



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

Developed by Rowing Canada Aviron,
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Overview:

As Rowing Canada Aviron moves forward with a systematic development program, it is important to create a testing and monitoring system that reflects the needs of athletes and coaches on the pathway to Olympic and Paralympic performance.

RADAR has been established as a series of assessments throughout the calendar year that provide Rowing Canada Aviron with the ability to monitor an athletes development while comparing them to established performance benchmarks. RADAR is comprised of both on water assessments and ergometer-based assessments.

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

Background of Testing:

To create a stronger development system in Canada we must find ways to better support our developing athletes and coaches. It is important that the National Development System provides a clear systematic pathway for athletes to develop to their maximal capacity. Currently there is a gap between athletes at the National Training Centres and the next group of developing athletes. It is important to recognize that proper development of athletes to the National Training Centres requires a more targeted approach focusing on technical, physiological and mental development; ensuring athletes are ready for their next stage of development.

RCA has restructured the RADAR program to better reflect the needs of the HP Development system in Canada and take into account the university, club and school activities. RADAR will continue to identify, track and monitor athletes while taking a multi layered look at their development. The information collected in RADAR allows RCA the ability to track each athlete's specific improvement while benchmarking them against, RCA established, performance markers required to perform at World Championships and Olympic Games. Testing has the ability to show changes to athletes physiology, without the need for laboratory testing, providing coaches and athletes immediate feedback on their recent training period and provide direction for their future training. RADAR provides the roadmap to individual development.

Advantages of adopting an ergometer test battery

- To provide a more representative picture of an athlete's development over the short and long term, as it applies to all aspects of rowing fitness. Laboratory tests can be useful to 1) ensure adequate rowing specific fitness is in place for further training; 2) look at aerobic and anaerobic profile of the athletes; and 3) help prescribe training zones, they are rarely available to be used in domestic programming. With the adoption of an ergometer test battery, coaches will gain a greater understanding of each individual's fitness traits and how they change through a training cycle. Coaches will not only be able to adapt training to suit the needs of the individual but 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. One of the possible reasons for athlete's inability to produce 'above expectations' performances on the world stage, could be linked to the athlete's reluctance to perform maximally on a regular basis. The ergometer tests are difficult to do and require maximal efforts. The more we expose our athletes to the expectation of maximal effort, the more it will help to improve our athlete's ability enter a performance state. It will also change the athlete's perceptions on their ability to produce maximal output on a regular basis.

- Gathering more information about each athlete throughout the year can only serve us better in the future in determining areas where the athlete can improve and help coaches design appropriate training programs for individual athletes that reflect the areas that require improvement. As an example, the testing battery might indicate that the athlete needs improvement in maximal power output. The individual athlete's 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.*
- 60 Minute Test: While not a required test for the RADAR program, it is recommended that coaches incorporate the 60 minute test (at free rate) into training programs for athletes involved in the RCA RADAR testing program. The 60 minute test provides a good indication of aerobic capacity.

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 will remain a critical part of assessing athletes development and potential to support HP teams. On water performances remain the core of our RADAR program and provide the greatest insight to coaches regarding an athletes development. These on water assessments will either be linked to an existing event or run as a Time Trial at an identified Centre. All athletes will be assessed and ranked against RCA's Gold Medal Standards. These events also allow RCA's development staff the opportunity to assess athlete's technique and provide feedback both to the athlete and their coach. Athletes must compete in at least 2 of the designated events listed below, one of which is the National Rowing Championships to be considered for carding for the following year.

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

- 1) RCA's Spring trials (East and West)
- 2) NRC's – National Rowing Championships

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

RADAR Submission Dates:

The table below outlines what tests are required for each submission period and deadline for all data to be completed and entered into the Athlete Monitoring Data base - www.cscnet.ca . All athletes interested in RCA's National Development System must submit the appropriate information to this on-line database.

Olympic Development Program

	February 16, 2014				April 6, 2014				September 14, 2014				November 23, 2014			
	U17	U19	U23	Senior	U17	U19	U23	Senior	U17	U19	U23	Senior	U17	U19	U23	Senior
<i>Peak Power (MDF)</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>1 Minute</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓*	✓*	✓	✓	✓	✓	✓	✓
<i>2000 Meter</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>6000 Meter</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* The September 1minute ergometer piece will act as RCA's Fall Junior Challenge.

Paralympic Program

	February 16, 2014			April 7, 2014			September 14, 2014			November 23, 2014		
	LTA	TA	AS	LTA	TA	AS	LTA	TA	AS	LTA	TA	AS
<i>Peak Power (MDF)</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>1 Minute</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>1000 Meter</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>6000 Meter</i>	✓			✓			✓			✓		
<i>20 minute</i>		✓	✓		✓	✓		✓	✓		✓	✓

Completion of RADAR testing must fit into the following parameters.

1. Testing must 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. The RADAR Week must be completed within 30 days of the submission deadline. Coaches should review their training program and determine how to best fit this testing into their loading and unloading phases and training cycles
3. All testing must be witnessed and verified by a coach.

RADAR Week:

Overview

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. 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 / 1000m all out – PARA (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 submission for 2014.

	Lwt Women	Lwt Men
February 16 th	SRW +2.5	74 kg
April 6 th	SRW +2	74 kg
Spring Trials (Mid April / Early May)	SRW +1	72.5 kg
September 14 th	SRW +5	75 kg
NRC	SRW +3	72.5 kg
November 23 rd	SRW +4	74 kg

* SRW = Summer Racing Weight. Please see appendix A for further information on Lightweight Womens' 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 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***

- ***Sport Canada Athlete Assistance Program***
- ***RCA's Selection document***

Sport Canada Athlete Assistance Program (CARDING):

Carding for 2015 will be based on both on-water performances and RADAR ergometer performances. Athletes will be ranked based on their on water performances and their individual ergometer performances for each test. Further information on 2015 carding will be forthcoming in early 2014.

Invitation to selection events and camps:

Targeted Athletes will be invited to Camps and Selection events based on their ranking within the RADAR program.

Athlete development:

Routine dialog will be held between RCA's Development staff, the athlete, and his / her coach on the results of their testing and what is required / expected to progress in the development system. This will ensure all parties are in agreement on how the athletes 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 individualize training programs.

Program evaluation and review:

The ongoing collection of this data will allow RCA staff, performance partners, and physiologists to re-evaluate the RCA's benchmarks and performance standards.

Protocols:

All ergometer tests should be completed on a Concept 2 without the use of sliders. We are currently reviewing the impact on scores based on the use of sliders, however our current benchmarks do not allow for accurate comparison.

Peak Power

Purpose: Assess the ability to develop peak power on a rowing ergometer.

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: The test will be done using 190 Drag Factor (Max Drag Factor). Set the drag factor to 190 on the erg prior to the start of the test. In addition to setting the drag factor, 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 grasps the erg handle and positions themselves in a full compressed ready position at the catch. The assessor positions himself or herself so that they can see the ergometer display and record the required data. When the athlete is in the ready position the assessor will give the command "READY, GO". At that time the athlete will pull ten strokes as hard as possible, trying to row as close to full slide as they are capable. Once the trial is completed the athlete will have a 90-180 seconds break 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). Set the drag factor accordingly prior to the start of the test.

Warm Up: Athletes should perform a standard pre race warm up that supports performance at the prescribed testing distance. A recommended warm up is provided in the week of testing section.

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

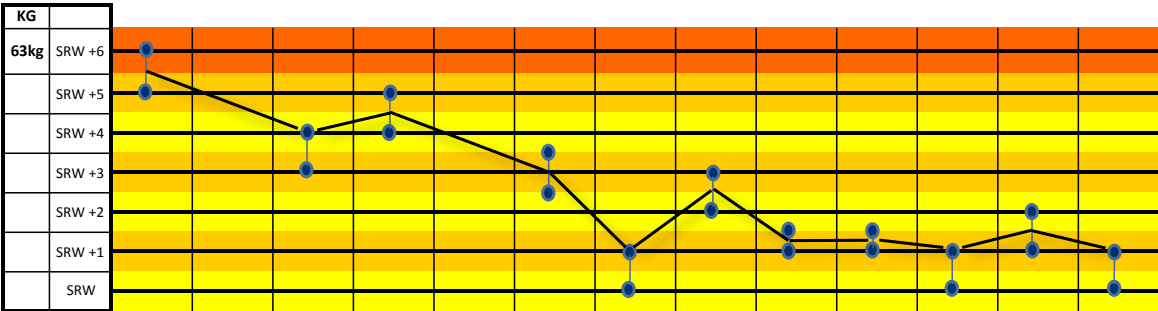
Category		Testing DF*	Max DF
Junior Women	-	110	190
Lightweight Women	-	110	190
Open Women	-	110	190
Junior Men	-	120	190
Lightweight Men	-	120	190
Open Men	-	130	190
LTA Men	-	120	190
LTA Women	-	110	190
TA / AS Men & Women	-	Preferred	190

* 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.