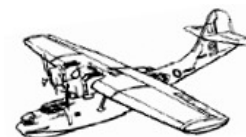




RADAR RETURNS



ECHOES FROM THE PAST AND PRESENT

If you look behind you, you can see the future in your footsteps.

A saying of the Ngunawal people of southern New South Wales

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EDITORIAL

In this, the third and final issue of Volume 10, we have become resigned to the ten-page format, though the flow of material from our general readership seems to have fallen somewhat. That is a pity and I urge you to take steps now to remedy it.

I have no doubt that there are still many important tales to be told by those whose memories extend to those early days of radar when its shape was being forged in the furnace of a world war, and I look forward to more of them being recounted in the very limited time we have available. It is good to note, as we and some of our friends have, that there is revival of interest in such matters especially among the generation of our grandchildren. Though at present this is directed particularly to the events and people of WWI, it seems certain that, as we depart the scene, there will be a growing thirst for first-hand (primary) accounts of our time, some of which, unfortunately, we still carry only in our memories.

Never before in history have there been such facilities for history itself to be recorded 'on the fly'. Though the technological advances upon which this development are based are very largely the product of the sixty years or so since WWII, and so, of course, were not available as they would now be to record the war as it happened. But they are available to

those of us who have been privileged to survive into the 21st Century so that our memories may be recorded, though, as may be necessary in many cases, with the help of members of the younger generations who have the technological skills but not the memories themselves. Clearly, many of us must seek their help to make the contributions to recorded history that they are beginning to find so fascinating. The generation after them, with none of us around, is likely to be even more interested.

Write it, or, if you can't write it, record it; if you can't do that, ask your grandchildren or the young lass or lad next door to record it for you!

This Issue

Here we complete the saga of Colin Kerr-Grant's memories. We had a number of complimentary comments about Part 1, so there will be people waiting to read Part 2. We also had a letter from the Editor of the Museum Newsletter of the RAF Air Defence Radar Museum at Neatishead in Norfolk, England, asking if they could reproduce the two parts of the article in their May and August issues. With Colin's permission, we have happily agreed.

The other major article herein is a summary of the roles played by the various organisations prominent in the development of radar in Australia during WWII, prepared by Ed Simmonds. This clarifies some aspects of the history of the times which have become murky as a result of the claims and counter-claims of postwar scribes, some at least of whom seem to have had axes to grind.

We are also pleased to include another anecdote from David Davies, who was an Army AA officer in the Darwin area in the dark days of 1942-43, giving another perspective on the action there.

Finance

There has been a pleasing flow of donations since the last issue, certainly comfortably covering its costs. A few of these have made their first contributions since I began producing Radar Returns, but there are still many whose consciences may trouble them. It is perhaps relevant to recall that 22 April will mark the second anniversary of Pete Smith's sad departure.

Future Developments

1. Radar Returns Website

In the July issue last year I reported that I was seeking advice from the information technology experts among my grandchildren on the feasibility of setting up a *Radar Returns* website. I can now report that one of them, Patrick Stirling, has undertaken to do the necessary spade-work upon which it will be founded. We now have a registered domain name and the site itself is up and running though still 'under construction'. Its address is given below.

The general objective is to complement Radar Returns with a website having as its principal aims:

- to extend awareness of the part played by Australian radar in frustrating Japanese expansion;
- to encourage the recording of individual sidelights on the history of wartime radar, so extending the work done by the books edited by Simmonds and Smith, *Radar Yarns* and *More Radar Yarns*, as well as by *Radar Returns*;
- to provide a forum for exchange of memories among former radar people;
- to make available existing records of WWII radar and the facilities to extend or correct them;
- to include a searchable file of all previous issues of *Radar Returns* and searchable records of the Simmonds/Smith publications including the *Pictorials*;
- to provide an outlet for information on the development of radar air defence in the period since World War II;
- to encourage radar veterans to seek help from later generations, their local library or wherever in gaining access to the information and contacts available through such a website.

Clearly other uses will become apparent as

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FADED ECHOES

The deaths of the following people have come to our notice since the publication of the previous issue. Obituaries where available will follow this listing. If you can provide further details on anyone mentioned, please send them to Radar Returns so that their histories may be more fully recorded.

William James Clarke, MBE,
6/12/1910 - 6/12/2005
NSW, S/Ldr

Keith Stanley English,
11/1/1922 - 31/8/2005
WA; Sgt

William Maxwell Freeburn,
30/3/1922 - 19/6/2005
NSW; Cpl

Lyll Leslie Gillespie, OAM ISO
23/7/1919 - 23/1/2006
ACT; R Mech (35G) (see p. 3 for tribute)

Kevin James Harrington,
24/1/1926 - 30/8/2005
Qld; LAC R Op (106)

Francis Harrie Harvey,
26/4/1911 - 11/8/2005
NSW; LAC R Mech (48G)

Lyle Robert Hoad,
4/7/1924 - 14/7/2005
NSW; LAC Filter Clerk

Murray Hugh Lascalles Jardine,
23/11/1925 - 26/10/2004
Qld; LAC R Op (91)

William Desmond Kaye,
26/12/1923 - 1/8/2005
ACT; F/Lt R Off (B2, 12A)

Eric Raymond Kelly,
8/12/1920 - 19/11/05
Vic; Sgt R Mech (13G). (see p.2 for tribute)

Allan Joseph Peter MacRae,
6/7/1919 - 30/10/2005
NSW; LAC R Op (101)
Married Gloria Gotch R Op (40)

Ronald Harcourt Middleton,
16/12/1924 - February, 2005
Qld; LAC R Op (89)

Jack Horatio Roper
26/9/1921 - 25/2/2006
Vic; Cpl WT (see tribute, p 4)

John Sebastian Ryan,
2/5/1925 - 16/9/2005
Qld; LAC R Mech (61A)

Clive Ronald Sinclair,
10/3/1916 - 24/9/2005
NSW; LAC R Op (69) (See p.3 for tribute)

Ethel Mary (Mitch) Smallwood OAM,
(Mitchell) 6/1/1920 - 29/1/2006
Vic; ACW R Op (51); Married Arthur M R
Smallwood, R Mech (34G) (dec'd)

Hewitt Jack Townsend
26/6/1920 - 21/7/2005
SA, F/Sgt WOM (see tribute, p 4)

Elsie Margaret (Meg) Trebilcock (Stiles)
1/7/1921 - 2005
Vic, R Op (41)

Evald Douglas Wade,
26/1/1925 - 22/9/2005
Parkes, NSW, R Op (82) (see tribute, p 4)

TRIBUTES

Eric Raymund Kelly

Ray Kelly was born and brought up in Cessnock, NSW. His father died when he was six years old and Ray left school at 14 to help support his mother and sister. He started work as a telegraph messenger boy, became a male telephonist and then was a postman until joining the RAAF.

Ray had had an avid practical interest in radio since he built his first crystal set at the age of 12. In 1941, he enlisted in the RAAF as a trainee radio mechanic. After completing the No 5 course at Melbourne Technical College, he was posted to do 13G Radio Mechanics course at Richmond. His postings included 23RS (Lytton, Q) 305RS (Goodenough Is.), 307RS (Peron Is), 344RS (West Montalivet Is), 59RS (Lee Point, NT) and 1RIMU and he reached the rank of Sgt.

After the war, Ray returned to his job as a postman but was soon able to transfer to the telephone section and then to the radio section of the PMG's Department. He moved to the ABC, working for some time as a control booth operator and later in the recording section. In 1950, he became a shift supervisor with Radio Australia in Shepparton. After about five years, he joined the Australian Broadcast Control Board, testing and inspecting radio stations and doing field surveys for new stations, and retired on health grounds in 1976.

His passion for radios and collecting led him to play a major role in the founding of the Historical Radio Society of Australia, through which he developed an extensive network of very close friends with like interests both in Australia and overseas.

In 1947, Ray married Betty whom he had met during his course in Melbourne. He was devastated when she died suddenly in 1973. He was a devoted family man and is mourned by his four children, grandchildren and a broad extended family. To them we extend our deep sympathy.

Ray's son, Tony, helped prepare this tribute. Ed Simmonds and Norm Smith both trained and served with Ray Kelly:

I was privileged to have known and worked with Ray Kelly. He was a quiet, humble man with a good sense of humour. We trained

together at No. 1 STT and at 1 RS, Richmond.

A gifted radio man with previous radio experience, he was better than most mechanics, including me. He could cope with new situations and took to radar like a duck to water.

For instance, at Richmond we were trained on ACO and AW equipment but he had no problems when the two of us were posted straight to a CHL station whereas I had continually to consult the manuals.

Shortly after that posting Ray joined Norm Smith on 305RS, which went to Goodenough and Kiriwina Islands, on the 'front line,' while I went to Darwin. However, we met again in 1943 at No. 1RIMU, Croydon. Almost as soon as he arrived he had a bout of malaria. The unit's nursing sister sent him to Concord Hospital. On the second day the quiet, unassuming man asked the nurse in the ward for a bandage as he wanted to put a fresh one on a small sore on his leg. She said that she would do it and was shocked to find that he had a tropical ulcer. Needless to say we did not see him at Croydon for a while.

Finally, in my opinion, Ray was one of the best radar mechanics in the RAAF as well as being an excellent radar operator. In addition he made a significant contribution to the collection of material for our history.

Alas, another quiet achiever has gone to the 'Great Doover in the Sky.'

Ed Simmonds

I first met Ray at 1STT, Melbourne in January 1942. We came together again in October 1942 when we joined F/O Bernard Katz as part of a crew of some 30 airmen forming 305RS at Kissing Point, Townsville. Ray was among those who worked hard scrounging through the various defence depots seeking the equipment and supplies needed to sustain the unit for an indefinite time in a hostile area, handicapped by not being able to give a valid reason because of the strict secrecy requirements.

The station was airlifted to Port Moresby in early December, where it experienced its first air raids and did some more scrounging before embarking on MS *Muliana* for Milne Bay. A shallow-draft vessel took the unit to the southern shore of Goodenough Is, still some 20 km from its destination at the northern end of the island. Despite that, the equipment was in position and reporting enemy aircraft some days before the Fighter Sector at Milne Bay expected it. Ray was one of the four mechanics who set up a preventive maintenance schedule which ensured that the unit was never off the air because of breakdown whilst on the island.

Ray was with us until May 1943 and we remember him with pride and admiration.

Norm Smith

TRIBUTES (Cont.)**Clive Ronald Sinclair**

Clive was born in Sydney, attended North Sydney Boys High School and completed his Intermediate Certificate in 1931. Leaving school at the age of 15, he started work as a brickie's labourer but, with the Depression dragging on, was unable to get work in the building industry. He and his cousin moved to the bush, lived in a tent and worked for farmers in the Bathurst area splitting hardwood logs to make fence posts. Clive returned to Sydney in 1933 and resumed work as a brickie's labourer.

In 1934, Clive enlisted in the 18th Infantry Battalion, serving in the Signals Platoon. He applied for a commission with the RAAF as a trainee pilot in 1937 but his maths were not up to the required standard. He transferred to the 1st Cavalry Division Signals Unit as a mounted signaller.

Clive left the Army in 1938 and got a job as a station hand at Harden, where he remained until he joined the RAAF as an Aircrew Trainee in July 1941. He completed his EFTS course, but failed to complete the SFTS course, remustering as an observer trainee in 1942. He qualified as an Observer (Navigator) in February 1943, but was again remustered as a Radar Operator (Ground) and posted to Radar School, Richmond, in March, 1943. After this, Clive was posted to 319 Radar Station and in May 1943 was with this unit at Fenton Field, NT, as part of the air defence of Darwin.

On 30 June, 1943, Clive had a close shave when he was caught at Fenton Field (a US bomber base) during a Japanese raid. He got his revenge when his unit, 132RS, tracked four Japanese twin-engined reconnaissance aircraft near Darwin on 17 August, 1943 and controlled the interception which destroyed two of them. Clive was the operator on the crew which handled the interceptions.

Clive's other postings in North-Western Area were 308RS and 59RS. He was posted to 111 MFCU in May 1945 and joined 316RS, participating in the Allied landings at Labuan Is in June.

In August 1945 Clive was seriously injured. He was helping some Americans unload supplies from an LST when an air raid alarm sounded. An American driving a large truck leapt for cover without applying the handbrake. The truck rolled forward, and Clive was crushed against the side of the LST. His left arm and knee were badly injured. Returned to Australia in December 1945, he remained in Concord Repatriation Hospital until discharged in May 1946, classed as Permanently Medically Unfit.

Clive had hoped to apply for a Soldier Settlement farm after the war, but his injuries

meant that he could not pass the medical required of applicants. He returned to work as a brickie's labourer but he also went to technical college, completing Matriculation and a bricklaying trade qualification.

He worked as a bricklayer from 1948 to 1958. However, he had contracted severe dermatitis (along with recurrent malaria) during his World War II service. The dermatitis reacted badly to the mortar he used as a bricklayer, and he needed to change jobs. He went back to technical college and he studied Meat Inspection and Food Inspection. He then got a job with the NSW Department of Health where he worked as a Food Inspector until his retirement in 1976.

Meanwhile, in 1948 Clive had enlisted in the CMF. Starting as a private with 1 Army Air Support Signals Unit, he moved to 1st Light Anti-Aircraft Regiment in 1950, working with 40 mm Bofors anti-aircraft guns (a strange move for a former pilot trainee). He volunteered for Korea and was accepted until the Army checked his RAAF record and found that he had been discharged Permanently Medically Unfit. The trip to Korea was off.

By 1954, Clive had become a Warrant Officer 2nd Class (Troop Sergeant Major) with 1st Light Anti-Aircraft Regiment. In 1955 He sat and passed his exams to become a commissioned officer and was commissioned into the Royal Australian Army Medical Corps as a lieutenant in the Administrative and Technical Branch. From 1960 to 1963 he served as the Officer Commanding, Eastern Command Hygiene Training Unit. In 1964 he moved to the Reserve of Officers, and ceased his active involvement with the CMF.

After returning to Sydney in 1973, Clive marched on every Anzac Day; 2005 was the first Anzac Day march which Clive failed to complete on his own. With his son Jim, he attended the Bendigo, Wagga, Canberra, Maroochydore, Adelaide and Geelong reunions and made many new friends.

Clive was a very good sportsman. He was a NSW State representative in the triple jump in 1936 and raced 18-footers on Sydney Harbour in the 1930s. A keen soccer player, he played club soccer for Belmore Church of Christ before WWII and later was a member of the 316RS soccer team. After the war he played soccer for Lane Cove Football Club until the early 1950s. Clive was also a keen amateur boxer, a good shot and was heavily involved in the National Fitness Club movement in the 1940s and early 1950s. He learnt fencing (swordsmanship), becoming a instructor, specialising in the epee. In 2005 he took up the sport of rowing.

Clive married Jean Park on 29 December 1954; she died in 2002. They are survived by

a son, a daughter and four grandchildren.

Clive was an interesting man with a wide range of interests. He remained a 'geriatric teenager' until the end.

Information supplied by Jim Sinclair

Lyllal Leslie Gillespie OAM, ISO

Lyllal was born in Queanbeyan and educated in Canberra and at Melbourne Technical College. In September 1941 he married Norma Joan Bogg.

In August 1942, Lyllal joined the RAAF and, after training as a radar mechanic, was one of those who formed No.324 Radar at Mascot in May 1943 with then P/O Bill Gravell. After some ten months at Paradise (NWA) he served on 227 RS, 329RS and relieved at 328RS. He then went to New Guinea area as a mobile mechanic with 3RIMU in a number of locations including Momote, Madang, Mokerang Pt., Harengan Is., (Admiralty Is.), Finschhafen etc.

Having joined the Commonwealth Public Service in 1937, Lyllal returned to it after the war and held a number of important posts including Asst Dir., Dept of Works, Asst Administrator, NT, Dir. C'wealth Brickworks, Asst Sec, Dept Interior, and Canberra City Manager, Dept of Capital Territory, receiving the Imperial Service Order for Public Service on retiring in 1982.

In retirement he was active in community affairs, with special interest in the history of the Canberra region. He was a member of the Heraldry & Genealogy Soc'y Canb; Aust Rock Art Research Assoc'n; ACT Comm'n; Bicentennial Comm'n; Historical Museum Soc'y; and a Life Member of Canberra & District Historical Society and of the Horticultural Soc'y Canb. His many books recorded the histories of ACT schools; pictorial histories of three ACT families; ACT Aborigines, and ACT pioneers.

He continued writing for journal contracts and histories after his walking became limited and until his eyesight fell away seriously through 2004 leading to a broken arm. He made trips through the Kimberley with one of his sons and also with his daughters and granddaughters in latter days, visiting Cape Leveque, Broome and the Wallal - Port Hedland areas. He did not reach the isolated, inland 324RS Paradise site again after 1944 but contributed memories with Mervyn Clark to the booklet on 324RS. He was in regular contact with both Mervyn and Dean Dadds from 1997.

A great and proud family man he is survived by his wife Norma, four children, thirteen grandchildren and ten great grandchildren.

His name and work will be long remembered by the public as well as by his fond family.

Information supplied by Dean Dadds

TRIBUTES (Cont.)

Evald Douglas Wade

Ev Wade passed away at Parkes NSW on 22nd September 2005, after an eight-year battle with cancer.

He was born at Ellalong, went to school at nearby Cessnock and later to Teachers College in Armidale, NSW.

Ev joined the RAAF in April 1943 and trained as a radar op on Course 82 at Richmond. His postings included 26, 59, 150, 151 & 316 Radar Stations.

Postwar, Ev returned to teachers college then taught at various primary schools including Parkes Migrant School (the site of RAAF Parkes and now the local airport) and later at Peak Hill Aborigine Basic Skills School.

In 1950, he went farming with his father-in-law, Joe Venables, (he married Moya Venables in 1947) then farmed on his own from 1965 until 1980. He converted a gun shop to a sports store in Parkes, and retired because of ill-health in 1984.

Ev was a member of the Radar Air Defence Branch of the RAAF Association, NSW Division until his death. He attended the Wagga reunion in 1997 and regretted that ill health prevented him going to others.

I remembered Ev as my primary school teacher at the Parkes Boy's Primary in 1949. His sister-in law was my first girl-friend.

Howard Campbell

John Horatio Roper

Jack was a Wireless Telegraphist in the RAAF who spent most of his service on radar units including 303RS (Tufi), 41 Radar Wing, and 306RS (Bulolo) until it was disbanded in March 1944. Later he served with 337RS at Los Negros, Admiralty Islands, until he was discharged with the rank of corporal.

A painter by trade, he returned to that after the war, and also worked as a security guard. His great interests were bush walking and mountain-climbing.

He was a big man, as strong as a horse, who was always prepared to work where the job was the hardest. He was also big-hearted.

Jack had strong views about almost everything and loved to defend his opinions with very rational debate. Though he was usually correct in his arguments, but he was big-hearted enough to concede whenever he was shown to be wrong. There was never a dull moment when Jack was around.

He will be missed by his circle of long-standing friends and by his family - his wife, Jean, daughters Jan, Gaye, Sharon and son, Jon. We extend to them all our deep sympathy.

Len Ralph

Hewitt Jack Townsend

Jack Townsend was a radio ham since 1939 and a WOM whose RAAF service included a stint at No 5 Fighter Sector not long after the Darwin air raids began in 1942. He had reached the rank of F/Sgt when he was discharged in January 1946 to make his career in the PMG's Department (later Telecom).

He was actively involved in community affairs. A long-standing member of the RAAF Signals & Radar Association of SA, he became its President in 1991 and held that post until his death despite failing health over the last few years. He was also President of the Radio Hams Old-Timers Association, a member of the SA Yachting Club and Winemaster for the Beefsteak and Burgundy Club. A devoted family man, he is survived by his wife, Joan, and two sons.

Our sincere sympathy goes to them and to his many friends among radar and signals people in the SA Association.

Information from Ray Deane

PERSONAL NOTES

Jim Coad

Just after Christmas, we were distressed to learn of the passing of Jim Coad's wife, Maree. She was known to many of us through her participation in a number of reunions, and was a friendly, cheerful person who took an active part in the reunions she attended, even the most recent, in May 2005 at Geelong, though she was clearly unwell and having difficulty moving around. We shall miss her, and express our sincerest sympathy to Jim and to her family. (Editor)

Margaret 'Maree' Coad, nee Brown, 31/12/1922 - 21/12/2005

Maree was a Sydney girl who was school captain at Auburn Girls High School before taking voice training at the Sydney Conservatorium. During the war, she held a full-time job in the finance department of a stock and station agent as well as working as a volunteer at Concord Hospital, in recognition of which, in 1995, she was awarded the Civilian Service Medal.

Married soon after the war, they had a young son and a newborn daughter when Jim took up his farm in the Barunah Plains soldier settlement area near Cressy in western Victoria. They were true pioneers: no power, no formed roads, no fences and their first home was a hut. Maree, though a city girl, adapted well and she is remembered as a tireless and cheerful worker, helping Jim fence the property, milking the house cow, cooking for a large team of shearers and other farmhand duties, as well as bringing up three children. She was active in their community, an entertainer and a talented singer.

Maree is survived by Jim, their three children, Russell, Lynda and Jennifer, seven grandchildren and two great-grandchildren. Our sincere sympathy goes to them all.

Kevin Coughlin (with help from the family)

EDITORIAL (Cont. from p.1)

we gain experience, and we expect to get suggestions from the *RR* readership.

The site is now open with the first of the various services we hope to be providing as time passes and our expertise increases. Among the first items to be included will be the previous edition of *Radar Returns*; this (March) edition will be included as soon as it is available. An early feature will be a data base of wartime unit histories originally compiled by Pete Smith, which I am sure many people will find interesting. There is a considerable amount of other material waiting for consideration, so keep watching. Links to other useful and interesting sites will be provided. A 'guestbook' facility for your comments and other contributions will also be available.

2. Postwar News and Views

As I have explained above, my efforts with *Radar Returns* have been very much focused on the need to report and record matters related to the history of the WWII defence of Australia through radar, aware that these matters are of genuine interest to the bulk of our readership, people who served in the RAAF in functions directly related to radar.

There is, of course, a genuine interest in these matters among those people who came to Air Force radar after the war, and we have a significant level of readership among those who have made their careers or part of them in the RAAF during the last sixty years. In this time, which has been marked by a number of localised wars and massive technological development, there is much to be recorded which will be of interest not only to that group but to all of us.

In recognition of this, as from the July issue, Vol. 11 No.1, we shall be devoting a section of *RR* to postwar developments and activities. Initially we propose to use two pages for this purpose, though this will change as the structure of our readership interests develops. I am delighted to report that Lynette Horne has agreed to act as section editor. Lynette served full-time in the RAAF between 1980 and 2001, and now holds a commission as a S/Ldr in the Reserve. She invites suitable contributions, preferably by email to:

Lynette.J@bigpond.com.au

Other contact details are:

Ms L Horne, 30 Staatz Quarry Road,
Regency Downs, Qld 4341
Phone/Fax: 07 5465 6277

Warren Mann

THE EARLY DAYS OF RADAR IN AUSTRALIA - Part 2

In Part 1, Colin recalled the radar pioneers he had encountered when studying at Cambridge, the beginnings of No 1 Radio School where he was a member of the first officers' course, and his early experience as a Radar Officer (Air) working on Catalinas.

The Japanese invasion of Malaysia and the East Indies changed the priorities of the Defence Committee drastically, from the manufacture of ASV equipment to the establishment of AW stations in Australia and New Guinea. After the initial experimental station near Newcastle, Darwin and Rabaul were selected as the two most urgent locations but, when Rabaul was captured on 23 January, Port Moresby was substituted.

In January 1942, the Prime Minister was asked by RAAF HQ to request from the UK government the immediate supply of radar equipment comprising 6 CHL, 6 GCI and 6 AI sets. Meanwhile, it was decided, in collaboration with Radiophysics, to make the best possible use of the existing equipment in Australia, as soon as it could be adapted and installed. Israel, back from Singapore, was made RDF Liaison Officer in Sydney. I was recalled to Sydney and attached to Radiophysics, where there was hectic activity to produce or modify existing equipment for Air Warning. The Army had some ShD sets, but they had been designed for shore defence, with high resolution and a limited range of about 15 nautical miles. By increasing the pulse length with a reduction of the pulse repetition frequency, Dr Piddington was able to increase the range to 100 nautical miles, as demonstrated by initial tests at Dover Heights. Three prototype sets had been produced by the Gramophone Company (HMV); two were now destined for Darwin and Moresby.

In Britain the CHL aerials were often mounted on towers, which Israel and members of Radiophysics thought would be impossible to install effectively in remote parts of Australia. The engineer in charge of the NSW Government Railways workshop, Mr. J.G. Worledge, was asked by W/Cdr Pither to design and make a lightweight aerial tower and cabin for the AW equipment which could be easily transported and erected. The NSW Railways was already working for Radiophysics making aerials for the ShD equipment. These towers and aerials, with some modifications for the different equipment, were expanded to Plotting Rooms and other structures and material for the other services so that Mr Worledge and the NSW railway workshops made a most valuable contribution to the conduct of the war.

Piddington's original set with the increased

range, installed at Dover Heights, was produced in five days with the help of 14 other members of Radiophysics and, operated by the Army, provided air warning for Sydney for several months. However, it was not in a form suitable for installation or use in a field station. The prototype sets were available by the end of January, and a set with a lighter-weight aerial was flown to Darwin on the 5th February for installation for RS31 at Dripstone Caves, at a site which W/Cdr Pither had already selected on a personal visit.

The story of the first Japanese air raids on Darwin and the difficulties met in getting the station operational has been told elsewhere. However, it became operational on 22 March and thereafter played a crucial role in the defence of Darwin. The equipment for RS29, the second station originally destined for Rabaul, was now to be erected at Moresby, and was flown there shortly after Darwin had been established. Meanwhile, I had been sent to RAAF HQ at Moresby to make arrangements and select a site, which was on the top of a hill overlooking the runway. I then went to select a radar site at Milne Bay, where a detachment of the Army had constructed a runway and was being attacked by Japanese bombers. By then the US Navy had established a base on the north-eastern end of Milne Bay. They saw no need for a radar station, as they had no knowledge of radar, so the project was abandoned.

By this time the need for AW sets had become urgent; the original order for 6 sets from the Gramophone Company was increased to 21. The set designed by Radiophysics in consultation with the Gramophone Company was much lighter than anything obtainable from overseas so that it was transportable by air, together with the combined operating hut and aerial designed by Worledge and made in the NSW Railway workshops. This LW/AW set became the standard set in the South-West Pacific Area as it did not require concrete foundations and could be readily dismantled and moved to another site. Pither has recorded an occasion where a set was dismantled and flown 200 miles and set up, being operational again after only 36 hours. Some LW/AW sets were exported overseas in the later stages of the war. Their disadvantage seems to have been that the operator's space was somewhat cramped, and under its canvas cover could become unpleasantly hot in the tropics.

I was posted to RIMU at the beginning of January 1943 after four months at Townsville RAAF HQ following my time in New Guinea. While at RIMU, I was asked to give twice-weekly lectures to the Bailey officer-training course at Sydney University.

As equipment became available, new stations were established, many on the north and north-western coast of Australia. However, remote localities had to have their own power supplies and this increased the transport problems. 2½ KVA alternators were first tried, but later changed to 5 KVA alternators driven by Ford 10 engines.

Piddington's modified time-base circuitry as used in the AW sets coped with variations in the power supply. Most of the sites for these stations were chosen by either F/Lt George Day, RAF, or F/Lt Rex Wadsley, who were also active in supervising their installation.

The need to establish AW radar after the East Indies invasion in 1942 caused the fitting and use of ASV and other types of radar to be put aside for some time. Actually, two modified ASV sets, forming Nos. 301RS and 302RS, were set up in late 1942 to monitor Japanese shipping in the vicinity of Milne Bay. The adaptation of ASV equipment to air warning was being used by the RAF when the then F/O Israel and P/O Andrew Lewis went to join RAF squadrons in Singapore. The ASV Mark 11 sets mounted on Catalinas, Hudsons and Beauforts had some 'teething troubles' and aircrews were reluctant to use them. However, after training by F/O Barnes, RCAF, who had experience with Coastal Command in Britain, and when ASV Beacons were introduced in December 1942, the use of ASV became much more acceptable, especially when the war expanded over the Pacific and homing could be carried out under any conditions.

By mid-1942, radar research and development in England had produced such equipment as IFF, AI and ASV beacons. The RAAF decided eventually to install IFF (Identification Friend or Foe) (a transponder or response device which returns a coded signal when triggered by an AW radar), but it was not until 1944 that all aircraft were fitted. The Navy initially resisted using it in ships as it considered that the response signal would disclose the location of its ships to the enemy. However, it became world policy in 1942 to fit IFF on all ships, and the Navy complied, somewhat reluctantly.

ASV beacons were introduced in December 1942, some initial tests of one being made with the ASV on a Catalina at Rathmines, NSW. The beacons operate in the inverse way to IFF; if they receive an incoming radar signal from the ASV on an aircraft, they send out a coded response which enables the aircraft to identify the beacon and its position and its distance from the beacon and approximate bearing; in other words they are homing devices. I was at RAAF HQ in 1943 and was involved in the siting and installation of some of the early beacons, the first being at Castle Hill, Townsville. According to Pither, they "played a major

EARLY DAYS OF RADAR IN AUSTRALIA - Part 2 (Cont.)

part in persuading air crews to use ASV". As the war progressed into the Pacific, more aircraft became fitted with ASV, 420 having ASV at the end of 1943, and more were planned for 1944. New beacons were installed at forward bases and eventually 40 beacons were in operation.

In contrast, AI (Aircraft Interception) microwave radar equipment was not used in Australia during the war, although it is now standard in modern fighter aircraft. AI was essential in Britain for night fighters, and in cloudy conditions, for combating enemy raids. But night raids did not occur in operational areas here, and there were very few Japanese night sorties. Some equipment was available in Australia then and there was a proposal to install it in Beaufighters, but that never eventuated. Apparently, some US aircraft in 1943 had AI, but made little, if any, use of it.

The transfer of information from radar on aircraft or shipping movements became more complex after many additional radar stations became established, although it had been comparatively simple when there was only Darwin to inform fighter control. This caused the setting up of Filter Rooms in order to communicate concise information, from a number of radar stations, to fighter control. The increasing number of radar stations, especially in remote areas, eventually led to the establishment of Radar Wings, which were established at Darwin, Townsville and Moresby. These took over the provision of essential supplies and maintenance of stations in their areas, and also incorporated the Filter Rooms. 41 Radar Wing, Port Moresby, was the first to be established, with F/Lt B.F. Israel, promoted to Squadron Leader, as its first Commanding Officer. Remote stations often had difficult transport problems, had to generate their own electricity, and in many cases had difficulties in getting supplies delivered. For some stations in the Pacific they had to come by sea. However, in early 1945, MFCU's (Mobile Fighter Control Units) were established, the Radar Wings were abolished, additional RIMU's being formed to service the radar stations previously looked after by the Wings. The Filter Rooms became incorporated in the MFCU's.

Wing Commander Pither, more than any other person, was responsible for creating a complete new branch of the Royal Australian Air Force; his knowledge of every aspect of the use of radar supported his negotiations for training officers and radar mechanics and the creation of a new mustering for WAAAF Radar Operators. His foresight and ability to resolve administrative problems, not always

without difficulty, and to liaise with scientific and technical committees, are the main reasons for the successful creation of an essential adjunct to the Air Force. The other services, the Navy and the Army, had radar, but they had fewer trained people, less equipment and less varied equipment than the RAAF. Starting with half a dozen officers, by the end of the war, the RAAF Directorate of Radar comprised over 300 officers, 1500 ground and air mechanics, and 1400 radar operators, of which about 400 were WAAAF; nearly all of these had been trained at the Radar School.

It has not been possible to record the many technical and administrative problems which had to be dealt with in the early years of radar. Many of these are discussed in An Account of the Development and Use of Radar in the Royal Australian Air Force, RAAF HQ, December 1946, by Wing Commander A.G. Pither. This unpublished but comprehensive and excellently explicit report deals with most of the features and problems in the organisation and establishment of radar in the RAAF.

In addition to my somewhat limited experience as a Radar Officer, this account has drawn on a number of reports and publications, especially those of Ed Simmonds and Norm Smith whose book, *Echoes Over the Pacific*, gives a detailed account of the establishment of radar stations in the Pacific. I also acknowledge information supplied by Warren Mann.

Radar and the magnetron, developed for war, are now familiar in normal civilian life.

Colin Kerr-Grant

WEDGETAIL DEVELOPMENTS

In January, an Airborne Early Warning and Control (AEW&C) Wedgetail aircraft that will soon provide Australia with leading-edge air and maritime surveillance successfully conducted a 'world-first' 360-degree scanning with an airborne phased-array radar. The airborne test of the radar, carried out by the combined Boeing and Australian Defence Materiel Organisation AEW&C project team based in the USA, lasted more than three hours and operated trouble-free.

The Wedgetail is based on Boeing's next generation 737 aircraft, which is being modified to accommodate various sophisticated mission systems and radar. One of the unique features of this radar is that it can scan through 360 degrees with no moving parts, where other phased-array systems can only scan through 240 degrees.

The Boeing 737 Wedgetail aircraft will have far more flexibility and capability than other similar platforms in service today, and the

recent test is confirmation of its capabilities.

Project Wedgetail will increase Australia's effectiveness in surveillance and air combat, provide air defence support for our current and future naval fleets and will also assist in many civil support operations such as border-protection and search-and-rescue activities.

Australia will acquire six of the aircraft and associated support and systems, with significant support by Australian industry. The last four of these aircraft will be modified by Australian industry in Amberley, southern Queensland.

Meanwhile a 737 aircraft simulator has been installed and commissioned at RAAF Base Williamtown and will be evolved over the next 6 months into the Wedgetail configuration to allow the completion of training before the first aircraft is handed over officially to the RAAF in November 2006. The No 2 Squadron based at Williamtown will fly the AEW&C Wedgetails when they become operational.

The arrival, also in January 2006, of the first Boeing 737 Wedgetail aircraft at RAAF Base Amberley marks the start of the largest and most complex aircraft modification program ever undertaken in Australia.

The aircraft is the first of four AEW&C aircraft that will be modified at Boeing Australia's facilities, RAAF Amberley, to provide Australia with leading-edge air and maritime surveillance. The fleet of six state-of-the-art AEW&C aircraft will provide a critical new combat capability for Air Force with far more flexibility than other similar platforms in service today. The project will also strengthen Australia's defence industry capability.

Completion of the four Wedgetail aircraft in Australia will increase Australian industry involvement by \$80 million with a further \$75 million worth of associated export work and three technology transfer programs worth \$24 million to Australia. At its peak, the production line at RAAF Amberley will employ about 170 personnel including aircraft technicians, engineering and support staff.

This enhancement of Australia's skills capability will benefit Australia in the short and long term, through technology transfer and exposure to new capabilities.

The Wedgetail modification project will also develop Australia's capability to undertake fleet management and major electrical and structural modification for other 737 aircraft or 737-derivative aircraft.

In the five years since project signature, Project Wedgetail remains on schedule and on budget.

Based on press releases issued by the Department of Defence

A NEW RADAR CENTRE

The Defence Science and Technology Organisation (DSTO) and the University of Adelaide have signed an agreement to establish a centre of expertise in phased-array and microwave radar systems within the University's School of Electrical and Electronic Engineering. It is expected to boost the nation's capability in a niche technology of strategic importance to Australia's defence.

Research outputs from the new centre, the Centre of Expertise in Phased-Array and Microwave Radar Systems (CEPAMR), are expected to have significant long-term benefits in applications such as:

- development of phased-array radar on air-borne platforms as well as radars proposed for future naval platforms;
- emerging ballistic missile defence surveillance and tracking; and
- a potential indigenous air defence radar system for Army applications.

The Chief Defence Scientist, Dr Roger Lough, said "This will be a unique national capability at the forefront of advanced radar, telecommunications, navigation and electronic warfare applications."

DSTO scientist, Dr Bevan Bates, will be seconded to the University as Director of the new centre.

It is expected that the new centre will support growing national requirements for radio-frequency engineers within defence, industry and the civilian commercial airline sectors.

This is the second Centre of Expertise set up by DSTO and the University. The two organisations already collaborate in a Centre of Expertise in Photonics.

Press release, Department of Defence

NAVAL RADAR SYSTEMS CONTRACT

CEA Technologies, will continue their design and development of phased-array radar systems for the ANZAC Ship Anti Ship Missile Defence (ASMD) upgrades.

In September 2005, the government announced its intention to pursue a CEA active phased-array radar system as part of this upgrade. The Defence Material Organisation has recently signed a contract with CEA valued at \$12 million for further design work leading to a production contract expected to be awarded this year. This will enable CEA and Defence to cooperate in developing a phased-array design baseline, taking account of Navy's requirements for integrating their design into the ANZAC ship hull and combat system. It is expected to provide a world-leading system in ANZAC frigates, defending them from missile attack.

The ASMD upgrade project is estimated to

create up to 130 jobs during acquisition and installation, with 25 jobs to support the capability through life, with about \$260 million to be invested in Australia.

Press release, Department of Defence

A JAPANESE DAY RAID, 1943.

During 1942 and 1943, the two principal targets in Darwin Fortress for the Japanese bombers were the RAAF airfield and the shipping, wharves and oil tanks at the edge of the city. From November 1942 until January 1943, the raids came during the full moon period, but with the mounting of Radar AASL No 2 Mk6 on the 150 cm searchlights, they were caught in the SL beam on the 20th of January, and from then on, all raids were in daylight. Early in 1943, I was in charge of three 40mm Bofors LAA guns sited in the city to cover the oil tank area against low-level attack and there was a HAA battery of Oval 3.7 inch guns in the same area.

In December 1942, the Kittyhawks (P40Es) had been replaced by three Spitfire squadrons, 54 RAF, 452 and 457 RAAF, controlled from the RAAF 5 FS at Berrimah, where was also stationed the army Anti-Aircraft Operations Room (AAOR). This unit was in communication with the 5 HAA gun sites and had direct lines to four of the GL 2s (gun-control radars) on the gun sites.

On the 15th of March, we got warning of a large force of enemy aircraft approaching from the north-west. When the Oval site took post, the height-finder detachment lacked one member so, as I was not employed, I took the place of the No 2 and controlled the traversing of the instrument.

Soon a large 'V' of Bettys, 24 or more, appeared, flying at about 24,000 feet. The 5 gun sites prepared to engage, but were stopped by the RAAF controller (via the AAOR) as he claimed that there were Spitfires engaging the bombers. With my strong 'scope, I could see all the bombers clearly and there was not a Spitfire anywhere. I called to the Oval CP about the non-appearance of any fighters, but the RAAF would not allow us to fire. So 20 heavy guns remained silent as the bombers flew undisturbed across the city, emptying their bombs from Smith Street near Bty HQ, across Cavanagh Street and hit an oil tank on Stokes Hill. The bombers then turned in tight formation to starboard and returned undisturbed to Timor. One bomb missed my Cavanagh Street gun by less than 10 feet; the detachment was unharmed, though their quarters was hit, but the cook survived.

At a 'post-mortem' at unit HQ, our CO, Lt Col R.M. Ford, explained what had happened. The Japs had sent ahead some 25 fighters to three areas remote from the city, to lure our fighters away from the bombers;

it succeeded, as our three squadrons were vectored to them. Our pilots failed to advise Sector that they were all chasing fighters and not bombers; when they sighted the enemy, they merely called "Tally Ho" instead of making sensible reports. Had they done it properly, all our guns could have engaged the bombers over a period of several minutes.

The casualty data shows that we lost 4 Spitfires, while the enemy lost only fighters: 6 destroyed, 9 probable, and 5 damaged. Regrettably there has been some inaccurate writing about this raid, claiming that the bombers were engaged. The casualty figures reveal the correct version.

David Davies (Colonel, ret'd)

A GOLDEN LEGEND

Visiting the Gold Coast in late January 2006, I was able to meet up with some of my old radar mates, including David Ross and his wife Enid; Dave was with me on 306RS in 1943, located in the Bulolo Valley, in the Owen Stanley Ranges, Papua New Guinea. Dave and Enid told me a story about some gold which he had found while there.

A lot of gold had been found near Wau from 1900. The Bulolo Valley was the scene of extensive gold dredging from 1930 onwards. In 1939, eight dredges were operating in the area. As is told in more detail in *Golden 306*, p. 31, (see Publications, p. 10 below), Dave, Bob Barling and I had found a good amount of gold at Watut, about 12 miles from our camp, perhaps 3 or 4 ozs each.

Such discoveries were usually melted and poured into moulds to make ring blanks to be flogged off to Yank pilots. Dave, however, had moulded his gold into the shape of a crucifix, about 30mm by 25mm and 5mm thick, which he took home with him for Enid to whom he was then engaged.

One of Dave and Enid's granddaughters, Leata Ross, was planning her wedding and had arranged with a local jeweller to hand-make her wedding ring. She asked if she could have a small quantity of the gold from the crucifix to make an insert for the ring. That was agreed and the jeweller was able to remove enough from the rear of the cross to make a one-millimetre-wide heart to be fitted inside the ring.

Dave had forgotten how he had come by the gold, so he and the family were delighted when I was able to give them the details.

We don't know what Dave may have thought when he was making that crucifix for Enid so long ago. We can be sure that he would not have imagined that one day his granddaughters would be using it for their wedding rings.

Len Ralph

RAAF RADAR IN WWII: WHO DID WHAT?

The development and deployment of the radar used by the RAAF during World War II called for a great deal of electronic and other ingenuity. This was supplied by various authorities, often under great pressure. The authorities included the CSIR Radiophysics Laboratory (RPL), the New South Wales Government Railways (NSWGR), the Gramophone Company (HMV Radio), the Allied Works Council (AWC) and various local government bodies, as well as, and by no means least, the RAAF itself.

Quite a lot of this information is included in the CD publication, Technicalities and Generalities. However, the nature of the publication makes it difficult to get a broad picture of the distribution of responsibility among these authorities, so Ed Simmonds has prepared the following summary.

Radiophysics Laboratory (RPL)

The Radiophysics Laboratory of the CSIR was established early in 1940 to be the operational arm of the Radiophysics Advisory Board, whose function it was to advise the government through the Australian War Cabinet on the development and deployment of radar (that term, of course, was not used at the time). Several distinguished scientists were recruited, one of whom was Dr Jack Piddington who had had some association with the origins of radar in Britain. Among the RPL projects, the following are of special interest here:

MAWD

Modifications to the American SCR268 transmitter, especially the change in the Pulse Recurrence Frequency (PRF) from more than 4000 to about 1000, which enabled it to be used effectively for air warning as Modified Air Warning Device (MAWD).

Impedance Measuring Set (IMS)

Developed originally for the installation of ASV sets, this equipment was needed to match and phase the aerials in the original AWs with coaxial feeders. Otherwise rarely if ever used in the field.

Transmit-Receive (TR) Switch

This essential item was developed by Dr Joseph Pawsey and Harry Minnett to multiplex the aerial so that only one aerial was needed to both transmit and receive.

AW Mk.I Electronics

Under the direction of Dr J R Piddington, RPL designed and produced the first Australian-made air warning set, reportedly in a period of five and a half days following

Pearl Harbour, as a modified Shore Defence (ShD) set, itself based on the English ASV Mk II. This achievement was commendable and with a bit of tidying up it became the AW Mk. I. The modified ShD aerial was used with the AW prototypes and other fixed AW stations, becoming the AW Aerial.

RPL used the existing PMG cabinets and it was fortuitous that the electronics were light in weight. This attribute made the AW electronics a natural selection for use in the famous LW/AW. The most outstanding element in the AW receiver was the bridge circuit used by Dr Piddington in the time base. This enabled the set to accommodate the fluctuating voltages of some power supplies without any adjustment as required in English receivers.

AW Mk. II Electronics

The RPL realised that a more powerful transmitter would improve performance and, at the suggestion of one of its researchers, Owen Pulley, developed a ring circuit of four 100TH valves (similar to the SCR268) raising the pulse power from the 8-10kW of the Mk.I to 40kW

AW Mk. III Electronics

The RPL used two NT99 valves in a push-pull circuit, with spark modulation, to produce a pulse power of 150-200kW. Another big item was the decrease in crated weight of the transmitter from 1200 lbs in one cabinet for the Mk. IA to 500lbs in two elements of 410lbs and 90lbs. Adoption of this model would have made it easier for the men in manhandling the gear in the field but it was not taken up by the RAAF: "...the RAAF finally decided not to produce this set in quantity in view mainly of the difficulty of introducing new sets of spare components, and also the complication of training personnel to use the new equipment."

The reason given by the RAAF is quoted in full because there was no valid reasoning behind it. Radar personnel were often trained on one type of equipment and posted to a station having a different type of gear or other equipment such as BL4 interrogators and ASV beacons which they were expected to manage, maintain and operate without further training. The Mk III was clearly a missed opportunity; the much larger power output plus the use of a preamplifier gave increased range and the size and weight of the transmitter were reduced.

AW Mk. IV Electronics

This was the lightest model, using a Mk.III transmitter, with a modified type II ASV display replacing the Mk. IA receiver cabinet. With its lighter power supply, it would have been ideal for air warning even on beach landings. Once again it was not used by the RAAF.

AW Mk. V Electronics

This type had an Mk.III transmitter with a receiver incorporating some Radar Counter Measures (RCM). The RAAF only deployed one Mk. V at the end of the war in Borneo.

LW/GCI Mk.I

Using an SCR602T6 in an Mk.I AW tower, the LW/GCI Mk.I was designed as an air transportable GCI; the RAAF was not satisfied with its performance.

LW/GCI Mk.II

Though RPL may have helped develop this version, it is most likely that F/Lt G Day RAF, S/Ldr B Israel RAAF and the NSWGR made larger and more significant contributions.

RAAF

RAAF personnel often made contributions to improve performance in the field, such as, for example:

- Two RAAF radar mechanics enhanced the performance of MAWD by placing more reflectors (mesh) behind the transmitter aerials so reducing the amount of back radiation.
- The RAAF appears to have replaced the coaxial feeders in the AWs with open-wire feeders, eliminating the need for the IMS in ground-based air warning as well as increasing the range of the set.
- F/Lt Llewellyn produced a better version of the IMS but its application was directed towards airborne radar, as it was not needed in ground-based air warning.
- The RAAF in Darwin introduced 'spotted dogs' to show the performance of each station by plotting the location of each and every echo.
- The Mk.II was tested at 38RS on Bathurst Island and faults were found by the RAAF. The first deficiency was in the power rating of several resistors – that was changed. The second fault was that the transmitter wandered in frequency. This was corrected by Sgt G Thompson who made a cross connection at the grids of two of the valves.
- In the LW/GCI Mk. II manual it was claimed that RPL had tropicalised the SCR602 but in Borneo this proved unsatisfactory and the personnel solved the problem by dehumidifying the various components with carbon tetrachloride and then treating them with bees wax to give satisfactory performance.
- F/O I B Asman, in a short time, wrote a large manual for matching and phasing of all of the equipment used, including solving the problem with the ACO stations. RAAF personnel were able to perform this procedure on LW/AW units, which had open-wire feeders, without help from RPL

personnel. F/O Asman also designed of a Radio Frequency (RF) voltmeter to locate standing waves on open-wire feeders.

- F/O Horwitz, under the direction of the Radar Liaison Officer (RLO), made a list of all of the changes needed to improve reliability and, in conjunction with Mr Canning of HMV, the manufacturer, made the modifications which resulted in the AW Mk.IA model. They included 250 watt heaters in the cabinets, tropicalisation of components and the replacement of the wire-wound range potentiometer with a decade box, as the wire in the former moved after substantial use and gave false range readings.

Other activities of the RAAF included:

Modifications to the AW for the BL4 Interrogator

This circuitry was developed by F/O K Blair at the PMG laboratory in Melbourne.

LW/GCI Mk. II Electronics

As mentioned above, the RAAF had a big input into the new design.

Transit Cases

The design and specification of transit cases was a RAAF activity, though they were made by furniture manufacturers. These cases protected individual panels during transport and could be floated ashore if necessary. They were lighter to handle than the crated PMG cabinets.

New South Wales Government Railways (NSWGR)

The Department of Munitions established an annexe of the Eveleigh railway workshops at Wilson Street, Sydney. There much of the construction of radar towers and aerials was carried out under the direction of Mr J G Worledge. W/Cdr Pither stated that the NSWGR had reduced the lead-time by at least six months. This authority played a major part in the development of the air warning system and also made such items as plotting rooms to accompany the LW/AWs.

AW Tower and Aerial

This aerial was made by the NSWGR.

AW Transportable Tower

The incident at 31RS at Dripstone Caves was a lesson for Mr Worledge who quickly designed a new type of tower that could be easily erected in a minimum of time. In addition there was no need for concrete foundations. This tower was also used for the English COL-type of units.

LW/AW Mk. I Tower and Aerial

W/Cdr Pither asked Mr Worledge to design, in conjunction with S/Ldr (then F/Lt) Israel and S/Ldr Mitchell RAF, an air transportable tower and aerial. In 30 days a prototype of the accepted design had been erected. The basis of

the design was a COL-type array and it is believed that some unofficial advice from Dr Pawsey of RPL was sought by F/Lt Israel.

LW/AW Mk. II Tower

On his own initiative Mr Worledge went to inspect the LW/AW units in New Guinea. He was appalled at the high temperature and congestion in the tents so he designed and produced the Mk. II tower.

LW/GCI Mk.I

The tower and aerial was made under the direction of the RPL.

LW/GCI Mk. II

This included a change in the aerial design, requested by the RAAF, and required a hut attached to the aerial. It is probable that the Development Officer at No. 1 RIMU, F/Lt G Day, RAF, played a major role in the design.

The Gramophone Company (HMV (His Masters Voice) Radio)

The importance of this company cannot be overlooked. It manufactured all of the Australian-made electronics. It conducted research into the effects of humidity, built vibration tables to establish the properties of individual components and their suitability. It readily incorporated the modifications needed to make the AW Mk. IA and Mk. II models

Chassis to Incorporate the BL4 Interrogator

This small unit was made by the company as a matter of urgency immediately prior to the paratroopers landing at Nadzab.

Other Private-Sector Companies

There is a list of more than sixty Australian companies, large and small, and individuals whose achievements in the manufacture and supply of electronic, mechanical and ancillary equipment and components were significant. As F/Lt F H (Hal) Porter concluded in his important book, *Adventures in Radar* (1988): *Australia is justly proud of her services but can also be proud of her industrial achievements in war, which for such a small nation were indeed unique.*

Civilian and Other Authorities

The Allied Works Council and several local government authorities were used to construct buildings for fixed radar stations on mainland Australia and some islands off the east coast. This included the towers for the ACO stations and the igloos at several locations.

Ed Simmonds

RAAF HISTORICAL WALK

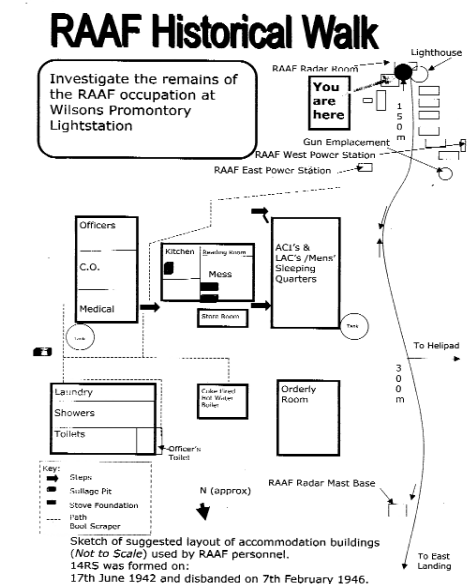
In April 2005 a bushfire burned through a section of Wilsons Promontory in Victoria; about 13% of the National Park was affected. The intensity of the fire varied considerably but it was the first time for 54 years that

much of this area has had a significant fire when the fuel load was quite high. The fire travelled south from near Tidal River and stopped at the lighthouse settlement where the RAAF No 14 Radar Station was in operation from 1942 until 1945.

The remains of the RAAF camp in the area near the lighthouse were exposed again and the National Park managers have been busy recording the archaeological features of the site. There were few remnants of the buildings left even before this fire as the same area including the buildings was burnt in 1951 and presumably cleared. The foundations, paths and some rusted metalwork are now very much in evidence. Now, so as to make the site more meaningful to visitors, a historical walk has been designed by placing weatherproof interpretative signs at key points. These cover such aspects as a brief history of the radar and Navy signal stations, the personnel who were there, how it all worked, the buildings, the flying fox etc. These signs will have photographs of the parts of the station and the men who served there as well as maps. The former radar building was not affected and bears the plaque placed and dedicated by members of the RAAF Radar Association in November 2003. The base structure of the antenna has also been found and will be marked, as have two concrete machine gun emplacements.

Even before the fire there was quite an interest from visitors to the lighthouse as brief histories of 14 Radar were provided in each of the former keepers' cottages that are now available for overnight visitor accommodation. These visitors would have all had to walk at least 19 km from Tidal River or Oberon saddle car park and then walk out again. The RAAF personnel who served there will, no doubt, vividly remember those long walks.

Ian McKellar



STATE ASSOCIATIONS

Victorian RAAF Radar Association

In February 1951, about thirty radar 'veterans' met in the Railway Institute rooms in Melbourne and decided to form the Victorian RAAF Radar Association. Joe Lynam was foundation President and Len Ralph was Secretary/Treasurer.

It was decided that the main objectives would be to provide a focal point for representation in Anzac Day Marches, to organise annual reunions, to represent the interests of members and, within strict guidelines, to provide bronze plaques to mark the sites of wartime radar stations.

From the beginning, there has been a good attendance at every annual reunion and Anzac Day March. In 2000, an August luncheon was added to the program and has proved very popular. Initial membership of about 450 has dropped to 120 of whom some 40 to 50 attend the March and the reunion.

Over the years a number of bronze plaques have been placed at locations around Australia. The first was in 1967 at Dripstone Caves near Darwin (31RS), in the placing of which it was agreed to combine with the NSW Branch; this resulted in a better plaque than had been planned initially. At present, four more plaques are being planned for sites of significant radar interest within Victoria.

Sadly on 8th October 2002, foundation President, Joseph Lynam, died. Joe had held that post for 51 years with dignity and honour, despite his being far from well during the last few years. Vice-President Alex Culvenor filled the vacancy at the next reunion.

We can speculate optimistically on the future of the Association. There is a small number of younger members who may be able to continue what we started fifty five years ago.

Len Ralph

Queensland

RAAF Radar Queensland

President: Bill Brown

Secretary/Treasurer: Noel and Monica Lynam

This new body, formed to provide a focus for the maintenance of social contact among the radar folk who belonged to the now disbanded Radar Branch of Queensland RAAF A, meets at 11am on the third Thursday of each month (except March - fourth Thursday) at the Irish Association rooms in Elizabeth Street, Brisbane. A small annual donation is sought to cover the costs of preparing and posting a newsletter. Lunch and drinks are available from the Club. All those interested are very welcome.

New South Wales

Radar Air Defence Branch, NSW RAAF Association

President: Walter Fielder-Gill

Secretary: Howard Campbell

As mentioned in the previous issue, the Branch is involved, with the ACT Division, RAAF Association, and serving members of the RAAF Surveillance and Response Group at Williamtown, in a ceremony placing and dedicating a plaque commemorating the role played by RAAF radar in WWII. The ceremony is being held at the RAAF Memorial Grove Remembrance Driveway in Canberra on 22 March, 2006, the 64th anniversary of the first detection and tracking of enemy aircraft by a RAAF radar station. On 22 March, 1942, No 31 Radar Station at Dripstone Caves, near Darwin, using the first Australian-designed and built ground-based equipment to become operational, detected aircraft approaching Darwin at a distance sufficient to permit US P40 Kittyhawk fighter aircraft to be scrambled and carry out successful interception.

The plaque commemorates the service of all members of the RAAF who were involved with radar during WWII. It is to be unveiled by A/Cdre Tim Owen, Commander of the SR Group, and dedicated by G/Capt Noel Williams (Chaplain). Walter expects about 100 people to attend, about half of them WWII veterans, one-third serving RAAF and the remainder postwar people.

South Australia

The RAAF Signals & Radar Association of SA

President: Vacant

Secretary: Ray Deane

Asst. Secretary: Ron Coat

The long-serving President, Jack Townsend, died in July 2005, and is greatly missed. The annual reunion luncheon will be held at the Marion Hotel, Marion, on Thursday, 20 April, as a prelude to the march on Anzac Day; all interested are welcome.

Western Australia

RAAF A (WA) Radar Group

President: Mark Bussanich

Secretary: Ray Sewell

Active membership of the Group has dropped off to the point that only two activities have been scheduled for 2006.

The next meeting will be held at RAAF A headquarters, Bull Creek at 11am on Thursday, 4 May 2006, followed by lunch at the Club. The other meeting for 2006 will be held at the same place and time on Thursday, 2 November. Anyone interested is very welcome to come to either or both of these functions.

PUBLICATIONS

For two reasons I have not yet got round to issuing the CD-ROM version of *Radar Yarns* that I expected to have had available. First, other demands on my time have caused it to slide down the priority list. Secondly, nobody has pestered me to do so, making me wonder what sort of a demand for it still exists. If you would like a copy, let me know and so help restore the incentive to move it along.

Whilst I do not at this stage have any spare copies of *Radar Yarns*, there are a few of *More Radar Yarns*, *Echoes Over the Pacific* and various unit histories still available. The CD-ROM., *Technicalities and Generalities*, is also still available.

Any copies of these or any other publications of possible interest to radar people that are no longer required would be warmly welcomed, either for resale to support our funds or for donation to appropriate museums or libraries. If you wish to sell them yourself, a notice to that effect can be inserted in *Radar Returns* and, probably, on the website.

There are still copies of *Golden 306*, kindly donated by its author, Len Ralph, which can be had for the special price of \$10 (inc. p&p).

The advent of the website will probably change the pattern of enquiry for publications, as we intend to put as many as possible of the earlier newsletters, books and pamphlets on to the net for access by anyone interested. Those who have publications in their names, or who are proposing to publish in the future, may care to discuss with me the possibility of publishing or promoting them through the net

A booklet on 27RS, Dunk Island has been prepared by Eric Unthank with help from several others who served there. It is a most interesting chronicle, competently written, and a significant addition to the record of unit histories. Anyone interested in it should contact Dr Eric Unthank, 18 Tyrrell Avenue, Blackburn, Vic 3130 (phone: 03 9878 5268).

A LAST WORD

We are not alone in thinking that military historians have overlooked the contributions made by radar during WWII. The following quotation is from the preface of a book called Canadians on Radar in South East Asia 1941-45 published in September 1998:

"In the late 1980's many of us former radar mechanics who were attached to the RAF were annoyed to find that military historians had completely ignored us. We knew we did not win the war by ourselves, but we knew that we had contributed – and it irked us that our contribution had been overlooked."

Ed Simmonds