FM 105-5

DEPARTMENT OF THE ARMY FIELD MANUAL

MANEUVER CONTROL

HEADQUARTERS, DEPARTMENT OF THE ARMY
FEBRUARY 1958

AGO 3353C—Jan

FIELD MANUAL
No. 105–5

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *4 February 1958*

MANEUVER CONTROL

* This manual supersedes FM 105–5, 18 August 1955, including C 1, 6 June 1956.

CHAPTER 1
INTRODUCTION

1. Purpose

This manual is designed as a guide for use in umpiring tactical exercises. The preparation of tactical exercises is covered in FM 21–5.

2. Application and Scope

a. The principles set forth herein are applicable regardless of the size or type of participating units or whether an actual friendly unit and Aggressor enemy are employed, such as in command post exercises. Procedures are modified as the scale and type of exercise and facilities dictate. Information on Aggressor, the maneuver enemy, is contained in FM 30–101, 30–102, 30–103, and 30–104.

b. The manual provides information on—

(1) Mission of the umpire.
(2) Organization and functions of an umpire group.
(3) Methods and procedures for controlling the operations of opposing forces and for indicating the effect of civilians on these operations in order to accomplish the objectives of the exercise.
(4) Umpire criteria.
(5) Umpire communications.
(6) Umpire selection and training.

c. The material presented herein is applicable without modification to both atomic and nonatomic tactical exercises.

3. Mission of the Umpire

The primary missions of an umpire are—

a. To determine and portray the effects of movement, disposition, firepower, and logistics on the development of a tactical situation.

b. To cause the exercise to develop in such a manner that the individual soldier and the unit commander can take action, make decisions, and apply the letter and the spirit of the Code of Conduct and the Law of Land Warfare.

c. To provide the exercise director a medium through which he can influence the operations of the opposing forces.

d. To report, as directed, all current and planned activities of the unit to which assigned.

e. When designated as an evaluator, to interject into the play of the exercise, data, material, or factors for test and evaluation as directed by the test and evaluation group.

f. When directed by the officer responsible for the preparation and conduct of the exercise, to critique the operations and report on the proficiency of the unit or activity for which he is umpire. In small tactical exercises, an individual "umpire" generally is both the rater or evaluator, and the controller. However, umpires may be subdivided into 2 separate and distinct groups,

particularly in major exercises, with 1 group functioning primarily as controllers and the other as evaluators.

4. Realism in Tactical Exercises

a. Tactical exercises are carried out under conditions resembling battle as nearly as possible. Realistic training in tactical exercises prevents excessive losses on the battlefield.

b. The umpire verbally paints the battle picture, assesses casualties and damage, and announces rulings in a manner that provides the realistic war situation that is lacking because of the absence of live ammunition or actual logistical problems. By "playing the game," the umpire assists in instilling combat realism into any tactical exercise.

c. Atomic play is included in all tactical exercises to impress on commanders and troops the magnitude of its effects on all aspects of planning and operations and resulting physical and psychological effects on civilian communities and populations therein.

d. Logistics must be portrayed and played in a realistic manner so that all commanders and staffs realize its influence on all aspects of planning and operations.

e. Sufficient Aggressor strength must be present, in any tactical exercise whether controlled or free, to develop logical and realistic situations. Properly utilized, the Aggressor force, by conducting activities on the ground and by providing prepared prisoners of war, documents, propaganda,

traffic for radio intercept, and simulated dead, can make available sufficient information to present realistically an overall picture of the Aggressor situation provided the available collection sources and agencies are properly directed and utilized by the U. S. commander and his staff.

5. Intelligence Aspect of Tactical Exercises

a. All tactical exercises, whether controlled or free and regardless of the size of forces involved, should require the use of every aspect of combat intelligence, to include the collecting and reporting of information by the individual soldier; the collecting and processing of information and intelligence by special intelligence agencies and personnel; and the production, use, and dissemination of intelligence by the commander and his staff.

b. In major exercises, and whenever feasible in smaller exercises, particular attention must be devoted to the realistic employment and integration of surveillance devices, whether simulated or actual, within the framework of the tactical unit's intelligence system.

c. Provisions for the collection or acquisition of information on enemy "targets" and for the rapid reporting, analysis, and exploitation of resulting target intelligence must receive special emphasis in all tactical exercises.

d. Aggressor doctrine emphasizes the utilization of clandestine intelligence, including espionage, sabotage, and other subversive actions. Security consciousness and the integration of counter-

intelligence activities into the maneuver control and evaluation plan should be stressed during both the planning and operational phases of all tactical exercises.

6. Safety Precautions

a. Explosives and pyrotechnics used in tactical exercises will be employed in accordance with applicable safety regulations and directives. Caution must be exercised in the use of chemical agents such as Tear Gas (Chloroacetophenone (CN) and (CN) solutions).

b. Certain elements participating in maneuvers may be responsible for the security of classified atomic weapons. These elements will be armed with live ammunition and are considered as neutral. Caution must be exercised in control of any action in the vicinity of these elements.

CHAPTER 2

ORGANIZATION AND FUNCTIONS OF THE UMPIRE GROUP

7. General

a. The two basic types of tactical exercises are—

(1) *Controlled.* The operation of the Aggressor force is controlled by the exercise director; the friendly force is permitted freedom of operation within prescribed limitations.

(2) *Free.* Both the Aggressor force and the friendly force are permitted freedom of operation within prescribed limitations.

b. The organization of the umpire group is dependent upon the type of exercise being conducted. The organization for a controlled tactical exercise is given in A, figure 1; for a free tactical exercise, in B, figure 1.

8. Exercise Director

The exercise director plans and conducts the exercise. Although he does not participate in the operations of the opposing forces, he acts as superior commander of both forces, the umpire group and the test and evaluation group. He presents the situation, initiates and coordinates the planning for and execution of the tactical phase; plans, coordinates, and recommends requirements

for test and evaluation, and supervises their interjection into the play of the exercise; and finally terminates the exercise. In small tactical exercises the exercise director and chief umpire may be the same person.

9. Organization for Control

The director controls the maneuver by either of the following methods:

a. When the exercise is conducted as outlined in paragraph 7*a*(1), use of an exercise controller is desirable. The Aggressor forces, the umpire group, and the air space controller are under the controller. The functions of the exercise controller are—

(1) Detailed planning in accordance with the scenario and with exercise directives.

(2) Conduct of the Umpire School (app. IV).

(3) Coordination of Aggressor forces and the umpire group with the general plan of the exercise.

(4) Conduct of required rehearsals by the umpire group with the general plan of the exercise.

(5) Control and utilization of air space over the battle area.

(6) Collection of information and data for the completion of the exercise final report. This information and data to be submitted to the exercise director at the close of the exercise for evaluation and inclusion in the exercise final report.

b. When the exercise is conducted as outlined in paragraph 7*a*(2) above, and opposing forces are approximately equal in strength, the organization shown in B, figure 1 is more effective. In this case, the functions outlined in *a* above, become the responsibility of the exercise director and the chief umpire.

10. Umpire Group

a. The organization of the umpire group shown in figures 1A and 1B is a guide and may be modified to meet the requirements of a particular tactical exercise. The chain of command for unit umpires parallels that of the units or headquarters to which they are assigned.

b. If the exercise is conducted as a controlled exercise, then necessary umpires are provided for the US forces. Umpire liaison teams, fire-marker teams, and such additional umpires as are required for the realistic play of the exercise are provided the Aggressor force.

c. When the exercise is conducted as free, umpires are provided for both sides.

d. In all exercises wherein classified atomic weapons play is to be included, personnel assigned to umpire all aspects of atomic weapons play must possess a security clearance of SECRET or higher.

11. Umpire Group Headquarters

The duties of the sections of the umpire group headquarters are as follows:

a. Chief Umpire. The chief umpire—

(1) Commands all umpire personnel.

(2) Is responsible for all umpire training and for the umpiring of the maneuver.

(3) Directs and coordinates the work of the various staff sections.

b. Chief Army Umpire. The chief Army umpire is responsible to the chief umpire for umpiring the Army phase of the maneuver and for Army umpire training.

c. Chief Air Force Umpire. The chief Air Force umpire is responsible to the chief umpire for umpiring the Air Force phase of the maneuver and for Air Force umpire training.

d. Chief Navy Umpire. The chief Navy umpire is responsible to the chief umpire for umpiring the naval phase of the exercise and for Navy umpire training.

e. Personnel and Administrative Section. The personnel and administrative section—

(1) Performs administrative and personnel duties for the umpire group and exercise controller.

(2) Supervises the umpiring of administrative activities.

(3) Supervises the civil affairs and military government activities to include—

(*a*) Plans, coordinates, and supervises the civil affairs/military government (CAMG) activities of the umpire staff and unit umpires.

(*b*) Injects CAMG problems into the play of the exercise.

(*c*) Supervises the CAMG training of the umpire staff and unit umpires.

(*d*) Prepares the CAMG section of the final umpire report.

f. Intelligence Section. The functions of the intelligence section fall into two distinct categories: intelligence aspects of the exercise and intelligence support of the umpire group.

(1) With regard to the intelligence aspects of the exercise, the chief of the section, in coordination with the operations and training section, plans and is responsible for—

(*a*) Supervision of umpiring of intelligence and counterintelligence aspects of the exercise.

(*b*) Participation in the operations center at umpire headquarters, to include the maintenance of a joint situation map and participation in briefings on the tactical situation.

(*c*) Supervision of umpiring of atomic target acquisitioning.

(*d*) Preparation of the intelligence aspects of the final umpire report.

(2) With regard to the intelligence support of the umpire group, the chief of the section plans and is responsible for—

(*a*) Providing the intelligence training for the umpire school.

(*b*) Arranging for personnel and equip-

ment to provide intelligence support for the umpire group.

(*c*) General staff supervision of security matters pertaining to the umpire group. This includes review of published exercise material to insure proper classification.

(*d*) Procurement and distribution of maps and aerial photographs for the umpire group.

g. Operations and Training Section. The operations and training section—

(1) Plans, coordinates, and supervises umpire operations.

(2) Is responsible for umpire training and conduct of the umpire school.

(3) Manages the umpire operations center.

(4) Supervises atomic weapons umpiring and manages the atomic weapons umpire group.

(5) Gathers and analyzes data with reference to atomic play.

(6) Reviews and analyzes umpire reports and compiles data on errors and deficiencies for the information of the chief umpire.

(7) Prepares the final umpire report and the historical summary of umpire activities.

(8) Is responsible for maintaining data pertaining to the tactical use of atomic weapons.

(9) Supervises the umpiring of special forces guerilla operations.

(10) Supervises the umpiring of the employment of army aviation.

h. Logistics Section. The logistics section—

(1) Supervises the umpiring of logistical activities.

(2) Supervises and conducts training of logistical service umpires.

(3) Supervises procurement and issue of supplies and equipment, and the operation of the umpire motor pool.

(4) Supervises the umpiring of logistical support for special weapons.

i. Communications Section. The communications section—

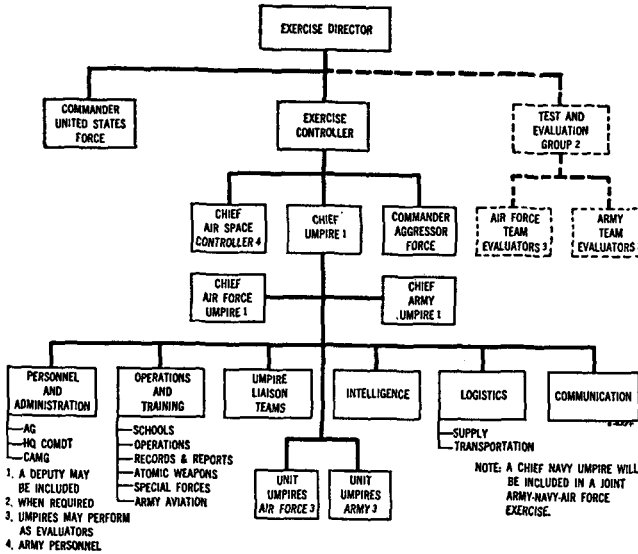
(1) Plans, directs, and supervises the installation and operation of the umpire communications system.

(2) Conducts instructions for the umpire school.

(3) Supervises the umpiring of communication activities.

j. Umpire Liaison Teams.

(1) Umpire liaison teams are organized, equipped, and prepared to serve in the field as staff representatives of the chief umpire, to reinforce unit umpires, to umpire special situations and, in emergencies, to take action in the name of the chief umpire. In large-scale exercises, umpire liaison teams are normally assigned to the senior umpire of participating corps or field army.

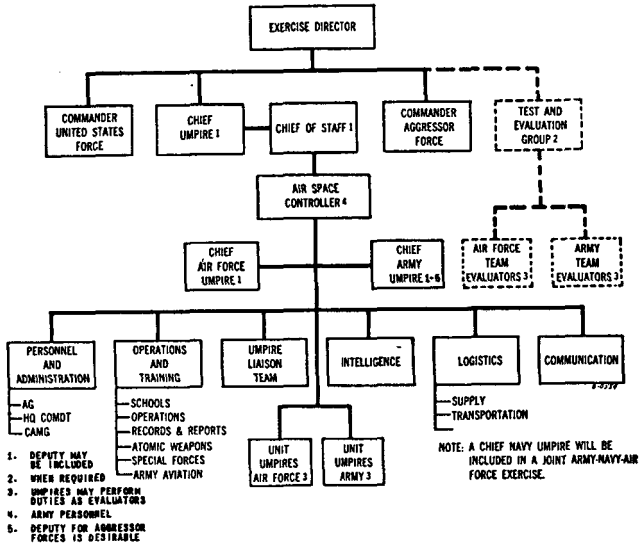


A Controlled exercise

Figure 1. Organization of the umpire group.

(2) The umpire liaison teams maintain direct communication with umpire headquarters.

k. Service Support. Administrative, supply, signal, and maintenance support is provided the umpire group. For large-scale exercises, selected table of organization and equipment (TOE) units capable of providing this support are assigned the umpire group.



B Free exercise

Figure 1—Continued.

CHAPTER 3

UMPIRE CONTROL AND PROCEDURES

Section I. UMPIRE CONTROL

12. General

a. Control during a tactical exercise is exercised by means of umpires assigned to units and activities. The combat responses or actions of participating troops are guided by means of rulings and direct announcements. Overall control is exercised by the chief umpire through umpire channels. Constant communication is maintained between the operating elements of the umpire group.

b. When making announcements, the umpire considers whether, in actual battle, the information would affect an individual, a portion of the unit, or the entire unit. These announcements are of such a nature as to make each individual soldier and unit commander aware of the tactical and logistical situations, which include the nature of friendly and hostile opposition and civilian reaction. The announcements are realistic and so phrased and delivered that the words and tone of voice used create the proper impression.

c. Umpires avoid interfering with troops and do not reveal the location of troops by unnecessarily exposing themselves. Unit umpires comply with instructions pertaining to cover, concealment, and

use of lights. The movement of unit umpires is not restricted to any particular area. They are allowed the freedom of movement necessary to best perform their duties. The only exception to this is in the area of units with an atomic weapons capability. Commanders of such units must provide physical security; therefore, provisions must be made and caution exercised to avoid conflict with the actual security measures provided for atomic weapons material. Unit umpires are not required to conform to radio silence, but exercise caution to prevent revealing the units position.

13. Specific Duties

Effective umpiring requires attentiveness and imagination in addition to professional ability. Generally, umpire duties are—

a. To create the atmosphere of a battlefield by depicting the tactical and logistical situation and events, to include activities of civilians within the combat area.

b. To determine and announce the results of contacts, after considering relative effective firepower, troop dispositions, logistical support, maneuver, and terrain conditions such as cover, concealment, and fields of fire.

c. To assess military and civilian casualties and damage to materiel.

d. To bring to the attention of the commander the effects upon operations created by refugees, displaced persons, and guerilla activities.

e. To designate captured personnel to be retained as prisoners of war.

f. To assist commanders in complying with safety regulations and report violations.

g. To supervise the tagging of simulated casualties, prisoners of war, and damaged or destroyed equipment (pars. 50–63).

h. To report on deficiencies as directed.

i. To cause action to be halted in the event a tactical or logistical situation threatens to get out of control.

j. To report plans and dispositions of the unit to the next higher umpire.

k. To command and supervise activities of subordinate umpires.

l. To prevent physical contact between troops of the opposing forces to avoid injury to personnel. Umpires and controllers must exercise extreme caution in controlling opposing forces to avoid undesirable incidents and accidents in the security area of special weapons units.

m. To prevent damage to materiel.

n. To instruct personnel of the unit to which assigned in umpire methods.

o. To be prepared to critique and submit a written or verbal report of the performance of the unit to which assigned.

14. Rulings

a. The umpire renders a prompt and logical ruling in any tactical or logistical situation which arises during the exercise. When contact is made

between the opposing forces, the umpires allow the situation to develop until a tactical ruling is indicated or required. Rulings are based on relative firepower, tactical employment, logistical support, dispositions, cover, concealment, terrain, fields of fire, surprise, and maneuver. Careful consideration is given to these factors so that umpiring is not merely a mathematical computation of relative firepower. The umpire takes necessary precautions to prevent bodily contact and injury or damage to materiel. He makes on-the-spot decisions, based upon the current local tactical or logistical situations, and determines and assesses losses to personnel and materiel. The umpire is not permitted to make tactical decisions, which are the responsibility of the unit commanders.

b. The umpire decides whether either force is able to advance and portrays the situation accordingly. If, for example, the situation is such that the unit would not be able to advance in actual combat, the umpire "paints the battle picture" by voice or over a loudspeaker to indicate intense and accurate hostile fire. In addition, when appropriate, he indicates that masses of refugees and displaced persons blocking main avenues of approach are considered effective deterents to the unit's ability to successfully conduct operations. If the unit would be able to advance, the umpire depicts appropriate enemy fire. This affords the commander information which should lead to a decision to advance.

c. Umpires will make a ruling when needed for clarification of a ruling previously made. Troops

must abide by umpire rulings without hesitation or argument. Umpires will assess additional delays, casualties, and/or damage if commanders or troops do not comply with umpire ruling(s). The unit umpire will advise the chief umpire of all such incidents.

15. Information Provided Umpires

a. Unit umpires are furnished copies of standing operating procedures (SOP) in addition to copies of operation and administrative orders of the unit to which assigned in order that they may study the plan of action, scheme of maneuver, and logistical support plan and report necessary information to umpire headquarters through umpire communication channels.

b. Information pertaining to the strength, disposition, and plans of action of units are furnished to the umpires of one side by the umpire of the opposing side. Exchange of information is continuous and is effected through direct communication between umpires of opposing sides.

16. Flags and Signals

The following flags and signals are used in tactical exercises:

a. Umpire Emergency Signals.

(1) *To stop infantry action.* White flag during the day and a yellow star cluster at night.

(2) *To stop tank action.* Blue flag during the day and green star cluster at night.

(3) *To stop all action.* Red star cluster. (Only regimental, battlegroup, or combat command umpire or higher authority directs the use of the red star cluster and authorizes action resumed.)

b. Disabled Vehicles. Orange flag.

c. Simulated Obstacles. Black flag.

d. Aerial Fire Marking. Red smoke grenades (par. 23*c*).

e. Air Strikes.

(1) *Aggressor.* Yellow smoke grenades.

(2) *Friendly.* White smoke grenade.

f. Firing of Tank and Antitank Weapons. When other means of representing fire is not available, a red flag is waved from the tank or gun position.

g. Atomic Weapons Strikes. These strikes are indicated by appropriate simulators augmented by announcement over a portable (vehicle or helicopter) public address system which will depict casualty and damage radii.

h. Artillery Fire. Pyrotechnics and simulators (par. 23*b*).

i. Frontlines.

(1) *United States.* Cerise (red) panels.

(2) *Aggressor.* Yellow panels.

j. Air Landing or Airdrops. Use of colored smoke in the area of a scheduled air landing or airdrop is reserved for the unit making the landing or drop for a period of H — 30 minutes to H + 1 hour.

k. Chemical Strikes. As announced by umpire headquarters.

l. Contaminated Areas. The appropriate standard marker for chemical biological, or radiological contamination.

17. Emergency Measures

a. If control is lost, the unit umpire halts the action of the unit or units involved. He immediately reports the facts together with the action he has taken to the next higher unit umpire, who investigates the situation and adopts one of the following courses of action:

(1) Announces his ruling to the unit umpire concerned.
(2) Reports the situation to the next higher unit umpire for appropriate action.

b. Action as described in *a* above is taken when any of the following conditions exist:

(1) Safety regulations are violated.
(2) Existing conditions endanger life or property.
(3) Exercise boundaries or off limits areas are violated.
(4) Range fires must be brought under control.

Section II. PROCEDURES

18. All Units Subject to Attack

a. All units in a tactical exercise, regardless of their type, mission, or location, are subject to at-

tack. Dismounted attacks against any unit are umpired in a manner similar to that prescribed for infantry. Umpires assigned to combat support units and service units, as well as those assigned to combat units, will be prepared to umpire any engagement in which their units are involved. Umpires should advise the unit commanders of the importance of keeping umpire(s) advised of contemplated actions.

b. Attack on a classified atomic weapon activity at any level will be so controlled by the unit umpires that attacking elements remain a minimum of 200 yards from any restricted or other security area. Umpires assigned to both combat and service atomic weapons units will be alert to terminate action early to preclude any misunderstanding on the part of security guards. Security areas will be appropriately marked. Guards, couriers, and other personnel directly involved will be identified as *Neutral* during the period they are actually concerned with the security of atomic weapons. When not concerned with the security of the weapons they may be identified as *Player* personnel and subject to the play of the exercise. Umpires will assess casualties and losses in the normal fashion regardless of the security and safety restrictions which preclude completion of an attack.

19. Infantry

a. Infantry umpiring is based primarily on the actions of company and platoon umpires.

b. Company and battle group umpires are responsible for—

(1) Reporting on the functioning of the unit as a whole, including its staff and any attached elements.

(2) Supervising and coordinating the control exercised by company and platoon umpires.

c. Platoon and company umpires control action as indicated in paragraphs 12 through 17.

d. The employment of supporting fires by company, battle group, and task force commanders during all phases of an action is carefully considered when evaluating comparative firepower. For example, the fact that an attacker, during the advance to contact, is subjected to the fires of supporting weapons of the defender is considered in computing comparative firepower. In such cases, umpires of the defender will obtain and transmit to the appropriate attack umpires timely information of the supporting fires employed. Based on this information, attack unit umpires will assess casualties and delays as appropriate.

20. Armor

a. The procedures for umpiring armor action are similar to those prescribed for infantry.

b. The tank platoon umpire rides in the tank of the platoon commander and uses his radio in making announcements. Tanks that fail to react realistically to enemy fire are ruled out of action by the umpire.

c. Fire duals between tanks, self-propelled guns, and/or antitank guns are judged on the basis of cover, concealment, position, fields of fire, first aimed shot, caliber of weapons, and whether the tanks are stationary or moving. There is no fixed method of determining the victor. Each action must be determined on its merit. In emergencies, blue flags (day) or green star clusters (night) are used to halt all tank action and to allow proper evaluation of all factors in order to arrive at a ruling.

21. Movement of Armor (Safety Procedures)

a. The umpire will slow down or stop all armor action when the lives of personnel on the ground are endangered.

b. For the safety of personnel on the ground, tanks will not be moved unless an observer is in the open turret hatch. If the interphone system is operating, the other hatches may be closed. If the interphone system is not operating, all hatches will be open so that the tank commander, driver, and assistant driver, if applicable, can constantly observe the ground over which the tank is moving.

c. The position of friendly and Aggressor forces and the density of civilian population will determine what safety measures are followed. Ordinarily, during the period from sunset to sunrise, cross-country movement by armor is made only when each tank or tracked vehicle is preceded by a dismounted man. (This includes the marshalling, assembly, or withdrawal of armor within the prescribed limits of the exercise area during the hours

of darkness.) When special illumination devices are used during night operations, special control procedures are announced.

d. Special instructions are issued for operation of armor on roads and/or across country at night.

e. Personnel on the ground stand when approached by armored vehicles. No additional casualties will be assessed against personnel who reveal their positions by reason of approaching armor.

22. Artillery

a. Umpires are responsible for—

(1) Observing the tactical employment of artillery units.

(2) Supervising subordinate umpires and fire-marker teams.

(3) Authorizing the marking of fire missions when proper artillery techniques are employed to include complete procedures from start of check to "missile away," in the case of guided missiles and rockets.

(4) Assessing casualties and damage against the unit to which assigned.

(5) Reporting all changes in artillery unit locations and events that directly influence the exercise play.

b. Among the functions observed and checked are—

(1) Planning and coordination.

(2) Intelligence.

(3) Fire direction.
(4) Logistics.
(5) Communitions.
(6) Missile and guidance station checkout and firing procedure.

23. Operation of Artillery Fire-Marker Teams

a. Ground or aerial artillery fire-marker teams are organized and equipped to mark simulated artillery fire in the area of the opposing force. They furnish shell report data to the unit umpires and commanders of units attached.

b. Pyrotechnics or other appropriate simulators are used to mark artillery fire at the impact area. The signal, flash, and sound, M–74 fired in the pistol M–8 or projector M–9, is used to simulate air bursts. The simulated hand grenades, simulators, shell burst ground, and other suitable pyrotechnics are also used (FM 30–104).

c. Aerial fire-marker teams are used whenever possible and are augmented by ground fire-marker teams. Aerial fire-marker teams have the advantage of mobility and are especially desirable for marking fires deep in enemy territory or in locations not accessible to ground teams. Smoke grenades or other suitable pyrotechnics are dropped in the target area from radio-equipped helicopter or liaison-type aircraft. A card containing shell-report data is attached by wire to the grenade.

d. Fire-marker teams are provided on the basis of approximately 5 teams per division and 2 teams per corps artillery group. One team per division

artillery or comparable headquarters for control (fire-marker control center) is considered the minimum requirement.

e. Separate fire-marker radio nets are required. It is desirable that there be at least 3 nets for division artillery and 1 net per corps artillery group so that requests for marking fires will not be delayed because of heavy radio traffic.

f. An example of the procedures employed in completing a fire-marking mission follows:

(1) The fire direction center (FDC) receives a fire mission.

(2) The fire direction center processes the mission.

(3) As the FDC processes the fire mission, the umpire at the FDC alerts the umpire with the firing battalion and the fire-marker team nearest the target or a fire-marker control center.

(4) The umpire at the FDC verifies the firing with the umpire at the firing battalion. He then provides the following information as it becomes available to the fire-marker team nearest the target or the fire-marker control center.

(*a*) Location and description of target.
(*b*) Number of rounds fired.
(*c*) Type of fuze.
(*d*) Azimuth from target to guns.
(*e*) Caliber of weapons.
(*f*) Chemical agent, if used.

(5) The fire-marker team expeditiously marks

the target, furnishes data for shell reports to the troops fired upon as indicated in (*b*) through (*f*) above, and reports "mission completed" to the unit umpire. Casualties and damage resulting from nonatomic artillery fire normally are assessed by the umpire with the affected headquarters or unit, but he receives the information on which to base the casualty and damage assessment from the fire-marker team marking the fire. The officer with the fire-marker team assesses casualties if a unit umpire is not present.

g. Fire-marker teams make every effort to provide the firing unit with information concerning the effect of its fires if the unit could be expected to obtain these results.

h. Artillery fire-marker teams maybe given an atomic capability (par. 34). If this is done fire-marker teams should be increased to approximately 9 per division. Fire-marker teams may then receive either an atomic or nonatomic request. Procedures for umpiring atomic strikes, paragraph 35, will still apply.

24. Army Air Defense Umpires

Umpires assigned to Army air defense units should be antiaircraft trained personnel and perform the following duties:

a. The air defense command post must be umpired to determine the effectiveness of fire distribution, the availability of identification information,

and the degree of control of friendly aircraft. The chief Army air defense umpire operates at the highest Army air defense command post, assisted as necessary to umpire the command post. All Army air defense umpires are supervised by the chief Army air defense umpire. Air defense group command post umpires umpire the command post and are assigned as necessary. Command post umpires supervise subordinate umpires and observe the overall tactical, technical, and administrative performance of the air defense elements.

b. Antiaircraft artillery battalion umpires supervise battery umpires and observe the overall tactical, technical, and administrative performance of the battalion.

c. Air defense umpires with antiaircraft artillery batteries (including headquarters battery of brigades and groups) perform the following duties:

(1) Observe the tactical, technical, and administrative performance of the air defense unit.

(2) Fire unit umpires assess and report the engagement of aircraft by surface-to-air (SAM) units. Fire unit umpires assess and report the losses inflicted by guns on attacking aircraft (par. 71). Group and brigade umpires determine the effectiveness of the defense from an overall standpoint and assess the number of aircraft allowed to penetrate the defense.

(3) Observe security; reconnaissance, selection, and occupation of position (RSOP);

preparation for action (to include leveling, orientation, and synchronization, and system checks and adjustments); and tactical and logistical effectiveness. The umpires observation of RSOP should result in an adjective rating except where direct action against the unit occurs or failure of a unit to become operational at the proper time has impact on the defense.

(4) If leveling, orientation, and synchronization, and system checks and adjustments are not proper, make appropriate adjustments in scores. Adjustment of scores will be not less than 50 percent reduction in effectiveness if procedures are not correct. These umpire decisions should be drastic in their application and stringently carried out to obtain, thorough training. Fire unit umpire must determine in each engagement that target detection, acquisition, identification, tracking, and engagement were such that kill was accomplished. This must take into account time and probability.

(5) Check for understanding of and compliance with brigade and/or group standing operating procedures. At brigade, check compliance with higher headquarters operational procedures and coordinating instructions.

(6) Check particularly for understanding and observance of conditions of readiness,

rules of engagement, fire restrictions, and command control.

(7) Check instructions pertaining to the use of atomic warheads and compliance with these instructions. Pass to higher umpire headquarters information regarding the use at low altitude of air defense atomic warheads which would have effect on the ground.

(8) Air defense umpires at brigade and group level carefully follow an attack and time the various steps of engagement. If timely engagement is not effected, adjustment will be made in assessing the effectiveness of the defense. It is pointed out that responsibility for indentification rests with the air craft in accordance with FM 110–5 (Joint Action Armed Forces). Delays or failure to identify properly should receive emphasis in umpire reporting.

d. Air defense units effectively attacked will have an appropriate number of weapons ruled out of action by the umpire for periods up to 12 hours and casualties assessed.

e. When employed in the surface role, air defense fires will be marked in accordance with paragraph 23. Umpires will note the air defense situation at the time to determine if diversion from the primary mission was warranted.

f. For air defense weapons employed in a direct-fire role in support of ground operations, unit umpires assess and report losses.

g. With the advent of SAM in the field army, the air defense concept has changed from one of "attrition," to one of "denial of penetration." Therefore, when considering guided missiles, it is no longer a matter of counting aircraft destroyed but a determination of whether any aircraft penetrated the defense. This concept must be employed to be realistic as one aircraft carrying an atomic weapon allowed to penetrate means that a friendly ground element or vital installation is lost.

25. Airborne Umpires

a. Qualified airborne umpires assigned to airborne units follow the procedures contained in paragraph 19. Airborne umpires are also located at departure airfields, landing fields, and drop zones within the airhead to observe and report upon the proficiency of airborne units in mounting and conducting an airborne operation.

b. Special effort is required by all control personnel to insure realistic situations in airborne operations. Because of training safety requirements, limited drop zones available and the gathering of observers and the press, locations and times of drops are difficult to conceal. This can result in the unrealistic disposition of opposing forces around the drop zone. Opposing forces should be restrained until such time as they can realistically move into a drop zone area.

26. Reconnaissance Units

Reconnaissance units operating from vehicles are controlled by umpires in a manner similar to that

for control of tanks (pars. 20 and 21). All tactical vehicles in reconnaissance units do not have radios; therefore, the umpire cannot directly control individual vehicles. If the reconnaissacne units operate on foot, they are umpired as infantry.

27. Service Unit Umpire

The mission of the service unit umpire is basically the same as that for an umpire with a combat unit. The principal duties of a service unit umpire are—

a. To observe the location and operational efficiency of service installations.

b. To require observance of realistic time and space factors in performance of the unit mission.

c. To determine if the unit effects timely displacement forward with advance elements and if continuous service is maintained during displacement.

d. To observe the adequacy and timeliness of information furnished the unit regarding the operations and plans of supported troops.

e. To assess losses in materiel and supplies when installations or movements are subjected to enemy action, and to follow up assessments of losses and damage to ascertain if proper logistical reconstitution measures are taken. When damages to supplies which are essential to the well-being of any unit are assessed, such supplies are released after a reasonable period.

f. To assess casualties and damages, including

those from atomic weapons, and to enforce delays as warranted by hostile action.

g. To determine the effectiveness of security, cover, concealment, dispersion, multiple supply installations, camouflage, blackout, antiaircraft defensive measures, area damage control measures, evacuation of casualties, and other practices that may be necessary in actual combat.

28. Staff Umpire

Umpires at battalion, battle group and higher headquarters check the staff functioning and the operations of attached elements. Checklists covering pertinent points are furnished by umpire group headquarters.

29. Air Umpires

a. Duties of Air Force Umpires. Certain duties and responsibilities of air force umpires are general and apply to any type of maneuver in which US Air Force units may participate. These duties are—

(1) Deciding the results of contacts, taking into account the prevailing tactical factors such as control of the air, relative forces and firepower, surprise, and unit readiness for action to include army air defense units.

(2) Determining the results of air attacks on ground targets either by means of a radar scoring unit, if available, or by reference to damage assessment tables.

(3) Keeping the chief Air Force umpire and other unit Air Force umpires informed by timely reports of the results of plans of maneuver of unit commanders and movements, actions, and disposition of Air Force maneuver units and installations. Notifying umpire headquarters (atomic weapons umpire group) of planned atomic attacks.

(4) Focusing the attention of all participating personnel on the training aspects of maneuver play, rather than the achievement of a factitious "victory" or "defeat"—guiding, where necessary, the development of situations so as to avoid this latter tendency.

b. Coordination of Air and Ground Umpire Functions. In any maneuver involving both air and ground action, many situations will arise in which air and ground operations interact with each other. The air space controller is responsible for this coordinating and umpiring the air space over the maneuver area. In some cases, the normal functions of air umpire tends to overlap with those of the ground umpire. Therefore, it becomes necessary to assign specific umpiring responsibilities to air and ground umpires. The following constitutes a general guide:

(1) *Air Force umpire.* The Air Force umpire umpires the following:

(*a*) All air-to-air contacts. Damage is assessed in accordance with damage assessment tables.

(*b*) All troop carrier responsibilities in the airborne assault or logistical support.

(*c*) When air-to-ground targets are involved, the air umpire with a flight transmits to umpire operations through air umpire channels the following information prior to takeoff:

1. Time of takeoff.

2. Estimated time of arrival at target.

3. Number and type of aircraft.

4. Type of armament.

5. Mission and specific targets.

6. Chemical agent, if used, and dosage are covered.

(*d*) All aerial reconnaissance missions, both visual and photographic.

(*e*) Damage by hostile attack to airbases and aircraft on airbases.

(*f*) Operation of the air control center.

(*g*) Logistical support by air force aircraft to include—

1. The appropriateness of directives issued for bringing air supply items to loading points.

2. Preparation of loading plans, effectiveness of combat loading, and adequacy of aircraft provided.

(2) *Army umpire.* The Army umpire umpires the following:

(*a*) In airborne airlanded, or helicopter-borne operations, the preparation for enplaning and the efficiency of loading plans in supporting tactical require-

ments of the forces, the actual "jump," and operations of the force thereafter.

(*b*) Damage to ground targets by attacking aircraft.

(*c*) Damage to attacking aircraft by ground defenses.

(*d*) When an air attack on ground targets includes the use of an atomic weapon, the casualty and damage assessments are made by the unit umpire as indicated in paragraph 35.

(*e*) Utilization and efficiency of logistical support by air.

c. Army Aviation Umpires.

(1) The mission of the Army aviation umpire is to measure the effectiveness and responsiveness of Army aviation units in improving internal mobility for the combat arms and their support. "Mobility" as used here includes rapid movement of personnel, supplies and equipment, but is aimed for more indirect methods of providing freedom of movement through reconnaissance, security, control, liaison and communications.

(2) Army aviation umpiring is based primarily on actions of staffs, companies and platoons so far as movements of personnel, supplies and equipment is concerned, but in the many other missions of which it is capable, the effectiveness of single aircraft or small groups must be accurately measured.

(3) Because Army aircraft have recently been brought under centralized control for administrative reasons umpires must be alert to the following pitfalls:

(*a*) Combat and combat support unit commanders as well as staffs, in the stress of operations, may forget or neglect to capitalize on Army aviation capabilities.

(*b*) Aviation elements, in their anxiety to be excellent technically, may tend to neglect the sole reason for their existence: full support to the combat arms.

(4) Aviation umpires should pay particular attention to areas such as the following:

(*a*) *Location of air strips.* Are they close enough that inordinate time is not wasted going to and from mission areas?

(*b*) *Communications.* Are internal and external communications adequate for timely assignment of missions and reporting the results thereof?

(*c*) *Service support.* For example, is timely engineer support available to level a mound so that an otherwise unusable field becomes an air strip?

(*d*) *Air-mobility.* Is it truly exploited, or do excessive distances from landing zones to objectives negate the advantage gained by flying in the first place?

(*e*) *Army aviation vulnerability.* Are cover, concealment and deception exploited?

(*f*) *Use of airspace.* Are the techniques for coordinated use of airspace both unilaterally and between the services effective?

(*g*) *Aviation maintenance.* Is the aviation unit capable of maintaining an acceptable aircraft availability rate months on end under adverse field conditions?

(*h*) *Mission performance.* Is Army aviation immediately responsive to the needs of the supported unit and do the results of missions justify the means?

30. Special Exercises

In special exercises such as arctic, amphibious, and airborne, qualified personnel are assigned to the staff of the exercise director to assist in preparing the problem and to the umpire group to instruct the umpires in special techniques.

31. Night Operations

a. Offensive. Umpires of night operations become familiar with the plans and objectives of the unit and make a daylight reconnaissance of the routes and objectives.

b. Defensive. The umpire becomes familiar with the terrain, organization of the ground, defensive fire plans, counterattack plans, and signals to be employed. Umpires of retrograde operations become familiar with movement plans.

32. Special Forces

Special forces guerilla operations are conducted within or behind both friendly and Aggressor lines. These operations are of a clandestine nature such as raids, ambushes, reconnaissance, harassment, subversion, and sabotage activities. An umpire is provided for each independent operation as in the case of an agent, patrol, or special guerilla mission. Umpires are airborne-qualified and are officers who have been properly oriented in special forces organization mission and operations. They will use the umpire communication nets to pass information back to umpire headquarters. Within the umpire headquarters, there should be a special forces guerilla operations umpire group which receives, records, and dispatches information as necessary regarding guerilla activities. It is essential that realistic assessments be played regarding guerilla activities. For example, in simulating the destruction of a bridge or cutting of communication wires; time, units, and materials required to effect the necessary repair or reconstruction should be as that expected under actual combat conditions.

33. Civil Affairs and Military Government Activities

Practical training in control of civilian refugees and related CAMG responsibilities of the combat commander are emphasized in maneuvers. The commander must be able to keep refugees and displaced persons from clogging the roads and to initiate action to transform them into useful persons who not only can resume their own support

but contribute to the operation. He does this mainly through his CAMG organization. Emergency measures—public safety, civilian supply, civil administration—are begun. The alleviation of the chaotic conditions of the civilian population, caused by the destructiveness of modern weapons, is essential to the accomplishment of the commander's mission, whether it be in actual or simulated combat conditions. Control of civilian refugees must be stressed in Army maneuvers. Planning for and introduction of realistic refugee activities and control of population problems must be accomplished from the maneuver director's headquarters down through the corps and division levels. During the field exercise, commanders must be required by the problems imposed upon them by the controllers (umpires) to designate routes for the evacuation of refugees and displaced persons, to establish refugee evacuation centers and refugee camps, and to take appropriate action for their care and control. In the event the commander fails to take the required action, the controller (umpire) assesses a time delay or other penalty as considered appropriate and, thus, delays or prevents the commander from accomplishing his assigned mission.

34. Atomic

a. Opposing forces may attempt to overwhelm the opponent with a mass atomic offensive during a relatively short time. An offensive of this nature places a heavy load on the umpire communication network. In order to avoid long delays in umpire reporting and to reduce confusion and misunder-

standing to a minimum, it is important that reports be submitted promptly, reporting procedures be simple, and that umpires assess combat situations rapidly. Advanced knowledge of the details of all prearranged, scheduled, and on-call atomic fire missions will greatly reduce the possibility of long delays.

b. The procedures outlined in this paragraph and paragraphs 35 and 82 may be modified by the director of the exercise and included within the normal artillery fire marking system through normal umpire channels. The director should consider the following factors before establishing an integrated system within the exercise:

(1) The number of atomic weapons to be employed.
(2) The speed required to implement delivery.
(3) The communications equipment available.
(4) The classification of the atomic weapons umpiring system to be used within the exercise.
(5) The availability of atomic weapons trained umpire personnel.

c. Two communication nets are established for atomic weapons umpiring as follows:

(1) General broadcast.
(2) Atomic weapons umpire.

d. The general broadcast net is used to broadcast strike data and time on target (TOT) and use of air defense atomic warhead information to all umpires, atomic weapons fire-marker control center (FMCC), and atomic fire-marker teams in the

maneuver area. The master transmitting station is located with the atomic weapons umpire group.

e. The atomic weapons umpire net is used for communications between FDC of artillery or other units having either a prepositioning or an atomic delivery capability, atomic planning headquarters, and atomic weapons umpire group (figs. 2 and 12).

35. Procedures for Umpiring Atomic Strikes

a. The procedure followed in umpiring atomic strikes is shown in figures 2 and 12. Appendix III outlines more general information on umpiring atomic strikes, including preparation of damage template and loss assessment.

b. Figure 2 represents the flow of information from the initiation and implementation of the atomic fire mission (by Aggressor) until the weapon is delivered on target (on US forces) and the unit umpire submits his atomic weapons loss report (fig. 5).

c. Atomic planning information is sent over the atomic weapons umpire net by the operations umpire at the approving headquarters to the atomic weapons umpire group (fig. 2). This information is provided in the form as shown on the atomic weapons planning report (fig. 3).

d. The atomic weapons umpire group, using the information contained in the atomic weapons planning report, prepares and broadcasts over the general broadcast net the alert notification (fig. 2). The alert notification consists of the information as shown in figure 4. The atomic weapons

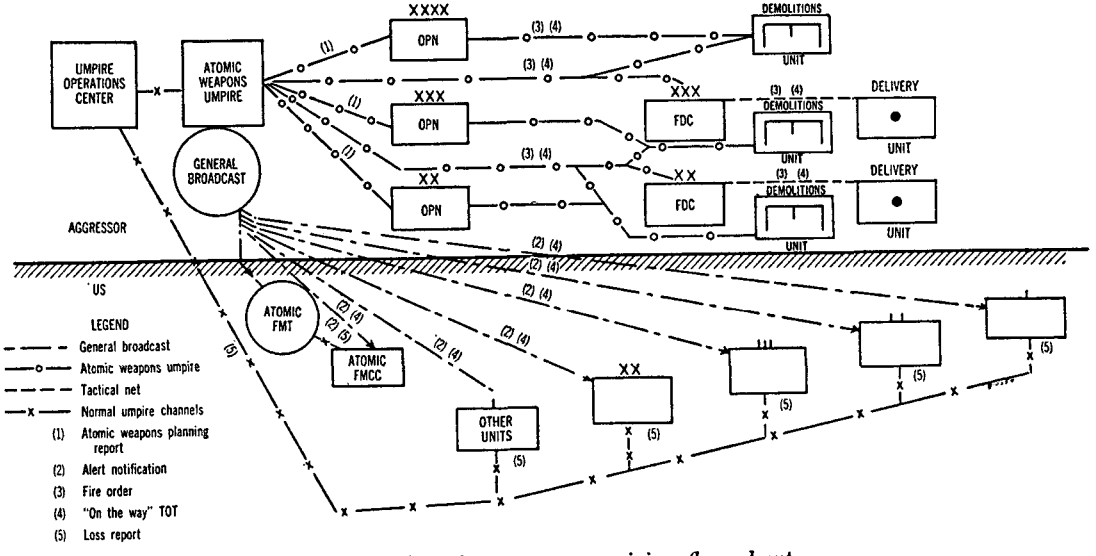


Figure 2. Atomic weapons umpiring flow chart.

umpire group, using appropriate but unrevealed criteria values, selects the atomic damage template which approximates the results to be expected from the weapon yield, height or depth of burst, and ambient conditions existing. The code number of the template selected is transmitted as items *c* and *f* of the atomic weapons alert notification.

e. The umpire of the FDC of the artillery delivery unit or the umpire of the firing unit for prepositioned weapons when the fire order is executed sends over the atomic weapons umpire net to the atomic weapons umpire group the "on the way" and TOT (fig. 2).

f. The "on the way" and TOT are broadcast immediately over the general broadcast net to the atomic weapons umpire group.

g. Upon receipt of the "on the way," all umpires whose units have been affected by the atomic strike notify unit commanders of—

(1) The situation as it would be then known to the commander.
(2) The restriction on all elements of the unit to remain in place, i.e., no further movement or communication permitted until released by the umpire.
(3) Those units which are located within a radius of the friendly or enemy atomic strike who would logically be able to see the fire ball or hear the explosion.

h. Upon receipt of the strike, the umpire of the unit who requested the atomic fires, notifies the commander of—

(1) The immediate results obtained. This includes a word picture of conditions in the vicinity of ground zero, the approximate yield and height or depth of burst of the weapon, and any other information that could be logically seen by a ground observer.

(2) The results of poststrike analysis, provided he has requested such analysis, to include a word picture of results obtained, i.e., tree blowdown radius, forest fires, debris blocking roads, craters, damaged equipment and weapons, enemy personnel losses, and damage to emplacement and fortification.

i. Utilizing the strike data and TOT information received over the general broadcast net, unit umpires estimate damage and casualties by applying appropriate atomic damage and fallout templates to the affected areas. Unit umpires also inform radiological survey teams and parties assigned to combat elements of amounts of simulated contamination in any area. Data are provided in the form of simulated spot instrument readings when the teams or parties are operating radiological detection equipment.

j. Upon notification of loss and damage assessment, unit umpires will perform the following functions:

(1) In large-scale exercises (group, battle group, combat command, regiment, division, and larger). In order to insure

adequate and realistic training for medical personnel and to create situations wherein command decisions are required (mass evacuations and burial, alternative command post and succession of command, replacement units, etc.), unit umpires will notify the unit commander of the situation (fig. 5) and then note and observe the action(s) of the commander or the senior survivor.

(2) In small-scale exercises (platoon, company, and battalion). When the unit umpire has realistically evaluated the effects of the atomic strike, he notifies the unit commander of the situation (fig. 5) and following the commander's explanation of the action(s) he would take in actual combat, the umpire releases the unit for further tactical employment and resumption of communication.

k. The unit umpire prepares and submits to the next higher umpire the atomic weapons loss report form (fig. 5) and those submitted by subordinate unit umpires.

l. The use of air defense atomic warheads at low altitude will require reporting as outlined above.

FROM: _____ DTG: _____

TO: _____ PRECEDENCE: _____

INFO COPIES TO: _____

a. Designation of mission: _____
b. Headquarters requesting: _____
c. Planning headquarters: _____
d. Delivery unit: [1] _____
e. Type of target: _____
f. Weapon designation: [1] _____
g. Height or depth of burst: [1] _____
h. Requested time on target: _____
i. Coordinates of desired ground zero: _____
j. Map sheet number: _____
k. Delivery system to be used: [1] _____

ORIGINATOR'S NAME AND RANK: _____

ORIGINAL TIME TRANSMITTED: _____

TIME RECIEVED: _____

[1] When classified information is used, these items will be indicated by means of operations code or message sent by means of a _____ line crypto (specify on-line or off-line crypto system).

Figure 3. Atomic weapons planning report.

FROM: _____ DTG: _____

TO: _____ PRECEDENCE: _____

a. Designation of mission: _____
b. Proposed time on target: _____
c. Template code: [1] _____
d. Coordinates of desired ground zero: _____
e. Map sheet number: _____
f. Ground contamination template code: [1] _____

[1] These items will be broadcast as code numbers or letters only.

Figure 4. Atomic weapons alert notification.

FROM: _____ DTG: _____

TO: _____ PRECEDENCE: _____

a. Designation of mission: _____
b. Time of detonation: _____
c. Coordinates of actual ground zero: _____
d. Template code: _____
e. Unit covered by report: _____
f. Coordinates of center of mass of unit: _____
g. Personnel losses: _____
h. Equipment losses (primary armament) (list): ___
i. Supply losses by class, quantity, and/or tonnage (list): _____

Figure 5. Atomic weapons loss report.

36. Operation of Atomic Weapons Fire-Marker Teams

a. In each divisional area of the opposing force, there are three atomic weapons fire-marker teams. One team acts as control and operates as the atomic fire-marker control center (FMCC). Each team consists of a ground and a helicopter section. The ground section has a specially marked jeep (¼ ton) and the helicopter section a specially marked helicopter (H–19, if available). The helicopter and jeep are equipped, in addition to normal communication equipment, with a public address system and a receiver capable of receiving the general broadcast. These teams are used to mark propositioned weapons in friendly areas as well as atomic fires delivered on opposing forces.

b. Upon receipt of the strike data over the general broadcast net, the FMCC directs either a ground section or helicopter section of the atomic weapons fire-marker team to proceed to the ground zero (GZ) and mark the target when the TOT is broadcast over the general broadcast net. If an atomic simulator is to be used, the team places and fires the simulator. Isodose lines of significant intensities will be indicated by coordinates or the radiation survey training set DVC 3–2 or a similar set will be used. The ground section or the helicopter section whichever is designated to mark the atomic strike, will cruise or circle in the vicinity of the affected area, announcing over the public address system information relative to the strike. Announcement contains the following information:

(1) GZ of strike.

(2) Air or ground burst.

(3) Template code.

37. Procedures for Umpiring Toxic Chemical Fires

a. Toxic chemical warfare play by Aggressor and friendly forces will be integrated into all maneuvers. This will test commanders and staffs in tactics and technique of toxic chemical employment as well as test troop proficiency in chemical defense. Maneuver control personnel should direct Aggressor employment of toxic chemicals to the extent that will give both forces maximum training in gas discipline and other aspects of chemical defense. Commanders of friendly unit should be encouraged to employ chemical fires to the maximum extent that such fires will favorably influence rapid and economical accomplishment of the mission, and such command decisions should be reflected in evaluations of tactical proficiency.

b. In a free maneuver, chemical fires will normally be initiated and approved by major headquarters for their forces (divisions and corps) within prescribed limitations established by maneuver director headquarters. A request for chemical fires is normally forwarded from the requesting unit through channels to the action headquarters. The action headquarters prepares the report of request for toxic chemical air or ground strike, as shown in figure 6. When nerve gas is to be employed, the umpire at action headquarters selects, on the basis of the area coverage capability, the appropriate section of the G-agent template (par. 48) and enters the code number of that section on

the report. Copies of the report are forwarded to the firing unit for action and to the chief umpire. (Action headquarters will clear mission with higher or maneuver director headquarters as required.)

FROM: _____ DGT: _____

TO: _____ PRECEDENCE: _____

INFO COPIES TO: _____

Item a. Designation of mission: _____
b. Headquarters requesting: _____
c. Delivery unit (air or ground): _____
d. Area coverage desired: _____
e. Type of target: _____
f. Agent: _____
g. Requested time on target: _____
h. Coordinates for desired center of contamination: _____
i. G-agent template code: _____
j. Bomb safety line: _____
k. Map sheet number: _____

ORIGINATOR'S NAME AND RANK _____

ORIGINAL TIME TRANSMITTED _____

TIME RECEIVED _____

Figure 6. Request for toxic chemical air or ground strike.

c. The training value of toxic chemical warfare play depends to a great extent upon the preparedness of umpire personnel to observe unit and individual reactions from the instant an attack begins. Therefore, prior to fire time, chief umpire

personnel prepare the alert notification of toxic chemical attack and forward copies to umpires located with units in the target area. Figure 7, a recommended format for this notification lists information which must be relayed to unit umpires. Fire-marker personnel may be used to supplement or replace the alert notification.

d. When the strike request is executed, the umpire of the FDC of the delivery unit broadcasts the "on the way" and TOT over the general broadcast net to unit umpires. Prior to an air strike, the air umpire with the delivery wing transmits through umpire channels time of takeoff and estimated time of arrival at target.

e. Upon receipt of the alert notification and/or TOT broadcasts, unit umpires in the target area use the G-agent template and/or mustard coverage data to locate units in relation to the target area. As the attack is fire marked, unit umpires make detailed observations of individual and unit reaction. On the basis of these observations, each unit umpire makes realistic casualty assessments (par. 59) and tags casualties. He verbally informs the unit commander of the situation as it would be known to the commander. The unit umpire then prepares the toxic chemical attack loss report (fig. 8) and forwards it through channels to the chief umpire. The loss report serves two purposes:

FROM: _____ DTG: _____

TO: _____ PRECEDENCE: _____

Item a. Designation of mission: _____

b. Proposed time on target: _____

c. Agent: _____

d. Delivery means: _____

e. G-agent template code (G-agent): _____

f. Target size (mustard): _____

g. Coordinates for desired center of contamination:

_____

h. Duration of contamination (if appropriate):

_____

i. Map sheet number: _____

ORIGINATOR'S NAME AND RANK _____

ORIGINAL TIME TRANSMITTED _____

TIME RECEIVED _____

Figure 7. Toxic chemical attack alert notification.

FROM: _____ DTG: _____

TO: _____ PRECEDENCE: _____

Item a. Designation of mission: _____

b. Time of attack: _____

c. Agent: _____

d. Delivery means: _____

e. Unit covered by report: _____

f. Coordinates of actual center of concentration: _____

g. Coordinates of center of mass of unit: _____

h. Activity of troops at time of attack: _____

i. Gas discipline of unit: _____

j. Personnel losses: _____

k. Equipment losses (list): _____

l. Supply losses by class, quantity, and tonage (list): _____

m. G-agent template code: _____

ORIGNATOR'S NAME AND RANK _____

ORIGINAL TIME TRANSMITTED _____

TIME RECEIVED: _____

Figure 8. Toxic chemical attack loss report.

(1) It informs umpire headquarters of losses to units attacked and

(2) It is used by the chief umpire to inject sufficient intelligence information into the play which will inform the attacking unit of results achieved.

f. When an agent of high persistency, such as mustard, is used in denial or defensive operations, umpires accompany or precede player units to the

area and evaluate command and individual reactions to contamination hazards present. Umpires inform commanders of time restrictions (par. 48) on safe use of contaminated areas and assess unit losses on the basis of compliance with these restrictions (pars. 60–63 and 67). Although agents of persistency are used more advantageously in denial-type operations than for immediate casualty production, casualties can be very high if unprotected troops move through a contaminated area or receive a direct hit. Personnel traversing contaminated areas must be masked. Lingering contamination is not considered in the play of G-agent employment, so advancing forces are not delayed in crossing such target areas.

g. In evaluating employment of toxic chemical agents, umpires should bear in mind the following general considerations:

(1) Limitation of weapons to those suitable for chemical fires, as indicated by firepower data in paragraph 48.

(2) A commander's cognizance of artillery support from higher headquarters (corps or army) in planning toxic chemical fires.

(3) Employment of agents in nonpersistent form primarily to cause immediate casualties.

(4) Employment of agents in persistent form primarily for denial or defensive purposes. A commander requesting a mustard attack must consider the effect of lingering contamination on operations of his

unit and adjacent units. If advancing ground units arrive at the target area before the end of the 4-hour period allowed for decay of contamination (par. 48), they must delay further advance or the commander must accept resulting casualties.

(5) A commander's use of intelligence and security in taking maximum advantage of the vulnerability and surprise aspects of toxic chemical employment.

(6) Command action taken prior to employment of toxic chemicals to insure that protective masks and other individual protective equipment are in the hands of troops, that masks have been inspected as prescribed, and that replacement protective equipment and supplies are available.

(7) The proficiency with which a commander plans and executes a toxic chemical attack to include the effects of attack time, terrain, weather conditions, and exploitation. Umpires should evaluate the availability of accurate weather information to the commander and general intelligence activities incident to the attack.

38. Umpire Procedures for Biological Agent Play

Umpiring of biological warfare play integrated into a maneuver of general forces is normally based on evaluations of intelligence activities and general troop proficiency in protective measures. A reporting system similar to that outlined in para-

graph 37 may be used to insure transmission of essential specific information through umpire channels. Preparedness of umpire personnel to observe individual and unit reaction to attack is also an important phase of biological warfare play. Information, in addition to obvious items such as mission and time of attack, which must be transmitted through umpire channels includes the following: agent, incubation period, duration of contamination if agent is spore-forming type, area coverage, and means of delivery. Area coverage is based on data in paragraph 49, and casualty assessment on data in paragraph 61.

39. Umpire Procedures for Radiological Play

a. Radiological play may be conducted from the standpoints of radioactivity either incident to employment of atomics as demolition weapons or as as primary and deliberate weapons effect. Normally the former is played in general forces maneuvers, with umpring procedures based on effects of naturally occurring radioactive fallout following surface or near-surface bursts.

b. Fallout templates (app. III) as required by planned surface or near-surface bursts are prepared and coded in conjunction with appropriate atomic damage templates. The atomic weapons umpire group determines which fallout template most closely meets the conditions of the simulated surface burst and relays the appropriate code number through umpire channels to the umpires of units that are affected by radiological contamination. Unit umpires are also provided with periodic re-

ports containing dose rate and decay information. A typical message would be, "In grid square so-and-so, dose rates are as follows: 0902 hours, 5000 r/hr; 0932 hours, 4800 r/hr; 1002 hours, 4000 r/hr; etc."

c. On the basis of the fallout template and dose rate reports, unit umpires evaluate action taken by commanders to minimize or avoid the fallout hazard present. In order to present a more realistic picture of this hazard, unit umpires reveal the location and extent of contaminated areas only to commanders who actively employ radiation monitoring teams or equipment. Such information is normally passed on to commanders by radioactive contamination markers, map overlays, and verbal description. Unit umpires inform monitoring teams of dose rates at specific locations. If a unit does not take steps to detect contamination, casualties are assessed accordingly, and the umpire gives the commander a continuing picture of increasing numbers of men displaying symptoms of radiation sickness.

d. Allowable time of stay, projected dose rates, and resulting doses (including accumulative) will be computed by atomic weapons trained personnel and made available to higher headquarters and umpires as directed. Commanders who fail to consider both acute and chronic radiation doses in moving troops across contaminated areas will have casualties assessed accordingly. Unit umpires should remember that both immediate and delayed casualties result from exposure to radiation. Time

factors contained in DA Pam 39–1 and in paragraph 61 are used in informing commanders of strength reduction.

e. Unit umpires should observe whether or not commanders issue and/or check radiological measuring devices and individual dose devices prior to any offensive employment of atomic weapons. They should also note whether commanders consider the hazard of radioactive fallout to their units and adjacent friendly units in planning surface or near-surface employment of atomic weapons.

40. Miscellaneous

a. Umpires are assigned to all operative special units, such as intelligence and counterintelligence specialist units, Army Security Agency units, electronic warfare units, and others participating in the exercise.

b. Adequate officer umpires should be provided to control and evaluate the following:

(1) Agent mission.

(2) Guerilla mission.

(3) Raid or infiltration mission (unit umpire may be used).

(4) Reconnaissance patrol (unit umpire may be used).

(5) Prisoner of war installations at division or higher echelons (to umpire the handling, processing, and exchange of prisoners). At levels below division, unit and/or staff umpires may be used.

Section III. RECORDS AND REPORTS

41. Troop Location Reports

Prompt and accurate reports are the foundation of umpire control. Although unit umpires down to and including those assigned to units of company level submit periodic reports as prescribed by the chief umpire, important changes in the situation or location of units are submitted without delay in the form of special reports. Such reports normally include the unit designation, location of the command post, current mission or employment, and any additional information pertaining to the current situation. For example: Co A, 321st Inf 98402450, occupying defensive position along BIG CREEK from 98302462 to 98702445.

42. Daily Report

A daily report on unit operations is prepared by all unit umpires and submitted to the chief umpire through umpire channels of command. The period to be covered, the time of submission, and the content or recommendation desired are prescribed by the chief umpire (fig. 9).

43. Artillery Control Forms

Fire-marker teams and fire-marker control teams keep a record of artillery fires and atomic bursts to include low-altitude air defense atomic warheads. This record is kept on a form similar to the artillery control log maintained at artillery FDC.

FROM: _____ DTG: _____
TO: _____ PRECEDENCE: _____
INFO COPIES TO: _____

a. Mission of unit.

b. Unit tactical situation.

(1) Location of units in contact.

(2) Location of organic units, reserves, command posts, heliports, boundaries, etc.

(3) Location of supporting or attached units.

(4) Synopsis of situation for period.

(5) Units operational effectiveness (excellent, satisfactory, unsatisfactory). (Give details regards commander, staff, and units.)

c. Unit administrative situation.

(1) Personnel.

(a) Number of assessed casualties.

(b) Number of replacements.

(c) Total combat effective strength of unit.

(d) Morale of individuals and unit.

(e) Discipline of individuals and unit.

(2) Logistics.

(a) Critical shortages.

(b) Supply conscientiousness of individuals and unit.

(c) Maintenance of equipment.

(d) Use of transportation.

(e) Synopsis of logistical situation.

(3) Units administrative effectiveness (excellent, satisfactory, unsatisfactory). (Give details regards command and staff knowledge and influence; and unit implementation.)

d. Summary of plans for next period.

e. Units overall combat (operational and administrative) effectiveness (excellent, satisfactory, unsatisfactory). (Give details regards command, staff, and unit participation.)

ORIGINATOR'S NAME AND RANK _____
ORIGINAL TIME TRANSMITTED _____
TIME RECEIVED _____

Figure 9. Umpire daily report.

CHAPTER 4
UMPIRING CRITERIA

Section I. COMBAT POWER AND RATES OF ADVANCE

44. Combat Power

a. Relative combat power is based on the tactical employment of forces to include surprise, maneuver, dispositions, cover, concealment, fields of fire, observation, obstacles, effective firepower, and adequate supplies to conduct the planned operation. When contact is made between opposing forces, normally one side is able to apply sufficient combat power to force the weaker to withdraw or be overrun and destroyed on the position. Careful consideration must be given to all tactical factors. Umpiring is not merely a mathematical computation of relative firepower.

b. In tactical exercises, the absence of live ammunition and actual assault operations requires that combat power be determined by the extent to which tactical employment of units brings to bear effective firepower. (For determination of relative firepower, see pars. 46–49.) Guides for the determination of combat power based on effective firepower are as follows:

(1) If a unit attacks by fire and also maneuvers a portion of its force to strike the opposing force other than frontally, credit

the maneuvering element with twice its effective firepower.

(2) If attacking unit strikes the defender's flank or rear with its entire force, credit attacking unit with three times its effective firepower.

(3) If attacking unit is predominantly armor and strikes defender's flank or rear, credit unit with five time effective firepower to compensate for shock action.

(4) If attacking unit secures a high degree of surprise, credit unit with up to five times firepower it would otherwise receive.

(5) If defender occupies prepared positions (good advantage taken of fields of fire, obstacles, observation, cover, concealment, camouflage, and individual protection), credit unit with up to five times firepower it would otherwise receive.

(6) Failure to observe proper tactical procedures or to make provisions for adequate supplies with which to conduct the operation results in loss of combat power through assessment of greater casualties and damage. (For casualty assessment and damage assessment, see pars. 50–72.)

c. Other than casualties and damage, artillery fires effect opposing combat power as follows:

(1) Effective counterbattery fire neutralizes opposing artillery units for the duration of the concentration.

(2) Artillery fire neutralizes the firepower of infantry within the impact area for the duration of the concentration.

(3) Artillery fire stops infantry movement within the impact area for the duration of the concentration.

d. Observed fires of tanks or self-propelled guns neutralize the firepower of dismounted troops and all other firepower not located in armored vehicles or behind effective natural or artificial cover for the duration of the observed fire. Neutralization is limited to the area being fired upon.

e. Smoke reduces combat power of—

(1) Tank and infantry units:

50 percent when unit is being smoked.

30 percent when their target is being smoked.

(2) Observed artillery fire: 25 percent when target is covered by effective smoke concentration.

(3) Antitank fire is ineffective against targets concealed by smoke.

f. Smoke does not reduce the firepower or effectiveness of guided missiles or of air defense weapons employing electronic fire control.

g. Firepower of units is reduced 10 percent while personnel are wearing protective masks.

h. Atomic fires neutralize all firepower within the area of immediate casualties for protected personnel.

45. Rates of Advance

a. The umpire decides whether or not a force is able to advance, based on a consideration of maneuver, firepower, and logistical support. An attacking unit may advance against an opposing unit when it has a combat power superiority of a minimum of 2 to 1, preferably 3 or 4 to 1.

b. The following table is an approximate guide for determining rates of advance of fighting units:

Table I. Rates of Advance

Ratio of combat power attacker : defender	Rate of advance yards per 15 minutes
2:1	50
3:1	75
4:1	100
5:1	150
10:1	300
15:1	450
20:1	600
over 20:1	600

c. Table I is a guide for determining rate of advance of units fighting as infantry. In armor units, consideration is given to the inherent mobility of armor when determining rate of advance. Armor units attacking with a combat superiority of 5:1 or greater are permitted to advance at 5 miles per hour or 2,000 meters per 15 minutes.

d. The above rates of advance may be decreased substantially because of lack of maneuver or logis-

tical support or when attacking in zones cluttered by civilian refugees, displaced persons, and evacuees.

Section II. FIREPOWER

46. Firepower

a. To establish a basis for computing firepower, a numerical rating is assigned each weapon. The numerical rating or firepower score for a particular weapon is based on the effectiveness of that weapon in comparison with other weapons.

b. Firepower scores are assigned in table II to friendly and Aggressor weapons when firing at the ranges indicated against personnel in open terrain.

Table II. Firepower of Direct Fire Weapons

Weapons	300 meters	500 meters	700 meters	[1] 1,000 meters	[1] 1,500–2,000 meters
Carbine, cal .30	1				
Gun, 40-mm twin (AA)	20	20	20	20	
Machinegun, cal .30 hv	8	8	8	8	
Machinegun, cal .30 lt	6	6	6	6	
Machinegun, cal .50	10	10	10	10	
Machinegun, cal .50 (quad [2])	30	30	30	30	
Rifle, cal .30 M1	1	0.5			
Rifle, auto, cal .30	3	1.5	0.5		
Rifle, 75-mm	15	15	15	15	
Rifle, 106-mm	20	20	20	20	
Rocket launcher, 3.5-in.	10	5			
Tank, 76-mm gun	28	28	28	[3]28	23
Tank, 90-mm gun	30	30	30	[3]30	25
Tank, 120-mm gun	32	32	32	32	

[1] Firepower score is extended to limit of effective combat range of weapon.

[2] Except when used against tanks.

[3] Score for tanks include main armament, 1 machinegun, cal .30, and 1 machinegun, cal .50.

c. Firepower score as indicated in table III is assigned weapons when used effectively in a supporting ground role. Firepower scores computed based on sustained rates of fire, effective width of burst, and fragmentation area.

Table III. Firepower Scoring [1]

Supporting weapons	Firepower score
Gun, 75-mm (AA)	15
Gun, 120-mm (AA)	20
Gun, 155-mm	45
Gun, 280-mm (nonatomic)	100
Gun, 8-in.	70
Gun, 300-mm	100
Gun, 40-mm (AW) (SD)	15
How, 75-mm and 80-mm pack	10
How, 105-mm	20
How, 155-mm	50
How, 8-in (nonatomic)	100
How, 205-mm	120
How, 240-mm	120
Mort, 81-mm	12
Mort, 4.2-in.	15
Mort, 120-mm and 150-mm	20
Rkt, 4.5-in.	20
SAM in SSM role	40

[1] For weapons not shown interpolate to nearest caliber.

d. The firepower score of a unit is determined by adding the firepower score of each of the primary organic weapons of the unit. The collective firepower score of a unit normally is based on the organic weapons actually in the unit. However, in order to simplify initial computation of fire-

power, the collective firepower score of similar type units are based on 100 percent of tables of organization and equipment (TOE) weapons.

e. Because of changes in organization and armaments of units and concepts of employment, the umpire headquarters must calculate unit firepower scores for all units participating in the exercise. These firepower scores are provided the unit umpires prior to the start of the exercise.

f. The unit umpire maintains an accurate record of effective firepower at all times. To accomplish this, he adjusts the initial firepower score of the unit involved by the percentage of the unit's losses and replacements. The firepower score of attached or supporting units is added to that of the supported unit. Only those units actually engaged in the fire fight or in position to support the actior are considered.

g. The firepower scores of US infantry units based on 100 percent of authorized weapons are shown in table IV. This table illustrates the use of firepower scores of individual weapons to obtain unit firepower scores. (Actual computations are shown in parentheses.) See appendix II for computer.

Table IV. Firepower—Infantry Battle Group (ROCID)

Unit	300 meters	500 meters	700 meters	1,000 meters
Battle group	1,385	985	680	615
	(1,384)	(984)	(680)	(616)
Rifle company	315	215	140	125
	(316)	(216)	(140)	(124)

Table IV. Firepower—Infantry Battle Group (ROCID)—Continued

Unit	300 meters	500 meters	700 meters	1,000 meters
Rifle platoon	60	35	15	10
	(60)	(35)	(16)	(12)
Rifle squad	15	10	1	
	(14)	(7)	(1)	
Weapons squad	20	15	15	10
	(18)	(14)	(13)	(12)
Weapons platoon	75	75	75	75
	(76)	(76)	(76)	(76)
Antitank squad	20	20	20	20
	(20)	(20)	(20)	(20)
Mortar squad	10	10	10	10
	(10)	(12)	(12)	(12)
Mortar battery	120	120	120	120
	(120)	(120)	(120)	(120)
Mortar platoon	60	60	60	60
	(60)	(60)	(60)	(60)

47. Effect of Ground Weapons Against Vehicles

Table V provides a compilation of the ranges at which ground weapons are considered effective against vehicles. Umpires in using this table must consider also the ability of the particular weapon to hit the target.

Table V. Effect of Ground Weapons Against Vehicles

Weapons and ammunition	Maximum effective range (meters)			
	Armored vehicles			
	Scout cars, half tracks	Light tanks, SP guns, full-track armd inf veh	Medium tanks	Unarmored vehicles
Cal .50, AP	500	----------	----------	[1] 2,000 [2] 1,000
57-mm, gun AP: 57-mm recoilless rifle, AP, HE, or HEAT				
From shoulder	[1] 800	[1] [3] 800	----------	[1] 800
	[2] 500	[2] [3] 500	----------	[2] 500
From mount	[1] 1,200	[1] [3] 800	----------	[1] 1,200
	[2] 800	[2] [3] 500	----------	[2] 800
40-mm AA gun, AP	1,000	400	[4] 400	[1] 3,500
75-mm AA gun and	[1] 1,500	[1] 1,000	[1] [5] [7] 1,000	[1] 1,500
90-mm AA gun	[2] 2,500	[2] 2,000	[2] [7] 1,000	[2] 2,500
75-mm or larger howitzer or recoilless rifle, AP, HE, or HEAT [6]	[1] 1,000	[1] 1,000	[1] [4] 1,000	[1] 1,000

3.5-in rocket	[1] 300	[1] 300	[1] 300	[1] 300
	[2] 200	[2] 200	[2] 200	[2] 200
Rifle and grenade				
Launcher antitank				
Grenade	[1] 75	[1] 75	----------	[1] 100
	[2] 50	[2] 50	----------	[2] 50
106-mm recoilless rifle	[1] 1,500	[1] 1,500	[1] 1,500	[1] 1,500
	[2] 1,000	[2] 1,000	[2] 1,000	[2] 1,000
Rifle, cal .30 M1	----------	----------	----------	500
Machinegun, cal .30	----------	----------	----------	[1] 2,000
Tank, 76-mm gun	[1] 3,000	[1] 2,000	[7] 1,000	[1] 3,000
	[2] 1,500	[2] 1,000	[4] 2,000	[2] 1,500
Tank, 90-mm gun	[1] 3,000	[1] 2,000	[7] 1,000	[1] 3,000
	[2] 1,500	[2] 1,000	[4] 2,000	[2] 1,500

[1] Stationary target.

[2] Moving target.

[3] Hits at this range with AP will not destroy but may immobilize.

[4] Flanks and rear only.

[5] 75-mm not effective against medium tanks.

[6] Ranges listed are for direct fire only.

[7] Target tank approaching head on.

48. Firepower and Contamination Criteria for Toxic Chemical Employment

a. General. Toxic chemical attacks are integrated into the fire support plan, to include selection of target, agent to be used, and delivery means. Weapons requirements are predetermined on the basis of G-agent templates or mustard ammunition data in *d* below, and are considered in concurrent activities of forces delivering the attack.

b. Artillery Requirements for Agents, Such as Nerve Gases, Used for Nonpersistant Effect. The time-on-target (TOT) method of fire is normally employed when a toxic chemical agent is used for nonpersistent effect, with fires of batteries or battalions concentrated to arrive on the target area in 30 seconds or less. G-agent capabilities of various artillery weapons are given in the G-agent template guide shown in figure 10. This guide has been developed to facilitate rapid computation of firepower requirements and area coverage for agents used for nonpersistent effect. Each square represents, in true size for each map scale, the area in which the designated type and number of weapons can produce 50 percent casualties to unmasked target personnel by the use of G-agents. Using these squares and meter measurements given, umpire headquarters prepares a G-agent area coverage template for use during the maneuver. Code numbers are assigned to each weapons section of the template to preclude dissemination of specific weapons data. Templates should be included in packets distributed to director and chief

G-AGENT COVERAGE

WEAPON	1:25,000	METERS	HECTARES 100 METER SQUARE	1:50,000	RDS. REQUIRED
105MM HOW 18 pieces		200-165	3.3		68
155MM HOW 18 pieces		200-290	5.8		36
155MM GUN 18 pieces		200-210	4.2		25
4.2" MORT CO OR 105MM MORT CO		200-235	4.7		80
155MM HOW 12 pieces		200-190	3.8		24
8" HOW 4 pieces		200-85	1.7		4
8" HOW 12 pieces		200-250	5		12

Figure 10. G-agent coverage.

umpire personnel, unit umpires, and umpires at headquarters where action will be taken on request for chemical fire missions (par. 37).

c. Artillery Requirements for Agents Used for Persistent Effect. Agents for persistent effect are best employed in denial type or defensive operations. Most advantageous use normally is to erect obstacles to the movement of opposing forces rather than to cause immediate casualties. Mustard-contamination areas affect maneuver play as do other types of obstacles, such as minefields and demolished bridges. The initial mustard fire mission should be completed in 15 minutes, if possible. Fire missions can be repeated to maintain desired concentration for as long as a commander deems practicable. Table VI gives weapons and number of rounds required per hectare to achieve a mustard concentration incapacitating to 50 percent of

masked personnel. More complete mustard ammunition requirements given in FM 3–5 may be used in lieu of table VI to give commanders greater flexibility of employment, but casualties must be adjusted accordingly.

Table VI. Munition Requirements Per Hectare: Mustard Concentration, ID_{50}, Masked Personnel in Target Area (Extracted From C1, FM 3–5)

Mustard Munitions Requirements[1] Per Hectare (100-meter squares)				
Vapor effects—8 MPH wind—inversion condition—70°F.—4 hours exposure				
Incapacitate 50 percent of masked personnel in target area.	4.2-inch mortar	4.5-inch rocket	105-mm howitzer	155-mm howitzer
	32 rounds	32 rounds	62 rounds	22 rounds

[1] For heavily wooded terrain, the above requirements should be cut in half.

d. Aircraft Requirements for Toxic Chemical Attack. For training purposes, it may be assumed that each M34 GB-filled bomb cluster will produce death among 50 percent of unmasked personnel over an area of one hectare. One aircraft with two M10 spray tanks (or the equivalent) can cover an area 70 meters in width and 450–550 meters in length with toxic chemical agent. Three aircraft each carrying 2 spray tanks increases the width of coverage to 150 meters. Spray data are also applicable to smoke employment.

e. Contaminated Delay Time. When a chemical agent of high persistency is used to deny ground to the opposing force, a time penalty of 4 hours from the time of the fire mission will be imposed on commanders who accept delay rather than cross or skirt the contaminated area. No casualties will be assessed.

49. Weapons Criteria for Biological Agent Attacks

Since biological warfare will normally be played only from the standpoint of friendly troop defense, firepower capabilities (artillery or aircraft) of the opposing force will not be used to deliver attacks. When the scenario for an exercise includes overt or covert employment of biological agents, the following data are used in estimating area coverage:

a. Spray from 1 aircraft—270 meters wide, 550 meters long.

b. One aerosol generator—90 meters wide, 3,100 meters long.

c. One aerosol bomb—90 meters wide, 180 meters long.

Section III. CASUALTY ASSESSMENT

50. General

a. All losses that affect the progress of action, such as casualties in combat and service units and destruction or capture of equipment, supplies, and installations, are considered in umpiring.

b. Platoon and company umpires keep a running record of losses assessed against the units to which

they are assigned. The umpires periodically inform the respective platoon leader and company commander of accumulated losses.

c. The firepower of a unit is reduced by the accumulated losses assessed against the unit.

d. The number of assessed casualties to be tagged and evacuated through medical channels depends upon the strength and capabilities of participating units and personnel. Personal property, individual weapons, and equipment are retained by the individual unless other official arrangements have been made.

e. The losses to be assessed as a result of enemy action are a matter of judgment. The relative strength of the opposing forces is an important factor. Casualties and damages assessed as a result of an atomic burst may be such as to eliminate the unit, installation, or activity. These losses can be expected and are played realistically to insure realism once assessments have been made; cancellation of these assessments should be made only by order of the exercise director.

51. Assessment of Casualties

a. The assessment of casualties imposes a penalty on combat units by reducing their effective strength. When opposing forces are in contact, casualties are assessed in inverse ratio to combat power; for example, friendly forces advancing with a combat power superiority of 5 to 1, losses to friendly forces will be about one-fifth of those suffered by the opposing force. Failure to apply proper tactical

principles results in a high percentage of casualties. Failure to utilize concealment and cover or movement through fields of fire without neutralizing the weapons covering the fields of fire results in the assessment of a high percentage of casualties.

b. The assessment of casualties provides opportunities for realistic training for medical personnel. Casualties evacuated to and released from medical treatment installations are returned to their units through normal replacement channels; casualties released from the division recovery and disposition section are sent to the division replacement company and returned to their units through replacement channels. Casualties assessed by unit umpires are tagged by medical personnel as they are assessed, and the umpire supervises this action. The tag shows the name, the status (as "walking wounded" or "litter case"), and the specific nature of the wounds (par. 84). If casualties are assessed as a result of an atomic, chemical, or biological strike, medical and other rescue personnel should determine if it is possible to enter the area. After appropriate action to determine the hazards in the area, the umpire furnishes the simulated data to permit a decision. If no precautions are taken, umpires should assess and tag as casualties medical and other rescue personnel who attempt to enter the area. Appropriate medical care is simulated as the casualty moves to the rear through medical channels.

c. In assessing casualties, the following ratios of killed to wounded are used as a guide:

	Killed	*Wounded*
Tank elements	1	3
Artillery elements	1	4
Infantry elements	1	4
All other ground force elements	1	4

For additional information on casualties, see FM 101–10, chapter 2.

52. Infantry Unit Casualty Assessment

Assessment of casualties against an infantry unit (for other than atomic weapons) in any 1 day of severe combat seldom exceeds 15 percent. This percentage is considered in computing the total number of casualties assessed against rifle units. Each following percentage of loss serves as a guide under each condition described.

a. Fire by opposing infantry—1 to 3 percent per hour.

b. Overrun by tanks or self-propelled guns. Elements within 100 meters of any tank or self-propelled gun:

(1) Not entrenched—3 percent per tank or 2 percent per self-propelled gun.

(2) Entrenched or in foxholes—1 percent per tank or self-propelled gun.

53. Artillery Unit Casualty Assessment

Personnel losses to artillery units subjected to counterbattery fire are negligible. Loss data for infantry are used when appropriate to the action considered. When a battery in position is attacked, casualty assessment against attacking and defending troops is based on criteria in paragraph 51,

and on the relative firepower of the opposing forces. The firepower computations are shown in appendix II.

54. Reconnaissance Unit Casualty Assessment

Personnel losses of reconnaissance units fighting dismounted are assessed on the same basis as infantry losses. Vehicle losses of reconnaissance units are assessed as indicated in paragraphs 56, 65–68, and 70.

55. Casualties From Atomic Fires

a. Casualties from an atomic burst are dictated by the atomic damage templates (app III).

b. Casualties are assessed in units if they are located in or cross fallout contamination areas without taking proper protective measures and remain beyond safe-stay periods.

c. Contaminated areas of significant intensities will be indicated by coordinates or by use of radiation training set DVC 3–2 or similar device.

56. Casualties From Air Action

a. Upon confirmation of an air attack, the umpire marks the target with appropriate colored smoke (par. 16*e*) and assesses casualties in accordance with table VII.

b. The table is based on 1 pass by 1 aircraft. The area of coverage, damage, and casualty assessments indicated are adjusted to the number of attacking aircraft. It is realized that the location of attack as reported by the pilot from his map

differs slightly from the actual strike. The fact that the pilot attempts to select the most remunerative target for his attack is considered in assessing casualties.

Table VII. Casualties Inflicted by Aircraft

Personnel targets	Casualties per pass (percentage) [1]
Marching column, day	20
Marching column, night	15
Entrucked, day	40
Entrucked, night	25
In bivouac, dispersed	15
In bivouac, not dispersed	25
In foxholes	5

[1] Percentage of actual number of personnel in an area 50 x 200 meters per aircraft.

Note. Percentages given above are for the initial pass on a target. Assess 10 percent of initial pass percentage for each additional pass on the same target up to a total of 3 additional passes.

57. Casualties From Artillery and Mortar Fires

a. Artillery Concentrations. Losses from artillery fire are related to caliber of weapon, area effectively covered, surprise achieved, fuze employed, number of weapons firing, and number of volleys fired. Table VIII lists applicable percentages of loss for field artillery weapons using nonatomic projectiles. In determining losses incurred and area effectively covered by antiaircraft artillery, tank, and other weapons used in a field artillery role, use the effects data for the weapon in

table VIII which most closely correspond in caliber to the one being used.

b. Mortar Fire. Eight rounds of light or medium mortar (81-mm) or six rounds of heavy mortar (4.2-inch) are considered equivalent to a battery volley of light artillery.

Table VIII. Artillery Concentration Data

1. Weapon	Radius in meters area effectively covered by one battery volley	one battalion volley
75-mm howitzer	55	100
105-mm howitzer	80	115
155-mm howitzer	130	170
155-mm gun	90	180
8-in. howitzer	105	135
8-in. gun	110	205
240-mm howitzer	120	190
280-mm gun	100	145
4.2-in. mortar	150	190

2. Casualties per battery volley:

Erect	— 3 percent
Running	— 3 percent
Prone	— 1 percent
Entrenched	— 1 percent
In trucks	— 3 percent

(Percentages apply to number of personnel actually in the area.)

58. Casualties From Mines and Booby Traps

a. When simulated mines with live fuzes are used, the umpire assesses casualties in the following ways:

(1) For pressure-actuated antipersonnel

mines, only the man who actuates the mine is assessed a casualty.

(2) For a trip wire or actuated antipersonnel mine within a radius of 10 meters, 50 percent of the personnel are assessed as casualties and all mine detectors are destroyed.

(3) For a pressure-actuated antitank mine, personnel within a radius of 15 meters are assessed as casualties and all mine detectors are destroyed.

(4) For integrated high explosive (HE)—chemical minefields, 10 percent of the casualties from pressure-actuated antipersonnel mines are assessed as chemical casualties.

b. When manually breaching a minefield containing antipersonnel and antitank mines, the following is used:

(1) Assess 1 casualty per 50 meters of depth when a force manually breaches a 2-lane path 3 meters wide, 1 casualty per 100 meters of depth when breaching a 1-lane path 1.5 meters wide, and 2 casualties per 50 meters of depth when breaching one 7-meter vehicle lane.

(2) If minefield is covered by fire, casualty assessment will be determined by type and amount of covering fire.

(3) When integrated HE—chemical minefields are manually breached, the presence of chemical mines increases breaching

time by 50 percent. Failure to wear protective clothing will result in additional casualties.

c. When hasty breaching by tank or infantry is used, tables IX and X may be used as guides in assessing casualties.

Table IX. Antipersonnel Mine Casualties

Apers mine density per meter of mine field front.	24	20	16	12	8	4	2
Casualties (percentage)___	80	70	60	50	40	30	20

Note. Rates increase with poor visibility and decrease with poor camouflage.

59. Assessment of Casualties From Flamethrower Action

Losses resulting from flamethrower action are based upon the following:

a. Impact Areas.

Portable flamethrower ____10 x 49 meters
Mechanized flamethrower___15 x 175 meters

b. Casualties Assessed.

25 percent of personnel in the open.
50 percent of personnel in bunkers or fortifications with open embrasures and doorways.

Table X. Antitank Mine Tank Losses

AT mine density per meter__	3	2	1	0.5	0.2
Tank losses (percentage)____	90	80	60	30	10

Note. Rates increase with poor visibility and decrease with poor camouflage.

60. Toxic Chemical Casualty Assessment

a. General. Losses from toxic chemical attack are indicated separately from other losses. In G-agent attacks, casualty percentages are determined largely by the ability of troops to mask within 15 seconds following attack. In mustard attacks, percentages depend upon the state of gas discipline, exposure time, and protective clothing available. When a toxic chemical attack alert notification is used, unit umpires will be prepared to observe unit and individual reactions from the moment the attack starts and can thus make more realistic casualty assessments. After a unit umpire applies assessment data in *b* and *c* below, to the local situation, he submits the toxic chemical attack loss report through umpire channels. All casualty assessments should stress the importance of satisfactory gas discipline in reducing personnel losses.

b. Casualty Assessment From G-Agent Attack. Unit umpires use the appropriate G-agent template (par. 48) to assess casualties on units located within the target area by applying the following percentages and factors to the local situation:

(1) Casualty assessment rates from G-agent attacks are based on the following percentages:

(*a*) Unmasked personnel—50 percent dead*.

(*b*) Troops masking when alerted to attack —10 to 25 percent dead*.

(*c*) Troops masked prior to attack—5 percent dead*.

* Part of these deaths will be incapacitations initially and will require evacuation. However, additional incapacitations are not considered significant enough to warrant assessment of additional casualties.

(2) If gas discipline of a unit is generally unsatisfactory (below the 15-second masking standard outlined in *d* below), casualties will be assessed on the basis of "unmasked personnel." The exact percentage of casualties among personnel masking upon attack will be determined by the unit umpire in each specific situation, based on his evaluation of gas discipline and general unit reaction. If gas discipline is satisfactory (all personnel masked within 15 seconds), 10 percent casualties should be assessed. If troops are active or are perspiring at the time of attack, the percentage of casualties will be increased significantly even when mask discipline is satisfactory. The 5 percent casualty rate among troops masked prior to attack can be expected to result from improperly adjusted masks, malfunctioning masks, and fragmentation effects of delivery means.

c. Casualty Assessment From Mustard Attack. If troops ignore contamination markers or if a commander elects to cross a contaminated area rather than take the delay penalty (par. 48), casualties are assessed 7 hours after exposure on the basis of table XI.

Table XI. Casualty Assessment (Percentage per 100 meters of area crossed): Areas Contaminated With Mustard, Temperate Weather Conditions

	Unmasked and unprotected	Masks only	Masks and protective clothing
Troops on foot	14.0	2.5	1.0
Troops crawling	50.0	5.0	2.0
Troops in vehicles	1.0	0.5	0

d. Gas Discipline. Once toxic chemical warfare or biological warfare is assumed to have been initiated, personnel are required to mask immediately upon any direct attack by shell, spray, bomb, rocket, or cloud. The gas discipline of a unit is rated as satisfactory, unsatisfactory, or superior on the basis of the following standards:

(1) For a unit to receive a satisfactory rating in gas discipline, it must apply the prescribed procedures in FM 21–40 and FM 21–41, for masking, first aid, self-aid, and unmasking.

(2) Any performance by a unit below these minimum standards will be evaluated as unsatisfactory gas discipline, and casualties will be assessed accordingly.

(3) A unit is considered to have superior mask discipline when, in addition to standards in (1) above, it exhibits the following proficiency:

(*a*) Continue its mission during a gas attack with minimum loss in operating efficiency.

(*b*) Cross, avoid, or function in the contaminated area with minimum loss in operating efficiency.

(*c*) Decontaminate unit equipment.

(*d*) Operate and maintain unit chemical equipment.

(4) In assessing G-agent casualties, the above criteria should be used by umpires to determine casualties to personnel alerted to attack, within the 10–25 percent limitation.

e. Fragmentation Casualties. Following nerve gas attack, total casualty assessments should include casualties resulting from fragmentation effects, as well as those from chemical effects. A G-agent shell has approximately 45 percent as much fragmentation effect as an HE shell of the same type. This contributes to the 5 percent casualties among troops already masked at time of G-agent attack.

f. Evacuation. In order to add realism to the training situation, a representative percentage of casualties assessed should be tagged "chemical agent" and put into the medical treatment and evacuation system. Approximately 25 percent of the casualties resulting from a nerve gas attack will require evacuation.

61. Assessment of Biological Agent Casualties

a. Losses from biological agent attacks are indicated separately from other losses. Casualty percentages are determined by such factors as the following:

(1) Alertness of unit to imminence of attack, including immediate reaction to obvious indications, such as spray or dense smoke, immediate reaction to an alarm, and alertness to unusual weapons or dispensers. Such possible indications of biological attack should be reported and investigated immediately.

(2) State of unit gas discipline. Units and individuals must meet standards outlined in paragraph 60*d*.

(3) Decontamination procedures taken. Since soap and water is an effective field decontaminant, umpire personnel should observe whether maximum use is made of this decontaminant. Unit SOP's covering detection and sample collection and decontamination procedures should be in existence.

(4) Manner in which unit evacuates or operates in area suspected of contamination. Umpires should observe whether or not personnel are masked and whether movement is dispersed and precautions have been taken to prevent the stirring up of secondary aerosols.

b. Biological casualties are assessed after a 1 to 3-day incubation period, as announced by umpire headquarters. Such assessment is based on umpire observations of unit activity at the time of attack and information in table XII.

c. For training purposes, Aggressor forces may

be assumed to have two effective biological warfare agents: *bacillus pneumosporus* a sporeforming lethal-type agent, and *bacterium fatigum*, a vegetative incapacitating-type agent. The standard simulant bacillus globigii, which is a live harmless biological agent, may be used to simulate Aggressor agent *bacillus pneumosporus*. No symptoms occur in exposed personnel. Table XII gives casualty assessment data for the two assumed Aggressor agents.

Table XII. Assessment of Casualties From Assumed Aggressor Agents Bacillus Pneumosporus and Bacterium Fatigum

Aggressor Agent *Bacillus Pneumosporus*

Condition of personnel	Exposed personnel *		
	Total percentage casualties	Percentage fatalities untreated	Percentage fatalities treated
Exposed 15 seconds prior to masking (received LD_{50}).	53	50	26
Exposed 120 seconds prior to masking (received 8 x LD_{50}).	89—99	84—95	48

See footnote at end of table.

Table XII—Continued

Aggressor Agent *Bacterium Fatigum* (friendly forces having 40 percent effective immunity)

Condition of personnel	Exposed personnel *		
	Total percentage casualties	Percentage fatalities untreated	Percentage fatalities treated
Exposed 15 seconds prior to masking (received ID_{50}).	30	2	0
Exposed 120 seconds prior to masking (received x 8 ID_{50}).	54	3	0

* "Casualties" includes all personnel requiring treatment and evacuation following the simulated attack; "fatalities" refers to the percentages of casualties which can be expected to result eventually in death. LD_{50}, or lethal dose$_{50}$, is that amount of organisms necessary to kill 50 percent of personnel exposed; ID_{50}, or infective dose$_{50}$, is that amount of organisms necessary to infect 50 percent of personnel exposed. Exposed personnel received either an LD or an ID, depending upon agent used, in 15 seconds.

d. A representative portion, within limits established by maneuver director headquarters, of assumed casualties should be tagged and put into the medical treatment and evacuation system at the end of the announced incubation period. A realistic ratio of fatalities to illnesses should be maintained as simulated casualties are moved through medical installations.

62. Assessing Casualties From Radioactive Fallout

a. Both immediate and delayed casualties are assessed when radioactive fallout is played as a secondary effect of surface bursts of atomic weapons or as a primary weapons effect. Using the appropriate fallout template (app. III) and dose rate reports received through umpire channels,

unit umpires continually assess casualties and inform commanders of strength reductions resulting from radiation sickness. In order to present a realistic combat situation, unit umpires should endeavor to establish rates and times as nearly parallel as possible to those resulting from actual exposure, considering individuals casualties on the day actual symptoms could be expected to occur. A representative portion of casualties, within limits established by maneuver headquarters, should be put into the evacuation system daily. Shielding criteria for use in assessing radiation casualties is given in DA Pam 39–1.

b. Casualties from acute radiation doses are assessed in units in or crossing contaminated areas on the basis of fallout templates and decay data received through umpire channels. Unit umpires establish safe stay times as indicated by the fallout template and inform commanders of losses incurred. DA Pam 39–1, table I, gives dose rates varying in effect from negligible to lethal and times at which symptoms and incapacitation or death can be expected to occur.

c. Chronic doses of radiation, or the effects of repeated exposure to smaller dose rates, become an important consideration in commander judgment when detonation of several atomic weapons is simulated. Unit umpires should keep general tab on accumulative doses received by unit personnel and assess casualties accordingly when contamination is present or when contaminated areas are crossed. Percentages of casualties expected to occur from dose rates received over a period of 3 months are given in table XIII.

Table XIII. Estimated Casualty Effects of Radiation Doses Expressed as Percentage of Force Affected [1]

Total dose (r)	Early effects for periods of time over which total dose is received					Late effects
	1 day (percentage)	3 days (percentage	1 week (percentage)	1 month (percentage	3 months (percentage)	
0 to 75	0 sick	----------	----------	----------	0 sick	None
100	2 sick	0 sick	----------	----------	0 sick	None
125	15 sick	2 sick	0 sick	----------	0 sick	None
150	25 sick	10 sick	2 sick	0 sick	0 sick	None
200	50 sick [2]	25 sick	15 sick	2 sick	0 sick	Some late effects
300	100 sick [2] 20 die [2]	60 sick 5 die	40 sick	15 sick	0 sick	Some late effects
450	100 sick [2] 50 die [2]	100 sick 25 die	90 sick 15 die	50 sick	0–5 sick	Some late effects
650	100 sick [2] 95 die [2]	100 sick 90 die	100 sick 40 die	80 sick 10 die	5–10 sick	Some late effects

[1] This table applies to healthy, young adults under usual working conditions. The percentage of fatalities will be decreased with adequate medical treatment. The percentage figures are based on an interpretation of the best current available evidence and may be changed as more information is accumulated.

[2] Based on Nav Med P–1330, DA Pam 8–11, and Air Force Manual AFM 160–11.

63. Civilian Casualty Assessment

Unit umpires realistically assess simulated civilian casualties resulting from atomic as well as nonatomic fires. Civilian casualties from atomic weapons will be assessed in accordance with paragraphs 55 and 62. The approximate number of civilian casualties will be provided by unit umpires to the closest military unit for necessary action.

Section IV. DAMAGE ASSESSMENT

64. Materiel Damage Assessment

a. Umpires assess vehicles and other materiel damaged or destroyed on the basis of a reasonable loss expectancy in a similar combat engagement. The umpire informs the occupants and operators of the severity of the damage by completing a damage tag (par. 85).

b. Damages to ambulances carrying actual casualties and/or emergency medical supplies, kitchen trucks, and mail trucks are not assessed.

c. Cargoes of vehicles ruled out of action may be transferred to other vehicles by the using unit, provided such cargo has not been ruled as destroyed.

65. Damage From Artillery Fires

Vehicles passing through or remaining within an artillery or mortar concentration of battalion size or larger are assessed losses as follows:

a. Armored vehicles____⅓ percent per battery volley (155-mm or larger weapons).

b. Unarmored vehicles___3 percent per battery volley.

66. Damage From Atomic Fires

a. Materiel damaged by an atomic burst is assessed damage as indicated by the appropriate atomic damage template (app. III).

b. Materiel contaminated by fallout from a surface or near surface burst is considered to have the same intensity of radioactivity as the area in which it is located at the time of contamination. The decay rates apply to the materiel in the area until it is decontaminated.

67. Damage From Toxic Chemical or Biological Contamination

a. Materiel (except class I supplies) contaminated by mustard is assessed as slightly damaged; class I supplies are assessed damage according to the degree of contamination. Personnel handling contaminated materiel are required to wear protective masks until simulated decontamination is accomplished. Vehicles and weapons must be decontaminated, or operating personnel must continue to wear protective masks for a minimum of 6 hours after contamination. Usual time for decontamination of a vehicle is 30 minutes. Materiel in the target area during G-agent attack is not normally assessed as damaged by contamination, but a portion should be assessed as slightly damaged by fragmentation effects (par. 60*e*).

b. Normally only class I supplies which are not

packaged or canned at the time of attack will be assessed as materiel losses from biological attack.

68. Fire Duels (Armor)

a. Fire duals at great range are difficult to umpire. Losses are assessed only when, in the opinion of the umpire, a fair decision can be made. No losses against other tanks are assessed from the fire of guns of vehicles in motion.

b. Guns of comparable size are scored on the basis of position as follows:

(1) Ground gun behind natural or artificial cover—2.

(2) Vehicular-mounted gun (armored) behind natural or artificial cover—4.

(3) Ground gun unprotected by natural or artificial cover—1.

(4) Vehicular-mounted gun (armored) unprotected by natural or artificial cover—3.

c. Guns must be laid accurately on the targets. If blank ammunition is not available, a red flag is waved to simulate firing.

d. A collective score method is used if the number of guns or vehicles or both engaged in the fire dual is sufficient to render the foregoing method of scoring impracticable. The umpire determines the total score of each side and rules all or a portion of the weaker side destroyed. Terrain, tactical employment, and duration of the action are considered. Losses to the stronger side are assessed in the inverse ratio of the total scores. *Example:*

Friendly forces score, 40; Aggressor score, 30; 20 Aggressor vehicles ruled destroyed; three-fourths of 20, or 15 of the friendly vehicles ruled destroyed.

e. When tanks maneuver against tanks, provided they are within effective range, the losses are computed in the inverse ratio of participating tanks of the opposing forces. Consideration is given to cover, concealment, position, first aimed shot, caliber of weapons, part of tank exposed and whether tanks are stationary or moving. A medium tank is considered the equivalent of 1½ light tanks. *Example:* Friendly force, 10 medium and 15 light tanks; Aggressor, 20 light tanks; losses are computed in the ratio of 2 friendly tanks to 3 Aggressor tanks.

69. Area Damage Control

The introduction of nuclear weapons into military operation will have a profound import upon the course of both tactical and logistical operations. Realistic umpiring of area damage control operations is essential to proper maneuver control. For details of area damage control umpiring procedure, see appendix III, section IV.

70. Damage From Air Action

The following table is applicable to assessment of damages resulting from air action:

Table XIV. Damage to Ground Targets by Aircraft (Nonatomic)

Target	Damage per sortie
Unarmored vehicles	13
Armored vehicles	11
POL dumps	20 percent
Ammo dumps	20 percent
Supply dumps	20 percent
Gun emplacements	11
Field pieces	11
Buildings (per building)	40 percent
Missile launching site	11
Atomic logistic installation	11

[1] In no case will the assessment exceed the number of actual targets.

Note. Percentages given above are for the initial pass on a target. Assess 10 percent of initial pass percentage for each additional pass on the same target up to a total of three additional passes.

71. Aircraft Destroyed By Ground Fire

a. Air defense battery umpires perform their duties as prescribed in paragraph 13. Adequate air-ground communications is available so that the antiaircraft battalion umpire can report losses to the air umpire with the flight. When determining the losses to be assessed against aircraft resulting from ground fire, consideration is given to the type weapons which engage the target. For example, when the target is out of range of gun type weapons but within range of surface-to-air missile (SAM) units, only the SAM units are considered to be engaging the target.

b. Losses to flights engaged by guided missiles and number of penetrations will be assessed as follows:

(1) Analyze the effectiveness of the defense utilizing the burst locator technique as explained in Training Circular 44–2.

(2) Calculate the total number of missiles capable of being fired against a particular aircraft or flight.

(3) If appropriate, reduce this total number by a percentage factor (par. 24*c*(4)) selected by the umpire to indicate realistically loss in effectiveness due to maintenance failure, lack of operational readiness, improper leveling, orientation, or synchronization and other shortcomings in the target engagement cycle. NIKE AJAX checks and adjustments umpired will be as set forth in the NIKE AJAX *Commander's Inspection Handbook.*

(4) Utilizing the factors listed below, which introduce an assumed weapon kill probability, calculate the total number of aircraft which could be kept from penetrating the defense.

(5) Based on the number of enemy aircraft in the raid and the capability of the defense as calculated in the preceding subparagraphs, compute the number of aircraft penetrating the defense.

*Assumed SAM kill factors**	
NIKE AJAX	.5
NIKE HERCULES	.7
HAWK	.8

* When atomic warheads are utilized, umpires must modify the conventional warhead factors to incorporate the high kill probability of the atomic warhead.

c. Losses of flights engaged by both gun and light air defense weapons (including 75-mm "Skysweepers") are the sum of the losses incurred from each type of fire. Aircraft losses are assessed in accordance with the following formula:

(1) For planes, other than jet, within 15,000 feet altitude and attacking a defended area: (Number of guns in the defense) $\times$ (Number of planes) $\times$ .03 = loss.

(2) For jet aircraft, divide the resulting loss by 2.

d. Offensive aircraft on low-altitude close support missions are subjected to a flat 20 percent kill rate by local air defenses. This rate applies to all air defense gun type weapons: 90-mm, 75-mm (Skysweeper), and 40-mm.

e. Fractions greater than 0.5 will be assessed as a whole aircraft.

72. Damage to Civilian Communities and Property

a. The damage to civilian communities and property during the conduct of combat operations should be realistically portrayed by unit umpires, so that appropriate civil affairs/military government (CAMG) play may be accomplished.

b. Effective control can be uniformly handled by the publication of consolidated damage assessments from the director's level to all participants.

Section V. CAPTURE OF PERSONNEL AND MATERIEL

73. Capture of Personnel

a. The capture of friendly force personnel pro-

vides added realism and also imposes a penalty on the unit by reducing its operational effectiveness. All Aggressor troops are subject to capture. Selected Aggressor personnel, atomic delivery units, atomic logistic units, etc., may be injected into the exercise for capture by the friendly force as a part of the intelligence play and to provide training in the proper methods of prisoner of war evacuation, treatment, interrogation, and processing. This should include, in the interest of realism, personnel who will speak only a foreign language. See FM 30–104.

b. Prisoners of war are guarded properly to prevent escape just as they would be in an actual situation except that live ammunition is not issued to prisoner of war guards.

c. The chief umpire arranges for frequent exchanges of prisoners to avoid keeping too many men out of training. Prisoners being repatriated during such exchanges will be considered as noncombatants in every respect until they have been returned to control of their respective units.

d. When an entire unit or the major portion thereof has been captured, the umpire authorizes the retention of selected individuals as prisoners of war, and directs that the remainder of the captured personnel be moved to a designated location and remain out of action for a specified period of time. Umpires should require capturing units to evacuate prisoners of war promptly. Aggressor-prepared prisoners make themselves known to the umpire so they can be designated for retention as

prisoners of war to be processed. However, if the time out of action permits and if facilities and personnel are available, all or as many as possible of the captured unit will be processed as prisoners of war. Special instructor teams should be available to conduct the training listed in *e* below, to entire captured units. These teams should be composed of 2 or 3 well-qualified individuals, operating from maneuver director headquarters.

e. During the time prisoners are detained (by either side), they should be held long enough to receive concentrated instruction in—

(1) Code of conduct.

(2) Methods of prisoner of war camp organization.

(3) Escape and evasion.

(4) Survival (including in-camp survival).

f. Prisoners of war retain their personal property, individual weapons, and equipment during processing. The capturing or holding unit provides rations and emergency medical care for prisoners of war as required.

g. Capturing forces or units subject maneuver prisoners to interrogation, indoctrination in opposing forces concepts, and exploitation in respect to questionnaires, broadcasts, and written statements, but do not subject them to indignities or physical pressure. Captors remain responsible for the health and welfare of prisoners and will not endeavor by undue means to force prisoners to violate the code of conduct. Commanders and um-

pires insure that realism is kept within reasonable bounds. In considering the circumstances of capture, proper recognition is given surprise, aggressiveness, stealth, ambush, and mobility so that these factors are tactically rewarded in the play of the exercise. When appropriate, umpires include in their daily reports the following additional items:

(1) Actions of prisoners while under control of opposing force.

(2) Treatment accorded prisoners by their captors.

(3) Prisoner knowledge of provisions of the Code of Conduct and Geneva Conventions of 12 August 1949.

74. Capture of Installations and Materiel

a. Installations.

(1) Medical installations which are captured by either side are returned to parent units as soon as practicable.

(2) Depots, supply points, railheads, distributing points, and dumps captured by either side are ruled out of action for the duration of the exercise or such other period as determined by the chief umpire.

(3) Installations, supply points or other activities possessing classified atomic materiel will not be subject to actual capture but will be ruled out of action for the duration of the exercise or such other period as determined by the chief umpire.

b. Materiel.

(1) Vehicles, Army aircraft, weapons, pneumatic equipment, and sonic equipment (except that with fire marker teams) are subject to capture except as noted in (2) and (4) below, and are processed with their drivers and crews to avoid loss or damage to government property. Vehicles, Army aircraft, and weapons ruled captured are held in place out of action for a designated period of time or they are dispatched to a prisoner of war installation and held there for the period of time designated by the umpire. At no time will the driver or crew be separated from the vehicle.

(2) Kitchen trucks and ration trucks are normally returned to parent units without delay. However, in the interest of realism, minimum delays may be assessed. Ambulances actually carrying casualties and mail trucks are not subject to capture.

(3) Cargoes of vehicles processed with prisoners remain with the vehicles. Transfer to other vehicles is prohibited except that gasoline and blank ammunition may be taken by the capturing unit.

(4) Tampering with Army aircraft or removal of aviation gasoline will be strictly prohibited.

(5) Security of classified atomic weapons material will not be violated. Personnel and

forces responsible for the security of the material will not be replaced, harassed, molested, or interfered with.

Section VI. OBSTACLES

75. Obstacles

a. General.

(1) Obstacles may be simulated but are actually created if permissible on the terrain being used. The primary purpose of an obstacle is to delay the opposing force. However, obstacles affect friendly as well as enemy troops and umpires will impose appropriate delays in all cases. If the obstacle is to be simulated, the necessary materials and personnel must actually be on hand and checked by the umpire. The obstacle is marked when the time estimated to be required to complete it has passed. Partial obstacles for which insufficient time exists for completion are rated as to effectiveness and marked by the unit umpire at the time work is assumed to have ceased. The state of effectiveness of an incomplete obstacle is noted on the Certificate of Obstacle (fig. 11) (i.e., partial demolition of a bridge has reduced the capacity from 40 tons to 5 tons; partially completed minefield is effective only where mines actually have been laid).

(2) The unit that completes or partially com-

pletes a simulated obstacle furnishes a guard who is given umpire authority and identification so that he can enforce compliance by all troops. Guards remain on duty at obstacles until relieved by the umpire or until the end of the exercise. After the opposing force has reduced an obstacle, the unit umpire relieves the guard who is then returned administratively to his unit.

(3) When a simulated obstacle is completed or work is assumed to have ceased on a partially completed obstacle, the unit umpire furnishes the guard one copy of completed Certificate of Obstacle. If an umpire is not present, a unit officer signs the certificate but must advise the unit umpire of his action. The umpire checks the form as soon as practicable; however, the statement of the form is valid with the signature of a unit officer. The unit executing a simulated obstacle also places a black flag at each end of the obstacle.

b. Reducing Obstacles.

(1) The time required to reduce an obstacle is determined from instructions contained in the Certificate of Obstacle. If the obstacle is covered by fire, the time required by the opposing force to reduce the obstacle is greater and casualties are assessed in accordance with instructions contained in paragraphs 50 through 63.

(2) Time required to breach minefields.

(*a*) When minefields comprise practice or simulated mines, the opposing troops are required actually to breach the minefield using approved techniques.

(*b*) When the minefield is simulated, the time required for breaching can be calculated from table XV.

c. Engineer Data. The time for completion of various engineer tasks such as, minefield laying, breaching data, construction data and repair of obstacles can be calculated from FM 101–10, FM 5–35, and FM 20–32.

Table XV. Minefield Breaching Data

Activity	Average rate	Probable casualties for mines
Breach and mark (tracing tape) a 3-foot to 5-foot path through the entire field, marking AT mines and hand neutralizing all Apers mine encountered.	50 meters per hour (flat, open terrain, some tall grass).	1 per 100 meters of depth.
Breach and mark (tracing tape) two 3-foot to 5-foot paths 7-meters on either side of and parallel to center line, marking AT mines and hand neutralizing Apers mines.	50-meters per hour (terrain as above).	1 per 50 meters of depth.
Breach and mark 7-meter vehicular lane, marking AT mines and hand neutralizing Apers mines.	50 meters per hour (terrain as above).	2 per 50 meters of depth.

Table XV. Minefield Breeching Data—Continued

Activity	Average rate	Probable casualties for mines
Uncover and remove by rope all AT and Apers mines previously marked by above parties.	5 min per man per mine.	25 percent of rates shown above for breaching and marking (due mainly to undetected and unmarked small nonmetallic mines).

Note. For integrated He-chemical minefield, decrease rates above by 50 percent and increase probable casualty estimates by 50 percent.

CERTIFICATE OF OBSTACLE

(to be executed by unit officer when umpire is not present)

1. TYPE AND NATURE OF OBSTACLE (Example: Bridge demolition, bridge damaged by bombs, road crater, prepositioned weapons).

2. METHOD USED (Brief description of work done. Example: Destroyed abutments by tamped charges, etc.)

3. MATERIAL OR EXPLOSIVE USED (Example: for abutments, 6 charges 200 pounds each, 10 charges 15 pounds each)

4. STARTED (Date and hour)
   COMPLETED (Date and hour) or
   DATE AND HOUR BOMBED

5. COMMENT:

UMPIRE CERTIFICATE

1. I HAVE INSPECTED THE OBSTACLE DESCRIBED ABOVE AND FIND THAT IT (WILL) (WILL NOT) CREATE AN EFFECTIVE MILITARY OBSTACLE.

2. DATE AND HOUR EXECUTED: (If no umpire is present at the time of execution, this may be completed by the senior officer of the executing party and be official. An umpire will verify all such work executed by his unit as soon as practicable.)

UNIT OFFICER _____ UMPIRE _____

OBSTACLE REDUCED AT _____ HRS

DATE _____

BY _____

(UNIT) (SIGNATURE OF UMPIRE) (RANK)

Figure 11. Certificate of obstacle.

INSTRUCTIONS—UMPIRES

ACTIONS: Require operations to be actual whenever possible. Fill in data on reverse side and give to guard at obstacle. Check that material to execute or reduce simulated obstacles is at site when operations are carried out. Visit all detachments sent on obstacle work to complete the certificate.

SPECIAL NOTES

Troops may go around an obstacle, provided the movement is actual. The umpire with a delayed unit must not modify the provisions of the certificate of obstacle under any circumstances.

When a defended obstacle is attacked by the opposing side, the result of the attack is decided as in any similar action. The clearing of an obstacle by the attacker can commence only after successful completion of the attack is ruled by the umpire.

Figure 11—Continued.

d. Delays and Casualties.

(1) Obstacles that result from air action, atomic attack, toxic chemical or biological contamination, and radiological contamination, are marked by the ground umpire who assesses the damage. He completes the certificate, places the flags, and details a guard from the nearest unit.

(2) Troops may go around an obstacle provided the movement is actual. The umpire with a delayed unit will not modify the provisions of the certificate of an obstacle under any circumstances.

(3) Areas contaminated by toxic chemicals and fallout must be recognized by combat elements. Units failing to avoid such areas or take necessary precaution are assessed appropriate casualties.

(4) Marching columns or convoys attacked by air, armor, or artillery and prevented from reacting logically by administrative restrictions, are assessed delays equivalent to the time required to disperse and assemble.

(5) Personnel working on bridges, roads, or other projects who are subjected to massed mortar or artillery fire or an air attack are required to cease work for the duration of the concentration or attack. Work may continue if the area is subjected to interdiction fire only but no work can be carried on in an area subject to direct small-arms fire.

e. Obstacles From Air Action. Air attacks against bridges and the delays resulting from the damage inflicted influence the progress of a tactical exercise. Prior notice of air attacks on bridges is furnished umpire operations by air umpires in order that an umpire is designated to be at the bridge site at the time of the attack. When the bridge is defended by an antiaircraft unit, the antiaircraft unit umpire is designated to act as the umpire at the bridge site. The number and weight of bombs and number of hits on target are given the umpire at the bridge site through umpire channels. The

umpire uses the following as a guide in assessing delays and damages to bridges:

(1) Steel truss and concrete bridges of substantial construction.

Bomb weight	Delay (after arrival of men and material)	Necessary for repair
100 lb	None	None.
300 to 600 lb	2 hr	1 plat engineer, 3 trailer loads timber or equivalent.
1,000 to 2,000 lb	4 hr	1 plat engineer, 6 trailer loads timber or equivalent.

(2) Wooden highway and railroad bridges. A 100-pound bomb or heavier has same conditions as shown in *a*(1) above, for 300 to 600-pound bombs.

(3) Ponton bridge. A 100-pound bomb or heavier requires a 1-hour delay after material for one-third or 4 spans of the bridge is at the site.

(4) Conditions in (1), (2), and (3) above, are for 1 hit; for more than 1 hit, men, material, and delay are increased accordingly.

f. Obstacles and Delays From Atomic Burst. The atomic weapons umpire group determines which atomic damage template (ADT) is appropriate for

the type of burst and informs unit umpires of the actual ground zero and which ADT to use (par. 35). From this information, the unit umpire can determine the extent of obstacles or other damage and casualties in his particular area. He uses this information in umpiring situations in the affected area. Delays are assessed in accordance with time required to clear the obstacle. The rate of clearance concerning tree blowdown resulting from a simulated atomic burst is 250 meters square per engineer bulldozer and associated equipment per hour.

CHAPTER 5
UMPIRE COMMUNICATIONS

76. General

Communications for the ground umpire group normally consist of radio, wire, and messenger. For large-scale exercises, communications for the ground umpire group may be augmented by the use of helicopters. Wire and messengers are used for routine messages to reduce the volume of radio traffic. Radio communication is mandatory for umpire liaison teams, fire marker teams, and unit umpires at battalion level and below. An extensive wire net, with readily accessible leads to all key localities in the exercise area, is essential to insure adequate communications between umpire headquarters and unit umpires.

77. Free and Controlled Exercises

In free exercises, identical communication nets are provided for umpires with both sides. Only the fire marker net and the umpire liaison net are required for umpires with the Aggressor force in controlled exercises when unit umpires are not assigned.

78. Umpire Communication Center

In a large-scale exercise, in order to facilitate the review and analysis of umpire reports by the operations section of headquarters, umpire group,

it is necessary to establish an umpire communications center. The communications center has sufficient stations to provide 1 radio receiver for each 3 battalions and/or battle groups reporting to the operations section. Telephone facilities are also provided. Teletype circuits are provided between relay stations, umpire operations section, and exercise director war room.

79. Radio Nets

Umpire radio nets are organized in the same manner as, and parallel to, normal troop radio nets.

80. Umpire Liaison Teams

Umpire liaison teams, using the exercise signal operation instructions (SOI), operate in any net of the unit to which temporarily assigned. When not performing umpire functions, these teams standby (monitor) the chief umpire net.

81. Fire Marking

Fire marker teams maintain radio contact with the unit to which attached. Only under exceptional circumstances will existing artillery lines of communications be used for communication between the control team and the FDCs.

82. Atomic Weapons Umpiring Nets

a. Two special communication nets are required for the handling of atomic weapons umpiring. These nets are—

(1) General broadcast.

(2) Atomic weapons umpire.

b. The general broadcast net is used to broadcast strike data, TOT, and low altitude air defense atomic burst information to all umpires, atomic weapons FMCC, and fire marker teams.

c. The atomic weapons umpire net is used for communications between FDCs of artillery or other units having either a prepositioned or atomic weapons delivery capability, atomic planning headquarters, and atomic weapons umpire group.

d. Atomic weapons umpire net (fig. 12).

(1) Net normally operates on voice but has capability of operating on radioteletype (RTT) if necessary.

(2) TSEC/KW–9 or prearranged brevity and/or operation codes are used for security of information pertaining to strike data.

(3) Particular attention is paid to propagation charts so the best frequencies are allotted to this net.

(4) Net is operated on one frequency with net control at atomic weapons umpire group. Net is operated either free or controlled.

(5) This net is backed up by the umpire wire system.

e. General broadcast net.

(1) Net will normally operate on voice.

(2) Prearranged brevity and/or operation codes will be used for security of information pertaining to strike data.

(3) To check operation and reception of transmission, the master station will send a time check every hour on the hour. This enables the fire marker teams to check the reception in whatever area they may be located.

(4) Particular attention is paid to propagation charts so the best frequencies are allotted to this net.

83. Umpire Relay Center

When distance or mechanical difficulties preclude battalion umpires or liaison teams from communicating directly with the communications center at umpire headquarters, relay stations are suitably located throughout the exercise area to retransmit messages to the umpire operations room. Radio communications are augmented by telephone and teletype circuits between the relay stations and umpire communications center in sufficient number to handle expected *peak* traffic loads. Operating personnel of relay stations are augmented by umpire operations personnel to screen or consolidate messages and to maintain a limited operations map for the chief umpire and exercise director.

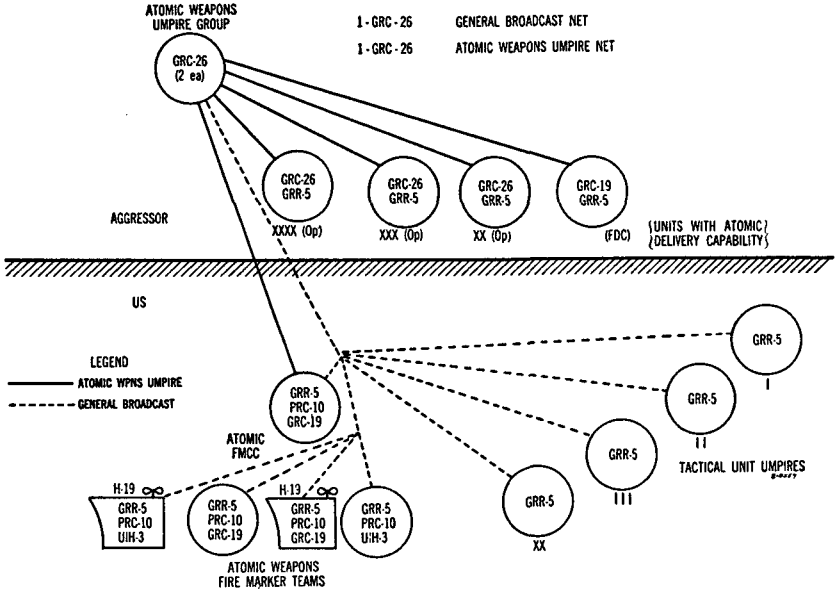


Figure 12. Atomic weapons umpiring net.

CHAPTER 6
MISCELLANEOUS

Section I. CASUALTY AND DAMAGE TAGS

84. Casualty Tags
(fig. 13)

In assessment of casualties, see paragraph 51. Umpires use the folowing tags when assessing casualties:

a. Walking Wounded. A green card bearing the words: "Walking Wounded. Proceed to your unit aid station for evacuation."

b. Litter Case. A red tag bearing the words: "Litter Case. Remain in place until picked up and evacuated by litter bearers. You may call for aid men."

c. Dead. A white card bearing the words: "Dead. The recovery and disposition section will pick you up, evacuate, and process you. Upon completion of action by recovery and disposition section, you will be returned to your unit through replacement channels."

85. Damage Tags
(par. 52)

a. Slightly Damaged. A green tag bearing the words: "Slightly Damaged" (fig. 14).

(GREEN COLOR)

WALKING WOUNDED

NATURE OF WOUND

Proceed to Your Unit Aid Station for Evacuation

(RED COLOR)

LITTER CASE

NATURE OF WOUND

Remain in Place Until Picked Up and Evacuated by Litter Bearers. You May Call For Aid Men.

(WHITE COLOR)

DEAD

The Division Recovery and Disposition Section Will Pick You Up, Evacuate, and Process You. Upon Completion of Action by Recovery and Disposition Section, You Will Be Returned to Your Unit Through Replacement Channels.

Figure 13. Casualty tags.

(1) The umpire assessing the damage fills out the front of the tag giving time, date, and place the vehicular equipment was damaged. The unit and the bumper number (or other equivalent number) are entered in the spaces provided. The nature of the damage is briefly described. The driver or noncommissioned officer (NCO) in charge of the vehicle or equipment signs on the back of the perforated stub. The umpire signs the tag and the stub. The stub is retained by the umpire, and the tag is tied to the equipment or vehicle. All stubs are forwarded to umpire headquarters along with other reports. An orange flag is displayed on the vehicle or equipment.

(2) The driver or NCO in charge determines a course of action to be taken to repair the vehicle or equipment. The individual completing the repairs fills out the back of the tag. An officer or NCO in charge of the repairing unit, or the driver in case of first echelon repairs, signs the tag. The tag and the orange flags are removed from the vehicle or equipment and turned over to the umpire of the unit making the repairs. The umpires send all tags with their reports to umpire headquarters where a check is made to make certain that all vehicles and equipment which have been tagged as slightly

damaged have been properly repaired (simulated) and that proper logistical factors are taken into account.

b. Severely Damaged. A red card bearing the words: "Severely Damaged" (fig. 15).

(1) The umpire's procedure in filling out this tag is the same as in *a*(1) above.

(2) The driver or NCO in charge of the equipment or vehicle contacts his unit commander to have the equipment or vehicle evacuated for repairs. The unit making the repairs fills out that portion of the back of the tag pertaining to repairs. An officer or NCO of the unit making the repairs signs the tag. If it is decided to replace the item, then that portion of the tag pertaining to replacement is completed. An officer or NCO of the issuing unit signs the tag. In either case, the completed tag is turned over to the unit umpire who forwards it to umpire headquarters. A check is made to see that all vehicles or equipment tagged "Severely Damaged" have been properly evacuated and repaired (simulated) or replaced and that proper logistical factors are taken into account.

c. Destroyed. A white tag bearing the word: "Destroyed" (fig. 16).

(1) The umpire fills out the tag as in *a*(1) above.

(2) The driver or NCO in charge of the vehicle or equipment remains in place for 1 hour. The unit reports, through channels, the combat loss. When the replacement item is available at battle group supply (or equivalent office), the unit is notified to come and pick up the replacement. The vehicle or equipment is taken to the point of delivery where the tag is removed and the equipment is placed in service. An officer or NCO of the issuing office fills out the back of the tag, signs it, and turns it over to the unit umpire. The tag is forwarded to umpire headquarters where a check is made to see that all destroyed vehicles and equipment are properly replaced.

d. Contaminated. A blue tag bearing the word: "Contaminated" (fig. 17).

(1) The umpire procedure for filling out this tag is outlined in *a*(1) above.

(2) Personal equipment will be decontaminated by the individual. The driver or NCO in charge of the equipment or vehicle contacts his unit commander to have equipment decontaminated. The unit performing the decontamination fills out that portion of the tag pertaining to decontamination and signs the tag denoting method used in decontamination. The completed tag is turned over to the unit

umpire for forwarding to umpire headquarters.

e. When an item of equipment or material is both damaged and contaminated, two tags will be placed on the item and proper action taken as outlined above.

f. To facilitate matching up tags and stubs at umpire headquarters, they are numbered serially prior to issue.

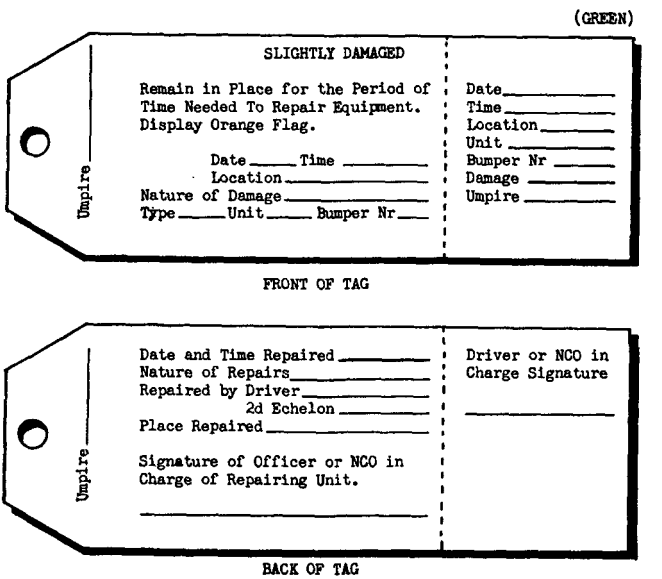
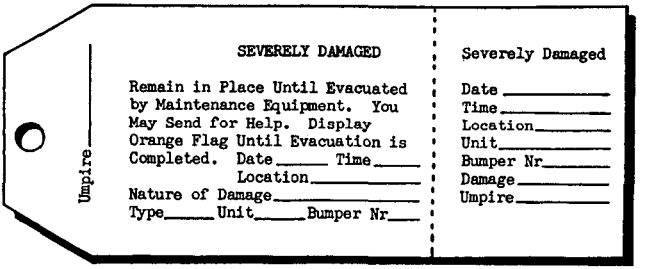
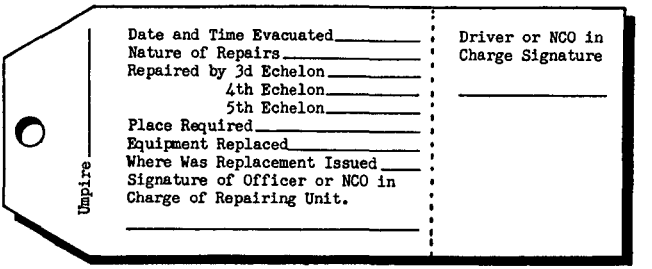


Figure 14. Slightly damaged tag.

(RED)



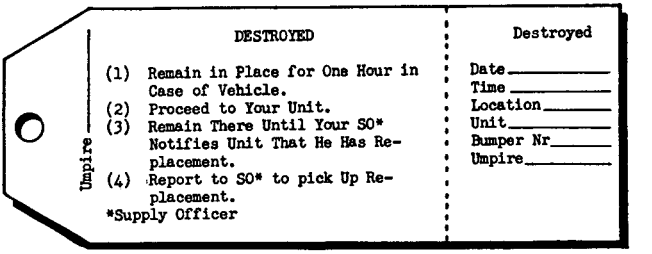
FRONT OF TAG



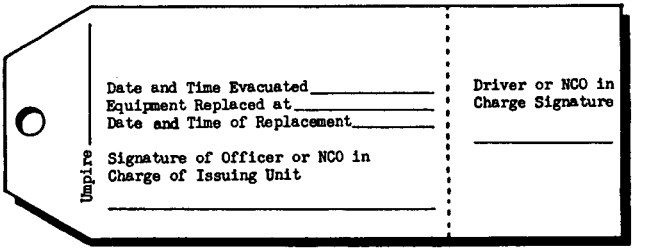
BACK OF TAG

Figure 15. Severely damaged tag.

(WHITE)



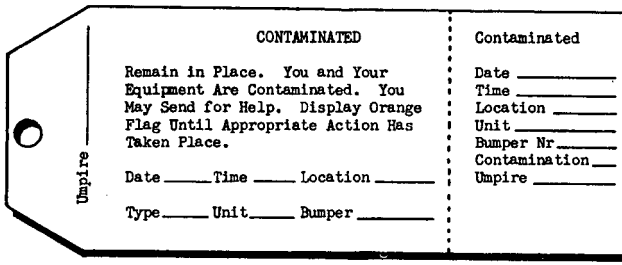
FRONT OF TAG



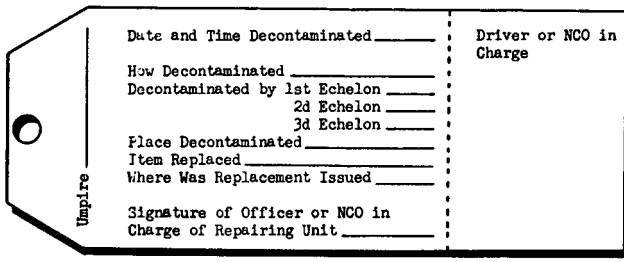
BACK OF TAG

Figure 16. Destroyed tag.

(BLUE)



FRONT OF TAG



BACK OF TAG

Figure 17. Contaminated tag.

Section II. PERSONNEL

86. Assignment of Umpires

a. Care is exercised in the assignment of umpires. Every effort is made to obtain personnel with previous umpire experience for key staff and specialist positions. Officers assigned as unit umpires should have served in the same branch of service as the unit to which assigned. Combat experience is especially desirable. Personnel are

so far as possible, from units other than those participating in the exercise to minimize a tendency to become a "part" of the unit and to facilitate maintaining strict neutrality in attitude and actions.

b. Officers assigned to the atomic weapons subsection must be graduates of a special weapons course of a service school. SAM umpires must include personnel trained in the employment of air defense atomic warheads. In addition, officers trained in atomic weapons employment are integrated into all major units at umpire headquarters and at exercise director headquarters.

c. Air defense umpires must be qualified in their primary MOS and, based on the MOS, are assigned to units to be umpired.

87. Personnel Requirements

The personnel requirements set forth in this section are a guide only. The requirements for a specific exercise may vary considerably from those outlined below. In exercises of battle group or smaller scale, training tests, or organization and equipment tests, provision of umpires as indicated in paragraph 88, column 1, is appropriate. In exercises of division or larger scale, assignment of umpires as indicated in paragraph 88, column 2, is generally adequate. The objective of a particular exercise may indicate the desirably of using a combination of columns (1) and (2).

88. Unit Umpires Infantry Division (ROCID)

a. Division Troops.

	(1) *Small-scale exercises*		(2) *Large-scale exercises*	
	Off	*Driver*	*Off*	*Driver*
Division headquarters	5[c]	2[a]	5[c]	2[a]
Intelligence umpire	1	1[a]	1	1[a]
Brigade headquarters	2	2[a]	2	2[a]
"Troubleshooter" umpire.	4	4[a]	4	4[a]
Military police detachment.	1	1[a]	0[c]	--
Medical Corps umpire	1	1	1	1
Division trains				
Trains headquarters and band.	2	2[a]	1	1[a]
Quartermaster company.	1	1	1	1
Medical battalion	1	1	1	1
Clearing company	1	1	0[c]	--
Ambulance company	1	1	0[c]	--
Ordnance battalion	1	1[a]	1	1[a]
Ordnance company forward.	1	1[a]	1	1[a]
Ordnance company rear.	1	1[a]	1	1[a]
Aviation company	1	1[a]	1	1[a]
Transportation battalion.	1	1[a]	1	1[a]
Division artillery				
Headquarters	1	1[a]	1	1[a]
Central fire control agency.	1	1[a]	1	1[a]
Artillery battalion	1	1[a]	3	3[a]
Artillery battery	1	1	0[d]	--
Tank battalion	2	2[a]	1	1[a]
Tank company	1	1[a]	2	2[a]
Tank platoon	1	1[a]	0[d]	--

	(1) Small-scale exercises		(2) Large-scale exercises	
	Off	*Driver*	*Off*	*Driver*
Engineer battalion[b]	1	1	2	2
Engineer company	1	1[a]	0[d]	--
Signal battalion	1	1	1	1
Reconnaissance battalion	1	1[a]	1	1[a]
Reconnaissance company.	1	1	1	1
Reconnaissance platoon.	1	1	1	1
Reconnaissance and surveillance platoon.	1	1	1	1
b. Infantry Battle Group.				
Battle group headquarters.	2	1[a]	2	2[a]
Intelligence umpire	1	1	1	1
Reconnaissance platoon.	1	1	1	1
Engineer platoon	1	1	0[d]	--
Medical platoon	1	1	0[e]	--
Supply and maintenance platoon.	--	--	--	--
Communication platoon	--	--	--	--
Antitank platoon	1	1	0[d]	--
Mortar battery	1	1[a]	0[c]	--
Mortar platoon	1	1	0[d]	--
Rifle company	1	1[a]	2	2[a]
Rifle platoon	1	1	0[d]	--
Weapons platoon	1	1	0[d]	--

[a] Also operates radio.

[b] Umpires assigned to engineer units on same basis as infantry if to act as infantry.

[c] Commander of units also act as unit umpires.

[d] Commanders of units act as unit umpires in absence of designated umpires of their parent unit and in specific instances assist unit umpires as requested, viz., dissemination of information, designating casualties, etc.

[e] One of the officer umpires for division headquarters must be special weapons trained.

89. Unit Umpires Armor Division (ROCAD)

Umpires are assigned to comparable units of the armor division on the same basis as to units of the infantry division (par. 88). Additional umpires are assigned to other units of the armor division as follows:

	(1) *Small-scale exercises*		(2) *Large-scale exercises*	
	Off	*Driver*	*Off*	*Driver*
Combat command headquarters.	2	*2	2	*2
Quartermaster battalion headquarters.	1	*1	1	*1

90. Unit Umpires Airborne Division (ROTAD)

Umpires are assigned to comparable units of the airborne division on the same basis as to units of the infantry division (par. 88). Umpires are assigned to other units of the airborne division as follows:

	(1) *Small-scale exercises*		(2) *Large-scale exercises*	
	Off	*Driver*	*Off*	*Driver*
Support command	1	1	1	1
Supply and transportation company.	1	1	0	0
Maintenance battalion.	1	*1	1	*1
Headquarters and support company.	2	2	2	2
Emergency repair company.	2	2	2	2

* Also operates radio.

	(1) Small-scale exercises		(2) Large-scale exercises	
	Off	*Driver*	*Off*	*Driver*
Parachute supply company.	1	1	0	0
Command and control battalion.	1	1	1	1
Reconnaissance troop.	1	1	1	1

91. Unit Umpires Armored Cavalry Regiment

Umpires are assigned to the howitzer company of the armored cavalry regiment on the same basis as to an artillery battery (par. 88) and to regimental headquarters on the same basis as to a combat command headquarters. Assignment of umpires to other units of the armored cavalry regiment is on the basis of assignment to units of the infantry division and the armored division (pars. 88 and 89).

92. Umpire Liaison Teams

Umpire liaison teams require 1 officer and 2 radio operator-drivers (par. 11*j*).

93. Fire-Marker Teams

a. Ground fire-marker teams consist of 1 officer, 1 enlisted assistant, and 1 enlisted driver/radio operator (par. 23).

b. Aerial fire-marker teams consist of 1 officer (pilot-radio operator) and 1 assistant (par. 23).

c. Atomic weapons fire-marker teams consist of the following (par. 36):

(1) Ground section—2 officers and 2 enlisted assistant driver/radio operators.
(2) Helicopter section—2 officers (pilot-radio operator) and 2 enlisted assistants.

d. Atomic weapons fire-marker teams may be integrated within *a* and *b* above, after consideration of the factors in paragraph 34*b*.

94. Miscellaneous

a. Umpires are assigned to all operative special units such as military intelligence service units, civil affairs/military government units, psychological warfare units, electronic warfare units, Army Security Agency units, Counter Intelligence Corps units, atomic delivery and atomic support units, special forces units and others as required.

b. Headquarters, depots, hospitals, and units of a logistical command are assigned umpires on the same basis as comparable headquarters and units listed in paragraph 88. Umpire requirements are less for those units whose missions make them comparatively stable.

95. Noncommissioned Officers

Qualified noncommissioned officers are used as assistant umpires and may be used as umpires in small-unit exercises.

96. Reporting to Units

Umpires join the unit or headquarters to which assigned a minimum of 1 day and preferably 2 days prior to the start of the exercise in order to permit

them to become familiar with the unit, its status, and its missions. The unit to which assigned provides class I and III support for the umpire.

Section III. UMPIRE TRAINING

97. General

Regardless of how well trained the troops are, tactical exercises are successful only when effectively umpired. Every troop unit will maintain a nucleus of trained umpire personnel to be used in tactical exercises.

98. The Umpire School

The umpire school is the key to the successful umpiring of any tactical exercise. Therefore, it is essential that planning for the umpire school be initiated at the earliest practicable date. Planning should include a determination of the number of qualified special weapons umpires required and whether or not the play of atomic weapons is to be based on classified or unclassified data. Qualified personnel are assembled early in the planning phase to prepare the umpire training program and necessary instructional material. Previously qualified instructors are used for the umpire school.

99. Program

(app. IV)

a. The time required for umpire training depends upon the status of training of the umpire personnel and the type of tactical exercise to be conducted. This may vary from a few hours for a

squad or platoon problem to as much as several weeks for a joint Army-Navy-Air Force exercise. The training includes classroom conferences and demonstrations of umpiring followed by reconnaissance of the exercise area and actual practice in umpire control methods with troops. Particular attention is paid to schooling umpires in atomic, toxic chemical, biological, and radiological warfare aspects of the exercise and their duties incident thereto. Umpire checklists are provided. Communications are thoroughly tested during the practical training in the field. Practical exercises conducted during the umpire training phase afford the chief umpire a means of testing the umpires. The exercises are varied so that umpires develop confidence in their ability to handle all situations likely to be encountered. When circumstances permit, umpires work with units in the field to afford them an opportunity to apply and practice the methods and techniques taught in the classroom. Small-unit exercises are particularly valuable, not only for this purpose, but also to orient troops in umpire methods and procedures. This type of training is especially suitable for the training of large groups since those not engaged in umpiring observe and later critique the performance of the others.

b. One or more practical exercises are conducted for umpires prior to any large tactical exercise. Simulated atomic bursts, casualty and damage assessments, and reporting procedures incident to the use of atomic weapons are rehearsed by all umpires prior to the conduct of the field exercise.

c. The umpire training program must include special training for army air defense umpires as well as training in air defense for all umpires.

Section IV. IDENTIFICATION

100. Identification of Personnel

a. U. S. Force Troops. Regulation uniform of the Armed Forces of the United States.

b. Aggressor Force Troops. Aggressor uniforms and insignia as prescribed in FM 30–101.

c. Umpires, Except Fire Markers. A white cloth loop on the left side under the arm and over the shoulder.

d. Fire Markers. A red cloth loop on the left side under the arm and over the shoulder.

e. Personnel Assigned to the Headquarters of the Exercise Director.

A red and white cloth loop on the left side under the arm and over the shoulder.

f. Observers and Other Neutral Personnel (including atomic weapons security forces). A green cloth loop on the left side under the arm and over the shoulder.

101. Identification of Vehicles

a. U. S. Forces. As prescribed in AR 850–5.

b. Aggressor Force Vehicles. As prescribed in FM 30–101.

c. Umpire Group. A white flag approximately 1 foot square on a 4-foot staff fastened to the right front bumper of the vehicle.

d. Headquarters, Exercise Director. A red and white flag approximately 1 foot square on a 4-foot staff fastened to the right front bumper of the vehicle. Upper half of the flag is to be white and the lower half is to be red.

e. Other Neutral Vehicles (including those vehicles transporting atomic weapons). A green flag approximately 1 foot square on a 4-foot staff fastened to the right front bumper of the vehicle.

102. Identification of Aircraft

a. Umpire and exercise director aircraft are marked with four 12-inch bands alternating white and green around each wing. Similar markings are placed around the fuselage of helicopters.

b. Atomic weapons fire-marker helicopters are marked with four 12-inch red bands placed around the fuselage.

c. Aggressor aircraft bear the Aggressor marking as prescribed in FM 30–101.

103. Identification of Medical Vehicles and Installations

a. Red Cross markings are used on medical vehicles and installations. On occasion their use is curtailed by the commander for tactical reasons. Medical units and personnel participating in tactical exercises are considered under the protective provisions of the Geneva Convention.

b. Actual casualties and emergency medical supplies are transported in vehicles displaying a Red Cross flag. Such vehicles are permitted complete freedom of action by all personnel.

Section V. TRANSPORTATION

104. General

a. Vehicles equipped with nonportable type radio sets are assigned to umpires and to other persons as required, including liaison teams, fire-marker teams, and unit umpires down to battalion or company level depending upon the type of units being umpired and the area to be covered.

b. Transportation for umpires not assigned vehicles is provided by units to which umpires are assigned.

c. Vehicles are provided for special activities, including prisoner of war exchange and shifting small unit umpires.

d. Spare vehicles equipped with suitable radios are available for replacement and emergency purposes.

e. Army aircraft, equipped with appropriate radio communications, are provided for umpire use whenever necessary in order to provide umpires with the same speed and mobility as the forces being observed.

APPENDIX I

REFERENCES

AR 220–55_____Field Organization, Field and Command Post Exercises.
AR 350–177____The Maneuver Enemy Aggressor.
AR 380–5_____Military Security, Safeguarding Defense Information.
AR 525–50_____Army Air Defense Operations.
AR 611–201____Manual of Enlisted Military Occupational Specialties.
AR 580–10_____Policy and procedures for the exchange of Atomic information with the UK and Canada under the terms of the agreement for cooperation regarding Atomic Information for mutual Defense purposes.
FM 3–5_____Tactics and Techniques of CBR Warfare.
FM 19–40_____Handling Prisoners of War.
FM 21–5_____Military Training.
FM 21–30_____Military Symbols.
FM 21–40_____Defense Against CBR Attack.
FM 21–41_____Soldier's Manual for Defense Against CBR Attack.
FM 21–48_____CBR Training Exercises.
FM 27–5_____U. S. Army-Navy Manual of CANG.

FM 27–10_____The Law of Land Warfare.
FM 30–5_____Combat Intelligence.
FM 30–7_____Combat Intelligence, Regiment, Combat Command and Smaller Units.
FM 30–15_____Examination of Personnel and Documents.
FM 30–101_____The Maneuver Enemy.
FM 30–102_____Handbook on Aggressor Military Forces.
FM 30–103_____Aggressor Order of Battle.
FM 30–104_____Aggressor Representation.
FM 41-series____CANG Manuals.
FM 44-series____Air Defense Manuals.
FM 100–5_____Field Service Regulations, Operations.
FM 101–5_____Staff Officers' Field Manual Staff Organization and Procedure.
FM 101–10_____Staff Officers' Field Manual: Organization, Technical, and Logistical Data.
FM 110–5_____JAAF with changes.
FM 3–216_____Military Biology and Biological Warfare Agents.
FM 101–31_____Staff Officers' Field Manual-Atomic Weapons Employment (U)
FM 101–31A____Supplement to FM 101–31, Atomic Weapons Employment (U).
Pam 310-series__List of Military Publications.
Pam 39–1_____Atomic Weapons Employment.
DA Pam 21–71_The US Fighting Man's Code.

DA Pam 310–5_.Military Publications, Index of Graphic Training Aids and Devices.
SR 320–5–1_____Dictionary of United States Army Terms.
SR 320–50_____Authorized Abbreviations.
TC 1_____Army Training Policies.
AR 350–30_____ Code of Conduct.
TC 25_____Organization and Tactical Principles Employment of NIKE GM units in CONUS.
TC 33_____Combined Arms Units in Atomic Warfare.
TC 44–2_____Organization and Tactical Principles for the Employment of AAGM in Theatre of Operations.
TF 30–1543_____The Aggressor Force. (Running Time: 26 min.)
TM 9–1981_____ Military Pyrotechnics.
TM 23–200-_____Capabilities of Atomic Weapons (U).
TC 3–2_____Radiological Surveys.

APPENDIX II
THE FIREPOWER COMPUTER

1. A simple firepower computer, applicable to both US and Aggressor forces, for use by unit umpires in computing firepower scores is described in the following paragraphs.

2. The computer consists of a cover (fig. 18) and appropriate inserts (figs. 19 to 25). The cover indicates ranges at which the firepower of individual weapons (side A) and the firepower of infantry units (side B) are effective. The firepower scores for units are based on all the weapons normally engaging in fire fights. When damage of weapons in a unit is assessed, the given firepower score is reduced by the scores of the weapons damaged. There are 7 inserts; 1 for US weapons and 1 for each new division divisional unit (ROCAD) (ROCID) (ROTAD) (figs. 19, 20, and 21), 1 for US artillery weapons (fig. 26), 1 for US artillery unit in a self-defense role (figs. 22 and 23), 1 for Aggressor weapons and Aggressor rifle battalion (fig. 24) and 1 for Aggressor mechanized battalion and Aggressor airborne rifle battalion (fig. 25). Information concerning firepower and casualty assessment, applicable to both US and Aggressor forces, has been extracted and printed on the back of the insert for ready reference (fig. 27). The same cover may be used with either insert. Inserts

for other units are prepared and used when the provisions of an exercise require it (for example arctic or jungle exercises or special task type units).

3. The cover is made from 4-inch by 11¾-inch piece of 100-pound weight white index paper, or similar material. When folded and glued (fig. 18), a 4-inch by 5¾-inch cover envelope is formed.

4. The inserts are made from a 5¾-inch by 8-inch piece of paper of the same type as the cover. When folded (fig. 28), a 4-inch by 5¾-inch insert is formed. When printed on one card, the position of A and B should be carefully noted. The inserts shown in figures 20 and 25 are used with side A of figures 19 and 24 respectively. For convenience and ready identification, it is desirable that information pertaining to the US forces be printed on paper of a color different from that pertaining to the Aggressor or opposing forces.

5. The firepower computer is assembled by sliding the insert into the cover. Side A of insert matches side A of cover. After the insert is placed in the cover, the firepower scores of the various weapons, for a given range, are read through the open slot of side A. At a given range, the firepower score of infantry units from a squad to and including a battle group can be determined on side B.

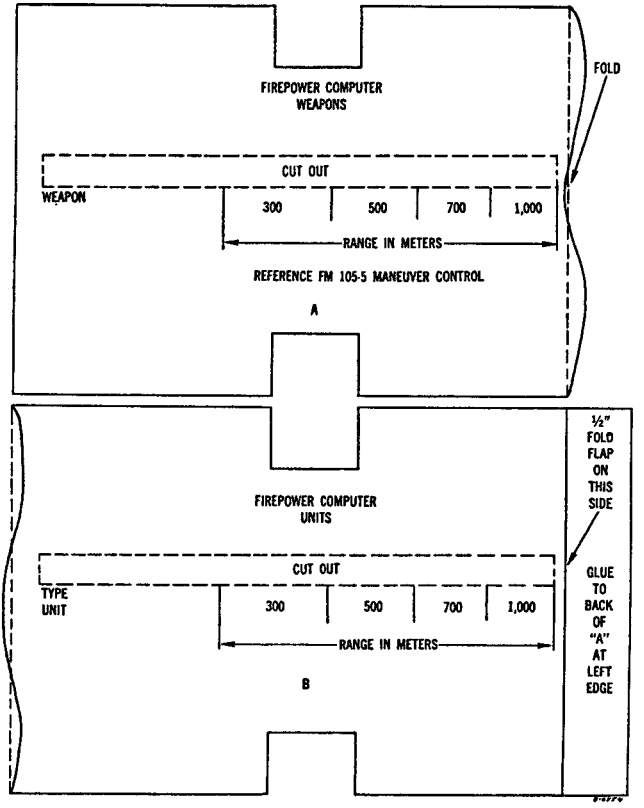


Figure 18. Firepower computer (cover).

Firepower Computer—U. S. Weapons

Weapon	300 meters	500 meters	700 meters	1,000 meters
Carbine	1			
40-mm gun (dual)	20	20	20	20
90-mm gun (tank)	30	30	30	30
280-mm gun	100	100	100	100
MG lt .30 cal	6	6	6	6
MG hvy .30 cal	8	8	8	8
MG .50 cal	10	10	10	10
MG .50 quad	30	30	30	30
75-mm pack how	10	10	10	10
105-mm how	20	20	20	20
155-mm how	50	50	50	50
81-mm mortar			12	12
4.2-in. mortar			15	15
Rifle	1	.5		
Bar	3	1.5	.5	

Figure 19. Firepower chart—U. S. (insert).

Firepower Computer—U. S. Weapons—Continued

Weapon	300 meters	500 meters	700 meters	1,000 meters
106-mm Rifle	20	20	20	20
3.5-in. Rocket	10	5		

Ⓐ

* * * * * * *

Firepower Computer—U. S. Infantry Division (ROCID)

Unit	300 meters	500 meters	700 meters	1,000 meters
Infantry battle group	1,385	985	680	615
Rifle company	315	215	140	125
Rifle platoon	60	35	15	10
Rifle squad	15	10	1	
Weapons squad	20	15	15	10

Weapons platoon	75	75	75	75
AT squad	20	20	20	20
Mortar squad	10	10	10	10
Mortar battery	120	120	120	120
Mortar platoon	60	60	60	60
Tank battalion	2,325	2,322	2,322	2,322
Tank co	450	450	450	450
Tank platoon	150	150	150	150
Scout platoon	75	72	72	72
Cavalry squadron	1,008	990	990	990
Troop	336	330	330	330
Platoon	112	106	106	106
Tank section	55	55	55	55
Rifle squad	20	15	10	10
Scout section	25	24	24	24
Mortar squad	12	12	12	12

Ⓑ

* * * * * * *

Figure 19—Continued.

Firepower Computer U. S. Airborne Combat Group (ROTAD)

Unit	300 meters	500 meters	700 meters	1,000 meters
Combat group	1,580	1,120	985	620
Rifle co	290	200	175	100
Rifle platoon	60	35	15	10
Rifle squad	15	10	1	
Weapons squad	20	15	15	10
Weapons platoon	65	65	65	65
Mortar section	25	25	25	25
AT section	40	40	40	40
Mortar battery	120	120	120	120
Mortar platoon	60	60	60	60

Ⓑ

Figure 20. Firepower chart—U. S. (insert).

Firepower Computer U. S. Armored Division (ROCAD)

Unit	300 meters	500 meters	700 meters	1,000 meters
Armored infantry battalion	1,255	1,052	872	872
4.2-in. mortar platoon	60	60	60	60
Scout platoon	75	72	72	72
Rifle co	280	230	185	185
Rifle platoon	80	65	50	50
Rifle squad	20	15	10	10
MG squad	20	20	20	20
Mortar platoon (81-mm)	36	36	36	36
Mortar squad (81-mm)	12	12	12	12
Tank battalion (90-mm)	1,935	1,932	1,932	1,932
4.2 mortar platoon				60
Scout platoon	75	72	72	72
Tank co	450	450	450	450
Tank platoon	150	150	150	150
Cavalry squadron	1,780	1,708	1,648	1,648
Troop	445	427	412	412

Figure 21. Firepower chart U. S. (insert).

Firepower Computer U. S. Armored Division (ROCAD)—Continued

Unit	300 meters	500 meters	700 meters	1,000 meters
Tank platoon	140	140	140	140
Rifle platoon	60	45	30	30
Scout platoon	75	72	72	72
Mortar section	30	30	30	30

Ⓑ

* * * * * * *

Figure 21—Continued.

Firepower Computers—Artillery—Direct Fire Only

Unit	Range in Meters			
	300	500	700	1,000
Mortar battery (4.2 mort)[1]	240	210	130	110
Battalion (105-mm how)	1,400	1,300	1,000	800
HQ and HQ btry	250	200	150	100
Ea, 105-mm how btry	340	330	260	210
Sp wpn btry	130	110	70	70
Battalion (75-mm pack how)[2]	840	740	490	450
HQ, H&S btry	240	200	130	120
Ea, 75-mm how btry[3]	200	180	120	110
Battalion (155-mm how)[3 4]	1,900	1,800	1,550	1,350
HQ and HQ btry	200	170	120	90
Ea, 155-mm how btry[3]	530	510	450	400
Svc btry	110	100	80	60
Battalion (155-mm gun)[5]	1,330	1,260	1,040	900
HQ and HQ btry	200	170	120	90
Ea, 155-mm gun btry[3]	340	330	280	250
Svc btry	110	100	80	60

Figure 22. Firepower computer—artillery.

[1] Minimum range of 4.2-in. mort is 850 meters; therefore, add 160 points to value of mort btry fire at 1,000 meters if enemy is engaged at that range by indirect fire of morts.

[2] Reduce values for 75-mm how btry by 20 percent, and values for battalion by 10 percent, if full use is not made of 75-mm how in defense of position.

[3] Figures for each type of unit may be used for similar units in composite battalion of ROCID and ROCAD division.

[4] Reduce values for how btry by 60 percent, and values for battalion by 50 percent if full use is not made of how in defense of position.

[5] Reduce values for gun btry by 50 percent and values for battalion by 40 percent if full use is not made of 155-mm guns in defense of position.

Figure 22—Continued.

Firepower Computers—Artillery—Direct Fire Only

Unit	Range in Meters			
	300	500	700	1,000
Battalion (8-in. how)[1]	1,990	1,920	1,820	1,650
HQ and HQ btry	200	170	120	90
Ea, 8-in. how btry	560	550	540	500
Svc btry	110	100	80	60
Battalion (8-in. gun and 240-mm how)[2 3]	670	600	440	300

HQ and HQ btry	200	170	120	90
Ea, 8-in. gun btry[2]	120	110	80	50
Svc btry	110	100	80	60
Battalion (280-mm gun)[4]	1,340	1,230	1,010	930
HQ, H&S btry	230	180	110	90
Ea, 280-mm gun	370	350	300	280
Battalion (762-mm rkt)[5]	340	310	220	190
HQ, H&S btry	240	220	150	130
Firing btry	100	90	70	60
Battalion (CORPORAL)	400	320	190	170
HQ, H&S btry	230	190	120	100
Firing btry	170	130	70	70
Battalion (REDSTONE)	390	340	220	190
HQ, H&S btry	170	140	80	70
Ea, firing btry[2]	110	100	70	60

[1] Reduce values for how btry by 70 percent and values for battalion by 60 percent if full use is not made of 8-in. how in defense of position.

[2] Minimum range of 8-in. gun is 9,800 meters; therefore, no credit has been allowed for fires of this weapon.

[3] This table may also be used for 240-mm how (minimum range 7,700 meters).

[4] Reduce values for 280-mm gun btry by 90 percent and values for battalion by 50 percent if full use is not made of 280-mm guns in defense of position.

[5] Minimum range of 762-mm rocket is 8,500 meters; therefore, no credit has been allowed for fires of this weapon.

Figure 23. Firepower computer—artillery.

Firepower Computer of Aggressor Weapons

Unit	300 meters	500 meters	700 meters	1,000 meters
75-mm how	10	10	10	10
75-mm gun	12	12	12	12
80-mm gun	15	15	15	15
105-mm gun	20	20	20	20
81-mm mortar			12	12
120-mm mortar			20	20
LMG	6	6	6	6
HMG cal .30	8	8	8	8
HMG cal .50	10	10	10	10
Rifle	1	.5		

Ⓐ

* * * * * * *

Firepower Computer Aggressor Rifle Battalion

Unit	300 meters	500 meters	700 meters	1,000 meters
Battalion	725	630	535	535
MG platoon	25	25	25	25
Rifle company	150	115	85	85
Rifle platoon	40	40	20	20
Rifle squad	15	10	5	5
MG company	95	95	95	95
MG platoon	30	30	30	30
MG squad	10	10	10	10
Mortar company			110	110
Mortar platoon			35	35
AT company	80	80	80	80
AT platoon (55-mm)	20	20	20	20
AT platoon (75-mm)	30	30	30	30

Ⓑ

* * * * * * *

Figure 24. Firepower chart—Aggressor (insert).

Firepower Aggressor—Mechanized Battalion

Unit	300 meters	500 meters	700 meters	1,000 meters
Battalion	405	365	325	325
Rifle company	80	70	55	55
Rifle platoon	30	25	20	20
Rifle squad	10	10	5	5
MG company	50	50	50	50
MG platoon			25	25
Mortar company			70	70
Mortar platoon			35	35
AT company	40	40	40	40
AT platoon	20	20	20	20

Ⓑ

* * * * * * *

Firepower Aggressor Airborne Rifle Battalion

Unit	300 meters	500 meters	700 meters	1,000 meters
Battalion	910	845	790	790
Rifle company	185	170	155	155
Rifle platoon	40	35	30	30
Rifle squad	10	10	5	5
MG platoon	70	70	70	70
40-mm mortar squad			10	10
Mortar company			110	110
Mortar platoon			35	35
AT company	60	60	60	60
AT platoon			30	30

Ⓑ

* * * * * * *

Figure 25. Firepower chart—Aggressor (insert).

Firepower computer—US Artillery [1]

Weapon	Range	Firepower score
280-mm gun	0–28,500 meters	100
240-mm how	7,700–23,000 meters	120
8-in how	0–16,900 meters	100
8-in gun	9,800–32,300 meters	70
155-mm how	0–14,900 meters	50
105-mm how (towed)	0–11,200 meters	20
105-mm how (Sp)	0–10,700 meters	20
75-mm pack Tow	0–8,700 meters	10

[1] This card is not to be used with a fire computer cover but is used separately and when required can become part of figure 27.

Figure 26. Firepower chart—artillery.

FIREPOWER

1. An attack unit may advance against an opposing unit when it has firepower superiority as follows:

a. Normal minimum of 2 to 1, preferable 3 or 4 to 1.

b. Defender with good cover and concealment, 5 to 1.

c. Surprise flank or rear attack, 1 to 1 or 2 to 1.

2. Unit using fire and maneuver in frontal attack; credit unit with twice actual firepower.

3. Unit attacking frontally by fire and maneuvering to strike defenders' flank or rear; credit unit with three times actual firepower.

4. Effects on firepower of—

a. Smoke.

(1) On unit firing; 50 percent reduction of infantry firepower.

Figure 27. Firepower and casualty assessment notes (insert).

(2) On target; 25 percent reduction of infantry firepower.

(3) On tanks, vehicles; 90 percent reduction of antitank fire.

(4) On target; 25 percent reduction of observed artillery fire.

b. Artillery Fire.

(1) On infantry unit; firepower of unit neutralized during artillery fire.

(2) On artillery battery; neutralize battery 4 minutes per battery volley fired.

c. Tank, Self-Propelled Gun Fire. Observed fire on dismounted troops neutralize the firepower of the dismounted troops for the duration of the observed fire.

d. Aviation. Firepower of troops under attack neutralized during attack.

CASUALTY ASSESSMENT

1. Fire by opposing infantry: 1 percent to 3 percent per hour.

2. Personnel under artillery fire:

a. Standing, running, or in trucks; 3 percent per battery volley.

b. Prone; 1 percent per battery volley.

c. Entrenched; 1 percent per battery volley.

3. Infantry within 100 meters of attacking tanks or self-propelled guns.

a. Not entrenched: 3 percent per tank or 2 percent per self-propelled guns.

b. Entrenched: 1 percent per tank or self-propelled gun.

Figure 27—Continued.

4. Casualties inflicted by aircraft:

Target	*Casualties per pass* [1] *(percentage)*
Marching column, day	20
Marching column, night	15
Entrucked, day	40
Entrucked, night	25
In bivouac, dispersed	15
In bivouac, not dispersed	25
In foxholes	5

[1] Percentage of actual number of personnel in an area 50 x 200 meters per aircraft.

Note. Percentages given above are for the initial pass on a target. Assess 10 percent of initial pass percentage for each additional pass on the same target up to a total of three additional passes.

RULINGS OF UMPIRES ARE FINAL

Figure 27—Continued.

FIREPOWER COMPUTER OF AGGRESSOR WEAPONS				
UNIT	300 METERS	500 METERS	700 METERS	1,000 METERS
75-MM HOW	10	10	10	10
75-MM GUN	12	12	12	12
80-MM GUN	15	15	15	15
105-MM GUN	20	20	20	20
81-MM MORTAR			12	12
120-MM MORTAR			20	20
LMG	6	6	6	6
HMG CAL .30	8	8	8	8
HMG CAL .50	10	10	10	10
RIFLE	1	.5		

A

B

FIREPOWER COMPUTER AGGRESSOR RIFLE BATTALION				
UNIT	300 METERS	500 METERS	700 METERS	1,000 METERS
BATTALION	725	630	535	535
MG PLATOON	25	25	25	25
RIFLE COMPANY	150	115	85	85
RIFLE PLATOON	40	40	20	20
RIFLE SQUAD	15	10	5	5
MG COMPANY	95	95	95	95
MG PLATOON	30	30	30	30
MG SQUAD	10	10	10	10
MORTAR COMPANY			110	110
MORTAR PLATOON			35	35
AT COMPANY	80	80	80	80
AT PLATOON (55-MM)	20	20	20	20
AT PLATOON (75-MM)	30	30	30	30

Figure 28. Fire power chart—(insert)—front—when printed on one card.

APPENDIX III

ATOMIC

Section I. ATOMIC DAMAGE TEMPLATE

1. The realism with which atomic weapons are "played" and the successful integration of atomic weapons in tactical exercises depends to a large extent, upon the maner in which unit umpires perform their duties. Unit umpires are trained in the use of atomic damage templates (ADT) and the fallout casualty assessment system prior to the start of the exercise.

2. The atomic damage and fallout casualty assessment system provides means of assessing damage and casualties from an atomic burst. Method and data to be used in the preparation of these templates is contained in FM 101–31 and FM 101–31A or DA Pam 39–1 and TM 23–200 or other appropriate publications.

3. Atomic damage templates for unit umpires are prepared by umpire headquarters prior to the start of the exercise. The atomic weapons group at umpire headquarters prepares these templates for selected representative yields and heights or depths of burst. Copies of templates are issued all unit umpires. The number of different templates is held to a minimum and each is given a code number. The code number is the only identi-

fying information printed on the template. Templates are classified FOR OFFICIAL USE ONLY.

4. Atomic damage templates provide a means for rapid assessment of damage and casualties and for determining areas contaminated by neutron-induced radiation.

a. When an appropriate headquarters makes a decision to employ an atomic weapon, it furnishes the atomic weapons umpire group an atomic weapons planning report (par. 35).

b. The atomic weapons umpire group adjusts the actual ground zero and actual height of burst from that desired in accordance with the circular probable error (CEP), reliability, vertical dispersion tables, direction of fire, and any other variable to probability application for the weapon used. This adjustment is carried out in accordance with the system of probability determination currently approved at the time of the exercise.

c. The atomic weapons umpire group determines which of the prepared atomic damage templates and fallout templates (if a simulated near surface, surface or subsurface burst) most closely meets the conditions and informs the unit umpires concerned of the code number of the templates to be used. This information is given over the general broadcast net. In the event the probability determination indicates a surface burst, the umpire control group takes the action covered in section II of this appendix.

Section II. PLAY OF FALLOUT

5. A scenario for the play of fallout is prepared in advance by umpire headquarters. This scenario provides the manner in which intensity reading, dose rate and other information are given, when requested, to radiation and monitoring personnel of the units. In the preparation of the scenario, fallout templates are prepared, issued to unit umpires and the unit umpires trained in their use prior to the exercise. The fallout templates are used with proper decay factors to determine average intensities. The atomic weapons umpire group prepares a fallout prediction analysis of the surface burst involved based on the yield of the weapon and the meteorological data existing at burst time. This prediction analysis is performed according to the current doctrine in fallout prediction as covered in FM 101–31 and FM 101–31A or other pertinent directives. Following the analysis, the unit umpire is advised of the ground zero; the observable effects in the vicinity of ground zero, such as crater size, tree blowdown diameter, thermal damage diameter, the height of the cloud; and the coordinates delineating the area covered by various rates of fallout radiation as determined desirable by the umpire headquarters. Intensities from induced radiation will be announced in a like manner.

6. The unit umpires advised of the fallout data inform the units in the vicinity of the burst of the readily observable manifestations of the atomic bursts to include the fact that it is a surface burst,

the azimuth to the stem, and the height to the cloud top. Upon action being taken by the higher headquarters to ascertain other information (such as by aerial reconnaissance), the umpire will then inform them of other manifestations suitable to the action taken by the headquarters. If units are operating radiac monitoring instruments, the umpire advises any units within the areas receiving fallout of the intensity reading. Casualties resulting from radiation exposure will be assessed by unit umpires while units are in or crossing a contaminated area according to the rates specified by umpire headquarters for the intensities existing. If unit umpires do not have the data for assessing casualties for units crossing a contaminated area, a report to umpire headquarters of the route, rate, and time of crossing and degree of protection is required. Umpire headquarters then computes the casualties and informs the unit umpire of the proper assessment.

Section III. COMMAND ACTION

7. Civilian casualties resulting from exposure to radiation while in an area contaminated by fallout are assessed. Unit umpires inform commanders of constantly increasing numbers of civilians displaying symptoms of radiation sickness by painting the picture until remedial action is taken.

8. Umpires evaluate the action taken by the commander in countering atomic attack on his forces. This is a difficult task and requires sound judgment but must be done to insure realistic play of atomic warfare.

9. Commanders accomplish, in accordance with established SOP's, planning to determine and offset to the maximum the vulnerability of units of their command to atomic attack. Higher unit umpires examine these SOP's to determine their adequacy.

10. When a unit of a command is hit by a simulated atomic weapon, the umpire evaluates the command action taken. Points to be considered are—

a. Measures taken to determine combat efficiency of the striken unit.

b. Timeliness of the dispatch of a control and assessment team to the area of the strike.

c. Report to higher headquarters of information relative to the attack.

d. Whether the commander, as a result of information received from the control and assessment team, makes necessary modifications to his prior plan, to include a decision as to the striken unit's ability to continue its mission or to be replaced.

e. If the umpire rules that the command post (CP) of a unit has been destroyed, determine whether or not provisions (SOP) for an alternate CP for the succession of command were known and implemented.

11. The unit umpire of the unit hit by a simulated atomic weapon will not permit the unit to transmit or receive any messages by electrical means. The unit umpire paints the picture of the results of the atomic strike to the unit commander

and, if applicable, to the control and assessment team. The unit umpire evaluates the action of the unit commander and the control and assessment team relative to the following:

a. Measures taken to estimate combat efficiency and ability of unit to continue its mission.

b. Measure taken to maintain or regain control of the disabled unit.

c. Steps taken for the care and evacuation of the wounded.

12. If proper command action is not taken, umpires assess penalties by imposing additional delays, casualties, and damage.

Section IV. AREA DAMAGE CONTROL (LARGER UNITS)

13. Umpiring of damage resulting from an atomic attack requires assessment of appropriate delays in related tactical or logistical activities and umpiring actual area damage control operations.

a. Assessment of Delay. Atomic fire-marker teams are provided with sufficient personnel to enable them to block all routes into the blast area and to halt all movement until essential area damage control measures have been implemented. These personnel are posted at the line of visible damage and are prepared to describe the damage which has resulted from the blast to unit umpires. Unit umpires of any unit entering the area require the unit to take necessary action and impose appropriate time delays prior to permitting the unit to proceed.

b. Damage Control Operations.

(1) *Prestrike actions.* The umpire examines unit SOP and/or area damage control plans to determine their adequacy. This evaluation includes the unit's ability and readiness to implement the plans.

(2) *Poststrike actions.* The umpiring of area damage control operations requires initiative and imagination on the part of the umpire. He visualizes the damage which has occured and is prepared to describe this to the commander in detail. He immobilizes the unit, severs its communications, and takes other action to reduce its effectiveness commensurate with the degree of damage inflicted. Because of the above requirement, the umpiring of area damage control plan in a free tactical exercise is extremely difficult. It is easier in a controlled tactical exercise where a scenario is provided the umpire to enable him to supervise area damage control play and permit umpires of unaffected units outside the damage area to observe and evaluate the relief and rescue operations of the unit which he is umpiring.

APPENDIX IV

UMPIRE TRAINING PROGRAM

The following training program may be used as a guide for the preparation of umpire training schedules. If the exercise plan calls for special operations, then the schedule must be modified to include umpire training in these special operations.

Subject	Hours
Introductory	2
Official welcome	⅛
Purpose and scope of exercise	⅞
Maneuver area rights and restrictions	½
Participating troops	1
General subjects	49
Umpire school organization and umpire organization.	1
Supply and supply economy	1
Orientation on Aggressor	1
Aggressor demonstration	1
Safety precautions	1
Map reading	5
Utilization of intelligence	2
Reconnaissance of exercise area	8
Maneuver control	1
Land-mine warfare	2
Chemical and biological warfare	2
Employment of pyrotechnics and control devices	1
Orientation on the air-ground system	1
Communication plan with channels for the exercise	1
Radio-telephone procedure	1

Subject	Hours
Operation of radio sets and communication security	1
SOI–SSI–SOP	1
Communication field exercise with review	3
Conduct of the maneuver, maneuver control, area right, and restrictions.	1
Command post exercise	8
Atomic aspect of the exercise	2
Organization and tactics (concurrently by umpire assignment).	2
Artillery	(2)
Antiaircraft artillery	(2)
Armored units	(2)
Organization of infantry and airborne divisions	(1)
Employment of infantry in offensive and defensive operations.	(1)
Organization and operation of airborne corps [1]	(1)
Airborne assault [1]	(1)
Special forces units	(1)
Tank-infantry artillery team	1
Civil affairs and military government	1
Umpiring	25
Umpiring duties, general	1
Tactical and organizational factor of ground umpiring.	2
Capture of personnel and materiel	1
Assessment of casualties and damages	1
Umpiring land-mine warfare	1
Umpiring special forces activities	1
Computation of losses due to chemical agents	1
Casualty and damage assessment due to chemical and biological attack.	1
Duties of umpires in the atomic play of the exercise.	8
Obstacles and delays	1

[1] Used only when exercise is predominantly an airborne one or is required for proper umpire orientation. Time to be taken from open time.

Subject	Hours
Umpiring—Continued	
Umpiring civil affairs/military government activities.	1
Umpire records and reports	2
Intelligence (concurrently by impure assignment).	2
Army Security Agency umpire duties	(2)
Field operations intelligence umpire duties	(2)
Counter Intelligence Corps umpire duties	(2)
Interrogation prisoner of war umpire duties	(2)
Order of battle umpire duties	(2)
Photo interpreter umpire duties	(2)
Technical intelligence umpire duties	(2)
Censorship umpire duties	(2)
Document analysis umpire duties	(2)
Recording teams umpire duties	(2)
Interpreter and translator umpire duties	(2)
Review of umpire duties	1
Examination	1
Practical Umpiring Training	44
Field demonstration of umpire methods	2
Practical field work to include rehearsal with Aggressor forces.	24
Testing of communications	8
Atomic weapons play umpiring	8
Critique of umpire training	2
Scheduled time	120
Open time	6
TOTAL	126

Notes. 1. All umpires will be enjoined to emphasize realism during maneuver in consonance with the provisions of the Code of Conduct.

2. Atomic instruction must provide the umpire with the knowledge necessary to assess casualties realistically and to evaluate operations and logistics of atomic delivery systems from stockpile to time on target.

INDEX

[AG 353 (23 Oct 57)]

By Order of *Wilber M. Brucker, Secretary of the Army:*

MAXWELL D. TAYLOR,
General, United States Army,
Chief of Staff.

Official:

HERBER
Major Genera
The A

Distributi
Active

DCSPER	US ARADCOM
ACSI	OS Maj Comd
DCSOPS	MDW
DCSLOG	Armies
CofF	Corps
CNGB	Div
CSpWAR	Brig
CAMG	Regt/Gp/Bg
TJAG	Bn
TAG	Co/Btry
TIG	Ft & Camps
CofCH	USMA
CINFO	CGSC
TPMG	USAWC
ASA	Br Svc Colleges
Technical Stf, DA	USAAVNS
Admin & Technical Stf Bd	USASWS
USCONARC	USAINTS
USA Arty Bd	USATC
USA Armor Bd	PMST Sr Div Unit
USA Inf Bd	PMST Jr Div Unit
USA Air Def Bd	Mil Dist
USA Abn & Elct Bd	MAAG
USA Avn Bd	Mil Mis
USA Arctic Test Bd	

NG: State AG; units—same as Active Army.

USAR: Same as Active Army.

For explanation of abbreviations used, see AR 320–50.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1958—440831