

# Washington Aerospace Range Procedures

**A sport rocketry range is a potentially hazardous area. Prior to flying or acting as a spectator, you will be required to sign a liability waiver. If you are not willing to sign the waiver, you will not be permitted to stay in the launch area. Please review the waiver before traveling to the launch! Liability waivers are available on the Washington Aerospace website. See the end of this document for the URL.**

**We have attempted to cover basic safety and range procedures in this document. It is not all-encompassing, nor is it a substitute for good judgment and common sense. Rocketry can be a hazardous activity – watch out for yourself and others.**

## Rules for all

- Parents, please keep your children under control, and please ensure they understand these rules.
- Dogs are permitted, but please keep them on a leash, and clean up after them.
- Alcohol is not permitted during flying hours.
- Please stay behind the flagged flight line barrier, and please do not set up your chairs etc. right at the barrier.
- Pay attention! Every flight is potentially dangerous to you and your family. If the Launch Control Officer (LCO) yells “Heads up!” he means it!
- If the LCO announces a flight as a “Heads Up” flight, that means get on your feet and pay attention until the rocket’s recovery device deploys or until the rocket is on the ground.
- If you are away from the pad area and cannot hear the public address speakers, please tune your FM radio to 91.1 MHz to monitor LCO announcements.
- Do not attempt to catch any rocket as it lands. Even a small rocket can cause an injury.
- Do not pick-up or move any rocket that is not yours, unless you have the owner’s permission.
- Please do not drive on the field to recover rockets.
- Please do not use FRS channel 9 or 8 except for emergencies. Other FRS channels are available for use.
- Absolutely no fireworks or open fires!
- The decisions of the Range Safety Officers are final and may not be appealed on the flying field.

## Club Officials

The Washington Aerospace Club (National Association of Rocketry Section 578) president is Jim Pommert. The Secretary/Treasurer is Bill Clugston. The Operations Manager is John Hawkins.

## Safety Officers

Tripoli requires that an L2-certified individual be appointed RSO and be on-site during the launch. NAR “...strongly recommend[s] that a Range Safety Officer be appointed and on duty at all times” but doesn’t specify qualifications for the RSO. Neither Tripoli nor NAR details the authority or responsibility of the RSO or how or when the RSO can delegate authority to others.

### Range Safety Officer:

- official responsibility for all safety-related issues
- responsible for appointing or approving all other safety officers
- can delegate authority to other safety officers
- must have Tripoli or NAR L2 certification
- the RSO is always “on call” for safety issues; use FRS channel 9 for emergencies
- RSO’s word on safety issues is final and will not be changed

## **Launch Control Officer:**

- handles load/fire/recover sequence for each rack
- declares “range open” and “range closed”
- monitors range for interference and/or safety problems
- pushes the buttons

The following tasks may be performed by the LCO or an assistant:

- announces flights on the PA system
- monitors descending rockets for safety hazards (separation, rocket headed for spectators, etc.)
- records flight results on the flight cards
- monitors the radio emergency channel (FRS channel 9)
- assists fliers with loading
- handles problems with the pads

## **Operations Officers:**

These people are responsible for smooth operation of the range. None of these positions requires any particular certification, but may require some experience.

## **Launch Director:**

- FAA notification
- arrangements with the landowner
- arrangements for porta-potties
- setup and teardown coordination
- weather control
- recruits and assigns safety officers to work at specific times and positions
- keeps track of who’s officially “on duty” and who’s available to answer questions and do fill-in duty

## **Pad Manager:**

- check that fliers have paid range fees and filled out flight cards (with RSO initials)
- assigns rockets to racks and pads

## **Range Manager:**

- assists flyers in placing rockets on pads, attaching igniters and checking continuity
- mobile in the launch area to assist flyers as required
- coordinates with RSO and LCO for misfires and recycles

## **Spotters:**

- monitor descending rockets so the LCO can concentrate on launching
- mark direction of downed rockets to aid in recovery
- assist fliers with recovery
- spotters communicate with fliers on FRS channel 11

## **Communications**

Although we have no set policy about the use of RF transmitters (e.g. for rocket control, telemetry or tracking) we request that anyone planning to do this contact the RSO and LCO well ahead of their flight so that we can coordinate frequency usage with other fliers.

The public address system at the LCO table is the primary means of communicating with fliers and spectators as a group. The PA signal is also broadcast on FM 91.1 MHz with a low-power transmitter. Fliers and spectators are encouraged to use a Walkman-style receiver to monitor the LCO announcements while on the range.

FRS (Family Radio Service) channel 9 is reserved for emergency communications and communications related to range safety. Backup channel is #8; the RSO will direct the switch if necessary. The LCO and RSO monitor FRS channel 9. Deputy RSOs and other range officers are encouraged to monitor FRS channel 9 as well. Anyone may call channel 9

with an emergency message (fire, someone injured while recovering a rocket, etc.). Range officers may also use channel 9 for issues that don't qualify as an emergency but need attention by the RSO or LCO.

Volunteer spotters monitor FRS channel 11. Fliers may use channel 11 to ask for assistance in tracking a rocket or locating a downed rocket.

Per FCC rules, we can't prevent other use of these frequencies by the general public, but we will enforce these policies on the range. Fliers, spectators and their families may use other FRS, HAM and cell frequencies as desired, but anyone who persists in interfering with official communications on these two channels will be required to turn in their radio and/or leave the range.

## Flying Rockets at WAC Launches

- There will be an all-fliers' meeting 15 minutes before the range opens. If you arrive after this, get briefed by an RSO. Range procedures and operating times will be reviewed.
- Sign in at the Pad Manager's table. Sign liability waiver and pay any applicable range fees.
- Any questions or confusion about the range policies must be answered before you bring a rocket to the check-in table. In other words, talk to the RSO about what you're planning to do beforehand.
- All WAC launches are conducted according to the NAR and Tripoli safety codes. Please be familiar with these before attending a launch.

### Sign your Rocket In:

- Obtain flight cards at the check-in table or from the WAC website. Fill out your flight card, and then bring your rocket, ready to fly, to the check-in table along the flight line, for inspection and scheduling.
- Flight of F total impulse or above including clusters, or staged flights of E total impulse or above must be initialed by the RSO.
- **IGNITERS SHOULD NOT BE INSTALLED IN F OR HIGHER IMPULSE ENGINES AT CHECK-IN!** Igniters should be attached to the outside of the rocket, well away from the nozzle, with masking tape. They are to be installed only after the rocket is on the rod in a vertical position.
  - **Exception:** If your rocket uses airstart/staging or if the igniter is installed as part of the motor assembly process (per manufacturers' instructions) please coordinate with an RSO before bringing your rocket to check-in. In this case, electronics must be safed and motor igniters shunted until the rocket is placed in the vertical position on the launch pad.
- **ALTIMETERS, TIMERS AND OTHER ELECTRONICS MUST BE SAFED AT CHECK-IN!!** Do not arm electronics until your rocket is on the rod in a vertical position.
- You may be asked at check-in to unpack your recovery system for inspection, and/or to answer questions about stability, structure, ejection charges, shock cord material, motor retention, etc., especially with untested scratch-built rockets.
- Have your certification card or cert application available if you are flying H or larger motors.

## Out to the Pad

- The Pad Manager will assign a rack and pad number, depending upon your rocket's launch lug size and rod availability. RACK is a group of rockets set up at the same time. PAD is a particular launch rod.
- When your rack is announced or posted and the range is OPEN, enter through the gate at the check-in table and place your rocket on the pad to which it is assigned.
- The Range Manager will be mobile in the launch area. He/she will assist you in getting your model on the pad, hooking up the igniters and checking continuity if you wish. Coordinate with the Pad Manager if you need to change rods/rails or move your model to another pad.

### Continuity Check:

- **For BP and small (E and below) motors:** connect the ignition lead. Continuity will be checked by the LCO prior to launch.
- **For Mid & High Power motors:** Touch the ignition leads together to make sure they are not powered up, then

hook up your igniter in open air, check continuity, and disconnect the igniter. Arm any electronics, then install the igniter in the motor, reconnect the ignition leads, and check continuity again.

- Give your flight card to the LCO, return behind the flight line and wait for your rocket to be launched. (The LCO will not launch your rocket without a flight card.)

## **Fly It!**

The LCO will announce your rocket using information from your flight card, will provide a short countdown, and then will fire your rocket. Note: If you have any reason to believe your rocket is unsafe, **BY ALL MEANS INTERRUPT the LCO IMMEDIATELY** right up to the moment of launch.

- **RECYCLE:** If your motor fails to ignite, you must retrieve it from the pad when the range opens, correct the problem elsewhere, and reschedule. (If the range is not busy, you might ask to immediately try again.)
- **RETRIEVAL:** When you go out to recover your rocket, BE ALERT! Be very aware of what is happening on the range at all times.
- **POST MORTEM ANALYSIS:** We have instituted a new policy both for club safety and for educating staff & flyers. If your flight was less than nominal (off angle, lawn dart, CATO, etc.) and the flight was F impulse or more, staged or clustered, after you recover your rocket, please get your flight card from the LCO, and return to the RSO that signed off on your flight. The RSO will discuss with you what happened & why, and make notes on your flight.

## **Rocket Recovery**

- **IF A ROCKET HEADS IN YOUR DIRECTION**, either under powered flight or recovery, keep your eyes on it, attempt to step out of its way, and make sure others around you are aware.
- **DO NOT ATTEMPT TO CATCH ANY ROCKET, YOURS OR OTHERWISE.** Even a lightweight rocket can cause an injury if it hits you, or you could trip and fall while trying to catch the rocket.
- You may pick up or move another flier's rocket that has landed only under either of the following conditions:
  - You have the owner's permission to do so
  - If you are a long distance away, and the rocket is undamaged, and no one appears to be looking for it, you may carefully bring it back to the LCO table; if the rocket is damaged, please note the location and report it to the LCO.
- If the rocket is being dragged by the wind, please carefully stop the rocket and place the parachute under its body tube or nose cone, and note the location and report it to the LCO.
- If you find a reloadable motor casing or other part that has separated from a rocket, wait until it has cooled off and bring it back to the LCO table.

## **Think Safety, Be Safe**

- If you observe a dangerous condition or activity, or you think something is being done which violates the NAR or Tripoli safety codes, contact the RSO immediately, using FRS Channel 9 if necessary.
- Rocketry as we do it has an excellent safety record, but this is still a potentially hazardous activity. The main hazards are: (A) flammable propellants, (B) objects flying through the air and falling from the sky.
- Always be alert to what is happening above and around you. Keep track of your children. Don't smoke near anything flammable. Keep behind the flight line unless you must go out to set up or retrieve your rocket, and then be very aware of what is going up, *and what is coming down!*
- Range is OPEN when it is permissible to approach the pad and prepare (or retrieve) your rocket. Range is CLOSED when rockets are being launched or when the RSO or LCO feels a hazard exists. High Power and Low Power pads are not always open at the same time.
- Range Safety Officer (RSO) and his deputies have final say in all matters.

**HAVE FUN AND FLY SAFE!**

**Washington Aerospace Club web site:**

<http://www.hawkfeather.com/wa-aero/>