

# TENNESSEE BUREAU OF INVESTIGATION

## Forensic Services Division

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### Firearm/Toolmark Standard Operating Procedures Manual

### NIBIN Procedure

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## 17.0 NIBIN PROCEDURE

**17.1 Scope:** The National Integrated Ballistics Information Network (NIBIN) is a ballistic imaging network designed for the acquisition and comparison of known and unknown cartridge cases (test fires and crime scene evidence). The NIBIN system is an Individual Characteristic Database (ICD). Images of cartridge cases are entered into the Integrated Ballistic Identification System (IBIS) using optical and electronic technology. The FTIU utilizes two separate IBIS components: IBIS BrassTrax 3D and IBIS Matchpoint +. The IBIS Brasstrax system images the primer (breech face) area, the firing pin impressions, and the ejector markings of fired cartridge cases, and the individual characteristics contained within those areas. These images are then stored in a database and algorithms are used to correlate the images against other images using filters such as caliber, shape of firing pin impression, and date of crime. These correlations produce lists of possible matches, ranked in order of correlation score based on individual characteristics (best match). Images from the breech face, firing pin impression, and ejector marks are all correlated independently. A trained firearm examiner or forensic technician can then recall images from the correlation list and compare them side by side on the IBIS Matchpoint+ system, looking for similar individual characteristics. If a possible association is found during this screening process, those images are marked as an unconfirmed Hit (NIBIN Lead), and a report sent to the requesting officer/agency. The actual evidence and/or test fired items must be microscopically examined by a trained firearm examiner to determine if the associated items had been fired in the same firearm. If this determination is made, the associated items are confirmed as a Hit.

Currently, the images entered into the NIBIN system are correlated against regional databases. Other agencies or regions may be added to the automatic correlation sites as deemed necessary for providing the best service to the customer. At the discretion of the firearm examiner or forensic technician, or if requested by the submitting agency, this search can be widened to include other states or regions, or the images may be searched nation-wide.

**17.2 Precautions/Limitations:** The NIBIN equipment provides a correlation list of possible matches. If a possible association is made, this information may be disseminated as an investigative lead prior to microscopic confirmation. In order for a Hit determination to be made, the actual evidence must be physically examined and microscopically confirmed by a trained firearm examiner.

## 17.3 Related Information:

- 17.3.1 Appendix 4 Range of Conclusions
- 17.3.2 Appendix 9 Test Fire Reference Collection
- 17.3.3 Worksheets Appendix 1 – Firearm Worksheets
- 17.3.4 NIBIN Lead Notification, No NIBIN Lead Notification reports
- 17.3.5 Section 24 NIBIN Triage Policy

## 17.4 Instruments:

- 17.4.1 IBIS BrassTrax 3D System
- 17.4.2 IBIS Matchpoint + System



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**17.5 Reagents/Materials:** None

**17.6 Hazards/Safety:** None

**17.7 Reference Materials/Controls/Calibration Checks:**

**17.7.1** A NIBIN performance check will be conducted annually ensure proper performance of the equipment.

**17.7.2** Proficiency tests will be performed annually by each forensic scientist or forensic technician using the NIBIN equipment.

**17.7.3** Test fired cartridge cases entered into NIBIN are maintained in the Test Fire Reference Collections (See Appendix 9). Evidence samples entered into NIBIN are returned to the submitting agency.

**17.8 Procedures/Instructions:**

**17.8.1** The NIBIN/IBIS User Guides and Training Manuals shall be followed.

**17.8.2** The firearm examiners and forensic technician(s) in the FTIU will be authorized by the Bureau of Alcohol, Tobacco, Firearms, and Explosives (BATFE) to make independent entries into the NIBIN system.

**17.8.3** The firearm examiners and forensic technician(s) shall ensure suitability of the items being entered. The firearm examiners and forensic technician(s) shall ensure that:

- Any evidence cartridge cases selected for entry into NIBIN shall have sufficient individual characteristics within the firing pin impression and/or breech face marks on the primer to affect a match. If there is more than one matching evidence cartridge case suitable for entry into the NIBIN system, the firearm examiner or forensic technician should select the best one for entry. If necessary, more than one sample can be entered if different individual characteristics reproduce better on different exhibits. Each sample must be uniquely identified in the NIBIN system.
- Any test fired cartridge cases selected for NIBIN entry shall have sufficient individual characteristics to affect a match. If more than one test fired cartridge case is needed to represent the firearm being test fired, or if different cartridge case compositions reproduce differently, more than one test fire may be entered into the NIBIN system. These must be uniquely identified in the NIBIN system.
- The firearm examiners and forensic technician(s) shall ensure the images acquired are of acceptable quality, and the ring placement is correct on breech face and firing pin images.
- Any information about the identification of evidence cartridge cases to each other and the selection of certain specimens for entry into NIBIN should be documented in the case notes.



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**17.8.4** The IBIS Brasstrax 3D system is not designed for bullet entry.

**17.8.5** Test fired cartridge cases from revolvers will not be routinely entered into the NIBIN database. Revolvers do not eject the fired cartridge cases, and it is unlikely for revolver cartridge case evidence to be recovered from a crime scene. However, test fired cartridge cases from revolvers may be entered into the NIBIN database at the discretion of the firearm examiner or forensic technician, or at the request of the submitting agency.

**17.8.6** The firearm examiner or forensic technician will search through the correlations for any possible associations. If no associations are found, this information will be disseminated in the form of a report.

**17.8.7** If a possible association is made, the firearm examiner or forensic technician will mark the related images in Matchpoint as an unconfirmed hit and will print off a side-by-side image of the two cartridge cases. This possible association/investigative lead information will be disseminated to each of the requesting officer(s) or agencies by report, email or phone call.

**17.8.8** If the requesting officer or agency requests confirmation of the possible association, all evidence must be submitted or resubmitted for microscopic confirmation by a trained firearm examiner. If the association is microscopically confirmed as a Hit, the linked items will be marked as Confirmed Hit(s) in the NIBIN system. The firearm examiner will disseminate this information to the requesting officer(s) or agencies by report, email, or phone call.

**17.9 Records:** The firearm examiner or forensic technician shall document their findings in the form of handwritten notes, computer generated notes, photography, and/or by utilizing a firearms worksheet. An abbreviated firearm worksheet may be used for NIBIN-only firearms. A NIBIN Triage worksheet may be used for NIBIN-only cartridge cases (see Section 24 NIBIN Triage Policy). The firearm examiner or forensic technician shall print the NIBIN Lead Notification or No NIBIN Lead Notification report for each exhibit correlated and maintain this report in the case file. All Confirmed Hits shall be documented in the case file.

**17.10 Interpretations of Results:** The NIBIN equipment provides a list of possible matches. In order for a Hit determination to be made, the actual evidence must be physically examined by a trained firearm examiner.

**17.11 Report Writing:** Most NIBIN report writing can be found in the Range of Conclusions Appendix 4. Reports may be generated identifying possible associations, with a request to have the evidence submitted for microscopic confirmation. An official TBI report is required when a NIBIN Hit has been confirmed.

#### **17.12 References:**

IBIS BrassTrax User Guide, Version 3.2, Forensic Technology, 2020.

IBIS Matchpoint User Guide, Version 3.2, Forensic Technology, 2020.

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Association of Firearms and Toolmark Examiners Training Manual, March 3, 2001.

Association of Firearms and Toolmark Examiners Procedures Manual, July 9, 2001.

Association of Firearms and Toolmark Examiners Glossary, 5<sup>th</sup> Edition, 2007.

“Forensic Examiners Firearms Recall/Safety Warning List”, FBI Laboratory.