



999 (Dunmow) Squadron

**Probationer
Training Syllabus**

999SQN (Dunmow & Districts) Air Training Corps

Dear Cadet

The Air Training Corps (ATC) is one of the largest youth organization in the UK. There are about 37,000 cadets belonging to some 1000 squadrons across the United Kingdom and undoubtedly there are many other young people joining other squadrons tonight

The ATC is a youth organization which is run on military lines under the Royal Air Force and, as such, offers a wide range of activities to its members, according to age and experience.

Your first few weeks will be spent learning about the ATC and this Squadron in particular. At the end of your course, and during you will be assessed and if you have made sufficient progress, a uniform will be issued to you and you will be enrolled into the ATC.

As you make further progress, a variety of exciting opportunities will become available to you - most of them free of charge. These include flying, gliding exercises and camps (UK and overseas)

This organization provides splendid training for life - the harder you work the more rewards will come your way. Most awards including flying/gliding are awarded by me to those of you who have worked hard for the Squadron, so work hard and play hard.

I look forward to welcoming you personally to the Squadron in the near future and hope you will enjoy a long and happy association with the ATC

Yours Sincerely,

J.Hayward,
Flight Lieutenant,
Officer Commanding 999 (Dunmow) Squadron ATC

Introduction

The AIR Training Corps is an organization for all young people aged between 13 and 20 years who are interested in aviation and a related subjects.

The object of probationer training is two-fold. Firstly it is to get the probationer cadet into uniform as quickly as possible and secondly to give uninterrupted progress to the quality and standards required of the Corps and 999 Squadron, At the end of the course, which will last six to eight weeks you will be trained up to second Class cadet standard

The course will enable you to recognize the various ranks in the services who's who in the squadron, uniform care and a brief history of the ATC and basic foot drill. Once past this stage, procedures for the issue of uniform will be commenced. Keep these and subsequent notes, they will form a revision notebook which will enable you our latest cadet to step on the first rung of the ladder which could bring you evenly to the highest technical grade for Staff Cadet and open the way to enjoy all activities this great organization has to offer.

Safety

Fire Brief

In the event of a fire –

Alarm	
Action	
Muster Point	

Remember - do not:

- Take any of your possessions
- Run in the building
- Try to fight the fire

To check that everybody understands what to do in case of a fire, we hold regular fire drills.

Make sure you know what to do and where the Muster Point is before the next drill.

Health & Safety

Everybody is responsible for Health and Safety. As a Cadet you must make sure that:

- You report any danger.
- You take care of yourself and others.
- You use any equipment in the way you have been trained.

You can also help by:

- Not place any items blocking fire exits or doorways.
- Turn off equipment when not in use.
- Knowing where your first aid kit is and who is your First Aider.
- Know where the fire exits and fire extinguishers are.

Who's, Who on Your Unit?

For your Squadron or Detached Flight to run well, there are several jobs that Staff and senior Cadets undertake. Some units may have more jobs, whilst some others will have less depending on size.

<i>Job</i>	<i>Rank</i>	<i>Name</i>
Commanding Officer		
↓		
Adjutant		
↓		
Training Officer		
↓		
Supply Officer		
↓		
Squadron Warrant Officer		
↓		
Instructor		
↓		
Instructor		
↓		
Instructor		
↓		
Instructor		
↓		
Senior Cadet NCO		
↓		
A Flight NCO		

ATC Ranks

The Air Training Corps, like most organizations, has its own special rules and code of behavior. As we're associated with the RAF, it is their rules and behavior which we use.

CADETS

So that we recognize the authority and amount of responsibility cadets have, they are promoted and given ranks when they show that they could be leaders.

The ranks are not commissioned, that is they are not confirmed by Her Majesty The Queen. They are therefore called non-commissioned officers or NCO's for short.













The lowest rank for an NCO is a Corporal. He or she wears two stripes - called chevrons - on each shoulder. Chevrons are 'v' shaped,

Next is a Sergeant who has three chevrons and the next promotion is to Flight Sergeant who wears three chevrons with a crown above them.

The highest rank a cadet can be promoted, to is a Cadet Warrant Officer, and he she does not wear any chevrons, but has a crown with a laurel wreath around it. This promotion is made by Corps Headquarters, all others are made at Squadron.

When addressing an NCO, cadets are to stand to ATTENTION and call them by their rank, i.e., 'Yes Corporal' or 'Is there anything else Flight Sergeant'.

ATC Ranks + Badges

Rank	Where + Who?	Rank Braid	Called?	Salute?
Air Commodore	HQAC CO			
Group Captain	Region CO			
Wing Commander	Wing CO			
Squadron Leader	Senior Wing Staff			
Flight Lieutenant	Unit CO or Wing Staff			
Flying Officer	Squadron Officer			
Pilot Officer	Squadron Officer			
Warrant Officer	Squadron's			
Civilian Instructor	Squadrons	<i>None</i>		
Cadet Warrant Officer	Squadrons			
Cadet Flight Sergeant	Squadrons			
Cadet Sergeant	Squadrons			
Cadet Corporal	Squadrons			

Classifications

Apart from the ranks which a cadet can attain, they can also be classified by their amount of knowledge of the Air Training Corps syllabus.

When a young person joins the ATC, they are called probationers. After a short period of training and success in a small exam, cadets are graded as Cadet Second Class.

From then on, a cadet is graded to a higher classification after successfully passing a series of examinations. The first examination, which is set at squadron level, will be taken at the end of the First Class Training. If successful, the cadet will be graded Cadet First Class. In recognition of this, a cadet will be presented with a STAR which is to be worn on the sash, on the right arm. This is an important classification. Until a cadet is graded First Class, he/she will not be allowed to go flying, gliding, annual camp or attend any visits to RAF stations.

The next grade is Leading Cadet and this is shown by the cadet wearing a "FOUR-BLADED PROPELLER WITH A STAR IN THE MIDDLE",




Finally, the highest technical grade a cadet can achieve is STAFF CADET. They can be recognized by the yellow coloured lanyard worn on their left shoulder, they wear no other badges apart from any NCO badges to which they may have been promoted.

The grades are therefore as follows -

PROBATIONER
CADET SECOND CLASS
CADET FIRST CLASS
LEADING CADET
SENIOR CADET
STAFF CADET

Leading, senior and staff cadet examinations are set at Headquarters Air Cadets.

ATC CLASSIFICATIONS

Level	Badge	Details
Second Class Cadet	None	
First Class Cadet		
Leading Cadet		
Senior Cadet		
Staff Cadet Part I	None	
Staff Cadet Part II		

Air Cadet Opportunities

As an Air Cadet the opportunities open to you are endless.

A few of these are shown below. Enter any other Squadron events in the spare spaces at the bottom. Complete the gaps to find out how to get involved.

Activity	Classification	Age
Flying		
Air Experience Flying		
Pilot Navigation Scheme		
Flying Scholarship		
Hang Gliding		
Microlight		
Gliding		
Gliding Induction Course		
Gliding Scholarship		
Advanced Gliding Training		
Adventure Training		
Squadron Activities		
NACATC Windermere		
NACATC Llanbedr		
Shooting		
Air Rifles		
Small Bore		
Full Bore		
ATC Marksman		
RAF Marksman		
Duke of Edinburgh's Award		
Bronze		
Silver		
Gold		
Academic		
BTEC Aviation Studies		
BTEC Public Services		
Camps		
UK Easter Camp		
UK Summer Camp		
Overseas Camp		
IACE		
Radio		
Provisional Operator		
Full Operator		

Leadership Courses		
Course I		
Course II		
Course III		
Other		
Junior Leaders		
Marine Courses		
Frimley Park Leadership		

SECURITY

Squadron Security

Security is mostly a matter of common sense. Every Cadet must play their part in looking after the unit's buildings and equipment.

Help your staff by reporting any problems, such as reporting damage such as broken windows.

Documents

As a Cadet you probably won't see any documents that require security. You may see magazines "for official use only" such as Aircraft Recognition or Aircraft Safety journals – this is OK as long as the information is kept to yourself and the Service and not discussed with others.

However, if you see any documents with the markings – Restricted or Confidential you should report these to your Staff, as they should be locked away.

Need to Know?

The best rule to remember as an Air Cadet is the "need to know" principle. Before passing on information about aircraft or aircraft movements, for example, think for a moment - does the other person need to know?

Visits to RAF Stations

All RAF Stations have Security Officers who maintain a high level of security of personnel, information and material. When visiting a Station you have a part to play with this.

Therefore, as an Air Cadet when visit RAF Stations, listen to the brief given to you and do as you are instructed. Especially do not take photographs unless you ask your escorting officer.

Lastly, if you ever see something that you think might be a threat to security – report it at once to a member of Staff.

RESPONSIBILITIES OF AN AIR CADET

The Air Training Corps is often seen as the public face of our parent organisation, the Royal Air Force – so it's very important that we behave in a responsible and appropriate way.

So that we all know the guidelines, we have a set of rules called Standing Orders, which lists what we can and cannot do.

Conduct

- All Cadets should behave in an airmanlike manner while on duty and travelling to and from home.
- Cadets should not cause damage to any equipment, furniture, building or vehicle. Any accidental damage should be reported to Staff.

Dress

- Cadets should always wear the correct uniform dress.
- Uniform and other ATC items should not be used at any other time than when on duty.
- Cadets should look after their uniform.

Leave of Absence

- Cadets should inform their staff in advance if they require leave of absence for holidays, study or other reasons.

Subscriptions

- Cadets should keep their subscriptions paid up to date.

Modes of Address

- All Officers, Warrant Officers and Civilian Instructors should be addressed as Sir or Ma'am. Furthermore Officers should be saluted.
- Cadet NCO's should be addressed by their Rank and Surname.

Security

- All visitors should be challenged and proof of identity requested. They should then be escorted to a member of Staff.

Record of Service Book

- Cadets are to use their Record of Service book (RAF F3822) for recording their progress through ATC activities. It is not to be used for any other purpose.

Why not find your Standing Orders to see if you have any different orders?

UNIFORM

The uniform is based on that worn by the Royal Air Force. Therefore, when you are in uniform, the general public will think that you are part of the RAF. They will also know that you are part of a large organization. They will also know to which Squadron you belong. They therefore judge the Squadron and the Corps on how you look and behave. The Squadron and the Corps are very proud of the good name it has throughout the town and the country. We expect you to uphold this good name.

You start off by wearing the uniform correctly. This means firstly that at all times it is to be kept clean and pressed. Demonstrations will be given on how to iron the uniform and clean your footwear.

WHEN WORN

You wear your uniform only at the following times:-

- (1) Going to and coming from parade nights,
- (2) When on parade.
- (3) When authorized by the CO for special meetings or outings.

You do NOT wear it on occasions which have nothing to do with the Air Training Corps.

HOW WORN

The only badges or decorations you can wear on the uniform are those permitted by the ATC. Girls who have pierced ears may only wear studs. Make-up, for girls, is to be kept to a minimum,

WHAT IS WORN

(See over for lists).

UNIFORM

Air Cadets are issued with over £250 of uniform and this should be worn and cleaned correctly.

Forms of Dress

You will find that you will have to wear different type of uniform for different purposes and at different times of the year.

Standard Dress

This is worn for most duties and features the working blue shirt.

In the summer it is worn without the jersey with the shirtsleeves rolled up.

Formal Dress

Formal dress features the Wedgewood Blue shirt and a tie. If it is worn without jersey, the sleeves are not to be rolled up.

Uniform Items

Headwear

The beret is worn with the ATC Badge over the left eye and the headband level, 25mm above the eyebrows. The loose material should be drawn to the right side of the head.

The beret can be occasionally dry cleaned but should never be washed, as it is pure wool. To ensure a long life the lining and label should not be removed.

Turbans may be worn by Sikh Cadets – provided the turban is of RAF Blue/Grey colour and worn with the ATC beret badge at the front.

Shirt

Cadets are issued with two shirts – a Working Blue shirt (dark blue) and a Wedgewood Blue shirt (light blue) that is worn for formal occasions with a black tie.

Shirts should be regularly washed and ironed with a steam iron.

Jersey

All Cadets wear the V Necked or Round necked Jersey as part of both normal working dress and with formal dress (with Wedgewood Blue shirt + tie).

Jerseys can be laundered but as they have high wool content care should be taken. After washing the elbow and shoulder patches should be ironed.

Trousers/Slacks

Cadets are issued with trousers made of wool/cotton mix.

They should fit comfortably around the waist, and be long enough so that the 2nd lace hole up the boot is just visible.

Trousers can be washed on a cool cycle but care must be taken when ironing, not to have the iron too hot, which results in a shiny appearance. Alternatively you can use a damp tea towel in between the iron and trousers.

Skirt

The hem of the skirt when worn should be 50-100mm below the centre of the knee.

Skirts can be washed on a cool cycle but care must be taken when ironing, not to have the iron too hot, which results in a shiny appearance. Alternatively you can use a damp tea towel in between the iron and skirt.

Shoes

Shoes are not normally issued for hygiene reasons.

Shoes or boots should be of a plain pattern, be clean and have a highly polished toe.

Polishing the toecap requires the careful application of polish with a soft cloth, and delicate, gentle polishing until the polish shines up. Application of moisture, either as spittle or water helps, but only a small amount; else you simply make a watery paste instead of polishing the shine on. A soft cloth or cotton wool is ideal for this. For cleaning the welt, the edge of the sole that 'sticks out' around the shoe, try using an old toothbrush.

Socks/Hosiery

Black or dark socks are to be worn with trousers and slacks.

With skirts Pretty Polly Barely Back (15 Denier) tights are to be worn.

Other Uniform Items Issued

- Foul Weather Jacket
- Coveralls
- Brassard

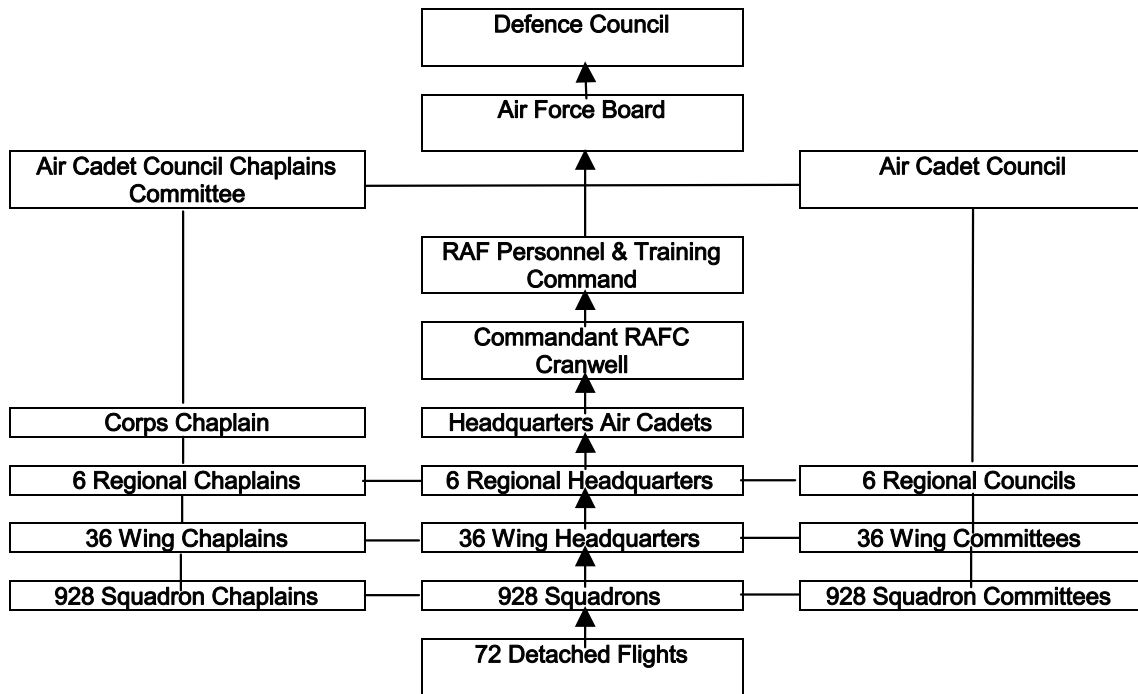
AIR TRAINING CORPS

ATC Organisation

The ATC is based on the most important unit – The Squadron or Detached Flight and the Cadets in them. We've already looked at who's, who on your unit and how things are organized – in this section we'll look at the rest of the Air Training Corps.

In total there are around 1,000 Squadrons and Detached Flights throughout the UK. There are also several overseas squadrons in Germany and Cyprus.

To support them, there is an organisation to help your Staff to offer a wide range of activities.



Squadrons

A Squadron should have a minimum of 30 Cadets.

The staff consists of Officers, Warrant Officers and Civilian Instructors – all of them are volunteers who run the Squadrons in the evenings and weekends.

Staff may assist them from local RAF Stations.

Detached Flights

A unit that cannot parade enough Cadets to be a Squadron can have a Detached Flight, which normally have around 15 Cadets.

The Detached Flight will report through a nearby Squadron.

Wings

Squadrons and Detached Flights within an area are grouped together into Wings – ours is Thames Valley Wing, which covers Oxfordshire and Berkshire and has 28 Squadrons and Detached Flights.

The Headquarters is at Abingdon on the edge of the ex RAF Airfield (now Dalton Barracks) and has a full-time staff of 3 - a Wing Administrative Officer (a Squadron Leader), an Administrative Officer and a Typist.

A Wing Commander commands the Wing and he has a team of Wing Staff who provide support to the Squadrons and Detached Flights. The Wing Commander and Wing Staff Officers are volunteers.

Regions

There are 6 Regions which each consists of six Wings.

Our Region is South-West Region and has its Headquarters at Devizes. Its Wings cover from Cornwall up to Gloucester and across to Berkshire and Hampshire.

The Regions are commanded by a full-time staff of a Commandant (a Group Captain), a Region Administrative Officer (a Squadron Leader), an Administrative Officer, a Typist and a Driver.

They are assisted by volunteer Regional Staffs Officer to cover aspects such as Gliding, Adventure Training, etc.

Headquarters Air Cadets (HQAC)

Based at RAF College Cranwell, Headquarters Air Cadets (HQAC) is responsible for the running of the Air Training Corps and RAF Sections of the Combined Cadet Force (CCF) – together these are called the Air Cadet Organisation (ACO).

The HQ is manned by a large full time team headed up by The Commandant (an Air Commodore) and The Chief of Staff (a Group Captain). Their staffs manage all of the different areas – flying, gliding, shooting, adventure training, etc

Air Commodore in Chief



HRH Prince Philip, The Duke of Edinburgh has been the Air Commodore in Chief of the Air Training Corps since 1953.

Although this is a mainly ceremonial role, The Duke of Edinburgh is very active in supporting the Corps.

Civilian Committees

All Squadrons, Wings and Regions are supported by Civilian Committees. Their job is to look after the Welfare of the Cadets and Staff, raise money for activities not funded by the RAF and to help raise the profile of the ATC.

Civilian Committees always welcome Parents and Guardians to the their meetings.

Padres

All Squadrons, Wings, Region and Corps have Padres to look after the spiritual welfare of everybody in the ATC.

Squadron Padres will often be seen in action organising Padre's hours where the Padre and Cadets will talk about issues important to them.

Volunteer Gliding Schools (VGS)

There are 27 Gliding Schools nationwide providing Gliding Induction Course and Gliding Scholarships.

Volunteers (headed up by a Squadron Leader) run the school at weekends and school holidays.

Air Experience Flights (AEF)

There are 13 Air Experience Flights nationwide who provide flying experience for Cadets. The aircraft are supplied from a local University Air Squadron pool.

The staff is made up from serving and retired RAF Pilots and headed up by a full-time Squadron Leader.

ATC HISTORY

The ATC can trace its roots right back to 1938. In this section we will see how the ATC has developed since then.

Aims

The aims of the ATC are:

- *To promote and encourage among young people a practical interest in aviation and the Royal Air Force.*
- *To provide training that will be useful both in the Services and in civilian life.*
- *To foster the spirit of adventure, and to develop the qualities of leadership and good citizenship.*

Motto



The motto of the Air Training Corps is "Venture Adventure".

This is shown on the Corps Crest and Corps Banner. Note that the banner also features the Duke of Edinburgh's Cipher, as HRH is our Air Commodore in Chief.

The Early Days

Before World War II, in 1938, The Air League of Great Britain decided to form a youth organisation for aviation minded young men. They called it the Air Defence Cadet Corps (ADCC).

The founder of the ADCC was Air Commodore Chamier – today we call him the father of the ATC.

In the next 3 years over 200 Squadrons were formed.

Each Squadron's aim was to prepare Cadets for joining the RAF or Fleet Air Arm by giving them as much Service and aviation background as possible, as well as giving instruction in drill, discipline and how to behave on RAF Stations.

Founding of the ATC

The government saw that the ADCC was becoming very successful and thought it would be a useful pre-service organisation for young men joining the Royal Air Force and the Royal Naval Air Service (RNAS).

Therefore on February 5th 1941 the Air Training Corps was born with King George VI agreeing to be Air Commodore in Chief and issuing a Royal Warrant setting out the Corp's aims.

In honour of the efforts of the early Squadrons of the ADCC the first 50 Squadrons were called founder Squadrons and were allowed to use the letter "F" after their Squadron number.

During the war Cadets were used to carry messages, help with clerical duties, helped handle aircraft and moving stores and equipment. They also filled thousands of sandbags and loaded miles of belts of ammunition.



Post War

Following the end of the war in 1945 the ATC got down to work in its peacetime role and the strength reduced to around 30,000 Cadets.



In addition to developing the gliding training undertaken during the war, dedicated Air Experience Flying in two seater Chipmunk Aircraft was also introduced and the Duke of Edinburgh's award was first offered to Cadets.

The Corps was presented with it's first banner on 5th February 1962 to marks its 21st Birthday by HRH Duke of Edinburgh who had been the Air Commodore in Chief since the death of His Majesty George VI.

Reorganisation

In 1967 it was decided to see if the ATC could be better organised for a Post War society.

The Morris report recommended many changes to the Corps and it's training. As a result, Staff Cadet training, Project Training and Adventure Training were introduced.

Girls Arrive

In 1980 the first Girls were allowed to join the ATC. These girls took up the ATC Challenge and by 1981 they were flying solo in gliders, gaining marksman badges and taking part in the Duke of Edinburgh's Award.

The ATC Today

Over 60 years on from that idea by Air Commodore Chamier the ATC still finds itself strong and active. It has, of course, changed considerably from those early days but still captures the imagination and enthusiasm for aviation and the Royal Air Force amongst young people.



RAF HISTORY

In this Section we will look at how the Royal Air Force was formed and how it has developed over time.

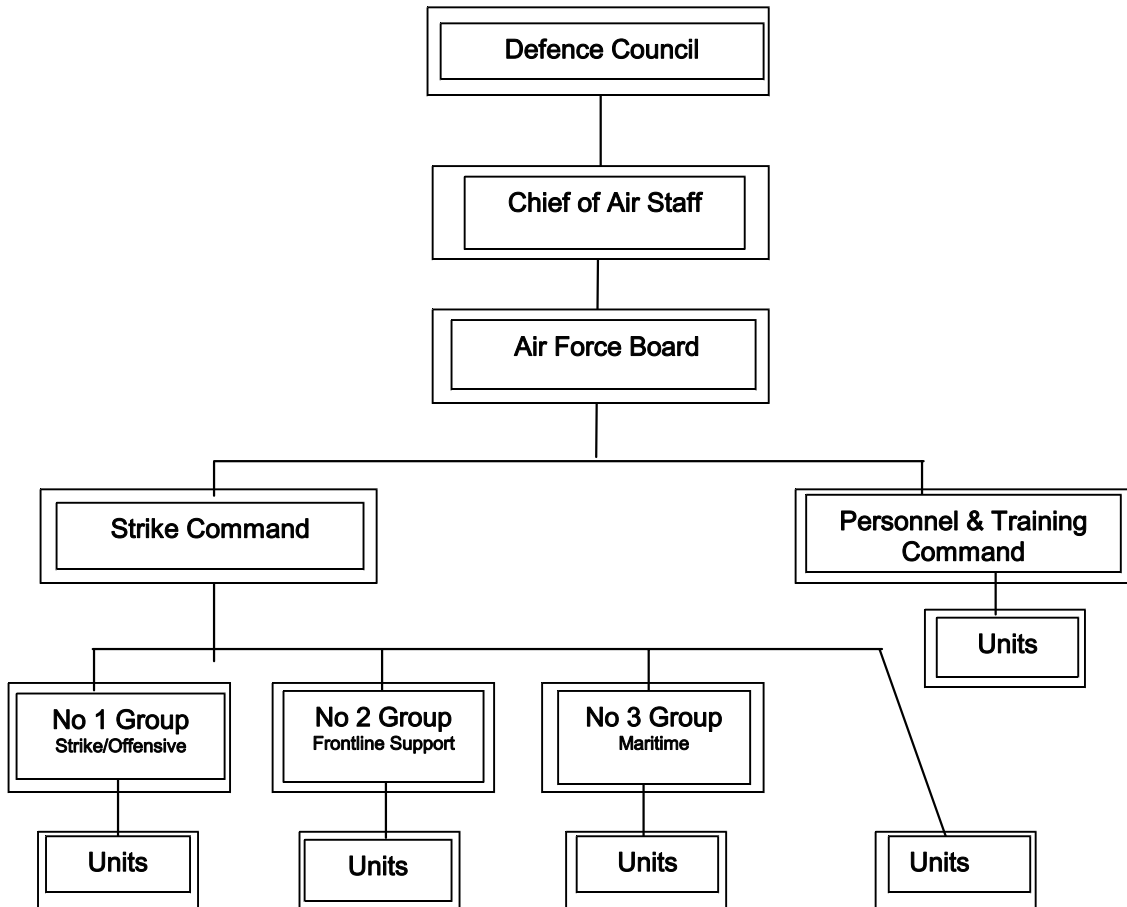
May 1912	Royal Flying Corps (RFC) was formed. The aircraft were unarmed and were intended for use for reconnaissance sorties.
June 1914	Royal Naval Air Service (RNAS) was formed to support naval operations because of the special problems this posed.
1914	World War One. When Germans started shooting down reconnaissance aircraft, they were fitted with guns to protect themselves – this was the birth of the Fighter aircraft
1916	As a result of German Zeppelin (Airship) raids it was realised that aircraft could also be used for bombing and both the RFC and RNAS commenced bombing raids
1 st April 1918	Royal Air Force (RAF) formed from RFC and RNAS
November 1918	The end of World War One saw the RAF with 190 Squadrons and 190,000 men under Lord Trenchard (the father of the RAF).
1920	Strength had dropped to 30 Squadrons and 25,000 men. Government decides to concentrate on building up a solid training organisation to allow for future expansion if required.
1920	RAF College Cranwell formed to training Officer Cadets.
1922	School of Apprentice Training founded at RAF Halton for the training of highly skilled aircraft engineers
1922	RAF Staff College formed at Andover to train senior Officers for command.
1925	Auxiliary Air Force formed.
1927,29 + 31	RAF wins Schneider Trophy for the fastest aircraft with speed ranging from 281 to 341 MPH. From these aircraft the Spitfire was born.
1935	RADAR (Radio Detection And Ranging) radio detection system invented.
1936	Introduction of Commands – Fighter, Bomber, Coastal and Training – to meet with the expansion of the RAF.
1937	Royal Navy took control of the RNAS
1939	World War Two starts – peak RAF strength is 1,100,000 men)
July 1940	Battle of Britain – RAF successful in overturning Luftwaffe (German Air Force) attacks against overwhelming odds (600 British to a 1,000 German fighters)
1945	World War II ends
	Canberra – the worlds first jet bomber enters service
1956	The Comet – the worlds first jet transport aircraft enters service
1956	Vickers Valiant drops first British nuclear weapon. Until 1970 RAF responsible for nuclear deterrent with the V Force – Valiants, Victors and Vulcans
1960	The Lightning – the RAF's first Mach 2 jet fighter introduced and the development of a aerial tanker force with Valiant aircraft
1969	The Harrier – the worlds first Vertical and Short Take Off and Landing (V/STOL) aircraft
1982	Falklands War – RAF uses Vulcan bombers to bomb Argentineans from Ascension Island using Air to Air refueling – the longest bombing mission of air power
1990	Gulf War – rapid response by Tornado's, which were in theatre within 50 hours. Accurate bombing utilised – 90% of all bombs fell within 5 Feet of target.
1999	Kosovo – RAF supports operations
2000	RAF Strength at 53,000
2000	Joint Force 2000 introduced – RN Sea Harriers + RAF Harriers operating together.

RAF ORGANISATION

Any large organisation like the Royal Air Force must be well organised to cope with all the tasks asked of it. In this section will see how the RAF is organised from the highest levels right down to Squadron level.

Family Tree

The Prime Minister and Cabinet hold supreme responsibility for national defence and the policies the country should follow. They exercise control through the Defence Council of which the Secretary of State for Defence is Chairman.



RAF Commands

There are two Commands in today's Royal Air Force:

Strike Command

From its Headquarters at RAF High Wycombe, Strike Command controls all of the RAF's offensive and defensive operations worldwide.

Overseas units include Falkland Islands, Ascension Island, Cyprus and Gibraltar as well as administering the Tornado Training Unit at Goose bay in Canada.

Within the command there are three Groups:

No 1 Group	No 2 Group	No 3 Group
Strike attack and offensive support including Fighters, Bombers, Tactical Transport	Supports frontline operations with Air Transport, Air to Air Refueling, Airborne Early Warning, RAF Regiment	Maritime elements including Joint Force Harrier, Maritime Patrol, SAR Helicopters, Mountain Rescue Teams

Personnel & Training Command

Based at RAF Insworth Personnel and Training Command (PTC) manages all aspects of recruiting, training, career management, welfare, conditions of service, resettlement and pensions together with some Supply and Engineering functions.

Within HQ PTC is the RAF Training Group Agency, which is responsible for both The Red Arrows and Headquarters Air Cadets amongst nine other RAF Stations and other minor units elsewhere.

RAF Units and Stations

The organisation of all RAF Stations follows the same basic pattern and is organised into three Wings (Commanded by Wing Commanders) which report to the Station Commander (normally a Group Captain):

Operations	Engineering	Administrative
Flying, Operations, Air Traffic Control	Aircraft, Electrical, Mechanical	Training, Supply, Catering, Police, Estate, RAF Regiment, Physical Education, Medical, Accounts, Personnel Services, etc

HISTORY OF FLIGHT

Background

As you move through this section you will see how aviation has developed from the Hot Air Balloon to today's Eurofighter.

However, first, we'll look at the development of lighter-than-air aircraft before we move onto heavier-than-air aircraft later.

Lighter Than Air

The history of lighter than air flight is a recent one and can only be traced back for around 200 years.

The first types of flight were in balloons and airships.

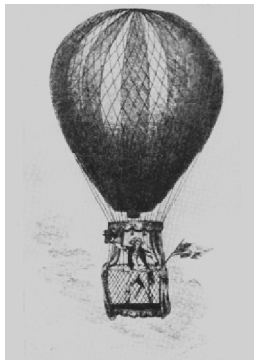
They fly because they displace their own volume producing an upthrust. A balloon the size of a house would contain about ½ tonnes of gas and would displace about 4 tonnes of air.

Balloon Flight

Although we have dreamed of flying for many years it was not until 1783 that the Montgolfier brothers built a hot air balloon with a 12 metre (39 foot) diameter and powered by hot air from a fire built at the launch site.

The balloon managed to climb to a height of 305 metres (1000 feet) before the hot air inside the balloon cooled and it began to descend.

Later that year the first human flight took place, remaining airborne for 25 minutes and travelling a distance of some 9 Kilometres (6 miles).



However the Montgolfier balloon was soon obsolete and replaced by a more practical balloon filled with Hydrogen instead made by J Charles.

Together with a helper Charles made a 43 Kilometre (27 mile) flight from Paris, which was witnessed by over 400,000 people.

His design was such a good one that it is very similar to modern gas filled balloons, which now use non-flammable Helium instead

Hot Air Balloons

Most modern balloons are hot air balloons.

Heating up the air inside them causes it to expand and become less dense – this produces lift.

The air is heated using large propane containers attached below the open neck of the balloon and can also be ignited in short bursts whilst in flight to maintain or gain height.

To lose height a vent in the top of the balloon releases the hot air.



Airships

The problem with hot air balloons is that they are not easily navigable as only the wind and the earth's rotation carries them along.

To overcome this, around 100 years after Montgolfier's first flight, the first airship designs were produced.

Engines were attached to provide forward motion and rudders attached to provide control.

In the early 1900's airships became a very popular form of air travel. They were quiet and comfortable. They were also used for military, scientific and freighting duties.



Unfortunately because they were filled with flammable hydrogen gas they were dangerous. There were many airship accidents and finally when the passenger airship Hindenberg burst into flames in 1937 many people lost confidence in them.

Today airships are making a revival and are filled with safe helium gas instead.

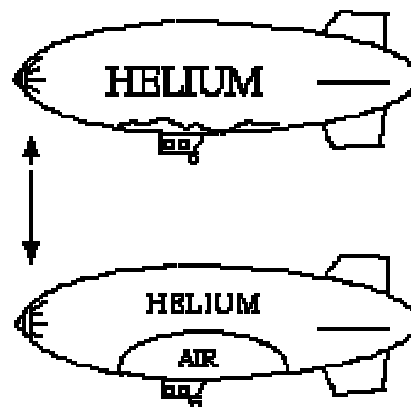


How are Airships controlled?

Inside the airship are two inflatable air bags called baloonets. Inflating or deflating these allows the airship to rise or descend.

To rise, air is released from the baloonets reducing the weight of the airship and allowing the helium to expand, giving more lift.

To descend, air is forced into the baloonets. This increases the weight of the airship and compresses the helium gas so that lift is reduced.

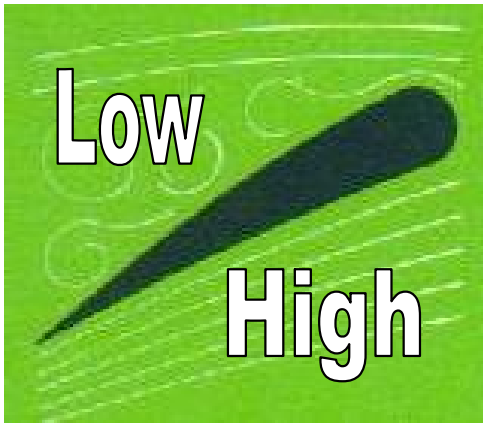
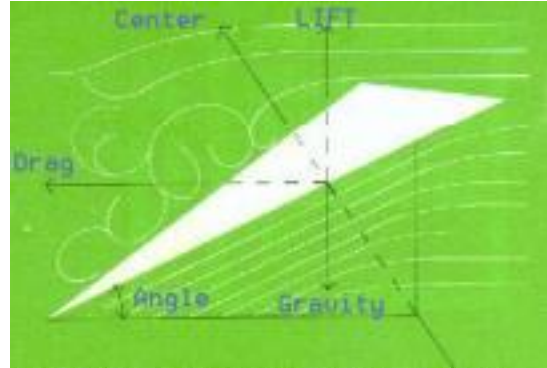


Heavier-than-air flight

Kites

The simplest form of heavier than air flight is the kite.

The kite flies because of its shape, its tail and the way the string is attached. Together these make sure the kite flies at the correct angle to the wind.



The weight of the kite is balanced by the force of the wind beneath and by lift caused by the kite's shape. Lift is produced by the wind passing over the top of the kite creating a low pressure and by the air underneath being at a higher pressure – the kite lifts up.

A kite can produce a lot of lift and some kites have been built large enough to carry a military observer.

Gliders

The problem with kite is that it is connected to the ground by a line.

Therefore, in 1804 Sir George Cayley built the first model glider. It was little more than a broomstick with a kite mounted at one end and vertical and horizontal tail surfaces at the other end. It was capable of stable flight over many metres.

From this humble beginning Cayley produced a glider that could carry a small boy.

Powered Flight

Powered flight needs an engine that is light, reliable and good power to weight ratio.

In 1848 John Stringfellow successfully flew a 6 Metre (10 foot) model powered by a tiny steam engine across a large room.

Attempts to make larger versions of steam powered aircraft failed.

In the meantime aviators experimented with lightweight construction and practical methods of controlling flight.

One of these was a German – Otto Lilenthal who built the forerunners of today's hang-gliders.



In 1885, another German, Gottlieb Daimler developed the first single cylinder combustion engine which produced a power to weight far superior to any other engine.

On 17th December 1903 the American brothers Orville and Wilbur Wright flew a full 120 feet in their powered aircraft "The Flyer". By the end of that first day they had flown 260 metres (852 feet).

This was the first time that man had been airborne and in control of a heavier than air aircraft.



Powered flight developed quickly until on 25th July 1909 a Frenchman – Louis Bleriot flew across the English Channel landing at Dover in Kent after a 37-minute flight in his Bleriot Type X1 monoplane.

World War One

With the start of WW1 in 1914, the latest version of the Bleriot saw itself in action as an observation aircraft.

However, both sides quickly started arming their aircraft leading the development of specialist fighter aircraft such as the Sopwith Camel (shown here) and specialist bombers such as the Vickers Vimy.



Schneider Trophy



Between the wars a competition was started for the quickest aircraft. The forerunner of the Spitfire (the Supermarine SB6) won the trophy outright when it came first three years in succession.

Airliners

In the 1930's the development of specialised airliners made great strides. This led to air travel becoming more accessible to the masses.



World War Two



WW2 once again accelerated the development of aircraft design. This included the use of the Merlin engine in The Spitfire and Hurricane and the development of the jet engine.

Jet Propulsion



The development of the jet engine led to aircraft such as the Canberra – the world's first jet bomber.

Another development was the Comet – the world's first jet powered airliner.



Today



Recent developments have seen the world-class fighter Eurofighter "Typhoon" which will shortly entering RAF service.

Also, airliners continue develop – proposed designs include this double-decker Airbus.



BASIC FOOT DRILL

Drill is a mandatory feature of all stages of the Air Training Corps syllabus of training, and it is important to develop and maintain a high standard in drill deportment and personal appearance in all personnel,

ATTENTION

The position of attention is a very often required. It is a position of alertness, without being stiff or strained, in readiness for a word of command. the muscles of the body are therefore to be controlled but breathing is not to be restrained and no part of the body is to be held rigid the position is little more than simply standing upright and still.

It is a position of balance with the weight of the body on both feet, evenly distributed between the fore-part of the feet and the heels and carried. evenly over the thighs,

The position can be assumed voluntarily (when required) and is to be assumed on command. The cautionary word of command is ATTEN - and the executive part is TION (pronounced "SHUN"). Thus on the executive word of command

ATTEN - TION

- (a) Bend the left knee, bring the left foot smartly in to the right, without stamping, so that the heels ate together and in line, The toes of the feet are turned outwards at an a ngle of 45 degrees.
- (b) The body an neck are to be brought erect, knees straight, head straight, chin drawn in, and the eyes looking straight ahead,
- (c) The shoulders (which are to be level and square to ' the front) are to be drawn downwards and backwards without strain and stiffness so as to bring the chest to its natural position,
- (d) The arms are to be straightened with straight wrists and brought to the sides with the palm hands turned towards the sides with foyers lightly dawned, km thumbs in. front touching the forefingers so that the thumbs and tips of the fingers rest lightly on the thighs with the thumb on the side seam of the trouser or skirt.

STANDING AT EASE

This is a more common position. It is often taken up voluntarily for example when falling in an parade individuals are to stand at ease after taking up their dressing. But more often than not it will be assumed on command, the command being given from the position, of attention. The cautionary word of command is - STAND AT - and the executive word is - EASE. It is more relaxed than the attention, but is still a drill movement and you must stand still having taken up the position,

On the word of command

- EASE

- (a) Bend the left Knee and place the foot smartly on the ground 3 cm (12in) to the left of the right foot.
- (b) At the same time, the hands are to be placed behind the back, the back of the right hand in the palm of the left hand with the thumbs crossed right over left
- (a) The arms are to hang easily to their full extent,

STANDING EASY

Ws is the position in which the limbs, head and hand may be moved, but not the feet: if the feet are moved whilst in formation. the dressing may be lost, It is a position in which you can relax. No slouching, talking or unnecessary movement. Feet will be placed 3 ' (12in) apart. You will assume this position from the At Ease and will be assumed on command.

The above movements sound lengthy and complex but when practiced they are easily assumed and become a matter of habit.

These are the very basic of foot drill movements. Time permitting you will be taught turns to the left and right, about turn, and final dismissal procedures.

SALUTING

It is a tradition in the services for commissioned officers to be saluted. Saluting is a form of greeting and it started in the days of old when knights greeted each other by raising their right arms to show that they were not carrying a weapon and therefore they came in peace. the Red Indians did the same and everybody knows their greeting

HOW

Nowadays, all cadets and NCO's salute commissioned officers when they approach or leave them, Amongst officers, they will salute officers of higher rank. Saluting is now a form of showing respect for the Queen whose authority (or commission) the officer holds, The higher the rank, the greater the authority,

To show the proper respect, the cadet must be properly dressed and wearing a hat. The officer will always acknowledge the salute but if he is not fully dressed, e.g. no hat, he will not salute back. You must however, unless told otherwise, salute the officer even when he is not in uniform.

Cadets and NCO's will also salute officers of the Army and the Royal Navy in the same manner as with an RAF Officer. in addition, officers of all other nations' armed forces are to be accorded the usual courtesies.

When passing an officer in the street, you will salute as you walk past, turning your head and eyes in the direction of the officer,

If there are a number of cadets in a party, only one person salutes, the others do an eyes right or eyes left . Decide who will salute as you approach. It is usually the senior person who salutes.

You will get plenty of practice in saluting and it is an important part of the practical side of your training.

DRILL**Why Drill?**

Drill helps us to have self-discipline and to work as a team.

Probationer Drill Test

Below is the drill standard that you will need to meet at the end of your Probationer Training.

<u>WORDS OF COMMAND</u>	<u>POINTS TO LOOK FOR</u>
<u>Squad Shun</u>	Correct Position. Smart, alert. correct knee-lift. Feet 45 °,heels together.
<u>Stand at Ease</u>	Head erect. Hands crossed, feet correctly placed; alert.
<u>Squad Shun</u>	Correct Position. Smart, alert. correct knee-lift. Feet 45 °,heels together
<u>Right Turn</u>	Hands not moving. Correct feet pivoting. Correct knee-lift.
<u>About Turn</u>	Hands not moving. Correct feet pivoting. Correct knee-lift
<u>Left Turn</u>	Hands not moving. Correct feet pivoting. Correct knee-lift
<u>About Turn</u>	Hands not moving. Correct feet pivoting. Correct knee-lift
<u>Open order March</u>	No arm swing. Correct distance. Correct direction.
<u>Right incline</u>	Hands not moving. Correct feet pivoting. Correct knee-lift
<u>To the front Salute</u>	Position of hand at salute. Timing. Smooth, smart arm swing.
<u>To the right Salute</u>	Position of hand at salute. Timing. Smooth, smart arm swing
<u>Left incline</u>	Hands not moving. Correct feet pivoting. Correct knee-lift
<u>Close order March</u>	No arm swing. Correct distance. Correct direction.
<u>Right Turn</u>	Hands not moving. Correct feet pivoting. Correct knee-lift
<u>3 paces step forwards March</u>	No arm swing. Correct distance. Correct timing. Halt at Attention.
<u>3 paces left close March</u>	No arm swing. Correct distance & direction. Timing. Knee-lift.
<u>About Turn</u>	Hands not moving. Correct feet pivoting. Correct knee-lift
<u>3 paces step forwards March</u>	No arm swing. Correct distance. Correct timing. Halt at Attention
<u>Right Turn</u>	Hands not moving. Correct feet pivoting. Correct knee-lift
<u>Left Turn</u>	Hands not moving. Correct feet pivoting. Correct knee-lift
<u>Stand at Ease</u>	Head erect. Hands crossed, feet correctly placed; alert.

Marching Section

To pass your First-Class Training, you will also be required to complete this marching section:

<u>By the left quick March</u>	Left-foot lead. 120ppm. Correct height arm swing. No tick-tocking
<u>Squad Halt</u>	Arm swinging until stop; @ position of attention.
<u>By the Left quick March</u>	Left-foot lead. 120ppm. Correct height arm swing. No tick-tocking
<u>To the right Salute</u>	Check pace; salute for five paces; head & eyes turned. Smart.
<u>About Turn</u>	Check pace; three pace turn to right, arm swinging on step off.
<u>Change direction right Wheel</u>	Inside man stepping short, outside man stepping out. 6 paces.
<u>Change direction left Wheel</u>	Inside man stepping short, outside man stepping out. 6 paces.
<u>Squad Halt</u>	Arm swinging until stop; @ position of attention.