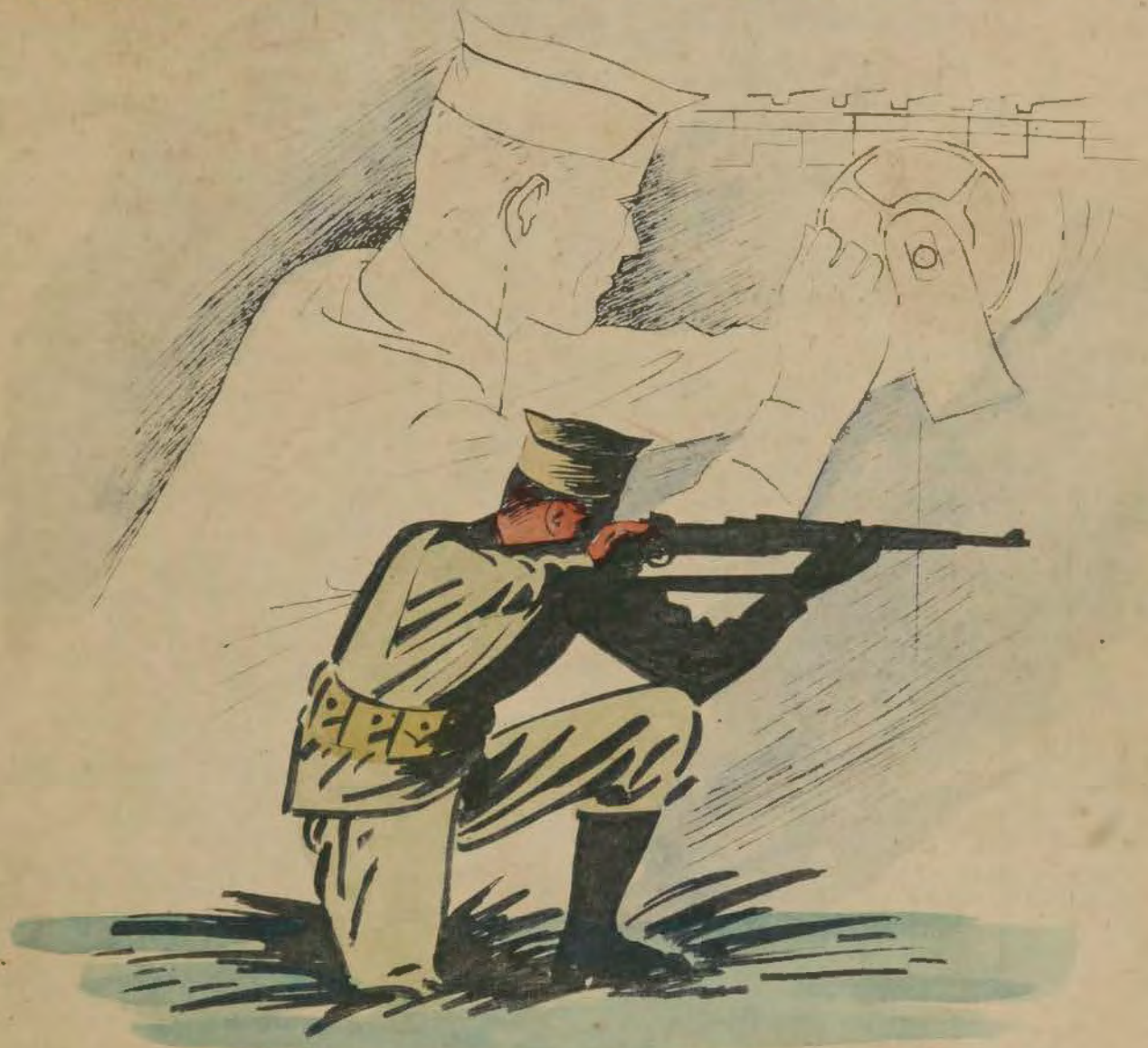
TRAINING THE SOLDIER-MECHANIC



THE ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND · MARYLAND



TRAINING CONDUCTED AT THE O.R.T.C.

PREFACE

...Among the many problems confronting the Ordnance Replacement Training Center, since its beginning early in 1941, has been the necessity of developing suitable training methods. Adequate facilities, equipment, instructional aids and trained personnel were not available with which to organize a training program for Ordnance Replacements. Of necessity, training methods and equipment were improvised by drawing upon all available talent and ability. The training goal for each new trainee must always be the attainment of proficiency, not academic but practical, so that he will be qualified to satisfactorily perform his duties as a field soldier and technician-helper. The pages which follow give a cross-section of some of the methods developed for the attainment of this goal.

BASIC TRAINING
28 DAYS

...balanced diet in the

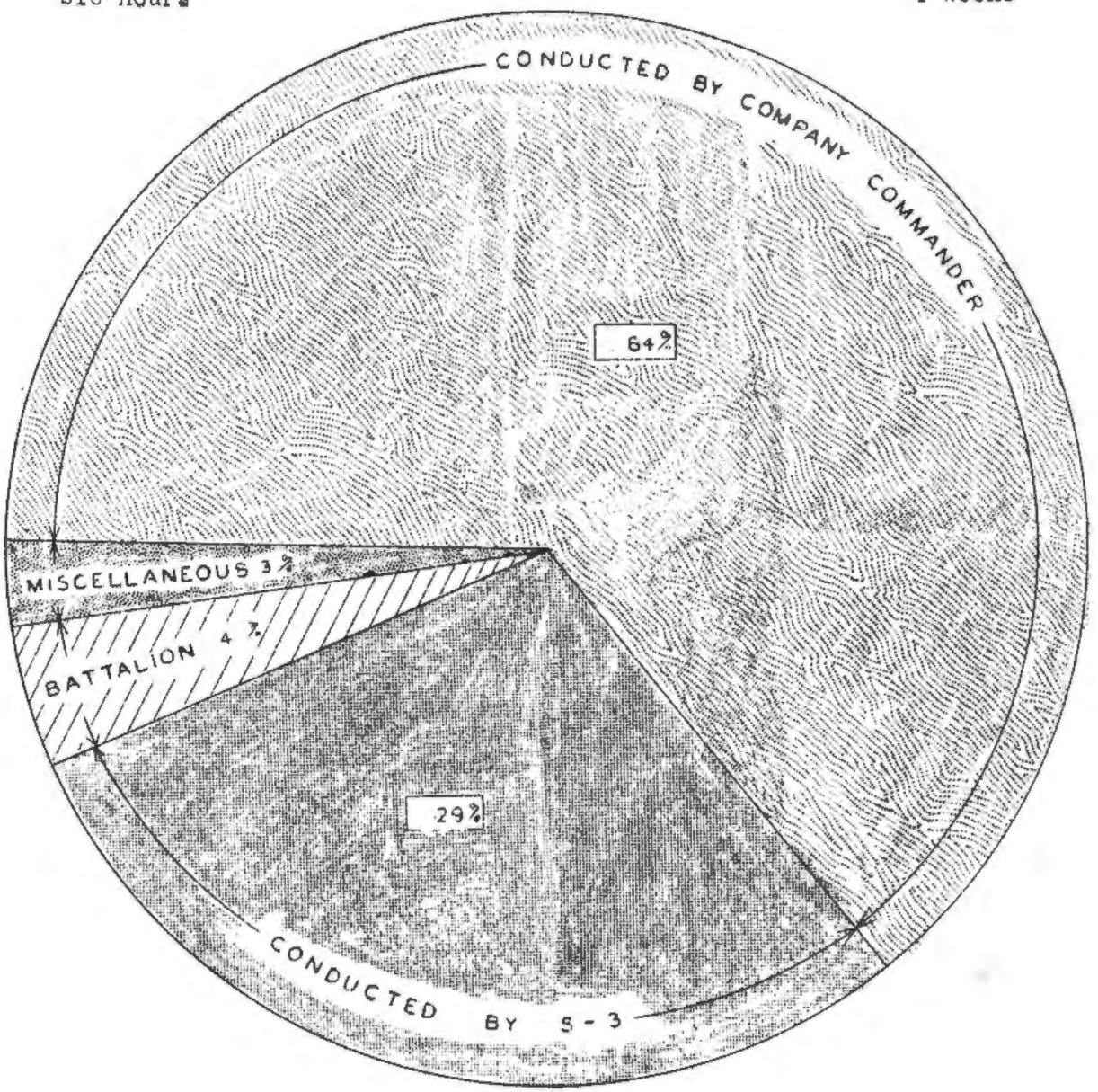
allocation of training periods

for required basic subjects...

ANALYSIS OF BASIC TRAINING TIME

Responsibility for Conduct of Instruction

216 Hours 4 Weeks



CONDUCTED BY	TYPE OF ACTIVITY
Company Commander	Close Order Drill, Rifle Marksmanship Physical Training, Marches
S-3	Lectures, Field Exercises, Examinations
Battalion	Retreat Parades, Reviews
Miscellaneous	Chaplain's Talk, Aptitude Test

COURSES AND HOURS OF INSTRUCTION IN BASIC TRAINING

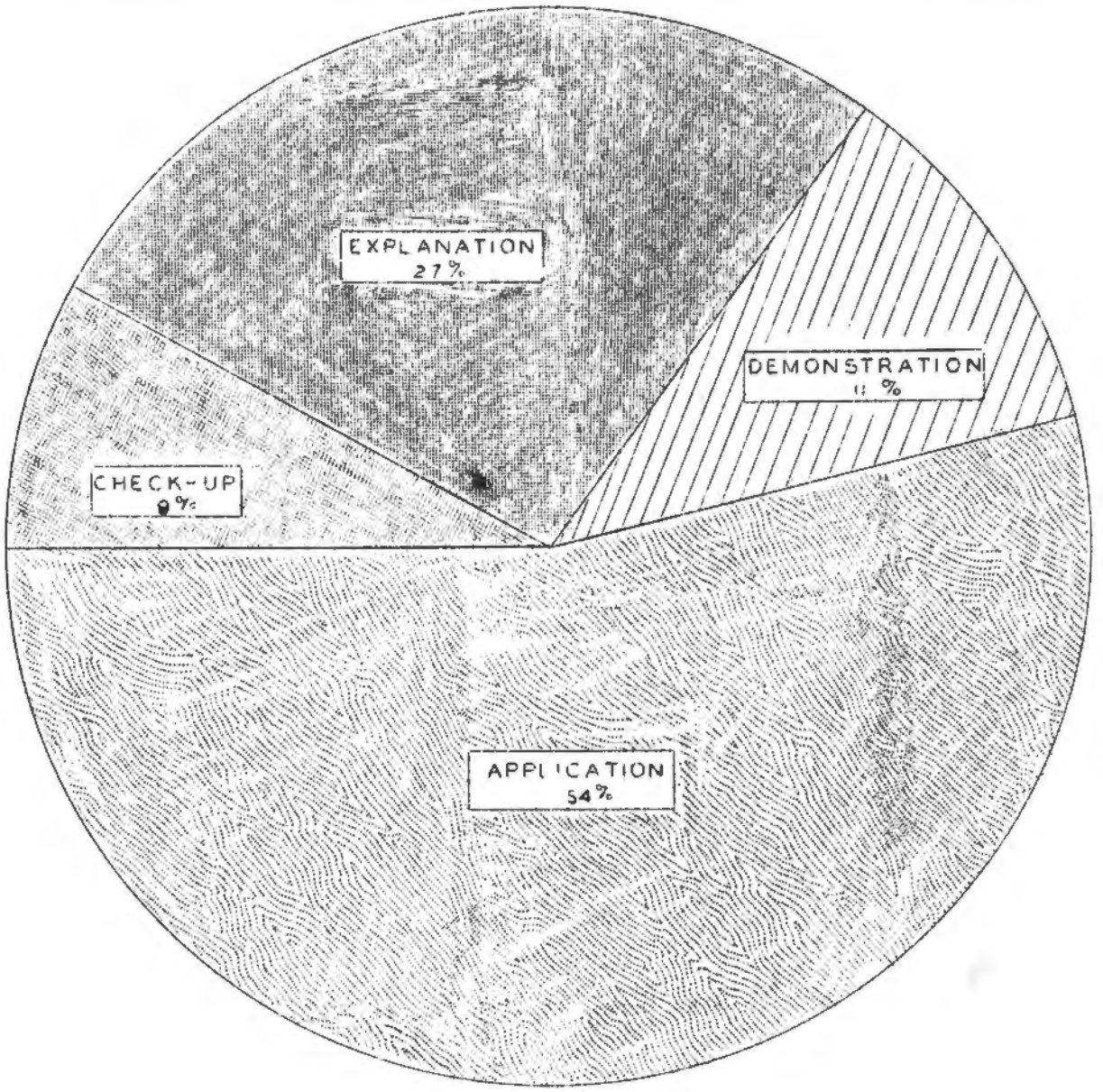
COURSE	HOURS
ORIENTATION	
Aptitude Tests Class.	3
Reclass, Interviews Class.	4
Orientation March on Post (5 miles), including talk by Post Chaplains	3
Address by Comm. Gen'l.	1
Post Regulations	1
War Department Orientation Course, including:	
The War: Its Origin and Opening Phases	1
War Resources: The Struggle to Maintain Lines of Supply	1
War in Russia and the Near East	1
War in the Far East	1
MILITARY	
Military Courtesy I	1
Military Courtesy II	1
Military Courtesy III	1
Sex Hygiene	1
Articles of War I	1
Articles of War II	1
Care of Clo. & Equip. I	1
Care of Clo. & Equip. II	2
First Aid - Lect. I	2
First Aid - Dem. I	2
First Aid - Lect. II	1
First Aid - Dem. II	2
Military Sanitation	1
Interior Guard I	2
Interior Guard II	1
Organization of the Army	1
Safeguarding Mil. Info.	2
FIELD	
Defense vs. Chem. Attk. I	1
Defense vs. Chem. Attk. II	2
Defense vs. Chem. Attk. III	2
Map Reading	2
Camouflage	1
Individual Security	2
Defense vs. Air Attack I	2
Defense vs. Air Attack II	1
Defense vs. Mech. Attack	2
Tent Pitching & Display of Equipment Practice	2
Field Fortifications	1
Mil. Sanit. Demonst.	2
Indiv. Security Practice	2
Scouting & Patrolling	1
Scout & Patrol Exercise	3
Field Fortification Exer.	3
Night Operations	4
Debarkation Net	1
First Aid Exercise	1
Map Reading Exercise	1
Indiv. Security Exercise	1
Def. vs. Air Attk. Exer.	1
Def. vs. Mech. Attk. Exer.	2
Camouflage Exercise (shown below under Examinations)	1 2
MARKSMANSHIP	
Rifle Lecture	1
Rifle Preliminary	29
Rifle, Cal. .22 Firing	6
Rifle, Cal. .30 Firing	18
DRILL & CEREMONIES	
Close Order Drill	23
Extended Order Drill	6
Insp. of Pers. & Equip.	4
Review & Inspection	4
Review & Display of Field Equipment	3
EXAMINATIONS AND MAKEUPS	
Close Order Drill	1
Field Training (Bivouac)	2
Comprehensive, Written	1
Comprehensive, Practical	4
Makeup Instruction	6
PHYSICAL TRAINING	
Physical Training	13
BASIC BRANCH	
Motor Vehicle Operation	12
Elementary Science	1
Organization of Ordnance	1
MARCHES	
(Listed above under Orient.)	3
March (10 miles)	4
March, Tactical (5 miles)	4

ANALYSIS OF BASIC TRAINING TIME

Four Cardinal Principles of Teaching

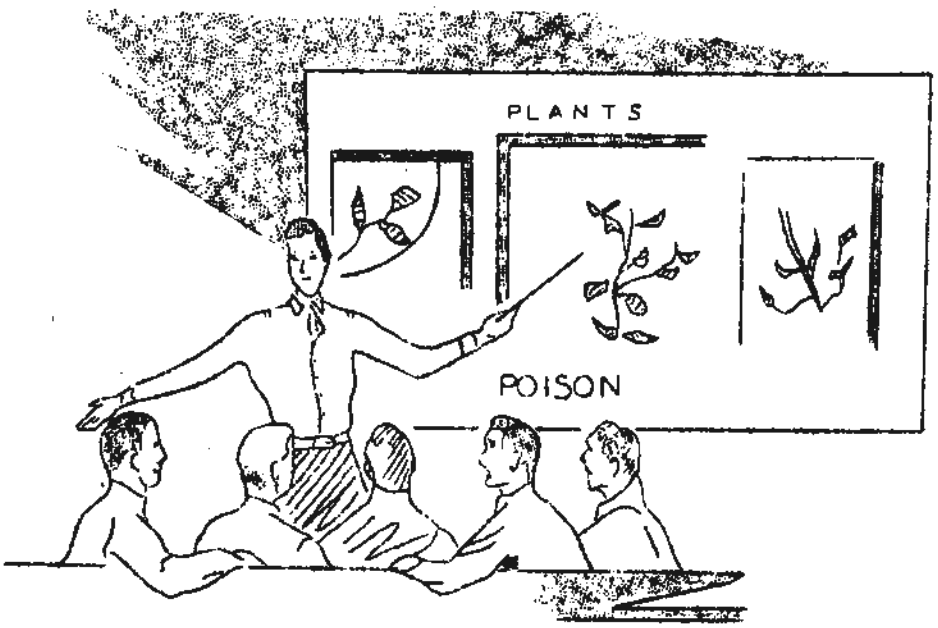
216 Hours

4 Weeks



DISTRIBUTION OF DAY INTO TRAINING PERIODS

MORNING		AFTERNOON		EVENING	
1st Period	0745 - 0835	5th Period	1245 - 1335	9th Period	1800 - 1850
2nd Period	0845 - 0935	6th Period	1345 - 1435	10th Period	1900 - 1950
3rd Period	0945 - 1035	7th Period	1445 - 1535		
4th Period	1045 - 1135	8th Period	1545 - 1635		



...mass instruction in many basic subjects... conducted by specially trained officers... aided by a variety of charts, maps, and models...an integration of explanation (lecture), demonstration (dramatized skits and participation (note-taking aids, oral questioning and practice).....

HEADQUARTERS DIVISION, TRAINING DEPARTMENT
ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND, MARYLAND

COURSE OUTLINES FOR LECTURES AND DEMONSTRATIONS IN BASIC INSTRUCTION

Use of Outlines

The following notes will be helpful in getting the maximum benefit from the attached course outlines, which contain information and references to be used in preparing lectures and demonstrations.

1. "Objective and Scope" indicates the material covered. Major points only can be considered.

2. "Training Aids" listed are flexible. Difficulties in procurement challenge the ingenuity of the instructor in devising substitutes. Chart sizes are 3½' x 8' or 3½' x 5'. Mimeograph reproductions on 8" x 10½" paper provide the instructor with a miniature which he can study in preparing lectures without cumbersome handling of the large charts.

3. Running time for the instruction is indicated in the left-hand margins. The amount of time allotted for a particular subject indicates its relative importance. This holds true for the periods of demonstration and practical application, as well as for the lecture periods.

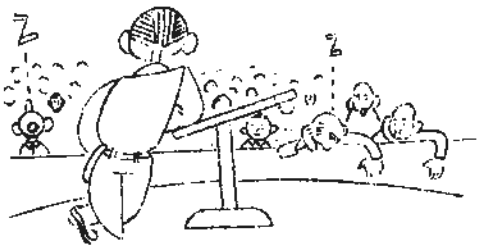
4. Marginal notes indicate reference material for the major points covered. This information is necessary for complete understanding of the outline material. The outline is an aid in preparing the lecture; it is not a set of notes to be read from the rostrum.

5. The "Bibliography" furnishes a convenient listing of references.

6. "Pertinent Training Films" should be viewed by the instructor to gain background in the subject. Specific reels may be used at the discretion of the instructor.

7. "Scripts" are provided for dramatic scenes.

HINTS TO INSTRUCTORS



Timing is important. Course outlines indicate actual timing by experience. Remember this is basic training. Major points only can be covered.

The training aids listed are guides. Build training aids around the lecture; don't build the lecture around training aids.

The outlines proper are detailed. References in the left margin provide source information. Questions from the trainees are embarrassing when the instructor knows only the material of the outline. The outline is an aid in preparing a lecture, not a set of notes to be read from a rostrum.

The bibliography lists references to be studied <u>after</u> the outline material has been mastered.

Following are practical suggestions for lecturing technique:



1. Don't talk to your chart but about your chart. Charts are not an aid to you but an aid to those receiving instruction. Keep your eyes and attention on your class.



2. Stand erect without stiffness. If you do use a rostrum, don't lean on it.



3. Don't stand rooted to one spot but don't move about aimlessly. Give meaning to each movement about the stage.

4. Use gestures sparingly. Don't talk with your hands.



5. Check the position of your hands. Parade rest is a fair solution until you get the feel of things.

6. Adapt your vocabulary in particular and your material in general to your audience. Explain and define new words.



7. Speak loudly and clearly enough so that the men in the last row can hear easily. Enunciate every word. Speak slowly.

8. Talk <u>to</u> your audience, not <u>at</u> them. Get rid of the idea of making a speech. Check their reaction constantly.



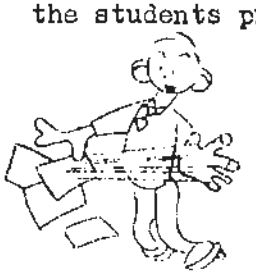
9. Attempt humor only if you have ability. A poor attempt ruins many otherwise good lectures.



10. Wherever possible use illustrations that are colorful and at the same time within the experience of your audience.

11. Emphasize and repeat important points. Don't just "talk about" your subject. Be patient and sympathetic with the students problems.





12. If you must use notes, don't become "tied" to them.



13. Above all be enthusiastic. Your audience will overlook many small faults and will be attentive if you are enthusiastic.

A. All instructors should study carefully and apply the principles and methods of instruction given in FM 21-5. See expecially Sections VI and VII, paragraphs 61 to 103 inclusive.

Course: The War, Its Origin and Opening Phases (04)

Time : One Hour

Objective: To present the background of the present War, from the Versailles Treaty to the Invasion of Poland. This is followed by a description of the early events of the War.

Training Aids:

A. Charts

1. Map of Europe
2. Map of Poland
3. Map of Scandinavian Countries
   a. Large
   b. Small
4. Map of France

B. Script

1. Cast
2. Costumes
3. Stage Help
4. Stage Settings

Marginal notes show running time of lecture, page and paragraph references to source material.

September, 23, 1942 - This supersedes all previous outlines.

I. The War, Its Origin and Opening Phases (04)

0:00 A. Introduction

0:02 (SCENE I: Country Store Skit.)

0:08 B. The attempt to insure a permanent peace by means of the Versailles Treaty in 1919.

1. Territorial partition of Germany and Austria-Hungary.

a. Germany's losses
(1) Alsace-Lorraine to France
(2) Eupen-Malmedy to Belgium
(3) Schleswig to Denmark
(4) Polish Corridor to Poland

b. Austria-Hungary's losses
(1) To Italy
(2) To Yugoslavia
(3) To Czechoslovakia
(4) To Poland

2. Demilitarization of Germany

The Struggle for World Order, pp. 13-16

a. Reduction of Army to 100,000 men and officers
b. Restrictions on size of Navy
c. Abolition of military and naval air force
d. Demilitarization of Rhineland

3. The League of Nations

a. Composition
b. Theoretical mode of operation

0:14 C. Failure of peace terms to insure tranquillity

Why Europe Went to War, pp. 42-48

1. Dissatisfaction of vanquished Germany

2. Dissatisfaction of victorious Italy and Japan because of their failure to acquire "spoils of the victor" in 1919

3. Failure of England and United States to enforce the rules of League; their absorbtion in domestic affairs.

0:17 D. Rise of Adolf Hitler

1. 1923 - formation and growth of National Socialist Party

2. Revolution and imprisonment of Hitler

3. Writing of Mein Kampf while languishing in prison cell

4. 1933 - President Von Hindenburgh appoints Hitler as Chancellor of Germany.

5. 1934 - Death of Hindenburgh; Hitler rises to presidency

0:20 E. Milestones of Aggression

1. Germay rearms

   a. Size of army increased
   b. Marshall Goering commissioned to build air force
   c. Naval restrictions of Versailles Treaty violated.

2. Saar Plebiscite

   a. Versailles Treaty had transferred coal-rich Saar Basin from Germay to France for fifteen year period. At end of period a plebiscite was to be arranged to determine whether the Saar should be French or German.
   b. January, 1935, Saar region voted to return to German ownership. However, German agents were guilty of coercing the population, and temporary German inhabitants flooded the polls.

3. Remilitarization and re-occupation of the Rhineland. Began in March of 1936.

   a. Purpose of remilitarization of Rhineland was to make Germany invulnerable in that borderland between France and Germany.
   b. Germany insisted upon its sovereign right to fortify its boundaries. Sent 100,000 men as a "token" re-occupation. Men were under orders to withdraw should French resist the move.

4. Italy conquers Ethiopia.

   a. Conquest completed in May of 1936.
   b. Italy was seeking to regain the "glory that had been Rome's" by building a colonial empire. Looked to Africa; rich, backward Ethiopia. Out of a 1934 border incident along the border between Italian Somaliland and Ethiopia, Italy manufactured a war - from beginning of 1935 until May of 1936.

5. Spanish Civil War

a. Began in Morocco, July of 1936. A large portion of army and air forces, and half the navy joined in the revolt which was headed by General Franco.

b. War was waged for two and a half years. Italy and Germany supported Rebels, Russia gave aid to Loyalists.

c. Effects of Spanish Civil War on European scene.

(1) German and Italian armies were given opportunity to test their tactics and equipment at the expense of Spanish populace and property.

(2) As result of successful collaboration in support of Rebel cause Mussolini and Hitler were impressed with the advisability of forming the Axis. Until this time the fascist powers had been at odds.

(a) Open military and political alliance, a 10 year pact. "If contrary to the wishes and hopes of the contracting parties it should happen that either of them should become involved in military entanglements with one other power or with other powers, the other contracting party will immediately rally to his side as an ally and will support him with all his military resources on land, at sea, and in the air."

(b) Unofficially, Hitler and Mussolini seem to have divided Europe and Africa into zones. Germany to reign unrestricted in Europe. Italy to be supreme in Africa.

6. Germany acquires Austria in March 1938.

a. Since Hitler's rise to power in 1933, the world expected him to move into Austria.

(1) Hitler is an Austrian by birth.

(2) In Mein Kampf he had written that all Austrians must be reunited under their great mother country, Germany.

b. But from 1934 to 1938 each time that Hitler had evidenced an intention to take a part of Austria under his wing he had been met by an Italian show of force at the Brenner Pass. This was sufficient to prevent Hitler from carrying out his plans for unification. But as a result of German-Italian cooperation in Spain, and the formation of the Axis, Germany now had a free hand in Central Europe as far as Italy was concerned.

c. Acquisition of Austria
   (1) March 11, 1938, German troops began to cross the frontier into Austria.
   (2) March 13, 1938, Chancellor Schussnig resigned, Seyss-Inquart, new Chancellor, proclaimed the political and geographic union of Austria with Germany.

7. Acquisition of Czechoslovakia.

a. Location of Sudetenland in western tip of Czechoslovakia. Industrially rich and well fortified territory which contained three million Sudeten Germans whose "freedom" Hitler demanded.
b. Munich Conference. Partition of Czechoslovakia began. Completed in March 1939 when Republic of Czechoslovakia was dissolved.

8. Russo-German pact.

Why Europe Went to War, pp. 17-24

a. August 1939; announcement of economic agreement and non-aggression pact between Germany and Russia. Each nation was bound to refrain from any act of force against the other.
b. Effect of pact - to free Germany, at least temporarily, from fear of attack by Russia on her eastern frontier. Now Germany was free to concentrate on her western foes.

9. Invasion of Poland.

Why Europe Went to War, pp. 25-35

The Background of Our War, pp. 24-41

a. Alleged provocation - Germany's desire for territorial rights in the Polish Corridor, and acquisition of city of Danzig.
b. War in Poland - September 1, 1939.
   (1) Strategic positions of German armies at the outset; unfavorable positions selected by Poland.
   (2) German pincers through Poland.
   (3) Destruction of Polish means of communication.
   (4) September 16, 1939 - Russia invades Poland.
   (5) September 27, 1939 - Capture of Warsaw.

0:38

F. Scandinavian Campaign.

The Background of Our War, pp. 41-58

1. Strategic significance of Scandinavia

a. Economic
   (1) Denmark and Norway - sources of food.
   (2) Norway - source of wood pulp.
   (3) Narvik - Norwegian port through which stream rich iron ore deposits which are essential to German

munitions-production.

b. Tactical -
(1) Norwegian southern coast ideal air base - suitable for attacks against England or Germany.
(2) Norwegian fjords - excellent submarine bases which would enable Germany to break the continental blockade.

0:45 (SCENE II: German, Norwegian, and British skit.)

(SCENE III: German, Norwegian, and British skit)

0:53 2. The campaign in Norway.

3. Reasons for speedy success in Scandinavia.

a. Coordinated attack of land, sea, and air arms against a surprised, unprepared Norway.
b. Quisling activities.

G. Campaign in the Low Countries.

1. Fall of The Netherlands

The Background of Our War, pp. 58-66

a. Dutch observation of strict neutrality and German allegation of attack to prevent Britain from seizing control.
b. Dutch defensive preparations
(1) Flooding fields
(2) Mining bridges, trees, roads
c. German five-day blitzkrieg forces Holland to surrender on May 15, 1940.
(1) Coordinated air and ground attack
(2) Activities of fifth columnists

2. Defeat of Belgium.

a. Crossing of Meuse River at Fort Eben Emael. Threatening of Belgian northern flank.
b. Break-through at Sedan caused entire northern front to give way.
c. May 29, 1940 - King of Belgians surrenders to "avoid further bloodshed".

3. Fall of France.

The Background of Our War, pp. 66-78

a. On May 12, after marching through Luxemburg and the Ardennes Forest, Germany arrived at Sedan where break-through occurred.

b. March from Sedan to Abbeville on the Channel

c. Evacuation of Dunkirk

d. Columns moving to the south to complete the conquest of France
   (1) From Amiens to isolate the coastal cities
   (2) From Rhiems to attack the Maginot Line from the rear at the same time a frontal attack was made

0:58 e. Breaking of the Maginot Line

1:00 (SCENE IV: "Lights of Victory")

BIBLIOGRAPHY

1. The Background of Our War, War Department Bureau of Public Relations, Farrar & Rinehart, Inc., New York 1942
2. Dean, Vera Micheles, The Struggle For World Order, The Foreign Policy Association, New York, 1941
3. Dean, Vera Micheles, Why Europe Went to War, The Foreign Policy Association, New York, 1942

SCRIPT

THE WAR, ITS ORIGIN AND OPENING PHASES

CAST:

		COSTUMES:
Zeke	A country hick.	1918 Army blouse, garrison cap - O.D. pants.
Elmer	A country storekeeper	White, shirt with blue stripes, grocer's apron, grey trousers.
Wessel	A Nazi stooge	G.I. uniform, Sam Brown belt, garrison cap, Nazi arm band.
Von. F.	Nazi General	G.I. uniform, Sam Brown belt, garrison cap, Nazi arm band.
Gus	Norwegian Father	Grey trousers, green plaid shirt, soft cap.
Eric	Norwegian Son	Sweater, neckerchief, khaki pants, stocking cap.
Hurley	Secretary to Chamberlain	Swallow-tailed coat, grey trousers, white shirt, dark tie.
Chamberlain	Prime Minister	Swallow-tailed coat, grey trousers, white shirt, dark tie, Homburg hat.
Voice	Voice over loudspeaker	

STAGE HELP:

Lights and Curtain.....1 man

Sound.....1 man

Stage Right.....2 men

Stage Left.....2 men

Fly Loft.....2 men

INITIAL DIRECTIONS

LIGHTS: House lights on; one bank of footlights on; side lights on; set-up spots for German scene (right, red), Norwegian (center, white), English (left, amber). Electric sign box (nine lines), down right on apron. Lights on Map of Norway must be connected. Lights on Map of Europe must be connected. Neither one lighted.

CURTAIN: Red Curtain closed. Blue Curtain closed.

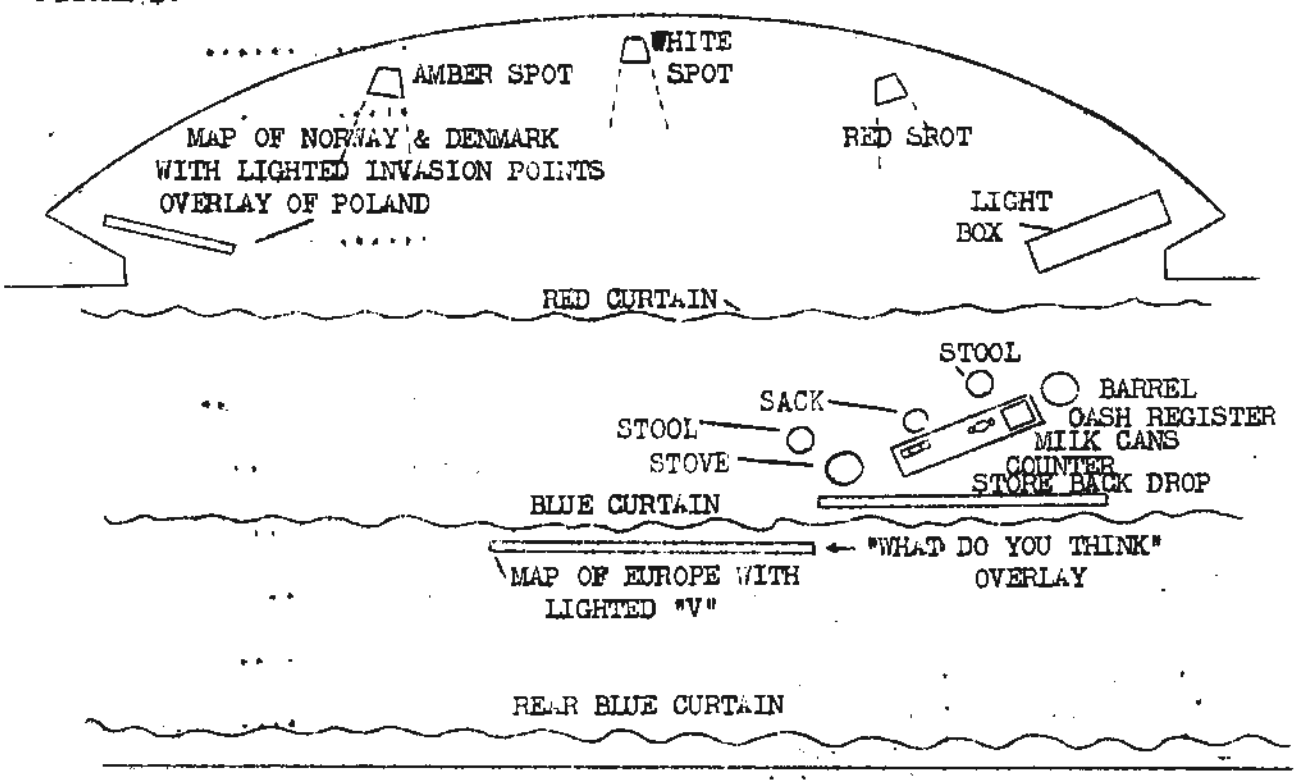
SCENE I

STAGE DIRECTIONS: Nine line electric sign box down right on apron.

(1) Germany Rearms
(2) Saar Plebisite
(3) Occupation of Rhineland
(4) Italy invades Ethiopia
(5) Spanish Civil War
(6) Acquisition of Austria
(7) Partition of Czechoslovakia
(8) Russo-German Treaty
(9) Invasion of Poland)

Map of Norway with overlay of Map of Poland down left on apron.
Map of Europe, center in rear of first Blue Curtain:
Country store scene right date: June 29, 1919.
Props for German (right), English (left) and Norwegian (center) available back stage.

FIGURE I:



MUSIC: March music while troops file in.

OPENING:

LIGHTS: House lights out and foots up full.

MUSIC: Fade out with ----------

ACTION: Officer enters down right, crosses to down center on apron and delivers the ----------

PROLOG: ----------On conclusion, officer exits left.

MUSIC: "Turkey in the Straw" fade up strong and hold for five seconds, fade with ---

CURTAIN: Red curtain opens slowly.

(Zeke enters, left, and crosses up right to country store scene, where Elmer is working on his books behind counter-----)

LIGHTS: Top light on when curtain open full.

ZEKE: Say, whaddya give a thirsty man to drink around these parts?

ELMER: There's water in the back room - (RECOGNIZES ZEKE) Zeke, How the Hell are you? Seems like a long time since you and I finally got orders to quit fightin' last November, two days after the Armistice. Heard ya'd be comin' home this week. Bout time they let you boys get out of Germany.

ZEKE: I was lucky. There's still a good-sized army over there to keep the Dutchmen in line. Got into New York yestiddy mornin' an' came straight home, and I've been thirsty ever since I got off the boat.

ELMER: Guess ya' haven't gottenused to this here prohibition, have ya'? Neither have I. The W.C.T.U. never could have slipped that one over on us if we'd been around. (PULLS OUT CIDER JUG FROM UNDER COUNTER) Anyhow, the revenooers haven't found this yet.

ZEKE: (TAKES A LONG DRINK) Sure am glad this war's over. See by the mornin' paper that Germany signed that treaty they made at Versales.

ELMER: I hope we've seen the end of it, but I ain't so sartin'.

ZEKE: What d'ya mean?

ELMER: Waal, there's a lot of people who won't be satisfied. Take the Germans f'f'instance; mightn't be so easy to keep them from tryin' all over again.

ZEKE: No sense lookin' for trouble, Elmer. Don't forgit who won the war.

ELMER: Mebbe so, but we'd better keep a weathe eye and not go soft. What we need is a first-class Volunteer Fire Department where everybody turns out at the least sign of a fire. Mebbe this here League of Nations will do the trick, if they really mean business and are set to man the pumps. And Uncle Sam had better get in on it at the start to help keep things straightened out.

ZEKE: Reckon we can let them Europeans put out their own fires. Let 'em have a National League, or whatever it is, if they want it. I'm for playin' in the American League.

ELMER: I'm afeard most people here'll agree with you.

ZEKE: Elmer, you worry too much. I say let 'em mind their business and we'll mind ours. Let's have another swallow of that apple-juice and forget war. Everybody's tired of fightin' and killin'. Nobody'll dast start another war while you and me are livin'. Leastwise they'll never get this country in it.

ELMER: I hope you're right, Zeke.

MUSIC: Turkey in the Straw up full and fade out as ----------

CURTAIN: Red curtain closes.

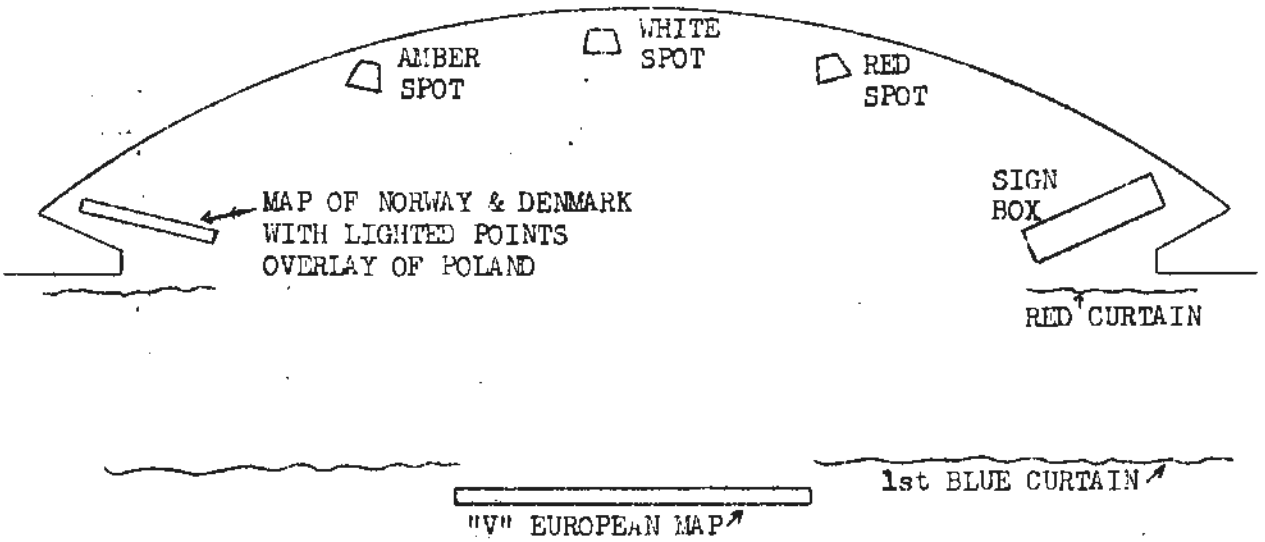
LIGHTS: Kill over head lights, and side lights.

ACTION: Lecturer enters right and crosses down center on apron.

(Notes for operation of nine-line electric sign) One man will sit in back of the sign and watch for cues from the lecturer. These cues will be either a glance at the operator or a distinct tap on the floor with the pointer by the lecturer. Start with the first line and continue at each tap or glance.

STAGE DIRECTIONS: Remove country store scene.

FIGURE II



CURTAIN: Open blue curtain just wide enough to show map of Europe. Slowly open red curtain three quarters of the way.

LIGHTS: Put on over head lights.

ACTION: Lecturer goes up on apron to talk about Poland.

CURTAIN: Close Red Curtain slowly and open blue curtain for work and close when scenes set.

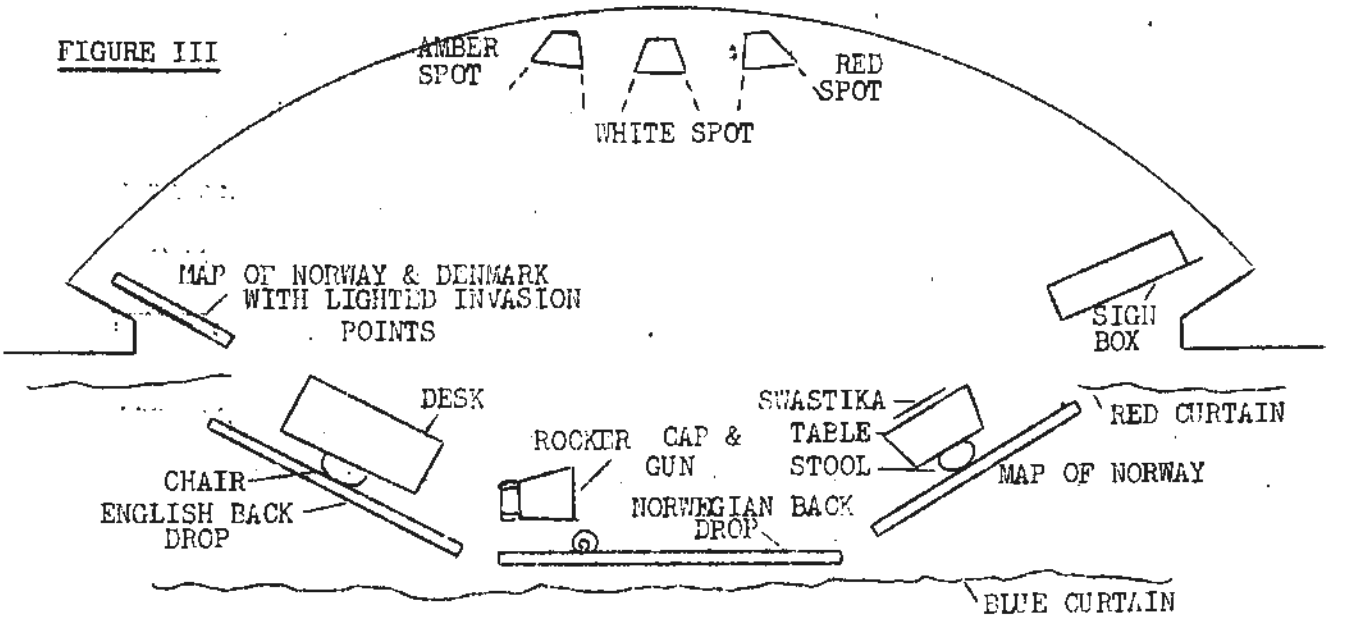
LIGHTS: Kill overhead lights.

(Notes for operation of Map of Poland)
When lecturer taps map with his hand, pull up the map.

SCENE II

STAGE DIRECTIONS: German Scene right in front of Blue curtain; Initial Norwegian scene center (with gun and hat); English Scene left. Put back drops of left and right scenes at an angle, facing the center of stage front; these must be held from the rear.

FIGURE III



ACTION: Lecturer exits left.

LIGHTS: Blackout every thing, including title box. Leave power on the Map of Norway.

CURTAIN: Slowly open Red Curtain.

LIGHTS: Red spot on right scene.

ACTION: Von Fugel seated at desk, Wessel takes one step forward and salutes.

WESSEL)
VON F): (TOGETHER) Heil Hitler!

VON F : What is it, Wessel?

WESSEL : A message, Herr Oberst.

VON F : I told you I wasn't to be disturbed.

WESSEL : It is marked urgent.

VON F : Very well.

(VON F. TAKES LETTER FROM WESSEL, WHO STARTS TO LEAVE.)

VON F : Wait, Wessel ..... this may concern you.

WESSEL : Yes, Herr Oberst.

VON F : This is important, Wessel ..... this is the news we've been waiting for. The leader has given us a real task ..... the invasion of Norway!

WESSEL : Norway!

VON F : (READ AS A LETTER, DON'T RECITE) Yes. Listen.....

"Prepare immediately to act as part of the expeditionary force to attack Norway. You will divide your troops into two forces, one of which will attack Stavenger; the other will attack Bergen. You will entrain tomorrow at the seventh hour for Hamburg, where you will embark for your objectives under the protection of our naval and air forces. When you land, public utilities and buildings will be in the control of our sympathizers under Vidkun Quisling. You will be met by Karl Anderson and Hans Ibsen, who will act as your guides. All resistance is to be ruthlessly crushed. After establishing beach-heads, follow offensive plan "A". Further orders by wireless,"

Signed, Von Brauchitsch. Commanding.

WESSEL: At last we can put our plans into action.

VON F : Yes. You will make the preliminary arrangements immediately. Do you have those names?

WESSEL: Yes, Herr Oberst ..... Anderson and Ibsen.

VON F : Very well. Carry out your orders. Heil Hitler!

WESSEL: Heil Hitler!

LIGHTS: Red spot out, White spot up on Norwegian scene, center.

ERIC: (RUSHES INTO ROOM) Father! Father! The Germans are landing in the harbor and parachuting on the airport. I am going to fight.....

GUSTAVE: It is too late for that, my son.....

ERIC: Too late to fight ! ! ! !

GUSTAVE: Who is in command? Where will our troops assemble?

ERIC: I don't know, but....

GUSTAVE: What organization do we have?

ERIC: I don't know. But I'm sure every Norwegian will rise to the defense of our country.....

GUSTAVE: But Eric! ! Every Norwegian is not loyal. This morning Hans Ibsen, came out of his house in the uniform of a Storm Trooper.

ERIC: I wish I'd been here...Yes, I know...Karl Anderson, my own schoolmate is commanding the forces that have taken over the radio station. And Henrich is with him...They're taking orders from those tourists that have been boarding with Mrs. Grieg....

GUSTAVE: It will be difficult to stop them now. We must wait and fight them by Sabotage and secret publications.....

ERIC: No, we must fight now until the English and French come to our aid....

(AS ERIC GRABS CAP AND GUN FROM RACK AND EXITS RIGHT)

GUSTAVE: Eric, my son, Wait.....

LIGHTS: Kill white spot, Amber spot on English Scene, left.

ACTION: (Chamberlain seated at desk as Hurley enters)

HURLEY: (ENTERS WITH MESSAGE) Mr. Chamberlain, here is news from the Intelligence Dept!

CHAMBER: (OPENS PAPER AND READS ALOUD) Hitler is expected to attack Norway and Denmark within 36 hours. Troop and supply movements have been observed at the ports on the North Sea.

HURLEY: And all the time we thought the attack would be on the Low Countries and France. Much of our equipment and many troops are there now.

CHAMBER: Yes, and we have little time to organize help for Scandinavia. What assistance can the French offer?

HURLEY: Not much! They feel they can't afford to weaken their own defenses.

CHAMBER: How true. And for months I have been trying to persuade Daladier of the necessity for a unified command of the French Navy and our own. Who knows but what we are working at cross purposes.

HURLEY: Sir, the admiralty states that they will be prepared to convoy our first brigade of troops across to Norway beginning tomorrow night.

CHAMBER: I'll call Daladier at once to see what he will offer as support.

HURLEY: I fear this turn of events will further strengthen the Opposition, who have so long been crying "Too little and too late."

LIGHTS: Blackout. (Put work lights on while curtain is closed)

CURTAIN: Close red curtain.

SOUND: VOICE OFF STAGE:

April 9, 1940 - German troops ride swiftly across Danish frontier and quickly occupy Copenhagen, (Light on #1 Map). Denmark passes under Nazi domination. German troop ships protected by pocket battleships, cruisers, and planes land at Oslo (Light #2 on Map), and take over Norwegian capital.

April 10: Stavenger, Betgen, and Trondeim fall (Light #3 on Map) before onslaught of German ships and planes.

April 11: Key port of Harvik (Light #4 on Map) successfully invaded.

April 13: Germans meet stiff resistance in interior of Norway.

April 15: British and French troops land at Folden Fjord, (Light #4 on Map), Nemers, and Aandalsnes.

April 20: German panzers smash Allied defenses. British, French, and Norwegians retreat before heavy attacks.

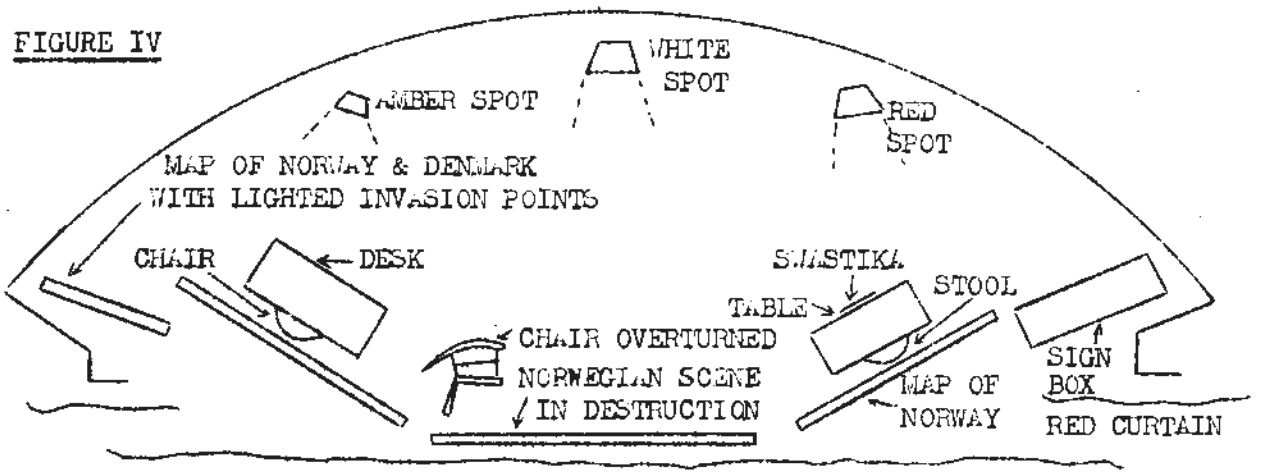
May 2: Allies withdraw troops south of Trondeim.

May 5: Nazis crush final resistance (Kill all Lights on Map)

SCENE III

STAGE DIRECTIONS: When curtain is closed, Reverse Norwegian back drop. Upset Rocking Chair; Gustave has been killed and is out on his back.

FIGURE IV



MUSIC: "Tannhauser" faded up and held through three scenes.

CURTAIN: Red curtain opens to reveal.

LIGHTS: Red light up on right (German Scene)

(German scene -- Von Fugel seated at desk with paper in front of him; Reads; Shows pleasure; Stands with disdainful air; Pins swastika on Map of Norway. Von Wessel and Von Fugel give salute toward map.)

LIGHTS: Red light out, white light up on Norwegian Scene for a moment, Cut white light and Amber spot up on British scene, left.

(HURLEY brings in message hands it to Chamberlain; Chamberlain reads; Shows keen disappointment; Crumbles message; Rises, puts on coat, takes umbrella and hat, and looks out the window,)

LIGHTS: Amber spot out.

CURTAIN: Close red Curtain.

MUSIC: Fades out

LIGHTS: Footlights up as .....

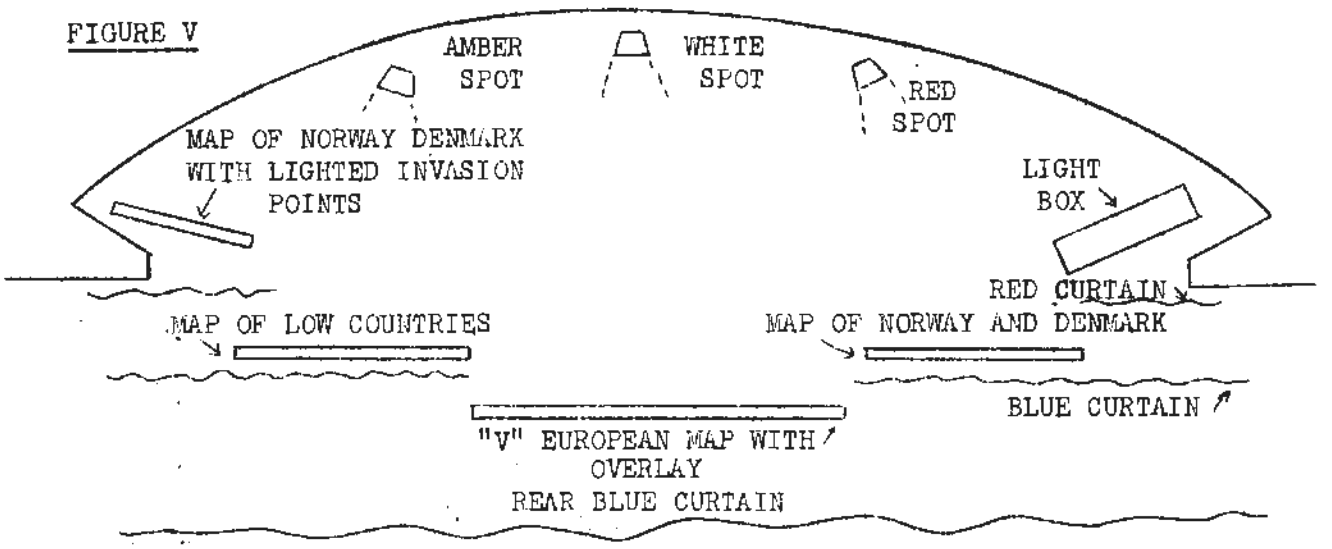
ACTION: Lecturer enter left and gives.

"LECTURE"

SCENE IV

STAGE DIRECTIONS: Hang picture of Uncle Sam on Norwegian backdrop, and raise. Reverse English backdrop to show Map of Low Countries. Right, Map (Norway) is brought flush with Blue curtain. Remove all other props.

FIGURE V



CURTAIN: When maps are set, open blue curtain just wide enough to show Map of Europe. Open red curtain slowly to show all three maps.

LIGHTS: Put on overhead lights.

ACTION: Lecturer exits right.

LIGHTS: (Put on white center spot on Map of Europe)
Switch on Blue "V" on Map of Europe.

OFF STAGE VOICE:

"In Europe the lights have been going out one by one. Death and destruction have ridden the fringe of the dark cloud that has swept across the sky from Norway to France. Continual blackness, like an Artic night, has enveloped lands, where a short time ago the bright light of freedom shone on free men. Through the gloom one small light still glimmers. Dimmed, perhaps through lack of attention, it remains as a pilot light by which the other lights in Europe may some day be rekindled. Should it be allowed to fade completely, throwing all Europe into total darkness? Or should it be brightened by the only nation in the world with the power to do it and the desire to see that the light of freedom still burns. Is America to play a role whose influence will be felt down through the ages? If so, what should that role be? "What do you think?

LIGHTS: Cues for blackout.

"In Europe the lights.....KILL OVERHEAD LIGHTS

"Death and destruction....KILL TWO BANKS OF FOOTS

"Continual blackness.....KILL REMAINING FOOTLIGHTS

"Through the gloom.....KILL SPOT ON MAP (Theater should be blacked out by now)

CURTAINS: Close blue curtain on -- "THROWING ALL EUROPE INTO.."

STAGE DIRECTIONS: Lower figure of Uncle Sam on "IS AMERICA TO PLAY."

LIGHTS: Center spot up on "WHAT DO YOU THINK?"

MUSIC: "Stars and Stripes Forever" up full on "WHAT DO YOU THINK" hold for five seconds and fade as...

CURTAIN: Red Curtain closes.

LIGHTS: House lights up.

MUSIC: March music up while troops file out.

F I N I S

Course: Military Courtesy II and III (M2 and M3)

Time : Two Hours Total. One Hour (M2), One Hour (M3)

Objective and Scope: To develop in the individual soldier an appreciation of military courtesy and discipline by means of lecture, film and demonstration.

Training Aids: (M2)

A. Training Film

1. TF 11-157, "Military Courtesy and Customs of the Service" - Running time: 26 minutes

B. Equipment for Demonstration I: "Reporting to the Company Commander"

1. Two tables (folding)
2. Two chairs
3. Two signs
   a. "Company Commander"
   b. "First Sergeant"

Training Aids: (M3)

A. Equipment for Demonstration III: "Pay Table"

1. Two tables (folding)
2. Two chairs
3. Two blankets
4. Revolver
5. Pistol belt and pistol for Guard
6. Stage money

B. Equipment for Demonstration IV: "Courtesies extended armed and unarmed"

1. Rifle and cartridge belt
2. Pistol and pistol belt

C. Equipment for Demonstration V: "Mess Hall - Work Detail - Athletic Activity"

1. Mess table
2. Pick, shovel, or rake
3. Soft-ball

Marginal notes show running time of lecture, page and paragraph references to source material.

September 23, 1942 - This supersedes all previous outlines.

I. Outline of Military Courtesy II (M2)

0:00 A. Introduction to Military Courtesy

1. Courtesies of civilian life are carried over to Army life.

a. Army courtesy is similar to and an extension of civilian courtesy.
(1) Saluting
(2) Other courtesies, such as calling attention upon the approach of an officer

2. Reasons for military courtesy

a. Development of discipline as a step toward obedience to orders
b. To instill a spirit of cooperation and teamwork

0:04 B. TF 11-157, "Military Courtesy and Customs of the Service"

0:30 (5 minutes for movement to demonstration area)

0:35 C. Demonstration I: "Reporting to the Company Commander"

FM 21-50, p. 16, par. 9j

1. Procedure: This demonstration portrays an Orderly Room. The Company Commander and the First Sergeant are at their desks. After a short period of instruction by an officer or noncommissioned officer several men will be selected to report to the Company Commander.

0:55 (5 minutes for recess or movement to next demonstration)

II. Outline of Military Courtesy III (M3)

The following demonstrations will be arranged in a "Country Fair" fashion and placed at various points in the company area. Companies will be divided into four platoons and each platoon will be assigned to an individual demonstration. At the end of every 11 minute period a designated noncommissioned officer will blow a whistle and each platoon will move to the next demonstration. Process will be repeated until all platoons have seen each demonstration. Demonstrations should be arranged so that the platoons will move in a clockwise direction from one demonstration to the next.

0:00 A. Demonstration II; "Proper and Improper Dress of Soldier"

1. Procedure: This demonstration should emphasize proper and improper dress for enlisted men in fatigue, duty and dress uniform. It is suggested that two men be employed for each class of dress; one to be improperly dressed and the other properly attired. A noncommissioned officer will point out discrepancies and emphasize proper attire.

0:11 (2 minutes for movement to next demonstration)

0:13 B. Demonstration III; "Pay Table"

1. Procedure: In this demonstration a typical pay day scene will be enacted. A noncommissioned officer will explain the proper procedure after which several men will be selected to report to the pay table. Corrections will be made as each reports.

0:24 (2 minutes for movement to next demonstration)

0:26 C. Demonstration IV: "Courtesies extended when armed and when unarmed"

1. Procedure: Portray by a short talk and by example saluting when armed and when unarmed. Emphasize an individual soldier's action when in formation and when on Guard Duty.

0:37 (2 minutes for movement to next demonstration)

0:39 D. Demonstration V: "Mess Hall - Work Detail - Athletic Activity"

FM 21-50, p. 24, par. 10c-10e

1. Procedure: Demonstrate by short talk and by example the courtesies to be extended when a soldier is approached by an officer when the soldier is on a work detail, when eating, or when engaged in athletic activities.

0:50 (10 minutes for recess or movement between instruction areas)

BIBLIOGRAPHY

1. FM 21-50, Military Courtesy and Discipline, January, 1941
2. The Officer's Guide, 5th Edition, The Military Service Publishing Company, Harrisburg, Pa., 1941

PERTINENT FILMS

1. TF 11-157, "Military Courtesy and Customs of the Service", 1941, 26 minutes

Course: Ammunition I & II (T2 & T3)

Time: Four Hours Total - Two Hours (T2), Two Hours (T3)

Objective and Scope: To instruct the trainee in the simple nomenclature, classification, functioning, and proper handling of Ammunition.

Training Aids (T2)

A. Charts

	File No.
1. Low and High Explosives	T2.14
2. Complete round of Artillery Ammunition	T2.2
3. Separate Loading Ammunition	T2.9
4. Fuzes	T2.17
5. Small Arms Ammunition	T2.4

B. Training Films

1. TF 1-222, "Small Arms Ammunition - Caliber .50, .30, and .45 Cartridge," 9 minutes
2. TF 1-221, "Small Arms Handling and Storage," 11 minutes

C. Ammunition (Dummy)

1. 1 Round (ea.) of 75mm Ammunition and 37mm Ammunition
2. 1 Round (ea.) of Cal. .45 Ball and Cal. .50 Ball.
3. 1 Round Cal. .30 A.P.

D. Miscellaneous

1. 1 Box (ea.) for Cal. .30 Ball and Cal. .45 Ball
2. 1 Box (ea.) for Cal. .50 Tracer and Cal. .50 A.P.
3. 3-Cloverleaf Type for Artillery Ammunition

Training Aids (T3)

A. Charts

	File No.
1. Fragmentation Hand Grenade	T2.10
2. Trench Mortar Ammunition	T2.11
3. Bombs	T2.12

B. Training Films

1. TF 1-256, "Aerial Bombs - Methods of Loading Bombs," 18 minutes
2. TF 5-147, "The Antitank Mine M-1," 4 minutes - show only first part

C. Ammunition (Dummy)

1. 1 (ea.) Bomb, demolition, M30 with Nose Fuze, M103 & Tail Fuze, M106
2. 1 (ea.) Grenade, Hand, (Fragmentation)
3. 1 (ea.) 60 and 81mm Mortar Shell

Marginal notes show running time of lecture, page and paragraph references to source material.

September 23, 1942 - This supersedes all previous outlines.

I. Outline of Ammunition (T2)

0:00 A. Definition and Classification of Ammunition

OS Ammunition General, p. 4

1. Artillery Ammunition

2. Small Arms Ammunition

3. Hand Grenades

4. Trench Mortar Shells

5. Pyrotechnics

6. Bombs

7. Antitank Mines

0:02 B. Military Explosives (Use Chart T2.14)

OS Ammunition General, pp. 4-23, pars. 1-11

1. Classification of Explosives

a. Rate of burning
(1) Low Explosives - slow burning
(2) High Explosives - fast burning or instantaneous

CS 9-18, Vol. I, pp. 1-17, pars. 1-13

b. Sensitivity to impact or shock
(1) Sensitive
(2) Intermediate
(3) Non-sensitive

2. Individual Military Explosives - classification, sensitivity, use and safety precautions

a. Black Powder
b. Smokeless Powder
c. E.C. Blank Powder
d. Balistite
e. TNT - Tri-nitro-toluene
f. Amatol
g. Explosive "D"
h. Tetryl
i. Mercury fulminate
j. Lead Azide
k. Potassium Chlorate (mixture for Small Arms primer element)

0:20 C. Artillery Ammunition - Ammunition for weapons with a bore diameter of .6 inch or greater

OS 9-20
Vol. I, p. 7,
par. 1

1. Components necessary for complete round (Use Chart T2.2)

   a. Primer
   b. Propelling charge
   c. Container (cartridge case or bags), for propelling charge
   d. Fuze
   e. Booster
   f. Projectile
   g. Additional
      (1) Rotating Band
      (2) Bourrelet
      (3) Boat tail
      (4) Ogive

2. Three forms

TM 9-1900,
p. 64, p. 65
par. 76

   a. Fixed
   b. Semi-fixed
   c. Separate Loading (Use Chart T2.9)

3. Types and colors

OS 9-18,
Vol. III,
pp. 182-194,
par. 125

   a. High explosive shell - yellow
   b. Armor-Piercing Shell - yellow
   c. Armor-Piercing Shot - black
   d. Chemical Shell - Gray body
      (1) Screening agent - one yellow band
      (2) Casualty producing agent
         (a) Non-persistent agent - one green band
         (b) Persistent agent - two green bands
      (3) Harassing agent - one red band
      (4) Incendiary agent - one purple band
   e. Shrapnel - red
   f. Cannister - black
   g. Practice - blue

0:50 (10 minutes for recess or movement between instructor areas)

1:00

4. Fuzes (Use Chart T2.17)

OS 9-20,
Vol. I
p. 45, par. 44

   a. Types
      (1) Assembled in point
         (a) Impact
            1. Instantaneous
            2. Delay
         (b) Time
         (c) Combination
   b. Point detonating fuze, M48

OS 9-20, Vol. I, p. 45, par. 44

(1) Function (stress Interrupter)
(2) Superquick and delay element
(3) Safety features

c. Base detonating fuze, M38

OS 9-20, Vol. I, p. 47, p. 48, par. 14

(1) Function
(2) Safety feature

1:05

5. Care and packing

TM 9-1900, pp. 75 - 76, par. 87

a. Protection against moisture and heat
b. Protection against mechanical damage
c. Packing of fixed, semi-fixed, and separate loading ammunition

1:10

D. Small Arms Ammunition - Ammunition for weapons with a bore diameter of less than .6 in.

TM 9-1900, p. 35, par. 40

1. Components necessary for complete round

a. Cartridge case
b. Primer
c. Propelling charge
d. Bullet
e. (Mention **cannelure,** head, neck, and shoulder)

2. Difference in Calibers - Definition of Caliber (Use Chart T2.4)

TM 9-1990, p. 3, par. 4

a. Caliber .50
b. Caliber .45
c. Caliber .30
d. Caliber .45
e. Subcaliber tubes and adapters for artillery weapons which use ammunition of similar size and type
f. (Mention shotguns of 12 gage and definition of gage)

3. Types (Classification)

TM 9-1990, p. 5, par. 6

a. Ball
b. Armor-piercing
c. Tracer
d. Blank
e. Dummy
f. Gallery practice
g. Guard
h. High-pressure test
i. Incendiary
j. Subcaliber
h. Shotgun shells

4. Grades

TM 9-1990, p. 9, p. 10, par. 13

a. Grades for Caliber .30 and .50
   (1) AC - Aircraft and Antiaircraft machine gun
   (2) R - Rifles and semiautomatic
   (3) MG - Ground machine guns
   (4) 3 - Unserviceable, not to be used

b. The grades for caliber .45
   (1) 1- Revolvers, automatics, pistols, and submachine guns
   (2) 2- Automatic pistol and submachine guns, only
   (3) RT - Not to be used. Requires roll test. (Will be disposed of as directed in OFSB 3-5)
   (4) 3 - Unserviceable, not to be used

1:25 5. TF 1-222, "Small Arms Ammunition - Calibers .50, .30, and .45, Cartridges "

1:34 6. TF 1-221, "Small Arms Handling and Storage". (Shows approved methods of handling and storing small arms ammunition)

1:45 7. Review markings on the boxes

1:50 (10 minute for recess or movement between instruction areas)

II. Outline of Ammunition II (T3)

0:00 A. Grenades

1. Hand Grenade

TM 9-1900, p. 47, pars. 58-60
OS 9-18, Vol 2 p. 113, p. 144 pars. 105-106
ORD. SGT., (August, 1942) p. 200, p. 201

a. Fragmentation grenade (Use Chart T2.10)
   (1) Body
   (2) Fuze assembly
   (3) Bursting charge
   (4) Color - yellow
   (5) Use

b. Offensive grenade
   (1) Body
   (2) Fuze assembly
   (3) Bursting charge
   (4) Color - yellow
   (5) Use

TM 9-1900, p. 47, p. 48, pars. 61-63
OS 9-18, Vol. 2, p. 114, p. 115 pars. 107, 108

c. Chemical grenade
   (1) Gas grenade
      (a) Body
      (b) Fuze assembly
      (c) Burning mixture

ORD. SGT.,
(August 1942)
p. 200, p. 201

(d) Color - gray with one red band (harassing agent)

(2) Smoke grenade

d. Practice grenade

e. Training grenade

d. Packing of hand grenade

2. Grenades (Rifle)

a. H.E. grenade

b. Antitank grenade

c. Cartridge grenade

d. Practice grenade

0:20 B. Trench Mortar Ammunition (Use Chart T2.11)

TM 9-1900
pp. 60-63, pars. 71-75
OS 9-11,
Vol. 2,
pp. 125-142,
pars. 113-120

1. Components for complete round description

2. Description

a. 60-mm

b. 81 mm

c. 3 - inch

3. Classification

a. High explosive shell

b. Chemical shell

(1) Gas

(2) Smoke

c. Practice shell

d. Training shell

4. Packing and marking

0:40 C. Pyrotechnics

TM 9-1900,
pp. 114-119,
pars. 99-110

1. Description

2. Classification

a. Ground

b. Aircraft

3. Composition

4. Flares

a. Reconnaissance flare
b. Night bombing flare
c. Emergency landing flare
d. Airport flare

5. Photoflash Bombs

6. Aircraft signals

7. Drift signal

8. Ground signal

0:50 (10 minutes for recess or movement between instruction areas)

1:00 D. Bombs (Use Chart T2.12)

TM 9-1980, p. 2, par. 4

1. Classification

a. Explosive bombs
(1) Demolition - General purpose (GP)
(2) Fragmentation
(3) Armor-piercing (AP)
(4) Semi-armor-piercing (SAP)
(5) Depth
(6) Practice
b. Chemical bombs
c. Inert bombs
d. Incendiary bombs

2. Demolition bombs

FM 9-1980, p. 2, p. 3, par. 4

a. Weights
b. Color

3. Fragmentation bombs

TM 9-1980, pp. 72-83, pars. 63-72

a. Weights
b. Color - Olive Drab

4. Fragmentation bomb clusters

5. Chemical bombs

TM 9-1980, pp. 84-95, pars. 73-81

a. Weights
b. Color - Gray body (Color bands vary as to type agent used)

6. Brief description of the following :

a. Incendiary bombs
b. Armor-piercing and semi-armor-piercing bombs
c. Depth bombs
d. Practice bombs
e. Drill bombs

TM 9-1980, p. 7, p.8, par. 12

7. Fuzes

a. Types
b. Arming
c. Safe dropping

1:22

8. TF 1-256,"Aerial Bombs - Methods of Loading Bombs"

1:40

E. Antitank Mines

1. TF 5-14, "The Antitank Mine M-1", (Show only 4 minutes)

TM 9-1900, pp. 51-55, pars. 65-70

2. Review of Antitank Mine

1:50

(10 minutes for recess or movement between instruction areas)

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1. TM 9-1900, Ammunition, General, September 8, 1941
2. TM 9-1980, Bombs for Aircraft, June 3, 1942
3. TM 9-1990, Small Arms Ammunition, May 23, 1942
4. OS (No number) Ammunition, General, October, 1940
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7. Hayes, T. J., Elements of Ordnance, John Wiley & Sons, Inc., New York, 1942
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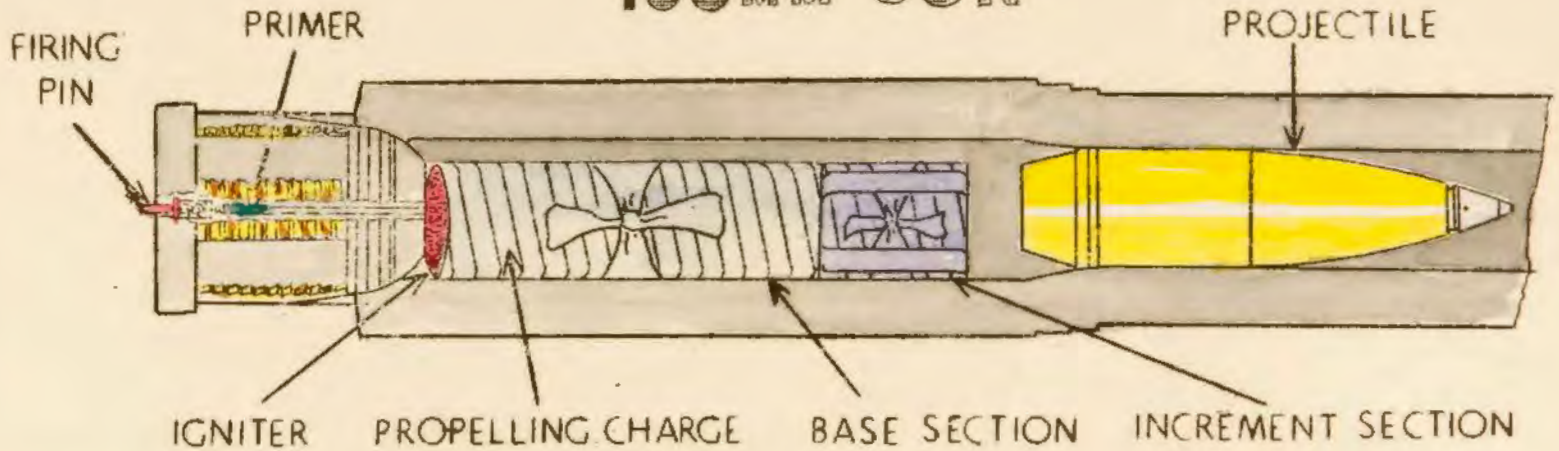
PERTINENT FILMS

1. TF 1-222, "Small Arms Ammunition, Calibers .50, .30, and .45 Cartridge," 1941, 9 minutes
2. TF 1-221, "Small Arms Handling and Storage," 1941, 11 minutes
3. TF 5-147, "The Antitank Mine M-1", 1941, 9 minutes
4. TF 1-256, "Aerial Bombs, Methods of Loading Bombs", 1941, 18 minutes

MINIATURE REPRODUCTION OF BASIC CHART EXECUTED BY SILK SCREEN PROCESS

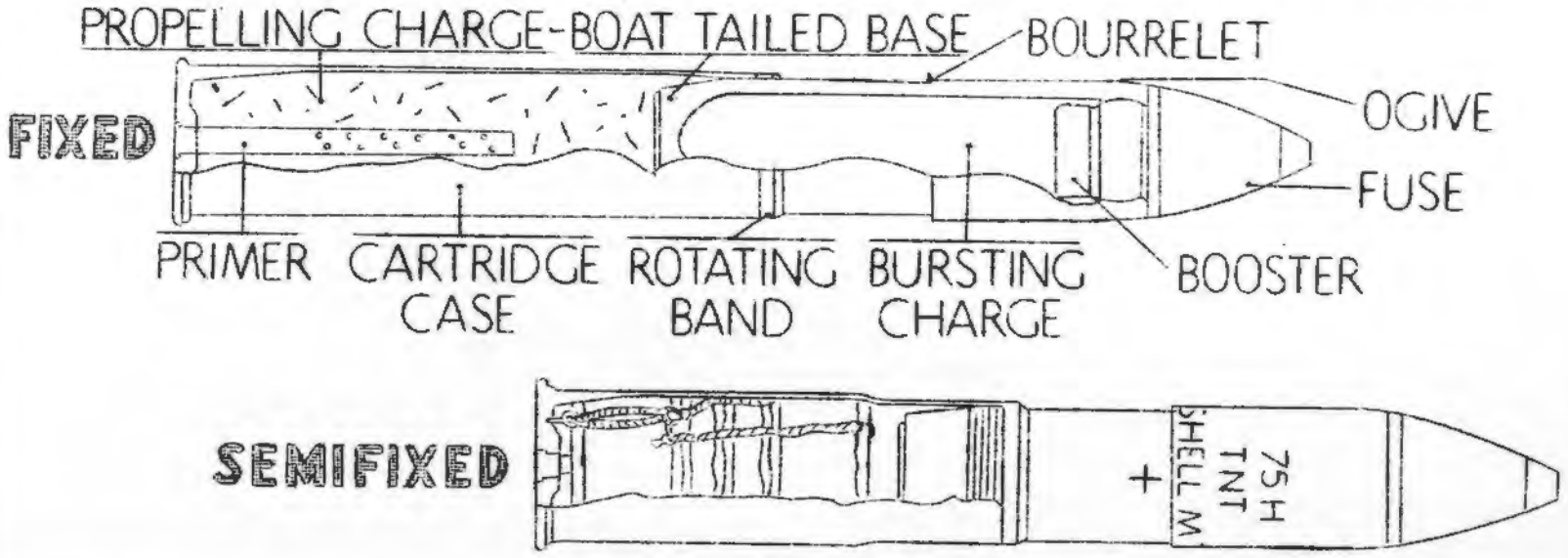


SEPARATE LOADING AMMUNITION
155MM GUN



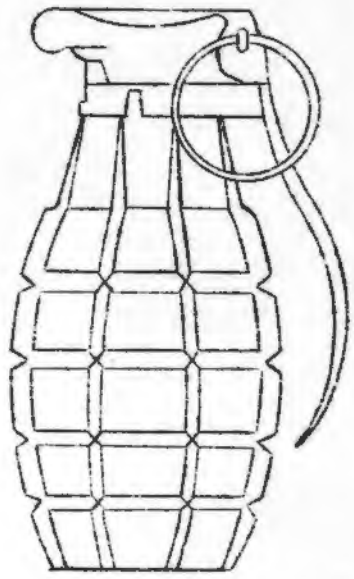
T2.9 TRAINING DEPARTMENT, O.R.T.C.
ABERDEEN PROVING GROUND, MD.

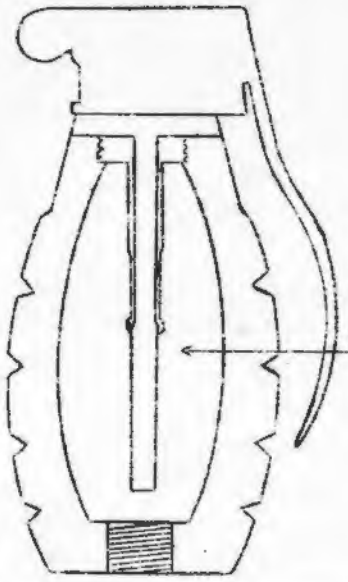
COMPLETE ROUND OF ARTILLERY AMMUNITION

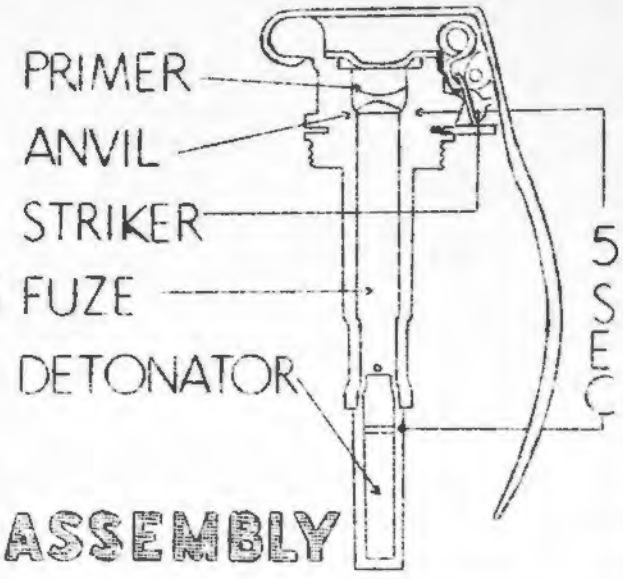


T2.2 TRAINING DEPARTMENT, O.R.T.C.
ABERDEEN PROVING GROUND, MD.

FRAGMENTATION HAND GRENADE



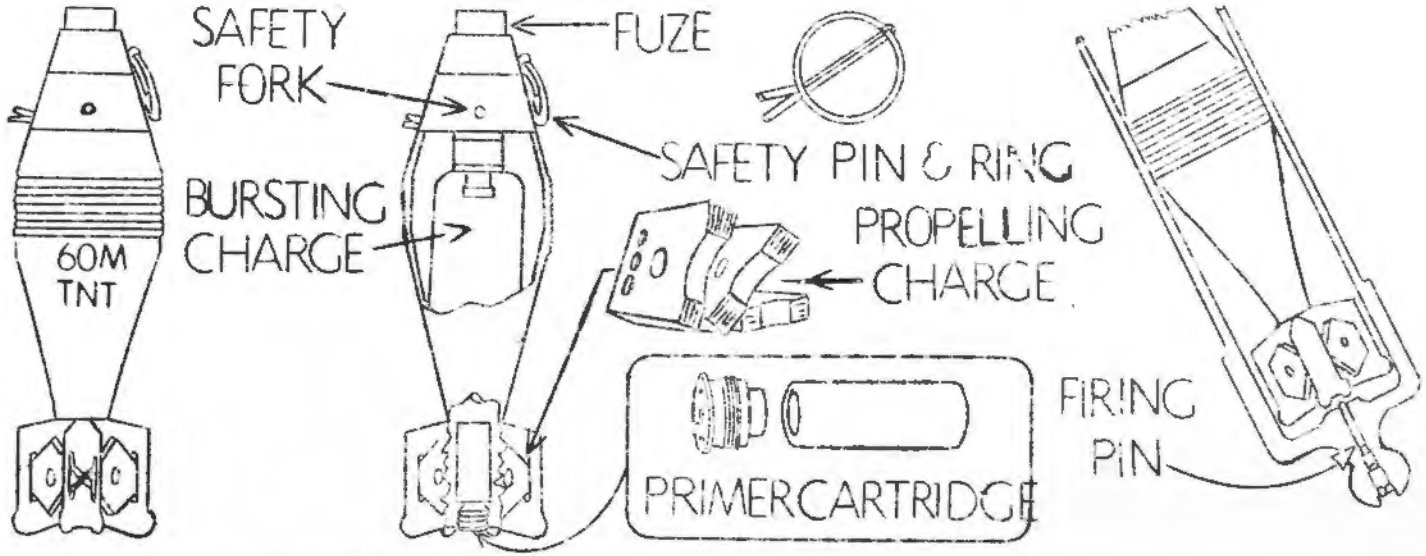




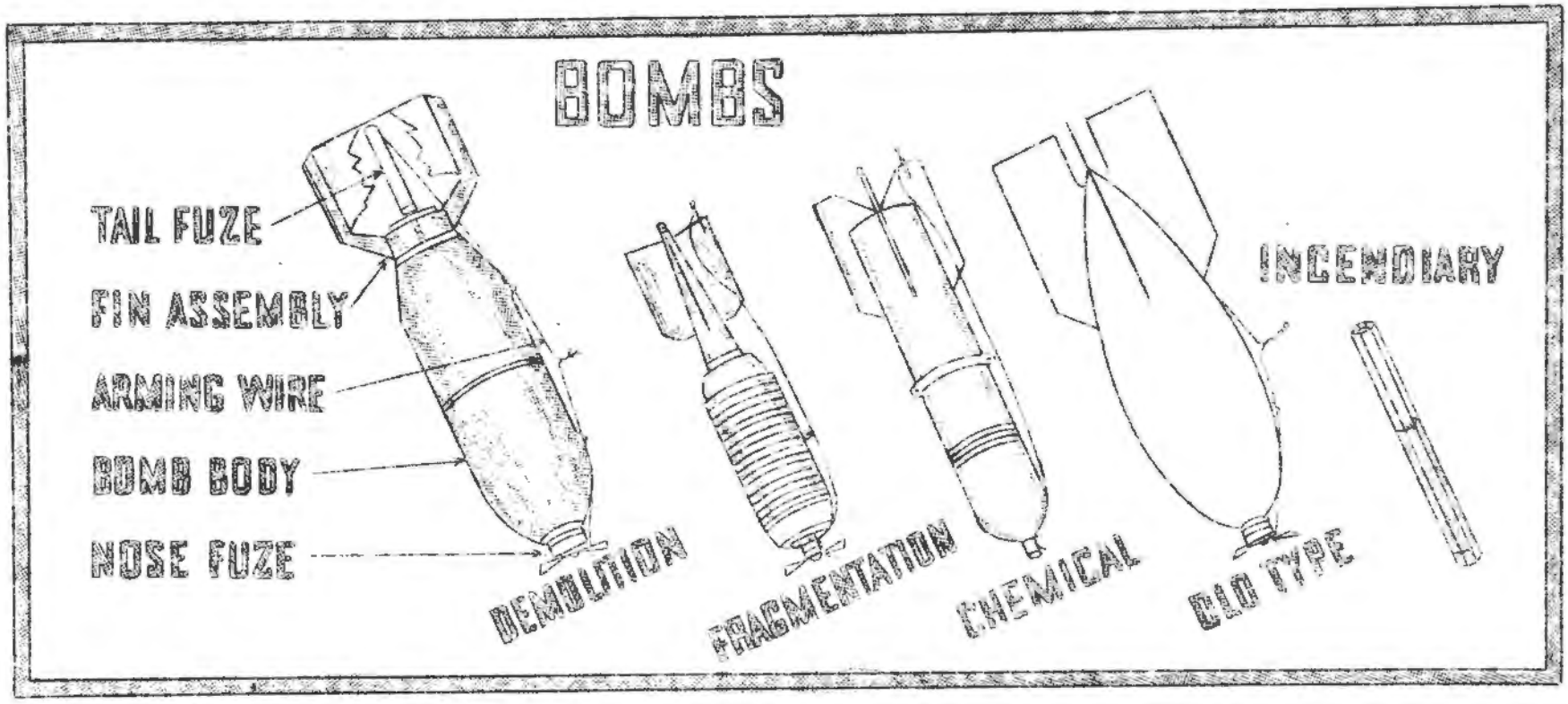
FUZE ASSEMBLY

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60 MM TRENCH MORTAR AMMUNITION



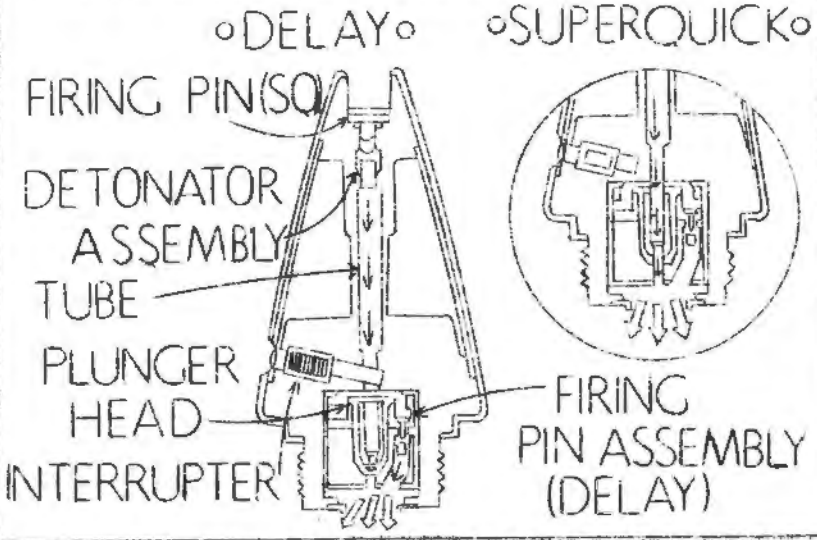
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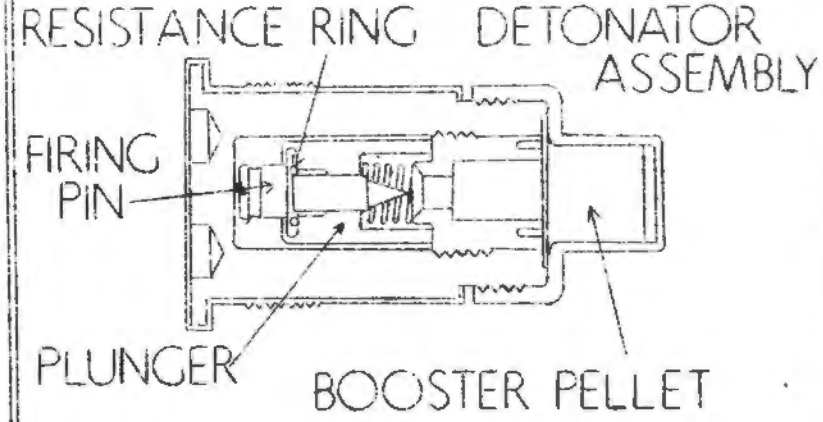
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FUZES

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C O M P R E H E N S I V E E X A M I N A T I O N NO. 5

Q U E S T I O N B O O K

First, print your Name, Company, and Battalion on the blanks provided on the answer sheet. Do not turn this page until you are told to do so. After you have been told to begin, read each question carefully and circle one of the possible four choices on the answer sheet.

Do not write in this book!

For example: In the following question the correct answer is "D".

O. The Ordnance Replacement Training Center trains:
A. Men for the Engineers Corps.
B. Men for the Coast Artillery.
C. Infantry Troops.
D. Men for the Ordnance Department.

On your answer sheet you would find question No. O - and circle "D" as shown below.

O. A B C (D)

You will be allowed forty-five minutes for this examination. After 4 weeks of training the average trainee can score 60 per cent on this examination.

1. When a man suffers from heat exhaustion:
   A. His face is flushed and very hot.
   B. His body temperature must be reduced by applying cold water.
   C. His pulse is rapid and very strong.
   D. He should be given a drink of water in which a small amount of salt has been dissolved.

2. The insignia in FIG. 1 represents:
   A. Services of supply.
   B. Chemical warfare service.
   C. Judge Advocate General's Dept.
   D. Quartermaster Corps.



FIG. 1

3. The insignia in FIG. 2 denotes:
   A. Finance Dept.
   B. Inspector General's Dept.
   C. Judge Advocate General's Dept.
   D. Adjutant General's Dept.

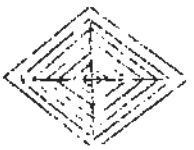


FIG. 2

4. At the command "Close Ranks, MARCH," The Second Rank:
   A. Stands fast.
   B. Takes three steps forward.
   C. Takes one step forward.
   D. Takes two steps forward.

5. In which one of the following situations is a soldier <u>not</u> guilty of desertion (for which the penalty may be death):
   A. He goes AWOL during a battle in which his organization is engaged with the intent to return after the battle is over.
   B. He goes AWOL with the intent of joining another branch of the army under an assumed name.
   C. He goes AWOL with the intent of not returning because he honestly believes the draft board made a mistake in selecting him.
   D. He goes to jail under a one year sentence by a civil court for a crime he committed while he was AWOL.

6. A private is accompanying an N.C.O., who is driving a goverment vehicle. When the vehicle passes an officer
   A. The N. C. O. will salute for himself and the private.
   B. Only the private will salute.
   C. Both men will salute.
   D. Neither of the men will salute.

7. "Contact Parties" will:
   A. Contact the enemy and report findings to the Commanding General.
   B. Maintain contact between troops when signal communication is impractical.
   C. Contact civilian producers to formulate war contracts.
   D. Operate out of the Maintenance Office of the Division Ordnance Section, keeping contact with the fighting troops and rendering maintenance service.

8. If a vehicle is going 25 miles per hour in convoy, the minimum distance between itself and the vehicle ahead is:
   A. 50 yards.
   B. 50 feet.
   C. 25 yards.
   D. 75 yards.

9. General orders apply:
   A. To all soldiers in all armies.
   B. To all soldiers on guard duty in the army of the United States - wherever located.
   C. To all army posts except exempted stations.
   D. To soldiers guarding general headquarters.

10. Against which one of the following will an individual prone shelter or slit trench not protect you:
   A. Bomb fragments
   B. Shell fragments
   C. Tanks
   D. Small arms fire

11. The sergeant in Fig. 3 is signalling his men to
   A. Assemble
   B. Move forward
   C. Commence firing
   D. Halt

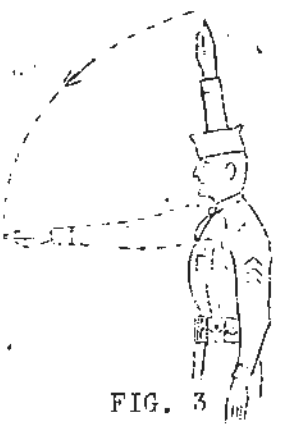


FIG. 3

12. The suspension system in Fig. 4 is for which one of the following U. S. vehicles:
   A. Medium Tank
   B. Light Tank
   C. Heavy Tank
   D. Half track

FIG. 4



13. In order to "clear the facepiece" of his gas mask, a soldier should:
   A. Close the outlet valve and exhale vigorously.
   B. Pinch the hose and exhale vigorously.
   C. Apply anti-dim to the eyepiece.
   D. Remove the faceform from the facepiece.

14. On a burning magnesium bomb, the best procedure ordinarily is to use:
   A. A jet of water
   B. A carbon dioxide fire extinguisher
   C. A spray of water
   D. Carbon tetrachloride fire extinguisher

15. When it is necessary for troops to move across an open field in a camouflaged area they should:
   A. Scatter across the field to avoid making paths.
   B. Crawl over the ground, staying close together.
   C. March across the field in single file.
   D. Form columns of three and double time across the field.

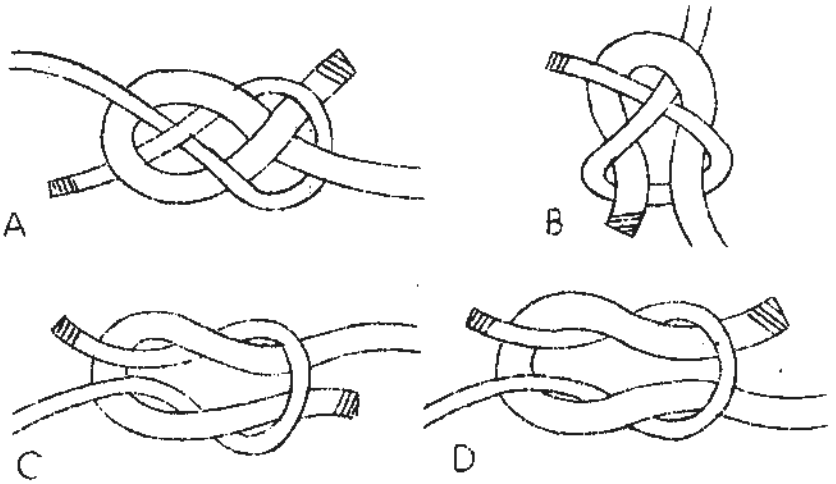


FIG. 5

16. Which of the knots in FIG. 5 would be used to join two ropes of unequal diameter, A, B, C, or D.

17. The fracture in Fig. 6
   A. Is a simple fracture because there is one break.
   B. Should be set immediately by the first aider.
   C. Is a compound fracture.
   D. Should never be splinted.



FIG. 6

18. The airplane in Fig. 7 is
   A. A sweptback, round-tipped, mid-wing monoplane.
   B. A slightly dihedral, tapered, low-wing monoplane.
   C. A Gull wing, raked tip, sweptback monoplane.
   D. An elliptical-tipped parasol type with radial engine.

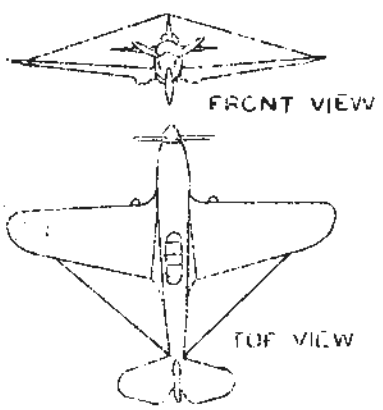


FIG. 7

19. At the command "Backward, MARCH", a soldier:
   A. Marches backward, taking 15 inch steps beginning with the left foot.
   B. Takes a 12 inch step to the rear with the left foot and brings the right foot alongside.
   C. Takes 12 inch steps to the rear beginning with the left foot.
   D. Takes 18 inch steps to the rear beginning with the left foot.

20. You are firing the U. S. Rifle, caliber .30, M1903 at a target 300 yards distant, and your shots are striking one foot to the right of the bull. You should adjust your rear sight:
   A. One point to the left.
   B. One point to the right.
   C. Two points to the left.
   D. Two points to the right.

21. A sentinel may be sentenced to die for:
   A. Quitting his post without being properly relieved.
   B. Failing to give the alarm in case of fire:
   C. Failing to report a call from a post more distant from the guardhouse than his own.
   D. Allowing a person to pass during challenging hours without proper authority.

22. The primary purpose of anti-tank mines is to:
   A. Completely destroy the tank.
   B. Kill the occupants of the tank.
   C. Bury the tank in the crater formed by the mines explosion.
   D. Smash the tracks or bogie wheels of the tank.

23. The Division in the Ordnance Department that has the duty of storing, issuing, maintaining, and inspecting ordnance materiel is the:
   A. Field Service Division.
   B. Military Training Division.
   C. Technical Division.
   D. Industrial Division.

24. When indoors a soldier salutes:
   A. On passing an officer in the hallway.
   B. When reporting to an officer.
   C. When inspected by an officer in the barracks.
   D. When spoken to by an officer.

25. If a woodtick gets on your skin and you cannot quickly get to a doctor you should be sure to:
   A. Keep the tick in place with a bandage until you can see a doctor.
   B. Apply calamine lotion to the affected area.
   C. Remove the entire tick, unbroken, from the skin.
   D. Take a hot bath using G. I. soap and water.

26. The location of the left hand in the position of "Port Arms" is:
A. Opposite the left shoulder.
B. 3 inches to the front of the belt buckle.
C. At the small of the stock of the rifle.
D. About 3 inches below the chin.

27. The Commander-in-Chief of the Army of the United States is:
A. General George C. Marshall.
B. President Roosevelt.
C. General Douglas MacArthur.
D. Admiral William D. Leahy.

28. Ammunition supply points are manned and operated by:
A. Personnel of the Division Ordnance Section.
B. Personnel of the Infantry Regiment using the supply point.
C. Special troops assigned by G.H.Q.
D. A section sent out from an ammunition company.

29. Which one of the features on Fig. 8 will show up lightest on an aerial photograph, a, b, c, or d?

30. Activity in an area will be revealed to the enemy chiefly by:
A. Dark shadows in the area.
B. A change in the appearance of the area that will be shown by an aerial photograph.
C. Important landmarks.
D. Birds flying around the area.

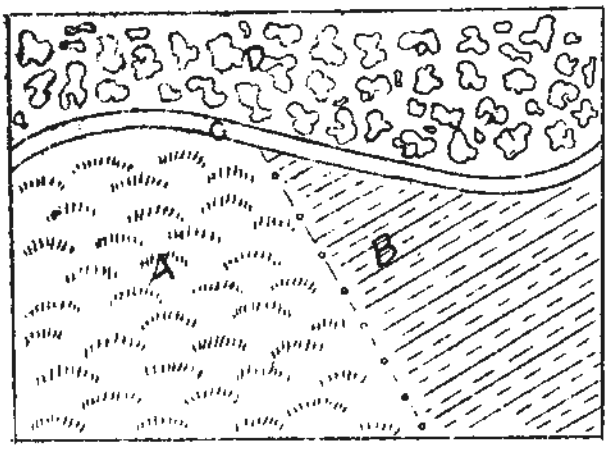


FIG. 8

31. Which one of the following groups is not part of the Army of the U.S.:
A. Selective Service Men.
B. National Guard.
C. Coast Guard.
D. Organized Reserves.

32. Major General Harris is;
A. Commanding General of the Aberdeen Proving Ground.
B. Chief of the Military Training Division.
C. Commanding General of the Ordnance Replacement Training Center.
D. Commandant of the Ordnance School.

33. If you had been exposed to a lung irritant, the next thing you should do after adjusting your mask is to:
A. Breathe deeply.
B. Exercise violently.
C. Lie down and rest quietly.
D. Walk to the field hospital.

34. You are standing at attention. The corporal gives the preparatory command, "Forward". You should:
A. Start marching.
B. Stand perfectly still.
C. Shift the weight of the body to the right leg without making any noticeable movement.
D. Lean forward on the right leg so that you will be able to lift the left leg easily and promptly.

35. In the cleaning of the U. S. Rifle, Cal. .30, M1903, which of the following statements is false?
A. The bore of the rifle will be protected with a thin film of oil issued for the purpose.
B. The following parts may be removed: front sight cover, floor plate and follower, gun sling, and bolt.
C. After firing, the bore and chamber must be cleaned thoroughly not later than the evening of the day of firing, and then each day for the next succeeding 3 days.
D. To avoid possible injury, the cleaning rod will be inserted in the muzzle end of the bore.

36. The six ammunition companies in the Ordnance Ammunition Battalion will:
A. Establish one or two large ammunition depots in the communication zone.
B. Establish and man ammunition depots and supply points throughout the combat zone.
C. Operate ammunition depots back in the Army Service Area from which regimental ammunition trains will draw ammunition for the regiment.
D. Keep close contact with the Division to which they are assigned so that they can properly perform their mission.

37. The distance between opened ranks is:
A. 40 inches.
B. 60 inches.
C. 70 inches.
D. 80 inches.

38. The three papers you must have with you whenever you drive an Army truck or other government vehicle are:
A. Trip ticket, memorandum receipt, accident report blank.
B. Certificate of vehicle safety, Government driver's license, accident report blank.
C. Government driver's license, trip ticket, certificate of vehicle safety.
D. Accident report blank, Government driver's license, trip ticket.

39. To balance the 10-lb. weight in Fig. 9, the end of the rope must be pulled downward with a force of:
A. 2 lbs.
B. 3 1/3 lbs.
C. 5 lbs.
D. 10 lbs.

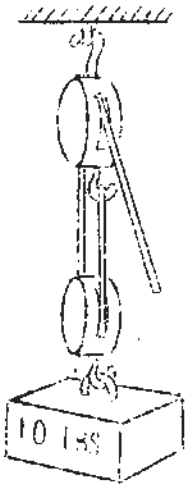


Fig. 9

40. Which of the following arms and services is not part of the Army Ground Forces?
A. Coast Artillery.
B. Corps of Engineers.
C. Cavalry.
D. Field Artillery.

41. The insignia in Fig. 10 is worn by a:
A. Warrant Officer.
B. Technician, Third Grade.
C. Master Sergeant.
D. Technical Sergeant.


Fig. 10

42. Hand grenades are effective at short ranges:
A. Against the turret of a tank.
B. Against the bogie wheels and under the belly of a tank.
C. Against the hull of a tank.
D. Against the sponson.

43. Which of the following items is not Ordnance Materiel?
A. Small arms ammunition.
B. Scout cars.
C. Gas Masks.
D. Personnel carriers.

44. Contour lines are lines which:
A. Run North and South on the map.
B. Show the deviation between True and Magnetic North.
C. Show the elevation of points on the map.
D. Help us find points on the map by the use of grid readings.

45. The tour of duty on ordinary week days of members of the Interior Guard is:
A. 2 hours.
B. 3 hours.
C. 12 hours.
D. 24 hours.

46. When the command "Test for Gas" is given, the soldier should:
   A. Take a deep breath and exhale a portion, stoop down, being careful not to touch the ground except with the soles of his shoes, break the seal of the mask and take a sniff of air.
   B. Stoop down, steadying himself by placing his right hand on the ground and take a sniff of air.
   C. Rise on his toes, break the seal of his mask and take a sniff of air.
   D. Pinch together the walls of the hose near the canister and inhale to see whether the facepiece will collapse against the face.

47. A clove hitch is:
   A. A knot that is partially cut.
   B. A bow knot shaped like a four-leaf clover.
   C. A hitch used to sling barrels or hogsheads.
   D. A knot used to fasten a rope at right angles to a spar.

48. In order to detect a camouflaged position the enemy will depend primarily upon:
   A. Balloon observation.
   B. Secret agents.
   C. Direct observation.
   D. Aerial photography.

49. The first European Country to lose its independence when Hitler started adding territory to the German Empire was:
   A. Austria.
   B. Czechoslovakia.
   C. Poland
   D. Holland.

50. After aligning the sights of his weapon, a soldier should control his breathing before firing by:
   A. Concentrating on trigger squeeze and forgetting about his breathing.
   B. Taking a deep breath and closing the lungs by tightening the throat muscles.
   C. Breathing naturally to prevent nervousness.
   D. Taking a deep breath, exhaling part of it, and holding the rest by tightening the throat muscles.

51. If a riot breaks out on Post No. 15, the sentinel should call:
   A. "Corporal of the Guard, No. 15".
   B. "The Guard, No. 15".
   C. "Corporal of the Guard, No. 15, Riot".
   D. "Riot, No. 15".

52. When a soldier does not admit responsibility for government property he has damaged through his own negligence, he may be required to pay for the damaged property on:
A. A Report of Survey.
B. An I. & I. Report.
C. A Statement of Charges.
D. An Over, Short and Damaged Report.

53. The symbol in Fig. 11 represents:
A. A plowed field.
B. A railroad.
C. A forest.
D. A marshland.

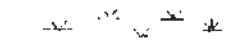


Fig. 11

54. Which one of the following should a prisoner <u>not</u> tell about himself:
A. Name.
B. Rank
C. Serial Number.
D. Branch of service

55. In case of a Call to Arms while he is walking Post No. 15, a sentinel:
A. Goes immediately to his barracks.
B. Goes immediately to the Guardhouse.
C. Calls "Call to Arms, No. 15".
D. Begins challenging all persons who come on or near his post.

56. In choosing a good bivouac area we look for:
A. A secluded spot, far from good roads or other transportation facilities which could be used by the enemy.
B. Open fields providing unobstructed views in all directions.
C. An area with few natural obstacles, so that we can make a quick get-away if necessary.
D. A thickly wooded area with many natural obstacles that can be supplemented by artificial barriers, near existing roads.

57. The color black on a colored map represents:
A. Contour lines.
B. Man-made objects.
C. Natural growth
D. Marshland.

58. The sights of your U. S. Rifle, Cal. .30, M1903 are set at 200 yards and you are firing at the "A" target at 200 yards in the prone position. Your shots are consistently hitting 6 inches below the center of the bull's eye. To make the succeeding shots hit the center of the bull's eye, the sight should read;
A. 150 yards.
B. 350 yards.
C. 400 yards.
D. 425 yards.

59. The longest safe period a tourniquet should be kept tightly in place before loosening is:
A. Until a doctor has been located.
B. Ten minutes
C. Two hours.
D. Twenty minutes.

60. Natural materials are preferable to artificial materials for camouflage because:
A. Burlap is no longer available for military use.
B. The colors and texture will match those in the area we occupy.
C. Natural materials will not have to be changed often.
D. Those materials are always found in abundance.

61. Triangulation is a term used to describe:
A. The March, 1942, reorganization of the Army.
B. A preliminary sighting exercises used in small-arms instruction.
C. Communication between command echelons of the triangular division.
D. A method of determining north on a map from two known points.

62. At the outset of the Russo-German War, the most important drive the Germans made was the one:
A. Toward Moscow.
B. Toward Leningrad.
C. In the South of Russia.
D. Toward Murmansk.

63. In September, 1940, President Roosevelt exchanged 50 U. S. destroyers with Britian for:
A. The right to quarter American Troops in Iceland.
B. Several British islands in the Carribean.
C. An equal number of tankers.
D. A string of naval bases in the Atlantic.

64. Which one of the following is not a duty of a gas sentry:
A. Detect the presence of chemical agents.
B. Pass on all gas alarms that he may hear.
C. Regulate entrance to and exit from a protective shelter.
D. Locate the position of sleeping men in his area.

65. When outdoors saluting distance is ordinarily:
A. 4 to 40 paces.
B. 15 paces.
C. Whenever it seems most convenient.
D. 6 to 30 paces.

66. Were it not for the effects of gravity, gyrodynamic force, and air resistance, a bullet would:
A. Tumble.
B. Go in a straight line.
C. Curve to the side.
D. Drop sharply.

67. A platoon is marching to the left oblique when the command "Forward March" is given. "March" is given:
A. As the left foot strikes the ground.
B. As the right foot strikes the ground.
C. As either foot strikes the ground since it makes no difference.
D. The next time the left foot strikes the ground after "Forward" is given on the right foot.

68. The symbol in Fig. 12 is for:
A. A cemetery.
B. A church.
C. A hospital
D. A schoolhouse.



FIG. 12

69. When driving a government vehicle, the driver is <u>not</u> responsible for:
A. Proper lubrication.
B. Tools and equipment.
C. Missing or loose parts.
D. Detailed mechanical repairs.

70. When on the march, you should drink water in the following manner:
A. Sparingly.
B. Two quarts daily.
C. Only after meals.
D. At least one gallon a day.

71. When you are sighting the 1903 rifle, the bull's eye should be aligned with the front sight so that:
A. The lower half of the bull is covered.
B. The center of the bull's eye is in line with the top of the front sight.
C. The bull's eye "floats" slightly to the left of the front sight to allow for drift.
D. The bull's eye is centered on top of the front sight, which just touches it at 6 o'clock.

72. The smallest unit that composes an independent fighting team is the:
A. Platoon
B. Battalion.
C. Division.
D. Corps.

73. In the event of mechanized attack Ordnance troops should:
A. Go out and beat off the attack with the use of all weapons at hand.
B. Give the alarm to higher Headquarters and wait for help.
C. Organize a rear guard to use whatever barriers are available plus defensive fire for delaying the attack, meanwhile moving the company out to a new area.
D. Camouflage the establishment so it cannot be seen and destroy everything if discovered.

74. When carrying an injured person on a stretcher, the bearers should:
   A. Walk in step.
   B. Run to reach a field dressing station as soon as possible.
   C. Walk out of step
   D. Keep the litter tilted so that the foot will be higher than the head.

75. The caliber of a weapon refers to:
   A. The distance between opposite grooves in the weapon.
   B. The largest diameter of the projectile used in the weapon.
   C. The distance between opposite lands in the weapon.
   D. The length of the projectile used in the weapon.

Have you answered all the questions? Remember, it is better to take an intelligent guess than it is to leave a question unanswered.

After you have finished this examination, keep your seat, and remain quiet.

_____, _____, _____, _____
(Last Name) (Initials) (Company) (Battalion)

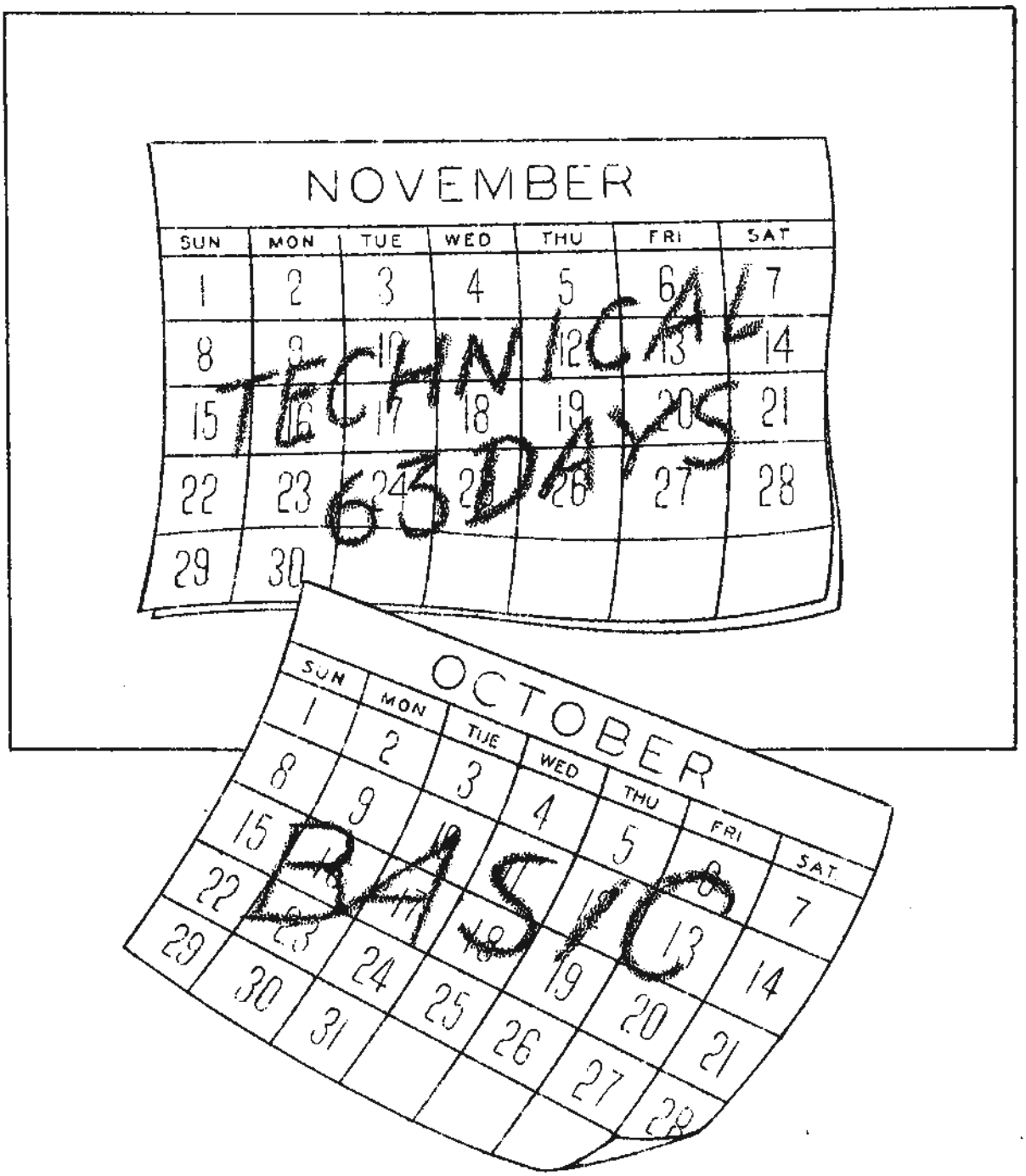
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ORDNANCE REPLACEMENT TRAINING CENTER
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COMPREHENSIVE EXAMINATION No. 5

ANSWER SHEET

Directions: Circle your answer on this sheet; do not write in the question book.

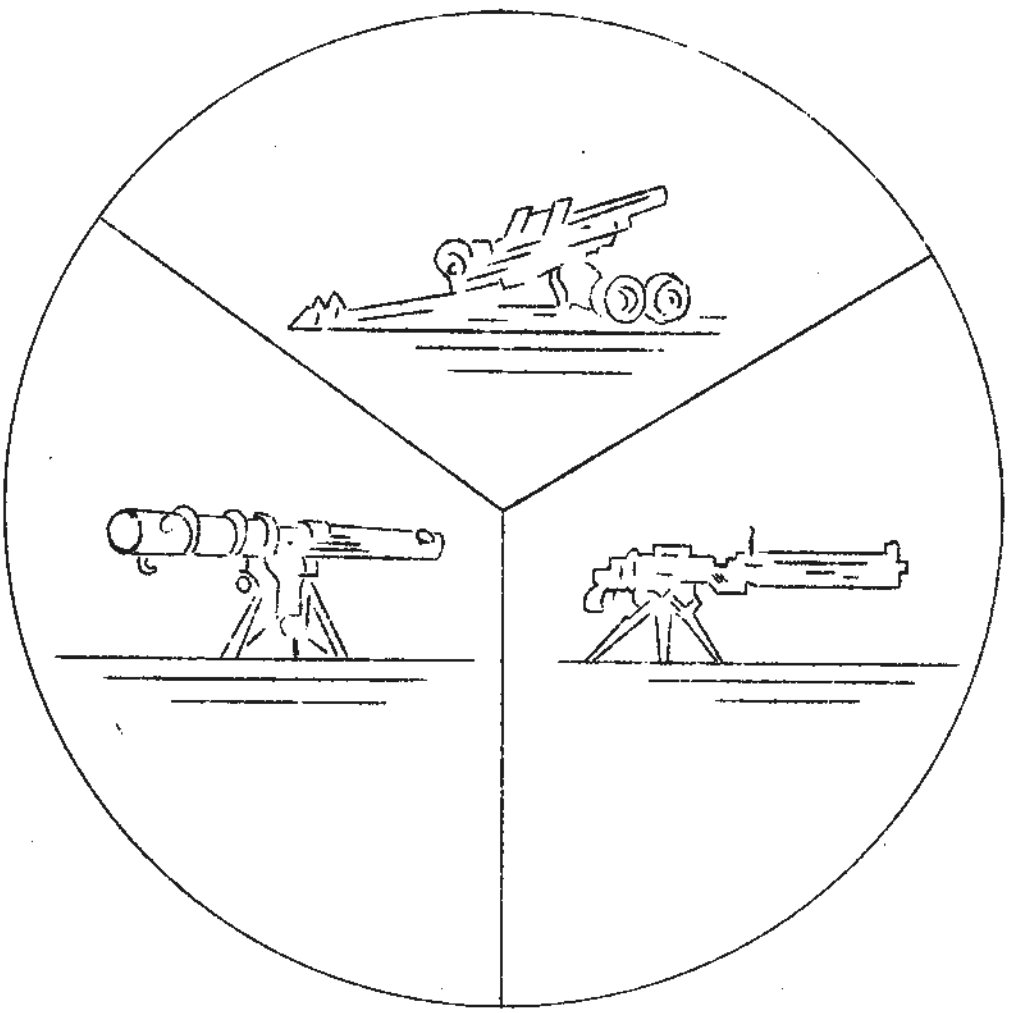
1. A B C D	20. A B C D	39. A B C D	58. A B C D
2. A B C D	21. A B C D	40. A B C D	59. A B C D
3. A B C D	22. A B C D	41. A B C D	60. A B C D
4. A B C D	23. A B C D	42. A B C D	61. A B C D
5. A B C D	24. A B C D	43. A B C D	62. A B C D
6. A B C D	25. A B C D	44. A B C D	63. A B C D
7. A B C D	26. A B C D	45. A B C D	64. A B C D
8. A B C D	27. A B C D	46. A B C D	65. A B C D
9. A B C D	28. A B C D	47. A B C D	66. A B C D
10. A B C D	29. A B C D	48. A B C D	67. A B C D
11. A B C D	30. A B C D	49. A B C D	68. A B C D
12. A B C D	31. A B C D	50. A B C D	69. A B C D
13. A B C D	32. A B C D	51. A B C D	70. A B C D
14. A B C D	33. A B C D	52. A B C D	71. A B C D
15. A B C D	34. A B C D	53. A B C D	72. A B C D
16. A B C D	35. A B C D	54. A B C D	73. A B C D
17. A B C D	36. A B C D	55. A B C D	74. A B C D
18. A B C D	37. A B C D	56. A B C D	75. A B C D
19. A B C D	38. A B C D	57. A B C D	



TECHNICAL
TRAINING

At the completion of 4 weeks basic military training, Ordnance trainees receive 9 weeks basic technical training in one of the following specialist courses. Sub courses starred (*) include 2 weeks training in elementary shop practice.

PERCENT OF TOTAL	COURSE	SUB COURSES
9	AMMUNITION TECHNICIANS	Aviation Ordnance Ground Ammunition
11	ARMORERS	Hand & Shoulder Weapons * Machine Guns *
13	ARTILLERY MECHANICS	Antiaircraft * Light * Medium & Heavy *
26	AUTOMOTIVE MECHANICS	Light Tank, Elementary * Medium Tank, Elementary * Scout Car, Elementary * Tractor, Elementary * Light Tank Medium Tank Scout Car Tractor
7	AUTOMOTIVE DRIVERS *	
12	CLERKS	Administrative Supply
6	COOKS & BAKERS	
5	INSTRUMENT REPAIRMEN	
11	SERVICE TRAINING	Blacksmiths Carpenters Leather & Canvas Workers Machinists * Painters Welders
100 %		



...planning a complete basic technical course... simplified and standardized to assist capable but inexperienced instructors...definite allocation of all training time...maximum use of equipment...requirement for student participation...testing and grading of attained skill

TRAINING AIDS SECTION
ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND, MARYLAND

September 9, 1942

MEMORANDUM:

TO: Technical Training Instructors.

SUBJECT: This memorandum includes the material lists, the procedure used, the forms developed and the factors considered while forming a course of training on a 37-mm Antitank Gun, M3, mounted on an M4 carriage.
This information with a set of the completed material is furnished with the thought in mind that new and revised training programs are constantly being developed and you as an instructor in a technical section may be able to use this material as a reference in the preparation of courses in your department.

FACTORS: The factors considered in the preparation of this course were:

a. The proper utilization of time and equipment.
b. The maximum amount of related information and practice work.
c. Sufficient training material to enable both trainee and the instructor to work to their utmost capacity.
d. A suitable type student record sheet for the recording of progress.

1. Equipment Used

Note. - The designated equipment, tools, etc. are based on an 8-man class taught by a senior and an assistant instructor.

1 each 37-mm antitank gun mounted on an M4 carriage (Complete).
1 each Breech block assembly.
1 each Traversing mechanism.
1 each Elevating mechanism.
1 each Recoil mechanism.
1 each Recoil mechanism stand.

Note. - Since it is necessary that the recoil mechanism be mounted on trunion blocks capable of locking at the desired degree of elevation, a proper type mounting stand will be designed and built to include a pair of lock type trunion blocks thus permitting practice service work even though the recoil mechanism is not mounted on a carriage.

II. Training aids used.

a. 1 each Chart - Carriage and wheel assembly.
b. 1 each Chart - Gun tube, breech ring, upper sleigh assembly and lower sleigh.
c. 1 each Chart - Breech block.
d. 1 each Chart - Elevating mechanism.
e. 1 each Chart - Traversing mechanism.
f. 1 each Chart - Recoil mechanism.
g. 1 each Chart - Upper carriage assembly.

III. Tools used.

a. 4 each Standard tool kits to include all tools listed on Job Sheet No. 1.
b. 1 each Flat steel bar - 6 inches by 3/4 inch by 1/4 inch.
c. 1 each Gunners quadrant.
d. 1 each Testing target and stand.

Note. - It is preferable that each gun have a standard tool kit. This would eliminate the inventory of tools listed on the lesson plan, and the job sheet following the heading "Tools". You would list in that space, "Tool Kit No. ___".

IV. Supplies used.

a. 1 gal. - Recoil oil.
b. 1 lb. - Gun Grease.
c. 1 lb. - Soda ash.
d. 1 qt. - Cylinder oil.
e. 1 each - Oil squirt can.
f. 1 each - Web strap 12 inches long.
g. 1 each - Bucket, drain oil.
h. 2 each - Buckets (for tube cleaning).
i. 1 each - Can of cleaning solvent.
j. 1 each - Emery cloth.
k. 1 lot - Cotton waste.
l. 1 lot - Clean rags.
m. 1 lot - Burlap jute.
n. 1 lot - Assorted Cotter pins.
o. 1 strip - Crocus cloth.

V. Training materiel used.

a. 10 each FM 23-90 Manuals.
b. 10 each TM 9-1245 Manuals.

(Mimeographed Materiel)

c. 2 each Instructors examinations.
d. 2 each General lectures.
e. 10 each Lesson Plans No. 1 to 9 inclusive.
f. 10 each Job Sheets No. 1 to 9 inclusive.
g. 10 each Job Reports No. 1 to 9 inclusive.
h. 10 each Question Sheets (Daily Exams) No. 1 to 9 inclusive.
i. 10 each Lubrication procedure forms.
j. 5 each Trainee examinations.
k. 1 each Attendance and Student Record Sheet.

Note. - The instructors examination listed under topic "c" is designed to serve as one of the factors in determining whether or not a trainee is sufficiently experienced on this gun to serve as an assistant instructor. A second factor to be considered is the trainees

mechanical aptitude and this may be gauged by having him complete all steps listed on job sheets No. 1 to 9 inclusive. The time required for performing this test should not exceed six hours. A complete set of this materiel is attached for reference.

VI. Suggested Procedure.

a. - Assistant instructor prepares tool kits, equipment, supplies, training aids and training material.

b. - Senior instructor assembles the eight men assigned to the class and gives a thirty minute lecture on Part No. 1 of General Lecture. Note. - Parts No. 2 and 3 of the general lectures are to be given at such time as this information is of the most value to the class. Part 4 is to be given before starting Job. No. 9. (See general lecture and instructors notes attached.)

c. - Following lecture Part I, divide the class into four groups of 2 men each. The senior instructor supervises and instructs groups a and b; the assistant instructor supervises and instructs group c and d, using the lesson plan, job sheet, job report, and question sheet as indicated in the following cycle. (See lesson plans and job sheets attached.)

d. - These small groups are then assigned in the following manner: Group a and b to job sheet No. 1, which covers disassembly of the 37-mm antitank gun into prime units and on the completion of job sheet No. 1, group a would be assigned job sheet No. 2 (Disassembly of the M4 gun carriage) and then instructed to work on the right side of the carriage. Group b would receive job sheet No. 2 and instructed to work on the left side of the carriage. Upon the completion of job sheet No. 2, job sheet No. 3 (assembly of the M4 carriage) would be assigned to Group a and job sheet No. 3 would also be assigned to Group b and on completion of job sheet No. 3, groups a and b would be assigned job sheet No. 8 (Reassembly of the 37-mm M3 antitank gun, mounted on an M4 carriage). The total elapse of time on the completion of job sheet No. 8 would be 4 hours, 30 minutes.

e. - While groups No. a and b were doing job No. 1, 2, 3, and 8, Groups c and d were being cycled through job sheet No. 4 (Disassembly and reassembly of the breech block); job sheet No. 5 (Disassembly and reassembly of the elevating mechanism and firing control); job sheet No. 6 (Disassembly and reassembly of the traversing mechanism); job sheet No. 7 (Disassembly and assembly of the recoil mechanism). Total time allotted to these four jobs is 4 hours, 30 minutes.

f. - The steps listed on the above mentioned jobs are to be performed on the spare units listed in Paragraph 3, thus allowing group a and b a disassembly and reassembly of the gun into prime units and a complete disassembly and reassembly of the gun carriage. At this point groups a and b change places with groups No. c and d and the same procedure is followed allowing each group of men to cover the complete disassembly and reassembly of all units. Total elapsed time is nine hours.

g. - After completing all work on job sheets no. 1 to 8 inclusive, job sheet No. 9 (Inspection, adjustments, and lubrication) would be issued to each man of the four groups. This job is to be covered on a demonstration basis thus allowing the student to follow the job sheet. The assistant instructor will make all demonstrations allowing the senior instructor full time for pointing out to the trainee the importance of each step during the demonstration. (See Lesson Plan No. 9, and Job Sheet No. 9 for additional information.) Total elapsed time: 12 hours, 30 minutes.

h. - Following the completion of jobs No. 1 to 9 inclusive including the completing of the No. 9 job report and No. 9 question sheet, trainee examination is given. (This examination is one of five prepared examinations of similar content.) The allotted time for the examination is one hour, 30 minutes. The last 3/4 hour of the allotted time is to be used in open discussion on the examination and on the gun used. Total elapsed time: 13 hours, 50 minutes. See time Schedule listed below:

TIME SCHEDULE

	Hours and Minutes		
Job Sheet No. 1 - Disassemble into prime units	1:00		
Job Sheet No. 2 - Disassemble carriage.....	1:10		Groups No.
Job Sheet No. 3 - Assemble carriage	1:10		1 & 2
Job Sheet No. 8 - Assemble prime units.....	1:10		
Total elapsed time - - - - - - -		4:30	
Job Sheet No. 4 - Disassemble and assemble breech block...	:30		
Job Sheet No. 5 - Disassemble and assemble elevating mechanism and firing control.....	1:45		Groups No.
Job Sheet No. 6 - Disassemble and assemble traversing mechanism.....	1:00		3 & 4
Job Sheet No. 7 - Disassemble and assemble recoil mechanism	1:15		
Total elapsed time - - - - - - -		4:30	
Job Sheet No. 9 - Group Demonstration. Inspecting, adjusting, and lubrication - - - - - - - - -		1:20	
Time allotted for examination - - - - - - - - -		1:30	
Time allotted for general lectures - - - - - -		2:00	
Total elapsed time - - - - - - -		13:50	

Total time allotted for each week of instructions: 27 hours and 40 minutes.

Note: - During a course of training there is always one problem which confronts the instructor, viz; certain trainees will try to "ride upon the shoulder of another trainee" and in most cases the good student and the poor student are given the same grade.

It is possible under the plan used on this program to regroup the men after they have completed their first four jobs. (See Paragraph VI, f.) Remove one trainee from group No. 1a and place him in group No. 2b, and assign the trainee removed from group No. 2b to work with the trainees remaining in group No. 1a. This regrouping of men takes place before the groups are transferred to their second instructor. The breaking up of the undesirable combinations affords the instructor a better check on the individual trainee.

VII. Attendance and Student Record Sheet.

A problem present in all emergency training programs is the lack of sufficient time to test individually the mechanical proficiency of the trainee on each operation of a given job. The second problem present is the difference in methods necessarily used due to the size of the weapon, and the time allotted for technical training.

To illustrate: The 37-mm gun used in this procedure is a comparatively small weapon and each of the eight trainees are allowed to completely disassemble and reassemble all units of the gun. Mechanical proficiency is given a maximum value of 60 points; daily examinations, (Question Sheet), 10 points; attitude, 10 points; and final examinations, 20 points.

The 105-mm Howitzer and carriage, M1, is a large heavy gun and six men are assigned to the class. Since time will not allow each trainee a complete disassembly and reassembly of all units of the gun, he works as a part of a group and the value given mechanical proficiency is dropped to 20 points; daily examinations, 20 points; attitude, 20 points; and final examination, 40 points.

The values set in the above illustrations were selected at random as they will vary depending on the type or model of gun being taught. The Section Chief will in all cases set the grade values.

The Student Record Sheets attached (Pages No. 9 and No. 10) clearly indicate the total maximum points used for grading on two types of guns. Each "Maximum Point" total (except the "Final Examination") is divided by the number of half days allotted to the gun. The result is then placed on the record sheet under the corresponding number of half days. As instruction proceeds these maximum figures listed serve as a guide in grading the trainees work. Daily points are then totaled and placed in the column marked "Points". The final examination is given and the grade points are recorded in the space following "Final Examination". Total all points and record under column marked "Total". (See Student Record Sheets attached.)

VIII. The order in which training materiel was prepared.

a. Job sheet.
b. Job report.
c. Question sheet.
d. Lesson Plan.
e. General lecture.
f. Trainee examination.
g. Instructor examination.
h. Attendance & Student Record Sheet.

IX. Analyze the gun to determine the number of Job Sheets needed.

X. Preparation of the Job Sheet.

a. Complete all topics listed on the standard job sheet form except "Time".
b. Have a senior instructor disassemble the gun using the correct procedure.

X. Preparation of the Job Sheet - Cont'd.

c. Record each step. (Use correct nomenclature.)
d. Insert the necessary sketches needed to guide the trainee.
e. Use the procedure as outlined when preparing the job sheets necessary for the reassembly of the gun.
f. Include necessary cautions.
Note. - See attached Job Sheet.

XI. Preparation of the Job Report.

a. Prepare Job Report as a continuation of Job Sheet.
Note. - Write job report so as to necessitate the trainees mental review of each operation performed in the proper sequence as listed on the job sheet. (See attached Job Reports.) The job report is not graded but is considered as a part of the mechanical proficiency grade.

XII. Preparation of the Question Sheet.

a. Use the technical manuals issued to the trainee as a basis for the questions asked which concern type of construction, function, malfunction, inspection, lubrication, and preventive maintenance.
Note. - Through error a space for the students name and instructors name was ommitted on the samples attached. This must be included as it is necessary for grading purposes.

XIII. Preparation of Lesson Plan.

a. Complete all items as listed on Lesson Plan No. 1 to and including Step No. 10 listed under "Procedure". Omit "Time allotted" as this will be covered later. (See Lesson Plan No. 1 attached.)

b. Refer to the corresponding numbered job sheet and determine the number of instructor demonstrations necessary. List them following Step No. 10.

c. Complete Steps No. 14 to 19 inclusive under Paragraph "Procedure".

d. If additional check up questions are to be used, add the heading "Questions" and directly beneath it place a limited number of important questions which concern the danger points in your lesson.

e. If study assignments are to be given, add "Assignments" following "Questions" and state specifically the manual number, the paragraph and the page.
Note. - These Lesson Plans are prepared to serve as an instructors guide while doing the various jobs.

XIV. Preparation of General Lecture.

a. Complete all items listed on General Lecture form attached. Omit "Time Allotted". Obtain approval of the Section Chief on the values listed for grading under Part I, Topic 5 of the General Lecture. (Also see line 4 - Attendance and grade record - page 9.)

b. Note carefully the items listed in the right hand margin on the sample General Lecture form. List the demonstrating unit, the necessary training aids and specific references.

XIV. Preparation of the General Lecture - Continued.

Note. - It is sometimes possible to incorporate the general lecture topics in the lesson plan. This can be determined by the individual job. If it is possible to do this the General Lecture form need not be used.

XV. Preparation of the Examination.

a. Prepare the necessary number of trainee examinations of approximately the same content. This will allow a somewhat varied selection on examination day.

b. You will note that the essay type question is not used in this form and that the answer to each question is placed in a designated space on the left hand margin of the page. This aids in the grading of the examinations by clerks who know nothing about the gun. (See sample examination attached.)

c. Nomenclature check questions can also be used on this type of examination form as they allow the answer to be placed in the column at the left hand margin of the page. (See Job Sheet No. 1, Question No. 10.)

XVI. Preparation of the Instructors Examination.

a. The instructors examination uses practically the same form as the trainee examination except for Questions No. 98, 99, and 100. These three essay type questions used will help to determine whether or not the trainee is capable of expressing the complete function or operation of a unit. (See Para. V, and the Instructors Examination attached.)

XVII. Time allotted.

On completion of the job sheets an instructor of the artillery section used the procedure listed and performed all operations, step by step, on this gun. Each individual job was timed. Upon completion of the work the total time used by this person, without assistance, was 5 hours, 40 minutes. After determining that the trainees were to work in pairs in the performance of each job, one-half of the total allotted time for the week (13 hours, 50 minutes) was allotted as listed on the time schedule. (See Para. IV.) Sufficient time was deducted from the 13 hours 50 minutes for the General Lecture and the trainee examination. The allotted time was recorded on the Job Sheet and the corresponding Lesson Plan. The two hours deducted for the general lecture was recorded under "Time Allotted" on the general lecture.

One hour and thirty minutes was allotted for the examination. It is presumed that this examination can be completed in approximately forty-five minutes thus allowing the remaining forty-five minutes to be used in discussion.

XVIII. Attendance and Student record.

(See Paragraph VII)

XIX. Adjustment of Allotted time.

The time allotted to the general lecture and the job sheets may be adjusted in the following manner:

Evaluate each topic of the general lecture and give it a plus or minus value. Use these values in the general lecture notes.

The same procedure applies to the steps or operations listed under procedure on the job sheet. Select operations of minor importance and teach them as a group demonstration. This will allow additional practice time on the operations of major importance.

XX. Preparation of Charts and Training Aids.

a. Determine the necessary number of charts and visual aids needed.
b. Be sure the charts and visual aids are made in such a way so as to expose hidden gear trains etc.
c. Standardize the size of chart used so proper storage of this material can be arranged.

STUDENT RECORD SHEET

ATTENDANCE AND GRADE RECORD CLASS: Light Artillery GROUP NO.

WEEK OF: INSTRUCTOR:

SUBJECT : 37-MM Antitank Gun, Mounted on M4 Carriage

MAXIMUM POINTS: Mechanical Proficiency (MP) 60	Attitude (A) 10	Daily Exam (E) 10	Final Exam (FE) 20	Total Points 100	Total Class Days--2½

No.	Name	Org.		Maximum Points Monday A.M.	Monday P.M.	Maximum Points Tuesday A.M.	Tuesday P.M.	Maximum Points Wednesday A.M.	Wednesday P.M.	Maximum Points Thursday A.M.	Thursday P.M.	Maximum Points Friday A.M.	Friday P.M.	Points		TOTAL
			MP	12	12	12	12	12						60		
			A	2	2	2	2	2						10		
			E	2	2	2	2	2						10	Final Exam 20	100
			MP	7	8	9	9	9						42		
	John Doe		A	2	2	2	2	2						10		
			E	1	2	2	2	2						9	Final Exam 15	76

STUDENT RECORD SHEET

ATTENDANCE AND GRADE RECORD CLASS: Light Artillery GROUP NO.

WEEK OF: INSTRUCTOR:

SUBJECT: 105-mm Howitzer and Carriage, M1.

MAXIMUM POINTS: Mechanical Proficiency (MP) 20	Attitude (A) 20	Daily Exam (E) 20	Final Exam (FE) 40	Total Points 100	Total Class Days--5

No.	Name	Org.		Maximum Points Monday		Maximum Points Tuesday		Maximum Points Wednesday		Maximum Points Thursday		Maximum Points Friday		Points		TOTAL
			MP	2	2	2	2	2	2	2	2	2	2	20		
			A	2	2	2	2	2	2	2	2	2	2	20		
			E	2	2	2	2	2	2	2	2	2	2	20	Final Exam 40	100
	John Doe		MP	1	1	1	1	1	2	2	2	2	2	15		
			A	1	1	1	1	2	2	2	2	2	2	16		
			E	1	2	2	1	2	1	2	1	2	2	16	Final Exam 30	77

ARTILLERY SECTION
ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND, MD.

Class: Light Artillery.

General Lecture

TYPE: The general characteristics, components, functions of the components, malfunctions and maintenance of the 37-mm gun, antitank, M3, mounted on an M4 gun carriage.

OBJECTIVE: To teach trainees the general characteristics, nomenclature, functions; and malfunctions of the components, inspection, lubrication and preventive maintenance of the 37-mm antitank gun mounted on M4 carriage.

REFERENCES: TM 9-1245, FM 23-70, OS 9-48, and SNL A-44, and Instructor's Notes.

TIME ALLOTTED: Two hours.

TEACHING METHOD: Lecture and demonstration of complete gun.

TRAINING AIDS: One set of Charts (Components).

TOOLS: Refer to tools listed under "Tools" on Job Sheet No. 1.

EQUIPMENT: One 37-mm gun, antitank, M3, mounted on an M4 gun carriage.

PROCEDURE: Part I. Introduction. General Characteristics and Ammunition.

Assemble the students so that all men will have an unobstructed view of the instructor, the gun and the charts.

Display 37-mm antitank gun mounted on M4 carriage.

TIME: 30 Minutes.

Lecture.--Introduction of the course.

1. The purpose and objective of this course.
2. The length of the course.
3. What the student is expected to learn.
   (a) Nomenclature.
   (b) Disassembly.
   (c) Assembly.
   (d) Adjustments.
   (e) Characteristics.
   (f) Functions.
   (g) Malfunctions.
   (h) Lubrication.
   (i) Inspections.
4. The importance of the students knowledge.
5. The method of grading employed.
   (a) Shop work (Job Report). 60%
   (b) Study Questions (Questions Sheets). 10%
   (c) Attitude 10%
   (d) Final examination. 20%

6. Explanation of working with job sheets, and when to complete job report.
7. Men will work two in a team except on job sheet No. 9.
8. Proper care and use of tools and equipment.
9. Safety factors.
   (a) Observe cautions and notes on job sheets carefully
   (b) Call the instructor when in doubt.
   (c) Use care and be sure that the man-power is sufficient when handling heavy parts.
   (d) Never disassemble the recoil mechanism except under the immediate supervision of the instructor.

Chart, Recoil Mechanism.

Part I, Continued. - Characteristics and Ammunition.

1. Long range, flat trajectory.
2. Single shot.
3. Drop type breech block.
4. Mounted on split trail type carriage.
5. One man control of aiming, elevating, traversing and firing.
6. What it is used for.
7. Range: 3400 yards, effective 1700 yards.
8. Firepower: 25-20.
9. Muzzle velocity: 2600 f/s.
10. High explosive armor piercing.
11. Elevation: 15° Depression: 10° Traverse: 60°
12. Length of recoil: Normal 20 inches.
13. Average longevity of life: 15,000 rounds.
14. Weight of gun: 912 lbs.
15. Weight of gun tube: 191 lbs.
16. Ammunition. (Discuss briefly)
    (a) Fixed type.
        1 Armor piercing.
        2 High explosive.
        3 Cannister
        4 Target Practice.
    (b) Use of firing tables.
    (c) Identification.
    (d) Mark or Model.
    (e) Lot Number.
    (f) Data Card.
    (g) Painting and Marking
    (h) Care, handling, and preservation.
    (i) Authorized rounds.
    (j) Packing.

Instruct trainee to use FM 23-70 as a guide during lectures.

Part II. Components and functions. Discuss generally advising the student that additional information will be furnished during the disassembly and reassembly of the gun. TIME: 30 Minutes.

1. The gun tube. Chart, Tube, Breech Ring, Upper Sleigh, Lower Sleigh Assembly.
   (a) One piece forging.
   (b) Rifled bore threaded to screw onto the breech ring.
   (c) Twelve lands and twelve grooves.
   (d) Front bearing has flange threaded for lock nut to secure position.
   (e) Keyways to engage with keys in the front yoke to prevent rotation.

2. The breech ring:
   (a) Bored and threaded to receive the tube.
   (b) Rear half slotted vertically to receive the breech block.
   (c) Studs inside ring serve as extractor pivots.
   (d) Hole through lower left wall forms trigger bearing.
   (e) Counter bore provides pocket for tripper.

3. The Extractors:
   (a) Positioned against the side walls of the breech recess.
   (b) Lips of longer upper arms tie in pockets on each side of chamber and engage the flanges of the cartridge.
   (c) Camming lugs on the lower arms project inward to engage the cammed surface of the breechlock.

4. M4 Gun Carriage. Chart, M4 Wheel and Carriage Assembly.
   (a) Split trail.
   (b) Means of transportation.
   (c) Base for firing.

5. The breech block assembly. Chart, Breech Block.
   (a) Houses parts of the firing mechanism.
   (b) Closes rear end of the gun tube.

6. Traversing Mechanism. Chart, Traversing Mechanism.
   (a) Moves the gun horizontally. (Demonstrate)

7. Elevating Mechanism. Chart, Elevating Mechanism.
   (a) Provides means of elevating and depressing gun. (Demonstrate)

8. Recoil Mechanism. — Chart, Recoil Mechanism.
   (a) A break for the recoil when gun is fired
   (b) Returns tube to the original position after firing and recoil has stopped.

9. Compensating bar.
   (a) Purpose.

Part III. Malfunction. — Time 30 Min.

1. Failure to fire.
   (a) Defective ammunition.
   (b) Weak, broken or burned firing spring.
   (c) Missing or broken trigger plunger spring.
   (d) Broken trigger arm.

2. Breech cannot be opened. — Chart, Breech block.
   (a) Failure to release pressure on firing mechanism lever after firing.
   (b) Weak or broken trigger plunger spring.
   (c) Weak or broken firing retractor spring.

3. Failure to extract or eject.
   (a) Broken extractors.
   (b) Dirty ammunition.
   (c) Dirty chamber.
   (d) Sluggish movement of the breech lever to the rear.

4. Failure to feed.
   (a) Defective ammunition.
   (b) Dirt in chamber.

5. Sluggish recoil and counterrecoil. — Chart, Tube, Breech ring, upper sleigh, Lower sleigh assembly.
   (a) Excessive oil in the recoil cylinder.
   (b) Dirty or burned rails of guides.
   (c) Lack of lubrication of the rails.

6. Binding of the wheels. — Chart wheel & carriage assembly.
   (a) Damaged bearings
   (b) Incorrect adjustment
   (c) Lubrication.

7. Binding and irregular elevations.
   (a) Gears burred or broken.
   (b) Foreign matter in the gear box.
   (c) Check lubrication.

8. Binding and irregular traverse.
   (a) Check for lost motion in shafts and gears
   (b) Check for damaged parts
   (c) Check lubrication.

Part IV. Inspection, Lubrication and Preventive Maintenance. — Time 30 Min.

A No. 9 Job Sheet and one lubricating chart is issued to each student and the instructor uses a sample job sheet to discuss the inspections listed and a chart for lubricating procedure followed. Note: Give this part of lecture previous to the demonstration on Lesson plan #9.

1. Inspection.
   (a) Purpose of inspection. — Ref. TM 9-1245
   (b) How to perform an inspection. — Pages 4 and 5.

2. Lubrication.
   (a) Type of lubricants used.
   (b) Types of lubrication equipment needed.
   (c) How to use lubrication charts.

3. Preventive Maintenance.
   (a) Inspection and lubrication as a part of preventive maintenance.
   (b) Removal of dirt and grit.
   (c) Rust and its cause.
   (d) When to use water as a cleaner
   (e) When to use soda ash as a cleaner
   (f) When and where to use dry cleaning solvent.
   (g) Where to use crocus cloth.
   (h) Where to use Emery cloth.
   (i) Use of burlap jute to clean bore.
   (j) The use of waste, clean rags and sponges.

Note to the instructor:

The Topics or Talking Points listed in this general lecture are to be supplemented with Instructor Notes. Also include in your notes the source of the information if it is available. In each case where a TM or FM is used, list the page and paragraph numbers.

These notes are to cover the following items:
   (a) What is it?
   (b) What is it used for?
   (c) How does it function?
   (d) How is it serviced? (Including preventive maintenance)
   (e) Malfunction and remedy.

RESTRICTED

ARTILLERY SECTION
ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND, MARYLAND

CLASS: LIGHT ARTILLERY

LESSON PLAN NO. I

TOPIC: Disassembly of the 37 M/M gun, anti-tank, M3 on an M4 carriage into prime units.

OBJECTIVE: To teach trainees the proper method of disassembling the 37 M/M gun, anti-tank, M3 mounted on an M4 carriage into prime units.

REFERENCE: TM 9-1245
FM 23-70

TIME ALLOTTED: One hour and ten minutes.

TEACHING METHOD: Supervised shop work by the trainees.
Instructor demonstrations.
Coach & pupil.

TRAINING AIDS: One set charts - step by step disassembly.
Film Strip 7-68

TOOLS: 1 ea. - Steel chest M6 & contents consisting of:
- 1 Chisel, machs., hand, cold, 3/4"
- 1 Drift, brass, stght., 3/8" rd. x 4"
- 1 File, A.S., hand, sec.-cut, 8"
- 1 File, A.S., half-rd., sm.,6"
- 1 Hammer, copper, 1 1/2 lb.
- 1 Hammer, machs., ball pein, 20 oz.
- 1 Handle, file, 1 1/8" x 4"
- 1 Handle, file, 1 1/4" x 4 1/4"
- 1 Punch, drive pin, .06 in. pt.
- 1 Screwdriver, close quarter, 1 1/2" blade
- 2 Wrench, socket head set screw 3/32" hex.
- 2 Wrench, socket head set screw 1/8" hex.
- 1 Wrench, monkey 16"
- 1 Roll, tool M4 consisting of:
  - 1 Screwdriver, close quarter 1 1/2"blade
  - 1 Screwdriver, close quarter, 3" blade
  - 1 Spacer, piston rod unmoving
  - 1 Wrench, adj., agle.-end, 12" (1 5/16" cap.)
  - 1 Wrench, comb., 37 M/M gun carriage, M4
  - 1 Wrench, socket head set screw, 3/32" hex.
  - 1 Wrench, auger, dble.-hd., alloy-S., 1 1/4" x 1 5/8"
  - 1 Wrench, socket head set screw, 1/8" hex.

CLASS: LIGHT ARTILLERY Lesson Plan No. ___

1 Wrench, socket head set screw, 3/16" hex.
1 Wrench, spanner, hook adj., 2 - 4 3/4"
1 Puller, piston rod unmoving
1 Guide, piston rod
1 Pump, tin
1 Guage, tire pressure
1 1 lb. grease, lubricating, medium
2 Gun, oil recoil cylinder filling

EQUIPMENT:
1 Rod, Steel, 3' x 3/4"
2 Horses; Wooden

PROCEDURE:

1. Assemble students so that all men will have an unobstructed view of the instructor.

2. Distribute a No. 1 job to each man.

3. Briefly explain the scope of this job.

4. Explanation of the use of the job sheet:
   a. How to follow the procedure.
   b. How and when to fill in the job report.
   c. How and when to fill in the question sheet.

5. Explanation of working in teams of two.

6. Method of grading.

7. Meaning of grade attained to the trainee.

8. Group the students in pairs and assign to guns.

9. Distribute tools.

10. Start the students on the procedure.

11. The instructor will demonstrate placing the gun in the firing position in operation I.

12. The instructor will demonstrate Procedure II, "Removal of the breech block."

13. The instructor will caution men in removing brackets of necessary caution to prevent damage to the dowel pins and will demonstrate the method of rapping the brackets off with a brass drift in Procedure IV, "Remove the parallelogram linkage assembly."

CLASS: LIGHT ARTILLERY Lesson Plan No. I.

14. At the conclusion of the procedure the instructor will have men clean and put away all tools and equipment.

15. Instruct when to complete job report.

16. Distribute one job question sheet to each man and start class, filling in the question sheet.

17. Collect all job sheets and question sheets as soon as completed and have them graded.

18. Discuss the job report and the question sheet with the students.

19. Have the job sheets graded and returned to the students.

RESTRICTED

ARTILLERY SECTION
ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND, MARYLAND

CLASS: LIGHT ARTILLERY

Job Sheet No. 1

NAME: _____ GROUP: _____ CO. _____ BN. _____

INSTRUCTOR: _____ DATE: _____ GRADE: _____

TITLE: DISASSEMBLY OF THE 37 M/M GUN ANTI-TANK M3 MOUNTED ON AN M4 CARRIAGE INTO PRIME UNITS.

TIME: One hour and ten minutes.

OBJECTIVE: To teach trainees the proper method of disassembling, cleaning and inspecting the 37 M/M Gun, anti-tank, M3.

REFERENCE: FM 23-70 - Instructor Notes - TM 9-1245.

TRAINING AIDS: 1 ea. Chart (Recoil mechanism).

TOOLS: 1 ea. - Steel chest M6 & contents consisting of:
- 1 Chisel, machs., hand, cold, 3/4"
- 1 Drift, brass, stght., 3/8" rd. x 4"
- 1 File, A.S., hand, sec.-cut, 8"
- 1 File, A.S., half-rd., sm., 6"
- 1 Hammer, copper, 1 1/2 lb.
- 1 Hammer, machs., ball pein, 20 oz.
- 1 Handle, file, 1 1/8" x 4"
- 1 Handle, file, 1 1/4" x 4 1/4"
- 1 Punch, drive pin, .06 in. pt.
- 1 Screwdriver, close quarter, 1 1/2" blade
- 2 Wrench, socket head set screw 3/32" hex.
- 2 Wrench, socket head set screw 1/8" hex.
- 1 Wrench, monkey 16"
- 1 Roll, tool M4 consisting of:
  - 1 Screwdriver, close quarter 1 1/2" blade
  - 1 Screwdriver, close quarter, 3" blade
  - 1 Spacer, piston rod unmoving
  - 1 Wrench, adj., sgle.-end, 12" (1 5/16" cap.
  - 1 Wrench, comb., 37 M/M gun carriage, M4
  - 1 Wrench, auger, dble.-hd., alloy-S., 1 1/4" x 1 5/8"
  - 1 Wrench, socket head set screw, 3/32" hex.
  - 1 Wrench, socket head set screw, 1/8" hex.

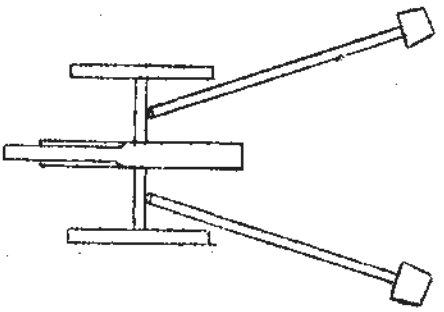
CLASS: LIGHT ARTILLERY Job Sheet No. 1

1 Wrench, socket head set screw, 3/16" hex.
1 Wrench, spanner, hook adj., 2 - 4 3/4"
1 Puller, piston rod unmoving
1 Guide, piston rod
1 Pump, tin
1 Guage, tire pressure
1 1 lb. grease, lubricating, medium
2 Gun, oil recoil cylinder filling

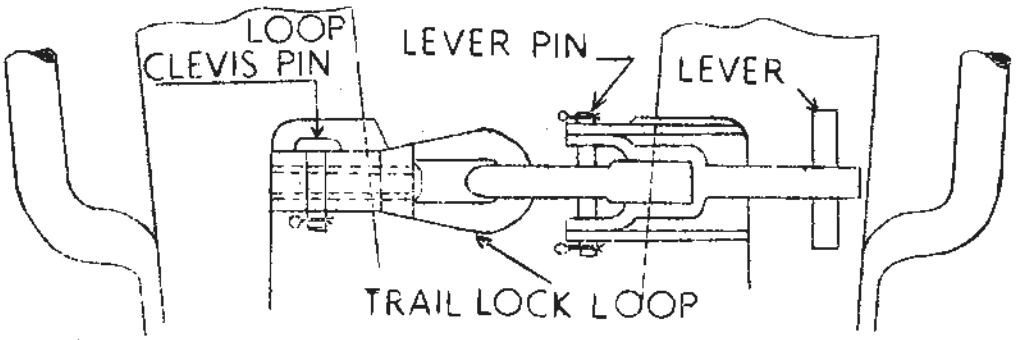
EQUIPMENT 1 ea. 37 M/M anti-tank gun, M3 on an M4 on an M4 carriage.
1 ea. Rod, steel, 3' x 3/4"
2 ea. Horses, wooden
1 ea. Parts, crib

PROCEDURE:

I Place the gun in the firing position.



1. Open the trail lock.



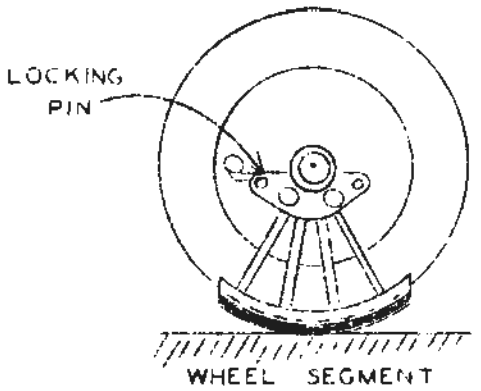
2. Spread the trails fully.

3. Lock the trails in position with the trail pins.

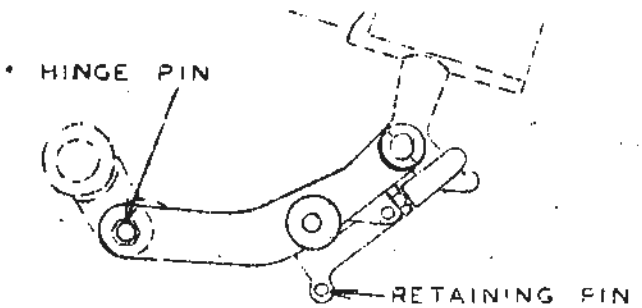
CLASS: LIGHT ARTILLERY Job Sheet No. 1

4. Set the gun on the wheel segments and lock.

CAUTION: Be sure that the wheel segment locking pins are held out in this operation until the wheel segments are in position, otherwise the pins will be broken.



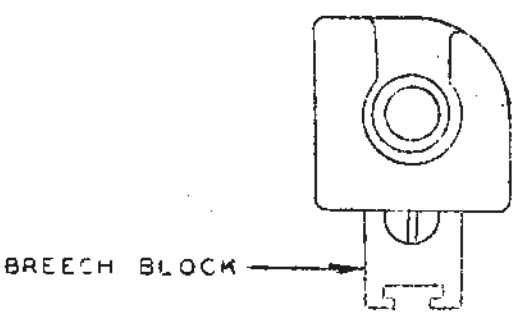
5. Open the travelling lock.



TRAVELING LOCK

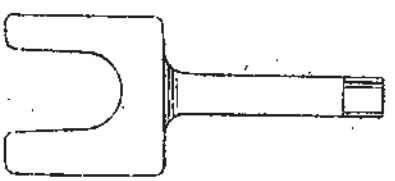
6. Level the tube by turning the elevating handwheel.

II Removal of the breech block from the breech ring.



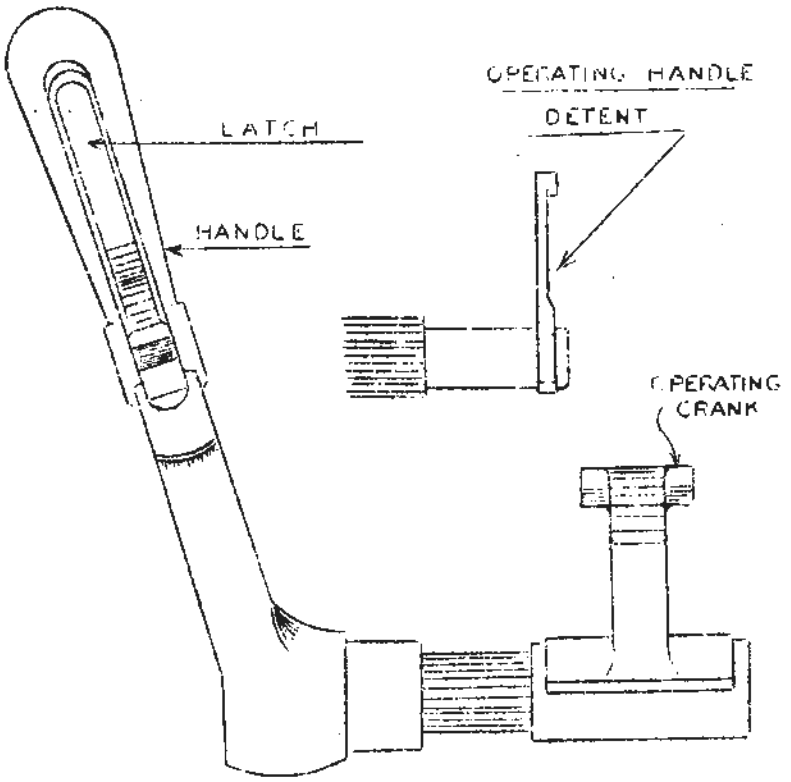
BREECH RING

1. Remove the operating handle detent.



OPERATING HANDLE DETENT

2. Depress the operating handle latch and draw the operating handle out.



CAUTION: Hold the hand under the breech block in this operation to prevent dropping the breech block on the floor. The breech block will drop immediately when the operating handle is withdrawn.

3. Lower the breech block slightly and pull the operating crank from between the breech ring lugs.

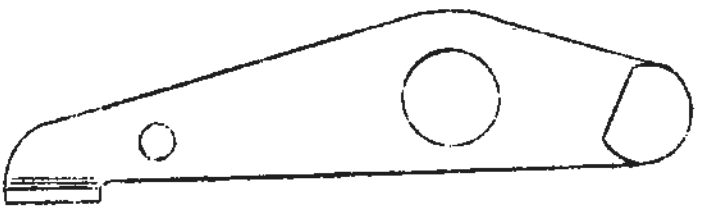
4. Lower the breech block about one inch to allow the operating crank trunions to slip out of their slots in the breech lock.

5. Push the breech block down through the breech ring.

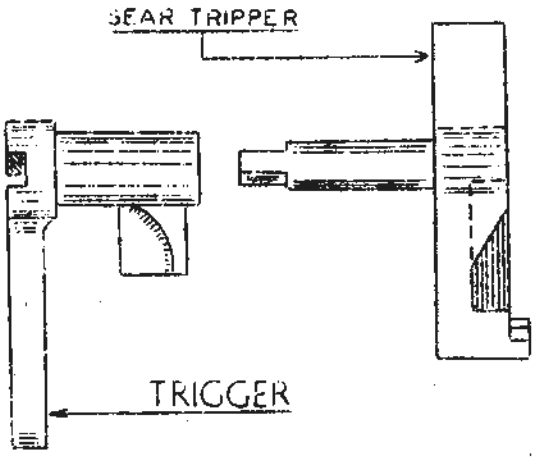
6. Remove the crank.

CLASS: LIGHT ARTILLERY Job Sheet No. 1

7. Remove the extractors.

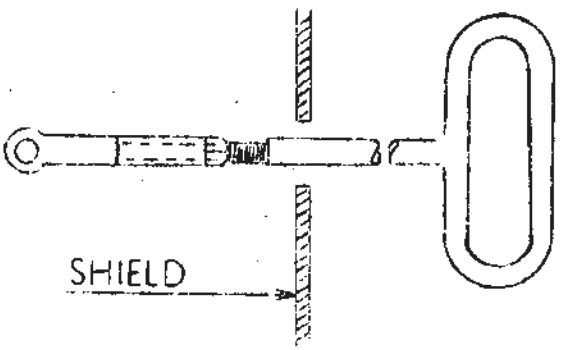


8. Remove the sear tripper.



III. Remove the Shield & Shoulder Guard.

1. Remove the cotter pin end clevis pin from the clutch throwout arm.



2. Pull the throw-out clutch handle back through the shield.

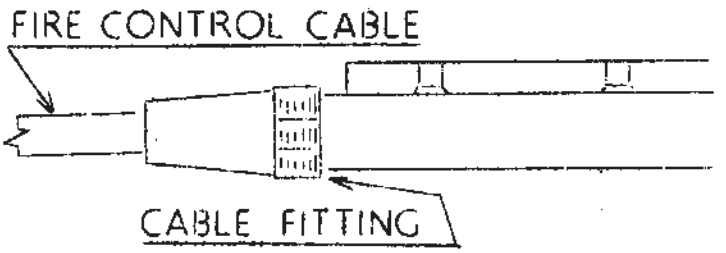
3. Remove the five shield retaining bolts, nuts and washers, and remove shield.

CAUTION: Support shield while removing the last of the 5 retaining bolts.

CLASS: LIGHT ARTILLERY Job Sheet No. 1

4. Place the nuts and washers back on the bolts, finger tight, and store parts.

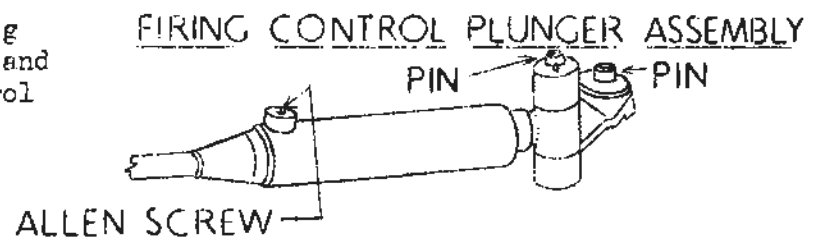
5. Remove the firing control cable fitting.



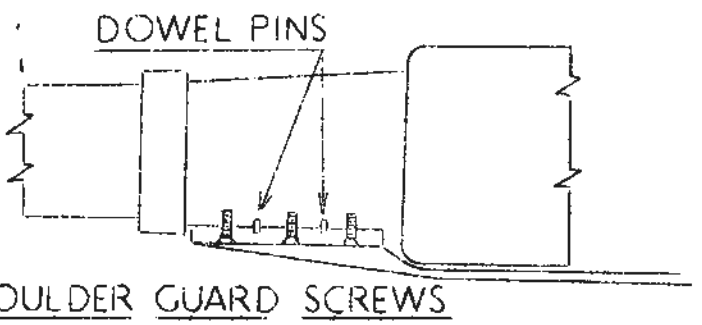
6. Remove the cotter key and clevis pin from the firing control eye.

7. Unscrew the firing control eye and remove the safety screw that holds the firing control plunger in position.

8. Remove the firing control plunger and the firing control cable from its place.

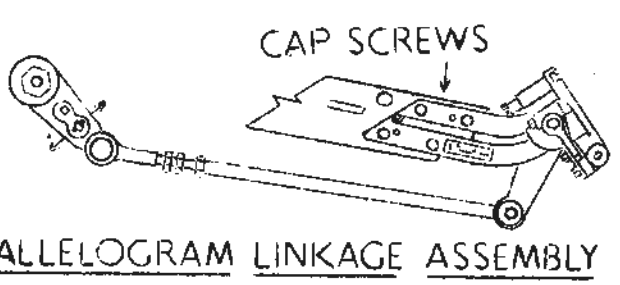


9. Remove the three screws that hold the shoulder guard in position.



10. Remove the shoulder guard and attached firing mechanism.

IV. Remove the parallelogram linkage assembly.



CLASS: LIGHT ARTILLERY Job Sheet No. 1

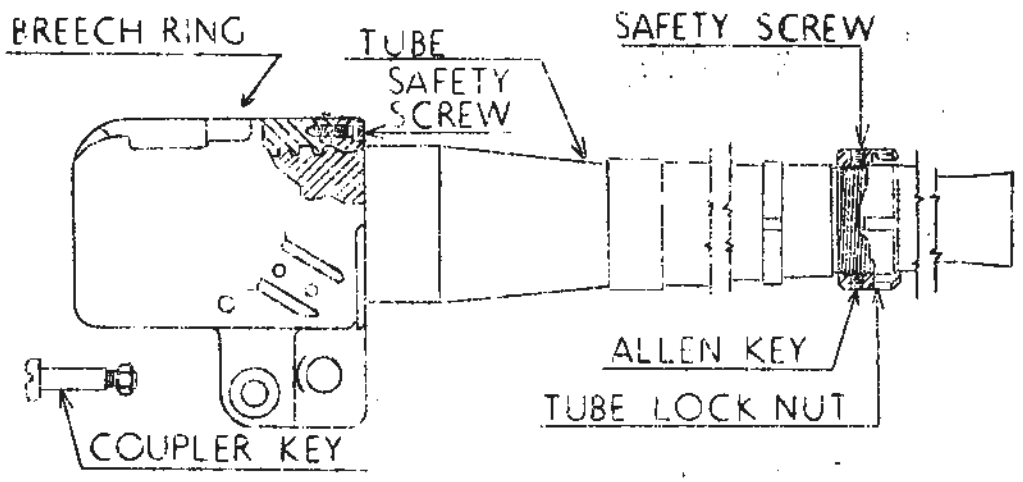
1. Remove the four telescope holder adapter retaining bolts and permit the linkage assembly to swing free.

   NOTE: Use care in removing all brackets so as not to damage the dowel pins.

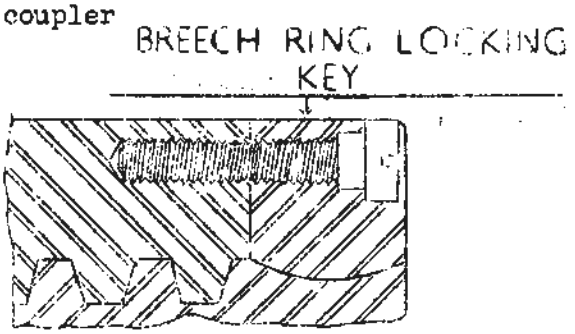
2. Unscrew the link tube arm trunion retaining nut.

3. Remove the link tube arm by tapping off with a brass drift while supporting the upper assembly.

V Removal of the gun tube, upper sleigh and disassembly of the breech ring.



1. Remove the coupler key.



2. Back the two Allen safety screws from the tube locking nut.

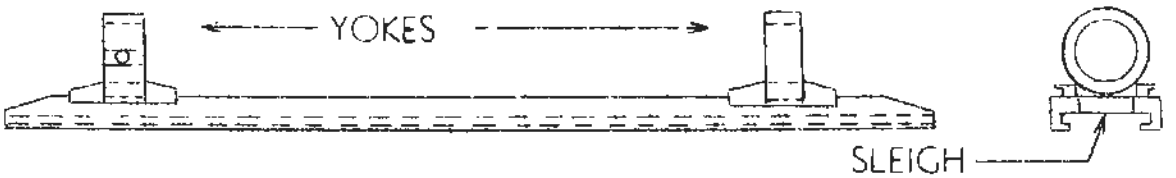
3. Unscrew the tube locking nut and remove.

4. With one man at the breech of the gun tube, another at the muzzle and one in the middle, pull the gun tube to the rear through the gun tube retaining yokes, while holding the upper sleigh to prevent it from sliding back with the tube and place the tube on wooden horses.

CLASS: LIGHT ARTILLERY Job Sheet No. 1

CAUTION: Use extreme care to guide the tube through the yokes to prevent damage to the threads.

5. Slide the upper sleigh to the rear using extreme care not to jam the slides as this is a brass to steel contact and place on the wooden horses.



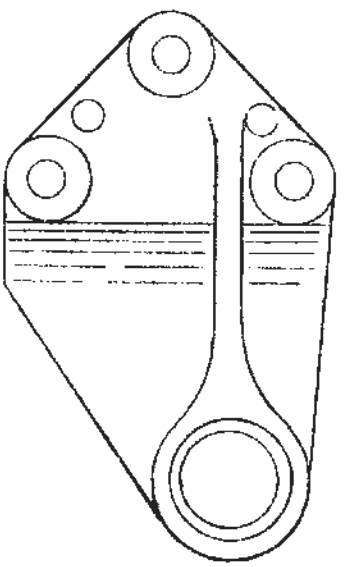
6. Remove the breech ring locking key safety screw.

7. Remove the breech ring locking key.

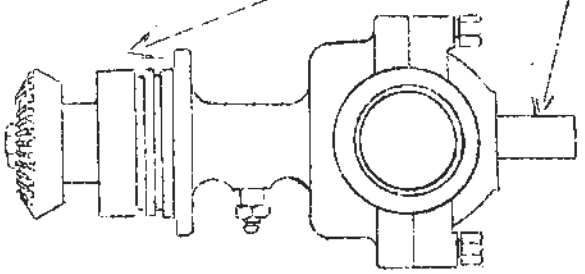
8. Remove the breech ring by unscrewing in a counter clockwise direction.

VI. Remove the elevating mechanism.

1. Remove the elevating bracket by removing the three retaining cap screws and tapping off with a brass drift.

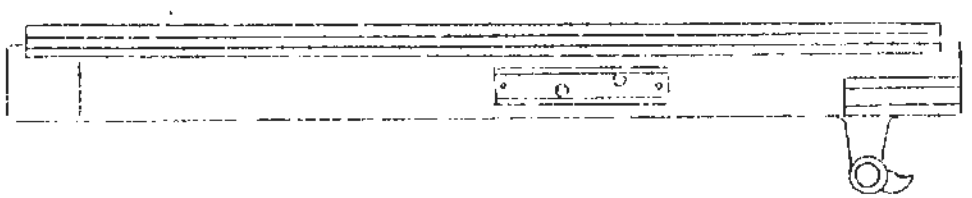


2. Work the elevating mechanism free from the recoil cylinder and the elevating gear shaft housing.



CAUTION: A slight up and down motion on the recoil cylinder will aid in the removal of this assembly.

VII. Removal of the recoil cylinder and lower sleigh assembly.



1. Remove the two trunion bearing caps.

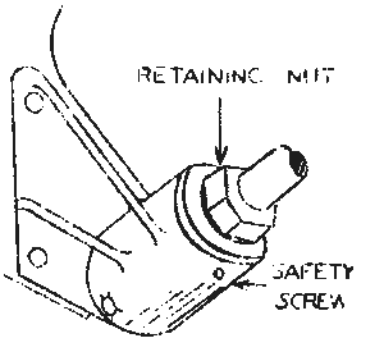


2. Lift the recoil cylinder and lower sleigh assembly from the carriage.

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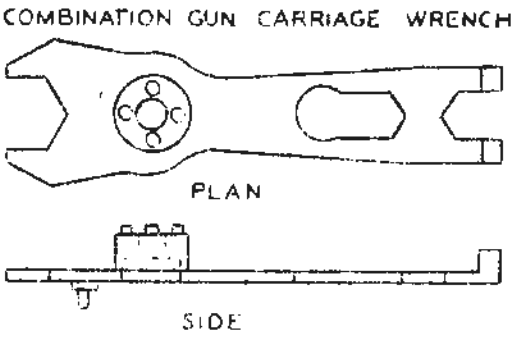
VIII Remove the elevating & firing controls.

1. Remove traversing hand wheel bracket bolt and nut. See sketch Par. IX.
2. Remove the safety screw.

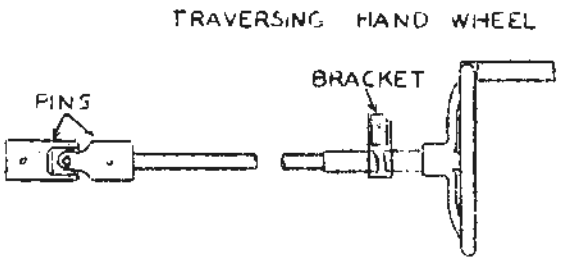


3. Unscrew retaining nut removing entire arm assembly from housing.

NOTE: USE SPECIAL WRENCH

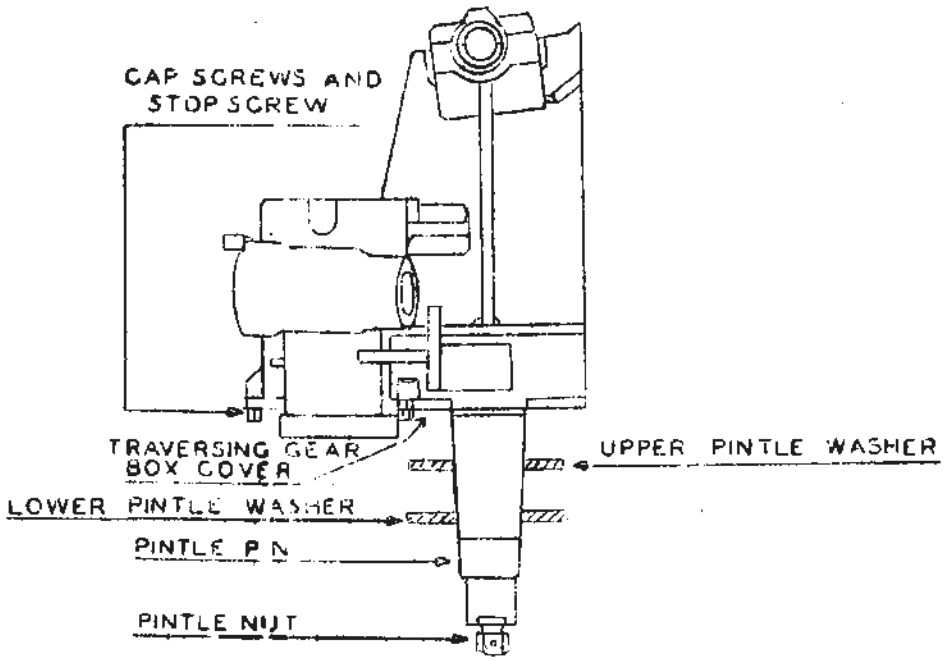


IX. Remove the traversing hand wheel by removing the tapered retaining pin.



CLASS: LIGHT ARTILLERY Job Sheet No. 1

X Remove the top carriage.

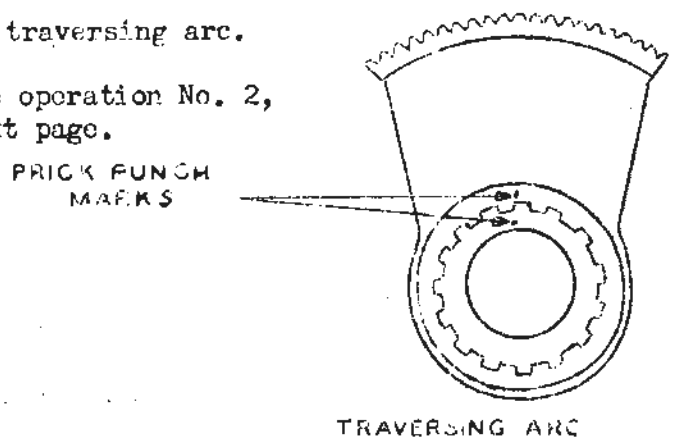


1. Remove the 9 cap screws.
2. Remove stop screw.
3. Remove pintle nut and washer, and cotter pin.
4. Swing the assembly to the extreme left and lift the top carriage from the lower carriage.

CAUTION: Be extremely careful not to damage the two bearing races.

XI Removal of the traversing arc.

NOTE: See operation No. 2, next page.



CLASS: LIGHT ARTILLERY Job Sheet No. 1

1. Remove the upper pintle housing washer.

2. Rap the traversing arc from the carriage spline with a brass drift. NOTE: Prick punch the traversing arc and place a corresponding mark opposite the first mark on the spline.

   CAUTION: Be sure to rap evenly all the way around in this step to prevent cocking on the spline.

3. Remove the traversing gear box cover.

JOB REPORT:

1. The gun was placed in firing position before disassembling. Yes ___ No ___

2. The segment locking plungers were held out while placing the wheel segments in position. Yes ___ No ___

3. The breech block was removed from the breech ring and stored safely. Yes ___ No ___

4. A hand was used to support the breech block while removing the operating crank. Yes ___ No ___

5. The breech block was lowered about one inch to allow the operating crank trunions to slip out of their slots. Yes ___ No ___

6. The clutch throw-out arm was removed to allow the removal of the shield. Yes ___ No ___

7. The parallelogram linkage was not disassembled during its removal. Yes ___ No ___

8. Three men guided the gun tube through the yokes during removal to prevent damage to the threads. Yes ___ No ___

9. The slight up and down movement of the recoil cylinder aided in the removal of the elevating mechanism. Yes ___ No ___

10. The safety screw was removed before removing the elevating arm assembly. Yes ___ No ___

CLASS: LIGHT ARTILLERY Job Sheet No. 1

'll. The carriage was swung to the extreme left before attempting to remove the assembly. Yes ___ No ___

APPROVED: _____

REMARKS:

Disassembly of the 37 M/M, anti-tank gun mounted on an M4 Carriage into prime units. (Cont'd.)

CLASS: LIGHT ARTILLERY Job Sheet No. 1

INSTRUCTIONS:

1. True or False Questions: If the statement is true encircle the T. If the statement is false encircle the F.

2. Multiple Choice Questions: Place a check mark ✓ in the space next to the correct statement.

3. Completion Questions: Write the omitted word in the lettered space in the left hand answer column opposite the question.

QUESTIONS:

T F 1. The first operation necessary when disassembling a 37 M/M anti-tank gun mounted on an M-3 carriage is to place the gun in firing position.

2. The tube is locked in the upper sleigh by the use of:
(a) _____ (a) cotter pins.
(b) _____ (b) cap screws.
(c) _____ (c) welding.
(d) _____ (d) lock nut and lock screw.

3. The operation of raising and lowering the breech block is controlled by:
(a) _____ (a) compressed air.
(b) _____ (b) hydraulic pressure.
(c) _____ (c) the elevating mechanism.
(d) _____ (d) the operating handle.

4. The elevating mechanism controls the:
(a) _____ (a) rate of gun fire.
(b) _____ (b) degree of traverse.
(c) _____ (c) height of gun tube.
(d) _____ (d) operation of the breech block.

5. The traversing mechanism controls the:
(a) _____ (a) operation of the clutch release mechanism.
(b) _____ (b) height of the gun carriage when being towed.
(c) _____ (c) degree of turn to right or left.
(d) _____ (d) elevation of sight mechanism.

(a) _____ 6. The recoil cylinder is provided with ____(a)____ which guide the sleigh during the recoil movement of the gun.

CLASS: LIGHT ARTILLERY JOB SHEET No. 1

(a)_____ 7. The top carriage rotates horizontally on the pintle pin which permits movement of the gun in ____(a)____.

(a)_____ 8. The pintle pin is housed in the __(a)__ which is assembled to the axle.

(a)_____ 9. The traversing arc is secured to the support and meshes with the __(a)__ of the traversing mechanism.

(a)_____ 10. The recoil cylinder is held to the top carriage by ____(a)____ caps.

RESTRICTED

ARTILLERY SECTION
ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND, MARYLAND

CLASS: LIGHT ARTILLERY

EXAMINATION No. 1

NAME:_____GROUP _____CO.____BN._____

INSTRUCTOR:_____DATE: _____ GRADE:_____

Subject: The 37 M/M anti-tank gun, M3, mounted on an M4 gun carriage.

INSTRUCTIONS:

1. True or False Questions: If the statement is true encircle the T. If the statement is false encircle the F.

2. Multiple Choice Questions: Place a check mark ✓ in the space next to the correct statement.

3. Completion Questions: Write the omitted word in the lettered space in the left hand answer column opposite the question.

QUESTIONS:

T F 1. The first operation necessary when disassembling a 37 M/M, anti-tank gun mounted on an M3 carriage is to place the gun in firing position.

T F 2. The axle is assembled to the support by a pin seated in a needle bearing assembly.

T F 3. During the reassembly of the gun carriage the compensating bar was installed before the installation of the wheel segments.

T F 4. The cocking lever is removed without having to depress the sear.

T F 5. An Allen screw is used to attach the firing control disc plunger.

T F 6. The traversing hand wheel is the only method used to change the position of the gun tube in traverse.

T F 7. The recoil of the 37 M/M anti-tank gun is controlled by hydro-spring action.

T F 8. The gear face of the traversing arc points to the rear of the carrier when installed.

CLASS: LIGHT ARTILLERY Examination

T T 9. The 37 M/M gun in service should be star gauged at approximately 20 per cent and 90 per cent of their average accured life in rounds fired.

T T 10. The best solution for cleaning the gun bore is one pound of soda ash to one gallon of water.

11. The tube is locked in the upper sleigh by the use of:
(a) _____ (a) cotter pins.
(b) _____ (b) cap screws.
(c) _____ (c) welding.
(d) _____ (d) lock nut and lock screw.

12. The operation of raising and lowering the breech block is controlled by:
(a) _____ (a) compressed air.
(b) _____ (b) hydraulic pressure.
(c) _____ (c) the elevating mechanism.
(d) _____ (d) the operating handle.

13. The elevating mechanism controls the:
(a) _____ (a) rate of gun fire.
(b) _____ (b) degree of traverse.
(c) _____ (c) height of gun tube.
(d) _____ (d) operation of the breech block.

14. The traversing mechanism controls the:
(a) _____ (a) operation of the clutch release mechanism.
(b) _____ (b) height of the gun carriage when being towed.
(c) _____ (c) degree of turn to right or left.
(d) _____ (d) elevation of sight mechanism.

15. The axle support gib bearings provide a free movement of the:
(a) _____ (a) carriage wheels.
(b) _____ (b) recoil mechanism.
(c) _____ (c) support around the horizontal pin.
(d) _____ (d) traversing mechanism.

16. The disc and wheel assembly are secured to the hub by:
(a) _____ (a) welding.
(b) _____ (b) cap screws.
(c) _____ (c) studs and nuts.
(d) _____ (d) lock rings.

CLASS: LIGHT ARTILLERY Examination

17. The wheel segments are locked in place by:
(a) _____ (a) welding.
(b) _____ (b) the use of bolts and nuts.
(c) _____ (c) the traveling lock.
(d) _____ (d) a plunger.

18. The trails are locked in traveling position by:
(a) _____ (a) pins.
(b) _____ (b) bolts and nuts.
(c) _____ (c) the traveling lock.
(d) _____ (d) the trail lugs.

19. The trails were locked in firing position by the use of:
(a) _____ (a) traveling lock.
(b) _____ (b) trail lock.
(c) _____ (c) a pin.
(d) _____ (d) a bolt and nut.

20. The compensating bar was placed in:
(a) _____ (a) the axle guides.
(b) _____ (b) position ahead of the axle.
(c) _____ (c) position below the axle.
(d) _____ (d) position above the axle.

21. The trails are attached to the compensating bar by the use of:
(a) _____ (a) welding.
(b) _____ (b) cap screws.
(c) _____ (c) hinge pins.
(d) _____ (d) trail locks.

22. The traveling lock is attached to the:
(a) _____ (a) trails.
(b) _____ (b) compensating bar.
(c) _____ (c) lower apron.
(d) _____ (d) right and left guard.

23. The sear was depressed to permit the release of the:
(a) _____ (a) firing pin from the firing pin holder.
(b) _____ (b) firing pin assembly.
(c) _____ (c) breech block from the breech ring.
(d) _____ (d) breech ring from the gun tube.

24. The tripper, trigger, trigger plunger and spring are supported in the:
(a) _____ (a) breech block.
(b) _____ (b) elevating mechanism.
(c) _____ (c) traversing mechanism.
(d) _____ (d) breech ring.

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25. The sear is notched for the engagement of the:
(a) _____ (a) firing spring.
(b) _____ (b) firing pin.
(c) _____ (c) sear lug of the guide.
(d) _____ (d) cocking lever plunger.

26. The elevating mechanism serrated nut is held in position by a:
(a) _____ (a) lock spring.
(b) _____ (b) disc spring.
(c) _____ (c) Allen screw.
(d) _____ (d) plunger and spring.

27. The thrust on the elevating gear shaft is controlled by:
(a) _____ (a) needle bearings.
(b) _____ (b) a bushing.
(c) _____ (c) thrust bearing and thrust washers.
(d) _____ (d) thrust pin and thrust washer.

28. Operation of the hand wheel controls:
(a) _____ (a) elevation of the gun.
(b) _____ (b) operation of the clutch release mechanism.
(c) _____ (c) movement of the traversing arc.
(d) _____ (d) adjustment of the gun in traverse.

29. The traversing arc is attached to the:
(a) _____ (a) axle.
(b) _____ (b) support.
(c) _____ (c) hand wheel shaft.
(d) _____ (d) worm wheel shaft.

30. The traverse release mechanism is operated by:
(a) _____ (a) the elevating knob.
(b) _____ (b) the traverse releasing handle.
(c) _____ (c) traveling lock.
(d) _____ (d) the parallelogram.

brass
31. The rails on the recoil cylinder are held to the cylinder by:
(a) _____ (a) machine screws.
(b) _____ (b) dowel pins.
(c) _____ (c) welding
(d) _____ (d) taper pins.

32. The action of the recoil cylinder is partially controlled by the use of:
(a) _____ (a) one spring in the recoil cylinder.
(b) _____ (b) two springs in the recoil cylinder.
(c) _____ (c) three springs in the recoil cylinder.
(d) _____ (d) four springs in the recoil cylinder.

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33. The recoil cylinder is filled with:
(a) _____ (a) 3 pints of recoil oil.
(b) _____ (b) 4 pints of recoil oil.
(c) _____ (c) 5 pints of recoil oil.
(d) _____ (d) 2 pints of recoil oil.

34. The upper carriage is attached to the lower carriage by a:
(a) _____ (a) needle bearings.
(b) _____ (b) thrust washer.
(c) _____ (c) pintle support pin.
(d) _____ (d) ball thrust bearing.

35. The recoil cylinder is held in place by:
(a) _____ (a) lugs.
(b) _____ (b) trunion bearing caps.
(c) _____ (c) support brackets.
(d) _____ (d) welding

36. The parallelogram linkage assembly is used to:
(a) _____ (a) to control elevation of tube.
(b) _____ (b) to adjust the gun tube and the telescope in a parallel line.
(c) _____ (c) to control traverse.
(d) _____ (d) to control trigger action.

37. The gun tube is prevented from turning in the upper sleigh by the use of:
(a) _____ (a) keys.
(b) _____ (b) set screws.
(c) _____ (c) a locking nut.
(d) _____ (d) two safety screws.

38. The line of sight through the telescope must be parallel with the axis of the bore of the gun and move with it, to accomplish this:
(a) _____ (a) 7 adjustments are necessary.
(b) _____ (b) 3 adjustments are provided.
(c) _____ (c) 5 adjustments are provided.
(d) _____ (d) 2 adjustments are provided.

39. The angular difference between the axis of bore and the telescope holder shall not exceed.
(a) _____ (a) 3 mils at both points.
(b) _____ (b) 2 mils at both points.
(c) _____ (c) 1 mil at both points.
(d) _____ (d) 1 1/2 mils at both points.

CLASS: LIGHT ARTILLERY Examination

40. In order to remove grease from the bearings and other parts:
(a) _____ (a) a soda ash solution is used.
(b) _____ (b) water is used.
(c) _____ (c) a dry cleaning solvent is used.
(d) _____ (d) crocus cloth is used.

(a) _____ 41. The top carriage rotates horizontally on the pintle pin which permits movement of the gun in __(a)__.

(a) _____ 42. When the trails are in the firing position __(a)__ are in contact with the trail brackets.

(a) _____ 43. The wheel bearing adjusting nut was tightened until a drag was felt when the wheel was rotated then the bearing adjusting nut was backed off __(a)__ castle.

(a) _____ 44. The operating arm of the tripper extends upward and carries a cam surface for actuating the __(a)__.

(a) _____ 45. A handle on the trigger actuator is provided for hand operation of the __(a)__.

(a) _____ 46. The traversing release mechanism is actuated by movement of the traverse releasing handle toward the __(a)__ of the gun.

(a) _____ 47. The recoil mechanism of the 37 M/M gun uses two counter recoil springs and a Brass __(a)__ was placed in the cylinder between the ends of these springs.

(a) _____ 48. The extractors were installed and the breech block was lowered through the breech ring after depressing the __(a)__ the operating crank was installed in the breech block and the breech block assembly was raised to install the operating lever.

(a) _____ 49. The purpose of bore sight adjustment is to parallel the line of sight passing through the telescope with __(a)__ and vertical axis of bore of gun.

(a) _____ 50. Failure of the gun to fire is caused by defective ammunition, broken or burred firing __(a)__, weak or broken firing spring, defective trigger actuator mechanism, damaged or missing trigger plunger spring, broken trigger arm, gun not completely in battery.

R E S T R I C T E D

ARTILLERY SECTION
ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND, MARYLAND

CLASS: LIGHT ARTILLERY

INSTRUCTORS' EXAMINATION

NAME: _____ CO. _____ BN. _____

DATE: _____ GRADE: _____

Subject: The 37 M/M anti-tank gun, M3 mounted on an M4 carriage.

INSTRUCTIONS:

1. True or False Questions: If the statement is true encircle the T. If the statement is false encircle the F.

2. Multiple Choice Questions: Place a check mark ✓ in the space next to the correct statement.

3. Completion Questions: Write the omitted word in the lettered space in the left hand answer column opposite the question.

QUESTIONS:

T F 1. There are several features on the 37 M/M anti-tank gun, M3, mounted on an M4 carriage that are required for a good anti-tank weapon; it is a mobile, slow-firing, accurate gun; it uses hard hitting armour piercing ammunition and the top carriage has a pintle type of mount for fast traversing; it is simple in design and function and affords protection for the crew.

T F 2. This weapon is a single shot weapon with a drop type of breech block and uses an inertia type of firing mechanism.

T F 3. The tube is a one piece forging with a rifled bore of uniform right hand twist, one turn in 25 calibers, and has an average life of 10,000 rounds.

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T F 4. The weight of this gun is; 191 lbs., weight of gun and carriage; 912 lbs., elevation; 15 degrees, depression 10 dgr., traverse right or left 30 dgr., range; maximum; 8,500, Max. Effective; 3,400 yds., Avr. eff. 1,700 yds. Recoil mechanism, Hydro-spring type, Normal recoil 20 inches, Max. 20 1/2. Minimum 17 inches. The recoil cylinder is filled with 5 pints of low pour point heavy recoil oil. Tires, 6 ply, 6:00-16. Pressure 10 lbs. Ammunition; weight AP round, 3.14 lbs. projectile 1.92 lbs., muzzle velocity 2600 feet per sec. Weight of HE round, 2.72 lbs. projectile, 1.23 lbs., muzzle vel. 2750 ft. per sec.

T F 5. The first operation necessary when disassembling a 37M/M anti-tank gun is to place the gun in firing position.

T F 6. The axle is assembled to the support by a pin seated in a needle bearing assembly.

T F 7. During the reassembly of the gun carriage the compensating bar was installed before the installation of the wheel segments.

T F 8. The gib bearings serve to distribute all the force of the recoil to the right trail.

T F 9. The cocking lever is removed without having to depress the sear.

T F 10. The cocking lever plunger spring is depressed by the sear.

T F 11. An Allen screw is used to attach the firing control disk plunger.

T F 12. The firing control link hinge pin is welded to the bracket.

T F 13. The traversing mechanism controls the height of the tube.

T F 14. The traversing hand wheel is the only method used to change the position of the gun tube in traverse.

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T F 15. The recoil of th 37 M/M, anti-tank gun is controlled by hydro-spring action.

T F 16. The breech ring and the piston rod are connected together by the use of welding.

T F 17. The gear face of the traversing arc points to the rear of the carrier when installed.

T F 18. The traversing gear box cover is installed after the installation of the traversing arc.

T F 19. Inspection is for the purpose of determining the condition, whether repairs or adjustments are required, and the remedies necessary to insure that the material is in such serviceable condition that it will function properly.

T F 20. The 37 M/M guns in service should be star gauged at approximately 20 per cent and 90 percent of their average accured life in rounds fired.

21. The tube is locked in the upper sleigh by the use of:

(a) _____ (a) cotter pins.
(b) _____ (b) cap screws.
(c) _____ (c) welding.
(d) _____ (d) lock nut and lock screw.

22. The operation of raising and lowering the breech block is controlled by:

(a) _____ (a) compressed air.
(b) _____ (b) hydraulic pressure.
(c) _____ (c) the elevating mechanism.
(d) _____ (d) the operating handle.

23. The elevating mechanism controls the:

(a) _____ (a) rate of gun fire.
(b) _____ (b) degree of traverse.
(c) _____ (c) height of gun tube.
(d) _____ (d) operation of the breech block.

24. The traversing mechanism controls the:

(a) _____ (a) operation of the clutch release mechanism.
(b) _____ (b) height of the gun carriage when being towed.
(c) _____ (c) degree of turn to right or left.
(d) _____ (d) elevation of sight mechanism.

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25. The axle support gib bearings provide a free movement of the:
(a) _____ (a) carriage wheels.
(b) _____ (b) recoil mechanism.
(c) _____ (c) support around the horizontal pin.
(d) _____ (d) traversing mechanism.

26. The disc and wheel assembly are secured to the hub by:
(a) _____ (a) welding.
(b) _____ (b) cap screws.
(c) _____ (c) studs and nuts.
(d) _____ (d) lock rings.

27. The wheel segments are locked in place by:
(a) _____ (a) welding.
(b) _____ (b) the use of bolts and nuts.
(c) _____ (c) the traveling lock.
(d) _____ (d) a plunger.

28. The trails are locked in traveling position by:
(a) _____ (a) pins.
(b) _____ (b) bolts and nuts.
(c) _____ (c) the traveling lock.
(d) _____ (d) the trail lugs.

29. The trails were locked in firing position by the use of:
(a) _____ (a) traveling lock.
(b) _____ (b) trail lock.
(c) _____ (c) a pin.
(d) _____ (d) a bolt and nut.

30. The compensating bar was placed in:
(a) _____ (a) the axle guides.
(b) _____ (b) position ahead of the axle.
(c) _____ (c) position below the axle.
(d) _____ (d) position above the axle.

31. The trails are attached to the compensating bar by the use of:
(a) _____ (a) welding.
(b) _____ (b) cap screws.
(c) _____ (c) hinge pins.
(d) _____ (d) trail locks.

32. The traveling lock is attached to the:
(a) _____ (a) trails.
(b) _____ (b) compensating bar.
(c) _____ (c) lower apron.
(d) _____ (d) right and left guard.

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33. The firing spring retainer cap was depressed and turned.
(a) _____ (a) one full turn.
(b) _____ (b) one half turn.
(c) _____ (c) one third turn.
(d) _____ (d) one quarter turn.

34. The sear was depressed to permit the release of the:
(a) _____ (a) firing pin from the firing pin holder.
(b) _____ (b) firing pin assembly.
(c) _____ (c) breech block from the breech ring.
(d) _____ (d) breech ring from the gun tube.

35. The tripper, trigger, trigger plunger and spring are supported in the:
(a) _____ (a) breech block.
(b) _____ (b) elevating mechanism.
(c) _____ (c) traversing mechanism.
(d) _____ (d) breech ring.

36. The sear is notched for the engagement of the:
(a) _____ (a) firing spring.
(b) _____ (b) firing pin.
(c) _____ (c) sear lug of the guide.
(d) _____ (d) cocking lever plunger.

37. The elevating mechanism serrated nut is held in position by a:
(a) _____ (a) lock pin.
(b) _____ (b) disc spring.
(c) _____ (c) Allen screw.
(d) _____ (d) plunger and spring.

38. The thrust on the elevating gear shaft is controlled by:
(a) _____ (a) needle bearings.
(b) _____ (b) a bushing.
(c) _____ (c) thrust bearing and thrust washers.
(d) _____ (d) thrust pin and thrust washer.

39. The elevating mechanism short shaft thrust is taken care of by two thrust bearings and washers, the shaft is supported by:
(a) _____ (a) roller bearings.
(b) _____ (b) bushings.
(c) _____ (c) ball bearings.
(d) _____ (d) needle bearings.

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40. Operation of the hand wheel controls:
(a) _____ (a) elevation of the gun.
(b) _____ (b) operation of the clutch release mechanism.
(c) _____ (c) movement of the traversing arc.
(d) _____ (d) adjustment of the gun in traverse.

41. The traversing arc is attached to the:
(a) _____ (a) axle.
(b) _____ (b) support.
(c) _____ (c) hand wheel shaft.
(d) _____ (d) worm wheel shaft.

42. The traverse release mechanism is operated by:
(a) _____ (a) the elevating knob.
(b) _____ (b) the traverse releasing handle.
(c) _____ (c) traveling lock.
(d) _____ (d) the parallelogram.

43. The brass rails on the recoil cylinder are held to the cylinder by:
(a) _____ (a) machine screws.
(b) _____ (b) dowel pins.
(c) _____ (c) welding.
(d) _____ (d) taper pins.

44. The action of the recoil cylinder is partially controlled by the use of:
(a) _____ (a) one spring in the recoil cylinder.
(b) _____ (b) two springs in the recoil cylinder.
(c) _____ (c) three springs in the recoil cylinder.
(d) _____ (d) four springs in the recoil cylinder.

45. The recoil cylinder is filled with:
(a) _____ (a) 3 pints of recoil oil.
(b) _____ (b) 4 pints of recoil oil.
(c) _____ (c) 5 pints of recoil oil.
(d) _____ (d) 2 pints of recoil oil.

46. The upper carriage is attached to the lower carriage by a:
(a) _____ (a) needle bearings.
(b) _____ (b) thrust washer.
(c) _____ (c) pintle support pin.
(d) _____ (d) ball thrust bearing.

47. The recoil cylinder is held in place by:
(a) _____ (a) lugs.
(b) _____ (b) trunion bearing caps.
(c) _____ (c) support brackets.
(d) _____ (d) welding.

CLASS: LIGHT ARTILLERY Instructors' Examination

48. The parallelogram linkage assembly is used to:
(a) _____ (a) to control elevation of tube.
(b) _____ (b) to adjust the gun tube and the telescope in a parallel line.
(c) _____ (c) to control traverse.
(d) _____ (d) to control trigger action.

49. The gun tube is prevented from turning in the upper sleigh by the use of:
(a) _____ (a) keys.
(b) _____ (b) set screws.
(c) _____ (c) a locking nut.
(d) _____ (d) two safety screws.

50. The line of sight through the telescope must be parallel with the axis of the bore of the gun and move with it, to accomplish this:
(a) _____ (a) 7 adjustments are necessary.
(b) _____ (b) 3 adjustments are provided.
(c) _____ (c) 5 adjustments are provided.
(d) _____ (d) 2 adjustments are provided.

51. The angular difference between the axis of bore and the telescope holder shall not exceed:
(a) _____ (a) 3 mils at both points.
(b) _____ (b) 2 mils at both points.
(c) _____ (c) 1 mil at both points.
(d) _____ (d) 1 1/2 mils at both points.

52. The parallelogram linkage assembly is adjusted:
(a) _____ (a) by means of shims.
(b) _____ (b) by bending the linkage.
(c) _____ (c) by adjusting the differential screw and eccentrics.
(d) _____ (d) by changing the position of the upper mounting bolts.

(a) _____ 53. The recoil cylinder is provided with ___(a)___ which guide the sleigh during the recoil movement of the gun.

(a) _____ 54. The top carriage rotates horizontally on the pintle pin which permits movement of the gun in a ___(a)___.

(a) _____ 55. The pintle pin is housed in the ___(a)___ which is assembled to the axle.

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(a) _____ 56. The traversing arc is secured to the support and meshes with the (a) of the traversing mechanism.

(a) _____ 57. With the trails spread, (a) contact brackets on the support.

(a) _____ 58. A section of the (a) is carried on each trail.

(a) _____ 59. The trail spades are at the (a) end of the trail.

(a) _____ 60. The trail lever is locked by a (a).

(a) _____ 61. The lunette is mounted on the (a) trail.

(a) _____ (b) _____ 62. The apron is attached by the use of (a) (b).

(a) _____ 63. A (a) is used to prevent leakage of wheel bearing lubricant.

(a) _____ 64. The wheel bearing adjusting nut was tightened until a drag was felt when the wheel was rotated then the bearing adjusting nut was backed off (a) castle.

(a) _____ 65. The retainer is a round plug which closes the (a) assembly hole in the breech block.

(a) _____ 66. The firing pin bears rearward on the (a) and forward on the stop.

(a) _____ 67. The operating arm of the tripper extends upward and carries a cam surface for actuating the (a).

(a) _____ 68. Adjustment of the gun in elevation is transmitted from the knob to the (a) by a system of shafts and gears.

(a) _____ 69. The (a) of the elevation mechanism are all mounted on anti-friction bearings and the gear case is sealed by oil retainers.

(a) _____ 70. The (a) actuator is assembled on a bracket and consists of a plunger and trigger lever.

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(a) _____ 71. A handle on the trigger actuator is provided for hand operation of the (a).

(a) _____ 72. The traversing release handle is returned to its normal position by the action of (a).

(a) _____ 73. The traversing release mechanism is actuated by movement of the traverse releasing handle toward the (a) of the gun.

(a) _____ 74. The traversing arc is mounted on (a) which are a part of the support.

(a) _____ 75. The recoil mechanism of the 37 M/M gun uses two counter recoil springs and a (a) was placed in the cylinder between the ends of these springs.

(a) _____ 76. The front of the recoil cylinder was (a) to drain the recoil oil.

(a) _____ 77. The piston valve is held in position by the use of a (a).

(a) _____ 78. Leakage of oil from the recoil cylinder is prevented by the use of a piston (a) gland.

(a) _____ 79. The shoulder guard was placed in position and the dowel pins were lined up with their sockets before installation of the (a).

(a) _____ 80. The firing mechanism plunger and (a) were installed and a wrench was used to hold the cable end while the plunger was screwed into position.

(a) _____ 81. The throw-out (a) handle was placed in position and the clevis was aligned with the hole in the clutch throw-out arm before installing the clevis pin and cotter key.

(a) _____ 82. The trigger plunger and spring were held in a (a) position while the trigger was installed.

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(a) _____ 83. The extractors were installed and the breech block was lowered through the breech ring after depressing the (a), the operating crank was installed in the breech block and the breech block assembly was raised to install the operating lever.

(a) _____ 84. The purpose of bore sight adjustment is to parallel the line of sight passing through the telescope with (a) and vertical axis of bore of gun.

(a) _____ 85. The telescope, M6, is a straight tube telescope with no (a).

(a) _____ 86. A linkage system connecting the telescope holder with the gun trunion transmits (a) to the telescope as the gun is elevated or depressed.

(a) _____ 87. To facilitate identification all oil holes and grease fittings should be made conspicuous by circling with bright (a).

(a) _____ 88. Gear cases and other assemblies packed with grease are changed and repacked every (a) months of use by Ordnance maintenance personnel.

(a) _____ 89. Failure of the gun to fire can be caused by weak or broken (a) burred or broken firing pin and the correction necessary is to replace the broken or defective part.

(a) _____ 90. Backlash or binding in the elevating mechanism is usually caused by the short shaft gear (a) being loose.

(a) _____ 91. Excessive end play in the traversing mechanism is usually caused by a loose (a) gear.

(a) _____ 92. Failure of the quick release mechanism is usually caused by a weak or broken throw-out (a) spring.

(a) _____ 93. Failure of the gun piece to return to the battery is usually caused by weak or broken counter recoil springs or excessive oil in the (a) mechanism, occasionally dirty or burred rails and guides will be at fault.

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(a) _____ 94. When the gun piece returns to the battery with too great a shock the cause is not enough ___(a)___ in the recoil mechanism.

(a) _____ 95. A leakage of oil from the recoil cylinder is usually caused by a worn ___(a)___ packing or gasket.

(a) _____ 96. The length of the carriage from muzzle to lunette is ___(a)___ inches.

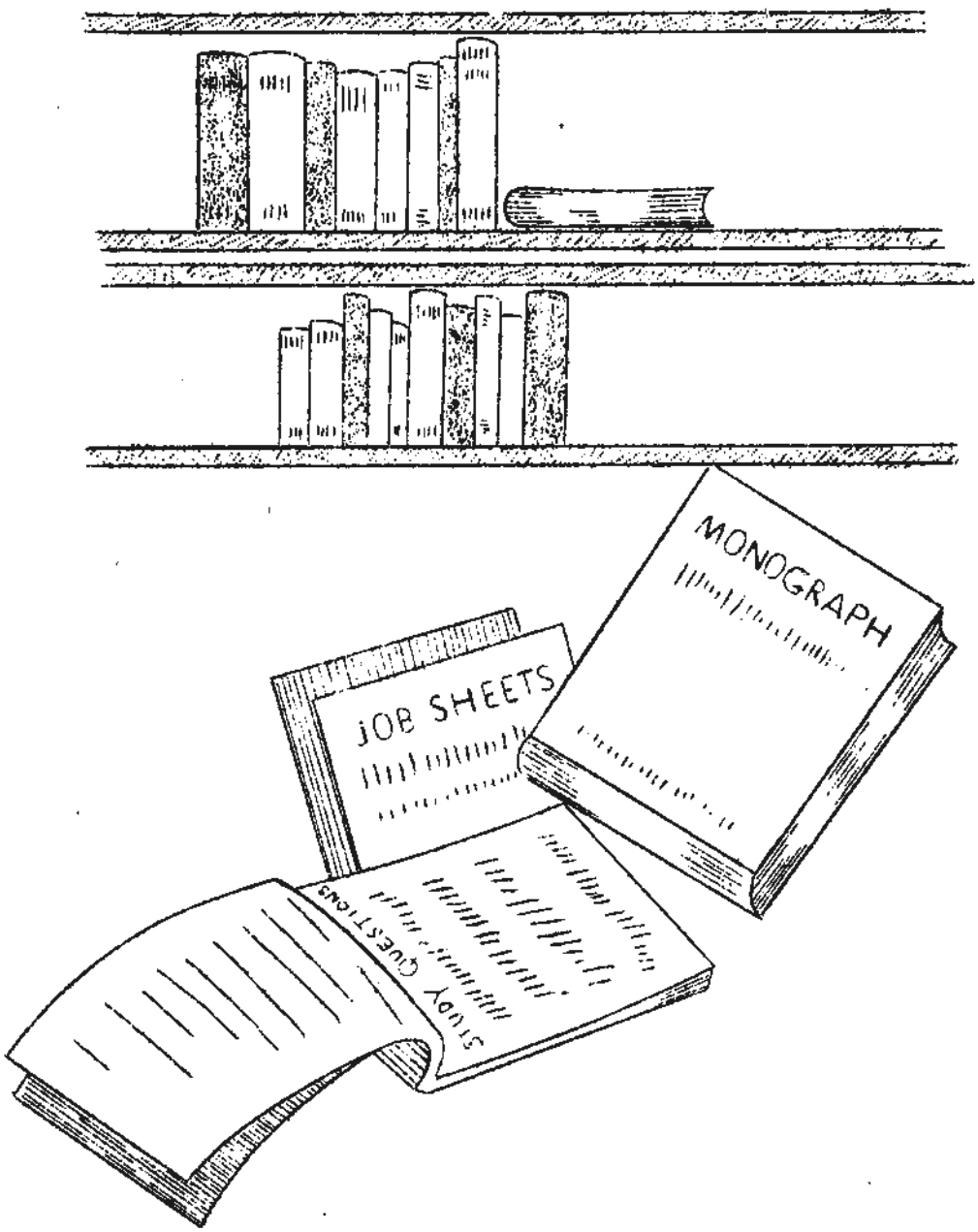
(a) _____ 97. The overall travelling height of the carriage is ___(a)___ inches measured at the hub caps.

98. Describe in detail the complete assembly of the breech block assuming that it is completely disassembled.

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99. Describe in detail the assembly of the breech block in the breech ring and the inspections necessary to see that it is operating properly.

100. Describe in detail the action that takes place concerning the recoil mechanism when the gun is fired.

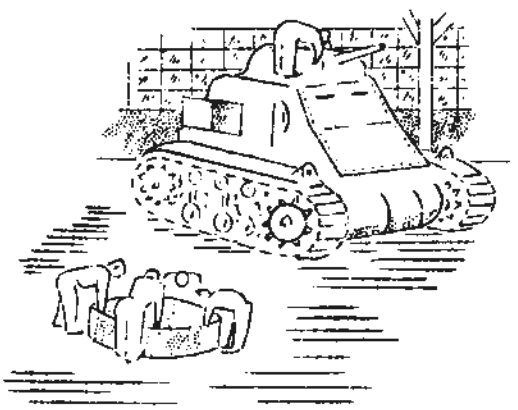


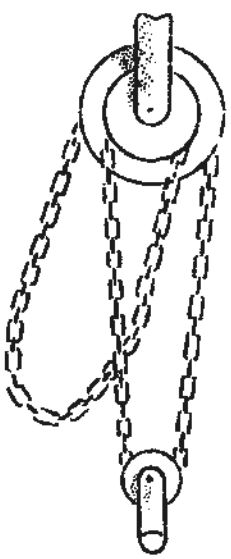
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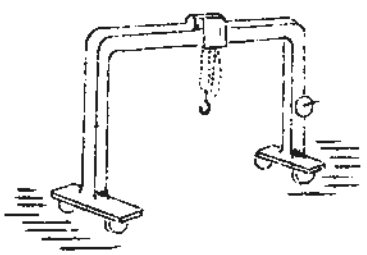
material for the trainee.....

I N T R O D U C T I O N

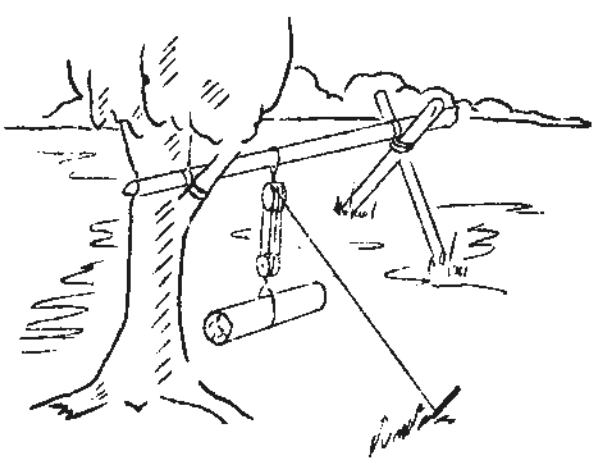
Almost every Ordnance non-commissioned officer will at some time have to handle an object which is too heavy for him and his men to lift. He will then use some kind of mechanical device to multiply human strength so that the lifting can be done efficiently.







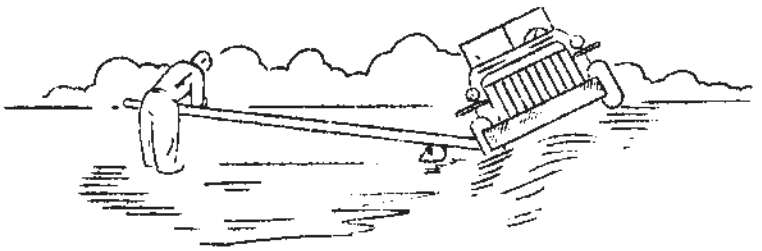
In factories and in base shops there is ready-made equipment such as chain falls, gantry cranes and A-frames.



They are specially designed lifting devices which require little thought on the part of the user. Naturally, these are not available in the field.

MACHINES AND MECHANICAL ADVANTAGE

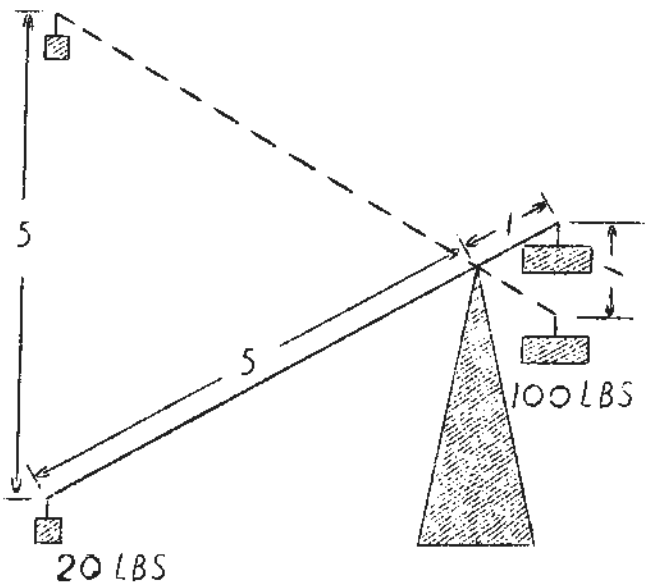
Field rigging makes use of various devices which increase the force that a man can exert, but in all these only one basic principle is involved.



This principle is:

A small force applied over a great distance will move a great load a short distance.

This is shown by the lever. The small weight on the long end of the lever can move a great distance and exactly balance the large weight which moves a short distance. The work done - the weight times the distance it moves - is the same in both cases. Therefore there is no energy gained.



We see in the sketch that a weight of 20 pounds exactly balances another which is 5 times as heavy, or 100 lbs., on the lever. This is true because the small weight moves 5 times as far as the large weight. We also notice that the long lever arm is 5 times as long as the short one, and that the small weight is

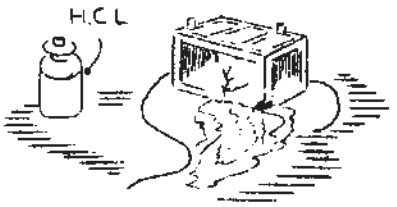
(TEST: The tackle you are to use should be formed with the rope to be tested. Fasten it between two fixed objects and apply force stronger than that to be used in actual lifting.)

CARE AND STORAGE OF ROPE

When storing or handling rope be sure to guard against:

1. Commercial Acids:

A common acid (Sulphuric) is found in automobile batteries. Because it is very strong, never allow rope to come in contact with batteries that may be lying about unprotected.



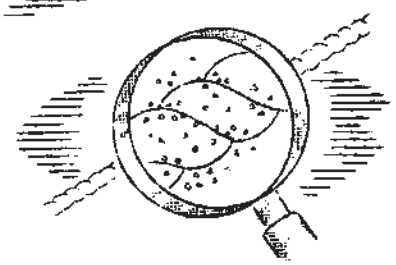
2. Uric Acid:

This is found in urine.



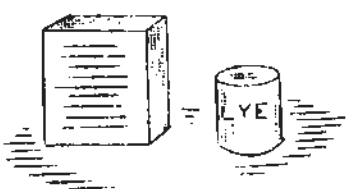
3. Sand:

This may be picked up almost anywhere. It cuts the inner fibres. Wash the rope frequently.



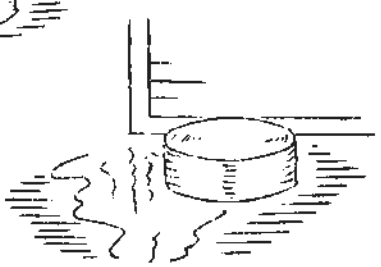
4. Commercial Caustic:

This weakens rope as does acid.



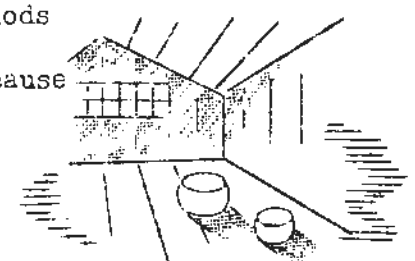
5. Mold:

This will attack any wet rope, especially if it is dirty. Store rope in a cool dry place.



6. Dry-Rot:

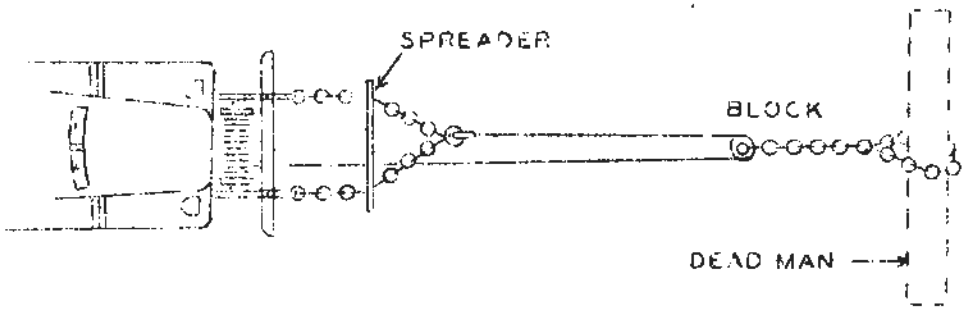
Storing in a hot dry place for long periods causes rope to become weak and limp, because of dry-rot. Avoid storing in attics or furnace rooms.



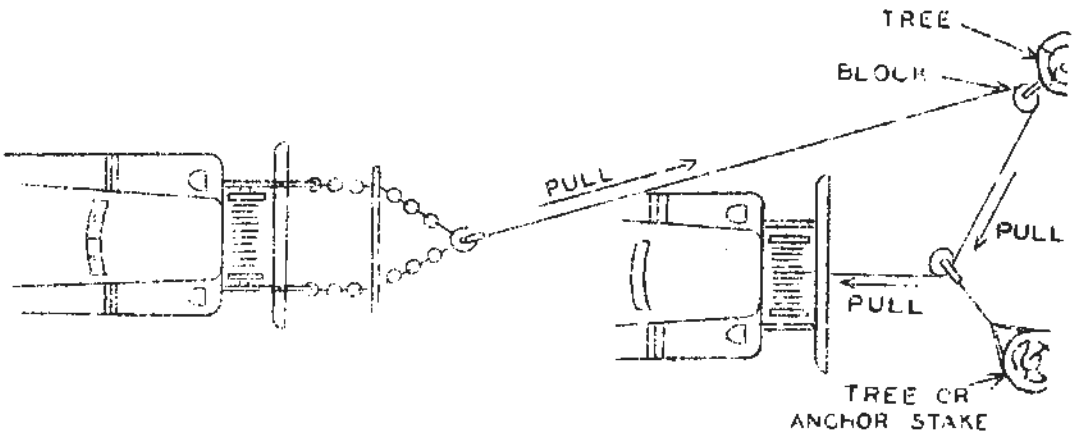
New rope should make a creaking sound when it is tied or twisted. If it does not do this there is reason to doubt its strength. It should be tested before being used.

Arrangements for pulling vehicles over difficult terrain varies according to circumstances. Several typical situations are shown. Minor variations of these can be used in most cases.

For exceptionally heavy going the arrangement shown below is ideal. The pulling power of the winch is doubled without exceeding its capacity.



In the arrangement below, notice the position of the anchored stakes. They are placed exactly opposite the direction of pull of the cables.





...simplified explanations of difficult technical terms and concepts.....furnished each trainee for use in the course and subsequent reference in the field.....

DIOPTER SCALE:
Graduations in diopters placed on a scale to show the setting of the eyepiece for each individual eye and to allow quick and accurate focusing of the eyepiece if the setting of the observer is known.

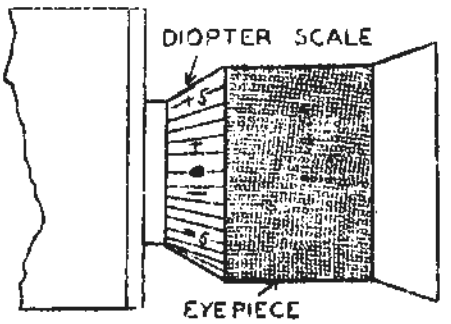


Fig. 30 - Diopter scale of Field Glass

DISPERSION:
The separation of a beam of white light into its component colors, as in passing through a prism.

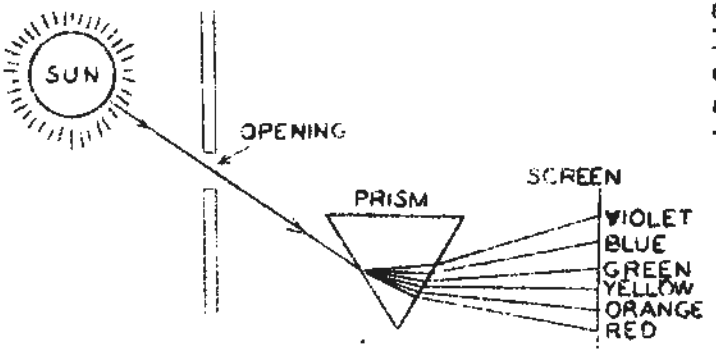


Fig. 31 - Dispersion

DISTORTION: (see ABERRATION)

DIVERGENT: Proceeding or extending from a common point.

DIVERGING LENS: (see LENS, DIVERGING)

DOUBLE VISION: An undesirable condition existing when the optical axes of the two telescopes of a binocular instrument are not parallel. The two separate fields of view seen through the instrument will not correctly superimpose as a result, and everything appears double in the field of view.

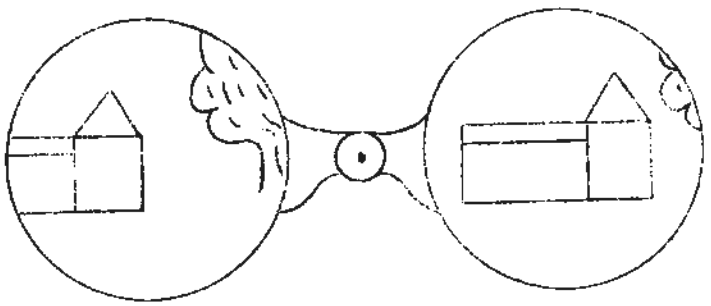


Fig. 32a Looking through each telescope separately.

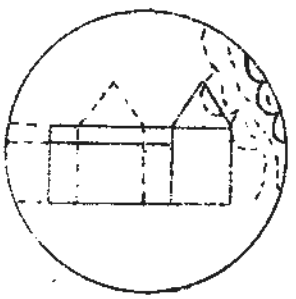


Fig. 32b Looking through both telescopes simultaneously.

DRIFT: The departure of a projectile from the vertical plane containing the axis of the bore, due to the action of air resistance, rotation, and gravity.

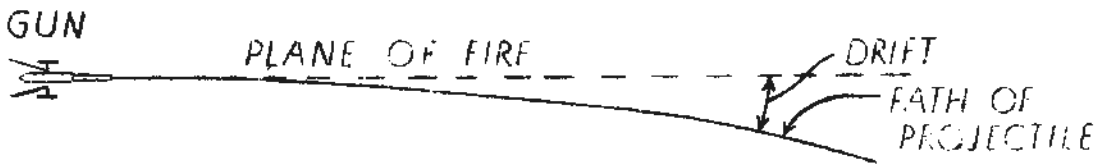


Fig. 33 - Trajectory viewed from above (The drift is exaggerated)

E

EFFECTIVE APERTURE OF OBJECTIVE: Diameter of that aperture through which pass only light rays which are effective and essential to the formation of the image. This is sometimes obtained by the use of a diaphragm. (see APERTURE OF OBJECTIVE).

ELEMENTARY LENS EQUATION: Law giving the quantitative relation between the distance of the object, image and principal focus of the lens. If we represent these values by "Do", "Di", and F respectively, we have:

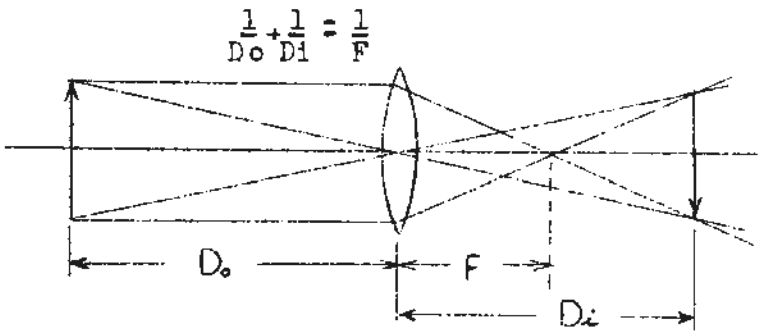


Fig. 34 - Lens equation

EMERGENT: Coming out of, or emerging from.

EMERY: Abrasive material used to grind down glass and metal.

ENTRANCE PUPIL: The smallest diaphragm or opening for the rays of light that enter the instrument; those rays of light formed in a pencil of light that are effective to the optical system.

ERECTING SYSTEM: A set-up of lenses, or prisms, used in an instrument to make the image appear upright and in the same position as the naked eye would see it.

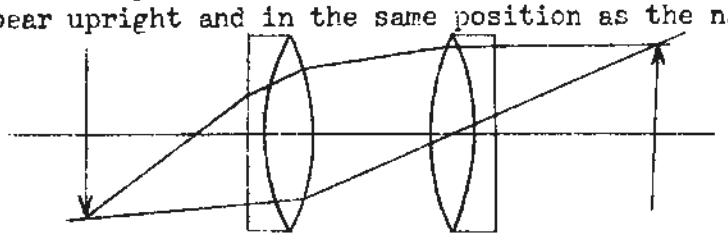


Fig. 35 - Lens erecting system

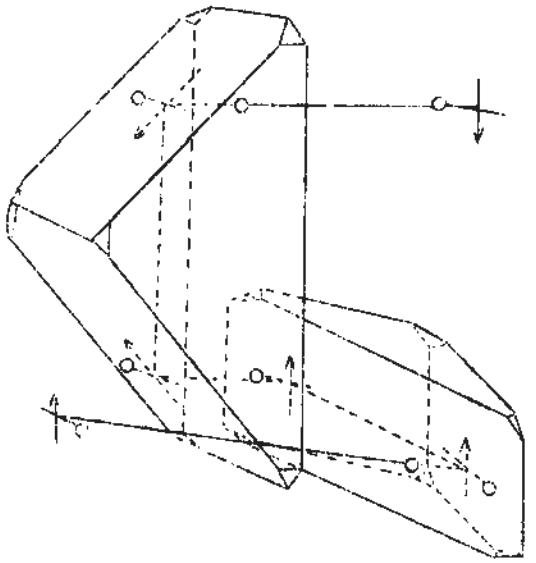


Fig. 36
Porro prism
erecting system

ETCHING: A process of engraving, wherein lines are produced by the biting or cutting action of an acid. (see RETICLE)

EXIT PUPIL: The bundle of rays emerging from the eyepiece. It can be seen as a luminous circle by looking at the eyepiece from a distance of about eight inches.

EYE DISTANCE: The distance from the pupil of the eye to the eye lens of an instrument.

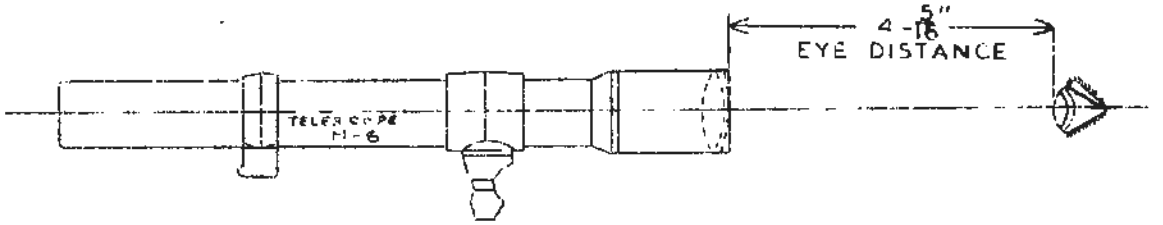


Fig. 37 - Eye distance (Telescope, M6)

EYELENS: The lens of an instrument that is nearest the eye. (see EYEPIECE)

EYEPIECE: An optical system usually containing an eyelens and a field-lens. This arrangement is used in an instrument to form a virtual, enlarged image of the real image formed by the objective. The lens nearest the eye is called the eyelens and the lens directly in front of the

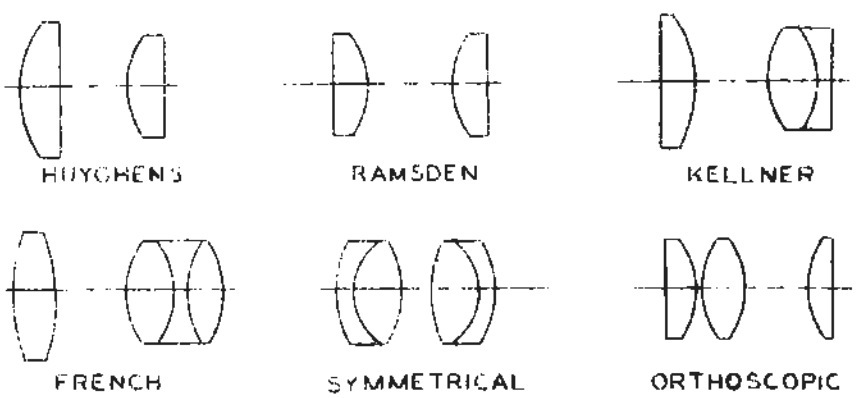
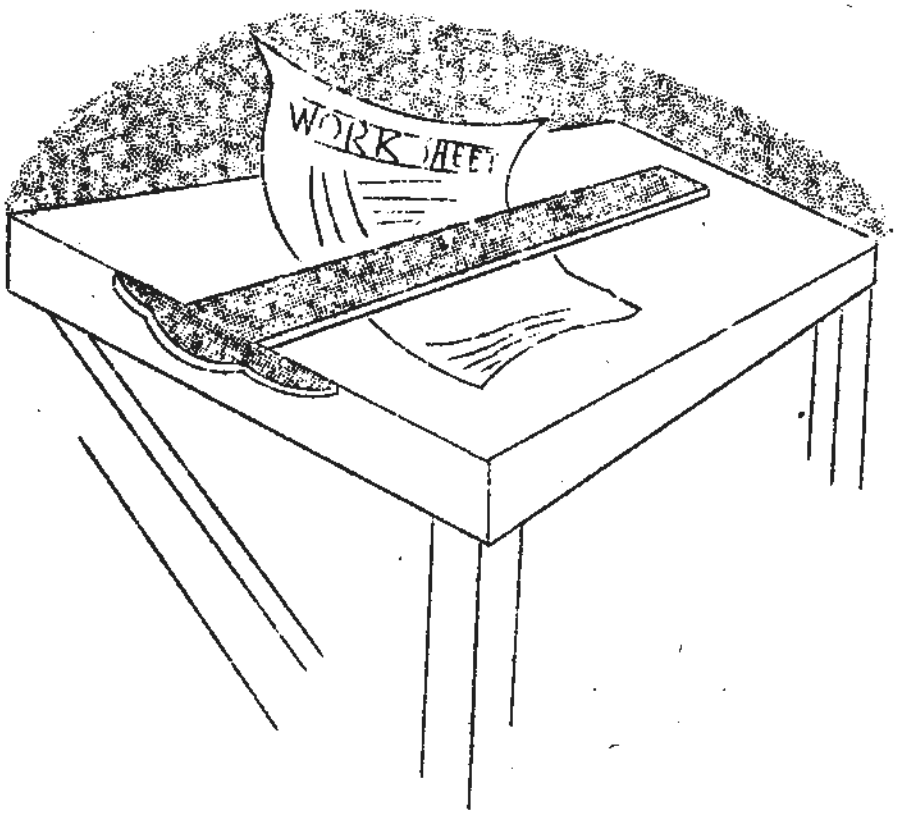


Fig. 38 - Common Types of Eyepieces



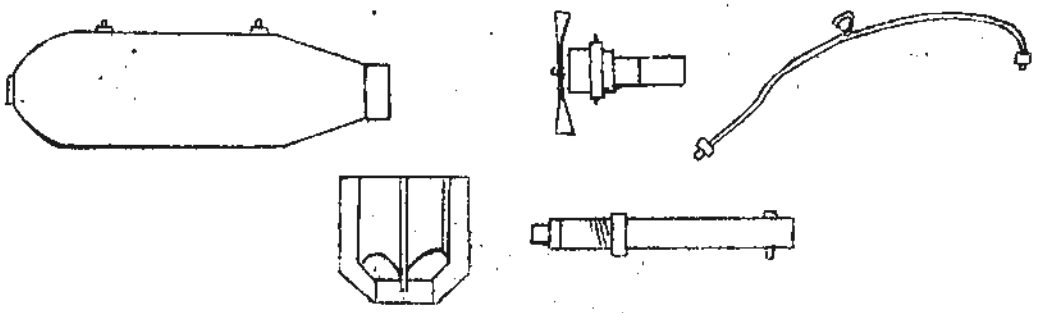
...daily work sheets...following class-

room instruction and practice.....

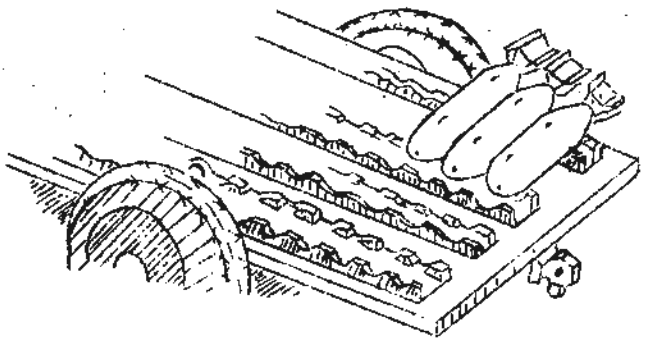
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DAILY WORK SHEET #8

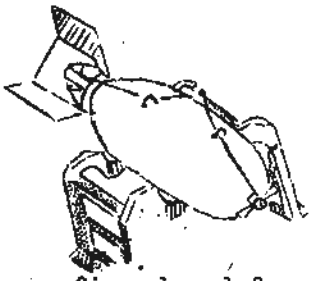
FINNING AND FUZING OF BOMBS



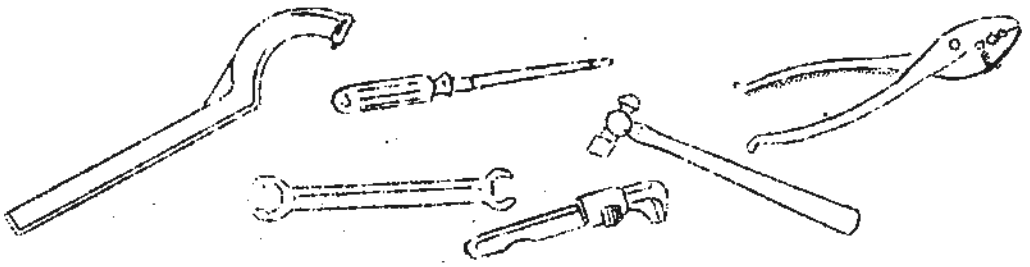
1. Here are pictured the components necessary to assemble the complete round. By numbering the parts, show the order in which you would assemble this bomb.
2. When assembling the fins to the bomb body, the_____of the fin assembly is lined up with the_____ _____.



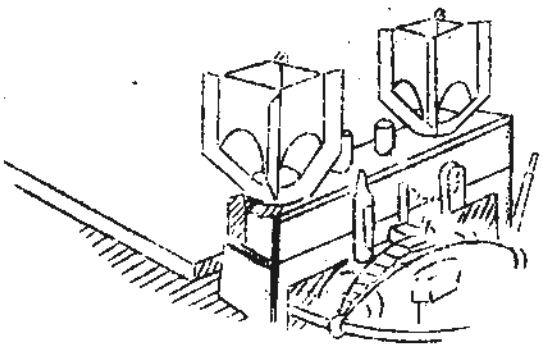
3. We know that the bombs loaded on this trailer weigh _____ pounds because they are _____and_____.
4. The fuzes for the bombs are carried in the_____of the _____. They are kept in the _____ _____until ready to insert them in the bomb body.
5. If you were fuzing a demolition bomb without assistance, you (would) (would not) remove both closing plugs at the same time in order to cut down on time.



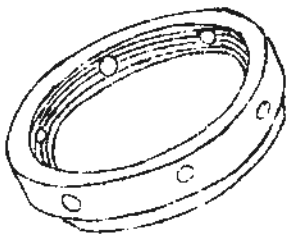
6. This bomb has just been finned and fuzed. It was lifted from the_____and placed on the _____ before the fin and fuzes were assembled. The bomb must weigh at least_____pounds.
7. Before inserting the fuze, it is necessary to make certain that the_____ _____is clean.



8. Of these tools that are found in the tool chests, which would you use in finning and fuzing bombs?
9. When assembling the arming wire to the fuzes on a demolition bomb, the Fahnestock clip is placed on the_____ _____ which runs through the_____fuze.

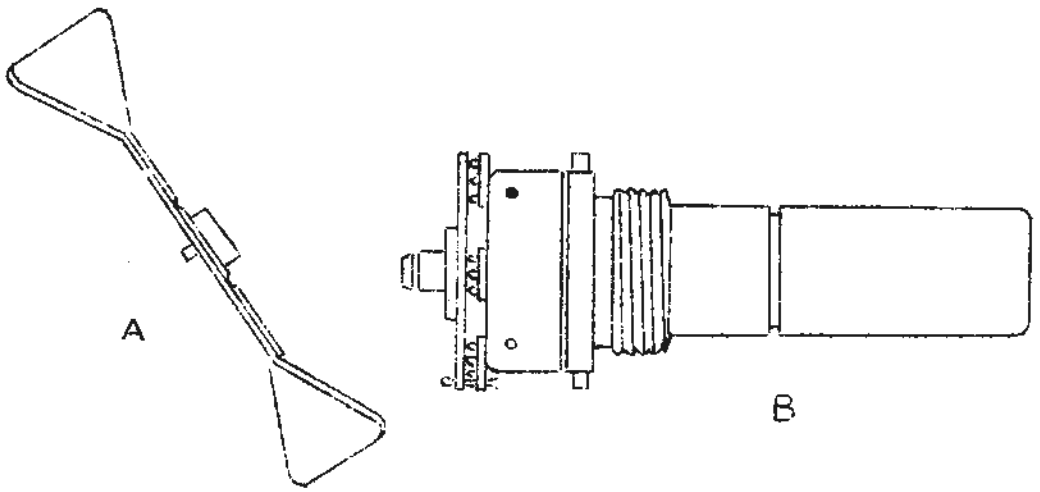


10. These fins are mounted on_____ _____with fin spacers. Fins for bombs of_____pounds or more are carried in this manner.
11. If you were inserting a fuze in a bomb, you would use_____ _____to tighten it into the fuze cavity.
12. The_____adapter booster is used with the M106 tail fuze.



13. Above is pictured a _____ _____ _____ _____. This is on the _____of the bomb, and is removed or tightened by means of a _____ _____.

14. Before the arming wire is assembled to the fuze it must be passed through the _____ _____.

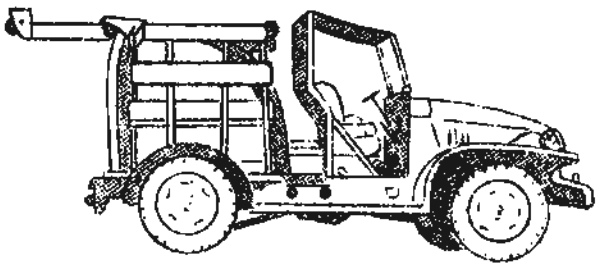


15. When A and B are assembled we have an M103 fuze. This is known as an _____ _____fuze. A (should) (should not) be assembled to B before B is assembled to the bomb.

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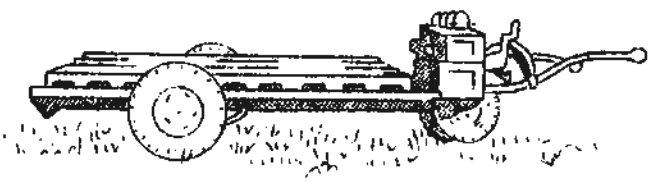
DAILY WORK SHEET #9

BOMB TRUCK AND TRAILER EQUIPMENT

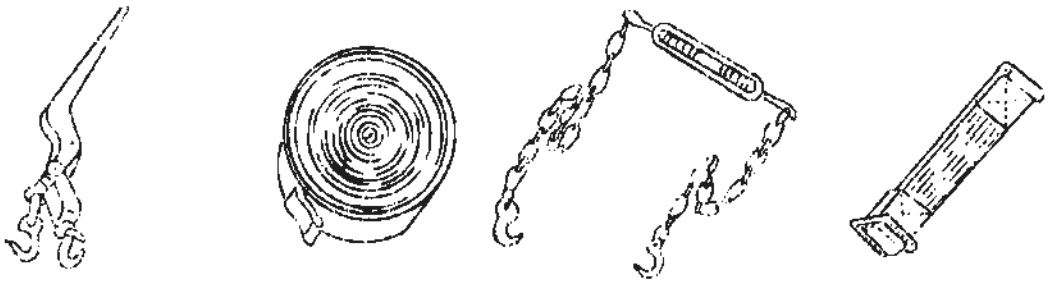


1. The above drawing is of the standard bomb _____.
   It is a _____ wheel drive _____, _____ ton, with the
   model number _____.
2. The vehicle shown in question 1 has seating space for _____
   persons. This personnel consists of a _____ _____,
   a _____, and _____ munition workers.

3.

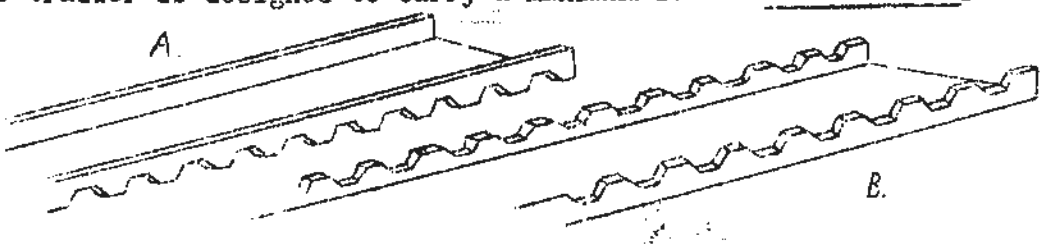


   This is a _____ _____. It is used for _____
   _____. It has _____ wheels, and the model number is
   _____.
4. A provision has been made for "braking" the trailer. This is
   known as the _____ _____ system.
   In addition to this system, the trailer is equipped with a
   _____ _____ brake for parking purposes.



5. Here is pictured some equipment for the bomb trailer. Identify each. They are used to _____.

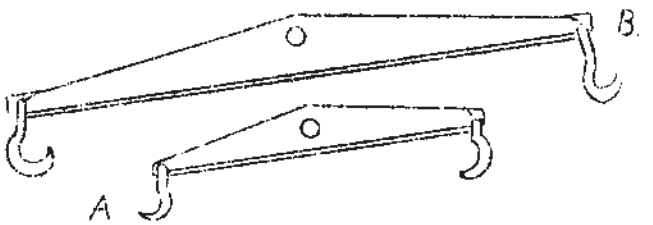
6. The bomb service truck is equipped to tow _____ trailers. The trailer is designed to carry a maximum load of _____ pounds.



7. Here are two channel irons: A is in the position for carrying bombs which weigh from _____ pounds to _____ pounds; B is in the position for carrying bombs which weigh _____ pounds or less.

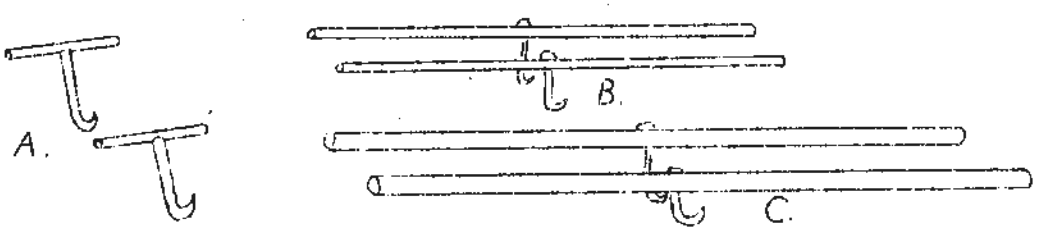
8. The bomb trailer is connected to the bomb service truck by means of a _____.

9.



Pictured here are two _____. A is _____ inches in length, and is used on bombs up to and including _____ pounds. B is _____ inches long.

10.



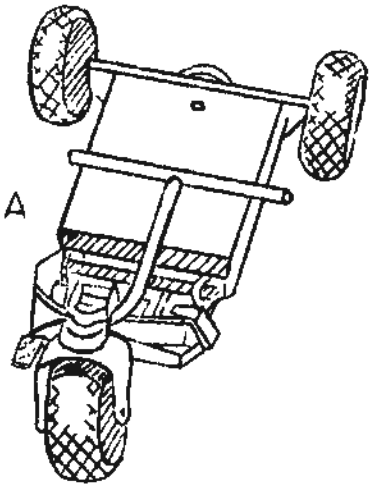
A, B, and C are used for handling bombs. To distinguish one from the other, we call them:

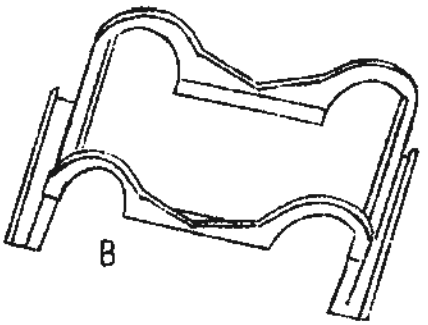
A. _____

B. _____

C. _____

11. On the rear platform of the bomb service truck is mounted a _____ and _____ of _____ ton capacity for the purpose of loading and unloading _____ bombs.

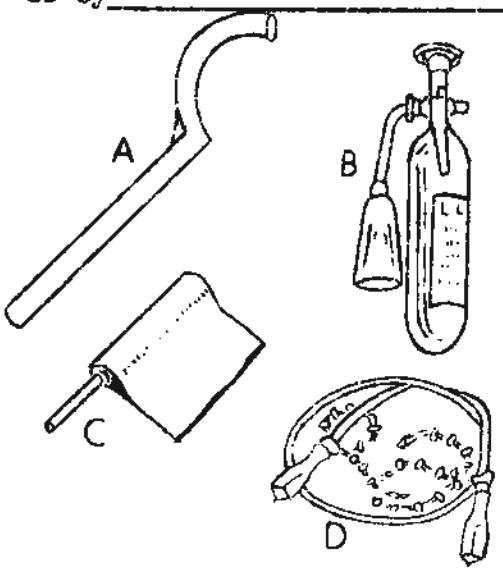




12. A is a_____.
B is a_____.
Both A and B are used with bombs of _____pounds or more.

13. One way of testing whether or not the electric brake system is working when the trailer is attached to the service truck is by_____.

14.



A._____

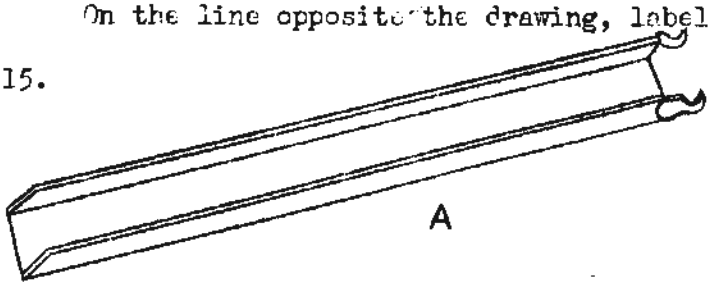
B._____

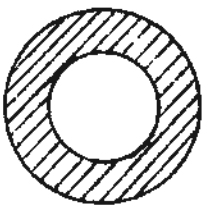
C._____

D._____

On the line opposite the drawing, label the objects pictured.

15.

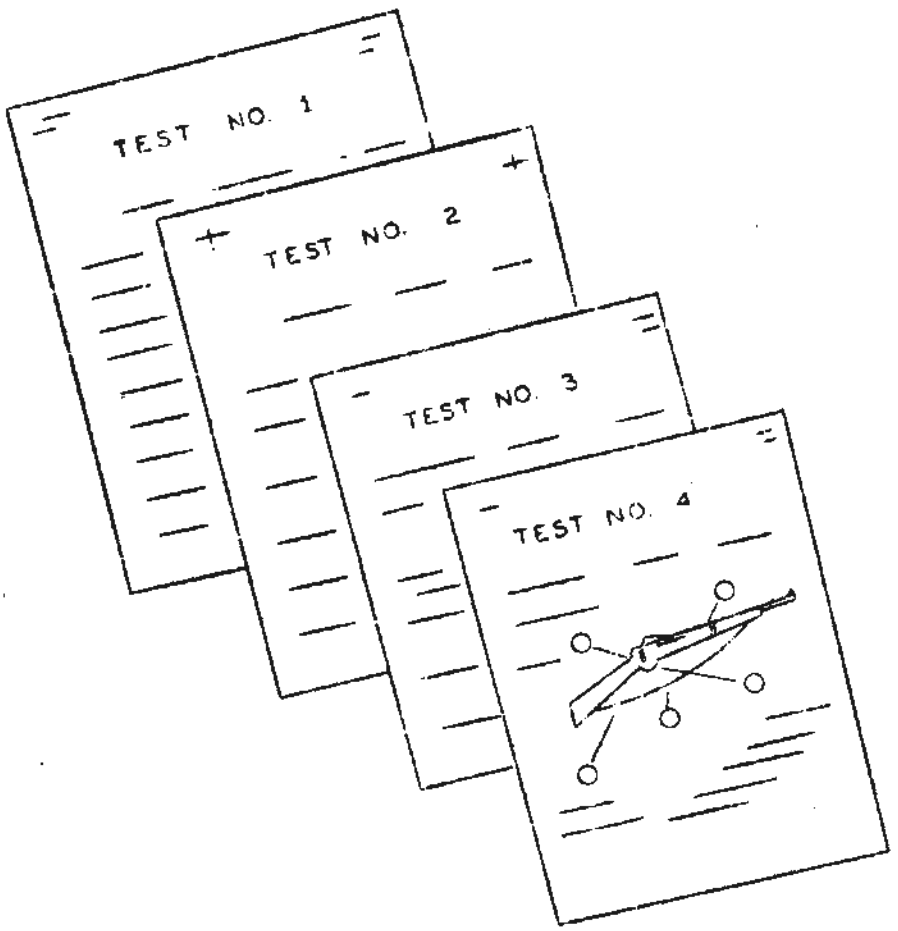




A is a_____, and is used on the trailer when carrying bombs of_____pounds or more. B is a _____, and is used on the_____ when handling bombs of_____pounds or larger.

16. List, according to weights, the maximum load of bombs for one trailer.

Weight	Number



...system of multiple tests...sets of tests covering each phase of instruction...illustrative...objective...checking the individual instructor as well as the trainee.....

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THE PREPARATION OF OBJECTIVE EXAMINATIONS

The following suggestions are made for the purpose of improving the testing program in the Technical Sections. Apply those that can be utilized in your Section:

A. Form of Tests:

1. Those who are preparing sets of examinations for use by sections should always follow the same general layout in setting up all work. Be uniform in preparing examinations.

2. It is advisable to use a cover sheet on long tests. It should include all instructions and examples. If answer sheets are not to be used, then the cover sheet should also include spaces for student's name, company, battalion, group, and date of examination.

3. Have all parts of the examination preceded by instructions which are simple and understandable. The use of examples of each type of test item will usually enable students to understand what is required of them. Tests should be easy to give.

4. Construct objective tests in such a manner that a key can be used in grading. Whenever possible, arrange the spaces for the answers in columns so that a key can be placed beside the column of answers.

B. General Suggestions:

1. Outline the material you have covered and build your questions on that outline.

2. Tests should measure the objectives and aims of the lesson or course. All the important phases of the subject matter should be covered as far as possible. Provide for wide coverage and adequate sampling of subject matter.

3. Use questions that can be answered in a definite way; the score will be more reliable.

4. Check for trivial, ambiguous, suggestive, or catch questions, questions which suggest answers to other questions, or answers which depend upon other answers or questions.

Examples:

Trivial: T F The carbine is heavier than the 1903 rifle.

Ambiguous: T F The pistol is a more dangerous weapon than the carbine? (Dangerous to whom?)

Suggestive: The muzzle-loading cannon was loaded with balls from the __(muzzle)__ end.

Catch: T F A nine-point saw has eight teeth per foot. (Scored false because "foot" is substituted for "inch".)

Questions which suggest answers to other questions:

1. The best way to stop arterial bleeding is by application of a _____ between the wound and the heart.

2. T F A tourniquet should be loosed approximately every half hour.

Questions which depend on other questions or answers:

A. The purposes of machining metal on the shaper are:

1. (Remove surplus metal)

2. (Produce a smooth surface)

B. The 2 cuts needed to produce those results are:

1. (roughing)

2. (finishing)

5. In preparing test items, the accepted rules of good grammar, punctuation, spelling and capitalization should be observed.

6. On all tests, except short check-up quizzes, it is advisable to use more than one type of question.

7. If a certain type question is to be included, be sure to include several of that type. For example, do not have a test with 63 Multiple-Choice items, one True-False item, and two Completion items; but rather have more True-False and Completion items to "balance" the test.

8. Group the questions of a particular kind together and precede

them by proper instructions for that type question. It is well, if possible, to give an example to illustrate how the question should be answered.

9. Arrange the test items in the order of increasing difficulty - easiest to most difficult.

10. Questions should measure the application of facts and principles, not merely memorized facts.

11. Questions which can be answered by the exercise of intelligence without knowledge of subject matter are to be avoided.

12. For long tests it is advisable to have an answer sheet. In this way the same test booklets can be used for different groups, since each man indicates his answers on the answer sheet and does not mark the test booklet. The advantages of this procedure are that it affords a saving of paper, prevents excessive re-mimeographing of tests, and places all results on one sheet so that they are easy to grade. It should provide spaces for the student's name, company, group, battalion, and date of examination.

Suggestions for Construction of TRUE FALSE Items

1. Balance the number of True-False items, i.e., having about 50% True and about 50% False in random order.

2. Avoid long statements.

   Example:

   (Poor) T F 1. The azimuth compensating mechanism automatically applies the azimuth correction to compensate for the error ensuing when the gun is elevated with the gun trunnion out of level.

   (Better) T F 1. The azimuth compensating mechanism automatically corrects the error resulting when the gun is elevated with the trunnion out of level.

3. Avoid ambiguous statements:

   Example:

   (Poor) T F 1. Pliers are handier tools than screwdrivers.

   (Better) T F 1. Pliers are handier tools for holding than screwdrivers.

4. Avoid suggestive statements:

   Example:

   (Poor) T F 1. The center punch is used to mark the center of holes for drilling.

   (Better) T F 1. The center punch is used to mark holes for drilling.

5. Avoid complex-compound sentences:

   Example:

   (Poor) T F 1. To raise the float level setting of the carburetor float level, a small screwdriver is used, but pliers are never used as they will result in distortion of the curvature of the brass lip.

   NOTE: Long statements such as the above should be broken down into a series of simple test items. The following two suggestions will illustrate the recommended form.

(Better) T F 1. To raise the float level setting of the carburetor float level, a small screwdriver is used on the brass lip.

(Better) T F 1. Pliers are never used on the brass lip in setting the float level.

6. Avoid double negatives:

Example:

(Poor) T F 1. When the toe of the clutch is not held down, the clutch is disengaged.

(Better) T F 1. When the toe of the clutch is down, the clutch is engaged.

7. Avoid trick or puzzle questions:

Example:

(Poor) T F 1. The Springfield rifle was adopted in 1903 B.C. (False)

(Better) T F 1. The Springfield rifle was adopted in 1903 A.D. (Or omit the A.D. entirely. If false question is desired, change the 1903 to some other date.)

8. Avoid use of partially ture and partially false items:

Example:

(Poor) T F 1. Mustard gas is a non-persistent gas and smells like horse-radish.

(Better) T F 1. Mustard gas is a persistent gas and smells like horse-radish.

9. Avoid use of give-away words, i.e., always, never, only:

Example:

(Poor) T F 1. Roasting iron ore in kilns is always more satisfactory than in heaps.

(It has been shwon that in a great majority of test items the inclusion of such words gives a definite clue to the answer. Items which contain the words only, alone, all, none, nothing, always, or never, are usually "false". Likewise, items containing the words should, may, most, often, and generally are usually "true".)

10. Use the following form for True-False instructions:

TRUE-FALSE ITEMS

Instructions: Encircle the "T" or "F" according to whether the statement is True or False.

Example:

T (F) 1. In the Rifle, U.S., Cal. .30, M1903A1, the sear pin joins the sear to the trigger.

11. If using a separate answer sheet, use the following instructions:

Instructions: Encircle the "T" or "F" on the answer sheet according to whether the statement is True or False. Do Not Write on Test Booklet.

Suggestions for Construction of Multiple-Choice Items

1. All choices should be plausible.

   Example:

   1. The U.S. Rifle, Cal. .30, M1903, is:

      a. Blow-back operated.
      b. Gas operated.
      c. Manually operated.
      d. Electrically operated.

2. Use at least four and no more than six choices.

3. Avoid giving clues; do not use "an" or "a" before a list of responses.

   Example:

   1. Iron is an:

      a. Compound.
      b. Chemical mixture.
      c. Element.
      d. Physical Mixture.

4. Vary the order of correct responses.

5. Avoid having more than one response which may be correct.

   Example:

   1. When a Statement of Charges is presented to a soldier he may:

      _____ a. Sign it.
      _____ b. Request a Report of Survey.
      _____ c. Pay the charges on presentation.
      _____ d. Request a Report of Survey or sign the Statement of Charges.

      (An instructor would probably consider choice "d" as being the "most correct"; choices "a" and "b", however, cannot be marked incorrect.)

6. Use the following form for your Multiple-Choice instructions:

MULTIPLE-CHOICE ITEMS

Instructions: Place a check mark (✓) in the blank to the LEFT of the best response.

Example:

1. The Elbow Telescope M5 reticle is used for sighting directly on the target at ranges from:

   ✓ a. 400 to 3000 yards.
   ____ b. 200 to 1600 yards.
   ____ c. 200 to 3000 yards.
   ____ d. 300 to 2000 yards.

6. If using a separate answer sheet, use the following instructions:

   Instructions: Place the letter of the best response in the space provided on the answer sheet.

Suggestions for Construction of Completion Type Items

1. Make only one word or idea complete the sentence.

2. Limit the completion of each statement to one or two blanks. One blank is better. In case of an enumeration of items, several blanks may be used if the statement is clearly worded.

Example:

(Poor) 1. _____ gums are made from a _____ combination of resins and _____ known as _____ resins.

(Too many blanks in the above sentence make it meaningless to the student.)

3. Do not make the lengths of the blanks a clue to the answer.

Example:

(Poor) 1. The primary colors are red, blue, yellow.
or
1. The primary colors are r e d, b l u e, y e l l o w.

(The student can readily see that red is the only color that fits into the first blank, and blue the only color for the second blank. This leaves only one blank to fill, with 1 out of 4 chances, since orange, yellow, indigo and violet are the only colors which will fit this blank.)

(Better) 1. The primary colors are _____, _____, _____.

4. Do not merely take a sentence verbatim from a book and leave out a word or phrase to form the completion item.

5. Use the following form for the Completion Type instructions:

COMPLETION ITEMS

Instructions: In the blanks provided to the LEFT write the proper word or phrase to complete the statements.

Example:

a. eight 1. The ammunition for the U.S. Rifle, Cal. .30, M1 is loaded in clips of (a.) rounds.

6. If using a separate answer sheet, use the following instructions:

Instructions: In the blanks provided on the answer sheet write the correct word or phrase to complete the statements. Do not write on Test Booklet.

Suggestions for Construction of Matching Type Items

1. If less than ten complete items are to be matched, make an excess of statements in one column or the other.

2. Limit a matching question to the measurement of one idea.

3. Check for clues in pairing.

Examples:

(Poor)	_____ 1.	Flat cold chisel	1.	for filleting corners
	_____ 2.	Oil Groove chisel	2.	for chipping grooves and keyways
	_____ 3.	Round nose chisel	3.	for chipping flat surfaces
	_____ 4.	Cape chisel	4.	for chiseling oil grooves

(Any time ten or less pairs are used in a matching test, there should be an excess of statements in one column or the other to eliminate chance in the answering. The example shown here is attempting to measure only one idea, as a matching test should, but to no success. Note the underlined words or "clues" in the statements which should be avoided.)

4. Avoid having a small number of distinctive facts in a general list since these obviously reduce the field of choice to selection among a very few alternatives.

Examples:

_____	1. Chief of Ordnance	1.	Quartermaster Corps
_____	2. A ground force	2.	Henry L. Stimson
_____	3. COMMANDS A REGIMENT	3.	LIEUTENANT GENERAL
_____	4. 105 mm howitzer	4.	Ordnance
_____	5. Commanding General, A.P.G.	5.	Small arms weapon
_____	6. M1 rifle	6.	Maj. Gen. Campbell
_____	7. Secretary of War	7.	Artillery Piece
_____	8. Maintains war materiel	8.	Maj. Gen. Harris
_____	9. COMMANDS A CORPS	9.	COLONEL
_____	10. Supplies Non-war equipment	10.	Infantry

(Note how the different groupings will suggest the answer to the student. In this example there are four groups: names of men, Army forces, commanders, and weapons. For example, when a student reads No. 2 - "A ground force" - there are only 3 possible choices for him to make, since only 3 of the branches of the Army are listed.)

5. Use the following form in your instructions for matching type test:

MATCHING ITEMS

Instructions: In the spaces to the LEFT of the paint pigments, listed below, write the NUMBER of the proper vehicle as shown in the righthand column.

Example:

1. _____	White lead	1. Long spar varnish
_____	Varnish	2. Tung oil
_____	Aluminum	3. Water
_____	Calcimine	4. Fish oil
_____	Red lead	5. Ethyl alcohol
_____	Graphite	6. Turpentine
_____	Lacquer	7. Benzine
		8. Amyl acetate
		9. Linseed oil

Suggestions for Construction of Identification-of-Parts Items

1. There should be a minimum of three parts for identification.

2. Arrange the spaces for answers in column form, if possible. This is better than having the answers written in the drawing as it is easier to score.

3. Where detailed or difficult parts are to be identified, the item may be made easier for the students by listing the names of the parts and having the students match the names with the parts shown.

4. Number all parts of the diagram correctly and clearly.

5. Use the following form for your Identification-of-Parts type items:

IDENTIFICATION-OF-PARTS ITEMS

Instructions: Identify the parts of the diagram shown below by writing the name of each part on the correct blank.

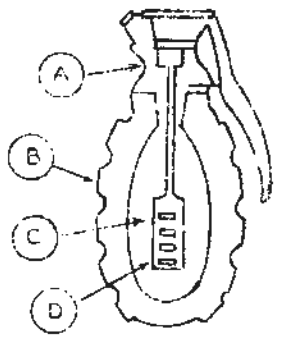
Example:

a. _____

b. _____

c. _____

d. _____



6. If using an answer sheet, use the following instructions:

Instructions: Identify the parts of the diagram shown below by writing the name of each part on the correct blank on the answer sheet.

7. For the simplified form use the following instructions:

Instructions: Identify the parts of the diagram shown below by writing the correct letters from the list of the parts in the proper circles.

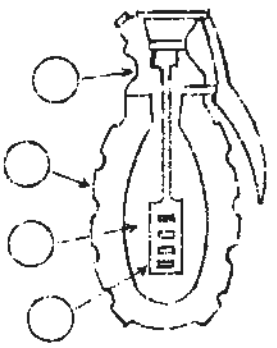
Example:

a. Fuze assembly.

b. Body

c. Explosive charge.

d. Detonator or powder cup.



Suggestions for Construction of Functional Items

1. This type of question is intended to test the student's knowledge of the functioning of a particular mechanism.

2. Arrange the spaces for answers in column form. It makes scoring easier. Number all parts of the diagram correctly and clearly.

3. Accurately determine the sequence of movement of the component parts. Provide for a way to indicate simultaneous movements in your instructions.

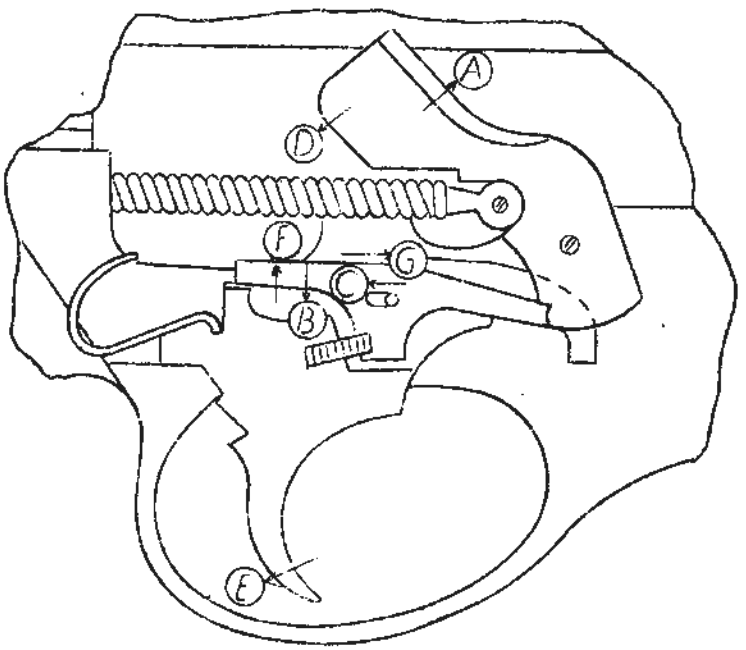
4. Always give the student the position of the weapon immediately before functioning. For example, in small arms; hammer cocked, or uncocked; or position immediately after firing.

5. Use the following form for Functional Items.

FUNCTIONAL ITEMS

Instructions: Starting with the hammer cocked, write the letters accompanying the directional arrows in the spaces provided, indicating the sequence of movement of the trigger, sear, and hammer. In the entire operation the trigger is pulled until the hammer is reengaged by the sear with the trigger still depressed. (Note: In cases where two pieces move simultaneously, the piece from which the force originates is considered to move first.)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____



Suggestions for Construction of Sequence of Operations Items

1. This type of question is designed to test the ability of the student to reason out the sequence of operations involved in a job.

2. Care should be taken to have each operation a separate one and that no two steps can be interchanged.

3. Use the following form for Sequence of Operations Items

Instructions: The following steps of ignition timing are not in sequence. Number the steps in the space provided in the answer column in their proper order of operation.

_____ Place a screw driver or stiff piece of wire on top of No. 1 piston.

_____ Tighten the distributor lock screw.

_____ Connect the primary lead to the distributor, making sure to replace the washers and primary clips.

_____ Remove No. 1 spark plug.

_____ Continue to rotate the engine until No. 1 piston is on top dead center as indicated by the screw driver or wire.

_____ Place a .0015" feeler blade between the breaker points and turn the distributor body in the direction of normal rotation until the points are closed.
NOTE: Rotation of the distributor shaft can be determined by turning the rotor. The centrifugal advance mechanism will permit the rotor to be turned only in the direction of rotation.

_____ Place the distributor in position on the engine with the rotor opposite No. 1 spark plug segment.

_____ Have an assistant turn the engine over in the direction of rotation with a crank.

_____ Place thumb over No. 1 spark plug hole and continue to crank until pressure is felt against the thumb indicating the compression stroke.

_____ Sort the spark plug wires according to length and install starting with No. 1, keeping in mind the firing order and direction of rotation.

_____ Turn the distributor body against the direction of rotation while putting a slight pull on the feeler blade until the exact moment of release by the points.

_____ Install the distributor cap.

ARMORERS SECTION
ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND, MARYLAND

CLASS: BROWNING AUTOMATIC RIFLE, CAL. .30, M1918A2

Examination No. 1

NAME: _____ COMPANY _____ BN. _____

GROUP _____ GRADE _____

TRUE OR FALSE QUESTIONS

Instructions: Encircle the "T" or "F" according to whether the statement is True or False.

1. T F The front sight key prevents movement of the front sight base from side to side.

2. T F Movement of the rear sight leaf to the right to adjust for windage or drift moves the strike of the bullet to the left.

3. T F The purpose of the forearm shield is to protect the recoil spring from heat.

4. T F The gas cylinder gauge used in inspecting the Browning Automatic Rifle, Cal. .30, M1918A2 is smaller in diameter than that used for the Browning Automatic Rifle, Cal. .30, M1918.

5. T F The empty cartridge case strikes both the ejector and the outside of the receiver before being completely ejected.

6. T F The top plate forms the top of the locking recess in the receiver.

7. T F The actuator spring is compressed by the forward movement of the actuator.

8. T F When firing at the reduced automatic rate of fire, the sear actually engages the slide between each shot.

COMPLETION QUESTIONS

Instructions: In the blanks provided write the correct word or words to complete the following statements.

9. The most commonly used magazine for this weapon has a capacity of _____ rounds.

10. The cyclic rate of fire of the Browning Automatic Rifle, Cal. .30, M1918A2 at the reduced automatic rate of fire is _____ _____ rounds per minute.

11. The gas cylinder assembly on the Browning Automatic Rifle, Cal. .30, M1918A2 consists of the gas cylinder _____ and gas cylinder _____.

12. To remove the bolt group from the receiver, it is necessary to depress the _____ against the side of the receiver in order to lift up the rear end of the bolt.

13. The hammer pin attaches the slide to the _____ and _____.

14. The tendency of the bolt group to buckle at the joint of the bolt and bolt lock on the forward movement is prevented by the rear end of the _____ and by the shoulder of the _____ bearing against the _____.

15. At the breech end of the barrel is a slot which provides clearance for the _____ when the bolt is locked.

16. The stock retaining sleeve assembly is retained in this weapon by threads on the _____ engaging those on the _____.

17. The sear spring is composed of three leafs, the outer two resting on the front end of the _____ and the middle one on the _____.

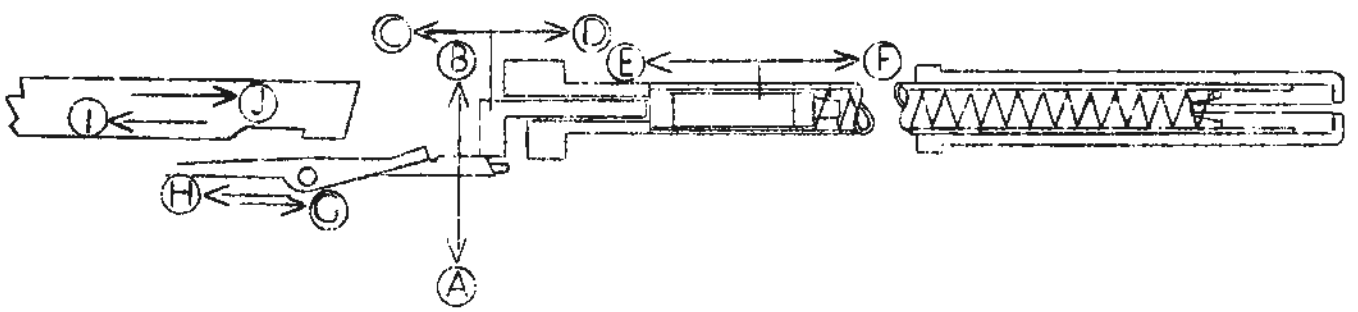
18. The change lever is retained in each of its three positions by the tension of the _____.

19. The bottom of the connector fits into a recess in the trigger where it rests on the _____.

20. If excessive headspace does not exist, the variation in distance between the positions of the hammer pin using the minimum headspace gauge and the maximum headspace gauge should not be _____ than _____ of an inch.

21. To check the chamber of the barrel for excessive depth, it is necessary to remove the barrel from the receiver, insert the _____ headspace gauge and measure the distance from the face of the _____ to the flat surface on the base of the _____ with a _____.

22. Using the lettered directional arrows, indicate the sequence of movement of the slide, actuator, sear release, and sear from the time the slide is moving to the rear during reduced automatic fire until the slide is released from the sear and is traveling forward for the next shot. (NOTE: In cases where two parts move simultaneously, the piece from which the force originates shall be considered the first to move.)



1. _____ 5. _____ 9. _____

2. _____ 6. _____ 10. _____

3. _____ 7. _____

4. _____ 8. _____

ARMORERS SECTION
ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND, MARYLAND

CLASS: BROWNING AUTOMATIC RIFLE, CAL. .30, M1918A2

Examination No. 2

NAME: _____ COMPANY _____ BN. _____

GROUP _____ GRADE _____

TRUE OR FALSE QUESTIONS

Instructions: Encircle the "T" or "F" according to whether the statement is True or False.

1. T F The flash hiders on the Browning Automatic Rifle, Cal. .30, M1918A1 and the Browning Automatic Rifle, Cal. .30, M1918A2 are identical.

2. T F The bipod used on the Browning Automatic Rifle, Cal. .30, M1918A2 has adjustable legs.

3. T F Gas port settings on a perfectly functioning automatic rifle shall never be varied to speed up the rate of fire.

4. T F The gas piston is screwed into the slide and retained there by the gas piston retaining pin.

5. T F The change lever may be moved to the safe position with the bolt in its locked position.

6. T F The forward movement of the slide stops as the hammer strikes the firing pin.

7. T F The parts of the rate reducing mechanism continue to move back and forth when the weapon is being fired at the full automatic rate.

8. T F The front end of the sear is held up continuously during full automatic fire.

COMPLETION QUESTIONS

Instructions: In the blanks provided write the correct word or words to complete the following statements.

9. The approximate weight of the Browning Automatic Rifle, Cal. .30, M1918A2 without the sling is _____ pounds.

10. Four of the major differences between the original Browning Automatic Rifle, Cal. .30, M1918, and the new Browning Automatic Rifle, Cal. .30, M1918A2 are:

1. _____

2. _____

3. _____

4. _____

11. The bolt assembly consists of the _____, the _____, and the _____.

12. The rearward movement of the recoiling parts terminates when the rear face of the _____ contacts the _____.

13. The buffer mechanism in the Browning Automatic Rifle, Cal. .30, M1918A2 consists of the buffer _____, buffer friction _____, buffer friction _____, buffer _____, buffer _____, and buffer _____.

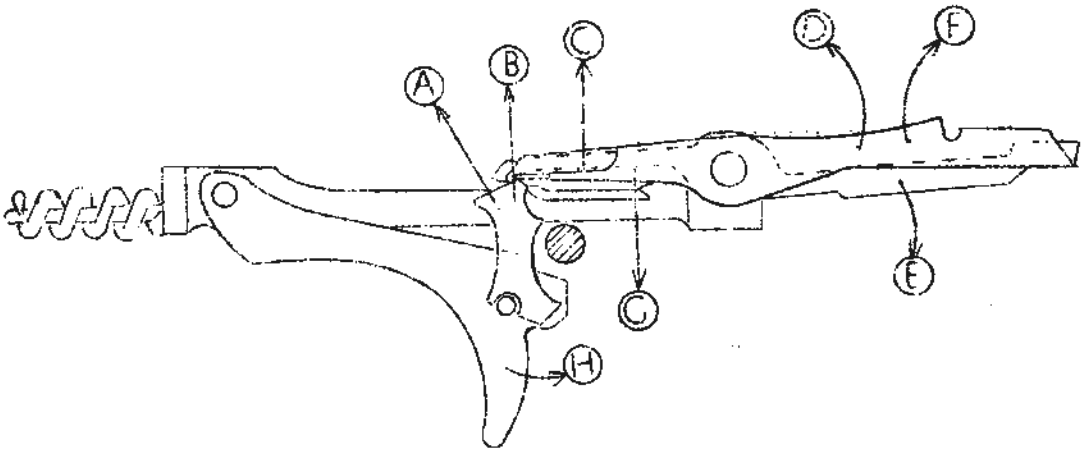
14. The butt stock is retained to the rest of the weapon by the _____ assembly.

15. The connector is prevented from moving forward from under the sear spring by the _____ or the _____.

16. The connector is prevented from moving forward during full automatic fire by the engagement of the tongue on the _____ with the portion of the connector called the _____.

17. The minimum headspace gauge used in the field for this weapon is the_____and the maximum headspace gauge used is the_____.

18. As the weapon is fired once at the reduced automatic rate from the open bolt position, indicate by the lettered directional arrows the sequence of movement of the sear, connector, trigger and sear release stop lever from the time the trigger is squeezed until the slide is again engaged by the sear with the trigger still to the rear. (NOTE: In cases where two parts move simultaneously, the piece from which the force originates shall be considered to move first.)



1. _____ 5. _____

2. _____ 6. _____

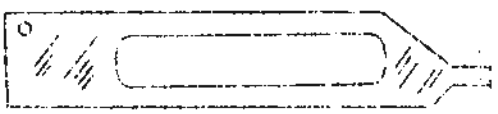
3. _____ 7. _____

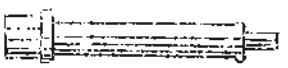
4. _____ 8. _____

19. Identify the following parts:



A. _____





B. _____ C. _____

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ORDNANCE REPLACEMENT TRAINING CENTER
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CLASS: BROWNING AUTOMATIC RIFLE, CAL. .30, M1918A2

Examination No. 3

NAME: _____ COMPANY _____ BN. _____

GROUP _____ GRADE _____

TRUE OR FALSE QUESTIONS

Instructions: Encircle the "T" or "F" according to whether the statement is True or False.

1. T F The Browning Automatic Rifle, Cal. .30, M1918A2 can be set for either automatic or semi-automatic rates of fire.

2. T F The stock rest is adjustable for both windage and elevation.

3. T F The firing pin is cammed to the rear by contact with the under side of the bolt lock.

4. T F The change lever stop blocks forward movement of the change lever so the weapon will not slip off safe accidentally.

5. T F The firing pin is driven forward by the middle leaf of the hammer.

6. T F The safety on this weapon moves under the sear to prevent it from being pulled down when on safe.

7. T F "NO-GO" type gauges are used in the inspection of the gas cylinder and gas piston.

8. T F There are two gas cylinder tube brackets, the one on the gas cylinder tube called the male and the other on the barrel called the female.

COMPLETION QUESTIONS

Instructions: In the blanks provided write the correct word or words to complete the following statements.

9. The number of the Standard Nomenclature List covering all models of this weapon is S.N.L. _____.

EXAMINATION NO. 3 -- BROWNING AUTOMATIC RIFLE -- (Cont'd.)

10. Screwed on the front end of the barrel of the Browning Automatic Rifle, Cal. .30, M1918A2 is the _____.

11. The rear sight leaf on the Browning Automatic Rifle, Cal. .30, M1918A2 is graduated to _____yards.

12. To assure alignment of each of the gas ports in the gas cylinder with the gas port in the barrel three different recesses are cut in the _____into one of which the gas cylinder _____fits for each port.

13. On the under side of the slide is a notch to allow for engagement of the slide with the _____.

14. With the change lever set in the safe position, the full position of the change lever blocks the upward movement of the _____.

15. The buffer friction cups are made of _____and the buffer friction cones are made of _____.

16. On the forward movement of the rate reducing mechanism, the actuator is driven forward by the _____ until it strikes the _____which moves forward, camming the _____down and releasing the _____to go forward.

17. To remove the magazine from the rifle, it is necessary to press forward on the _____.

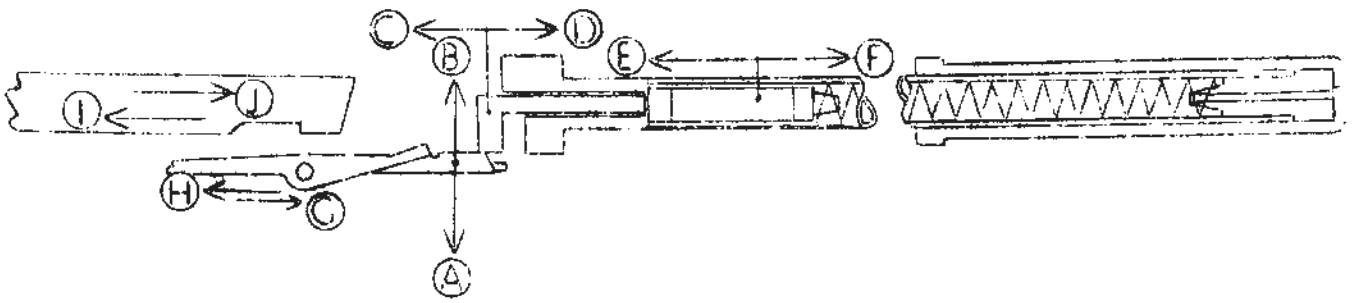
18. Pressure exerted on the trigger to depress the rear end of the sear is exerted against two springs, the _____ spring, and the _____ spring.

19. If excessive headspace is found to exist in the weapon, the first step to locate the excess is by replacement of working parts that might cause it, such as the _____ of the _____.

20. When checking the depth of the chamber of a barrel, the distance between the face of the _____ and the base of the _____ should not be less than _____ of an inch.

21. The ejector is retained in the trigger guard group by the _____ acting under the tension of the _____ spring.

22. Using the lettered directional arrows, indicate the sequence of movement of the slide, actuator, sear release, and sear, from the time the slide is moving to the rear during reduced automatic fire until the slide is released from the sear and is traveling forward for the next shot. (NOTE: In cases where two parts move simultaneously, the piece from which the force originates shall be considered the first to move.)



1. _____ 5. _____ 9. _____

2. _____ 6. _____ 10. _____

3. _____ 7. _____ 11. _____

4. _____ 8. _____

ARMORERS SECTION
ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND, MARYLAND

CLASS: BROWNING AUTOMATIC RIFLE, CAL. .30, M1918A2

Examination No. 4

NAME: _____ COMPANY _____ EN. _____

GROUP _____ GRADE _____

TRUE OR FALSE QUESTIONS

Instructions: Encircle the "T" or "F" according to whether the statement is True or False.

1. T F The rear sight group on the Browning Automatic Rifle, Cal. .30, M1918A2 contains no mechanism for windage adjustment.

2. T F The purpose of the three holes in the gas cylinder is to permit the increasing or decreasing of gas pressure if the weapon isn't functioning properly.

3. T F If the gas piston is loose on the slide, it should be tightened before firing the weapon.

4. T F The purpose of the first .19" rearward movement of the slide is to allow the bullet to leave the muzzle before unlocking starts.

5. T F The rear end of the recoil spring guide fits in a slot in the receiver.

6. T F If the sear spring is improperly assembled, this weapon, when fired at the reduced automatic rate with the muzzle of the gun depressed, will not function for more than one shot.

7. T F No breech bore gauge is used with this weapon.

8. T F The middle leaf of the sear spring acts on the sear release stop lever.

COMPLETION QUESTIONS

Instructions: In the blanks provided write the correct word or words to complete the following statements.

9. The rear sight group on the Browning Automatic Rifle, Cal. .30, M1918A2 consists of two main parts, the rear sight _____ _____ and the rear sight _____.

10. For prone firing, the front end of the Browning Automatic Rifle, Cal. .30, M1918A2 is supported by a _____.

11. The two purposes of the gas piston guide rings are:

    1. _____

    2. _____

12. During recoil, the recoil spring is compressed between a shoulder in the _____ and the _____.

13. The buffer head contains the _____, locked in the buffer head by the _____.

14. The rear end of the buffer spring rests against the _____ _____.

15. The rearward movement of the actuator is positively stopped by the _____ located inside the _____ _____.

16. In the reduced automatic rate of fire, the connector, on its upward movement, is cammed from under the _____ by a cam surface on the _____ but remains under the _____.

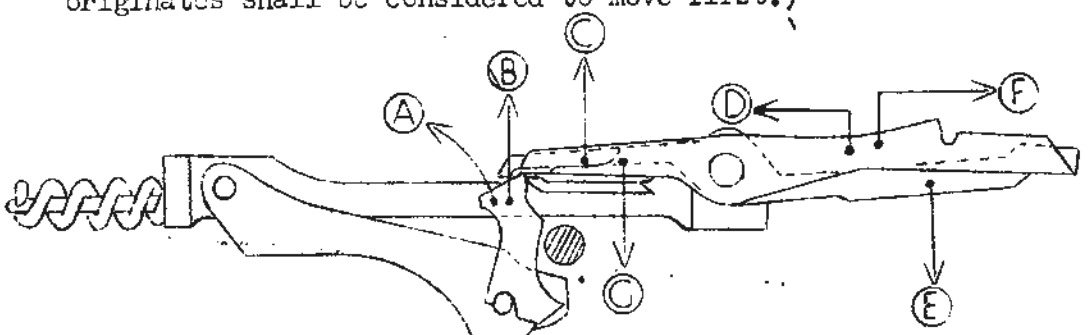
17. Elongated holes to allow for counter recoil are found around the _____ pin in the _____, and around the _____ pin in the _____.

18. The change lever cannot be set at safe without first depressing the _____.

19. If excessive headspace still exists after replacement of the working parts that might cause it, the _____ is next removed and checked.

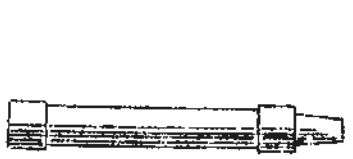
20. When replacing a barrel, it is essential to match the alignment marks on the new _____ with those on the old _____.

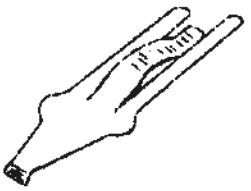
21. As the weapon is fired once at the reduced automatic rate from the open bolt position, indicate by the lettered directional arrows the sequence of movement of the sear, connector, trigger, and sear release stop lever from the time the trigger is squeezed until the slide is again engaged by the sear with the trigger still to the rear. (NOTE: In cases where two parts move simultaneously, the piece from which the force originates shall be considered to move first.)



1. _____ 5. _____
2. _____ 6. _____
3. _____ 7. _____
4. _____ 8. _____

22. Identify the following parts.





A. _____ B. _____



C. _____

ARMORERS SECTION
ORDNANCE REPLACEMENT TRAINING CENTER
ABERDEEN PROVING GROUND, MARYLAND

CLASS: BROWNING AUTOMATIC RIFLE, CAL. .30, M1918A2

Examination No. 5

NAME: _____ COMPANY _____ BN. _____

GROUP _____ GRADE _____

TRUE OR FALSE QUESTIONS

Instructions: Encircle the "T" or "F" according to whether the statement is True or False.

1. T F Each click of the windage knob on the Browning Automatic Rifle, Cal. .30, M1918A2 represents a movement of three inches on the target at 100 yards.

2. T F The purpose of the shallow holes along the outside of the gas cylinder body is to allow a gripping surface for the Browning Automatic Rifle combination tool in disassembly.

3. T F Around the face of the gas piston are three piston rings which serve to retain the gas pressure in front of the piston at the moment of impact.

4. T F The buffer friction cones are placed in the buffer tube before the buffer friction cups.

5. T F The forward movement of the slide is terminated as the slide strikes the rear shoulder of the gas cylinder tube.

6. T F A broken stop lever spring may cause this weapon to continue firing at the reduced automatic rate of fire after the trigger has been released.

7. T F In disassembly, the sear pin should always be removed before the trigger pin.

8. T F Use of brass washers for shims or removal of metal from the rear of the barrel is authorized in cases where the alignment marks cannot be made to match perfectly.

COMPLETION QUESTIONS

Instructions: In the blanks provided write the correct word or words to complete the following statements.

9. The cyclic rate of fire of the Browning Automatic Rifle, Cal. .30, M1918A2 at the full automatic rate of fire is _____ _____ shots per minute.

10. The peep hole in the rear sight group is found on the rear sight _____.

11. The first piece removed in the disassembly of the magazine is the magazine _____.

12. The six gas escape ports are located in the _____.

13. The slide and the bolt travel to the rear at the same rate of speed only after _____ is completed.

14. When the magazine is inserted into the weapon, its upward movement is stopped by the _____.

15. A safety feature of this weapon is that while the bolt is in an unlocked position, the firing pin is held retracted from the _____ of the bolt by the camming surface in the slot of the _____.

16. Briefly, the action of the rate reducing mechanism during the rearward motion is as follows: The slide, as it comes to the rear, contacts the sear release, which in turn drives the _____ back inside the _____ compressing the _____ until its rearward movement is halted by the _____.

17. The recoil of the slide is absorbed by the _____ and the _____.

18. The change lever has three positions, the forward for _____ _____ fire, the middle for _____ fire, and the rear one for _____.

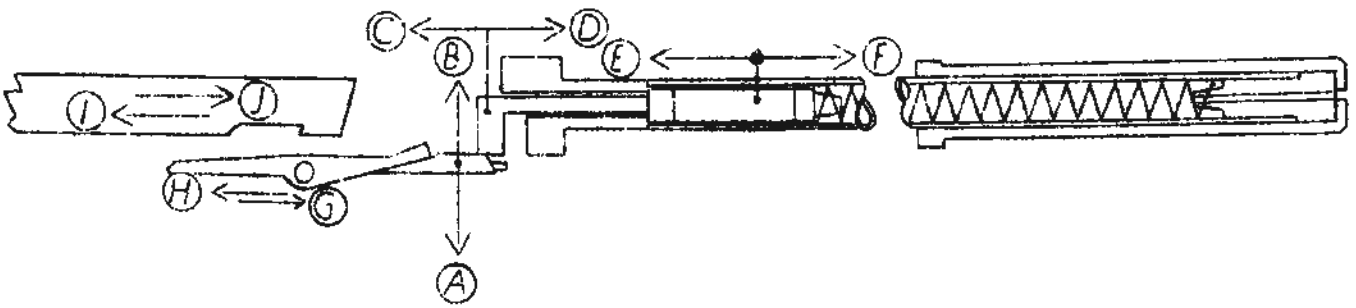
19. The shock of counter recoil, which occurs as the sear engages with the slide, is absorbed by the _____.

20. Excessive headspace in the Browning Automatic Rifle, Cal. .30, M1918A2 may be due to:

1. _____
2. _____
3. _____
4. _____

21. The only cause for excessive headspace that cannot be corrected in the field is that located in the _____.

22. Using the lettered directional arrows, indicate the sequence of movement of the slide, actuator, sear release and sear from the time the slide is moving to the rear during reduced automatic fire until the slide is released from the sear and is traveling forward for the next shot. (NOTE: In cases where two parts move simultaneously, the piece from which the force originates shall be considered the first to move.)



1. _____ 5. _____ 9. _____

2. _____ 6. _____ 10. _____

3. _____ 7. _____ 11. _____

4. _____ 8. _____



...examples of student participation.....



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