



**RCA RADAR**  
**ROWING ATHLETE DEVELOPMENT AND RANKING**  
For Olympic and Paralympic Development Athletes

Developed by Rowing Canada Aviron,  
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## Overview:

RADAR provides rowers and coaches with information to assess their progress on the High Performance pathway. It allow coaches and athletes to assess their training programs through a series of regular testing where progress can be measured, and hopefully to identify potential areas of weakness the athlete and coach can work on to improve for the following set of tests.

The RADAR battery of testing requires a series of performances approximately once every three months throughout the period from September to May.

This document overviews the RADAR program for the following categories:

**Olympic Development** - U17, U19, U23, and Senior athletes training towards High Performance programs and not currently training full time at one of RCA's NTC's.

**Paralympic Development** – All athletes eligible to compete in Paralympic events

## RADAR Submission Information:

Submissions are to be completed and entered into the Athlete Monitoring Database, <https://rca-athlete-tracker.sportingdna.com> . Athletes interested in RCA's National Development System are to submit the appropriate information to this on-line database.

Completion of RADAR testing must fit into the following parameters.

1. Testing should be completed over a six-day period, also know as RCA's RADAR Week. Please see RADAR week section for order of tests and prescribed training.
2. Testing can be completed and submitted at any point within an approximately 3 month range as found below in Tables 1 and 2. Coaches should review their training program and determine how to best fit this testing into their loading and unloading phases and training cycles
3. Once all tests are completed information should be submitted into the athlete monitoring database. Questions regarding the athlete monitoring database should be addressed to Chuck McDiarmid at [cmcdiarmid@rowingcanada.org](mailto:cmcdiarmid@rowingcanada.org)
4. All testing must be witnessed and verified by a coach.

The following tables outline the tests required for each RADAR submission

<b>Olympic Development Program</b>		<b>Category</b>	
Test	U19	U23	SR
Peak Power - 190 Drag Factor	✓	✓	✓
1 Minute	✓	✓	✓
2000 Meter	✓	✓	✓
6000 Meter	✓	✓	✓
<b>Paralympic Development Program</b>		<b>Category</b>	
Test	LTA	TA	AS
Peak Power - 190 Drag Factor	✓	✓	✓
1 Minute	✓	✓	✓
1000 Meter	✓	✓	✓
6000 Meter	✓		
<b>20 minute</b>		✓	✓

**Submission Date Ranges:** There are *three submission periods* throughout the year. Testing can be completed and submitted at any time within the date range. We encourage athlete and coaches to complete the testing earlier in the submission period, as this will allow for athletes to redo tests or reschedule due to illness or injury. In the case of multiple submissions during the date range the highest performance will be used for circulation.

***RADAR Submission periods***

	<b>Period 1</b>	<b>Period 2</b>	<b>Period 3</b>
2015/16 submissions	September 1, 2015 - November 22, 2015	December 1, 2015 - February 29, 2016	March 1, 2016, - May 15, 2016
2016/17 submissions	September 1, 2016 - November 20, 2016	December 1, 2016 - February 28, 2017	March 1, 2017, - May 15, 2017
2017/18 submissions	September 1, 2017 - November 19, 2017	December 1, 2017 - February 28, 2018	March 1, 2018, - May 15, 2018

***Required Submissions: Olympic Development***

U23 and Junior Athletes are to complete and submit the following to be considered for National team programs.

*2016 and beyond, team Selection* – Minimum of 2 out of the 3 submissions

***Required Submissions: Paralympic Development***

All Athletes are to complete and submit the following to be considered for National team programs.

*2016 and beyond, team Selection* – Minimum of 2 out of the 3 submissions

## RADAR Week:

To move towards a consistent testing program, Rowing Canada Aviron is requiring that coaches use the following schedule to deliver the RADAR tests to their athletes. The work completed during this week is a useful training effort. This prescribed schedule takes into account the training undertaken on the days in between ergometer measurements, and the order in which the tests are completed. This procedure will be considered RCA's RADAR Week. The RADAR Week should occur within a rest/recovery week and frequency and duration of activities should be programmed accordingly. To further ensure comparability within and across programs the RADAR Week must be completed within the time approved time frame.

### Prescribed RADAR Week Schedule:

Day	Time	Event
2 Days Prior to RADAR	Session 1	90 Minute Cat 6
1 Day Prior to RADAR	Rest Day	No training – Only active recovery / stretching
1	Session 1	6000m all out – Olympic Development and PARA LTA 20 minute all out - Para TA and AS
	Session 2	15 km Cat 5-6 row / erg or 60 minute Cat 5-6 cross training
2	Session 1	Peak Power MDF test - followed in 20 minutes by 1 Minute all out test 10 km Cat 6 row or 60 minute Cat 6 cross training
	Session 2	10-12 Km Cat 6 row (technique) / Erg Prep
3	Session 1	2000m all out – Olympic Development 1000m all out – Paralympic Development (LTA, TA & AS)
Post RADAR		Return to Regularly scheduled training

**Weight Requirements for Lightweight Rowers:** Athletes seeking consideration as a lightweight must submit a current weight for the following tests.

1. 2000m ergometer submission
2. 6000m ergometer submission
3. Water based submissions

Weigh-in will occur on the day of test not less than 1 hour and not more than 2 hours prior to the start of the test. Weigh-in must be witnessed by the athletes designated coach.

The following are the Maximum allowable weights for each RADAR submissions

	Light Women (LW)	Light Men (LM)
December 1 <sup>st</sup> - February 28 <sup>th</sup> / Period 2	SRW +2.5	74 kg
March 1 <sup>st</sup> – May 15 <sup>th</sup> / Period 3	SRW +2	74 kg
Spring Trials (Mid April / Early May)	SRW +1	72.5 kg
September 1 <sup>st</sup> – November date / Period 1	SRW +4	74 kg
NRC	SRW +3 (to a max of 60kg)	72.5 kg

\* SRW = Summer Race Weight. Please see appendix A for further info on Lightweight Women's weight targets. SRW for each individual LW athlete is assigned by the Performance Director - Women. Those not assigned a SRW will use 57kg as their SRW.

## **How Results will be used:**

The information will be distributed to all participating athletes and coaches. The range of scores and individual athlete scores will be provided to illustrate strengths and weaknesses relative to their peers.

The collection, analysis, and evaluation of the data collected serves RCA's primary goal of better servicing and managing its Targeted Talent. The following are examples of how some results may be used through the year.

**\* The following Documents should be referenced for details on the use of RADAR specific to these programs**

- ***RCA Carding Criteria (Athlete Assistance Program)***
- ***RCA's Selection Criteria***

## **Sport Canada Athlete Assistance Program (CARDING):**

Carding for 2015 will be based on both on-water performances and RADAR ergometer performances as outlined in the Carding Criteria. Athletes will be ranked based on their on water performances and their individual ergometer performances among other considerations. Carding Criteria is published annually on the RCA website.

## **Invitation to selection events and camps:**

Rowing Canada Aviron will use data to assess the ongoing progress of athletes who are seeking selection to RCA's national development programs e.g. invitation to Training Camps or Selection Events.

## **Athlete development:**

Routine dialog will be held between RCA's Development Program staff, the athlete, and his or her coach on the results of their testing and what is required and expected to progress in the development system. This will ensure all parties are in agreement on how the athlete is progressing as well as establishing potential short term and long-term benchmarks.

**Training program monitoring and development:** The results of the RADAR submissions will allow RCA programs to work closely with Targeted athlete and their program coaches to help individualize training programs.

## Background of Testing:

Use of this testing tracks the correct development of athletes towards the National Training Centres, focusing on technical, physiological and mental development.

RADAR will continue to identify, track and monitor athletes while taking a multi layered look at their development. The information collected in RADAR allows tracking each athlete's specific improvement while benchmarking them against performance levels that are required to perform at a World Championship and Olympic Games. Testing has the ability provide coaches and athletes immediate feedback on their recent training period and necessary changes in direction for their future training.

### Advantages of adopting an ergometer test battery

- With the adoption of an ergometer test battery, athletes and coaches are provided with a representative picture of an athlete's development over short and long term training cycles. Coaches will be able to adapt training to suit the needs of the individual and identify trends that may have a positive or negative impact on the development of the overall program.
- Athletes will be required to produce maximal efforts over all tests, a number of times each year, similar to what is required at international levels.
- For example, the testing battery might indicate that the athlete needs improvement in maximal power output. The individual athletes training program designed by the coach can then address and help the athlete improve in that area.

## RADAR - Ergometer Assessments

The following is an overview of the ergometer tests that will be considered part of RCA's RADAR assessments.

### ***Olympic Development Program***

- Peak Power - 10 stroke Test: Peak Watts - Measures Peak Power. Athlete's maximum output available to them. Measurement of ATP output.
- 1 Minute test: Measures Anaerobic Power. Power output potential of the anaerobic lactate system. Energy produced without the use of oxygen.
- 2000 Meter Test: Race Distance. Approximate VO2 max. Maximal aerobic power.
- 6000 Meter Test: Anaerobic Threshold (Cat 4). Point at which the body switches from aerobic to more anaerobic energy metabolism (point at which accumulation exceeds removal). It is a good indicator of aerobic fitness and efficiency. *Generally the average wattage for this test is slightly higher than the wattage that corresponds with lactate threshold on a lactate step test.*

### ***Paralympic Program***

- Peak Power - 10 stroke Test: Peak Watts - Measures Peak Power. Athlete's maximum output available to them. Measurement of ATP output.
- 1 Minute test: Measures Anaerobic Power. Power output potential of the anaerobic lactate system. Energy produced without the use of oxygen.
- 1000 Meter Test: Race Distance. Approximate VO2 max. Maximal aerobic power.
- 6000 Meter Test (LTA) or 20 Minute Test (TA and AS). Point at which the body switches from aerobic to more anaerobic energy metabolism. It is a good indicator of aerobic fitness and efficiency. *Generally the average wattage for this test is slightly higher than the wattage that corresponds with lactate threshold on a lactate step test*

## **RADAR – On Water Assessments**

On water assessments are a critical part of assessing athletes' development and potential to support HP teams. All athletes will be assessed and ranked against RCA's Gold Medal Standards. These events allow coaches to assess athletes' technique and boat speed and provide feedback to both the athlete and their coach.

Athletes seeking Sport Canada Carding must achieve designated performance standards at these events to be considered for funding.

*\* Please refer the RCA Carding Criteria for further information.*

Currently RCA has 2 official water based assessments, they are as follows.

- 1) Spring Selection Trails – U23 & Junior
- 2) National Rowing Championships

Please see RCA's Calendar of events for dates and locations for each.



## ERG PROTOCOLS

All ergometer tests should be completed on a Concept 2 without the use of sliders.

### **Peak Power**

*Purpose:* Assess the ability to develop peak power.

*Equipment:*

- Concept II ergometer - \*The CII should be placed on a non-slip surface or held in place by weights or the tester.
- Clipboard
- Pen
- Data sheet

*Set-up:* Use 190 Drag Factor (Max Drag Factor) for all athletes. For stroke length assessment, a piece of black electrical tape should be placed across the rail at the point where the athlete reaches full compression. This will provide the assessor a guide to see if the athlete is rowing full slide. The C2 monitor should be set to just row and adjusted so that Watts are displayed on the screen.

*Warm Up:* Warm up is ten minutes of easy ergometer rowing with 2-3 maximal two stroke efforts interspersed through the ten minutes. Maximal stroke efforts should be done at both drag factors.

*The test:* Each athlete will perform two 10-stroke trials. The highest power, in Watts, seen for any of the ten strokes is recorded on the data sheet as the Peak Power. At least 90 seconds but not more than 180 seconds of rest is provided between each of the trials. This test is best done in groups of 2-3 so that one athlete can be testing while the others are resting for their next trial.

*Performance:* The athlete sits in a full compressed ready position at the catch. The assessors positions themselves so that they can see the ergometer display and record the required data. During the performance the athlete will pull ten strokes as hard as possible, trying to row as close to full slide as they are capable. Rest break: 90-180 seconds before repeating the same procedure again.

### **1 minute / 2000m / 6000m / 1000m / 20 minute**

*Equipment:*

- Concept II ergometer, Model C or later - \*The CII should be placed on a non-slip surface or held in place by weights or the tester.
- Clipboard
- Pen
- Data sheet

*Set-up:* The test will be done using Testing Drag Factor (as seen in the table below).

*Warm Up:* Athletes should perform a standard pre race warm up that supports performance at the prescribed testing distance.

*The test:* The athlete will start each test in the catch position. The ergometer monitor should be set in a countdown mode specific to the test being completed. At the completion of each test the following results should be recorded

- Average Watts
- Average split
- Average Stroke rate
- Final time or distance results

Further information can be downloaded for those seeking detailed information on athlete race strategy and tactics. This can be done by setting the recall mode on the monitor to the desired time or distance.

## Drag factors

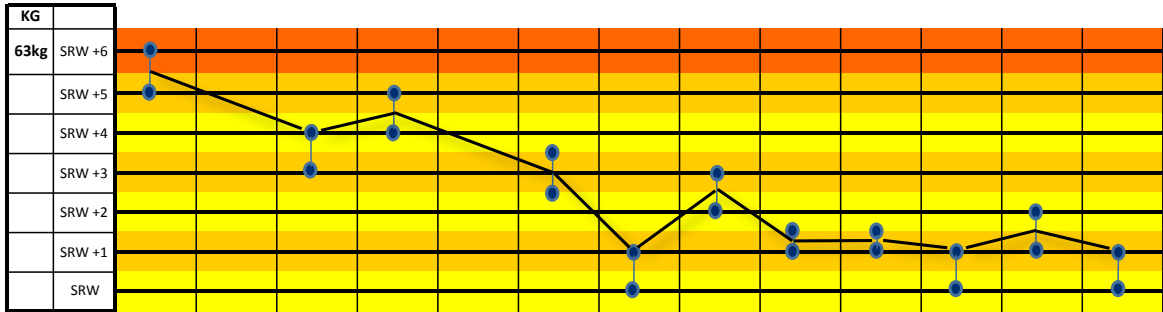
<b>Category</b>	<b>Testing DF*</b>	<b>Max DF</b>
Junior Women	110	190
Lightweight Women	110	190
Open Women	110	190
Junior Men	120	190
Lightweight Men	120	190
Open Men	130	190
LTA Men	120	190
LTA Women	110	190
TA / AS Men & Women	Preferred	190

\* The Testing Drag Factors should be use for all ergometer submissions other than the dedicated Peak Power testing

# Appendix A

## Light Women Weight Progression Protocol

SRW = Summer Race Weight  
 SRW is set by the Head Coach  
 Unless noted otherwise SRW is 57 kilograms



Date	1st Sept	1st Oct	1st Nov	1st Dec	1st Jan	1st Feb	1st Mar	1st Apr	1st May	1st Jun	1st Jul	1st Aug	1st Sep
Testing & Competitions	RADAR		NRC	RADAR or LTC 6k		RADAR or LTC 2k	Wcup	RADAR or LTC 2k	Spring Assessment		Wcup		Wchamp
Comments	Max body weight of 63kg not exceeded throughout this period			Body weight progressively lowered				Body weight maintained at levels indicated throughout this period.					

General Notes;

- 1 LW must follow this protocol to be eligible for crew boat selection.
- 2 For competitions the last 0.5kg - 1.0kg to be lost through gut emptying and light sweat.
- 3 The lower limit of each range is the target weight for the competitions.
- 4 Goal is to train energy neutral, i.e. Calorie intake matches energy demands of each session.