External ballistics

External ballistics is the study of the flight of a projectile from the muzzle of the weapon to the target. External ballistics starts as soon as internal ballistics comes to an end.
Internal ballistics is limited to happenings, which occurs inside the barrel of the firearm.

External ballistics as well as internal ballistics are important from the forensic point of view. External ballistics is concerned with firing of police to disperse the crowd, use of improvised firearms (country made weapons) used in criminal cases involving homicides and murders. It contributes much during war times. In peace time, it plays an important role in space travel where atmosphere is absent and projectile move in vacuum.

Some aspects of external ballistics have been discussed in the part-I namely resistance due to air, bullet drop due to gravitational pull of the earth, maximum vertical range, remaining velocity, Ballistic coefficient and sectional density and others including horizontal range determination, Wind drift, yaw, instability of bullet spin, escape velocity and others would be discussed in this part along with structural features and shape of the trajectories and their relation to the velocity of the projectiles.

Horizontal range determination

Horizontal range is the distance travelled by the bullet horizontally.

If a bullet is fired with a velocity V at an angle of elevation μ its components in vertical direction and horizontal direction would be $V \sin\mu$ *and* $V \cos\mu$ respectively, when air resistance is not taken into consideration.

Distance travelled by the bullet in horizontal direction $R = T \times$ effective velocity
(Horizontal component of initial velocity V) = $T \times V \cos \mu$; where T= travel time

Factors Affecting Trajectory

There are internal as well as external factors affecting the trajectory of the projectile which are discussed below:-

Internal factors

Internal factors affecting Trajectory shape are:
- Velocity of the projectile
- Spin of the projectile
- The angle of fire
- Structural features

External factors

External factors affecting trajectory shape are:

- Resistance of air
- Wind deflection
- Gravitational pull on the projectile