FINDINGS OF THE SOUNDING ROCKET WORKING GROUP

October 4-5, 1993

1. We are alarmed that Code S has been directed to participate in a voucher demonstration program for the launch of suborbital payloads. Congress' original intent, as expressed by Congressman George E. Brown, Jr., Chairman of the House Committee on Science, Space, and Technology, was that a voucher demonstration program would not adversely affect scientific investigations. Given the fact that no new resources are provided and that Code S participation will be significant, we are concerned that the expenditures required for the demonstration will have a significant negative impact on support of space science research in the suborbital program. It is essential that the size and scope of a demonstration program be minimized so as to insure the least impact on the existing science sounding rocket program.

If Code S participation is unavoidable, we urge that planning of this demonstration include the active participation by science discipline chiefs in the disciplines that will be affected.

2. It has become apparent to the NASA Suborbital Program Office that the pacing item in executing a foreign rocket campaign may be the negotiation of diplomatic memoranda of understanding between the United States and the foreign host government rather than the development and deployment of payloads and launch services. We also acknowledge and appreciate that NASA Headquarters and the Wallops project office invest considerable effort in planning each campaign that they undertake and that they schedule the major campaigns so as to achieve all of the science goals without major impact to other approved programs. In the case of the Dip-Equator campaign, the campaign has been postponed from 1993 to 1994 because of the difficulty of arriving at a suitable diplomatic agreement. As a result of this slip, an astrophysics campaign in Australia has been slipped from 1994 to 1995 and principal investigators are concerned that the schedule for this campaign is now driven by the successful execution of the Brazilian campaign.

We suggest that in cases when major off-shore campaigns slip, their rescheduling be reviewed by the NASA Headquarters Sounding Rocket Change Board or its equivalent, with representation from all scientific disciplines using the suborbital rocket program. Firm scheduling of a foreign campaign should take place only after assurances from Headquarters Code IR (International Relations) that diplomatic issues can be successfully surmounted.

3. The exploitation of existing but "new to NASA" technology can be a cost-effective way to achieve new scientific objectives or to develop new experimental techniques. We urge that NASA Headquarters review the language of current suborbital and SR&T NRA's for the purpose of explicitly recognizing the value of applying or adapting "new to NASA" technologies to proposed instrument concept studies, suborbital instrumentation, and other relevant research efforts. A possible modification to existing text could be the addition of another evaluation criterion to those currently listed (see Sec. 6.1, pg A-10 in the Space Physics NRA No. 93-OSS-1). The resources to adapt "new-to-NASA" technology

to SRT concepts and suborbital payloads might be found in other NASA offices, such as the Office of Commercial Programs, Code C, of NASA Headquarters.

4. We urge that the Suborbital Project accept weight reduction as an important consideration in the design of future payload structures and the selection of future subsystems. Although a reduction of a few pounds in a single subsystem provides less benefit than transition to a more powerful booster, a weight-conscious approach to the design of the entire payload system (including experimenters' designs of their instruments) can ultimately provide better performance in support of scientific objectives.

To evaluate and identify likely cost-effective technical advances applicable to the suborbital program, we suggest that the GSFC Engineering Directorate (Code 700) and the Suborbital Projects Division (Code 840) jointly implement a means of acquainting the Suborbital Project with relevant "new to NASA" technologies. We also ask that a strategy for transferring useful technologies into practice in support of suborbital sounding rockets and experimenters' instrumentation be defined.

The working group also recognizes that the introduction of new technology must ultimately be driven by likely payoffs in the ability to accomplish important and hitherto unattainable scientific research. The Sounding Rocket Project Scientist will canvas the working group and the user community to identify technologies expected to be useful for future suborbital research and report his findings to the project and program offices.

5. Currently available state-of-the-art gyroscope and star tracker technology, if developed as a lightweight attitude determination/control system, would be of benefit to a wide range of science disciplines. The improvement would come about not only in faster target acquisition for fine-pointed payloads, but also through the avoidance of target drift in the field of view (FOV) during observations. Some astrophysics payloads might find a 20% improvement in real observing time from these factors. For new payloads with a small FOV, the current level of pointing accuracy (3-5 arc min) using gyros may be unacceptable whereas the 1/2 arc min accuracy of a CCD-based attitude determination/control system would be excellent. The higher accuracy could also eliminate the need for "joystick" control for some experiments.

Even non-fine-pointed payloads that now use photographic film cameras to determine payload attitude by recording star fields would benefit from such a new system, as the immediate post-flight availability of aspect information would save months of aspect analysis.

We therefore request that the Wallops Flight Facility continue its evaluation of such systems and expand its contacts with university and industry teams so as to encompass the entire field of active developments in this area.