Timer Examinations

1 Scope

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

2 Introduction

Various electrical and mechanical timing devices are frequently utilized in the improvised fabrication of explosive devices. In an electrical fuzing (i.e., initiating) system, an electrical or mechanical timer is used to function as an on/off switch to complete an electrical circuit, in which electrical energy is applied through conductors to function an initiator that causes the main charge to explode. Mechanical clocks have also been utilized in non-electrical systems. In this method, strings have been attached to the winding stems which are, in turn, attached to other components. Upon the activation of the alarm, the winding stem tightens the string, which causes another component in the device to directly or indirectly cause the device to function.

Timing devices are also utilized as an arming feature in the fabrication of an improvised explosive device (IED). Their operation enables the fuzing system to operate which causes the device to function.

Through an examination of a timing device, or its fragmented remains, its functionality within the IED and manufacturing information can sometimes be determine. This data can provide the investigator lead information which can facilitate the identification of the subject(s) and/or group responsible for constructing the device. Additionally, the intercomparison of timing devices has identified a pattern of use and modification (a builder's signature) which has enabled investigators to link individual IEDs to one source.

The item(s) should be appropriately packaged to preclude the possibility of being damaged or contaminated. Timing mechanisms are usually submitted with other components of the IED and, as such, may be intact, disassembled, or fragmented through the forces produced from an exploding device.

3 Equipment/Material/Reagents

Below is a list of items that can be used to examine timers and their 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, 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
- Multimeter
- 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 Standard Operating Procedure (SOP). The basic examinations (e.g., type, manufacturer, condition, dial, how modified) will be conducted prior to an intercomparison examination. The similarities with regard to the basic components will be noted. However, particular emphasis in this examination will be on the method(s) of alteration/fabrication which is similar or the same between the examined mechanisms. Refer to the Safety section in this SOP before starting any examinations.

Explosives and hazardous devices personnel will:

6.1 Before any examination is conducted, ensure that 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 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 timing mechanism for any trace evidence that could be of value. This type of evidence could include, but not limited to the following: hairs, fibers, blood, bone, glass, paint, explosives, latent fingerprints.

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 on the item(s) by means of notes or photographs before it is removed.

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

- Construction characteristics
- Manufacturer
- Brand
- Type
- Special Properties (e.g., physical condition, functionality, modifications made for use in IED)

6.6 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 are made by comparison of observable/measurable physical characteristics with those provided in the above reference/literature materials.

6.7 Visually/microscopically examine the timing mechanism to determine if there are individual microscopic marks of value for comparison/identification purposes.

6.8 When appropriate, compare timing mechanisms to other timing mechanisms in the same submission (incident) or another submission.

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 Fragmented metal components have sharp edges. Therefore, puncture resistant gloves should be worn when handling these items.

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 and prevent DNA from being transferred to the items.

10.3 Items potentially bearing blood or other body fluids will be disinfected with 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

Director of Central Intelligence, Improvised Explosive Devices (IEDs) and Other Criminal and Terrorist Devices – A Basic Reference Manual, Interagency Intelligence Committee on Terrorism, 2000

Stoffel, J., Explosives and Homemade Bombs, 2nd Edition, Charles C. Thomas, 1977

Thurman, J.T., Practical Bomb Scene Investigation, 2nd Edition, CRC Press, 2011

Rev. #	Issue Date	History
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

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