

AEROSPACE ENGINEERING TRAINING SUPPORT TO AUSTRALIA'S DEFENCE FORCE AND ITS SUPPORT INDUSTRIES



➤ A true success story



➤ 16 years of partnering support to the ADF and its support industries



➤ Passion for innovation



➤ Passion for graduates and their preparation for a rewarding career



BRIEF NATCOE STORY

National Aerospace Training Centre Of Excellence

Growing in size and reputation over the past 16 years, the National Aerospace Training Centre of Excellence is arguably the largest aerospace engineering training organisation in the southern hemisphere. Training is conducted onsite at the RAAF Base at Forest Hill near Wagga Wagga.

Since 1994 this specialist training centre has provided aerospace engineering training (trade and advanced technical training) together with associated support services, for more than 800 Department of Defence and Defence Support Industry trainees each year. Trainees are drawn from the three major arms of the Australian Defence Force (Air Force, Army and Navy) and from overseas countries associated with Defence Cooperation Programs, including Singapore, Papua New Guinea and the Philippines. In addition, trainees from the Australian Defence Support Industries, i.e. Boeing and QANTAS, have also been trained at the Centre.

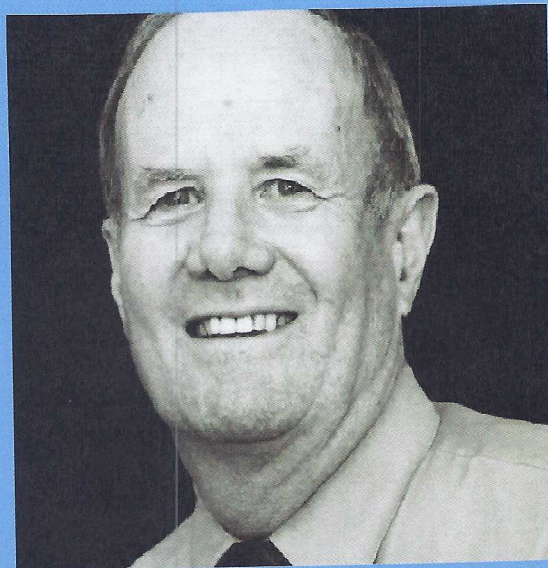
In the order of \$65 million of training aids are involved in the support of this training delivery, including 55 aircraft – Macchi jet trainers, CT4 Airtrainers, Metroliners, Winjeel, Wessex, Iroquois and Sabre aircraft – and a full size C130H cockpit simulator, FA-18 training boards and other training aids.

This training contract and associated support services covers the full range of aerospace engineering disciplines, including aircraft airframes, engines, aircraft avionics and electronics, aircraft structures, together with a number of post graduate courses involving aerospace engineering. A wide range of accredited and short course programs are also available to international customers to assist with both demobilisation programs and specific skills development programs for students employed by the Defence Force.

To achieve this continual contractual success, Riverina Institute has deliberately focused on three specific outcomes: customer focus, student focus and instructor industry currency focus.

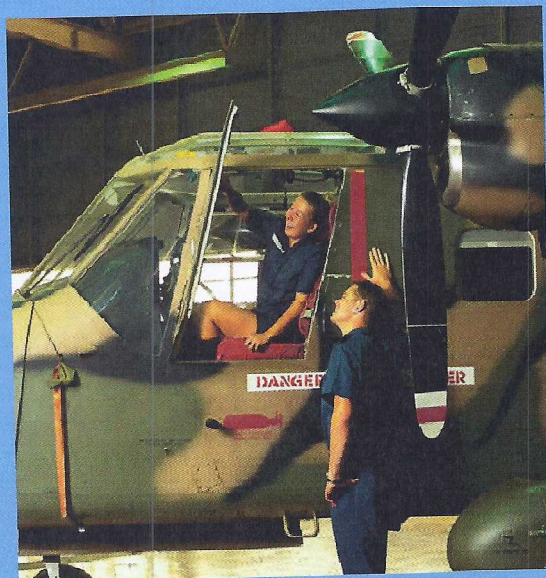
121 staff are employed to deliver this contract, and the Australian Defence Force also seconds about 54 uniform aerospace technicians to assist with the training delivery.

The National Aerospace Training Centre of Excellence is presently restricted to accepting only Australian Defence Force students for aerospace training.



“Riverina Institute has established a contract with the Australian Defence Force that is an exemplar for Defence tri service contractor supported training and a benchmark for successful partnering.”

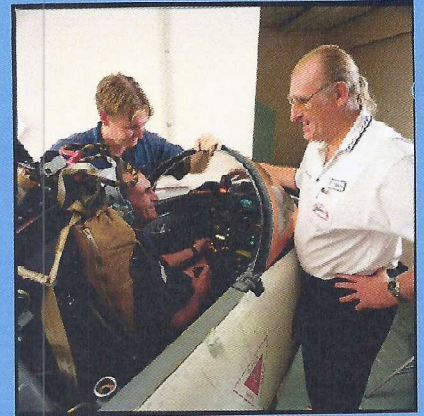
**Col Bradford AM (above)
– Director, National Aerospace Training
Centre of Excellence**



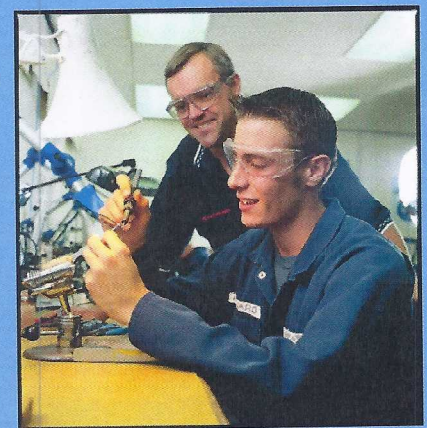
**A MODEL FOR
CONTRACTOR AND
MILITARY WORKFORCE
INTEGRATION**

By Wing Commander Steve Hayes MBE & Mr Col Bradford AM

The RAAF School of Technical Training (RAAFSTT) has been in existence for over 50 years and provides Tri-Service aerospace engineering training as well as clerical and supply training for the Air Force. RAAFSTT is often spoken of as the exemplar Tri-Service contractor supported training establishment in the Australian Defence Force (ADF). Why is this so? We believe the answer lies in the committed and integrated workforce developed over several years through a unique partnership that exists between the commonwealth and the National Aerospace Training Centre of Excellence (NATCOE), a campus of TAFE NSW, Riverina Institute. The partnership that underpins the integrated contract/defence workforce model has been refined over a period of 10 years, is highly successful and provides a clear education and experiential benefit to the military graduates for RAAFSTT.

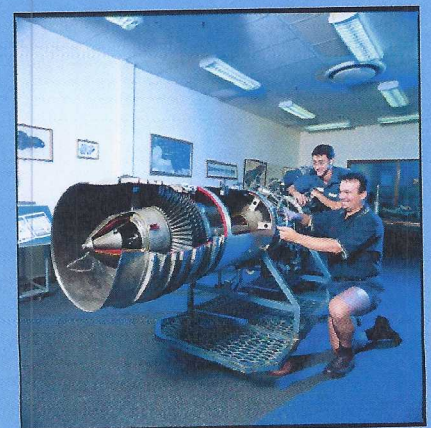


A simple yet effective management philosophy underpins the integrated workforce model. RAAFSTT and NATCOE management have established a seamless management arrangement to ensure that all graduates meet the whole range of attributes demanded of a uniformed trade technician. The reverse also applies. Although the graduates need the academic excellence and aerospace engineering competency provided by NATCOE to achieve the graduation standard, the 'whole-of-school' management emphasis has always been specifically directed to producing military trade technicians.



The agreed 'focus on RAAFSTT, focus on producing exceptional military trade technicians' as the management philosophy endorsed by both RAAFSTT and NATCOE, drove the establishment of an integrated contractor/defence workforce model. The development was facilitated by a number of important, and in hindsight, clearly essential stepping-stone to achieving success.

Firstly, most NATCOE management and instructional staff are ex-military, with a previous affiliation to RAAFSTT, its vision and Tri-Service values. Secondly RAAFSTT defence personnel were involved over the partnering period as full members of any recruiting panels for selection of NATCOE staff. Thirdly, there was a unique but outstandingly important and successful contract enhancement implemented by NATCOE, involving a policy of financially and cooperatively improving training delivery quality. This policy involved NATCOE on constantly monitoring costs associated with contract delivery and implementing savings and efficiencies immediately they were highlighted, that is, fully applying partnering principles in an ongoing and continuous manner, millions of dollars re-invested in improved training quality. It is significant that the policy was not implemented as a 'one-off policy' and has been in operation consistently with involvement from both parties, over the life of the contract.



Further in the stepping-stones to achieving success, the clear and supportive recognition by NATCOE of the importance of military inculcation within RAAFSTT, was paramount to the success of the integrated environment. Specific strategies were put into place within RAAFSTT to ensure defence ethos/cultural awareness (military inculcation) was fully covered in the training deliver and support environment on a daily basis. Simple strategies such as having all instructors supportive of the trainee's personal needs/problems, particularly out of hours, and maintaining standard discipline across RAAFSTT were implemented. Similarly, managing all sections along organisational lines standard to those of the ADF and always relating training to military experience, background and equipment, continually emphasised the importance of military inculcation in the minds of trainees.

Lastly, there has been unanimous support from instructional staff for implementing a seamless organisational arrangements focused on high quality instructional delivery rather than wasting energy focusing cumbersome and duplicated management structures. In all individual training sections, Defence Warrant Officers, Senior Non Commissioned Officers and NATCOE Senior Instructors work side by side within RAAFSTT in a completely integrated organisational structure. Thus they can specifically concentrate on the output, the military graduate. RAAFSTT and NATCOE review the management structure on a regular basis to optimise work performance.

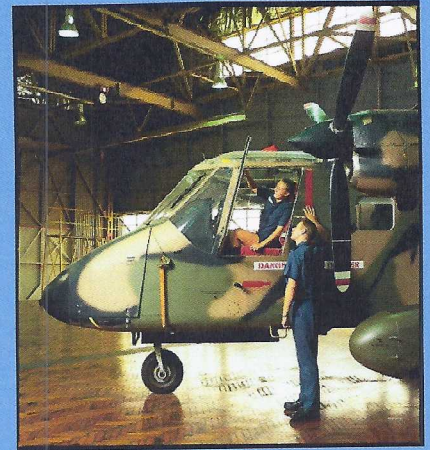
To illustrate this focus, views of a cross section of our management executives and instructors relating to the practical benefits of an integrated workforce model are provided below:

- 'An integrated workforce enhances the quality of training delivered as the attributes of Service and civilian combined create a more dynamic workplace.'
- 'I believe the greatest challenge, and therefore our greatest success, has been the acceptance of the contractor as an integral part of the defence organisation, imperative to the success has been the leadership provided by the CO's RAAFSTT and the Director NATCOE. Were these two players not intent on success, integration would not have worked.'
- 'Communication and cooperation; as a management team we discuss everything we do, respect each other's opinion and then actively promote a united front.'
- 'All briefs are to all staff, we don't have any dedicated RAAF or NATCOE briefs, we consider everything we have to say has an effect on, or is of interest to, all staff.'



In some respects, introducing an integrated contractor/defence workforce was the easy part. Maintaining the focus remains the challenge. At RAAFSTT the focus has been maintained in a number of simple, but effective ways. A continuing concentration has been directed to the partnering arrangement and the underlying principle agreed back in 1995, 'That RAAFSTT and NATCOE would work together ethically and professionally in a spirit of continuous improvement to achieve recognised excellence in aerospace training'.

In conclusion, integrating a defence and contractor workplace into arguably the exemplar for Tri-Service contractor supported training, has been a challenge and did not occur overnight. But it did occur in a deliberate and focused manner, to the credit of both Defence and contractor staff and to the clear benefit of RAAFSTT military graduates. A supportive partnering arrangement set the scene, together with a very simple but effective management philosophy by both parties of 'a focus on RAAFSTT, a focus on producing exceptional military trade technicians'. This focus has facilitated the implementation of a remarkable organisational arrangement, that at the instructional level, always direct emphasis towards the trainee, the military graduate. That is the real success that brings obvious pride to all the staff members of RAAFSTT and NATCOE.



PRESENT ADF TRAINING COURSES (MEA07)

- ADF Core

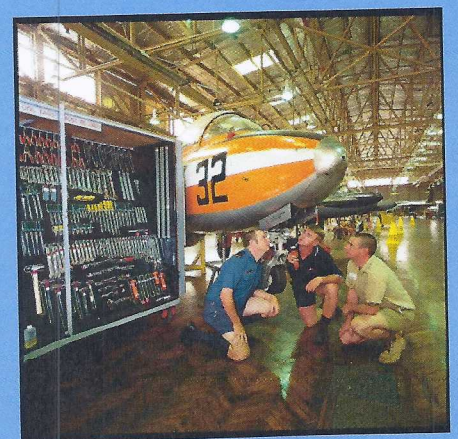
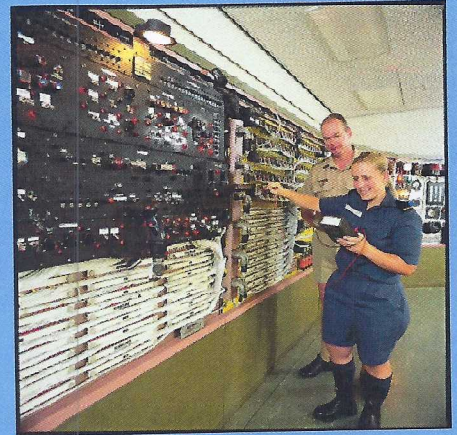
- Avionics Technician
 - Common
 - RAAF specific
 - Army specific
 - RAN specific

- Aircraft Technician
 - Common
 - RAAF specific
 - Army Specific
 - RAN specific

- Armament Technician
 - RAAF only

- Aircraft Structural Fitters
 - Common
 - RAAF specific
 - Army Specific
 - No RAN specific course

- Post Graduate Courses
 - All services and contractors



MEA07 ADF CORE

For MEA07 ATECH, ARMTECH, AVTECH & ASTFITT Courses

Curricula

<i>Module Abbrev.</i>	<i>Full Title</i>	<i>Module Length</i>
<i>Phase 1</i>		
TMP	Maths & Physics	52
ITS Intro		1
OHS	Occupational Health & Safety	36
IA	Introduction to Aviation	32
FOF	Fundamentals of Flight	38
TD	Technical Drawing	13
TDQ	Technical Documentation & Quality	17
AMP	Aircraft Materials & Processes	26
TA	Technical Administration	42
BHS	Basic Hand Skills	114
IEP	Introduction to Electrical Principles	30
EOI	Explosive Ordnance Introduction	19.5
ACS	Aircraft Safety	24
AMC	Aircraft Mechanical Components	43
CID	Corrosion Identification	10
ARI	Aircraft Removal & Installation	88
FLD	Flight Line Duties	91

AVIONICS TECHNICIAN MEA07

Curricula

Module		Module Length
<i>Phase 2</i>		
AVTS Intro		2
FF	Fault Finding	16
BDC	Basic Electrical Theory - DC	42
BAC	Basic Electrical Theory - AC	69
ETT	Electrical Termination Techniques	41
AFA	Analogue Fundamentals A	55
AFB	Analogue Fundamentals B	61
ESD	Electronic Special Devices	33
LFF	Logical Fault Finding	60
AFC	Analogue Fundamentals C	74
DFA	Digital Fundamentals A	40
DFB	Digital Fundamentals B	42
ELH	Electrical Looms & Harnesses	68
MG	Motors & Generators	68.0
ES	Electrical Systems	73
SSM	Synchro Systems & Servo Mechanisms	64.0
GYP	Gyroscope Principles	28.0
BAI	Basic Aircraft Instruments	41.0
FRN	Flight Reference & Navigation	55.0
FCS	Flight Control Systems	55.0
EDS	Electronic Display Systems	26.0
RPP	Radio Principles & Propagation	26.0
COM	Aircraft Communications Systems	49.0
SRS	Secondary Radar Systems	8.0
RNS	Radio Navigation Systems	22.0
AST	Avionics System Testing	36.0
CAMM24T	Cam 2 for Training	24.0
<i>Phase 3 RAAF:</i>		
PCB	Printed Circuit Board Soldering	36
OXM	Oxygen Systems Maintenance	25
PR	Primary Radar Systems	30
ENV	Aircraft Environmental Systems	19
FLO	Flight Line Operations	16
<i>Phase 3 ARA</i>		
CT	Communication Transceivers	88
RWA	Rotary Wing Avionics	41
ED	Engineering Drawing	61
FLO	Flight Line Operations	16
<i>Phase 3 RAN</i>		
CT	Communication Transceivers	88
PR	Primary Radar Systems	30
RWA	Rotary Wing Avionics	41
CIA	Corrosion in Aviation	35
ASW	Anti Submarine Warfare	7
FLO	Flight Line Operations	16

AIRCRAFT TECHNICIAN MEA07

Curricula

Module		Module Length
<i>Phase 2</i>		
ATS Intro		2
BA	Basic Avionics	36
FF	Fault Finding	16
HYS	Hydraulic Systems	55
AAS	Aircraft Auxiliary Systems	28
MP	Maintenance Practices	48
GTP	Gas Turbine Principles	62
GTS	Gas Turbine Systems	92
MPE	Maintenance Practices Engines	59
UCS	Undercarriage Susyems	43
ECS	Environmental Control Systems	27
FC	Flight Controls	39
CIA	Corrosion in Aviation	35
MPA	Maintenance Practices Aircraft	75
APR	Aircraft Plumbing Repair	18
CCR	Aircraft Cables & Control Rods	18
CAMM24T	Cam 2 for Training	24
<i>RAAF Phase 3</i>		
PRI	Propeller Removal & Inspection	39
PI	Propeller Inspection	44
FLO	Flight Line Operations	16
<i>ARA Phase 3</i>		
PRI	Propeller Removal & Inspection	39
VCA	Vapour Cycle Airconditioning	24
RWS	Rotary Wing Systems	56
TUR	Turning	33
ED	Engineering Drawing	61
CPS	Repair Aircraft Composites	48
CPR	Composites	40
RFD	Riveting & Fastening Devices	34
ASC	Aircraft Sheetmetal Components	57
ARP	Aircraft Repair Procedures	50
ECT	Electrical Cable Terminations	60
FLO	Flight Line Operations	16
<i>RAN Phase 3</i>		
VCA	Vapour Cycle Airconditioning	24
RWS	Rotary Wing Systems	56
TUR	Turning	33
ETA	Electrical Termination Aircraft	24
CPS	Repair Aircraft Composites	48
CPR	Composites	40
RFD	Riveting & Fastening Devices	34
ASC	Aircraft Sheetmetal Components	57
AGC	Advanced Geometric Construction	51
ARP	Aircraft Repair Procedures	50
TPT	Templates & Pressed Tools	33
FT	Fabrication Techniques	60
APD	Advanced Pattern Development	60
AAR	Advanced Aircraft Repair Procedures	60
FLO	Flight Line Operations	16

ARMAMENT TECHNICIAN

Curricula

Module	Module Length
Stage 2	
Armament Specialist	
Stage 3	
AVTS Intro	2
FF	16
BDC	42
BAC	69
ETT	41
AFA	55
PCB	36
ESD	33
DFA	40
MG	68
ELH	68
ES	73
PCR	40
AMT	19
FLO	16
CAMM24T	24

AIRCRAFT STRUCTURAL FITTER MEA07

Curricula

Module		Module Length
<i>Phase 2</i>		
ATS Intro		2
GC	Geometric Construction	25
BSM	Basic Sheetmetal Work	49
PLD	Parallel Line Development & Manufacture	59
RLD	Radial Line Development & Manufacture	63
TDF	Triangulation Development & Fabrication	54
ASC	Aircraft Sheetmetal Components	57
ABD	Advanced Bracket Development	83
RFD	Riveting & Fastening Devices	34
CCR	Aircraft Cables & Control Rods	18
HYS	Hydraulic Systems	55
APR	Aircraft Plumbing Repair	18
AAS	Aircraft Auxiliary Systems	28
MP	Maintenance Practices	48
UCS	Undercarriage Susyems	43
FC	Flight Controls	39
ECS	Environmental Control Systems	27
ARP	Aircraft Repair Procedures	50
TPT	Templates & Pressed Tools	33
FT	Fabrication Techniques	60
APD	Advanced Pattern Development	60
CIA	Corrosion in Aviation	35
WSC	Wing Section Construction	125
AGC	Advanced Geometric Construction	51
AAR	Advanced Aircraft Repair Procedures	60
CPS	Repair Aircraft Composites	48
CPR	Composites	40
CAMM24T	Cam 2 for Training	24
<i>RAAF Phase 3</i>		
FLO	Flight Line Operations	16
<i>ARA Phase 3</i>		
ED	Engineering Drawing	61
RWS	Rotary Wing Systems	56
FLO	Flight Line Operations	16

Post Grad Coures

Cam2 Data Manager

Auto Airconditioning Maintenance

Restricted Electrical Work

ADFA Engineering Workshop Practices

High Reliability Hand Soldering Supervisor

Welder Aircraft

Airconditioning/Refrigeration Specialist

General Servicing Equipment Technician

Unit Maintenance Manager

WHAT HAS CHANGED FROM OUR TIMES

- Trades and reduced training times at Wagga
- Train Army, Navy and Airforce and the odd Boeing/Qantas trainees
- Contractor delivered training but ADF instructors still involved
- Suggest discipline has reduced
- But society has introduced restrictions on disciplinary power
- Female trainees
- Trainee self confidence/respect for rank different to our times
- Society has introduced a “blame someone else” syndrome
- Interest in sport has declined
- Long term Defence careers declining
- RAAF Recruit Training Unit now on RAAF Base Wagga
- Hand skills in most have declined but computer skills great

**WHAT HASN'T
CHANGED
FROM OUR TIMES**

- Still mainly World War II vintage buildings!!
- Still basically “face to face” instruction
- Still get the odd “donkey” but majority of trainees are great kids
- We concentrate on “attitude, attitude, attitude”
- And most importantly have continually insisted that Defence is still the “gate-keeper” for graduation standards

But of interest are Don Mazlin’s comments below mentioning concerns in his days with:

- Insufficient instructors
- Long winded approval process for syllabus changes
- Gaining more detail into courses
- Lack of current training aids, and
- Whinge from the field on “quality of graduate”

All Don’s comments are still really valid today!!!

MY TIME AT RAAF SCHOOL OF TECHNICAL TRAINING

By Don Mazlin

1. I was posted to instructional SQN RSTT in June 1956 to be Officer i/c Instrument Section. This post had not been filled for some years and the section was being run by WOFF Ray Wall who was in charge of both the Electrical and Instrument sections. Hence it may be assumed that training had not been a high priority for the powers-that-be when allocating management resources prior to my arrival.
2. There were three streams of trainees coming through the section; Apprentices, Adult Trainees and National Service Trainees and the constant difficulty was in meeting the training commitment with few instructors available. Also bear in mind that this was a time of dramatic change in technology for the RAAF in that jet aircraft had not been around very long and instrumentation using electronics was making great inroads into areas that had previously been the province of mechanical devices. (When I think of the mk4 Bombsight, the air driven auto pilot, or the navigation instruments (API, GPI, etc) I marvel at the ingenuity of the designers of the late wartime or post war time period.)
3. These technology changes and the fact that trade training had been somewhat neglected meant that much of what needed to be done had to originate from RSTT. Our higher authority was Training Command which was more concerned with administrative matters than the nuts and bolts of a syllabus. The command was happy for us to propose changes to all the syllabi but the process of having these approved was a rather long winded business. We would often start teaching to an amended syllabus before the formal approval was received but the larger difficulty was that the courses just got longer and longer as new instrumentation came into service because we still had to cover many of the old techniques. This meant extending the length of course for adults and Nashos and cramming more into a fixed period of apprentices.
4. We were always trying to scrounge instruments for training. Modern electronic equipment such as gyro magnetic compasses or Mk9 Auto Pilot was sometimes issued to the school but we could never get enough items to allow the students to gain practical bench experience in dismantling and reassembling instruments. I made a visit to 1AD with Jack Kelly 1958 and to 2AD and 3AD with Jack Bennett in about 1959 to make them aware of our need for training items and subsequently some equipment arrived at Wagga. Of course the strict accounting procedures of the day didn't help until a special category of "training aids" was created.
5. We had practically no contact with civilian firms such as Smiths, or Sperry or National Instruments Co. We had informal feedback from RAAF units about the quality of tradesman we were turning out but it was usually to whinge about the fellows not being trained sufficiently. Ex- apprentices were far better than other trainees in that they were regarded as still under training during the first twelve months after graduation from Wagga which gave them a great advantage over adult trainees.

6. Re Personnel who served with me at RSTT Instrument Section memory isn't so good but I recall Max Cather, Jack Kelly, Reg Yardley, Col Jones, Joe Coffey, George Stevens, Jack Bennett, Blue Crisp and Doug Fitzpatrick. I left in October 1960 and a few months before that Howard Kaye was posted in as an under-study. Bob Bartram took over as Officer i/c Instrument Training a few months after I left.