1. Introduction

There were 52 participants from outside the United States among the 353 registered at the symposium—making this very much an international conference. The largest delegation was from Canada, and Belgium, Denmark, Finland, France, Germany, Malaysia, Netherlands, and Switzerland also had delegations present. Contributing to the success of the symposium were the theme and location, plus the inclusion of special sessions.

The AMS sponsored the symposium through the Committee on Atmospheric Measurements, which organized the technical program in cooperation with the AMS Committee on Aeronautical Meteorology. NOAA's Wave Propagation Laboratory and NCAR's Atmospheric Technology Division were co-hosts, and the AMS Denver Chapter cooperated as local host. A Conference on Atmospheric Measurements from Aircraft and the Fifth Workshop on Atmospheric Acoustics overlapped the closing sessions. Commercial exhibits by 17 companies featured a concentrated display of meteorological sensors and data-processing equipment of interest to the attendees (see Fig. 1). The Tuesday field trip by three bus loads of registrants included stops at the Boulder Atmospheric Observatory, with its new 300 m high meteorological tower (Fig. 2), and the NCAR Research Aviation Facility. That evening a sellout crowd heard Paul MacCready, Jr., describe the effort that went into winning the prize for manpowered flight using the now famous Gossamer Condor.\(^1\)

2. Theme and discussions

The theme of the symposium was “Remote Sensing Systems—Their Advantages and Limitations, and Requirements for Complementary Direct Observations,” which was used as a framework and not in a restrictive sense. The papers ranged widely over the field of meteorological observations and instrumentation.\(^2\) The topic of the first four sessions was “In Situ Instruments and Calibration.” Discussions and questions centered around the amount of quality control, sampling rates, and representativeness. “Experiments, Data, and Operations” was discussed in Sessions 5 and 6, where questions were directed primarily at the procedures and results of the individual experiments. Sessions 7-10 were directed toward use of indirect methods of observation by radar, lidar, and radiometry. Discussion included specific questions with much attention given to the application of these techniques to routine operational problems.

All of the sessions were well attended and produced lively discussions. Most of the scheduled speakers appeared, and when they did not, interesting substitute papers were available for presentation.

3. Specific topics

Discussion of the familiar problem of making reliable, accurate measurements of the water vapor content of the atmosphere at remote sites without intervention of a human observer recurred in the first three sessions. At an informal meeting on humidity held on Thursday evening, consideration was given to the problem of reliable humidity sensors. Discussion turned to more fundamental questions such as what do we need to measure and what are the requirements for the data. After discussion of various sensors and problems, the group responded positively to the proposal for greater interagency communication and cooperation and the holding of a humidity workshop. A mailing list of those interested in keeping in touch was developed; others would be welcome to join in.

As the symposium progressed, it became apparent that the electronic data-gathering and processing equipment, which was so much the pride of earlier symposiums, has become commonplace. More effort is being exerted in the design of the sensors themselves to produce accurate and reliable measurements. There has also been a resurgence of efforts to make in situ measurements from towers and automatic observing systems.

\(^1\) Functional Experimentation Test Branch, NOAA/Test and Evaluation Laboratory, Sterling, Va. 22170.

\(^2\) Editor's note: A news item on MacCready winning the Kremer Prize appeared in the December BULLETIN (p. 1322).

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Fig. 1. View of the commercial exhibit area.

Fig. 2. Symposium attendees in front of the new 300 m meteorological tower at the Boulder Atmospheric Observatory.
The measurement of meteorological parameters from tall towers erected solely for that purpose might have been considered as a subtheme of the symposium. This was tied in directly with the tour of the Boulder Atmospheric Observatory, which includes a new 300 m meteorological tower. Some relatively new work on the establishment of reliable networks of meteorological towers was presented. The increasing application of such systems to practical problems in diffusion and observation for aircraft operations was of special interest.

The mid-sessions of the symposium presented a very interesting view of accomplishments in remote-sensing research, which has provided methods and equipment that are now ready for conversion to practical engineering devices. From these sessions it was clear that the satellite has become indispensable in meteorological observations and that many new capabilities for meteorological observations from satellites are still being developed. The use of satellite information related to long-term changes in the weather and climate was especially in evidence.

The Conference on Atmospheric Measurements from Aircraft concentrated heavily on cloud physics instrumentation, with special emphasis on the sampling of cloud particles and cloud composition. Special attention was paid to intercomparison between aircraft and the calibration of instrumentation used for aircraft measurements.

Both bistatic and monostatic acoustic-sounding techniques have become commonplace, and the measurements by acoustic techniques are worldwide. The Fifth Workshop on Atmospheric Acoustics presented many discussions of the applications of acoustics-sounding techniques and measurements to operational meteorological purposes. These applications include such things as detection and measurement of air turbulence and wind shear for warning aircraft in airport approach zones and the measurement of boundary layer parameters for use in atmospheric pollution forecasts.

4. Overview

The attendance and participation in this symposium show that those involved in designing and using new meteorological sounding devices do need to get together and discuss problems associated with these measurements. While they present their research results to the meteorological community, users of the new devices provide an input on requirements for accuracy, reliability, and distribution. The desirability of adding special workshops and conferences to such a symposium, thereby maximizing the return from the travel dollar investment, was clearly demonstrated. The members of the Committee on Atmospheric Measurements were encouraged by the results of this symposium to continue the series with approximately the same time spacing. In general, the facilities were excellent, and the visual aids clearly legible.

The split into dual sessions on Thursday and Friday caused mild schizophrenia for some of the attendees who found that sessions containing papers that they wished to hear and discuss were being presented simultaneously in different rooms. This along with the problem of listening to a large number of papers of mild interest until the one of greatest interest to the listener is presented are recurrent problems but are not amenable to a simple solution.

It was suggested that the program printed in advance of the symposium list all of the papers to be delivered without grouping them into sessions. Those preregistering for the symposium could indicate the papers of particular interest to them and the sessions would be arranged so that the individual attendee could make maximum use of the time expended on the symposium. This is an interesting idea worthy of consideration even though the envisioned logistics appear monumental. A suggestion was also made that one session of the symposium provide each of the exhibitors 5 or 10 minutes to give a presentation of his products.