



DEPARTMENT OF THE ARMY  
HEADQUARTERS, U.S. ARMY ARMOR CENTER AND FORT KNOX  
FORT KNOX, KENTUCKY 40121-5000

REPLY TO  
ATTENTION OF:

ATZK-PT (350)

27 NOV 2000

MEMORANDUM FOR

Commanders, All Units Reporting Directly to This Headquarters  
Commanders, Fort Knox Partners in Excellence  
Directors and Chiefs, Staff Offices/Departments, This Headquarters

SUBJECT: Fort Knox Regulation 385-22, Range Regulation (Training/Impact Areas)

1. We at Fort Knox face many challenges in range operations. Our customers cover the full spectrum, from a soldier who just enlisted in the Army and is undergoing Initial Entry Training (IET), to the experienced combat veteran who comes here from home station to train on weekends.
2. We are a TRADOC installation, and as such, we must comply with TRADOC rules and regulations. The range complex is established to facilitate a very structured training regiment with the predominant requirement being to support IET for both officers and enlisted soldiers. With this in mind, rigid safety requirements have been instituted across the range complex. This structured methodology, which so efficiently facilitates our IET mission, causes friction with our other customers in some instances. This customer base has vast and varied experience ranging from no training to the experienced combat veteran. Generally, units coming to Fort Knox to train in this configuration enter the training event at a higher proficiency and with a solid knowledge base such as SOPs, battle books, and its own internal/external major subordinate unit regulations. Their leadership is firmly embedded throughout the rank and file of the organization. Our issue is—how do we provide an opportunity to maximize a training event for this spectrum of customers in a safe environment that facilitates the achievement of the desired training objectives?
3. With this specific goal in mind, Fort Knox Regulation 385-22, Range Regulation (Training/Impact Areas), has undergone a major revision. This regulation is an attempt to best serve the needs of our customers without sacrificing or compromising safety or training standards. We wish to facilitate training, but not at the cost of safety.
4. The intent of this regulation is to provide one focal point that encompasses all the associated requirements that will allow a unit to train here at Fort Knox. We have consolidated numerous regulations, LOIs, MOUs, SOPs, etc., into a single source document that addresses the tactics, techniques, and procedures from drawing weapons/ammunition, transporting the same, range execution, and finally residual turn-in. Units desiring to train on the Fort Knox range complex

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SUBJECT: Fort Knox Regulation 395-22, Range Regulation (Training/Impact Areas)

will be required to understand and comply with this regulation. For a quick reference we provided a summary of changes, but revisions are extensive and require prudent review. Failure to adhere to the regulation, and security of arms, ammunition, and explosives (AA&E) per Annex B will result in severe penalty to the unit and could result in suspension of the use of Fort Knox facilities.

5. In the past, I have been advised that training was curtailed, not because of safety, but because of administrative issues. This was done at great cost to the customer, and we gain very little in terms of training effectiveness, lessons learned, or safety. I have now directed that training will not be curtailed because of administrative or protocol errors. They must be corrected as soon as possible, but training will continue. I have further directed Range Control be a facilitator of resolving these administrative problems. I completely understand that this will require a major shift in mindset, but it will happen. Administrative, protocol, and procedural problems will be forwarded through G3 to the appropriate chain of command for action or information.

6. When you train at our range and training area complex, we expect you to “train to standard”--not time. There may be an unforecasted need to extend the range hours. This can be accomplished if you agree to absorb the associated cost, and there is sufficient lead-time to organize the work force.

7. If you have training requirements or objectives that would require exceptions to this regulation, they can be accommodated. It will require approval by the installation commander. Contact the G3 directly for the methodology.

8. In summation, this transformation will take time, and we must work this issue together to ensure a safe and effective training environment.

FOR THE COMMANDER:



J. MICHAEL LINEBERGER  
Colonel, GS  
G3/Director of Plans, Training,  
and Mobilization

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SUBJECT: Fort Knox Regulation 395-22, Range Regulation (Training/Impact Areas)

DISTRIBUTION:

A plus

1 - ea applicable NG/RC unit

CF:

DCG, USAARMC

**Fort Knox Regulation 385-22**

**Safety**

**Range Regulation  
(Training/Impact Areas)**

Headquarters  
U.S. Army Armor Center and Fort Knox  
Fort Knox, Kentucky 40121-5000  
1 December 2000

# SUMMARY OF CHANGES

Fort Knox Regulation 385-22, Range Regulation, (Training/Impact Areas). This regulation revises policy relating to the operation of the Fort Knox training complex. This is not simply an update of an existing regulation. The extensive changes make this a new regulation. All those in command of units that use the Fort Knox Training Complex, and each individual who will serve as an Officer-in-Charge of training, or Range Safety Officer need a comprehensive review of this regulation. It is an inherent responsibility of the Chain-of-Command to enforce this regulation. Some of the major changes included in this regulation include:

- The data on each individual range has been moved into a self-standing document “Fort Knox Range Book,” which will be published at a later date
- MEDIC support realigned with current policy
- Ammunition request, issue, turn-in and security policies are expanded to provide a central source of data supporting range use.
- AA&E Security
  - Rules of engagement
  - Guard requirements
- Adverse action authority established at the G3 level
  - Terminating range safety certification
  - Suspension of training
- Helicopter Gunnery
  - Updated from COBRAs to generic requirements
    - Specifics on AH64
  - Modernized approach to control of gunnery
- Artillery
  - Updated from “old tube” base to modern tactics
    - Specifics on PALADIN gunnery support
- Requirements to avoid elevated risk conditions from exposure to smoke
- Declination procedures and locations provided
- Checklists for key activities have been updated
- References for all requirements updated
- Definitions and abbreviations added to Glossary
- Uniform policy eliminated from this regulation and will be established through policy memos.

Headquarters  
U.S. Army Armor Center and Fort Knox  
Fort Knox, Kentucky 40121-5000  
1 December 2000

Safety

RANGE REGULATION  
(TRAINING/IMPACT AREAS)

Summary. This regulation covers Safety procedures on Range Training/Impact Areas.

Applicability. This regulation applies to all U.S. Army Armor Center (USAARMC) and Fort Knox major activities, directorates, staff offices/departments, Fort Knox Partners in Excellence, and all other Active Duty, Reserve Component and non-DOD agencies using the range and training land complex.

Suggested Improvements. The proponent of this regulation is Range Division, G3/Directorate of Plans, Training, and Mobilization. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to CDR, USAARMC and Fort Knox, ATTN: ATZK-PTR, Fort Knox, Kentucky 40121-5000.

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\*This regulation supersedes USAARMC Reg 385-22, 6 May 85.

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## CHAPTER 1

### GENERAL

1-1. **PURPOSE.** This regulation prescribes limitations, requirements, and general safety precautions necessary to support the safe and efficient use of the training complex facilities, and to decrease the possibility of accidents in the firing and other uses of ammunition and explosives by troops in training, target practice, and to the extent practicable, combat and range operations.

#### 1-2. **RELATED PUBLICATIONS.**

a. Precautions covering specific classes and types of ammunitions and weapons are given in technical manuals and training publications. (See DA Pam 25-30 and Stock Lists 1-2 and 1-3.)

b. Army Ranges and Training Land Program, AR 210-21, prescribes procedures for the planning, programming, developing and operating training ranges.

c. Regulations for firing guided missiles and heavy rockets for training, target practice, and combat are contained in AR 385-62.

d. Policies and procedures for firing ammunition for training, target practice, and combat are contained in AR 385-63 and DA Pam 385-63.

1-3. **EXPLANATION OF TERMS.** See Appendix K

#### 1-4. **NON-MILITARY PERSONNEL.**

a. All nonmilitary personnel must have prior approval before being allowed on active ranges or training areas.

b. Officers in charge of range or training area activities involving family members of Department of the Army (DA) personnel, Department of Defense (DOD) civilians, or other civilian personnel will request approval of the activity NLT 10 duty days in advance through Range Division to G3/Director, Plans, Training, and Mobilization. Request will include all planned safety and control measures, i.e., safety briefings, hearing protection, transportation, risk assessment data, etc.

c. When the training complex is authorized for use by nonmilitary organizations such as schools; county, municipal, state, or federal agencies; organized clubs (including Rod and Gun Clubs) or civic associations, one individual will be designated OIC, and one will be designated Range Safety Officer (RSO). A bi-lateral agreement must be completed between the installation/community and the range user, detailing all responsibilities of each party. Requests for use will be submitted through the installation/community Range Management Officer (RMO), (Army)/ Range Safety Manager (Marine Corps), the installation/community safety manager, the installation Judge Advocate General (JAG), to the installation/community commander

for approval. This agreement will be incorporated into the Report of Availability as required by AR 405-80.

(1) Completion of a National Rifle Association approved pistol and rifle course or an equivalent, e.g. United States Precision Shooting Association (USPSA), or National Range Officer Institute (NROI), is mandatory for civilians designated to perform the duties of OIC and RSO. The installation/community commander, based on input from the range officer, safety manager (Army)/Range Safety Manager (Marine Corps), JAG, and other staff agencies as appropriate, will determine the equivalency.

(2) The installation/community RMO will ensure designated OIC and RSO are briefed on their duties and responsibilities.

(3) Requests will identify if non-DOD associated minors will be involved in the activity. If minors are involved the activity must be an approved course of marksmanship training, unless otherwise approved by the installation/community commanding general.

b. Those organizations and agencies specified in paragraph 1-6c will comply with this regulation, local range regulations, Standing Operating Procedures (SOPs), and any other DOD or DA applicable regulations. Specific requirements will be identified in a written agreement established between the installation and nonmilitary organization(s).

c. Military family members engaging in authorized marksmanship training and/or participating in activities involving weapons firing, such as organizational or family days, will comply with this regulation, installation/community range regulations and SOPs. Requests for these activities will specify if minors will be involved.

d. Civilian personnel, such as military family members and local populace, must receive authorization from the installation/community range officer to enter the training complex to participate in or observe capabilities exercises, fire power demonstrations, training courses, competitions, or other types of firing. Such personnel will remain in designated safe areas as determined by the installation/community range manager.

#### 1-5. **DEVIATIONS.**

a. The Commanding General, Fort Knox, has the authority to deviate from specific portions of AR 385-62 and AR 385-63. This authority may not be further subdelegated. Deviation authority will be limited to the following:

(1) Reducing the dimensions of surface danger areas.

(2) Modifying prescribed firing appropriate for the status of training of participating soldiers/Marines to increase realism in training.

(3) Allowing personnel who are not directly participating in the actual conduct of training within the Surface Danger Zone (SDZ).

b. Approve deviations will be effective for not more than 1 year. It is the responsibility of the requester to renew the deviation documentation at the end of 1 year.

c. Requests for deviation will be submitted to the Commander, U.S. Army Armor Center and Fort Knox, ATTN: ATZK-PTR. Request and backup material will be submitted in three copies. Deviations for firing activities will include the following:

- (1) Firing position by coordinates.
- (2) Target locations by coordinates and type of target, e.g., wood, metal, hard, etc.
- (3) Types of ammunition to be fired from each firing point and the target positions to be engaged.
- (4) Right and left firing limits in mils.
- (5) Maximum gun elevation in mils.
- (6) What actions by the firing personnel will be taken to ensure safe firing.
- (7) What benefits will be derived from the activity permitted by the approved deviation documentation.
- (8) Why the firing is necessary.
- (9) Depict the surface danger zone on Fort Knox Special Map 1:50,000 (three copies).
- (10) Risk assessment.

d. When firing under an approved deviation, a complete copy of the deviation document must be on the range. All personnel involved in the firing activity must be fully briefed on the restrictions contained in the deviation.

e. It is the responsibility of the Range OIC and RSO to ensure that all activities conducted under an approved deviation meet the restrictions and requirements of the deviation documentation.

f. Training units may not deviate from the standards provided in this regulation without written approval of the installation commander.

**1-6. RANGE SAFETY CERTIFICATION.** All OICs of ranges and training areas, and all RSOs must possess a valid Range Safety Card. Range Safety Cards are issued by G3/DPTM Range Division and are valid for 1 year.

a. Personnel desiring to attend the range safety briefing will contact Range Operations to schedule attendance. The briefing is given twice a week. Special briefings for Reserve



Component personnel will be coordinated 10 days in advance. Upon attendance and satisfactory completion of the briefing, the individual will be issued a Range Safety Card.

b. Before serving as an OIC of a range or training area or a RSO, the individual's safety card must be certified. Certifying officials must be commissioned officers, serving in the direct chain of command; Commanders, Staff Division Chiefs or higher. Certification identifies that the individual has been trained and is qualified to be an OIC or RSO or the type weapon or training to be performed.

c. Examples of certification are:

<u>TYPE WEAPON/TRAINING</u>	<u>CAPACITY</u>	<u>RANK/NAME</u>	<u>SIGNATURE</u>
M16A1 Rifle	R-OIC		
.45 Cal Pistol	R-SO		
M60A3 Tank	R-OIC		
*Training Area w/Pyro	OIC		
Claymore Mine	R-OIC		
Demo-TNT+C4	R-SO		
TOW	R-SO		
4.2 Mortar	R-SO		
CS Gas	OIC		

TO BE FILLED OUT IN INK  
BY CERTIFYING OFFICIAL

(1) R-OIC certifies that the individual is qualified to supervise a live-fire range with that weapon/weapon system being fired.

(2) RSO certifies that the individual is qualified to supervise all range safety activities with that weapon/weapon system being fired.

(3) \*Certifies that the individual is qualified to supervise a training area activity where pyrotechnics may be employed. Training area certifications must address use of eye safe laser if these systems are to be employed.

d. OIC and safety officers involved in serious range incidents may lose their certification if determined to be in violation of AR 385-62, AR 385-63, and/or this regulation, or while an incident is under investigation their certification may be suspended. Incidents that endanger or cause injury to personnel or destroy government property may cause loss of certification for a period of from 1 to 12 months. Involvement in another such incident may cause permanent loss of certification. Incidents where the involved individual ignored policy or where integrity issues are involved may lose certification for longer periods. Pending input from the involved commander and decision by the G3, the RMO may suspend certification.

#### 1-7. **SERIOUS INCIDENTS.**

a. Serious range incidents are those events that cause or could cause injury to military or civilian personnel, serious adverse impacts on training facilities, violations of impact area control, or destruction of government property. The RMO will issue, as required, cease fire,

cease fire freeze, or cease training orders to immediately terminate acts or situations endangering personnel, government property, or training complex facilities.

b. Serious range incidents will be reviewed by the RMO.

c. When a serious range incident is declared by the RMO, the training activity will be stopped until sufficient information is gathered to determine what happened, how it happened, what steps are needed to preclude a recurrence, and support a safe return to a training status.

d. The RMO, in situations when the control of training has sufficiently deteriorated and a continuing safety problem exists, or when the unit/activity has disregarded instructions from Range Division, and/or continues a situation which is in violation of this regulation, may terminate the units period of authorized use of the training complex facilities and direct the unit to immediately depart the training complex.

#### **1-8. RANGE/TRAINING AREA CONFERENCE.**

a. A conference will be held at 0900, every second Wednesday of the month, in the Range Division Conference Room, Bldg. No. 6034, Pickett Road, for the purpose of reconfirming the assignment of ranges and training areas for the next month and to identify and resolve problems concerning the use, maintenance, and scheduling of training complex facilities. Major subordinate and training commands will be represented at the conference by an individual authorized to make decisions for that command relative to training matters.

b. Items presented within the Range Conference become valid requirements of the training complex SOP. Minutes of the conference will be provided by email to requesting units/activities. Units or activities desiring to comment on these requirements should do so, in writing, before the following Range Conference.



CHAPTER 2

RANGES AND TRAINING AREAS

2-1. **GENERAL.** All training complex facilities are employed in general support of the total training community and are under the direct supervision of G3 Range Division.

2-2. **MANAGEMENT.** The RMO will be under the direction and supervision of the G3/DPTM. The RMO serves as the central point of control and coordination for all activities conducted within the training complex, is responsible for the control, maintenance, supervision, security, development and safety of training complex facilities and will:

- a. Serve as the Safety Officer and Fire Marshal for the range and training complex.
- b. Assists the OIC of training to ensure the efficient and safe operation and use of ranges and training areas. Assistance will include, but is not limited to, the inspection of firing and training facility use to ensure compliance with this regulation.
- c. Prepare and disseminate as needed the Range and Impact Area Schedule and other appropriate notices. Prepare a daily training complex schedule, which serves as the document of record for scheduled training complex use.
- d. Designate danger areas and ensure they are posted with appropriate warning signs and that required barriers are constructed at appropriate places.
- e. Take appropriate measures to protect personnel downrange.
- f. Supervise a range inspections & technical assistance branch, which will:
  - (1) Provide on-site assistance to the OIC of training.
  - (2) Conduct facility inspections before, during, and after use.
  - (3) Observe range, bivouac, and training area activities for compliance with this regulation and other related regulatory publications.
  - (4) Perform/supervise caretaker maintenance of training facilities.
  - (5) Brief the OIC of training on facility use during sign-on activities.
  - (6) Check all training facilities daily for serviceability, incidents of vandalism, and acts of trespassing.
  - (7) Patrol all roads within the training complex and identify unsafe conditions and terminate unsafe activities or activities prohibited by this regulation.

g. Provide teams of target systems operators to operate, control use and maintain ranges supported by moving target systems, computerized target systems, or other facility sensitive ranges.

h. Operate a Range Operations Center, which will:

(1) Continuously monitor and serve as net control station on the Range Control radio frequencies; FM 38.90 (Primary) and FM 38.80 (Alternate).

(2) Control coordination, safety, and maintenance of all training complex facilities.

(3) Serve as office of record for all training complex data. Record and compile daily use data.

(4) Serve as the Net Control Station (NCS) on FM 40.10 during Medical evacuation (MEDEVAC) operations within the training complex.

(5) Approve or disapprove requests for impact area entrance (air and ground) and requests from range OICs for a firing status.

(6) Identify and terminate unsafe acts within the training complex and report such events to the RMO.

(7) Provide all Range Safety Briefings leading to command certification of OICs and RSOs. Maintain records on briefings and certified personnel.

(8) Provide weather advisories to units and personnel operating within the training complex.

i. Operate a range maintenance activity, which will:

(1) Construct targets and target support materials.

(2) Perform maintenance on target devices and inventory, warehouse and issue targets, target devices, and associated equipment..

(3) Perform bleacher maintenance on bleachers assigned to Range Division, and perform periodic inspections certifying the bleachers safe for use.

(4) Perform maintenance on range facilities, including the construction and maintenance of range barriers and gates.

j. Ensure that range equipment is properly accounted for and maintained in a serviceable condition, and that special targets, target materials, and range equipment are available at Range Division for issue to using units, within imposed resourcing limits.

- k. Ensure personnel wear hearing protection devices per AR 40-5 and MWO 5574.2.
- l. Justify the conduct of fire over the heads of unprotected troops.
- m. Develop local SOP for the safe operation and use of ranges and training facilities.
- n. Exercise control of all gates and barriers employed in the training complex.

2-3. **ACCESS TO THE TRAINING COMPLEX:** Access to the training complex is limited to authorized personnel performing activities that have been approved by G3 Range Division. All visitors, observers, inspectors, etc., must be approved before entry. Range Division will coordinate all access approvals with the units that may realize a training or resource impact caused by the visit.

2-4. **FACILITY CONTROL DURING USE.** The OIC of training is responsible for all activities involving his use of a training facility. His responsibility starts with pre-range/training coordination and continues through facility occupation, closing, and clearance. The OIC must exercise control over all activities conducted on the facility, or within assigned training areas. The OIC will conduct all operations within established and approved procedures provided by this regulation and the policies and procedures establishing the risk assessment, avoidance and mitigation program.

a. If support elements, such as Armor School support units, unit range support personnel, or instructors from another unit/activity are employed, they are subordinate to the OIC throughout the occupation of the assigned training facility.

b. A guard force, if employed during the period of facility use, will be supervised by the OIC through the guard force Noncommissioned Officer in Charge (NCOIC). The OIC will brief the guard force and personally notify Range Operations when turning the facility over to the guard force. The OIC will be available to the guard force NCOIC to assist in problem resolution.

**2-5. OCCUPYING, OPENING, AND CLOSING OF RANGES, TRAINING AREAS AND ALL TRAINING COMPLEX FACILITIES.**

- a. Occupying ranges and bivouac sites.

(1) A Range Division representative will be present before a unit moves onto a range, bivouac site and most training area activities. If the range inspector is not present, the using unit will notify Range Operations. A joint inspection of the facilities will be conducted and the range inspector will give the user a facilities briefing. If unit personnel fail to properly sign for the facility from a range inspector and have occupied any section of the facility, the unit automatically assumes responsibility for the facility as it is. During the facility sign-on action the unit will be provided a copy of the sign-on inspection checklist. This checklist will identify the results of the pre-use inspection. Any additional clearance requirements, such as corrective maintenance or grass cutting will also be annotated on this sheet.

(2) The OIC of training will coordinate with Range Operations for all range support NLT 10 duty days before the scheduled training. Range support includes targets, target devices, period of moving target support, and scheduling facilities inspections. The OIC of short notice range requirements, realized less than 10 days before the first firing day, must coordinate range support within 24 hours after the facility scheduling request has been approved.

(3) The period of facility use is governed by the times stated on the approved facility scheduling request. Occupation of a facility will be conducted plus or minus 30 minutes from the start time and clearance completed before the termination time on the approved scheduling request.

b. Opening and closing of training facilities. All ranges, bivouac sites, training areas, and firing points must be opened with Range Operations using the following procedures:

(1) The OIC of the range/training area will, upon arrival at the facility, call Range Operations on landline (or radio if landline is not available) (FM frequency 38.90/Primary, or 38.80/Alternate) and inform Range Operations that the facility is occupied. The OIC must have a copy of the facility scheduling request, approving use of the facility, in possession. An occupied status does not allow for training/firing. This is a preparation phase only. The OIC must also verify radio communications with Range Control before commencing any activities on assigned training complex facilities.

(2) The OIC must ensure that a safety briefing is provided to all personnel who will be on the facility during any portion of the units use. This safety briefing will include the threats generated by dud and unfired munitions and pyrotechnics.

(3) When opening a range or firing point, the OIC will call Range Operations, identify that he/she is ready to start firing, and give Range Operations the following information:

(a) Name of range calling from.

(b) OIC name, rank, last four digits of SSN, and date of last safety briefing by Range Operations.

(c) RSO name, rank, and date of last safety briefing by Range Operations.

(d) Medical coverage as required by appendix A.

(e) All personnel have been briefed on range safety and the risks generated by dud and unfired munitions and pyrotechnics.

(f) Red flag during daylight hours to be replaced by blinking red light during hours of darkness.

(g) Range firing limit markers visible.

(h) Number of personnel on the range. Total includes total number of personnel to be trained and all instructors and support personnel.

(i) Unit firing.

(4) Interim reports:

(a) OIC will inform Range Operations of time of first round downrange as soon as possible after it is fired.

(b) OIC will request a temporary cease-fire status from Range Operations for all nonfiring periods in excess of 15 minutes and subsequently request permission to resume firing.

(c) Request permission from Range Operations for personnel to enter the impact/target area.

(5) Closing range: The OIC will submit the following:

(a) Amount and type of ammunition fired. Ammunition data will be provided to Range Operations by Department of defense Ammunition Code (DODAC).

(b) Number of personnel trained.

(c) Time last round fired.

(d) Maintain a written log which will include the time and Range Operations' initials approving occupation, opening, temporary cease-fires, impact area entries, clearance, number of personnel trained, number of rounds fired, and closing.

(6) Speed signs will be posted on main range service roads by using unit to slow vehicles down to 10 mph, if using unit is training on both sides of the road simultaneously and troops are required to cross the road between training sights. If training is being conducted only on one side of the road, speed signs will not be posted.

(7) When occupying a training area, the OIC will give Range Operations the following information:

(a) Unit and location by checkpoints with any changes.

(b) Name and rank of OIC, last four digits of SSN, and date of current range safety briefing.

(c) Number of personnel to include total number of personnel training, instructors, and all on-site support personnel.



(d) Copy of the approved facility scheduling document must be present on site. This document serves as a contract for facility or land use and may contain critical instructions or restrictions concerning the period of schedule use.

c. All ranges, training areas, and bivouac sites must be closed with Range Operations before the unit departs the facility.

d. Clearance Inspection. The OIC will call Range Operations and request a clearance inspection. Inspections must be conducted during hours of daylight. If it is impossible for an inspection to be conducted before the unit's departure, or if the inspection conducted is unsatisfactory, the OIC, using unit commander, or Training Requirement (TR) commander is responsible to coordinate with Range Operations to schedule subsequent inspections. Reinspections must be completed within 24 hours of the failed inspection. During reinspections the entire area authorized for use may be inspected.

e. Reoccupation of facilities. To monitor the actual training status within the training complex, provide for timely evacuation support, and gain required land use data, the OICs of training exercises using facilities for more than 1 day will reoccupy the facility each day through Range Operations. Reoccupation will be conducted before starting training on each successive day of facilities use.

f. User units will:

(1) Maintain communication with Range Operations at all times when operating within the training complex. If communication is lost, the training unit will cease training until communication is reestablished with Range Control. The Range Control net is a "plain language" net. Units will use the facility name and their standard unit designation as a call sign. Aircraft will use their tail number, prefixed with "Army" for active duty, or "Guard" for National Guard, etc.

(2) Comply with applicable provisions of Fort Knox, this regulation, and higher headquarters directives pertaining to the firing and security of weapons and ammunition.

(3) Ensure OIC and RSO are present on the range while range is in a firing status or OIC is in the training area during all periods of training. If there is an OIC or RSO change, the outgoing OIC must personally notify Range Operations to affect the change. This action will be annotated on the OIC range log and the log will be transferred to the new OIC.

(4) Ensure OIC meets the requirements of AR 385-63, DA Pam 385-63 and this regulation. The OIC and RSO must have a valid range safety card, validated for the weapon/weapons systems to be fired. If more than one class of weapon is to be fired (tank, artillery, or mortar), a separate RSO is required for each primary weapons system.

(5) Ensure RSO meets the requirements of AR 385-63 and DA Pam 385-63. The RSO designated by unit will have no other duties during the period of duty as RSO. The RSO may have as many assistants (E5 or above) as may be required for the type of firing conducted.

(6) Designate a pit safety officer (E6 or above or qualified civilian) for known distance (KD) ranges where pit details are used, and ensure this officer remains in the pits during the firing.

(7) Conserve supplies and prevent damage or removal of range equipment.

(8) Observe prescribed field sanitation procedures. Latrines will be scrubbed daily with soap and water by using unit. Hand washing facilities will be available at each latrine (water, paper towels, etc., will be furnished by unit).

(9) Enforce provisions of regulations pertaining to clearing of weapons before leaving the firing line. All personnel and vehicles present on ranges or training sites will be inspected to ensure that no ammunition, links, empty brass, pyrotechnics, boxes, etc., remain in their possession after closing the range.

(10) Police areas as designated by the supporting range technician.

(11) Remove all equipment brought onto the range. This includes policing brass, etc., and removal to proper turn-in point.

(12) Guard ammunition, brass, weapons, vehicles, and other equipment until removed from training site/range; see appendix B.

(13) Remove and replace unserviceable targets. Cartons and cardboard will be removed to proper turn-in points. Local burning or burying of trash is prohibited.

(14) Before final clearance can be obtained, restore the assigned range(s), facilities, and lands to a satisfactory condition.

(15) By 0800 of the morning following a night firing exercise, police the range and have it inspected by a range technician. Range clearance will be given only after a satisfactory inspection.

(16) Provide Range Division with a troop labor detail (minimum of three personnel) to perform maintenance on training complex facilities (cutting grass, police, etc.). In lieu of providing labor support, a unit may be assigned specific maintenance requirements to be completed before receiving a facility clearance.

(17) Not modify the range or its facilities without prior written approval from the Range Management Officer.

(18) Ensure proper clearance is received before moving into or departing bivouac sites.

(19) Receive permission from Range Operations before moving ammunition, personnel, or equipment onto a range/training area before the approved time and date scheduled.

(20) Except in an emergency, not allow personnel, equipment, or vehicles on grass or seeded areas on ranges.

(21) Immediately report all incidents and/or accidents to Range Control.

**2-6. MEDICAL REQUIREMENTS.** See appendix A.

**2-7. IMPACT AREA CONTROL.**

a. The control and management of all impact areas is the responsibility of the RMO.

b. Entry into any impact area is prohibited without prior approval from Range Operations. Any entry into the impact area is considered hazardous; appropriate control and supervision is mandatory.

c. All impact area entries and departures must be reported at the time of occurrence to Range Operations. Entry reports must include identity of person and/or unit, number of personnel involved, area to be entered, purpose, approximate time required to complete mission, and mode of transport. Departure reports must include clearance of all personnel and equipment. Entry and exit reports will be made by the OIC or RSO.

d. No target material of any nature will be placed within the impact area without specific approval of the RMO. No glass, reflective metals, or other laser deflecting materials will be deposited or used as target material within the impact area.

e. Specific areas within the impact area are considered high threat UXO areas due to the extended use of UXO (dud) producing weapons. The creation of additional high threat dud areas is prohibited per AR 385-63 and DA Pam 385-63.

f. Impact areas employed to contain high explosive anti-tank (HEAT) munitions are considered dedicated high hazard impact areas. Per HQ TRADOC/Safety, all lands included in the HEAT surface hazard area are included in this classification.

**2-8. VEHICLE USE WITHIN TRAINING COMPLEX.**

a. Tracked vehicles are not authorized on any small arms range without prior approval from Range Division.

b. Main Range Road North of Holder Complex will not be used for tracked vehicle test driving or "maintenance runs." Carpenter Test Road, is the recommended area for these activities.

c. When performing target and target device servicing and range clearance on tank ranges, the use of tracked vehicles requires prior approval of Range Operations.

d. Vehicle traffic within the training areas is restricted to established roads unless the vehicles are supporting training within authorized and assigned areas.

e. Training objectives or test projects requiring tracked vehicles to exceed the 15 mph limit for tracked vehicles on range roads will be identified during submission of the unit scheduling request, or in a separate memorandum. A route overlay, in two copies, including time schedules and road guard positions, will be submitted with the scheduling request. Range Operations will return one copy of the overlay to the unit after approval. That copy must be in the Officer in Charge (OIC) possession during the training. The OIC of training must ensure that all personnel involved in high-speed training are properly briefed on safety, authorized routes, and area limitations, and that proper risk assessment documentation is available at the training site.

f. On range roads and in the training areas, communication between the track commander and the driver will be maintained or a ground guide will be used at all times.

g. The control of Privately Owned Vehicles (POVs) is an integral part of the training complex risk reduction and security programs. POVs will not travel through, be parked in, or adjacent to ranges, bivouac sites, and training areas, except as follows:

(1) South Boundary Road east of Old Highway 251 connecting to Seventh Armored Division Road, Seventh Armored Division Road from South Boundary Road to Wilson Road, and major paved highways such as US 60, Highway 1638, and Vine Grove Road.

(2) Bldg. No. 9244 vic Carpenter Test Area, Garvin, Wilson, French, and Yano Ranges, within designated parking areas, and the Mounted Urban Combat Training Site POV parking area (Range pass required).

(3) Ranges supporting nonmilitary organizations authorized to use military training facilities such as law enforcement agencies and approved rifle/pistol clubs. Prior coordination and approval from Range Division is required.

(4) Personnel visiting Fort Knox on official business (other than students attending courses taught at Fort Knox). Prior approval from Range Division is required.

(5) Civilian contractors involved in authorized contract work that has been coordinated with the RMO.

(6) Heavy equipment operators from Directorate of Base Operations Support (DBOS) and Range Division personnel with appointed place of duty assignments at specific modernized range facilities, or who are responding to emergency situations as approved by the Range Manager.

(7) Authorized command group exceptions to policy.

(8) Personnel involved in authorized recreational activities. A parking permit is required to be posted on windshield of the POV.

(9) Volunteer Game Wardens while performing official duties as authorized by the PMO.

k. Personnel desiring to travel to and/or park POV in a range or training area may request an exception to policy. Requests will be submitted through Range Division to the G3/Director, Plans, Training, and Mobilization. The request for exception to policy must include the mission requiring POV use, provisions for car pooling, time frame POV is required, identity of POV and driver, and why military transport cannot be used. Approved requests will be posted on the windshield of the POV while it is within the training complex.

l. Range Division may issue, upon approval, a "POV Range Pass" to personnel who have authorized POV use within the complex on a "long term" basis.

m. In the interest of safety and to decrease damage to roads caused by tracked vehicle operation, all units will:

(1) Post guards at damaged areas which might possibly cause accidents. Remove mud and debris deposited on public roads (e.g., state, county, etc.) at crossing sites. This will be done where possible with the least disruption of traffic. On interior post paved roads, attempts will be made to reduce mud being tracked on paved roads. However, in cases where it is unavoidable and the location and quantity of mud presents a traffic hazard to wheeled vehicles, the unit/activity will attempt to remove the mud. The unit/activity is responsible for notifying DBOS for assistance in any road scraping or clearing operation.

(2) Repair damage to roads and shoulders of roads within capability of unit within 24 hours of the incident.

(3) Ensure that all tracked vehicles enter and leave the training areas only at authorized turnoffs (see Fort Knox Special Map 1:50,000). Tank commanders will exercise caution at turnoffs to reduce road damage.

(4) Ensure that tracked vehicles are not used on roads adjacent to post boundaries. Highway 60 and 1638 are off limits to tracked vehicles without specific approval from DBOS and PMO.

## 2-9. **RANGE ROADS.**

a. The road network servicing the training complex is a key support element of the training mission. The Provost Marshal's Office (PMO) and Range Division will patrol these roads to identify and report unsafe conditions and activities and to provide assistance to training complex users as needed. Unsafe activities will be stopped and the activity OIC and the commander of the training command notified of the situation. Training will not continue until immediate corrective measures are completed.

b. Training area complex roads will not be closed or blocked without approval of Range Division.

c. An OIC of training who desires to close a training complex roadway must request approval of the action, in writing, 10 duty days in advance of the closure. The request will include full justification of the action, identify the period of the closure, and what control measures will be used to support the closure. Road guards used to close a road will coordinate the passage of emergency vehicles and priority traffic with the OIC of training. Priority traffic will be identified by Range Operations. Road guards will be fully briefed by the OIC of training and will be in communications with the OIC.

d. Range roads will not be used for organized physical training. Formation runs will not be conducted on training complex roads.

e. Range service roads, internal roads in training areas, and those roads servicing only ranges and training areas are off limits to unauthorized military and civilian vehicles. Authorized vehicles include authorized sportsmen/civilian contract personnel employed by DA for projects within training complex, facilities engineers performing assigned functions, military vehicles engaged in authorized training, training support or preparation, military law enforcement activities, Government or civilian law enforcement agencies during authorized training activities, and others as specifically authorized per para 1-4.

f. Due to the high density of wheeled and tracked vehicle traffic, parking on the shoulders of range roads is extremely hazardous and a frequent cause of accidents. Only authorized vehicles will park on the shoulders of the road. Training units, sportsmen, and visitors authorized within the training complex will park just off the shoulders of the roads within the area they are authorized to use.

g. Vehicle breakdowns that block primary service roads, and all vehicle accidents occurring within the training complex will be immediately reported to Range Operations. Range Operations will notify the PMO and other agencies as required.

h. Range roads will not be used for training that could generate hazards to other traffic, or cause damage to the roads without prior approval from Range Division.

i. Blackout Driving. Units may conduct blackout-driving operations within assigned training areas under a commander's risk assessment. However, if the unit desires to use any training complex road for blackout driving prior coordination with Range Control is required. The unit must submit a route overlay a minimum of 10 days in advance of the intended training. This overlay will identify the route, time schedules, road guard positions and uniform, and the type(s) of vehicles involved in the training event. Accompanying the overlay will be a memorandum signed by the unit commander requesting publication of the event in the Fort Knox Weekly Bulletin. This submission must be completed in time for the notice to be published in the Weekly Bulletin. The OICs of any blackout driving activity will ensure internal communication is established providing route coverage so that an accident or incident may be rapidly reported to the OIC.

## 2-10. RANGE GUARDS OR BARRIERS.

a. Range Division will control and inspect all installed gates and barriers to impact areas, range and training facilities, and boundary gates to the training complex.

b. The OIC is responsible for placement and removal of temporary roadblocks and guards required by Range Operations.

c. Units will not stop or impede access to any area by Range Division personnel and vehicles. Guards at unit roadblocks will be instructed to immediately allow Range Division vehicle and personnel to pass.

d. Roads and impact areas permanently endangered by firing or presenting a UXO hazard are marked by roadblocks and signs. These roadblocks and signs will not be passed except by personnel engaged in training who travel safe routes designated by the RMO.

e. Personnel will not pass or circumvent road guards or roadblocks except by permission from Range Operations. Violators will be reported to Range Operations.

**2-11. AIRSPACE SAFETY.**

a. See chapter 13.

b. Range Operations is the controlling agency for the restricted airspace over the training complex, R3704. Flight operations within the restricted area is prohibited unless prior coordination is made through Range Operations.

c. Aircraft sighted over impact areas will be reported to Range Operations immediately. If the range is in a firing status, the range will be placed in a cease-fire status by the OIC until the aircraft has cleared the area and Range Operations approves the return to a firing status.

d. Aircraft over flying the impact area will maintain FM radio communication with Range Operations (38.90, alternate 38.80).

**2-12. FIELD AIRSTRIPS.**

a. Field strips are off limits to unauthorized vehicular traffic and dismounted training without expressed permission from Range Operations. The use of Pyrotechnics or choro-benzalmalonitrile (CS) gas used within 1,000 meters of field strips is not authorized. The use of field strips will be cleared through airfield operations (Godman Airfield) and Range Operations. Field airstrips are scheduled as separate facilities. Approved use of a training area with an airstrip located within its boundaries does not provide approved use of the airstrip. The name and location of these field strips (reference Fort Knox Special Map 1:50,000) are as follows:

- |                          |        |
|--------------------------|--------|
| (1) Cedar Creek Airstrip | 036862 |
| (2) Twin Knobs Airstrip  | 086935 |

- |                              |        |
|------------------------------|--------|
| (3) East Gate Airstrip       | 091934 |
| (4) Wilcox Lake Airstrip     | 066022 |
| (5) Mt. Eden Church Airstrip | 037022 |
| (6) Otter Creek Airstrip     | 868932 |

**2-13. TRESPASSING ON RANGE AREAS.**

a. Range and impact areas are danger areas and are off limits to all personnel except those granted permission by Range Operations. Personnel who have permission to enter the range and impact areas will notify Range Operations immediately upon arrival at the range, or before impact area entry, and immediately after departing the impact area or range.

b. Range areas will not be used for tactical training or other nonfiring exercises or activities except by approval from the Range Management Officer.

c. Handling or removing unexploded ammunition (duds) by unauthorized personnel is not permitted.

d. Access into impact areas shall be strictly controlled with entry permission required from Range Division. Those portions of the impact area identified as dud contaminated will be surface cleared of dud munitions before access for training, environmental activities or recreational activities.

**2-14. VIOLATIONS OF SURFACE DANGER ZONES/AREAS.** The following procedures will be followed if a unit fires outside the designated safety limits:

a. Personnel will immediately cease fire and everyone will fall to the rear of the weapon, leaving all settings on that weapon as they were fired until checked by an investigating officer. A report of the incident will be immediately made to Range Operations and the cease-fire will remain in effect until lifted by the Fort Knox RMO.

b. An immediate check by the range OIC will be made to ascertain if injuries or loss of life or property resulted from the incident. The results of this check will be reported to Range Operations by the most expedient means available.

c. Range Operations will notify the PMO, G3/DPTM, PAO, and the Safety Office upon receiving any report identifying rounds impacting off the reservation.

**2-15. CONSTRUCTION AND MODIFICATION OF RANGES/TRAINING AREAS.**

a. All requests for repair or modification of existing training complex facilities will be submitted to Range Division. The facility number, name, grid coordinates, and description of required repair or construction must be clearly stated.



b. Minor modifications to facilities, such as painting, fencing, posting of signs, installation of barriers, minor erosion control efforts and range road improvements, and small construction projects desired to be completed by the requesting agency, will be submitted to Range Division. Projects will be submitted in memorandum format and include justification and an impact statement.

c. Major modifications to existing facilities and all new facility construction projects must be coordinated with the RMO before submission to G3/DPTM. Project submissions under \$200,000 must include complete justification, including the training requirements which necessitate the project, duration and frequency of use projections, and an impact statement. The results of the pre-coordination efforts with the RMO must be included in the project submission. Projects in excess of \$200,000 require additional documentation. The submitting activity is required to prepare the Functional Requirements Summary (FRS) portion of the Project Development Brochure-1 (PDB-1). AR 415-15 provides guidance for PDB-1 preparation.

#### 2-16. RANGE FIRES.

a. Anyone observing a fire in the training area or impact area will report it immediately to Range Operations. The observer will give the exact location if possible. Units will continue to train or fire unless notified by Range Operations to cease fire or training. In case of emergency, which involves danger to personnel, target equipment, or range facilities, the OIC will order a cease-fire - if on a range - and take necessary action to extinguish or control the fire without entering the impact area. If the fire is in a training area, the OIC will move the unit out of danger and take necessary action to extinguish or control the fire until relieved by the Fire Marshal or a representative. Range Operations will be notified of the action being taken.

b. Upon notification, Range Operations will report any fire to the Fire Department. The Fire Department will decide whether to extinguish the fire or permit it to burn. If a decision is made to extinguish the fire in an impact area, the Fire Department will notify Range Operations, who will order a cease-fire on the ranges concerned. Fire fighting equipment may enter the impact area only with permission from Range Operations.

c. The Fire Marshal is responsible for the fire fighting effort. The OIC of firing/training will render all possible assistance.

d. Fires will be reported according to the following format:

- (1) Location and type.
- (2) Name and telephone number of person reporting.
- (3) How the fire started.
- (4) Unit or person starting fire.
- (5) Direction fire is spreading.

- e. Fires will be reported by the most expeditious means available.
- f. Warming and cooking fires.

(1) Warming and cooking fires must be built in fire barrels or stoves furnished by unit. Open-type fires are prohibited.

(2) OIC may authorize fires for warmth and cooking, provided the fires will not:

- (a) Interfere with training.
- (b) Be located within 50 feet of buildings and bleachers.
- (c) Be located where loss of control might lead to a forest or brush fire.
- (d) Be built in impact areas where duds are known to be present.

(3) The OIC will ensure that fires are extinguished and policed.

(4) Warming and cooking fires must be built in fire barrels or stoves furnished by unit. Open-type fires are prohibited.

#### 2-17. ENVIRONMENTAL PROTECTION AND CONSERVATION.

a. General environmental protection and conservation effectiveness are the responsibilities of all personnel using the training complex. Commanders must ensure that no wanton or deliberate destruction of the natural or harvestable resources occurs during training exercises.

b. Sanitary Landfills (dumps) will not be dug except as authorized by Range Operations. Refuse will be taken to the post Sanitary Landfill and disposed.

c. Cutting firewood within the training complex is authorized by DBOS Environmental Division in coordination with Range Operations.

d. Before conducting activities involving digging (foxholes, tank traps, sumps, etc.) coordination with Range Operations is required.

e. Maximum use will be made of established tank trails and roads for administrative moves and road marches.

f. The cutting of trees and bushes for use as camouflage within the cantonment area is prohibited. Trees and bushes may be used for camouflage purposes in training areas with Eastern Red Cedar as an unrestricted species. All other species may be used up to two inches in trunk diameter.

g. Freshly seeded areas will not be used for training.

h. Hardwood trees, other than those mentioned in paragraph 2-14f above, will not be cut or damaged without prior approval from the Fort Knox Forester.

i. Vehicles will enter streams only during approved fording operations. Vehicles will not be washed in streams.

j. Vehicle refueling on range firing lines is prohibited while firing is in progress. Units will clean up any petroleum, oils, and lubricants (POL) contamination before clearing the range. Units are required to deploy with spill kits to support all fueling operations, and to support recovery of fluids lost due to mechanical failures or accidents realized during transit to/from the training sites and while on the training site. Units realizing spill may request spill kit coverage from Range Division.

#### 2-18. **BIVOUAC AREAS.**

a. Administrative bivouac sites will be used for nontactical, administrative bivouac activities only. Use of these sites will be scheduled separately from the surrounding training area. The use of pyrotechnics, CS Gas, field latrines, sumps, foxholes, fighting positions, etc., is prohibited. Tracked and wheeled vehicles over 2 1/2 tons will not enter bivouac sites. Transportation Motor Pool (TMP) commercial issue 5-ton trucks may operate within administrative bivouac areas provided the cargo weight does not exceed 2 1/2 tons.

b. Units desiring tactical bivouac training will identify the desired area and request its specific use on the facility scheduling request.

#### 2-19. **TRAINING AREAS.**

a. Range Division oversees the use of 18 major training areas, which are subdivided into sub-areas called hunting areas. Units desiring use of these facilities will request the desired area by identifying both the training and hunting area(s) to be used.

b. Training area users will:

(1) Supply a qualified OIC of training who will be on site and in charge of the training at all times. The OIC must possess a valid range safety card.

(2) Meet all occupation and opening and closing requirements as established by this regulation.

(3) Ensure training is contained within assigned areas.

(4) Perform pretraining safety briefings to all personnel engaged in the training event. The briefing will include the threat from dud and unfired munitions and pyrotechnics.

(5) Prevent unauthorized use of lasers. Ensure laser ports are closed/covered to preclude accidental firing of unfiltered, non-eye safe lasers, or laser safety switch guards installed.

(6) Backhaul all trash and residue, including residue from pyrotechnics. No brass or residue will be placed in any latrine or dumpster. Unfired munitions (blanks, pyrotechnics, etc.) will be returned to the ammunition supply point. Dud pyrotechnics will be identified, marked and reported to Range Division for EOD clearance.

(7) Request approval from Range Operations to install foxholes, tank traps, sumps, and barrier wire. Ensure all foxholes, tank traps and sumps are filled and land is returned to its natural state upon completion of field exercises.

(8) Provide an armed guard for weapons when they are not under individual control and secure temporary holding sites for pyrotechnics and blank ammunition against pilferage by stationing a guard next to the holding site; see appendix B.

(9) Maintain continuous communications with Range Operations.

## 2-20. ROAD MARCHES.

a. Units conducting foot road marches using training complex roads/areas will submit route overlays to Range Operations 10 days before the training event. High density training units may submit numbered overlays, which may be activated by phone, with Range Operations 10 days before the march. Overlays will identify route of march, break areas, and ambush points (if used), and contain index data identifying any pyrotechnics, blanks, or gas used during the activity.

b. The OIC of training must have a valid range safety card and be certified for the type of training to be conducted.

(1) Maintain communications with Range Operations.

(2) Ensure that all members of the march stay on the shoulders of the roads or on paralleling paths. No one is to walk on the road surfaces on primary roadways within the training complex.

(3) Position advance and rear road guards a minimum of 50 meters from the main body. They will wear appropriate safety vests to warn approaching traffic.

(4) Ensure that any vehicles supporting the march stay to the side of the road to reduce passing problems with other traffic.

(5) Move all personnel off the sides of the road when tracked vehicles, HETS or other large vehicles pass the column.

(6) Ensure trash is not deposited along roadsides during mounted or dismounted marches.

c. Vehicle road marches involving high speeds, "buttoned-up" armored vehicles, or other activities which create a hazard or impede other traffic on primary roadways will be coordinated with Range Operations. Blackout driving operations on range roads requires prior approval by Range Operations. Requests for blackout driving on range roads will include route overlays and a commander's memorandum requesting announcement of intent to conduct blackout driving in the Fort Knox Weekly Bulletin.

**2-21. SEVERE WEATHER.**

a. Unit Commanders are responsible for providing notification of severe weather conditions to their personnel deployed in the training complex. Additional alerts and information will be made available to units in the training complex through the Range Control radio net; FM 38.90. The modification of training to meet severe weather alerts is a command responsibility.

b. Range Division will provide all users of the training complex additional weather threat data as it becomes available. These advisories are for use by the OIC during his assessment of risk. During extreme risk conditions, generated by weather conditions, Range Division may direct suspensions of training or other activities until the threat passes.

c. The OIC of training will include weather as an element of the risk assessment for the training event and be ready to implement the units severe weather SOP in the event of approaching severe weather conditions. This SOP must include reaction to the threat from lightning and high winds.

**2-22. USE OF TRAINING COMPLEX FACILITIES BY CLUBS OR OTHER RECREATIONAL ACTIVITIES.** Clubs or other similar nonmilitary activities desiring use of training complex facilities must be recognized on post under the provisions of DODI 1000.15. The point of entry to coordinate this effort is the Fort Knox Army Community Service (ACS) office. A copy of the approved recognition will be provided to Range Division before facility scheduling.

**2-23. PRIVATELY-OWNED FIREARMS.** Privately-owned firearms will not be fired on any ranges, except French Range, or in any training area, without approval of the RMO. This does not cover firearms involved in authorized recreational events.

## CHAPTER 3

### AMMUNITION

#### 3-1. GENERAL.

a. The Department of the Army and Headquarters, TRADOC have established detailed procedures for unit management of ammunition in AR 710-2, DA Pam 710-2-1, and TRADOC Reg 700-2. The guidelines contained herein are local ammunition section operating procedures designed to simplify the forecasting, requisition, issue, turn-in, transportation, safety, security, and handling of ammunition. These guidelines should be used in conjunction with AR 710-2, DA Pam 710-2-1, and TRADOC Reg 700-2 procedures and are not intended to modify or supplement specific requirements in those directives.

b. The OIC and RSO will have on hand and be familiar with current field and technical manuals for the weapons system being fired.

c. The RSO will supervise storage of all munitions at the units range ammunition issue point.

d. All ammunition and explosives will be under guard while stored within the training complex per appendix B.

e. The ramps on M113/Bradley series tracked vehicles will not be used as load-bearing platforms to transport ammunition. The ramps will not be held or supported parallel to the ground to serve as a load bearing platform.

f. Unloading/loading ammunition onto vehicles on the firing line, when the firing line is firing, is prohibited.

#### 3-2. PROGRAMMING FOR AMMUNITION.

a. Prepare DA Form 5514-R (TAMIS Training Ammunition Forecast Report) as outlined in DA Pam 710-2-1, and submit through command channels to this headquarters, ATTN: ATZK-PTP-A (Ammunition Coordinator), not later than the 10th of each month. The report should include requirements for all ammunition (to include dummy, inert or practice items). Requirements that munitions be cleared "for use in overhead fire" must be specifically annotated and must be received 90 days before the anticipated requirement date.

b. Organizations/activities requiring ammunition for use at other TRADOC or FORSCOM installations will observe procedures outlined in TRADOC Reg 700-2.

c. State Adjutants General and major Army Reserve commands must comply with procedures outlined in TRADOC Reg 700-2.

#### 3-3. REQUESTS FOR AMMUNITION.

a. Requests for ammunition to support basic and operational loads, i.e., mobilization, contingency or operations plans, guard, security police missions, etc., will be prepared and processed as indicated in the following paragraphs. Accountability will be maintained per DA Pam 710-2-1. The commander of the unit or activity receiving the ammunition is responsible for ensuring issue/return documents are promptly provided to the applicable property book officer so necessary accountability can be maintained.

b. Requests for training ammunition and explosives will be prepared on DA Form 581 (Request for Issue and Turn-in of Ammunition) in strict compliance with chapter 11, DA Pam 710-2-1. Requests MUST reflect NSN and DODIC and Training Event Code.

c. Submit ammunition requests through established training channels, i.e., Battalion S-3, U.S. Army Reserve Command (for USAR); State Adjutant General's Office (for ARNG); or U.S. Reserve Officer Training Corps Region (for ROTC), for approval and/or processing. Requests for basic and operational loads must be processed through appropriate property book officers.

d. DA Forms 581 received from U.S. ROTC for use at training sites other than Fort Knox must include a certificate stating that quantity-distance, compatibility, storage facilities, and security meet all requirements of these regulations: AR 190-11, AR 385-64, DOD 5100.76-M, and DOD 6055.9 STD. Requests which do not include this certificate will be returned for correction before ammunition is issued or shipped.

e. DA Forms 581 must be initiated in sufficient time to arrive at the Muldraugh Ammunition Storage Area (MASA) at least 3 working days before the requested pickup date. Ammunition not picked up within 2 working days of the date specified on the ammunition request will be canceled.

f. Request for shipment of ammunition to off-post units or activities must be submitted to arrive at the MASA at least 60 calendar days before the required delivery date.

### **3-4. RECEIPT OF AMMUNITION.**

a. Requisitioning units will provide all transportation, working parties, and security required for the movement of ammunition from/to the MASA.

(1) Transportation equipment:

(a) DA Pam 710-2 requires that unit commanders designate personnel to inspect vehicles transporting ammunition before their arrival at the MASA. Inspection will be listed on DD Form 626 (Motor Vehicle Inspection [Transporting Hazardous Materials]). Vehicles transporting ammunition off-post must meet Department of Transportation (DOT) safety standards and must be inspected by MASA surveillance personnel using DD Form 626. Driver/operator of vehicle must have an operator's license stamped, "Hazardous Materials Handling Qualified." There is NO provision for waiver of ANY safety requirement or safety equipment listed on the inspection form for unit personnel to inspect vehicles transporting ammunition or explosives off-post.

(b) Off-post movement of any quantity of live ammunition over public highways requires a valid DD Form 1266 (Request for Special Hauling Permit). See your supporting transportation/movements coordinator for details.

(c) Vehicles transporting ammunition and explosives must display the appropriate DOT Placards (on all four sides). Placards are posted when ammunition is loaded and removed when ammunition is unloaded. Only the highest classification of placard is posted on the vehicle. Placards must be securely taped or fastened in such a manner to be totally visible at all times. Current listings of placards for most common use items are available at the Muldraugh Ammunition Storage Area (MASA), phone (502) 624-8154, DSN 464-8154.

(d) All U.S. Army tactical vehicles are suitable for transporting ammunition. All non-covered vehicles transporting munitions will have tarps to cover load, to include appropriate straps/lines for securing. The use of privately-owned vehicles is prohibited.

(e) Sufficient number of vehicles must be available in order to comply with ammunition compatibility requirements. Only the driver and assistant driver is permitted to ride in a vehicle transporting ammunition. Detail personnel must be transported in a separate vehicle.

(f) During periods of severe weather, i.e. heavy snow, ice, etc., vehicles transporting ammunition and explosives to and from the MASA may require tire chains on the rear wheels (or both the front and rear wheels) if road conditions inside the MASA warrant. All snow and ice must be removed from bed of vehicle before loading.

(g) A current chart indicating transportation compatibility of common use ammunition items is available at the MASA.

(h) Units are required to provide sufficient tie-down straps (NSN 1670-00-725-1437 or 5340-00-980-9277) to meet load requirements when picking up ammunition. Vehicle operators are required to inspect loads to ensure that vehicle load limits are not exceeded, loading equipment is properly adjusted and loads are secured to meet road and transit conditions.

(2) Commanders are responsible for security of ammunition and missiles as prescribed in AR 190-11. Ammunition will never be left unattended or unsecured.

(a) Security requirements for each Controlled Item Inventory Codes (CIIC) are:

<u>CIIC</u>	<u>REQUIRES ARMED GUARD</u>	<u>CUSTODY OF SGT OR ABOVE</u>	<u>CONTROL OF DESIGNATED PERSONNEL</u>	<u>TWO PERSON RULE</u>
1, 5, 6 (Category I)	X	X	X	X
2, 8 (Category II)		X	X	X
3 (Category III)			X	X
4 (Category IV)			X	X



b. Issues.

(1) Issuing hours for the MASA are from 0800-1530, Monday through Friday. All ammunition issues are on a "fill or kill" basis, with no dues out established. Storage magazines are secured promptly at 1600. Issues or turn-ins not completed by 1600 will be zeroed or canceled. When emergency overtime is required to complete issues/turn-ins to/from on-post units, costs must be borne by the unit or major command requesting the overtime.

(2) One copy of the issue DA Form 581 and DA Form 3151-R (Ammunition Stores Slip) is provided with each issue. The form indicates items, quantities and lot numbers issued, and cites handling and security restrictions which may apply to the ammunition.

c. Signature cards.

(1) Signature card procedures outlined in DA Pam 710-2-1, section IV, chapter II, will be followed. Cards which do not reflect all required information will be rejected.

(2) Provisions for adding/deleting persons from DA Form 1687 (Notice of Delegation of Authority – Receipt for Supplies) do not apply to Class 5 ammunition. The most recently dated DA Form 1687 will always supersede all previously dated cards for a unit.

d. Vehicles to be loaded with explosives in advance of scheduled usage may be parked in the MASA Vehicle Holding Area (VHA) subject to the following conditions.

(1) A request to park explosive-laden vehicles is initiated by FK Form 187 (Muldraugh Ammunition Storage Area [MASA] Vehicle Holding Area [VHA] Parking Request).

(2) Vehicles may be left for a period not to exceed 72 hours (excluding weekends and holidays).

(3) Safety inspection must be performed as indicated in paragraph 15-4a(1)(a) above. Loads must be properly covered, segregated, secured, tied down, and vehicles properly placarded. Vehicles must have and employ drip pans to prevent contamination from petroleum leaks.

(4) Small, loose, pilferable type items, i.e., small arms ammunition, simulators, etc., must be in a locked, banded, or otherwise sealed container, so that access cannot be gained to the items without resulting in damage to the container or seals.

(5) VEHICLES WHICH CONTAIN MIXED LOADS OF BOTH AMMUNITION RESIDUE AND LIVE AMMUNITION WILL BE DENIED ENTRANCE TO THE VHA.

(6) Vehicles denied access to the MASA VHA may be parked on ranges. Unit personnel should contact the Range Office, phone 624-1447/2135, and provide 24-hour security for the vehicle(s).

(7) Ammunition MAY NOT be added to, or removed from, vehicles while parked in the VHA. The only exception to this requirement involves vehicles which will not start and require a "tow" or "jump-start." Units must be prepared to unload the vehicle before "towing." Jump-starting is permitted using slave cables (tactical vehicles) or jumper cables (TMP vehicles). Use of starter fluid, spray, etc., and/or performance of any mechanical work, i.e., repair or removal of carburetor, is prohibited.

f. To remove vehicles from the VHA:

(1) Unit representative must have the receipt copy of the VHA FK Form 187, a valid military driver's license and a valid U.S. Government-issued identification card. A driver's license is acceptable identification for the individual IF it contains a picture of the individual.

(2) Unit representative must have at least two full fire extinguishers, rated 10 B:C or more. Armed guard and/or escorts must be present, if required (paragraph 15-4a(2) above).

(3) Unit representative will physically inventory the contents of the vehicle before departure from the VHA, and immediately report any discrepancies to the MASA guard.

g. Separate procedures apply to use of the VHA for vehicles containing contingency plan ammunition. Coordinate requirements with the Chief, MASA, phone 624-8154/4611.

**3-5. TRAINING AMMUNITION MANAGEMENT AND CONTROL.** Units requesting and receiving ammunition from the MASA must be completely familiar with requirements and procedures contained in DA Pam 710-2-1, chapter 11.

**3-6. STORAGE OF AMMUNITION IN UNIT AREAS.** Explosive storage license requirements contained in AR 385-64, provide the following instructions or limitations on storage of ammunition in unit or higher headquarters areas: limit quantities of Class/Division 1.4 items stored in arms rooms (e.g., MP, security guard force, and CID) to quantity necessary to meet 1 day operational requirement. Do not store Class/Division 1.4 items in training unit arms rooms. Draw and store ammunition for qualification and training purposes at the local ammunition supply holding area to support unit training.

**3-7. STORAGE AND USE OF AMMUNITION AND EXPLOSIVES ON RANGES.**

a. The following general guidelines apply to range ammunition supply points:

(1) Flame/spark producing items, flammable liquid (bore cleaner, oil, etc.) and designated smoking areas should be at least 50 feet from the ammunition storage/issue site. All ammunition at firing sites will be located outside the backblast area for the weapon(s) involved and stored at a position which will reduce the potential for ignition, explosion, or detonation.

(2) Display appropriate fire symbols in such a manner as to be visible from the range entrance.

(3) Two fire extinguishers, rated 10 BC or more, will be readily available for use.

(4) Ammunition will be positioned on pallets or suitable dunnage to provide 3 to 6 inches of clearance off the ground. Ammunition will be covered and stored off the ground by the use of dunnage, transport trailers, or in place shelters.

(5) Break seals only on those boxes to be immediately unpacked and fired. Do not remove seals ahead of time. The unpacking of ammunition at the firing line should be limited to the least number of rounds that will permit efficient firing of the exercise. For mortars, it is the amount of ammunition for a fire for effect; or when supporting tank gunnery, no more than 10 illumination rounds. For tanks, it is only the amount of ammunition to be uploaded before firing. Mortar ammunition that is broken down for immediate use will be stored with the fiber canisters covering the primer and any exposed charges.

(6) Do not burn excess propellant increments until the projectile or mortar has been fired.

(7) Some ammunition boxes and pallets are treated with potentially hazardous preservatives. If burned, they may produce toxic fumes. Troops should wash their hands after handling them. Eating at the ammunition point should be prohibited.

(8) All residue (clips, boxes, cans, speed loaders, bandoleers, brass, etc.) must be sorted and turned in upon completion of firing. Brass must be relatively clean and checked to ensure separation of empty brass and live or damaged rounds.

(a) Under no circumstances will any type of residue be kept on the range, destroyed, or discarded in trash containers. Combustible residue storage or sorting points must be located at least 50 feet from the ammunition storage (temporary issue) points.

(b) Unannounced inspections of range-firing activity will be conducted by the MASA QAS(AS). Inspection reports will be submitted through command channels for corrective action as appropriate.

(9) Ammunition will be issued to a firing unit immediately before conducting scheduled firing exercises. The ammunition will not be distributed to troop personnel until they are on the ready or firing line.

### **3-8. AMMUNITION MALFUNCTIONS REPORTING FORMAT.**

a. The following reporting procedures will be followed in cases of any malfunction to Range Operations:

(1) Range, observation point (OP), firing point, training area, and grid coordinates.

(2) Type and caliber of ammunitions.

- (3) Number of malfunctions.
- (4) Time/date of malfunction.
- (5) Name of OIC.
- (6) Name, unit, and telephone number of person.

b. Immediately REPORT ALL malfunctions to Range Control. Contact Range Control for instructions Range Operations will, in turn, notify the DBOS POC. (QAS)(AS) Range Control will notify applicable personnel and an investigation will be initiated per AR 75-1.

### 3-9. AMMUNITION HANDLING/STORAGE.

- a. See appendix B.
- b. Ammunition and explosives may be held in the issue point on the range where it is to be used. Before holding more than a 1-day requirement of ammunition on the range, permission will be obtained from Range Operations. Units holding ammunition on the range will comply with AR 385-62, AR 385-63, DA Pam 385-63, and this regulation. Ammunition and explosives will be guarded according to the categories listed in appendix B.
- c. Detailed procedures for the issue, turn-in, transportation, and handling of misfires may be found in the bulletins released by the DBOS ammunition section.
- d. Mortar rounds will be transported to the firing point from the ammunition point in one of two manners:
  - (1) In the wooden ammunition box.
  - (2) In the fiber container and strapped into the ammunition racks inside the mortar carrier.
- e. If mortar ammunition is prepared for firing inside the carrier, it will be properly stored inside the ready rack.
- f. All White Phosphorus (WP) ammunition will be transported and stored with the nose end facing up, because of the possible settling of chemical fillers. WP rounds found improperly transported or stored will not be fired and are to be considered unsafe. Range Operations will be immediately notified of the situation and arrangements made to have the rounds inspected by qualified personnel before firing.
- g. Weapons, ammunition, and brass involved in malfunctions will remain undisturbed and under guard until cleared, normally the Ammunition Surveillance Officer. An immediate report of the incident will be made to Range Operations. A malfunction of ammunition is defined as an incident in which a munition properly employed fails to perform as designed and causes injury,

damage to the weapon, or renders the weapon temporarily inoperative. Misfires of small arms ammunition, which are corrected by immediate action procedures, are not considered as a malfunction.

### 3-10. MISFIRES AND HANG FIRES.

a. Provisions for removal of misfires will be per AR 385-62, AR 385-63, DA Pam 385-63, bulletins provided by the DBOS ammunition section, and applicable field manuals (FM) and technical manuals (TM). Required time limits must be followed for hang fires or cook offs to prevent injury as prescribed by the applicable TM or FM. Misfires are to be retained on the range and turned in. Ensure that misfire ammunition is marked "Misfire" and is not mixed with serviceable ammunition.

b. Misfires will be handled per the appropriate TM for the weapon/ammunition. Misfires will be removed from range before range clearance. Misfires or stuck ammunition requiring QASAS assistance will be processed through Range Operations. Any misfire incident causing a delay in training, or involving demolitions or mine misfires will be reported to Range Operations.

### 3-11. DUD PROCEDURES.

a. A dud is any explosive munition such as a fuse, projectile, grenade, or artillery simulator or mine that has been fired from a weapon or otherwise activated and failed to detonate. Fired munitions and/or projectiles will not be tampered with. Duds are not recoverable. Any object that appears to be a dud will be treated as such.

b. Commanders are responsible for instructing all personnel that duds are not to be disturbed under any circumstances. In the interest of safety, it is the duty of all personnel to note the exact location of duds and report them to Range Operations. Duds located outside/inside an impact area will be clearly marked by placing a stick, twig, etc., topped with a piece of paper, handkerchief, etc., about 2 to 3 feet from the object. An immediate report will be made to Range Operations containing the following information:

- (1) Grid coordinates.
- (2) Number of duds.
- (3) Type of duds (high explosive, illumination, etc).
- (4) How marked.
- (5) Name and duty phone number of individual who knows location of duds.
- (6) Caliber/size (60mm, 105 mm, 8 inch, etc).
- (7) Fuzing, if known.

c. Range Operations will notify EOD who will, in turn, destroy the dud(s).

d. Under some circumstances, units may be tasked with conducting live-fire exercises in which troops are required to maneuver over an area immediately after artillery, tank cannon, and mortars have been fired into the same area. If any dud is identified, immediately notify Range Operations. With Range Operations approval, ongoing training will be restricted to a safe distance from the dud. If feasible, a guard will be stationed a safe distance away to warn fellow soldiers of the danger and to direct EOD personnel to the dud.

e. If hand grenade duds occur during live grenade training, throwing will cease immediately and Range Operations will be notified. A live grenade will not be thrown at dud grenades. Units operating on an established grenade range will adhere to the grenade range SOP for actions in the event of a dud grenade.

### **3-12. AMMUNITION RESTRICTIONS.**

a. To prevent accidents caused by blast effects of certain training ammunition, artillery simulators, hand grenade simulators, and grenades will be limited for use by personnel designated by unit commanders, and under the supervision of an officer experienced in the use of such materials. The OIC of this type training must have proper certifications listed on his range safety card.

b. The destruction of excess powder bags and charge increments under field conditions is allowed if part of the training event. Precautions will be taken when burning field artillery powder bags and mortar charges/increments to ensure all established safety and fire prevention procedures are met. If destruction of excess charges is not part of the training event, they will be returned with the ammo residue. See Chapter 11.

**3-13. AMMUNITION FOR OVERHEAD FIRE.** Specific lots of ammunition are designated as suitable for overhead fire. Ammunition requests (DA Form 581) will indicate the DODAC (Department of Defense Ammunition Code) and quantities required for overhead fire. All other ammunition lots are restricted from overhead fire.

### **3-14. TRANSPORTATION OF AMMUNITION AND EXPLOSIVES.**

a. Instructions for transportation of ammunition and explosives to training areas are contained in AR 190-11 and AR 385-64. See appendix B.

b. Specific areas have been designated by the Range Management Officer on the main gun tank ranges/training areas for parking of semi-trailer ammunition vehicles. Only authorized parking areas as identified by the range inspector will be used.

c. Ammunition, pyrotechnics, and explosives will not be transported by privately-owned vehicle (POV).

### **3-15. SUSPENDED AMMUNITION.**

a. The QASAS, MASA, is responsible for monitoring suspensions and restrictions and determining appropriate actions.

b. When suspension/restriction notices are received, Ammunition Surveillance will determine the presence of affected lots. In the event a suspended/restricted lot is in use on the range, immediate action will be taken to ensure using units are notified. Specific instructions concerning hazards, precautions and necessary technical assistance will be provided.

c. All ammunition used at this installation must be issued at this installation, otherwise suspended/restricted ammunition cannot be identified. For this reason, it is essential that units coordinate with Ammunition Surveillance before bringing ammunition from their home station.

### **3-16. TURN-IN OF UNUSED AND UNSERVICEABLE AMMUNITION.**

a. On completion of firing, return all unused and/or unserviceable ammunition to the MASA. Prepare DA Form 581 in five copies in strict compliance with DA Pam 710-2-1. Schedule the turn-in 24 hours (1 working day) in advance by delivering a copy of the live turn-in document to the MASA for SAAS-4 computer processing.

b. Vehicles returning ammunition will be inspected under the same criteria outlined in paragraph 15-4a(1)(a). Vehicle loads MUST be segregated by type and lot number BEFORE entering the MASA. Vehicles with unsegregated loads WILL NOT be processed. There is NO segregation area in the MASA.

c. Serviceable ammunition will be listed on DA Form 581 citing correct NSN, DODIC, nomenclature, and quantity. Returned ammunition will be packed exactly as it was issued, to include inner pack cardboard boxes and packing, and outer wire bound containers. All fuses or detonating elements will be set on "SAFE." All safety devices will be reinstalled in their original position. An Ammunition Inspection Certificate signed by a SFC or above from the unit returning the items will be placed in each opened container. Unexpended ammunition from more than one issue document MAY NOT be consolidated for turn-in on a single document.

d. Ammunition which cannot be returned to stock for immediate issue due to condition, lost lot identity, incorrect containers, or packing materials is classified as unserviceable and may be referred for property adjustment action per AR 735-5. Turn-in units must provide a completed DA Form 581 BEFORE returns will be accepted.

e. If, for any reason, it is impossible to return the ammunition in a safe condition, request technical advice and assistance from the MASA Surveillance Office, phone 624-8120.

### **3-17. AMMUNITION BRASS, RESIDUE, AND COMPONENTS.**

a. All recoverable ammunition residue (DA Pam 710-2-1, paragraph 11-3e) will be returned directly to the MASA. Turn-ins are accepted Monday through Thursday on a first-come-first-served basis. Turn-ins are accepted on Friday on an appointment basis only.

b. **Returns must be segregated/sorted before entering the MASA. There is NO segregation area in the MASA. Expended small arms cartridge casings and links must be segregated by type, i.e., steel, brass, aluminum, and by caliber, and casings from live ammunition sorted from blank ammunition casings. All residue ammo cans and boxes will be EMPTY.**

c. Prepare DA Form 581 in strict compliance with DA Pam 710-2-1. Required statements and remarks must be included on the form.

d. The requirement for prior unit inspection of returns and correct document preparation will be rigidly enforced. Incomplete documentation will be rejected. If acceptance inspection reveals live rounds, unfired primers, etc., the turn-in will cease. Credit will be given for items accepted to that point. All remaining items on the turn-in document will be rejected and returned to the unit pending re-inspection by an SFC or above and preparation of new turn-in documents.

### 3-18. RECONCILIATION OF AMMUNITION ISSUES.

a. The activity that first issued the ammunition on DA Form 5515 (Training Ammunition Control Document) reconciles the issue with the user per paragraph 11-14, DA Pam 710-2-1.

b. Within 5 working days after completion of the training event, the activity receiving the ammunition from the MASA must reconcile the issue as follows:

(1) Return all unexpended ammunition. **Return all ammunition residue and packing materials.**

(2) **Submit a DA Form 5811-R (Certificate–Lost or Damaged Class 5 Ammunition Items) for shortages of ammunition and residue. (AR 15-6 investigation is required for shortages/overages of Category I and II items.)**

(3) Initiate action and attach evidence of that action (e.g., copy of Report of Survey, request for investigation, etc.) when damage to live ammunition is other than fair wear and tear (FWT).

(4) Submit a DA Form 5692-R (Ammunition Consumption Certificate) for specially controlled training ammunition (paragraph 11-13.1, DA Pam 710-2-1).

c. When reconciliation is not completed within the 5 working day period, without prior coordination, no more training ammunition will be issued until reconciliation is completed, either by turn-in action or proof of initiation of investigation.



d. When units have ammunition on hand, regardless of the reason or circumstance, after turn-in has been completed and document reconciled, amended turn-ins must be prepared and processed as outlined in paragraph 11-15j, DA Pam 710-2-1.

**3-19. TRANSPORTATION OF AMMUNITION AND EXPLOSIVES BY GOVERNMENT-OWNED MOTOR VEHICLES.**

a. Motor truck shipments. Requirements pertaining to motor truck shipments of ammunition and explosives are contained in AR 190-11 and AR 385-55 and will be complied with when transporting ammunition and explosives.

b. In transit.

(1) ANY movement of ANY quantity of live or blank ammunition and/or explosives, on (or crossing) ANY public traffic route requires coordination and approval of the Kentucky Transportation Office by issue of a DD Form 1266.

(2) The route for internal transportation of ammunition and explosives is from the MASA via Brandenburg Station Road to Frazier Road, then either to Wilson Road or Range Road to the ranges. Units using Range Road to get to the ranges may use North Delaware Street to Eisenhower Avenue to Main Range Road in order to avoid Agony Hill. No other routes will be used without prior approval of the Provost Marshal, this headquarters. Movement of ammunition laded vehicles through the main post cantonment area is prohibited.

(3) Vehicles transporting ammunition to Yano Range may be routed along Brandenburg Station Road to U.S. Highway 31W overpass, then on U.S. 31W to intersection of Kentucky State Road 434 to Yano Range. NOTE: DD Form 1266 is required. Vehicles transporting ammunition to the Zussman MOUT site will travel the military road; Main Range Road north, crossing the Salt River Bridge to Mt Eden Road. Ammunition will not be transported on Highway 44.

(4) Civilian operators of explosive-laden military vehicles traveling off-post must have in their possession a valid Commercial Driver's License (CDL) stamped "HAZMAT CERTIFIED."

(5) Military drivers must have an OF 346 with hazard endorsement for ammunition/explosives.

**3-20. REPORTING GUIDED MISSILE FIRINGS.** Commanders of units firing TOW, DRAGON, STINGER, etc. missile systems are responsible for preparing and submitting Firing Data Reports to Commander, U.S. Army Missile Command, within 3 days of the firing.

**3-21. AMMUNITION BASIC LOADS.**

a. Policy, procedures, and detailed responsibilities for the requisitioning of unit basic loads of ammunition are contained in FORSCOM Reg 700-3 (Ammunition Basic Loads).

b. Periodically, FORSCOM provides an approved Basic Load Authorization and Basic Load Recap for review and processing. After review by unit commanders and required changes are entered, the Recap is returned to this headquarters, ATTN: ATZK-OSS-A for approval. The approving office returns two copies of the Recap (or FORSCOM Form 149-R [Ammunition Basic Load Computation Sheet]) to the unit for file, one copy to the MASA for supply action.

c. Ammunition basic loads held in MASA storage will be issued only in event of actual deployment or mobilization, or direction of higher headquarters.

### **3-22. PROCEDURES FOR AMMUNITION AMNESTY AND AMMUNITION "FOUND ON POST."**

a. Personnel safety shall be the primary consideration at all times. Ammunition of unknown origin, excluding small arms ammunition .50 caliber and below, is considered to be hazardous and must not be moved by untrained personnel. Mark the location and notify the Explosives Ordnance Detachment (EOD), phone (502) 624-6425/5631, and they will respond to the location of the hazardous item.

b. The MASA is the primary ammunition found on post (AFOP) and amnesty turn-in point. All ammunition, components, and ammunition residue will be accepted with or without documentation, from military or civilian personnel, with no questions asked, during normal operating hours. MASA will establish maintain and monitor an ammunition amnesty box, capable of accepting material larger than .50 caliber within the authorized limits to the Brandenburg Station Road entrance. This box will be inspected and emptied daily by ASP personnel. MASA will establish an ammunition amnesty day for the installation annually, the date, location and process will be established and published annually by the Chief of MASA.

c. The Explosive Ordnance Detachment (EOD) will respond to calls of AFOP or amnesty ammunition suspected of being in a hazardous condition. Responding EOD personnel will determine appropriate disposition of the material, i.e., immediate destruction or recovery and return to the MASA. The EOD is NOT a designated amnesty turn-in point and ammunition will not be taken to that unit for disposition.

d. Commanders will establish an Ammunition Amnesty Program and employ the ammunition found on post procedures as outlined herein. Commanders will ensure that the following is included in the unit program and being complied with.

(1) A non-intimidating atmosphere for soldiers and civilians to freely turn-in or report the location of ammunition. Do not ask personal questions i.e., name, address, unit. Questions about how the ammunition may be asked, so that ammunition control can be improved, however ammunition amnesty users are not required to answer these questions. No attempt will be made to punish or prosecute individuals using the amnesty program, since this will discourage use by others in the future.

(2) All soldiers and civilians will have the option to turn-in or report AFOP and amnesty ammunition through their chain of command without fear of reprisal.

(3) Semi-annual amnesty program training will be conducted at the unit/activity level. The training and attendance is to be documented and filed per regulatory procedures.

(4) All personnel involved in a training exercise employing ammunition and explosives will be given a safety and ammunition program briefing before the training exercise.

(5) A copy of the ammunition amnesty program policy will be posted on the unit/activity bulletin board with ammunition amnesty turn-in posters. Posters will contain location of ammunition amnesty turn-in points, telephone numbers and information for potential users.

**(6) The location of all amnesty boxes established will be coordinated with Armor Branch Safety Office and the approved location will be reported to the Chief of MASA through memorandum. The same action is required upon the addition, deletion and relocation of an ammunition amnesty box.**

(7) Ensure that only the approved design boxes are used. The accepted boxes are equipped with a hasp/staple for a padlock and having a single deposit hole at the top, no larger than 7/8 inch in diameter. Boxes should be marked "AMMUNITION AMNESTY BOX FOR SMALL ARMS AMMUNITION ONLY."

(8) Amnesty boxes will be inspected and emptied daily.

(9) The establishment and use of ammunition amnesty boxes on ranges is prohibited.

e. The Law Enforcement Command will establish ammunition amnesty boxes at each entrance to the installation and at the Military Police Station. The Military Police will assist persons in identifying locations and obtaining EOD assistance to location of ammunition suspected of being in hazardous condition. The amnesty boxes will be inspected and emptied daily.

f. Turn-in procedures, persons desiring to turn in other items will call the Ammunition Hot Line, (502) 624-AMMO, for information, 24 hours a day. If the items are suspected of being hazardous condition, personnel should call EOD, (502) 624-6426/5631, who will respond to the location of the suspected hazard. Information is also available by calling the Ammunition Supply Point (502) 624-8154/4611/8120, during normal operating hours. Ammunition larger than .50 caliber may be turned in to MASA during normal operating hours. Other than normal operating hours, it may be placed in the ammunition amnesty adjacent to the Brandenburg Station Road entrance. This amnesty area will be inspected and emptied daily by ASP personnel.

g. Amnesty boxes, capable of accepting materiel larger than .50 caliber may be established ONLY under the following conditions.

(1) Amnesty boxes must meet Quantity Distance (QD) and explosives safety requirements for all classes of ammunition, i.e., minimum distance of 670 feet from nearest inhabited building or public traffic route; sandbagged on three sides and barricaded on one side.

(2) Boxes must be configured so that trained personnel can determine when items have been placed in the box.

(3) Prior coordination with the QAS(AS), Armor Branch Safety Office, and Fort Knox Provost Marshal office (Physical Security) is required before boxes are established.

**3-23. SURVEILLANCE OF AMMUNITION IN TROOP UNITS.** All units or activities storing ammunition and/or explosives are subject to inspection by Armor Branch Safety Office QAS(AS). The inspections will be made on an unannounced/as required basis, to determine if storage is per safety and surveillance regulations, with results reported through command channels for information and/or correction action, as applicable.

**3-24. AVAILABILITY OF AMMUNITION RESIDUE FOR TRAINING PURPOSES.**

a. All recoverable ammunition residue, without exception, is to be returned to the MASA. Retention by units for any purpose is not authorized.

b. When ammunition residue is required for a valid specific training purpose, request the residue on a DA Form 581. Prepare the DA Form 581 in six copies.

c. Many wooden ammunition containers and pallets are treated with chemical preservatives which are potentially hazardous when handled or ingested. Use of these items as construction material, partitions, flower boxes, storage containers, etc. is prohibited.

d. Units are not authorized to request ammunition residue from the DRMO (DA Pam 710-2-1).

**3-25. TRANSPORTATION OF DOT CLASS 1.4 SMALL ARMS AMMUNITION IN GOVERNMENT SEDANS OR VEHICLES WITHOUT SEPARATE CARGO COMPARTMENT.** Small arms ammunition ONLY may be transported in the trunk of sedans or in vehicles without separate cargo compartments, i.e., vans, M151 1/1 ton truck, etc., providing:

a. The Total Net Explosive Weight (TNEW) does not exceed 25 pounds.

b. Loads are secured to prevent shifting during transit, regardless of quantity.

c. Vehicle weight limits are not exceeded.

d. Vehicle safety/inspection requirements are met. Fire Symbol No. 4 is displayed for on-post movement.

e. Appropriate DOT placard is displayed.

f. DD Form 836 (Shipping Paper and Emergency Response Information for Hazardous Materials Transported by Government Vehicles).

- g. HAZMAT certified.
- h. Package weight less than 66 pounds requires ORM-D stamp.

## CHAPTER 4

### FIRING

4-1. **GENERAL.** Persons in charge of or using ranges, maneuver areas, and training facilities are responsible for compliance with the safety requirements of this regulation, AR 385-62, AR 385-63, DA Pam 385-63, and the applicable TM and FM for the training to be conducted.

#### 4-2. **RANGE SAFETY.**

a. The range OIC and RSO must have a valid range safety card in their possession and be certified on the types of weapons to be fired. If the OIC is responsible for training that involves more than one type of weapon/weapon system, he/she will be qualified with the primary system and use additional safety officers who will supervise each of the other weapons involved.

b. The right and left firing limits are marked by limit markers and firing will not be conducted outside the range firing limit established by these markers. If a limit marker is knocked down or missing, the firing unit will cease fire and have firing personnel replace it after obtaining clearance to enter the impact area (right and left limit markers must be visible to the naked eye at all times). On those tank ranges with several possible firing courses, limit markers may not be posted due to the confusion that a large number of markers would cause. On these ranges, the firing unit will adhere to the restrictions identified in the appropriate firing deviation documentation or as established by Range Division. Proper target exposure control is required to ensure rounds remain within established limits.

c. Any individual who observes a condition which makes firing dangerous will immediately command "cease firing." This information is to be included in the RSO safety orientation to all firing personnel.

d. Before any combined arms live-fire exercise, multi-weapons system demonstration, or other live-fire exercise that uses a mix of major weapon systems, the OIC and RSO will jointly brief the RMO on the concept of the operation. This briefing will be held at least 30 days before the exercise. The OIC will have the surface area danger zones for each major weapons system per AR 385-62 at the briefing.

e. Range Technicians assigned by Range Operations will inspect/observe training for compliance with safety requirements and facility use restrictions. Units that operate training/range areas will adhere to instructions issued by the range technician.

f. In the event of live fire impacting in areas of troop training in the field, certain actions are necessary to reduce casualties resulting from the incoming fire and expedite care of casualties and evacuation to medical facilities. Units will ensure all personnel are instructed in procedures to follow if caught in an area subject to live fire. Daily, before the beginning of training at ranges, training areas, and bivouac sites or base camps, unit training instructor or OIC will

instruct unit on procedures to be followed. Instructions will, as a minimum, include the following:

- (1) Specific areas in which troops will take cover.
- (2) Location of medical personnel in the immediate vicinity.

g. If live fire is received in the vicinity of troops, the OIC will immediately report the following information to Range Operations:

- (1) Type fire being received.
- (2) Identification and location of unit by coordinates.
- (3) Number of casualties and nature of wounds.
- (4) Location of nearest helicopter landing zone.

#### 4-3. **COMMANDERS.**

a. Commanders are responsible for the safe operation of ranges used by their units.

b. Commanders of units firing ammunition, detonating explosives, or otherwise training in a range area will designate an OIC and RSO with assistant safety officers/noncommissioned officers, as required. A separate qualified safety officer is required for each major weapons system involved in a range exercise. The overall RSO is responsible for coordinating the efforts of subordinate safety officers. Commanders will ensure that those personnel selected for these duties have been thoroughly trained and have demonstrated a complete knowledge of safety procedures pertaining to the type of weapons being fired. This training/knowledge must be verified and the range safety card validated for each weapon/weapons system that the individual is qualified to supervise.

c. Commanders, or their designated representatives, are responsible for briefing the OIC on specific responsibilities before firing on any range.

d. The duties and responsibilities of the OIC of firing will be supplemented by AR 385-62, AR 385-63, DA Pam 385-63, and the FMs and TMs governing the type of training to be conducted. These instructions may also be supplemented by instructions from the commander and/or the G3/DPTM through the RMO.

#### 4-4. **WHO MAY BE AN OIC OR RSO.**

a. OIC.

(1) The OIC and RSO must have attended the Range Division safety briefing and have a safety card properly validated for the range or training area they are supervising. They must be qualified on the weapons or subsystems to be supervised.

(2) The OIC of training areas using pyrotechnics or CS Gas will be grade E7 or above.

(3) DA civilians serving as OIC of live-fire ranges must be grade GS-09 or above.

b. RSO.

(1) The RSO must have satisfactorily completed a standard program of instruction in the duties of RSO developed by the battalion to which they are assigned.

(2) The RSO must be qualified and knowledgeable in the weapons system involved and the RSO duties required.

(3) DA civilians serving as RSO of live-fire ranges must be grade GS-07 or above.

4-5. **OIC.** The OIC will:

a. Be present on the range during all firing and exercise full control over all activities conducted on the range facility during the entire period of assignment as approved on the FK Form 129. The OIC must maintain constant communications with Range Operations.

b. Ensure that all equipment needed for the range is signed for from Range Division the day before intended use. Equipment for weekend or holiday firing will normally be picked up by 1500 the workday before weekend or holiday firing. Weekend, holiday, and nonduty hour pickup must be coordinated with Range Operations NLT 1200, the duty day before the pickup date. Soft targets, such as dumpsters and vehicle bodies, require approval from the RMO. All glass and reflective material must be completely removed from any target object before being placed in the impact area. Using units are responsible for procuring, preparing, and transporting soft targets.

c. Supervise the occupation and prefiring preparation of the range. The OIC will ensure that the occupation report is made with Range Operations and that the sign-on inspection and facilities briefing is conducted with the supporting range technician.

d. Before firing, open the range with Range Operations and record the opening time and initials of the Range Operations personnel approving opening. Report first round downrange and all cease-fires in excess of 15 minutes. Close the range with Range Operations upon completion of firing and again record the time and initials.

e. Ensure that a current copy of this regulation, or AR 385-62, as appropriate, a functional magnetic/lensatic compass, and appropriate manuals for weapons being fired are present on the range. A copy of the approved facility scheduling document will be present at training sites.



If conducting firing under a deviation of safety criteria, an approved copy of the deviation document will be on the range.

f. Emplace sufficient targets at the appropriate time to eliminate unnecessary and uncoordinated cease-fire periods. All targets will be emplaced before daylight firing times. Schedules for emplacing targets are provided below. Due to common impact areas and required range technician checks of protective berms and bunkers, the OIC may expect mandatory cease-fires during these periods. The functionality of the range and protection of high cost downrange devices and systems must be maintained. If downrange entry is not required by either the unit(s) or Range Division, the unit(s) may continue training through these periods.

(1) Summer (1 May-30 September), 0600-0730, 1200-1330, 1930-2100.

(2) Winter (1 December-30 April), 0600-0800, 1200-1300, 1630-1800.

g. Issue a cease-fire" when ordered to do so by the RMO or his/her representative. The OIC must develop and employ sufficient internal controls and communications so as to immediately obey cease-fire, cease-fire freeze, or cease training orders.

#### 4-6. **LANDING ZONE (LZ) OIC.**

a. An LZ OIC is required for airmobile/air assault operations.

b. Flight routes will be coordinated with Godman Army Airfield and Range Operations a minimum of 72 hours before conducting airmobile operations.

c. Range Operations will be notified by the LZ OIC 10 minutes before the first lift-off time from the LZ. The LZ will be opened and closed through coordination with Range Operations.

d. Range Operations will be notified, at the time of departure of the last aircraft, that use of the LZ has been completed. Range Operations will be notified when the use of an LZ has been terminated.

4-7. **RSO.** The RSO must also be present on the range during the entire period the range is in a firing status. The RSO will be thoroughly familiar with this regulation, safety requirements outlined in the TM or FM of the type weapons being fired. The RSO will:

a. Ensure that AR 385-64 and appendix B of this regulation is being followed per proper ammunition procedures (receipt, storage, malfunctions, turn-in, and transportation).

b. Ensure that each weapon is inspected before and during firing to assure safe operation. After firing, ensure each weapon is clear of ammunition. The RSO ensure that a system of weapons checks are in place after firing and before removal of the weapon from the firing line that provides for two different personnel to inspect the weapons for ammunition (a "two-eyes check"). This same procedure will be employed before securing firing vehicles on the firing line during an extended cease fire period.

- c. Verify elevation and deflection safety limits. Prohibit the execution of fire commands which would cause projectiles firing outside safety limits.
- d. Report to the unit commander for a safety briefing before assuming duties.
- e. Ensure that the safety officer checklist is used before, during, and after firing.
- f. Before starting live-fire activities, review all safety aspects of the range with the OIC, ensure Range Operations has cleared the range to fire, and grant the OIC clearance to fire.
- g. Be directly involved with impact area control:
  - (1) Security of gates or placement of roadblocks.
  - (2) Clearance of personnel downrange

#### 4-8. **FIRING CONDITIONS.**

- a. Ammunition will not be fired over ammunition storage areas, public traffic routes, or other nonrelated inhabited areas without approval from the RMO.
- b. If weather conditions, smoke, dust, or other factors obscure the target area or range limit marker, firing will be stopped until conditions improve.
- c. During periods of dry weather, which produce a severe danger of fire, Range Operations may impose restrictions covering certain munitions to reduce the probability of range fires.

## CHAPTER 5

### RANGE SUPPLIES AND TARGET SUPPORT

#### 5-1. GENERAL.

a. Range supplies are available for issue to units from the Range Division Supply Office, Bldg. No. 6034, Pickett Road.

b. Supplies for use on ranges and training areas will be requested using the unit facility scheduling request, or in memorandum format to G3 Range Division submitted 10 days before scheduled use date.

c. Units requesting supplies will be issued their targets, equipment, etc., 1 day before firing. If firing is to be conducted on weekends or holidays, range equipment will be issued on the last scheduled normal working day by 1300. Range Division Supply is not normally open outside of core hours (weekends and holidays). If targets or supplies are to be drawn on weekends or at night, using units will precoordinate the issue at least 24 duty hours in advance of the issue. Support of this request will be dependent on the availability of personnel and the units agreement to fund the overtime.

d. Target materials requested will be expended in the manner stated on request. All unused and salvaged materials will be returned to Range Supply upon completion of firing. Range Supply will determine what materials are reusable before the unit destroys, or completes a turn-in to the Post Sanitary Landfill. Failure to meet this requirement may result in a Report of Survey action.

e. Range Supply hours of operation for drawing targets and equipment and for turn-in activities are as follows:

(1) Monday through Friday - 0730-1130 and 1230-1500.

(2) Weekends, nights, and holidays - as coordinated with Range Operations.

f. Valid signature cards, DA Form 1687 (Notice of Delegation of Authority Receipt for Supplies) (four copies each) are required to be on file with Range Division for units desiring to draw range supplies or equipment. Only those personnel on the signature cards will be issued equipment, targets, target devices, or target boots.

g. It is a using unit/OIC responsibility to coordinate issue, pickup, transport, emplace, service, recover, clean (as required), and turn in range support equipment.

#### 5-2. CARE OF SUPPLIES.

a. Security of issued items is a using unit responsibility.

b. Lumber and plywood issued for target support is a high loss item and strict control is required.

c. Damaged target devices will require the using unit to initiate release from accountability documentation.

d. Target boots will be exchanged with Range Supply on a one-for-one basis once the target boot becomes unserviceable. The replacement cost for lost target boots is \$11 each.

### 5-3. AVAILABLE TARGETS/EQUIPMENT.

a. Targets. A broad spectrum of small arms targets are available. All current stock numbered targets should be available for immediate issue. Nonstandard targets require prior coordination, and sufficient time for ordering or fabrication.

b. Tank gunnery targets. These are listed in the Tank Gunnery Catalog issued by the Armor School. Boresight panels are already installed on all major tank ranges. Additional panels may be drawn from Range Supply. Thermal target support must be identified on the unit scheduling request.

c. Miscellaneous equipment.

(1) Disk, target spotter, 3-inch.

(2) Disk, target spotter, 5-inch.

(3) Flag, range, scarlet.

(4) Amplifier.

(5) Speaker.

(6) Road barrier, temporary, with stand.

(7) Warning/laser sign.

d. Stationary Tank Automated Target System (STATS).

(1) General description. The STATS is a remote controlled operating unit for raising and lowering a target in conjunction with training in the use of tank/antitank weapons. The target consists of a plywood sheet which forms the outlines of various threat vehicles and automatically indicates hits by lowering of the target, or illumination of a lamp.

(2) Instructions for use. Units desiring to use the STATS on ranges constructed in such a manner as to support this use will draw the training device from Range Division (Maintenance Branch). Unit operators for the STATS equipment, and the unit personnel drawing the STATS

equipment from Range Division must have received a STATS briefing given by Range Operations before operating the system. Units are to coordinate with Range Operations to attend this briefing during normal duty hours. Special briefings for Reserve Component personnel will be coordinated with G3 Operations & Training Division, Reserve Component Support Section and Range Operations.

(3) STATS are expensive and cannot be replaced. Using units must provide for safe transport and secure storage of the devices. STATS devices will not be left in position downrange after firing is completed without the approval of Range Operations.

(4) Troubleshooting. Unit personnel are not authorized to troubleshoot STATS equipment (only Range Division personnel); units desiring assistance will contact Range Division.

(5) Loading, transporting, and unloading. The equipment must be handled very carefully by personnel during all loading, transporting, and unloading.

(6) Maintenance of equipment. After firing, remove earth and dirt from the STATS equipment before turn-in at Range Division. High pressure water will not be used to clean units.

e. Thermal target systems.

(1) Use of thermal targets on the older generation of ranges requires the range user to draw thermal target support materials and equipment from Range Division, or to provide this support internally. Regardless of the source of the support, the deployment of thermal targetry support requires coordination with Range Division 10 days in advance of the training event.

(2) A briefing is required by the using unit before issue of Range Division thermal target support materials and equipment. To receive this briefing, coordinate with Range Division.

(3) Using units are to use extreme care when using thermal target systems to prevent system damage and avoidable high cost replacement action due to incorrect installation.

(4) Generators issued by Range Division in support of thermal target systems will not be used for any other purpose. Using units will provide unleaded gasoline for these generators. Malfunctioning generators will be reported to the on-site range inspector. During transport generators will not be stacked on each other, or on other equipment. Units are advised to keep batteries and all other equipment, especially generators well separated during transport to prevent electrical shorts leading to damaged equipment and fires.

f. M31A1 target lifting device. M31A1 devices support many of the Fort Knox rifle and pistol ranges. This device was a temporary training device in the 1960 and is still in use throughout the Army. These devices are electrically operated from the range towers through underground wiring.

(1) Using units will identify and report malfunctioning targets, and provide assistance in the repair or replacement of targets and/or M31A1 devices as required.

(2) Personnel from 3-81 Armor, 1<sup>st</sup> Armored Training Brigade who are assigned to specific BRM ranges under a primary use agreement with Range Division will perform the following first echelon maintenance on M31A1 target systems: replace targets as necessary; inspect and tighten "T" bar assembly; clear debris from target box and M31A1 devices; inspect and tighten wire connections; lubricate as directed by Range Division (not less than every 6 months); and replace malfunctioning M31A1 devices. Ranges used by 3-81 Armor, in support of the BCT/OSUT mission, must be left in operational condition, and ready to support other users.

(3) M31A1 devices will be left in the upright position.

(4) Before use, ice and snow will be removed from M31A1 devices and targets.

g. Moving target systems. Units using ranges with moving target systems and desiring moving target support will coordinate with Range Operations 10 days before the day the moving target support is required.

(1) Requests for moving target support will identify the start and end times of moving target use. These time frames will be confirmed by the unit with Range Operations 3 days before the training.

(2) On the older generation of ranges (Baum and Steeles Ranges) using units will install targets on the moving target system and provide detail personnel to clean debris from moving target systems when training is completed.

#### **5-4. USE OF RANGE DEVICES.**

a. The units must maintain a qualified individual on range to supervise and resolve problems with all issued range devices. This individual must have attended the Range Division class on the target devices.

b. Problems with Range Division issued devices should be immediately reported to Range Operations. Coordination for problem resolution assistance must be initiated at the earliest possible time.

CHAPTER 6

CONDUCT OF GROUND FIRING

6-1. **SAFETY.**

- a. Firing will be conducted under the supervision of the OIC.
- b. Firers will be informed of firing limits, position, location, and other special limitations.
- c. Required safety briefing will be completed before firing begins.
- d. Personnel will fire within limits (safety panels) established for the exercise.
- e. Left-handed firers, when firing M16/M16A1 rifles not modified for left hand firing, must use the brass deflector. The top button of the firer's jacket will be buttoned to prevent hot brass from touching any part of the exposed body.
- f. All personnel on active firing lines will wear the standard issue Kevlar helmet.
- g. Handguns will not be loaded until the OIC has ordered "Load and lock" (for revolver "load").
- h. On vehicular mounted weapon ranges, all members of a vehicle crew will wear the combat vehicle crewman's helmet or the modified aural ear muffler within an audio capacity for the weapon firing. Personnel to the rear of the firing line will wear ear protection devices as prescribed.
- i. A rope or chain will be fastened to each tank/vehicle when multiple vehicles are parked on line on a firing line at the midway point in the length of each tank and a "STOP" sign will be suspended from the center of the connecting rope or chain.
- j. When removing expended ammunition from tanks, expended shell casings, or "aft-caps" will not be thrown from the vehicle to the ground. At the end of each firing exercise, the shell casings will be handed from the turret to a man on the fender or sponson box and then handed to a man on the ground after ensuring that no one is endangered by this action.
- k. Laser firing will be treated the same as the firing of live munitions. All lasers determined to be "eye safe," through systems design or use of approved filters, may be fired as a blank fire weapons system.

6-2. **ENTERING TARGET/IMPACT AREAS.** When a range is temporarily closed due to personnel entering the impact area, the following will apply:

- a. Tank ranges.

(1) Before the OIC requests permission from Range Operations for personnel to enter the impact area, all weapons will be cleared, gun tubes fully elevated, and green flags prominently displayed. All personnel will dismount the vehicles and move to the rear of the firing line.

(2) The RSO will ensure that all turret power is off in each vehicle, no one is in the gunner's seat, and actions indicated in subparagraph (1) above have been completed.

(3) The RSO will personally verify, by head count, the number of personnel going downrange and request permission from Range Operations to enter the impact area.

(4) The only activities allowed uprange on the firing line while personnel are downrange are stowing ammunition in the tank, unloading expended brass, and activities not involving the weapons system. Upon completion of these activities, all personnel will dismount the vehicles and move to the rear of the firing line.

(5) Upon return of personnel from the impact area, the RSO will personally verify the head count. Permission to resume firing will be obtained from Range Operations.

b. 25-meter range. As a soldier completes firing a shot group, the rifle will be checked and cleared by an assistant instructor. When all rifles have been cleared, the controller in the tower will announce that the firing line is clear. The firers may then move downrange.

c. All other ranges. Before entering the impact area of the range being fired, all weapons will be locked/cleared and the personnel moved to the rear of the firing line. The range OIC will ensure this has been done before requesting permission from Range Operations to enter the impact area.

d. The closing and opening of ranges are the responsibility of Range Operations in coordination with the range OIC; however, the final approval will remain with Range Operations. The opening of the range will not take place until all personnel have cleared the impact area and Range Operations has been notified.

### 6-3. **OVERHEAD FIRE.**

a. Overhead fire above unprotected troops with ammunition, pyrotechnics, missiles, and/or rockets except where specifically authorized is prohibited. When authorized, all ammunition components (e.g., fuze, projectile, propellant) must be certified as cleared for overhead fire as per Technical Bulletin (TB) 9-1300-385/NAVSEA TWO24-AA-ORD-010. Only CSA may authorize deviation from this requirement except as specifically identified.

b. Overhead fire with small arms ammunition may not be conducted without approval from the RMO.



c. Overhead fire with artillery ammunition may be conducted per AR 385-63 if the fuze and round are cleared for overhead fire. Overhead fire requires prior coordination and approval with the RMO.

**6-4. UNEXPLODED ORDNANCE (UXO or DUDS).**

a. All UXO (duds) must be considered unstable and highly dangerous. Access to UXO/dud contaminated areas will be strictly controlled to reduce risk; AR 210-21, AR 385-63 and DA Pam 385-63.

b. Handling UXO is restricted to activities conducted by EOD. Removal of UXO/dud munitions from any impact area is not authorized unless under EOD control and with Range Manager approval.

c. All UXO/dud munitions sightings will be rapidly reported to Range Operations.

d. Munitions with the potential of generating dud contamination are restricted to those impact areas already known to present a dud threat. The expansion of dud contaminated lands is prohibited.

**6-5. TURN-INS.**

a. Firing of ammunition/explosives to avoid turn-in procedures is prohibited. The conduct of "mad minutes" during normal range training activities, or the detonation of amounts of explosives in excess of the identified training event is wasteful, dangerous and generates avoidable costs in weapons repair and range maintenance. Unused munitions are to be repacked and returned to the ammunition supply point.

b. Abandoning, dumping, burying or otherwise concealing munitions, pyrotechnics or residue from these items, including packing materials, in the training complex is prohibited.

## CHAPTER 7

### HAND/RIFLE GRENADES

#### 7-1. **GENERAL.**

a. All personnel must be thoroughly familiar with the safety precautions (FM 23-30) for handling, throwing, firing, and disposing of live grenades before such training. In view of the relatively high potential for a training accident among inexperienced troops handling grenades, soldiers participating in the handling of live grenades must be briefed thoroughly at the range of the sequence of events and what is expected of them.

b. Nothing will be placed in the impact area of a grenade range which will impede or deflect the forward motion of the grenade or cause the grenade to bounce or rebound.

c. The grenade range impact area will be clear of all vegetation and the impact area filed with clean, clay free sand, which has passed through a #10 sieve. The using unit will recover all craters or depressions in the impact area daily.

d. All grenades that fail to explode (misfire) after being thrown or fired are considered duds. Duds will be reported to Range Operations and destroyed by EOD personnel only. Live grenades will not be thrown at duds, or into the impact area containing a dud grenade. An observer from the unit will be stationed at the impact area where the dud grenade is located until EOD arrives. Observer will maintain a safe distance from the dud grenade.

#### 7-2. **HAND GRENADES (ALL TYPES TO INCLUDE SMOKE AND RIOT CONTROL).**

Each soldier must successfully complete the distance and accuracy course before throwing casualty producing grenades.

##### a. Operational safety factors.

(1) Loose fuzes containing detonators must be handled with extreme care at all times.

(2) Grenade safety pins will not be pulled until the grenades are to be thrown. No attempts to replace the safety pin will be made once it is pulled. The grenade must be thrown after the safety pin has been pulled.

(3) Grenades will not be lifted, handled, or carried by the safety pull rings.

(4) Grenades will be thrown during training to achieve a ground burst only. The safety lever must not be released before throwing.

(5) Personnel other than those throwing or safety personnel must be at least 150 meters from point of burst unless adequate cover is provided.

7-3. **RIFLE GRENADES.** Operational safety factors (40 mm ammunition).

a. All personnel will receive instructions as described in pertinent publications before firing to include importance of reporting duds.

b. Duds will be accounted for, marked by user personnel with dud stakes, and cleared from the range after each firing exercise by EOD personnel per approved procedures.

c. The OIC will submit a report to Range Operations after completion of firing exercise as follows:

(1) That all grenades have exploded, or

(2) Indicate number of duds, with approximate location, and how they are marked.

7-4. **CHEMICAL GRENADES.**

a. Burning type. After the safety pin has been pulled, the grenade will be thrown before the safety lever is released.

b. Fragmentation type.

(1) Grenades will be thrown from barricaded positions only.

(2) During training, the M15 and M34 grenades will be thrown on live grenade ranges only.

c. Bursting type, riot control grenades.

(1) All personnel will be instructed on the holding of the M25 grenade.

(2) The safety pin must be kept depressed until the grenade is thrown.

(3) The M25 type grenade will not be thrown closer than 25 meters from the nearest unprotected person.

## CHAPTER 8

### ROCKETS/MISSILES

#### 8-1. **ROCKETS.**

a. Before firing, the danger zone to the rear of the launcher, as identified in Chapter 8, DA Pam 385-63, will be cleared of personnel, material, and vegetation.

b. When firing the rockets from shoulder launchers, all loading preparation for firing and unloading will be done on the firing line.

c. Backblast hazard areas are increased when temperatures are below freezing. Although generally doubled in size, the OIC of rocket firing events will properly adjust backblast hazard areas per temperature and data contained in the TM for the rocket being fired.

8-2. **MISSILES.** See AR 385-62.

#### 8-3. **TUBE-LAUNCHED, OPTICALLY TRACKED, WIRE-GUIDED (TOW) MISSILES.**

a. Only those personnel actively engaged in firing and controlling TOW missiles as specified in appropriate field manuals and technical manuals will be permitted in the SDZ. Mission essential personnel directly associated with, but not actively engaged in the firing of TOW missiles may be located at protected sites within area H, such as behind earthen berms.

b. All wire residue from firing TOW missiles will be recovered by the firing unit. Impact area entrance for wire collection must be coordinated with Range Operations. Wire that cannot be pulled out of dud contaminated impact areas may be left in place. All wire on constructed tank ranges will be completely removed.

c. At least single hearing protection will be worn by all personnel within the rectangle 100 m to either side and 200 m to the rear of the TOW firing point.

#### 8-4. **DRAGON.**

a. The entire SDZ will be cleared of all nonmission essential personnel.

b. Only those personnel actively engaged in firing and control of Dragon guided missiles as specified by appropriate field manuals or technical manuals will be permitted in the SDZ at the time of firing. Nonoperational personnel will move to a distance of at least 50 meters to the side of the launcher (110 meters when firing M222 HEAT rounds).

c. The gunner and all other personnel in caution areas 1, 2, and/or 3 will wear flak jacket, helmet, eye protection, and single hearing protection.

d. At least single hearing protection will be worn by all personnel within the rectangle 170 m to either side and 260 m to the rear of the DRAGON firing points.

e. All wire residue from firing DRAGON missiles will be recovered by the firing unit. Impact area entrance for wire collection must be coordinated with Range Operations. Wire that cannot be pulled out of dud contaminated impact areas may be left in place. All wire on constructed tank ranges will be completely removed.

8-5. **JAVELIN.** The JAVELIN is shoulder launched, man portable, anti-armor weapon system. It fires a passive imaging infrared missile with a lock on before launch guidance system.

a. Before firing any JAVELIN missile, the entire SDZ will be cleared of nonmission essential personnel. Only those personnel specified in appropriate field manuals and technical manuals will be permitted in the SDZ.

b. Personnel will neither stand nor permit any part of their body to be directly behind or in front of the JAVELIN launcher.

c. See applicable field and technical manuals for preparation and firing operations.

CHAPTER 9

RECOILLESS WEAPONS

9-1. **FIRING CONDITIONS.**

a. Personnel will not be permitted to stand or let any portion of their bodies be directly behind the rifle with ammunition in the chamber when opening or closing the breech block.

b. Recoilless weapons will not be fired within buildings or 50 meters of a vertical or nearly vertical backstop, barriers or obstacles due to the risk of debris ricochets.

c. Loose material, including expendable cartridge cases, will be removed from backblast area (SDZ Area F).

d. Recoilless weapons will not be fired over the heads of troops.

9-2. **SURFACE DANGER AREAS.** A surface danger area overlay will be submitted for all recoilless weapons firing.

CHAPTER 10

MORTARS

10-1. **GENERAL.**

a. All mortar firing conducted at Fort Knox requires an approved surface danger area overlay. Two copies of the overlays will be submitted on overlay paper to Range Operations NLT 10 days before firing.

b. An approved copy of the surface danger area overlay must be on site during firing.

c. All firing of mortar illumination rounds will provide a minimum downrange clearance of 200 meters for casing impact from any moving target installation. See para 10-3c(1).

d. The data list provided on the surface danger area overlay will include:

- (1) Firing point.
- (2) Firing point grid coordinate.
- (3) Map designation.
- (4) Organization to fire.
- (5) Weapon (full nomenclature).
- (6) Firing table (number/issue used to formulate danger area data)
- (7) Firing table elevation bracket (4.2 inch mortar).
- (8) Ammunition (full nomenclature).
- (9) Maximum charge.
- (10) Minimum charge.
- (11) Maximum ordinate (altitude in feet).
- (12) Fuze.
- (13) Limits: Right, left, maximum range, minimum range.
- (14) Direction of fire.

(15) Special instructions/remarks.

(16) Prepared by (print rank and name).

(17) Date prepared.

(18) Approved by (individual within the unit who has approved the mission and the surface range area overlay - print name and rank - signature).

e. All personnel who take part in mortar firing will wear standard issue Kevlar helmets. At the Commander's discretion, the gunners may remove their helmets while sighting the mortar. All personnel within the hearing hazard zone for the mortar/cartridge/charge increment used shall wear approved single hearing protection. The hearing hazard zone is usually defined in the manuals for the mortar or cartridges. If the hearing hazard zone information cannot be determined, require hearing protection within 200 meters.

#### 10-2. **60 MM, 81 MM, AND 4.2 MORTARS.**

a. Firing mortars over the heads of troops is not recommended.

b. Overhead fire is allowed when soldiers are in tanks with hatches closed located 100 meters or more from the line of fire.

c. Increments removed from rounds before firing will be placed in a metal or wooden covered container located outside the firing vehicle/position at a safe fire separation distance. Unused increments will be handled and destroyed PER the appropriate FM for the mortar being fired.

d. Do not fire the M720 cartridge in the M19 mortar above propellant charge 2.

e. Do not fire the M720 cartridge with charge greater than 1 in the hand held mode.

f. For firing restrictions and limitations on cartridges and fuzes, see TM 43.0001-29.

#### 10-3. **4.2 INCH MORTAR.**

a. Do not fire at an elevation greater than 1,065 mils (60 degrees).

b. Mortars assembled with fuze PD M51A5 will not be fired using less than seven increments to ensure constant arming of the fuze.

c. The following data will be used to compute the vicinity of casing impact for 4.2 inch mortar illumination rounds:



(1) To determine the vicinity of casing impact for the 4.2 inch mortar illumination round fired with a planned burst after maximum ordinate is reached (down-leg), the following formula will be used:

Step 1: Constant "A" x charge -

Step 2: The result of Step 1 + constant "3" =

Step 3: The result of Step 2 + range to burst = range to impact vicinity in meters.

To obtain the constants for the above computation, use the following data:

USING CHARGES	*CONSTANT "A"	CONSTANT "B"
6 to 17	-2.3	986.00
18 to 31	-6.79	710.36
32 to 41	-1.50	546.5

\*Note the figures for constant "A" are minus numbers.

(2) To determine the vicinity of casing impact for the 4.2 inch mortar illumination round fired with a planned burst before maximum ordinate (up leg), the following formula will be used: 782.33 plus the sum of 211.78 x charge.

10-4. **120 MM MORTARS.** 120 mm mortars can be fired with a M303 insert using 300 series 81 mm projectiles or 81 mm short range training round (SRTR).

CHAPTER 11

ARTILLERY

**SECTION I: ALL ARTILLERY UNITS**

**11-1. RESPONSIBILITIES.**

a. Commanders.

(1) Major unit commanders will establish procedures for qualifying and certifying personnel required to perform safety duties per AR 385-63, DA Pam 385-63 and FM 5-60.

(2) Medic coverage is as outlined in appendix A.

(3) Ensure that all personnel within 50 meters of the firing points are wearing Kevlar helmets and proper hearing protection.

(4) Commanders will investigate firing incidents.

b. Range Safety Officer (RSO).

(1) With the exception of the M109A6 Paladin Weapon System, the RSO will be present in each firing position when using the training area method or in a position requiring a separate SDZ as appropriate. Unique Paladin safety procedures are outlined in para 11-5 and 11-6.

(2) The RSO's duties include:

(a) Establishing an overall safety system within the firing position.

(b) Ensuring personnel required to perform safety checks are competent, properly briefed on their duties, and command certified by their unit.

(c) Enforcing compliance with this regulation.

(3) The RSO may also perform the duties of the platoon leader, FDO, or platoon sergeant; however, these duties will not interfere with the safety requirement of the RSO. While firing is in progress, the RSO duties will be limited to those they can perform without leaving the firing position.

(4) Before departing for the range, the RSO and safety personnel should understand, comply with and have available the following references.

(a) AR 385-62 or AR 383-63 and DA Pam 385-63, as appropriate for the weapon being fired.

- (b) USAARMC Reg 385-1.
- (c) USAARMC Reg 385-10.
- (d) All applicable FMs (i.e., 6-40, 6-50, and 6-60) and TMs for the weapon system are used.
- (5) The RSO will ensure the following equipment is on hand and in the field.
  - (a) Approved SDZ for units firing from each position to be used.
  - (b) Applicable tabular firing table. (Cannon)
  - (c) Applicable graphical firing table or properly functioning back up computer system (BUCS)/battery computer system (BCS) for tube artillery.
  - (d) Applicable graphical site table. (Cannon)
  - (e) Map of the area.
  - (f) Two properly functioning and declinated aiming circles. (Cannon)
  - (g) One Serviceable gunner's quadrant per firing platoon. (Cannon)
- (6) Before firing, the RSO will--
  - (a) Ensure that ammunition is handled and stored safely, and check it for obvious defects.
  - (b) Inform each section chief of the right and left deflection limits, minimum and maximum quadrant elevation, and the minimum time setting.
  - (c) Visually check the line of the tube for parallel laying.
  - (d) Establish internal safety communications. Ensure that permission to fire is granted by Range Operations and ensure compliance with all scheduled check fires.
  - (e) Verify the SDZ that applies to the unit, exercise, and date with Range Control.
  - (f) Prepare the safety diagram. The RSOs will have in their possession copies of SDZ, and safety Ts applicable to the firing for which they are responsible. Other personnel performing safety duties will have copies of appropriate safety Ts.
  - (g) Verify personnel responsible for safety checks are command certified and have the appropriate safety diagram/safety Ts.

- (h) Verify the battery/launcher is in the position specified on the SDZ.
  - (i) Verify the azimuth of fire used to compute the safety diagram and lay the howitzers was used by the FDC.
  - (j) Verify the FDC has the safety diagram and all no fire areas drawn on the firing charts or map.
  - (k) Verify that a firing status has been issued by Range Control.
  - (l) Verify minimum quadrant elevation (min QE) determined by the executive officer/firing platoon leader. Compare the executive officer's Minimum Quadrant (XO's min QE) for the minimum range from the SDZ, using the larger of the two as the MIN QE. (Cannon)
  - (m) Verify visible portion of applicable danger areas are clear of personnel (check with FO). Ensure that firing does not commence until rounds can be observed visually from manned OP, or electronically with radar.
  - (n) Brief all observers to be alert for rounds out of impact and to report such incidents to Range Control.
- c. Platoon leader/sergeant. The platoon leader and platoon sergeant are responsible for the general safety practices of the firing platoon and for the professional competence of their personnel. They will closely supervise the safe firing of the battery, to include proper performance of safety duties by personnel and elimination of unsafe conditions.
- d. Chief of Section. The section chief (SC) is responsible for safety checks required within his/her section to include checks of the weapon and ammunition, provided he/she is command certified. During firing, section chiefs will:
- (1) Ensure rounds are not fired below Min QE or above Max QE, outside left and right deflection limits, or with fuze settings below minimum time, as specified on his safety T.
  - (2) Command "CHECK FIRING" and give reasons. Examples: "CHECKING FIRING, outside right Deflection limits" or, "CHECK FIRING, below Min QE."
  - (3) Accept final responsibility for safety of weapon settings and crew prior to commanding "FIRE."
  - (4) Command "CHECKFIRING" if he/she observes any unsafe conditions. Report these conditions to the chain of command, and suspend firing until the unsafe conditions are corrected.
  - (5) Verify the ammunition to be fired is the type specified on the SDZ.
- e. Fire direction officer (FDO), including battery operations officer and platoon operations officer.

(1) The FDO will verify the safety limits from the safety diagram and all no fire areas are properly plotted on the firing charts or map, and that only safe fire commands are transmitted to the firing sections.

(2) The FDO will be designated by the Officer-In-Charge (OIC) and may be either a commissioned or noncommissioned officer.

(3) The FDO will verify and apply either MET + VE or registration corrections to cannon artillery and MET to MLRS safety diagrams/safety Ts to include those held by other individuals performing safety duties within the firing position.

f. Observers.

(1) Observers may be checked in by the unit they are supporting. The observers must maintain communications with the element that checked them onto the range. They are not required to maintain communications with Range Control.

(2) Artillery rounds fired must be observed. Observers will not engage targets they are unable to observe unless radar is available to support the firing unit.

(3) Observers will have the no fire areas and the safety limits of the unit they are supporting drawn on an overlay or map. Only targets contained within the authorized safety limits will be engaged by indirect fire.

(4) Observers will call "CHECKFIRING" and report any rounds unobserved or round observed out of impact.

**11-2. REQUIREMENTS/PROCEDURES.**

a. General.

(1) Administrative. SDZs will be prepared by the unit and submitted to Range Control a minimum of 10 days before the firing exercise. No ammunition, fuze, weapon, type of fire, or charge other than that authorized by the SDZ will be used.

(2) Safety. The accuracy of safety diagrams/safety Ts will be verified by independent computations. Both sets of computed safety data will be present on the firing position.

(3) Positioning/Survey.

(a) Unit OICs/RSOs will choose tactical firing positions within a scheduled training area that will best meet the training needs of the unit. Firing positions must be 400 meters from the post boundary and public traffic routes. Once a position has been chosen, the unit's organic survey section will be used to survey each position.

(b) Unit survey personnel will select a suitable location for the survey control point (SCP). Survey personnel will use conventional survey techniques and/or position and azimuth determining system (PADS) to provide an accurate location of the SCP. The Range Safety Officer will verify the location of the SCP using resection, graphic resection, a Precision Lightweight Global Positioning System Receiver on Figure of Merit 1, or a map spot within 100 meters of the SCP. NOTE- Do not use Precision Lightweight Global Positioning System Receiver to obtain or verify direction.

(4) Observation of rounds. NOTE: For use of lasers, see Chapter 18.

(a) A round which impacts outside the impact area, outside the unit's prescribed safety limits, or within a No Fire Area, is defined as "Round Out Of Impact."

(b) Units observing rounds out of impact will immediately cause the responsible unit to suspend firing if the unit can be immediately identified and report the incident to Range Control. The report should include:

Date/time/location.

Injury to personnel.

Equipment damage.

Number of rounds.

Airburst estimated height.

Ground burst (do not disturb crater or fragments until Range Control personnel arrive).

Location of observer.

Source of round (if known).

Name and unit of person reporting.

(c) Upon receipt of a round out of impact report, Range Control will direct "Cease Fire Freeze" for all units firing indirect fire.

(d) On receipt of cease-fire, message containing the word FREEZE, no weapons will be moved or fired. Sighting and aiming stakes will be left in place, fire control equipment will not be altered, fire direction equipment will not be shut off/altered, and ammunition, to include unused propellant bags, will not be moved or touched. Personnel will move at least 50 feet away from weapons and weapons vehicles.

(e) Range Control will--

1. Notify key staff agencies per Range Control SOP.
  2. Give the authorization for units to begin incident investigation without disturbing any data or equipment.
  3. As the investigation proceeds, return units determined to be safe to a firing status.
  4. Report the incident to the major command headquarters of the unit involved. If the incident was attributed to human failure, the Range Officer will request through command channels that the commander conduct a formal investigation.
  5. Advise subordinate commands if the incident involved suspended ammunition.
  6. Authorize continuation of operations when appropriate.
- (5) Ammunition.
- (a) Strict adherence to directives in FM 6-50, TM 9-1300-206, TM 43-0001-28, AR 385-63, FM 6-60 and the appropriate weapons operator's manual will be applied at firing positions.
  - (b) Ammunition and/or residue powder increments will not be left unguarded; Appendix B.
  - (c) Units that bring their own ammunition or that have ammunition shipped in for their use must have that ammunition inspected by the Fort Knox ASP before use. The Fort Knox ASP will verify in writing that the ammunition has not been suspended or restricted from use. Cannon artillery ammunition must also be cleared for overhead fire. If it is not, special coordination must be conducted with Range Control. The ASP must contact the using unit on the last working day before firing for a final verification for clearance.
  - (d) Ammunition will be transported and handled only under the direct supervision of personnel who are thoroughly familiar with safety and security regulations listed in AR 385-63, AR 385-62, TM 9-1300-206, FM 5-25, FMs for specific weapons, and Appendix B of this regulation.
  - (e) Dunnage, blocking, and tiedown straps will be used in accordance with Chapter 3. Ammunition will be secured in such a manner as to prevent any movement.
  - (f) Vehicles transporting or uploaded with explosives will:
    1. Carry "EXPLOSIVES" signs on the front, rear, and each side as outlined in CFR 49, Part 172,D, E, and F. Signs will be covered or removed when vehicles are not carrying explosives.

2. Meet regulatory requirements listed in ARs 385-62 and 385-63, DA Pam 385-63, TM 9-1300-206 and in FMs for specific reference.

3. Be equipped with two working 10 BC-rated fire extinguishers. This requirement is satisfied by portable fire extinguishers on wheeled vehicles, or one portable extinguisher on tracked vehicles, provided the tracked vehicle is equipped with an operational internal fire extinguishing system.

4. Ensure units desiring to carry troops and ammunition together in vehicles designated as prime movers for towed howitzers will ensure that the ammunition is secured in such a manner as to prevent any movements (in accordance with TM 9-1300-206), and that troops are seated on seats designated for that purpose.

(g) Ammunition will be drawn from Ammunition Supply Point (ASP) and transported to a field staging area. Field staging areas will be located outside the cantonment area, at least 400 meters from post and cantonment area boundaries, public traffic routes, and inhabited buildings. Field staging areas may also be set up on established firing positions. For MLRS, pods will be located at least 800m away from the firing position.

(h) Ammunition may be distributed to tactical vehicles per TMs for that vehicle. Propellant and projectiles may be carried on firing vehicles designed for that purpose. Projectiles will not be transported while fused except when issued as a fused round. (See Paladin Procedures.)

(i) Combat configuration is defined as the transportation of explosives and their components that are not of a compatible nature as listed in TM 9-1300-206. While in combat configuration:

1. Unit commanders may transport ammunition if the vehicle has been authorized per appropriate TM to carry ammunition (e.g. M109 Series)

2. Units must maintain adequate control of the convoy and post roadguards along the designated route.

(j) Ammunition may be transported in cantonment area in standard configuration. (Not fused)

(k) The OIC/NCOIC of exercises involving the use of ammunition will conduct an ammunition safety briefing before issue. The briefing will cover, as a minimum:

1. Dangers of ammunition tampering.

2. Handling and firing ammunition.

3. Proper storage.



4. Steps to take in the event of an ammunition mishap.

(l) Disposal of excess propellant.

1. A command safety certified officer/NCO (SSG or above) will supervise the training for disposal of propellant.

2. Excess propellant will be transported to the powder burning area in a metal container on a cargo vehicle with a metal cargo bed, with explosive signs and operational fire extinguishers. No other material, equipment, or passengers will be transported in the cargo bed with excess propellant. Under no circumstances will gasoline, kerosene, or diesel fuel be used to either aid ignition or burning.

3. Excess powder will be burned on hard or gravel surfaces away from vehicles, personnel, flammable areas and dry vegetation. When stacking powder bags or mortar charges/increments, they will not exceed two in height. The length of any pile should not be more than 50 feet from point A to point B.

4. Units must check-in with Range Control, identifying the unit, OIC, and location.

5. Personnel and equipment (except a two-man burning detail) will be at least 200 feet from the burning site.

6. There will be sufficient number of personnel, equipment and water standing by to control/extinguish the fire. Unit personnel will remain at the burn site until all hot flammable materials are extinguished.

7. The gases released by the burning of powder bags and mortar charges/increments are toxic. Personnel are to be placed upwind of all burning piles.

8. When surface winds exceed 18 knots, the fire threat condition HIGH, or other safety considerations may warrant, Range Control may restrict powder burning. In this event, the ammunition supply point will be notified of the situation and arrangements will be made to turn in the powder bags or mortar charges/increments.

(m) In the event of an ammunition malfunction or any significant weapon malfunction that causes a serious incident, the RSO/OIC will:

1. Suspend firing.

2. Ensure the weapon and/or ammunition involved remain intact.

3. Contact Range Control.

4. Continue training when released by Range Control.

(n) Restrictions:

1. Firing unfuzed projectiles is prohibited.
2. ICM is not authorized for use on Fort Knox.

b. Overhead, flanking and close-support fire.

(1) DA Pam 385-63, chapter 11, discusses ammunition clearance for overhead fire. Generally, when personnel occupy any part of surface danger Area D, only lots of ammunition cleared for overhead fire will be used. The vast majority of firing positions at Fort Knox require the use of ammunition cleared for overhead fire. Ammunition requisitions should be clearly marked "For Overhead Fire" whenever personnel may be in surface danger Area D.

(2) Artillery ammunition used in training exercises involving overhead firing and close support of ground troops by overhead or flanking fire will be from the same lot number for each exercise. If lot numbers must be changed, the new lot will be fired for adjustment before firing overhead of unprotected troops. Small quantities of several lots of ammunition may be fired in training exercises; however, when firing mixed lots, overhead and flanking fire is prohibited.

(3) If ammunition is not cleared for overhead fire, roads and tank trails passing under the trajectory of artillery ammunition must be blocked and personnel removed from Area D before firing may commence. Blocking any road requires prior coordination with Range Control.

(4) Area D will not be occupied under any circumstances during artillery direct fire.

(5) Copperhead, RAP, ICM will not be used for overhead fire.

c. Surface Danger Zone.

d. Overlays will be submitted by the firing unit to Range Operations in two copies 10 days in advance of firing date. The following information is required on each overlay submitted to Range Division:

OVERLAY RECORD (EXAMPLE)

TNG AREA/FIRING POINT	(1, 7, Lawley, etc.)
COORDINATE (Battery Center)	(0433 8,625, etc.)
MAP	(Ft Knox 1:50,000, etc.)
ORGANIZATION	(1/41 FA, etc.)
WEAPONS TO FIRE	(M110 8 SP, M106A1 4.2 M30, etc.)
FIRING TABLE	(4.2-H-2, 155 AM-i , etc.)
AMMUNITIONS	(WP M1 10, HE M107, etc.)
CHARGE	(800 m w/o 23-1/8, 2G, 3W, etc.)
FUZE	(PD, MTSQ, etc.)

LIMITS RIGHT	(0700 m, etc.)	
LIMITS LEFT	(0250 m, etc.)	
DIRECTION OF FIRE	(0450 m, etc.)	
RANGE MAX	(9000 m, etc.)	
RANGE MIN	(7000 m, etc.)	
MAX ORD HIGH/LOW ANGLE	(Altitude in ft)	
PREPARED BY	(L. B. Right)	Signature
DATE PREPARED	(6-7-89)	
APPROVED BY	(CO, 33, Btry CO, Safety Off)	Signature

e. Surface Danger Area E.

(1) As defined in AR 385-63 the surface danger Area E, for cannon firing indirect fire, is that area immediately in front of the piece bounded by the deflection limits expanded right and left by 445 mils and extending forward by 300m meters from a 105mm howitzer, and 350 meters for a 155mm and an 8-inch howitzer.

(2) Since danger Area E is an area of variable hazards, namely, blast, overpressure and debris, personnel access out to the distances from the gun position as listed above is prohibited. This does not apply to weapon crews firing from an approved tactical configuration and operational personnel involved in the firing exercise with a valid need to enter this area.

(3) Artillery units firing from positions closer than the distances listed in paragraph (a) will control access to roads passing through danger Area E. Road guards must be able to communicate with the firing unit FDC in order to cease fire the unit when needed. Traffic on improved roads (gravel or paved) will not be stopped longer than 5 minutes at a time.

f. Surface Danger Area F is the area immediately to the rear of the launcher which is directly exposed to blast and debris. It extends 350 meters to the left and right of the launcher firing point, perpendicular to the azimuth of flight (AOF) and 400 meters to the rear of the firing point, parallel to the AOF. Personnel are prohibited from occupying this area.

g. The Noise Hazard Area (NHA) extends behind Area F. It can only be occupied by mission essential personnel wearing double hearing protection. Draw a box that extends beyond Area F an additional 300 meters (500 meters for the M28 rocket) to the rear of the firing point.

h. Clearance procedures.

(1) Upon completion of training, the unit commander will require a thorough police of the range training facility ensuring no debris has been left in the area, and that weapon spade holes, foxholes, slit trenches, sumps, etc., have been filled and leveled. Destroyed, damaged, or missing firing point markers and orienting stations will be reported to Range Control. Units are responsible for police of their general training area.

(2) Garbage and trash accumulated by units bivouacked on the range will not be buried or discarded on the range. On-post units will use their normal on-post facilities for waste disposal. Off-post units will contact Range Control for information on disposal.

## **SECTION II: CANNON (NONPALADIN) UNITS**

### **11-3. RESPONSIBILITIES.**

- a. Commanders. Per Chapter 11-1(a).
- b. Range Safety Officer (RSO). Per Chapter 11-1(b).
- c. Platoon Leader/Sergeant. Per Chapter 11-1(c).
- d. Section Chiefs will:
  - (1) Record lay data on gunners reference cards.
  - (2) Ensure they have the proper safety Ts for that firing position.
  - (3) Assist the RSO in accomplishing the following actions before firing.
    - (a) Verify the proper positioning of the aiming posts, collimator, or aiming point in reference to the referred deflection by sighting through the weapon sight.
    - (b) Verify boresight of each weapon after each change of firing position.
    - (c) Verify the sight settings (to include slipping azimuth scale).
    - (d) Verify the placement of safety stakes or safety tapes/chalk marks if the stakes/marks are required by the commander.
  - (4) Fire only serviceable rounds of authorized ammunition. If there is any doubt whether a particular type round is authorized, they will check with the RSO before allowing the round in question to be loaded and fired.
  - (5) Confirm the proper charge increments for each type round are present before the round is prepared for firing.
  - (6) Once the round is prepared, verify the placement of the correct number and type of charge increments in the powder chamber before firing the howitzer.

#### **11-4. REQUIREMENTS/PROCEDURES.**

a. General. NonPaladin cannon units may use either the "Training Area Method" or the "Firing Point Method" to shoot on Fort Knox.

b. Safety.

(1) Each firing position will have a designated position center, battery center or center howitzer. Safety data computations will be initiated using this point. Safety Ts constructed using this data will be valid for howitzers within a 200-meter radius. Howitzers outside of the 200-meter radius of the position center or gun will have a separate safety T computed if manual fire direction methods are used. If automated fire direction is used then a single safety T will be sufficient for all guns regardless of distance from the center of battery (COB).

(a) For manually computed firing data, unless the SDZ indicates otherwise, weapons will be located within a 200 meter- radius of the firing marker or surveyed grid location. When firing extended fronts, weapons displaced outside the 200 meter- radius from the FP marker will have a separate safety T computed based on displacement from the FP marker. For firing data computed with BCS, IFSAS, and AFATDS units may use extended fronts with one safety T computed for all pieces based on COB.

(b) Request for a firing position from units using less than a complete battery of weapons should reflect a preference for a firing position of less than 200-meter radius. A smaller firing position radius allows the size of the impact area assigned on the SDZ to be increased.

(c) Surface danger areas, computed and constructed by the unit and approved by Range Control, are to include piece displacement factors.

(d) Refer special firing requests not covered above to Range Control for coordination and/or decision.

(2) Computing Min and Max QE. See FM 6-40 for details.

(3) Verifying azimuth of fire.

(a) Verify the azimuth of fire of the battery/platoon by using a second aiming circle. The second aiming circle (safety circle), will be set up at least 10 meters from the lay circle and will be oriented using any approved (FM 6-50) method other than the one used to orient the lay circle (as long as the safe survey is not common with the lay survey). To take into account for variation, a maximum of +/- 10 mils will be allowed between the lay circle and the safety circle. Tolerance between safety circle and gun will be +/- 2 mils. Units are encouraged to lay howitzers by orienting angle or simultaneous observation methods and using grid azimuth to verify lay.

(b) Verify the azimuth of fire for each howitzer by means of a declinated M2 compass.

(4) Before registration or application of the meteorological data (MET + VE), initial targets must be visible and in the central portion of the safety fan. This is to verify the location and lay of the weapon. After the verification has been completed, select a registration point as close to central portion of the safety fan as possible. After the registration, registration corrections must be applied to time, deflection, and quadrant limits. Units may fire a MET + VE check round in place of a registration.

(5) The officer/NCO responsible for the operation of the FDC will have the safety limits specified by the SDZ drawn (per FM 6-40) on the firing charts. At a minimum, charts will depict the lateral azimuth limits and the minimum/maximum ranges, to include doglegs, and any permanent or temporary no fire areas (NFAs). Permanent NFAs are--

- (a) Rogers Hollow, Area 17, FT 020020, 1000m radius.
- (b) Upper and Lower Douglas Lake, Area 4, ES 988860, also off- limits area.
- (c) Temporary NFAs. Consult with Range Control.
- (d) Procedures to compute or verify safety data.

(1) Once the target area and the position center have been plotted, the position safety officer will use a range deflection protractor to construct a safety box within the target area. Unit safety personnel are encouraged to use as much of the target area as possible and construct safety boxes that contain doglegs.

(2) Target areas are a designated area that field artillery cannon safety officers use to construct artillery safety boxes. Use this data to compute and construct safety Ts as specified in FM 6-40, for firing positions. All probable errors and surface danger areas are accounted for in the target area.

(3) Each firing position will have a firing chart and a mounted 1:50,000 Fort Knox map with the appropriate target area plotted on it.

(4) The RSO will verify that the safety box is contained within the specified target area.

(5) The following information will be extracted from the constructed safety box to construct a basic safety diagram for safety computations.

- Left azimuth limit.
- Right azimuth limit.
- Minimum range.
- Maximum range.
- Azimuth of fire.

(6) The altitude of the firing position, maximum altitude at minimum range, and minimum altitude at maximum range will be obtained from the Fort Knox range map.

(7) Safety officers may select the charges of their choice provided the minimum charge fired is capable of achieving 1400 meters beyond the minimum range line.

(8) Minimum quadrant elevations will exceed 267 mils when data is computed.

(9) BUCS or BCS may be used to compute or verify safety data. TC 6-40A appendix I contains procedures to compute safety data using BUCS and BCS.

(10) OIC and RSO will fire the first round from a new firing position as close to the center of the target area as observation allows.

c. Positioning/Survey. Unit survey personnel and the RSO will decide on a suitable location for the orienting station. Survey personnel will use conventional survey techniques and/or position and azimuth determining systems (PADS) to provide an accurate location of the ORSTA and azimuth to the EOL for each position.

d. Observation of Rounds. Per FM 6-30.

e. Ammunition.

(1) Precutting of powder charges is NOT authorized except for controlling demonstrations where a registration has been conducted or for training in suppressive fire situation.

(2) Presetting of time fuzes is not authorized unless the ASP issues time fuzes in lieu of PD, the commander may then authorize time fuzes to be preset to PD action.

(3) Occasionally, units may experience malfunctions where the projectile fails to exit the tube. If the unit experiences a "sticker," the RSO will immediately call a check firing on that piece and notify Range Control.

(a) Personnel will NOT tamper with the weapon before the arrival of the QASAS. The QASAS will determine what actions will be taken to clear the weapon. EOD will not attempt to extract the projectile until the QASAS gives approval.

(b) Refer to the appropriate -10 for additional guidance.

(1) When direct fire is employed, the safety limits used to compute low angle safety data will be taken from the safety card. RSOs construct a safety T that will be given to section chiefs.

(2) Howitzers will be laid using orienting angle, grid azimuth, or simultaneous observation methods orienting an M-2 aiming circle. The azimuth of fire will be verified per FM 6-50.

(3) The howitzer will be marked with deflection limits using tape, chalk, or safety markers for SP howitzers and staked for towed howitzers.

(4) For range, even though firing is conducted with the use of the range scale in the direct fire telescope, the chief of section must verify the elevation with gunners quadrant.

### **SECTION III: PALADIN UNITS**

#### **11-5. RESPONSIBILITIES.**

- a. Commanders. Per Chapters 4-3, and 11-1(a).
- b. Range Safety Officer (RSO)/OIC.

(1) Paladin tactics require only one RSO for each three-gun platoon as opposed to one RSO for each firing position in nonPaladin units. The RSO can be the OIC and perform the duties of the platoon leader, platoon sergeant or fire direction officer. The RSO will be physically present within the platoon area of operation, which includes any of the three weapon locations, the fire direction center or the platoon operations center. The RSO must be an E7 or above, and be command safety certified on the Paladin weapon system. The RSO will ensure that all safety requirements are met.

(2) The RSO, battery commander, or gunnery sergeant, and unit survey personnel will select a suitable location for the survey control point (SCP). The range safety officer will verify the location of the SCP using resection, graphic resection, a Precision Lightweight Global Positioning System Receiver on Figure of Merit 1, or a map spot within 100 meters of the SCP. NOTE-Do not use Precision Lightweight Global Positioning System Receiver to obtain or verify direction.

(3) The range safety/fire direction officer will--

(a) Draw the sector of fire on the chart/map-- Brigade/Division boundaries are equal to and represent the weapon's right, left, minimum, and maximum safety limits.

(b) Compute left limit, right limit, minimum quadrant, maximum quadrant, and, minimum time for shell illumination. Illumination safety will use the same procedures as outlined for M109A2/A3. Safety Ts will be on the howitzer for illumination.

(4) Platoon leader/sergeant. Before live fire, a safety certified person, gunnery sergeant or above, will verify that the Automated Fire Control System data base input for each gun section is correct. As a minimum, verify the following.

- (a) Initialization grid (taken from a SCP).
- (b) Internal communications in the Paladin.
- (c) Direction.
- (d) Fire control alignment test data (Confidence Check).



(e) Dry-fire verification mission.

(5) Section chief. Upon entering a new Position Area the chief of section will complete the following steps.

(a) Press the arrive key on the Automated Fire Control System screen before removing the tube from the travel lock position. This automatically transmits a HOW; UPDATE message to the platoon operations center. The platoon operations center will use this HOW; UPDATE to construct a Paladin tracking chart to verify location and to conduct the dry-fire verification mission. NOTE-Conduct a dry-fire verification mission whenever there is a major change in the Automated Fire Control System data base (MVV/MET/Registration).

(b) Verify the direction of the weapon system using one of the techniques described in FM 6-70. If verification is not within tolerance, the howitzer must conduct a navigation restart and/or update using a SCP.

(c) Verify the howitzer's location either by Precision Lightweight Global Positioning System Receiver (on figure of Merit 1), map spot, or with another howitzer. If verification is not valid, the howitzer must conduct a navigation update or a navigation restart using a SCP and a dry-fire verification mission. As a minimum, conduct a navigation update with a SCP every 27 kilometers followed by a dry-fire verification mission.

(d) As part of the Paladin movement orders, enter the left and right limits into the Lightweight Computer System and transmit to each Paladin.

(e) Enter the minimum quadrant elevation in the Automated Fire Control System as load elevation. The minimum quadrant is the greater of 267 mils, computed XO's minimum quadrant (the platoon operations center will check for intervening crests every mission) or minimum quadrant computed at the lowest charge to the minimum range line or forward line of own troops.

(f) Enter the maximum quadrant elevation in the Automated Fire Control System as maximum tube elevation. This represents the maximum range line as determined by the platoon operations center. For high angle fires, the chief of section must ask for and receive permission to exceed maximum quadrant from the platoon operations center.

(g) Verify automated firing limits with the platoon operations center. This includes left and right sector limits and the MIN and MAX QEs.

(h) Ensure "WARNING Tube not in Lay Position," no longer appears on the screen of the Automated Fire Control System.

(i) Ensure Lay Key is "backlit."

(j) Verify actual and command deflection/quadrant match to an accuracy of 1 mil.

(k) Announce any warning message generated by the automated fire control system to the platoon operations center (e.g., sector of fire violation, maximum elevation). ONLY THE PLATOON OPERATIONS CENTER CAN GIVE THE AUTHORIZATION TO OVERRIDE THE VIOLATION.

(l) Enter SITE DATA after every move, both tactical and survivability. For emergency mission (Hipshoot), chief of section will verify firing data clears any site to crest.

(m) Ensure the procedures contained in FM 6-70 are followed.

(6) Fire direction officer (FDO) and BOC/POC. Fire direction officers and fire direction chiefs will:

(a) Be safety certified.

(b) Have a firing chart or a map plotting the same target areas and no fire areas as the forward observer. NOTE: The impact areas already account for all secondary danger areas and probable errors.

(c) Conduct a dry fire mission to a target in the impact area whenever there is a major change in the data base (gun or FDC). Use only authorized charge and shell/fuze combinations for the dry-fire verification. This mission must specify charge and use of a converged sheaf. Failure to specify the charge and a converged sheaf will produce data out of tolerance due to aimpoint selection routine of the Lightweight Computer Unit.

(d) Compare the Automated Fire Control System and the Lightweight Computer Unit/Battery Computer System data to ensure the computed data is within the following tolerances.

Deflection	1 mil
Quadrant	1 mil
Fuze Setting	0.1 sec

(e) Select a charge that is capable of achieving 1400 meters beyond the buffer zone of the impact area.

(f) Verify that the plot for all target grids/locations and subsequent adjustments plot inside and do not violate the limits of either the target area or any no fire areas drawn on the map/chart.

(g) Draw the sector of fire on the chart/map. The brigade/division boundaries are equal to and represent the weapon's right, left, minimum, and maximum safety limits.

(h) Compute left limit, right limit, minimum quadrant, maximum quadrant, and, minimum time for shell illumination. Illumination safety will use the same procedures as outlined for the M109A2/A3. Safety Ts will be on the howitzer for illumination.

(7) Observer.

(a) The observer will plot the appropriate target area(s) and all no fire areas on the map.

(b) There must be a minimum of two agencies (e.g., forward observer and platoon operations center) that verify target location is safe to fire.

#### **11-6. REQUIREMENTS/PROCEDURES.**

a. General. Paladin will use the training area method to tactically occupy and fire from locations within a scheduled training area. The platoon position area can have up to a 500 meter radius (Version 10) or 750 meter radius (Version 11). Firing positions must be per SDZs generated by the firing unit and approved by Range Control.

b. Administrative. Per FM 6-70.

c. Safety. Per FM 6-50.

d. Positioning/survey. Per FM 6-2.

e. Observation of rounds. Per FM 6-30.

f. Ammunition.

(1) Paladin units may travel with fuzed ammunition on the howitzer (only HE/PD-M557 and M739 fuzes) when the following conditions are met.

(a) The on-board fire extinguisher system is operational.

(b) Crew members perform before, during and after operational checks to ensure there are no fuel or electrical problems that could cause a fire.

(c) Only the M557 and M739 series fuzes may be prefuzed. Do not mate Mechanical Time, Mechanical Time Super Quick, and Variable Time fuzes to projectiles.

(d) Fuzed ammunition will not be transported in the cantonment area.

(2) Section chiefs are responsible for inspecting ammunition for serviceability according to TM 2350-314-10.

(3) Precutting of powder charges is NOT authorized except for controlled demonstrations where a registration has been conducted or for training in suppressive fire situations.

(4) Presetting of time fuzes is not authorized unless the ASP issues time fuzes in lieu of PD. In this case, the fuze must be preset to its PD setting.

(5) Occasionally, units may experience malfunctions where the projectile fails to exit the tube. If the unit experiences a "sticker," the RSO will immediately call a check firing on that piece and notify Range Control.

(a) Personnel will NOT tamper with the weapon before the arrival of QASAS. The QASAS will determine what actions will be taken to clear the weapon. EOD will not attempt to extract the projectile until the QASAS gives approval.

(b) Refer to the appropriate -10 for additional guidance.

1. When direct fire is employed, the safety limits used to compute low angle safety data will be taken from the safety card. RSOs construct a safety T that will be given to section chiefs.

2. Howitzers will be layed using orienting angle, grid azimuth, or simultaneous observation methods orienting an M-2 aiming circle. The azimuth of fire will be verified per FM 6-50.

3. The howitzer will be marked with deflection limits using tape, chalk, or safety markers for SP howitzers and staked for towed howitzers.

4. For range, even though firing is conducted with the use of the range scale in the direct fire telescope, the chief of section must verify the elevation with gunners quadrant.

#### **SECTION IV: MLRS UNITS**

##### **11-7. RESPONSIBILITIES.**

a. Commanders. Ensure the overall safety administration and execution of all live fires. Ensure all personnel participating in live fire exercises are safety certified.

b. Range safety officer (RSO). Per Chapters 4-7 and 11-1(f), (g), and (h).

c. Platoon leader/sergeant.

(1) As directed by the battery operations center, compute and prepare safety data/safety Ts.

(2) Check to ensure launchers are properly calibrated, updated and start-up data is correct.

(3) Ensure personnel understand and follow the correct procedures for conducting a live fire.

(4) Check the lot number of the launch pod container (LPC).

(5) Enforce safety policies and procedures established by AR 385-63 and post regulations.

(6) Collect and maintain a hard copy of all firing data per higher headquarters' directives.

d. Launcher section chief.

(1) Check that all procedures in the launcher are conducted per applicable technical manuals.

(2) Verify launcher has a valid calibration and is updated with a verified SCP.

(3) Verify LPC lot number and that the proper data according to the lot number is entered.

(4) Receive all instructions and firing commands from the controlling FDC.

(5) Verify launcher firing position within a designated firing area with PDS; and PLGR or map spot.

(6) Check firing data with a safety T to determine if the launcher is laid and safe.

(7) Ensure latest meteorological (MET) message is used.

(8) Record all missions on a launcher fire mission log (DA 7233) and provide this log to the controlling FDC upon completion of firing.

(9) Verify all data before arming and firing the launcher.

e. Battery operations officer/fire direction chief.

(1) Battery operations officer.

(a) Check the computation of safety data/safety Ts.

(b) Ensure the FDC has all safety data displayed properly in the battery and platoon FDCs.

(c) Review validity of MET and check that all launchers have valid MET, firing position and target locations.

(d) Direct the execution of all fire missions.

(e) Perform duties of battalion S3 (paragraph 5-7f) when the battalion is not conducting live fire exercise.

(f) Ensure copies of the LCU printout, launcher fire mission logs (DA 7233) and FDC fire mission logs (DA 7232) are maintained on all data pertaining to the live fire exercise for at least 30 days.

(g) Verify that actual launcher locations match location for active SDZ.

(2) Controlling FDC chief.

(a) Ensure LCU with operational printer is present.

(b) Print out all incoming and outgoing messages/data.

(c) Verify set up and operation of the LCU.

(d) Verify all data sent to and received from the launchers is correct.

(e) Ensure data received by the launchers is within applicable safety parameters.

(f) Direct setup of all safety data and overlays required by Range Control and FM 6-60.

f. Battalion S3.

(1) Request MET support.

(2) Request firing safety limits from Range Control.

(3) Ensure valid MET is on hand and transmitted to the controlling FDC.

(4) Maintain communications with Range Control, and monitor check-in and check-out codes for firing units.

(5) Ensure all Safety of Use Messages are on hand before the live fire exercise.

(6) Coordinate observation post locations with Range Control.

#### **11-8. REQUIREMENTS/PROCEDURES FOR LIVE FIRE.**

a. General.

(1) Comply with the five elements of accurate predicted fire.

(2) Ensure unit does not live fire without proper “wet” check-in code from Range Control.

(3) Conduct face-to-face coordination with Range Control.

(4) The commander will conduct a risk assessment and brief his/her personnel on the results before live firing and ensure that the risk assessment results are available at all operations centers involved in the live fire.

(5) Establish SCPs for update and calibration runs.

(6) Ensure launchers do not update on and subsequently fire off of the same point. Doing this eliminates the on board safety verification (SRP/PDS) between update point and firing point survey.

b. Administrative.

(1) Units are responsible for computing SDZ for all intended firing positions/OPAREAs and briefing Range Control. Range Control will issue a serial number for each SDZ. The SDZ must be activated with Range Control before the unit entering a firing status and commencing life fire operations. SDZs must be updated with Range Control annually.

(2) Provide sufficient detail personnel to serve as a fire fighting team. The team will have an NCOIC, vehicle with radio and sufficient fire fighting equipment (to include 5 gallon water cans).

(3) Provide visual observers positioned to verify warhead event/impact; with binoculars, vehicle with operational radio and night vision goggles (night fire only). They will monitor the designated radio net. Observers will be trained by the unit to determine warhead event/impact location. The observers will have a Fort Knox map with safety overlay.

(4) Coordinate with Range Control for Reduced Range Practice Rocket (RRPR) road guard requirements.

c. There are three methods to compute safety data for MLRS live-firing.

(1) The first of these is for point-to-point firing using the surface danger zone (SDZ) parameters contained in AR 385-63. When firing the M28/M28A1 training rocket in the point-to-point method at Fort Knox, the following safety T tolerances between check systems will be used to construct the safety T.

	M28		M28A1
M28A1AZ & QE	+ - 5 mils	AZ & QE	+ - 5 mils
Fuze Setting	+ - 5 seconds		

(2) The firing point and OPAREA methods allow the unit to develop a safety T for either a firing point or a firing operations area (OPAREA). Both of these methods are detailed in FM 6-60, appendix J, and comply with all SDZ requirements established in AR 385-63.

(3) The firing point and OPAREA methods allow the unit to conduct more realistic and tactically driven live-fire exercises, thus significantly enhancing training. They apply the SDZ requirements around an installation impact area rather than a specific target. They also apply launcher danger areas to either individual firing points or a larger firing OPAREA. However, in the event of a conflict, AR 385-63 has precedence.

d. Verify that SCPs are correct. Graphical resection or map spot methods of location may be used to verify the SCPs. The PLGR may also be used when the position error reading is +/- 20 meters, or when operating at a Figure of Merit of 1 or less.

e. Observation of Rounds.

(1) Radar will be used in conjunction with observers when visual observation is limited/restricted. The radar will operate in the "Friendly Fire" mode and the time interval between rockets for multiple round missions will not be less than 30 seconds (if only radar is used).

(2) Rockets not observed or observed out of safe will immediately be reported to Range Control. The unit will place itself in check fire-freeze pending a determination of the problem resulting in the unobserved or out of safe rocket.

f. Ammunition. Per Chapter 3 and Chapter 11.



CHAPTER 12

TRACK VEHICLE GUNNERY

12-1. **GENERAL.** This chapter prescribes requirements for firing track vehicle mounted main guns, machine guns, and sub-caliber training devices.

12-2. **SAFETY.**

- a. Unit commanders are responsible for safety during all phases of training.
- b. Unit commanders will select weapons system qualified personnel in the grade SFC/E7 or above to serve as the OIC and SSG/E6 or above to serve as RSO to assist them in discharging their safety responsibilities (OIC).
- c. The range OIC and RSO will be familiar with and have available on the range this regulation, the TM appropriate to the firing weapons system, and a complete and current copy of the approved deviation of safety criteria, as applicable.
- d. All personnel will be briefed on range safety before starting live-fire activities.
- e. The individual tank commanders (TCs), as appointed by the unit commander, are responsible for the safe firing and operation of their tanks.
- f. During daylight and good visibility, flags will be displayed by the firing vehicle; at night and during reduced visibility, lights will be displayed by the firing vehicle. (Example: Battery operated flashlights with colored lenses will be attached to the antenna.)
- g. While personnel are downrange, all guns will be cleared and elevated.
- h. Use of on-board laser systems are outlined in Chapter 19 of this regulation. No personnel will be within the safety fan of a non-eye safer laser during firing, without prior approval from Range Division and use of protective glasses that are within the correct frequency range for the laser being fired.
- i. 25 mm chain gun.
  - (1) Before starting live-fire activities, the RSO will verify the correct setting of the ammunition selection switch located in the ammunition loading box.
  - (2) Before rotating the turret for loading, the RSO or an appointed assistant will physically verify the SAFE positioning of the manual safety switch.
  - (3) Firing engagements involving multiple selections of different types of 25 mm rounds require prior coordination with Range Operations. The OIC will develop target

engagement sequences and safety policies to preclude the firing of AP type rounds with HE elevation indexed.

j. A functional compass (magnetic/lensatic) will be available on the range to verify left and right limits and to identify direction of rounds thought to be fired out of the surface danger area.

### 12-3. **FIRING REQUIREMENTS.**

a. Range limit markers must be visible at all times when firing is being conducted. During hours of darkness, the range markers will display sufficient auxiliary lighting to make them readily visible to the naked eye.

b. Individual firing vehicles will display proper flags on the firing line.

c. Stop signs will be placed between each vehicle on the firing line to prevent individuals from going forward of firing vehicle.

d. No cross range firing is authorized on any tank range.

e. For medical requirements, see appendix A.

f. Communications by intercom or radio will be maintained between the using unit and the target systems operator on moving target system ranges at all times (OIC responsibility)

g. Before firing, the OIC and RSO will review all prefiring safety checks. The RSO will give the OIC clearance to fire.

h. When firing under an approved deviation of safety criteria, all provisions of the deviation documentation will be met. All personnel engaged in the firing activity will be briefed on the restrictions imposed by the deviation documentation.

i. When firing vehicle mounted weapons such as the M60 and .50 caliber machine guns, which are not turret mounted and controlled, the weapon will be chained to prevent firing out of identified left and right limits and at excessive elevation.

12-4. **SURFACE DANGER ZONES.** See DA Pam 385-63.

12-5. **GRENADE LAUNCHERS.** Occupancy of the surface danger zone by unprotected personnel in the open is prohibited during the firing of track vehicle mounted grenade launchers. Prior coordination with Range Operations is required for firing casualty producing grenades.

12-6. **THERMAL TARGET SUPPORT.**

a. The standard for modernized mounted ranges at Fort Knox is the use of "hot beds" for the generation of a thermal target image. On these ranges thermal signature generating materials are only employed on the moving Armor and Infantry targets or stationary Infantry targets.

Stationary vehicle targets are constructed of wood and are heated while in the down position by resting on a heated platform. Units desiring use of some other system of thermal image generation than that used on these ranges must coordinate with the RMO. Once approved, the unit is responsible for procurement of the alternate materials/targets. The requesting unit may also be required to supply man-hours to assist Range Division personnel assigned to the range to install the alternate target support. Units using alternate target support will be responsible for the removal of the materials after completion of firing and to assist in returning the target array back to its original condition.

b. Older generation ranges must employ thermal image generating materials applied directly on the face of the wooden target. Units using these ranges are responsible for the deployment, support, and recovery of these target arrays.

CHAPTER 13

AIRSPACE/AIRCRAFT/AERIAL GUNNERY

13-1. **GENERAL.**

a. All Army aviation activities within the Fort Knox range and training area complex Restricted Area (R3704) will be conducted PER applicable DA and Fort Knox regulations, or other applicable regulations, circulars, TM, FM, and safety of flight messages.

b. R3704 is subdivided into four restricted subareas: A, A1, A2, and A3. Range Operations controls the Restricted Area over the ranges and the training complex. Overflights of the ranges and training complex are prohibited unless prior coordination is made with Range Operations.

c. All flight operations conducted on Fort Knox will be per Fort Knox Regulation 95-1 and coordinated with Godman Army Airfield Operations.

d. Aircraft operating within the Restricted Area airspace will maintain radio communications with Range Control (FM 38.90). When operating in a flight of aircraft, at least one aircraft will be in communication with Range Operations. Should communications with Range Operations be lost, the pilot will immediately contact Godman Army Airfield. If flight activities can be coordinated with Range Operations through Godman Army Airfield the training may continue. If not, flight activities will be terminated and the pilot will immediately coordinate with Godman/Advisory for flight route information for the most expeditious route out of the Restricted Area and training complex.

e. Field airstrips within the Fort Knox training complex must be scheduled for use. Airstrip activities must be coordinated with Range Operations and Godman Army Airfield. Units with approval to use a field airstrip must limit their activities to the airstrip. The surrounding training lands are not included in approval for airstrip use and must be scheduled separately.

f. Airspace routing used by armed aircraft flying from the ammunition loading site to the firing range and return will be plotted on a map or chart and maintained by both the using unit and the installation/community range control. This course will be selected so that accidental firing at any point on the course will minimize risk to life and property.

g. The commander of the air unit or OIC of training will:

(1) Provide personnel and communication facilities for control of aircraft operating in the Restricted Area and over the training complex.

(2) Immediately report the jettisoning of any equipment, bombs, rockets and projectiles to Range Operations, whether on or off the reservation. This report will include time, type of ordnance, altitude, speed, direction of flight, and position. A short explanation of the reason why the jettisoning was necessary will be provided to Range Operations.

(3) Locate duds dropped or fired by aircraft to coordinate their destruction with Range Operations.

g. Pilots who must enter the Restricted Area or range area will:

(1) Contact Range Operations for clearance and report:

(a) Type and serial (tail) number of aircraft.

(b) Training Area or Range to be entered and the Grid coordinates, if requested.

(c) Expected time of entry into area.

(d) Expected time of departure from the area.

(2) Pilots will be furnished specified safe routes of entry and exit by Range Operations. These routes will be followed. Pilots will not enter the marked impact areas, or fly in front of any firing line (down range) without direct approval from Range Operations.

(3) Pilots will call Range Operations upon departure from a Training Area or Range.

### 13-2. FLIGHT FOLLOWING.

a. All aircraft penetrating the Godman Army Airfield Class D Airspace will call Godman/Advisory on VHF 126.2 for clearance through the Controlled Airspace.

b. All aircraft penetrating the Fort Knox Range and Training Area complex will call Range Operations on FM 38.90.

c. Range Operations will be advised of the following:

(1) Aircraft type and identification number.

(2) Intended destination.

(3) Route, altitude, and purpose of flight.

d. Aircraft will notify Range Operations upon reaching each checkpoint, arrival at destination, and time of departure to return to Godman/home station or fieldstrip.

13-3. **AERIAL GUNNERY.** Fort Knox has two aerial gunnery ranges within its main impact area.

a. Super Range. The range, as designed, becomes a tactical exercise and not just a qualification course. The whole impact area becomes the range. It is capable of training all types of units equipped with attack helicopters. The major problem with this range is that it

closes down all other range activity within this impact area. However, this range can be made available on weekends, with proper coordination and long-range scheduling. Firing boxes are depicted on the Fort Knox Special Map 1:50,000. Firing data is available from Range Operations.

b. East Boundary. This aerial gunnery range extends along the east boundary of the main impact area from Training Area 1 to the 96 horizontal grid line (Fort Knox Special Map 1:50,000) Firing is conducted at targets located within the impact area based on approved overlays. Firing from this area does not require other ranges to be closed. Firing from tank ranges or other locations into the main impact area may be approved on a case-by-case basis, when properly coordinated.

c. Yano, Cedar Creek and St Vith Tank Ranges are constructed facilities with pop-up and moving targets. These facilities can support aerial gunnery. Coordination and scheduling for support by the area weapons scoring system (AWSS) is a unit requirement.

13-4. **CONDUCT OF FIRE.** Conduct of fire will be per FM 1-140, DA Pam 385-63, and this regulation

13-5. **FIRING OVERLAYS.**

a. Surface danger area overlays will be submitted to Range Operations 10 days before scheduled firing. Overlays will be submitted in two copies on overlay paper.

b. Surface danger area overlays will include the following data:

- (1) Organization to fire.
- (2) Type of aircraft.
- (3) Type of ordnance.
- (4) Inbound flight route and altitude.
- (5) Outbound flight route and altitude.
- (6) Firing altitude.

13-6. **ATTACK HELICOPTER CREW EVALUATION SAFETY.** Procedures necessary for the safe operation of the Aerial Gunnery Crew Qualification Range and those procedures required for familiarization and demonstration firing will apply to all personnel participating in or firing on Fort Knox aerial gunnery ranges.

a. OIC. The OIC is the officer in overall charge of the entire range operation. The OIC is responsible for the development of the maneuver and firing phase of the range operation to assure rigid compliance with applicable FM, range regulations, safety rules, and practices for

establishment of the overall safety program. The OIC exercises supervisory authority for all personnel on the range to ensure the safe operation of the range.

b. Tower Control Officer (TCO) The TCO works for the OIC and supervises individual aircraft operating downrange. The TCO exercises supervisory authority for the aircraft when maneuvering downrange. The TCO has the following responsibilities:

(1) Ensures that the aircraft complies with the safety procedures established for the range exercises and does not stray outside the range area.

(2) Places the aircraft in firing positions and gives the team a call for fire. The call for fire will contain the following information, as a minimum:

- (a) Type weapon to be used.
- (b) Target description.
- (c) Direction to the target.
- (d) Range to the target.
- (e) Whether the engagement will be from a stationary hover or will be running fire.

(3) Instructs the pilot of each aircraft to report attack complete and switches (for the weapons system) cold before leaving the firing position.

(4) Issues any special precautions that apply to the particular firing position.

(5) Grants permission for the pilots to arm the firing circuits and begin the attack.

c. Range Safety Officer (RSO). The RSO works for the OIC and monitors range operations to ensure compliance with range safety procedures. The RSO is responsible for monitoring the range operation for compliance with applicable safety procedures. If a hazardous situation is discovered, the RSO will correct the situation on the spot. If the RSO cannot correct the situation, he will close down the operation and report the difficulty to the OIC, who in turn will notify Range Operations.

d. The Pilot in Command (PC) of each aircraft will:

(1) Directly supervise firing in conjunction with the call for fire received from the TCO.

(2) Be familiar with the impact area, firing limits, danger zones, and range safety regulations.

(3) Assure that the firing is conducted only when the aircraft is on course and the weapons system aimed at the target.

(4) Arm and disarms the firing system. The crew will arm the system only after receiving permission from the TCO and when the aircraft is oriented down range. The weapons system will be disarmed before departing each firing position, or when firing is conducted which could result in rounds impacting outside the target area or limits of fire. The crew will report switches cold to the TCO.

(5) Assures that the weapon switches are in the proper position before departing a firing position.

e. General.

(1) All aviators will be thoroughly briefed on the contents of this chapter before participating in any aerial gunnery exercise.

(2) All pilots will be familiar with the unit SOP; chapter 13, DA Pam 385-673; and applicable provisions of this regulation.

(3) Aircraft will not enter the range area unless cleared to do so by the TCO.

(4) Before the first firing run of the day, the OIC will have the range flight inspected to ensure that no one is downrange. Guards will be placed on roads leading into the range area as required by Range Operations to ensure that no one accidentally enters the range area. Road guards will be in radio communications with the OIC. Anyone spotting any unauthorized vehicle or personnel down range or an uncontrolled aircraft near the range, or any other hazard will immediately command "CEASE FIRE."

(5) Functional checks of weapons systems other than an initialization will not be made unless specifically approved by the OIC.

(6) When operating in a firing area that is not supported with an over watching range tower, or a observation point with a control team on site with functional communications, the TCO will be aboard an aircraft above the fire team to ensure firing aircraft are in the proper firing box, with guns facing the target area. The aircraft supporting the TCO must have positive radio communications with all firing aircraft.

(7) Positive radio communication will be maintained at all times between all aircraft and the range tower. If communication is lost, firing will be suspended immediately and all aircraft downrange will return to the ready line. A lost communications signal will be briefed during the OICs briefing to the crew. The range tower will, at all times, have positive control over all aircraft in their team while in the range area.

(8) Route overlays are available for review at Range Division.

f. Attack aircraft. The attack aircraft will: Maintain the armament switches in the off or safe position until cleared "hot" by the range tower.



g. Armed aircraft. No armed aircraft will overfly populated areas or highways except in the event of a severe emergency that dictates the most expeditious route to a safe landing area.

h. Over flown areas. No adjacent ranges or impact areas will be over flown without clearance from the OIC.

i. Aircraft departure. No aircraft will depart the range until the weapons system has been cleared by qualified armament personnel and verified as "safe" by an OIC. Aircraft using Yano, Cedar Creek or St Vith Ranges in conjunction with Cedar Creek Airstrip may delay clearance until arrival at the airstrip FARP.

j. Attack helicopter. Attack helicopter will have weapons cleared and safe before refueling.

k. Refueling procedures. In addition to normal refueling procedures, fuel handlers will ensure that wing store ground safing pins are installed before refueling aircraft. Spill kits will be stationed at all refuel points.

#### **13-7. ARMED HELICOPTER EMERGENCY LANDINGS.**

a. Armed helicopters experiencing in-flight emergencies will land at the most convenient and suitable landing site within the confines of the range area. Pilots will deviate from this procedure only when the nature of the emergency renders field site landing hazardous to the crew and/or aircraft.

b. If field site landing cannot be accomplished and the aircraft must return to Godman Army Airfield, the pilot in command will accomplish the following as the situation permits:

(1) Notify Range Operations that he will attempt jettison external ordnance on the Range or in the adjacent Training Area if appropriate.

(2) Place all weapon switches and master armament switch to OFF.

(3) Pull all armament circuit breakers.

(4) Contact Godman/Advisory and declare a precautionary or emergency landing as the situation dictates.

(5) If live ordnance is on board, declare an emergency to receive landing clearance at Godman Army Airfield. Notify the Air Traffic Controller in Godman/Advisory that the aircraft has live ordnance on board and give the exact nature of the emergency.

(6) Comply with Fort Knox Regulation 95-1 and the instructions issued by the ATC Controller, as much as possible.

(7) After landing with live ordnance, ensure that no one moves or disturbs the aircraft until all ammunition has been removed by authorized aircraft armament personnel.

c. Armed helicopter crews are reminded that Godman Army Airfield is surrounded by high density housing and working areas. Helicopters landing at Godman Army Airfield with live ordnance present a grave threat to the safety of personnel. For this reason, landing with live ammunition at Godman is to be made only in an actual emergency. Pilots will avoid over flying any populated areas while returning to Godman Army Airfield.

13-8. **NIGHT FIRING.** Because Attack Helicopter aerial gunnery is designed to test crew efficiency in a demanding, combat-type environment, the requirements for night firing are stringent.

a. All crewmembers of aircraft operation downrange must be qualified per the aircraft specific aircrew training manual (ATM).

b. Aircraft requirements:

(1) All aircraft will operate with lights on steady, dim.

(2) Canopies will be clean and free of scratches.

(3) Aircraft equipped with Night Vision Systems or Night Vision Devices can conduct night firing, under blackout conditions, while using Night Vision Systems or Devices. These systems/devices must be fully operational. Crews members must be trained and proficient in their use. All crewmembers of the firing aircraft, OIC, TSO, RSO and the Range Tower must have a Night Vision capability. Pre coordination is required with the Range Management Office.

c. Night lighting.

(1) Each landing site will be marked with a lighted inverted "Y."

(2) "Bean bag" lights will be placed on the panel markers designating the start- and cease-fire lines. (Artificial illumination of the firing positions may be used as an alternate.)

d. Only one team will operate downrange when firing at night.

e. The nonfiring pilot's duty during target engagement is to monitor aircraft attitude and proximity to obstacles.

f. Diving fire is prohibited.

g. Individual Pilots, Commanders, and OICs of training are responsible for monitoring crew rest limits as defined in the unit's SOP.

13-9. **ARMAMENT.**

a. The first action to be taken, when aircraft land on the rearm line is to safe and clear the weapons. (Bullet catchers will be installed on #134 guns.)

b. No one will walk in front of unsafe weapons.

c. Aircraft will be loaded in the following manner:

(1) Install ground safety pins in outboard wing stores and safe.

(2) Install ground safety pins in inboard wing stores and safe.

(3) Safe the turret weapons.

(4) Load turret.

(5) Load inboard wing stores.

(6) Load outboard wing stores.

(7) When loading occurs during night operations all of the lighting requirements and procedures listed in Para 13-8 above will be complied with.

d. The following steps will be taken before loading 2.75 inch FFAR:

(1) Shut down aircraft.

(2) Ground aircraft.

(3) Conduct stray voltage check.

(4) Conduct all additional procedures directed by each specific aircraft's operators' manual.

(5) Have no radio transmission within 16 meters of loaded aircraft.

e. Functional checks of weapons system will not be made unless specifically approved by the OIC.

f. All personnel on the rearm line will wear hearing protection when the aircraft are running.

g. Aircraft that are to moved to the refuel area will have all rockets unloaded, and guns cleared and made safe. Before repositioning aircraft will be inspected by the armament pad chief or PC.

#### **13-10. AMMUNITION STORAGE AND HANDLING.**

a. The ammunition storage point will not be under aircraft landing and takeoff flight paths. It will be located far enough from the aircraft parking area that debris from an aircraft accident will not enter the storage area.

- b. All ammunition will be stored on trucks or on at least six inches of dunnage and covered with double tarpaulin to prevent water damage.
- c. Rockets will be stored with the warheads facing downrange.
- d. Ammunition will not be dropped from trucks or tossed from person to person. Dropped rockets will be set aside and will not be fired until they have been inspected and approved for firing by a qualified ammunition inspector from the ammunition supply point.
- e. No more than two aircraft loads of ammunition will be stored at each rearm point.
- f. No more than 65 2.75 inch FFAR will be stored at each rearm point.
- g. The 2.75 inch FFAR will not be stacked more than five rows high.
- h. Ammunition removed from packing crates will be covered with a double tarpaulin if left out overnight.
- i. Aircraft refueling will be conducted per FM 67-10-1 and the appropriate operators' manuals.

**13-11. HIGH PERFORMANCE AIRCRAFT (USAF, USN & USMC).**

- a. The provisions of this chapter apply to the employment and control of High Performance Aircraft during the conduct of gunnery operations. Necessary exceptions will be considered on a case by case basis when coordinated in advance.
- b. Firing overlays PER para 13-5 will be submitted for both gunnery and bombing activities.
- c. Pre coordination with the Range Management Officer is required.
- d. Emergency landings at Godman Army Airfield with hot weapons system will be conducted per unit and Fort Knox Regulation 95-1. See para 13-7.
- e. High Performance Aircraft will use established Close Air Support (CAS) Procedures for entry and exit in to Restricted Area, R 3704 A & B. A CAS Letter Of Agreement (LOA) between the 19th Air Support Group and Godman Army Airfield/Tower outlines these procedures.

**13-12. EXTERNAL LOAD OPERATIONS.** See FM 55-450-1.

## CHAPTER 14

### AIR DEFENSE WEAPONS

14-1. **SAFETY.** This chapter covers air defense weapons in their use against aerial targets and direct fire at stationary targets in the ground support role.

a. A surface danger area overlay for the range and a scheduling request for the facility will be submitted to Range Division, no later than 10 days in advance of scheduled date of use of range. The request for scheduling the range will be valid only when the overlay has been approved by Range Division.

b. Do not locate troops within the surface danger zone while firing at aerial targets.

c. If personnel are to be in the surface danger zone at points other than the battery positions, cover must be provided.

d. An OIC and RSO will be on each range. They will comply with requirements set forth in Chapter 4 of this regulation.

### 14-2. **FIRING.**

a. The range will be opened by the OIC or RSO through Range Control before any firing takes place.

b. No aircraft will enter the danger zone until permission has been granted by Range Control.

c. No registration or check firing will be done during demonstrations or any time when spectators are present.

d. All weapon firing at aerial targets will be on a single firing line at pre-designated firing positions. All weapons will be properly marked with visible indicators.

e. All personnel, except those firing weapons, the OIC, and safety personnel, will remain behind the firing line.

f. The surface danger zone for firing at aerial targets is outlined in chapter 14, DA Pam 385-63. The limits of the surface danger zone for direct or indirect firing will be identified on the Range Control approved SDZ overlay.

g. Stakes for limit of fire for each weapon on the firing line will be posted before any firing is requested. Weapons/weapons systems with built-in capabilities to establish firm left and right deflection limits, i.e. Avenger, may use these systems in lieu of the ground stake method. The RSO will ensure no weapon fires outside those limits.

## CHAPTER 15

### COMBINED ARMS EXERCISES

15-1. **OFFICER IN CHARGE.** Before conducting a combined arms live-fire exercise, the OIC and RSO must be thoroughly familiar with AR 385-62, this regulation, and the scenario and safety plan for the exercise to be conducted. The OIC for the exercise must be a commissioned officer.

15-2. **SCHEDULING.** The unit desiring to conduct a CALFEX must submit a detailed range scheduling request, per appendix E, a minimum of 3 months before the proposed exercise.

15-3. **EXERCISE PLAN.** Accompanying the request will be a complete range fan for each weapons system to be fired during the exercise. A typed scenario and safety plan will be prepared for each live-fire exercise and will arrive at Range Division at least 10 days before the exercise. A dry fire rehearsal by the firing unit(s) is strongly encouraged and may be required by the RMO.

#### 15-4. **SAFETY.**

a. Safety personnel, with appropriate equipment, and the exercise safety plan will be used during all exercise rehearsals. Safety personnel will monitor each type weapons system.

b. Emergency cease-fire signals will be prearranged and prepared for employment at all times.

c. The OIC must have full control over all activities on the range. If the OIC loses positive control over any firing element involved in the exercise, the entire exercise will be stopped until control is regained.

15-5. **CHIEF SAFETY OFFICER (CSO).** A CSO (a commissioned officer) will be appointed for each combined arms live-fire exercise. The CSO will coordinate the efforts of all systems safety officers and be provided enough personnel, transportation, and communication to properly perform his/her duties. The CSO will be responsible for arranging a safety briefing from Range Operations for all personnel that do not have a valid safety briefing card.

15-6. **SYSTEMS SAFETY OFFICER (SSO).** A SSO will be appointed for each major weapons system involved in the exercise, i.e., tanks, artillery, mortar, dismounted infantry, etc. The SSO will be safety qualified and certified on the weapons system he/she is to supervise.

15-7. **COMMUNICATIONS.** The OIC will maintain constant 2-way communications with Range Operations at all times during the exercise.

15-8. **CLEARANCE PROCEDURES.** Users desiring to clear combined arms live-fire facilities will follow the procedures in para 2-5, chapter 2.

CHAPTER 16

CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL (CBR) ACTIVITIES

16-1. **GENERAL.**

a. Use of riot control agents (RCA) during training on a range or firing point requires prior approval by the Range Manager and publishing in the Fort Knox Weekly Bulletin. The unit's request for facility scheduling, overlay, and 6-digit coordinates for use of chemical munitions will be submitted to Range Operations a minimum of 10 days before the date of use. RCA will not be used within the training complex unless a notice is published in the Fort Knox Weekly Bulletin 3 days before the date of use. This notice will be submitted by the using unit to Range Operations for approval in sufficient time for further submission for publishing in the Fort Knox Weekly Bulletin. Use of RCAs in the training complex will adhere to the following.

(1) RCA use is limited to CS, CSX, CS-1, CS-2, and CR. All other RCAs are prohibited for training use.

(2) Use of RCAs in training requires supervision by personnel specially trained in field behavior, individual protection, and first aid for RCAs. Personnel that meet this criteria are Chemical Officers (branch code 74), Chemical Noncommissioned Officers (MOSC 54B), school trained Nuclear, Biological and Chemical (NBC) officers, Secondary Skill Identifier (SSI) 3R and noncommissioned officers (NCO) Secondary Qualification Identifier (SQI) C.

(3) RCAs will not be used under conditions that are dangerous to life or property. Minimum safe distances to heavily traveled installation/community roads, railroad right of ways, airfields (including all aircraft landing areas), or inhabited areas are:

(a) CS Chambers will be at least 100 meters away from heavily traveled roads, 500 meters from aircraft operations and inhabited areas, and 1000 meters from the nearest installation boundary.

(b) Field training exercises involving gases will be 500 meters or more away from public traffic routes, the nearest inhabited buildings, and any occupied firing points or airstrips, and 1000 meters from installation boundaries or major civilian highways including US 31W, US 60, KY 1638, KY 313 and Vine Grove Road through Training Area 8.

(c) CS gas or other riot control agents will not be deployed during periods when prevailing winds will cause the gas to endanger any traffic on any road.

(4) Before a scheduled RCA exercise, training supervisors must conduct a readiness evaluation of personnel. Before being exposed to RCAs, all personnel with respiratory ailments, open wounds, severe facial acne, or any active dermatitis, and pregnant soldiers must be referred to a medical officer for evaluation. The medical officer will evaluate the health records of these individuals and, when necessary, examine the soldiers to determine their readiness to undergo

training without undue medical risk. The examination results (stating can/can not participate in training with RCAs ONLY) will be documented in the soldiers medical records.

(5) Commanders must ensure protective masks are available for all soldiers participating in training.

(6) When protective gear is worn, commanders shall consider the additional heat stress placed on soldiers. When using the Wet-Bulb Globe Temperature (WBGT) to determine the heat category, add 10 degrees if troops are in body armor mission-oriented protective posture (MOPP) level four (4). High ambient temperatures, high humidity, and heavy workload are factors which increase the potential for heat injuries. To reduce the heat stress risk, commanders should:

(a) Provide a water supply and encourage all soldiers to drink plenty of water. Supervisors will monitor personnel undergoing training to ensure soldiers and marines frequently drink water to replace lost fluids.

(b) Reduce the MOPP level under high heat stress conditions when possible.

(c) Schedule additional rest breaks during training to allow troops to cool off. These periods also can be used for critiques. Where possible, use vehicles to move soldiers who are in a protective posture.

(d) Ensure subordinate commanders/leaders check their personnel for early signs of heat stress. Authorize frequent breaks while operating in a protective posture.

(7) Wearing of contact lenses while masked is prohibited. Soldiers who wear contact lenses must remove them and use standard prescription eyeglasses during chemical defense training which includes wearing the protective mask. Unnecessary eye irritation will occur if RCA particles are trapped under contact lenses. The lenses also may be lost due to excessive tearing. All individuals requiring corrective lenses must have masks with correctly fitted optical inserts.

(8) Unprotected soldiers shall not be exposed to RCAs longer than 15 seconds.

(9) The use of trip wires to detonate riot control agents is prohibited without prior approval of the RMO.

b. Personnel specified in paragraph 16-1a(2) will supervise the mask confidence course.

c. Employment conditions.

(1) CS, CSX, CS-1, CS-2, and CR will be used in training only under the supervision of an NBC officer or NCO who has received formal training in the characteristics, capabilities, and training applications of these agents. Only CS in capsule form may be used in the CS chamber.



(2) RCAs will not be released when personnel located downwind will be affected, unless exposure to a controlled concentration is desired. CS agents will not be released within 50 meters of unprotected spectators located upwind.

(3) CS agents irritate the eyes, the respiratory tract, and moist skin areas of the body. A field protective mask, field clothing with collar, cuffs buttoned and trouser legs tucked into boots will protect against field concentrations of CS. Personnel handling or dispensing bulk CS will wear rubber gloves, hood, rubber boots, rubber apron, protective masks, and field clothing secured at neck, wrists, and ankles.

(4) Individuals affected by RCAs will move to fresh air and face into the wind for 5-10 minutes, avoid rubbing the eyes. Remain well spaced from other affected personnel. If accidentally exposed to an RCA, clothing will be removed from the affected skin as soon as possible. Flush the exposed area(s) with large volumes of cool water for not less than 15 minutes, then seek prompt medical attention. If available, mild soap should be used to cleanse the contaminated skin.

(5) Hot water should not be used when showering as it will raise the vapor point of the CS resulting in further contamination and discomfort, especially to the eyes and respiratory system.

(6) When eyes are contaminated with CS agent, treat them with a 1 percent solution for sodium bicarbonate (baking soda). If not available, hold the eyes open with fingers and flush with water not less than 15 minutes, then seek medical attention.

(7) Contaminated clothing will be removed from the area to prevent accidental contamination of unprotected personnel.

16-2. **SMOKE.** The use of smoke in training poses special health and safety issues. The following precautions apply to all smoke training with fog oil, hexachlorethane (HC), red phosphorus (RP), white phosphorus (WP), plasticized WP (PWP), terephthalic Acid (TA), colored and diesel smokes:

a. Personnel will carry a protective mask when participating in exercises which include the use of smoke. Personnel will mask:

(1) Before exposure to any concentration of smoke produced by M8 white smoke grenades, M83 smoke grenade (TA), smoke pots (HC & TA smoke) or metallic powder obscurants.

(2) When passing through or operating in dense (visibility less than 50 meters) smoke such as smoke blankets and smoke curtains.

(3) When operating in or passing through a smoke haze (visibility greater than 50 meters) and the duration of exposure will exceed 4 hours.

(4) Anytime exposure to smoke produces breathing difficulty, eye irritation or discomfort. Such effects in one individual will serve as a signal for all similarly exposed personnel to mask.

(5) When using smoke during military operations in urban terrain (MOUT) training and/or when operating in enclosed spaces. The protective mask is not effective in oxygen deficient atmospheres. Care must be taken not to enter areas where oxygen may have been displaced.

b. Clothing is to be laundered and personnel will shower after exercises involving exposure to smoke. Troops exposed to smoke should reduce skin exposure by rolling down their sleeves.

c. Special care must be taken when using HC and TA smoke to ensure that appropriate protection is provided to all personnel who may be exposed. When planning for the use of HC smoke in training, consideration must be given to weather conditions and the potential downwind effects of the smoke. Positive controls, (observation, control points, communications) must be established to prevent exposure of unprotected personnel. Detailed hazard information is available on appropriate Materiel Safety Data Sheet (MSDS).

d. FS (sulfur trioxide-chlorosulfonic acid solution) and FM (titanium tetrachloride) smoke shall not be used in training.

e. Smoke will not be used in public demonstrations, displays, or ceremonies unless positive dissipation of the smoke can be assured and no exposure to the public or nonparticipating personnel is expected. A risk assessment must be conducted by the agency conducting the public demonstration, in conjunction with the installation/community range officer and safety manager, for all uses of smoke in demonstrations, displays, or ceremonies.

f. The OIC of training will prohibit the use of HC smoke when the danger of secondary fires exists.

g. Residue from expended smoke munitions will be collected and back-hauled by the using unit.

h. Smoke will not be used within 1,000 meters of the reservation boundary or within 100 meters of an established road.

i. A 10-meter safety radius will be maintained from HC smoke grenades.

j. The OIC of training will prohibit the use of HC smoke when the danger of secondary fires exists.

### 16-3. SMOKE POTS.

a. Personnel manually firing HC and TA smoke pots will mask and keep their face turned away from the pots to prevent burn injuries. Once HC and TA smoke pots have ignited, personnel will quickly move away a minimum distance of 30 meters.

b. Precautions will be taken to prevent ground fires. HC and TA smokepots shall not be fired inside buildings, tents, or other enclosed areas due to fire and health hazards from associated fumes. Exceptions are building/structures especially designed for smoke training or situations which, after conducting a through risk assessment, minimizing hazards the appropriate commander accepts the residual risk.

c. HC and TA smoke pots must be kept dry. Any addition of water to HC and TA smoke mixtures may cause it to burn erratically, explode, or result in spontaneous combustion. HC smoke pots will not be ignited during visible precipitation (snow or rain).

d. The M4A2 smoke pot must be vented for at least 5 minutes in accordance with TB CML 100.

e. When electrically firing the M5 HC smoke pot, at least 30 meters of WD-1/TT wire will be used.

CHAPTER 17

MINES, FIRING DEVICES, PYROTECHNICS, AND EXPLOSIVE CHARGES

17-1. **GENERAL.**

a. This chapter prescribes the general procedures for handling and detonating explosives, mines, firing devices, trip flares, and simulators used by troops in training. It does not include projectiles, rockets, bomb fuzes or firing devices covered in other paragraphs of this regulation unless otherwise stated.

b. The OIC and RSO must possess a valid range safety card and be certified for the type of training to be conducted. Certification is the responsibility of the unit commander.

c. The use of explosive charges and mines requires that a surface danger area overlay be submitted to Range Operations NLT 10 working days before the firing date. Approved overlays will be valid for the time frames identified on the overlay. Units or activities frequently using the same site for the same type training event may submit overlays for recognized demolition areas and request approval of the overlay for a 12 month period.

(1) The overlay will include the following index data:

- Unit/activity
- Demolition area (name/coordinates)
- Type explosives (list each type used)
- Employment (surface, shape, cratering, etc.)
- Maximum charge (Range Operations will approve NEW limits)
- Method of detonation (electrical/non-electrical)
- Date/time of detonation
- Ammunition Storage Point
- Safe area for personnel

(2) The overlay will depict the point of detonation, missile, hazard area, and the location of the firing party and observers. Road guard positions will be identified by a circled "x." Road guard positions must be in communication with the OIC of training.

(3) Included with the overlay will be a Specific Operating SOP. The Specific Operating SOP will be prepared by the Range OIC or Range Safety Officer in ink for each explosive operation. One copy of the Specific Operating SOP will be attached to the overlay, and one copy will be on site during all live-fire operations. As a minimum, the Specific Operating SOP will contain the following:

- Mission/task to be accomplished
- Range OIC
- Range Safety Officer

Instructor/Assistant Instructors and their duties  
Explosives, type and quantity to be used  
Procedures/method and sequence of operations

d. Personnel will comply with the provisions of FM 5-250, AR 385-64, DA Pam 385-63, Fort Knox Reg 700-1, the specific operating manuals for the ordnance to be employed, and this regulation for the handling and firing of explosives, mines, trip flares, simulators, and firing devices.

e. The quarries located on Porter River Road, those located in Training Area 3, 6, and 17, and all other training quarries will be scheduled for use as any other range or training area. Activities conducted in these areas will adhere to this regulation and all other pertinent publications.

f. Explosives will be transported per FM 5-250 and Appendix B of this regulation.

g. The OIC of training will brief all road guards as to their duties. Traffic will not be blocked without coordination with Range Operations.

#### 17-2. **FIRING PRECAUTIONS.**

a. The OIC will comply with FM 5-250, AR 385-62, AR 385-64, Fort Knox Reg 700-1, and Appendix B of this regulation, for handling, storing, and transporting munitions to ranges and training areas.

b. All demolitions training operations will be discontinued during, or on the approach of an electrical storm or severe dust storm.

(1) No explosive operation will be conducted during severe weather conditions, which poses a hazard to electrical firing systems or so detracts from students attentiveness as to degrade safety. The OIC of training will instruct all personnel to seek cover during severe weather per the unit's SOP.

(2) Electrical firing systems will not be used when thunder or lightning storms are likely. If such storms approach during electrical firing operations, cease operations immediately, disconnect blasting caps from the firing wire and shunt blasting cap wires, and remove blasting caps from explosives and take the blasting caps to the blasting cap storage site. Electrically primed charges may be detonated rather than dismantled.

(3) Lightning is a hazard to both electrical and nonelectrical blasting caps. A strike or a nearby miss is almost certain to initiate either type system. If lightning strikes even when far away from the blasting site, it may cause high local earth currents and shock waves that may initiate electrical firing circuits.

(4) Always consider the sensitivity of electrical firing systems to static electricity. This is especially a hazard during dry, dusty weather. Personnel should periodically ground

themselves to remove static charge. This can be accomplished by placing a hand on the ground before grabbing bare electric firing wire or cap wire.

- c. The location of firing parties and spectators will conform with the approved overlay.
- d. Minimum length of time fuze authorized for nonelectric firing systems is 6 feet. This 6 feet of time fuze does not allow for the cutting of 6 inches of time fuze from exposed ends before setting the charge. Precutting time fuze will only be authorized if the above requirement can be met.
- e. Only approved equipment, per the references in paragraph 18-2a, will be used during explosive operations.
- f. Premature detonation of electric blasting caps by induced current from radio frequency signals is possible. Radio transmission is prohibited within 50 meters of any electric biasing cap or electrical firing system. Safe separation distance for various types of radios are listed in Fort Knox Reg 700-1 and FM 5-250.
- g. Smoking is not permitted during explosive operations. The OIC of training will designate a smoking/break area.
- h. Detonating cord should be used to prime charges on above ground charges to minimize the need to use blasting caps. It is recommended that all shots be dual primed. This significantly reduces the possibility of a misfire.
- i. All misfire procedures will be per the applicable publications. Explosive items that do not have misfire procedures or whose misfire procedures fail are considered duds and will be treated as such. For clearance of dud munitions contact Range Operations.
- j. The OIC will maintain the direct and continuous control of the blasting machine or power source during all phases of explosive operations utilizing and electrical firing system.
- k. Blasting caps will only be transported in an approved cap container. Blasting caps will not be carried in any individuals pockets.
- l. Charges placed against wood, steel, concrete, or other solid material will be placed on the side nearest the observers, so that major fragments are propelled away from them.
- m. Blasting caps will not be buried. Charges primed with blasting caps will be surface blasts only.
- n. All personnel engaged in operations in which explosives are involved shall be thoroughly trained in explosive safety and be capable of recognizing hazardous explosive exposures. Instructor personnel must meet this requirement and be fully competent and experienced in the safe handling and employment of explosives.

o. At no time will firing devices, fuzes or blasting caps be pointed at personnel. Crimping operations will be conducted per FM 5-250. Personnel will not be positioned within the fragmentation pattern of any crimping operation.

p. Improper, rough, and careless handling of explosives may result not only in malfunctioning, but may cause accidents which result in loss of life, injury, or property damage. Explosives will not be subjected to heat, shock or friction during handling.

q. Safety will be the prime consideration during explosive operations. At no time will safety be violated for the sake of speed or ease of operation. Any person detecting an unsafe act will immediately stop the operation and notify the OIC or safety officer. Range Operations will be immediately notified per this regulation, of any safety violation or range incidents.

### 17-3. **PERSONNEL LIMITS.**

a. A minimum number of personnel will be exposed for a minimum amount of time, to the smallest quantity of explosives, consistent with safety and efficiency.

b. Tasks not necessary to the explosive operation will be prohibited within the immediate vicinity of the explosive operation.

c. All personnel not involved in the explosive operation will be in the safe area. The safe area will be designated by the OIC. Minimum safe distances for personnel will not be waived.

### 17-4. **STORAGE.**

a. No pile or stack of explosives will exceed 500 pounds of Net Explosive Weight (NEW).

b. Demolition materials, dynamite, black powder, and detonators will each be stored separately. Blasting caps will be kept 25 feet from all explosives until ready for use.

c. Inert or practice munitions will be placed in a separate pile or stack designated for that type of material. At no time will inert or practice munitions be mixed with live munitions.

d. The safety officer will supervise all storage of explosives, and ensure that types are clearly separated and identified and that dunnage and tarpaulin covers are used.

e. Minimum distance for the ammunition storage point from the explosives operation site will be the same as that for the safe area for personnel.

### 17-5. **RESPONSIBILITY FOR DEMOLITION EXERCISES.** The responsible OIC will:

a. Ensure that the responsibility for the preparation, placement or firing of charges is not divided. The OIC is responsible for the supervision of all phases of the demolition operation.

- b. Ensure that safety of personnel equipment and explosives is being conducted per this regulation.
- c. Supervise the handling of explosives and ensure this regulation is being followed in detail.
- d. Ensure that the restrictions/requirements as identified on the approved firing overlay are met.
- e. Conduct a detailed safety briefing on site before conducting explosive operations.
- f. Ensure that the following reference materials are on site before conducting explosive operations: The Specific Operating SOP, Fort Knox Reg 385-22, FM 5-250, and other publications covering the specific munitions to be deployed.
- g. Ensure that an AUDIBLE WARNING is given before initiation of an explosive charge.
- h. Conduct a search of the demolition site after each detonation to ensure that the area is free of unexploded explosives.
- i. Ensure that all shot holes are filled in at the completion of the demolition operation. All material such as fuze igniters, burnt time fuze, etc. will be policed up before continuation of explosive operations.
- j. Ensure strict accountability of all class V items.

#### 17-6. **FIRE FIGHTING.**

- a. A small fire involving explosives may readily become an intense conflagration or an explosion. It is therefore, vitally important to attack a small fire immediately. Immediate use of authorized hand equipment and fire extinguishers must be made. However, personnel must not be exposed to the hazards of an imminent explosion. Notify Range Operations immediately.
- b. If a fire develops after a detonation and no explosives are involved in the fire, notify Range Operations and be prepared to fight the fire if instructed to do so by Range operations.
- c. If a fire develops after a detonation and explosives are involved in the fire, evacuate all personnel to a safe distance and notify Range Operations immediately. DO NOT attempt to fight the fire.

#### 17-7. **PYROTECHNICS.**

- a. Commanders and OICs in charge of or using the ranges, maneuver areas and training facilities will ensure that all unit personnel required to handle, load and fire pyrotechnics /simulators receive proper training. Untrained personnel will not be allowed to handle or fire pyrotechnic/simulators.



- b. The OIC of training will ensure that the appropriate manual for each device to be used is on site and that all use requirements have been covered in the safety briefing.
- c. The use of pyrotechnics within 1000 meters of the reservation boundary is prohibited.
- d. If during use a pyrotechnic fails to properly operate and causes injury, Range Operations will immediately be notified. The OIC of training will freeze the accident site until released by a representative of the Safety Office or QASAS Ammunition Surveillance Section.
- e. Each service trip flare (M48, M49) will be fenced (engineer tape etc.) or guarded to prevent personnel from approaching within 2 meters of the impulsed flare.
- f. Accountability and use of pyrotechnics will be controlled by the OIC. They will be used only as intended. All vehicles and personnel will be checked for pyrotechnics before departing the range, training area or bivouac site.
- g. Unfired pyrotechnics will be turned in through normal ammunition turn-in procedures. All residue will be policed and back-hauled.
- h. Commercial fireworks area prohibited from use on any range, training area or bivouac site.
- i. Once activated (string pulled), a grenade or artillery simulator will be immediately thrown. Holding or "cooking-off" is prohibited.
- j. Dud simulators will not be touched. These items will be marked and reported to Range Operations for EOD support.
- k. Pyrotechnic simulator or simulator cartridges will not be cut open or tampered with.
- l. Pyrotechnic simulators will not be aimed at or thrown around or near personnel or equipment.
- m. All pyrotechnics will be kept away from fires, batteries, generators or any source of static electricity.
- n. Pyrotechnics will not be stored on or in a vehicle where it would be exposed to extreme heat or vibration
- o. Standard issue leather gloves or safety gloves will be worn on the throwing hand of the user.
- p. Know what type simulator is in your hand before you activate it. Some simulators are very similar in appearance, but the fuze delay is very different.
- q. Eye protection, preferably a face shield, will be worn by the user.

**17-8. ANTI-TANK WEAPONS EFFECT SIGNATURE SIMULATOR (ATWESS) AND HOFFMAN SIMULATORS.**

- a. Read and follow all instructions in the ATWESS and Hoffman operator's manual.
- b. Do not tamper with or attempt to remove explosive contents.
- c. Never stand in front of or behind the ATWESS device when loading or unloading.
- d. When loading an ATWESS cartridge, ensure that the firing pin has retracted, the automatic safety has engaged and the power cable is disconnected before closing the breech.
- e. The ATWESS devices can be discharged by dropping, striking or kicking. Use extreme caution when handling these devices.
- f. Hoffman devices are fired by electrical charge. Do not allow them to come into contact with any electrical sources such as batteries generators and other sources of static electricity.
- g. When loading the Hoffman charge into the firing device, ensure that you always stand to the rear.
- h. Before loading the Hoffman device, ensure that the control box is set in the load position and the power cable to the device is disconnected.
- i. In the event that a Hoffman charge fails to fire and it is still in the firing tube of the Hoffman device, the charge should be shunted (replace the original plastic shunt cover back over the lead wires) and return to the ammo NCO for proper turn-in. This is a misfire, not a dud.
- j. Ensure that Hoffman charges that fail to fire are stored separately from other Hoffman charges.
- k. If at any time the fail to fire rate of any pyrotechnic reaches 10 percent of the number of charges used there could be a problem with that particular lot number of munitions. Contact Range Operations and they will coordinate with Ammo Surveillance personnel for assistance.

17-9. **MINES.** No live mines will be buried within the Fort Knox Training Complex.

**17-10. MINE CLEARING LINE CHARGE (MICLIC).**

- a. Due to high exhaust temperature the MICLIC shall not be towed behind an M1 Tank.
- b. The M68 inert charge should not be fired more than three times as additional firings may result in breakage of charge blocks and erratic flight of the rocket.
- c. Misfire/dud line charges will be destroyed by EOD only after all misfire procedures have been performed by the firing unit.

d. Expended MICLIC rocket motors generate hazards from fuel residues in the motor. These motors units will be treated as unexploded ordnance, or as commonly called, a dud. EOD will be notified of MICLIC rocket motor locations and the item treated as an explosive and unstable dud.

#### 17-11. FLAME WEAPONS

a. General. This paragraph covers safety requirements for portable mechanical flame throwers. All personnel will be familiar with the operation of the equipment they are to use and the safety precautions as specified in the TM series (for mechanical flame throwers).

b. First aid and fire fighting.

(1) An emergency vehicle containing proper first aid equipment for burns and a trained medical aidman will be available in the immediate vicinity of the firing. No firing is to be conducted unless the aidman and equipment are present.

(2) An aidman with first aid material and a litter will be located 10 meters behind the firing line during live firing.

(3) Adequate fire fighting facilities will be provided. As a minimum, two 10-pound CO<sub>2</sub> or similar function or larger fire extinguishers will be immediately available to the rear of the flame gunner. A wet or flameproof blanket will be on hand to supplement the fire extinguisher. In addition, TA 50-914 authorizes special protective clothing.

(4) Fire extinguishers within vehicles will be filled and in good operating condition. Personnel will be familiar with the location and operation of all fire extinguishers in vehicles.

(5) If anyone is accidentally hit by flame, any resulting fire should be extinguished by immediately smothering with propositioned fire extinguishers, rolling on the ground, or using a wet blanket. All personnel on the range will be briefed that "slapping the fire out" will cause it to spread.

(6) Signs will be posted which prohibit open flames or other sources of ignition and prohibit personnel from smoking within 15 meters of any flame throwers or the scene of filling and charging operations.

c. Portable flame throwers.

(1) For initial training and indoctrination firing, a practice range free of vegetation and other flammable material should be used. The cleared area will be at least 110 meters around the sides of the flame thrower.

(2) During firing, personnel other than instructors or assistant operators will not be permitted within 10 meters of the sides or rear of the flame throwers or within the danger area.

d. Mechanized flame thrower. In addition to applicable portions of subparagraph b above, the following safety requirements will be observed when firing mechanized flame throwers:

(1) For initial training and indoctrination firing (stationary firing), a practice range free of vegetation 275 meters long by 110 meters wide should be used.

(2) Moving flame throwing vehicles should be deployed at least 40 meters apart while firing.

(3) In no case will the gun be depressed more than 20 degrees.

(4) Firing will not be conducted in unfavorable winds where danger of blowback onto the vehicles or crews exists.

(5) Personnel will not approach closer than 10 meters to the sides or rear of the vehicle during firing.

e. M202 FLASH. Use of the M202 FLASH requires prior coordination with Range Operations due to identified firing and dud restrictions. Coordination for use of this weapon will be conducted NLT 10 days before firing.

## CHAPTER 18

### LASER CONTROL GUIDELINES

18-1. **GENERAL.** The use of a laser which is not eye safe falls under the same basic requirements as tank main gun firing.

18-2. **LASER RANGE SAFETY OFFICER (LRSO).** A person qualified in both range operation procedures and laser operations is termed in this chapter as the LRSO. The LRSO is responsible for the following:

a. Thoroughly instructing all personnel authorized to participate in the laser operation regarding safety precautions to be followed. This instruction should be of such scope so any fears generated by a lack of knowledge that may be harbored by participating personnel will be alleviated. The LRSO will read and understand the contents of AR 385-63, DA Pam 385-63 and MIL-HDBK-828 (Laser Range Safety). AR 11-9 and AR 40-5 outline general laser radiation safety requirement and will be used to provide safety briefing data for personnel involved in laser range activities.

b. Ensuring that safe standing operating procedures are implemented and target areas are established with the appropriate buffer zones around the target area as defined by the greatest laser-to-target distance. The LRSO will provide adequate surveillance of the target area, ensuring that no unauthorized personnel enter that area. The LRSO will ensure that communication between the laser operator and personnel in the target area is maintained and that protective eyewear is worn as required during the operation. Any break in communication will automatically terminate laser operation. Emergency signals for terminating laser use will be precoordinated.

c. Immediately reporting any case of suspected overexposure to the eye from laser radiation to the installation surgeon so an eye examination can be performed within 24 hours of the laser operation.

18-3. **LASER OPERATION.** The laser operator will fire only at designated targets which are diffuse reflectors, and will at no time fire at specular surfaces such as glass, mirrors, windows, polished metals, etc. To meet this constraint, remove, cover, or paint specular surfaces. Inability to follow this constraint would require general use of laser eye protection by all personnel within sight of the laser range area.

18-4. **EYE PROTECTION.** All personnel forward of the laser firing vehicle shall wear laser protective eyewear designed for the specific wavelength of the firing laser(s), i.e., Ruby - 694.3 NM, ND YAG-1064 NM, ND YAG doubled 532 ND. Laser filters designed for protection against one type of laser may not protect against harm from another type. Laser eye protection will have an optical density (OD) to ensure adequate protection for the specific laser being fired.

**18-5. INCLEMENT WEATHER AND NIGHT OPERATIONS.** No precautions other than as previously stated are required at night or during rain, snow, or fog.

**18-6. OPERATION OUTSIDE OF RANGE AREA.**

a. The laser system will not be operated or experimented with when removed from its mount, such as a tripod or vehicle, unless specifically authorized by the appropriate maintenance manual.

b. When operating in a training area, laser systems, however mounted (vehicle, aircraft, tripod, or hand held) will not conduct firing activities with non-eye safe laser. Laser ports will be closed and locked on vehicles so equipped. Ballistic doors/covers will be closed on all other vehicles.

c. Use of lasers with user installed modifications to make the laser eye safe, such as the M1A1 tank laser rangefinder with green lens eyesafe system installed and employed outside a range area, requires prior coordination with Range Operations. Before commencing laser use, the OIC/LRSO will notify Range Operations that all laser vehicles have been personally inspected and the eye safe modification(s) is (are) properly mounted. The OIC/LRSO must have a valid range safety card and be certified on training area use of the involved equipment and laser.

**18-7. EYE-SAFE SYSTEM FOR THE LASER RANGE FINDER (ESSLR) DEVICES.**

a. Before using the ESSLR devices on any training area or range, the filters must be checked for:

- (1) Cracks in the glass.
- (2) Loosening in the mount.
- (3) Stripped threads on screws.

If any faults are noted, the filters will not be used.

b. All safety precautions are outlined in TM 9-6920-704-10 for the use of ESSLR devices. If any unsafe act is noted while training with any eye safing device, the training will "cease" until the fault is corrected.

**18-8. MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM (MILES) DEVICES.** Although the laser light emitted by MILES equipment transmitters is considered eye safe by the Bureau of Radiological Health, suitable precautions must be taken to avoid possible damage to the eye from overexposure to this radiated energy.

a. Avoid viewing laser emitter at close range. Increasing the distance from the eye to the laser source greatly reduces the risks of exposure.

- b. Avoid viewing the emitter directly along the optical axis of the radiated beam.
- c. Especially avoid viewing the emitter directly along the optical axis of the beam through stabilized optics such as binoculars, telescopes, or periscopes at ranges of less than 50 meters.
- d. Avoid aiming the MILES controller gun at an individual's eyes during a pre-exercise inspection of the helmet harness.

18-9. **BEAM TERMINATION.** During laser operations, no portion of the laser beam will extend beyond the controlled target area. This will be accomplished by constructing the target or choosing a natural target, the size of which will intercept the laser beam and provide an additional buffer zone. Targets will be located so they have a geographical backstop, i.e., a mountain, dense forest, or the ground.

18-10. **BUFFER ZONE.**

a. The extent of the buffer zone depends on the aiming accuracy of the laser device. The aiming accuracy of the laser device depends upon whether the laser is mounted on a stable platform, i.e., a static base that cannot be easily moved by someone jarring it (e.g., heavy-duty tripod, static tank, or reinforced bench mount) or an unstable platform (e.g., light tripod, hand grip, moving tank, or aircraft) . The stable platform generally requires only 2 mil buffer zones; without gyrostabilization, the 10 mil buffer zones may be required.

b. When conducting laser fire with inexperienced personnel, a 10 mil buffer zone is required due to the increased probability of high or overline shots.

18-11. **OPTICAL INSTRUMENTS.** The use of optical devices to observe the target during laser operation will not be permitted unless flat specular surfaces have been removed from the target area or appropriate laser safety filters are placed in the optical train of the binocular or telescope.

18-12. **ICE.** Laser reflections from clear ice may present a hazardous situation. Under certain conditions, approximately 2 percent of the impinging energy will be reflected when the beam strikes flat surfaces which are covered with glazed ice.

18-13. **WARNING SIGNS.** Barricades and warning signs used to prevent personnel from entering a weapon firing area may also be used for that same purpose in conjunction with laser firing. The additional requirements posed by the laser in this regard are to mark extended range areas if one is required, and to provide notice at the range entrance to indicate that laser operations are being conducted. A sign as shown in figure 18-1 will be prominently posted whenever laser activities are conducted.

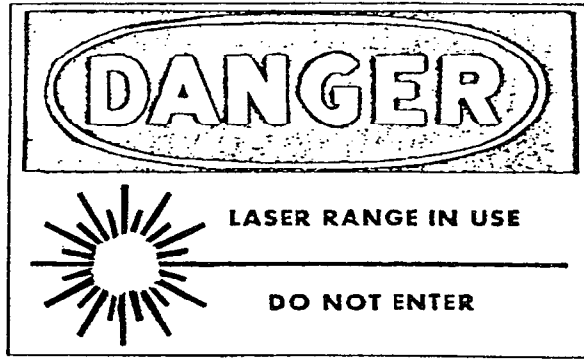


Figure 18-1. Range Warning Sign

18-14. **TARGET LOCATION.**

a. All targets that will receive laser fire will be the appropriate number of mils below the skyline, and inside the left and right boundaries of the range. This provides a buffer zone for laser containment.

b. To prevent potential hazards to unprotected personnel from diffuse reflections, some laser devices should not be fired at any surface that is located within a range of 20 meters or less. Necessary precautions, such as the removal of brush and trees, should be taken.

18-15. **SAFETY PERSONNEL.** On ranges where only a laser is being used, a medic and ambulance are not required. An OIC (E6 and above) will be present. The range will be opened and closed the same as any range firing projectiles.

FOR THE COMMANDER:



OFFICIAL:  
GEORGE EDWARDS  
Colonel, GS  
Chief of Staff

ROBERT L. BROOKS  
Director of Information Management

DISTRIBUTION:  
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APPENDIX A

MEDICAL SUPPORT

A-1. **REFERENCE.** Memorandum, CG, TRADOC, ATTG-IS, 13 December 1999, subject: TRADOC Medical Support to Training Policy.

A-2. **GENERAL.** This appendix specifies the minimum essential medical support required for all range and training area activities. The base level support, Advanced Trauma Life Support (ATLS) services must be available for all training activities. Clinical treatment for ATLS is defined as the provision of trauma care by either a physician or a physician's assistant.

A-3. **REQUIREMENTS.**

a. Advanced Trauma Life Support (ATLS). Clinical treatment of injured personnel must be available within 1 hour.

b. Ambulance. A covered vehicle, properly identified as an ambulance, with an assigned driver, which is able to transport a litter/stretchers must be present on all live fire ranges and demolitions sites.

c. Qualified Medical Personnel. A 91B/C MOS qualified soldier, a certified Combat Lifesaver, or a soldier who is certified as having received training from a U.S. Army Medical Department Activity (USAMEDDAC), Fort Knox approved program of instruction, a USN corpsman with a Naval Enlisted Classification (NEC) of 8408 (Battlefield Medic) or 8707 (Dental Technician) may also serve.

d. Medical aid bags for 91B/C medical personnel will contain the following:

<u>ITEM</u>	<u>QTY O/H</u>	<u>ITEM</u>	<u>QTY O/H</u>
Alcohol Pads	25 each	Ammonia Inhalants	1 box
Bacitracin	1 tube	Motrin	20 each
Silvadene	1 tube	Sudafed	1 bottle
1" tape	1 roll	½" tape	1 roll
Band-Aids	4 pkgs	Catheter 18GA	6 each
Catheter 20GA	6 each	Gloves	2 pkgs
Insect Sting Kit	1 each	J-Tubes	3 each
Scissors	1 pair	Foot Powder	6 each
Hydrogen Peroxide	1 bottle	Insect Repellent	4 bottles
Scrub Brush	3 each	3" Ace Wrap	2 each
4" Ace Wrap	2 each	6" Ace Wrap	2 each
2x2	1 pkg	4x4	1 pkg
Abdominal Dressing	3 each	Balsawood Splints	4 each

<u>ITEM</u>	<u>QTY O/H</u>	<u>ITEM</u>	<u>QTY O/H</u>
Casualty Blanket	1 each	C-Collar	1 each
Chux	1 pkg	Cravats	8 each
Cups	1 pkg	Field Dressings	8 each
IV Tubing	6 each	Kerlix	2 each
Moleskin	1 roll	Ringer's Lactate	3 each
Sam Splints	2 each	Sodium Chloride	3 each
Stethoscope	1 each	Tourniquet	2 each

e. While serving as a medic supporting activities in the training complex, the medical aid bags for Combat Lifesaver and other first aid qualified medical personnel will contain the following:

<u>ITEM</u>	<u>QTY O/H</u>	<u>ITEM</u>	<u>QTY O/H</u>
Acetaminophen	2 bottles	1" tape	1 roll
J-Tube, large	1 each	J-Tube, small	1 each
Antropine *	5 each	Band-Aid	18 each
2" Ace Bandage	1 roll	Bandage, Muslin Triangular	4 each
Medical Instrument Case	1 each	Catheter 18GA	2 each
Diazepam Injection	5 each	Field Litter	1 each
Gloves	3 pair	Field Dressing	6 each
Scissors	1 each	IV Injection Set (10 drops/ml)	2 each
Povidone-Iodine Pads	12 each	Pseudoephedrine Hydrochloride	1 box
Povidone-Iodine Ointment	8 tubes	Sam Splint	1 each
Ringer's Lactate	2 each	Redcross Armband	1 each
Tourniquet	1 each	Litter Straps	2 each

\* Wartime Only

**A-4. COMMANDERS/OIC RESPONSIBILITIES.**

a. The unit commander or OIC of training is responsible for determining if emergency evacuation is required based on the advice of the senior medical personnel present and/or personal evaluation of the situation.

b. When the on-site ambulance is used to transport injured personnel from a range, all live fire will cease until the ambulance returns or is replaced.

c. All injury producing accidents occurring in the training complex will be reported immediately to Range Control for coordination with Ireland Army Hospital (IAH) Emergency

Room (ER) and other agencies as required. Under no circumstances are personnel to be evacuated to IAH ER before advising Range Control. This line of coordination ensures proper IAH ER staffing is available to treat the patient on arrival at the ER.

d. The OIC will brief all personnel on training safety as part of the installation's on-going program to reduce injury producing accidents.

e. The OIC will ensure that personnel evacuated for medical treatment do not possess weapons, ammunition, explosives or pyrotechnics.

f. The OIC will ensure that all equipment, weapons, ammunition, or any other evidence is left in place, not tampered with, and secured for investigation as required.

#### **A-5. EMERGENCY ACCIDENT PROCEDURES.**

a. These procedures will be used to evacuate injured personnel by air ambulance in emergency situations, when ground ambulance is not available, or when use of the on-range ambulance is not feasible. Requests for air medical evacuation will be called to Range Control by the coordinating agency.

b. The OIC will:

(1) Stop the exercise.

(2) Immediately advise Range Control of the accident and that detailed information will follow once the situation is clarified. Range Control will alert IAH ER and Air Medical Evacuation (MEDEVAC) that an emergency evacuation may be required.

(3) Determine the actual on-site situation. Provide medical attention. Determine if evacuation of personnel is required. In mass casualty situations, assistant instructors and students should be used to assist.

(4) If emergency (air) evacuation is not required, advise Range Control and be prepared to provide the required accident information. Non-emergency injuries will be transported to the appropriate treatment facility by the training unit using its on-site ambulance.

(5) If Air MEDEVAC is required, the following process will be followed:

(a) Range Control will be advised of the number of injured personnel, type(s) of injury, location, and any special equipment requirements.

(b) Range Control will notify of the Air MEDEVAC service of the requirement, IAH ER of the incoming injured personnel and type of injuries, and place a cease-fire order on any ranges conflicting with aircraft's flight route.

(c) Range Control will advise the requesting OIC of Air MEDEVAC's ETA and coordinate the actual landing zone (LZ) and how it will be marked. During daylight, the LZ should be marked by RED smoke. Do not use smoke upwind of the LZ. During hours of darkness, the LZ should be marked by bright "chem-lites." Range Control will provide the Air MEDEVAC aircraft with limited flight following information.

(d) After the injured personnel have been evacuated, the OIC will provide the following information to Range Control: Name, rank, and SSAN of the injured, what happened, how it happened, where it happened, and when it happened.

**A-6. COMMUNICATIONS.**

a. During an Air MEDEVAC operation, primary communications is FM radio using frequency 38.90. The secondary means of communicating is by range telephone system or cell phone.

b. Once an air evacuation request is made, the OIC, or another responsible NCO, must monitor the radio or telephone if it's being used. Do not hang up the telephone – keep the line open.

c. Because of emergency conditions, Range Control may direct the OIC to change FM frequencies to 40.10 and continue the mission.

**A-7. TRADOC COMMANDER'S MEDICAL SUPPORT REQUIREMENTS MATRIX.**

<u>TRAINING CATEGORY</u>	<u>TRAINING EVENT</u>	<u>MEDICAL SUPPORT STANDARD</u>
Ranger Training	All	ATLS, MEDIC
Unit Training	Mountain Ops Without Rappelling/Free Climbing	ATLS, CLS
	Mountain Ops With Rappelling/Free Climbing	ATLS, MEDIC
	STX & FTX	ATLS, CLS
	MOUT	ATLS, MEDIC
Weapons & Ammunitions	Hand Grenades	ATLS, MEDIC
	Grenade Launcher	ATLS, MEDIC
	Live Fire	ATLS, CLS
	Live Fire & Maneuver	ATLS, MEDIC
	Demolitions	ATLS, CLS
	Sapper Leader	ATLS, MEDIC
	CALFEX	ATLS, MEDIC
Flame Wpns	ATLS, MEDIC	

<u>TRAINING CATEGORY</u>	<u>TRAINING EVENT</u>	<u>MEDICAL SUPPORT STANDARD</u>
Waterborne	Small Boat	ATLS, CLS + CPR
	Swamp Movement	ATLS, CLS
	Stream Crossing	ATLS, CLS + CPR
	Poncho Raft	ATLS, CLS + CPR
	CWST	ATLS, CLS + CPR
	Deep Dives	ATLS, DMT
	Underwater Construction	ATLS, DMT
Aerial/Aviation	Aerial (POI)	ATLS, Crash Team ATLS, MEDIC
	Airborne Ops	ATLS, MEDIC
	HALO Ops	ATLS, CLS
	Air Assault	ATLS, MEDIC
	Fast Rope	ATLS, CLS
	Rappelling Tower	ATLS, MEDIC
	Rappelling No Tower	
Individual	Day Land Navigation	ATLS, CLS
	Night Land Navigation	ATLS, CLS
	EIB/EFMB	ATLS, CLS
	Road Marches	ATLS, CLS
	NBC	ATLS, CLS
	Conditioning & Confidence	
	Obstacle Courses	ATLS, CLS + CPR
	Combatives	ATLS, CLS
	Driver Tng (Wheel/Track)	ATLS, CLS
	SERE	ATLS, CLS

APPENDIX B

SECURITY OF ARMS, AMMUNITION, AND EXPLOSIVES (AA&E) DURING TRANSPORT AND STORAGE IN TRAINING COMPLEXES.

**B-1. REFERENCES:**

- a. AR 190-11, 30 September 1993, Physical Security of Arms, Ammunition, and Explosives.
- b. AR 190-14, 12 March 1993, Carrying of Firearms and Use of Force for Law Enforcement and Security Duties.
- c. AR 190-51, 30 September 1993, Security of Unclassified Army Property (Sensitive and Nonsensitive).
- d. AR 710-2, 31 October 1997, Inventory Management Supply Policy Below the Wholesale Level.
- e. DA Pam 710-2-1, 31 December 1997, Using Unit Supply System (Manual Procedures).
- f. USAARMC Reg No. 210-17, 12 July 1996, Interior Guard Duty.

**B-2. OBJECTIVE.** To assist commanders, Partners in Excellence, and directorate staff agencies to protect and safeguard AA&E in the training complex.

**B-3. CATEGORIES OF AA&E.**

- a. Category I (missiles and rockets).

(1) Nonnuclear manportable missiles and rockets “in a ready to fire” configuration; for example, Stinger, Javelin, light antitank weapon (LAW) and AT-4 antitank weapon.

(2) This category also applies where the launcher tube and the explosive rounds are jointly stored or transported.

- b. Arms.

(1) Category II. Light automatic weapons, including .50 caliber, M16A2 rifle, Squad Automatic Weapons (SAW), and 40 mm MK 19 machine gun.

- (2) Category III.

- (a) Launch tube and gripstock for Stinger missile.

(b) Launch tube, sight assembly, and gripstock for Hamlet and Redeye missiles.

(c) Tracker for Dragon missiles.

(d) Mortar tubes up to and including 81 mm.

(e) Grenade launchers.

(f) Rocket and missile launchers, unpacked weight of 100 pounds or less.

(g) Flame throwers.

(h) The launcher or missile guidance set or the optical sight for the ground mounted TOW.

(i) Launch control unit for Javelin missile

(3) Category IV.

(a) Shoulder-fired weapons, other than manportable missiles, rockets, and grenade launchers, not fully automatic.

(b) Handguns.

(c) Recoilless rifles, including 90 mm.

c. Ammunitions and Explosives.

(1) Category I. Explosive complete rounds for Category I missiles and rockets (See a(1) above).

(2) Category II.

(a) Hand or rifle grenades, high explosive, and white phosphorous.

(b) Mines, antitank, or antipersonnel (unpacked weight of 50 pounds or less each).

(c) Explosives used in demolition operations; for example, C-4, TNT, and military dynamite.

(d) Critical binary munitions components containing "DF" and "QL" when they are stored separately from each other and from the binary chemical munition bodies in which they are intended to be employed .

(3) Category III.

(a) Ammunition, .50 caliber and larger, with explosive filled projectile (unpacked weight of 100 pounds or less each).

(b) Grenades, incendiary, and fuses for high explosive grenades.

(c) Blasting caps.

(d) Supplementary charges (uninstalled, or installed in projectiles in a manner allowing easy removal without special tools or equipment).

(e) Bulk explosives.

(f) Detonating cord.

(4) Category IV.

(a) Ammunition with nonexplosive projectile (unpacked weight of 100 pounds or less each).

(b) Fuzes, except for (3)(b), above.

(c) Grenades, illumination, smoke and CS/CN (tear producing).

(d) Incendiary destroyers.

(e) Riot control agents, 100 pound package or less.

(f) Ammunition for weapons in (3), above, not otherwise categorized.

(g) Pyrotechnics, including; Artillery & grenade simulators, booby trap simulators, trip flares, aerial star clusters and parachute flares, and Hoffman charges.

#### **B-4. PROTECTION OF AA&E IN THE TRAINING COMPLEX.**

a. Category I and II AA&E, when being transported, will be placed in the custody of a commissioned officer, warrant officer, NCO (E-5 and above) or DOD civilian (GS-5 or above). Personnel assigned these duties will be screened and evaluated using DA Form 7281-R (Command Oriented Arms, Ammunition and Explosives (AA&E) Security Screening and Evaluation Record).

b. When transporting and storing Category I and II weapons, an armed guard will be provided when weapons are not under individual control.

c. When transporting and storing Category I and II ammunition and explosives in the training complex, an armed guard will be provided.



d. Category I through IV AA&E will be transported in an enclosed vehicle, i.e. connex, MILVAN, fully enclosed truck bed with read doors, etc., per AR 190-11. Category II through IV AA&E will be covered while in transport, i.e., a truck or trailer with covered cargo area, tarps lashed over the cargo, etc.

e. Category III and IV ammunition and explosives will be provided that security the on-site commander deems necessary per current threat level.

f. A guard will be provided for Category III and IV weapons (shotguns, handguns and not fully automatic shoulder fired weapons) when not under individual control. Commanders will determine if guards will be armed based on current threat condition. Changes to the threat condition will be identified and provided to all on post (cantonment) activities by G3/DPTM. Units deployed in the training complex will be notified of these changes by their parent command and Range Division.

#### **B-5. ADDITIONAL PHYSICAL SECURITY REQUIREMENTS FOR CATEGORY I AA&E.**

a. At least two drivers will accompany the shipment to ensure at least one driver maintains continuous observation of the shipment. Commanders may arm these drivers to satisfy the armed guard requirement or provide additional personnel to be used as armed guards.

b. Access to the Field Level Munitions Storage Area (FLMSA), an area designated by the commander to temporarily store munitions in a field environment, will be strictly controlled. The two-person rule will apply to CAT I missiles and rockets at these locations.

c. At least two armed guards will be posted at the FLMSA to control access, to protect the CAT I missiles and rockets, and to enforce the two-person rule. The guards will be equipped with a primary and alternate means of communications. At a minimum armed guards will be checked every 4 hours by an individual appointed by the commander.

d. Perimeter barriers, either temporary or permanent, must be placed to preclude unauthorized entry into the storage area. Storage areas will be posted as a "Restricted Area."

#### **B-6. ADDITIONAL PHYSICAL SECURITY REQUIREMENTS FOR CATEGORY II THROUGH IV AA&E.**

a. AA&E will be under continuous positive control. Weapons not under individual control will be secured while on range (i.e., cage, chained, locked racks covered by a tarp, or in a vehicle).

b. AA&E will not be left unattended or unsecured.

c. Persons charged with the custody of AA&E will have the capability to sound the alarm if a forceful theft is attempted.

d. A response force will be available to protect the AA&E.

e. A system of supervisory checks will be established to ensure all personnel comply with security procedures. Supervisory checks of the AA&E holding area will be made to ensure the AA&E being guarded have not been tampered with.

f. Control of ammunition and explosives during field training or range firing will be monitored closely by all officers, NCOs, or civilian equivalents. Upon completion of training, the area(s) will be policed and unused ammunition and explosives are not retained. Close supervision by officers, NCOs, or civilian equivalents can eliminate most security problems in the training area.

g. Selection of personnel to perform guard duties at AA&E holding areas will be closely monitored by commanders to ensure only responsible individuals are assigned duty. Range OIC's and NCOIC's will brief guards on security requirements and rules of engagement.

#### **B-7. USE OF ARMED GUARDS FOR THE SECURITY OF AA&E IN THE TRAINING COMPLEX.**

##### a. Guard Personnel Requirements

(1) Guard Personnel should not be selected from the following categories:

(a) Individuals who are pending or awaiting final disposition of judicial action.

(b) Individuals who are being separated from the service under less than honorable conditions.

(c) Individuals who have been medically diagnosed as chronic alcoholic or drug abusers and formally enrolled in the Fort Knox Alcohol and Drug Abuse Preventative Control Program.

(d) Persons who have proven to be emotionally unstable or whose behavior indicates that their possession of firearms or dangerous weapons would be unwise.

(2) Only government-owned weapons will be used. Personnel will be armed with a weapon with which they have qualified within the past 12 months. All guard personnel will be briefed on weapons safety and operating procedures.

(3) Guards with firearms will follow security precautions and carry ammunition as indicated below:

##### b. M9, 9mm pistol.

(1) The pistol will be kept holstered and secured by means of a lanyard secured at one end to the butt of the weapon and the other end to the pistol belt.

(2) Magazine(s) will be carried in the ammunition pouch attached to the pistol belt.

(3) Ammunition will be carried in the weapon, but not chambered.

c. M16A2 rifle.

(1) Weapon will be placed on "safe" and will be carried at sling or port arms while on duty. Weapon will not be put down or left unattended.

(2) Ammunition will be carried in the weapon but not chambered.

d. Guards will use weapon only as a last resort. Procedures which must be strictly adhered to are:

(1) Never chamber a round and disengage the safety on the weapon unless a clear need to do so exists.

(2) Immediately unload, clear, and place the weapon on "safe" when the need to have a loaded weapon no longer exists.

**B-8. RULES OF ENGAGEMENT.** Guards will adhere to the following Rules of Engagement and Use of Force guidelines as outlined in AR 190-14 and USAARMC Regulation 210-17 and any other SJA approved legal guidelines.

a. Right of Self Defense

(1) You have the right to defend yourself.

(2) You may use deadly force when necessary to prevent an imminent threat of death or grievous bodily harm to you or other innocent persons.

b. General Rules

(1) Use minimum force necessary to accomplish your mission.

(2) You must be qualified and trained on the weapon used for guard duty.

(3) Treat everyone, including civilians and detainees, humanely.

c. Challenging

(1) If a belligerent threatens:

(a) Order him to halt and identify himself.

(b) Order him to state his business

(c) If his actions are legitimate the belligerent may continue, if not, order him to go away or detain him

(d) If the belligerent will not follow orders, use the minimum force necessary to accomplish your mission, deadly force may be used ONLY to defend yourself or as outlined below.

d. When to Use Deadly Force

(1) For self defense, when death or serious injury is imminent.

(2) To protect assets not involving national security but inherently dangerous to others in the hands of an unauthorized individual such as high risk portable and lethal missiles, rockets, arms, ammunition, explosives, chemical agents and special nuclear material.

NOTE: You may use minimum force to protect other property, but NOT deadly force.

e. Minimum Force

(1) Use deadly force only as a last resort.

(2) If you must open fire:

(a) Fire only aimed shots.

(b) Fire no more than necessary.

(c) Render aid to the wounded, as the situation permits.

f. Opening Fire

(1) Fire only aimed shots, avoid shots that may endanger innocent bystanders.

(2) You may open fire only if you, friendly forces, or persons or Army AA&E under your protection are threatened with deadly force. You may open fire against:

(a) An individual who fires or aims his weapon at you or persons or property under your protection.

(b) An individual who plants or throws an incendiary device at you or persons or property under your protection.

(c) An individual who deliberately drives a vehicle at you or persons or property under your protection AND you can not move out of the vehicles way.

(3) You may also fire against an individual who attempts to take possession of friendly force weapons, ammunition, or other protected property AND there is no other way of avoiding this.

## APPENDIX C

### WATERBORNE OPERATIONS

#### C-1. GENERAL.

a. This chapter, in conjunction with the references in para C-6, below, prescribes procedures for safe training in waterborne operations. Commanders of units conducting waterborne training will include the provisions of this regulation and appropriate reference(s) into the unit standing operating procedures (SOP). The SOP will include checklists to be used by all officers/instructors/NCO involved in the training.

b. Each operation in or over water should be evaluated (to include a hazard analysis) by the operational unit in conjunction with the installation safety office for a determination of required safety measures based on type operations, existing or expected conditions, and existing regulations and manuals. Certified divers in designated safety boats, located downstream from the operation, will be present at all water operations. Medical personnel with resuscitation equipment will be located in the safety boat and on one of the banks. On-call MEDEVAC will be coordinated in advance.

c. Since the operational unit commanders conduct a hazard analysis (risk assessment) in conjunction with the installation safety officer, they have the latitude to modify the policy standards as the type operation dictates and/or the conditions warrant. Whenever the operational unit commander modifies this policy or standards, the chain of command, up to installation/division level, will be informed and approval obtained.

(1) Due to periodic shortages of qualified divers, this requirement may be modified. All units conducting vehicle swim operations will make every effort to have a diver present. When a diver is not available, units can substitute a Red Cross certified lifeguard in a power safety boat located downstream from the operation. This substitution also applies to light infantry in rubber rafts (RB 7 or 15), slide for life operations, and rope drops.

(2) If, for example, a Type III or V vest is required for a particular type operation, the unit commander may use a Type I or II because they exceed the required capabilities of the Type III or V.

d. For waterborne operations, planning will include consideration of the effects of cold water and wind chill in inducing hyperthermia, and the actions to be taken to avoid it.

#### C-2. PERSONAL FLOATATION DEVICES (PFD).

a. Types.

(1) Type I. This preserver has at least 20 pounds of buoyancy, and is designed to turn over 95 percent of the population so that they float in a vertical, slightly backward position in the water. The NSNs are 4220-00-252-0581 and 4220-00-542-2110.

(2) Type II. This preserver has at least 15.5 pounds of buoyancy, and should turn over at least 50 percent of the population to a face-up position. It is faster to put on and is more comfortable to wear than Type I.

(3) Type III. This preserver has at least 15.5 pounds of buoyancy, and will maintain a person in a face-up vertical position. The NSN is 4220-00-142-1726.

(4) Type IV. This describes a boat cushion or any floating object intended for this purpose that has at least 16.5 pounds of buoyancy.

(5) Type V. This preserver has at least 17.5 pounds of buoyancy and is used in training/work situations. The pads are arranged to provide great freedom of movement. The NSN is 4220-00-555-9006.

(6) Inflatable. Inflatable PFDSs will not be used.

b. Engineer operations. wherever possible, the Type I or III vest will be used. When operational requirements require the Type V vest, additional safety or life saving measures, such as life lines, rescue boats, and divers, should be used. If fast or rough water conditions exist, the Type I or III vest will be used. Calm water is considered to be water moving at 5 feet per second or less; rough/fast water is water moving faster than 5 feet per second or a sea state of III (Beaufort Scale) . Bridge erection boat crew and passengers will wear the Type III or V at all times during an operation.

c. Light infantry operations. During amphibious assaults, river crossings, and small boat operations, the type V vest is acceptable for use during calm water conditions. When the Type V PFDS is used, additional safety measures will be used as noted in para 3b above. If rough/fast water conditions exist, the Type I or III vest will be used. For beach assaults, when soldiers are required to carry full packs and equipment, the Navy MIL-L-850 PFDS can be used.

d. All drivers and crew members involved in the swimming of track and wheel vehicles will wear the Type III or V vest during vehicle swimming operations. No personnel in the vehicle will have on-load bearing equipment during the swimming operation.

e. All nonamphibious vehicle crew members being transported with their vehicle during rafting and bridging operations will wear Type III or V vests.

### **C-3. VEHICLE PRE-OPERATION PROCEDURES.**

a. Instructions in the appropriate operator's manual, unit checklist, and this regulation will be complied with in preparing for and conducting waterborne training.

- b. An on-site safety briefing will be conducted by the OIC.
- c. A safety officer and safety NCO will be appointed for the operation. Each will have a valid range safety card.
- d. The OIC will ensure that required PFDSs have been issued. A visual check to ensure proper fit and serviceability of these life vests will be made.
- e. Two abandon-vehicle drills will be conducted on land before the swim operation with the vehicle configured and manned as it will be during the training operation.
- f. All vehicle drivers will be given instructions on how to operate their vehicle during water operations.
- g. All amphibious vehicles will be predipped within 24 hours of a swim operation. The vehicles will be inspected per the pre-swim operation checks in the applicable TM. Trainees will not be used to perform this operation. A recovery vehicle tow cable will be attached to the swim vehicle before it enters the water. The vehicle will enter the water until it floats. The tank commander (TC) will visually check to ensure there are no water leaks, verify load distribution, and ensure proper bilge pump operation. The swim vehicle will then be pulled ashore.
- h. An appropriate length of rope/nylon twine and buoyant marker will be attached to each swim vehicle. This marker will not be removed until termination of the swim operation.

#### **C-4. TRACK VEHICLE WATER OPERATIONS.**

- a. All vehicle hatches, except the driver's hatch, will be closed when the vehicle enters the water. As soon as the vehicle floats, the hatches will be opened and locked. After the hatches are opened, all personnel will stand and observe the swim operations.
- b. Seat belts will not be used during waterborne training.
- c. Hearing protection will be worn by crew and passengers when vehicle is in operation.
- d. Per para C-1b, above, a powered rescue boat will be in the water near the swimming vehicle. All occupants should be strong swimmers and must wear PFDSs. The boat will carry the following rescue equipment:
  - (1) Life ring with 50 feet or 3/8 or 1/2 inch nylon rope attached to the boat.
  - (2) Anchor with line attached to the boat.
  - (3) Two paddles/oars.
  - (4) Radio.



(5) Powered megaphone.

(6) Searchlight and running lights during night operation.

(7) Resuscitator.

e. Trouser legs will be unbloused while on the water. Web equipment or other items which may hinder evacuation from the vehicle will not be worn.

f. When training inexperienced drivers, only one vehicle will be in the water at any given time.

g. Qualified medical and recovery vehicle personnel and equipment will be positioned to provide immediate rescue and recovery operations.

h. Radio contact will be maintained between the OIC, rescue boat, and swimming vehicle(s).

i. Intercom communication between driver and TC will be maintained.

j. In case of thunder and lightning, all vehicles, boats, and personnel will leave the water until the weather clears.

k. As soon as operationally feasible, the TC/driver will perform a post water operation check per the applicable TM.

#### **C-5. VEHICLE SINKING.**

a. Rescue personnel immediately.

(1) Render medical first aid as needed.

(2) Clear the water and account for all personnel.

(3) Notify Range Operations.

(4) Recover and impound vehicle for accident investigation purposes.

b. Before resuming the operation, recheck all vehicles to ensure they are properly prepared for swimming. Brief all personnel on the possible causes of the sinking.

#### **C-6. REFERENCES.**

a. AR 385-15.

b. FM 90-13.

c. Individual equipment technical manuals.

## APPENDIX D

### RANGE COMMUNICATION CENTER

#### D-1. METHODS OF CONTROL.

a. Range Division operates the Range Communications Center from Bldg. No. 6034, Pickett Road.

b. The Range Operations switchboard is the primary means of communication with the range complex. Military FM radio serves as the secondary means of communication; primary frequency is 38.90 and alternate frequency is 38.80. Range Operations also monitors the MEDEVAC frequency, 40.10. During emergency evacuation missions, Range Operations serves as Net Control Station on the MEDEVAC frequency.

#### D-2. COMMUNICATIONS REQUIREMENTS.

a. It is the responsibility of units or activities (OIC) to establish and maintain communications with Range Operations throughout all periods of training/occupation of training complex facilities.

b. Immediately upon arrival at ranges or training areas, all units using any portion of a range or training area will establish communications with Range Operations and maintain it at all times. This applies equally to nonfire and live-fire training. Using units will not end communications until the last element has departed the range/training area. If communications with Range Operations are disrupted for any reason, all firing/training will cease immediately until communications are reestablished. Due to the close proximity of certain ranges, units experiencing communication problems may establish communications with Range Operations by adjacent range phones and continue to fire if approval is received from Range Operations.

#### D-3. RANGE TELEPHONES.

a. Range telephone lines will not be used for tactical purposes unless authorized by Range Operations. The range telephones are for official use only and will not be used to conduct personal business.

b. Tapping circuits except at designated points, cutting, and displacing permanent lines is prohibited. If additional field wire circuits are needed, temporary circuits may be installed upon approval by Range Operations. These circuits will be removed when no longer needed. Switchboards will not be connected to range telephone drops.

#### D-4. RADIO COMMUNICATIONS.

a. The Range Control Net is used to support the safe and efficient use of training complex facilities. All traffic on the Range Operations frequencies will be sent clear; no codes, signal operational instruction (SOI) calls signs, or other such signal security measures will be used.

b. The Range Control Net services only those units or activities located within the training complex. "Motor Pool" radio checks are not to be conducted on these frequencies. This net is for traffic between units deployed in the training complex and Range Operations. Unit-to-unit traffic will be conducted on other authorized frequencies.

c. Using unit call signs will consist of the unit's TO&E or TDA identification and the location of the calling unit. Example: B Company, 5-15 Cav, Ditto Hill Range; B-2-46, Training Area 3.

#### **D-5. OFFICER IN CHARGE (OIC) REQUIREMENTS.**

a. Failure to comply with established communication requirements is in violation of this regulation will be grounds for immediate closing of the range or training area by Range Operations.

b. The OICs of training who fail to meet range communication requirements may forfeit their range safety certification.

## APPENDIX E

### PROCEDURES FOR REQUESTING TRAINING COMPLEX FACILITIES

#### E-1. GENERAL.

a. The use of any range, training area, bivouac site, or quarry on the Fort Knox reservation requires written approval from G3/DPTM, Range Division. The format for the request and subsequent approval is the electronic scheduling request provided by the Range Facility Management Support System (RFMSS). FK Form 129 provides the manual "hard copy" format. The time frames approved on the request constitute the total period of occupation by the requester. Before termination of the period of use assigned by the approved scheduling request, the area will be prepared for clearance inspection.

b. Units, activities, and OICs of training will identify what type of training is to be conducted, what weapons and munitions will be used, and what ranges or training areas are desired to support the training mission. Questions concerning facility use will be directed to Range Division. After identifying what is to be done and where it can be conducted, the landspace will be requested from G3/DPTM, Operations & Training Division, Schools/Scheduling Branch.

c. The assignment of a range/training area to a unit does not include the exclusive use of roads and trails within the area unless special requirements are justified and approved by Range Division. Units assigned training areas do not have use of bivouac sites firing points, airstrips or other facilities located in the training area unless they specify use of these facilities during submission of the scheduling request.

d. Special or unique training requirements held which are not covered by this regulation will be coordinated with Range Operations.

e. Conflicts not resolved which involve training facility use or scheduling problems will be referred to G3/DPTM, Operations and Training Division, Schools/Scheduling Branch.

f. Range Operations will conduct periodic inspections to ensure units are using ranges and training areas as scheduled.

g. Units and personnel that have training facilities signed for on a long term basis and approved by Range Division will maintain ranges and training sites in a high state of police, and comply with this regulation at all times. Ranges will be maintained in a ready-to-use condition so that others may use the facility without requiring special preparation.

#### E-2. REQUESTS AND SCHEDULING.

a. The following procedures will apply when submitting requirements:

(1) All projected training complex requirements, up to 18 months in advance, are to be submitted electronically through RFMSS. This program can be obtained through coordination with Range Division. Submissions of hard copy/paper requests using FK Form 129 will be sent to G3/DPTM, Operation and Training Division, Schools/Scheduling Branch. Before submitting FK Form 129, telephonic coordination should be made with Operations and Training Division, Schools/Scheduling Branch to confirm the availability of the desired facility. External units, (Active Component [AC], United States Army Reserve [USAR], Army National Guard [ARNG] and sister services) will coordinate all requests for ranges and training areas through the Reserve Component Support Section, Support Branch, Operations and Training Division, G3/DPTM.

(2) Operations and Training Division will perform a continuous analysis of the entire 18-month planning period to identify problem areas/conflicts.

(3) Scheduling conflicts which arise between users of ranges, training areas, and bivouac sites will be identified by Operations and Training Division and the scheduling request will be returned to the unit/activity to coordinate dual use of the facility requested. If problems arise and dual coordination is not possible, the requester will contact Scheduling Branch for assistance in selecting alternate facilities. Range Division approval is required for any joint/dual use of a training facility involving units other than from the same battalion.

(4) Fort Knox units/activities that have an approved scheduling request will coordinate/confirm their requirement for the facility at the Range Conference meeting 4 weeks in advance of the event.

(5) Ranges and training areas will be requested by external units during the Annual Scheduling Conference, normally held in conjunction with the Armor Conference, preceding the beginning of the training year in which the unit plans to conduct the training event. Because the TRADOC POI necessarily has a higher priority than unit training, availability of ranges and training areas cannot be determined until POI requirements are established, normally at the beginning of the fiscal year. G3 Range Division and Operations & Training Division will reconcile POI requirements with pending unit requests as soon as possible following receipt of the formal scheduling actions from requesting units after the Annual Scheduling Conference. Units must re-confirm their intention of using the requested range or training area at least 30 days before the date of training.

(6) Priority for training will be scheduled per Fort Knox Reg 350-1 by G/3DPTM, Operations and Training Division, Schools/Scheduling Branch.

b. FK Form 129.

(1) FK Form 129 will be submitted to Schools/Scheduling Branch not later than 3 working days before the training activity. Special request or changes will be made no later than 3 working days in advance so the request or change can be processed for range requirements, targets, canceled areas being released from recreational use, etc. Requests submitted later than 3 working days will include full justification why the request is late and will be signed by an O-5 or above.

(2) Requests for range use which do not conform with already approved surface danger areas and all mortar, artillery, and demolitions firing require approved surface danger areas overlays. Facility scheduling may be approved on submission of the scheduling request; however, a firing status will not be approved by Range Operations unless an approved overlay is on file at Range Division and on hand at the firing site. Overlays must be submitted to Range Operations 10 days before the firing dates.

(3) Cancellation of a scheduled facility will be done immediately on identification of non-use. To cancel a scheduled facility, the requester will call Range Operations (4-2134/2135) not later than 1 hour before the start time shown on the scheduling request. A FK Form 129, formally canceling the facility, which must be received by Schools/Scheduling Branch not later than 1 working day after the cancellation, must follow this call. Failure to comply with this procedure will result in assignment of a "no-show" status.

(4) Minimum information required on the FK Form 129 is as follows:

(a) Requests for basic rifle marksmanship (BRM) ranges/courses or other small arms firing activities will include the following: type of weapon by caliber and model number; type of ammunition (ball, tracer, etc.) and DODAC numbers of the munitions; specific firing positions (range, firing points, or 8-digit coordinate); exact time/date of occupation; type of vehicles on range; name of individual responsible to occupy range; and targets required.

(b) Requests for tank ranges, artillery, or mortar firing points will include the following: type of weapon (caliber and model number); ammunition (fuse and type projectile and DODAC numbers of the munitions); specific firing positions (range, firing points, or 8-digit coordinate); date and time facility is desired for occupation; gunnery table being fired (tank range only); targets required; name of individual responsible to occupy facility; and type vehicles to be used.

(c) Requests for training areas will include the following: training/hunting area required; type weapons that will be used; type of pyrotechnics to be used; date and time training area will be occupied; type of training which will be conducted; type vehicles to be used; grid coordinates for CS Gas usage (six digits); and name of individual responsible to occupy area. Due to various projects (construction, reseeding, etc.), portions of training areas may be restricted. Therefore, statements to that effect may be required on the electronic scheduling request or FK Form 129 from time to time.

(d) Requests for demolition activities will include the following: type of explosives to be used (weight of biggest charge); firing site (range, demolition area, or 8-digit coordinate); exact time of occupation; type fuze and blasting cap to be used; type vehicle on site; road guard locations; and name of individual responsible to occupy area.

(e) Requests for training facilities which will require several training areas and/or bivouac sites, or which include special activities such as blackout operations, high speed track vehicle traffic, smoke operations, chemical attacks, and emplacement of obstacles and aggressor activities, will be supported by and activity's overlay (1:50,000 scale). Request/overlay must be

detailed to identify terrain requirements, routes of march, location of special activities, and dates and times of desired use.

**E-3. ASSIGNMENT PRIORITY.**

- a. Priority 1: Deploying units in support of contingency operations.
- b. Priority 2: Repair of downrange target support facilities by DBOS and Range Division. Conducted as required to maintain facility serviceability.
- c. Priority 3: USAARMS scheduled training and initial entry training (IET).
- d. Priority 4: Specialized training/demonstration directed by the command group.
- e. Priority 5: External unit (AC, USAR, ARNG and sister services) training.
- f. Priority 6: Testing activities for approved tests.
- g. Priority 7 - Semiannual maintenance by DBOS.
- h. Priority 8: Main impact area and cemetery maintenance by DBOS. (Note: The period 10 April - 30 May is elevated to priority 2 for cemetery maintenance.)
- i. Priority 9: Other routine training activities.
- j. Priority 10: Recreational activities.

**E-4. SAMPLE OF FK FORM 129.**

- a. Scheduling range (see figure E-1).
- b. Update/change to FK Form 129 (see figure E-2).
- c. Cancellation of ranges (see figure E-3).
- d. Scheduling training areas/indirect firing positions (see figure E-4).
- e. Cancellation of training areas/indirect firing positions (see figure E-5).
- f. Scheduling bivouac site (see figure E-6).
- g. Scheduling indirect firing positions (see figure E-7).



**RANGE AND TRAINING AREA ASSIGNMENTS**

*For use of this form, see USAARMC Reg 385-22*

TO: RANGE OFFICER, G3/DPTM	FROM: MAJOR UNIT	FROM: (Date) 23 Sep 00	TO: (Date) 27 Sep 00	DATE: 1 Sep 00
<b>NAME OF UNIT</b>				

RANGE AND TRAINING AREA REQUIREMENTS FOR ORGANIZATIONS INDICATED ARE:

RANGE/TRAINING AREAS	TYPE OF WEAPON	TYPE OF AMMO	FIRING POINTS	TYPE OF TARGET MOVING/STA	DAY OF WEEK	DATE	HOURS	ORG TO FIRE
O'Brien TABLE VI	LASER				SAT	23 Sep 00	0800-2400	Master Gunner 8
A&B (MOD)	M68 105mm	TPDS-T		20-E Type SIL	SUN	24 Sep 00	0001-2400NF	
		HEAT-TPT		8-TK FRNTL	MON	25 Sep 00	0001-2400NF	
		HEP-TPT		1-MOVING TK	TUE	26 Sep 00	0001-0800NF	
	M85 MG	BALL, Cal 50 TR		4-AT SIL	TUE	26 Sep 00	0800-2400	
	M240 MG	BALL, 7.62mm TR		2-TRK FRNTL	WED	27 Sep 00	0001-0800NF	
		GRN HND SMK RED		2-4x4 PLYWOOD	WED	27 Sep 00	0800-2400	
		GRN,RED STAR CLUSTER		ZERO				
				6-STATS DEV				
				1-STATS CON BOX				
RICE	MORTAR				SAT	23 Sep 00	1700-2400	Master Gunner 8
					TUE	26 Sep 00	1700-2400	
					WED	27 Sep 00	1700-2400	

REMARKS OR SPECIAL REQUESTS:  
M60A3 M151A2  
M60A1 M35A2  
M577 M88  
M106 M113A1

NF = NON FIRE

The OIC/C, Instr. of NAME OF UNIT, is responsible for complying w/the provisions of Ft Knox Reg. 385-22.

TYPED NAME, GRADE, AND PHONE NO. for REX H. BURNS, SSG, 4-1447	SIGNATURE <i>R. Burns</i>
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Figure E-1. Example for scheduling a range.

E-5

<b>RANGE AND TRAINING AREA ASSIGNMENTS</b> <small>For use of this form, see USAARMC Reg 385-22</small>								
TO: RANGE OFFICER, G3/DPTM			FROM: MAJOR UNIT		FROM: (Date)		TO: (Date)	DATE:
			NAME OF UNIT		23 Sep 00		27 Sep 00	2 Sep 00
RANGE AND TRAINING AREA REQUIREMENTS FOR ORGANIZATIONS INDICATED ARE:								
RANGE/TRAINING AREAS	TYPE OF WEAPON	TYPE OF AMMO	FIRING POINTS	TYPE OF TARGET MOVING/STA	DAY OF WEEK	DATE	HOURS	ORG TO FIRE
UPDATE 129 DATED 1 SEP 00 (UPDATE WPNS, AMMO & VEHICLES)								
O'Brien	-ADD- BREWSTER TELFARE	- ADD - BALL, 5.56mm TR BALL, CAL 50 APIT			SAT	23 Sep 00	0800-2400	Master Gunner 8
					SUN	24 Sep 00	0001-2400NF	
					MON	25 Sep 00	0001-2400NF	
					TUE	26 Sep 00	0001-0800NF	
					TUE	26 Sep 00	0800-2400	
					WED	27 Sep 00	0001-0800NF	
					WED	27 Sep 00	0800-2400	
RICE	MORTAR	- ADD - 4.2 ILLUM			SAT	23 Sep 00	1700-2400	Master Gunner 8
					TUE	26 Sep 00	1700-2400	
					WED	27 Sep 00	1700-2400	
REMARKS OR SPECIAL REQUESTS: - ADD - M1								
TYPED NAME, GRADE, AND PHONE NO. <i>for</i> REX H. BURNS, SSG, 4-1447					SIGNATURE <i>R. Burns</i>			

Figure E-2. Example of update/change.

RANGE AND TRAINING AREA ASSIGNMENTS <small>For use of Ft S for m, see USAARMC Reg 385-22</small>									
TO: RANGE OFFICER, G3DPTM		FROM: MAJOR UNIT		NAME OF UNIT		FROM: (Date)		TO: (Date)	
						23 Sep 00		27 Sep 00	
								DATE: 2 Sep 00	
RANGE AND TRAINING AREA REQUIREMENTS FOR ORGANIZATIONS INDICATED ARE:									
RANGE/TRAINING AREAS	TYPE OF WEAPON	TYPE OF AMMO	FIRING POINTS	TYPE OF TARGET MOVING/STA	DAY OF WEEK	DATE	HOURS	ORG TO FIRE	
CANCEL 129 DATED 1 SEP 00									
O'Brien					SAT SUN MON TUE TUE WED WED	23 Sep 00 24 Sep 00 25 Sep 00 26 Sep 00 26 Sep 00 27 Sep 00 27 Sep 00	0800-2400 0001-2400NF 0001-2400NF 0001-0800NF 0800-2400 0001-0800NF 0800-2400	Master Gunner 8	
RICE					SAT TUE WED	23 Sep 00 26 Sep 00 27 Sep 00	1700-2400 1700-2400 1700-2400	Master Gunner 8	
REMARKS OR SPECIAL REQUESTS:									
TYPED NAME, GRADE, AND PHONE NO. for REX H. BURNS, SSG, 4-1447								SIGNATURE <i>R. Burnum</i>	

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Figure E-3. Example of cancellation.


RANGE AND TRAINING AREA ASSIGNMENTS								
TO: RANGE OFFICER, G3DPTM			FROM: MAJOR UNIT		FROM: (Date)		TO: (Date)	DATE:
			NAME OF UNIT		23 Sep 00		2 Oct 00	2 Sep 00
RANGE AND TRAINING AREA REQUIREMENTS FOR ORGANIZATIONS INDICATED ARE:								
RANGE/TRAINING AREAS	TYPE OF WEAPON	TYPE OF AMMO	FIRING POINTS	TYPE OF TARGET MOVING/STA	DAY OF WEEK	DATE	HOURS	ORG TO FIRE
TA 8, 9, 10 HA 8 thru 14 MTTC	M2 MG M85 MG M16A1	GREN, HND SMK, HC GREN, HND SMK, GREEN GREN, HND SMK, VIOLET GREN, HND SMK, CS BLANK 7.62mm M64 SIG GND WHITE, STAR PARA SIM PROJ GRD BURST CHG, HOFFMAN FUZE, WARNING SIM BOOBY TRAP, WHISTLE POT, SMK, HC, 30 LBS FLARE, TRIP M49 COMPLETE BLANK, 50 CAL BLANK, 50 CAL BLANK, 5.56mm ATWESS			SAT SUN MON TUE WED THUR FRI SAT SUN MON	23 Sep 00 24 Sep 00 25 Sep 00 26 Sep 00 27 Sep 00 28 Sep 00 29 Sep 00 30 Sep 00 1 Oct 00 2 Oct 00	0800-2400 0001-2400 0001-2400 0001-2400 0001-2400 0001-2400 0001-2400 0001-2400 0001-2400 0001-2400 0001-1200	AOB-20
REMARKS OR SPECIAL REQUESTS: M3 M577 M149A1 NOTE: GRID FOR CS USAGE IS 845967, 860964, 880935, 883935, & 889929. M60A3 M792 M901 TIME OF CHEMICAL USAGE IS 1000-1200, 1400-1600, 2000-2200. M60A1 M151A2 M416 M113A1 M35A2 NOTE: UNITS WILL CROSS PIPELINES, ROADS, AND UNDERGROUND AQUADUCTS ONLY AT AUTHORIZED CROSSINGS. The OIC/C Inst of NAME OF UNIT is responsible for complying w/the provisions of Ft Knox Reg 385-22								
TYPED NAME, GRADE, AND PHONE NO. for REX H. BURNS, SSG, 4-1447					SIGNATURE 			

Figure E-4. Example for scheduling training areas/indirect firing positions.

RANGE AND TRAINING AREA ASSIGNMENTS									
TO: RANGE OFFICER, G3DFTM		FROM: MAJOR UNIT		DATE:		DATE:		DATE:	
		NAME OF UNIT		23 Sep 00		2 Oct 00		3 Sep 00	
RANGE AND TRAINING AREA REQUIREMENTS FOR ORGANIZATIONS INDICATED ARE:									
RANGE/TRAINING AREAS	TYPE OF WEAPON	TYPE OF AMMO	FIRING POINTS	TYPE OF TARGET MOVING/STA	DAY OF WEEK	DATE	HOURS	ORG TO FIRE	
CANCEL 129 DATED 2 SEP 00 TA 8, 9, 10 HA 8 thru 14					SAT SUN MON TUE WED THUR FRI SAT SUN MON	23 Sep 00 24 Sep 00 25 Sep 00 26 Sep 00 27 Sep 00 28 Sep 00 29 Sep 00 30 Sep 00 1 Oct 00 2 Oct 00	0800-2400 0001-2400 0001-2400 0001-2400 0001-2400 0001-2400 0001-2400 0001-2400 0001-2400 0001-1200		
REMARKS OR SPECIAL REQUESTS:									
TYPED NAME, GRADE, AND PHONE NO. for REX H. BURNS, SSG, 4-1447									
SIGNATURE <i>R. Burnen</i>									

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Figure E-5. Example of cancellation of training areas/indirect firing positions.

<b>RANGE AND TRAINING AREA ASSIGNMENTS</b> <small>For use of this form, see USAARMC Reg 385-22</small>								
TO: RANGE OFFICER, G3DPTM			FROM: MAJOR UNIT		FROM: (Date)		TO: (Date)	DATE:
			NAME OF UNIT		25 Sep 00		28 Sep 00	3 Sep 00
RANGE AND TRAINING AREA REQUIREMENTS FOR ORGANIZATIONS INDICATED ARE:								
RANGE/TRAINING AREAS	TYPE OF WEAPON	TYPE OF AMMO	FIRING POINTS	TYPE OF TARGET MOVING/STA	DAY OF WEEK	DATE	HOURS	ORG TO FIRE
BIVOUAC SITE 6	M16A1 M1911A1 M60 MG	NA			MON TUE WED THUR	25 Sep 00 26 Sep 00 27 Sep 00 28 Sep 00	1200-2400 0001-2400 0001-2400 0001-0900	A-13-4
REMARKS OR SPECIAL REQUESTS: M151A1      CPT SMITH IS RESPONSIBLE TO OCCUPY BIV SITE 6. NO OPEN FIRES AUTHORIZED. M35A1 TMP PICKUP  The OIC/C, Instr of NAME OF UNIT is responsible for complying w/the provisions of Ft Knox Reg 385-22.								
TYPED NAME, GRADE, AND PHONE NO.					SIGNATURE			
for REX H. BURNS, SSG, 4-1447								

Figure E-6. Example for scheduling bivouac sites.

RANGE AND TRAINING AREA ASSIGNMENTS								
TO: RANGE OFFICER, G3/DPTM			FROM: MAJOR UNIT		FROM: (Date)		TO: (Date)	DATE:
			NAME OF UNIT		12 Dec 00		14 Dec 00	13 Nov 00
RANGE AND TRAINING AREA REQUIREMENTS FOR ORGANIZATIONS INDICATED ARE:								
RANGE/TRAINING AREAS	TYPE OF WEAPON	TYPE OF AMMO	FIRING POINTS	TYPE OF TARGET MOVING/STA	DAY OF WEEK	DATE	HOURS	ORG TO FIRE
TA 2 HA 87	MORTAR M16A1 M1911A1	4.2" ILLUM HE WP FUZE PD RED SMOKE GREN WHITE SMOKE GREN 5.56mm BLANK	2A-B-C	STA	TUE WED THUR	12 Dec 00 13 Dec 00 14 Dec 00	0800-2400 0001-2400 0001-1600	CSC 5/33d AR
REMARKS OR SPECIAL REQUESTS: M106A1 M125A1 M151A2 M113A1 The OIC/C, Instr of NAME OF UNIT is responsible for complying w/the provisions of Ft Knox Reg 385-22.								
TYPED NAME, GRADE, AND PHONE NO. <i>for</i> REX H. BURNS, SSG, 4-1447					SIGNATURE <i>B. Burlison</i>			

Figure E-7. Example for scheduling indirect firing positions.

## APPENDIX F

### DECLINATION PROCEDURES AND LOCATIONS

**F-1. DECLINATION OF AIMING CIRCLE.** The following rules prescribe how often and under what circumstances the aiming circle should be declinated.

- a. After an electrical storm or after receiving a severe physical shock.
- b. When the aiming circle has been moved more than 40 kilometers from where it was last declinated.
- c. Every 30 days.

**F-2. DECLINATION STATIONS.** Fort Knox has one declination station as identified in Figure F-1.

**F-3. HOW TO DECLINATE** (As prescribed in FM 6-2 and FM 6-50)

- a. Set up the aiming circle in the prescribed manner.
- b. Set the known azimuth to the azimuth mark on the scales of the instrument, with the lower (nonrecording) motion knob and sight on the azimuth mark.
- c. Release the magnet needle, with the upper (recording) motion knob center with needle through the magnetic magnifier.
- d. Read the declination constant directly from the scale and record it.
- e. Repeat the steps above using a second mark (preferable in a different or opposite direction). If a third mark is available, use it.
- f. Compare the two (or three) declination constants. If they are more than 2 mils different, repeat steps 1 through 5. If they are within 2 mils, determine the mean and record the constant on the notation strip of the aiming circle.

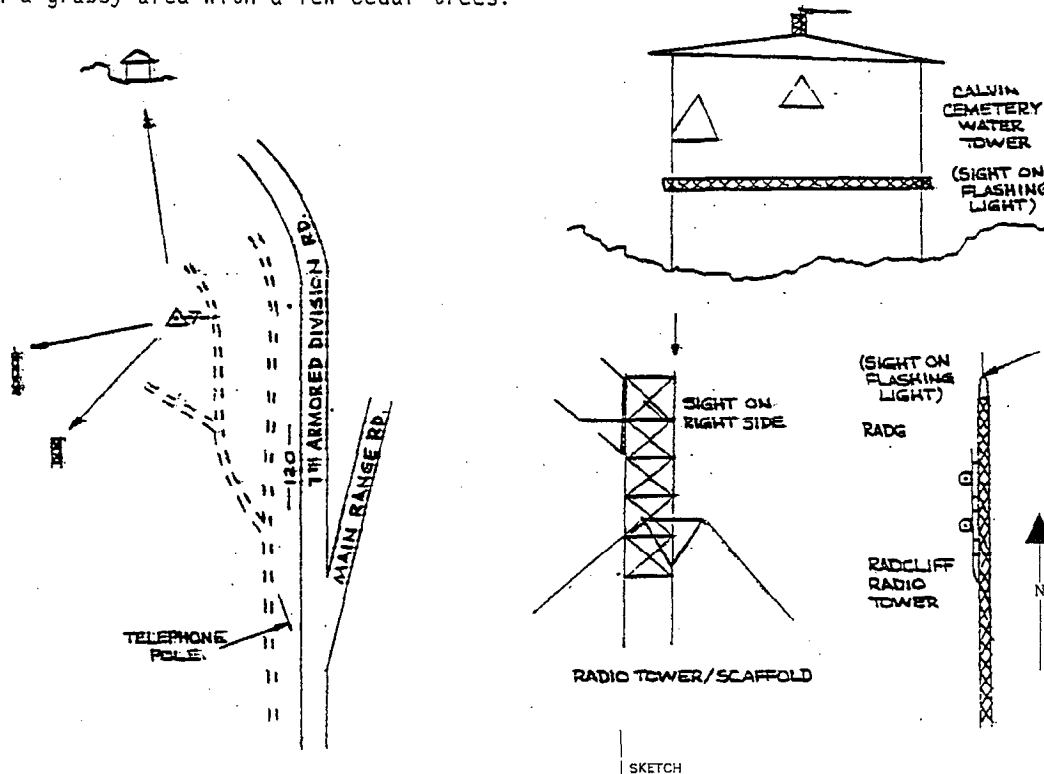
**F-4. BEST RESULTS.** For best results, no metallic objects (i.e., vehicles, weapons, etc.) should be near the aiming circle during the declination process.



COUNTRY United States		TYPE OF MARK 50 cal shell casing		STATION Declination Station Bravo	
LOCALITY Ft. Knox, KY		STAMPING ON MARK NONE		AGENCY (CAST IN MARKS) NONE	
ELEVATION 208.4 (M)		LATITUDE 37° 51' 16" N		LONGITUDE 85° 55' 02" W	
DATUM Clarke 1866		DATUM Clark 1866		ESTABLISHED BY (AGENCY) HHB 1/77 FA	
(EASTING) 595 256.4 (M)		(NORTHING) 4 190 004.3 (M)		GRID AND ZONE UIM 16S	
(NORTHING) (EASTING) (M) (M)		(EASTING) (NORTHING) (M) (M)		DATE 19 Jul 89	
TO OBTAIN GRID AZIMUTH, ADD		TO OBTAIN GRID AZ. (ADD) (SUB.)		TO THE GEODETTIC AZIMUTH	
TO OBTAIN GRID AZ. (ADD) (SUB.)		TO OBTAIN GRID AZ. (ADD) (SUB.)		TO THE GEODETTIC AZIMUTH	
OBJECT	AZIMUTH OR DIRECTION (GRID)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID. DISTANCE (METERS) (FEET)	
Radio Tower/Scaffold	4081. 0 m				
Radcliff Radio Tower	4670. 3 m				
Calvin Cem. Wtr. Twr.	6237. 0 m				

Declination Station Bravo is identified by a 50 cal shell casing set in a 3" dia. rubber pipe filled with concrete and approx. 2" above ground.

Station is located on Ft. Knox Military Reservation at the vicinity of the intersection of 7th Armored Division Rd. and Main Range Rd. Starting at the telephone pole on the west side of the road at the intersection, proceed north approx. 120 M. along 7th Armored Division Rd. Station is located approx. 30 M. west of this point in a grassy area with a few cedar trees.



DA FORM 1959, OCT 64

REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is TRADOC.

USAPA V1.00

Figure F-1. Declination Station

## APPENDIX G

## RANGE MAINTENANCE RESPONSIBILITIES

G-1. **DEFINITION.** Range maintenance includes those actions to maintain range facilities in an operational and safe condition.

G-2. **RESPONSIBILITIES.** The RMO is responsible for coordinating heavy and general maintenance requirements on ranges with DBOS, and Directorate of Information Management (DOIM). Units requesting work to be completed must submit all work requests to the Range Division.

G-3. **MAINTENANCE FUNCTIONS.**

a. Specific maintenance functions are listed below:

<u>TYPE OF FACILITY</u>	<u>MAINTENANCE REQUIREMENT</u>	<u>ORGANIZATION RESPONSIBLE</u>	<u>ORGANIZATION DOING WORK</u>
Basic Rifle Marksmanship Ranges	Construction of numbered stakes, painting, and installation	DBOS/Range	Range
	Construction and painting of scorers' benches	DBOS	DBOS
	Construction and painting of firing line markers (range limit markers)	DBOS/Range	Range
	Construction and emplacement of target boots	Range	Range/Using unit
	Cleaning/clearing concrete foxholes	Using unit	Using unit
	Repair drainage in foxholes	DBOS	DBOS /Range
	Repair foxholes	DBOS	DBOS
	Clearing brush	DBOS/Range/ Using unit	DBOS/Range/ Using unit
	Replace stumps	DBOS	DBOS
Electric	DBOS	DBOS	

<u>TYPE OF FACILITY</u>	<u>MAINTENANCE REQUIREMENT</u>	<u>ORGANIZATION RESPONSIBLE</u>	<u>ORGANIZATION DOING WORK</u>
Basic Rifle Marksmanship Ranges (Cont.)	Replace fire lane markers (range limit markers)	Range	Using unit w/Range NCO
	Troubleshoot M31A1 devices	Using unit	Using unit w/Range NCO assistance, if necessary
	Emplace M31A1 devices downrange	Using unit	Using unit w/Range NCO assistance, if necessary
	Emplace targets	Using unit	Using unit
	Clean and drain M31A1 coffins	Using unit	Using unit
	Rework rocked areas	DBOS	DBOS
	Prepare ranges for fall and spring maintenance	Using unit/ Range/ DBOS	Using unit/ Range/ DBOS
	*Fall and spring maintenance	DBOS/Range	DBOS/Range
	Snow removal (pop-up devices, walks, towers, latrines, etc)	Using unit/ DBOS	Using unit/DBOS
	Manufacture of plastic airplanes	TASC	TASC
	Clear fire lanes.	Using unit	Using unit/DBOS/ Range
	Repair M31A1 devices	DBOS	DBOS
	Repair mess areas, blister bag holders, and flagpoles	Range	Range
	Repair, replace, and maintain night fire equipment (M30 devices)	TASC	TASC
Inspect, repair, and paint bleachers on Range Division property book	Range	Range	

<u>TYPE OF FACILITY</u>	<u>MAINTENANCE REQUIREMENT</u>	<u>ORGANIZATION RESPONSIBLE</u>	<u>ORGANIZATION DOING WORK</u>
Basic Rifle Marksmanship Ranges (Cont.)	Rebuild target frames	Range	Range
	Reface targets	Using unit	Using unit
	*Trim grass	Using unit	Using unit
	Police ranges	Using unit	Using unit
	Construct and repair target holding mechanisms (KD)	Range	Range
	Construct, paint, and install downrange lane marking panels	Range	Range
	Construct, paint, and install range limit markers	Range	Range
	Replace bulletproof glass	DBOS	DBOS
	Replace earth in impact area of grenade range	DBOS	DBOS
	Replace or repair periscopes	TASC	TASC
	Replace or repair gun mounts	DBOS	DBOS/Range
	Repair, paint, or rebuild pistol stands	DBOS	Range
	Rebuild target frames	Range	Range
	Repair berms on small arms ranges	DBOS	DBOS/using unit
	Repair or rebuild training courts (grenade ranges)	DBOS	DBOS
Repair or replace foot bridges	Range	Range	

<u>TYPE OF FACILITY</u>	<u>MAINTENANCE REQUIREMENT</u>	<u>ORGANIZATION RESPONSIBLE</u>	<u>ORGANIZATION DOING WORK</u>
Tank Ranges	Fall and spring maintenance	DBOS/Range	DBOS/Range
	Repair railroad track	DBOS	DBOS
	Clean track of earth	DBOS	DBOS
	Electric	DBOS	DBOS
	Operate and repair target tow cars	Range	Range
	Operate and repair target trailers	Range	Range
	Construct targets	Range	Range
	Emplace targets	Using unit	Using unit
	Clean target device concrete pads	Using unit	Using unit
	Clean moving target carrier roof	Range	Using unit/Range inspector to supervise
	Clean electric moving target rail	Range	Range/Using unit
	Repair target protective berms	DBOS	DBOS
	Replace rolling stock on railroad tracks	Using unit	Using unit
	Replace fire lane markers (range limit markers)	Using unit/ Range	Using unit/Range
	Construct fire lane markers	Range	Range
	Install and replace boresight panels	Range	Range/Using unit
	Operate subcaliber moving target equipment.	Using unit	Using unit

<u>TYPE OF FACILITY</u>	<u>MAINTENANCE REQUIREMENT</u>	<u>ORGANIZATION RESPONSIBLE</u>	<u>ORGANIZATION DOING WORK</u>
Training Areas	Repair sub-caliber moving target equipment	DBOS	DBOS/Range
	Re-rock hard stands and lanes	DBOS	DBOS
	Grade firing line, course roads, and parking area	Using unit/DBOS	Using unit/DBOS
	Emplacement of STATS/SAABS	Using unit	Using unit
	*Devices are preinstalled on modernized ranges		
	Troubleshoot STATS/SAABS	Range	Range/Using unit
	Rebuild or replace latrines	DBOS	DBOS / Range
	Rebuild trails, roads, etc	DBOS	DBOS
Buildings and Structures	Rebuild or major repair	DBOS	DBOS
	Repaint	DBOS	DBOS
	Replace glass or plexiglas in windows	Range	Range
	Minor repair	Range	Range
	Clean	Using unit	Using unit
	Pump (latrines, kitchen sumps)	DBOS	DBOS
	Electric, heating oil	DBOS	DBOS
	Heating coal or propane	DBOS	DBOS
	Stove repair	DBOS	DBOS/Range
	Sheet metal	DBOS	DBOS

<u>TYPE OF FACILITY</u>	<u>MAINTENANCE REQUIREMENT</u>	<u>ORGANIZATION RESPONSIBLE</u>	<u>ORGANIZATION DOING WORK</u>
Mess areas	Construct or repair	Range	Range
Lister bag covers	Construct or repair	Range	Range
Range flagpoles	Construct, repair, and replace	Range	Range
**Grass cutting	As defined by Army regulations, training manuals, and command guidance	DBOS	DBOS/Using unit
Communications	Telephone, switchboard, and drops; replace or repair	DOIM	DOIM
	Installation of horns and speakers	DOIM	DOIM
	Installation of amplifiers	DOIM	DOIM
	Repair of PA systems	DBOS	DBOS
Barriers	Installation and repair	DBOS	Range
Warning signs	Paint and supplying	DBOS	DBOS
	Mounting	Range	Range
Drainage	As necessary	DBOS	DBOS/Range

\* During periods of scheduled maintenance, 3-81 Armor Range NCOs and other long duration range facility tenants will be present on the facility to assist in maintenance efforts.

\*\*Grass cutting requirements assigned to DBOS are limited to the sides of established range roads; around numbered facilities, the range sign, and flagpole; and that area immediately in front of the firing line as defined by Army regulations, published training manuals, and command guidance which provides for target acquisition without violating established target detection doctrine. Using units are responsible for cutting/trimming all target protective berms to provide target visibility. Range areas having training aids installed on the range to support realism in training will be cut/trimmed by the using unit.

b. Using unit maintenance responsibilities on sub-caliber tank ranges, scale ranges, and some special ranges fall under the basic rifle marksmanship and tank range classification. For example, units using Mendick Range must troubleshoot target devices as well as grade (drag) the course roads and parking area.

APPENDIX H

DESCRIPTION OF TRAINING COMPLEX FACILITIES

**H-1. GENERAL.**

a. Fort Knox operates ranges, bivouac sites, and training areas in primary support of the installation's training missions. All facilities within the training complex are controlled by G3/DPTM Range Division.

b. Units/activities identifying faults with any of the training complex facilities will notify Range Operations.

c. Use of weapons, munitions, or lasers, except as identified under each range facility, requires direct coordination with the RMO.

d. Target storage facilities are available on most active ranges. Targets, as identified on the approved scheduling request, can be obtained from Range Division, Maintenance Branch. During the range sign on briefing from the range technician, targets, target devices, and range facilities will be covered.

e. The use of any weapon/munitions which can produce explosive or casualty producing duds in areas other than those specifically identified for this purpose must be approved by the RMO.

f. The firing of incendiary or armor piercing munitions on ranges supported by electrical target devices is prohibited without specific approval from the RMO.

**H-2. TRAINING AND MANEUVER AREAS (NONFIRING).** The training areas listed in this section are available for tactical training. Blanks, pyrotechnics, and smoke may be used if unit has an approved scheduling request with these items listed. Chemical agents are authorized only when the overlay and the units scheduling request with these items listed have been approved. There are a total of 18 training areas for use by units; therefore, within the training areas, certain hunting areas will be used to depict unit boundaries for control of area for training.

<u>TRAINING AREA</u>	<u>HUNTING AREA</u>	<u>TYPE OF TRAINING</u>
1	112	Primary (P) use is observation for artillery firing.
2	87, 88, 89, 90	P - maneuver area and artillery firing points (HA 87, 88, 89, and 90).
3	82 83, 84, 85	P - Table IX and artillery firing. Maneuver areas and artillery firing points.



<u>TRAINING AREA</u>	<u>HUNTING AREA</u>	<u>TYPE OF TRAINING</u>
4	79, 81	P - maneuver area.
5	74, 77	P - maneuver area.
6	73	P - 14.5 simulator training. S - maneuver and compass course.
7	57 58 72	P - maneuver area (driving course). IET Compass course. Maneuver area.
8	13 14 15	P - maneuver area. Swim site (water operation). Maneuver area.
9	12, 14	P - maneuver area.
10	7, 8, 9, 10	P - maneuver area.
11	TOW/D0ragon	P - TOW/Dragon site and compass course.
12	1, 2, 3, 5 4 6	P - maneuver area. Vehicle recovery site. Compass course.
13	20	P - tank maneuver area and vehicle recovery site.
14	16, 18, 19	P - (16 - driving route) S - 16, 18, 19 - maneuver area and compass course.
15	17	P - small unit training area.
16	29, 30, 31, 32, 33, 37	P - small unit training for all hunting areas.
17	34, 35, 36, 43, 44	P - small unit training (infantry, mech, and scout training).
18	39, 40, 41, 42, 95, 96  47	P - small unit training (infantry, mech, and scout training).  Test site.

**H-3. BIVOUAC SITES.**

a. The bivouac sites listed below are authorized for training (reference Fort Knox Special Map 1:50,000). No pyrotechnics or blanks will be used in administrative bivouac sites. Tracked and wheeled vehicles over 2 1/2 tons are not allowed in any bivouac site. Latrines will be scrubbed daily with soap and water (using unit). Hand washing facilities will be available at each latrine (using unit).

b. Bivouac sites 1 through 13 and 15 are for administrative bivouac only. Site 14 is a tactical bivouac site under primary use of Ground Mobility Division.

c. Site listing.

<u>SITE NO.</u>	<u>LOCATION</u>	<u>PHONE</u>	<u>MESS AREA</u>	<u>NO. LATRINES</u>	<u>SIZE</u>
1	983977	No	Yes	1	1 company
2	986978	No	Yes	1	1 company
3	961955	Yes	Yes	1	1 company
4	962943	No	Yes	1	1 company
5	964942	No	Yes	1	1 company
6	957908	No	Yes	2	1 company
7	957899	No	Yes	1	1 company
8	957887	No	No	1	1 company
9	001854	No	Yes	2	2 companies
10	008850	No	No	2	2 companies
11	011848	No	Yes	2	2 companies
12	015853	No	Yes	1	1 company
13	019856	No	No	2	2 companies
14	874003	No	No	1	1 company
15	865045	No	Yes	1	1 company

**H-4. ARTILLERY AND MORTAR POSITIONS.** Approximately 25 established firing points are available for artillery and mortar firing (see Fort Knox Special Map 1:50,000). The following training areas are used for firing sites:

<u>TRAINING AREA</u>	<u>FIRING POINTS</u>	<u>WEAPONS</u>
2	11	155mm and 8-inch; 81and 4.2 mortar
3	10	155mm and 8-inch; 81and 4.2 mortar
17	4	155mm and 8-inch; 81and 4.2 mortar

NOTE: Several range sites allow artillery and mortar firing when given special permission by Range Management Officer (see range list, secondary use information). Additional unprepared firing sites are available upon user request. Overlays must be submitted to Range Operations for approval.

**H-5. DEMOLITION AREAS.**

a. Demolition areas are managed by unit mission. Charges (weight & type) will be listed on the unit generated surface danger are diagram and reviewed for approval by Range Division.

b. Requirements for tree and steel cutting require prior coordination with Range Operations.

c. Missile hazard. The minimum surface danger area for less than 27 pounds of explosives is 300 meters.

d. Units responsible for conducting demolition training will ensure road guards are briefed on their duties and have communications with the OIC.

<u>DEMO AREA NO.</u>	<u>NO. OF GUARDS</u>	<u>LOCATION</u>
Mill Creek Demolitions	1	960930
Raridan Hollow	1	008010
Rodgers Hollow	1	014005

NOTE: Guards will not stop vehicle traffic; they will only alert vehicle drivers to demolition firing and locations. Guards will instruct vehicle drivers to turn off radios that have transmitting power.

## H-6. RANGES.

a. A list of active ranges, in alphabetical order, is as follows:

NAME	PRIMARY USE	REMARKS
Ames	MLRS Firing Point	Undevised
Baum	Tank	Older Generation Range
Blair	Rifle Field Fire/Night Fire	M31A1 Device
Boydston	Tank/50 Cal Qual	Older Generation Range
Brown	Pistol Qual/Shotgun	M31A1 Devices
Brumfield	Machine Gun	Undevised
Canby Hill	Rifle 25 meter	
Cedar Creek MPTR	Tank Table VIII	Modernized Range
Clark	Rifle 25 Meter	Older Generation Range
Crane	Machine Gun	Fam Fire
Crane 2	Pistol Fam fire	Undevised
*Crumb	Special Purpose/EOD	Undevised
Danner Rocket	LAW/Sub Cal	
Demo-6 (Mobilization Range)	Demolition	
Donnelly	Tank	Older Generation Range
Easy Gap Close Combat	Rifle Fire & Movement	"Buddy Team" Fire & Move
Easy Gap Defense	Rifle Defensive Fire	2-man Foxhole supported
Easy Gap M203	M203 and LAW	HE & Inert
Easy Gap 1 & 2 (Mobilization Rg)	Rifle 25 Meter	
Finnegan	Rifle 25 Meter	
Finney (Mobilization)	Sub Cal .22	
Frazer CPQO	Pistol Qual (day/night )	Modernized
Garvin	Special Purpose	
George	Rifle Field Fire	Older Generation Range
Hackett	Tank, MK19 & Special Purpose	HE Impact Area
Handiboe	Rifle 25 Meter	
Heins Qual Tng Range (QTR)	Mach gun Qual	Rifle, Pistol, Sniper, M203
Kennedy	Tank (degraded)	Older Generation Facility
Land Mine Warfare (Mobilization)	Claymore	
Lee Pistol	Small arms	Targets in target boots
Longstreet 1 and 2	Machine Gun Transition	M31A1 Devices
McFarland-Oliver	Tank Table VIII (Degraded)	Older Generation Facility
McKie Close Combat	Rifle Fire & Movement	
Mendick	Scale Tank Range	
Mill Creek Grenade	Hand Grenade	6 Throwing bays
Morgan	Rifle Field Fire	Modernized
Pells	Rifle Record	

NAME	PRIMARY USE	REMARKS
Poorman Infiltration	Overhead Fire Infiltration	
Reiley (Formerly) Dripping Springs	Rifle Field Fire	Modernized Range
Schroeder (Formerly Forest Hill)	Rifle Field Fire	Downrange feedback
Rice (Mobilization Range)	Rifle 25 Meter	
Rodgers Hollow	Special Purpose Demolitions	
St. Vith MPTR	Tank Table VIII	2 Course Roads
Salt River Range	Riveriene Operations	Special Operations Range
Scott Mountain	Rifle KD	10 Firing Points
Steeles	Tank Table VI	Older Generation Facility
Super Aerial Gunnery	Aerial Gunnery	
TOW/Dragon	Simulator	
Wilcox	Tank & Special Purpose	
Wilson	Tank/Sub Cal	
Woods #1 & #2 (Formerly Ditto Hill)	Rifle Record	2, 16 point ranges
Yano MPRCH	Tank	
Zussman Urban Combat Tng	Urban setting training	Urban unrest to mid intensity cbt

\*Crumb Range has been assigned in support of the EOD munitions disposal mission and may not be used for other activities without the concurrence of the EOD Unit Commander, and the approval of the RMO.

## APPENDIX I

### CHECKLISTS

I-1. **GENERAL.** The checklists listed in the following paragraphs are provided as samples only. The OIC will develop his/her and the RSO's checklist based on this regulation and area/range specific requirements. The below reminders are the minimum requirements of the OIC and RSO. If there is any uncertainty regarding range safety firing line control (handling of duds, misfire procedures, etc.), immediately contact Range Division for guidance on the correct procedures to be followed.

#### I-2. **SAFETY CHECKLIST FOR THE RSO AND OIC OF WEAPONS FIRING.**

a. Before departing for the range, the OIC will ensure that:

(1) One qualified RSO is available.

(2) He/she is familiar with the applicable portions of AR 385-63, this regulation, and knows firing procedures and safety precautions found in applicable field and technical manuals.

b. Before firing, the OIC will ensure:

(1) Permission to fire has been obtained from Range Division.

(2) The weapon has been borescoped (if applicable); the correct entry made in the logbook, DA Form 2408-4; and the entry verified by the commander.

(3) A qualified aidman (see appendix A) with a medical aid kit is present.

(4) All weapon crews and other personnel present are briefed on range safety.

(5) All personnel are wearing ear protection devices.

(6) The RSO has reported the range ready and safe for firing to the OIC

i.e., "Sir, We are located at the correct facility we are scheduled to use (scheduling approval on site); we have the correct weapons and munitions authorized for use by the scheduling approval; the weapons have been checked and meet specifications for safe firing; medical support is on site; all personnel on site have received the safety briefing; hearing protection requirements have been briefed and all personnel are wearing required hearing protection; the impact area has been checked and from visual inspection appears clear; the range flag is up (red light up and blinking); and we have time and initials from Range Control for a firing status; Sir, we are cleared to fire."

c. During firing, the RSO and OIC will:

- (1) Ensure that all personnel wear appropriate headgear and hearing protection.
- (2) Ensure guards are posted at appropriate points.
- (3) Prevent personnel from going forward of the firing line; use markers (warning signs) or rope between tanks/vehicles.
- (4) Continually check to ensure that firing is within the safety limits. Supervise removal of unfired or misfired rounds procedures outlined in appropriate manuals.
- (5) Ensure that no part of anyone's body is behind the breech of the gun while it is loaded.
- (6) Ensure ammunition is always under armed guard.
- (7) Ensure that all weapon systems are cleared before movement is allowed in front of the weapon and before the weapon is permitted off the range.

### **I-3. OIC/RSO CHECKLIST - SMALL ARMS, TANK, AND SPECIAL RANGES.**

a. Before firing:

- (1) Is a copy of this regulation, AR 385-62, AR 385-64, as appropriate, and appropriate manual(s) for the type weapons being fired available on the range?
- (2) Is ammunition properly stored and being handled properly? (Reference this regulation.)
- (3) Is the range flag properly displayed (range flag issued by Range Division NCO) or blinking lights (night firing)?
- (4) Is an ambulance and qualified medical personnel with medical kit present?
- (5) Has the range impact area been visibly checked to ensure that it is clear of all personnel?
- (6) Are the right and left limits of the range clearly visible and have the troops been made aware of their locations? (Ensure troops understand the reasons for using range markers.)
- (7) Has dual means of communication been established with Range Division (radio and phone)?
- (8) Has the range been opened with Range Division and the opening time received and recorded?

b. During firing:

- (1) Are safety personnel checking weapons before and during firing to ensure safe operations?
- (2) Are communications being maintained with Range Division?
- (3) Are any of the range limitations being violated?
- (4) The RSO will ensure no one enters the range impact area/is downrange.

c. After firing: Range Division requires an inspection of each range when a unit has completed firing. If the same unit has the range scheduled for 2 or more days in succession, the range will be inspected on the last day of usage. On preceding days, it is only necessary for the firing unit to call Range Division and obtain opening/closing times.

- (1) Has a thorough police of the range been conducted?
- (2) Has a shakedown of all personnel and a 100 percent accountability of all ammunition brought to the range been conducted?
- (3) Have the target shed and range tower been locked (if applicable)? Has the range flag been taken down?
- (4) Has a Range Division NCO cleared the range?
- (5) Has Range Division been notified that the range has been cleared and a closing time been received from Range Division?
- (6) Has Range Division been notified of any discrepancies noted on the range (i.e., target shed door torn off, window broken, etc.)

**I-4. RSO GUIDE AND CHECKLIST FOR MORTAR OR ARTILLERY FIRING.**

a. Before departing for the firing point, the RSO will:

- (1) Read and understand pertinent parts of appropriate manual of weapons to be fired, and this regulation.
- (2) Procure and take to the range, this regulation, appropriate manuals for weapons to be fired, and tabular and graphical firing tables.

b. Before firing, the RSO will:

- (1) Verify that the approved range scheduling request applies to the unit and the date and time firing are planned.



(2) Verify that the firing position(s) occupied is the same as shown on the range request, and that all range safety overlays comply with the firing data (safety overlays must be submitted to Range Division for approval 10 working days before the firing). Safety fans will be drawn on overlay paper, using Fort Knox Special Map 1:50,000.

(3) Verify that the boresight and lay of each weapon is correct.

(4) Compute the minimum elevation and the safety diagram.

(5) Supervise the placing of safety stakes and the installation of the range flag.

(6) Ensure that ammunition is handled and stored safely, and checked for obvious defects.

(7) Inform each section chief of the right and left deflection limits, minimum and maximum quadrant elevation, and minimum time setting.

(8) Visually check the line of the tube for parallel laying.

(9) Establish internal safety communications. Ensure that permission to fire is granted by Range Division; ensure compliance with all scheduled check fires.

(10) Ensure that the unit has established communications with Range Division.

(11) Check the visible part of the impact area to see that it is clear.

(12) Verify that the weapons have been borescoped, and that the correct entry is made in the logbook, DA Form 2408-4 (Record Weapon Data) , and verified by the commander.

(13) Notify the OIC of firing when it is safe to fire.

c. During firing, the RSO will:

(1) Enforce all safety regulations at all times.

(2) Not allow a weapon to be fired with an incorrect setting or charge which would cause a projectile to land or burst outside the safety limits.

(3) Immediately command "cease fire/check fire" when an incorrect setting or charge which would cause a projectile to land or burst outside the safety limits is detected.

(4) Close the firing point with Range Division when firing is completed and the areas have been policed.

**I-5. SAFETY CHECKLIST FOR OIC OF MORTAR OR ARTILLERY FIRING (AS APPLICABLE).**

a. Before departing for the firing point, the OIC will ensure that:

- (1) A request for firing was submitted and approved by Range Division.
- (2) A safety overlay has been submitted to Range Division and approved.
- (3) He/she is familiar with all publications concerning the activities to be conducted and weapons used.
- (4) He/she has in his/her possession required maps, this regulation, AR 385-63, the Range and Impact Area Schedule, and current publications pertaining to the unit's activities and weapons used.
- (5) RSOs are properly qualified in their duties.
- (6) The weapon has been borescoped as specified in para 1b(12) above.

b. Before firing, the OIC will ensure that:

- (1) All participating personnel are familiar with current safety regulations pertaining to the unit's activities.
- (2) The boresight and lay of each weapon is correct.
- (3) Minimum elevations are determined by the RSO. The RSO minimum elevations will be compared with the firing battery executive officer's minimum elevations for site to mask, using the larger of the two as minimum elevation.
- (4) Ammunition and fuze to be fired are as specified for firing.
- (5) Permission to fire has been obtained from Range Division and that all scheduled "cease-fires/check fires" are relayed to all firing elements.
- (6) The maximum safe quadrant that will ensure illuminating projectiles impacting in the safety fans is computed.
- (7) Communications have been established with Range Division.
- (8) A qualified medic with a medical kit is present at the firing position.
- (9) The safety overlays prepared by the RSO are correct. During firing, the OIC of firing will ensure that all personnel within 50 meters of the firing point are wearing Kevlar helmets and hearing protection.

- c. Unused powder bags/charge increments will be disposed of per this regulation.

**I-6. RANGE ACCEPTANCE AND RETURN.**

- a. All ranges will be signed for by the using unit after a complete inspection with a range inspector has been conducted. During this inspection, ATZK-PT Form 4820 (Training Complex Facility Sign-on), figure I-1, will be signed by the using unit representative.

- b. Tank ranges supported by moving targets or tank target lifting devices will be inspected and signed for by the OIC.

- c. Range clearance inspections will be conducted by the using activity and a range inspector before final clearance being identified by the range inspectors signature on ATZK-PT Form 4820 (figure I-2).

TRAINING COMPLEX FACILITY SIGN ON

DATE \_\_\_\_\_

USING UNIT \_\_\_\_\_  
 FACILITY \_\_\_\_\_

1. Time scheduled to sign-on \_\_\_\_\_ Time signed on \_\_\_\_\_
2. Range flag received by \_\_\_\_\_
3. Required regulations on site? AR 385-62/63, USAARMC Regs 385-22 and 700-1, manuals for weapons being fired, USAARMC Form 129, waiver (if needed), functional compass, MIAI Gunners Quadrant? YES \_\_\_\_\_ NO \_\_\_\_\_
4. Unit briefed on:

GENERAL

RANGES

Facility Layout and Function-----	
Commo with Range Ops -----	
Training Status Requirements----- i.e. Guard, Occupation, Training, Closing	
Access for Range Div Vehicles-----	
No POVs -----	
Standard Uniform-----	
Tree Cutting only IAW 385-22-----	
No Foxholes, Trenches, Sumps----- or Barbed Wire without approved DF by Range Div	
Report all Accidents/Incidents-----	
Ammunition Storage-Range & Bivouac-----	

Use of Red Flag-----	
Firing Status with Range Ops-----	
Target Location & Use-----	
Guards and Gates-----	
Vehicle Control on the Facility -- and on Range Roads	
Scheduled Shut-downs -----	
Use of Calibration Bunkers-----	
Maximum Charges -----	
Limits of Fire -----	
Night Firing Lighting Requirements-----	
Impact Area Control Waiver ----- Briefing	

BIVOUAC SITES

No Vehicles over 2½ Ton-----	
No Blanks - No Pyro-----	
No Foxholes, Sumps, Trenches-----	
Vehicles Stay on Roads-----	

5. During use of the facility you may be required to furnish a troop detail to the Range Inspector to accomplish facility maintenance IAW USAARMC Reg 385-22.
6. All items on the reverse side of this form will be accomplished prior to calling Range Operations for a clearance inspection. Courtesy inspections are not provided.

REMARKS

Printed Name/Rank/Unit \_\_\_\_\_

Date/Time/Signature \_\_\_\_\_

Range Inspector \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Figure I-1. Training Complex Facility Sign-on.

TRAINING COMPLEX FACILITY CLEARANCE

USING UNIT \_\_\_\_\_ UNIT REPRESENTATIVE \_\_\_\_\_ DATE \_\_\_\_\_

FACILITY \_\_\_\_\_

INSPECTION NUMBER \_\_\_\_\_ TIME \_\_\_\_\_

\*\*Prior to inspection, all unit equipment is to be removed from the facility.

<u>GENERAL</u>	<u>GO</u>	<u>NO GO</u>
Area Police - Trash, Wire, Markers, etc., Removed from Facility ----	_____	_____
Latrine - Washed, Cleaned, Toilet Paper Removed-----	_____	_____
Urinals Washed, Unplugged, Drained -----	_____	_____
Bldg # _____ Full _____ 3/4 _____ 1/2 _____	_____	_____
All Buildings/Towers Clean and Neat-----	_____	_____
All Oil Spills Removed -----	_____	_____
Range Equipment Present and Operational (Flag, Bleachers, etc.)----	_____	_____
Warming Barrels Emptied -----	_____	_____
All Commo Wire Removed -----	_____	_____
Ash Pits Policed of Trash and Wire -----	_____	_____
Mud/Debris Removed from Roads, Damaged Grass Areas Levelled and-----	_____	_____
Reseeded-----	_____	_____
 <u>RANGE</u>		
Police of all Firing Points/Lanes (Trash, Brass, Links, etc)-----	_____	_____
Police of Impact Area and ALL Target Bunkers (Debris & Trash)-----	_____	_____
Remove Targets from Moving Target Carrier - Bolts Returned to RI----	_____	_____
Remove SABOT Debris from Downrange Roads -----	_____	_____
Boresight Panel and Limit Markers Checked for Holes and Service- ability (Replacement by Using Unit)-----	_____	_____
Small Arms Targets Pasted and Patched, Restored or Replaced-----	_____	_____
Misfire Pit Checked and Cleared-----	_____	_____
Mud and Debris Removed from ALL Target Positions, Moving Target Covers and All Concrete Pads (Firing Pads, Ammo Pads and All Concrete Walkways)-----	_____	_____
Tank Range Service Roads, and Graveled Lanes and Firing Points Dragged-----	_____	_____
 <u>BIVOUAC SITE</u>		
All Tent Drainage Trenches Filled and Smoothed Out-----	_____	_____
All "Cover and Concealment" Materials Unpiled/Distributed-----	_____	_____
 <u>TRAINING AREAS</u>		
Area Policed of Pyro Residue, all Duds Marked and Reported-----	_____	_____
All Foxholes, Trenches, Sumps & Fighting Positions Filled and Mounded - Concealment Materials Unpiled-----	_____	_____
Is there anything that will stop the next unit from using the facility?-----	_____	_____

Other Clearance Requirements/Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

I have fully inspected this facility and cleared the unit: \_\_\_\_\_  
 RI SIGNATURE - UNIT # \_\_\_\_\_

ATZK-PT FORM 4620, APR 88 (Back)

Figure I-2. Training Complex Facility Clearance.

APPENDIX J

REFERENCES

**SECTION 1: REFERENCE PUBLICATIONS.**

AR 11-9, 28 May 1999, The Army Radiation Safety Program

AR 40-5, 15 October 1990, Preventive Medicine

AR 75-1, 20 August 1993, Malfunctions Involving Ammunition and Explosives

AR 95-2, 10 August 1990, Air Traffic, Airspace, Airfields, Flight Activities, and Navigational Aids

AR 95-27, 11 November 1994, Operational Procedures for Aircraft Carrying Hazardous Materials

AR 210-21,1 May 1997, Army Ranges and Training Land Program

AR 385-10, 23 May 1988, The Army Safety Program

AR 385-40, 1 November 1994, Accident Reporting and Records

AR 385-63, 15 October 1983, Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat

AR 385-64, 28 November 1997, US Army Explosives Safety Program

DA Pam 40-501, 10 December 1998, Hearing Conservation Program

DA Pam 385-64, 28 November 1997, Ammunition and Explosives Safety Standards

FM 6-40, 23 April 1996, Tactics, Techniques, and Procedures for Field Artillery

MIL-HDBK-828 Laser Range Safety

TB CML 100, 6 April, 1964, Smoke Pot

TB MED 506, 15 December 1981, Occupational and Environmental Health Occupational Vision

TB MED 524, 20 June 1985, Control of Hazards to Health from Laser Radiation

TB 9-1300-385, 1 January 00, Munitions Restricted or Suspended

Fort Knox Reg 385-22 (1 Dec 00)

TC 25-8, 25 February 1992, Training Ranges

## **SECTION II: RELATED PUBLICATIONS**

AR 75-15, 1 November 1978, Responsibilities and Procedures for Explosive Ordnance Disposal

AR 95-1, 1 September 1997, Flight Regulations

AR 200-1, 21 February 1997, Environmental Protection and Enhancement

AR 200-2, 23 December 1988, Environmental Effects of Army Actions

FM 1-140, 29 March 1996, Helicopter Gunnery

FM 5-103, 10 June 1985, Survivability

FM 5-250, 30 July 1998, Explosives and Demolitions

FM 6-50, 23 December 1996, Tactics, Techniques, and Procedures for the Field Artillery  
Cannon Battery

FM 6-60, 23 April 1996, Tactics, Techniques, and Procedures for Multiple Launched Rocket  
Systems

FM 10-67-1, 2 April 1998, Concepts and Equipment of Petroleum Operations

FM 17-12-1-1, 5 May 1998, Tank Gunnery (Abrams) Vol 1

FM 17-12-1-2, 5 May 1998, Tank Gunnery (Abrams) Vol 2

FM 20-32, 29 May 1998, Mine/Countermine Operations

FM 21-11, 27 October 1988, First Aid for Soldiers

FM 21-26, 7 May 1993, Map Reading and Land Navigation

FM 21-75, 3 August 1984, Combat Skills of the Soldier

FM 23-1, 18 March 1996, Bradley Gunnery

FM 23-14, 26 January 1994, M249 Light Machine Gun in the Automatic Rifle Role

FM 23-23, 6 January 1966, Antipersonnel Mine, M18A1 and M18

FM 23-27, 27 December 1988, MK 19, 40-MM Grenade Machine Gun, MOD 3

FM 23-30, 27 December 1988, Grenades and Pyrotechnic Signals

FM 23-65, 19 June 1991, Browning Machinegun, Cal 50, HB, M2

FM 23-67, 29 February 1984, Machinegun 762mm, M60

FM 100-14, 23 August 1998, Risk Management

TB 9-1310-251-10, 24 February 1995, Operator's Manual Range Clearing Procedures for Cartridge 40MM: TP, M918

TB MED 524, 20 June 1985, Control of Hazards to Health from LASER Radiation

TM 9-1300-200, 3 October 1969, Ammunition General

TM 9-1330-200-34, 15 July 1993, Direct Support and General Support Maintenance Manual for Grenades (TM 1303-34/1)

TM 9-1345-203-12, 30 October 1995, Operator's and Unit Manual for Land Mines

TM 9-1370-207-10, 31 March 1991, Operators Manual for Pyrotechnic Simulators

TM 9-1375-213-12, 30 March 1973, Operators and Unit Maintenance Manual (Including Repair Parts and Special Tools List): Demolition Materials

TM 43-0001-27, 29 April, 1994, Army Ammunition Data Sheets Small Caliber Ammunition FSC 1305

TM 43-0001-28, 28 April 1994, Army Ammunition Data Sheets Artillery Ammunition Guns, Howitzers, Mortars, Recoilless Rifles, Grenade Launchers, and Artillery Fuzes (Federal Supply Class 1310, 1315, 1320, 1490)

TM 43-0001-29, 30 June 1994, Army Ammunition Data Sheets for Grenades

TM 43-0001-30, 1 December 1981, Army Ammunition Data Sheets for Rockets, Rocket Systems, Rocket Fuzes, Rocket Motors (Federal Supply Class 1340)

TM 43-0001-36, 1 September 1994, Army Ammunition Data Sheets for Land Mines (FSC 1345)

TM 43-0001-37, 6 January 1994, Army Ammunition Data Sheets for Military Pyrotechnics (Federal Supply Class 1370)

TM 43-0001-38, 25 July 1994, Army Ammunition Data Sheets for Demolition Materials



## APPENDIX K

### GLOSSARY

#### **SECTION I: TERMS AND DEFINITIONS.**

**ASSISTANT SAFETY OFFICER.** Assistant Range Safety Officer (ARSO). Officer, warrant officer, or noncommissioned officer designated and briefed by the OIC and RSO, who assists the RSO in carrying out the safety responsibilities for the range or activity.

**BUTTONED-UP.** All hatch covers are in a closed and secure position.

**CEASE-FIRE.** A command given by anyone observing an unsafe firing condition on any training complex to immediately terminate an active (hot, wet) firing status of a weapon system(s). All weapons will be cleared and made safe. Turret mounted weapons will be elevated. A cease-fire may be ordered by Range Division personnel, the OIC, Safety Officer, or anyone on a range observing an unsafe act. It can be used for administrative purposes or meal breaks. Temporary cease-fires of 15 minutes or longer will be reported to Range Operations.

**CEASE-FIRE FREEZE.** Immediate termination of all firing activities. Weapons/weapon systems are not moved or altered; all settings remain as is. Personnel are removed from in and around the weapons and guards are posted to prevent tampering. A cease-fire freeze order is normally employed when rounds have been fired out of the approved surface danger area.

**CEASE TRAINING.** Immediate termination of all activities. The OIC will centralize and account for all personnel and equipment. Normally directed by Range Operations in response to an ongoing safety hazard or in cases of units conducting unauthorized activities.

**CERTIFIED.** OICs and safety officers are certified after their successful completion of the range safety briefing, and a commissioned officer verifying by signature on the safety card that they are trained and able to serve in that position for identified activities.

**COLD FIRING STATUS.** A firing condition where authorization to fire a weapon system has not been given or has been revoked by the installation/community range control organization. Also referred to as a dry firing status.

**COOK OFF.** A cook off may occur when the barrel is hot enough to cause the explosive train or primer to ignite without activating normal firing mechanisms.

**DEDICATED IMPACT AREA.** See impact area.

**DEVIATION.** A departure from the requirements established by this regulation and/or the policy in AR 385-63, Range Safety, or DA Pam 385-63. Deviation requires written approval.

DUD. A dud is a discharged projectile containing an explosive charge which has failed to function on impact or at the predetermined time. Duds are extremely dangerous and will not be handled or moved by anyone other than EOD personnel. The Fort Knox impact area has been receiving ordnance since World War I and many duds appear to be little more than rusted hunks of metal. Many of these old duds have been found fully functional. See Unexploded Ordnance (UXO)

DUD CONTAMINATED AREA. Any area where there are known or suspected unexploded munitions (DUD ammunition or explosives) regardless of type.

FIRING LANE. The area within which a weapon system is fired. It consists of a start fire line, cease fire-disarm line, and left and right limits of fire.

FIRING LINE. The line from which weapon systems are fired downrange which consists of firing points or positions.

FIRING POSITION. The point or location at which a weapon system (excluding demolitions) is placed for firing. For demolitions, the firing position is the point or location at which the firing crew is located during demolition operations.

FLAK JACKET. Fragmentation body armor protective vest (CTA 50-900 Update).

GUARD STATUS. A status requested from Range Operations by the OIC of training to cover periods when a training facility is occupied, but with no activity being conducted other than guard functions. During a guard status, the OIC may depart the area, leaving a guard force NCOIC. A guard status will be requested by only the OIC; the request must identify start and termination times. The CIC must brief the guard force NCOIC and observe his initial contact with Range Operations.

HANGFIRE. A hangfire is a delay in the functioning of the propelling charge or explosive train. A hangfire cannot immediately be distinguished from a misfire. For this reason, always wait the prescribed time (as established by the appropriate FM or TN) for misfires before attempting to clear the weapon.

HEARING HAZARD/HEARING HAZARD ZONE. Hearing protection must be worn by all personnel exposed to levels of 140 dBp and above. The area where the impulse noise levels are 140 dBp or higher and hearing protection is required.

HEARING PROTECTION ZONE. Area on the range within which hearing protection must be worn by all personnel during weapons fire. It may be larger than the hearing hazard zone, but never smaller.

HIGH HAZARD IMPACT AREA. See impact area.

**HOT FIRING STATUS.** A firing condition where authorization to fire a weapon system has been given by the installation/community range control organization. Also referred to as a wet firing status.

**IMPACT AREA.** The ground and associated airspace within the training complex used to contain fired, or launched ammunition and explosives, and the resulting fragments, debris, and components from various weapon systems. Depicted as pink on the Fort Knox Special Map. On a range, it is considered as that area forward of the firing line. A weapon system impact area is the area within the surface danger zone used to contain fired, or launched ammunition and explosives, and the resulting fragments, debris, and components. Indirect fire weapon system impact areas include probable error for range and deflection. Direct fire weapon system impact areas encompass the total surface danger zone from the firing point or position downrange to distance X.

a. Temporary impact area. An impact area within the training complex used for a limited period of time to contain fired or launched ammunition and explosives and the resulting fragments, debris, and components. Temporary impact areas are normally used for non-DUD producing ammunition or explosives, and should be able to be cleared and returned to other training support following termination of firing.

b. Dedicated impact area. An impact area that is permanently designated within the training complex and used indefinitely to contain fired or launched ammunition and explosives and the resulting fragments, debris, and components. Dedicated impact areas contain dud munitions that are considered less hazardous than those with an extreme hazard of unplanned detonation. Duds contained in dedicated impact areas are hazardous, present life/limb risk, and are unstable, but are not considered as unstable as those identified in high hazard impact areas.

c. High hazard impact area. An impact area that is permanently designated within the training complex and used to contain sensitive high explosive ammunition and explosives and the resulting fragments, debris, and components. High hazard impact areas are normally established as part of dedicated impact areas where access is very limited and strictly controlled due to the extreme hazard of dud ordnance (i.e., ICM, LAW 40 mm, HEAT rounds, HEIT and other highly sensitive ammunition and explosives).

**MALFUNCTION.** Failure of an ammunition item to function as expected when fired, launched, or when explosive items function under conditions that should not cause functioning. Malfunctions include hangfires, misfires, duds, abnormal functioning and premature functioning of explosive items under normal handling, maintenance, storage, transportation, and tactical deployment. Malfunctions do not include accidents or incidents that arise solely from negligence, malpractice, or situations such as vehicle accidents or fires.

**MEDEVAC.** Emergency medical evacuation normally conducted by helicopter.

**MISFIRE.** An item of ammunition whose primer of initiation has failed to function or has failed to ignite the succeeding explosive train. A complete failure to fire which is not necessarily hazardous. Since it cannot be readily distinguished from a delay in functioning (hangfire), it must be handled as worst case in accordance with procedures for the weapon system.

**MISSION ESSENTIAL PERSONNEL.** Those individuals who are directly involved or in support of weapon systems firing without whom the firing mission could not take place.

**NO-SHOW.** A status assigned to a unit which failed to occupy a training facility as scheduled. No-shows are a reportable statistic.

**OCCUPIED STATUS.** After signing for the facility from the range inspector and moving on the training facility, the OIC will contact Range Operations and be given an occupied status. This is a training status covering all but live-fire training.

**OFFICER IN CHARGE (OIC).** The officer, warrant officer, or noncommissioned officer, certified for the training to be conducted, and who is responsible for soldiers conducting firing or operations within the training complex. Within the Armor School environment, the OIC may be supplied by the activity in charge of the training to be conducted. The OIC must be on site during all periods of training preparation and training, and be in total control of all activities. Is responsible for everything that does or does not happen within the confines of the assigned facility.

**OPEN STATUS.** A training status assigned by Range Operations describing authorized livefire activities. Training areas will be opened in a training status. The OIC of training must request an open status before commencing active live-fire training.

**QAS(AS) or QASAS.** Quality Assurance Specialist Ammunition Surveillance. Department of the Army civilians that function in the ammunition surveillance program at installations that receive, store, maintain, issue, use, and dispose of ammunition.

**RANGE AREA.** The landspace that starts at the edge of the range administrative area and ends at the last target installation. That part of the range area forward of the firing line is also impact area.

**RANGE MANAGEMENT OFFICER.** Range Management Officer is the individual charged with the supervision and enforcement of installation range safety and control of range use, maintenance, modification, and installation of ranges and training facilities per procedures prescribed herein, and the policies of the commander. Serves as Chief, G3 Range Division.

**RANGE PERSONNEL.** Those persons specifically designated to assist the Range Management Officer in the discharge of his duties. Range Division personnel have permission to observe/inspect any range or training site unannounced.

**RANGE SAFETY OFFICER (RSO).** The officer, warrant officer, or noncommissioned officer (SSG/E6 or above) who is the direct representative of the officer in charge (OIC) of firing or

other operations. The RSO will be certified on the weapons to be fired. The RSO is responsible to the OIC for insuring the adequacy of safety of firing, training operations, for final determination that, before firing, correct settings are placed on indirect fire weapons and ammunition represent data within prescribed safety limits and ensuring compliance with laser range safety requirements and local standing operating procedures. The RSO must inform the OIC of the safety status of the range before starting live-fire activities.

**RISK MANAGEMENT.** The process of weighing (analyzing) training realism and the expected benefits of an exercise or operation against the known risks.

**RUNAWAY GUN.** A gun that continues to fire after the trigger is released.

**RUPTURED CARTRIDGE.** When the shell casing of a cartridge bursts or ruptures inside the chamber of a weapon, this constitutes a ruptured cartridge. There is usually a failure to eject from the weapon.

**SERIOUS RANGE INCIDENT.** Events which cause injury or could cause injury to personnel, destroy Government property, or cause serious adverse impacts on training facilities.

**STOPPAGE.** An interruption in the cycle of functioning caused by faulty action of the gun or faulty ammunition.

**SURFACE DANGER ZONE (AREA) (SDZ).** The ground and airspace designated within the training complex (to include associated safety areas) for vertical and lateral containment of projectiles, fragments, debris, and components resulting from the firing, launching, or detonation of weapon systems to include explosives and demolitions.

**TRAINING COMPLEX.** The Fort Knox training complex consists of all reservation landspace outside the cantonment area, which is used in support of the installation's training mission.

**UNEXPLODED ORDNANCE (UXO), DUDs.** Ammunition and explosives which have been primed fused, armed, or otherwise prepared for actions and which has been fired, dropped, launched, projected or placed in such a manner as to constitute a hazard to operations, installations/communities, personnel, or materiel, and remains unexploded either by malfunction, or designs or any other cause.

**USING UNIT.** The unit engaged in training and identified as the requester on the FK Form 129 approving use of the facility.

**WEAPON SYSTEM QUALIFIED.** An individual, military or civilian, who has completed a standard program of instruction for a particular weapon system.

**WEAPON SYSTEM KNOWLEDGEABLE.** An individual, military or civilian, who has completed a standard program of instruction for a particular weapon system or has completed familiarization training established by the installation commander. Familiarization training may involve live-fire training.

**SECTION II: ABBREVIATIONS/ACRONYMS**

ACS	Army Community Service
AIT	Advanced Individual Training
AOF	Azimuth of Flight (Artillery)
AP	Armor Piercing
APU	Auxiliary Power Unit
ASP	Ammunition Supply Point
ATWESS	Anti-Tank Weapons Effect Simulator
AWSS	Area Weapons Scoring System
BCS	Battery Computer System (Artillery Operations)
BCT	Basic Combat Training
BDU	Battle Dress Uniform
BOC/POC	Battery Operations Center/Platoon Operations Center (Artillery Operations)
BUCS	Back Up Computer System (Artillery Operations)
C&C	Command & Control Aircraft
COB	Center of Battery (Artillery)
CSA	Chief of Staff, Army
CSO	Chief Safety Officer (Aviation Operations)
DA	Department of the Army
DBOS	Directorate of Base Operations Support
DIVARTY	Division Artillery
DOD	Department of Defense
DODAC	Department of Defense Ammunition Code
DOIM	Directorate of Information Management
DZ	Drop Zone (Airborne Operations)
EOD	Explosive Ordnance Disposal
EOL	End of the Orienting Line (Artillery Operations)
ER	Emergency Room (Medical Operations)
ESSLR	Eye Safe System for Laser Range Finders
FARP	Forward Armament and Refuel Point
FDC	Fire Direction Center (Artillery)
FDO	Fire Direction Officer (Artillery)
FFAR	Free Flight Aerial Rocket
FM	Field Manual
FO	Forward Observer
HC	Hexachlorethane (Chemical used to produce smoke)
HE	High Explosives
HEAT	High Explosives Anti Tank
IAH	Ireland Army Hospital
PER	In Accordance With
ICM	Improved Conventional Munitions
IP	Instructor Pilot (Aviation Operations)
JAG	Judge Advocate General
LBE	Load Bearing Equipment

LCU	Lightweight Computer Unit (Artillery Operations)
LOA	Letter of Agreement
LPC	Launcher Pod Container (Artillery; MLRS)
LRSO	Laser Range Safety Officer
LZ	Land Zone (Aviation Operations)
MEDDEVAC	Medical Evacuation
MET	Meteorological Condition Data
MICLIC	Mine Clearing Line Charge
MILES	Multiple Integrated Laser Engagement System
MinQE	Minimum Quadrant Elevation (Artillery)
MLRS	Multiple Launch Rocket system
MOPP	Mission-Oriented Protective Posture
MOUT	Military Operations in Urban Terrain
MP	Military Police
MSDS	Material Safety Data Sheet
NEC	Navy Enlisted Classification
NCOIC	NonCommissioned Officer In Charge
NCS	Net Control Station
NHA	Noise Hazard Area
NOE	Nap of the Earth (Aviation Operations)
NROI	National Range Officer Institute
OC	Observer Controller
OIC	Officer In Charge
OP	Observation Post
OPAREA	Firing Operations Area (Artillery; MLRS) Operations
ORSTA	Orienting Station (Artillery Operations)
OSUT	One Station Unit Training
PADS	Position and Azimuth Determining System
PAO	Public Affairs Office
PD	Point Detonating
PIBD	Point Initiating, Base Detonating (describes function of HEAT fuse)
PLGR	Precision Lightweight GPS Receiver (Artillery Operations)
PMO	Provost Marshal Office
POV	Privately Owned Vehicle
POW	Privately Owned Weapon
QE	Quadrant Elevation (Artillery)
QAS(AS) or QASAS	Quality Assurance Specialist Ammunition Surveillance
RCA	Riot Control Agent
RFMSS	Range Facility Management Support System
RMO	Range Management Officer
RRPR	Reduced Range Practice Rocket (Artillery; MLRS)
RSO	Range Safety Officer
SC	Section Chief
SCP	Survey Control Point (Artillery)
SDA	Surface Danger Area

SDZ	Surface Danger Zone
SOP	Standard Operation Procedures
SP	Self Propelled
SRP/PDS	Stabilization Reference Package/Position Determining System (Artillery)
SRTA	Short Range Training Round
SSO	Systems Safety Officer (Aviation and CALFEX Operations)
STAT	Stationary Tank Automated Target System
TA	Terephthalic Acid (Chemical used to produce smoke)
TB	Technical Bulletin
TC	Tank Commander (Refers to all tracked vehicles)
TCO	Team Control Officer (Attack Aviation)
THMTG	Target Holding Mechanism, Tank gunnery
TM	Technical Manual
TMP	Transportation Motor Pool
TOW	Tube-Launched, Optically Tracked, Wire Guided Missile
USAARMC	United States Army Armor Center
USAMEDDAC	US Army Medical Department Activity
UXO	Unexploded Ordnance
WBGT	Wet-Globe Temperature
WP	White Phosphorus (chemical munitions)