FREEFALL STYLE & ACCURACY LANDING

CONTENTS

1 GENERAL

Freefall Style and Accuracy Landing were the first two competitive events in the history of sport parachuting. The two events are often referred to as Style and Accuracy, and the discipline is often referred to as Classics. In both events the competitor is required to demonstrate his precision abilities relative to the ground. In Freefall Style the competitor manoeuvres his body in freefall, as accurately and as quickly as possible, using a target on the ground as reference, and in Accuracy Landing the competitor tries to land as close as possible to a target on the ground.

In essence both events are individual events where the participant competes against his own, and other competitor's, skills.

In training it is possible to do accuracy after a style jump, if an accuracy parachute is worn. In competition, style and accuracy always take place on separate jumps. It is possible to compete in only one of the disciplines. However, an overall position in the competition is only given to those competitors who compete in both disciplines.

Accuracy Landing is also combined with Giant Slalom Skiing to form a discipline called Para-Ski. The two events are competed for separately and a combined score and position are given.

The purpose of this section is to recommend certain procedures and training methods that experienced style and accuracy jumpers have found to be safe and effective methods of conducting the events. The contents of the accuracy section are heavily based on the Classic owner's manual (*with kind permission of Jimmy Hayhurst; US Style and Accuracy team, and John Eiff; designer of the Classic accuracy canopy*).

2 FREEFALL STYLE

2.1 EQUIPMENT

2.1.1 COMPULSORY EQUIPMENT

- Dual parachute harness system (container)
- Square reserve
- Square main
- Protective footgear
- Eye protection
- Altimeter

2.1.2 RECOMMENDED EQUIPMENT

- Gloves
- Head protection

2.1.3 OPTIONAL EQUIPMENT

- RSL
- AAD
- Hook knife

2.1.4 EQUIPMENT DESIGN

- Parachute

Any parachute you are comfortable with, that opens satisfactorily at high speed is good for style. Many people do style wearing their accuracy canopy, so that they can do accuracy afterwards. However, the fastest style times are being achieved wearing a small container, which means wearing a small parachute. The larger the container and parachute, the heavier it is and therefore the more inertia it has. A smaller

parachute weighs less so has less inertia, which will make your turns and loops faster for the same arm input.

• Container

Any container you are comfortable with, that opens satisfactorily at high speed, and has no tendency to open prematurely, is good for style. However, the fastest style times are being achieved wearing small containers because they weigh less and therefore have less inertia, which makes your turns and loops faster. Containers specifically designed for style are available which give the optimum shape when in the tucked freefall position used in style.

• Jumpsuit

The faster you are falling, the quicker your turns and loops are for the same arm input. Therefore a tight jumpsuit is preferable. To give the best effect to your arm inputs, the forearm material should be thick, while the rest of the suit is slick. Backward facing lower leg pockets are incorporated on some suits to accelerate your loops.

• Footwear

Relatively small shoes are preferable because they give less drag and are less likely to cause your legs to be pulled out of the tuck position in the highspeed airflow.

• Handwear

The style rules do not make any specific regulations regarding handwear. Gloves that give a reasonable amount of drag should be worn, to give the best effect to your arm inputs. Some top style jumpers use composite 'paddles' that attach to the forearm and cover the hand area. Webbed gloves are also effective.

• Goggles

You need clear vision to do good style because you have to keep accurate track of the ground marker. The marker is 200 sq m in size, and brightly coloured. You need to be able to see the ground marker form 7500ft while diving, turning and looping so goggles without scratches or damage are a must.

• Altimeter

A normal skydiving altimeter is satisfactory for style. The altimeter should be worn where it can be seen clearly when in a style tuck. Wrist altimeters are unsuitable because the hands are not in direct view when doing style. A chest strap or leg strap mounted altimeter is best.

2.2 PROCEDURES AND RULES OF THE SKY

• Briefing - ensure that all jumpers on the load are capable and are briefed as to the dive sequence and safety procedures.
• Ensure that the pilot is briefed as to what you are doing
• The following points should be covered:
- Run in Direction
- Exit order
- Exit commands for style
- Time between exits
- Emergency procedures
- Correct style series

2.3 TRAINING PROGRAMME - BASIC STUDENT EXERCISES

• Abbreviations and terms specific to Style

Base Time	Time the series was completed in.
Penalty	Time added to the base time for mistakes and inaccuracies
Under	Turn penalty for less than a 360° turn
Over	Turn penalty for more than a 360° turn
Minus	Loop penalty for less than a 360° loop
Plus	Loop penalty for more than a 360° loop
Deviation	Body roll penalty
Arrow	Direction penalty

• General

A style jump is a series of freefall manoeuvres performed as fast as possible, in relation to a ground marker. The time is judged from the ground marker in real time by judges using telemeters or, more commonly, after the jump from video taken by a video camera positioned at the marker. Time is added for mistakes and inaccuracies.
Each jump consists of four flat turns and two backloops, which results in four different style series:

Series 1 - Left Set - Left-Right-Loop-Left-Right-Loop
Series 2 - Right Set - Right-Left-Loop-Right-Left-Loop
Series 3 - Left Cross - Left-Right-Loop-Right-Left-Loop
Series 4 - Right Cross - Right-Left-Loop-Left-Right-Loop

A competition consists of five jumps. The first four jumps are the four series above, in a drawn order. The fifth jump is one of the series above, chosen by the competitor.

Each jump breaks down into five sections: Exit, Fall-away, Settle, Series, and Canopy.

• Exit

Style run-ins are usually downwind, so that the jumper is facing the target on exit. The exit point is early, the throw forward of the aircraft taking the jumper to the opening point. If the winds are very light the run in can be made into wind but the exit will be well before the overhead of the DZ so that the jumper will still face the target on exit. The run in is at 7200ft.

The run in direction, corrections, and exit commands are given by the judges on the ground over the pilot's radio. When the aircraft is nearing the exit point and judges and video are ready for the jumper, the judges radio "Standby, Standby". This is immediately relayed to the jumper. When the aircraft is at the exit point, the judges radio "Exit, Exit, Exit". This is immediately relayed to the jumper who must immediately leave the aircraft.

On run in look out of the door well before the exit point to pick up the style ground marker. Look ahead on the run in to pick a horizon marker or prominent object, and then look back along the run in to pick another horizon marker or object. A line between the two markers must run straight through the style ground marker. These markers will help you during your turns and loops. As you get near to the exit point, look at the pilot to receive the standby and exit commands. Be ready in the door to jump immediately. As soon as you get the command look out and re-acquire the style ground marker, and then jump.

Style is only judgeable within a 60° - 80° elevation angle from the style ground marker. Outside of this zone it is not possible for the judges to see the manoeuvres clearly enough. Dropping below the 60° angle, or passing over the 80° angle, can be caused by the judges giving the exit command too early or too late, in which case you will get a rejump. However, if you delay your exit and then go over the 80° angle, or you exit early and then drop below the 60° angle, you will not get a rejump.

If you experience freefall drift of more than 10° during your style series you will get a rejump. This can be caused by the judges choosing the wrong run-in direction, the pilot flying inaccurately, or upper winds. However, don't give up on your series just because you *think* you have had 10° drift, keep going and deal with it. The drift is recorded by the judges and they may assess your drift as less than 10°, which means no rejump.

• Fall away

The fall away is the time that you pick up speed so that you can perform the series as fast as possible. It is acceptable to stay flat, dive head down, sit, or stand, but in all cases you must stay on the style ground marker heading. It is not acceptable to fall on no particular heading and then line up before starting the series. The judges will start the clock if you make an obvious turn. If you dive do not go into a true head down because it will be impossible to keep the style ground marker in sight. Keep your head slightly back so you can see the marker (Figure 1). Use the fall away to get to the maximum controllable speed possible while still holding the style ground marker heading.

During the fall away, since you know which direction the first turn is going to be, offset slowly very slightly away from the turn, about 5 degrees (this will not cause the judges to start the clock). This will avoid Arrow penalties at the start of the first turn.

• Settle

At the end of the fall away, settle yourself into your style position. How you settle into the position will obviously depend on what position you used in the fall away. For many top jumpers the settle is only for a fraction of a second. The best position to do style is the tuck position (Figure 2) because it keeps the body as small as possible, which allows very fast turns and loops to be performed. However, a flat position is acceptable. Whatever position is used, the body must be in the horizontal plane and facing the ground.

• Series

Start your series positively, so the judges can easily see when you are starting. As you get 3/4 round the first turn begin to stop the turn. Aim to overshoot the heading slightly (about 5°) as this avoids Under penalties. Do the same for the second turn. As you start the loop, keep your head tucked in and keep the style ground marker in view as long as possible. This will help to keep your position small which will make the loop faster. As you get 3/4 round the loop begin to stop the loop and set up for the next turn. Try not to sit up when finishing the loop, as this will result in Plus penalties. Similarly, starting the turn before completing the loop will result in Minus penalties. Try to come out of the loop on a heading about 5° away from the next turn to avoid Arrow penalties. Do the second half of the series in the same way as the first half. Try to keep your body position tight throughout the series.

The left and right cross series are often slower than the left and right series because the first loop in the cross series often puts you on the Arrow penalty side of the third turn. This is because the slight overshoot at the end of the second turn, followed by a perfect loop, will put you slightly into the third turn. To get a good time in a cross series, it is sometimes necessary to correct the loop heading during the loop, which takes a lot of practice.

• Canopy

As soon as you finish the last loop of your series, come out of your style position and prepare to pull. Don't track, there is no one else near you and, if you have planned your jump correctly, you don't have time.

As soon as your canopy is open, get on the toggles and fly away from the run in line. Make a habit of doing this even if you are the only canopy in the air. In competition, another style competitor will be jumping within 20 seconds of your opening. If you stay on the run in line you may get in get in the line of the video camera filming the next jumper.

Do not land near the style ground marker or video.

- **Planning**

Always plan your jump. Base your plan on your experience in style. Don't try to go faster than you are used to doing, it will only result in a lot of penalties. Your plan should be specific and clear in your mind, and cover all the sections of the jump (exit, fall away, settle, series, and canopy). Specific planning for a style jump should begin about 20 minutes prior to take off, not earlier.

To work out the timings for the fall away, settle, and series sections of the jump, work backwards from the required opening altitude.

You are exiting at 7200ft, which gives you about a 23 sec freefall if you are in a tight style tuck, or 28 seconds in a flat position, for an opening height of 2500ft.

Decide how many seconds you want from the end of the series to opening the parachute. 3 seconds is reasonable.

Then decide approximately how fast you can do a series.

Then decide how much time you want to settle before starting the series.

Add all three figures together and subtract from 23 or 28 as appropriate. That will tell you how many seconds you can fall away for.

As an example: A jumper who pulls 3 seconds after finishing the series, does a series in around 9 seconds in a tight tuck, and does a 1 second settle, has 10 seconds spare to do the fall away.

Obviously the more you stay in the fall away, the faster you are falling when you do your series, so the faster your series is likely to be. With experience, and faster series, your timings will change and will also become second nature. Top style jumpers can fall away for 14 seconds, settle for less than half a second, do a series in under 6 seconds, and pull immediately after the last loop.

Once you have your timings planned, decide how you are going to fall away. A flat position is easiest when starting style, but you will soon find that you want to gain more speed, by using a different position, as you become more experienced.

Then concentrate on the series. Make sure you are planning to do the right one!
Visualise the whole series, try to identify the potential penalty areas, and decide how you are going to avoid the penalties. Go to the style ground marker and check the run in direction being used. Then look around the outside of the drop zone so that you can pick out potential markers on the run in line.

Practising style can be done using a style training harness - a hanging harness that allows the jumper to turn and loop in a tucked position. However, in the absence of a training harness, practice your series by kneeling on the ground and making all the arm movements you will use, while visualising the series.

- **Execution**

  - Exit

  On every run in, check the direction in case it has changed from the last jump, and pick up horizon markers ahead and behind. Look at the pilot as you near the exit point. As soon as the exit command is given, acquire the style ground marker and immediately leave the aircraft

  - Fall away

  Get on heading and into whichever fall away position you are going to use, and then focus on the series you are going to do. Treat the jump as a 100m sprint, and the fall away is when you are in the blocks and ready to start. Concentrate on getting as fast as possible during the fall away while remaining controlled and on heading.

  - Settle

  Quickly get your position as you want it and get on with the series. Don't spend too much time getting your position; it will only make your fall rate slow down. Don't waver either side of the heading because the judges will start the clock at the first sign of a turn, even if it is the wrong one.

  - Series

  Start your series like you are leaving the blocks for a 100m sprint. Be forceful and powerful. As soon as you start the series your control must be intuitive. There is no time to think your way through the series, it has to be done as you planned and memorised. Go fast and controlled, and keep your body position as small as possible. Do not stop to correct small mistakes, accept them and carry on. Work hard to make the second half of the series as fast as the first half. Focus on speed, control, body position, and the ground marker, all the way through the series. When you come out of the last loop, make sure you don't sit up - stay level and come out of your style position to get ready to pull.

  - Canopy

  Remember to fly clear of the run-in line as soon as you have the canopy under control.

- **Exercise 1**

7200ft exit. Fall away for 5 seconds. Stay in a flat position throughout the fall away and series. Do a half series (turn, turn loop). Do this exercise until you can consistently complete a half series in under 8 seconds. As your times start to get quicker, increase your fall away time so that you finish your half series no more than 1500ft above opening height. Open at 2500ft

- **Exercise 2**

7200ft exit. Fall away for 5 seconds. Stay in a flat position throughout the fall away and series. Do a full series. Do this exercise until you can consistently complete a full series in under 16 seconds. As your times start to get quicker, increase your fall away time so that you finish your series no more than 1300ft above opening height. Open at 2500ft.

• **Exercise 3**

7200ft exit. Fall away for 10 seconds. Do a full series. Do this exercise until you can consistently complete a full series in under 14 seconds. Start by using a flat position throughout the jump. Then, as your times start to get quicker experiment with different fall away positions to find the one you prefer. When you have found a fall away position that suits you, start to increase your fall away times until you finish your series no more than 1100ft above opening height. Open at 2500ft

• **Further training**

Fast style comes with practice and it is very much a personal task to get under 14 seconds. Following the guidelines in this document will get you to under 14 seconds without a great deal of coaching. When you are consistent to 14 seconds, coaching can get you faster. Contact the Freefall Style and Accuracy Landing sub committee of the SSA for more information.

Here is an example of an ambitious but achievable set of style goals:

- Four series with a 16sec average after 100 style jumps
- Four series with a 14sec average after 300 style jumps
- Four series with a 12sec average after 500 style jumps
- Four series with a 10sec average after 700 style jumps
- Four series with a 8sec average after 900 style jumps
- Four series with a 7sec average after 1000 style jumps

3 ACCURACY LANDING

3.1 EQUIPMENT

3.1.1 COMPULSORY EQUIPMENT

- Dual parachute harness system (container)
- Square reserve
- Square main, of appropriate wing loading for accuracy
- Protective footgear
- Altimeter

3.1.2 RECOMMENDED EQUIPMENT

- Gloves
- Head protection
- Eye protection
- Accuracy shoes

3.1.3 OPTIONAL EQUIPMENT

- RSL
- AAD
- Hook knife

3.1.4 EQUIPMENT DESIGN

- Parachute

An accuracy parachute is a specialist piece of equipment that is specifically designed to have a low descent rate and almost vertical sink, when on deep brakes, with a gradual change from flight to stall. The best accuracy is performed on these parachutes because it makes the final 30ft of the approach more predictable and slow. However, reasonably good accuracy can be performed on any lightly loaded parachute. The optimum sea level wing loading for accuracy is 0.7 lbs/sq ft, with a

range of 0.65 to 0.75 lb/sq ft. Therefore a student canopy is satisfactory for most people to learn the basics on, and achieve metre accuracy. However, trying to do centimeter accuracy on a student parachute will result in heavy landings. Therefore a proper accuracy canopy should be used when attempting to get closer than 5 metres to the target. Some of the canopies specifically designed for accuracy are the Parafoil, Classic, CCL, and Da Vinci.

• Harness

Don’t waste jumps. Get set up properly in a suspended harness on the ground. Your harness should be snug, symmetrical (hanging evenly left/right), and a plumb line dropped from your chin should pass abeam your insteps - meaning that you are hanging upright not leaning back (Figure 3). Select a harness with diagonal straps, or a container design that forces you against the chest strap and main support webbing.

• Jumpsuit

Fabric should be snug from knees to ankles. No loose material blocking your view of shoe or heel.

• Footwear

The Accuracy Landing competition rules state that 'In order not to damage the AMD, suitable footwear must be worn'. Judges can inspect shoes at any time and can disqualify the competitor or require the shoes to be changed. Therefore it is important to follow some basic rules when choosing shoes. The heel should be flat and well defined, and be at least 1cm diameter. No pointed heels are allowed. The rear strike point should be visible, not hidden under the heel cup. Because no manufacturer makes specific shoes for this event, it is usual to modify a pair of commercially available shoes. A good pair of track spikes, with an accuracy heel added, the spikes removed, and the spike area covered with a stick-on sole, make good accuracy shoes. Check the shoes of an experienced accuracy jumper, and find out where they were modified.

• Toggles and Gloves

Hard toggles with an offset hole are recommended. Loop toggles bite into the hands when held at 50% brake for most of the jump. The offset hole in hard toggles makes the steering line go between your first and second fingers, and gives the most natural, and therefore least stressful, hand position for accuracy. Combining the hard toggles with thin leather gloves provides the optimum feel for controlling the canopy.

• Glasses and Goggles

You need 20-20 vision to do good accuracy. If you wear glasses normally you should wear them to do accuracy. You should be able to see the AMD at around 1000ft. If your eyes water excessively, wear goggles - most top accuracy jumpers do.

• Altimeter

A normal skydiving altimeter is sufficient to learn with. However, it does not have a very detailed scale from 1000ft to the ground and can be difficult to use for the approach pattern. More accurate altimeters exist, having 3000ft or 1000m for one turn of the needle, specifically for accuracy. The altimeter should be worn where it can be seen clearly when looking down at the tuffet. Wrist altimeters are unsuitable because the hands are not in direct view when looking down. An altimeter mounted on the chest strap, leg strap, or, most effectively, on the thigh is best.

3.2 PROCEDURES AND RULES OF THE SKY

• Briefing - ensure that all jumpers on the load are capable and are briefed as to the dive sequence and safety procedures.
• Ensure that the pilot is briefed as to what you are doing (warn other air traffic as well as other jumpers who might cross your flight plans as you set up for finals in accuracy).
• The following points should be covered:
- Run-in direction
- Exit order
- Time between exits
- Length of delays
- Designation of leading man
- Order of landing
- Emergency procedures

3.3 TRAINING PROGRAMME - BASIC STUDENT EXERCISES

• Abbreviations and terms specific to Accuracy

AMD	Automatic Measuring Device
Pad	Another name for the AMD
Tuffet	Padded or inflatable landing area, approximately 5m diameter
Dead Centre	The target in the middle of the AMD
Disc	Another name for the Dead Centre

• General

An accuracy jump is a jump landing as close as possible to a pre defined ground marker. The marker is 3cm diameter (although this may reduce as accuracy scores improve) on a 35cm diameter pad. The pad is placed in the middle of a padded or inflatable soft landing area (a tuffet) of approximately 5m diameter. The pad is an electronic device that records the point of contact and measures its distance in centimetres from the edge of the 3cm marker. The distance is measured out to a maximum of 16cm. Any landing outside 16cm receives a score of 16cm.

A competition consists of ten jumps. The first eight jumps are the team competition jumps, in teams of five, with the individual scores counting towards the individual places, and the total team score counting towards the team places. The last two jumps are the semi-final and final rounds and are done as individual jumps.

Each jump breaks down into sections: Spotting, Manoeuvring, Circuit, Approach Zone, Power Zone, Sink Zone, and Foot Placement.

• Spotting

With the advent of GPS spotting, and the high performance canopies that can recover from bad spots, jumpers are no longer used to spotting and rarely practice it. Learn to spot; it is critical for Accuracy Landing. Learn to adjust the parallel of the run-in, and the run-in direction. Spotting is outside the scope of this document and is something you should have learned in the ISP. Make sure the pilot knows the run-in direction you want before take off, and that you might change it once on run-in. Remember that an accuracy spot can change from jump to jump. A good jump pilot will have no problem with you directing the spot and changing the direction during the run-in. However, a pilot only used to dropping jumpers from high altitude on GPS may not be used to jumpers directing the spot, and may not realise the spotting precision you require.

• Manoeuvring

Figure 4 shows a plan view of the flight, from exit and opening, to the start of the approach zone. Manoeuvre as desired (crabbing, S-turns, holding and running) but stay fairly close to the wind line. It is basic, but the times you don't are the jumps that go bad. Plan your manoeuvring to position yourself for a wind check at 1000ft. The stronger the winds, the further upwind this check must occur.

Hold into the indicated ground wind at half brakes and check your canopy's penetration at 1000ft. Half brake airspeed, with your hands at 'ear level' is about 7m/s. Use this information to gauge the winds. For example, if you ground speed is zero, the winds at 1000ft are 7m/s. Make this check on every jump and you will soon become proficient at estimating the winds you will face on finals. The wind on finals is usually slightly less than the wind at 1000ft, and can differ in direction.

• Circuit

Now turn downwind at half brakes, aiming to pass 300ft to the side of the tuffet at 600ft. Start your base turn so as to end up behind the target at the correct angle for the winds. Keep looking at the tuffet throughout the circuit.

Some jumpers work in feet for height and feet for distance, some in feet and metres, and some in metres and metres. Therefore three separate approach angle graphs are shown here (Figures 5, 6, and 7). To make the numbers easier, the initial approach height is slightly different from graph to graph, but they all give a 45° approach angle in nil winds. Choose the one that suits you. The rest of this document will assume you have chosen the feet-metres graph.

• Approach Zone

Complete your base leg turn so as to pass through the 'window' for your final approach - the initial approach height of your graph at a distance appropriate for the wind. In nil winds, your approach angle should be 45°. In stronger winds, a steeper approach angle will be required. If the winds are strong, start your approach well upwind of the target, sliding sideways into position only slightly behind the target. You are now in the Approach Zone. Spend the next 150ft (about 15 seconds) working to achieve a glide slope that will carry you beyond the target to +5m, at 66% brakes.
Work hard - be a pilot not a passenger.

If you are too steep for the wind conditions, try S-turns, sustained deep braking, or tap in and out of light sink to get down to the correct angle. Avoid stalling the canopy; it is unsafe and will only confuse matters. If you too shallow for the wind conditions, let up and fly at 25% brakes. Keep correcting until you have both 66% brake and a glide slope that will overfly the target.

• Power Zone

As you approach 100ft, the first transition point in your approach, you are about 10 seconds from landing. It is time to aim a little closer to the pad, which you do by increasing brakes to 80%, hands level with your sternum, forearms about 30° above the horizontal.

You are now in the Power Zone (Figure 8). The canopy is flying, your control pressure is firm, and the canopy responds in a linear fashion to your inputs. Let up, and you move forward, making the glide slope shallower. Push down, and you slow down, making the glide slope steeper. You are flying to just beyond the pad, aiming at the far side of the tuffet, about 2.5m beyond the disc. You are approaching 30ft, the second transition point in your approach, where you transition into the Sink Zone.

• Sink Zone

Transition simply means changing from your slight overfly glide slope, increasing your braking, steepening your angle, and aiming for the dead centre. You are now in the Sink Zone (Figure 8). If you have flown your approach well, you'll arrive at about 15ft, with 100% brakes, or very light sink. At 100% brakes the canopy will remain stable, over your head, with no pre-stall rockback. This will maximise the accuracy of your foot placement.

• Foot Placement

Foot placement is the most critical, and often least trained, aspect of accuracy. An excellent approach, from which a perfect dead centre could be scored, can easily be spoiled by poor foot placement. This is where the design of your shoes becomes critical. You must be able to see the part of the shoe you are aiming to put on the target, when looking down the back of the heel. As you start to transition, keep both legs bent and relaxed, with the lower legs straight down, as if sitting on a stool. Keep the toes up so the heels are the lowest point.

Most people have a preferred foot to strike with. However, don’t discount the other foot, it may be necessary to strike with it on some occasions, like a gust over the target or inaccurate canopy control.

As you sink onto the pad, raise the leg not being used to strike so it doesn’t hit the ground first. Raise it gently and forward. Don’t tuck it back behind you because it will probably hit the ground first, and be off the pad. Keep the leg of the striking foot bent, aiming to fly the bent leg all the way to touchdown. This will give you freedom to move the foot to the correct position to hit the disc.

Practising foot placement can be done using an accuracy training harness - a harness hanging on bungees that gives the correct approach angle and speed of the last 5 ft of an accuracy jump. However, in the absence of a training harness, practice foot placement by sitting in a chair that has arms. Put a practice pad on the floor in front of you, push down on the chair arms to lift yourself up, and raise your striking foot at the same time. Then move forward and strike the pad with a bent leg while still holding the chair arms. Practice with the other foot as well. This form of practice is free and will certainly improve your scores.

• Planning

Always plan your jump. Base your plan on the conditions you observe at the DZ in the moments before you take off, plus an awareness of any trends. Your plan should be specific and clear in your mind, yet have flexibility for unexpected changes. The *process* of planning is important: it prepares you and forces you to anticipate what might happen. Specific planning for a jump should begin about 10 minutes prior to take off, not earlier.

First learn to read a DZ. Locate the target, windsocks, flags, streamers, smoke etc. Study terrain, note buildings and trees that will generate turbulence on particular approach directions. Pace out the distance to prominent features, and note where an approximate 300ft radius circle falls around the target. Study the DZ map, learn the cardinal headings (north, south, east, and west), and talk to locals about typical wind patterns and exit points.

Now read the conditions. Observe low level clouds, cloud shadow movement, jump plane drift and speed over the ground, the wind drift indicator, canopies in the air, surface wind indications, thermals, and turbulence. Prior to any competition, a wind drift indicator is dropped directly over the pad from 2300ft. Watch the streamer closely. In addition to telling you the exit point it will also show any crosswinds. If winds from 2000ft to 600ft differ in direction significantly from the ground wind (i.e. there is a crosswind at altitude) then plan to fly your manoeuvring and circuit towards the upper wind.

Now answer these three questions:
- Where is the exit point?
- What is the average wind speed at 1000ft?
- What is the surface wind line and wind speed?

Now plan your jump in the following sections:
- Spotting
- Exit, and canopy flight to 1000ft (Manoeuvring)
  1000ft to base leg, and turn to final (Circuit)
- Final approach (Approach, Power, and Sink zones)
- Foot Placement

- **Execution**

Now you have a plan, follow it through. But be prepared to be flexible in case you misread the wind, or conditions change.

Brief the pilot before take off on the run-in you require, and make him aware that you will direct the spot and may require direction changes from the run-in you have given him. When you are spotting make sure you look straight down, assess the drift, and correct as required.

From exit to 300ft you can follow your plan by talking yourself through it, and you have some time to think if you need to change it. Below 300ft your flying must become progressively less "rational" and increasingly more "intuitive". The closer you get to the pad, the less time you have for "mind talk" and the more you need to "just do it".

Below 100ft, there is absolutely no time for "mind talk". The conscious mind focuses on the goal (the Dead Centre) allowing the unconscious mind to do the steering. Only experience will teach you the best responses to each situation, and early on you must learn to quiet your conscious mind, letting your unconscious mind learn by trial and error. Let your conscious mind go to work after the jump, analysing what went well and what can be improved.

What happens above 30ft is not the most important part of precision (measured in centimetres) accuracy. What happens below 30ft is. There are many ways to fly your canopy into a workable short final position. Learn a method that works for you, and stick to it, so that you consistently arrive at the second transition point (30ft short final above and behind the pad) in stable flight and ready to go to work, shifting into intense "fine focus" for your flight down to, and foot placement onto, the dead centre.

- **Exercise 1**

Nominate yourself a target point well away from the normal landing area that has clear area all around it out to 100m. Make sure the target point is easy to see from the air. Use a canopy loaded to a maximum of 1.0 lb/sq ft for this exercise. Plan an accuracy jump, as briefed above, for every jump, even when doing other disciplines. Then, after passing 2500ft, manoeuvre to get to the first transition point (100ft) as if you were doing accuracy to your target. As you get to the first transition point, don’t transition from 66% brakes into the 80% brake Power Zone. Let up on your brakes to get to full flight and then carry out a normal flared landing beyond your target. DO NOT attempt to hit your target. Do not let up on your brakes too rapidly to get to full flight as this can cause some canopies to dive (check the effect on your canopy at altitude). Do this exercise until you can consistently get to the first transition point for your nominated target, in as many wind conditions as possible.

• Exercise 2

Nominate yourself a target point in soft ground well away from the normal landing area, that has clear area all around it out to 50m. Make sure the target point is easy to see from the air. Use a canopy loaded to a maximum of 0.85 lb/sq ft for this exercise. Plan an accuracy jump, as briefed above, for every jump, even when doing other disciplines. Then, after passing 2500ft, manoeuvre to get to the first transition point (100ft) as if you were doing accuracy to your target. As you get to the first transition point, don't transition from 66% brakes into the 80% brake Power Zone. Keep at 66% brakes and aiming at 5m beyond the target. DO NOT attempt to hit your target. Then carry out a flared landing from 66% brakes, to a point beyond your target. This will not be as effective as a full flare landing and the stall point will be higher than a full flare stall point (check the effect on your canopy at altitude). This approach should give you a landing within 10m of your nominated target. Do this exercise until you can consistently get to within 10m, in as many wind conditions as possible.

• Exercise 3

Nominate yourself a target point in soft ground well away from the normal landing area, that has clear area all around it out to 30m. Make sure the target point is easy to see from the air. Use a canopy loaded to a maximum of 0.70 lb/sq ft for this exercise. Plan an accuracy jump, as briefed above, for every jump, even when doing other disciplines. Then, after passing 2500ft, manoeuvre to get to the first transition point (100ft) as if you were doing accuracy to your target. As you get to the first transition point, don't transition from 66% brakes into the 80% brake Power Zone. Put very slightly more brake on, to about 70%, and aim at 3m beyond the target. DO NOT attempt to hit your target. Then carry out a flared landing from 70% brakes, to a point beyond your target. This will not be as effective as a full flare landing and the stall point will be higher than a full flare stall point (check the effect on your canopy at altitude). This approach should give you a landing within 5m of your nominated target. Do this exercise until you can consistently get to within 5m, in as many wind conditions as possible.

• Further training

Good accuracy comes with practice and it is very much a personal task to get within 5m. Following the guidelines in this document will get you to within 5m without a great deal of coaching. When you are consistent to 5m, it will be necessary to make approaches to a tuffet in order to get more accurate without injury. Once you are making consistent approaches onto a tuffet, coaching can get you onto the pad and improve your centimetres score. Find a drop zone that has a tuffet or contact the Freefall Style and Accuracy Landing sub committee of the SSA for more information.

Here is an example of an ambitious but achievable set of accuracy goals:

Ten jumps inside 10 metres	after 100 accuracy jumps
Ten jumps inside 5 metres	after 300 accuracy jumps
Ten jumps with a 15cm average	after 500 accuracy jumps
Ten jumps with a 7cm average	after 700 accuracy jumps
Ten jumps with a 4cm average	after 900 accuracy jumps
Ten jumps with a 1cm average	after 1000 accuracy jumps

4 PARA-SKI

This discipline combines the two events of Accuracy Landing and Giant Slalom Skiing. It has been an international event almost as long as Accuracy Landing, and started in Europe with competitions between avalanche rescue teams in the 1950s. At that time the rescuers used to parachute into the mountains then ski to the avalanche site, because there were no helicopters. Many top European accuracy jumpers do Para-Ski in the winter.

Para-Ski accuracy is the same as normal accuracy, as described above, except that the tuffet is in the mountains on a snow slope of at least 25°. The sloping tuffet and mountain wind conditions make this a very difficult form of accuracy, therefore scores are given out to 1 metre. A competition consists of seven jumps.

The Giant Slalom Skiing is an individual race against the clock down a 1000m slope with a fall of 250m, and with approximately 35 gates. A competition consists of one seeding run and two competition runs. The Giant Slalom Skiing takes place under the rules and regulations of the International Ski Federation and is not covered in this document.

Contact the Freefall Style and Accuracy Landing sub committee of the SSA for more information.

5 EMERGENCY PROCEDURES

In Freefall Style and Accuracy Landing, the parachute emergencies are similar to those discussed in the student's training and no unique emergencies are associated with the discipline. However, in competition, some specific procedures are followed.

Freefall Style: A premature opening is not grounds for a rejump. However, a malfunction after completing the style series does not affect the style score.

Accuracy Landing: A cutaway, or a parachute malfunction that creates control problems (for instance a locked brake), is grounds for a rejump. The jumper must signal immediately with arms and legs outstretched, and make no attempt to approach the target or land in the target area. Immediately following a landing with a control problem, the parachute must be inspected by the judges; therefore the problem must not be cleared by the jumper after landing.

6 CATEGORY TESTS

CAT I

The student shall have successfully completed the Intermediate Skills Programme (ISP) as contained in Section 5 (PANAM MOPs).

CAT II

The student shall have successfully completed the following tasks in both disciplines:

Freefall Style. Two, pre-declared, Freefall Style series in no more than 16 seconds (after penalties) on two separate jumps.

Accuracy Landing. Two, pre declared, self-spotted jumps ending with stand-up landings within 10 meters of a pre-designated landing target.

CAT III

The student shall have successfully completed the following tasks in both disciplines:

Freefall Style. Two, pre-declared, Freefall Style series in no more than 14 seconds (after penalties) on two separate jumps.

Accuracy Landing. Two, pre-declared, self-spotted jumps ending with landings within 5 meter of the centre of a tuffet.

7 LICENCE REQUIREMENTS

A Licence

An applicant for an A licence shall:

• Have met all the A licence requirements in section 2 (PANAM MOPs)

B Licence

An applicant for a B licence shall:
• Have met all the B licence requirements in section 2 (PANAM MOPs)
• Passed the Category III test in Freefall Style, and in Accuracy Landing.

C Licence

An applicant for a C licence shall:

• Have met all the C licence requirements in section 2 (PANAM MOPs).
• Have performed Accuracy Landing with an average over five consecutive jumps onto an AMD of no more than 15cm.
• Have performed Freefall Style with an average over three consecutive jumps of no more than 13 seconds (after penalties).

D Licence

An applicant for a D licence shall:

• Have met all the D licence requirements in section 2 (PANAM MOPs).
• Have performed Accuracy Landing with an average over eight consecutive jumps onto an AMD of no more than 12cm, in a regional, or higher category, Accuracy Landing competition,
• Have performed Freefall Style with an average over four consecutive jumps of no more than 12 seconds (after penalties), in a regional, or higher category, Freefall Style competition.

8 COACHES

The coach rating is designed to give a formal qualification to those who teach Style and Accuracy jumpers up to Cat III level. All applicants for coach ratings must be recommended by a CI, and endorsed by the Freefall Style and Accuracy Landing sub committee of PANAM (see Form 19). Official results sheets from competitions, or the competition judge's signature against logbook entries, will be required to confirm performance requirements.

An applicant for a Freefall Style and Accuracy Landing Coach Rating must:

• Have a minimum of 300 jumps.
• Have successfully completed a PANAM approved Jumpmaster, Static Line Instructor, or AFF Instructor Course
• Hold a PANAM C or D licence, with performance minima obtained in any discipline.
• Have successfully completed a SSA recognised judging seminar in Freefall Style, and in Accuracy Landing.
• Have competed at regional level or higher in Freefall Style, and in Accuracy Landing
• Have performed Freefall Style with an average over three jumps of no more than 13 sec (after penalties) on three different series.
• Have performed Accuracy Landing with an average over five consecutive jumps onto an AMD of no more than 15cm.

To remain current as a Freefall Style and Accuracy Landing Coach the rating holder must:

• Have performed at least 10 Accuracy Landing jumps in the previous 12 months.
• Have performed at least 5 Freefall Style jumps in the previous 12 months.
• Have attended a SSA recognised judging seminar in Freefall Style, and in Accuracy Landing in the previous 24 months.

9 FIGURES

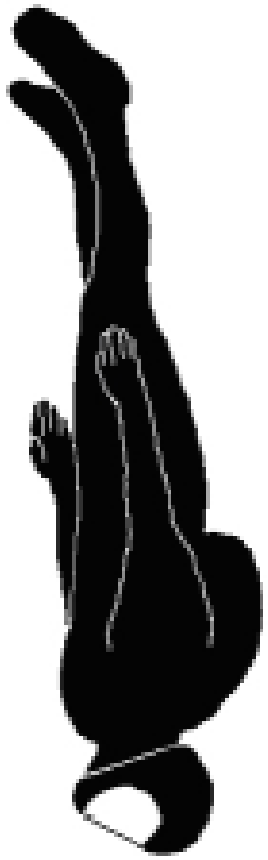

FIG 2 - THE TUCK POSITION

FIG 1 - THE DIVE POSITION

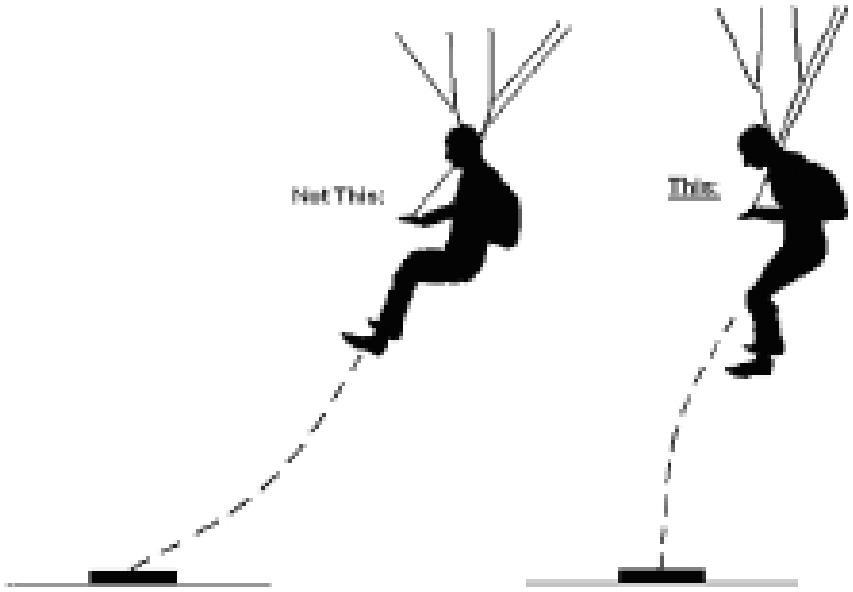

FIG 3 - HARNESS POSITION

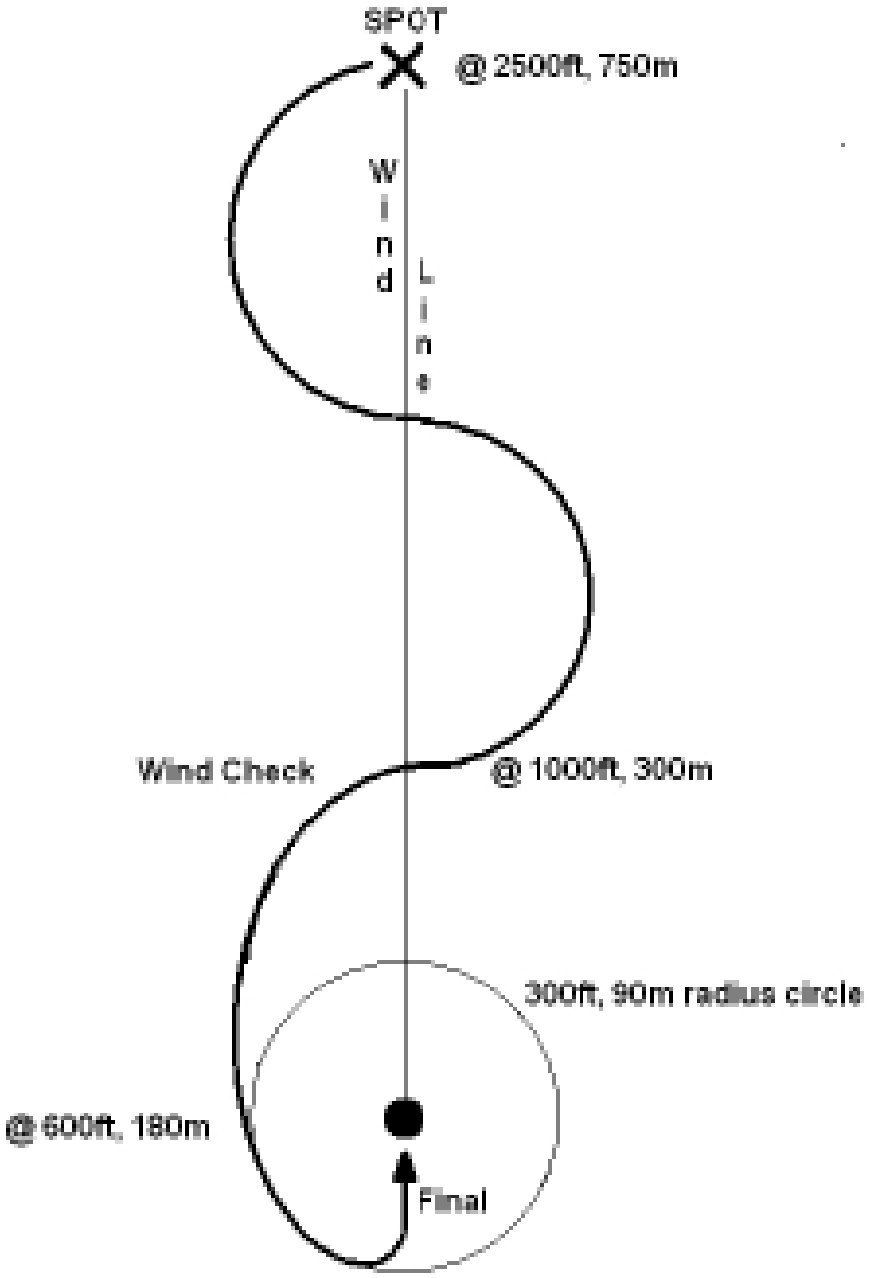

FIG 4 - MANOEUVRING AND CIRCUIT

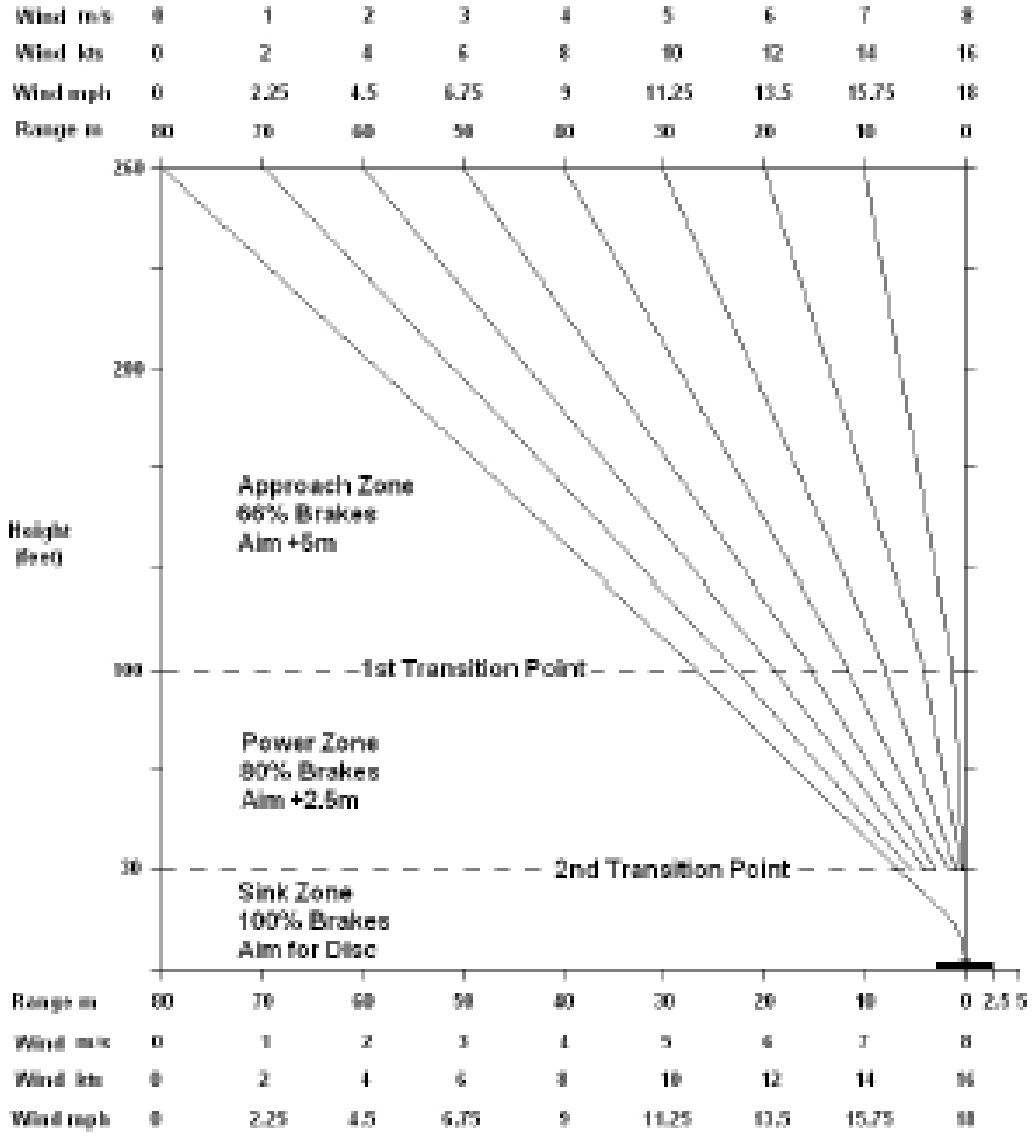

FIG 5 - APPROACH ANGLES - FEET/METRES

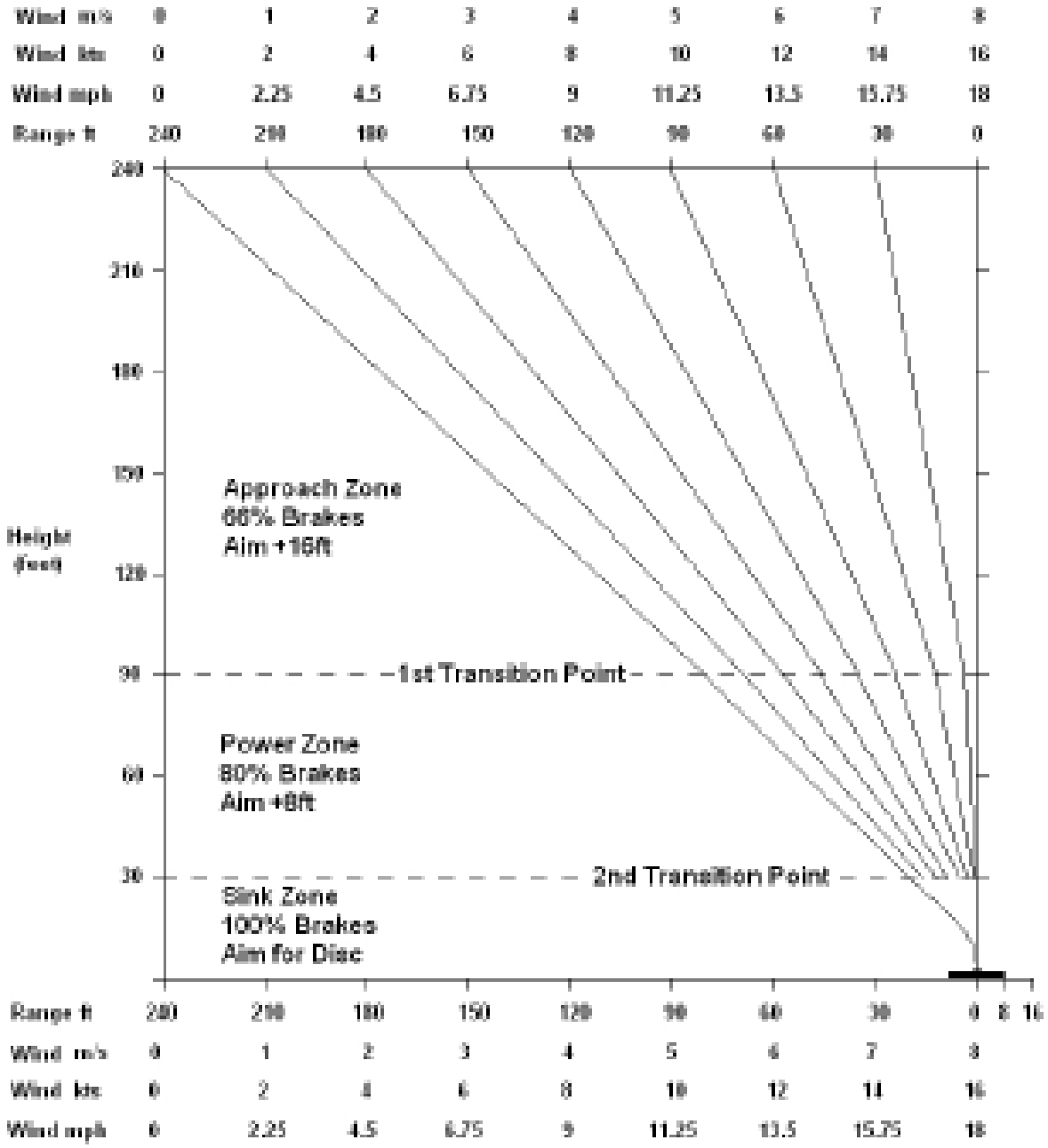

FIG 6 - APPROACH ANGLES - FEET/FEET

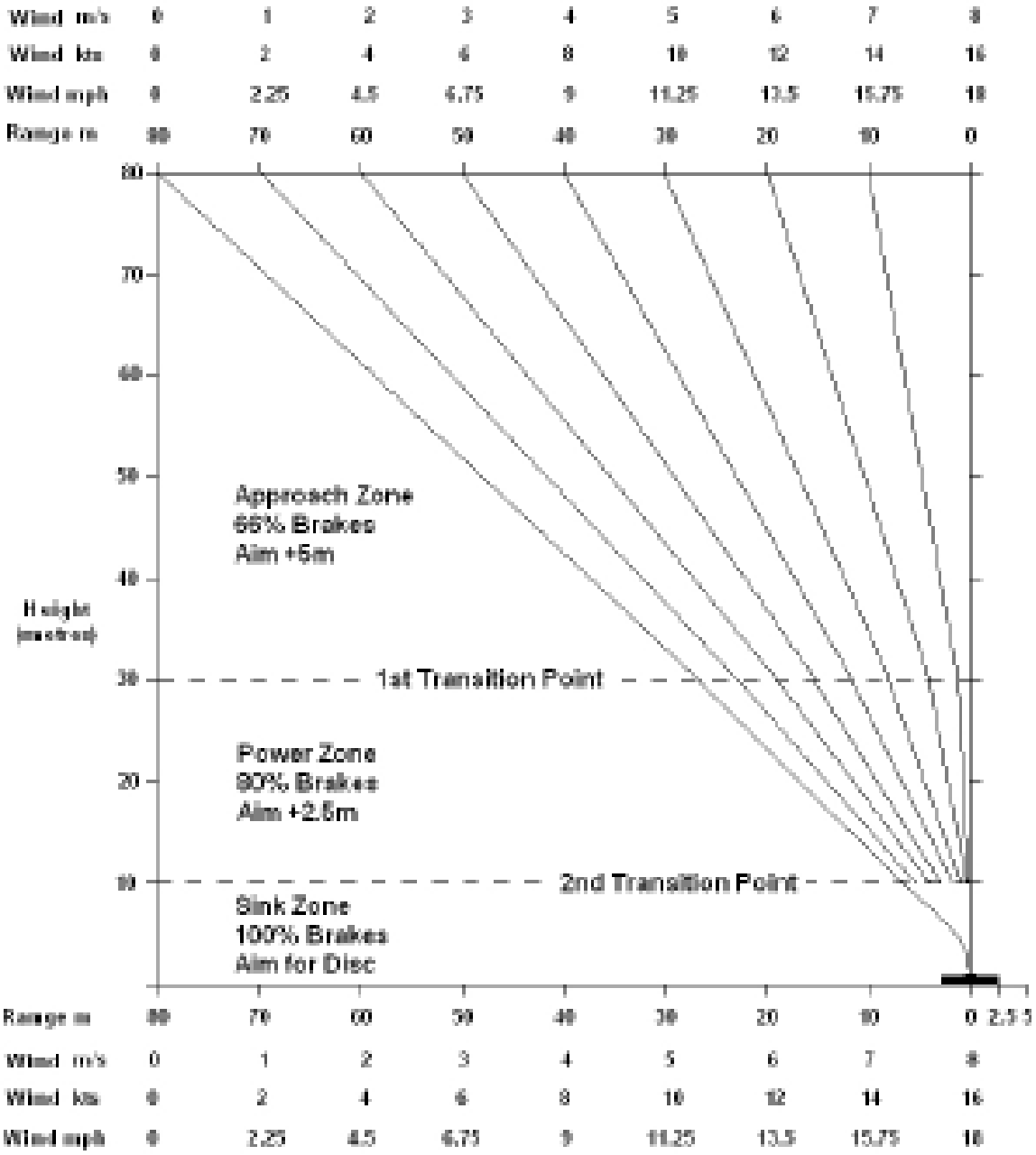

FIG 7 - APPROACH ANGLES - METRES/METRES

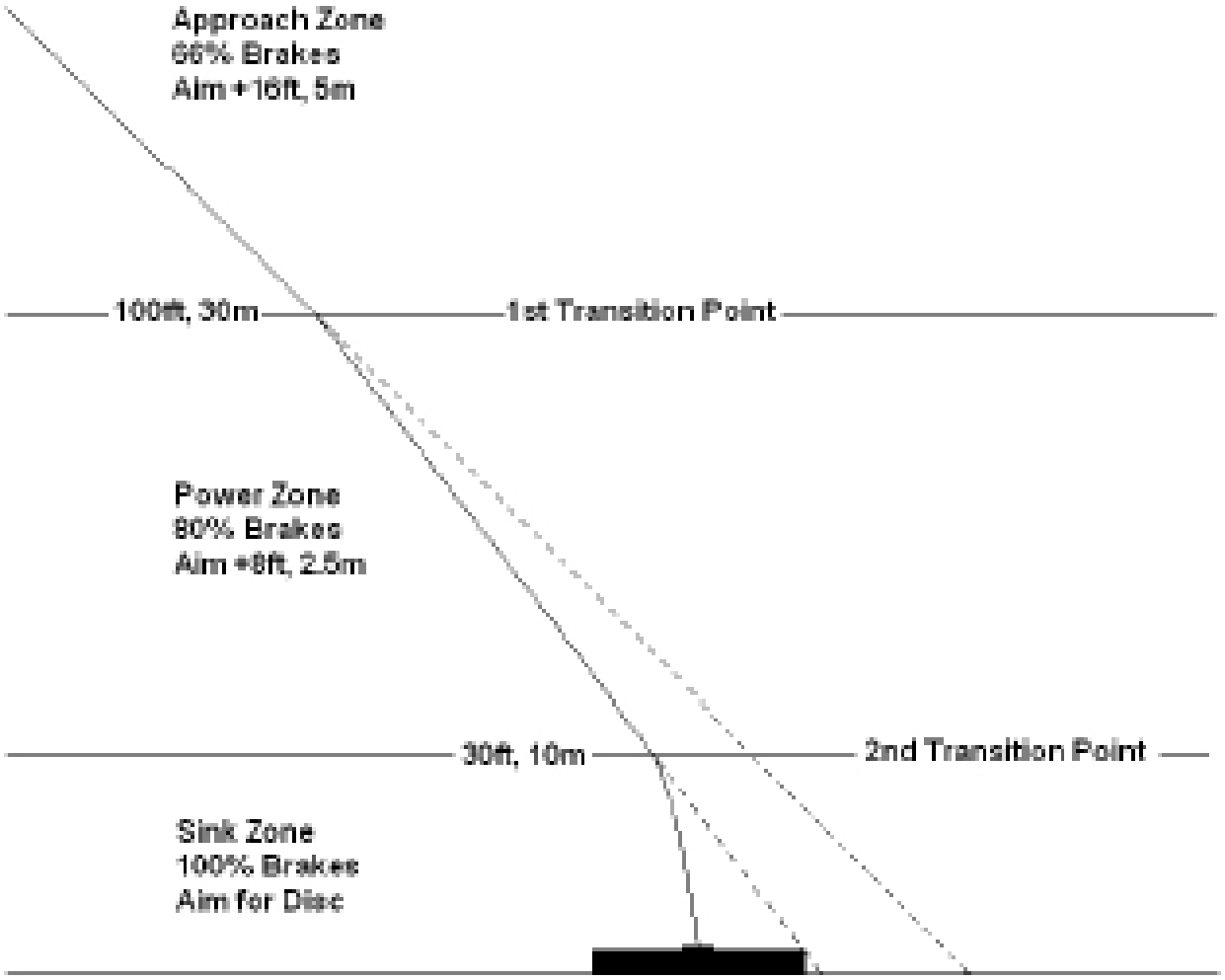

FIG 8 - FINALS - THE LAST 100FT