DEPARTMENT OF TACTICS
UNITED STATES ARMY AVIATION SCHOOL
FORT RUCKER, ALABAMA/FORT STEWART, GEORGIA

August 1969
File No. 5/69-250-1
72-205-1
73-205-1

PERFORMANCE CHECK

PRINCIPLES OF AERIAL GUNNERY

In the following performance check you are given a situation, and then a series of questions pertaining to the situation.

First read the situation and decide what your role in the situation will be.

Next read the question, then decide which of the answers best describes the course of action that you should take.

After you finish the first situation, read the second and answer the questions that follow that situation.

NOTE: The questions pertain only to the situation that immediately precedes the question.

SITUATION FOR QUESTIONS 1-5

You are the copilot/gunner of a UH-1C on a gun run. The target is two grass houses (each approximately 7m long), in an open field. Your aircraft has an M21 armament subsystem, and the enemy has light automatic weapons.

1. As copilot/gunner you will engage the target at 1000 meters and keep fire on the target until you break from the firing pass at 500 meters. To place fire on the target you must start firing with:

   a. Your center pipper above the target and move your sight picture down to the target as the range decreases.

   b. Your center of the pipper below the target and move the sight image up as you close on the target.

   c. Your center of the pipper on the target and move the sight image below the target as you close on the target.

d. Your center of the pipper on the target and maintain the reticle image on the target.

2. While you are on the gun run you come under enemy fire from the left of the aircraft. You estimate the range to be 1000 meters. To place fire on this position you must aim:

   a. High and right of the target.

   b. Low and right of the target.

   c. High and left of the target.

   d. Low and left of the target.

3. You notice while you are firing that as you move your head in relation to the sight the reticle image moves off the target. This is caused by _____.

4. Looking through the sight you notice one of the grass houses fills about 1/6 of your reticle. The target is about:

   a. 400 meters.

   b. 500 meters.

   c. 600 meters.

   d. 700 meters.

5. The pilot starts a right break away from the target. To keep fire on this target you must aim _____and_____.

SITUATION FOR QUESTIONS 6-10

You are now the aircraft commander of a UH-1C armed with a M21 subsystem. You are on a mission in close support of friendly forces. The friendly forces are pinned down in an open rice paddy by an enemy force in a tree line 200 meters to the north.

6. Will you make your firing pass on the enemy from:

   a. North to south.

   b. South to north.

   c. East to west.

d. Northeast to southwest.

7. There is a 30 knot crosswind from your right as you start your firing pass, so you must aim:

   a. 8 mils downwind.

   b. 16 mils short.

   c. 8 mils upwind.

   d. 12 mils upwind.

8. As you fire your first rocket you notice you were out of trim to the left. Your rocket will land to the _____ of the target.

9. If you maintain your 80K power setting while on the rocket run, your rocket will hit_____.

10. After firing a rocket you notice it hit short. You must correct for this with your second, so you aim _____.

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PERFORMANCE OBJECTIVES

M16/M21 INTRODUCTION

1. KNOWLEDGES: Without the aid of notes or references and without error, the student will be able to--

   a. List the four major subassemblies of the M16/M21.

   b. State the difference between the function of the cartridge drive on the M16 and the crossover drive on the M21.

   c. List the two switches on the circuit control box, and state the purpose for each.

   d. State the maximum effective range of each of the gun systems.

   e. State the two rates of fire of the M21 automatic gun system and the combined cyclic rate of fire of the M16 machinegun system.

   f. Select from several possible limits the correct flexible limits for the M21 automatic gun system and the M16 machinegun system.

   g. List the effects the M16/M21 installation has on the autorotational characteristics of the UH-1.

   h. List the longest burst of fire than can be delivered by the automatic gun.

   i. List the burst radius of the 2.75-inch rocket 10-pound warhead.

2. SKILLS: None.

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ADVANCE SHEET

M16/M21 INTRODUCTION

PURPOSE: This instruction is designed to acquaint you with the three major components of the M16/M21 armament systems to include the operation and characteristics, capabilities, and limitations of the various components and their effect on the aircraft. This sheet will also briefly cover loading of the automatic gun system.

CONSIDERATIONS:

1. During the last decade the development of armed helicopters has come a long way from the "homespun" Rube Goldberg devices that heralded our early beginnings.

2. From the two Browning machineguns mounted on the skids of an H-13, we have advanced to the devastating automatic guns capable of firing 4800 shots per minute. We have added a flexing capability to our guns so they are now directed by the copilot/gunner independently of the helicopter's axis. We have in effect fully armed a flying carpet.

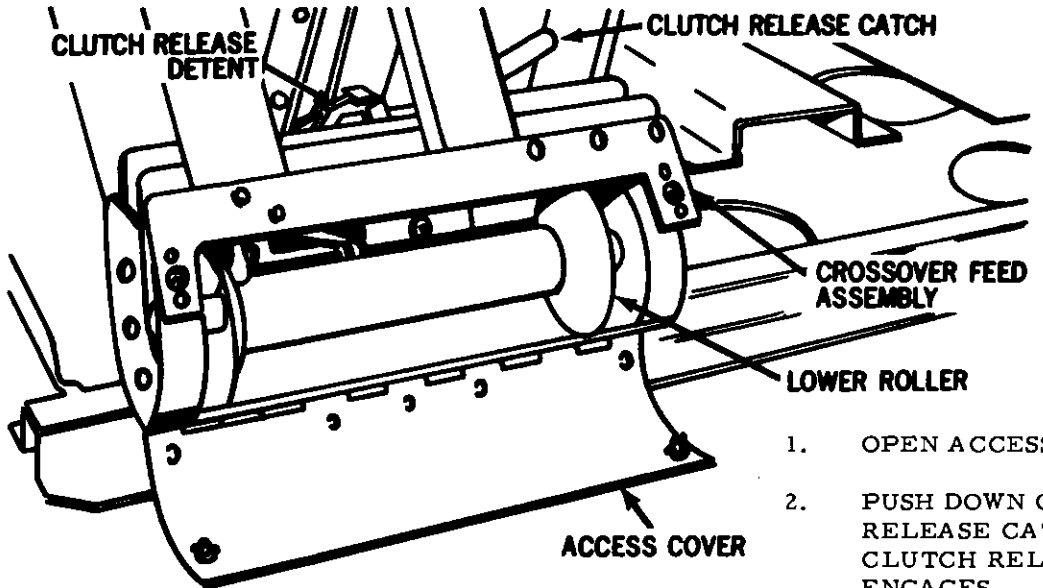
3. By way of clarification, the M16/M21 armament subsystems covered in this 2-hour block consist basically of two gun mount assemblies, one ammunition feeding system, a fire control system, machineguns or electrically driven automatic guns, and necessary attaching hardware.

4. The M16 consists of a four-gun machinegun system and two seven-round launcher pods. It weighs 1294 pounds with 6700 rounds of 7.62mm ammunition and 14 2.75-inch rockets with 10-pound warheads.

5. The M21 uses two electrically driven automatic guns and two seven-round rocket launchers with 6400 rounds of 7.62mm ammunition and 14 2.75-inch rockets with 10-pound warheads. This subsystem weighs about 1346 pounds.

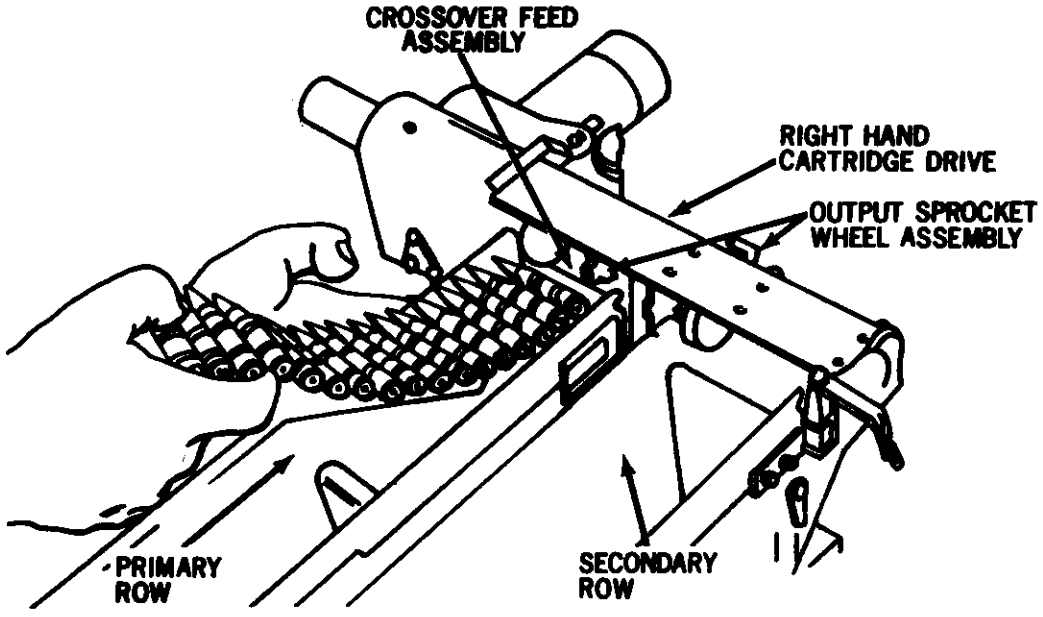
6. Should a fire or explosion occur in the launchers, they should be jettisoned. Care must be taken when this is done above 80 knots airspeed as absolute aircraft trim must be assured. These external stores can also be jettisoned when the pilot's discretion deems they would impair a successful forced landing.

7. The most common cause or stoppages in both of these systems is improper loading. It can also be said that the majority of our problems are operator-induced. Because all of you will soon be operators, we have inserted the following information:



1. OPEN ACCESS DOOR.
2. PUSH DOWN ON CLUTCH; RELEASE CATCH UNTIL CLUTCH RELEASE DETENT ENGAGES.

A - CROSSOVER FEED ASSEMBLY PREPARED FOR CARTRIDGE LOADING



1. START LINKED CARTRIDGES INTO CROSSOVER OF RIGHT HAND CARTRIDGE DRIVE WITH LINK DOUBLE LOOP END FIRST, BULLETS TO FRONT, AND CLOSED SIDE OF LINK UP. FEED IN CARTRIDGES UNTIL FOUR OR FIVE PASS UNDER LOWER ROLLER AND LAY ON ACCESS COVER.

2. FOLD LINKED CARTRIDGES BACK AND FORTH TO FILL OUTBOARD AMMUNITION BOX ASSEMBLY, THEN FILL CENTER AND INBOARD AMMUNITION BOX ASSEMBLIES.

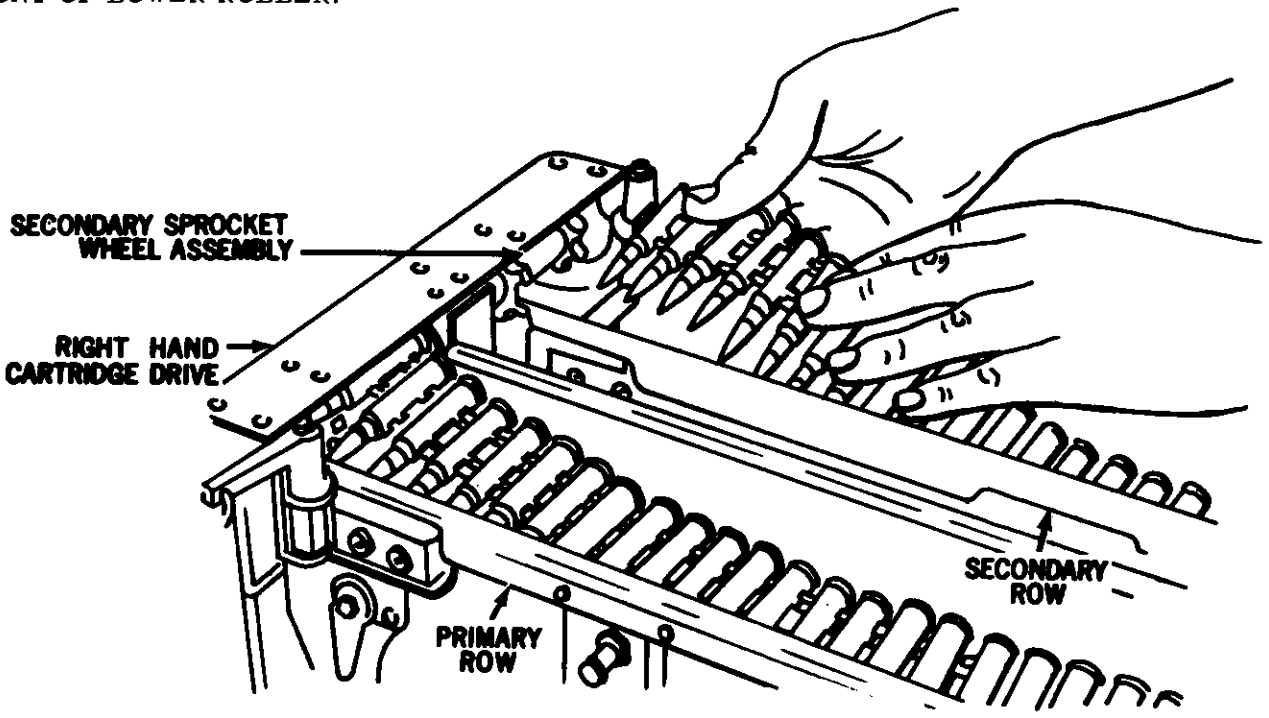
3. RUN REMAINING LINKED CARTRIDGES, OPEN SIDE UP, OVER OUTPUT SPROCKET WHEEL ASSEMBLY.

B - LOADING PRIMARY ROW OF AMMUNITION BOX ASSEMBLIES.

FIGURE 14.1 - LOADING CROSSOVER FEED ASSEMBLY.

1. START LOADING LINKED CARTRIDGES IN OUTBOARD AMMUNITION BOX ASSEMBLY WITH LINK DOUBLE LOOP END FIRST, BULLETS TO FRONT, AND OPEN SIDE OF LINK UP. FOLD BACK AND FORTH TO FILL OUTBOARD, CENTER, AND INBOARD AMMUNITION BOX ASSEMBLIES.

2. RUN REMAINING LINKED CARTRIDGES. OPEN SIDE OF LINK UP OVER SECONDARY SPROCKET WHEEL ASSEMBLY UNTIL SEVERAL CARTRIDGES ARE IN FRONT OF LOWER ROLLER.

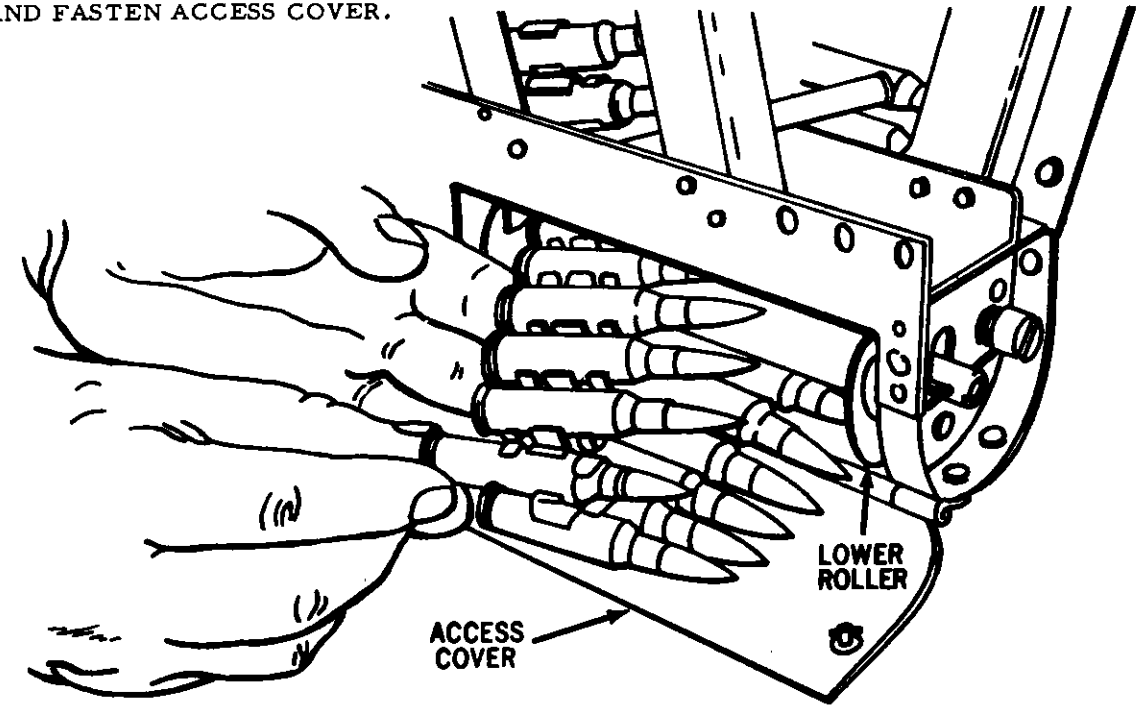


A - LOADING SECONDARY ROW OF AMMUNITION BOX ASSEMBLIES.

1. MATE FREE ENDS OF THE TWO BELTS OF CARTRIDGES AND JOIN BY INSERTING ONE CARTRIDGE IN THE LINK LOOPS.

2. PULL CARTRIDGES BACK INTO SECONDARY ROW OF AMMUNITION BOX ASSEMBLIES UNTIL CARTRIDGES ARE SNUG AROUND LOWER ROLLER.

3. CLOSE AND FASTEN ACCESS COVER.



B - JOINING LINKED CARTRIDGES FROM PRIMARY AND SECONDARY ROWS OF AMMUNITION BOX ASSEMBLIES.

FIGURE 14.2 - LOADING CROSSOVER FEED ASSEMBLY.

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STUDENT OUTLINE

M16/M21 INTRODUCTION

Period one of two periods.

1. Gun systems.

a. M16.

(1) Uses standard M60 ground-mounted machinegun with parts removed.

(a)

(b)

(c)

(d)

(e)

(2) Parts added.

(a)

(b)

(c)

(d)

(e)

(3) M16: M60C tabulated data.

(a) Type.

(b) Weight.

(c) Length.

(d) Feed.

(e) Rate of fire.

(f) Maximum effective range.

(g) Maximum range.

(h) Operation.

(4) M16 ammunition capacity.

(5) Installation on UH-1.

(a) Gun mount assembly.

(b) Attaching hardware.

(c) Mounting of guns (M60C).

(d) Charger.

(e) Gun mount axis.

(6) Ammunition feed system.

(a) Ammunition boxes.

(b) Box tray and tiedown straps.

(c) Cartridge drives.

(d) Ammunition chutes.

b. Automatic gun system (M21).

(1) Designed from inception as an aircraft weapon.

(2) M21: M134 tabulated data.

(a) Type.

(b) Weight.

(c) Length.

(d) Feed.

(e) Rate of fire.

(f) Range (maximum).

(g) Maximum effective range.

(h) Operation.

(3) M21 ammunition capacity.

(4) Burst limit.

(5) Immediate action.

(6) Installation on UH-1. Gun mounts and attaching hardware.

(7) Mounting of guns.

(8) Delinking feeder.

(9) Electric drive motor.

(10) Gun mount axis.

(11) Ammunition feed system.

(a) Crossover drives.

(b) Ammunition boxes and tiedown straps.

(c) Ammunition chuting.

2. Rack assembly.

a.

b.

c.

d.

e.

f.

g.

h.

i.

3. Launcher pod.

a.

b.

c.

Period two of two periods.

1. Fire control system.

    a. Circuit control box (M16).

        (1)

        (2)

        (3)

        (4)

    b. Circuit control box (M21).

        (1)

        (2)

        (3)

    c. Intervalometer control panel.

        (1) MODE SELECTOR switch.

        (2) PAIR SELECTOR switch.

(3) JETTISON switch.

(4) ROCKET RESET button.

(5)

d. Flexible mode sighting station.

(1)

(a) Suspension linkage.

1.

2.

3.

(b) Controller.

1.

2.

3.

4.

a.

b.

c.

e. XM60 reflex infinity sight.

(1)

(2)

(3)

(4)

(5)

(6)

2. 2.75-inch rockets.

a.

b.

(1)

(2)

(3)

c.

3. Limitations and effect on aircraft.

a. Machineguns and automatic guns with rockets.

(1)

(2)

b. Aircraft.

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

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PERFORMANCE CHECK

M16/M21 INTRODUCTION

1. List two of the four major subassemblies of the M16/M21.

   a.

   b.

   c.

   d.

2. List the purpose of the crossover drive.

3. List the purpose of the cartridge drive.

4. List two switches on the circuit control box and give a purpose for each:

   a. _____. Purpose: _____
   _____.

   b. _____. Purpose: _____
   _____.

5. What is the maximum effective range of the gun systems?

   a. M21:

   b. M16:

6. What is the combined rate of fire of the machinegun system?

7. Match the correct flexible limits.

a. M16.

b. M21.

(1) ____ Up 10, down 85, out 70, in 12.

(2) ____ Up 10, down 85, out 60, in 15.

(3) ____ Up 15, down 60, out 70, in 10.

(4) ____ Up 10, down 70, out 60, in 10.

(5) ____ Up 15, down 60, out 70, in 12.

8. What effect does installation have on the autorotational characteristics?

9. What is the longest burst of fire that can be used with the M21?

10. What is the burst radius of the 10-pound warhead, 2.75-inch rocket, the 6-pound warhead?

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PERFORMANCE OBJECTIVES

ATTACK HELICOPTER ORGANIZATION AND MISSIONS

1. KNOWLEDGES: Without the aid of notes or references, the student should be able to :

   a. State the basic element of attack helicopter organization.

   b. List five (5) briefing elements that should be given prior to an attack helicopter operation.

   c. List seven (7) of the basic guidelines of attack helicopter employment.

   d. List five (5) missions normally performed by attack helicopters.

   e. List four (4) types of reconnaissance performed by attack helicopters.

   f. List the three (3) phases of an airmobile assault requiring attack helicopter support.

2. SKILLS: None.

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STUDENT OUTLINE

ATTACK HELICOPTER ORGANIZATION AND MISSIONS

1. Attack helicopter organization for employment.

   a. Fire team. 2 helicopter

   b. Reinforced fire team. 3

   c. Platoon. 6 flight and 2 reserve.

2. Elements of information desired prior to an attack helicopter operation.

   a. Situation

      (1) Enemy.

         (a)

         (b)

(c)

(d)

(2) Friendly forces.

(a)

(b)

1.

2.

3.

4.

b. Mission.

c. Execution.

d. Administration and logistics.

(1) fuel

(2) ammo

(3) repair

e. Command and Signal.

(1) communicate

(2) frequency + call sign - 501

(3)

3. Cardinal Rules.

a. know the situation

b. take your time

c. 50-1000' agl. Dead man Zone.

d. terrain feates (do not fly them)

e. high recon

f. avoid target overflight

g. 180° wing is a no-no.

h. locate the friendly the friendly

i. assume the area to be hot

j. do not fire over the friendly's head

k. fire only on good [illegible]

1.

4. Typical missions.

a. Convoy escort.

(1) recon

(2) sink

(3) Organization

(a) destroy ambush.

(b)

b. Reconnaissance

(1)

(2)

(a) route

(b) area – terrain features

(3)

(a) zone – boundaries,

(b) special –

c. Raid type missions.

d. Support of ground forces.

e. Security missions.

(1)

(2)

f. Escort of unarmed aircraft (medivac or resupply).

g. Support and recovery of downed crews and aircraft.

(1)

(2)

h. Escort of airmobile force.

(1) staging area – PZ

(2) enroute

(3) landing zone

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PERFORMANCE CHECK

ATTACK HELICOPTER ORGANIZATION AND MISSIONS

1. Knowledges:

a. The basic element of attack helicopter organization as employed in Vietnam is the _____.

b. List seven (7) of the twelve (12) basic guidelines of attack helicopter employment.

(1)

(2)

(3)

(4)

(5)

(6)

(7)

c. List five (5) missions normally performed by attack helicopters.

(1)

(2)

(3)

(4)

(5)

d. List four (4) types of reconnaissance performed by attack helicopters.

(1)

(2)

(3)

(4)

e. List the three (3) phases of an airmobile assault requiring attack helicopter support.

(1)

(2)

(3)

2. Skills: None.

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PERFORMANCE OBJECTIVES

HELICOPTER ARMAMENT SUBSYSTEMS-VIDEO TAPE

1. KNOWLEDGES: With the aid of notes or reference material, the student will be able to --

   a. Recite the maximum effective ranges of the M16 and M21 systems.

   b. Write the options provided the armed helicopter commander by having a multiple weapon capability with the M16 and M21 systems.

   c. Recite the total number of rockets carried by the XM3 system.

   d. Recite the maximum effective range of the XM3 system.

   e. When provided with the nomenclature of the major external components of the M5 system, describe the location of the components as mounted on the helicopter.

   f. Write the deflection limit of the M5 system.

   g. Write the type of target the M22 was designed to engage and write an example of such a target.

   h. Recite the total number of missiles carried by the M22 system.

   i. Recite the maximum effective range of the XM27 system.

   j. Write the elevation limits of the XM27 system.

2. SKILLS: None.

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ADVANCE SHEET

HELICOPTER ARMAMENT SUBSYSTEMS -VIDEO TAPE

PURPOSE: This period of instruction is designed to familiarize the student with capabilities, limitation, and characteristics of the XM3, M16, M21, XM27, M5, and M22 armament systems.

PERFORMANCE OBJECTIVES:

1. KNOWLEDGES: With the aid of notes or reference material, the student will be able to--

a. Recite the maximum effective ranges of the M21 and the M16 systems.

b. Write the options provided the attack helicopter commander by having a multiple weapon capability with the M16 and M21 systems.

c. Recite the total number of rockets carried by the XM3 system.

d. Recite the maximum effective range of the XM3 system.

e. When provided with the nomenclature of the major external components of the M5 system, describe the location of the components as mounted on the helicopter.

f. Write the deflection limit of the M5 system.

g. Write the type of target the M22 was designed to engage, and write an example of such a target.

h. Recite the total number of missiles carried by the M22 system.

i. Recite the maximum effective range of the XM27 system.

j. Write the elevation limits of the XM27 system.

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ANNEX A (HELICOPTER ARMAMENT SYSTEM DATA SHEET) TO ADVANCE SHEET

HELICOPTER ARMAMENT SUBSYSTEMS-VIDEO TAPE

XM3 HELICOPTER ARMAMENT SYSTEM

CAPABILITIES:	Direct fire, area fire weapon, capable of destruction as well as neutralization.
COMPONENTS:	Two 24-tube rocket pods, M60 reflex infinity sight, circuit control box, interconnecting box. Total weight, 1,439 pounds.
OPERATION:	
FIXED:	Fired by pilot or copilot (cyclic stick button).
AMMUNITION:	
TYPE:	2.75-inch fin stabilized folding fin aerial rocket.
WARHEAD:	
TYPE:	High-explosive, high-explosive antitank, white phosphorus, inert, and smoke color-red, green, yellow, flechette.
WEIGHT:	10-pound warhead, bursting radius-10 meters. 6.45-pound warhead, bursting radius-6 meters. 17-pound warhead, bursting radius-13 meters.
AMOUNT:	48 rockets.

RANGE:

MAXIMUM EFFECTIVE: 2,500 meters.

MINIMUM SAFE SLANT: 300 meters.

M16 HELICOPTER ARMAMENT SYSTEM

CAPABILITIES: Permits the attack helicopter commander to select the weapon system, either machinegun or rocket, which will be more effective toward the neutralization of the target. M16 system provides the helicopter with a neutralization fire capability against enemy ground troops and soft installation targets.

COMPONENTS:

M16 SYSTEM: Two gun-mount assemblies, ammunition feed system, 12 ammunition boxes, eight sections ammunition chuting, two cartridge drive motors, four M60C machineguns-capable of a combined rate of fire 2,200 rounds per minute, sighting station-which provides a means of remotely directing and firing the guns, circuti control box. Total weight, 1,315 pounds with 10-pound warhead.

ROCKET SYSTEM: Two XM157/M158 rocket pods (seven rockets per pod), rack assembly, intervalometer, M60 reflex intervalometer control panel.

OPERATION:

M16 SYSTEM:

FLEXIBLE: Fired by copilot gunner. Flex limits, 12° inboard, 15° elevation, 70° outboard, 60° depression.

STOWED: Fired by copilot gunner or pilot (cyclic stick button).

ROCKET SYSTEM: Fired by copilot or pilot (cyclic stick button).

AMMUNITION:

M16 SYSTEM:

FLEXIBLE: Fired by copilot gunner. Flex limits, 12° inboard, 15° elevation, 70° outboard, 60° depression.

STOWED: Fired by copilot gunner or pilot (cyclic stick button).

ROCKET SYSTEM: Fired by copilot or pilot (cyclic stick button).

AMMUNITION:

M16 SYSTEM: 6,700 rounds, 7.62mm.

ROCKET SYSTEM: 14 2.75-inch rockets.

RANGE:

M16 SYSTEM:

MAXIMUM EFFECTIVE: 750 meters.

ROCKET SYSTEM:

MAXIMUM EFFECTIVE: 2,500 meters.

MINIMUM SLANT SAFE: 300 meters.

M21 HELICOPTER ARMAMENT SYSTEM

CAPABILITIES: Permits the attack helicopter commander to select the weapon system, either minigun or rocket (or both), which will be most effective toward neutralization of the target. M21 system provides the helicopter with a neutralization fire capability against enemy ground troops and soft installation targets.

COMPONENTS:

M21 SYSTEM: Two gun-mount assemblies, ammunition feed system, 12 ammunition boxes, two ammunition chutes, two cross-over cartridge drive motors, two M134 automatic guns-capable of a combined rate of fire of 4,800 shots per minute (each gun fires 2,400 shots per minute-stopping one

gun by interrupter switch increases the rate to 4,000 shots per minute of remaining gun), sighting station-provides a means of remotely directing and firing the guns, circuit control box. Total weight-approximately 1,346 pounds with 10-pound warhead.

NOTE: Gun selector switch must be in ALL position to allow interrupter switch to increase rate of fire to 4,000 shots per minute.

ROCKET SYSTEM: Two XM157/M158 rocket pods (seven rockets per pod), rack assembly, intervalometer, M60 reflex infinity sight, intervalometer control panel.

OPERATION:

M21 (AUTOMATIC GUNS): 6,400 rounds, 7.62mm.

ROCKET SYSTEM: 14 2.75-inch rockets.

RANGE:

M21 (AUTOMATIC GUNS):

MAXIMUM EFFECTIVE: 1,000 meters.

ROCKET SYSTEM:

MAXIMUM EFFECTIVE: 2,500 meters.

MINIMUM SAFE SLANT: 300 meters.

M5 HELICOPTER ARMAMENT SYSTEM

CAPABILITIES: Direct fire, area fire weapon, capable of neutralizing ground troops (most success with troop in open), soft material targets, and lightly armored vehicles.

COMPONENTS: Flexible, power-operated turret, M75 40mm grenade launcher, ammunition feed system-ammunition box, feet chuting, and an ammunition booster, turret, control panel, sighting station-means for remotely positioning the launcher. Total weight, 335.3 pounds with 150 rounds of ammunition.

OPERATION:

FLEXIBLE:	Fired by copilot gunner. Flex limits, 15° elevation, 35° depression, 60° deflection (left or right of center).
STOWED:	Fired by pilot or copilot.
RATE OF FIRE:	220 shots per minute.

AMMUNITION:

TYPE:	40mm projectile.
WARHEAD:	M384 high-explosive-bursting radius 10 meters. M385 practice round-solid aluminum projectile.
AMOUNT:	150 rounds total. Development for 300 total rounds being issued in Vietnam.

RANGE:

MAXIMUM EMPLOYABLE:	1,750 meters.
MAXIMUM EFFECTIVE:	1,200 meters.
MINIMUM SAFE SLANT:	300 meters.

M22 HELICOPTER ARMAMENT SYSTEM

CAPABILITIES:	Only point target system presently in the attack helicopter inventory. Capable of defeating any known armor.
COMPONENTS:	Launcher support assembly, MK-8 sight, M58 monocular sight, guidance control stick, missile selection box, guidance control unit-electrical failure a down right control will be transmitted to missile. Total weight, 741 pounds, fully loaded.
OPERATION:	Fired by copilot gunner and guided in flight through guidance control stick.

AMMUNITION:

TYPE:	AGM22B missile.

WARHEAD:	HE-shape charge, capable of penetrating 22 inches of steel at 90°. Training round with weighted head with red nonexplosive marking powder.
AMOUNT:	Six AGM22B missiles.
RANGE:	
MAXIMUM PRACTICAL EFFECTIVE:	3,500 meters.
MINIMUM PRACTICAL EFFECTIVE:	500 meters.

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PERFORMANCE CHECK

HELICOPTER ARMAMENT SUBSYSTEMS -VIDEO TAPE

1. What is the maximum effective range of the M16 machine gun system?

2. Write the options provided the attack helicopter commander by having a multiple-weapon capability with the M16 and M21 systems.

3. What are the two rates of fire available on the XM27 system?

4. What is the total number of rockets carried by the XM3 system?

5. What is the maximum effective range of the 2.75 FFAR on the M16, M21, and XM3?

6. Using the components listed below, describe the location of the components as mounted on the helicopter.

   a. 40mm M75 grenade launcher.

   b. Flexible, power-operated turret.

7. Write the deflection limit of the M5 system.

8. Write the type of target the M22 was designed to engage, and write an example of such a target.

9. What is the total number of missiles carried on the M22 system?

ITEM	XM-3	M-5	M-6	M-16	M-21	M-22
Weight	1439*	335 448*	830	1294*	1346	681.5
Jettison Weight	1355*	N/A	N/A	378*	378*	561
Ammunition Capacity	48-2.75"	150-40mm	6700 7.62mm	6700-7.62mm 14-2175"	6400-7.62mm 14-2.75"	6 (AGM-22B)
Maximum Range	8750	1750	3200	8650-2.75" 3200-7.62mm	Same as M-16	3500
Max Eff Range	2500	1200	750	2500-2.75" 750-7.62mm	2500-2.75" 1000-7.62mm	3500
Min Safe Range	300	300	100	300-2.75" 100-7.62mm	Same as M-16	500
Rate of Fire (Max)	6pr/sec (ripple)	220 SPM	550 per gun 2200-system	2200-7.62mm 6pr/sec-2.75"	4800-(2) guns 4000-(1) gun 6pr/sec-2175"	1 per 23 sec or 1 in 3 sec for broken wire
Bursting Radius	6-10-13 m***	10m	N/A	6-10-13m-2.75"	Same as M-16	N/A
Muzzle/Max Velocity	2300FPS	790	2750	2750-7.62mm 2300-2.75"	2850-7.62mm 2300-2.75"	600FPS
Power Source	28V DC	28V DC	28V DC 1000-2000PSI Hydraulic	28V DC 1000-2000PSI Hydraulic	28V DC 1000-2000PSI Hydraulic	24-28V DC
			+15°	+15°	+10°	

ITEM	XM-3	M-5	M-6	M-16	M-21	M-22
Flexible Limits	N/A	+15° -35° 60° L&R	-60° 70° out 12° in	-60° 70° out 12° in	-85° 70° out 12° in	N/A

*BASED ON 10lb WARHEAD
**BASED ON 300 ROUNDS 40mm
***6-10-17 Lb WARHEAD RESPECTIVELY