



The Ron Howard Collection

by

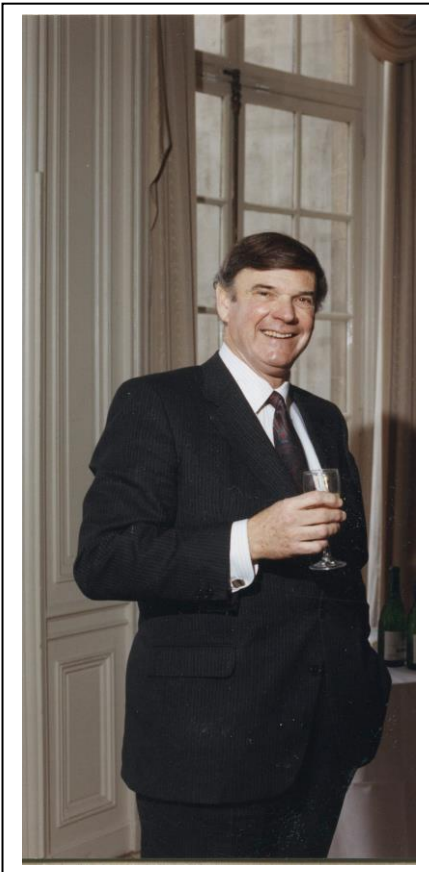
C.T.Bartlett

23rd September 2019

Ron Howard

Engineer and Director

Ronald Walter HOWARD CBE BE FREng Hon FRAeS, (1929-2017)



Ron Howard was born in Adelaide, Australia in 1929. He graduated with a Bachelor of Engineering (Electrical) from Adelaide University in 1950 and a Fellowship Diploma (Diploma of Technical Instrumentation) from the South Australian School of Mines in 1951. He entered into 'industry' by way of the Australian Government service and was appointed to the Long Range Weapons establishment at Salisbury and Woomera where among other projects he worked on the first UK Guided Missile, RTVI. In 1951-2 he was seconded to Britain to work on Guided Missiles in the Admiralty Gunnery Establishment, Teddington and at RAE Aberporth.

In June 1951 Ron Howard arrived at Heathrow Airport having travelled from Australia via San Francisco. Apparently, the journey to the UK required several attempts to get across the Atlantic in a Stratocruiser. Heathrow was still under construction and the 'arrivals hall' was still a Nissen Hut. He spent his first night in London at the Park Lane Hotel since this was the only one he recognized having 'acquired' it many times while playing Monopoly! Back in Australia, he was involved in the firings of the UK Guided Missiles and also set up the firing of Guided Rockets at Woomera.

Ron Howard then left the Civil Service and came to Europe on a Youth Hosteling Holiday, whilst seeking employment. He told the story of how he came to Elliott Bros. by recalling how one day in Genoa (Italy) he was eating chips which were wrapped in a copy of an English newspaper, when, through the grease he saw an advertisement for Engineers by Elliotts! This led to his ultimate introduction to the Company, beginning at Borehamwood in 1954 as a Project Leader on Auto-Stabilisers, and Auto-Pilots for Lightning Aircraft.

In the late 1950s he pioneered the dual-monitored concept of safe automatic landing used on the VC10 and subsequently on the BAC one-eleven and Concorde. Coupled with this, he wrote in 1960 the first definitive paper to the Air Registration Board setting out guidelines for the statistical safety assessment required for certification of autolandings systems under the 1 in 107 fatal accident criteria. The substance of this paper was subsequently expanded by various authorities to become the basis of all such certification to the present day, including the new "fly-by-wire" systems.

In 1955 he met an old school friend, Enid Gretta Harrington, and they were married at Riddlesworth Hall in Norfolk. They had two daughters Julie Rosanna (Morgan) daughters Jane Clare (Lynch).

Ron Howard progressed on moving to Elliotts at Rochester and from 1960 to he 1965 held a progression of appointments in Elliott Flight Automation Limited (EFA Ltd) from Assistant Chief Engineer and then became Divisional Manager of Transport Aircraft Controls, heading a team which at one time had D.I. Jackson, A.J. Colwell and Brian Woolf as members, all of whom rose to successful appointments within the Company.

He was appointed Assistant General Manager in 1962 and Joint General Manager in 1965, responsible for Control Systems, and had seven Divisions reporting to him. Ron Howard was first appointed to the Company Board (Elliott Flight Automation) in 1965 and was made Managing Director of the Dynamics Group of the successor Company GEC Avionics Limited in 1986-87. He was appointed Managing Director GEC Avionics and a Director of GEC-Marconi in 1987. He was appointed Chairman of GEC Avionics from 1990.

During 60s he also developed the safety-critical system design principles for fly-by-wire, one of his special interests, which came to first fruition for a combat aircraft in the Panavia Tornado. He also devised the "dissimilar redundant" safety-critical system design concepts used on the Airbus aircraft (A310, A300-600 and A320) and had management responsibility for the development extension of this into the fly-by-wire system now adopted by Boeing for the B777.

Ron Howard pioneered many of the principles which are the foundation of the Company's business. These include automatic landing systems for VC-10 and Concorde. He developed the principles of the first safety critical fly-by-wire system for the Tornado and EFA and for passenger airliners which eventually led to electronic slat and flap controls for Airbus and the fly-by-wire system on the Boeing 777.

Ron Howard has played a leading role in his Company's export activities to the United States. The latter commenced with his acquisition in 1965 of the first contracts ever placed in the UK for avionics equipment for a new US aircraft, the Lockheed C5A. At this time, he founded the United States associate Company originally called EAIC to give support to the UK export activity.

In the early 1980s he received the group of contract awards to GEC Avionics for the USAF and Navy Standard Central Air Data programme (SCADC). This was a life-cycle-cost improvement programme, one of the largest of its class ever placed in the Western world and now covering over 4000 aircraft of 35 types. Later programmes within his responsibility included the Army Phoenix Reconnaissance Drone system and the Digital active controls system for the Experimental Aircraft Programme (EAP) from which followed the system for the European Fighter Aircraft.

In 1987 he was responsible for the acquisition by GEC of two United States avionics companies, Lear Astronics Inc and Developmental Sciences Inc, which operate as GEC Avionics associate companies.

Under his management GEC Avionics from its Headquarters at Rochester, Kent, was

continuously successful in avionics exports, achieving its 14th Queen's Award in 1988, second in this respect only to Rolls Royce and the consolidated BAe. This export business was more than half of the UK total in Avionics, peaking at over £200 million per annum in 1988 in a total Company turnover of over £400 million. (8000 people).

He was a member of the Aeronautical Research Council, is a past chairman of the Aviation Division of the EEA, on which he served for 20 years, and a past chairman of the Technical Board of the SBAC, on which he served for 17 years. He was joint Chairman with Deputy Controller Research MOD(PE) of the Joint Research Council in 1978-80. He has served on the CAA R & D Board and was a member of the CAA Air Requirements Board. He was also a member of the DTI Aviation Committee and the Board of Management of the Royal Aerospace Establishment, the Department of Energy Offshore Energy Technology Board and a member of Court of Cranfield.

He was elected President of the SBAC (Society of British Aerospace Companies) for the year 1989/90 and was deputy President for Farnborough '90.

Ron Howard was awarded the Bronze Medal of the Royal Aeronautical Society in 1973 and the British Gold Medal for Aeronautics in 1986 "For his exceptional contribution to the development and success at home and overseas of British avionics systems, and in recognition of the manner in which he has exercised engineering and marketing leadership of the highest standard." ...

He is the author of many technical papers and twice winner of the Aeronautical Society's Simms Prize. ("Automatic Flight Controls in Fixed Wing Aircraft" (1973), the basis for his 1975 Sir George Cayley Memorial Lecture, and "Progress in the use of automatic flight controls in safety critical applications", the basis for his European Pioneers Lecture in Braunschweig (presented in German) in 1980). He was also joint author of several Technical works, including '*Reliability in Automatic Landing*' and '*Concepts of Redundancy for 'all weather' landing*'.

He was made a CBE for services to the avionics industry in the 1991 New Year's Honours.

He has 500 hours as Pilot in light aircraft and gliders, and other interests include the restoration of historic domestic buildings and antique furniture. He served for 4 years on the Boxley Parish Council, taking a special interest in Conservation and Environmental matters.

After his retirement in 1992 he went back to Adelaide and worked at the University of South Australia.

Ron Howard died at the age of 88 on Friday, 23rd June 2017, in Adelaide, South Australia.

Ron W. Howard was a son of the Antipodes, having originated in, South Australia. (He allegedly had a map of England upside down on his office wall)

Ron Howard Lectures, Papers and Speeches

Lectures and Papers

The Rochester Avionic Archives has many speeches and lectures given by Ron Howard together with some of the background material used to create these. Eventually it is planned to have OCR copies of these papers on-line.

- ☐ **(RAA Cat. No. D0654)** *'Design Specification for an Automatic Flight Control System for the Vickers-Armstrong (Aircraft) Ltd 1100 series VC10 Aircraft'* by R. W. Howard, August 1958
- ☐ **(RAA Cat. No. D0655)** *'A consideration of equipment reliability requirements for automatic landing systems,'* by RW Howard of Elliott Bros (London) Ltd Borehamwood. Issue 2 June 1960. Elliott response EP 2 to the Air Registration Board. Document ARB-LTA-19.
- ☐ **(RAA Cat. No. D0656)** *'Automatic Landing and the Auto-Control System for the Vickers-Armstrong (aircraft) Ltd VC10'*, by RW Howard of Transport Aircraft Control Division, Elliott Bros (London) Ltd Borehamwood. Second meeting of the A.T.A. All-Weather Operations Committee Atlantic City September 1960.
- ☐ **(RAA Cat. No. D0657)** *'Reliability in Automatic Landing'* by R W Howard, R K Barltrop, G S Bishop and F Bevan. Transport Aircraft Control Division Elliott Brothers (London) 7th October 1960 (Reprinted from *FLIGHT* Magazine)
- ☐ **(RAA Cat. No. D0643)** *'The development of reliability in airborne electronic equipment with some reference to the VC10 automatic landing system'*, by RW Howard and G S Bishop. RAeS/IEE Joint Conference on The Importance of Electricity in The Control of Aircraft. February 1962.
- ☐ **(RAA Cat. No. D0658)** *'All weather landing: the last 100 feet'*, by R W Howard of Elliott Bros (London) Ltd Presented at the IFALPA 'All weather landing' Symposium Amsterdam October 1962.
- ☐ **(RAA Cat. No. D0659)** *'Flight control systems for VTOL transport aircraft'*, by RW Howard of EA Flight Automation Ltd. Reprinted from *Interavia World Review of Aviation and Astronautics*, Issue 2 1963.
- ☐ **(RAA Cat. No. D0660)** *'Autocontrol of jet and fan lift VTOL'*, by RW Howard from *FLIGHT International* February 1963. (3 copies)

- ☐ **(RAA Cat. No. D0661)** *'Concepts of Redundancy for All-Weather Landing'* by R.W.Howard of Elliott Bros (London) Ltd. Presented at the International Air Transport Association 15th Technical Conference in Lucerne April 1963.

- ☐ **(RAA Cat. No. D0662)** *'The Practical Design and Testing of the Automatic Monitoring System in the VC10'*, by R.W.Howard Assistant General Manager of Elliott Flight Automation. Presented at the F.A.A. Second International Aviation R & D Symposium: All-Weather Landing Systems: Atlantic City, New Jersey. September 1963.

- ☐ **(RAA Cat. No. D0663)** *'The use of redundancy in system design'*. Session A, symposium summary from The Society of Instrument Technology held at Northampton College of Advanced Technology 14th February 1964.

- ☐ **(RAA Cat. No. D0664)** *'The use of redundancy in aircraft flying control systems'*, by RW Howard of Elliott Flight Automation. 14th Feb 1964 presented at the Society of Instrument Technology Symposium. 2 copies. (This may be the same as D0663)

- ☐ *'Reliability and Serviceability Problems in the use of Digital Computers for the control of Aircraft Engines'* by R.W.Howard. 25th March 1965. (Originally this was marked Company Confidential)

- ☐ **(RAA Cat. No. D0651)** *'Failure-Surviving Automatic Flight Control System'* by R.W.Howard MAC Division Elliott Bros (London) Ltd c. 1965. Document 74TD37

- ☐ **(RAA Cat. No. D0665)** *'Automatic Controls for VSTOL Aircraft'*, by R W Howard Elliott Flight Automation Ltd. Presented to the VTOL/STOL Symposium July 7th 1964 at the Empire Test Pilot's School RAE Farnborough, Hants.

- ☐ **(RAA Cat. No. D0647)** *'V/STOL in civil aviation,'* BALPA Flight System/Flight Deck Displays and Automatic Flight Control Technical Symposium. Presented by RW Howard of Elliott Flight Automation Ltd.1970. (Also, the whole proceedings of this symposium including discussion and questions)

- ☐ **(RAA Cat. No. D0652)** *'Digital data processing in automatic flight control systems'*, by RW Howard of Elliott Flight Automation 1970 AGARD Paper.

- ☐ **(RAA Cat. No. D0650)** *'Avionics Reliability Design and Practice'*, by RW Howard of Marconi-Elliott Avionic Systems Ltd, 11th February 1972. Civil Aircraft Research Committee CARC. (3 copies)

- ☐ **(RAA Cat. No. D0649)** *'The Influence of Avionic Equipment on Aircraft Timekeeping'*, By RW Howard presented at the RAeS Spring Convention May 1972.

- ☐ **(RAA Cat. No. D0666)** *'Flies and fly by wire'*, by RW Howard July 1973. Draft copy.

- ☐ **(RAA Cat. No. D0667)** *'Automatic flight controls in fixed wing aircraft. The first 100 years.'*
This paper was presented to a joint meeting of the Royal Aeronautical Society and Institute of Electrical Engineering at Hamilton Place on 18th October 1972. Published in the Aeronautical Journal of the Royal Aeronautical Society, November 1973

- ☐ **(RAA Cat. No. D0668)** *'Cost effectiveness of systems'*, by D.P. Howlett Hawker-Siddeley Aviation, Hatfield and R.W. Howard Marconi-Elliott Avionic Systems. Presented at the RAeS Symposium 'Designing from the Inside Out', 6th February 1975.

- ☐ **(RAA Cat. No. D0669)** *'Those magnificent men and their flight controls'*, by R.W. Howard. A lecture to the RAeS Gloucester and Cheltenham Branch March 1975.

- ☐ **(RAA Cat. No. D0652)** *'Aiding the coachman'*, the Cayley Memorial Lecture by R.W. Howard 1975. A draft copy.

- ☐ **(RAA Cat. No. D0648)** *'Meeting the requirements for equipment from European sources'*. By R.W. Howard of Marconi-Elliott Avionic Systems Ltd. Presented at the RAeS Air Transport Group Symposium on 'Co-operation in European Air Transport'. 25th February 1976.

- ☐ *'Advanced Control Technology'* by R.W.Howard of Marconi-Elliott Avionic Systems Ltd. Presented at the Royal Aeronautical Society Spring Convention on 'Seeds for success in Civil Aircraft design in the next two decades'. 19th-20th May 1976.

- ☐ *'YC-14/C-14'* Presentation by R.W.Howard at The Savoy 30th May 1977

- ☐ *'Progress in the use of Automatic Flight Controls in Safety Critical Applications'* by R.W.Howard 29th May 1980.

- ☐ **(RAA Cat. No. D0644)** *'Progress in the use of automatic flight controls in safety critical applications,'* by R.W. Howard. This paper was presented at the fifth European Pioneers' Day held in Brunswick, Germany on 29th May 1980. Paper No. 831. Published in the Aeronautical Journal of the Royal Aeronautical Society, October 1980. (Several copies in German and English).

- ☐ **(RAA Cat. No. D0670)** *'Safety assessment of aircraft systems and future problems,'* by R.W. Howard. A one-week course presented at Cranfield College of Aeronautics December 1982.

- ☐ **(RAA Cat. No. D0671)** *'Safety Assessment. Impact of New Technologies'* 1983 No author but probably R.W.Howard (See above)

- ☐ **(RAA Cat. No. D0674)** *'The needs for management skills,'* by R.W. Howard. RAeS, 22nd May 1984.

- ☐ **(RAA Cat. No. D0675)** *'European collaboration in avionics'* by R.W. Howard, Issue 1b 18th March 1985.

- ☐ **(RAA Cat. No. D0676)** *'Procurement and Project Management,'* by R.W. Howard. Lecture to the Royal Military College of Science, 25 October 1986.

- ☐ Paper presented to the Alvey Conference VLSI and Software, July 1986.

- ☐ **(RAA Cat. No. D0677)** *'Contrasts between Military Procurement and Best Practice in Recent Commercial Contracting,'* by RW Howard, DTI Aviation Committee April 1991.

- ☐ *'Options for change presentation. Aerospace, Avionics and equipment,'* by RW Howard May 1991. Draft copy.

- ☐ **(RAA Cat. No. D0678)** *'Reductions in UK Defence Expenditure. A View on the implications for the Civil Aerospace Sector,'* By RW Howard, 5 June 1991. Draft Copy.

- ☐ *'SBAC/DTI Delegation to the Soviet Union,'* a report from RW Howard 5th August 1991.

- ☐ *'Human Element in Automated Avionics,'* by RW Howard chairman of GEC Avionics Ltd. Published in the Avionics Journal October 1991.

- ☐ 'The Marine Technology Directorate Ltd, 5th Annual General Meeting. A presentation by RW Howard on Technology Transfer. 26th November 1991.

- ☐ **(RAA Cat. No. D0646)** '*Breaking through the 10⁶ barrier.*' (RAA Cat. No. D0646)
This paper was presented to the International Federation of Airworthiness Conference, 20-23 October 1991, Auckland, New Zealand. Paper No 1898. Published in the Aeronautical Journal of the Royal Aeronautical Society, August/September 1992. (At least 4 copies)

- ☐ '*UK defence procurement and thoughts,*' by R.W. Howard 29 January 1992.

- ☐ **(RAA Cat. No. D0645)** '*Planning for Super-Safety. The Fail-Safe Dimension.*' Kings Norton Lecture: 27th June 2000, Cranfield Branch of the Aeronautical Society. Published in The Royal Aeronautical Society. June 2000

- ☐ **(RAA Cat. No. D0673)** '*History of Concorde from personal experience*', by RW Howard. A lecture to the Aviation Museum, West Torrens, Adelaide, South Australia. May 2004 (3 draft copies).

- ☐ **(RAA Cat. No. D0672)** '*The Soviet Union and I*', by RW Howard. Presented at the RAeS Adelaide, S.Australia Branch Tuesday 26th September 2006. (Personal recollections of the Cold War period in Aerospace from both sides of the Iron Curtain including visits to the USSR up to the time of its collapse.)

- ☐ **(RAA Cat. No. D0679)** '*Aircraft Stability and Control-The Wright Brothers to the Boeing 777*'. Presented to the Australian RAeS, February 2006

- ☐ '*A Hundred Years of Automatic Flight Control*', by RW Howard. Published in the RAeS Journal (3 copies). Also, some notes on Automatic control of FBW Aircraft over 100 years in a scrapbook of various papers. No date

- ☐ '*An approach to human centred design*', by RW Howard. Presented to the Massachusetts Institute of Technology. No date

- ☐ '*Understanding the Global Accident Rate Past and Future*', by RW Howard draft. No date.

- ☐ *'The importance of the survivability concept in air transport system design'*, The First 50 Years by RW Howard (overhead slides and notes). No date.

Speeches

These are typically After-Dinner speeches.

- ☐ *'Background to the Award'* A speech to the Lord Lieutenant, Lord Bishop, Your Worships etc on the occasion of the Queens Award for the Standard Central Air Data Computer SCADC at Rochester on 7th October 1988
- ☐ ITEC Prizegiving at GEC Avionics on 28th April 1989.
- ☐ SBAC President's Policy Committee Dinner (Also called the PPAC 'Nicolas Ridley' Dinner) by R.W. Howard President at the House of Commons on 30th November 1989.
- ☐ DESO Symposium Dinner Hampton Court, 7th December 1989. Response by R. W. Howard.
- ☐ Speech at Bromley College 5th April 1990. Annual College Prize Giving.
- ☐ Presentation of a Painting to RAF Halton by R.W. Howard Chairman of GEC Avionics 8th June 1990.
- ☐ Opening of GEC Gliding Championships. 28th July 1990 at Lasham.
- ☐ Real-Time Data Communications for Military Applications at the Heathrow Penta Hotel 28-29 November 1990.
- ☐ 'Reductions in UK Defence expenditure: SBAC view on the implications for the civil aerospace sector.' Presented at the Associate Members Committee St James, London 19th March 1991.
- ☐ 'The European Equipment Industry' by R.W. Howard Chairman of GEC Avionics Ltd given in Toulouse on 28th June 1991.
- ☐ '1991 Sopwith Lecture', 2nd July 1991 Vote of thanks by R.W. Howard.
- ☐ The Marine Technology Directorate Ltd. Fifth Annual General Meeting 26th November 1991. Presentation by R.W. Howard Chairman of GEC Avionics.

Folder of Miscellaneous Papers by R.W.Howard.

- ☐ '*Automatic Controls for V/STOL Aircraft*' by R W Howard of Elliott Flight Automation Ltd, VTOL/STOL Symposium 7th July 1964 at the Empire Test Pilots School RAE Farnborough. (2 copies Drafts)
- ☐ '*Reliability & Serviceability problems in the use of Digital Computers for the control of aircraft engines.*' by R W Howard. 25th March 1965
- ☐ '*Reliability in Analogue Systems*' by R W Howard a synopsis.
- ☐ '*The achievement of reliability in VTOL automatic control systems.*' By R W Howard Assistant General Manager, 19 July 1963 presented to DFL at Braunschweig. (2 copies)
- ☐ '*Safety in the air*' a 14-minute programme on the British contribution to avionics to make flying safer by RW Howard. Recorded on Thursday, 14 November 1968, 2:45 to 4:0pm at Studio 9 BBC Bush House.
- ☐ '*Safety and control in the air*' by RW Howard. Draft
- ☐ VC 10, film script for the BBC August 1968.
- ☐ '*Supersonic adventure*', BBC script about Concorde. This consisted of three programmes looking at Concorde and beyond. The programmes were on BBC-1 and went out in 1967 at 7:05p.m. on Wednesday 30th August, Wednesday 6th September and Wednesday 13th September. Ron Howard of \Elliott Flight Automation had a 15minute presentation.
- ☐ '*The systems approach to avionics*', RJ Lees, HGR Robinson and Dr TS Moss from RAE Farnborough. IEE/RAE S. Savoy Pl December 1969.
- ☐ RWH publications for film scripts part two.