

Empowering a Motorsport Nation

Pit Lane Radar Officials Handbook

*A supplement to the Pit Lane
and Grid Officials Handbook*

**MOTORSPORT AUSTRALIA
OFFICIALS**



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References:

Motorsport Australia Manual

Motorsport Australia Radar Speed Detection Instructional Sheet

Australian Standard AS2898.2-2003 Part 2: Radar Speed Detection

2021.1 Supercars Speed Gun Operations

Pit Lane and Grid Officials Handbook

LTI 20-20 UltraLyte 100 Laser Speed Measurement System User Manual

Falcon Hand-Held Traffic Radar Operator's Manual

Bushnell Velocity User Manual

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1.0 Introduction

Radar personnel operate as part of the Pit Lane and Grid team. This handbook is a general guideline for radar operation, roles and associated responsibilities in Pit Lane. The information provided in this handbook applies to LIDAR and Doppler Radar devices (hereafter both will be referred to as "radar"). Follow the manufacturer's recommendations for operation of your specific device. This handbook is supplementary to appropriate training.

This document is written in conjunction with the Motorsport Australia Radar Speed Detection Instructional Sheet, Australian Standard AS2898.2-2003 Part 2: Radar Speed Detection and the 2021.1 Supercars Speed Gun Operations. Always operate speed measurement devices according to the manufacturer's recommendations.

2.0 General

The Pit Lane speed limit is 40 km/h and applies to ALL vehicles transiting Pit Lane, unless specified otherwise by the Clerk of the Course or the event Supplementary Regulations. The purpose of the radar in Pit Lane is to act as a deterrent to prevent speeding and to maintain safety in Pit Lane.

3.0 Roles

The following roles may be rotated provided there are adequate personnel to do so. On some occasions the Judge of Fact will be the operator and scribe.

3.1 Operator/Judge of Fact

All Pit Lane Speed Judges of Fact will be listed in the event Supplementary Regulations or on any official noticeboard.

- The role of the operator is to operate the radar and verbally relay the speed readings and corresponding car number to the scribe.
- The responsibilities of a Judge of Fact are as follows:
 - A Judge of Fact must be present at all times to operate the radar, supervise and/or facilitate training.
 - A Judge of Fact must be impartial and certain of the facts they are appointed to judge.
- In the event of a speed infringement the Judge of Fact will sign a written report.
- Training of new operators will initially be undertaken during practice sessions. Progression to qualifying and race sessions will then follow upon satisfactory skill development.

3.2 Scribe

The scribe is responsible for the following:

- Recording the speed readings and car number relayed verbally from the operator on a speed log.
 - As the operator is the Judge of Fact, only speed readings relayed verbally to the scribe are recorded on the log and speeding report.

- The scribe must be positioned to hear the operator relaying the speed readings.
- Completing the speeding report form for the operator/Judge of Fact to sign.
- Recording the time on the log for each speeding infringement.
 - It is only necessary to record the time on the log every 10-20 entries if none of them are infringements.
 - Occasionally more than one radar will report an infringement for the same transit through Pit Lane, the time will indicate as such to prevent an additional penalty.
 - Recording time in 24-hour format, particularly for any events 12 hours or longer.
- Removing any objects or personnel obstructing the radar and its operation.

4.0 Documentation

A clipboard/folder containing adequate blank copies of the Pit Lane Speed Log sheets and the correct speeding report form for the event is required to be supplied along with the radar gun. At some events the folders are supplied by the Secretary of the Event or the Pit Chief, at other events the folder may need to be supplied by the radar operator. Refer to Appendix A for a printable blank speed log and report form.

- Pit Lane Speed log
 - Complete the required fields as indicated.
 - Clearly note the current session for subsequent speed readings.
 - Record speed readings, the corresponding car number and time in the spaces provided. Refer to Appendix B for an example speed log.
- Pit Lane Speeding Report
 - Complete the required fields. Refer to Appendix C for an example report form.
 - Completed speeding reports should be submitted to Race Control via the nearest senior Pit Lane official or delegate where practical.
 - Reporting requirements and procedure may vary depending on the event or category.
 - Further information regarding specific reporting procedures will be provided by the Pit Chief or the Clerk of the Course at the event.
 - Notify Race Control of a report that requires collection. The radio procedure is as follows:
 - "Race Control Radar 1, I have a report requiring collection"
 - This will prompt a senior Pit Lane official or delegate to collect and submit the report.

5.0 Setup

- Collect the radar and ensure that the operators are trained and know how to use the device. The radar is to be returned to where it was collected from at the end of each day.
- Check that you have all necessary equipment:
 - Clipboard/folder with speed logs and report forms
 - Spare batteries
 - Weather protection.
- Check that the radar is working properly and the test certificate is valid.

- If there are any issues with the radar at any point during the event, notify your senior Pit Lane officials verbally, not over the radio network and return it to where it was collected. Refer to Appendix D for troubleshooting common issues.
- Set up the radar in the following manner:
 - To ensure accurate readings, the radar must be aimed in a direct line at the target vehicle. You must maintain a direct line of sight as much as practical on the target vehicle as it transits the Pit Lane.
 - If there is more than one radar, aim to have a straight line of sight to at least the next radar, or positioned where the line of sight of both radars covers the whole lane (e.g. Pit Exit and middle Pit Lane both aiming towards Pit Entry).
 - Take into consideration external factors that can cause inaccurate readings.
 - Electromagnetic Interference (EMI) e.g. Radio Frequency Interference (RFI).
 - Extraneous moving objects e.g. people, waved pit signs.
 - Curved surfaces e.g. open wheeled vehicles.
 - If the radar is aimed at an angle towards the target vehicle, inaccurate readings will occur, this is called the Cosine Effect.
 - Reflections from stationary objects such as signs, can reflect the radar beam away from the target vehicle for doppler devices.

6.0 Operation

Note: The following procedure may not apply to all events or categories. Clarify with the Pit Chief or the Clerk of the Course, whether certain events or particular categories require an independent operating procedure. Refer to Appendix E for the Supercars procedure.

- Follow the manufacturer's recommendations for operation.
- Position the radar according to the above setup considerations.
- Note the location of the radar as Pit Entry, Pit Exit or a garage number.
- The area which the speed limit applies is between the control lines at Pit Entry and Pit Exit.
- When operating a handheld device, stay as still as possible, your movement towards or away from the target vehicle will be factored into the speed reading. Sideways movement can also cause high reading glitches.
- Aim the device correctly and record speed readings for vehicles transiting Pit Lane.
- Continue to monitor the speed of the vehicle after the readings have been recorded.
- Target the next vehicle provided there is a suitable gap to acquire an accurate reading.
- With respect to readings taken, "If in doubt, leave it out".
- Readings affected by external factors within the detection area should be omitted.
- Report speed infringements according to the procedure specific to the event or category.
- A valid reading for a speed infringement consists of a minimum of 4 consecutive speed readings above the speed limit.
- Speed readings and/or infringements must not be reported to teams or other persons.
- Radio communications should not be used to relay speed information.

- If objects or personnel obstructing the radar cannot be removed, reposition the radar in an appropriate location.
- Handle the device with care and protect the device from wet weather. Rain ponchos, plastic bags or any other waterproof material can be used to cover the radar and folders in wet weather.

Appendix A: Blank Forms

Printable blank forms:

Page 9 - Pit Lane Speed Log

Page 10 - Pit Lane Speeding Report



Pit Lane Speeding Report

Circuit: _____

Date: _____

Category: _____

Session: _____

Car Number: _____

Radar Location: _____

Consecutive Speeds Recorded: _____ / _____ / _____ / _____ / _____ / _____ / _____ / _____ / _____ / _____

Time of Infringement: _____

Radar Operator's Name: _____
(print)

(sign)

Appendix B: Example Pit Lane Speed Log

PIT LANE SPEED LOG

Radar Location: PIT EXIT

EVENT: EXAMPLE 500

Date: 15 / 06 / 2021

SESSION: EXAMPLE (RACE 1)

Page: 1 of

Car No.	SPEED				TIME
1	37	40	39	38	1050
FORMULA EXAMPLE (RACE 1)					
EXAMPLE GT (RACE 2)					
19	39	39	39	39	1159
63	38	40	38		
29	39	38			
87	39	40	39	38	
48	39	40	39	40	
71	38	37	38	39	
59	41	39	38		
129	39	38	36	38	
25	40	41	40	38	
71	36	38	40		1208
EXAMPLE CARS (PRACTICE 4)					
23	37	38	37	38	1281
35	37	37	38		
17	38	37	38	37	
12	39	38	37	36	
33	39	38	39	38	
888	37	38	38	37	
6	37	38	37	38	
8	37	38	37	38	
15	39	38	38	37	
78	39	37			
97	36	37	38	37	
9	38	39	38	36	
99	38	38	37	37	
3	37	38	37	38	
2	37	38	38	37	
23	38	39	37		
35	40	38	37	38	
55	38	39	37	38	
7	36	38	37	38	1237
6	37	38	37		
17	39	38	37	38	1245
14	38	37	38	37	
15	39	38	39	38	
78	39	38	37	38	
8	39	38	39	38	
99	39	38			
97	39	38	39	38	

Car No.	SPEED				TIME
19	38	38			
111	38				
35	38	38	38	38	
2	40	39	38	39	
7	38	37	38	35	
55	38	38			
21	39	38	39	35	
17	38	37			
14	38	37	38	39	
97	39	38	37	37	1253
33	38	38	38	38	
78	39	39			
8	39	38	39	38	
12	39	38	38		
99	38				
35	38	38	38		
9	36	37	38	37	
22	38	38			
23	39	38			
99	39	39	38		
5	39				
EXAMPLE TOURING CARS R1					
EXAMPLE 2 Q1					
44	37	38	37	38	1339
27	37	38	38		
55	39	38	38	37	
16	36	37	37	38	
28	37	36			
35	38	36	37		
21	37				
22	37	38	37	38	
23	39	38	37	38	
24	38	38	38	37	1342
42	37	37	39	38	
32	38	38	28	37	
22	37	36			
12	37	38	37	38	
1	37	38	36	38	
2	37	36	38	39	
3	39	39	38	37	
4	36	37			
5	37	38	37		

Appendix C: Example Pit Lane Speeding Report



Pit Lane Speeding Report

Circuit: Sundown Date: 24/10/2021

Category: Example Touring Cars Session: Practice 2

Car Number: 57

Radar Location: Pit Entry

Consecutive Speeds Recorded: 56 / 55 / 57 / 58 / 58 / 59 / / / /

Time of Infringement: 15:23

Radar Operator's Name: RAY DAR
(print)

Ray Dar
(sign)

Appendix D: Troubleshooting Common Issues

Note: The following solutions are a general guideline only and may not be applicable to all devices. Where applicable follow the manufacturer's troubleshooting guide.

The radar is having difficulty locking on to the target vehicle.

- Release the trigger and try again.
- Aim the device in a steady and smooth manner.
- Consider the following questions:
 - Are there other moving objects within the detection area? Are any of them blocking or partially obstructing the target vehicle?
 - Is the target vehicle too far away or too close? Are you normally able to get a lock in that region?
 - Lighting conditions, is the ambient light dimmer or brighter than usual?
 - Are there a lot of reflective surfaces in the detection area?
 - Consider the colour and finish of the target vehicle e.g. Matte black is hard to lock onto.
 - Is it raining?
 - Is there a crosswind?
 - Are the lenses clean?
 - Is there a lack of flat surfaces? e.g. open wheeled vehicles.
- Test the device on a stationary object, preferably of known distance.
- Turn the device off and on again.
- Remove and re-insert the batteries.
- Replace the batteries.

The screen is blank.

- Try turning it on.
- Replace the batteries.

The radar is taking readings on its own.

- Return the device back to where it was collected from.

The radar is displaying an unexpected reading.

- Are there extraneous moving objects or reflective surfaces within the detection area?
- Consider the following objects within the detection area that may cause an unexpectedly high or low reading:
 - People
 - Waved signs
 - Reflective surfaces
 - Other vehicles e.g. Vehicles on the track.
- After determining the potential cause of the inaccurate reading, re-aim the device in a manner that avoids the cause of interference.

If all else fails, take the device back to where you got it from. When it comes to unfavourable weather conditions, just remember to keep the device clean and dry.

Appendix E: Supercars Procedure

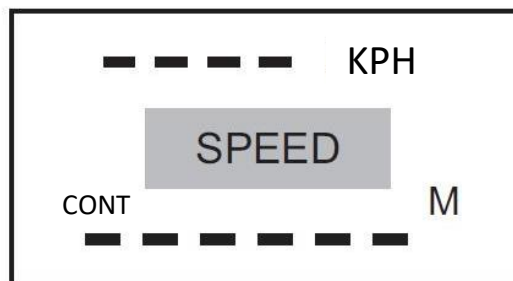
There is a "Pit Entry" and "Pit Exit" radar. Locations vary depending on the circuit and line of sight requirements. The following procedure applies to all events in the Supercars Championship, Supercars promoted events and support category sessions.

Setup:

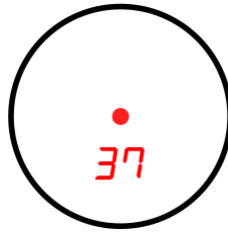
- The radars are collected from the Supercars transporter in the paddock and returned at the end of each day. It is a precision instrument, handle with care.
- Check that the device is working properly and the test certificate is valid.
- If there are any issues with the radar at any point during the event, notify a senior Pit Lane official verbally, not over the radio network and immediately return the device to the Supercars transporter for examination and/or repair.
- The folders and documentation can be obtained from the Pit Chief or the Secretary of the Event.
- Set up the device and ensure it is level, the device must always be used with the tripod provided.
- Ensure the line of sight of the radar is directly facing traffic.
- Ensure the line of sight of both radars covers the area in which the speed limit applies.
- The area which the speed limit applies is between the control lines at Pit Entry and Pit Exit.

Operation:

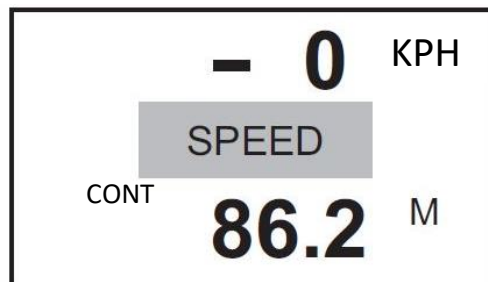
- Press the trigger to turn on the device. It will run through a "self-test" routine, once completed the screen will display the following:



- Ensure the radar is set to acquire readings in "CONT" mode.
- To ensure accurate readings, the radar must be aimed in a direct line at the target vehicle. You must maintain a direct line of sight as much as practical on the target vehicle as it transits the Pit Lane.
- To take a reading, hold down the trigger while aiming the red dot in the sight at the target vehicle as per the following:
 - Aim at the centre of either the front or back panel e.g. a flat, not curved target area.
 - Once the device has locked onto the target vehicle, a high-pitched tone will sound with each valid reading at a rate of 2/second.
 - The speed will appear below the dot.



- The speed reading will be positive if the target vehicle is moving towards you and negative when the target vehicle is moving away.
- Once the trigger is released the final speed reading and distance will be held on the LCD screen.



- When the radar is unable to acquire a valid reading, a constant deep tone will be accompanied by an error message displayed on the LCD screen.
- Record consecutive speeds in the "SPEED" columns of the speed log.
- Continue to monitor the speed of the vehicle after the readings have been recorded.
- Target the next vehicle provided there is a suitable gap to acquire an accurate reading.
- Readings affected by external factors within the detection area should be omitted.
- A valid recording for a speed infringement consists of a minimum of 4 consecutive speed readings exceeding 41km/h.
- Speed readings and/or infringements must not be reported to teams or other persons.
- Radio communications should not be used to relay speed information.
- Pit Lane speeding report forms should be submitted as follows:

Session	Deliver to
Practice and qualifying	A Supercars official in Pit Lane
Races	The Clerk of the Course in Race Control

- If objects or personnel obstructing the radar cannot be removed, reposition the radar in an appropriate location.
- Protect the device from wet weather. Rain ponchos, plastic bags or any other waterproof material can be used to cover the radar and folders in wet weather.