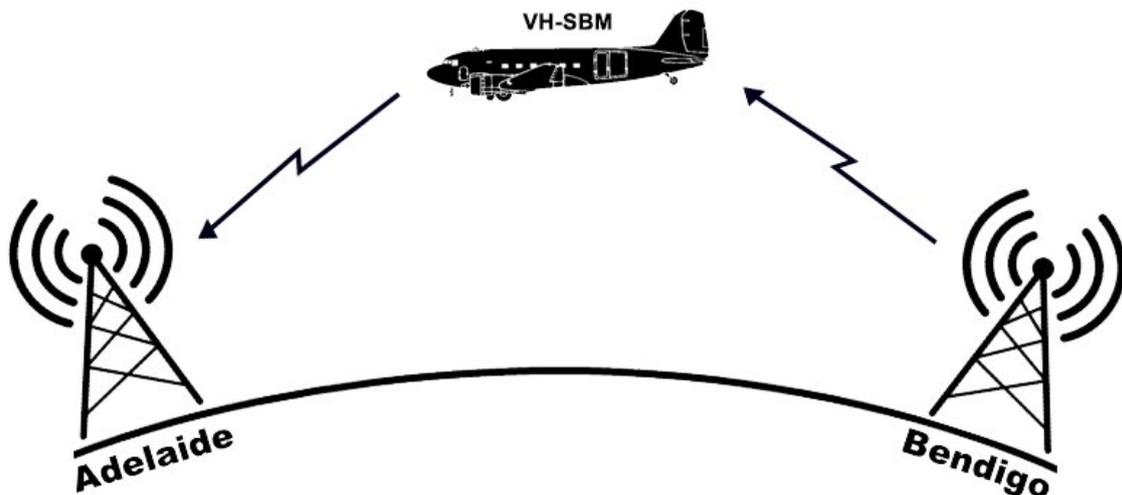

Canberra Royal Visit 20 February 1963 Broadcast Live on TV by TAA

By Ron Austin in collaboration with Richard Yates
and with thanks to the Historical Radio Society of Australia



In May 2020, retired TAA and Australian Airlines captain Ron Austin sent me his account of an event in February 1963 when he flew a modified DC-3 that acted as an aerial TV relay station. The object of this exercise was to provide live television coverage of a Royal Visit to Canberra on 20 February 1963.

I was confident that this would be a good story for inclusion on the Melbourne Branch's Member Stories web page so I did some research to see if there was any other information available about this event which might be useful. I was delighted to find an article written by a member of the Historical Radio Society of Australia (HRSA) that had been published in that Society's magazine 'Radio Waves' in July

1998. The writer, the late Neil Wain, described the technical background to the aerial TV relay and it was not difficult to conclude that an amalgamation of Neil Wain's article and Ron Austin's memories of the event would make for an interesting story.

I tracked down and made contact with the HRSA to ask if it would be possible to draw on The 'Radio Waves' article content and photographs to add to Ron Austin's account and I am grateful to the HRSA President, Kevin Poulter, for kindly allowing the RAeS to do so. I have worked with Ron in finalising the draft combined story; we hope you will enjoy the end result which follows.

Richard Yates FRAeS

Introduction

In February/March 1963, the Queen and the Duke of Edinburgh visited Australia to participate in the fiftieth anniversary celebration of the naming of Canberra. Because of the significance of the occasion, the Australian Broadcasting Commission (as the ABC was then known) proposed a project aimed at broadcasting the Queen's visit live to Adelaide on the night of 20 February 1963.

Adelaide was not connected to the East Coast terrestrial TV relay network at that time, the links for which only extended as far to the west as Bendigo so it was suggested that the possibility of setting up some sort of aerial relay should be explored. To determine whether such a broadcast might be feasible, the Postmaster General's (PMG) Research Laboratories agreed to undertake some experiments which, if successful, would culminate in the broadcast happening on 20 February.



VH-SBM at Nhill (Vic) airport during the evaluation test phase

It was thought that a TV relay to Adelaide should be possible using a suitably equipped and strategically-located aircraft as an airborne repeater. The idea was for the aircraft to carry equipment capable of receiving TV signals broadcast from the National TV station at Bendigo (Ch.1) and relaying the program on a vacant channel (Ch.5A) to the ABC TV transmitter site on Mt Lofty near Adelaide for re-transmission on ABS2. Twenty years earlier, a similar scheme had been considered by the RAF during World War 2 to extend the range of the airborne navigation aid 'Oboe' deeper into enemy territory but the scheme was never put into practice. The ABC/PMG project required the airborne TV relay equipment to be in a position approximately midway between the two ground stations at Bendigo and Mt Lofty and flown at an altitude sufficient to give a line-of-sight path to each site. The ABC, in partnership with the PMG, chartered

a Trans-Australian Airlines Douglas DC-3 freighter for the experiments and eventual broadcast from TAA's New Guinea-based Sunbird Services fleet, registration VH-SBM.

Proving the Concept

A month or so before the Royal Visit, a team of PMG Research Laboratories personnel was formed to conduct a series of experimental evaluation tests to prove the concept. If this worked, the team would then work out how best to achieve the successful aerial relay of a live TV broadcast. In the test phase of the exercise during the period leading up to the event itself on 20 February, the aircraft was fitted with an RCA BW-7A field intensity receiver and a simple, ventrally-mounted whip antenna to study the signal strength of Channel 8's Bendigo transmission at various altitudes near Nhill, in Victoria. If initial testing proved successful, a larger aerial would be fitted for the broadcast but this was not ready for the evaluation test phase.



The BW7A receiver lashed in position on the plotting table inside the aircraft (with pieces of string!)

In early January 1963, arrangements were made to equip TAA Sunbird Services' DC-3 'Sierra Bravo Mike' (VH-SBM) with two off-air Channel 1 receivers (main and standby), two small Channel 5A transmitters, monitoring equipment (which included a small, domestic-type TV), antennae and the associated power supplies. The Channel 5A transmitter antenna was fitted to the top of the tail fin while the Channel 1 receiving whip antenna was in the ventral position. Following a number of test flights captained by TAA's David Pomeroy, analysis of the test results indicated that the proposal was feasible. It was determined that the aircraft would need to be flown in an orbit of about one mile in

diameter at a point above Lake Albacutya near the Victorian town of Rainbow at an altitude between 10,000 and 15,000 feet above sea level, depending on the meteorological conditions. The PMG technicians found working in the unpressurised cabin at these altitudes somewhat challenging for a variety of reasons. These included the need to wear oxygen masks, the cool temperature (which wasn't helped by draughts from gaps around the rear doors and the opening in the floor where the ventral antenna was fitted), ineffectual cabin heaters and the constant engine noise and vibration.



VH-SBM at Adelaide during the evaluation test phase (Note the paint removed from the top of the fin for the transmitter antenna and the receiver's whip antenna fitted in the ventral position.) Image kindly provided by Geoff Goodall (<https://www.goodall.com.au/default.htm>)

Final Modifications

Following the successful 'proof of concept' tests, further modifications were made to the aircraft by replacing the two Channel 5A transmitters with a large Siemens transmitter and fitting a housing to accommodate the larger receiving antenna. Because of the size of the receiving antenna, when the aircraft was on the ground it had to be stowed in the retracted position beneath, and partially housed within, the fuselage. Once airborne, the antenna was lowered for operation, protruding some 2 metres below the fuselage when extended. Thus equipped, the DC-3 became an ABC transmitting station. An important extra item also had to be added to the flight crew's pre-take-off and pre-landing checklists to ensure that the aerial was retracted into the fuselage.

Preparation for the final event with the larger receiving antenna fitted commenced on Wednesday 17 February. TAA Captain Ron Austin and a First Officer were rostered to fly for three days of testing in advance of the

ceremony transmission flight on 20 February, together with a small team of PMG technicians. The technical team's task was to determine the height at which the received signal was at a maximum and to verify the strength of the relayed signal being received in Adelaide, this being reported to the aircraft via an air/ground VHF transceiver.

The TV relay equipment on the aircraft was tested by flying around in the vicinity of the South Australian/Victorian border where, as per the proof of concept/evaluation test phase, the TV transmission signal from the ABC station at Bendigo could be received and relayed onward to Adelaide. The crew had only four days to perfect the final transmission procedure before the Queen appeared in Canberra at 8pm on the Saturday night.

In his own words, Ron Austin recalls the days leading up to, and including, the critical transmission.



The retracted Channel 1 receiving antenna below the fuselage and some of the PMG technicians

Long Days Leading Up to the Broadcast

A planned program was followed and we spent the first three days flying 'on station' to ensure that the link would work when required. It was fortunate that a cricket Test match was being played in Sydney at the time which provided valid material for re-transmission to Adelaide. The signal from Bendigo was monitored by the PMG technicians for picture quality on the domestic-type TV set and a large Siemens transmitter then relayed the signal to Adelaide; I remember being told that this transmitter cost more than the DC-3 itself.

On the first day we took off from Melbourne for the Bordertown area, this being the midpoint between Bendigo and Adelaide. In flight the

technicians adjusted the lower aerial to give us a satisfactory picture in the cabin at our altitude of 8000 ft. Because the airborne Director could not tell how well the relayed signal was being received in Adelaide, their counterparts there had devised a number scale, which increased as the resolution improved. We flew around while the radio from Adelaide called "50-50-50" or "40-30". When the signal strength diminished, the airborne Director would ask us to turn quickly or change altitude; we tried steep turns, flat turns, as well as increasing and decreasing altitude, the aim being to maintain a strong signal in Adelaide. The Director was watching the picture received from Bendigo all the time and whenever the signal deteriorated in quality, he again called for additional flight manoeuvres.

As you might guess, we were operating in the busy airway between Melbourne and Adelaide and we needed clearance from air traffic control for any change of altitude. At times, we would request a climb to nine thousand feet but if there was no obvious gain in climbing to a higher level, the Director would call for us to descend again. It could take a considerable time to obtain an altitude clearance but the air traffic controllers were very patient. Steep turns, which gave the least time with the aerial deflected, were good fun for us, but for the technicians in the cabin bent at the knees and their body weight increased by the higher G-forces it wasn't so much fun. At times we would fly straight and level for minutes at a time, but atmosphere conditions affect radio waves which change constantly due to variations in temperature, atmospheric pressure, time of day and "gremlins". The objective was to find the best compromise in terms of the received signal strength vis-à-vis the aircraft's position and altitude.

After taking off from Melbourne on the first day, we flew for four hours before landing in Adelaide. In fact we only circled at the border for one hour because the airborne and Adelaide technical teams needed to meet for a discussion on procedures. On the second day we flew for nine hours, six of which were spent chasing the two signals, flight time on the third day was eight and a half hours. On the critical day, a test transmission was arranged for late Saturday afternoon, to be followed in the evening by the live broadcast of the Queen following which we would break off and return to Melbourne.

It Was Alright on the Night - Just

Saturday turned out to be another nine-hour flying day but not by design. When flight planning in Adelaide on Saturday afternoon we used Greenwich Mean Time for navigation reasons, whereas the TV schedule was naturally based on Eastern Standard Time for Canberra and Bendigo, and Central Time for Adelaide. Due to other pressures involved and the three different time zones we actually took off one hour earlier than necessary.

We have all heard tales of fate and luck; well both were in evidence on that Saturday. After taking off from Adelaide we were climbing out over the Murray River and we pilots were discussing who was going to be liable to pay for this additional hour when the Director appeared and asked if we had a torch. Torches being mandatory equipment for pilots, we had one each which we offered to the Director. Apparently a radio valve had failed in the expensive Siemens transmitter and the heat had welded the valve to its base on the transmitter chassis so simply changing the valve was not an option. The technicians intended to bypass the valve base by soldering "pig tails of wire" on each contact of the new valve and then soldering these wires directly into the chassis. Using only our torches to light the area and make the repair, the technicians completed their work-around task and we were able to go on the air with just five minutes to spare before the scheduled transmission time. The fact that we took off an hour earlier than planned turned out to be fortuitous because the extra hour gave the PMG technical team time to identify the unserviceable valve and come up with a work-around. Without that unplanned extra hour, all would have been lost and nothing was ever said about it. Adelaide saw the Queen in Canberra live on TV as it happened and when the broadcast ended we returned to Melbourne feeling quite satisfied; mission accomplished.