



**BRITISH MODEL FLYING ASSOCIATION  
THE R/C ACHIEVEMENT SCHEME**

**TEST STANDARDS for CHIEF EXAMINERS  
and CLUB EXAMINERS**

**GUIDANCE for TEST CANDIDATES**

**THE 'A' CERTIFICATE  
(HELICOPTER)**

**ISSUE 4**

**February 2004**

## **General**

The 'A' certificate is a measure of flying ability and safety which 'may be equated to a safe solo standard of flying' and an increasing number of clubs use it as their 'safe solo' test. As an examiner, the level of competence you should expect of a candidate should be based on that criterion; that is, is this person, in your opinion, fit to be allowed to fly unsupervised?

A pilot capable of flying to 'B' certificate standards and wishing to go straight to the Helicopter 'B' test without taking the 'A' test may do so but candidates should on no account be forced along this path. A flyer, known within a club to be a good pilot, going through the 'A' before taking the 'B' can be an excellent example to the rest of the club members and this should be pointed out to any candidate wishing to go direct to the 'B'.

The candidate should have studied the BMFA handbook and be familiar with the 'Safety code for general flying' as well as the 'Operational guide, 'all models', 'radio control' and helicopter" sections. Besides being an excellent guide to the safe flying of helicopters and other model aircraft, most of the questions asked at the end of the test will be from these sections of the handbook

## **The Model**

The test can be performed with virtually any model helicopter, fixed pitch or collective. The helicopter may be internal combustion engine or electric motor powered.

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.

## **Gyros**

It is acceptable to use an electro-mechanical or solid state gyro in any helicopter being used to take the test although electronic stabilisation is restricted to a single sensor acting in rotation around the yaw axis only.

This allows a range of gyros to be fitted, from simple yaw dampers to solid state heading lock units but only acting on the tail rotor.

The use of any autopilot and/or artificial stability features which are (or may be) designed into such units beyond the definition above is not acceptable during the test.

## **Height and Speed**

The 'A' certificate candidate should be a reasonably confident pilot, even though they may have been flying helicopters for only a few months. Flying too high or too low is not the mark of a confident pilot. The test should be flown at the heights specified in the individual elements with little deviation.

The two manoeuvres in the 'A' certificate test require slightly different speeds as will be explained on the manoeuvre descriptions.

## **Consistency**

The candidate must ensure that the model stays at a reasonably constant height and heading and moves at a constant speed through the manoeuvres as required. All deviations from steady and well controlled flight should be noted as they will form part of your examiner's judgement of the test flight. Good use of the controls to maintain a constant height throughout the test is something you must watch carefully for.

Slight variations of height and failure to fly spot-on lines are not necessarily reasons to fail the candidate on their own, but they do give an indication of the pilot's general level of competence and should influence your final decision.

Very poor height control or significant failures to hover with the tail held in the correct direction are a sure sign that the pilot has not practised the test and are legitimate reasons to fail the candidate.

## **Continuity**

The manoeuvres are set out in such a way that they are flown one after the other as a short sequence. You should discuss with the candidate before the flight the way in which you would like the various elements flown and the candidate should have a good knowledge of the test before the event. If the candidate is very hesitant during the test and is not capable of following the set sequence then you might conclude that they have either not had enough practice or that their basic flying skills are not yet well enough developed.

## **Trim**

It is expected that the candidate will start the test with a model that has been trimmed out previously . If you see obvious signs that the model is out of trim and the candidate makes no attempt to rectify the matter, you may well question their basic competence.

On the other hand, if they do need to re-trim and are making attempts to do so, you should make allowances for a short time of flight with a somewhat erratic path. This should not be penalised unless it puts the model in any dangerous situations or unless the model flies behind the pilot or into any other unsafe area. If the pilot does use the first part of the flight as a trimming exercise, they should be required to land as soon as they are satisfied with the trim and the test should then commence at manoeuvre (b). If a flight is abandoned prior to starting manoeuvre (b) because of trim problems it will not count as a test flight attempt.

## **Nerves**

Quiet competence is what you are looking for during the flight, but most candidates may well be nervous, and you should make some allowance for this. If the flyer is very nervous you should seriously consider abandoning the test for the time being and arranging a coaching flight or two for the candidate to settle them down before re-taking the test. This can be done on the same day and can really help those candidates who have trouble with nerves when flying in a test situation.

## **Repeating Manoeuvres**

At 'A' certificate level, the manoeuvres are simple and the candidate should be competent to fly them with very few errors. If you identify any major faults, the test should be taken again. It may be, however, that the candidate will make minor mistakes on a manoeuvre and if you

are not fully satisfied with what you have seen you should not hesitate to ask for the manoeuvre to be repeated.

Some judgement is called for on your part here. The idea is not to let the candidate have two or three attempts at each manoeuvre until they get it right, but more to give you the best chance of assessing the competence of the pilot you are testing.

You should consider what you have seen the model do, and if you think to yourself, 'that could be better', then request that the manoeuvre be repeated. Beware of doing this too often, though, as you would be degrading the worth of the test and it must not degenerate into a series of practice manoeuvres.

### **Repeating the test**

The rules allow two attempts at the test in one day and if the candidate fails the first of these you must consider their performance in deciding what to do next. Many failures will be reasonably good or borderline cases and in these circumstances it may be appropriate to arrange one or two coaching flights before repeating the test. Remember that many of the candidates will be unfamiliar with flying under pressure and might do very well on the second test.

However, it will probably be obvious to you on many occasions that the pilot you are testing is simply not ready for the test they are taking. In this situation it is better that you tell them so quite clearly. It could then be extremely useful for you to arrange a demonstration test for them so that they can gain an understanding of the standard of flying that is required, especially if they are not clear about the manoeuvres and the positioning for them. This, possibly with a little coaching, is far more useful to everyone than simply telling the candidate that they have failed.

Another possibility that may occur during a test is an engine failure part way through which, with helicopters at this standard, could very well lead to a damaged model. The rules are that the test should be performed in one flight, so if this happens you cannot let the candidate go up again and continue where they left off.

In this case you should certainly offer them another 'A' certificate test flight but you must make sure that they have had enough time to sort out what the problem was and to thoroughly check the model for any possible damage. Under no circumstances let them go straight into another 'test' flight without having a preliminary proving flight so that you are both sure that the problem has been solved and that the model is airworthy.

How they handled the first emergency and how thoroughly they checked over the model for possible damage may also be of interest to you !

A flight which is abandoned for any reason prior to starting manoeuvre (b) will not count as a test flight attempt.

### **Ground Positioning**

It is a requirement that 'all manoeuvres are carried out in front of the pilot'. For all of the helicopter 'A' test, the pilot will be facing into wind and standing a comfortable distance (which they will choose) downwind of the take-off point and the model will always be upwind of them..

The candidate will have to choose the spot for their 'take-off and landing pad'. There is no laid down size for such an area but you should expect all take-offs and landings to be confined to within a metre or so of the selected spot. Most importantly, the candidate should select a spot which is a safe distance from the pits area and which will not cause overflying of other pilots, spectators or pits areas during the test.

If their original choice is bad in this respect but they quickly realise the problem and ask to re-position before starting the test they should not be penalised. If they start the test from a poor position and try to work around the problem then you should stop the test and offer a re-try under the terms of 'Repeating the Test' above.

### **Administration**

There are separate forms for Examiners to use during the Helicopter 'A' test, but if you do not have one then the fixed wing 'A' form may be used but it is **essential** that parts 1 and 2 (and 3 if you have old paperwork) of the 'pass form' are clearly and separately marked by you with the word '**HELICOPTER**'.

Forms should wait no longer than a month before being sent in to the Controller. You should take great care that all the details are filled in correctly, especially the successful candidates **NAME and, if possible, their BMFA number** (this can save a great deal of confusion). This is very important as what is seen on the pass form is what will appear on the final certificate. It is embarrassing for you to have to send one back to be re-done and it gives the candidate a definite impression of sloppy work by someone

### **Helpers for Disabled Candidates, Young Candidates and Others Who have Requested Help During the Test**

When disabled or young candidates present themselves for the test it may be that they will not physically be able to perform all the actions that most candidates can. At times, other candidates may also request help with certain physical aspects during the test (they may, for instance, have an injured finger). There will be times when you, as an Examiner, will think 'how much can I relax the test requirements for this person'.

Many Examiners make the decision to make no allowances at all but this effectively bars many people from attempting the tests. If we think of the achievement scheme as a true national scheme then we must consider how we can accommodate candidates, not how we can stop them from participating.

The answer, of course, is that you, as an Examiner, must make on-the-spot decisions about what you will allow during the test and, in such cases, you are within your authority to take such decisions. The guidelines set out below may help but at all times the three items at the end of this section must take precedence. They are not negotiable and mean that, whoever the candidate is, they have to convince you that they know what they are doing or what is happening for the full duration of the test.

For instance, a disabled flyer may have difficulty handling the model and may not be able to carry it out to the strip or retrieve it after the flight. The sensible use of a helper is certainly allowable in such cases but it is essential that they only do what the candidate asks them to do. Pre-flight checks and engine starting may be another problem area that can be overcome by a helper but you should expect the candidate to do as much of the work as

possible themselves and they should be able to talk you through anything that the helper does for them. Be sure to discuss all this with the candidate before starting the test.

All of these comments can apply to younger flyers too but there is an added complication with engine starting. Many parents are very unhappy about letting their children near a running engine and will not allow them to start their own engines. This is a perfectly valid view and, again, is a case where a helper can be used. If this situation does occur with the younger candidates, however, you should insist that they do all the pre-flight and preparation work themselves, up to applying the starter to the engine. If they cannot do this then they should not pass.

After engine start, the helper can adjust engine controls and carry the model but only on the instructions of the candidate.

**In all cases:**

**(1) If, at any time, the helper takes over the decision making process from the candidate then the candidate must fail.**

**(2) You can make no allowances whatsoever for anyone during the flying of the test. The candidate can either perform the flight manoeuvres as specified or they can't. If they can't then they must not be passed.**

Make sure in your briefing that both the candidate and the helper are fully aware of both of these points.

## **The Test**

**(A) Carry out pre-flight checks as required by the BMFA safety codes.**

The pre-flight checks are laid out clearly in the BMFA Members' Handbook. The candidate should also go through the pre-flying session checks, also laid out in the Handbook. Ask the candidate to go through their checks as if the test was their first flight of the day.

Points to look for are that the candidate has a steady and regular ground routine, especially when starting and tuning the engine. Nerves should not play a part in the pits, and you should satisfy yourself that the candidate is in full control of what they are doing whilst preparing the helicopter for flight.

A tidy flight box and a neat ground layout makes a good impression but bear in mind that that 'A' certificate candidates may not have been flying for too long and you should make allowances.

A poor performance in this area is not direct grounds for failing the candidate but can certainly be part of a cumulative fail if other aspects of the performance are below the standard you expect.

Pay particular attention to the way the candidate uses the local frequency control system and make sure they understand it and use the correct sequence of 'get the peg, Tx on, Rx on'. Watch carefully and take note that the transmitter controls, trims and switches are checked carefully by the pilot. You should also specifically look for the candidate to positively check that the idle-up switches are not set to on.

Any candidate who switches on their radio before checking the frequency control system must be failed on the spot.

It is important that the candidate is seen to hold the rotor head securely during the starting procedure and until the model is past the flight line. If there is no one else available then there is nothing to stop you aiding the candidate by carrying the model to the test pad 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 these points over with the candidate in your pre-flight briefing.

**(b), (c), (d), (e) and (f) together form a horizontal 'L'.**

During the course of manoeuvres (b), (c), (d), (e) and (f) the model should not have deviated significantly from a straight line drawn between the end points. Slight drifting may be permissible in adverse wind conditions, but should be rapidly corrected and put back on the correct course. If the deviation is severe, or the model does not follow the line at all, the candidate should not pass. The hovering speed between the end points is at the discretion of the candidate but must be no faster than a slow walk.

Each stop should be a controlled hover, with any movement being quickly checked, without signs of large over corrections. The pauses at each hovering point should be approximately fifteen seconds and they should be estimated by yourself as you observe the flying. When you are satisfied that the hover time has been completed at each point you should indicate to the candidate to move on.

The height of the helicopter should be consistent throughout these manoeuvres with no major deviations.

**(b) Take off and hover tail in over the take-off point, with the helicopter skids at eye level, for approximately fifteen seconds.**

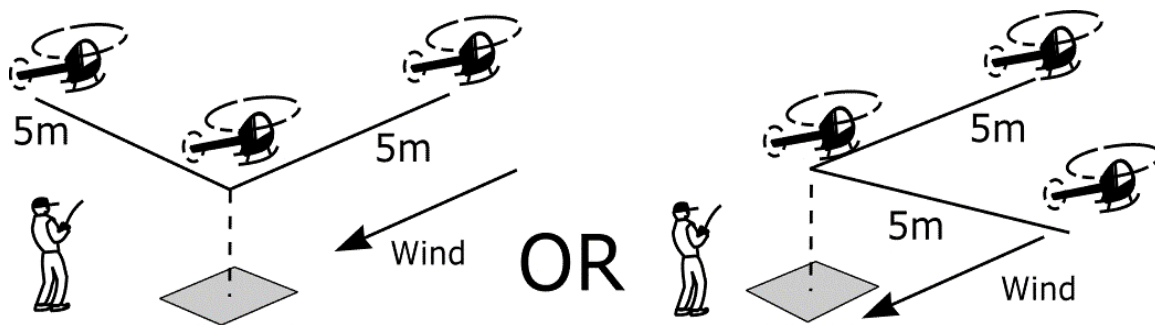
Take off should be smooth and the lift to eye level should be vertical, straight and controlled with the model a comfortable and safe distance in front of the pilot. Once at eye level the model should remain stationary, and the tail should not oscillate unduly. You should notify the candidate when the standard hover time of approximately fifteen seconds has passed and ask him to commence with the next part of the manoeuvre.

**(c) Hover the helicopter slowly sideways, either to the left or right, for approximately five metres, stop, and hover briefly.**

The pilot may choose to perform the hover in either direction (to his left or right) but must state in which way he intends to go prior to starting to move. Once you have been told the direction, the candidate should, without turning the model, commence a sideways hover at eye level for a distance of approximately five metres. Having travelled about five metres the pilot will stop the model and hold it in a steady hover at eye level and, with the tail pointing in the same direction as it was when it took off, for the standard hover time.

**(d) Hover the helicopter slowly sideways in the opposite direction to bring it back to its original position in front of the pilot, stop, and hover briefly.**

At the end of the hover time the pilot, without turning the model, will hover it sideways in the opposite direction returning to a point over the spot at which it initially took off. At this point the pilot will once again stop and hover the model with it still facing in the same direction as it was at take-off.



**(e) Fly slowly forwards for approximately five metres, stop, and hover briefly.**

After the standard hover time and on your command, the pilot now hovers the model forward, at the same pace at which he did the sideways manoeuvres, for a distance of about five metres then stopping and hovering steadily. All the previous comments about line, height at eye level, speed and steadiness apply and the orientation of the model should still be facing into wind as for all the rest of the first set of manoeuvres.

**(f) Fly slowly backwards, bringing the helicopter back to its original position over the take-off point, stop, hover briefly and land.**

After the standard hover time and on your command, the model is hovered backwards (without turning it) to the start position, stopped and hovered for the standard time above the landing pad with skids at eye level. After the hover time has been completed the model should descend and land close to the original take off point. During this last section, you will be observing the same criteria as previously and the model should have performed as before in relation to the course and at a similar speed. The descent and landing should be smooth and steady with little oscillation of the tail on touch down caused by poor tail control.



## Special Note

Although the 'A' certificate (Helicopter) schedule is short enough to be flown by most electric powered helicopters on one charge, this may not always be so, especially if the pilot has a trim problem to sort out early in the flight.

If the pilot wishes to change battery packs then this is the place in the test to do it. The model should be carried back to the pits and returned to the take-off point as quickly as possible, taking no more than a minute or so. The pilot is not to be allowed to re-charge batteries part way through the test, they can only replace the pack.

### **(g) Take off and hover briefly, turn sideways either left or right and fly forwards to perform two 'lazy eights', each at least 30 metres in length. Each time the model passes in front of the pilot it must be sideways on.**

The pilot should check that the area he intends to overfly is clear and that no other models are flying in the near vicinity; you should be watching for definite head movements as they scan the area.

The pilot should fly this manoeuvre at a safe height above eye level, but should not fly at such a height that the model cannot be clearly seen by both the pilot and yourself. Between eye level and five metres is the correct height band for this part of the test and the model should hover through the lazy eights, not fly through them. The pilot must be clear about the height at which they wish to fly before they take-off and you should discuss this with them in the pre-flight briefing..

The pilot having ensured it is safe to do so, the model takes-off, rises smoothly to the flight level previously selected and hovers for the standard time. The pilot then turns the model 90°, either left or right and, at the same time, slowly moves off forward at about a fast walking pace (but still in the hover). It is not required that the 90° turn is completed before the model accelerates; the turn and acceleration may be one smooth manoeuvre although the pilot may treat them as separate manoeuvres if they wish.

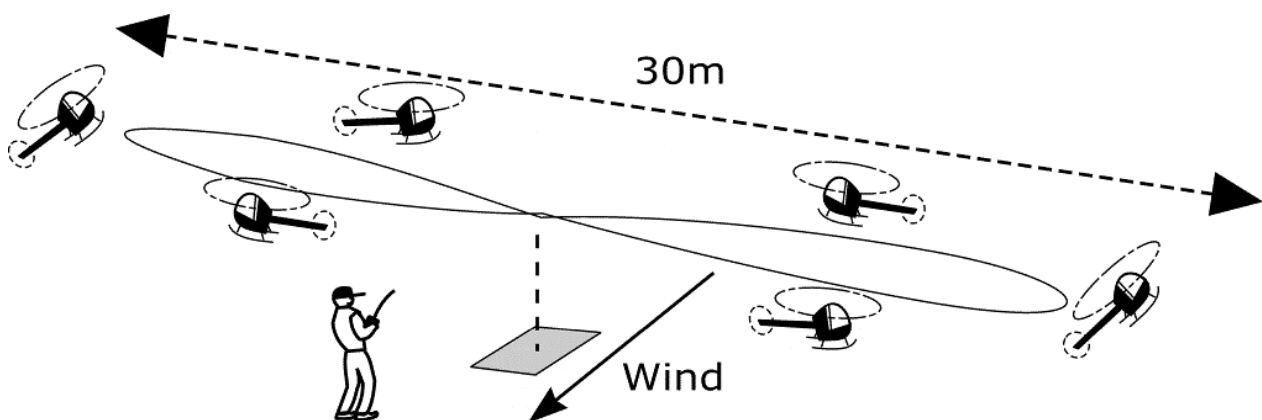
The pilot moves away at his chosen height for a distance of about fifteen metres where they begin a turn into wind, continuing the turn smoothly through 180° and bringing the model back across in front of them. Without hesitation the model continues at the same speed in the new direction until it has flown past the pilot for a further fifteen metres to his opposite side. At this point he smoothly executes another turn into wind for 180°, causing the model to be now moving in the same direction as the first leg, again hovering across in front of the pilot.

The model does not stop at this point but it then repeats the events of the first lazy eight until two full eights have almost been completed and the model is approaching the take-off/landing area.

During the lazy eights, you will be looking for a safe controlled flight throughout. The candidate should not lose or gain height significantly on the turns and should hover in a straight line between the turns with only sufficient drift on the model to prevent the it from moving either further away or, more dangerously, closer to himself during each leg of the manoeuvre. The **overall** length of each eight should be at least thirty metres and the model must be sideways on to the pilot each time it passes across their front. Some allowance can be made for a strong or gusty wind, for instance in any significant wind the model will be

slightly tail in as it passes in front of the pilot to allow for drift, but the basic points of the manoeuvre must still be demonstrated.

The turns should be made by use of cyclic and rudder co-ordinated correctly, and must not be half pirouettes at the end of each leg. The flight pattern should be as the diagram in the BMFA Members' Handbook and not deviate significantly from it. The pilot should be equally competent to the left and to the right when flying this manoeuvre, that is, turning left into wind or turning right into wind. If any significant difference in their flying skills shows up here then you should seriously consider whether they show the degree of competence necessary. It should be borne in mind that the manoeuvres in the test have been made reasonably simple, so that a fairly high degree of control can be demanded.



**(h) At the conclusion of the 'lazy eights', bring the helicopter to a halt above the original take-off point, hover briefly and land.**

At this point the model should be approaching the area of the landing pad, still at the chosen manoeuvre height, and the pilot should aim to smoothly decelerate the model, at the same time turning the it into wind and stopping the model in front of himself, still at the chosen height and approximately over the landing area. After hovering there for the standard time, the model should then descend smoothly and land. The pilot may perform the stop and turn into wind as two separate manoeuvres if they wish although this is not a requirement.

After landing, the candidate should shut down the engine and allow the rotor blades to stop turning before collecting the model to return to the pits.

**(i) Complete post flight checks as required by the BMFA Safety Codes.**

These are clearly set out in the BMFA Members' Handbook, but you should pay particular attention to the correct Rx off, Tx off sequence and watch carefully to see that the frequency control system in use is cleared correctly.

## The Questions

The candidate then 'must answer correctly a minimum of five questions on safety matters, based on the BMFA Safety Codes for General flying and local flying rules'

How many questions you ask will depend on the circumstances at the time. For instance, if the candidate has done a good flying test and answers the first five questions with confidence then you need go no further. An acceptable test but with some rough edges can be offset to an extent by the candidate performing well in the first five questions.

A candidate who has done a test which you found only just acceptable and who hesitates on the questions should be asked a few more than five questions and if you are still not satisfied that they have actually read the safety codes, you should not hesitate to fail them.

The achievement scheme is a test of both flying ability and knowledge. It does not matter how well the candidate can fly, if they are unable to answer the safety questions they should not pass.

There is some debate as to whether a list of 'approved' questions should be published for examiners to use. Current opinion is that if such a list is published then candidates will also be able to study the list, and will not need to study the BMFA handbook. This is probably not a good idea.

As an examiner, however, you should prepare yourself thoroughly for any testing that you do, and you are encouraged to sort out a personal list of suitable questions. Do not forget that you can call upon any local rules which you are aware of and that the candidate should know. If you do compile a personal list of questions, do not let the candidate see them.

Remember that the majority of the questions you ask are to be BASED on the BMFA safety codes; you are not expected to ask them 'parrot fashion' and the candidate is not expected to answer in that manner either.

This opens up the possibility of asking the 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 could go wrong? ; why should models not be hovered out of or into the pit area?

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