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WEAPONRY AND MATERIEL OF THE BRITISH ARMED FORCES

Учебное пособие

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The textbook *Weaponry and Materiel of the British Armed Forces* is a continuation of the cycle of textbooks for the practical course of military translation (English). The textbook is designed for teaching learners undergoing military studies in the specialization 'Linguistic support of military activity' with a level of English at Upper Intermediate (B2) or above.

The textbook consists of 19 units, each of which contains a unit dictionary, introductory exercises, main text and a range of language and translation exercises.

The study materials in the textbook offer a wide range of opportunities to prepare for paragraph-phrase interpreting, consecutive interpreting, written translation and summarizing of foreign-language texts. As a result of using the textbook, learners will gain a wide-ranging understanding of the main types of weaponry and materiel of the British Armed Forces and their current state, and also significantly improve their knowledge of terminology necessary for working in the military-industrial sphere.

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Lesson 1.

Fundamentals of Small Arms Weapons

ACTIVE TERMS AND EXPRESSIONS

small arms (SA)	стрелковое оружие
cycle of operation	рабочий цикл
cartridge	патрон
case	гильза
bullet	пуля
powder charge	пороховой заряд
primer	капсюль
shoulder weapon	ручное оружие с прикладом
hand weapon	ручное оружие без приклада
machine gun	пулемёт
tripod	треножный станок
barrel	ствол, канал ствола
breech end	казённая часть
chamber	патронник
chambering	досылание патрона
bolt	затвор
receiver	ствольная коробка
lug	выступ
notch	выемка, паз
locking	запирание канала ствола
stop	упор
handle	рукоять
rod	стержень
firing pin	ударник
spring	пружина
cocking	взведение
tang	зубец
block	блок
latch	защёлка
sear	шептало
to pivot	поворачиваться, качаться

trigger	спусковой крючок
firing mechanism	ударно-спусковой механизм (УСМ)
hammer	курок
muzzle	дуло, дульный срез ствола
unlocking	отпирание канала ствола
extraction	извлечение стреляной гильзы
extractor	выбрасыватель
ejection	извлечение стреляной гильзы из ствольной коробки
chambering	досылание патрона
feeding	питание, подача патронов
clip	обойма
ammunition belt	патронная лента
magazine	магазин

INTRODUCTORY EXERCISES

I. Найдите в тексте эквиваленты словосочетаний:

Устанавливаться на наземных транспортных средствах и летательных аппаратах; помещаться в канал ствола; добавлять выступ на боковой части затвора; запираение канала ствола; добавить рукоять; продвинуть ударник вперёд; установить крючок или зубец на заднюю часть ударника; добавить к ствольной коробке блок; по форме напоминать защёлку; возвращаться в первоначальное положение; использоваться в большинстве образцов стрелкового оружия; упираться в поддерживающий выступ; покидать канал ствола через дульный срез; отпирание канала ствола; нажимать на спусковой крючок; извлечение стреляной гильзы из патронника; входить в выступ и извлекать гильзу из ствольной коробки; подача боеприпаса.

II. Найдите в тексте и переведите словосочетания:

to be placed in the barrel and fired; to fasten a lug to the side of the bolt; to prevent the bolt from sliding out of the receiver; to put a hook or tang on the rear end of the firing pin; to pivot back and forth; to be

cocked simply by opening and closing the bolt; to send the bullet out through the muzzle; to strike the case and eject it; placing the cartridge in the chamber; securing the bolt in place behind the cartridge; squeezing the trigger so the firing pin will fire the cartridge.

TEXT

Cycle of operation

This is a cartridge – the type of ammunition used in most small arms. It consists of a metal case, a bullet, a powder charge to drive the bullet, and a primer at the base to start the powder burning. A sharp tap with a pointed instrument will explode the primer, ignite the powder charge and drive out the bullet. To control this powerful explosion and direct the bullet toward the target is the purpose of all small arms weapons. The term small arms includes shoulder weapons, hand weapons, machine guns mounted on ground tripods and vehicles and planes. Some are comparatively simple, others are complex, but there is a basic similarity which runs through them all. Since they all fire the same type of ammunition, they all function in the same general way. In all of them a cartridge is placed in the barrel and fired. The empty case is then removed to make room for the next cartridge. This process is called the cycle of operation, and every small arms weapon contains the mechanical means of performing it.

To explain this cycle, let's construct a model weapon. It will not resemble any particular weapon, but it will include all of the basic features needed to perform the various individual steps in the cycle of operation. We'll start with the barrel. Removing the top half of the barrel we can see inside.

In the breech end is the chamber. This is where the cartridge fits and where the explosion occurs. Placing the cartridge in the chamber is known as chambering. A sharp tap on the primer would explode the powder charge and drive the bullet out. The same explosion would also drive the case backward out of the chamber. Therefore, the cartridge case must be held in the chamber, so most of the explosion will propel the bullet.

The part which backs up the cartridge is usually known as the bolt. One end of this bolt fits against the rear of the cartridge and holds the case in place when it's fired. In order to hold the bolt in position we need something to support it. The barrel too must be held in position. The piece supporting them is known as the receiver. There is a channel in which the bolt can slide. The barrel is attached to the front end. With this side section removed from the receiver and the bolt back we can still chamber a cartridge by moving the bolt forward. This takes care of the first step of the cycle of operation – chambering. Instead of depending entirely on weight of the bolt to hold in the case when the cartridge is fired, we'll use some way of locking the bolt in place.

The simplest way of locking is to fasten a lug to the side of the bolt. A notch is caught in the side of the receiver. When we close the bolt we can turn it so the lug fits into the notch and the bolt is securely locked. This is the second step of the cycle of operation – locking.

It can be made easier by adding a handle to move the bolt. The handle can also be used to strike this stop. This prevents the bolt from sliding out of the receiver. With the bolt closed, how are we going to fire the cartridge? To fire the cartridge we must strike the primer, however the bolt is in the way. Apparently, we'll have to go through it. This bolt was prepared for that, the top half can be removed. It has a channel running through its entire length. All that is needed is a rod to reach from one end to the other. This rod is called the firing pin.

You'll notice that it is slightly longer than the bolt, so its point will extend a little beyond the face of the bolt. We can now strike the primer by driving the firing pin forward. One way to drive the firing pin is by using a spring. We've put the spring around the firing pin with one end against this stop, the other end is braced against this shoulder in the bolt. Now when we pull back the firing pin, the spring is compressed. When we release the pin, the spring drives it forward against the primer.

This is one way of accomplishing the step known as firing. However, it's awkward to pull back the pin and release it by hand each time we want to fire. We need a means of holding the pin back until we're ready

to fire. This is known as cocking. Supposing we put a hook or tang on the rear end of the firing pin. We can still pull the pin back and release it by hand. Now we'll rig up something to hook it onto, but first we'll have to add a block to the receiver to hold the parts we'll need.

The first part is a latch like piece known as the sear. If we hold it here under the firing pin, we can catch the tang of the pin when it's drawn back. We'll mount the sear on this pin so that it will pivot freely. We can release the firing pin by pushing down the front or nose of the sear.

This is where the trigger comes in. It's mounted on this pin underneath the sear. The trigger can now pivot back and forth. When the trigger is squeezed, it moves the rear end of the sear up, the nose of the sear moves down and the firing pin is released. Once the sear is lowered, we have to move it back up to catch the firing pin the next time it's pulled back. That's why we need a spring – a sear spring – to push the sear up. It's installed underneath the sear. Now when we squeeze the trigger, we lower the nose of the sear until it releases the firing pin. Then, when we let go the trigger, the spring raises the sear nose so it will catch the firing pin when it comes back. The spring also returns the trigger to its original position. We no longer have to cut the firing pin by hand. As the bolt is opened, we can cock the weapon at the same time. The firing pin tang cams the nose of the sear down and the sear snaps back up. As the bolt moves forward, the sear catches the tang and holds it, and the piece is ready to fire. That takes care of the step known as cocking.

Now we have a basic firing mechanism similar to that used in a number of small arms weapons. But there is also another kind of firing mechanism. Some weapons use a hammer which strikes the firing pin. We will build this hammer type of firing mechanism on the model. First let's attach the hammer so it can pivot and strike the firing pin. The spring was taken from around the firing pin to drive the hammer. The firing pin is retracted by various methods in different weapons and it remains in the rear position until the weapon is fired. To guide the spring, a rod is run through it the front end of the spring is braced against this shoulder. The rear end of the spring is braced against this

supporting block. The rod is attached to the hammer so that the spring pushes against the hammer. When the hammer is pulled back, the spring is compressed. Then the spring drives the hammer forward against the firing pin. To cock this firing mechanism, we can use the same sear, trigger and sear spring that we used before. When the hammer is pulled back, the sear snaps up into this notch and the weapon is cocked. When the trigger is squeezed, the nose of the sear slips out of the notch and the hammer is driven forward against the firing pin. This mechanism like the other one can be cocked simply by opening and closing the bolt.

Squeezing the trigger fires the cartridge and sends the bullet out through the muzzle, but it also leaves us with an empty case in the chamber. Before we can get at the case, we have to perform the next step in the cycle of operation – unlocking. We still have the problem of removing the empty case from the chamber. This is known as extraction. On a real weapon, extraction is a serious problem. When a cartridge is fired, the case expands until it is tightly wedged in the chamber. We need something to grip the case firmly and extract it when we open the bolt. The part which does this job is known as the extractor. It has a hook to grip the extracting groove in the head of the cartridge case. The extractor is attached to the front end of the bolt. As the bolt is closed, the extractor snaps into the extracting groove in the head of the case, and it retains its grip as the bolt is locked. Now when we open the bolt, the extractor pulls the case out of the chamber. Our next problem is ejection – getting the empty case out of the receiver. Notice how the case is held by the extractor. If we pry under the case on the side opposite the extractor, we can eject it from the receiver. If we take a slice off the edge of the bolt, we can get at the case more easily. Now we will build an ejector in the side of the receiver. It consists of a small lever and a spring. We will attach the lever so it pivots at one end, with the other end held outward by the spring. When we push the bolt forward, the ejector is moved into the side of the receiver. When the case is extracted, the ejector slides into the notch, strikes the case and ejects it.

Let's watch it again. Our weapon is almost complete, but we still have to feed the cartridges to it one at time by hand. The actual chambering of the cartridge is satisfactory. The bolt moves it forward and it enters the chamber. But once the weapon is fired and the empty case ejected, we want another cartridge waiting ready to be chambered. In other words, we want some method of feeding. There are several ways we can get feeding: 1) by placing a clip of cartridges in the receiver, 2) by using an ammunition belt, 3) or by using a magazine. We will use a magazine. One side is transparent so we can see what's going on. Inside is a spring and this follower. As the cartridge is put in from the top, the spring is compressed. As the next round is inserted, the first one is pushed down and the spring is further compressed. The spring, of course, keeps pushing the cartridges against the top. But these lips prevent them from being pushed out. A cartridge can be removed only by sliding it forward like this, and once it is removed, the spring feeds the next one into the position. Now let's install the magazine into the receiver.

The magazine is placed so that the top cartridge pushes against the underside of the bolt. When the bolt is opened, it slides back until the face of the bolt clears the rear of the cartridge. Then the cartridge is fed up into the path of the bolt. As the bolt comes forward, it strips the cartridge from the magazine and chambers it, and the spring in the magazine moves the next cartridge up into position. Now each time the bolt is opened, a cartridge is waiting to be chambered. That's the last step in the cycle of operation – feeding. Our basic weapon is complete. It will perform all eight steps of the cycle of operation. Let's take them in sequence:

1. First there's chambering: placing the cartridge in the chamber.
2. Next is locking: securing the bolt in place behind the cartridge;
3. Then – firing: squeezing the trigger so the firing pin will fire the cartridge.
4. Unlocking: freeing the bolt from the barrel.
5. Next: extraction and ejection, withdrawing and throwing out the empty case.

6. At the same time – cocking: preparing the firing mechanism to fire again.

7. And feeding: placing the next round in position for chambering.

Then the cycle starts over again. These are the eight steps any small-arms weapon must perform each time it fires a cartridge. The steps may not always come in exactly the same order and the means of performing them may vary. But regardless of the type of weapon, all eight steps will be performed. And once you know the cycle of operation, you've come a long way toward understanding any small arms weapon.

Ссылка на видео:

https://www.youtube.com/watch?v=HJnhr08aIJs&ab_channel=MadMaxTrac

III. Ответьте на вопросы:

1. What is a cartridge?
2. What weapons does the term 'small arms' include?
3. What is chambering?
4. What is locking?
5. What is firing?
6. What is unlocking?
7. What is extraction and ejection?
8. What is cocking?
9. What is feeding?

IV. Подберите определения к терминам:

extraction	placing the cartridge in the chamber
ejection	throwing out the empty case
feeding	preparing the firing mechanism to fire again
unlocking	securing the bolt in place behind the cartridge
cocking	withdrawing the empty case
firing	freeing the bolt from the barrel
chambering	squeezing the trigger so the firing pin will fire the cartridge
locking	placing the next round in position for chambering

V. Переведите письменно. Значение неизвестных вам терминов выясните по словарю:

Патрон для большинства образцов стрелкового оружия состоит из металлической гильзы, пули, порохового заряда, который толкает пулю; а также капсюля в донной части гильзы для воспламенения порохового заряда. С помощью бойка происходит накалывание капсюля, в результате чего воспламеняется пороховой заряд.

Предназначением стрелкового оружия является управление энергией взрыва и направление пули в сторону цели. Под термином стрелковое оружие подразумевается ручное оружие с прикладом или без него, а также станковые пулеметы. Поскольку в них используется одинаковый тип боеприпасов, конструкция всех образцов стрелкового оружия достаточно похожа. Во всех образцах стрелкового оружия патрон помещается в канал ствола, после чего производится выстрел. Затем извлекается пустая гильза, для досылания нового патрона. После досылания патрона в патронник, путем накалывания капсюля при помощи ударника, происходит воспламенение порохового заряда, который выталкивает пулю. Энергия пороховых газов также выталкивает гильзу в обратном направлении из патронника. Деталь, которая удерживает патрон в патроннике, называется затвором. Передняя часть затвора фиксирует гильзу в момент выстрела.

Принцип работы любого образца стрелкового оружия включает в себя следующие 8 этапов рабочего цикла: 1) досылание патрона в патронник; 2) запираение канала ствола: фиксация затвора в переднем положении; 3) выстрел: нажатие спускового крючка, накалывание капсюля ударником; 4) отпирание канала ствола; 5) извлечение и выбрасывание стреляной гильзы с отводом затвора назад; 6) одновременно с этим происходит взведение: подготовка ударно-спускового механизма к очередному выстрелу; 7) подача боеприпаса: подача патрона для дальнейшего досылания. После этого рабочий цикл повторяется заново.

VI. Расскажите по-английски об основных этапах рабочего цикла огнестрельного оружия.

Lesson 2.

Ballistics, Part 1

ACTIVE TERMS AND EXPRESSIONS

ballistics	баллистика
interior ballistics	внутренняя баллистика
exterior ballistics	внешняя баллистика
terminal ballistics	баллистика конечных скоростей
projectile	снаряд
howitzer	гаубица
mortar	миномёт
propellant	метательный заряд ВВ
recoil	отдача (откат)
velocity	скорость
powder	порох
grain	зерно
degressive grain	дегрессивное зерно
progressive grain	прогрессивное зерно
tube-shaped grain	трубчатое зерно
powder sheets	пороховая нарезка, пучки пороха
liquid propellants	жидкое горючее
cannonball	пушечное ядро
to streamline	придавать обтекаемую (аэродинамическую) форму
fins	стабилизаторы (оперение)
to spin	вращаться по продольной оси
tumbling	кувыркание
drift	отклонение
grooves	канавки
drag	сопротивление воздуха
soft rotating band	поясок из мягкого металла
wind shield	баллистический наконечник аэродинамической формы
boat-tailing	запоясная (задняя) часть конической формы

INTRODUCTORY EXERCISES

I. Найдите в тексте эквиваленты словосочетаний:

Приводиться в движение реактивным двигателем, движение снаряда в полёте, воздействие боеприпаса на цель, выталкивать продукты сгорания из камеры сгорания, резкий импульс давления очень короткого действия, увеличиваться с меньшей скоростью, приводить к быстрому снижению давления, получать равномерный разгон, значительный выброс дульного пламени, обеспечивать мощный краткосрочный импульс, смешивать в необходимой пропорции для обеспечения постоянного горения, стабилизировать снаряд в полёте.

II. Найдите в тексте и переведите словосочетания:

To get the desired tactical results, to exert an equal force to the left to propel the rocket, to use the rocket principle, to drop off rapidly, to give the projectile a steady push, to be best suited to the weapon concern, to burn a suitable charge of progressive grains, to assure constant burning, to assume a particular tactical purpose, to overcome air resistance, to have the projectile spin, allow for the drift and aiming.

TEXT BALLISTICS, PART 1

Ballistics is an increasingly important and complex science, that deals with the technical problems involved in hitting a given target in a field and getting the desired tactical results. Sometimes the ammunition we need to do a particular job can be carried to the target or placed in the target's path. Sometimes it can be dropped on the target, but in most cases, it has to be fired or propelled. This involves the solution of the three different kinds of problems, which are covered by three closely related divisions of ballistics. Interior ballistics is concerned with the launching of the ammunition. Exterior ballistics is concerned with behavior in flight. And terminal ballistics deals with the action of ammunition at the target.

Let's look first at the problems involved in launching our ammunition with launching devices that are complex, precision made instruments, but operate on a principle as simple as that employed in a peashooter. When the pressure behind the projectile becomes strong enough, the projectile will move. In any gun, howitzer, mortar or small-arms weapon the pressure behind the projectile is caused by the burning of the propelling charge or propellant, which forms a tremendous amount of gas in the chamber. This pressure is measured in thousands of pounds per square inch and is exerted equally on all surrounding surfaces but with different results. The forces represented by the vertical arrows have no effect on the projectile. The pressure, or force to the right, is against the projectile, the most readily moveable of the surrounding surfaces, and sends it out of the bore. At the same time, the force to the left is against the gun, which moves in recoil.

By making a few changes in our simplified gun, we can see what happens when we launch a rocket. In effect, the lightweight rocket replaces the gun, and the lightweight gas replaces the projectile. The pressure inside, being equal in all directions, forces the gas out of the chamber at an extremely high velocity. At the same time, the pressure exerts an equal force to the left to propel the rocket.

Military rockets operate on exactly the same principle as the fourth of July variety, the bazooka also uses the rocket principle while the recoilless rifle is a combination gun and rocket. The propellant used in guns and most rockets is some form of nitrocellulose, commonly called powder.

Modern powder is made in grains, the grains taking many different forms to get the various pressures needed in the many different modern weapons. Apart from chemical composition, grain size is the most important single factor in determining how rapidly a powder charge will burn. Just as wood shavings will burn more rapidly than the same way of logs, because there's more burning surface exposed, so well small grains burn more rapidly than a large grain of the same weight. When small rapidly burning grains are used, the propelling effect is that

of a sharp sudden thrust. The effect we get from large grains is that of a sustained push, but grain design also affects the rate of burning. In general, there are three types of grains: a large grain with seven holes, a medium sized grain with one hole, and a small solid grain, called a degressive grain. When ignited inside a gun, it burns fast, and the pressure rises rapidly. As the burning surface decreases, pressure is generated at a slower rate.

Here's a graph to show pressure action during burning. The degressive grain produces a very high pressure quickly, but the movement of the projectile tends to let the pressure drop off rapidly.

The medium sized grain with a single hole is called a neutral grain. In this form of grain, the burning is slower at first, but the burning surface remains constant during the burning period. Thus the maximum pressure is not as high as with the degressive type, nor does the pressure drop off as sharply when the projectile moves. The large grain with the seven lengthwise holes is called a progressive grain. Here the burning surface increases due to the number of holes. The pressure produced is not as high as with the others, but it falls off even less rapidly as the projectile moves. This grain is preferred in modern high velocity weapons because it gives the projectile a steady push, produces higher muzzle velocities, and has a lower maximum pressure than is possible with other types of grains.

There are many other grain designs; the fast-burning powder sheets for mortars, for example, neutral tube-shaped grains for certain types of rockets, as well as a variety of other kinds, each designed to provide the particular burning characteristics, best suited to the weapon concern. Now let's see what kind of pressure action we need for different guns. When we burn a suitable charge of progressive grains, the pressure is moderate, and sustained, sending the projectile out of the bore with a continuous push. This kind of pressure action is just what we need to get high velocity in long-barreled artillery. But now we'll see what happens when we use the same charge in a short-barreled weapon. There's considerable muzzle flash and the powder continuous burning, even after the projectile has left the

bore, indicating that energy is being wasted. For a short-barreled weapon, a small degressive grain should be used. This builds up maximum pressure quickly to accelerate the projectile in a short space without undue burning afterward. This kind of pressure action is just what we want for low velocity weapons, such as mortars or pistols. But if we use degressive grains in a long-barreled gun, there's a chance that the higher maximum pressure produced will blow it up. For a rocket, we need a low, steady pressure, so we use a special neutral grain. The low pressure will not burst the lightweight rocket, yet give smooth acceleration. For the V2 and other large rockets, it's better to use certain liquid propellants, mixing them at a constant rate to assure constant burning.

In all cases, the propellant must assume a particular tactical purpose. That means providing the desired velocity with a minimum of smoke, flash, and wear on the weapon. Interior ballistics is a highly complicated science. And what you've seen isn't the whole story by any means, but you do know what an important part pressure plays in launching the projectiles. You know something of the effects of grain size and design on gas pressure. And you know the relative burning action of the progressive and other types of grain. In other words, you've got a good idea of why and how a projectile leaves home. Now you're ready to consider exterior ballistics. Exterior ballistics is concerned with the behavior of projectiles in flight.

If we could fire a cannonball influenced by no outside forces, it would continue forever in its original direction at its original velocity. If we add the force of gravity, the cannonball follows this sort of path or "trajectory". By adding air resistance, we get this result, and the range is shortened even more. To overcome air resistance and get greater range, we might streamline our cannonball, stretching it into a projectile. But look what happens, our projectile tumbles and the range is shorter than ever. We need something to stabilize our projectile in flight. One solution is to equip the projector with fins. The use of fins, solves the problem very effectively for mortars and some types of rockets, and the result is much greater range.

Having the projectile spin is another solution to the tumbling problem. This, however, causes the projectile to swirl from a straight course, drifting to one side, according to the direction of the spin. That isn't as bad as it might seem, because we know what's going to happen, and we allow for the drift and aiming. To get the required spin, spiral grooves are cut in the bore of a gun and a soft rotating band, put around the projectile. The band engages the groove, and the projectile rotates, or spins. Although there are many forces affecting the projectile, the most important to remember are gravity, which pulls the projectile down and drag due to air resistance, which slows the projectile.

There's nothing we can do about gravity, but we can overcome the effects of drag to some extent in the design of our projectiles. For instance, by the streamlined wind shield on this one. Boat-tailing is another method of streamlining also helps to reduce drag. For long-range fire we must consider in addition to gravity and drag: the effects of varying density of the air, the temperature of the air, winds over the trajectory and the rotation of the Earth. The basic problem of the exterior ballistics is always the same – to study, improve and predict the behavior of projectiles or missiles in flight. Solution of the problem involves the knowledge of many complex forces, the application of many scientific principles, the use of many ingenious lightning fast computing machines. The ultimate purpose of all of these is to design projectiles and compute firing tables both of such accuracy that our combat units get the maximum number of direct hits.

III. Ответьте на вопросы:

1. What is ballistics?
2. What is the basic principle of firing a weapon?
3. What does the size of powder grain affect?
4. What is interior ballistics?
5. What is exterior ballistics?
6. What is terminal ballistics?
7. What are the types of gunpowder grain?

8. What is the most important single factor in determining how rapidly a powder charge will burn?
9. What are the ways to streamline a projectile?

IV. Переведите письменно:

Предметом изучения трех разделов баллистики являются три вида проблем, связанных между собой. Внутренняя баллистика изучает явления, происходящие в канале ствола (пусковой установки) во время выстрела. Предметом внешней баллистики является движение снаряда (пули) в полете. Баллистика конечных скоростей изучает воздействие боеприпаса на цель.

Любой образец вооружения (пусковых установок) представляет собой достаточно сложное техническое устройство, требующее точной обработки при изготовлении. В любом образце стрелкового вооружения, миномете, гаубице или пушке, необходимое давление создается путем горения метательного заряда взрывчатого вещества в зарядной камере (гильзе). Данное давление действует на снаряд и выталкивает его из канала ствола. Предназначением метательного заряда является придание боеприпасу необходимой скорости, при минимальном износе оружия и наименьшем возможном выбросе дыма и пламени.

Метательное ВВ, используемое в артиллерийских (стрелковых) боеприпасах, является одним из разновидностей оружейного пороха. Размер зерен является наиболее значимым фактором определения скорости горения пороха. Мелкозернистый порох горит быстрее, чем такое же количество крупнозернистого пороха. При использовании мелких, быстро горящих зерен, получается резкий импульс давления очень короткого действия. При сжигании крупных зерен, возникает плавная равномерная движущая сила, при этом форма зерен также влияет на скорость горения. Существует три основных вида пороховых зерен – крупные зерна с семью отверстиями, зерна среднего размера с одним отверстием и мелкие твердые зерна.

Из-за силы притяжения, снаряд движется по дуге, называемой траекторией. Дальность полета снаряда падает, помимо силы притяжения, также из-за сопротивления воздуха. Стабилизация снаряда в полете достигается путем установки на снаряд стабилизаторов (оперения), а также придания снаряду вращения вокруг продольной оси. Для этого, в канале ствола нарезаются специальные канавки, а на снаряд надевается специальный пояс из мягкого металла, который деформируясь от нарезок, придает снаряду необходимое вращение.

V. Составьте устный доклад на английском языке на тему «Основные положения внутренней и внешней баллистики».

Lesson 3. Ballistics, Part 2

ACTIVE TERMS AND EXPRESSIONS

terminal ballistics	баллистика конечных скоростей
projectile	снаряд
bomb	авиабомба
warhead	боевая часть ракеты
mine	мина (миномётный снаряд)
grenade	граната
blast	ударная (взрывная) волна
fragmentation	осколочное действие
fragments	осколки
incendiary projectiles	зажигательные боеприпасы
bomb clusters	кассетные авиабомбы
fuse	взрыватель
time fuse	взрыватель с часовым механизмом
high explosive (HE)	(бризантное) взрывчатое вещество
proximity fuse	дистанционный (неконтактный) взрыватель
reinforced concrete	железобетон
tough-nosed armor piercing projectile	бронебойный снаряд с укрепленной носовой частью
pillbox	укрытие
interior ballistics	специалист по внешней баллистике

INTRODUCTORY EXERCISES

I. Найдите в тексте эквиваленты словосочетаний:

С максимальной экономией средств, повреждать или разрушать кирпичные и бетонные сооружения, использовать снаряд с высокой начальной скоростью и укрепленной носовой частью без

взрывчатого вещества внутри, выдерживать необходимые пропорции между толщиной стенок снаряда и зарядом ВВ, разлетаться на сотни летящих осколков, оставлять рваные неровные отверстия, наносить значительный ущерб личному составу, вызывать пожары, действовать в момент контакта с целью, располагать в головной части снаряда, срабатывать автоматически при приближении боеприпаса к цели.

II. Найдите в тексте и переведите словосочетания:

To provide different basic effects, to start fires to cause great damage in a city, to go off automatically when it's near the target, to penetrate without breaking up, to have a short delay action after impact, to provide with the proper destructive potentialities at the target.

TEXT BALLISTICS, PART 2

And that is where terminal ballistics comes in. In terminal ballistics, we are concerned with what happens at the target, with the problem of getting the type of action we want for each different kind of target by the most economical practicable means. Our projectiles, bombs, warheads, mines, grenades and so forth are designed to provide different basic effects. By using a large amount of high explosive, we get an effect called blast making use of violently expanding gases under tremendous pressure. Blast shatters brittle masonry or concrete. It will also twist and tear the metal construction of buildings and vehicles. Yes, penetration is the important thing. We can use high velocity projectiles with a tough nose and little or no explosive. This sort of projectile will penetrate wood, stone and up to several inches of steel.

By using certain proportions between the weight of the explosive and the thickness of the projectile, we can get fragmentation. Our projectile of bomb breaks up into hundreds of flying fragments. They penetrate like bullets, but leave more jagged, irregular holes. Fragments from bursting shells can do severe damage to personnel and to light structures such as this plane.

Finally, by using incendiary projectiles or bomb clusters, we can start fires to cause great damage in a city or in a structure, or in area where large quantities of supplies are stored. Generally speaking, each type of action will be effective against one particular type of target, but a combination will be even more effective – so our projectiles and bombs are usually designed with such combination in mind. Now to time or control the action of the projectile at the target. We use different types of fuses. Some of our fuses act on impact either instantly or after a short delay. Time fuses act to set time after launching, proximity fuses when they get near the target. Fuse's location is also important - in certain cases we'll get the best results by placing the fuse at the front end of the projectile. In other cases, it works better in the base. Bomb fuses are sometimes placed on the side, and in the larger bombs more than one fuse is necessary. The fuse type and fuse location determine to a large extent the type of action we get at the target.

Now let's consider a typical application of these fundamentals of terminal ballistics in dealing with an enemy plane. Fragmentation is the effect we want. Besides endangering personnel in the plane, flying fragments can wreck the engines, weaken structural members, and may penetrate the fuel tanks, generating enough heat to start a fire. The shell to do this particular job must carry enough High Explosive to shatter the shell case and produce high velocity fragments of the most effective size. Now, what about the fuse for this job. We might use a time fuse. But our best bet will be a fuse of the proximity type, one that will go off automatically when it's near the target.

If we're dealing with an armoured target, one of reinforced concrete, the first problem is to penetrate, so we need a tough-nosed armor piercing projectile that will be strong enough to withstand an impact, one that will penetrate without breaking up. Fragmentation is effective after penetration, so a small explosive charge is added. In this case, the fuse must be placed in a base of the projectile and should have a short delay action after impact. The combined effect of penetration and fragmentation gaps both the pillbox and its occupant. If we don't have

high velocity, we can get penetration by sharply focusing the force of the explosion. This is done by the proper shaping of a high-explosive charge. It is up to the terminal ballistics to determine from his experience and his experiments which combination of effects will be destructive of each kind of target.

And there are other elements to be considered by the terminal ballistics. In all cases, the ammunition he prescribes must be suitable for mass production. It must also be safe to handle, transport and store. Technically, it must present no impossible problems in any phase of ballistics. The first concern of the interior ballistics is the safe and successful launching of the ammunition. The important point to the exterior ballistics is predicting its behavior in flight. By means of firing tables this information is passed on to the appropriate using units, they, in turn, must launch the ammunition with the full confidence that the terminal ballistics has provided it with the proper destructive potentialities at the target.

III. Ответьте на вопросы:

1. What is the focus of terminal ballistics?
2. What is blast?
3. How can we get fragmentation?
4. What types of fuses do you know?
5. What additional elements of ammunition need to be considered by a terminal ballistics?

IV. Переведите письменно:

Баллистика конечных скоростей изучает воздействие боеприпаса на цель. Выбор наиболее эффективного способа поражения цели, позволяет добиться максимальной экономии средств. Различные боеприпасы Используют различное поражающее действие. При подрыве взрывчатого вещества возникает эффект ударной (взрывной) волны, которая разрушает кирпичные и бетонные сооружения и транспортные средства. Снаряд с высокой начальной скоростью и

укрепленной носовой частью без взрывчатого вещества внутри способен пробить деревянные и каменные сооружения, а также металлические конструкции. Осколочный боеприпас при подрыве разрывается на сотни летящих осколков, которые могут нанести значительный ущерб как личному составу, так и небронированным объектам. Каждый поражающий эффект наиболее эффективен против определенного типа целей.

В различных боеприпасах применяются различные типы взрывателей. Взрыватели ударного типа действуют в момент контакта с целью. Взрыватели с часовым механизмом используются для подрыва через определенный промежуток времени, дистанционные (неконтактные) взрыватели – для подрыва боеприпаса при приближении к цели. Расположение и тип взрывателя в большой степени определяет эффективность поражения цели.

Для поражения укрепленной цели, первоочередной задачей является пробитие, поэтому необходимо использовать бронебойный снаряд. Но в такой снаряд помещается небольшой заряд взрывчатого вещества. Комбинированное бронебойно-осколочное действие поражает как само укрытие, так и личный состав, находящийся внутри. При отсутствии возможности придать снаряду высокую начальную скорость, можно пробить броню при помощи кумулятивного эффекта. Данный эффект достигается приданием заряду взрывчатого вещества в боеприпасе необходимой формы. Во всех случаях, первоочередной задачей внутренней баллистики является расчет параметров успешного запуска (выстрела) боеприпаса. Исследования в области внешней баллистики позволяют предугадать поведение снаряда (пули) в полете. В виде таблиц стрельбы эта информация доводится непосредственно до огневых подразделений, которые используют именно те типы боеприпасов, которые, согласно выкладкам баллистики конечных скоростей, обеспечивает необходимое поражающее действие на конкретную цель.

V. Составьте устный доклад на английском языке на тему «Основные положения баллистики конечных скоростей».

Lesson 4.

British Small Arms Weapons, Part I

ACTIVE TERMS AND EXPRESSIONS

assault rifle	штурмовая винтовка
selective fire rifle	автоматическая винтовка с переводчиком огня
gas-operated	устроенный по принципу использования энергии пороховых газов
bullpup configuration	схема компоновки «булл-пап» (ударный механизм и магазин расположены в прикладе)
short-barreled carbine	короткоствольная винтовка
powder gases	пороховые газы
short-stroke	с коротким ходом
gas piston	газовый поршень
gas regulator	газовый переключатель
rotating cylindrical bolt	поворотный затвор
locking spline	запирающий клин
extractor	выбрасывающий механизм
casing ejector	окно для выброса гильз
cam stud	кулачковый механизм
helical camming guide	винтовой направляющий паз
bolt carrier	затворная рама
trigger group	спусковой механизм
pistol grip	пистолетная рукоятка
cocking handle	рукоятка взведения затвора
receiver	ствольная коробка
hammer-firing mechanism	курковый ударный механизм
fire selector lever	переводчик огня
safety catch	предохранитель
cross bolt type safety	предохранитель запирающего типа
slotted flash suppressor	щелевой пламегаситель
blank-firing adaptor	устройство для стрельбы холостыми

	патронами
bayonet	штык-нож
magazine release button	рычаг отсоединения магазина
magazine housing	приёмник магазина
buttpad	затыльник приклада
cheek rest	щека приклада
Picatinny railed handguard	ствольная накладка с планкой Пикатинни
optical sight	оптический прицел
iron sight	механический прицел
illuminated aiming pointer	лазерный целеуказатель
die-cast aluminium body	литой алюминиевый корпус
rear aperture	прицел
front blade; blade foresight	мушка
windage	поправка на ветер
holding and opening device	затворная задержка
dust cover	пылезащитные колпачок
Sights Unit Small Arms, Trilux (SUSAT)	оптический прицел SUSAT
trigger mechanism housing (TMH)	спусковая коробка
TMH pin	направляющий стержень возвратной пружины
barrel	ствол
top cover	крышка ствольной коробки
trigger guard	спусковая скоба
hand guard	ствольная накладка
muzzle	дульный срез

INTRODUCTORY EXERCISES

I. Подберите эквиваленты терминов:

selective fire, gas-operated, bullpup configuration, three-position adjustable gas regulator short-stroke gas piston, rotating cylindrical bolt, cam stud, helical camming guide, radially mounted locking splines, forward-mounted pistol grip.

II. Дополните английские эквиваленты, используя приведенные ниже слова и словосочетания:

использовать пороховые газы, отводимые через отверстие в канале ствола — ... ignited powder gases bled through a port in the barrel; — ставить в тактически невыгодное положение — ... to a tactical disadvantage; оставлять незащищённым большую часть тела — ... the majority of the body; не допускать воздействия пороховых газов на газовый поршень — ... any gas from reaching the piston; позволять вести одиночную стрельбу — ... semi-automatic fire; предотвращать случайный выстрел — ... accidental firing; блокировать движение спускового крючка — ...the movement of the trigger; быть оснащённым механическими прицельными приспособлениями — ...with fixed iron sights; располагаться внутри рукоятки для переноски — ...inside the carrying handle.

to use; to give rise; to prevent (x2); to enable; to block; to expose; to serve; to be configured; to be housed.

TEXT
SA80

The SA80 (Small Arms for the 1980s) is a British family of 5.56mm small arms. It is a selective fire, gas-operated assault rifle. Elements of its design, in particular the bullpup configuration, come from the earlier EM-2 rifle. The first prototypes were trialed in 1976 and production ended in 1994. It is due to remain in service until 2025.

The L85 rifle variant of the SA80 family has been the standard issue service rifle of the British Armed Forces since 1987, replacing the L1A1 variant of the FN FAL. The improved L85A2 remains in service today. The remainder of the family comprises the L86 Light Support Weapon, the short-barrelled L22 carbine and the L98 Cadet rifle.

SA80 was the last in a long line of British weapons (including the Lee-Enfield family) to come from the national arms development and production facility at Enfield Lock.

Operating mechanism

With the exception of the L98A1, the SA80 system is a selective fire gas-operated design that uses ignited powder gases bled through a port in the barrel to provide the weapon's automation. The rifle uses a short-stroke gas piston system located above the barrel, which is fed gas through a three-position adjustable gas regulator. The first gas setting is used for normal operations, the second is for use in difficult environmental conditions, while the third setting prevents any gas from reaching the piston and is used to launch rifle grenades. The weapon uses a rotating cylindrical bolt that contains 7 radially mounted locking splines, an extractor and casing ejector. The bolt's rotation is controlled by a cam stud that slides inside a helical camming guide machined into the bolt carrier.

Features

The family is built in a bullpup layout (the action is behind the trigger group), with a forward-mounted pistol grip. The main advantage of this type of arrangement is the overall compactness of the weapon, which can be achieved without compromising the barrel length, hence the overall length of the L85 rifle is shorter than a carbine, but the barrel length is that of an assault rifle. However, the adoption of this layout also means the rifle must be used exclusively right-handed since the ejection port and cocking handle (which reciprocates during firing) are on the right side of the receiver, making aimed fire from the left shoulder impossible. This can also give rise to a tactical disadvantage when firing around the left of cover, where the shooter must expose the majority of their body.

The SA80 family is hammer-fired and has a trigger mechanism with a fire-control selector that enables semi-automatic fire and fully automatic fire (the fire selector lever is located at the left side of the receiver, just aft of the magazine). A cross bolt type safety prevents accidental firing and is located above the trigger; the "safe" setting blocks the movement of the trigger.

The L85 rifle features a barrel with a slotted flash suppressor, which also serves as a mounting base for attaching and launching rifle grenades, attaching a blank-firing adaptor or a bayonet.

The weapon's receiver is made from stamped sheet steel, reinforced with welded and riveted machined steel inserts. Synthetics were also used (i.e. the handguards, pistol grip, butt pad and cheek rest were all fabricated from nylon). A Picatinny-railed handguard was also developed for the type.

Sights

Rifles used by the Royal Marines, British Army infantry soldiers (and other soldiers with a dismounted close combat role) and the RAF Regiment are equipped with a SUSAT (Sight Unit Small Arms, Trilux) optical sight, with a fixed 4x magnification and an illuminated aiming pointer powered by a variable tritium light source (as of 2006 almost all British Army personnel deployed on operations have been issued SUSATs). Mounted on the SUSAT's one-piece pressure die-cast aluminium body are a set of back-up iron sights that consist of a front blade and small rear aperture. Rifles used with other branches of the armed forces when not on operations are configured with fixed iron sights, consisting of a flip rear aperture housed inside the carrying handle and a forward post vertical blade foresight, installed on a bracket above the gas block. The rear sight can be adjusted for windage, and the foresight – elevation. In place of the SUSAT a passive night vision CWS scope can be used, and also – independent of the SUSAT – a laser pointer.

III. Ответьте на вопросы:

1. What kind of a weapon is the SA80?
2. What types of operating mechanism does the SA80 utilize?
 1. What is the distinctive feature of the SA80?
 2. What are the disadvantages of the SA80 layout?
 3. What sights does the SA80 rifle have?

IV. Используя схему, назовите составные части штурмовой винтовки L85 на русском языке:



- 1 – rear TMH pin; 2 – cheek piece; 3 – dust cover; 4 – SUSAT;
 5 – cocking handle; 6 – top cover; 7 – hand guard; 8 – muzzle;
 9 – barrel; 10 – trigger guard; 11 – trigger; 12 – safety catch; 13 – pistol
 grip; 14 – front TMH pin; 15 – 30-round magazine; 16 – magazine housing;
 17 – holding and opening device; 18 – butt piece

V. Переведите письменно:

Автоматическая винтовка L85

Автоматическая винтовка L85 (калибр 5.56 мм, полное наименование – L85A2) относится к классу индивидуального стрелкового оружия. Ее более поздняя модификация (A2) состоит на вооружении британской армии.

Для ведения боевых действий винтовка, как правило, оснащается лазерным целеуказателем типа LLM01. Кроме того, на нее может устанавливаться 40-мм подствольный гранатомет типа L123A2: в таком случае общий вес винтовки увеличивается на 1.49 кг. Магазин предыдущей модификации L85A1 был выполнен из алюминия, что делало его недостаточно надежным. На сегодня существует три типа магазинов, которыми снаряжается винтовка L85A2: новейший из них Magpul EMAG выполнен из пластика, предыдущие – из стали и нержавеющей стали. Первый и основной тип используется для боевых патронов, в то время как остальные два – для ведения холостой стрельбы. На магазинах, предназначенных для холостых патронов, присутствует соответствующая маркировка в виде желтых полос, которая запрещает их снаряжение боевыми патронами. Кроме того, из-за разницы в длине магазин для холостой стрельбы невозможно снарядить боевыми патронами.

Начиная с 2007 года, проводится оснащение отдельных частей и подразделений перспективными образцами оптических оружейных прицелов, в частности ствольной накладкой с направляющей Пикатинни (дополнительной рукоятью или сошкой), а также новым вихревым пламегасителем.

VI. Переведите письменно:

Стрелковое оружие

Стрелковое, т.е. огнестрельное оружие калибром менее 14,5, подразделяется на ручное (личное) огнестрельное оружие и огнестрельное оружие с прикладом.

Ручное оружие предназначено для ведения огня с одной руки на малые дистанции. Существует два его основных вида. Первый – это автоматический пистолет. Это название некорректно, т.к. на самом деле оружие является полуавтоматическим или самозарядным, стреляя один раз, после нажатия спускового крючка. Вторым видом является револьвер, оборудованный поворотным барабаном, в котором помещаются патроны.

Основным личным оружием СВ Великобритании является автоматический пистолет, калибром 9 мм, L131A1. Он состоит из трех основных частей: рамки, ствола и кожуха-затвора. Рукоятка полая, для размещения внутри обоймы на 17 патронов.

Оружие, огонь из которого ведется с упором в плечо (оружие с прикладом) включает в себя винтовки, карабины, пистолеты-пулеметы, автоматы и пулеметы.

Штурмовая винтовка из линейки SA-80, под индексом L85 поступила на вооружение ВС Великобритании в 19878, заменив вариант бельгийской штурмовой винтовки FN FAL под индексом L1A1. В настоящее время на вооружении состоит модернизированный вариант L85A2. Другими образцами линейки являются легкий пулемет L86, укороченный карабин L22 и учебная винтовка L98.

Пулеметы предназначены для поддержки пехоты в обороне и наступлении огнем высокой плотности и точности, которые недоступны для индивидуального стрелкового оружия. Определение «пулемет» широко используется для многих образцов оружия, включая легкие, средние и многоцелевые пулеметы. Пулемет является автоматическим оружием, как правило, действующим на основе принципа отвода пороховых газов, с воздушным охлаждением и ленточным питанием. Боеприпасы подаются в пулемет при помощи гибкой многозвенной металлической ленты. Огонь может вестись с сошек, треноги, либо во время атаки с упором в плечо или бедро. Оружие имеет сменный ствол.

VII. Переведите письменно:

Ручные гранаты

При ведении боевых действий, пехотинцу необходимо оружие для того, чтобы выбивать противника с позиций и ДОС. Таким оружием являются ручные гранаты. Они используются для поражения живой силы противника, маскировки (задымления), как сигнальные средства, для зажигательного эффекта и борьбы с беспорядками. Они классифицируются на осветительные, осколочные, наступательные, химические и учебные. Все существующие типы гранат имеют схожие характеристики – малую дальность (броска) и небольшой радиус поражения. Основными составными частями гранаты являются: корпус, заряд ВВ и запал. Заряд ВВ, либо ОВ располагается внутри корпуса. Он определяет назначение и боевые свойства гранаты. Запал является устройством, с помощью которого осуществляется подрыв гранаты.

Lesson 5.

British Small Arms Weapons, Part II

ACTIVE TERMS AND EXPRESSIONS

sidearm	личное оружие
ergonomics	эргономика
recoil system	система отдачи
short recoil-operated	использования отдачи при коротком ходе ствола
field strip	неполная разборка
front sight	мушка
rear sight	целик
double-stack	двухрядный коробчатый магазин
backstraps	задние пластины рукояти
magazine catch	кнопка защёлки магазина
recoil spring	возвратная пружина
trigger pull	усилие спускового крючка
trigger safety	предохранительный рычаг спускового крючка
firing pin safety	автоматический предохранитель ударника
cycling malfunction	неисправности, связанные с автоматикой пистолета
drop safety	противоударный предохранитель

INTRODUCTORY EXERCISES

I. Найдите в тексте и переведите словосочетания на русский:

To feature better ergonomics and improved recoil system, to be made of high strength polymer, to give access to the majority of cleaning needs, to utilize a double-stack magazine, to be fitted to many different hand sizes, to be further redesigned, to prevent firing as a result of unwanted drops.

TEXT

Glock 17

In early 2013, British armed forces received a new standard sidearm. The Glock 17 was brought into service, replacing the venerable Browning L9A1 after over 40 years in MOD arsenal.

Austrian military and police adopted Glock 17 pistols in 1982, and following that the brand had expanded worldwide. Soon after the Glock made its appearance, the Norwegian and Swedish armed forces began carrying it as well. The Glock 17's popularity grew, and in 1984 NATO took it in as well, making it a standard NATO firearm.

Over the years, the Glock has updated its basic design several times throughout its production history through different releases, nicknamed "generations". One of the latest models released by the company is designated "Gen 4", featuring better ergonomics and improved recoil system.

Features

The Glock 17 is 9mm, short recoil-operated, semi-automatic, and uses a modified Browning system. Many of the Glock's parts are made of high strength polymer based on nylon. Ease of maintenance was a high point to pass the military trials at the time. Modern Glocks consist of only 34 parts, which means fewer things to break or go wrong. A user can field strip the pistol in a matter of seconds giving access to the majority of cleaning needs. The gun features a front and rear sight, the former of which is in dot form, the latter in "U" form. The pistol utilizes a double-stack magazine which holds 17 rounds of 9x19mm Parabellum, compared to 13 held by the Browning's.

In Gen 4, interchangeable backstraps were introduced allowing the pistol to be fitted to many different hand sizes. The magazine catch was redesigned and was made reversible, a much-appreciated feature for left-handed shooters. The recoil spring was further redesigned to a double recoil spring. This allows for less felt recoil than the previous variants. Glock's prioritization of safety is evident in the somewhat

heavy 5.5-lb trigger pull of the Glock 17, as well as the Safe Action System built into Gen4 models. Made up of three parts, the Safe Action System is designed to prevent three of the most common safety problems from ever occurring – the trigger safety needs to be engaged in order for the trigger to fire, the firing pin safety prevents against any kind of cycling malfunction, and the drop safety prevents firing as a result of unwanted drops or other accidents of that nature. With these three independent internal safety mechanisms, Glock 17 with a round loaded in its chamber can be drawn and fired without further delay.

II. Используя схему, назовите составные части пистолета Glock 17 на русском языке.



1 – barrel; 2 – front sight; 3 – slide lock; 4 – slide;
5 – slide stop lever; 6 – rear sight; 7 – frame; 8 – magazine;
9 – magazine catch; 10 – trigger; 11 – trigger guard

III. Переведите письменно:

Автоматическая винтовка L85

Автоматическая винтовка L85 (калибр 5.56 мм, полное наименование – L85A2) относится к классу индивидуального стрелкового оружия. Ее более поздняя модификация (A2) состоит на вооружении британской армии.

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TEXT

ACTIVE TERMS AND EXPRESSIONS

long range rifle	снайперская винтовка
bolt-action	продольно-скользящий затвор
fixed stock	фиксированный приклад
bipod	сошки
folding stock	складной приклад
cheek piece	щека приклада
scope	прицел
monopod	монопод, сошка
Picatinny rail	планка Пикатинни

day sight	дневной прицел
sound suppressor	Прибор бесшумной и беспламенной стрельбы (ПББС), глушитель

INTRODUCTORY EXERCISES

IV. Найдите в тексте и переведите словосочетания на русский:

To have fixed stocks, to be fed from detachable 5-round capacity magazines, to allow the sniper to comfortably align his eye with the scope, to support the rifle in a set position, to reduce the sound and noise signature.

L115A3 Long Range Rifle

The L115A3 long range rifle is the current British Army standard bolt-action sniper rifle chambered in .338 Lapua Magnum (8.6x70 mm). The roots of this rifle in British service go back to the early to mid-1990s. It was originally purchased as the L115A1 in the 1990s and saw some service in the invasion of Iraq. L115A1 had fixed stocks, Parker-Hale bipods also used on the L118, and a smaller 3 to 12 power scope. Over the coming years, the L115A2 version was developed, which saw plenty of service in Afghanistan with British Special Forces. The A2 pattern had a bipod similar to the one used on the L96 rifle and a folding stock.

The L115A3, a scaled-up version of the Arctic Warfare .308, was developed by Accuracy International for the international market. The rifle was introduced as part of the Sniper System Improvement Programme (SSIP), with the first weapons being fielded by 16 Air Assault Brigade in Helmand in 2008.

The A3 pattern adopted a 5 to 25 power scope perfect for long range sniper engagements. In Afghanistan, the British regularly used these rifles effectively out to 2,000 meters and beyond. In 2009 the second longest sniper kill in history was made with the L115A3 rifle in Afghanistan. A British Army sniper Craig Harrison killed two Taliban fighters at a range of 2475 meters. At the time it was the longest sniper kill ever made.

Features

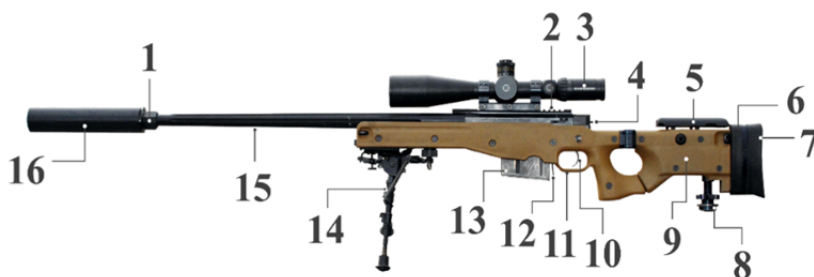
The weapon is fed from detachable 5-round capacity magazines. The folding buttstock reduces the length of the weapon so the L115A3 is more comfortable to carry in a backpack than rifles with fixed buttstocks. Another improvement over the L115A1 was adjustable cheek piece. It allows the sniper to comfortably align his eye with the scope.

The L115A3 comes with a new adjustable bipod. There is also a monopod. These allow the sniper to support the rifle in a set position while locating the target.

This weapon has a Picatinny rail and comes with with a 5-25x magnification day sight.

The L115A3 can mount a sound suppressor. It reduces the sound and noise signature, hence reduces the chance of detection and increases survivability of the sniper.

V. Используя схему, назовите составные части снайперской винтовки L115A3 на русском языке:



- 1 – muzzle; 2 – action rail; 3 – scope; 4 – firing pin indicator;
5 – cheek piece; 6 – spacers; 7 – butt piece; 8 – monopod;
9 – folding stock; 10 – trigger; 11 – trigger guard;
12 – magazine release; 13 – 5-round magazine; 14 – bipod;
15 – barrel; 16 – suppressor

VI. Изучите таблицу и переведите ее содержание:































Photo	Name	Origin	Type	Caliber	Notes
PISTOLS					
	L9A1		Semi-automatic pistol	9mm	Standard issue pistol. It is a self-loading, semi-automatic pistol chambered in 9mm NATO. It has been in service since 1954 and is currently being replaced by the Glock 17 Gen 4.
	L105A1 L105A2 L106A1 L107A1 L117A1		Semi-automatic pistol	9mm	Variants of the SIG Sauer P226 were purchased as an interim replacement for the L9A1 as an UOR for use in Afghanistan. Although purchased as an interim weapon, they will continue to be used until the end of their life cycles.
	L131A1		Semi-automatic pistol	9mm	New standard issue pistol, replacing the L9A1 'Browning' and eventually the SIG Sauer. Around 25,000 have been purchased.
ASSAULT, BATTLE RIFLES					
	L85A2 L86A2 L22A2		Assault rifle, Light support weapon, Carbine	5.56x 45mm	The L85A2 (IW) is the standard assault rifle. It can be fitted the: SUSAT, ACOG or Thermal Viper 2 sights. Other attachments for the L85A2 include the L123A1 Underslung Grenade Launcher (UGL) which is complemented by the new 'Rapid Acquisition Aiming Module' for better accuracy and range.
	L129A1		Sharpshooter rifle	7.62x 51mm	The primary designated marksman rifle. It is equipped with an ACOG optical sight for long-range engagements. At least 1,500 rifles had been delivered by May 2013. There is also a Sniper No.2 version of the L129A1, with 12x Schmidt & Bender sights and a suppressor, to be used by the second man in sniper teams.
	HK417		Sharpshooter rifle	7.62x 51mm	Battle rifle used by the Royal Military Police Close Protection Unit, the UKSF and the SFSG.
	L119A1		Assault rifle	5.56x 45mm	Available in two variants: the C8 SFW and the shorter C8 COB. The weapon is used by the specialist pathfinders unit of the Parachute Regiment as well as the UKSF, Royal Military Police Close Protection Unit, and the SFSG.

Photo	Name	Origin	Type	Caliber	Notes
SHOTGUNS					
	L128A1		Semi-automatic shotgun	12-gauge	Has a capacity of eight rounds and a maximum effective range of 140 m (460 ft) for solid shot and 40 m (130 ft) for buckshot.
	L74A1		Pump-action shotgun	12-gauge	Used by UKSF as a breaching shotgun.
SNIPER RIFLES					
	L118A1 L118A1 AWC		Sniper rifle	7.62x51mm	Improved variant of the L96 that entered service in 1985. The rifle has an effective range of around 800 meters and is designed to perform in both desert and arctic conditions. In recent years, the L118A1 has largely replaced by the L129A1 and the L115A3 in front-line service. The L118A1 AWC is used exclusively by the SAS. The weapon is compact with a folding stock and a suppressor. It can be disassembled into a small suitcase for covert operations.
	L129A1		Sniper rifle	.338 Lapua Magnum	Primary sniper rifle. It is equipped with a 25x scope, a suppressor, a folding stock, and a five-round magazine. The .338 Lapua Magnum "is heavier than the 7.62mm round of the L118A1, and is less likely to be deflected by wind over extremely long ranges." The effective range of the L115A3 is in excess of 1,100 m.
	HK417		Anti-material rifle	.50 BMG	The L121A1 (AW50F) is intended to engage a variety of targets including radar installations, light vehicles (including light armoured vehicles), field fortifications, boats and ammunition dumps. The standard ammunition combines a penetrator, high explosive and incendiary effect in a single round. Used by the SAS.
	L119A1		Anti-material rifle	.50 BMG	Recoil-operated, semi-automatic anti-material rifle. The British Army uses the M82A1 version

MACHINE GUNS					
	L108A1 L110A2 L110A3 Minimi 7.62		Light machine gun	5.56 mm 7.62 mm	Standard "FN Minimi" variant and the British Army's designated light machine gun. The weapon is belt-fed and equipped with a bipod. The L110A2 and L110A3 are known as the "FN Minimi Para" and are equipped with a shortened barrel and a collapsible stock, with one issued per four man infantry fireteam. The Minimi 7.62 is the latest version of the weapon to enter front-line service. It is designed to fire 7.62mm rounds.
	L7A2		General- purpose machine gun	7.62 mm	British Army version of the Belgian FN MAG.
	L1A1		Heavy machine gun	.50 BMG	British Army version of the American M2 Browning. It can be attached to both armoured vehicles and tripods.
	L134A1		Grenade machine gun	40 mm	Has a 320rpm rate of fire and an effective range of 1,500 m (4,900 ft) - 2,000 m (6,600 ft). It is used for suppression of enemy infantry and can be mounted on both armoured vehicles and tripods.

Lesson 6.

Crew-Operated Weapons

ACTIVE TERMS AND EXPRESSIONS

general purpose machine gun	единый пулемёт
belt-fed	с ленточной подачей патронов
sustained fire (SF)	непрерывный огонь, огонь из станкового (стационарного) пулемёта
gas operated	отвод пороховых газов
open bolt	открытый затвор
quick-change barrel	быстросменный ствол
slotted flash suppressor	щелевой пламегаситель
carry handle	рукоятка для переноски
gas regulator	газовый регулятор
gas cylinder	газовый цилиндр
fixed stock	нескладной (фиксированный) приклад
pistol grip	пистолетная рукоятка
iron sights	открытые прицельные приспособления
tripod	треножный станок
team, crew	здесь: расчёт

INTRODUCTORY EXERCISES

I. Найдите в тексте и переведите словосочетания на русский:

To be used as a light weapon and in a sustained fire role, to use an open bolt design, to have a slotted flash suppressor, to be fitted with a folding bipod, to be operated by a two-man team, to provide battalion-level fire support.

TEXT

L7A2 General Purpose Machine Gun

The L7A2 General Purpose Machine Gun is a 7.62mm, belt-fed, general purpose machine gun which can be used as a light weapon and in a sustained fire (SF) role.

After the Second World War the Belgian MAG General Purpose Machine Gun was selected as the winning design to replace both the Vickers Heavy Machine Gun and Bren Light Machine Gun. Built under license at the Royal Small Arms Factory, it was designated as 7.62mm L7A2 General Purpose Machine Gun (GPMG), or 'Gimpy'.

Design

The L7A2 is a gas operated medium machine gun that uses an open bolt design derived from the proven Browning Automatic Rifle, with the belt feed mechanism based on that of German wartime designs, providing for a reliable and robust weapon.

The quick-change barrel has a slotted flash suppressor. Attached to the barrel is the front sight, carry handle and gas regulator. The machine gun is fitted with a folding bipod attached to the end of the gas cylinder; a fixed stock, pistol grip and iron sights.

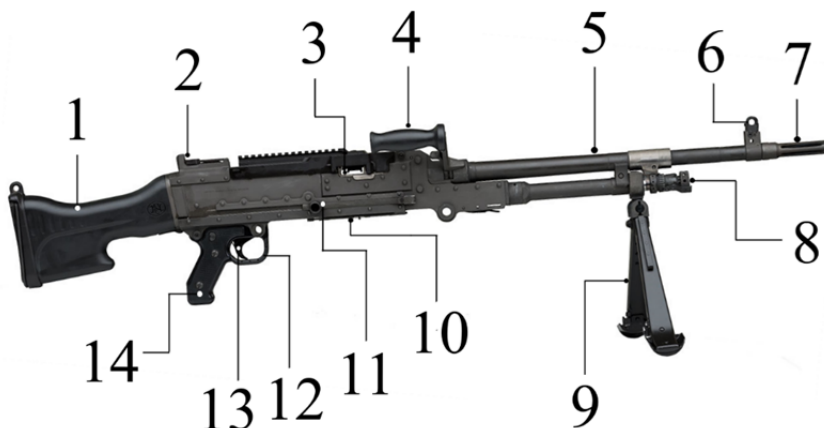
Use in combat

The GPMG can be used as both a Light Machine Gun, firing from the shoulder or in the sustained fire mode installed on a tripod. In the SF role it is operated by a two-man team, in a specialist machine gun platoon to provide battalion-level fire support.

The Parachute Regiment has always been a major user of the GPMG and in operations from the Middle East, Northern Ireland through to the Falklands, Kosovo and Afghanistan the GPMG has provided over 50 years of service.

The newer 5.56mm Minimi Light Machine Gun has supplemented the Gimpy in the British Army, but the Parachute Regiment still carry the Gimpy on foot patrols in Afghanistan for its superior weight of fire, stopping power and range. In the sustained fire role, the GPMG, with a two-man crew, lays down 750 rounds-per-minute at up to 1800 meters.

II. Используя схему, назовите составные части единого пулемёта L7A2 на русском языке:



**1 – fixed stock; 2 – rear sight; 3 – spent casing ejection port;
 4 – carry handle; 5 – barrel; 6 – front sight; 7 – slotted flash
 suppressor; 8 – gas regulator; 9 – folding bipod;
 10 – ejection opening cover; 11 – cocking lever; 12 – trigger guard;
 13 – trigger; 14 – pistol grip**

ACTIVE TERMS AND EXPRESSIONS

mortar	миномёт
indirect fire	огонь с закрытых огневых позиций, стрельба непрямой наводкой
base plate	опорная плита
mortar shell	мина, миномётный снаряд, артиллерийская мина
propelling charge	метательный заряд
impact fuze	ударный взрыватель
exploder	детонирующее взрывчатое вещество (ВВ)
high explosive filler	фугасный разрывной заряд

primary charge	основной заряд
body	корпус снаряда
tail section	хвостовая часть
augmenting charge	дополнительный заряд
tail fins	стабилизатор
Urgent Operational Requirement (UOR)	срочная оперативная потребность (система, используемая Министерством обороны Великобритании для получения срочного оборудования для операций)

INTRODUCTORY EXERCIZES

III. Найдите в тексте и переведите словосочетания на русский:

To provide short-range indirect fire at high angles, to be used directly by the infantry units at the front line, to be mounted on a base plate that allows for some adjustment, to create gas that pushes the mortar shell out of the tube, to be added and removed, to increase the flexibility in terms of range, to provide infantry a weapon for quick and immediate indirect fire.

TEXT Mortar

A modern mortar is a weapon that provides short-range indirect fire at high angles, usually between 45 and 80 degrees. The first modern mortar was the so called Stokes Mortar, it was developed during the First World War. Unlike traditional mortars it was relatively small and mobile, which made it well-suited for trench warfare, because unlike unwieldy artillery it could be used directly by the infantry units at the front line.

Of course mortars design evolved since the Stokes mortar, but the basic principles are still the same. So how does a modern mortar work?

How does a mortar work?

A mortar is basically just a huge tube, which is closed on the bottom side and mounted on a base plate that allows for some adjustment. At

the bottom of the barrel there is a fixed firing pin. If a mortar shell is dropped into the barrel and hits the pin, the propelling charge is ignited.

Then the explosion of the propelling charge creates gas that pushes the mortar shell (or the bomb) out of the tube.

Mortar Components and Shell Components

The mortar shell is sometimes also called bomb. Its main components are the impact fuze at the top, which triggers the exploder. Followed by the high explosive filler in the body, the primary charge in the tail section and usually augmenting charges on the tail.

As you can see, the propelling charge is made up of two components – the primary charge and the augmenting charge. The first is inside the mortar round, whereas the augmenting charges are usually outside of the mortar shell and can be added and removed in order to reduce the power and thus speed and range of the shell.

Range variation due to augmenting charges

The addition and removal of augmenting charges increases the flexibility in terms of range, since a mortar usually operates at angles of 45 to 80 degree. To give you some reference, for the British 81mm L16 mortar introduced in the mid-sixties, the max range of just the primary charge is 520 meters, whereas with 6 augmentation charges a max range of 4680 m can be achieved. Yet, the minimum range with all charges is 1700 m, whereas with just the primary charge it can be used as close as 180 m.

The Tail Fins

One interesting aspect about a mortar shell are its tail fins. Originally they were cheap and added to provide some stability, but during the Second World War it became obvious that these fins had a major influence on both accuracy and range. Thus, emphasis was given to create efficient and well-produced fins. The tail fins need to be placed at some distance to the body, due to the low pressure inhibiting

their effect. In theory, the fins should be of a greater diameter than the body, but the cost were usually not worth the benefits of complicate designs.





Basic Advantages and Characteristics of Modern Mortars

Since you have an idea how a mortar works, now a short overview on the basic advantages and characteristics of a modern mortar: it is a cheap and easy-to-produce weapon that provides infantry a weapon for quick and immediate indirect fire, unlike artillery which needs to be called in from the rear. Furthermore, due to the weight and size, light and medium mortars are portable. Thus they are usually part of the infantry and not the artillery units.

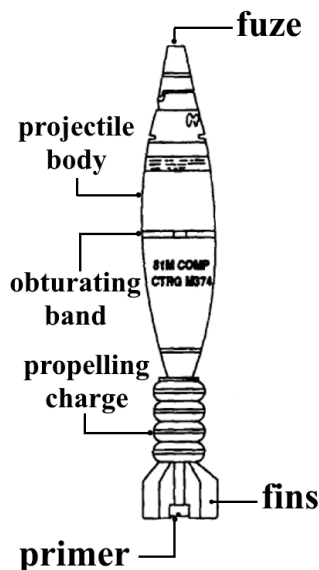
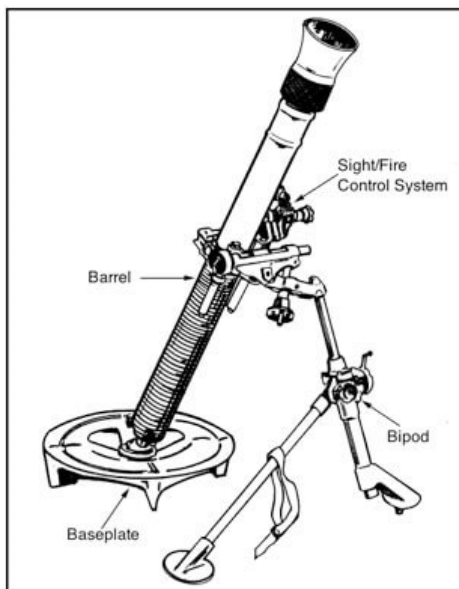
Ссылка на видео:

https://www.youtube.com/watch?v=aELkvDPHQU8&t=6s&ab_channel=MilitaryHistoryVisualized

IV. Изучите таблицу и переведите ее содержание:

Photo	Name	Origin	Type	Caliber	Notes
MORTARS					
	M6-895		Mortar	60 mm	Procured as an UOR. It can be fired in both the direct and indirect roles at a rate of 1–12 rounds a minute and can also be operated in the hand-held mode. Around 1,900 of the 60mm mortars were purchased as a UOR to replace the older 51mm Mortar that served on operations.
	L16A2		Mortar	81 mm	Operated by a three man team. It is often vehicle-borne, and in mechanized infantry battalions is mounted and fired from an FV432 vehicle. Around 470 in service.

V. Используя схему, назовите составные части миномёта L16A2 на русском языке:



ACTIVE TERMS AND EXPRESSIONS

man-portable	переносной
fire-and-forget	самонаводящийся
bunker	ДОС
command launch unit (LCU)	командно-пусковой блок (КПБ), блок прицельно-пускового оборудования
missile	ракета, выстрел
launch tube assembly (LTA)	пусковая труба в сборе
test measurement or diagnostic equipment	контрольно-измерительная и диагностическая аппаратура
guidance	наведение
survivability	живучесть
top-attack mode	режим пикирования
direct-fire mode	режим прямой атаки в горизонтальной плоскости
target lock-on	захват цели
limited back-blast	безоткатный

infrared seeker	инфракрасной головкой самонаведения (ИК ГСН)
handgrip	рукоять управления
guidance section	система наведения
target tracking	отслеживание цели
flight control	управление ракетой в полёте
mid-body section	средняя часть
missile skin	оболочка ракеты
electronic safe arm and fire unit (ESAF)	элемент электронной задержки детонации основного заряда
wings	крылья
warhead section	боевая часть, боеголовка
HEAT type tandem warhead	танDEMная кумулятивная боевая часть
propulsion section	ракетный двигатель
launch motor	стартовый двигатель
flight motor	маршевый двигатель
exhaust gases	газообразные продукты сгорания ракетного топлива
control actuator section	рулевой привод, рули ракеты

INTRODUCTORY EXERCIZES

VI. Найдите в тексте эквиваленты словосочетаний:

Состоять из командно-пускового блока (КПБ) и ракеты, расположенной в пусковой трубе в сборе, использовать без специального контрольно-измерительного или диагностического оборудования, позволять стрелку занять укрытие немедленно после выстрела, обеспечивать безопасность при стрельбе из помещений и закрытых боевых позиций, противодействовать нынешним и прогнозируемым угрозам, использовать ночью и в условиях ограниченной видимости.

VII. Найдите в тексте и переведите словосочетания на русский:

To approach from above to impact and detonate on the top of the target, to provide target tracking and flight control signals, to utilise an

explosive shaped charge, to penetrate armour, to protect the gunner from hot exhaust gases, to provide internal electrical power.

TEXT

FGM-148 Javelin



The Javelin surface-attack guided missile and launcher is a man-portable fire-and-forget weapon system used against enemy tanks, bunkers, buildings, small boats, and slow-moving helicopters consisting of a command launch unit (CLU) and a missile sealed in a disposable launch tube assembly.

Javelin is fielded with no specific test measurement or diagnostic equipment, allowing combat forces to deploy rapidly and unencumbered. Javelin's fire-and-forget guidance mode enables gunners to fire and then immediately take cover which greatly increases survivability. Special features include a selectable top-attack or direct-fire mode (for targets under cover or for use in urban terrain against bunkers and buildings), target lock-on before launch, and a limited back-blast that enables gunners to safely fire from enclosures and covered fighting positions.

Its 2,000-meter range enable the Javelin to defeat current and projected enemy armour threats. The Javelin is operated by an individual soldier or in crews of two or three. Soldiers can use the Javelin during the day, at night, and during limited visibility conditions.

Attack modes

The missile has two gunner-selectable attack modes: top or direct. Each mode has its own flight path or profile for reaching the target.

a. Top Attack Mode.

(1) The top attack is the default mode when the missile infrared seeker is first activated. In the top attack mode, the missile approaches from above to impact and detonate on the top of the target. This capacity allows the gunner to attack a vehicle from the front, rear, or the side and greatly increases the probability of a kill. Armored vehicles usually have less protective armor on top. The minimum engagement distance is 150 meters.

b. Direct Attack Mode.

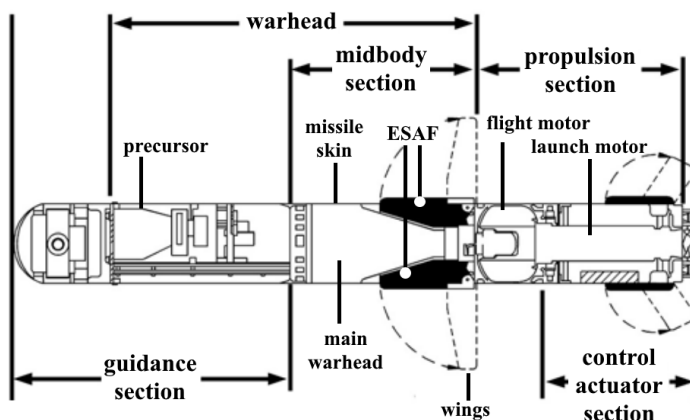
(1) The gunner pushes the attack select (ATTK SEL) switch on the right handgrip to change attack modes. In the direct attack mode, the missile flies on a more direct path to the target. The missile impacts and detonates on the side (front, rear, or flank) of the target. The minimum engagement distance is 65 meters.

Missile

The Javelin missile can be divided into several sections. The guidance section provides target tracking and flight control signals. It is the forward section of the missile. The mid-body section includes the missile skin, electronic safe arm and fire unit (ESAF), wings, and the main charge of the warhead. Warhead section includes a HEAT type tandem warhead which utilises an explosive shaped charge to create a stream of super plastically deformed metal formed from trumpet-shaped metallic liners. The result is a narrow high velocity particle stream that can penetrate armour. The propulsion section consists of the

launch and flight motors. The launch motor propels the missile out of the LTA. It provides the initial force to push the missile a safe distance from the gunner before the flight motor ignites to ensure the gunner's safety. The flight motor powers the missile to the target during flight. It ignites when the missile is a safe distance from the gunner, protecting the gunner from hot exhaust gases generated when the motor fires. The control actuator section maneuvers the missile during flight and provides internal electrical power.

VIII. Используя схему, назовите составные части ракеты FGM-148 Javelin на русском языке:



IX. Изучите таблицу и переведите ее содержание:

	MBT LAW		Anti-tank weapon	150 mm warhead	Disposable, man-portable, short range fire-and-forget anti-tank guided missile system. It is designed to "knock out any main battle tank in just one shot by striking it from above."
	FGM-148 Javelin		Anti-tank weapon	127 mm warhead	Man-portable medium range anti-tank missile system. It fires a High Explosive Anti Tank (HEAT) warhead and is capable of penetrating explosive-reactive armour.
	ILAW		Anti-tank weapon	84 mm warhead	Small quantities of AT4 CS HP projectiles have been purchased.
	Anti-Structures Munition		Anti-structure weapon	90 mm warhead	Disposable, man-portable guided anti-structure weapon. It is designed to destroy hardened structures such as bunkers, buildings and other fixed positions.
	L72A9		Anti-structure weapon	66 mm warhead	Primarily used against bunkers, buildings and other fixed positions, but also effective against light armour and soft-skinned vehicles.

Lesson 7.

L118 Light Gun

ACTIVE TERMS AND EXPRESSIONS

elevating mass	качающаяся часть лафета
saddle	сиденье седлового типа
controls	органы управления
trail assembly	станины в сборе
spades	сошники
platform	опорная плита
suspension	механизм поддрессорования
sighting system	прицельные приспособления
ordnance	ствол (с затвором)
recoil system	противооткатное устройство
cradle	люлька
trunnion	цапфа
balancing gear	уравновешивающий механизм
electric firing gear	электроспуск
multibaffle muzzle brake	многокамерный дульный тормоз
sliding breech block	клиновой затвор
lever	рычаг
hydropneumatic	гидропневматический
recuperator	накатник
buffer	буферный тормоз
elevation	угол возвышения
elevating arc	зубчатый сектор механизма вертикального наведения
compression spring	нажимная пружина
firing gear	ударный механизм
waterproofed	водонепроницаемый
electric magneto	электромагнитический
ammunition system	боеприпас в комплекте
rotating towing eye	вращающаяся буксировочная петля
overrun brake	инерционный тормоз
barrel clamp	зажимная скоба

lightweight fabrication	легковесная металлоконструкция
tyres	шины
wire stays	проволочная стяжка
trailing arm suspension	продольный рычаг подвески
torsion springs	торсионные пружины
shock absorbers	амортизаторы
manhandling	ручная переноска
handbrake	рычаг стояночного тормоза
layer	наводчик
direct fire telescope	оптический прицел для ведения стрельбы прямой наводкой
graticule	углоизмерительная сетка
night sight	ночной прицел
propellant charge	метательный заряд
percussion primer	капсюль-воспламенитель
brass case	латунная гильза
electrical primer	электровоспламенитель
base bleed round	снаряд с донным газогенератором
HE	брзантный (снаряд)
High Explosive, Squash Head (HESH)	бронебойно-фугасный (букв. «фугасный со сминаемой головной частью»)
Squash Head (SH)	бронебойный
High Explosive, Rocket-Assisted (HERA)	фугасный активно-реактивный снаряд
jack	домкрат
quick release wheel	быстросъёмное колесо
traverse gear pin	цапфа поворотного механизма
clamp	закреплять
deflection	метод наводки орудия отклонением точки прицеливания
graduation	(прицельная) шкала
attachment brackets	кронштейны
tritium sights	прицел с тритиевыми элементами

INTRODUCTORY EXERCISES

I. Расшифруйте сокращения и подберите соответствующие эквиваленты к ним:

HE – ...

HESH – ...

SH – ...

HERA – ...

II. Найдите в тексте эквиваленты словосочетаний:

Приводиться в движение рычагом, установленным в верхней части орудия, непрерывно вращать маховик во всем диапазоне высот, располагаться на станине, предназначаться для различных условий стрельбы и грунта, применяться для местности с мягким грунтом или при стрельбе без опорной плиты, обеспечивать устойчивость орудия, демонтироваться для перевозки орудия, применять метод наводки орудия отклонением точки прицеливания, переоборудование углоизмерительной сетки прицела со шкалы с ценой деления 0-10 на шкалу с ценой деления 0-05, маркировка всех деталей, модификация стержней кронштейнов, использование стандартной краски и камуфляжной схемы окраски ВС США, использование в работе противооткатного устройства азота вместо воздуха, использование габаритного фонаря американского образца.

TEXT

L118 light gun

The 105 mm Light Gun consists of the following main components: elevating mass, saddle and controls, trail and spades, platform, suspension and sighting system.

The elevating mass consists of the 105 mm ordnance, recoil system, cradle including trunnions, balancing gear and electric firing gear. The gun is fitted with a multibaffle muzzle brake, which can be easily removed for cleaning. The vertical sliding breech block is actuated by a

lever mounted on the top. The hydropneumatic recoil system has a separate recuperator and the buffer is fitted with a cut-off gear to shorten the recoil length as elevation is increased. The recoil system is mounted in a lightweight fabricated cradle, which carries the elevating arc and a simple helical compression spring-balancing gear. The firing gear, which is mounted on the cradle, is fully waterproofed and is of the electric magneto type.

The saddle is a lightweight fabrication on which the complete elevating mass is carried. It provides a top traverse of 11° . The elevating gear is a simple mechanical system providing constant handwheel effort throughout the range of elevation. A clutch is provided to reduce abnormal firing loads on the equipment.

The trail is fabricated in high-strength corrosion-resistant steel. It is bow shaped, enabling the breech operator and loader to remain within the trail and maintain a high rate of fire at all elevations. The platform is carried on top of the trail during travelling. The forward end carries the saddle, traversing gear, suspension and the layer's seat. At the rear are the non-rotating towing eye, overrun brake, barrel clamp and spades. The spade system, of which there are three types, caters for various firing and ground conditions. The first type is a combined rock and digger spade for use, normally with the platform, on rock or firm ground; the second is a field spade for use on very soft ground or when firing without a platform and the third is a snow spade.

The platform is a circular lightweight fabrication that gives a firm base and permanent gun stability under all conditions. The tyres run on the outer edge of the platform, which is connected to the underside of the gun by four wire stays.

The wheels, which have large section 9.00×16 tyres, incorporate special hydraulically operated overrun brakes. This ensures safe towing at a high speed with a light vehicle such as a Land Rover (4×4). The brakes can also be operated during firing by a lever at the rear end of the trail. For manhandling purposes, an individual handbrake is fitted at each wheel. The trailing arm suspension has laminated torsion springs

and shock-absorbers. The suspension system remains in operation during firing and assists in maintaining the stability of the equipment and reducing carriage stresses.

Indirect and direct sight system and controls are operated by the layer while seated. Indirect laying has been simplified by the abolition of a separate setting for angle of sight. The quadrant elevation is set on the elevation scale. A direct fire telescope is fitted which incorporates a moving illuminated graticule, which is adjusted for lead to allow for target movement and range. A direct fire night sight is also available. Trilux activated light sources are fitted to illuminate all scales and graticules, eliminating the use of electric batteries on the equipment.

The L35 charge contains the first five charge zones in a single brass cartridge case. The propellant charge is ignited by the L10 electrical primer, which is more reliable than a percussion primer. The Supercharge, L36, for maximum range, has a separate brass case and also has an L10 electrical primer.

In mid-1986, it was revealed that the now BAE Systems Land Systems was working on extended-range (base bleed) and cargo rounds as a private venture. The former has been fired with standard Supercharge L36 and has achieved a range of over 20,000 m compared to the 17,200 m of the standard projectile. The base bleed round is currently designated the X/RO 0381 ERHE which during trials in 1998 achieved a range of around 20.60 km. This extended-range projectile has yet to enter production.

The 105 mm Light Gun fires the following BAE Systems Land Systems-manufactured separate loading ammunition: HE (L31) with the projectile weighing 16.1 kg; HESH (L42) with the projectile weighing 10.49 kg (no longer produced); illuminating (L43); SH/practice (L41- no longer produced); smoke (L45) with the projectile weighing 15.89 kg; smoke, coloured red (L37) and smoke, coloured orange (L38).

A range of 14,300 m can be achieved by the L119 Light Gun firing the M760, which is basically an M1 projectile with an M200 charge

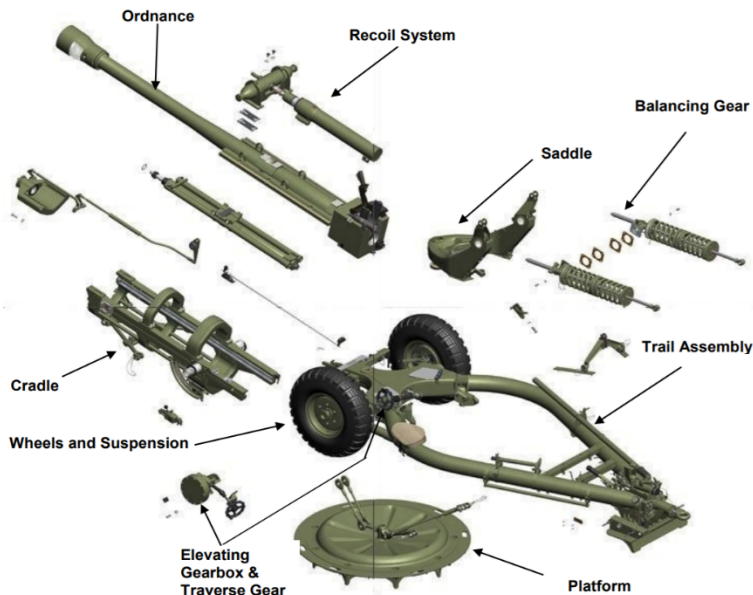
system. A range of 19,500 m can be achieved with the M913 HERA projectile and 19,000 m with the new ERM1 base bleed projectile.

The 105 mm Light Gun can be carried slung under a Puma helicopter as one load. The elevating mass can be removed to give two light helicopter (for example, Wessex) loads and the complete weapon can be reassembled with one simple tool in less than 30 minutes.

The 105 mm Light Gun is normally towed with the gun in the forward (firing) position. For long distances the gun is towed with the barrel rotated through 180° and clamped to the trail. This attitude is achieved by jacking up the equipment with a jack stowed on the trail, removing the quick-release wheel and traverse gear pin, clamping the barrel and replacing the wheel. The complete conversion takes less than 1 minute.

Firing US M1 105 mm ammunition and using the M200 charge system originally developed for the M204, a range of 14,000 m is achieved. Firing the M913 HERA cartridge, with the M229 charge 8 propelling charge, a range of 19,500 m is achieved. US changes include: modifications to the sight to permit use of the deflection method of laying, revision of the graticule pattern of the sight to incorporate 5 mil graduations instead of 10 mil, addition of attachment brackets for the battery computer, provision of attachment brackets for M90 muzzle velocity measurement system, labelling of all items containing radioactive elements (tritium sights), modification of tie down brackets, use of standard US paint type and US camouflage pattern, use of nitrogen in the recoil system instead of air, use of US tail-light patterns, incorporation of recent UK MoD minor modifications, elevation level guidance plate for M200 charge system, modified engraving and limited US thread forms in some areas of the weapon.

III. Используя схему, назовите составные части 105-мм артиллерийское орудия L118 на русском языке:



IV. Переведите письменно:

Общие характеристики артиллерийских орудий

Артиллерийское орудие-это оружие, размером больше чем стрелковое, выбрасывающее снаряды из ствола при помощи взрывчатого вещества, которое может заряжаться отдельно от снаряда (раздельно-гильзовое или картузное зарядание), вместе со снарядом (унитарное зарядание), либо комбинированным способом.

В соответствии со своими ТТХ артиллерийские орудия делятся на пушки, гаубицы и минометы.

Пушка – это а/о с относительно длинным стволом, калибром более 12,7 мм, имеющее относительно небольшие углы

вертикальной наводки, стреляющее по настильной траектории с большой начальной скоростью снаряда.

Гаубица – это а/о, со стволом средней длины (между пушечным и минометным с большими углами вертикальной наводки, выстреливающее снаряд со средней начальной скоростью по навесной траектории.

Миномет использует большие углы вертикальной наводки и выстреливает боеприпас с меньшей дульной скоростью и по более высокой траектории, чем гаубица. Минометы не состоят на вооружении полевой артиллерии.

V. Переведите письменно, значение неизвестных терминов выясните по словарю:

If the Army had to fight tonight, it is unlikely that it could deploy a single brigade let alone two to counter peer threats. The only deployable vehicles the Army has at the moment are its “Dogs of War,” the protected mobility fleet. None of these are ideal for high intensity warfare against peer adversaries.

The Army’s artillery systems also need a fundamental recapitalisation to ensure it can bring a credible weight of fire to any future conflict. It needs a new communications and information system (CIS). However, a further programme to replace its existing Bowman CIS, LEtacCIS / Morpheus, is also in trouble with the contractor needing more time and money to deliver what has already been agreed and paid for.

Lesson 8.

AS90 Howitzer

ACTIVE TERMS AND EXPRESSIONS

self-propelled howitzer	самоходная гаубица
turret	башня
hull	корпус
tracked chassis	гусеничное шасси
recoil system	противооткатное устройство
hydrogas suspension system	гидропневматическую подвеска
double-baffle muzzle brake	двухкамерный дульный тормоз
fume extractor	эжектор
split-block breech	клиновый затвор
traverse	поворот (башни), горизонтальное наведение
elevation	возвышение, наведение по вертикали
drives	силовые приводы
manual controls	ручные приводы
stowage boxes	укладочные ящики
hatch	люк
gradient	уклон, крутизна
road wheel	ведущее колесо
track-return rollers	опорный каток
drive sprocket	звёздочка привода
idler	направляющее колесо
NBC (nuclear, biological, chemical) protection system	система РХБ-защиты; система защиты от оружия массового поражения
fire detection suppression system	автоматическая система пожаротушения
auto-lay	автоматическое наведение
DRU (dynamic reference unit)	компьютерная система динамических расчётов
ring laser gyro	кольцевой лазерный гироскоп
bearing	азимут цели

INTRODUCTORY EXERCISES

I. Найдите в тексте эквиваленты словосочетаний:

Быть принятой на вооружение ВС Великобритании, устанавливаться в кормовой части корпуса, осуществляться посредством электрических силовых приводов, вести огонь всеми стандартными боеприпасами НАТО, позволять достигнуть максимального темпа ведения огня, иметь собственный привод, регулироваться механиком-водителем из отделения управления.

II. Найдите в тексте и переведите словосочетания:

To be divided into 3 compartments, to be located at the rear of the hull, to have a crew of five, to be of all-welded steel armour construction, to be used to store supplies, to include night vision, to be laid automatically in bearing.

TEXT

AS90 self-propelled howitzer

The AS90 Braveheart is a 155mm tracked self-propelled howitzer manufactured by the British Company BAE Systems. The AS90 project was completed in March 1985, and the first prototype was shown at the British Army Equipment Exhibition in June 1986. It entered in service with the British army in 1992.

Armament

The AS90 Braveheart 155mm self-propelled howitzer is fitted a large turret mounted at the rear of the hull of a tracked chassis. The gun is equipped with a recoil and hydrogas suspension system. It has a double-baffle muzzle brake, fume extractor, and a split-block breech. Turret traverse is through a full continuous 360° and weapon elevation is from -5 to +70°. Elevation and traverse drives are both electric and operate at a rate of 10°/s. Full manual controls are provided in case of electric failure. The AS90 is armed with a 155 mm 39 caliber barrel

that can fire all the standard NATO artillery projectiles including the HE M107 and extended range types. Thanks to an automated loading system, it can fire a burst of three rounds in less than 10 seconds, an intense rate of 6 rds/min for 3 minutes and a sustained rate of fire of 2 rds/min. The AS90 can carry a total of 48 projectiles with 31 stowed in the turret bustle in four magazine modules, each of which has a motor that moves the required projectile to the correct position. The remaining 17 projectiles are stored in the hull of the vehicle. With standard ammunition, the AS90 can fire at a maximum range of 24,700 m and 30,000 m with assisted projectile. The barrel is locked in the road position by a clamp mounted at the front of the hull. In firing position, the barrel clamp is operated by the driver from inside the vehicle.

Design and protection

The AS90 Braveheart 155mm self-propelled howitzer is divided into 3 compartments with the driver sits at the front left with the power pack to his right and the turret located at the rear of the hull. The AS90 has a crew of 5 including the driver, commander, gunner, loader and co-loader. The hull and the turret of the AS90 Braveheart 155mm self-propelled howitzer is of all-welded steel armour construction with a maximum thickness of 17 mm which provides protection for the crew against the firing of small arms and shell splinters. There is a large door opening to the rear of the chassis for access and ammunition resupply and mounted either side of this on the outside are two integral armoured containers that can be used to store supplies and other equipment. Externally mounted on the turret shell are five stowage boxes, three to the right side and two to the left side, one for each crew member's use. There is a small hatch to the left side of the turret.

Mobility

The AS90 Braveheart 155mm self-propelled howitzer is motorized with a Cummins VTA-903T-660 V-8 diesel engine developing 660 bhp at 2,800 rpm coupled to a Renk LSG 2000 fully automatic transmission

with 4 forward and 2 reverse gears. The AS90 can run at a maximum road speed of 55 km/h with a maximum cruising range of 370 km. The KRAB can negotiate a gradient up to 60% and side slope of 25% maximum. The vehicle can climb a vertical obstacle of 0.88 m and a trench of 2.8 m. It can ford a depth of 1.5 m without preparation. The hydro-pneumatic suspension of the AS90 consists on each side of 6 road wheels, four track-return rollers with the drive sprocket at the front and an idler at the rear. The upper part of the suspension is protected by rubber plates.

Accessories

Standard equipment of the AS90 Braveheart 155mm self-propelled howitzer includes night vision, NBC protection system, air conditioning and a fire detection suppression system. The AS90 is also fitted with a full navigation and auto-lay capability using the MAP's standard DRU based on ring laser gyro technology giving the gun complete autonomy. This enables the gun to be laid automatically in bearing as well as elevation. A diesel-powered auxiliary power unit is mounted in the forward part of the fighting compartment, so the main diesel engine does not need to be constantly run to operate the turret systems. A 7.62mm or 12.7mm machine gun can be mounted on the left hatch on the roof turret. Five smoke grenade dischargers are mounted on each side of the main gun.

Ссылка на видео:

https://www.youtube.com/watch?v=X8tHbgGiWN8&ab_channel=TheTankChannel

III. Переведите письменно:

Конструкция

В основном, все пушки и гаубицы состоят из ствола в сборе (ствольной группы) с затворным механизмом и станка.

Ствольная группа состоит из ствола и казенника. Полая часть ствола называется его каналом. Задняя часть канала ствола – это зарядная камера для размещения боеприпаса. Нарезка ствола

состоит из спиральных нарезов внутри канала ствола, участки между нарезами называются полями нарезов. Калибром орудия называется диаметр канала ствола между полями нарезов в дюймах или миллиметрах.

Казенник содержит затворный механизм, который обеспечивает досылание боеприпаса в зарядную камору и его запираение. К центру затворного механизма прикреплен ударный механизм, который производит детонацию боеприпаса. Главной частью затворного механизма является затвор, который запирает заднюю часть ствола. Существует два вида затворов – поршневой и клиновой.

Станок состоит из следующих частей: люльки, поддерживающей ствол, медведки, противооткатного устройства с тормозом отката и возвратным механизмом для гашения энергии отдачи и плавного торможения откатывающихся частей орудия и для предотвращения сдвижения лафета, вертлюга (верхнего станка лафета), который поддерживает люльку и на котором размещен механизм вертикальной наводки для подъема и опускания ствола на заданный угол, нижнего станка, который поддерживает вертлюг и на котором размещен механизм горизонтальной наводки, для осуществления перемещения оси орудия по горизонтали.

Кроме того, на станке также размещается орудиная панорама, щит, ось, колеса, рабочий и стояночный тормоз, раздвижные или коробчатые станины, а также сошники, ограничивающие движение орудия при отдаче.

IV. Переведите письменно:



Advanced Artillery Systems - Excalibur Army Dita

The Dita is a new Czech self-propelled howitzer. It is a further development of the DANA M2, but with a new highly automated turret. This artillery system was developed by Excalibur Army. The Dita was first publicly revealed in 2021.

Unusual feature of this self-propelled howitzer is that it uses a turreted layout, based on a wheeled rather than tracked chassis. Such unusual design appeared in the former Czechoslovakia back in the 1980s in the form of DANA. This Czechoslovak howitzer proved itself well. With the dissolution of Czechoslovakia, both Czech republic and Slovakia carried on improving this wheeled self-propelled howitzer.

The Dita is fitted with a 155 mm/L45 ordnance. Maximum range of fire is 39 km with base bleed projectile. Though the Dita can also reach targets located 50 km away with precision ammunition.

Though by modern standards a howitzer with a 45-caliber ordnance lacks in range. For example a very similar Slovak Zuzana 2 howitzer uses a more capable 155 mm/L52 ordnance. A number of modern howitzers can reach in excess of 70 km with special ammunition.

This artillery system is also capable of direct firing. The turret is capable of 60° traverse. Maximum rate of fire is 6 rounds per minute. Sustained rate of fire is 5 rounds per minute. A total of 40 rounds with associated charges are carried for the main gun.

This artillery system has an armored cab. Though protection is rather limited. Armor protects the crew and vital components only against small arms fire and artillery shell fragments. Armor of the Dita is vulnerable even to 5.56 or 7.62 mm armor-piercing ammunition. An NBC filtration system is installed.

This artillery system is highly automated. It contains automatic ammunition loading system, navigation, automatic gun laying systems, ballistic computers, diagnostic systems etc. The Dita is operated by a crew of only 2 - driver and vehicle commander. Though there is also a workstation for a third crew member provided in the turret. It is used only in an emergency to manually operate the turret.

Unlike many recent truck-mounted howitzers, such as the French CAESAR, that are based on modified military truck chassis, the Dita uses a purpose-built special wheeled chassis. Vehicle is powered by a Tatra T3C-928-90 turbocharged and air-cooled diesel, developing 400 hp. Engine is mated to an automatic transmission. This vehicle can travel over difficult terrain. There is an auxiliary power unit, which allows emergency control of the gun in case the main engine fails.

Lesson 9.

Internal Combustion Engine

ACTIVE TERMS AND EXPRESSIONS

gasoline	бензин
cylinder	цилиндр
piston	поршень
piston rod	поршневой стержень
crankshaft	коленчатый вал
fuel pump	топливный насос
carburetor	карбюратор
fuel lines	топливопровод
linkage	привод
accelerator pedal	педаль управления подачей топлива, педаль газа
carburetor valve	дроссельный клапан карбюратора, дроссель карбюратора
air cleaner	воздушный фильтр
generator	генератор электрического тока
coil	катушка
distributor	распределительный элемент, распределитель
spark plugs	свечи зажигания
rotor	ротор, бегунок
battery	аккумулятор
booster coil	катушка зажигания
distributor cap	крышка распределителя
cylinder head	головка блока цилиндров
camshaft	распределительный вал
valve lifters	толкатель клапана
cooling system	система охлаждения
fan	вентилятор
manifold	трубопровод

INTRODUCTORY EXERCISES

I. Найдите в тексте эквиваленты словосочетаний:

преобразовывать энергию взрыва в кинетическую энергию, двигаться вверх и вниз, воспламенять сжатую смесь воздуха и паров бензина, толкать поршень вниз, преобразовывать возвратно-поступательное движение в движение по кругу, перекачиваться топливным насосом к карбюратору через топливопровод, смешивать бензин с воздухом для образования взрывчатой смеси, соединять педаль управления подачей топлива с дроссельным клапаном карбюратора, увеличить подачу газа и разогнать двигатель, уменьшить подачу газа, распределять электрический ток к соответствующим свечам зажигания, быть присоединенным к каждой свече зажигания.

II. Найдите в тексте и переведите словосочетания на русский:

to contain the explosion, to form an explosive mixture, to boost the current to a voltage high enough to produce a spark, to distribute electrical current to the proper spark plug at the proper time, to have two banks of four cylinders each driving a common crankshaft, to lift and lower the valves in the cylinders, to have two banks of four cylinders each driving a common crankshaft, to contain the valves.

TEXT

Internal Combustion Engine

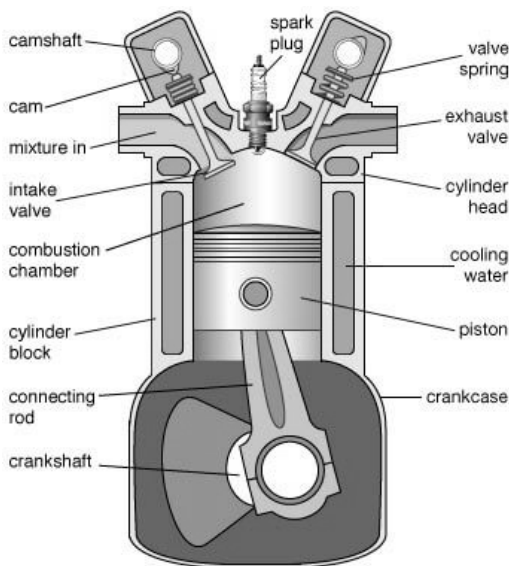
Gasoline and air mixed together form an explosive mixture, the basic job of the engine is to convert this explosive energy into motion. To contain the explosion, the engine uses a cylinder and, fitting snugly within the cylinder, a **piston** that slides up and down. Inside the cylinder an electric spark ignites the compressed gasoline and air and the hot gases from the explosion push the piston downwards. The **piston rod** is connected to a **crankshaft** which converts the up and down motion into rotary motion. The crankshaft then drives the rear wheels through various machinery which we'll see later.

Here's a different perspective on how the piston drives the crank shaft through the connecting rod. At the top of the cylinder are the valves which led in the gasoline and air mixture. For increased power and smoothness, modern auto engines have a number of cylinders driving one crankshaft. Gasoline from the tank is pumped by the **fuel pump** to the engines **carburetor** through the fuel lines. The carburetor mixes the gasoline with air to form the explosive mixture that drives the pistons. Here's a closer view of the carburetor: a **linkage** connects the **accelerator pedal** with a valve in the carburetor. Stepping on the gas opens this valve wider, increasing the gas flow and speeding up the engine, easing off on the pedal reduces the flow and the engine slows down,

Here, on an actual engine, other counterparts of the fuel system just diagrammed: the fuel pump, the fuel line from pump to carburetor, and the carburetor itself with its **air cleaner** removed. Here is the linkage connecting the carburetor to the accelerator pedal. The engines electrical system supplies the spark that fires the fuel mixture. As the engine rotates and drives a **generator** which keeps the car's battery charged, the battery supplies electricity to the **coil**, which boosts the current to a voltage, high enough to produce a spark, and then sends it through the **distributor** to the **spark plugs**, located in the cylinders. The distributor distributes electrical current to the proper spark plug at the proper time. Inside the distributor is a **rotor**, which, as it turns, touches a series of contacts, one of which is wired to each spark plug. The points open and close as the rotor turns, interrupting the current to produce the fuel-igniting spark. Here again other major parts of the engine's electrical system: the generator, the **battery**, the **booster coil**, distributor, and spark plugs. Now, looking at an actual engine, here is the generator, and the battery. Together at the rear of the engine are the coil, **the distributor cap**, containing the contacts swept by the rotor, the rotor itself, and the points which sometimes needed adjustments. And finally, in the cylinder heads – the spark plugs. The engine on this model chassis contains nearly all the parts found in a working engine. Let's break it down to its fundamentals and then build it up again.

Here's the heart of the engine, the cylinders and pistons. This engine, known as a V8, has two banks of four cylinders each driving a common crankshaft. The **camshaft** geared to the crankshaft lifts and lowers the valves in the cylinders. Now the right and left **cylinder heads**, containing the valves themselves, and the **valve lifters**. The distributor at the rear of the engine has also driven from the camshaft. Now the **fan**, the generator, and a part of the **cooling system**. Here, flashing lights simulate the firing of the spark plugs as the rotor supplies current to each and proper firing order. Continuing the build up here are the carburetor in the **manifold**. And finally the air cleaner atop the carburetor. Here's a rear view showing how the pistons drive the crankshaft, and down through the plastic housing we can see the gearing connecting the camshaft to the distributor. 4, 6 and 8 cylinder engines are standard today, this V8 configuration is very popular for its smoothness and power.

III. Используя схему, назовите составные части двигателя внутреннего сгорания на русском языке:



IV. Переведите письменно:

Двигатель внутреннего сгорания преобразует тепловую энергию горячей топливо – воздушной смеси в механическое движение. В двигателе расположены цилиндры с подвижными в вертикальной плоскости поршнями, достаточно плотно прилегающими к стенкам цилиндров. Внутри цилиндра через клапаны подается воздушно-топливная смесь, затем она сжимается под воздействием поршня и воспламеняется посредством электрической искры. Образовавшиеся в процессе горения газы толкают поршень вниз. Поршень при помощи шатуна вращает коленчатый вал, который в свою очередь, посредством трансмиссии, приводит в движение колеса. В большинстве современных автомобильных двигателях используется 4, 6 или 8 цилиндров. Бензин, через соединительные трубки подается из бака в карбюратор, при помощи топливного насоса. В карбюраторе бензин перемешивается с воздухом, образуя горючую смесь. Педаль газа соединена с дроссельной заслонкой карбюратора специальной механической тягой. Нажатие на педаль шире открывает заслонку, увеличивая подачу топлива и повышая обороты двигателя, при отпускании педали, подача топлива уменьшается и обороты двигателя падают. Система зажигания двигателя производит искру, воспламеняющую топливно-воздушную смесь. Коленчатый вал двигателя соединен с генератором, который вращаясь, заряжает аккумулятор. Электрический ток с аккумулятора поступает на катушку зажигания, которое преобразует его в ток высокого напряжения, достаточный для формирования искры, и через распределитель ток подается на свечи зажигания, расположенные в цилиндрах. Распределитель зажигания поочередно подает ток на нужную свечу в заданный момент времени.

Распределительный вал, соединенный шестернями с коленчатым валом, открывает и закрывает клапаны цилиндров. Распределитель зажигания также соединен с распределительным валом.

Lesson 10.

Infantry weapons. IFV “Warrior”

ACTIVE TERMS AND EXPRESSIONS

infantry fighting vehicle (IFV)	боевая машина пехоты (БМП)
armoured personnel carrier (APC)	бронетранспортер (БТР)
tracked	гусеничный
non-stabilised canon	нестабилизированная пушка
coaxial machine gun	спаренный пулемет
turret	башня
main gun	пушка
armour-piercing	бронепробивной
high-explosive, fragmentation (HE-FRAG)	осколочно-фугасный
all-welded	цельносварной
hull	корпус
laminated	многослойный
all-round protection	круговая защита
front arc	лобовая часть корпуса
passive armour	пассивная броня
RPG round	гранатометный выстрел; противотанковый снаряд
NBC protection system	система РХБ-защиты
firing port	амбразура
turbocharged diesel engine	дизельный двигатель с турбонаддувом
automatic transmission	автоматическая коробка передач
main battle tank (MBT)	основной боевой танк
dozer blade	отвал (нож) бульдозера
mine-clearing plough	минный трал
Mechanised Artillery Observation Vehicle (MAOV)	артиллерийский подвижный наблюдательный пункт
dummy	макет; имитация; ложный

repair and recovery vehicle	ремонтно-восстановительная машина
winch	лебёдка
crane	подъёмный кран
anti-tank guided weapon (ATGW)	противотанковая управляемая ракета (ПТУР)

INTRODUCTORY EXERCISES

I. Найдите в тексте и переведите словосочетания:

to cease the production; to operate armoured fighting vehicle; to be armed with non-stabilised canon and coaxial machine gun; to fire armour-piercing rounds; to enter through a door in the hull rear; to maintain in action; to be powered by turbocharged diesel engine; to keep up with Challenger 2 MBTs; to undergo an upgrade programme; to be converted to armoured recovery vehicles.

II. Подберите эквиваленты словосочетаний:

to keep in service	обеспечивать круговую защиту
to mate to an automatic transmission	оборудовать дополнительной пассивной броней
to test trial armament installations	в мирное время
to improve armour protection	сопрягать с автоматической коробкой передач
to withstand armour-piercing rounds	поражать низколетящие вертолеты
to engage low-flying helicopters	содержать в эксплуатации
to provide all-round protection	проводить испытания опытных образцов вооружения
to fit with extra passive armour panels	повышать защитные свойства брони
during peacetime operations	выдерживать попадание бронебойных снарядов

TEXT

IFV WARRIOR

The tracked IFV known to the British Army as the Warrior was originally known as MCV-80. It was intended to replace the old FV432 armoured personnel carrier. This vehicle was developed from the 1970s onwards. A series of pre-production prototypes built in the early 1980s. Production by GKN Defence commenced during 1986. The Warrior has been in British Army service since 1988, seeing combat in the Gulf in 1991 and during Iraq war. Production of this armoured vehicle ceased in 1995. The original order was for over 1,000 units but Army reorganisations reduced that to 789 of all types sufficient to equip seven Mechanised Infantry battalions. The British Army plans to operate these armoured fighting vehicles until 2035.

The base model is the Warrior Section Vehicle armed with non-stabilised 30-mm Rarden cannon and coaxial 7.62-mm machine gun in a two-man turret. The main gun fires armour-piercing and HE-FRAG rounds. It is capable of destroying enemy armoured personnel carriers at ranges of up to 1 500 m. It can also engage low-flying helicopters.

The Warrior IFV has an all-welded aluminium armour hull and laminated steel armour turret. It provides all-round protection against 14.5-mm armour-piercing rounds. Front arc is likely to withstand 25-mm armour-piercing rounds. During military conflicts vehicles are fitted with extra passive armour panels for protection against RPG rounds. But these are not normally carried during peacetime operations. This armoured fighting vehicle is also fitted with NBC protection system.

The seven troops carried enter through a door in the hull rear. Passengers enter and leave the vehicle via rear doors. Once they are inside there are sufficient combat supplies carried to maintain them in action for at least 48 hours. There are no firing ports in the hull in order to improve armour protection.

The Warrior IFV is powered by a Perkins CV8 TCA turbocharged diesel engine, developing 550 hp. Engine is located at the front. It is

mated to an Allison 4-speed automatic transmission. Engine and transmission are built in one module and can be replaced in field conditions within 40 minutes. Warrior is fast for its class of vehicles. With a maximum road speed of 75 km/h it can keep up with Challenger 2 MBTs over the toughest terrain. Warriors may be fitted with dozer blades or light mine-clearing ploughs.

The British Army also operates a Warrior Mechanised Artillery Observation Vehicle (MAOV) on which the only turret armament is a 7.62-mm machine gun and a dummy cannon barrel. There are two repair and recovery vehicles, the Warrior Mechanised Recovery Vehicle (Repair) (MCV(R)) and Mechanised Combat Repair Vehicle (MCVR), both armed with a single 7.62-mm machine gun and equipped for their roles with winches, cranes and other equipment.

A Warrior Command Vehicle is produced in four sub-variants (one for the artillery), all outwardly identical to the Section Vehicle. There is also Warrior carrying ATGW teams, originally armed with MILAN and eventually Javelin.

Several trial armament installations have been tested on Warrior including one with a 90-mm gun turret.

A special hot weather version known as the Desert Warrior, or Fahris, has been ordered by Kuwait – this model has a 25-mm cannon main armament. A total of 254 Desert Warrior IFVs were built.

British vehicles have seen frequent use and are undergoing an upgrade programme. It includes new armour, new turret and 40-mm cannon. Over 600 of these IFVs will be upgraded to keep them in service. Remaining Warriors will be converted to armoured recovery vehicles.

III. Ответьте на вопросы:

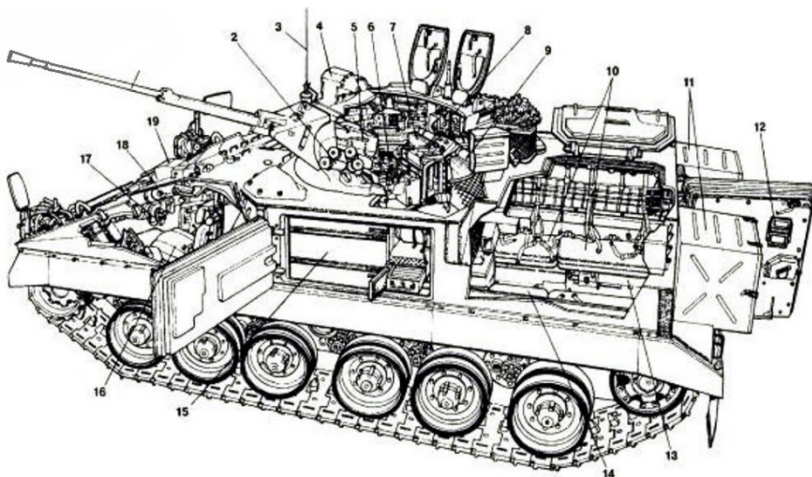
1. What is the main combat vehicle adopted in the British Army?
2. How long has the IFV Warrior been in service and which combat operations has it seen?
3. What armament is the Warrior equipped with?

4. What types of targets is the Warrior able to destroy?
5. Describe the Warrior's armour protection.
6. What type of propulsion is used in the Warrior?
7. What other types of combat vehicles are built on the Warrior's platform?
8. What types of anti-tank guided missiles do you know?
9. Are there any export versions of the Warrior?
10. What are the prospects for the IFV Warrior development?

IV. Изучите схему и переведите ее содержание:

Entered service	1988
Crew	3 men
Personnel	7 men
Dimensions and weight	
Weight	25.7 t
Length	6.34 m
Width	3.03 m
Height	2.7 m
Armament	
Main gun	30-mm cannon
Machine guns	1 x 7.62-mm
Mobility	
Engine	Perkins CV8 TCA diesel
Engine power	550 hp
Maximum road speed	75 km/h
Range	660 km
Maneuverability	
Gradient	60%
Side slope	40%
Vertical step	0.75 m
Trench	2.5 m
Fording	1.3 m

V. Используя схему, назовите основные элементы конструкции БМП на русском и английском языке:



**1 – 30 мм пушка; 2 – дымовые гранатометы; 3 – антенна;
4 – прицел командира; 5 – казенник пушки; 6 – боеукладка;
7 – сиденье командира; 8 – радиостанция; 9 – сиденье
наводчика; 10 – сиденья пехотинцев; 11 – ящики для
снаряжения; 12 – прибор наблюдения; 13 – гидропривод
открывания кормовой двери; 14 – биохимический туалет;
15 – фильтр-вентиляционная установка; 16 – сиденье
механика водителя; 17 – штурвал; 18 – люк механика водителя;
19 – прибор НВ**

VI. Переведите письменно:

В качестве основного вооружения MCV-80 выбрана 30-мм автоматическая пушка L21A1 «Рарден». Пушка имеет автоматику на основе отдачи ствола с длинным ходом, может вести огонь одиночными выстрелами или очередями по шесть выстрелов (точнее – две очереди по три выстрела подряд). Питание – кассетами по три патрона, скорострельность 80 – 90 выстр/мин. Сравнительно невысокий темп стрельбы позволил повысить ее

точность. Той же цели служат демпферы, установленные на конце кожуха ствола и гасящие его колебания при выстреле. Максимальная дальность стрельбы 4000 м. Углы наведения по вертикали от 0° до +45°. Стреляные гильзы удаляются через лючок за пределы башни. Пушка снабжена коническим пламегасителем и рукояткой перезарядки, ее казенная часть внутри башни имеет длину всего 430 мм. Она не снабжена стабилизатором - по мнению англичан, боевые машины могут вести прицельный огонь только с остановок.

В боекомплект, размещенный в башне между местами командира и наводчика, входят унитарные патроны нескольких типов. В качестве бронебойного поначалу использовался снаряд с бронепробиваемостью 30 мм на дистанции 1000 м. В 1985 году был принят выстрел L14A2 весом 822 г и длиной 285,55 мм с бронебойным подкалиберным трассирующим снарядом, разработанным «Ройал Орднанс» и американской фирмой «РАТЕС». Его масса 300 г, начальная скорость 1175 м/с, на дальности до 1500 м он пробивает 40-мм стальную броню при угле встречи до 45°. После вылета снаряда из канала ствола его поддон распадается на четыре сектора, а пирефорный состав в носке снаряда позволяет наблюдать за попаданиями. Считалось, что такой снаряд позволит «Уорриор» успешно бороться с советской БМП-2. Масса выстрела L5A2 с бронебойным снарядом – 904,4 г. Масса снаряда 357,4 г, начальная скорость 1070 м/с. Выстрел L13A1 с осколочным трассирующим снарядом - соответственно 903,9 г, 356,9 г и 1070 м/с.

VI. Переведите письменно:

The British Army is in a state of crisis at the moment. Two recent books on Iraq and Afghanistan have severely criticised its post-9/11 performance. Simon Akam's *The Changing of the Guard* and Ben Barry's *Blood, Metal and Dust* provide different vastly different perspectives of the two conflicts but reach the same conclusions. Both regard the two conflicts as strategic defeats.

The Army has been fighting a battle to renew itself, but it has constantly changed its mind about where its priorities lie. It is now clear that it must move away from counter-insurgency roles towards countering renewed peer adversary threats. However, it has so far failed to develop a compelling future plan. The Army's Integrated Review strategy is a train wreck. It was told that its previous aspirations, to field two Strike Brigades and two Armoured infantry Brigades were unaffordable. Consequently, the Warrior IFV capability sustainment programme was cancelled and the fleet will be retired by 2025. The Challenger 2 MBT fleet will be upgraded, but only 148 tanks will be modernised out of 227. To a certain extent, the Boxer MIV programme will offset the loss of Warrior, but if Army wishes to conduct high intensity operations against peer adversaries in northern Europe in winter it will need a fleet of medium tracked platforms including an IFV.

The armies of France, Italy and Germany all possess a minimum of 8 to 10 deployable brigades, with a large proportion being high-end heavy armour formations. If Britain cannot field 5 or 6 deployable brigades with at least two heavy armour brigades, then we really are in big trouble. The belief that heavy armour is redundant needs to be challenged. Potential adversaries are investing substantial resources to build larger MBT and IFV fleets. Britain cannot be an effective coalition partner to our NATO allies without rebuilding in this area. Though heavy tracked vehicles are difficult to deploy and vulnerable to UAVs and loitering munitions, nothing else can provide the mix of firepower, protection and mobility to seize and hold contested territory.

Lesson 11.

The Royal Navy Ships And Vessels Classification. Part 1

ACTIVE TERMS AND EXPRESSIONS

warship	боевой корабль
destroyer	эсминец (<i>эскадренный миноносец</i>)
displacement	водоизмещение
beam length	длина балки
forecastle	бак (<i>носовая часть судна</i>)
punch	ударная сила
firepower	огневая мощь
naval gun	корабельное орудие (<i>артиллерия</i>)
high explosive shell	фугасный снаряд
extended-range shell	боеприпас увеличенной дальности
Naval Gunfire Support	поддержка огнем корабельной артиллерии
artillery bombardment	артиллерийский обстрел
shore target	береговая цель
surface target	наземная цель
airborne target	воздушная цель
shore battery	батарея береговой обороны
anti-air missile	зенитная ракета
naval task group	оперативная группа ВМС
aerial threat	угроза с воздуха; средство воздушного нападения
Mach	число Маха
jet	реактивный двигатель
close-in weapon	корабельное вооружение ближнего радиуса действия
Gatling gun	пушечная установка типа Гатлинг
frigate	фрегат (<i>сторожевой корабль</i>)
General Purpose Machine Gun	универсальный пулемет
upper deck	верхняя палуба
gun crew	орудийный расчет

multi-mission warship	многоцелевой боевой корабль
acoustically quiet hull	малозумный корпус
unmanned vehicle	беспилотный аппарат
helicopter hangar	вертолетный ангар
flight deck	полетная палуба
aircraft carrier	авианосец
mine hunter	минный тральщик
Mine Counter Measure Vessel	корабль противоминной обороны (MCMV)
glass-reinforced plastic hull	корпус из стеклопластика
Mine Disposal System	система обнаружения и обезвреживания мин
underwater explosive	морская мина
fibre optic cable	оптоволоконный кабель
parent ship	плавучая база
reversible motor	реверсивный двигатель
sonar	гидролокатор; гидролокационная станция
seabed	морское дно
clearance diving team	водолазный отряд разминирования
humanitarian aid	гуманитарная помощь
manoeuvrability	маневренность
modular design	модульная конструкция
cruising speed (velocity)	крейсерская скорость
knot	узел (единица измерения скорости)
gas-turbine power plant	газотурбинный двигатель
diesel engine	дизельный двигатель
air-defense missile	ракета ПВО
torpedo launching tube	торпедный пусковой аппарат
acoustic guidance	акустическое наведение
antisubmarine missile	противолодочная ракета
missile launcher	ракетная пусковая установка
multi-mission	
multi-purpose	многоцелевой
multi-task	

INTRODUCTORY EXERCISES

I. Подберите эквиваленты словосочетаний:

1) to provide humanitarian aid	a) прорывать внешнее кольцо
2) to provide all-round defence	b) применять против наземных и воздушных целей
3) to enter service	c) охранять важные морские торговые пути
4) to provide high manoeuvrability	d) поступать на вооружение
5) to penetrate outer ring of defence	e) обеспечивать круговую оборону
6) to deal with wide variety of missions	f) оказывать гуманитарную помощь
7) to safeguard vital maritime trade routes	g) скрывать присутствие маскировать
8) to use against surface and airborne targets	h) обеспечивать высокую маневренность
9) to meet the demands of maritime environment	i) соответствовать требованиям боевой обстановки при ведении действий в море
10) to conceal the presence	j) выполнять широкий спектр боевых задач

II. Объясните на английском языке значение словосочетания «flexible mission bay», дайте несколько вариантов перевода. Составьте предложения на обоих языках.

TEXT

Ships and Vessels of the Royal Navy (Part I)

Destroyers (x6)

Destroyers are part of the backbone of the Royal Navy, committed around the world 365 days a year hunting pirates, drug runners or submarines, defending the Fleet from air attack, and providing

humanitarian aid after natural disasters. The UK's 6 Type 45 destroyers are advanced warships. Their mission is to shield the Fleet from air attack using Sea Viper missile which can knock targets out of the sky up to 70 miles away. They have a displacement of 8000 tonnes, length of 152 metres, and a beam length of 21.2 metres. Destroyers are armed with the MK8 gun, a 4.5in main gun; found on the forecastle, it is the most obvious provider of punch and firepower. The gun can fire up to two dozen high explosive shells, per minute, weighing more than 40kg, at targets more than a dozen miles away – and nearly 18 miles if special extended-range shells are used. The main purpose of the gun is Naval Gunfire Support – artillery bombardment of shore targets. In this role the gun is capable of firing the equivalent of a six-gun shore battery. The sophisticated multi-function Sampson radar is an essential part of the Type 45's air defence system.



The Sea Viper anti-air missile provides all-round defence – not just for the destroyer but for an entire naval task group – against all aerial threats up to 70 miles away. It races towards its target at speeds in excess of Mach Four (over 3,000 mph) using a series of tiny jets to manoeuvre. The Phalanx close-in weapon is a deadly last line of defence. Capable of engaging targets around one mile away, it is a radar-controlled Gatling gun which fires 20mm shells, spewing out 3,000 rounds a minute. It is designed to engage incoming enemy aircraft and missiles if they penetrated a ship or task group's outer ring of defences such as Sea Viper or Sea Dart.

Frigates (x13)

The Type 23 Frigates were originally designed to deal with the Cold War submarine threat, but have proven their versatility by dealing with a wide variety of missions. The Type 23, or Duke-class, frigates are the core of the frontline Fleet. They can be typically found east of Suez, safeguarding Britain's vital maritime trade routes or Britain's interests in the South Atlantic. They have a range of 7800 nautical miles, with a top speed of 28 knots. Its main weapon, as for destroyers, is the MK8 gun. Frigates also carry small-calibre guns such as the SA80, General Purpose Machine Gun and 9mm guns for use against both surface and airborne targets. Unlike the majority of the ships weapons systems, these guns are not radar and computer controlled, but aimed and fired by the upper deck gun crews.

The Type 26 Global Combat Ship is a 21st Century warship that will replace the Type 23 frigate as the workhorse of the Fleet, undertaking the Royal Navy's three core roles – warfighting, maritime security and international engagement – on the world stage. The Royal Navy is at the advanced stages of designing a new warship which will be a multi-mission warship designed for joint and multinational operations across the full spectrum of warfare, including complex combat operations, counter piracy, and humanitarian and disaster relief. It will be capable of operating independently for significant periods, or as part of a task group. The vision is that the planned 13 Type 26 ships will be delivered in both anti-submarine warfare and general purpose variants, sharing a common acoustically quiet hull to shield it from detection by submarines. Entering service as soon as possible after 2020, the Type 26 will be in service until at least 2059, and is being designed to be supported and upgraded as new technology becomes available, so that it will meet the demands of the maritime environment throughout its life. The ships will be equipped with some of the most modern and effective weapons systems available today, including Sea Ceptor missile system and 997 radar, which will be fitted in Type 23 frigates before being moved across to the Type 26. The one key area which makes the global

combat ship stand apart from other warships is its adaptability. The Type 26 will adapt to operations, allowing equipment and crew to flex to meet changing tasks. At the centre of this concept is the flexible mission bay located forward of the helicopter hangar, which can house and deploy additional boats, unmanned vehicles (aerial, surface or underwater) or up to ten containers for humanitarian aid. The design also incorporates a five-inch medium calibre gun and a flight deck that can operate aircraft up to Chinook helicopters.

Aircraft Carriers (x0)

The Royal Navy currently has no operational aircraft carriers, the last of the Invincible-class carriers being decommissioned in 2014 to be replaced by two Queen Elizabeth-class aircraft carriers, which will be the biggest and most powerful warships ever constructed for the Royal Navy. HMS Queen Elizabeth is the first of class and was named in 2014, will be commissioned in 2017 and become fully operational in 2020. Both ships will be versatile enough to be used for operations ranging from supporting war efforts to providing humanitarian aid and disaster relief.

Mine Hunters (x15)

Britain's seven Sandown-class MCMVs (Mine Counter Measure Vessels) have glass-reinforced plastic hulls to conceal their presence from the threat of sea-mines. These ships clear the way of mines to allow safe passage for larger forces, swiftly detecting and destroying any hidden dangers. The Seafox Mine Disposal System is the remotely operated submersible used to identify the threat of underwater explosives via fibre optic cables from the parent ship. Once a mine has been found the unit is guided to the target and will detonate a shape charge. Four independent reversible motors provide high manoeuvrability, allowing for exact placement prior to detonation. It has a single mounting carrying an Oerlikon 30mm gun. The Royal Navy's eight Hunt-class MCMVs use high definition sonar to hunt the

world's seabeds for mines and lost explosives which are then destroyed by the Hunt-class ship's own clearance diving teams or the Seafox Mine Disposal System. Like the Sandown-class MCMVs, it also has a single mounting carrying an Oerlikon 30mm gun.

III. Ответьте на вопросы:

1. What are the main tasks of the Royal Navy destroyers?
2. What weapons is Type 45 destroyer armed with?
3. What was the initial task of Type 23 frigates?
4. What are the essential characteristics of Type 23 frigate including its armament?
5. What are the advantages of Type 26 Global Combat Ship? Tell about its features.
6. Which aircraft carriers of the Royal Navy do you know?
7. What classes of MCMVs does the Royal Navy operate? What is the difference?
8. What is the destination of MCMVs?

IV. Подготовьте пересказ текста на русском языке.

V. Переведите на слух в быстром темпе:

водоизмещение; to conceal the presence; морская мина; flight deck; авианосец; MCMV; to provide high manoeuvrability; малошумный корпус; Naval Gunfire Support; система обнаружения и обезвреживания мин; high explosive shell; береговая цель; to enter service; seabed; охранять важные морские торговые пути; multi-mission warship; беспилотный аппарат; naval task group; плавучая база underwater explosive; зенитная ракета.

VI. Переведите письменно:

Последние годы Министерство Обороны Великобритании серьезно задумалось о модернизации как армии в целом, так и флота в частности. Этому свидетельствуют немалые субсидии на развитие вооруженных сил и военной науки.

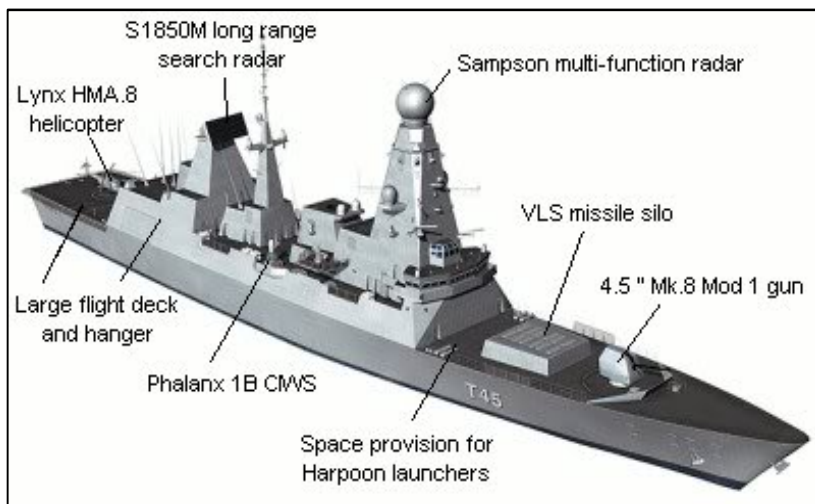
Программа по созданию кораблей будущего существует с 1998 года, но в активную свою фазу она вошла с 2010 года, когда компания BAE-Systems выиграла 4х летний контракт на разработку фрегатов «типа 26». В соответствии с утвержденной программой военные фрегаты нового «типа 26» должны быть готовы к 2021 году и начать к середине 2030х гг. заменять нынешние модели «тип 22» и «тип 23». Уже сейчас над новыми кораблями работают порядка 80 групп военных и гражданских инженеров, и число привлеченных специалистов будет увеличиваться.

Изначальный проект корабля предполагал создание судна водоизмещением 6850 тонн, длиной 141 метр и стоимостью порядка 500 миллионов фунтов. 30 ноября 2010 года компания BAE объявила о том, что были произведены ряд улучшений в проекте, что позволило снизить стоимость производства одного корабля до 250–300 миллионов и улучшить некоторые характеристики будущего корабля, о которых было объявлено в мае 2011 года. По новому проекту будущий фрегат будет длиной 148 метров, водоизмещением 5400 тонн и будет построен по принципу модульности. Ширина будущего судна составит 18 метров, а максимальная крейсерская скорость 24 узла. Для снижения общей стоимости корабля BAE-Systems предложила заменить газотурбинные двигатели на более низкие по стоимости дизельные. Однако, это снизит максимальную скорость корабля на 2–3 узла.

На будущие фрегаты предполагается устанавливать новейшие системы разведки и вооружения. Например, 3D сканеры «Артизан» (Artisan), «Сонар 2087» и ракеты противовоздушной обороны «морские перехватчики» (Sea Ceptor CAMM), которые способны поражать цели на дистанциях от 1 до 25 км. Так же, как и нынешние типы фрегатов, новые корабли будут вооружены торпедным пусковым аппаратом с легкими торпедами с акустическим наведением или торпедами нового поколения. Так

же, предполагается, что эти корабли будут вооружены двумя системами для запуска противолодочных ракет «Гарпун» (Harpoon). Однако, по опубликованному в 2012 году дизайну новых кораблей можно предположить, что на них могут быть установлены новые многоцелевые (противолодочные и противовоздушные) крылатые ракеты, например, «Персей» (CVS401 Perseus). Так же, пусковые установки могут быть заряжены крылатыми ракетами «Томагавк» (Tomahawk). Стоит отметить, что при всем этом фрегат этого типа будет иметь на своем борту 1 вертолет типа «Рысь» или «Мерлин».

VII. Используя нижеприведенную схему сделайте доклад на английском языке на тему «Вооружение и техническое оснащение фрегата Тип-45 ВМС Великобритании».



Lesson 12.

The Royal Navy Ships And Vessels Classification.

Part 2

ACTIVE TERMS AND EXPRESSIONS

Royal Marines	морская пехота ВМС Великобритании
Landing Platform Dock (LPD)	десантный корабль-док (ДКД)
Landing Platform Helicopter Ship	десантный вертолетоносный корабль-док (ДВКД)
amphibious assault ship	универсальный десантный корабль (УДК)
helicopter carrier	вертолетоносец
assault helicopter	ударный вертолет
two-spot flight deck	двухместная полетная палуба
floodable well dock	затопляемая док-камера
utility landing craft	десантный катер (баржа)
hanger	подвесное устройство
all-terrain tracked vehicle	гусеничная машина повышенной проходимости
close-in weapon system	система оружия ближнего действия (корабля)
supersonic missile	сверхзвуковая ракета
seven-barrel Gatling gun	семиствольный пулемет Гатлинга
Royal Air Force (RAF)	ВВС Великобритании
air group	(корабельная) авиагруппа
patrol vessel	сторожевой корабль
Fast Inshore Patrol Craft	катер прибрежного патрулирования
Patrol Boat Squadron	отряд патрульных катеров
crew	экипаж корабля (команда)
University Royal Naval Units (URNU)	учебный военный центр ВМС на базе гражданских ВУЗов
nuclear fleet	атомный флот
single mounting	одиночная орудийная установка
support ship	вспомогательный корабль
survey ship	гидрографическое судно
ice patrol ship	корабль ледовой разведки

hull mounted multi-beam	корпусный многолучевой
echo sounder	эхолот (монтируемый в корпусе корабля)
survey motor boat (SMB)	промерный катер
ramped work boat	рабочая лодка с аппарелью
rigid inflatable boat (RIB)	жестко-корпусная надувная лодка
azimuth thruster	азимутальное подруливающее устройство
swivelling pod	поворотная рулевая колонка
ocean survey vessel	океанографическое судно
High Resolution Multi Beam Sonar System (HRMBSS)	многолучевой гидролокатор высокого разрешения
swathe	зд. широкополосный
Hydrographic Office	Гидрографическое управление ВМС
coastal survey ship	прибрежное гидрографическое судно
sidescan sonar	гидролокатор бокового обзора
sensors	зд. радиоэлектронное оборудование
anti-submarine torpedo	противолодочная торпеда
acoustic proximity fuse	акустический неконтактный взрыватель
cruise missile	крылатая ракета
Tomahawk Land Attack Missile	ракета «Томагавк» для поражения наземных целей
attack submarine	ударная подводная лодка
nuclear deterrent force	силы ядерного сдерживания
nuclear missile submarine	атомная подводная лодка (АПЛ)
steam powered	на паровой тяге
operational flexibility	гибкость применения
covert surveillance	скрытное наблюдение
range	дальность хода
endurance	автономность корабля
accommodation	размещение
crew	экипаж корабля
combat management system (CMS)	система боевого управления
shared infrastructure operating system	сетевая операционная система

INTRODUCTORY EXERCISES

I. Подберите эквиваленты словосочетаний:

1) disaster relief operations	a) поражать подводные лодки и корабли противника на поверхности
2) to deliver commitments	b) скрытное наблюдение
3) global reach	c) заходить в иностранные морские порты
4) operational flexibility	d) осуществлять управление по проводам
5) to carry out inshore survey work	e) гибкость применения
6) to make visits to overseas ports	f) обнаруживать корабль на расстоянии более 50 миль
7) to blast enemy submarines or ships out of the water	g) устранение последствий стихийных бедствий
8) to guide by wires	h) вести исследовательские работы в прибрежной зоне
9) covert surveillance	i) выполнять обязательства
10) to hear vessels over 50 miles away	j) стратегия глобального присутствия

II. Найдите в тексте и переведите словосочетание «Antarctic Treaty». Найдите информацию о данном соглашении и сделайте краткий доклад на английском языке.

III. Найдите в тексте английские эквиваленты терминов и словосочетаний:

выполнять международные обязательства по охране окружающей среды; объединять современное радиоэлектронное оборудование, вооружение и передовые принципы компоновки; передавать по обратной связи изображения с поля боя; переназначать цель в полете; способный действовать

самостоятельно; с высокой точностью поражать наземные цели, находящиеся на удалении от берега; разведка в прибрежной зоне; большой комплект специального оборудования; поражать цель на расстоянии полутора километров; сближаться с целью при помощи встроенного гидролокатора; выслеживать и уничтожать атомные подводные лодки и надводные корабли противника.

TEXT

Ships and Vessels of the Royal Navy (Part II)

Assault Ships (x3)

The single role of the Royal Navy's two Landing Platform Dock ships is to transport Royal Marines ashore by air and by sea, with boats from the landing dock in the belly of the ship and by assault helicopter from the two-spot flight deck. LPDs can carry 256 troops, with their vehicles and combat supplies, and this can be swollen up to 405 troops. The vehicle deck has a capacity for up to 6 Challenger tanks or around 30 armoured all-terrain tracked vehicles. There is a floodable well dock able to take 4 utility landing craft. These vessels do not have a hanger but have equipment needed to support aircraft operations. The Goalkeeper close-in weapon system destroys supersonic missiles and aircraft which have evaded the outer layers of a ship's defences. Goalkeeper is a seven-barrel 30mm Gatling gun spewing 4,200 rounds per minute (70 rounds per second). It can track up to 15 targets at the same time, deciding which ones are the most dangerous before engaging them at ranges up to 1,500 metres.

The Royal Navy's one Landing Platform Helicopter Ship can carry 12 Sea King and 6 Lynx helicopters. The dedicated helicopter carrier and amphibious assault ship is designed to deliver troops to the centre of the action. RAF Chinook helicopters are normally carried as an integral part of the ship's air group. The Landing Platform Helicopter dock is designed to deliver troops to the centre of the action by helicopter or by landing craft. It is armed with the same weaponry as the Landing Platform Dock ships.

Patrol Vessels (x20)

Fourteen Archer-class P2000 Fast Inshore Patrol Craft form the First Patrol Boat Squadron. Their primary role is to support University Royal Naval Units (URNU) but they also contribute to a wide range of Fleet tasking, including safeguarding Britain's nuclear fleet. They have a single mounting carrying an Oerlikon 30mm gun and a simple hand-operated mounting carrying a single Oerlikon KAA200 automatic cannon, which can fire 1000 rounds a minute and has a range of 2000m.

Four River-class patrol ships with a crew of 45 can be used for anything from fire-fighting to disaster relief operations. They are armed with the same guns as the Archer-class patrol boats.

The two Scimitar-class fast patrol boats of the Royal Navy's Gibraltar Squadron, with a crew of 5 and a top speed of 32 knots, watch over Gibraltar's shores and support ships in the Strait of Gibraltar. They are armed with the same guns as the Archer-class and River-class patrol boats.

Survey Ships (x5)

The Royal Navy has an ice patrol ship, HMS Protector, which is deployed on operations for 330 days a year. The ship is capable of positioning to pinpoint accuracy in winds of up to 80 knots and is fitted with an impressive array of specialist equipment including a hull mounted multi-beam echo sounder; a state-of-the-art survey motor boat (SMB); an 8.5m ramped Work Boat; seven high-speed rigid inflatable and inflatable boats; three quad bikes and trailers and a Land Rover and two trailers. She helps to deliver the UK's commitments under the Antarctic Treaty, support science programmes and ensure that expeditions and vessels are meeting their international environmental obligations. The Ice Patrol Ship is a symbol of the Royal Navy's global reach, operational flexibility and the Service's ability to sustain operations wherever and whenever that presence is required.

The Royal Navy has two Echo-class survey ships designed to carry out a wide range of survey work, including support to submarine and amphibious operations. They each have a survey motor boat capable of

operating independently, supporting a small group of surveyors who can live and work ashore to carry out surveys. They are the first Royal Navy ships to use azimuth thrusters, where the propellers are part of a swivelling pod, allowing for precise manoeuvring.

HMS Scott is the Royal Navy's only ocean survey vessel. Scott has been specially designed to carry the modern High Resolution Multi Beam Sonar System (HRMBSS). This swath echo sounder is capable of collecting depth information over a strip of the sea bed several kilometres wide and gives Scott the capability of surveying 150km² of ocean floor every hour. All the processing of the data is conducted and checked onboard with the final product rendered to the UK Hydrographic Office in Taunton.

HMS Gleaner is a coastal survey ship and the Royal Navy's smallest commissioned vessel. The survey motor launch is an advanced survey vessel, using multi beam and sidescan sonar to collect data on the nature of the sea bed and the depth of water. She was designed to carry out inshore survey work along the South Coast of England, but has since carried out surveys around the coast of the UK, as well as making visits to overseas ports.

Submarines (x10)

The Royal Navy has two Astute-class attack submarines which are the largest, most advanced and most powerful attack submarines ever operated by the Royal Navy, combining world leading sensors, design and weaponry in a versatile vessel. Both are armed with the Spearfish anti-submarine torpedo, a heavyweight torpedo that weighs nearly two tonnes and is capable of blasting enemy submarines or ships out of the water. At full speed, Spearfish can attack at target up to 14 miles away. At low speed, that increases to more than 30 miles. It is guided either by a copper wire or closes on to its target using its inbuilt sonar, delivering a 660lb explosive charge which detonates either when it strikes the hull of an enemy submarine, or via an acoustic proximity fuse underneath the target. They are also equipped with the Tomahawk IV – known in the Royal Navy as TLAM (Tomahawk Land Attack

Cruise Missile) – that allows submarines to strike at ground targets hundreds of miles inland with pinpoint accuracy. It can be directed at a new target in mid-flight, and can also beam back images of the battlefield to its mother submarine.

The Royal Navy's four Trafalgar-class attack submarines were designed for the Cold War, but have been adapted to the demands of the 21st century. The primary role was to hunt out and destroy enemy nuclear missile submarines as well as surface ships; over the decades they have been kitted out to perform other roles including covert surveillance and inshore reconnaissance of installations and landing beaches. Fitted with advanced sonar, the system is so sensitive they can hear vessels over 50 miles away. They are armed as for the Astute-class submarines.

The four Vanguard-class submarines form the UK's strategic nuclear deterrent force. Each of the four boats is armed with Trident 2 D5 nuclear missiles. Like all submarines the Vanguard Class are steam powered, their reactors converting water into steam to drive the engines and generate electricity. The Trident nuclear missile is Britain's ultimate deterrent and weapon. The Trident can be fired at targets up to 7,000 miles away, ejected by high-pressure gas before the rockets fire when the missile reaches the surface. At its fastest it will travel at over 13,000 miles an hour. Each missile has the ability to deliver eight warheads against a dozen different targets. The submarines are also armed with the Spearfish torpedo.

IV. Ответьте на вопросы:

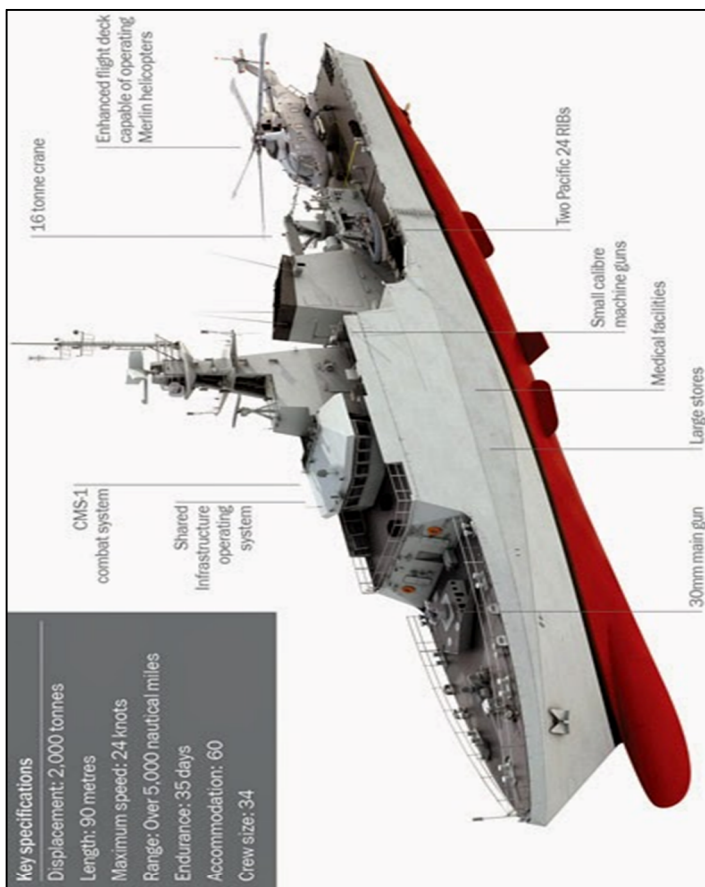
1. What are the Royal Navy assault ships designed for?
2. What is the difference between helicopter carrier and Landing Platform Helicopter Ship?
3. What combat means do the Royal Navy assault ships have?
4. Which types of patrol vessels do you know?
5. Which tasks can be assigned to patrol vessels?
6. What are the Royal Navy survey ships used for?
7. Which types of survey ships do you know? Which missions and characteristics do they have?

8. How are the Royal Navy submarines classified? Tell about their equipment and weaponry.

9. Which qualities do determine a paramount position occupied by submarines in the Royal Navy?

10. What types of Royal Navy ships and vessels do you know? Give the classification with general characteristics.

V. Используя схему, подготовьте доклад на английском языке на тему «Тактико-технические характеристики и общее устройство сторожевого корабля ВМС Великобритании».



VI. Переведите на слух в быстром темпе:

универсальный десантный корабль; helicopter carrier; десантный катер; Landing Platform Dock; затопляемая док-камера; air group; катер прибрежного патрулирования; University Royal Naval Units; сторожевой корабль; nuclear fleet; гидрографическое судно; ramped work boat; акустический неконтактный взрыватель; ocean survey vessel; ударная подводная лодка; nuclear missile submarine; силы ядерного сдерживания; global reach; гибкость применения; disaster relief operations; выполнять обязательства; covert surveillance; разведка в прибрежной зоне; coastal survey ship; одиночная оружейная установка.

Lesson 13.

Submarine Of The Royal Navy

ACTIVE TERMS AND EXPRESSIONS

Submarine Service	подводный флот; подводные силы
nuclear-powered submarine	атомная подводная лодка (АПЛ)
surface ship	надводный корабль
ballistic missile submarine	подводная лодка атомная с ракетами баллистическими (ПЛАРБ); ракетный подводный крейсер стратегического назначения (РПКСН)
antisubmarine rocket weapon system	противолодочный ракетный комплекс (ПЛРК)
fleet submarine	эскадренная подводная лодка
anti-submarine warfare	противолодочная оборона (ПЛО); борьба с подводными лодками
anti-surface warfare	борьба с надводными кораблями
cruise missile	крылатая ракета
attack vessel (submarine)	ударный корабль (подводная лодка)
hunter-killer vessel	корабль ПЛО
bomber 'fleet'	ядерный флот
pennant number	номер вымпела
hull number	заводской номер корабля
nuclear deterrent	средство ядерного устрашения
missile system	ракетный комплекс
nuclear warhead	ядерная боеголовка
Strategic Defence and Security Review	«Обзор стратегической обороны и безопасности»
reactor	силовая установка
land-attack missile	ракета для поражения наземных целей
nuclear-powered submersion	атомный; с ядерным реактором
surfacing	погружение
main ballast tanks (MBT)	всплытие
depth control tanks (DCT)	цистерны главного балласта (ЦГБ)
	цистерны вспомогательного балласта (ЦВБ)

pressure (inner) hull	прочный (внутренний) корпус
light (external) hull	легкий (внешний) корпус
twin-hull design	двухкорпусная схема
interhull space	межкорпусное (междубортное) пространство
sail	ограждение рубки
forward; fore	носовая часть корабля
rear; aft; bow	кормовая часть корабля
foreplanes	носовые рули
tailplanes	кормовые рули
forward trim tank	носовая дифференциальная цистерна
rear trim tank	кормовая дифференциальная цистерна
compartment; room	отсек; выгородка
block design	компоновка блочным методом
crew compartment	жилой отсек
torpedo compartment	торпедный отсек
missile compartment	ракетный отсек
turbine room	турбинный отсек
control room	центральный пост
battle station	боевой пост
general ship system	общекорабельная система
combat management system	автоматизированная система боевого управления (АСБУ)
electronic warfare systems	оборудование РЭВ
diving system	система всплытия-погружения
life support systems	система жизнеобеспечения подводной лодки
diesel generator set	дизель-генератор
electrical converter group	электрический преобразователь
battery room	аккумуляторный отсек; группа аккумуляторовных батарей
hydraulic system (installation)	гидравлическая система
pumping equipment	насосное оборудование
refrigerating system	холодильное оборудование
high-pressure system	система воздуха высокого давления
missile tube (bay)	ракетная шахта
mast-hoisting gear	подъемно-мачтовое устройство

steam generating system	паропроизводящая установка
steering room	румпельное отделение
hydraulic steering gear	гидравлический рулевой привод
shock absorber assembly	амортизационный блок
anti-sonar coating	противогидроакустическое покрытие
operational depth	рабочая глубина погружения
ship damage control	борьба за живучесть корабля
<hr/>	
watertightness	водонепроницаемость
flow	обтекание
solid-fuel missile	твердотопливный
stage	ступень ракеты
three-stage	трехступенчатый
electric torpedo	электрическая торпеда
superstructure; island	надстройка
launcher	пусковая установка
launch tube	
launching system	
non-penetrating	непроникающий

INTRODUCTORY EXERCISES

I. Расшифруйте и переведите аббревиатуры:

UK, RN, HMS, ARA, SSBN, SSN, TLAM, ASW, BAE.

II. Подберите эквиваленты словосочетаний:

1) to operate undetected	a) находиться в эксплуатации
2) to sink a surface ship	b) оснащаться атомной силовой установкой
3) to be nuclear-powered	c) нести ядерные боеголовки
4) to attack targets on land	d) принимать на вооружение
5) capable of reconnaissance missions	e) действовать скрытно
6) to carry nuclear warheads	f) потопить надводный корабль

7) to commission	г) способный выполнять разведывательные задачи
8) to be in service	h) наносить удары по наземным целям

TEXT

Royal Navy's Submarine Service

The Submarine Service is the submarine based element of the Royal Navy. It is sometimes referred to as the "Silent Service" as the submarines are generally required to operate undetected. The service was founded in 1901. The service made history in 1982 when, during the Falklands War, HMS Conqueror became the first nuclear-powered submarine to sink a surface ship, the ARA General Belgrano. Today, the Submarine Service consists of ballistic missile submarines (SSBN) and fleet submarines (SSN). All of the Royal Navy's submarines are nuclear-powered. The Submarine Service consists of two classes of Fleet submarines and one class of Ballistic Missile submarines.

Fleet submarines

There are six fleet submarines on active duty – four Trafalgar class submarines and two Astute class submarine. They are all nuclear submarines and are classified as SSNs.



Astute class nuclear-powered attack submarine

These submarines are armed with the Spearfish torpedo for anti-submarine and anti-surface warfare. Some are also armed with

Tomahawk cruise missiles for attacking targets on land. This capability was used by HMS Trafalgar against the Taliban in 2001 during Operation Veritas. The Fleet submarines are also capable of surveillance and reconnaissance missions. Fleet submarines are sometimes referred to as attack or hunter-killer vessels.

Ballistic missile submarines

The four ballistic missile submarines (SSBN) of the Royal Navy are all of the Vanguard class. They were all built by Vickers Shipbuilding and Engineering Ltd, now BAE Systems Submarine Solutions. The SSBN flotilla or bomber 'fleet' tends to be almost a separate entity, for example it rarely uses pennant numbers preferring to use hull numbers, thus Vanguard 05, Victorious 06, Vigilant 07 and Vengeance 08.



Vanguard class SSBN

The four Vanguard class boats are responsible for the United Kingdom's nuclear deterrent, and use the Trident missile system. Each boat can carry up to 16 Trident II D5 Missiles, each of which may carry up to 12 nuclear warheads. It is UK Government policy to limit the actual number of warheads carried to 48 per boat. There has been at least one SSBN on patrol at all times for around 40 years and since April 1969, the Royal Navy's SSBNs have not missed a single day on patrol.

Future submarines

A total force of seven Astute class fleet submarines is planned. As of June 2014, the first two boats are in commission and in service, the

third is launched and due to be commissioned by the end of 2015, while boats four to six are in various stages of construction. Boat number seven was confirmed in the October 2010 Strategic Defence and Security Review and long-lead items have been ordered. The Astute class submarine is the largest nuclear fleet submarine ever to serve with the Royal Navy, nearly 30% larger than its predecessors. Its power plant is the Rolls Royce PWR2 reactor, developed for the Vanguard class SSBN. The submarines armament consists of up to 38 Spearfish torpedoes and Tomahawk block IV land-attack missiles.

A Successor to the UK Trident system is in its early stages. The programme will seek to replace the current Vanguard class ballistic missile submarines starting sometime during the mid-late 2020s.

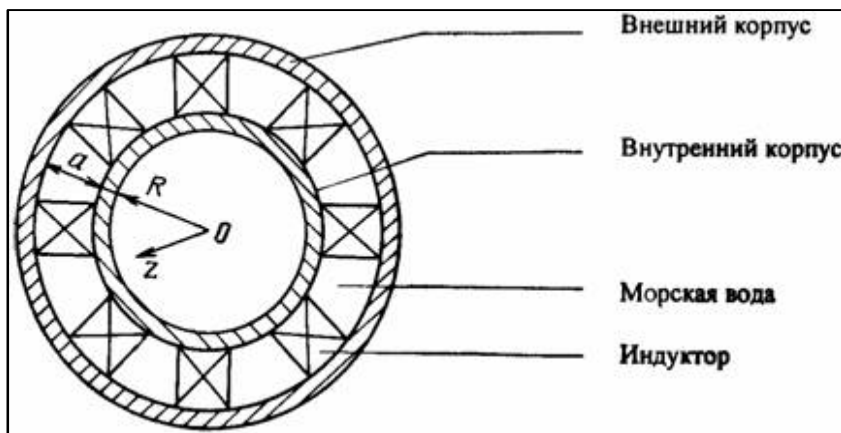
Exercises

III. Ответьте на вопросы:

1. How is the Royal Navy's Submarine Service also called and why?
2. What are the two main types of submarines commissioned in the RN?
3. How many SSNs are there in the RN? What class do they belong to?
4. What are the characteristics and missions of SSNs?
5. How many and which SSBNs are there in the RN?
6. What are the tasks and characteristics of Vanguard class submarines?
7. What are the plans of the RN regarding submarine fleet development?

IV. Ознакомьтесь с комментарием:

ANNOTATION

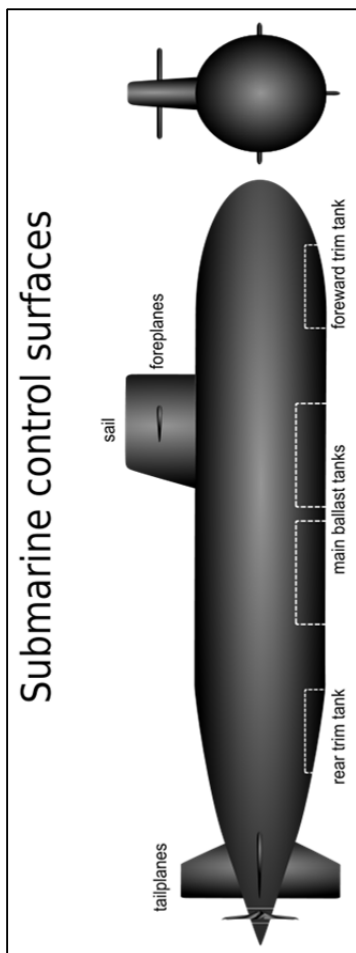


Обеспечение прочности и водонепроницаемости подводной лодки представляет собой сложную задачу. В случае двухкорпусной конструкции (на рис.) давление воды принимает на себя прочный корпус (внутренний), имеющий оптимальную форму для противостояния давлению. Обтекание обеспечивается лёгким корпусом (внешний). В ряде случаев при однокорпусной конструкции прочный корпус имеет форму, одновременно удовлетворяющую и условиям противостояния давлению, и условиям обтекаемости.

В английском языке для обозначения типов корпуса используются следующие термины:

Прочный корпус – **pressure hull (inner)**

Легкий корпус – **light hull (external)**



For general submersion or surfacing, submarines use the forward and aft tanks, called Main Ballast Tanks (MBT), which are filled with water to submerge or with air to surface. Submerged, MBTs generally remain flooded, which simplifies their design, and on many submarines these tanks are a section of interhull space. For more precise and quick control of depth, submarines use smaller Depth Control Tanks (DCT) – also called hard tanks (due to their ability to withstand higher pressure), or trim tanks.

На русский язык данные термины могут переводиться следующим образом:

Main Ballast Tanks (MBT) – цистерны главного балласта (ЦГБ)

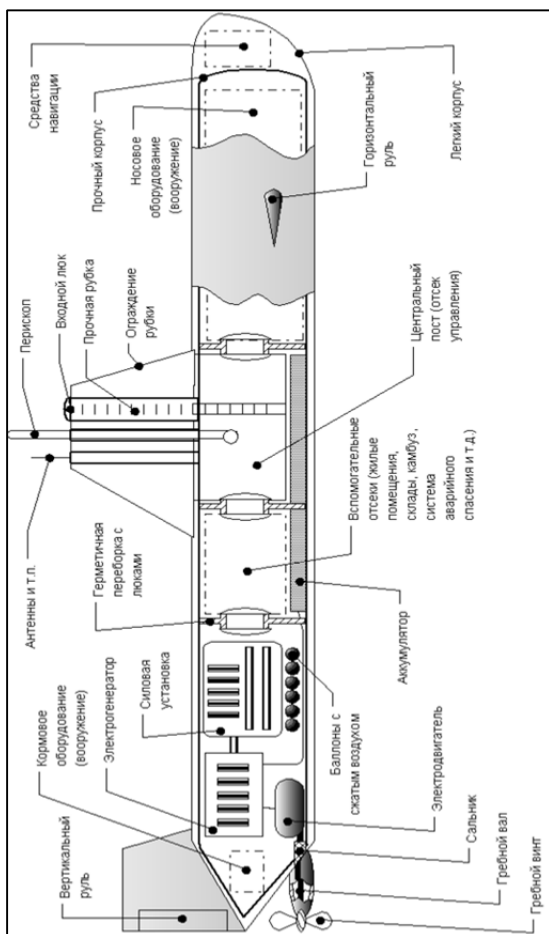
Depth Control Tanks (DCT) – цистерны вспомогательного балласта (ЦВБ)

V. Переведите на слух в быстром темпе:

цистерны главного балласта; pressure hull; горизонтальный руль; rudder; электрогенератор; propeller shaft; торпедный отсек; conning tower; силовая установка; fleet submarine; ударная подводная лодка; Submarine Service; легкий корпус; sail; система аварийного покидания; to work in shifts; прочный корпус; nuclear reactor;

действовать скрытно; to be nuclear-powered; крылатая ракета; ballistic missile submarine; надводный корабль; watertight bulkhead; цистерны вспомогательного балласта; galley; принимать на вооружение; land-attack missile; кормовое оборудование; compressed air tanks; гребной вал; to be in service.

VI. Опираясь на схему, подготовьте доклад на английском языке на тему «Общее устройство подводной лодки».



VII. Переведите письменно текст:

Проект 955 «Борей»

Атомные подводные лодки проекта 955 предназначены для нанесения ракетных ударов по стратегически важным военно-промышленным объектам противника.

Лодка выполнена по двухкорпусной схеме. Прочный корпус разделен на 8 отсеков. Первый отсек является торпедным. Также в нем находится аппаратная выгородка гидроакустического комплекса, носовая дифференциальная цистерна и носовая группа аккумуляторной батареи. Во втором отсеке расположен центральный пост, жилые и медицинские помещения, часть радиоэлектронного вооружения общекорабельных систем, таких как насосное оборудование, гидравлическая система, кондиционеры, электрические преобразователи и аккумуляторную батарею. Третий отсек вмещает в себя часть боевых постов, вспомогательное оборудование (дизель-генераторы, холодильные машины, различные насосы и элементы системы воздуха высокого давления), часть аппаратного оборудования РЭВ, а также шахты и фундаменты подъемно-мачтовых устройств. Четвертый и пятый - ракетные отсеки. Прочный корпус в их районе имеет максимальный диаметр. Шестой отсек отведен под паропроизводящую установку, а также ее вспомогательное и насосное оборудование. Далее следуют седьмой турбинный отсек, восьмой отсек с вспомогательным оборудованием и румпельное отделение с гидравлическими приводами кормовых рулей. В междубортном пространстве корпуса размещены цистерны главного балласта и цистерны замещения ракет. Сборка корпуса выполнена блочным методом: оборудование ПЛ установлено внутри корпуса на амортизаторах и в амортизационных блоках. Носовая оконечность ограждения рубки выполнена с наклоном вперед в целях улучшения обтекания. Корпус лодки покрыт резиновым противогидроакустическим покрытием. Рабочая

глубина погружения «Борея» составляет 380 м, а предельная – 450 м. Автономность - 90 суток.

На вооружение проекта 955 предусмотрен комплекс Д-30 (ЗК30) «Булава» с трехступенчатой твердотопливной ракетой Р-30 (ЗМ30). Для целей самообороны проект 955 оснащен восемью торпедными аппаратами. На проекте 09550 четыре ТА калибра 533 мм и четыре – калибра 650 мм, которые размещены в носовой части корпуса над главной антенной гидроакустического комплекса. В состав ракетно-торпедного вооружения входят многоцелевые электрические торпеды УГСТ, УСЭТ-80 и др., КРБД РК-55 «Гранат» или «Бирюза», ракеты ПЛРК «Водопад». Боезапас – до 40 единиц. Средства противодействия торпедному оружию и гидроакустическим средствам включают комплекс «Шлагбаум» с шестью 533-мм непроникающими ПУ в надстройке носовой части корпуса.

Управление всеми корабельными системами и оборудованием осуществляется посредством автоматизированной системы боевого управления (АСБУ) «Округ-55». В нее интегрированы все уровни систем вооружения, энергетической установки, систем всплытия-погружения, жизнеобеспечения и др.

Lesson 14.

Aircraft Carrier

ACTIVE TERMS AND EXPRESSIONS

Her Majesty's ship (HMS)	корабль ВМС Великобритании
lead ship	головное судно; флагман
aircraft carrier	авианосец (<i>авианесущий крейсер</i>)
aircraft carrier battle group (ACBG)	авианосная ударная группа (АУГ)
carrier-based aviation	палубная авиация
catapult	стартовая катапульта
arrestor wires	аэрофинишёр
vertical take-off and landing aircraft (VTOL)	самолет вертикального взлета и посадки (СВВП)
vertical and/or short take-off and landing (V/STOL)	самолет вертикального и (или) короткого взлета и посадки (СВКВП)
air wing	авиакрыло (<i>тактическая единица</i>)
attack helicopter	ударный вертолет
ship company	экипаж корабля
displacement	водоизмещение
draught	осадка
gas turbine generator unit	газотурбинный генератор
diesel generator set	дизель-генератор
low-voltage electrical system	электрическая сеть низкого напряжения
electric propulsion motor	электродвигатель
twin fixed-pitch propeller	гребной винт с фиксированным шагом
single island superstructure	надстройка с одним мостиком (рубкой)
flag bridge	флагманская рубка (мостик)
navigation bridge	ходовой (штурманский, командный) мостик
flying control center	мостик (рубка) управления полетами
aft island	кормовая надстройка
flight deck	полетная палуба
hangar deck	ангарная палуба

lift	подъемник
fixed wing aircraft	летательный аппарат с неподвижным крылом (<i>самолет</i>)
rotary wing aircraft	винтокрылый летательный аппарат (<i>вертолет</i>)
self-defence weapons	средства самообороны корабля
scanned array radar	РЛС с фазированной антенной решеткой
automatic detection	автоматическое обнаружение
track initiation	прогнозирование маршрута цели
Glide Path Camera (GPC)	курсо-глиссадная камера
weapons handling system	система обслуживания вооружения
palletized munitions	боеприпасы, уложенные штабелями
forward	носовая часть
aft	кормовая часть
port	левый борт
starboard	правый борт
war load	боевая нагрузка
Maritime Force Protection package	противокорабельная группа (<i>группа прикрытия/борьбы с морскими целями</i>)
Littoral Manoeuvre package	противобереговая ударная группа(<i>группа борьбы с береговыми/наземными целями</i>)
blade folding	складывание лопастей
tilt rotor	конвертоплан
galley	камбуз
navigation radar	навигационная РЛС
medium/long range radar	РЛС среднего/дальнего радиуса действия
mainmast	грот-мачта
flying control position	пункт управления полетами
aircraft lift	палубный подъемник самолетов
hangar mid bay	самолетный ангар (расположенный в средней части авианосца)
after engine room	кормовое машинное отделение

INTRODUCTORY EXERCISES

I. Подберите эквиваленты словосочетаний:

1) to be formally commissioned	a) надстройка с одним мостиком/рубкой
2) designed to operate	b) корабль модернизируется на протяжении всего срока службы
3) typically consist of	c) полностью автоматизированное обнаружение и сопровождение (цели)
4) airborne early warning	d) система вооружения с высокой степенью автоматизации
5) the ship is upgraded through its lifetime	e) предназначенный для размещения (определенного типа самолетов)
6) to use nuclear propulsion	f) официально поступить на вооружение
7) single island superstructure	g) поражать надводные цели
8) to counter seaborne threats	h) иметь ядерную силовую установку
9) fully automatic detection and track initiation	i) иметь в своем штатном составе
10) highly mechanized weapons handling system	j) дальнее радиолокационное обнаружение (ДРЛО)

II. Найдите в тексте перевод терминов и словосочетаний:

способен нести на борту до 40 самолетов и вертолетов; оборудован катапультами и аэрофинишерами; дальнее радиолокационное обнаружение; противолодочная борьба; размещение морских пехотинцев; вертолеты огневой поддержки; водоизмещение в 65000 тонн; ядерная силовая установка; газотурбинный генератор; гребной винт с фиксированным шагом; полетная палуба; РЛС с фазированной антенной решеткой; береговые пакгаузы; корабельная медсанчасть.

TEXT

The Queen Elizabeth Class Aircraft Carrier

HMS Queen Elizabeth is the lead ship of the Queen Elizabeth-class of aircraft carrier, the largest warship ever built for the Royal Navy and capable of carrying up to forty aircraft. She was named by Queen Elizabeth II on 4 July 2014, and is scheduled to be formally commissioned in May 2017, with initial operational capability from 2020.

Unlike most large carriers she is not fitted with catapults and arrestor wires and is instead designed to operate V/STOL aircraft; her air wing will typically consist of F-35B Lightning II fighter-bombers and Merlin helicopters for airborne early warning and anti-submarine warfare. The design emphasises flexibility, with accommodation for 250 Royal Marines and the ability to support them with attack helicopters and troop transports up to Chinook size and larger.

The ships' company is 679 rising to 1,600 with air element added. A more recent parliamentary reply stated the average crew size will be 672. She will have a displacement of 65,000 tonnes on delivery, but the design allows for this to reach over 70,000 tonnes as the ship is upgraded through its lifetime. She has an overall length of 280 metres (920 ft), a width at deck level of 70 metres (230 ft), a height of 56 metres (184 ft), a draught of 11 metres (36 ft) and a range of 10,000 nautical miles (12,000 mi; 19,000 km). The Ministry of Defence decided not to use nuclear propulsion due to its high cost, so power is supplied by two Rolls-Royce Marine Trent MT30 36 MW (48,000 hp) gas turbine generator units and four Wärtsilä diesel generator sets (two 9 MW or 12,000 hp and two 11 MW or 15,000 hp sets). The Trents and diesels are the largest ever supplied to the Royal Navy, and together they feed the low-voltage electrical systems as well as four GE Power Conversion's 20 MW Advanced Induction Motor (arranged in tandem) electric propulsion motors that drive the twin fixed-pitch propellers.

Instead of a single island superstructure containing both the ship's navigation bridge and flying control (flyco) centers, the ships will have these operations divided between two structures, with the forward island for navigating the ship and the aft island for controlling flying operations. Under the flight deck are a further nine decks. The hangar deck measures 155 by 33.5 metres (509 by 110 ft) with a height of 6.7 to 10 metres (22 to 33 ft), large enough to accommodate up to twenty fixed and rotary wing aircraft. To transfer aircraft from the hangar to the flight deck, the ships have two large lifts, each of which are capable of lifting two F-35-sized aircraft from the hangar to the flight deck in sixty seconds. The ships' only announced self-defence weapons are currently the Phalanx CIWS for airborne threats, with miniguns and 30 mm cannon to counter seaborne threats.

The ship's radars will be the BAE Systems and Thales S1850M, the same as fitted to the Type 45 destroyers, for long-range wide-area search, the BAE Systems Artisan 3D Type 997 maritime medium-range active electronically scanned array radar, and a navigation radar. BAE claims the S1850M has a fully automatic detection and track initiation that can track up to 1,000 air targets at a range of around 400 kilometres (250 mi). Artisan can track a target the size of a snooker ball over 20 kilometres (12 mi) away with a maximum range of 200 km. (Artisan will also be fitted to Type 23 frigates, the assault ships HMS Albion, HMS Bulwark and HMS Ocean.) They will also be fitted with the Ultra Electronics Series 2500 Electro Optical System (EOS) and Glide Path Camera (GPC).

Munitions and ammunition handling is accomplished using a highly mechanised weapons handling system (HMWHS). This is a first naval application of a common land-based warehouse system. The HMWHS moves palletized munitions from the magazines and weapon preparation areas, along track ways and via several lifts, forward and aft or port and starboard. The tracks can carry a pallet to magazines, the hangar, weapons preparation areas, and the flight deck. In a change from normal procedures the magazines are unmanned, the movement of

pallets is controlled from a central location, and manpower is only required when munitions are being initially stored or prepared for use. This system speeds up delivery and reduces the size of the crew by automation.

The two members of the Queen Elizabeth class (the other being HMS Prince of Wales) are each expected to be capable of carrying forty aircraft, a maximum of thirty-six F-35s and four helicopters. The 2010 SDSR anticipated the routine deployment of twelve F-35Bs, but a typical warload will be 24 F-35Bs and some helicopters. These could be a Maritime Force Protection package of nine anti-submarine Merlin HM2 and five Merlin Crowsnest for airborne early warning; alternatively a Littoral Manoeuvre package could include a mix of RAF Chinooks, Army Apaches, Merlin HC4 and Wildcat HM2. As of September 2013 six landing spots are planned, but the deck could be marked out for the operation of ten medium helicopters at once, allowing the lift of a company of 250 troops. The hangars are designed for CH-47 Chinook operations without blade folding and the V-22 Osprey tilt rotor, whilst the aircraft lifts can accommodate two Chinooks with unfolded blades.

Crew facilities will include a cinema, physical fitness areas and four galleys manned by sixty-seven catering staff. There are four large dining areas, the largest with the capacity to serve 960 meals in one hour. There are eleven medical staff for the eight-bed medical facility, which includes an operating theatre and a dental surgery. There are 1,600 bunks in 470 cabins, including accommodation for a company of 250 Royal Marines with wide assault routes up to the flight deck.

III. Ответьте на вопросы:

1. What type of aircraft is HMS Queen Elizabeth designed to operate?
2. How will her typical air wing look like?
3. What decks will she have?
4. Describe the hangar deck of HMS Queen Elizabeth.

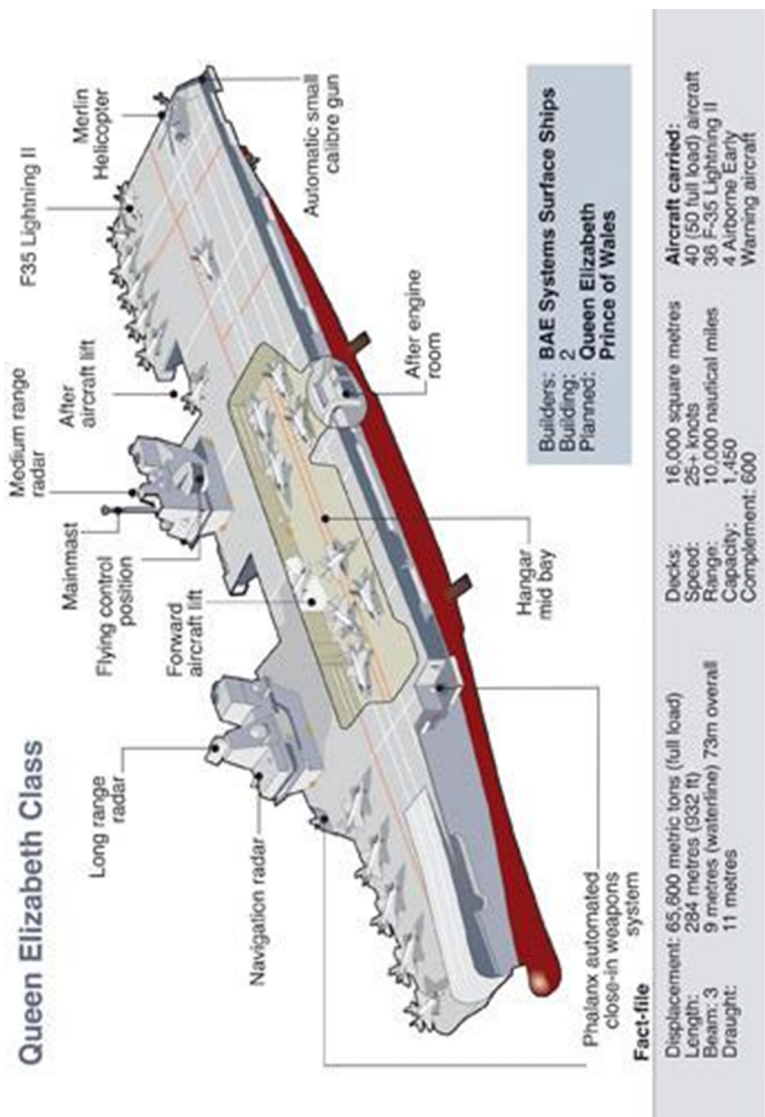
5. What kind of the power plant will HMS Queen Elizabeth be equipped with and why?
6. What kind of radar will be used on the ship?
7. What are the ships' only announced self-defence weapons?
8. What weapons handling system will be used on HMS Queen Elizabeth?
9. What will a typical warload of HMS Queen Elizabeth consist of?
10. What will crew facilities include?

IV. Подготовьте пересказ текста на русском языке.

V. Переведите на слух в быстром темпе:

anti-submarine warfare; принять на вооружение; attack helicopters; полетная палуба; troop transports; боеприпасы, уложенные штабелями; a displacement of 65,000 tonnes on delivery; гребной винт с фиксированным шагом; gas turbine generator units; поворотный винт; hangar deck; надстройка, navigation radar; пост руководителя полетами; mainmast; флагманская рубка; flight deck; medium helicopter.

VI. Подготовьте доклад на английском языке на тему «Устройство авианосца», используя следующую схему:



VII. Переведите письменно:

Авианосцы - это класс военных кораблей, основной ударной силой которых является палубная авиация. Современный авианосец, как правило, представляет собой корабль с большой плоской полетной палубой, на которой размещены катапульты и аэрофинишеры, для взлетов и посадок самолетов. Корпус корабля разделен водонепроницаемыми палубами и переборками на уровни и отсеки, в которых размещены ангары для самолетов и вертолетов, помещения для экипажа и атомная силовая установка. Единственным возвышением над полетной палубой является так называемый «остров» – надстройка, в которой размещены командный мостик, флагманская и ходовая рубки, пост руководителя полетов, а также антенны и радарные установки.

Обычно, авианосец является флагманом авианосной ударной группы, в которую помимо него входят корабли охранения (крейсера, эскадренные миноносцы, фрегаты, многоцелевые ПЛА) и суда обеспечения. Авианосная ударная группа (группировка) в зависимости от боевого предназначения может быть ударной, многоцелевой или противолодочной. Более крупное оперативное объединение из нескольких авианосцев и обеспечивающих их корабельных группировок называется авианосным ударным объединением или авианосной эскадрой (в ВМС США – оперативным флотом).

На данный момент существует несколько классов авианосцев, среди которых: супер авианосцы, многоцелевые авианосцы, легкие авианосцы, противолодочные авианосцы и универсальные десантные корабли (вертолетоносцы).

Lesson 15.

Plane control surfaces

ACTIVE TERMS AND EXPRESSIONS

control surfaces	органы управления (полётом)
to steer	управлять, держать курс (полёта)
primary control surfaces	главные (основные) органы управления
secondary control surfaces	вспомогательные органы управления
elevator	руль высоты
transverse axis	поперечная ось, ось тангажа
rudder	руль направления
yaw	рысканье
vertical axis	ось рысканья
ailerons	рули крена, элероны
center of gravity	центр тяжести
roll	крен
longitudinal axis	ось крена
lift	вертикальная тяга
aerodynamic drag	аэродинамическое лобовое сопротивление
flaps	закрылки
fuselage	фюзеляж
angle of inclination	угол наклона
takeoff	взлёт
slats	предкрылки
Krueger-flaps	предкрылок (щиток) Крюгера
curvature	кривизна (крыла)
spoilers	интерцепторы (спойлеры)
air brake	аэродинамический тормоз
gliders	планёр
elevons	элефон
flaperons	флаперон, элерон-закрылок
spoilerons	спойлерон, интерцептор управления креном

trim tabs	триммер
trimming	триммирование
control stick	ручка управления самолётом (РУС)
yoke	штурвал

INTRODUCTORY EXERCISES

I. Найдите в тексте и переведите словосочетания:

To stir the aircraft during the flight, to be divided into primary and secondary control surfaces, to maintain control of an aircraft in flight efficiently, to move the aircraft in its longitudinal axis, to generate more lift and reduce the speed at the same time, to neutralize the position of the control surface depending on several factors of the airplane.

TEXT

The control surfaces of a plane

The control surfaces comprise all the aerodynamic parts of an airplane that are used to steer the aircraft during the flight. They are divided into primary and secondary control surfaces. There are different types of control surfaces and mechanisms to maintain control of an aircraft in flight efficiently. The efficiency range of an aircraft changes depending on its speed.

The primary control surfaces are responsible for directing the aircraft. These are the elevator, to rise and lower the aircraft, moving the plane in its transverse axis; the rudder, to control the yaw, moving the plane in its vertical, or yaw-, axis; and the ailerons, to control the roll or tilting the plane from one side to the other, moving the aircraft in its longitudinal axis.

In case it is not clear to you, we'll review the axis of the airplane with this three-dimensional model: this is a transverse axis, the longitudinal axis, and the vertical axis; and the primary control surfaces are the elevator, the rudder, and the ailerons. Note that these axes converge at that specific point and this is the point of the aircraft we

call the center of gravity. It is the point where your aircraft is in balance. There is also they are dynamic center point but we can talk about that in another video.

Then we have the secondary control surfaces responsible for modifying the lift that the wings generate, or simply modifying the aerodynamics of the aircraft in other less conventional ways by either reducing or increasing lift, as well as the aerodynamic drag. Among them the flaps.

These are similar to the ailerons but they are closer to the fuselage and they have the task of generating more lift and reduce the speed at the same time. Depending on how much is the angle of inclination of the flaps, they can slow down the airplane even more or simply generate a little more lift during takeoff.

There are other more specialized surfaces such as slats and Krueger-flaps. These are used especially in large commercial airplanes and fighter jets. This is an extension in the leading edge that increases the curvature and wing area, increasing its lift at low speeds. The slats are usually deployed together with the flaps. The slats are not normally used in the small commercial airplanes, nor already controlled airplanes, but of course it is possible to use them, only that it's not usually necessary.

Finally, there are the spoilers and air brakes. These are used in commercial airplanes as well, and also in gliders through the use the lift on the wings and slow down the aircraft at the same time. These are used in the landing process or after landing. Fighter jets can use similar devices which can also be called air brake.

To control the flight of an aircraft, the control surfaces have to generate controlled imbalances in the aerodynamic forces acting on an airplane. That way we tilt the aircraft in its different access to achieve the desired maneuver. Helicopters use their blades as the same control surfaces, as their angle of attack can be modified depending on their position in the path of their rotation individually, that way they have the ultimate control. Depending on the functions played by the control

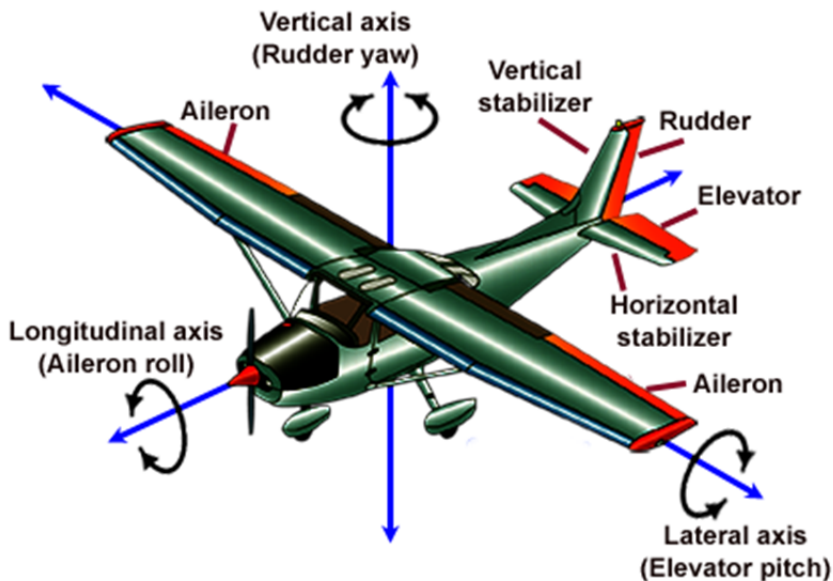
surfaces in an aircraft, they are called different names. For example, in a flying wing there is no tail, and it only has two control surfaces. They work as ailerons, but also as elevator. The functions are mixed in the same control surfaces and in that case they're no longer called ailerons but elevons. The same goes to ailerons that also perform the function of flaps. In that case, they are called flaperons, and there are also spoilerons: ailerons that also serve the function of spoilers.

Trim tabs are also found in full-sized airplanes. These are also part of the control surfaces, and their task is to neutralize the position of the control surface depending on several factors of the airplane, like its balance and if it's taken off or landing. Since the aerodynamic effects change during takeoff and also the balance is affected by the amount of fuel or weight shifting inside the airplane, trim tabs, or trimming in general, help neutralizing the control surfaces to its new neutral points so the pilot doesn't have to be correcting the airplane constantly.

Now let's talk about how you control the control surfaces or the airplane in general. Normally, you will find a control stick or yoke, similar to a steering wheel. These are going to control the primary control surfaces. The control system could be as simple as using wires to pull all the control surfaces, or more complex using electronic controlled motors or hydraulic systems.

To maneuver the aircraft using the control stick, you pull the stick to rise the nose and go up, push it or move it forward to go down, and move it left or right to roll the aircraft respectively using the ailerons. To use the rudder, we use the pedals, also left and right. To control the secondary control surfaces, depending on the aircraft you can use levers, buttons, switches, and others, because that's different in every kind of aircraft. The airplanes that use yokes, as the Cessnas, work under the same principle – you push the yoke to go down, pull it to go up, and turn it left and right to roll the aircraft.

II. Используя схему, назовите основные органы управления самолётом на русском языке:



III. Переведите письменно:

Назначение и состав систем управления самолетом

Совокупность бортовых устройств, обеспечивающих управление движением самолета, называют системой управления самолетом. Поскольку процесс управления самолетом осуществляется пилотом, находящимся в кабине экипажа, а элероны и рули находятся на крыле и хвостовом оперении, между этими участками должна быть конструктивная связь. Она должна обеспечить высокую надежность, легкость и эффективность управления положением самолета.

Очевидно, что при отклонении управляющих поверхностей, действующее на них усилие возрастает. Однако это не должно привести к недопустимому увеличению усилий на рычагах управления.

Система управления самолетом может быть неавтоматической, полуавтоматической или автоматической. Если процесс управления осуществляется непосредственно пилотом, т.е. пилот посредством мускульной силы приводит в действие органы управления и устройства, обеспечивающие создание и изменение управляющих движением самолета сил и моментов, то система управления называется неавтоматической (прямое управление самолетом).

Неавтоматизированные системы могут быть механическими и гидромеханическими. Механические системы - это первые самолётные системы, на базе которых созданы все современные комплексные системы основного управления. Балансировка и управление здесь осуществляются непосредственно мускульной силой экипажа в течение всего полёта.

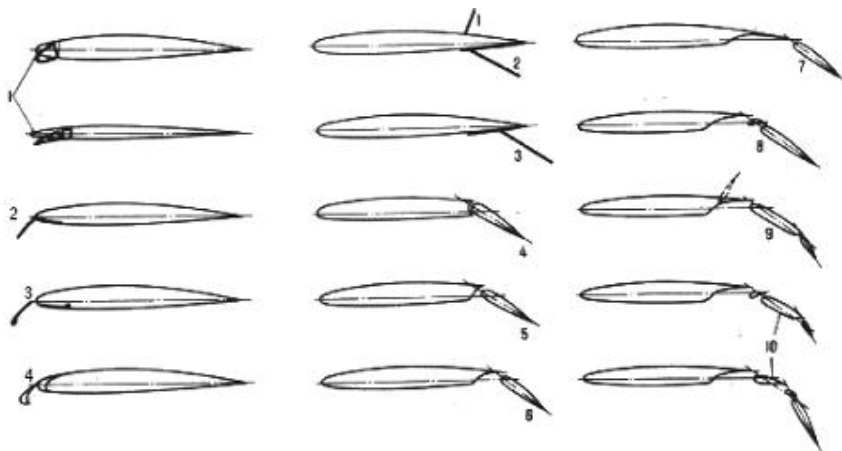
IV. Переведите письменно:

Рычаги управления самолетом

На современных самолетах гражданской авиации управление разделяется на две группы – ручное и ножное. Ручное управление применяют для воздействия на элероны и руль высоты. Командным рычагом в системах управления средних и тяжелых самолетов является штурвальная колонка. Для легких самолетов может быть применена ручка. Движение штурвала влево (против часовой стрелки) приведет к образованию левого крена. Соответственно поворот штурвала вправо (по часовой стрелке) вызовет появление правого крена. «Дача штурвала от себя» вызовет снижение, пикирование самолета. И, наоборот, при перемещении штурвала «на себя» самолет будет подниматься. Независимо от конкретного конструктивного исполнения на всех самолетах определенное движение штурвала или ручки вызовет эволюцию самолета одинакового характера. Ножное управление предназначено для управления рулем направления. «Дача правой ноги» вперед приведет к правому развороту. Таким образом,

конструкция управления предусматривает, чтобы изменение положения самолета в пространстве соответствовало естественным рефлексам человека.

V. Переведите письменно:



Назначение и состав вспомогательного управления самолётом

Вспомогательные системы управления значительно проще основной системы, они включают только часть ее агрегатов. Обычно это командные рычаги, проводка и исполнительные механизмы, приводящиеся в движение гидравлическими, электрическими, пневматическими устройствами или механическими приспособлениями.

Работа всех элементов механизации крыла (закрылков, предкрылков и спойлеров) основана на управлении пограничным слоем на поверхности крыла и изменении кривизны профиля крыла. Механизация крыла позволяет улучшить взлётно-посадочные и манёвренные характеристики самолёта, увеличить его полезную нагрузку и повысить безопасность полёта. Элементами механизации передней части крыла являются поворотные носки, предкрылки, носовые щитки, щитки Крюгера.

Элементами механизации задней части крыла являются поворотные закрылки, щелевые закрылки (без выдвижения, выдвижные одно-, двух-, трёхщелевые), закрылки Фаулера, поворотные и скользящие (выдвижные) щитки. Эффективность элементов механизации крыла зависит от относительных размеров, формы и положения относительно основной части крыла.

Элементы механизации передней части крыла обеспечивают ликвидацию срыва потока на крыле при больших углах атаки самолёта. Наиболее эффективными элементами механизации передней кромки являются предкрылки.

Lesson 16.

Schematic Design of the Airplane, Helicopter

ACTIVE TERMS AND EXPRESSIONS

screw propeller	винтовой пропеллер
airframe	планер самолета
jet engine	реактивный двигатель
powerplant	силовая установка
fuselage	фюзеляж
wings	крылья
empennage	хвостовое оперение
landing gear	шасси
central portion	средняя часть
cockpit	кабина экипажа
airfoil	аэродинамическая поверхность
lifting surface	несущая поверхность
high-wing	высоко расположенное крыло, высокоплан
mid-wing	среднерасположенное крыло
low-wing	низко расположенное крыло, низкоплан
tail section	хвостовая часть
trim tab	триммер
pitch	крен
rudder	руль направления
landing skid	ползковое шасси
strut	нога шасси
ski	лыжное шасси
reciprocating engine	поршневой двигатель
turbine engine	газотурбинный двигатель
power-driven	на механической тяге
hinged shaft	шарнирный вал
mast	вал несущего винта
torque	крутящий момент; реактивный момент
ducted fan	винт в кольце
single-rotor helicopters	вертолет одновинтовой схемы

counter-rotating rotors	винты противоположного вращения
3-bearing swivel nozzle	регулируемое реактивное сопло с отклоняемым вектором тяги
roll nozzle ducts	трубки сопла реактивной системы поперечного управления
leading-edge flap actuators	приводы закрылков
Pratt & Whitney F135 engine	двигатель Пратт энд Уитни F135
weapon bay door with mounted missile	створка оружейного отсека с установленной ракетой
lift fan drive-shaft	ведущий вал подъемного вентилятора
lift fan clutch	муфта подъемного вентилятора
split duct air intake	трубки воздухозаборника
valve box nozzle	выпускное отверстие клапанной камеры
lower lift fan door	нижняя створка отсека подъемного вентилятора
forward fuel tank	носовой топливный бак
oxygen under forward tank	кислородный бак
radar	радар
rudder pedals	педали управления рулем направления
ejection seat	катапультируемое кресло
lift fan	подъемный вентилятор
lift fan doors auxiliary vent	створки отсека подъемного вентилятора

INTRODUCTORY EXERCISES

I. Найдите в тексте и переведите словосочетания:

Aixed-wing aircraft that is heavier than the air; composition of the airframe can differ depending on the type of the aircraft; be designed to carry passengers and/or cargo; be attached at different portions of the fuselage; the movable parts of the horizontal stabiliser; to move the nose of the airplane to the sides; to take off and land vertically; to eliminate the effects of torque.

II. Найдите в тексте эквиваленты словосочетаний:

Самолет состоит из; конструкция большинства самолетов включает в себя следующие части; центральная часть корпуса;

перевозить пассажиров или груз; низко расположенное крыло; изменять крен воздушного судна; двигать в стороны нос самолета; состоять из двигателя и всех его компонентов.

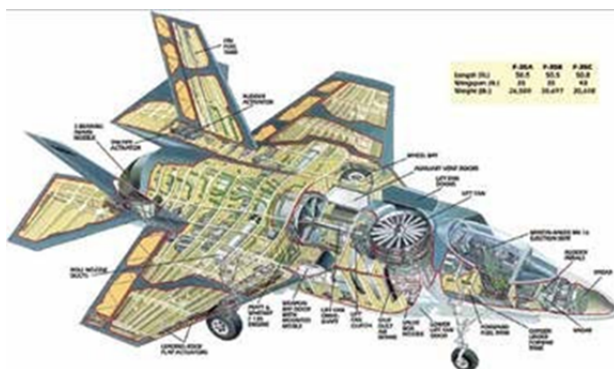
TEXT

Schematic design of an airplane (helicopter)

The airplane is a fixed-wing aircraft that is heavier than the air, propelled by a screw propeller or a jet engine. The airplane consists of the airframe and the powerplant. The composition of the airframe can differ depending on the type of the aircraft, but most airplanes comprise the following basic parts: the fuselage, wings, empennage and landing gear.

The fuselage is the central portion of the body of an airplane. It includes the cabin and / or the cockpit, which contains seats for the crew and the controls for the airplane. The cabin can be designed to carry passengers and / or cargo, its size and structure can differ in accordance with the aircraft's purpose. The fuselage may also provide attachment points for the other major airplane components.

The wings are the airfoils attached to each side of the fuselage and are the main lifting surfaces that support the airplane in flight. Wings may be attached at different portions of the fuselage: high-wing, mid-wing and low-wing designs.

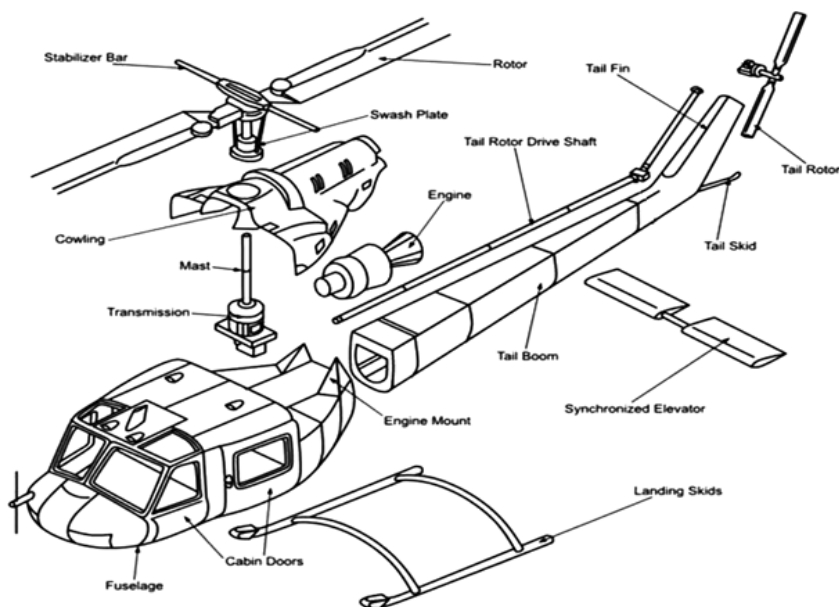


The number of wings can also vary: airplanes with a single set of wings are called monoplanes; airplanes with two sets are called biplanes.

The empennage is the tail section of an airplane; it includes a horizontal stabilizer and a vertical stabilizer. The movable parts of the horizontal stabilizer include elevators and trim tabs, which are used to adjust the airplane's pitch in the air. The movable part of the vertical stabilizer is called the rudder and is used to move the nose of the airplane to the sides.

The landing gear is located on the bottom part of the airplane's fuselage, it usually consists of wheels and struts, or, in some cases, skis or floats.

The airplane's power plant consists of the engine and all engine components, the propeller and the electrical system. Airplanes use three types of engines: reciprocating engines, turbine engines and jet engines.



The helicopter is an aircraft with one or more power-driven horizontal propellers or rotors that enable it to take off and land vertically, to move in any direction, or to remain stationary in the air. The helicopter's airframe consists of the fuselage, empennage and landing gear, which can consist of either landing skids or a set of wheels and struts.

The main airfoil of the helicopter is the rotor mounted on top of the fuselage on a hinged shaft (mast) connected with the vehicle's engine and flight controls. To eliminate the effects of torque, which causes the helicopter to turn in the opposite direction to the rotor, single-rotor helicopters use a smaller tail rotor or a ducted fan. Other helicopters use two main counter-rotating rotors to eliminate the effects of torque.

III. Ответьте на вопросы:

1. What is the airplane?
2. What basic parts do airplanes comprise?
3. What does the fuselage include?
4. At what portions of the fuselage can the wings be attached?
5. What does the empennage include?
6. What types of engine do airplanes use?
7. What does the helicopter's airframe consist of?
8. What is the purpose of a smaller tail rotor?

IV. Переведите письменно. Значение неизвестных вам терминов выясните по словарю:

Самолет – это летательный аппарат тяжелее воздуха, приводимый в движение при помощи пропеллера или реактивной тяги. Он состоит из планера и силовой установки. Силовая установка включает в себя всю совокупность устройств и систем для создания силы тяги (двигатели, движители, стартовые и полётные ускорители, устройства реверса тяги и т.п.). Планер – это структурная часть самолёта или вертолётa без силовой установки и оборудования.

Подъемная сила летательных аппаратов тяжелее воздуха создается за счет крыла либо несущего винта. Крылья самолетов могут крепиться к разным частям фюзеляжа в зависимости от конструкции.

Управление в воздухе самолетом осуществляется при помощи изменения положения плоскостей управления, а вертолетом – изменением наклона оси несущего винта.

Основным элементом планера является фюзеляж. В нем размещаются экипаж и органы управления, а также пассажиры и / или груз. Компоновка фюзеляжа существенно различается в зависимости от типа летательного аппарата.

V. Переведите письменно. Значение неизвестных вам терминов выясните по словарю:

A plane is a heavier-than-air aircraft with fixed wings used for the creation of lift when in motion. This motion is created by the propulsion power of the engine. Airplanes are designed for transportation of people and cargo, and also for special and military purposes. A combat plane is a plane equipped with various weapons and designed to hit air and ground targets and for accomplishing special missions.

In accordance with the mission combat planes are divided into bombers, fighter-bombers, attack planes, reconnaissance and transport planes.

The main parts of a plane are the fuselage, the wings, the tail unit and the power plant.

A fuselage is the plane body which connects the wings with the tail surface and holds the crew (a pilot, a copilot, a navigator, a flight engineer, a bombardier and others), the equipment of the plane and the cargo.

A wing is designated to develop the lift of the plane. It consists of a framework made mainly of spars and ribs and has a metal covering.

The tail surface of a plane is needed to control forces and change the flying mode. Usually it consists of fixed parts: the horizontal stabiliser, the vertical stabiliser, ailerons and rudder.

The landing gear is a device for takeoff and landing. It can be either retractable or non-retractable, depending on the plane's construction.

VI. Выступите в роли переводчика:

Что понимается под термином «фюзеляж»? Для чего он предназначен?	Usually, the term fuselage means an aircraft body. It is fuselage to which empennage, wings, and landing gear are attached. Its primary uses are to accommodate crew, to carry passengers, cargo, or technical equipment. It can also be fitted with fuel tanks or power plant
Всем известно, что ключевой частью самолета является крыло? Каково его основное предназначение?	The main purpose of the wings is to produce wing lift. A low pressure area forms above the upper edge of the wing, while a high pressure area forms below the lower edge of the wing, so the wing is "pushed" upward, and the plane flies up
За счет каких средств достигается устойчивость и управляемость самолета в полете?	Stability and sensitivity of an aircraft are provided by means of assembly of airfoils, called fins, which consist of vertical and horizontal fins. Due to the fact that these fins are located in the tailpiece, it's also called empennage
Что в корне отличает вертолет от самолета?	Helicopter is a rotary-wing craft capable of vertical take-off and landing. Its ascensional and propulsion forces are produced by means of one or several rotors with one or several drive connections during all stages of flight.

Lesson 17.

Schematic Design of the Jet Engine

Types of Aircraft Engines

ACTIVE TERMS AND EXPRESSIONS

jet engine	реактивный двигатель
consists of four main parts	состоять из четырех основных частей
compressor	компрессор
combustor chamber	камера сгорания
constant pressure	постоянное давление
nozzle	сопло
inlet airstream	входящий воздушный поток
combustion products	продукты сгорания
thrust	тяга
reciprocating engine (pistonengine)	поршневой двигатель
internal-combustion engine	двигатель внутреннего сгорания
turboprop (jet-prop) engine	турбовинтовой двигатель
turbofan engine	турбореактивный двухконтурный двигатель
turbojet engine	турбореактивный двигатель
rearward discharge of a jet	струя газов реактивного двигателя
inlet airstream	встречный поток воздуха
rotational motion	вращательное движение
propeller	винт
engine's exhaust	выхлоп двигателя
air inlet	забор воздуха, воздухозаборник
intake	впуск, впускное устройство
exhaust	выхлоп
primary stream	основной воздушный поток

INTRODUCTORY EXERSISES

I. Найдите в тексте и переведите словосочетания:

Rearward discharge of a jet; hot gases generated by burning fuel; 10 to 40 times the pressure of the inlet airstream; the continuous stream of high-pressure combustion products; to use one or more pistons in order to convert pressure; to power the air compressor; attached turbojet engine

II. Найдите в тексте эквиваленты словосочетаний:

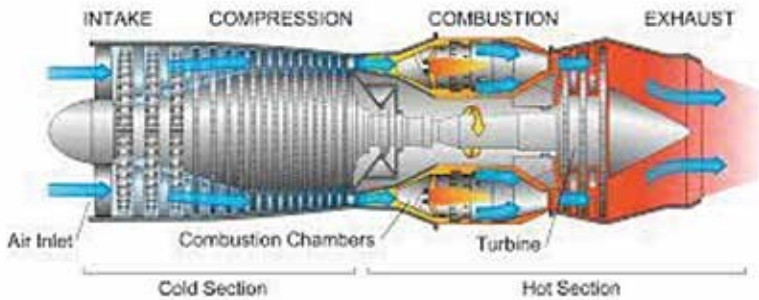
Двигатель внутреннего сгорания; сжимать воздух до показателя в; относительно постоянное давление; выходить из двигателя через сопло для создания тяги; вращательное движение винта; использовать газ как рабочее тело; создавать достаточную для движения самолета тягу.

TEXT

Schematic design of the jet engine. The types of modern aircraft engines

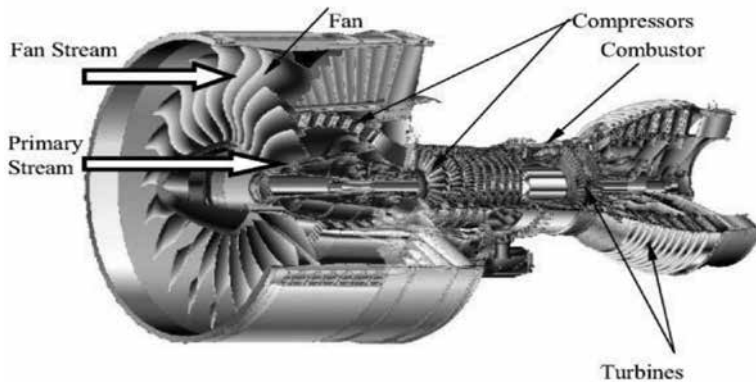
The jet engine is an internal-combustion engine that propels an aircraft by means of the rearward discharge of a jet, usually hot gases generated by burning fuel with air drawn in from the atmosphere.

The jet engine consists of four main parts: the compressor, combustor chamber, turbine and nozzle. The compressor is used to compress the air to a pressure ratio of typically 10 to 40 times the pressure of the inlet airstream. The compressed air then flows into the combustor chamber, where a steady stream of fuel mixes with it and burns at approximately constant pressure. The continuous stream of high-pressure combustion products then flows through the turbine, which powers the compressor, and exits the engine through the nozzle to produce thrust.



Modern aircraft use the following types of engines:

- The reciprocating engine (piston engine) is an internal-combustion engine that uses one or more pistons in order to convert pressure created by burning fuel into rotational motion of the propeller.
- The gas-turbine engine is an internal-combustion engine that uses gas as the working fluid to turn the turbine, which powers the air compressor. The thrust is produced when hot gas exits the engine through the nozzle.



- The turboprop (jet-prop) engine is a turbine engine, which works in a way that is quite similar to the gas-turbine engine, except that the turbine works to rotate the propeller, and the engine's exhaust is too weak to produce enough thrust to move the airplane on its own.

- The turbofan engine is similar to a turboprop engine, but has a fan instead of a propeller, which is enclosed in the casing. Another difference is that a turbofan's turbine is driven not by an internal-combustion engine, but by an attached turbojet engine.

- Jet engine.

III. Ответьте на вопросы:

1. By what means does an internal-combustion engine propel an aircraft?
2. What main parts does a jet consist of?
3. What is the purpose of the compressor?
4. How is thrust produced?
5. What is the difference between a piston engine, gas-turbine engine, and jet-prop engine?
6. By what means is the turbofan engine driven?

IV. Переведите письменно. Значение неизвестных вам терминов выясните по словарю:

Турбореактивный двигатель

Турбореактивный двигатель состоит из пяти основных компонентов: всасывающего патрубка, ротационного воздушного компрессора впереди, группы камер сгорания, в которых непрерывно воспламеняется впрыскиваемое топливо, турбины, вращающейся на общем валу с компрессором, и сопла.

Для запуска ТРД открывается топливный клапан и нажимается переключатель управляющего регулятора зажигания. Стартер прокручивает основной вал, в то время как катушки зажигания подают на свечи ток высокого напряжения для воспламенения воздушно-топливной смеси. После воспламенения смеси в любой из двух камер со свечами зажигания пламя распространяется в другие камеры через соединительные трубки. Прогрев ТРД не требуется, так как отсутствует трение металла о металл, и только некоторые узлы двигателя нуждаются в смазке.

На земле воздух нагнетается в камеру при помощи компрессора, а топливо подается под высоким давлением при помощи топливного насоса и непрерывно воспламеняется. В полете в подаче воздуха компрессору помогает встречный поток.

Скоростной выброс горячей смеси через лопатки приводит во вращение турбину с частотой оборотов от 8 до 16 тыс. об./мин. Выработанная механическая энергия используется компрессором и вспомогательными устройствами, таким образом, в камеру сгорания нагнетается больший объем воздуха для продолжения цикла.

Так же, как и обычному двигателю, ТРД на больших высотах требуется меньше топлива.

Подача топлива в камеры сгорания регулируется автоматическим регулятором с барометром.

V. Переведите письменно:

How Jet Engines Work

Most jet propelled airplanes use a turbofan design. The turbofan can be thought of as a high tech propeller inside of a duct called a diffuser, driven by a gas generator.

The Core

The core of a jet engine is a gas generator that creates high pressure gas to power a turbine. This setup has compressor, combustor, and turbine sections.

The Compressor

Compressed air makes for a much more powerful fuel combustion reaction relative to engine size. Compression happens in stages that force incoming air into an increasingly narrow chamber. A single compressor stage is comprised of a spinning rotor paired with a ring of stationary stator vanes which are attached to the core casing. Rotor

blades swirl the air as they force it through the compressor. Stator vanes slow this swirling momentum in exchange for increased air pressure. This compressor has four low pressure and ten high pressure stages.

The Combustor

Air is mixed with fuel and ignited as it passes through the combustor, releasing a jet of super high powered gas. The design shown here is an annular combustor, meaning "ring shaped." Compressed air enters the inlet nozzles. Each nozzle is coupled with a fuel injector, and is designed to swirl the incoming fuel and air for an even mix. A couple of igniter plugs, not unlike the spark plugs found in car engines, ignite this mixture and the reaction spreads evenly around the ring. Once started, combustion continues as long as air and fuel are supplied.

The turbine

Turbines at the rear of the jet engine are powered by exhaust gasses exiting the combustor. Much of the turbine power is used to turn the fan while a smaller percentage powers the compressor stages. Turbine fins get extremely hot. Some air from the compressor is diverted for cooling, and special coatings are used to keep temperatures down. The exhaust cone is specially shaped to mix and accelerate exhaust streams. It also covers sensitive internal engine parts.

The fan

Early jet engines were turbojets, where all incoming air flows through the core. Most modern winged aircraft engines are turbfans, where only a fraction of air enters the core or gas generator, and the resulting power turns a specially designed fan. Again, the fan can be thought of as a high-tech propeller inside of a duct. Air that does not enter the core is called bypass air.

High bypass engines are designed to move large quantities of air at slower cruising speeds (a range of about 310 to 620 mph). The exchange for high efficiency is engine size – high bypass engines can be very

large, with massive fans compared to core size. Commercial airliners or military transport aircraft are example applications.

Exhaust velocity is a major factor in jet engine noise. High bypass engines surround fast-moving core exhaust with large quantities of slower-moving bypass air for quieter operation. Military fighter aircraft use low bypass engines, which are more compact, have high power-to-weight ratios, plus supersonic and afterburner capabilities, in exchange for things like poor noise control and high fuel consumption.

Afterburner

High performance engines may have afterburner capability. Additional fuel is sprayed into a jet pipe section where it mixes with exhaust gas, and is ignited, producing a second stage of combustion. Since afterburner is fuel inefficient, it's generally used in short bursts during takeoff, climb, or combat maneuvers. The exhaust nozzle is adjustable for maximum exhaust acceleration and to avoid undesirable back-pressure which can harm forward engine parts.

VI. Переведите письменно:

Поршневой двигатель

Л/а с поршневым двигателем летит при помощи винта, тянущего или толкающего л/а со скоростью, достаточной для создания подъемной силы крыла, необходимой для того чтобы удерживаться в воздухе. Пропеллер крепится к главному валу, который через редуктор соединяется с коленчатым валом двигателя.

Турбореактивный двигатель

Турбореактивный двигатель состоит из пяти основных компонентов: всасывающего патрубка, ротационного воздушного компрессора впереди, группы камер сгорания, в которых непрерывно воспламеняется впрыскиваемое топливо, турбины, вращающейся на общем валу с компрессором и сопла.

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Подача топлива в камеры сгорания регулируется автоматическим регулятором с барометром.

Турбовинтовой двигатель (ТВД)

ТВД объединяет в себе черты реактивного и поршневого (с пропеллером) двигателей. Устройство ТВД схоже с ТРД, за исключением того, что к первому впереди присоединен пропеллер, вращаемый при помощи вала турбины через шестереночную трансмиссию для уменьшения числа оборотов; также для движения используется реактивная тяга от исходящих газов.

VII. Выступите в роли переводчика:

Общеизвестно, что на данный момент самым распространенным видом реактивных двигателей является турбореактивный двигатель. Что вы можете сказать о принципе его работы?	A turbojet engine works in the following way: a compressor sucks air in, compresses it, and directs it to a combustion chamber. There the compressed air mixes with fuel, inflames, and expands. The expanded gas forces the turbine, which is located on the same shaft with the compressor, to rotate. The remaining part of energy is moved to a convergent-divergent nozzle. As a result of directed efflux from the nozzle, the engine is affected by the thrust.
Какой основной тип двигателя применяется в винтовой авиатехнике?	In such a class of vehicle, piston engines are usually used. It produces thrust by means of a rotation movement of the propeller, as well as compound engines, with the thrust produced by the propeller being more than 50% of the total thrust of the engine.
Из каких основных частей состоит реактивный двигатель?	Any jet engine has to consist of at least 2 parts: a combustion chamber, where the freeing of the chemical energy occurs and its transformation to the heat energy of the gases, and a propulsive nozzle, where the heat energy, when the gases efflux the nozzle at a great speed, transforms to velocity energy, which, as a result, produces thrust.

Lesson 18.

Aircraft Weapons

ACTIVE TERMS AND EXPRESSIONS

aircraft weapons	авиационное вооружение
air-to-air weapon	управляемая ракета класса «воздух–воздух»
air-to-ground weapon	ракета класса «воздух–земля»
rocket	неуправляемая авиационная ракета
missile	управляемая ракета
Royal Air Force	Королевские военно-воздушные силы Великобритании
be equipped with	оснащаться
fixed-wing reconnaissance aircraft	самолет-разведчик с неизменяемой геометрией крыла
revolver cannon	револьверная пушка
(un)guided bomb	(не)управляемая бомба
fit with	снаряжаться (напр., фугасной боевой частью)
high-explosive warhead	фугасная боевая часть
short-range missiles	ракета малой дальности
medium-range missiles	ракета средней дальности
long-range missiles	ракета большой дальности
successor	следующий вариант
Paveway II LGB	управляемая авиационная бомба «Пейвуэй» с лазерной системой наведения
AIM-9X Sidewinder	«Сайдвиндер»

INTRODUCTORY EXERCISES

I. Найдите в тексте и переведите словосочетания:

Be classified as; be equipped with a wide variety of weapons; armed with machine guns; be unguided or guided by lasers; rockets fitted with a kinetic energy penetrator; which relies on its kinetic energy to destroy armoured targets; be divided into the following categories.

II. Найдите в тексте эквиваленты словосочетаний:

Подразделяться на; оснащаться в зависимости от назначения; вооружаться пулеметами или же не иметь вооружения вовсе; наводиться по лазерному лучу; уничтожать бронированные цели благодаря своей кинетической энергии; подразделяться на следующие категории; быть обнаруженным посредством пассивного или активного радиолокационного самонаведения.

TEXT

Aircraft weapons of the Royal Air Force

Aircraft weapons can generally be classified as air-to-air and air-to-ground weapons according to their target, and as bombs, rockets, missiles and guns according to function. The aircraft of the Royal Air Force can be equipped with a wide variety of weapons depending on their purpose.

Most non-combat aircraft of the RAF are either armed with machine guns (support helicopters), or do not have any weapon system at all (fixed-wing reconnaissance, transport or refueling aircraft).

The weapons used by the RAF are:

1. Aircraft guns such as Mauser 27mm and Aden 30mm revolver cannon and M60D machine gun.
2. Bombs, which can be unguided (for example 1000lb and 540lb General Purpose Bombs) or guided by lasers or satellites (Paveway II LGB and its successor Paveway III LGB bombs).



3. Rockets fitted with either a high-explosive warhead for attack on lightly protected constructions and ships, or a kinetic energy penetrator, which contains no explosives, but relies on its kinetic energy to destroy armoured targets.



4. Missiles. The missiles used by the RAF can be both air-to-air and air-to-ground and can be further divided into the following categories: short-range missiles (Sidewinder), medium-range missiles (Skyflash), long-range missiles (Meteor, Storm Shadow).

III. Переведите письменно. Значение неизвестных вам терминов выясните по словарю:

Вооружение самолетов и вертолетов можно разделить на пушечное и ракетное, последнее, в свою очередь, делится на системы «воздух–воздух» и «воздух–поверхность», а также на управляемые ракеты и неуправляемые ракетные снаряды.

Рассмотрим более подробно новейший образец пушечного вооружения самолетов королевских ВВС – пушку GAU-22/A Equaliser, которая представляет собой четырехствольный вариант 25-миллиметровой авиационной пушки GAU-12/U Equaliser с вращающимся блоком стволов. Она устанавливается на AV-8B Harrier II и ганшип AC-130U «Spooky». Новая пушка сконструирована на базе GAU-12, но количество стволов сократилось с пяти до четырёх, что позволило уменьшить массу на 20 килограмм, а габариты – на 20%. Выросла и точность стрельбы, а подвесной контейнер с боекомплектom на 220 снарядов закреплён под фюзеляжем в задней части самолёта. Скорострельность стрельбы достигает 2 700–3 300 выстрелов в минуту. GAU-22/A совершает 50 выстрелов в секунду, так что весь запас патронов пушка расходует довольно быстро и с inferнальным шумом. Компания General Dynamics Ordnance and Tactical Systems также разработала пушечную систему внутренней установки для традиционного варианта F-35A, предназначенного для Королевских ВВС, и съёмный пушечный блок Missionised Gun System для варианта F-35B с укороченным взлетом и посадкой и палубного варианта F-35C, предназначенных для базирования на новейших авианосцах типа «Квин Элизабет». Установка включает спиральный беззвеньевого механизм питания с 220 25-миллиметровыми снарядами. Оба варианта пушки GAU-22/A прошли критический анализ конструкции в июле 2005 г., и первый экземпляр был изготовлен в январе 2006 г. Первые стрельбовые испытания прошли в феврале этого же года.

IV. Переведите письменно. Значение неизвестных вам терминов выясните по словарю:

1. The firing control equipment includes complicated electronic and electromechanical devices capable of computing the correct lead or releasing point in a fraction of a second.

2. The gunnery system of a modern fighter plane consists of the fixed forward firing 20 mm automatic aerial guns, gun accessories, gun control systems and a computing sight.

3. Gun charging and firing are accomplished from the cockpit with the switches located on the armament panel and control stick grip.

4. An aircraft gun consists of seven major components: gun barrel, receiver, recoil mechanism, gas mechanism, breechblock, buffer assembly and a charger. During the process of firing, chambering a round, closing and opening the breech, extracting an empty case and management of the recoil and counter recoil actions is conducted automatically.

5. Aircraft gun armament consists of air guns and machine guns with ammunition and sighting systems used on aircraft. The main characteristics of air guns are as follows: calibre 20-45 mm, firing rate 3 000-6 000 rpm, muzzle velocity 1 000-1 100 mps, effective range of fire up to 2 000 meters.

6. According to design, modern air guns are divided into three main groups: single barrel, revolver type and unit type.

7. The air guns are designated to engage ground and air targets. They are usually fired electrically. An air gun fired continuously when there is ammunition and the electric circuit is closed. The gun is equipped with a pneumatic loading mechanism, which operates the breechblock, chambers a round, clears the chamber in case of misfire and puts on the safety after firing.

Lesson 19.

Missiles Classification

ACTIVE TERMS AND EXPRESSIONS

rocket propulsion	ракетная тяга
jet-propelled	реактивный
rearward ejection of matter	выброс вещества в обратном направлении
propulsive jet of gases	реактивная струя газов
solid or liquid propellants	твердое или жидкое топливо
turbojet system	турбореактивный двигатель
pulse-jet system	пульсирующий воздушно-реактивный двигатель
ramjet system	прямоточный воздушно-реактивный двигатель
oxidizer	окислитель
medium	(окружающая) среда
oxygen content of the air	содержание кислорода в воздухе
air-breathing	воздушно-реактивный
free-flight missile	неуправляемая ракета
rocketry	ракетостроение
air-to-air missile	ракета класса «воздух–воздух»
short-range air-to-air missile (SRAAM)	ракета класса «воздух–воздух» ближнего действия
within-visual-range air-to-air missile (WVRAAM)	ракета класса «воздух–воздух» для стрельбы на дальность прямой видимости
“dogfight” missile	ракета воздушного боя
agility	маневроспособность

heat-seeking missile	ракета с тепловой головкой самонаведения
medium-range missile air-to-air missile (MRAAM)	ракета класса «воздух–воздух» средней дальности
long-range missile air-to-air missile (LRAAM)	ракета класса «воздух–воздух» большой дальности
beyond visual range air-to-air missile (BVRAAM)	ракета класса «воздух–воздух» для поражения целей за пределами прямой видимости
radar guidance	радиолокационное наведение
inertial guidance	инерциальная система наведения
homing sensor	датчик системы самонаведения
air-to-surface missile (ASM)	управляемая ракета класса «воздух–поверхность»
air-to-ground missile (AGM)	управляемая ракета класса «воздух–земля»
unpowered guided glide bomb	управляемая планирующая бомба
laser guidance	лазерное наведение
infrared guidance	инфракрасное наведение
optical guidance	оптическое наведение
satellite guidance	спутниковое наведение
passive radar or active radar homing	пассивное и активное радиолокационное наведение
standoff distance	дальность пуска ракеты без входа в зону поражения ПВО

INTRODUCTORY EXERCISES

I. Найдите в тексте и переведите словосочетания:

Used broadly to describe a variety of jet-propelled missiles; to consist of the combustion products of solid or liquid propellants; to include turbojet, pulse-jet, and ramjet systems; to be capable of being guided or directed to a target after having been launched; to be powered by one or more rocket motors; to maintain higher average speed across engagement envelope; to rely upon radar guidance; to depend on the type of target; to be launched from a distance; to be launched over the horizon.

II. Найдите в тексте эквиваленты словосочетаний:

Являться следствием выброса вещества в обратном направлении; включать в себя турбореактивный, пульсирующий воздушно-реактивный и прямоточный воздушно-реактивный двигатели; топливо и окислитель; зависеть от содержания кислорода в воздухе; ракета, запускаемая с самолета, с целью уничтожения другого самолета; использовать датчик системы самонаведения.

TEXT

Missiles classification

Rocket and missile system, any of a variety of weapons systems that deliver explosive warheads to their targets by means of rocket propulsion. Rocket is a general term used broadly to describe a variety of jet-propelled missiles in which forward motion results from reaction to the rearward ejection of matter (usually hot gases) at high velocity. The propulsive jet of gases usually consists of the combustion products of solid or liquid propellants. In a more restrictive sense, rocket propulsion is a unique member of the family of jet-propulsion engines that includes turbojet, pulse-jet, and ramjet systems. The rocket engine is different from these in that the elements of its propulsive jet (that is, the fuel and oxidizer) are self-contained within the vehicle. Therefore, the

thrust produced is independent of the medium through which the vehicle travels, making the rocket engine capable of flight beyond the atmosphere or propulsion underwater. The turbojet, pulsejet, and ramjet engines, on the other hand, carry only their fuel and depend on the oxygen content of the air for burning. For this reason, these varieties of jet engine are called air-breathing and are limited to operation within the Earth's atmosphere. A rocket engine is a self-contained (i.e., non-air-breathing) propulsion system of the type described above, while the term rocket refers to any free-flight (unguided) missile of the types used since the beginning of rocketry. A guided missile is broadly any military missile that is capable of being guided or directed to a target after having been launched.

An air-to-air missile (AAM) is a missile fired from an aircraft for the purpose of destroying another aircraft. AAMs are typically powered by one or more rocket motors, usually solid fueled but sometimes liquid fueled. Ramjet engines, as used on the Meteor (missile) are emerging as propulsion that will enable future medium-range missiles to maintain higher average speed across their engagement envelope. Air-to-air missiles are broadly put in two groups. Those designed to engage opposing aircraft at ranges of less than 30 km are known as short-range or "within visual range" missiles (SRAAMs or WVRAAMs) and are sometimes called "dogfight" missiles because they are designed to optimize their agility rather than range. Most use infrared guidance and are called heat-seeking missiles. In contrast, medium- or long-range missiles (MRAAMs or LRAAMs), which both fall under the category of beyond visual range missiles (BVRAAMs), tend to rely upon radar guidance, of which there are many forms. Some modern ones use inertial guidance and/or "mid-course updates" to get the missile close enough to use an active homing sensor. The concepts of air-to-air missiles and surface-to-air missiles are very closely related, and in some cases versions of the same weapon may be used for both roles.

An air-to-surface missile (ASM) or air-to-ground missile (AGM) is a missile designed to be launched from military aircraft at targets on

land or sea. There are also unpowered guided glide bombs not considered missiles. The two most common propulsion systems for air-to-surface missiles are rocket motors, usually with shorter range, and slower, longer-range jet engines. Guidance for air-to-surface missiles is typically via laser guidance, infrared guidance, optical guidance or via satellite guidance signals. The type of guidance depends on the type of target. Ships, for example, may be detected via passive radar or active radar homing, less effective against multiple, small, fast-moving land targets. A major advantage of air-to-surface missiles for ground attack by aircraft is the standoff distance they provide: missiles can be launched from a distance without coming within range of the target's air defenses. Most air-to-surface missiles are fire-and-forget from a standoff distance, allowing the attacker to withdraw without approaching further after launch. Some missiles (typically cruise missiles or anti-ship missiles) have long enough range to be launched over the horizon, finding the target autonomously.

III. Ответьте на вопросы:

1. What is defined by the term “missile system”?
2. What is special about turbojet, pulse-jet, and ramjet systems in comparison with a rocket engine?
3. By what name are missiles which designed to engage opposing aircraft at ranges of less than 30 km known?
4. How are missiles with infrared guidance called?
5. What missiles are designed to be launched from military aircraft at targets on land or sea?
6. What is the typical guidance for air-to-surface missiles?

IV. Переведите письменно. Значение неизвестных вам терминов выясните по словарю:

ASRAAM air-to-air missile. ASRAAM is in service with the Royal Air Force as its Within Visual Range (WVR) Dominance weapon.

The weapon is also in operational service with the Royal Australian Air Force on its F/A-18 Hornet.

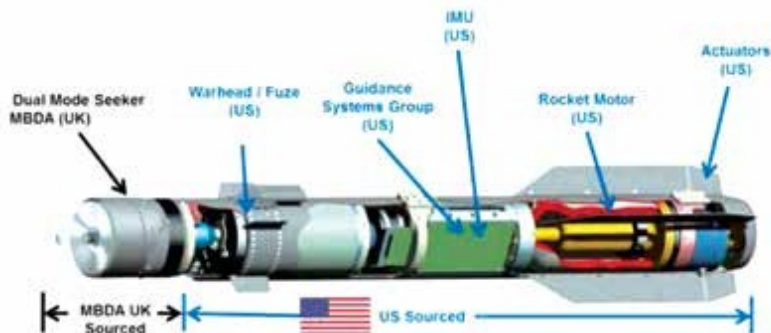
In WVR air combat, the ability to strike first is vital. A pilot engaging an enemy needs a missile that reacts more rapidly than ever before with the speed and agility to maximise the probability of a kill, regardless of evasive target manoeuvres or the deployment of countermeasures. ASRAAM has proven this capability.



ASRAAM accepts target information via the aircraft sensors, such as the radar or helmet mounted sight but can also act as an autonomous infrared search and track system. The RAAF has demonstrated successful 'over the shoulder' firing in Lock On After Launch (LOAL) mode against target drones that were behind the wing-line of the launch aircraft.

Already fully integrated with proven reliability on Typhoon, Tornado and F/A-18, ASRAAM is also being integrated onto the F-35 Lightning II. Proven capability demonstrated by firings from a range of aircraft, including: F-16, F/A-18, Tornado F3, Tornado GR4 and Typhoon aircraft.

Brimstone air-to-surface ground-attack missile. Brimstone provides a combat proven, low collateral, close air support weapon offering to the fast jet operator the unique capability of engaging a wide range of target types, including fast moving vehicles / vessels in both land and naval environments and in both direct and indirect modes.



The latest generation Brimstone builds upon the successful Brimstone Urgent Operational Requirement (UOR) which deployed the weapon into front line operations with the RAF.

Operationally deployed in the Afghanistan, Libya conflicts, Brimstone has proved to be the weapon of choice with its ability to perform surgical strikes in time critical missions with a true day / night capability.

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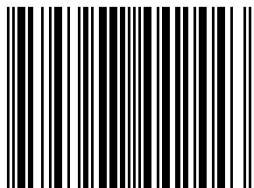
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