

A. Purpose:

To describe the procedures for documenting and classifying bullet/projectile evidence.

B. Responsibility:

Forensic Science Examiners assigned to the Firearms Unit.

C. Safety:

To avoid exposure to any potential bio-hazardous material, bullet/projectile evidence should be decontaminated.

D. Procedure:

The characteristics and condition of bullet evidence will be documented in the notes, using QR FA-11 Projectile Worksheet, QR FA-13 Notes Page, or QR FA-14 Fillable Blank Notes Page.

1. Caliber determination

- a. Measure the base diameter of the evidence bullet using a measuring device such as calipers. Damage may preclude this measurement.
- b. Caliber may also be determined by the use of the following equation:

$$(L + G)n \approx \pi d$$

(L + G) is the measurement of one land impression plus the measurement of one groove impression in inches

n is the number of lands/grooves

π is approximately 3.14

d is the diameter of the bullet in inches.

- c. Physical characteristics of the evidence bullet, such as weight, bullet shape, composition, nose design, and number and placement of cannelures may aid in caliber determination.
 - d. Caliber is written as a numerical term and may be written with or without the decimal point.
- 2. Other Characteristics**
- a. Any trace material (refer to FA SOP-II-3 Removing Debris and FB SOP-19 Trace.HLF Examination for guidance).

- b. Caliber
- c. Weight in grains
- d. Number of lands and grooves
- e. Dimensions of lands and grooves
- f. Direction of twist
- g. Composition of bullet
- h. Type of bullet
- i. Base description
- j. Possible manufacturer of bullet
- k. Cannelures
- l. Any other physical description of the bullet's condition

3. Measuring Land and Groove Dimensions

The land and groove dimensions may be measured in two ways on a comparison microscope: live image or by photograph. This data may be used to determine possible firearms with the assistance of a general rifling characteristics database.

- a. Mount the bullet on a microscope stage.
- b. Adjust the lighting as needed.
- c. Using the imaging software, follow the steps below for the chosen method.

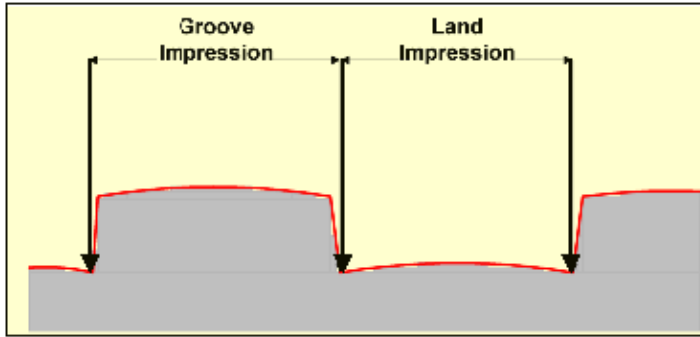
To measure by live image:

- 1. Click the Measure tab.
- 2. Choose the Distance Line Tool.
- 3. Measure the dimensions of the land or groove impression from shoulder to shoulder (see diagram below).
- 4. Record the data in case notes.

To measure by photograph:

- 1. Capture an image of the bullet by clicking on the "Acquire" button. Save the image in the appropriate folder.
- 2. Click Process tab → Annotate tab → Extended Annotation toolbox.
- 3. Using the Distance Line Tool, measure the dimensions of the land or groove impression from shoulder to shoulder (see diagram below).
- 4. Click Merge to add the measurement annotations to the image of the bullet. Save

the image in the appropriate folder.



E. References:

1. AFTE Glossary
2. GL 2 Safety Manual
3. FA SOP-II-3 Removing Debris
4. Forensic Biology SOP-19 Trace.HLF Examination
5. General rifling characteristics database