1. **Satellite (WRESAT) measurement of upper atmospheric molecular oxygen densities**
   The satellite 1967-118A, WRESAT, determined molecular oxygen profiles above 90 km and in the lower thermosphere by the absorption of solar ultraviolet radiation at satellite sunrise and sunset. Significant differences above 110 km were indicated by the data from the longitudinally separated groups of stations (Australia, South Africa and South America). A shelf of almost constant molecular oxygen density appears at altitudes of 110 to 120 km

2. **A preliminary analysis of WRESAT Lyman alpha data**
   Description of the University of Adelaide's Lyman alpha telescope, which was carried aboard WRESAT, is given. It is followed by an analysis of the results. These show a limb-brightening in northern hemisphere night time observations. Southern hemisphere night time data shows little variation in intensity during the satellite's rotation which has been interpreted as indicating that geocoronal hydrogen has a very large scale height. Surprisingly, no auroral brightening in Lyman alpha has yet been detected. Generally, the results are in fair agreement with those of other workers. A description of models, used to interpret earlier Lyman alpha data is given and it is concluded that only the geocoronal model is adequate.

3. **Design of the rotational kinetic energy dissipation system for the W.R.E. satellite WRESAT I**
   The fluid loop energy dissipator fitted To the Weapons Research Establishment satellite, WRESAT I, to ensure adequately fast attainment of the stable spin condition is described. Two theories giving the rate of dissipation of energy in terms of geometrical properties of the loop and physical properties of the fluid are presented. One is a simple analysis based on consideration of the mean cross-sectional flow within the tube, whereas the second is derived from the equation of laminar pipe flow and takes account of the variation in fluid velocity in the plane of the cross-section. Theoretical predictions of dissipator performance are compared with experimental measurements made with the dissipater in free oscillation as a compound pendulum, and with telemetry measurements from WRESAT I during its first orbit

4. **The design and development of the WRESAT electrical system**
   This report discusses the electrical system, power supplies and priming used in the w.R.E. Satellite. A summary of the environmental tests carried out during the satellite preparation is included. measurements of the ascent and orbital temperatures together with the housekeeping voltages are given

5. **WRESAT - the solar aspect problem**
   On board the Australian satellite WRESAT were solar radiation experiments which were dependent on knowing the position of the sun relative to the ion chambers. With the early breakdown of the optical aspect sensors, it was necessary to determine a method by which the data from the magnetometer could be used to provide solar aspect information. A method is described in this note.

6. **Preliminary proposal for WRESAT telemetry**
   This memorandum outlines the background and choice of a telemetry system for WRESAT; it is intended as a basis for projected discussions between W.R.E., NASA and others

7. **Airborne telemetry aerials for WRESAT**
   following outlines the design and performance of turnstile aerials and associated feed system for the satellite. Radiation patterns are presented for a prototype aerial system mounted in a dummy satellite cone

8. **Aerial pattern measurments of WRESAT telemetry**
   This addendum details the measurements made to obtain the contour plots of the complete spherical coverage of the telemetry aerial system installed in the WRESAT flight cone

9. **Flame attenuation of WRESAT I telemetry signals**
   By a comparison between calculated and measured telemetry signal strengths, this document shows the magnitude of attenuation of these signals attributable to flame attenuation during certain stages of powered flight of the WRESAT I launch vehicle

10. **The WRESAT telemetry system**
    Australia's first satellite was launched from Woomera on 29 November 1967. This paper describes the parameters selected, the telemetry carried in the satellite, and the telemetry ground receiving station at Woomera. Some details are included of the tests carried out at Orroral Valley to ensure compatibility with the world-wide STADAN stations. The results achieved and the effectiveness of the telemetry system are discussed

11. **An assessment of the information recovered from the satellite WRESAT**
    This paper briefly outlines the transmission, recording and processing of the information telemetred from the satellite WRESAT. An assessment is then made of the quantity and quality of the information recovered from the records

12. **The WRESAT timing unit**
    This paper gives an account of the design, construction and operational performance of the Timing Unit used in the WRESAT satellite which was successfully launched in November, 1967

13. **A data-handling system for information telemetered from the satellite WRESAT**
    This paper outlines the system developed by the authors to handle the PAM/FM telemetry signal recorded from the WRESAT PAM/FM/PM telemetry transmission. A novel feature of this data handling system is the emphasis on the use of a digital computer. This feature is discussed in detail, and reference is made to the limitations of the method.