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## **18.0 Integrated Ballistics Identification System (IBIS)**

18.1 **IBIS** is a computerized system for acquiring and storing the images of unidentified (questioned) bullets and cartridge cases and known (test fired) bullets and cartridge cases (fired from known firearms). **IBIS** photographs portions of the surface (land engraved areas) of a bullet and the primer/firing pin area of fired cartridge cases using state of the art optical and electronic technology. These images are then stored in databases and sophisticated algorithms are used to correlate the images against each other using filters such as caliber, rifling specifications, date of crime and date of entry. These correlations produce lists of possible matches with the highest scoring correlations at the top of the list. The IBIS Coordinator (Forensic Firearms Analyst II/Senior Firearms Examiner) can then call up the images and compare them side by side on a monitor. If a possible match is found during this screening process then the actual evidence to test or evidence to evidence is compared by an examiner on their comparison microscope for final determination.

18.1.1 The **IBIS** Technician has the responsibility for entering, storing and correlating all **IBIS** entries.

- These procedures can be found in the **IBIS** Procedures Manual.
- The Technician is also responsible for keeping a record of all cases and items entered each week. This will be done by printing out case and item information from IBIS each week and keeping the print outs.
- The Technician is also responsible for the back up of all IBIS information each week. At the beginning of each week, the Technician (or designee) will remove the previous weeks back up tape from the IBIS system. This back up tape will be taken to the designated off-site location, where it will be stored and where the new weeks back up tape will be retrieved. The new back up tape will be installed in the IBIS system for the current week. Specific back up details and procedures followed can be found in the **IBIS** Procedures Manual. These back up procedures comply with the National Integrated Ballistic Information Network (NIBIN) and IBIS backup procedures.

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18.1.2 All Firearm Examiners have the following responsibilities with respect to **IBIS**.

- Know which calibers are acceptable for **IBIS/Bulletproof™** entry.
  - Caliber 25 Auto
  - Caliber 223 Remington
  - Caliber 30 Carbine
  - All Caliber .32
  - All Caliber 38/.357
  - All Caliber 9mm
  - All Caliber 7.62 X 39mm
  - All Caliber 380
  - Caliber 357 Sig
  - All Caliber .40/10mm
  - All Caliber .41
  - All Caliber 44
  - All Caliber .45
- Know which calibers are acceptable for **IBIS/BRASSCATCHER®** entry.
  - All calibers listed under **IBIS/Bulletproof™** with the exception of any rimfire calibers and shotgun gauges.

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- Know the preferred ammunition for test firing known firearms for entry of test bullets/cartridge cases into **IBIS**.
  - 25 Auto - 50 gr. FMJ
  - 7.62 X 39mm - Any Former Communist Block - Steel Jacketed Ball ammunition.
  - 32 Auto - 71 gr. FMJ
  - 32 S & W - 88 gr. LRN
  - 32 S & W Long - 98 gr. LRN
  - 380 Auto - 95 gr. FMJ
  - 9mm Luger - 115 gr. FMJ
  - 38 Special - 158 gr LRN, CCI - 158 gr +P MJSP or 130 gr FMJ.
  - 357 Magnum - Same as 38 Special.
  - 357 Sig - 125 gr FMJ.
  - 40 S&W - 165 or 180 gr. JHP
  - 10mm - 180 gr. JHP or 200 gr FMJ.
  - 41 Magnum - 210 gr. LRN, 210 gr JSP or 210 gr JHP
  - 44 Magnum - 44 Special 180 gr JHP, 44 Special 180 gr. JHP, 44 Special 246 gr LRN, 44 Special 246 gr. LRN.
  - 45 Auto - 230 gr. FMJ.

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- The examiner must screen all unidentified evidence bullets and cartridge cases to determine if they are suitable for entry into **IBIS**.
  - Any evidence bullet selected for entry into **IBIS** must have at least one clear and distinct land engraved area (LMP) and must have sufficient individual characteristics to be able to effect a match.
  - Any evidence cartridge case selected for entry into **IBIS** must have sufficient individual characteristics within the firing pin impression and/or within the breech face marks on the primer to effect a match.
  - Any information about the identification of evidence bullets/cartridge cases to each other and the selection of certain specimens for entry into **IBIS** should be noted on the Microscopic Conclusions note page of the case report.
  - If there are more than one matching evidence bullets and/or cartridge cases suitable for entry into **IBIS**, the examiner should select the best one for entry or, if necessary, more than one if different individual characteristics reproduce better on different tests.
  - For each evidence specimen selected for entry into **IBIS** the examiner should provide the **IBIS** Technician with the following information. Q number, caliber, GRC'S (bullets only), offense and date of offense, submitting agency and agency file number.

18.1.3 All Firearm Examiners have the following responsibilities with respect to **IBIS** in addition to those outlined above:

- Firearm Examiners will verify all test fire identifications and test bullet and/or cartridge case selections for **IBIS**. This information will be noted on the Microscopic Conclusion note page of the case report.

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- Firearm Examiners will verify evidence bullet and/or evidence cartridge case selections for **IBIS**. This information will be noted on the Microscopic Conclusion note page of the case report.
- The **IBIS** Coordinator will be responsible for screening the correlations of all test fires and evidence bullets and/or cartridge cases entered into **IBIS**.
- The **IBIS** Coordinator will be responsible for entering information into the **IBIS** High Confidence Log (**BULLETPROOF & BRASSCATCHER**). (SEE APPENDIX I)
  - In the **Bulletproof™** database the **IBIS** Coordinator will mark the test or evidence bullet correlated against the database into the computer as the reference bullet.
    - ◆ The **IBIS** Coordinator will then compare the reference bullet against the top candidates on the correlation sheet. They will also compare the bullet against those entries where only a portion of the LMPS were entered with unusually high Max Lea scores and also against those entries with an unusually high Peak score.
    - ◆ If a possible match is found, the **IBIS** Coordinator will advise those examiners whose cases are involved and coordinate the examination of the reference bullet against the possible match bullet.
  - In the **BRASSCATCHER®** database the **IBIS** Coordinator will mark the test or evidence cartridge case correlated against the database into the computer as the reference cartridge case.
    - ◆ The **IBIS** Coordinator will compare at least the top five (5) candidates on the correlation sheets.
    - ◆ If a possible match is found, the **IBIS** Coordinator

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will advise those examiners whose cases are involved and coordinate the examination of the reference cartridge case against the possible match cartridge case.

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**18.2 IBIS Protocol:**

All **evidence** will be submitted by using an SBI-5 form with only one (1) case or incident per SBI-5.

Test fired bullets/cartridge cases fired by the submitting agency must be submitted on an SBI-21 form. All mandatory fields (Case #, Incident/Recovery Date, Information on firearm) must be completed. Multiple cases may be submitted on one SBI-21 form.

It will be left to the discretion of the **IBIS** Coordinator, whether or not to have evidence bullets or cartridge cases entered into **IBIS**, that are submitted where the date of offense is older than two (2) years.

It will be left to the discretion of the **IBIS** Coordinator, whether or not to have test fires from firearms entered into **IBIS**, when the date of seizure of the firearm is older than two (2) years.

Only the following calibers will be accepted as **IBIS ONLY** cases:

25 Auto Pistol  
7.62X39mm Rifle  
223 Remington  
30 Carbine  
32 Revolver and Pistol  
38/357 Revolver and Pistol  
9mm Pistol  
380 Pistol  
357 Sig  
40 S & W Pistol  
10mm Pistol  
41 Revolver and Pistol  
44 Revolver and Pistol  
45 Revolver and Pistol

Evidence bullets and cartridge cases that are submitted where the offense listed is anything other than **IBIS ONLY** will be assigned to the examiners according to the rotation provided to the Evidence Control Unit.

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Evidence bullets/cartridge cases and firearms that are submitted where the offense listed is **IBIS ONLY** (note: the submitting OCA # must be completed and the correct offense may be listed in the Additional Analyses Requested/Instructions block) may be assigned to the **IBIS** Technician.

The **IBIS** Technician may obtain assistance from the **IBIS** Coordinator/Senior Firearms Examiner when determining caliber and “GRC”s for an evidence bullet, for grouping evidence bullets and cartridge cases and for selecting the best specimen for entry into **IBIS**.

18.2.1 Internal chain of custody.

- If evidence is turned over to the **IBIS** Technician and/or the entry is done out of view of the Firearms Examiner, an internal chain of custody must be maintained.
- The transfer of evidence log in the LAP (Lab Automation Project) System, must be completed.
- Once the evidence item has been entered into the **IBIS** system, the technician will then turn the evidence back over to the Firearms Examiner and the transfer of evidence log in the LAP System must be completed.



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**18.3 IBIS QUALITY CONTROL/CALIBRATION AND PROFICIENCY TEST:**

18.3.1 The purpose of acquiring a Quality Control (QC) Bullet and Cartridge Case, minimally on a yearly basis (calendar year), is to address two issues: (1) to ensure that the **IBIS** hardware and software is calibrated and performing properly, and (2) to assure that the **IBIS** Technician/Firearms Examiner is acquiring data according to established training and protocols (proficiency test). Over a period of time, the correlation scores of the QC Bullet and QC Cartridge Case can be evaluated for trends in performance of the technician/examiner and **IBIS** system.

18.3.2 The following procedures are to be used as a guideline for establishing an **IBIS** QC Bullet and QC Cartridge Case. This bullet and cartridge case should be entered into **IBIS** on a yearly basis, the correlation results of which will be maintained in the individuals proficiency test file.

18.3.3 Selection of a Quality Control Bullet and Cartridge Case set.

- ◆ The source of the **IBIS** QC bullet and cartridge case set will be from a firearm from the Firearms Reference Collection.
- ◆ Once a potentially well-marked bullet and cartridge case is found, one bullet will be designated as the **IBIS** QC bullet and one Cartridge Case will be designated as the **IBIS** QC Cartridge Case.
- ◆ A second bullet and second cartridge case from this set will be designated as the Benchmark Bullet (Master Bullet) and Benchmark Cartridge Case (Master Cartridge Case).
- ◆ The identity of the weapon from which the bullet and cartridge case set was fired will be recorded and tagged so that future **IBIS** Quality Control bullets and cartridge cases may be reproduced.
- ◆ The firearms examiner in charge of the Firearms Reference Collection should be notified as to the identity of the test weapon in order to avoid the future destruction of this weapon.

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18.3.4 Having selected the **IBIS** QC Bullet set and the **IBIS** QC Cartridge Case set, one bullet and one cartridge case from the test-fired set will be carefully entered into **IBIS** as the **IBIS** “Benchmark” Bullet and **IBIS** “Benchmark” Cartridge Case. This Benchmark Bullet and Benchmark Cartridge Case will also be carefully marked, packaged and sealed. The entry will be done by the IBIS Technician.

18.3.5 Having entered the “Benchmark” bullet and cartridge case into **IBIS**, the other bullet and cartridge case from the test-fired set will be entered into **IBIS** as the “Quality Control” Bullet and “Quality Control” Cartridge Case. This QC Bullet and QC Cartridge Case will also be carefully marked and packaged. The entry of the “Quality Control” bullet and cartridge case will also serve as a proficiency test.

- ◆ The Proficiency Test will be administered to each individual making entries into the **IBIS** system, at least once a calendar year.
- ◆ During each year, the QC Bullet and the QC Cartridge Case will be acquired by each individual making entries into the IBIS system and correlated to the “Benchmark” bullet and cartridge case that is stored in the database.
- ◆ The score of that correlation will be compared to previous scores. Any apparent gross deviation from the previous scores will be discussed with the **IBIS** Coordinator and possible solutions to the deviation will be agreed upon prior to any further data acquisitions.

18.3.6 For the purpose of proficiency testing, the **IBIS** Coordinator will do the following:

- ◆ Review the entry of the “Quality Control” cartridge case and bullet. Ensure that proper laboratory and **IBIS** (user manual) procedures are followed.
- ◆ Evaluate the image quality and correlations results of each item entered.

- ◆ Review documentation and results with the **IBIS** Technician/ Firearms Examiner. The guidelines in the State Bureau of Investigation Crime Laboratory Procedure Manual, Quality Assurance/Control (section 20), will

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be followed in regards to any unsatisfactory findings.

- ◆ Results of the proficiency test will be documented and maintained in the appropriate proficiency test file. The results will also be forwarded to the proper administrator of the Firearms Section proficiency testing program.

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**18.4 IBIS COMPUTER SECURITY AND INCIDENT RESPONSE PROCEDURES:**

18.4 The IBIS system is part of a computer network run and maintained by the Bureau of Alcohol, Tobacco, Firearms and Explosives as part of the National Integrated Ballistics Information Network (NIBIN). Because of this participation in the NIBIN network all possible precautions should be exercised in preventing any unauthorized access of the IBIS system and any damage to the system that could affect the network. These precautions include reporting any security incidents to the BATFE as soon as possible and also keeping access to the IBIS system limited to only those currently working on/with the IBIS system.

18.4.1 The IBIS Technician has the following responsibilities.

- Keep a written log of all tape back up activity. This log file will include the date, tape number, and name of the person replacing the back up tape. (See Appendix I for a copy of the back up tape log file)
- Notify the IBIS Coordinator of any security problems or suspected security problems as well as any problems with the IBIS equipment, especially any equipment involved in network communications.

18.4.2 The IBIS Coordinator will be the designated IBIS security officer and has the following responsibilities.

- Notify the BATFE of any security issues/problems through the use of a Computer Security Incident Report Form (See Appendix I). The form will be faxed to the appropriate BATFE representative. The IBIS Coordinator will keep a copy of any security form submitted to the BATFE. The IBIS coordinator will be responsible for following up with the BATFE on any security incidents.
- Notify the BATFE of all IBIS users through the use of a BATFE Information Access form (See Appendix I). This form will be completed for each user of the IBIS system and faxed to the BATFE for processing. The original of each form will be kept on file with the IBIS Coordinator.



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## IBIS Firearm Examination

**Item #:**

**Make:**

**Caliber:**

**Type:**

**Serial Number:**

**Model:**

**GRC's:**

**Operating Condition:**

**Location of Identifying Marks/Tags:**

**Test Ammunition:**

**Tests Marked:**

**Container(s):**

**Package  
entered  
through:**

## Microscopic Notes

**Observations and Conclusions:**





## IBIS Entry

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**Item #:** \_\_\_\_\_ **Caliber/Gauge:** \_\_\_\_\_

**Item Type:** \_\_\_\_\_

**Manufacturer (cases only):** \_\_\_\_\_

**Firing Pin Shape (cases only):** \_\_\_\_\_

**GRC's (bullets only):** \_\_\_\_\_

**Location of Identifying Marks:** \_\_\_\_\_

**Trace Evidence:** \_\_\_\_\_

**Container(s):**

**Notes:**



ATF Automated Information System Backup Handling Record for the NIBIN/IBIS located at the  
NC SBI Laboratory, Raleigh, NC

[illegible]

Effective Date: June 1, 2003  
Initials:\_\_\_\_\_