LEN ADAMS.

BORN, 24th February 1938
DIED, 14th June 2005, Age 67.

Len Adams, former Head of the Radiation Effects and Component Analysis Techniques Section at the European Space Agency's European Space Research and Technology Centre (ESTEC) and later a consultant and honorary professor at Brunel University, spent most of his career doing work he really enjoyed. He was born in 1938 in India, where his father was on a Royal Air Force posting. His early career was in the British Merchant Navy as the youngest, fully qualified, radio officer in the fleet. He served firstly on passenger liners and then moved onto tankers and tank landing ships. After five years he left the sea, and worked at GEC Stanmore Research Laboratories as a missiles trials engineer. He subsequently worked at Imperial College's field station in Ascot, as an experimental officer doing research into thunderstorms. In 1965 he moved on to being an engineer at the European Space Research Organisation (ESRO) in Delft, The Netherlands. Here he started in the Technical Directorate being involved with building and testing of rocket payloads and later satellite systems. The work of this growing international organisation, originally scientific, evolved into spacecraft engineering and launch for the whole of Europe. In the late sixties, Len moved with the organisation to the large laboratory, ESTEC at Noordwijk and lived in Oegstgeest, near Leiden.

Len developed several of the arts which was desperately needed for making good spacecraft and as a Component Laboratory Manager, Len guided a team of experts which gave technical support to ESRO project groups in all matters concerning electronic components. Component reliability evaluations and failure analysis were carried out in this group's own laboratory, which at that time was rated as one of the most advanced Component Laboratories in Europe. The application of advanced techniques to failure analysis also soon opened the door to the radiation area. The component laboratory's 150 KeV X-Ray system and Scanning Electron Microscopes were used as early irradiation sources. As a resourceful engineer with physics experience Len very early tackled "Radiation Hardness Assurance" addressing all aspects of the effects of space radiation on components. Len supplied that resourcefulness, which extended to imaginative ways of using laboratory radiation to simulate the "great radiation laboratory" of outer space. The successful development of the laboratory CASE (Californium-252 Assessment of Single-event Effects) system and later the installation of the Co-60 gamma cell, are good examples of rapid progress. With the successful installation of external test sites such as the Proton Irradiation Facility at PSI, Switzerland and the Heavy-ion Irradiation Facility at UCL, Belgium, Len, as Head of the Radiation Effects and Component Analysis Techniques Section of the European Space Agency, was behind numerous internal and external activities, studies, qualification programs and later flight experiments. Len's passion for flying radiation experiments started back in 1977 with the GEOS flight where simple MOS transistors measured the space environment in geostationary orbit, to current Standard Radiation Environment Monitors (REM) flown on MIR and STRV-1B, and the SREM on PROBA and Rosetta. Because of the complex mixture of skills needed, Len's

group soon grew to a considerable size and had an international reputation as an original contributor to space technology and a source of funds for research. Len's role also evolved into being the point to which NASA and other national space agencies could come for information and collaboration in this specialist field. Thus, a part of the life of Len and his staff was extensive travel missions to the USA, Japan, Russia, India and South American countries, co-ordinating projects, giving scientific papers or reporting back to management on the policies and plans of other nations. His professional activities in promoting the science of radiation effects included work with the RADECS Association in Europe and IEEE/NSREC in the USA. Len often served as a reviewer or session chair at theses conferences and published many papers at the IEE/Transactions on Nuclear Science, in RADECS proceedings and other scientific journals. Important and lasting products of this intensive (and well-funded) work were the numerous ESA standards documents involving "Radiation Hardness Assurance" and the associated information banks. One of the "Contractor Reports" in this activity later evolved into the "Radiation Effects Handbook", by Holmes-Siedle and Adams, published by Oxford University Press, in two editions, 1992 and 2002, which attempted to encapsulate all this knowledge into straightforward guide for engineers.

An illustration of the speed at which Len got things done was his active support for a new invention called a RADFET, a special semiconductor transistor that measured accumulated radiation damage in space for a suitably small expense of weight and power (unmanned satellites cannot spare much of either). Starting development in 1975, the device was flying in space by 1977. This must be a record for speed, since ideas usually take much longer get into space. This illustrates a special influence which Len had on the projects which he handled. One knew that Len would always be positive and speedy. Any discussion or disagreements would be resolved in a friendly way and one would come out of the discussion feeling better and probably laughing as well. It was in this aspect that his bubbling personality and enjoyment of his work came out: in large organisations, special persuasion may be needed to achieve results. Around ESTEC, Len's laugh was often audible while a masterpiece of persuasion took place in a corridor. The process would often be rounded off later with a friendly meal or a "pie and a pint".

After retirement in 1998, Len moved to England. He did consulting work for Spur Electron, a small component reliability firm, advised CERN in Geneva on the parts requirements for the new LHC accelerator and, as an Honorary Professor, directed the research of at least one student at Brunel University. At his home at Aldeburgh on the East Coast, he was able to follow his enthusiasms for model making, especially boats, restoring old cars, gardening and experimental cuisine. Through his son-in-law he developed an interest in steam railways, and enjoyed a number of trips out on the footplate of various engines on the North Yorkshire Moors Railway. He also experienced more unusual forms of travel, including the steam lorry shown in the photograph * and a flight in a Tiger Moth aircraft.

He met his wife Yvette at GEC Stanmore, and they were married in 1962. He is survived by Yvette, their two daughters, Nikki and Jayne and their grandchildren Calvin and Inès.

Andrew Holmes-Siedle, Oxford, UK and Reno Harboe-Sorensen, Noordwijk, The Netherlands.