IRISH AIRSOFT ASSOCIATION

Irish Airsoft Association

Good Chronographing Guide

13th May 2009

Introduction

To ensure legal compliance with the Criminal Justice Act 2006 (CJA2006) legislation, airsoft devices must be chronographed to ensure they do not exceed the 1 joule power limitation imposed by the Act.

A chronograph device works by measuring the speed of an object (in this case a BB) passing between two fixed points. It measures the length of time it takes for the object to pass those two points and uses this to calculate the speed, normally in FPS (Feet Per Second) or M/s (Metres per second). Some more advanced chronographs can also calculate the energy level for a given BB weight and measure the Rate of Fire, usually in RPM (Rounds per Minute)

The two fixed points usually found in a chronograph are known as light gates. A light gate consists of two parts, one side transmits light, and the other receives it, as the BB passes through the gate, the light beam is interrupted and the timer starts. As the BB then passes through the second light gate, the timer is stopped. The length of time it takes for the BB to pass through those two points is then used to calculate the number of feet or metres per second the BB travelled.

One very important distinction to make is that of Joules and FPS. The limit set by the CJA2006 is 1 joule. This equates to the well known 328fps, but only with a standard 0.20g BB. With different BB weights, the fps required to achieve 1 joule varies. With heavier BBs the fps at 1 joule is lower.

The table below shows a common list of BB weights and their corresponding speed at 1 joule.

Energy	BB Weight	Feet/Second	Metres/Second
1 joule	0.20g	328	100
1 joule	0.23g	306	93.02
1 joule	0.25g	294	89.38
1 joule	0.28g	278	84.51
1 joule	0.3g	268	81.47

For this reason, it is important to set a baseline. It is recommended to always chronograph with 0.20g BBs.

IRISH AIRSOFT ASSOCIATION

Chronograph Procedure

Below are the recommended steps for chronograph testing of an airsoft device prior to gaming:

1. Check the hop-up has been turned all the way to the off position. This should be done by visibly checking the position of the hopup wheel and also by firing a shot in a safe direction. The BB should have a straight flight path and then drop off. If the BB curves upward dramatically, the hopup has been set high.
    - Note: At all times for chronographing, the hop-up should be set to off, a hopup which has been turned on will reduce FPS, however this is not an acceptable method to bring a device's power output down below 1 joule. For example, if a device chronographs at 1.1 joule with the hop-up off and 1 joule with the hop-up set to full, then it's maximum power output for the purposes of CJA2006 compliance is to be taken as 1.1 joule and therefore requires mechnical alteration to make it compliant.
2. Ensure the device has been loaded with 0.2g BBs for the purpose of chronograph testing.
    - It is recommended to keep a speed loader full of 0.2g BBs to hand and manually load several BBs into the magazine prior to testing.
3. Ensure the chronograph device is either;
    - Mounted to a tripod and set on a flat and level surface.
    - Placed on top of a level and secure surface while firing.
    - It is not acceptable to hold a chronograph device by hand while testing, it must be held secure and level.
4. The airsoft device should be held level and straight in line with the chronograph device. Shots which are fired through the device which are not parallel to the light gates will give erroneous readings.
5. Set the airsoft device to semi automatic (if applicable) and fire through the chronograph device.
6. If a satisfactory reading is given, it is recommended to mark the device in some way, with a small sticker in an incospicuous location or a tag of some form, especially for skirmishes with a large number of attendees. This means a quick look at a device can ascertain whether or not it has been subjected to testing and should make it easier to determine if a device is on the field of play without having been tested, whether by an oversight or intentional deception.
7. If a device is tested with having an energy level above 1 joule, that device must not be allowed onto the field of play until it has been mecahnically altered and re-tested. As above, it is not acceptable to increase the hopup to adjust a devices power output and chronograph operators should ensure to check that the hopup is off on subsequent retesting of the device.

Notes

It is recommended to purchase a chronograph with a backlit LCD display, this ensures the reading is clearly and accurately read by the operator.

Chronograph testing is not an exact science, there are many different factors which can affect the reading of a device, including but not limited to; Weather (humidity, temperature), Altitude and Ambient light levels.

Never shine a light source directly into the light gates of a chronograph device. This will give erroneous readings.