

Annex H

High Speed Proficiency Cert

Applicable to any model capable of exceeding 200kmh in level flight

General

The Achievement Scheme is run by the MFNZ as a National Scheme and it is open to all model flyers.

The High Speed certificate is a supplementary type, meaning the candidate has already successfully passed as a minimum the B test for their respective model.

The examination for a 'HS' certificate may be carried out by:

- (a) Two Registered Examiners (the 'lead' must be a Wing Examiner specific to the model being flown).
- (b) A Fixed/Rotary/Unpowered Wing Chief Examiner

The candidate must successfully complete the test schedules in one attempt. A maximum of two attempts at the examination are permitted in any one day.

The Model

The tests can be performed with virtually any model, i/c or electric or unpowered, the model must be capable of exceeding 200kmh in flight.

The use of gyros, autopilot or other electronic stability/pilot aids is not permitted during the tests. This does not apply to rotary winged aircraft; however, they must be flown in a rate/manual mode. If any such system is fitted to a fixed model it must be disabled during the tests and you should check that this has been done. The model may be hand launched or capable of taking off from the ground. GPS must not be used during any test.

Electric Powered Models must be treated as LIVE as soon as the main flight battery is connected, irrespective of radio state and great care must be demonstrated by the candidate. The arming sequence should be clearly understood and discussed/demonstrated to you by the candidate. This is particularly important with hotliner style models, Safe operation must be demonstrated by the candidate.

Whatever model is brought by the candidate; it must be suitable to fly the manoeuvres required by the test they are taking. You do not have the authority to alter the required manoeuvres to suit a model and if, in your opinion, the model is unsuitable for the test then you should explain this to the candidate and tell them that they cannot use that model.

The selection of the model to do the test is the responsibility of the pilot and it is they you are testing, not the model. Similarly, the type of model presented cannot be used as an excuse for not completing certain manoeuvres. A pilot cannot turn up with a twin, for instance, and then say that the spin is too dangerous because the model would not pull out of it.

Another important point to remember is that the candidate is not expected to build or even own the model they use. There is no reason why a flyer who does not own a suitable model could not borrow one from a friend or club mate.

Pre Flight Checks

Carry out pre-flight checks as required by the MFNZ safety codes. The pre-flight checks are laid out clearly in the MFNZ members manual.

Further to this, the High Speed certificate candidate should also demonstrate through knowledge of setup, including, but not limited to:

- **Control Surface Play:** Linkages should be tight, with no perceivable play which may induce flutter. Attention should be paid to flaps if fitted. This also applies to helicopter rotor heads
- **Correct Linkage Geometry:** Allowing for maximum servo resolution and torque, with no binding at extreme throws,
- **Airframe Strength:** Inspect spars, hinges, wing attachments for stress indications. Leading edges of composite models should be inspected for pinholes, and delamination
- **Propeller Hub Inspection:** Particularly in the case of Hotliner/F5B type models and Helicopters due to the extreme stresses placed on the drivetrain
- **Redundancy and separation:** Power system electronics should be separated from control electronics allowing for safe operation of the model in the case of power system failure
- **Failsafe's:** Failsafe's that put the airframe into the safest configuration possible should be demonstrated. Depending on airframe, this may include throttle off, flaps down (or full crow braking), tail surfaces set for slight climb/roll etc.

Pre Flight Test

The candidate should also go through the pre-flying session checks, also laid out in the members manual. Ask the candidate to go through their checks as if the test flight was their first flight of the day. Attention should be given to airframe, control linkages and surfaces. Points to look for are that the candidate has a steady and regular ground routine, especially when starting and tuning the engine.

Nerves may play a part in the pits but you should satisfy yourself that the candidate is actually in control of what they are doing when preparing their aircraft for flight. A neat ground layout makes a good impression. A poor performance in this area is not grounds for failing the candidate, however, but it is inevitable that you will be making mental notes of all aspects of the candidate's competence and this is one that might have an effect on a real 'borderline' case.

Pay particular attention to the way the candidate uses the local frequency control system and make sure that they fully understand it and use the correct sequence appropriate to their model. For 35 MHz, this is usually 'get the peg, TX on, Rx on'. For 2.4 GHz, the candidate should be aware of any local transmitter usage limitations and if a flight peg is required, it must be obtained before the TX is turned on.

Some radio equipment and, occasionally, a specific model requirement requires that the Rx be switched on first and, if this is the case, the candidate should explain this clearly to you. With electric powered models, take note that the candidate is aware that the model is 'live' as soon as the flight battery is plugged in and that they take appropriate safety precautions.

If a separate receiver battery is fitted, the candidate should have the opportunity to check the operation of the radio equipment before the flight battery is plugged in. Watch carefully and take note that the transmitter controls, trims and switches are checked by the pilot.

All candidates are required to be aware of the local the frequency control system and anyone who is required to use it but switches their radio on before doing so should be failed on the spot. If there is no one else available then there is nothing to stop you aiding the candidate by holding the model for the power check, carrying it out for take-off etc. but any such actions must be performed by you directly on the instructions of the candidate. You must not prompt them or carry out any actions of your own accord. Talk this over with the candidate in your pre-flight briefing.

If the test is being taken with an electric powered model, then the candidate should show that they are familiar with the safe handling of such models. In particular, they must demonstrate to you the 'arming' sequence for their model.

For safety reasons many speed controllers have a pre-programmed sequence of actions that have to be followed before the motor will respond to throttle stick movements. For instance, after switching on TX and Rx and then plugging in the main flight battery, one type of controller requires that you move the throttle stick from low to full throttle and then back to low before the motor is 'armed' and ready for flight. The candidate must be fully familiar with the system fitted to the model and should brief you on the system and demonstrate it working at some time during the pre-flight checks.

Generally, they must show that they are paying particular attention to the transmitter and receiver switch on sequence and they must make you aware that they are treating the model as 'live' as soon as the flight battery is plugged in, no matter what arming sequence they may then have to go through.

The pilot must demonstrate the correct function of the failsafe, where appropriate, before committing to the flight.

The pilot must stand in the designated pilot area for the entirety of the flying part of the test.

Flight Test

The model may take off from the ground, or be hand launched by the pilot, or by third party. In the case of the third party, the pilot should brief them on the operation of the model and safe handling of it in its live state.

Take off/Launch and complete a left (or right) hand circuit and overfly the take-off area.

The model may be carried out to the take-off position by the candidate or a helper or it may be taxied out from a safe position in front of the pits/pilots area. Taxiing out of the pits is an instant fail.

Prior to carrying or taxiing out, the pilot should inform other pilots flying that his model is going out onto the active area. Take off/Launch must be performed with the model a safe distance from the pilot box area and on a line which does not take the model towards the pits, other people or any other danger/no fly area. Take off should be reasonably straight and well controlled. It can be a point in the flyer's favour if, in the case of the take-off going wrong, they abandon it in a safe manner. It's far better that they think about what they are doing rather than try to coax a model with a sick engine into the air. If a take-off is aborted in a safe manner you should immediately reassure the candidate that they will not be penalised for taking correct actions, even though these may conflict with what the test requires.

Climb out should be at a steady angle and straight until operational height is reached when the model should be levelled, the throttle brought back to cruise power and the model established in the circuit. The type of circuit is not stated so either racetrack, rectangular or circular is acceptable. This choice of circuit type applies to the rest of the flight as well except when a certain type of circuit is specified for a manoeuvre. On completion of the circuit, the model will be flying into wind past the front of the pilot and, for safety reasons, just over the far edge of the take-off area. Tell the candidate prior to the flight the line that you want them to be following. You must make sure that the candidate is clear on this, the line will be set by the model flying across in front of them on a heading which should be agreed before the flight (usually, but not always, into wind) and passing over a set point. This first pass in front of the pilot is extremely important as it sets the standard height and line for the rest of the test and this standard height and line will be referred to often in these notes.

The High Speed Certificate candidate must know the legal area of the flying site, and be able to keep the model within visual range at all times. Failure to do this is an instant fail of the test.

Due to the differing natures of the High-speed models, be they Pylon, DS, Hotliners, etc. the test curriculum

is largely up to the examiner and dependant on the model flown, weather and wind directions, and the location. The examiner is looking for quiet competence and smooth control.

As an example, a test routine suitable for a hotliner or pylon racer:

Fly a full speed rectangular circuit at a constant height in the opposite direction to the landing circuit above.

Before commencing this manoeuvre, the pilot must check that the airspace is clear and announce his intentions to the other pilots, as the manoeuvre produces a flight path opposing the normal circuit direction. Any initial turn to position for this manoeuvre shall be away from the pilot box area. Watch once again for parallel legs with reasonable turns and level flight. A common mistake is to turn on to the final crosswind leg (the upwind one) too soon. The result of this will almost inevitably be that the final turn of the manoeuvre will be too close to the pilot and may finish up as a 'panic' turn. Make sure that candidates give themselves plenty of room upwind, especially if the wind is at all strong. Cross wind legs may be carried out in a throttle down configuration, however up and downwind legs must be done at full flight speed, the test demonstrating the pilot's ability to confidently and safely control the model.

Approach and Missed Approaches

The candidate should set up for a normal landing approach, allowing enough room for speed to be bled off as per a normal landing. While over the strip on final approach, the candidate should power up and go around. This must be done smoothly and in a controlled manner.

The actual approach and landing should be set up as above, with the candidate safely landing the model within the predefined landing area at a safe speed. Confidence in placing the model on the strip shows the pilot is familiar with the model and how to fly it.

Candidate Questions

The High Speed certificate is a supplementary type, meaning the candidate has already successfully passed as a minimum the B test for their respective model, and the associate questions.

However due to the nature of high speed flight further questions should be asked of the candidate

Remember that on no account can a good performance on the questions make up for a flying test that you considered a failure. If you have failed the candidate's flying, you should not even start to ask the questions. On the other hand, the achievement scheme is a test of both flying ability and knowledge. It doesn't matter how well the candidate can fly, if they cannot answer the questions they should not pass.

You are not expected to ask them 'parrot fashion' and the candidate is not expected to answer that way either. This opens the possibility of asking a candidate if they can think of reasons behind specific rules. For instance, why is the club frequency control system operated as it is and what might go wrong? or why should models not be taxied in or out of the pits area? There is always the possibility that the examiner may use the supplementary questions to further explore the candidates understanding of the mandatory questions.

Candidates Name	MFNZ Number	Date	Signature
Examiner's Name	MFNZ Number	Date	Signature

Examiners and Candidates Check List

The following is a short checklist of matters to discuss with the candidate taken from this document. This checklist can be used to ensure that all points raised above have been discussed with the pilot prior to any flights:

- 1 Has the candidate read: - The MFNZ members manual
Local site rules (if applicable)
- 2 Discuss whether the model is suitable in "these conditions"
- 3 Any "no fly zones" need to be identified
- 4 Remind candidate to talk you through anything that the helper does for
them as the test progresses
- 5 Agree model position after the launch and straight flight tasks (d & e) are
completed
- 6 Agree any Airspace requirements that need to be pre-determined by the
Examiner and Candidate prior to the commencement of the test flights