

# Military Ordnance Examinations

## 1 Scope

These procedures describe the process for military ordnance examinations and apply to explosives and hazardous devices caseworking personnel who examine military ordnance and their post-blast remains to determine identifying and functionality information.

## 2 Introduction

The term “Military Ordnance” refers to the types of explosives or pyrotechnics manufactured for the use by military forces. Hundreds of types of military ordnance are manufactured, usually to exacting specifications, with no discernible differences between items of the same type and model number. For a number of reasons to include a requirement for a long shelf life (years), the capability to produce the maximum number of casualties, and the ability to withstand relatively rough handling, military ordnance is usually manufactured with a very insensitive explosive contained within a hardened case of steel, heavy aluminum, or thick plastic. An exception is made for pyrotechnic materials, which are normally more sensitive than “military high explosives”. The explosive or pyrotechnic is usually initiated with either a mechanical or an electrical fuzing system.

The following is a representative list of various types of Military Ordnance: bombs, grenades, mines, missiles, projectiles, rockets, sub-munitions, and special signaling or pyrotechnics items. Demolition-type military explosives, such as C-4, block TNT, military dynamite, and military detonators used with these items are not included under this principle. These items are examined under their respective Explosives Devices Standard Operating Procedures (SOPs).

Due to the usual exacting specifications, military ordnance can be identified as to the type (i.e., grenade versus mine) and model. This identification can be a specific number that refers to a type/model to the exclusion of all others. Additionally, this type of ordnance is normally marked with a military locator or manufacturer number, also referred to as a “lot” number. This alphabetic/numeric number potentially provides information as to where, when, and by whom a particular item of ordnance was manufactured. However, there is not a specific serial number for each individual item which was manufactured; it is a tracking number for a volume (100’s or 1000’s) in that manufacturing run.

Military ordnance can be used as originally intended or in the construction of improvised explosive devices (IEDs).

The examination and identification of military ordnance assists the investigator in efforts to identify the person(s) and/or group responsible for fabricating or using the explosive device.

### 3 Equipment/Material/Reagents

Below is a list of items that can be used to examine military ordnance and its post-blast remains. Explosives and hazardous devices personnel should choose the most appropriate items based on the nature of the evidence.

- Personal Protective Equipment (e.g., lab coat, eye protection, full face shield, gloves)
- Hand tools (e.g., tweezers, pliers, utility knife)
- Cleaning materials and disinfectants (e.g., cloths, bleach, rubbing alcohol)
- Stereomicroscope (various magnifications)
- Ruler (e.g., standard 12 inch length)
- Micrometer
- Caliper
- X-ray equipment
- FBI Laboratory Explosives Reference Tool (EXPeRT) Database
- Reference texts, manuals, manufacturers' literature, and known materials are maintained in the Explosives library. Additional reference information can be obtained from direct contact with manufacturers and distributors.

### 4 Standards and Controls

Not applicable.

### 5 Sampling or Sample Selection

Not applicable.

### 6 Procedures

These procedures are implemented as part of the overall examination process outlined in the Device Examinations SOP. Refer to the Safety section of this SOP before starting any examinations.

Explosives and hazardous devices personnel will:

**6.1** Before any examination is conducted, ensure the item(s), as well as its container(s) and packaging, have been appropriately marked in accordance with the *FBI Laboratory Operations Manual (LOM)* (i.e., item number, initials, and full Laboratory number, when practicable).

**6.2** Ensure care is taken not to dislodge any trace evidence, obliterate and identifying marks which have been previously placed on the item(s), or obliterate any microscopic marks of value.

**6.3** Visually examine the item(s) for any trace evidence that could be of value. This evidence could include, but not limited to the following: hairs, fibers, blood, paint, or other particles.

**6.3.1** If the trace evidence is to be examined or preserved, contact the appropriate unit and determine if the material should be removed. Record the presence of the material by means of notes, sketches, or photographs before it is removed.

**6.4** Note the physical characteristics of the ordnance item through visual/microscopic examination. Physical measurements should be taken to aid in determining as many of the following attributes as possible:

- Construction characteristics
- Manufacturer (e.g., domestic or foreign)
- Type/model
- Special properties (e.g., physical condition, functionality, modifications made for use in the IED)

**6.5** If possible, determine the manufacturer, brand, and type by searching the EXPeRT data base, Explosive reference files, manufacturers' literature, and/or reference or known materials collection. Identifications or associations are made by comparison of observable/measurable physical characteristics with those provided in the above reference/literature materials.

## **7 Calculations**

Not applicable.

## **8 Measurement Uncertainty**

Not applicable.

## **9 Limitations**

Refer to the Limitations section in the Device Examinations SOP and Appendix B of the Explosives and Hazardous Devices Report Writing Guidelines SOP.

## **10 Safety**

Safety protocols, contained within the FBI Laboratory Safety Manual, will be observed at all times.

**10.1** Military ordnance contains explosives and/or pyrotechnics which can explode and/or cause fires resulting in serious bodily injury or death should they be accidentally initiated. Therefore, items of military ordnance should be handled with care and protected from sources of heat, shock, and friction in order to prevent accidental initiation. The following guidance is provided:

**10.1.1** When not under examination, military ordnance containing explosives and/or pyrotechnics will be stored in approved, explosion-proof containers (e.g., explosive magazine).

**10.1.2** Appropriate facial protection (e.g., eye protection, full face shield) will be worn when handling military ordnance containing explosives and/or pyrotechnics.

**10.1.3** When it is necessary to disassemble live military ordnance for examination, the process shall be conducted and/or supervised by military/Department of Defense (DOD) personnel in the presence of explosives and hazardous devices caseworking personnel at an appropriate location (e.g., demolition range).

**10.1.4** Military ordnance containing explosives and/or pyrotechnics will not be examined at the same time that detonators or primary explosives are examined.

**10.1.5** Individual items of military ordnance which contain large quantities of explosives (1 pound (454 grams) or more per item) will not be accepted for examination in the Laboratory. Such items should be secured in the Ammunition Supply Point at Marine Corps Base Quantico, Quantico, Virginia or an explosive evidence bunker at Redstone Arsenal, Huntsville, Alabama. Examinations of this type of ordnance should be conducted in a remote facility.

**10.2** Protective gloves (e.g., latex, nitrile) must be worn when handling items that have been possibly exposed to blood, tissue or other bodily fluids. Gloves will prevent exposure to possible hazardous material on the items as well as transfer of DNA to the items.

**10.3** Items potentially containing blood or other body fluids will be cleaned in a 2.5% bleach solution or other suitable disinfectant following discussions with personnel that may conduct other examinations of the items.

## **11 References**

*FBI Laboratory Division*

FBI Laboratory Quality Assurance Manual, Federal Bureau of Investigation, Laboratory Division, latest revision.

FBI Laboratory Operations Manual, Federal Bureau of Investigation, Laboratory Division, latest revision.

FBI Laboratory Safety Manual, Federal Bureau of Investigation, Laboratory Division, latest revision.

Explosive Devices SOPs, Federal Bureau of Investigation, Laboratory Division, latest revisions.

*Other*

Federal Bureau of Investigation, Identification of Military Ordnance, General Information Bulletin 75-2, FBI Bomb Data Center, 1975

Gersbeck, T., Practical Military Ordnance Identification, CRC Press, 2014

Pickett, M., Explosives Identification Guide, Thompson Delmar Learning, 2005

Thurman, J.T., Practical Bomb Scene Investigation, 2<sup>nd</sup> Edition, CRC Press, 2011

<u>Rev. #</u>	<u>Issue Date</u>	<u>History</u>
0	07/07/2006	Original Issue to follow QATU formatting and ASCLD/LAB-International requirements
1	10/02/2017	Administrative changes for grammar, clarity, and conformance to revised QAM and LOM. Removed references to the Explosives Unit to applicability to those conducting explosives and hazardous devices related examinations. Deleted Calibration section since it is no longer required. Updated Limitations section to refer the reader to the Device Examination SOP and Appendix B of the Explosives and Hazardous Devices Report Writing Guidelines SOP. Updated references.

**Approval**

Redacted - Signatures on File

Explosives Unit Chief

Date: 10/02/2017

**TL Approval**

Explosives and Hazardous  
Devices Technical Leader

Date: 10/02/2017

**QA Approval**

Quality Manager

Date: 10/02/2017