

**Indoor**

**B**



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

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

**THE 'B' CERTIFICATE  
(INDOOR AEROBATICS)**

**2018 ISSUE**



## Achievement Scheme Information & Communication

The BMFA Achievement Scheme provides every RC flyer the opportunity to set themselves an achievement target to aim for, and then have their progress assessed and confirmed by an examiner.

It is important that All those involved in training, examining and preparing for the tests, are well informed and up to date with all that the scheme has to offer. To this end, and to aid communication, important information regarding scheme developments, as well as details of all of the tests and their associated guidance documents, are made available to everyone via a number of sources, which include:-

- The Achievement Scheme website - <http://achievements.bmfa.org>
- The BMFA website - <http://bmfa.org>
- The BMFA News
- The Achievement Scheme closed Facebook group

It's important to appreciate that **ALL** of the scheme documents are reviewed and updated on an annual basis. Whichever document you are using, you will know if you have the right one, simply by looking at the date on the front cover. If it's not dated with the current year, it's the wrong one !

Most BMFA Clubs have Club Instructors/Examiners who will be familiar with the scheme and what is expected of anyone thinking of participating. If your club does not have a club examiner then each BMFA Area has an Achievement Scheme Coordinator (contact details can usually be found on the BMFA Area website) who can usually help in coordinating tests, or answering queries about tests etc. All BMFA Areas have Area Chief Examiners who would normally undertake Club Examiner tests, but are also available to help out with club tests, if requested. Importantly, they are also very knowledgeable about the scheme and its requirements. Area coordinators can often find an ACE that is close to your club, if you are having difficulty arranging for a test.

All BMFA Achievement Scheme & training documents are available to download from the BMFA Achievement Scheme website <http://achievements.bmfa.org>. You can also register your email address with the Achievement Scheme website and receive email notification of any news flashes, notification of scheme events and updates to documentation etc. as soon as they are published.

The Achievement Scheme also has a closed Facebook group (you just have to apply to be included) where comment and queries can be posted and examiners/instructors and members of the Achievement Scheme Review Committee can answer questions, or offer clarification.

If you have any query about the scheme or constructive comment on the scheme you can contact the Power/Silent Flight Scheme Controller ([RCPAS@bmfa.org](mailto:RCPAS@bmfa.org)), or the Achievement Scheme Review Committee, via the BMFA Office.

## General

The 'B' Certificate is “designed to recognise the pilot's more advanced ability and safety awareness”.

As an Examiner, therefore, the level of competence required from a candidate should be based on the question; 'has this person demonstrated their flying ability and safety to me in a satisfactory manner”.

The aim of the 'B' certificate is to give the indoor flyer a personal attainment goal beyond the 'A' Certificate; a demonstrated level of competence and safety which is attainable by the average pilot with a little thought and practice.

The Indoor aerobic 'B' Certificate has been set up as a method of encouraging indoor flyers to gain further flying skills by meeting and being tested to a recognised national standard.

The long term strategy behind this is that if enough indoor flyers qualify for their 'B' certificates then the general standard of flying at indoor events cannot help but rise. Examiners should be pressing this concept positively within their clubs and at indoor events.

**A candidate wishing to take the ‘B’ must already have passed the ‘A’ in that discipline.**

However where a candidate presents for a B test who does not already hold an ‘A’ certificate it is acceptable for the candidate to complete the flying portion of the ‘A’ test successfully and then move immediately to the flying portion of the ‘B’ test before attempting the test questions.

If the candidate passes the „A“ flying test but fails the ‘B’, then you should ask the ‘A’ questions. If the candidate passes both the ‘A’ and the ‘B’ flying tests, then you should ask the ‘B’ questions.

Note that the ‘A’ flying test does not finish until the model has been retrieved and the post flight checks have been completed.

The candidate for the 'B' should have studied the BMFA handbook and be familiar with the 'Safety Code for General Flying', any local site rules (if applicable), the 'Operational Guide, All Models and Radio Control' and the BMFA “Indoor flying code of practice”. Most of the questions asked at the end of the test will be from these sections of the handbook.

## **The Model**

The test will need to be performed with an aerobatic model with a minimum of 4 channels.

The use of a gyro or autopilot is not allowed during the test. If any such system is fitted to the model it must be disabled during the test and you should check that this has been done.

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.

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 their ability that is being tested, not the model.

## **Buddy Box Leads**

Buddy leads and other dual control training aids must not be used during any achievement scheme tests.

## **Hand Launching**

A hand launch is allowed if the model is not capable of a rolling take off.

## **Height, Speed and Size of Manoeuvres**

The 'B' certificate candidate should be a confident pilot and this should be shown in the speed at which they fly the test and the use of the available space. The size of the manoeuvres will be dependent on the space available for the flight, however the manoeuvres should be flown to make the best possible use of the space available. It is not acceptable for the model to touch the walls, ceiling, floor (except for take off and landing) or any other obstacles during any manoeuvre. If this occurs the examiner should ask himself if the candidate has practised the required manoeuvres enough.

The test has elements flown at both a low and a high level and elements that transition between low and high levels, those flown at low level should be flown at no more than a 1/4 of the available height from the ground (standard low level height), those flown at high level should be flown at no less than 3/4 of the available height from the ground (standard high level height). Manoeuvres that transition between the two levels should also use these 2 benchmarks for height.

Intelligent use of the throttle is an important factor in confident flying and you should watch out for this. A pilot who flies at take-off power throughout the whole flight should not pass; they are not thinking.

## Consistency

The combination of appropriate heights and good use of the throttle should mean that, although the model will be flying at various heights throughout the test, these heights will be flown in a steady and consistent manner and you should note if the height flown varies significantly when it doesn't need to.

It is a requirement that "all manoeuvres are carried out in front of the pilot" with the implication that the model will be crossing in front of the pilot just beyond the take-off and landing area on several occasions during the flight. Care should be taken by the pilot that the line of approach each time is consistent and you should take particular note if it is not.

Unnecessary varying of height, inconsistent lines and touching the walls, ceiling, floor (except for take off and landing) or any other obstacles are valid reasons to fail a candidate at this level as they give a good indication of the flyers general level of competence and they should strongly influence your final decision. Poorly flown height or lines are a sure sign that the flyer has either not practised the test or has not reached the required standard of flying and are legitimate reasons to fail them.

## Continuity

Although the manoeuvres are set out in such a way that they can be flown one after the other as a schedule, this is **NOT** what is expected. The normal flight will have at least one positioning circuit between each manoeuvre and the you should discuss this with the candidate before the flight. You, of course, should be watching any extra circuits just as carefully as the rest of the flight as they can tell you a lot about the competence of the flyer.

A pilot who transitions directly from one manoeuvre to the next is attempting to fly to a higher standard than required. This is quite acceptable if they are competent but you should watch out for the pilot who hasn't practised enough. Trying to fly the test in this way can get the candidate into some very awkward positions.

The „B“ certificate allows an intermediate landing. The intermediate landing must be at a predetermined point in the flight and only for the sole purpose of the fitting of a freshly charged battery. This landing may only be made with the prior consent of the Examiners. Two attempts per examination will be allowed in any one day.

You should be aware of the possibility of such an intermediate landing but under no circumstances must you allow an unscheduled landing to be passed under the rule. It must be applied exactly as written and any landing must take place at the point in the schedule agreed prior to the flight.

## Trim

It is expected that the candidate will start the test with a model that has been trimmed out previously but they should be able to trim the model out in the air very quickly if necessary. If you see obvious signs that the model is out of trim and the candidate makes no attempt to rectify the matter you should seriously question their basic competence.

Any re-trimming should be done on the first circuit and if the pilot cannot accomplish this then you should again seriously think about their basic ability, especially if they put the model in any danger or the model flies behind the pilot or in any other unsafe areas.

## Nerves

Quiet competence is what you should be looking for during the flight but most candidates will be nervous and you should make some allowance for this. If the flyer is very nervous, serious consideration should be given to abandoning the test for the time being and offering the candidate a coaching flight or two 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 'B' certificate level the candidate should be competent to fly the test with very few errors. If you see any major faults the test should be taken again. It may be, however, that the candidate will make a **minor** mistake on a manoeuvre and if you are not fully satisfied with what you have seen you should consider asking for the manoeuvre to be repeated. Some judgement is called for on your part here. A major mistake is grounds for failing the candidate, especially if loss of control has occurred or a dangerous situation has arisen. You should definitely **not** let them have multiple attempts at each manoeuvre until they get it right but you must give yourself 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 "could be better" then a request that the manoeuvre be repeated may be considered. Be extremely careful about using this option, however, as you could be degrading the worth of the test. It must not under any circumstances degenerate into a series of 'practice' manoeuvres.

## **Repeating the Test**

The rules allow two attempts at the test in a day. 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 pilots or they could be borderline cases. In these circumstances it might be appropriate to offer one or two coaching flights and then a repeat of the test. Remember that many of the candidates will be unfamiliar with flying under pressure and might do very well on the second test.

On the other hand, it will probably be obvious to you on many occasions that the pilot being testing is simply not ready for the test they are taking. In this situation it is better to tell them so quite clearly. It could then be extremely useful for you to offer to fly a demonstration test for the candidate (assuming that a suitable model is available to you and that you are happy to do so) so that the candidate can gain an idea of the standard of flying required, especially if they have shown a lack of understanding of the manoeuvres and positioning. This, possibly along with a little coaching, is far more useful to everyone than simply telling the candidate that they have failed.



## **Helpers for Disabled 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“.

Some 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 two 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 flying area, release it for launch 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 battery connection 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.

### **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 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 flight was their first flight of the day. Particular 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 connecting the flight battery. 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 and is to be expected from 'B' certificate candidates.

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 candidates 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 understand it and use the correct sequence of 'get the peg, Tx on, Rx on'. Also watch carefully and take note that the transmitter controls, trims and switches are checked by the pilot.

Any candidate who switches their radio on before checking the frequency control system 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.

As 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 on - receiver 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 stand in the designated pilot area for the entirety of the flying part of the test.

**(b) Take off and complete a left (or right) hand circuit and over fly the take-off area.**

The model may be carried out 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 must be done with the model a safe distance from the pits area and on a line which does not take the model towards the pits, other people or any other danger area.

Take off should be reasonably straight with the model not being pulled off the ground too soon. 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, 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 throttle should be brought back to cruise power, the model levelled out and the first turn of the circuit started.

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 past the front of the pilot at a safe distance out. 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 and passing over a set point.

**(c) Fly one inverted low level left hand circuit with a transition to one inverted high level left hand circuit.**

The type of circuit is not stated so either racetrack, rectangular or circular is acceptable. The manoeuvre starts as the model passes in front of the pilot and the low level circuit should be flown at a reasonably constant height of no more than 1/4 of the available height from the ground, the transition from low level to high level should take place as the model approaches and passes the pilot towards the end of the low level circuit and start of the high level circuit, the transition should be at a reasonably constant rate of climb but should not be approaching vertical. The high level circuit should be flown at no less than 3/4 of the available height from the ground.

**(d) Fly one inverted high level right hand circuit with a transition to one inverted low level right hand circuit.**

The type of circuit is not stated so either racetrack, rectangular or circular is acceptable. The manoeuvre starts as the model passes in front of the pilot and the high level circuit should be flown at a reasonably constant height of no less than 3/4 of the available height from the ground, the transition from high level to low level should take place as the model approaches and passes the pilot towards the end of the high level circuit and start of the low level circuit, the transition should be at a reasonably constant rate of descent but should not be approaching vertical. The low level circuit should be flown at no more than 1/4 of the available height from the ground.

**(e) Fly a “Cuban Eight” with half rolls.**

From level flight perform an inside 5/8 loop to inverted 45 degrees down, half roll to upright, perform a 3/4 outside loop to inverted 45 degrees down, half roll to upright and recover in level flight at the point where the first loop was started.

**(f) Perform a 2 turn inverted spin or 2 descending 360 degree inverted tight rudder turns.**

The spins/turns should be performed in front of the pilot, from level flight, half roll to inverted perform 2 spins/turns, exit inverted on the same heading as the entry, half roll to upright.

**(g) Fly 2 consecutive square loops.**

That is, from level flight, pull to vertical pull at each corner through 90 degrees and exit. This should be flown from the standard low level height and line and centred in front of the pilot, returning to standard low level height and line when the manoeuvre is complete.

The square loops should be superimposed on each other with each leg of approximately the same length and each corner of approximately the same radius. Throughout the duration of the manoeuvre, the heading of the model through the horizontal legs and the line through the vertical legs should not deviate substantially although minor deviations are acceptable.

**(h) Perform a  $\frac{3}{4}$  roll to knife edge flight for minimum 5 metres**

From level flight perform a  $\frac{3}{4}$  roll away from the flight line to knife edge flight, fly a minimum of 5 metres in knife edge,  $\frac{1}{4}$  roll to upright. The knife edge flight should be centred on the pilot. Throughout the duration of the manoeuvre, the heading of the model should not deviate substantially although minor deviations are acceptable.

**(i) Perform a 5 second prop hang, climb to maximum height and perform a stall turn.  $\frac{1}{4}$  roll in climb,  $\frac{1}{4}$  roll in descent.**

From level flight pull to vertical in front of pilot and prop hang for 5 seconds climb to maximum available height with  $\frac{1}{4}$  turn in climb so the "Canopy" is towards the pilot, perform a stall turn,  $\frac{1}{4}$  turn in descent and pull to exit. Exit to be on the same heading as entry.

**(j) Fly a harrier pass.**

From level flight pull to a high angle of attack maintain level forward movement for a minimum of 5 metres push to level flight. Harrier flight should be centred on the pilot. Throughout the duration of the manoeuvre, the heading of the model should not deviate substantially although minor deviations are acceptable.

**(k) Perform a rectangular approach and land**

The landing should be within a 2 metre by 2 metre square in front of the pilot.

The candidate should NOT take their transmitter with them when retrieving their model and it should be left with a competent person. If no one else is available to hold it then you should offer. When the model has been retrieved and returned to the pits area the transmitter should be returned to the pilot.

Remember that electric models must be assumed to be „live“ until the flight battery has been disconnected and the handling of the aircraft by the candidate must reflect this during retrieval and in the pits area.

## The Questions

The candidate then "must answer correctly a minimum of eight questions on safety matters, based on the BMFA Safety Codes for General Flying, local flying rules and the BMFA indoor code of practice."

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 safety questions they should not pass.

How many questions you should actually ask will depend on the circumstances at the time. For instance, if the candidate has done a good flying test and answers the first eight 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 eight 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 eight and if you are not satisfied that they have actually read the safety codes, you should not hesitate to fail them.

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 and this is probably not a good idea.

As an examiner, however, you should prepare yourself thoroughly for any testing that you do and you may wish to sort out your own personal and private list of sensible questions. Don't forget that you can use any local rules which you know and which the candidate should be aware of.

Remember that the majority 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 that way either.

This opens up 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?, why should operating transmitters not be taken out when retrieving models from an active flying area? or why should models not be taxied in or out of the pits area?

## Administration

There are specific forms for Examiners to use during the Indoor Aerobic „A“ test, and if you do not have one then a call to the BMFA Leicester office will have some in the post to you by return.

Completed forms should be sent to the Leicester office within seven days of the test and, whilst they must be filled in by the Examiner, they may be sent in to the office by either the Examiner or the Candidate. You should take great care that all the details are filled in correctly, especially the successful candidates **NAME** and their **BMFA number** (this can save a great deal of confusion). If the candidate is not a BMFA member then it is especially important that you get their name and address correct and in full.

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.











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