example, the sphere of influence of the urban heat island on temperature measurements is highly wind-direction dependant. Combined with this is the nature of the built landscape- urban environments are highly variable, even within the same city. In a landscape of predominantly tall buildings the wind tends to flow over the top but when there is a mix of tall and low buildings the flow is highly complex. Differences in building materials affects the absorption of solar radiation as does building shapes, the latter being yet more complex in that the effects are influenced by the angle of incidence, which is not a constant, and the changing areas of shadow. Influences are modified throughout the year as pockets of vegetation go through their seasonal cycles and the built environment changes through development.

The result of this variability for those taking urban measurements means that sensors must be very carefully sited and particular locations may not be suitable at all times of the day, or during all seasons or synoptic conditions. In order to obtain representative samples of the environment at local scale sensors must be sited high, otherwise only micro-scale effects will be measured which are highly influenced as described above. Where the latter are required it therefore follows that sensors positioned too high will not do. Also, different instruments are needed depending on the scale being measured.

The new WMO classification scale for urban environments was shown (Siting and Exposure of Meteorological Instruments at Urban Sites, Oke T. R. 2004 via www.urban-climate.org) which gives detailed categories based on quite fine differences between urban sites, taking into account the many variables and their scale, to allow grading of sites. The need for detailed metadata of urban observing sites was discussed as was the need for urban networks to use the same equipment. In particular, the need for temperature to be measured with aspirated shields in urban environments due to the sheltering of sites was noted.

Mr. Chris Hall (Met Office) then described UKMO activities in his presentation Factors in Siting Instruments in the Urban Environment. UKMO requirements are for measurements for two applications: climatological measurements and initial conditions for operational forecasting models. In the former case it is essential for data to be intercomparable with rural sites and for the record to be as little affected by surrounding changes to the built environment as possible. This places a requirement on positioning instruments in open sites which may not be representative of the urban core and often rooftop sites which are significantly compromised are inevitable. The decision is often enforced by considerations of security
of the equipment from vandalism. In the case of synoptic measurements, it is desirable that instruments are positioned clear of the urban canopy and its micro-scale effects as these would adversely affect model input. Again, this often means that roof-top instrumentation is the only practicable solution. It was noted that urban scale models are not presently run- although this may change in future- but that large scale models are instead down-scaled.

Chris then moved on to discuss how the Met Office are trying to get around the difficulties in urban environments by employing new technology. Weather radars with an operational range ~250km are employed giving coverage over the whole of the UK. Doppler radars can resolve the wind field and give a 2km resolution of low level winds, as well as vertical profiles. Aircraft reports are being increasingly used and instrumentation fitted to more commercial aircraft, currently giving temperature and wind profiles, with humidity soon to be added. Data is usually gathered during ascent where the rate of climb is higher than the rate of descent on the approach to landing. However, it is probable that more measurements will be taken over the urban canopy and the descent of aircraft over London increasingly employed. Vertical wind profilers are also being deployed in increasing numbers as a relatively cheap method of data capture, giving 2-4km resolution. There are currently five in operation although at present none are used in urban areas.

Mr. Paul Willis (AEA Technology) ended the morning session with *UK Urban Air Pollution Monitoring*. Pollution monitoring is carried out in all major city centres in order to meet EC legislative requirements, as well as throughout industry. In the urban environment monitoring is mainly for NOx and PM10. The equipment takes two forms: automatic stations with a variety of equipment which log data in real time, and sampling tubes which are attached to lamp-posts etc. and are removed after a suitable interval for analysis of the cumulative pollution collected. The nature of the measurements required for this application mean that measurements must be taken where the public are exposed, discounting roof-top sites and large open spaces and prioritising street canyons. Sensors are typically located at 1.0- 4.5m heights. Considerable work is done before sensors are positioned to predict the likely spatial distribution of pollutants and sites for sensors are chosen after this analysis has been done. Sites are carefully chosen to ensure that there are no immediate obstructions to the sensors and that the site will not change during the lifetime of the deployment.

Examples were given of typical deployments of instrumentation and, as with Chris Hall's presentation, the factor of vandalism of equipment was seen as an important driver of site selection. Street canyon monitoring usually employs two automatic stations- one at a predicted high-concentration location and another at a predicted background-level site- with many sampling tubes then distributed throughout the monitoring area to add spatial detail. Siting was described as a balancing act between conflicting considerations of good spatial coverage, high quality data, cost limitations, safe staff access (automatic stations must be visited regularly for calibration) and equipment security.

Finally, some understanding of data analysis was given and it was explained that a variety of other sources are consulted during this process. Synoptic data are used as well and consideration is given to the likely presence of outside influences on the pollution total- for example distant forest fires- which may skew the data.

After an excellent lunch, during which delegates had the chance to discuss proceedings informally, presentations resumed with Dr. Doug Middleton (Met Office) talking on *Lessons from Field Trials and the COST 715 Action on Urban Meteorology*. An overview of the COST 715 Action was given and further details can be found at [http://www2.dmu.dk/atmosphericenvironment/cost715.htm](http://www2.dmu.dk/atmosphericenvironment/cost715.htm). Several working groups were set up to study various aspects of urban meteorology, urban winds, heat flux and mixing depths, pollution episodes and met data for dispersion modelling. Doug concentrated on one group in which he had been involved, that studying the urban wind field. This group was tasked with comparing the urban and rural environment and did so by comparing winds at four locations:
Birmingham, Lisbon, Copenhagen and Barcelona. A weakness of current understanding was described in that urban winds have been measured at a variety of heights leading to great inconsistencies. The group has also made recommendations for a method to estimate an urban wind speed from a better exposed rural or airport site. Its approach relies on modern understanding of the turbulence profiles above the buildings, making particular use of results from controlled experiments in wind tunnels. The COST 715 Final Report has further details (see above link).

Doug also discussed lessons from Met Office field experiments at Birmingham with a site at Fort Dunlop. The ultimate aim was to assemble a data set of turbulence and heat flux measurements to help understand the urban influence. The team also obtained synoptic data and made turbulence measurements at Coleshill (east of the city, near the airport), where there is an operational meteorological station. They studied the comparable winds obtained at Fort Dunlop. A series of masts were erected at the Fort Dunlop trial site at 15, 30 and 45 metre heights to support sonic anemometers. The trial data were discussed, from which the study group had been able to conclude that winds at 10 metres height outside the urban environment correlated best with those at 30 metres height inside the urban environment, thus illustrating just how much the city slowed the wind. The importance of positioning anemometers well above the standard 10 metre height in urban environments in order to measure wind speeds comparable with rural areas was shown by the trial.

Recommendations for further work in this field were then given based on experience obtained during COST 715. It was stressed that sonic anemometers were best for the work. Flow regimes are complex in urban environments and cannot be properly captured by traditional cup anemometer type instrumentation. Pulsed Doppler LIDAR had been used during the ISB52 trials with the beam back-scattered and Doppler-shifted by aerosols to enable the urban boundary layer depth to be established. The field trials have shown that the erection of masts at sufficient heights are costly and difficult to site and Doppler LIDAR offers distinct advantages in this respect. The best case scenario was described as sonic anemometers coupled with LIDARs. COST 715 has concluded there is a need to better understand the Urban Roughness Sublayer. The likely height of this layer should be a consideration during trials and thought must be given to exactly what is to be sampled to ensure the best deployment of instrumentation.

Prof. Alan Robins (Surrey University) then presented a talk entitled *Combining Laboratory and Theoretical Modelling to Aid Siting and Understand Results*, using three wind tunnel case studies to illustrate some general conclusions. The history of the study of local scale atmospheric flow and dispersion showed that four complementary methods had traditionally been employed:

- computer modelling
- field experiment
- theoretical analysis
- wind tunnel modelling

He noted that what was true in the past remained so today but that the balance between the four had now changed. A great deal of understanding had been achieved by wind tunnel experiments (and latterly LES-CFD) but they have not done away with the need for field experiments by any means, owing to the complexities and variability of the 'real' wind that are not adequately resolved in the wind tunnel. Wind tunnels are still important, however, for pre-analysis to design the layout of sensors in the field, although the perfect siting cannot always be achieved in practice on the ground. They also still play a key role in developing basic understanding and in the interpretation of results from field experiments.

Alan then gave three examples of work in this field. The first was at Oldbury Power Station where the deployment of anemometers on masts and a LIDAR was successfully established from knowledge gained in earlier wind tunnel work. The experiment concerned flow and dispersion in the wake of a large building and confirmed the close correspondence between field and wind tunnel observations. The
second example involved flow around and through semi-porous obstructions, as typified by a chemical process plant. Here one aim was to design the installation of a system that would continuously monitor leaks and fugitive losses. The characteristics of the flow field near to the site were investigated using generic and site wind tunnel models and this proved to be an essential step in producing an adequate design.

The final case study was the EPSRC funded DAPPLE project (www.dapple.org.uk) and, in particular, the field campaigns of 2003 and 2004, which considered wind conditions and pollutant transfer at the intersections of urban street canyons in central London. Twelve sonic anemometers plus a roof-top AWS were employed during the experiments, with mountings at 4 and 8 metres heights on lamp-posts and mobile monitoring at 1.5 metre height within the street network. The wind tunnel work used flow visualisation and detailed measurement to help explain the unsteady flow conditions observed in the field near the intersection. The field tracer dispersion experiments had to be treated as unique events, whereas large ensembles of repeated experiments could be obtained in the wind tunnel for any given wind direction and source location, thus quantifying some (but probably not all) of the variability in dispersion behaviour likely in the field.

Dr. Janet Barlow (Reading University) continued where Alan Robins left off by providing a detailed study of the DAPPLE campaign with her presentation *Measurements to Support Dispersion Experiments*. It is important to understand dispersion of released gases not only for air quality reasons but also because of the risk of deliberate release by terrorists. The need is to understand the advection by the mean synoptic wind as well as diffusion by turbulence, the former being modified by the street layout and the latter being highly three-dimensional. Field trials, as opposed to laboratory experiments, capture the variability of wind speed and direction, thermodynamic effects and mixing by traffic.

Janet described in detail the DAPPLE campaign of 2003 in which a tracer was released upwind of the intersection of Marylebone Road and Gloucester Place, London. A propeller anemometer was roof-top mounted to provide a reference above the urban canopy (although it was accepted that at this height the anemometer was still within the canopy), with several ultrasonic anemometers in the street canyons at 5 and 7 metres heights in the microscale urban environment. The dispersion of the tracer was measured at ten sampling points.

The results of the experiment showed, perhaps unsurprisingly, that mixing increased as wind speed rose, whilst at the same time concentration reduced. However, the gas released at street level reached roof-top level quickly owing to turbulent mixing and this was not well predicted by wind tunnels. The flow at the road intersection was found to be highly dependant on wind direction with seemingly two layers, perpendicularly aligned with the coinciding street canyons. Quite subtle changes in prevailing wind direction caused significant changes in dispersal through the streets.

The conclusions reached by the experiment included a need for further work under different wind conditions with many more measurements to enable a better understanding of the complex flows. However, it was clear that the field work captured the full flow, which wind tunnels did not.

After a break for tea the final session of the day was opened by Dr. Andrew Quinn (University of Birmingham) with his presentation *Wind Measurement Requirements in Relation to Building Design*. An entertaining video clip was shown of footage of the Tacoma Narrows suspension bridge collapse, the first time, it was stated, that wind engineering was realised to be a serious requirement for general engineered structures (although I suspect that in the UK the Tay Bridge Disaster of 1879 had focussed minds, certainly of railway civil engineers, here- possibly this was just gust speeds, though). The problems to be faced are of direct damage from the wind as well as that from wind-blown debris and also the need for a supply of fresh air into the building- this latter being a particular feature during low wind conditions.
The current situation as regards the obtaining and use of wind data by building designers was discussed. It was shown that very little, if any, direct measurements are taken on site when buildings are being planned and the effects of buildings on wind flow are complex and poorly understood. A chart of wind speeds is used which has been compiled by detailed analysis of historical wind data over the British Isles. This does not take into account the particular wind flow unique to the location but it is considered that the allowances factored in to the designs will take care of this. In very large projects some wind tunnel analysis may be carried out. Typical design factor allowances are given in the building design codes and have been derived from previous experience, often with buildings of standard shapes, or which have been tested in rural locations in isolation, which rarely mirrors the truth of the urban environment. The design criteria were shown to take account of expected synoptic conditions, but not thunderstorms, tornadoes nor to allow for climate change.

It was clearly illustrated by the presentation that the present system is very much a rough and ready arrangement which works in most cases due to the factoring in of safety allowances. However, it was also clear that this sometimes fails dramatically when buildings interact badly with each other or with the terrain, something which was not tested for beforehand. There was shown to be a need to understand the unique wind factors within and between sites, within and above the urban canopy, as well as understanding turbulence levels and rainfall penetration. It was also pointed out that the present system treats wind entirely in the horizontal plane, which is not true of the complex flows in the urban environment nor of thunderstorm downbursts which have the potential to thereby seriously damage buildings designed to existing criteria. Raising of awareness of these issues within the civil engineering community would seem to be an issue for meteorologists but with the recognition that current practice is dictated by legal constraints.

The day's final presentation was given by Mr. John Packman (CEH, Wallingford) who spoke on Measuring Rainfall, Soil Moisture and Drain Flow in Urban Areas to Improve Urban Runoff Prediction. Traditionally, drains have been designed using a design rainfall intensity applied to the paved and roof area of the catchment. Design intensities are based on data from Met Office climatological stations that are not necessarily representative of urban sites and do not represent the effects of urbanisation well. Moreover, many studies by CEH, measuring rainfall and runoff rates, have shown that runoff from pervious areas was also important and that soil type was an important factor. These studies led to the formulation of the Wallingford Method of Storm Sewer Design (WMSSD) that is now the standard method used throughout the UK. One recent study was described, involving the Bradford Beck catchment draining most of Bradford, West Yorkshire. By carefully selecting representative but secure sites in parks, yards and gardens, a network of seven raingauges and six flow meters in the Beck system gave a true picture of urban rainfall and runoff processes against which the Wallingford Method could be tested and improved.

John then presented a series of current studies undertaken in urban areas to enable better management of drainage and described several new initiatives to manage water on site, rather than returning it to the sewer network at times of peak flow. These measures include swales, soakaways and garastors. Swales are ditches alongside carriageways with permeable linings into which the drainage water is channelled. The water thus collected drains away into the soil over a period of time- soakaways are similar and can comprise block paving with small gaps left between the blocks to create a permeable surface. Garastors comprise a system whereby peak flows of drainage water are diverted into holding tanks until such time as the level of water in the drainage system falls. When this happens the retained water can flow out of the tanks and drain away through the sewers.

In order to test the success of these schemes raingauges and flow meters were employed in urban locations, as well as soil moisture meters and this deployment was described. The problem of vandalism of instruments was again shown to be a feature and in many cases 'cheap' amateur standard raingauges had been used (Davis Instruments Vantage PRO2) in preference to professional models and mounted in some surprisingly unconventional sites. Gauges were shown in the middle of highway roundabouts
surrounded by low vegetation, and bolted to high garden fences but, interestingly, comparison with nearby networks of Environment Agency raingauges showed a good correlation.

The conclusions reached by these studies were that for modelling and development it is not necessary to find a long term site and that in urban areas it is usually possible to find a representative site (which may be unconventional) if one looks hard enough. Perhaps most interestingly, the use of cheap instruments was found not to be detrimental to this kind of work, especially when the initial costs and risk of loss in the urban environment are given full weight.

This was a very enjoyable meeting and stimulated much thought on a variety of threads. The urban environment was shown to be a diverse, fluid and complex place, which is still poorly understood but it is clear that much work is in progress there. The diverse range of requirements for measurements illustrated that a 'standard urban exposure' for instrumentation to be used by all is not feasible but it was also shown that the current 'standard' climatological exposure is equally unsuited to applications there. The new WMO guidelines look certain to be useful in understanding and intercomparing sites where measurements are being taken and experiences with raingauges in towns and cities suggest that unconventional exposures may describe the environment surprisingly well. Wind measurements, in particular, appear to need to be highly site-specific and unconventional in order to capture the complexities within the urban canopy, which may extend to a surprising height.

The thanks of the Group are extended to our speakers for their excellent presentations and to the University of Birmingham for hosting us in an excellent meeting room. I would also like to take this opportunity to thank the speakers for reviewing a draft of this meeting report and making many helpful amendments to it.

All of the presentations are available to download from the RMetS website at http://www.test.rmets.org/design/presentations.zip. Note that this is a large file and a broadband connection is recommended.

Andrew K. Overton

Progress in Upper Air Data Collection - Personal Aspects

My first job out of university in 1977 was as a Meteorologist/Physicist with the British Antarctic Survey (BAS). This included two winters at one of their Antarctic stations. I was sent to Faraday on the Antarctic Peninsula where a major part of my duties involved the daily radiosonde ascent. This is not an uncommon form of 'apprenticeship' for meteorologists. Typical of the relatively small and interlinked nature of the profession nearly 30 years later I am now working with Vaisala of Finland, the world's largest manufacturer of radiosondes and BAS is now one of my customers. The equipment I deal with today is much improved and easier to operate than that I used in the Antarctic. It occurred to me that a comparison between then and now would be interesting. Some things have certainly changed but some have not. Therefore I wrote down my recollections of a radiosonde ascent at Faraday in 1980 and asked one of the meteorologists at BAS to follow it up with an account of how the job is done today. The results follow: -

Carrying out a radiosonde sounding at Faraday in 1980

Preparations for flying the radiosonde started the night before. One of the jobs of the ‘night-met’, the meteorologist or ‘Met Man’ on night duty and usually the only person awake, was to prepare the radiosonde for the following morning ascent. The radiosondes at that time were polystyrene devices
about the size of shoeboxes and not especially reliable. They had to be assembled and tested with their humidity sensor, which in those days was a carbon hygristor about half the size of a credit card. The night-met was wise to get this task completed early in the night because of the high failure rate. The next duty, before waking his colleagues, was filling the balloon. We had a sizeable balloon shed and a hydrogen generator. The balloons were large by modern standards, about 1500g, because they had to carry a radar target as well as the heavy sonde.

Launching the sonde was a labour intensive affair needing the whole met team. Indoors, in the ‘sonde room’, one person would be needed on the sonde receiver and another, the wind man, on the radar controls. Outdoors someone would be responsible for guiding the radar with a kind of gun sight arrangement and someone, usually the night met, would launch the balloon. In any kind of wind it would take two people to launch the balloon, one to actually let the thing go before it disintegrated and someone energetic enough to stand downwind at the full extent of the suspension string and start running, or more often, wading through snow, downwind to give the sonde a chance of getting airborne without hitting the ground. The knack was to give the sonde a sideways push before it was snatched out of your hand. With any luck this would give the sonde a conical pendulum motion keeping it above the ground. Meanwhile the radar aimer would follow the radar target (in winter it carried a small light) as long as he could, the radar itself following his movements. Indoors the wind man had to lock onto the target manually. This involved staring at a CRT display, a bit like an oscilloscope trace, and moving a box, representing the radar range gate, back and forth to trap a spike in the trace representing the target. As soon as this was achieved he pressed a button and then hopefully the radar would follow automatically. If the balloon was lost from sight before lock then the wind man would have to control the azimuth and elevation of the radar in an attempt to find it.

Assuming all went well at launch and the radar could track the balloon the real work began. The radar had no memory or electronic output. Instead, once a minute, it would ‘beep’ and momentarily freeze three digital displays showing slant range, azimuth and elevation. The wind man then wrote these down and converted the range and elevation to distance using tables and plotted them on a huge sheet of paper. A large table dominated the sonde room, snooker table sized, with a kind of protractor-ruler arrangement. This allowed the wind man to plot the balloon location minute by minute. Wind speed and direction was then simply read off as the vector between the two successive minutes. The knack here was to keep ahead of the radar and its nagging ‘beeps’. This was not an easy task, especially at long ranges when the radar was liable to lose its lock and need to be manually brought back on target. Plotting all the winds ten degrees out or accidentally missing a minute data were also common problems on the wind computation.

Meanwhile two Metmen worked at the sonde receiver. The sonde output appeared on a chart recorder. As the sonde ascended an aneroid capsule, connected via an arrangement of levers, switched the sonde transmitter output between temperature and relative humidity. Counting the number of switches that had occurred derived the pressure at any point. Selecting points for a TEMP message was a matter of drawing connecting straight pencil lines along the chart so that temperature and RH did not deviate too far from these lines. Needless to say the potential for miscounting the pressure switches or other errors was huge. My favourite was the situation when on some days the temperature and RH lines merged and then separated. An inexperienced Metman could be fooled into mixing them up for a surprising length of time. Eventually his colleague, plotting a tephigram by hand as the flight progressed for the sake of calculating geopotential heights and identifying the tropopause, would start to comment that the atmosphere ‘looks a bit odd today’.

After burst there would be a rush to complete the TEMP message combining the sonde data with radar wind data. The wind man had selected his own significant points and now had to give wind data for the tropopause and other levels needed from the sonde data. Geopotential heights had to be calculated by iteration from the surface using the tephigram to approximate the hydrostatic equation over small intervals.
The TEMP message finally came together in the form of chinograph scrawl on a large Perspex template. It was sent out via a communications station in Port Stanley, Falkland Islands, by Morse code in the first instance. For this we needed our wireless operator. The term ‘wireless operator’ sounded dated even then, U-boats and Lancaster bombers had wireless operators not modern scientific stations. I don’t know if the title is still used. Anyway, sending out the 1200GMT SYNOP and TEMP was his first job of the day (actually early morning at our Longitude) so he would blunder from the bunkroom in his pyjamas straight into the radio shack. Watching him transmit was fascinating, he would almost go into a trance with his eyes fixed on the Perspex message board and his finger a blur on the Morse key. As soon as the message was sent we could relax with a cup of tea.

This whole process took two hours or more and involved 4 or 5 people. The potential for human error was enormous. We were very careful to check for these before we passed the message to the radio shack. Errors discovered at the last minute inevitably resulted in the use of huge quantities of alcohol (to clean the board), chinograph and soothing words to the long suffering wireless operator, by now being nagged, in Morse code, for the message by Port Stanley.

There was also a lot of potential for mechanical error. A foot getting tangled with the balloon string was the most common but the equipment often seemed designed to invite stupid mistakes such as sending the sonde away fixed on transmitting humidity only or with the radar target upside down.

My recollection is that morale was always high and we did try hard to get as many flights in as possible. Getting the sonde away in a strong wind and getting the radar to track it to extreme range was a matter of pride as was a complete CLIMAT TEMP statistics message at the end of the month. There were many high points to flying radiosondes, one I remember in particular was sending an ozone sonde to over 30 km in a brilliant blue polar atmosphere so still that the balloon rose straight up, clearly visible to the naked eye to its burst, before landing a few hundred metres from base.

Mike Brettle  

Carrying out a radiosonde sounding at Rothera and Halley in 2006

My first job out of university in 2000 was also as a ‘meteorologist/physicist’ with the British Antarctic Survey. I first spent two winters at Halley Station on the Brunt Ice Shelf and now spend the summer months at Rothera station on the Antarctic Peninsula. At both stations launching radiosondes is a main part of the met observer's job on station.

At Rothera station the work begins after the morning forecaster's brief for the pilots. The whole radiosonde ascent process requires only one person, so the duty met person then takes a ‘baked’ balloon from our oven and takes a walk over to the aircraft hanger on the far side of the station (across the runway). We use 350g balloons and we bake them at 60°C for 24hours before launch as this makes the balloon material more pliable and increases the height they eventually reach. In the hanger we have a small heated container where we prepare the sonde and check it for accurate temperature, pressure and humidity. The sondes are Vaisala RS80s which use GPS wind finding and transmit the signal back to a receiver on the hanger roof. This makes the calculation of wind speed and direction all a matter of computer processing of the GPS positions as the balloon rises.

We fill the balloons with Helium while inside the hanger and when full open the hanger doors, then walk (or run depending on wind conditions!) out and let go of the balloon with the sonde attached to the bottom. The string then unwinds on the top of the sonde until it is a clear distance from the balloon.
We then let the computer system do the processing of the data in the hanger. We can see the data coming in by remotely connecting to the computer from the Met room back in the main building. The program calculates the winds and plots the temperature and humidity. It plots the significant points but needs checking and we will often add more points if necessary. The TEMP message is calculated automatically and we then email it directly to the Met Office in Exeter. The profile is also directly used by the forecaster here at Rothera in the summer.

The whole balloon launching process seems much simpler than it used to be although we still have to contend with the Antarctic weather conditions which can’t be improved by the latest technology! Many hours are still spent chipping out doors from the ice or shovelling snow away to be able to launch the balloons. And lots of fun is had struggling with unwieldy balloons in 40 or 50kt winds!

At Halley the balloon launching process is very similar to Rothera but there is a specially designed balloon launching facility. This is a fancy name for a shipping container raised up on steel legs, but it does the job well. Halley has about 1m of snow accumulation a year so all buildings would be buried if they were not annually raised on their legs above the surface. The container has doors opening at either end to allow shelter from the wind when launching the balloon. However as it can be about 4m or 5 m above the surface, in strong winds of around 50kts, the balloon often goes down before going up again! It also gives the Met person a feeling of slight sea-sickness as the building sways in the wind. Halley has just started using the newer Vaisala RS92 radiosondes. These should give more accurate humidity measurements as they use two sensors, heating one to remove condensation while the other takes measurements, and then swapping between the two during the ascent.

There are a few other difficulties met people at each station have to overcome. At Halley sometimes we had to battle against the blowing snow in high winds following a rope hand-line from wooden post to wooden post, some days not even being able to see beyond the end of your arm. This turned a 2 minute walk to the container into a 30min struggle. Having said that, there was only 1 day in the two years I spent there when we didn’t manage to launch a balloon because of the weather, and that was when no one could even leave the main building because it was too windy! Being hit by constant walls of blowing snow at over 90mph was too much for any of us. At Rothera there are also other issues to contend with. In the winter months seals can sometimes be found near the base. They can be very grumpy if stumbled over by an unsuspecting Met person early in the morning in the darkness!

At both stations, in the cold months, a tried and tested technique is to dip the balloons, up to the neck, in a mix of aviation fuel and oil for about 15 minutes and then hang them to dry. I’m not sure how this trick came about but it really does work. The ‘Avtur’/ oil mix of 8:1 giving the best results. This makes the balloons reach much higher altitudes during the very cold winter months.

This summer at Rothera the balloons have featured heavily in the science projects here and also in the media. An aircraft fitted with meteorological instrumentation flew in a spiral around one balloon ascent and another balloon launch was recorded just last week as part of a visit by a BBC film crew here. There are always willing volunteers on station to come and help us launch a balloon on the nice days in the summer months, but funnily enough virtually none on a bad weather day!

Cathy Moore,
Met person, Halley and Rothera, 2000-present.
Summer Visit 2007
Centre for Ecology & Hydrology, Wallingford, Oxon.

The Group’s Summer Visit was held on Wednesday, 11th July 2007 at the Centre for Ecology & Hydrology (CEH), Wallingford, Oxfordshire and, as is our usual practice, was combined with the Group AGM. This event was also one of the Royal Meteorological Society's own Summer Visits of the year. Our AGM was held in the morning and a separate report of those proceedings appears elsewhere in this Newsletter. After lunch in the Centre canteen the 14 attendees reconvened for a tour of the establishment.

A trip outside was made to view the instrument enclosure (see photos on page 17)- which is shortly to move to a new site nearby- before the party reassembled in the meeting room to hear a presentation by Mark Robinson on some aspects of CEH's work.

Prototype Automatic Weather Stations (AWSs) developed during the 1960s, at what was then the Institute of Hydrology (IH), were illustrated, these being some of the first of the modern AWSs. Various production-model AWSs derived from the prototype were also shown, ending with the model widely used during the 1970s, 80s and 90s and still in use today at CEH and more widely by NERC, two of the latter being seen in the met. enclosure.

Raingauge catch over forests was the second topic discussed and a project was described involving the mounting of funnel-shaped gauges on masts within the tree canopy, allowing them to be raised and lowered to different heights to assess the changes in rain-catch. The results showed that there was little difference in catch at different heights. The net rainfall reaching the ground within the canopy was also measured by means of sheeting at ground level around the bases of trees and so catching drips from foliage, draining to raingauges. This showed that there was a loss of 30% of the precipitation by evaporation from the canopy, compared to the gross fall outside the canopy.

The presentation then moved on to address groundwater levels and borehole work. The neutron probe and borehole tensiometers (both developed at IH in the 1970s) are used by CEH and a description of the latter was given. The tensiometer consists of an extending cantilever mechanism holding a porous ceramic plate. The instrument is lowered down the borehole to the required depth whereupon the mechanism is extended, lodging it securely in the hole and bringing the ceramic plate into contact with the side of the borehole. By means of sensors connected to the plate it is possible to establish the degree of tension (suction) in the soil at that depth. By installing tensiometers at several depths, it is possible to obtain a profile of tensions and from this to establish, at any one point, if there is a downward flux of soil moisture (to recharge the groundwater) or an upward flux (to evaporation at the surface) or no flux in either direction (the zero flux plane). Simpler tensiometers were also on show that can be permanently installed individually at various shallow depths based on porous ceramic pots filled with water, the (suction) pressure being sensed by small electronic sensors.

IH/CEH have been involved in a long-term (45 year, and continuing) catchment study to assess how changing land use is affecting the hydrology of sites, employing a whole range of instruments, including eddy correlation techniques. An upland and lowland site have been compared: the Severn & Wye near Plynlimon in Wales representing the former and the Pang & Lambourn in Berkshire representing the latter. The Plynlimon study compared two distinct, adjacent landscapes- the Severn catchment consisting of 70% forest and the Wye of almost exclusively grassland. Changes to land use by forestry activity in the Severn catchment were then compared to data from the largely unchanging land use of the Wye catchment alongside. In Berkshire similar studies have been undertaken, more particularly concerned with the effects of urban development. Results from the Berkshire study can be seen via the CEH website at www.ceh.ac.uk by following the links to West Berkshire Water Watch.
Also on display was the ‘Hydra’, an eddy-correlation instrument developed at CEH which measures evaporation directly by sensing the rapid changes in relative humidity with an infra-red sensor along with 3D wind changes using an ultrasonic anemometer. A modified model can also measure CO₂ fluxes. These instruments have been used over the Amazon canopy in a long-standing joint project with Brazil. A long-path evaporation instrument using the scintillation of microwave radio waves was also illustrated, although no equipment could be displayed.

On show, but not discussed were examples of the soil moisture capacitance probe, developed at IH to measure soil moisture in the top few cm of soil - where the neutron probe is difficult to use due to its larger sphere of influence. CEH now also use a commercial, modified Time Domain Reflectrometry instrument that measures the delay of a radio pulse travelling down a waveguide inserted in the ground.

CEH also trial commercially available equipment to assess suitability for their work but they have a long tradition of in-house development going back to the 1960s, only a small part of which was covered in the visit, including remote sensing and satellite telemetry of AWS and river level measurements.

After the presentation it was possible to see just a few of the instruments which had been employed in the above projects, which were available for inspection in the room.

On behalf of the Group our thanks go to our hosts at CEH for an informative discussion of current work and for providing a venue for our AGM. Thanks are also due to Jonathan Shanklin who arranged the visit.

Andrew Overton & Ian Strangeways
(Note: A version of this report has been accepted for publication in Weather and reproduction here is by kind permission of John Wiley & Sons Ltd. and the Royal Meteorological Society.)
Summer Visit 2007- CEH Wallingford
The Met Site

A general view of the enclosure-
photo © Andrew Overton

Soil thermometers. The mesh covering is a rabbit
deterrent- photo © Andrew Overton

Members examining the evaporation pan-
photo © Ian Strangeways

One of the AWS in use, traditional windvane and
anemometer- photo © Ian Strangeways
Annual General Meeting

Held from 1115 to 1300 hrs on Wednesday 11th July 2007 at the Centre for Ecology & Hydrology, Wallingford, Oxon

The Minutes of the meeting

1. Attendance and apologies
14 members attended and apologies were received from Jonathan Wright, Paddy Bacon, Chris Stock, Anthony Bowles and John Wilde.

2. Minutes of last AGM
The minutes of the 2006 AGM (5th July 2006) were tabled and the actions were discussed. For the 2007 conference in Edinburgh, the manufacturer’s exhibition will last 2 days, as requested. The actions aimed at encouraging Group membership and about meeting arrangements had also been carried out. The minutes were then accepted by the meeting.

3. Chairman’s report
The Chairman, Jonathan Shanklin, provided a report, as follows:

“For me it has been another busy year, and once again I am conscious that I have only been able to put a limited amount of effort into the affairs of the Group. Taking a minimalist approach I have again cut and pasted from my previous report, so you will have seen some of the following before!

The AGM and summer visit in 2006 was held at BAS, however I contrived to be away at the SCAR meeting in Hobart, Tasmania. Thanks are due to my BAS colleagues for holding the fort, and to the rest of the committee for conducting the business. Following that Mike Bennett organised a meeting in the autumn on “Measuring the Boundary Layer”, which was held at the University of Manchester. The spring meeting was organised by Andrew Overton, with the aim of develop a view on standardising urban measurements. The conclusion seemed to be that they weren’t standardiseable, however it was a very interesting and revealing meeting, hosted by the University of Birmingham.

I would like to express thanks to all our meetings organisers, whose often substantial work goes on in the background. Over the next couple of years we have plans for further regular meetings, with a firm date for the autumn meeting, and the preliminary schedule is discussed on the Agenda. Suggestions for our programme are always welcome and particularly ideas on where to hold the AGM in conjunction with a field visit. We hope that Chilbolton will be possible next year, and as it happens I am visiting the site after this meeting! [I mentioned the possibility to the site manager, and he didn’t foresee any problems, provided numbers were at our usual level.]

The Committee has met twice during the year. Most of the business revolves around planning and organising the general meetings. However, as you will see on the Agenda we are also discussing how best to provide support to the amateur community and to those who make use of meteorological equipment, but who are not meteorologists. If anyone is willing to serve on the committee (and help organise meetings) please get in touch with John.

Mike Brettle has continued to act as our treasurer and thanks are due to him and to his company for the support that they give our group. John Prior from the Met Office has provided much support as secretary, and has ably coped with my absences and stood in my place. Richard McKay from Biral has had to resign from the role of newsletter editor, but we have an enthusiastic replacement in Andrew Overton. I would like to thank all the committee for their contributions to the work of the group, which I think plays a valuable role within the Royal Meteorological Society.
I have attended most of the quarterly meetings of the RMetS Meetings Committee, with Mike Brettle deputising when I was away”.

4. Treasurer’s report
The Treasurer, Mike Brettle, provided the accounts for the period 5 July 2006 to 11 July 2007 and the following report:

“Overall our financial position is healthy and there have been no major developments since the last AGM.

We have transferred another £500 into our interest earning account as agreed during the committee meeting on 12 March this year. This account attracts interest currently around 3%.

The two meetings held since the last AGM have been financially neutral for us, in both cases the main society took responsibility for income and costs.

The subject of financial arrangements for meetings has been discussed in committee. Basically my view has been that these are essentially for the organiser to decide with a proviso that if the meeting is to be subsidised then this should be discussed in committee in advance. In practice this means that meeting organisers have taken one of two approaches: - either they organise everything including collecting registration fees and paying costs or the main society does. The main society has a slight preference for us to organise our own finances and is happy to transfer funds collected via the website to our account if we are also paying the costs of the meeting. This means that we can use the society resources while also retaining full financial responsibility.

Also on the subject of meetings I would like to remind the membership that our healthy financial position does allow the possibility of paying expenses for speakers if needed or for subsidising student attendance at meetings, if deemed appropriate.

Membership is pretty static, it is currently 51 (48 last year, 52 the year before).

I propose that we carry on with membership fees at the current level”

The accounts were accepted by the meeting and the Chairman thanked Mike for his management of the Group’s finances and memberships.

5. Future Meetings
Arrangements have been made for an autumn meeting, as follows –

Title: Climate Measurements for the Future
Date: 7 November 2007
Venue: Meteorology Dept, University of Reading
Organiser: John Prior
Comments: This meeting will examine the impact of new technology on climate records. To cover costs, registration fees of £9 for Group members and Reading University students and £14 for others are proposed. As an incentive for Reading students, a year’s free Group membership subscription was suggested. Although registration forms will be used initially, it is hoped that on-line registration through RMetS will be possible after the conference in October. Programme and registration arrangements to be placed on the RMetS website and circulated with the September issue of Weather.
AGM & Summer Visit 2008 – it is hoped that the venue will be the atmospheric and radio research station at Chilbolton, Hampshire

We also hope to organise a joint meeting with the Worshipful Company of Scientific Instrument Manufacturers, WCSIM (see item 9).

A question was asked about whether RMetS normally meet any credit card charges (or pass them to the Group) when on-line registration is offered. (Action: Mike Brettle to check)

6 & 7. Election of Committee & Officers
Since the last AGM, Richard McKay has stood down as Newsletter Editor, owing to work pressures, and Andrew Overton has taken over. The aim is to produce a Newsletter each Spring and Autumn, following committee meetings, containing:

- Minutes of Group committee meetings and the AGM
- Reports on meetings held
- Details of future meetings and other activities
- News of developments in observing systems
- Short papers and articles by members

The Chairman noted that the Committee were able to accept 1 or 2 more members and would be pleased to know of any other Group members willing to join.

In response to a question about any rules for terms of office for Group committee members, the Chairman stated that there were no tenure rules.

The following members are willing to serve as the Committee and Officers of the Group:
Jonathan Shanklin  BAS (Chairman)
Mike Brettle   Vaisala Ltd (Treasurer & Membership Secretary)
John Prior   Met Office (Meetings Secretary)
Andrew Overton  Fellow RMetS (Newsletter Editor)
Mike Bennett   UMIST
Stephen Burt   Fellow RMetS
Dick Saffel   Campbell Scientific Ltd
Ian Strangeways  Terradata Ltd
Jonathan Wright  Metspec

The meeting approved this Committee for 2007/08.

8. Advice to Amateur Observers
Amateur observing was felt to be an important topic where the Group could provide advice and encouragement in terms of good practice (e.g. instrument exposure, calibration, site maintenance). Through liaison with the RMetS Accreditation Board, the Group had set up a small working group (Jonathan Shanklin, Mike Brettle, Andrew Overton and Paul Hardaker, Exec Director of RMetS) to plan and coordinate activities. Guidelines for AWS managers and for AWS auditors had been produced and Andrew Overton’s useful guide to the siting, exposure and calibration of AWS was available. A news release and/or mailshot to organisations that could request weather data is proposed. An issue could be the availability of CMets and FRMetS to meet the demand for site audits, given the large number of amateurs making observations of some kind.

Malcolm Walker drew attention to the RMetS MetLink initiative, enabling schools to post their data on a website [http://www.metlink.org/](http://www.metlink.org/), and asked whether the Group could assist to improve data quality. It was agreed that the most appropriate action would be to produce ‘Ten top tips’, based upon the AWS
Guide. These to be included in the Autumn Newsletter for comment and feedback. (Action: Jonathan Shanklin).

9. Any other business

- Contact with the WCSIM was noted, with enthusiasm for collaboration on both sides and the possibility of a joint meeting in 2008 e.g. on the trialling of instrumentation – the venue, timing, likely attendance, speakers and subject need to be explored (Action: John Prior)
- Andrew Overton suggested that speakers at Group meetings are sent a copy of the Newsletter in which the account of their meeting appears and this was agreed.
- It was suggested that summaries of Group meetings should be published in Weather and Paul Hardaker agreed to raise this with the ‘Weather’ Editor (Action: Paul Hardaker)
- Paul Hardaker noted that the extension of RMetS charter status to cover technical skills was being explored.

10. Date and Venue of next AGM
It is hoped that this will be at Chilbolton in summer 2008.

The AGM closed at 1300.

John Prior
6 August 2007

Committee Meeting
held from 12.30 to 16.00 hrs on Monday 17th September 2007
at 104 Oxford Road, Reading.

Minutes of the Meeting

Those present:
Mike Brettle, Treasurer
Stephen Burt
John Prior, Secretary
Dick Saffel
Jonathan Shanklin, Chairman
Ian Strangeways
Andrew Overton, Newsletter Editor

Item 1. Apologies
Mike Bennett, Jonathan Wright

Item 2. Agreement of Agenda
The agenda was agreed.

Item 3. Minutes of Meetings
The minutes of the Committee Meeting held on 12th March 2007 were agreed as being correct. Those items arising from the AGM on 11th July 2007 were also considered.

Item 4. Items arising
The 12th March actions were considered and most could be closed or were to be covered by later agenda items. The exceptions were:
Dick Saffel had arranged for an article about the SIG in the Spring 2007 issue of Campbell Scientific’s Measurement News and offered to do this on a regular basis. However, it was felt that similar publicity might also be possible in newsletters of other manufacturers who are SIG members. **Action:** Mike Brettle to confirm which manufacturers are members, for Dick Saffel to investigate.

Through John Prior, Chris Hall (Surface Networks Manager, Met Office) reported that unfortunately little progress had been made on improvements for the submission of ‘amateur’ observations to the Met Office. This was because priority was being given to the introduction of a new Met Monitoring System for synoptic observations. It was agreed that many ‘amateur’ stations provide high quality observations, comparable to the official network, and that the Met Office should encourage them to submit data. Issue to be kept under review, with 6 monthly progress reports  (**Action:** John Prior)

For the AGM actions, it was noted that:
Mike Brettle had established that the RMetS pay any fees for the use of credit cards when registering for meetings and that VAT can be claimed back on any expenditure.
Paul Hardaker was to respond on the publication of meeting summaries in “Weather”, but it was agreed that a succinct summary of the main issues and outcome of a meeting was to be preferred to a format that tried to cover what each speaker had said. This approach to be tried for the 7th November meeting, liaising with Julian Mayes the “Weather” Editor (**Action:** John Prior).

**Item 5. Treasurer’s Report**
Mike Brettle tabled the current state of the SIG’s accounts which showed the net assets to be £3931.92. With regard to encouraging students to attend SIG meetings, it was noted that 1 year membership of the SIG was being offered to those students attending the meeting on 7th November.

**Item 6. Newsletter**
Andy Overton reported that he had plenty of material for the Autumn 07 Newsletter and several items lined up for the Spring 08 one, including the site guidance and accreditation information.

**Item 7. Reports of Meetings**
*19th March 2007 – “Standard Urban Measurements” at University of Birmingham*
A successful meeting at a good venue, with 49 attending. The meeting report would appear in the Autumn Newsletter.

*11th July 2007 - AGM and Summer Visit, CEH Wallingford*
An enjoyable visit to CEH, with the tour of the observing site raising some interesting issues. Again, the meeting report would appear in the Autumn Newsletter.

*3rd-7th September 2007 - RMetS Conference, Edinburgh*
A manufacturer’s exhibition took place, but the exhibitors notes did not refer to the option of a shorter attendance. The scope for broadening the next conference to include more operational meteorology, especially observations, should be pursued. **Action:** Jonathan Shanklin to raise at the meetings committee, together with an offer of a manufacturers representative for the committee organising the next conference.

**Item 8. Future Meetings**
*7th November 2007 – “Climate measurements for the future” at University of Reading*
Promotion of this meeting was well underway (SIG website, “Weather” insert etc) with an RMetS Press Release planned for October. RMetS on-line registration, information on access by public transport and PowerPoint arrangements for the speakers are among the organising activities needing attention (**Actions:** John Prior)
AGM and Summer Visit 2008
It is hoped that the Summer Visit will be to the atmospheric and radio research station at Chilbolton, probably in the first half of July. **Action:** Jonathan Shanklin to agree a date and basic details (e.g. number of places) with Chilbolton so that they can be included in the next “Weather” insert (needed by 31 Jan 2008)

**Observations quality**
Mike Brettle had suggested a meeting on the operational use of observations, that would bring together data users (e.g. civil aviation, insurance companies, chemical installations) and data providers (e.g. Met Office, COL observers). This could be in late Spring 2008 and coincide with the issue of the RMetS guidance on making observations. A London area venue was preferred, possibly with RMetS subsidy of use of the Zoological Society of London meeting rooms, through the Royal Geographical Society or through the WCSIM (see below). Mike Brettle agreed to pursue possible speakers, venues etc (Action: Mike Brettle)

**WCSIM collaboration**
John Prior had been exploring this with a Met Office colleague who is a fellow of the WCSIM. Collaboration would be welcomed if a suitable subject for a meeting can be found. More needs to be known about the background and interests of the WCSIM membership – particularly any meteorology connections. It was agreed that plans for the observations quality meeting would be mentioned but the WCSIM needs to be asked to state the area(s) of meteorological instrumentation they wish to explore. (Action: John Prior)

Other meeting subjects suggested were:  
**Data transmission and presentation** – preferably as a ‘hands on’ workshop, with BAS offered as a venue and autumn 2008 for timing.  
**Measuring extremes / Measuring in extreme environments** - Spring 2009

**Item 9. Amateur Observations**
The RMetS Accreditation Board had asked the SIG to formally approve the “Guide to the siting, exposure and calibration of AWS” by Andrew Overton and the committee unanimously did this, with a vote of thanks to Andrew for producing the Guide. 
Also available are best practice guidelines concerning the installation and operation of sensors, a list of associations representing data users and some draft text (produced by Mike Brettle) for use when the information is distributed. Jonathan Shanklin has also produced a ‘top tips’ guide for setting up a weather station, following a suggestion at the AGM.
The following documentation is to be finalised and submitted to the Accreditation Board, who meet in October, after which the arrangements need to be approved by Council (Action: Jonathan Shanklin).

- Guidelines for AWS Site Auditors  
- Guidelines for AWS Site Managers  
- Distribution list of key organisations who use ‘amateur’ observations  
- Suggested text to promote the guidance and accreditation arrangements

**Item 10. Any other business**
None

**Item 11. Date of Next Meeting**
The date for the next committee meeting is: **Monday 10th March 2008.**

The meeting closed at 1600

John Prior, Secretary.
Group Officers

Chairman
Jonathan Shanklin
British Antarctic Survey
Madingley Road
Cambridge
CB3 0ET
Tel: 01223 221482
Fax: 01223 221279
Email: j.shanklin@bas.ac.uk

Secretary
John Prior
Met Office
Fitzroy Road
Exeter
EX1 3PB
Tel: 01392 886206
Email: john.prior@metoffice.gov.uk

Treasurer & Membership Secretary
Mike Brettle
Vaisala (UK) Ltd.
Unit 9
Swan Lane
Exning
Newmarket
Suffolk
CB8 7FN
Tel: 01638 576200
Fax: 01638 576240
Email: mike.brettle@vaisala.com

Newsletter Editor
Andy Overton
58 Zetland Road
Town Moor
Doncaster
South Yorkshire
DN2 5EJ
Tel: 01302 363462
Email: andrewkoverton@tiscali.co.uk

Committee Members
Dr. Mike Bennett (University of Manchester)
Mr. Stephen Burt (FRMetS)
Mr. Dick Saffell (Campbell Scientific Ltd.)
Dr. Ian Strangeways (Terradata Ltd.)
Mr. Jonathan Wright (Metspec)