BODY FLYING

D. L. HOWERSKI

£3.75

Linda Hamilton

TO

SKY-DIVER DRIVER FROM

BODY-FLYER

1st Edition 25/6/79

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ABOUT THE AUTHOR

Dave has been sky diving for 10 years and has accumulated over 1500 jumps and some 13 hours of free fall time.

He has been a motivating force and keen instructor of relative work in the United Kingdom for the past few years. He is currently a British Parachute Association Advanced Instructor Examiner and was previously a B.P.A. Councillor.

Since leaving the Army some 2 years ago he has been constantly involved in Sky-Diving activities including, free-fall - Cine Photography. In February 1979 he made aviation history by landing a parachute on a balloon in the Sudan, after having first exited the same balloon. He has also organised successful large formation British Record Attempts in 1978. This is his first book and he also worked on a film, to be released shortly.

He is currently teaching sky-diving as a full time occupation and is working on a second film.

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ACKNOWLEDGEMENTS

Very little of the content of this book, is my own unadulterated thought. I am deeply indebted to all those who taught me and continue to teach me! I thank anyone who has ever shared an aircraft or a sky-dive with me.

The following however have been fundamental contributors to this book.

SCRATCH GARRISON
GARY CARTER
MIKE GENNIS
ROGER HULL

Roger's ideas in particular bounce and sparkle through these dull pages like jewels in a rubbish dump.

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INTRODUCTION

As a former professional soldier, I have heard War described as the "Dance of Death". As a Sky-diver I have heard body flight described as the "Dance of Life".

The organisation of a modern multi-person Sky Dive is very much the work of an airborne choreographer.

Today in sport there is a new feeling of spiritual awareness. The eternal struggle for the ultimate achievement and perfection itself now finds us looking in many new directions not only mentally and physically but also psychologically as well.

Mans age old dream of flying and in particular body flight is fast becoming reality.

The fulfilment of subconscious desires and ancient dreams, the exhilaration of body flight and sense of achievement is something which I hope this book will help you attain.

D. L. HOWERSKI. NOVEMBER, 1978.

ENERGY & POTENTIAL

ENERGY AND POTENTIAL

Do we fall or do we fly? All falling bodies have energy which is Newtonian in origin. Gravity we know makes us come down. A falling body has a surface area but it may also have control elements. These control elements are your arms and legs. What can you do?

You can deflect air, you can also create lift. You have velocity and by use of your control elements you may direct that velocity, increase it or decrease it and alter its direction at will.

In simplest terms the human body in flight has six basic directions in which it can go. Obviously you are falling free, but put a reference point falling alongside you and relative to this you have your six directions.

Upwards, downwards, left, right, forward and backwards. Each and everyone of these directions may also be used in about 3 or 4 "gears" or even "overdive". You may also combine two or more at any one time for a particular problem.

Imagine your optimum reference point. Put a sphere around it with the reference point in the centre.

Any diameter you draw through the reference point is a possible direction so your potential for movement is omni-directional relative to your reference point.

Your Potential can be affected by various things. Obviously your own ability limits you, but mood and general state of mind will also affect your potential ability at any point in time.

Let us now look at the Graph on Chart A.

The vertical side of the Chart represents up and down movement, the lateral side obviously represents forward and backwards movement.

The Chart then is only in two dimensions. Sideways movement is not shown.

The dotted line on the outside represents the Aerodynamic limits for the individual concerned.

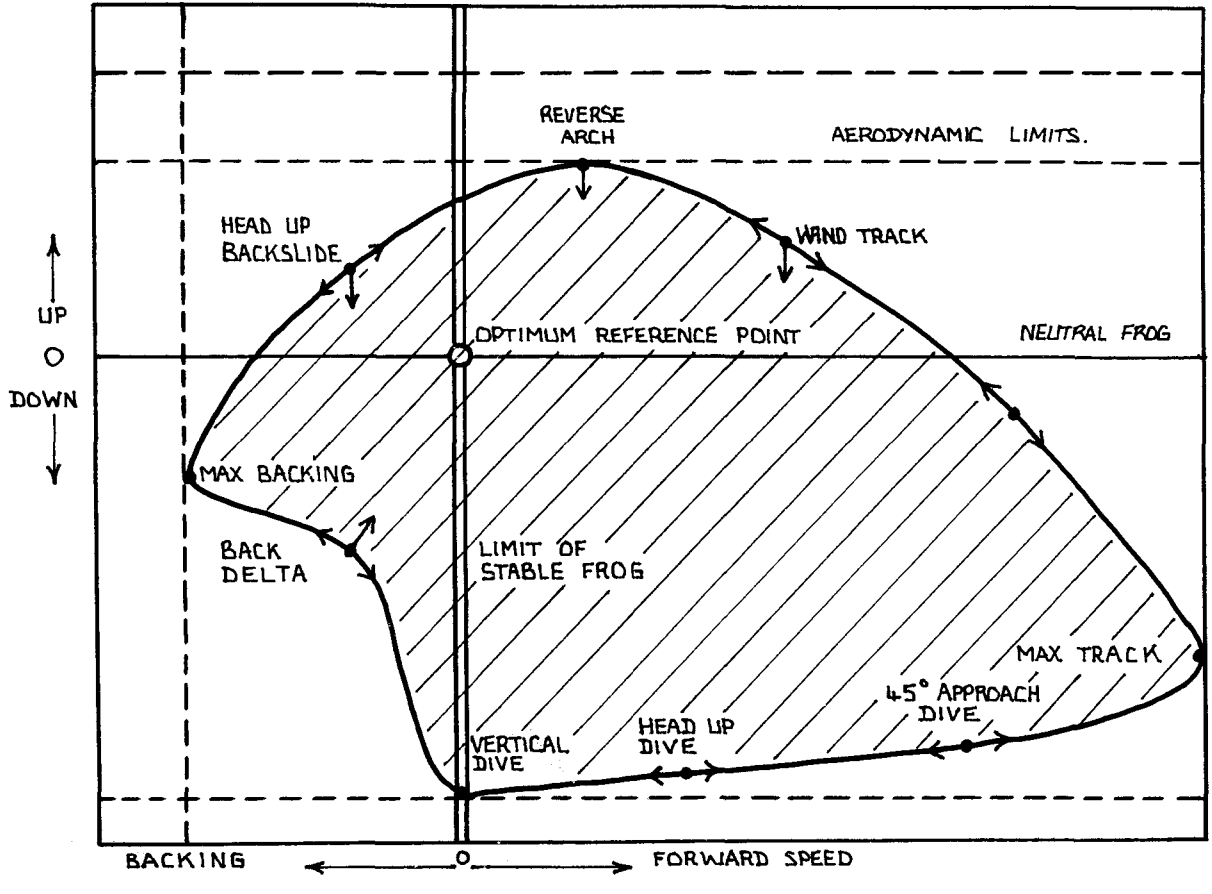
The plot on the chart is the envelope of Potential for that particular Sky-diver.

It represents his ability in the various directions shown.

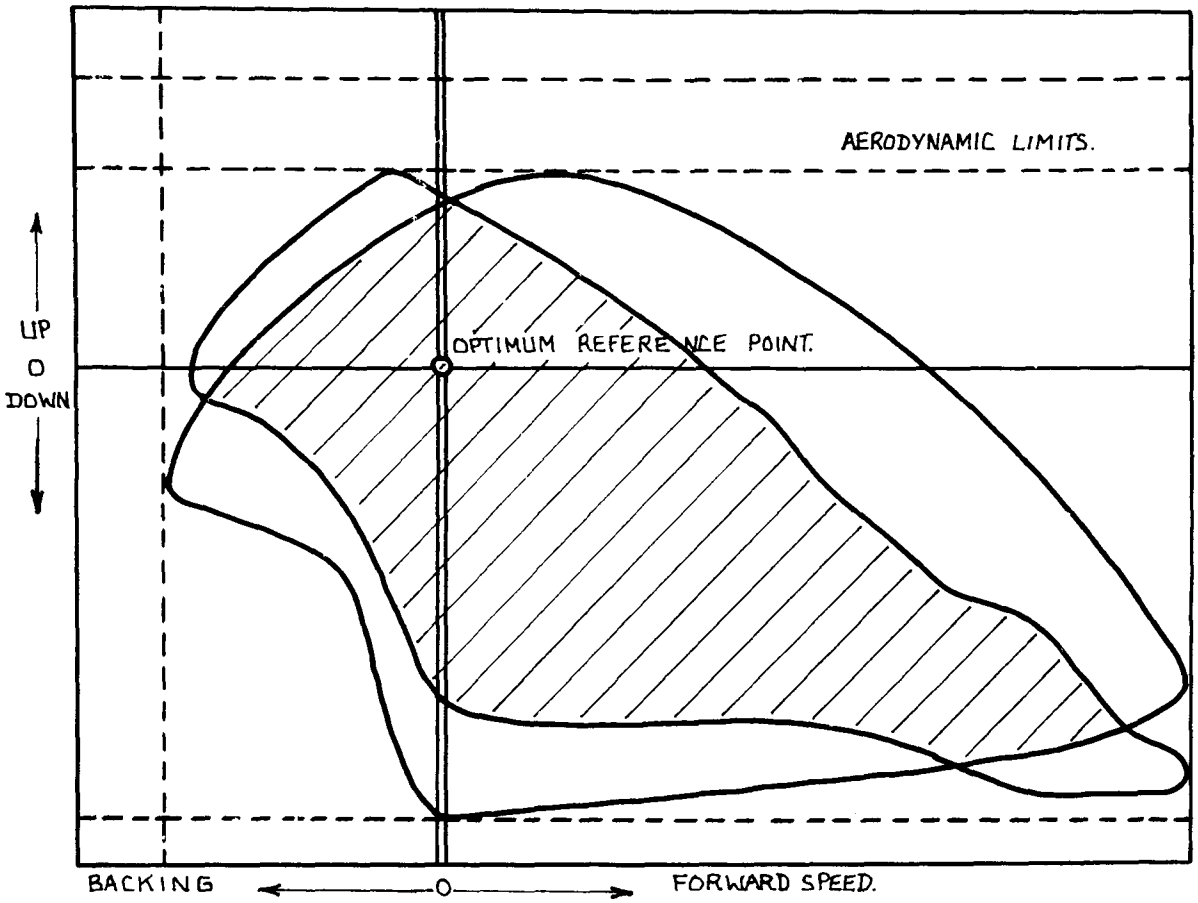
Let us look at the point on the chart where the plot is marked reverse arch and meets the aerodynamic limit line.

ENERGY + POTENTIAL.

CHART. A.



ENERGY + POTENTIAL. CHART. B.



At this point in time the Sky-diver is in a max-de-arch position. It is for him individually the best de-arch he can do. If he increases it he will lose it and flip into instability, because at that point in time, and with his current state of training he has reached his own aerodynamic limits and gone beyond it and out of control.

The max - track point on the chart is the same. We all know and accept that some of us can track better than others.

If this jumper tries to exceed his ability and adopts a more radical track position he will fall off it. Again he has reached his aerodynamic limits at this point in time.

Let us look at Chart B

We have here the plots of two jumpers marked on the chart. Obviously they are different.

However, on careful examination we can see that there is a shaded area common to these two jumpers.

This area is where their envelopes of Potential interlock. The area is smaller than their own individual area.

CHART C

Is interesting as we now have three jumpers envelopes of Potential plotted.

Once more the shaded area is that one which represents where each jumpers ability interlocks with the other two.

It is immediately noticeable that this common area is becoming smaller as we increase the number of jumpers working together.

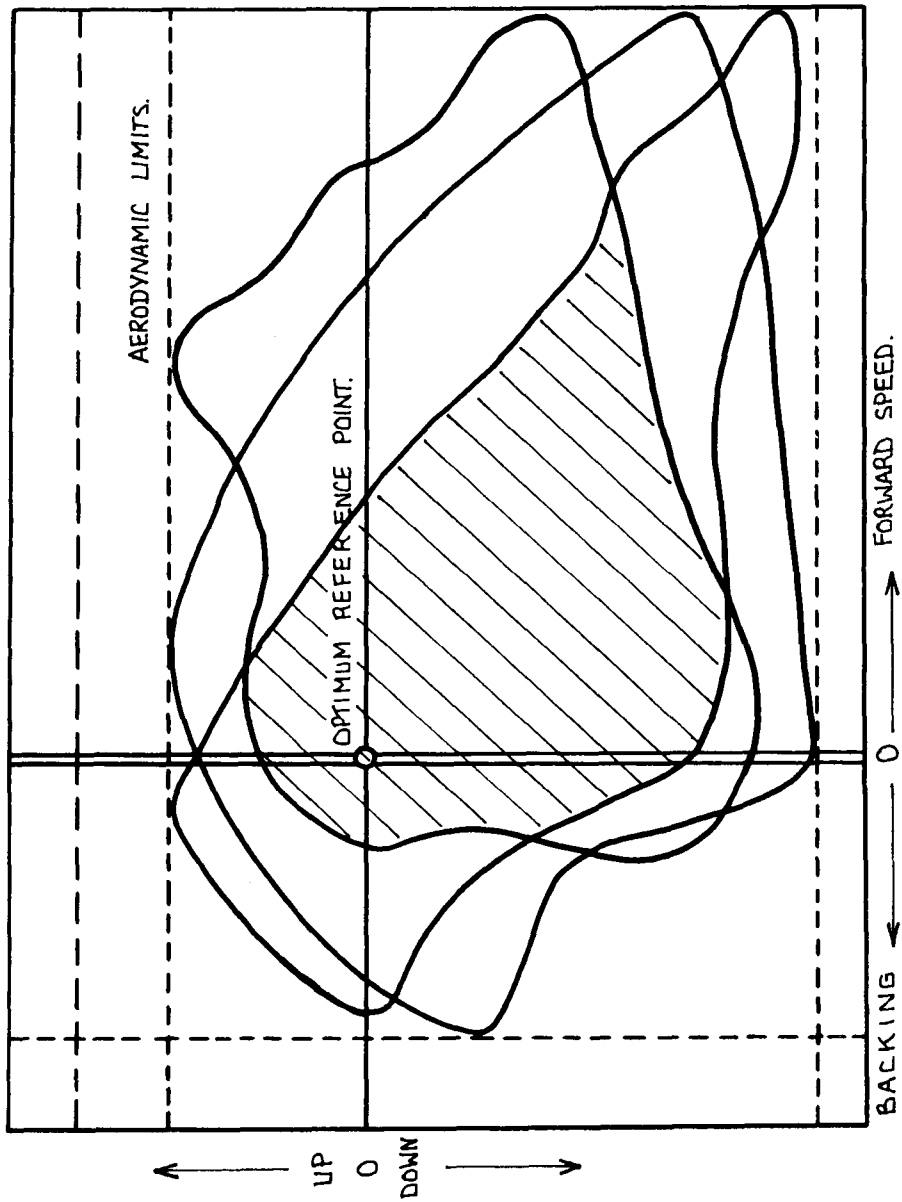
Different body sizes, different surface areas, different weights, different equipment and differing uses of control elements all cause this situation. The individual envelopes of Potential may never meet. It is quite possible for four jumpers to exit an aircraft not having a hope in hell of getting together because of this singular fact.

How can one improve this.

Simply by increasing your own potential. Expand it as much as you can. Learn to sideslip. Improve your tracking. Teach yourself to fast fall better and to slow fall more efficiently. Learn to do a "back-in". Make your Backsliding more effective. If a group of you work hard to expand your individual abilities and make your potential envelopes larger, then when you get together, your interlocking areas on the chart will be larger.

Thus your chances of success are greatly improved if not guaranteed.

It is up to you, the individual to do this.



STABILITY

Leslie Irvin tumbled out of an aircraft at 1500 ft over McCook Field, Ohio, in 1919 and made the first free fall descent. Canarozzo in the 1950's developed the basic dive position and Leo Valentine gave us the saucer shaped stable position again in the 1950's.

The sixties and early seventies has seen the development of a flat lazy R.W. position. Roger Hull in 1978 has given us the highly manoeuvrable sequential R.W. position known as the Dihedral effect.

Let us look at some basic positions.

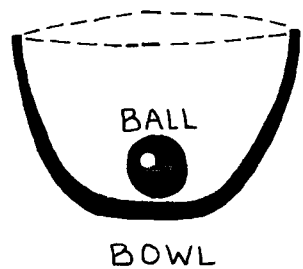
POSITIVE STABILITY.

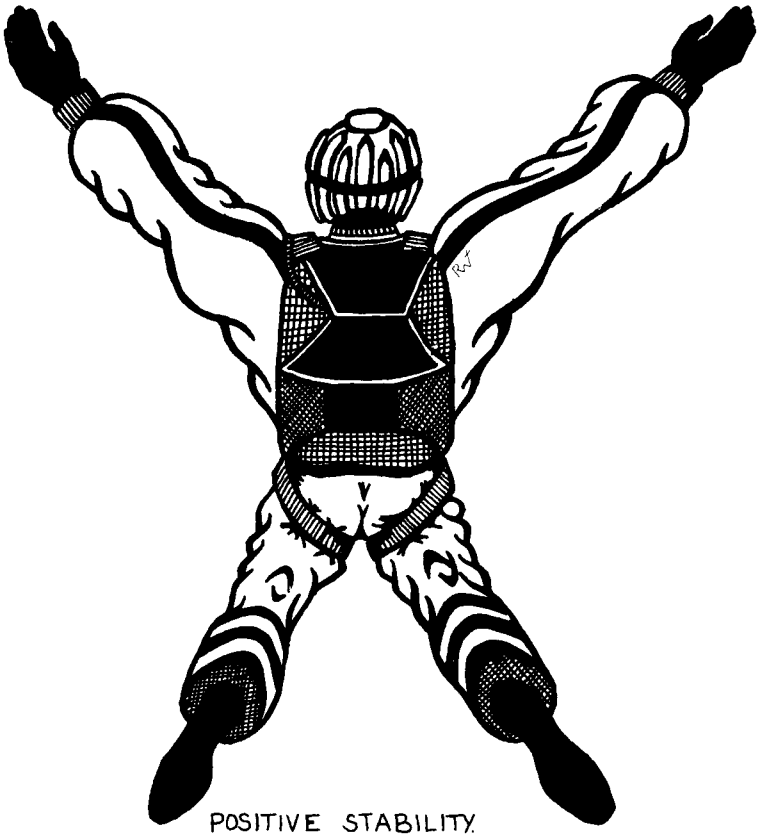
This can be likened to a ball placed in a bowl it will always roll to the bottom. The basic direction in which one will fall is down. It is the basic student position as first taught.

The budding relative worker is normally presented with a problem here. He or she has just spent all his jumps learning to master this position. He or she now wishes to move in other directions. But the only body position he knows is one which will take him straight down.

This singular fact is the cause of more struggling R.W. students than any other I know.

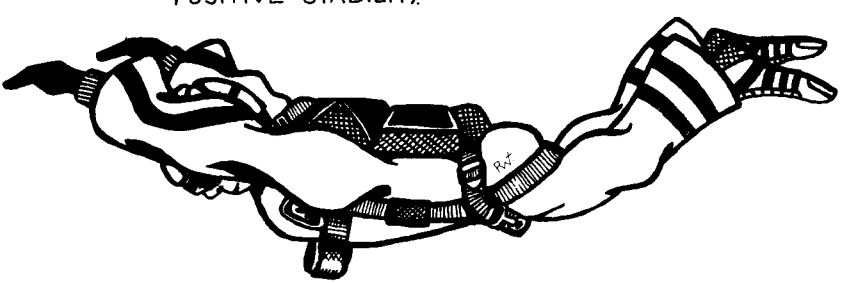
POSITIVE STABILITY



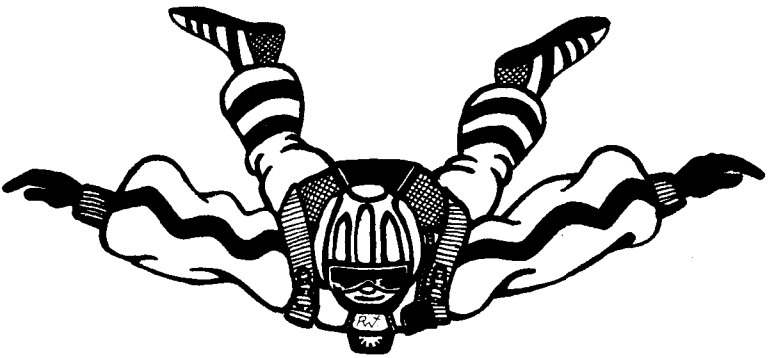


POSITIVE STABILITY
FROM ABOVE.

POSITIVE STABILITY



SIDE VIEW.
STUDENT POSITION.

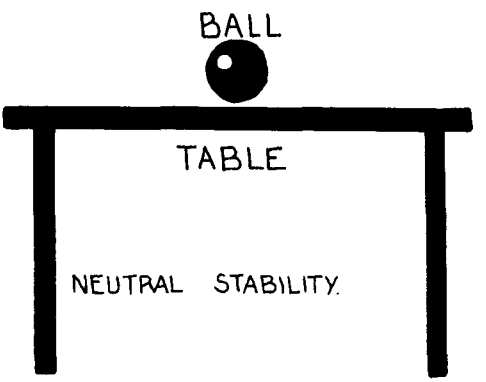


POSITIVE STABILITY
FRONT VIEW.

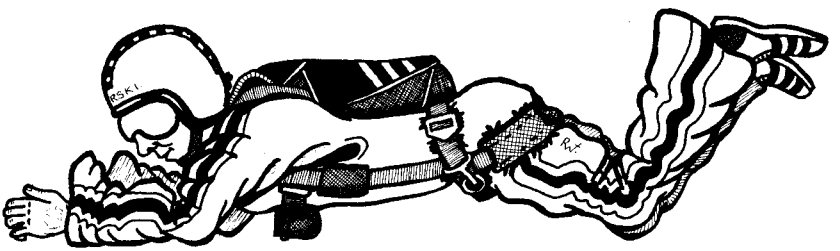
NEUTRAL STABILITY

This can be likened to a billiard ball placed on a flat table. It is in a neutral position and with the slightest momentum will move in any direction. It is a large flat lazy position generally adopted for R.W. It is reasonably manoeuvrable.

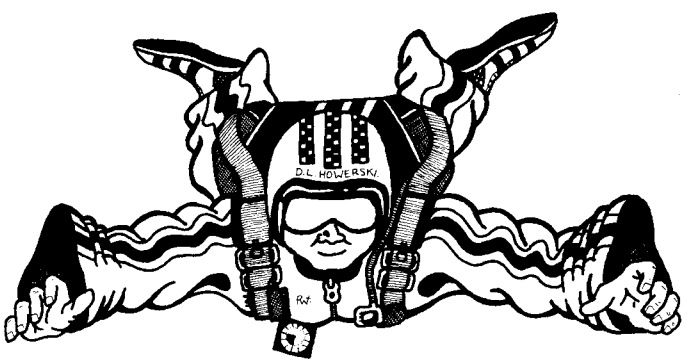
This is the generally accepted R.W. position that the budding relative worker should try to relax into. It is not a rigid body position such as the basic student stable, rather it is a more relaxed flat position of neutrality.



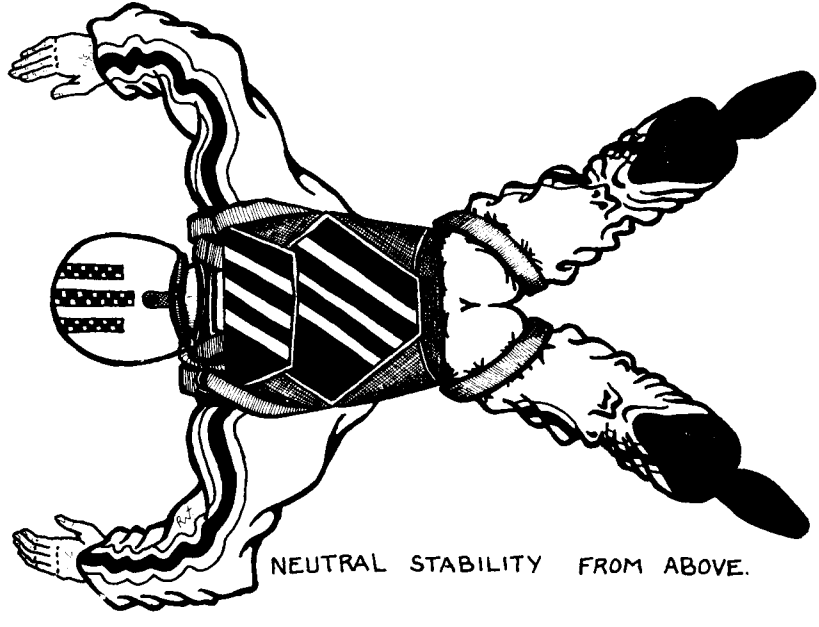
NEUTRAL STABILITY.



NEUTRAL STABILITY SIDE VIEW
FLAT R.W. POSITION.



NEUTRAL STABILITY FRONT VIEW.

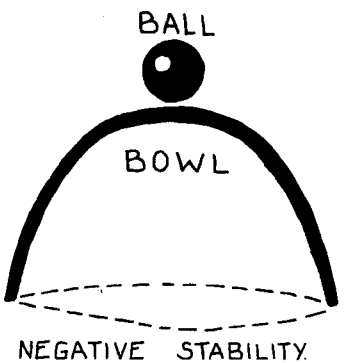


NEUTRAL STABILITY FROM ABOVE.

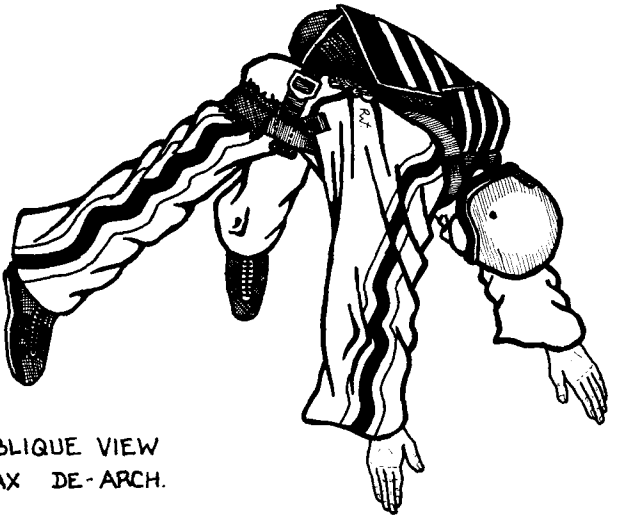
NEGATIVE STABILITY.

This is likened to a ball balanced on top of an upturned bowl. It is just balanced and the slightest movement will allow it to roll over.

For the Sky-diver it is almost a max-de-arch position, it is highly manoeuvrable but difficult to control and easily lost into instability.



NEGATIVE STABILITY



OBLIQUE VIEW
MAX DE-ARCH.

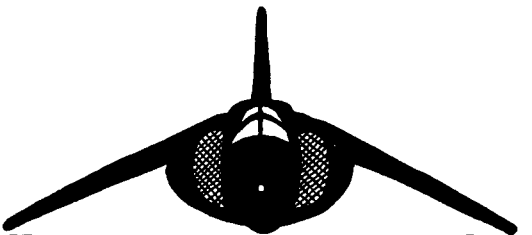
DIHEDRAL EFFECT.

This is a compromise between Negative stability and Neutral Stability. Look at the front view of a modern jet fighter and one gets the effect we are talking about.

The position is close to negative stability, it is easily rolled, has good efficient manoeuvreability. It is the best and most up-to-date body position to use for sequential Relative Work.

To obtain this position go from a normal neutral stable and drop the knees slightly and lower the hands about 5 inches below the level of the shoulders but keeping the hands within your peripheral vision.

Any of these positions, positive, negative, neutral, or the dihedral can be adopted by you, merely by moving your control elements, your hands and legs, to the required position.



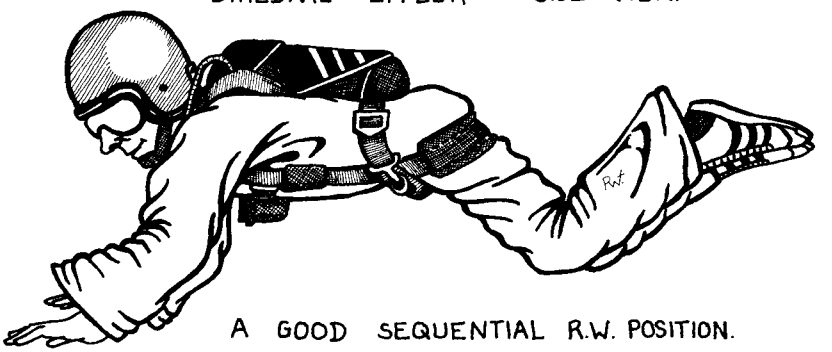
FRONT VIEW MODERN JET FIGHTER.

DIHEDRAL EFFECT.

FRONT VIEW
MODERN SKY-DIVER.

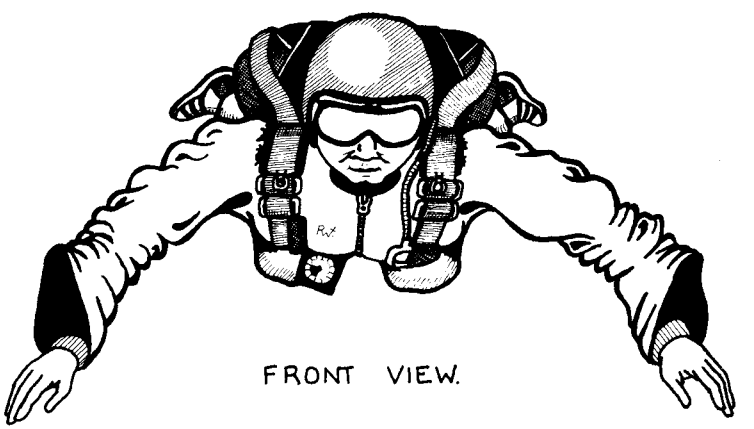
DIHEDRAL EFFECT.

DIHEDRAL EFFECT, SIDE VIEW.



A GOOD SEQUENTIAL R.W. POSITION.

DIHEDRAL EFFECT



FRONT VIEW.

MENTAL APPROACH

Your attitude of mind is very important. Relative work is enjoyable. You are paying money to go up there and enjoy yourself. You must have this view of it and so must your Load Organiser. He must instil it into everyone on the load. If you get a completion this is added exhilaration.

You must try and avoid animosity, pressure, politics, and character clashes. All of these can blow you jump on the ground. The interplay of characters and personalities is of tremendous importance.

If you can all leave that aircraft with the same dedication towards a common goal of aerial achievement and enjoyment and do so with a smile on your face, you are half way there. It is very much a team effort and you all need each others 100% support and co-operation for the ultimate achievement.

Every time you do an R.W. Jump you are striving for perfection or should be. It is almost a living art form. You are performing, creating, changing, evolving. It is a thing of grace and beauty both physically and spiritually.

The "High" and "Good Vibes" you get from a good dive can last several days it is a very emotional experience and you must approach it in the right emotions in order to make it the success you desire.

BASIC BODY POSITIONS

BASIC BODY POSITIONS.

What are they, when do you use them, how do you transition from one to another?

I will try and answer some of these questions. The variables you are presented with in any one sky-dive will always make this type of classification almost useless.

You will normally have to combine one or more of these in a quick smooth flowing transitional movement to arrive at where you want to be.

Still we must start somewhere.

NO LIFT DIVE

This position would normally be used on a large formation load if you wish to go straight down and then across, Presuming you are one of the last people to leave the aircraft probably 8 to 10 seconds after the first person.

You could use it from a slow flying aircraft if the base is a long way beneath you and below you. If you are exiting the trail aircraft in two aircraft formation, again the base may well be below you and directly beneath.

The hands are clasped behind the back and the head folded on to the chest watching your toes. The only surface area presented to the airflow are the shoulders.

Really this should only be used by "rear end flyers" on large formation loads. Even then its use is debatable.

It has distinct disadvantages. It loses you eye contact with the group. You may go low. In a large formation you will probably arrive at the base groups too early and interfere with 2nd or 3rd wave flyers, thus causing traffic problems.

However if you have a bad exit or a slow one it is a useful salvage technique to lose height very quickly.

DIVE DELTA

This is used to go down at a medium speed, but also you are moving across. The angle of attack is altered by moving the hands forward. Your direction is controlled by both the position of your head and movement of your hands. Eye contact with the target is essential and must be maintained throughout. Leg turns can also be used when arms are fairly wide and the position almost becomes a track. Your hands alone can be used for minute Aileron type correction on the approach to either the left or the right.

A steep long approach is suitable for a Delta position.

Also you must use it momentarily to lose height. Moving into the position and back out again immediately loses a few feet and gives you the velocity and direction you require to your target. Use this if you are more than 3 ft. above your target, and do not wish to fast fall.

You may flatten this position out by pushing hands forward and moving slowly into a normal stable position.

Dive / Delta.

THE STOP - GO - TECHNIQUE

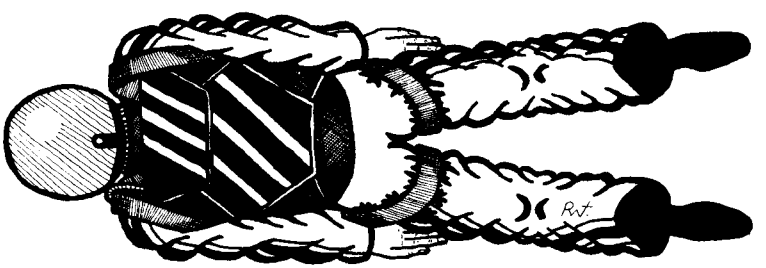
This is used to check your rate of descent, and angle of approach, and to avoid going below. It is of extreme value when first learning and using this position. Merely ease your hands slowly forward and flatten out your dive. Check your angle of attack, velocity, and altitude from the target. Re-assess the new situation, and then ease back into the Delta Dive. This will save you many otherwise abortive dives "Go slowly and get there faster".

TRACK

This is used firstly to track away from a completed formation. It generates lift and slows down you rate of vertical descent.

It can be used from a fast flying aircraft with a high airspeed on run in, and also in a large formation load, which will put you in a configuration, where it is required to go across to the formation as well as down.

TRACK ~ SIDE VIEW.



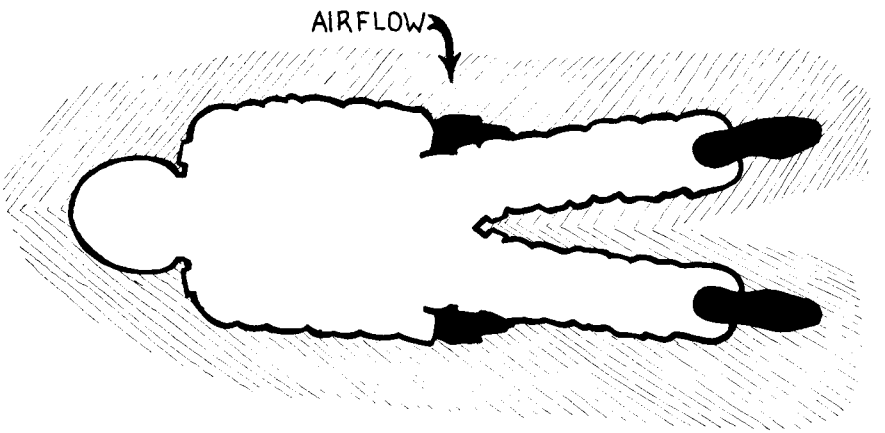
TRACK ~ FROM ABOVE.

SCRATCH GARRISON TRACK

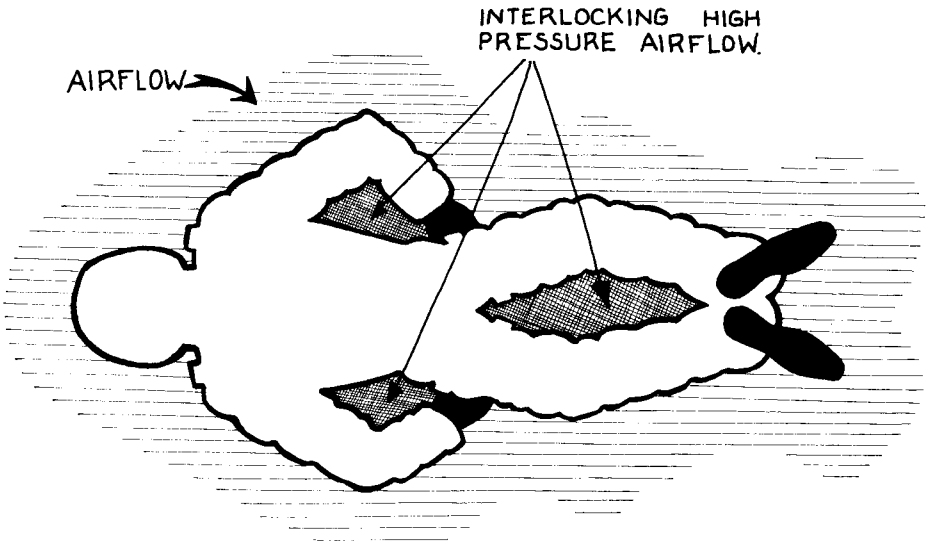
A body in free fall will always be surrounded by a high pressure airflow. If two of these airflows interlock then added lift is created.

The Scratch Garrison track position deliberately uses this principle to create a more efficient track than hitherto used.

The arms are bent and the hands turned around with palms facing behind the body. Then salute your thighs. The toes are pointed and joined together with the knees slightly bowed.



NORMAL TRACK POSITION.



SCRATCH GARRISON TRACK.

HAND TRACK

This is used to close the final few feet of an approach from 15 ft. out approximately.

It is generally misleading as most of the forward movement comes from two other sources.

(1) Momentum from previous manoeuvre still remaining - either (Dive, Delta, or Track which is being converted into forward speed.)

(2) Movement caused by straightening or "Kicking" of legs which has created lift from behind which in turn gives forward glide and some loss of height after a long distance is covered.

THERE ARE TWO METHODS

(1) DEFLECTION METHOD.

Your elbows remain in position and your lower forearms and hands are dropped deflecting airflow over upper surface of arms. This is not very efficient but if you use your elbows as pivots, then the forearms and hands can be used to brake speed and slip to the left or right. This method is not recommended.

(2) DELTA/DIHEDRAL METHOD

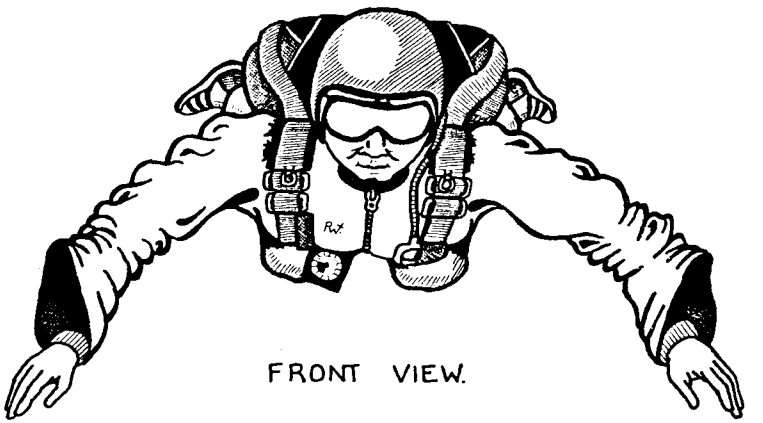
This is strongly recommended. Your arms are thrown back as if going into a Delta, but are held half way. Your hands do not complete the movement, and do not pass beyond the level of the shoulders unless a lower angle is required.

A very efficient and quick working position and in conjunction with straight legs very good for non-momentum R.W.

Once the hands have been moved backwards and forward movement of your body is generated, you should then bring your hands forward again, but keep them 5 inches below your shoulder and within your peripheral vision. Control and manoeuvrability in this position is excellent.

DEFLECTION METHOD.

DELTA DIHEDRAL METHOD



FRONT VIEW.

LEG TURNS

If your hands are occupied, either by being in contact with someone or being used to maintain your attitude and altitude, but you wish to turn or correct either your own approach, or the position of the formation you are in, use a leg turn. A common minconception is to straighten one leg to create lift in the rear and to turn in the opposite direction.

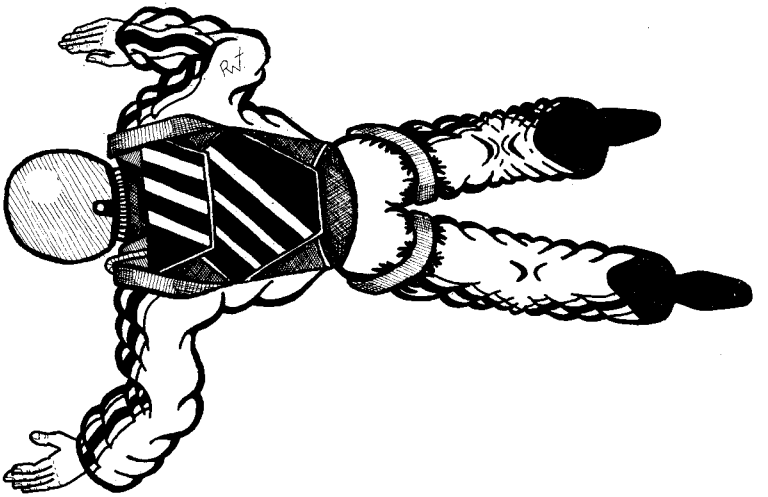
ie. Straighten right to go left. This is a bad method and causes problems with co-ordination and mind blocks.

The best method is exactly the opposite. Just tuck in the legs on the side or direction you wish to go. This automatically gives increased lift on opposite side. It is very efficient. To stop a turn merely ease out and counteract with the other leg. This is an absolute must for would be Sequential Jumpers.

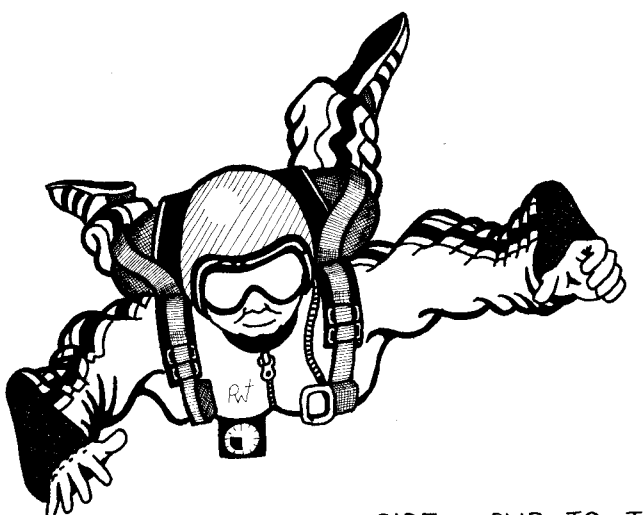
RIGHT HAND LEG BRAKE.

SIDE - SLIPPING

You would side-slip if you wish to dock sideways and are above, or you wish to move sideways and not alter your basic heading, or loose eye-contact. Generally this is done from a non-momentum R.W. position. Normally a combination of closing one side of the body up, i.e. an arm and leg tucked in together and possibly slightly extending the other arm and leg sideways. Also either of these movements will have similar effect done separately. Loss of lift and increase of lift with extended surface area tilts the body and gives it velocity and direction. Do it slowly at first. An arm or a leg moved out of sequence and too far forward or backward will initiate an unrequired turn as well.



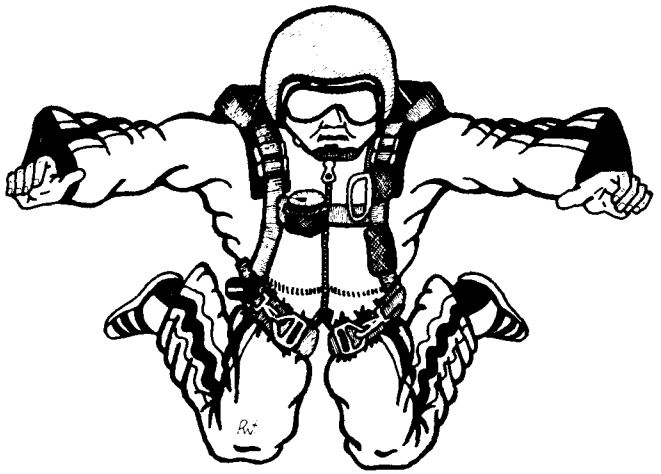
SIDE SLIP TO THE RIGHT.



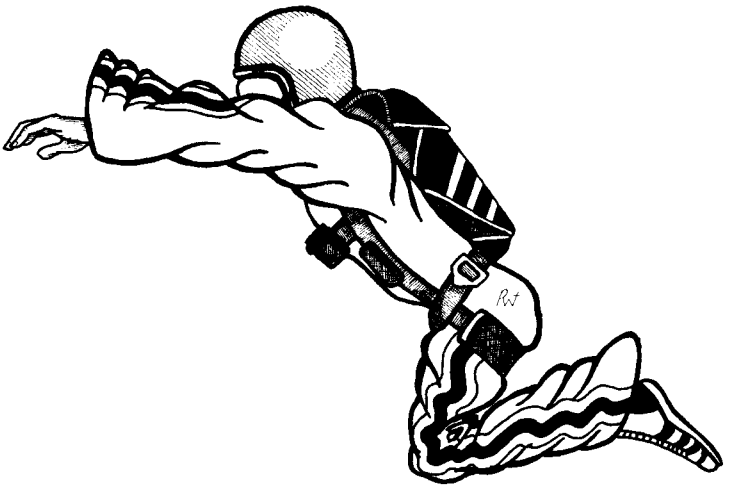
SIDE SLIP TO THE RIGHT.

BACK SLIDING

We must watch terminology here, this is really the opposite of hand tracking. The arms are straightened slightly and pushed forward slightly, thus creating lift and tilting the body backward and giving it direction and velocity. The legs may be pulled in slightly to accentuate the effect. This can be a useful part of a salvage technique if required. It may be used to make a link in the form of back sliding hook-up on to a target below and behind. Loss of height is dependant on to what degree the legs are tucked in if at all. It can be stopped by digging the hands down as brakes in much the same way one tucks up legs on entering a star.



BACK SLIDING ~ FRONT VIEW.



BACK SLIDING ~ SIDE VIEW.

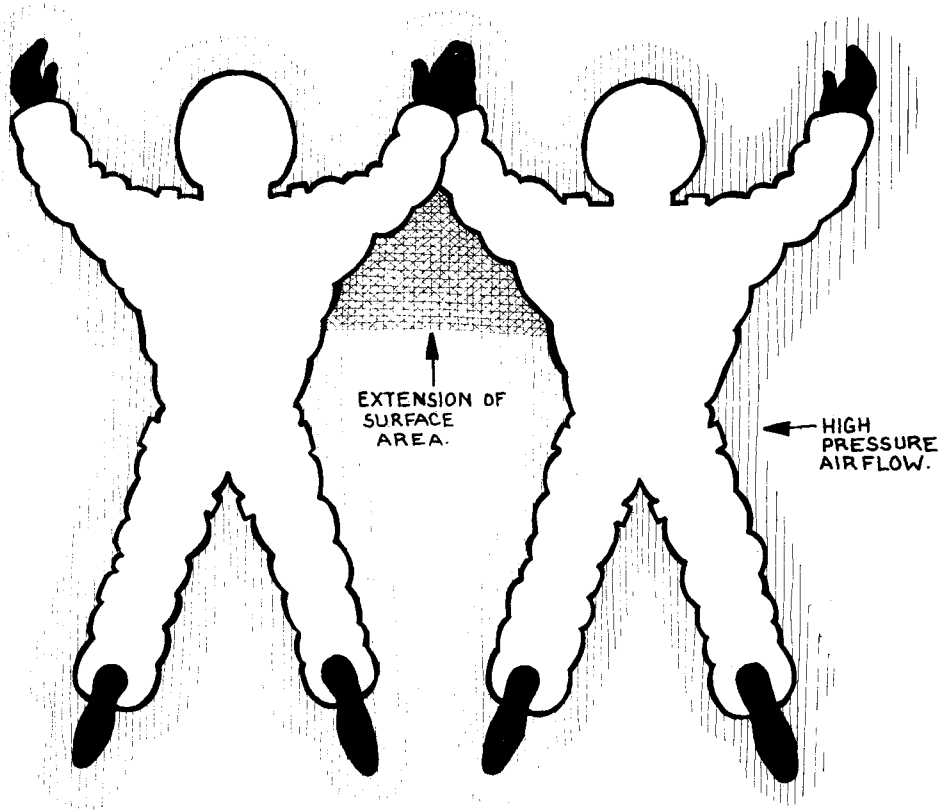
MAX DE-ARCH

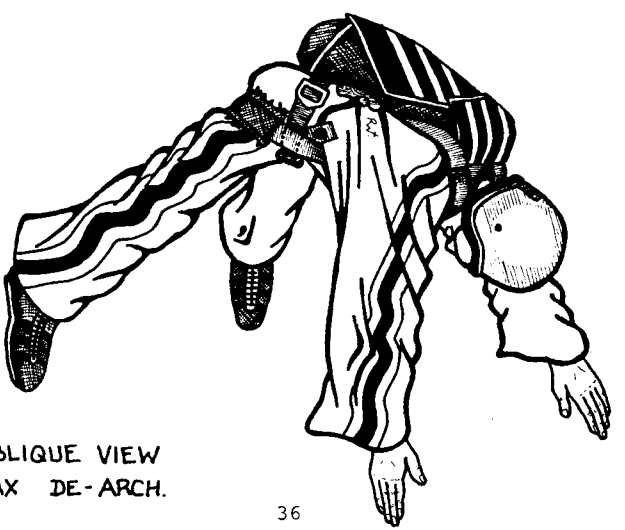
Wherever a high pressure airflow meets another, one obtains the equivalent of an extension of surface area, which slows down the speed of the formation. Thus more lift is generated.

You would use a max de-arch when you have gone low and need to return to a safe height from which to start your approach. The hands are pushed down and slightly forward. Your head must be down, if you look up, you bend your spine in the wrong direction and it will only efficiently bend in one direction at a time. So look down and then pull in your stomach and stick your backside up. Heels must be together in and toes out, to create a bow legged effect. Thus using the high pressure of area airflow between your legs.

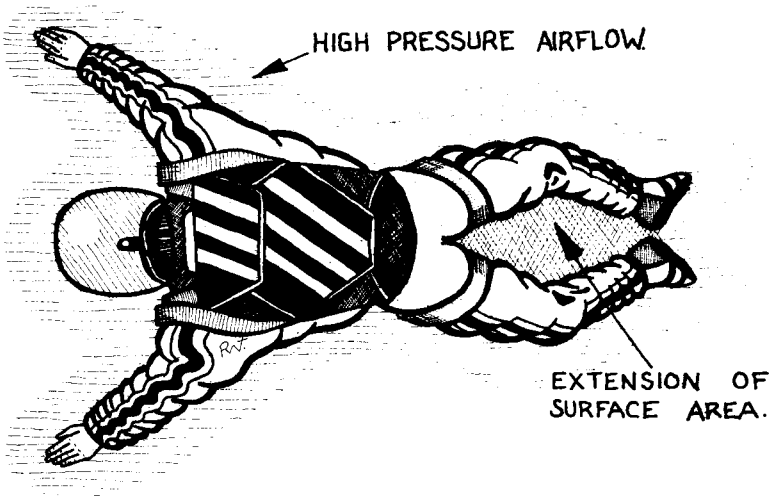
This position increases efficiency and cuts out lateral movement.

Always as a precaution turn away from formation before de-arching. Thus you should not come up underneath. Just a few seconds in this position will quickly get you back up there.





OBLIQUE VIEW
MAX DE-ARCH.



FAST FALL

Terminology is again relevant. This is not the fast fall of Style Jumpers. It is merely a reduced or tuck position. It is generally used when one wishes to lose a few feet in height. However for final positioning and minor disturbances in the formation in those last few feet it is extremely useful. In sequential in transition it will have to be used occasionally to keep within the teams potential envelope.

The position is merely a closing up of the stable position. The hands and arms and legs are pulled in closer to the body. This should be done slowly. It is held for whatever time you wish dependant on height to be lost, reaction time must be borne in mind. If you go into the position and straight out again, you will drop 1 ft. a fraction of a second later. If you tuck your elbows into your side and rotate your hands till thumbs point vertically you will collapse your wing area. This will result in a very efficient fast fall covering considerable loss of height quickly.

A fast fall movement can be combined with other approaches and body positions where the angle of attack is too high for that configuration at that point in time.

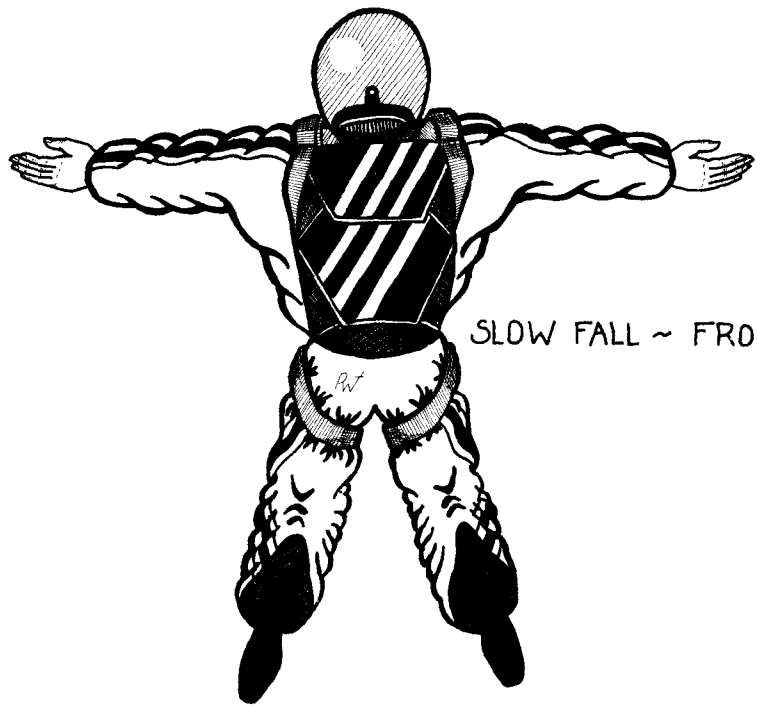
FAST FALL~ FROM ABOVE.

FAST FALL~ FRONT VIEW.

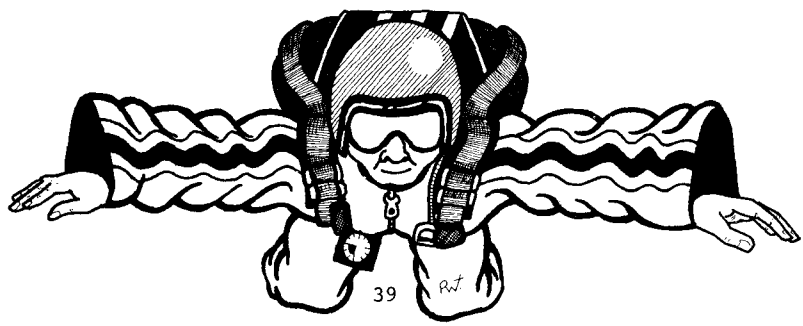
SLOW FALL

This is just the opposite of a fast fall, if you are sinking out on the group or formation, but have not gone below. It is a position which is not a De-arch and the correction you are making is not so severe as a De-Arch. You may use it in an Approach Configuration combined with another position should you feel your angle of attack is too low.

The position then is one of slowly spreading the arms and legs out and thus extending your surface area and increasing your lift. It should be done slowly. It should never be used for a gain of height more than a few feet as it is not that efficient. Instead use a De-Arch or "Pop-Up" utilising swoop cords.



SLOW FALL ~ FROM ABOVE.

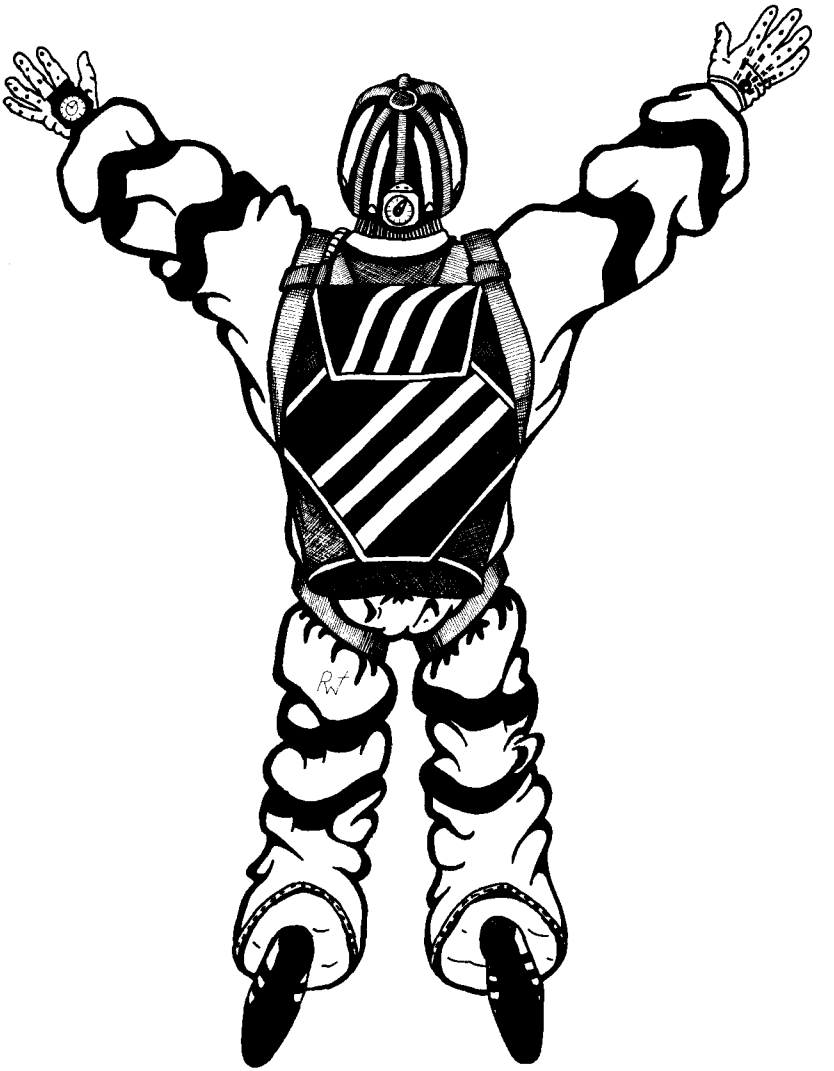


SLOW FALL ~ FRONT VIEW.

BACK DELTA

This is just the opposite of a normal delta. You are just moving backwards. The arms are high and wide and the feet are kept close together. At the moment this is not a recognised or widely used body position - however I believe it will be. Certainly Sequential Jumpers making fast, high 180° transitions, often use this. You could use it when approaching a formation if you wished to dock on the opposite side, but your approach is too high. You maintain momentum but do a 180° turn before you reach the formation and back delta over the top of it, maintaining eye contact with it. This saves lots of unnecessary flying across turning and coming back. You could also use a back-delta when part of a larger "piece" or formation, in order to assist its intended movement!

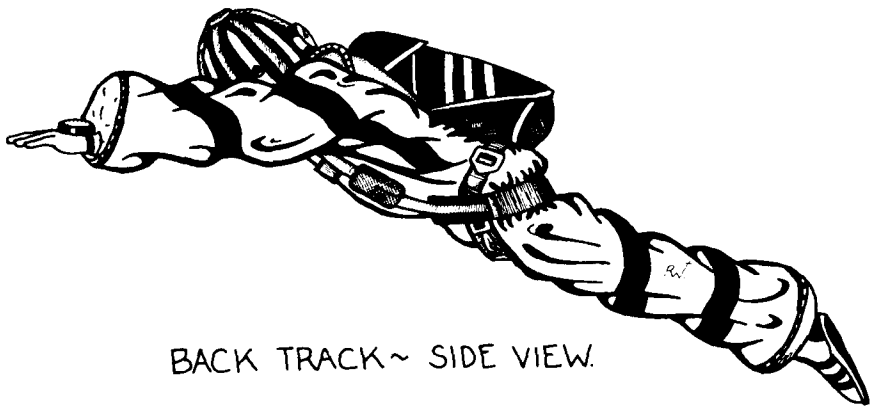
BACK DELTA ~ SIDE VIEW



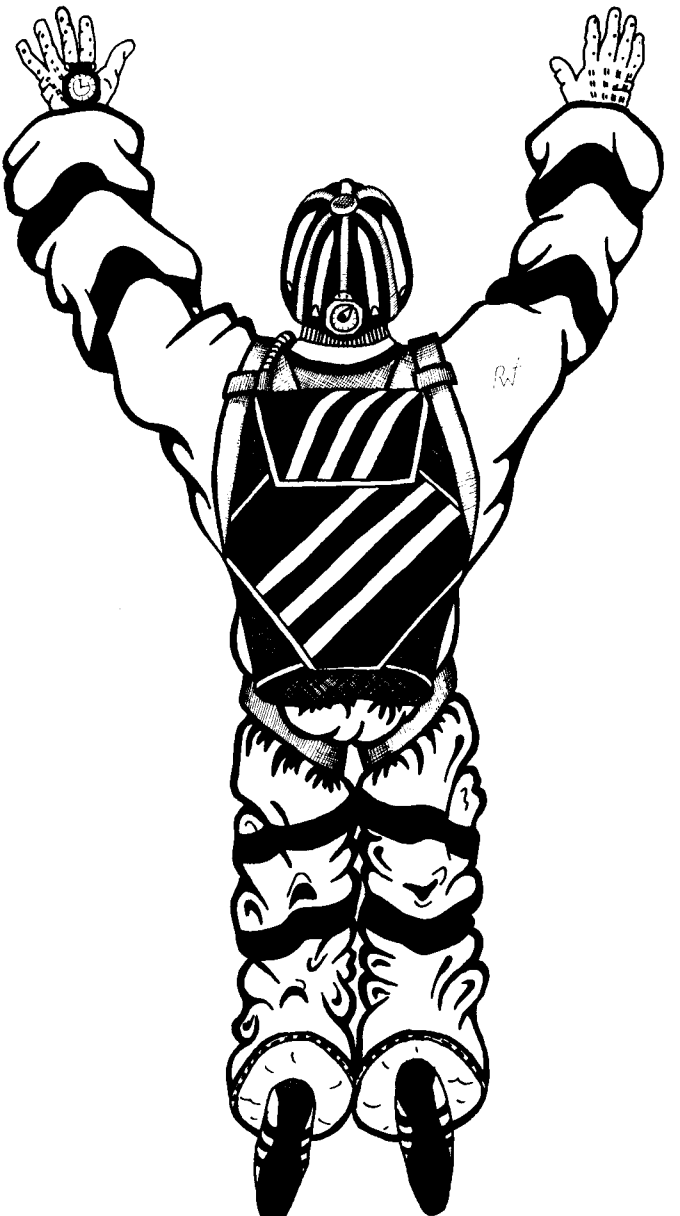
BACK DELTA ~ FROM ABOVE.

BACK-TRACK

Again this is merely a track in the opposite direction - "feet first". You may scoff at this and find it silly but I believe it will soon come to be a recognised and accepted body position. The position itself is still somewhat theoretical and I am open to ideas so write and tell me if you have a better one! The legs are slightly bowed with the heels touching, creating extra lift. The hands are close together and pointed back down the line of flight. The easiest way to adapt this position is to back-delta first and ease slowly into the back-track. Obviously visibility is nil. I don't see it being used as a method of flying across long distances. However I do see it being extensively used by one or two "controlling people", in order to move "pieces" or formations onto a new "heading" or "line of flight".



BACK TRACK~ SIDE VIEW.



BACK TRACK ~ FROM ABOVE.

APPROACHES

You could say that the ideal approach to any formation is from 15 ft. out and 4 ft. high, just in the final stage. You could also divide approach angles into various degrees of excellence or desirability.

However, the fact remains that very rarely will any two jumpers on the same dive be presented with the same problems. We are all different sizes and shapes, our equipment is different, our surface area is different, our rates of descent and potential abilities are likewise different. There is no ideal approach. We do not all exit the aircraft at the same micro-second in time. Despite efforts to achieve this we will all be presented with a different problem to each other on the same jump.

Indeed intelligent planning of sequential dives recognises and uses these facts. Some jumpers will be concentrating on getting down to a reference point while others position themselves around it, while still others come up to it from below.

So what the hell is an approach. It is the path you take from where you are to arrive in your position in the formation. I will try to cover some of the more common ones in detail.

HEAD ON CONVENTIONAL APPROACH

This is using a hand tracking position and may be from above or below. It can incorporate a slow fall or fast fall position into it, once the initial forward speed has been generated. It can be transitioned into, from a Delta or from a non-momentum R.W. position (stable position). Ideally it is slightly high, smooth flowing, and under control. It can be stopped by pushing the hands forward and up to stop a little speed, or once can sit up to kill off all speed. Your legs may be also be used to help brake speed by gently pulling up a knee (knee-braking) as your hands move slowly up and forward. A common error is to stop "dead" inside the "Burble" just a few feet or even inches from your slot, with no momentum left. This can be alleviated by straightening your legs once and then retracting them on contact.

The final moments are smoother if no snatching or grabbing takes place, but you can reach up and you can reach down. All that is required in either case is an intelligent counteraction with the legs to either lift or drop the rest of your body accordingly.

BACK IN

The true Back-in has momentum and you come in at reasonable speed similar to a normal head to head approach. The secret is to maintain your speed and do a slow fast turn just a few feet out. Eye-contact is of utmost importance. The object of the exercise is to fly your knee into the catchers hand. So you must glue your eyes to his hand and know where your own knee is. As you execute the turn look under your arm and

maintain eye-contact with the hand until you see and feel the grip is complete. The turn you do here is only 180 degree. If you enlarge or close your body position as you turn, the resultant height difference will cause you problems. Maintain the same position as you turn. Common error is loss of speed and turning and stopping short. To avoid this keep your speed up and turn as late as possible.

SIDE IN

Terminology again. This is not side slipping although one could use that technique. The turn here is only 90% and the approach is from the side of the target. This is a very useful and easy manoeuvre to perform, which is worthwhile practising. As before with the Back In, eye-contact should be maintained, and the initial approach is head on to the side of the target. On the last few feet watch the catchers hand and initiate slow flat turn placing your knee in the catchers hand. Once again look under your arm, keep up your speed and turn as late as possible.

BACK SLIDING-HOOK UP

This is a Back-in from a non-momentum R.W. position i.e. "close in" and with no forward speed. In sequential you have to keep the group tight together and so you cannot go a long way out for a nice momentum type approach.

The position is above and in front of the target. Look under your arm and find the hand, side slip if required to centralise and then by moving hands forward breakslide into position. A catcher may prove a useful salvage merchant in the technique, and the attacker should be relaxed enough for any quick reaction flying on his part to save the day. More up to date "close in" flying is slowly eliminating this technique.

FROM BELOW

Turn away from formation and max de-arch to acquire height for your approach. If you are a long way away you may come up and across at the same time. The most efficient method is to gain height first and then go in.

FROM ABOVE

If you are in close but too high with no speed then fast fall or reduce to get to an acceptable level. A Delta may also be used.

DIRECTLY ABOVE OR OVER SOMEONES BACK

If you are in his burble which extends up to above 8 ft, dependant on either his or her body size, you will be dropped on to them. Action in this case is to go big immediately. Your own increased lift will enable you to fly off their back, without taking anyone out. Do not, under any circum-

stances push them away, or drop your arm on to their back to prevent collision. You reduce your own surface area, increase your speed and will take them out.

If you are sat 12 or 15 ft. above someone and your face is on line with his feet, but you wish to dock head to head, what do you do? Well it is only a Delta, but lets call it the Spiral - Head - Down Technique.

SPIRAL - HEAD - DOWN TECHNIQUE

Drop your arms back and just use your head for direction as you spiral turn down. Your own mind will take over and calculate the angle of spiral turn required in the Delta position in order to arrive at your final point. You may use your body side-on to your direction of flight on your final turn, to flare out your speed and settle down in front of your target.

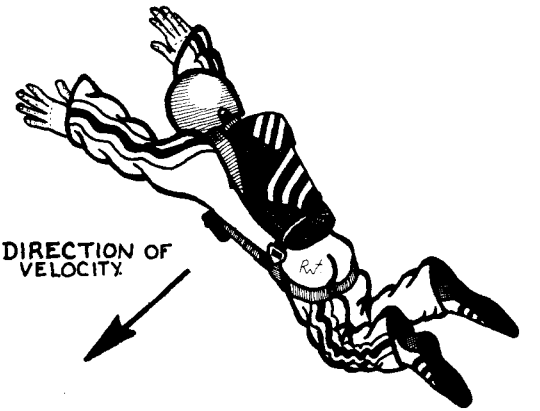
BODY FLARES

This is a technique which comes naturally but may be practised intentionally. When you flare out of a track this is such a technique. You are killing off speed and creating lift. You may do this sideways when chasing a rotating formation, or just when going for your slot after having to circle the formation. A transition from a body flare to another position should be undertaken with care and smoothness. You may still have a lot of momentum left, and this must be aligned into your new direction. A Jumpsuit which allows you a reasonable feeling for the airflow and also your own sense of quilibrium and awareness of attitude, heading, and speed will help. The Jumpsuit you can buy, the rest you can practise on specific jumps.

MUSHING OR SITTING UP

This position is basically a transitional position which is a combination of both lateral and vertical movement. It can be used at the end of a Delta to brake of speed and assess the situation while still moving toward the formation, it is not a flowing transition to a final hand tracking approach and can be slightly disrupting and costly in time. If your normal approach is too high and hot it can again be used as a sharp salvage technique to lose height and assess the new situation.

A floater who ends up high and hot may use this to lose height and convert to a slight backslide to gain lateral separation for a good final approach.



SITTING UP OR MUSHING.

TRANSITIONING FROM ONE BODY POSITION TO ANOTHER

As students we are all taught specific rigid body positions and how to execute planned exercises in the air. The last one we learn before progressing to relative work is the track. In a max track position you require rigidity and tension and have to use your physical strength. As we progress you learn by accident that you can in fact relax in a max track position.

The main problem then that the budding relative worker encounters is his own rigidity and tension when he adopts or trys to use some of the body positions we have looked at. They are in fact, smooth flowing movements in themselves, which are changing constantly as the situation changes.

So the actual point in time when you change a body position should be a smooth graceful movement, done in a relaxed manner, from a standpoint of knowledge. By that, I mean that as you change, you should be anticipating the resultant movement it's velocity and direction.

You must first mentally analyse the situation. Where do you want to go, how do you wish to get there? Use your depth perception, will you need to lose height or gain it? In what attitude or heading do you wish to arrive? Is your target doing anything unusual or is it also working and complementing your effort. If you move your body now, how long will the reaction time be before the movement has an effect on your flight path? Will your movement and transition have to be fast for a quicker more radical effect, or will it need to be slow and smooth?

All this takes your brain an instant or second to compute then your own co-ordination takes over.

Initially you should feel your way into these positions smoothly and try and find the limit of your own potential. How radically can you backslide before you lose control? How tight can you get your fast fall before you flip over into instability?

Feel for it, know and learn your own limits and expand them if you can. Quickness of mind is helped by fitness of body. So your physical well being and good health are also important. Train yourself to become alert and aware of everything that happens in the air. Eventually you should reach the stage where your mind can predict to you what other Sky-Divers around you are actually doing, though they, may at that time, not even be within your <u>normal</u> field of vision.

GRIPS, RIGIDITY, TENSION AND RELAXATION

Before we look at where to grip lets look at what happens when you actually arrive at your destination in the air and take up a grip.

In the world of pistol shooting and close quarter battle techniques, there is a method of holding a weapon known as a "Convulsive Grip". What happens is that when the man is faced with an armed enemy at close quarters he becomes both frightened and highly excited and adrenlin is pumped through the body. Certain chemicals are released and the muscles are tightened up. The fingers in this position, grip the pistol solidly, enabling the firer to shoot accurately using the "instinctive method".

At the exact point in time when you take up your grip the same thing happens and what this causes is both rigidity and tension in yourself and the formation you are in. If it is really bad the other jumpers will not be able to stop the effects and the formation may develope a rotation or other highly uncontrolled characteristics which will move it erratically around the sky. It may funnel if you break the grip. The jumpers involved will all be thrown apart and separated by the tension they have generated.

Obviously then we do not want tension or rigidity at this point in time. So how do we get fid of it? Once you are aware of it, you can dispel it. Some people have it more than others and have to work harder to combat this problem.

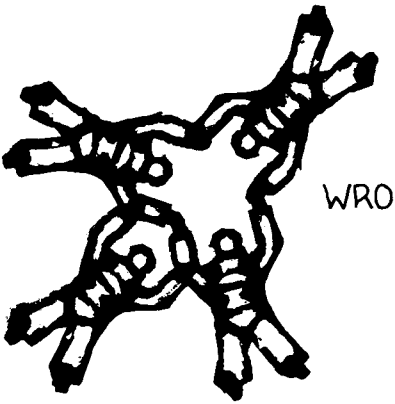
Make a conscious effort to relax once you have your grips. You may even have some form of signal between you, so that you all make an effort to relax. You will then gradually experience the ease with which you can now fly in the formation and also how much more stable and relaxed everything has become. Every time you make contact in the air, make a conscious effort to relax.

BREAKING-IN

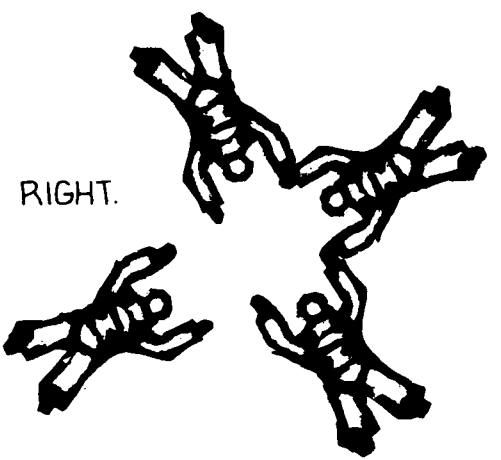
This really is a terrible left over from the past and should be eliminated as soon as possible. You should never break open grips to climb into your slot, if at all possible. It creates tension and several people doing this creates several lots of tension. Far better to fly non-contact and just fly into your slot and take up your grips incidental to actually being there.

If you do this, the formation will build smoother and more efficiently. You will eliminate tension and improve your own flying ability. You will also be arriving at the correct speed in the correct place.

Breaking in.



WRONG.



RIGHT.

NO TENSION GRIPS

You should practice this by flying towards a grip to release tension and then letting it go. If you have a no tension grip you will not disappear all over the sky, but should remain in position, ready and able to retake the grip. All your grips should ideally be no tension.

WHERE TO GRIP

Obviously depending on what formation you are building, determines the location of your grip.

ARMS = Grip on top of arm and not underneath as this will inflate the jumpsuit.

LEGS = Behind the knees is the best place. No overarm grips as this restricts your own wing area and your own flying ability.

Never take a grip on a jumpsuit close to a foot, and where possible never grip on lower legs or trouser bottoms. If you do, you will probably straighten the leg, create lift and forward glide on the person you are trying to get hold of. This causes tension in the grip you now have. If this happens, release it and fly in again.

BEST GRIP

Is on top of the elbow leaving the person free to fly.

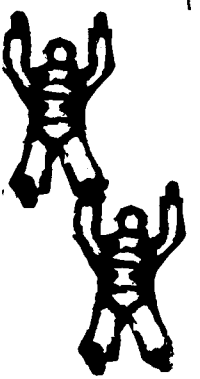
HARNESS GRIPS

Harness grips for linked exits are acceptable, but watch out for pull outs and throw away pilot chutes, belly bands etc. You don't want to deploy your friend outside the door at 9000 ft or put his canopy over the aircraft tail. He will not thank you.

SOME FORMATIONS

STAIRSTEP - Grip area is on back of the knee and your own wing area and flying ability is unimpeded.

Stairstep.



SIDE BODY FLAKE - Elbow and back of knee.

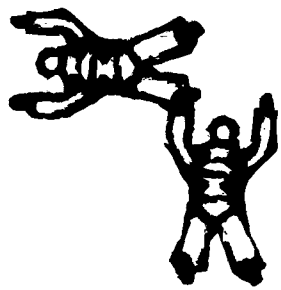
Side Body Flake.

CATERPILLAR - High inside grip up on the thighs with both your hands running between the other persons legs, gives you good control and visibility forward.

Caterpillar.

MONOPOLE - Take an outside grip on side of knee not inside.

Monopole.



TAKING A CORRECT GRIP

So you have finally arrived there you are 6 ft away and coming in slowly, your speed is nice, your target is steady and the approach looks good. Your heart is beating fast and the adrenlin is flowing. That last second you slow your speed right down and your hand moves out and mental blank. For gods sake get something, and you just grab wildly, pull the formation about and damn nearly take it out. It is moving all over the place. You look again, and realise you've got an ankle and are straightening a leg. How did it happen?

Well you just lost your concentration at the absolute final point in time that you should have taken the grip, and you rushed it. What you did not do was:-

USE YOUR EYES

Whenever you are on finals about to make contact concentrate not only your body but also your vision on exactly the point you wish to grip.

So if it is the back of a knee, look at the back of the knee and fly to that point. Do not fly to the jumper, fly to your point or location for the intended grip.

Eye contact with the exact point you wish to grip is essential. Then use your peripheral vision to locate your own hand. Know where your hand is. If you maintain eye contact, and go for a specific small area, you will get it right every time.

Concentrate on it mentally and also with your eyes.

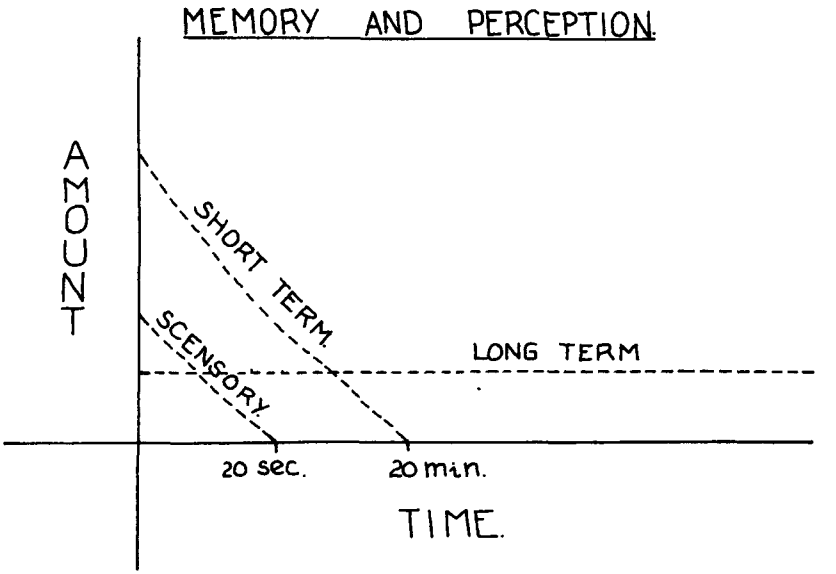
There must be nothing haphazard about it, it must be exact and accurate. Correct use of your vision will give you just such a contact.

MEMORY AND PERCEPTION

The success of a jump depends on not only the flying ability of the people invoved but also whether or not they can successfully remember what they are supposed to be doing. Many jumps are disasters because someone forgot what came next or was totally unable to reproduce in the air, the formation or sequence of events that had been planned on the ground.

This happens because the individual concerned or possible, as in many cases, the whole group, has not committed the dive to long term memory. Therefore at that point in time when the information is required in the air, we have a stress period and a complete failure of memory recall.

Let us have a look at some of the types of memory.


MEMORY AND PERCEPTION.
AMOUNT
SHORT TERM.
SCENSORY.
LONG TERM
20 sec.
20 min.
TIME.

SENSORY MEMORY

You are driving along a road, and you see a sign for a cross-roads. You slow down, pass the crossroads, and continue on your journey. You registered the sign and for a period of twenty seconds or so you are aware of its existence.

Yet in 1 hours time you will probably remember neither the sign nor the crossroads. It was only in sensory memory, and you have lost it.

SHORT TERM MEMORY

You wish to go shopping. You need seven items, so you write out a list. The shops are a ten minute walk away. You memorise the list, walk to the shops, and buy the items without reference to the list. In one months time you cannot remember what was on the list. You only committed it to short term memory.

LONG TERM MEMORY

You are five years old, stood on the edge of a railway platform, and an express train comes through at 120 miles per hour and frightens the life out of you. You never forget the incident. The first person of the opposite sex, with which you have a sexual relationship is likely to remain in memory for life. Your first close encounter with death. Your first jump etc., any of these things will become imprinted in your long term memory, and you retain them for life.

With sky diving you must get your dive into long term memory. Then once you are in the air it will all come naturally. We do this by two methods.

1. ORGANISATION

2. REHEARSAL

This is called Dirt Diving. By Dirt Diving and practising your jump on the ground you commit it to long term memory.

BRAIN LOCKS

This is when your mind goes blank. You cannot remember what to do next. You have forgotten.

PRESSURE

Under pressure memory reverts to first learned techniques. You first learnt to shoot by snatching at the trigger, but you now know you should squeeze it gently and hold your breath. The enemy is advancing, and they are real close, it is getting bloody dangerous. You snatch like hell and miss everything you are shooting at. The same thing happens in Sky Diving. You know the correct and most efficient

salvage technique, but you have messed it up and are under pressure, you automatically revert to the technique you first learnt. Can you teach an old dog new tricks? Yes, but he must commit it, to long term memory!

ALCOHOL, DRUGS AND STIMULANTS

All of these will greatly reduce your capabilities of memory recall. We have all seen the guy with a hangover, wondering where the hell he was last night.

DIRT DIVING

DIRT DIVING

We have looked at why we dirt dive now lets look at some of the other advantages and also how we do it.

All dirt dives normally are run by one individual, your load organiser, or if you like you can make a Chinese Parliament of it, but this tends to be inefficient.

Everybody puts on their jumpsuits and you walk through the whole dive several times including the exit. You then put on your equipment and practice the exit and the dive from the aircraft. Everyone is memorising jumpsuit colours and equipment colours. This may take up to two hours. Time spent could be as long as it takes for everyone to be familiar enough with the jump, to be able to perform it faultlessly on the ground, with symmetry, flow and timing. Finally dirt dive the jump at a deliberately high speed. You are creating an artificial stress situation. Is anyone now making errors??

FAULT FINDING

Your Organiser and yourselves should be looking for errors. Wrong body positions, bad approaches, incorrect grips, brain locks. Everyone should walk around bent at the waist, and fly the upper part of their body around. Give it realism, make wind noises if you like, or hum your favourite Sky-Diving film music.

Leg grips and difficult transitions on legs should be done by laying on the ground. The distances involved should equate accurately with those in the air.

You can save money and time by spotting all your errors on the ground and sorting them out. It is an open forum, one of you may well have a more efficient method of building your formation or of transitioning it.

REALISM

If you think that a certain transition or manoeuvre will turn a formation in the air, then turn it in your Dirt Dive. Decide what might go wrong and put that in your Dirt Dive. Rotate the base formation. Put someone in the wrong slot. Make an incorrect manoeuvre. Put someone low or take it out and rebuild. Go back to the last intermediate manoeuvre.

All of these things are open to you.

Once you have jumped and Dirt Dived the jump exactly as it happened, dont point the accusing finger at one lone individual. Just run through it, like it was, and you will all learn from this.

Dirt Diving is lots and lots of fun and can be tremendously enjoyable. It promotes team spirit, enthusiasm, and a good atmosphere. It is also astoundingly beneficial and a fundamental requirement for success.

Its free, its fun, DO IT!!

TIME AND MONEY

If someone had 12 hours of free fall time you would class him as a pretty experienced jumper. If 7 of those hours were spent doing R.W. you would expect him to be somewhat of an expert.

If you met a Squash Player who called himself an expert, you would laugh at him if he had only been playing for 7 hours. So you can see that with Sky-Diving we are only just scratching the surface. The thing is totally open ended, and you will never get that good. Your life just is not long enough.

Time then is of the essence, and it follows that we should make most use of it. Free Fall time costs money, so there is also a financial element to consider.

Do you use all your available time towards maximum working and learning, or is there any "Dead Time"?

Let us look at the average jump from 7,200 ft. The first five seconds on exit is generally wasted sorting things out, finding where everybody is and then going for it. The last five seconds again are "Dead Time". You begin height watching, your concentration shifts, you break-off and find a piece of sky, track away, wave off and pull. You know it is "Save Yourself Time" and that is what you are concentrating on.

Deduct 10 seconds from 30 and you have only 20 seconds of prime working time left in which to do good R.W.

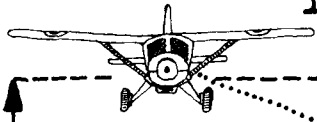
If you jump from 4,200 ft. you have virtually no prime time at all.

So with modern jumpsuits and equipment from 10,000 you will get nearly 50 seconds of Free Fall time. Deduct 10 seconds and you have 40 seconds prime working time.

This is twice that of a jump from 7,200 and it is never twice the price. So go higher, save money and get more prime time in and more Free Fall time.

There is one more advantage to this. You get twice the time, but only pack once.

TIME and MONEY.



7,200'.

5 secs. DEAD TIME.

EXIT AND SORT YOURSELF OUT, LOOK AROUND FIND PEOPLE, GO FOR IT. ACCELERATE BRAIN.

6,500' APPROX.

7,200'

20 secs. PRIME WORKING TIME.

SOLID, GOOD RW WORK ALL CONCENTRATION ON YOUR OWN FLYING EXCLUSIVELY.

3,500'.

5 secs. DEAD TIME.

SAVE YOURSELF TIME CHECK ALTITUDE, TURN, TRACK, FIND A BIT OF SKY, WAVE OFF AND PULL.

2,500'.

EXITS AND THE RELATIVE WIND

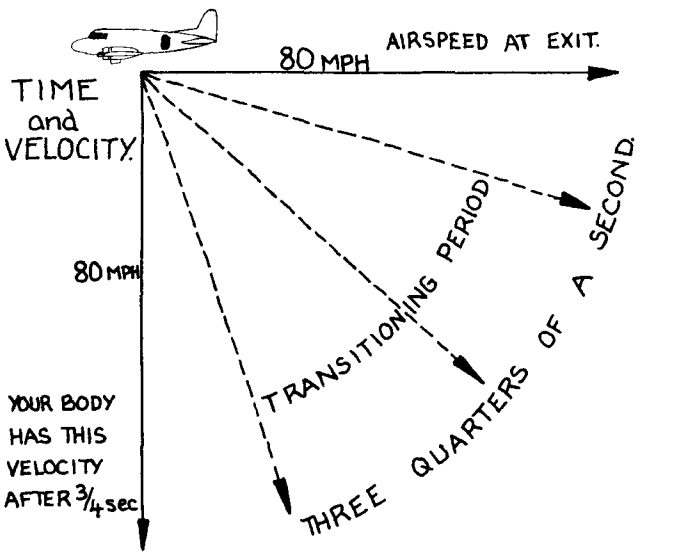
Everything you are going to do starts here. You must get this bit right, and thus the Dive gets off to a good start. The whole thing starts in the aircraft. Your Sky-Dive starts in the plane. There are so many varied factors involved here, that one could write a book about exits alone.

Firstly, let us try and examine some concepts. Sub-Terminal R.W. is generally a myth. There is, fast flowing air outside that aircraft. You just have to appreciate it is there, know its direction, and submerge in it to use it.

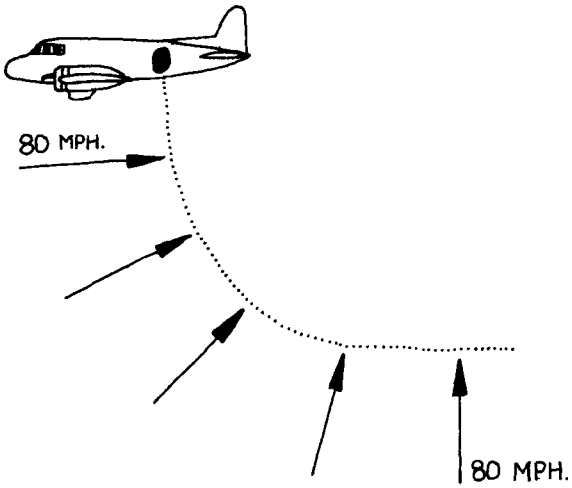
The average jumper and kit does terminal around about 100 mph today.

If you keep your airspeed high and don't cut back, you can "run in" about 70 knots or approximately 80 miles per hour. The high speed cushion of air transitions 90 degrees in the first ¾ seconds.

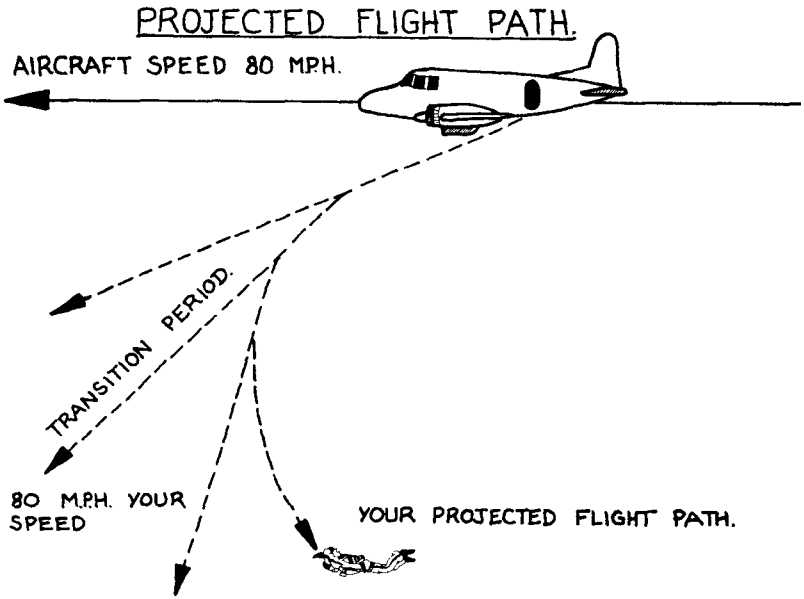
Exits and Relative Wind.



The Relative Wind.



Another way of looking at this is to imagine your projected flight path and the relative wind is always at a tangent to that curve in the first ¾ second.



How do we apply this concept. Well if you were at terminal velocity and you wanted to do a 360 degree right turn you could drop your right arm and shoulder and execute a turn. The axis on which you would rotate would be a vertical line through your body to the ground.

Using the relative wind you can do the same thing straight out of the door, but someone watching you will think you've done a cart wheel not a 360 degree right turn.

So what can you do, when you are at terminal velocity.

Well you can Delta, Track, Fast Fall, Slow Fall, Side Slip etc.

All of these can be done out of the door. The lead can track up and toward the No. 1. A Floater can track toward the main group. He can slow fall to gain height or fast fall to close distance. He can side slip.

Generally you have time enough to make one radical movement in order to position yourself in that first ¾ of a second. So figure out where you want to be and do something about it.

Each and every aircraft is different. Even in a basic 2 man jump there are numerous different methods of both positioning yourself and exiting. Let us have a look at some of the basic techniques and common problems.

EXITS, COUNT AND FLOATERS

Each aircraft will present a different problem, as will each person's build and equipment. There are general guidelines, but you must look at the aircraft you have, put your equipment on and go and dirt dive out of it, and figure out what will be the best for you and your group.

One can not really discuss exits properly without encroaching on Dive Organisation. What is your first formation, who is supposed to go where? Decide this first, then build your formation outside the aircraft on the actual ground. Once you have done this, move people back into the plane in a logical order, i.e. the closest people to the aircraft get back in first and so forth. You now have a logical exit order.

There should be no gaps between jumpers on exit. You should have your chest touching the back-pack of the man in front. A "light-hand contact" should be maintained as you go through the door.

Hold the man in front high up on the shoulders, do not interfer with his pull out or hand deploy. Once outside just let go and you will fly free. The slip stream will separate you both by a few feet.

If you are following a floater, rest your hand on his stomach, again maintain a light hand contact. Maintain and keep eye contact with him. Do not take your eyes off him. If you are further back and following either the man in front of you or the base group, again maintain eye contact, never take your eyes off your intended target. If you do, you will waste valuable time, and give yourself unwanted separation.

In early two man jumps, this loss of eye contact and lack of concentration and flying ability on exit, is the most common cause of all failures.

Once you are in large formation dives, you will have the ability to sort yourself out regardless of your inherent problems. When a fraction of a second out of the door, you will know and feel the transition from slip stream to normal free fall.

When you are jumping in small groups a common problem is the inability to control your own exit mainly because you are not thinking about the relative wind nor it's obvious effect on you as you exit.

The other main points that can help you avoid exit problems are as follows:-

YOUR HEAD AND IT'S POSITION

If you place your head above someone on exit it generally follows that once outside the aircraft you will be above them and vice versa, if your head is below them so will you be.

DIVING OR ROLLING

In a small, clean door aircraft with no strut or step. Do not angle yourself at 90 degrees to the aircraft line of flight. If you do, as you exit your body is presented side on to the slipstream and you will find yourself doing an involuntary 180 degree turn away from your target. If you can exit by trying to align your ankles back towards the Pilot, you will make a more efficient and controllable use of the slipstream by putting it more directly in line behind you.

If you are coming off your knees, then get your knees to the end of the cill. Do not dive out, merely roll over your knees with your ankles tucked up your backside and your arms spread forward and wide apart.

If you keep your knees back from the edge of the door as you vigorously dive out, the tendency is to elongate the legs which in turn creates extra lift behind which causes you either to lose eye contact with your target or to forward loop, neither of which is particularly helpful.

If you decide to exit from a position of one knee down on the floor, and the other foot next to it, beware the upwind leg and lack of symmetry. You may find an involuntary 180 degree leg turn happening ½ second out of the door and again eye contact is lost.

STRUT POSITIONS

Whenever you are on the strut, again eye contact is important. You may have one hand on the strut, and one on the near side of the door, and be hanging back looking towards the Pilot seat. You may sit in the "V" of the strut with your back to the line of flight, you may be out on the edge of the strut, with your chest high up inside between the strut and the underside of the wing. In this position pull your outside leg up to help you balance and get your chest as far forward as possible.

You may also dangle underneath the strut hanging on by two hands, with or without a foot support on the steps.

In all these positions you must maintain eye contact with the others and also appreciate how you are going to use the relative wind, and where is it coming from.

Never ever turn away from the main group at the point of exit, you will waste valuable time. You should always fly with your eyes concentrating on either the group or the individual you are after, your instincts will help you make the necessary body corrections to keep them or him within your field of vision.

BLOB EXITS

This is your ideal if you can do it. You are all compressed together and the count winds up the spring. You exit as a solid mass and the slip stream separates you by only a few feet.

Keep tight, keep close, and use a grip but only for a fraction of a second. Someone may have to push out, and someone may have to roll out, but the object of the exercise is to go out together en masse. There is a very normal and natural tendency to hang back and give the other guy in front a bit more room. Don't do it. Get up close and leave no space.

FEET AND LINE UPS

If you are lining up inside a large aircraft, look at your feet. If they are 3 feet behind the man in front that is 20 ft. outside the door. If everyone is sloppy in the line up then the last few people out will have a few hundred feet of altitude difference and a few seconds of time behind the main group. That is totally unncessary.

If you are close to the door you may even consider standing on each others toes. Do not waste floor space, cram someone in there. Wasted space, once outside the aircraft door, is wasted time and distance.

PRE-FORMED OR LINKED EXITS

Learn to free fly first, and then try these. This really is not a field in which I have much experience at this point in time.

As a group you may be lucky, and find them easy. You may however find that it takes you 50 jumps to sort it out on a team basis.

The flying ability of the group must be good and you should try to avoid tension or dragging someone out of the aircraft. Different aircrafts will present different problems and positioning for pre-formed exits.

My advice is to find a group who can do it successfully from that aircraft, and ask them what they do, and even then it may not work for you. Everyone must be in total harmony and be able to fly as one big body out of the aircraft.

SIDE BY SIDE - TWO MAN EXITS

Specifically for training jumps but you may put two lead men on an awareness dive, in this configuration.

On the strut you would look at each other. The less experienced jumper would always initiate the count, and thus be followed by the experienced one. If you do this it should guarantee a successful exit. You may be linked by one arm or fly free.

The floater positions are excellent for this type of exit but the upwind man should peel off fractionally earlier or be the initiator or less experienced of the two.

COUNTS

There are numerous counts in use and who is to say which is more effective. Some are serious some are amusing. Generally a 3 point compression count is to be recommended. The back man shouts "ready" and he has eye contact with the front element or the floater depending on the size of your group. Everyone replies with "Set". At this point the whole group pulls back inside the plane or bounces down and then up and the next noise is "Go" and the exit commences.

The advantages are that it compresses everyone and keeps them tight and it can be likened to a coiled spring effect.

The disadvantages are that whilst pulling back on the "set" it is possible to put your equipment in a position where it may catch the door.

Small groups should always work on eye contact between the front man possibly a floater, and the last man, when initiating the count. If possible incorporate a body movement which everyone can see and recognise. The floater's stomach moving in towards the door is obviously the "set". The lead pulling back indicates the same. A lead on a strut exit moving up to No. 1 and touching his chest with his chin. Any of these will indicate to someone who cannot hear the count exactly what the state of play is.

Eye contact is essential.

To smarten up your exits try it with eye contact and no count!

If it's a fun load think up a fun count. Being in the slipstream with a silly grin on your face will help you make a success of it.

Whatever count you use, everyone must know it.

Incorporate a body movement so that even if someone cannot hear he can still be aware of the timing. Above all maintain eye contact with essential people.

On large loads the back end should start moving slightly prematurely.

Practice your count and exit, with equipment on, out of the aircraft you will use. Do this several times.

Timing, harmony and group movement done smoothly and together is what you are after! You cannot afford to leave one man out who is just not quite sure what is happening. Everyone must be tuned in to each other, and the groups as a whole. There are no individuals on an exit count!

FLOATERS

When and where would you use them? What is their function? How do you float?

The answers to these questions again tend to encroach on Dive Organisation, but let us have a look.

A floater is someone who climbs outside the aircraft before exit, and hangs on until the point of exit arrives. He is generally not involved in building the base formation, but he may be. He tends to stay high on the main group and wait for his slot to build.

If the formation is being built on aircraft heading, then a floater's slot is on the far side. It is the most efficient way of building the formation and avoids unnecessary flying by other sky divers who exit later. A floater will usually be in the first layer, or wave, of clusters or flakers.

So a floater in his simplest guise is used for sky-diving efficiency, and the avoidance of unnecessary, lengthy flying and traffic jams.

There are three generally accepted floater locations.

REAR FLOATER

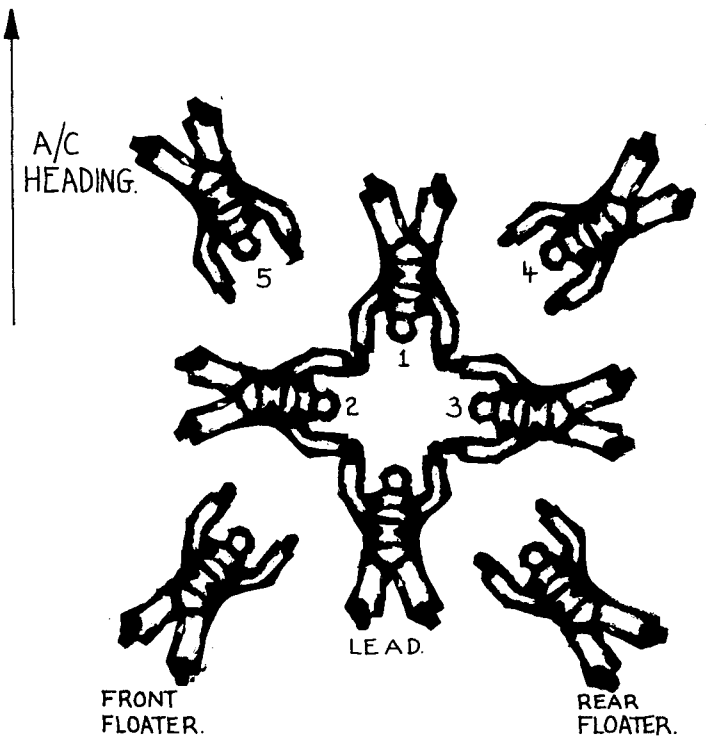
He is down towards the tail of the aircraft, and on exit will be positioned on the right side of the formation if you look at it on aircraft heading. Depending on aircraft type his grip could be anywhere. If he crouches low he can go low on the group. If he is high on the group, whilst hanging on outside, he will be high when he leaves. Different aircraft will present different grips, and different problems. If the front floater has climbed out first then the rear floater will find it easier, as the slipstream has been deflected away from him. He will nevertheless keep his upwind shoulder close to the fuselage and also maintain eye contact with the group. As he climbs out his head comes out first to locate his hand grip, then his hands and lastly his body.

CENTRE FLOATER

He normally climbs out last, as the other two floaters are already outside. He may prematurely position himself with his back to the door before the exit starts.

He is the main contact man with the group. Depending on the aircraft door size, he may or may not bend his legs for a slight crouch. Generally he will have a palms upward grip on the top cill of the door, a very relaxed position. He will maintain eye contact and is very much involved in the exit count of the main group. Again he is protected from slipstream, by the deflection of it, caused by the front floater.

Floaters.



FRONT FLOATER

The most difficult position.

You must climb out into the full unprotected blast of the slip stream. On certain aircraft the wing may interfere with your position and you may well have to crouch down.

Anyone doing front floater should practice climbing out beforehand. Again get your head out first, locate your hand grip with your eyes, then take a grip with your hand, then move out. It is advisable from this position to have someone either pushing you out or supporting you once outside, until such time as the centre floater is out.

Examine the aircraft type and see how you can make life easier.

FLOATING TECHNIQUES

All floaters should peel off from the upwind side first in order to exit square on to the slipstream.

Once you have mastered the floater position you will find it tremendously enjoyable. It is a position of immediate control which gives you full view of the exit and allows you to position yourself exactly where you want to be in the air. You are watching, assessing and manoeuvring throughout the first few seconds of exit.

If you wish to get close to the main group on exit you throw your arms back into a Delta for a fraction of a second and then bring them forward again. This in effect will delta or track you closer to them.

If you go big on exit or use swoopcords, as the relative wind transitions, you will in fact have gained height. The options open to you are totally open-ended. It is a superb position to work from. Just think about the relative wind and it's transition and decide where you want to be, and when, and then use it!

DIVE ORGANISATION

The key to the success of a dive starts very often in the early stages of organisation. There are two ways in which you can approach the problem.

A. Design the dive and then find the jumpers.

B. Look at the jumpers you have and then design the dive.

Whichever way you decide to do it, it is relatively immaterial, but what you cannot do is put "square pegs in round holes".

If you want a "completion" on your dive then assign jumpers with flying tasks and slots and transitions that are within their known level of ability.

However if you intention is to expand their envelope of potential, then make them work outside their known ability.

You must first examine the intention of the dive. What is it's function, fun?, completion? training?, record attempt?, competition?, demonstration?

Each one of these different situations will compel you to approach the organisation in a different manner.

You will require a pencil and a piece of paper and a very lively imagination. If you sky-dive for the rest of your natural life you may accumulate 48 hours of free fall. This is nothing, you are just scratching the surface of the tip of an iceberg. The options open to you are limitless. The one and only limit placed on your planning of a dive is your own imagination or lack of it.

Initially start by using a set of formation pools and select from these.

Always, always, select formations with the following in mind:-

SYMMETRY

FLOW

TIMING

It is far easier to memorise and follow a dive which has these three ingredients.

Without them your dirt dive and the dive itself becomes extremely difficult.

Natural flow will liven up any dive. You as organiser, are an airborne choreographer. Your group is dancing in the sky. So try and give them a dance they can remember and follow easily.

Try and think in three dimensions. Imagine the dive in your minds eye.

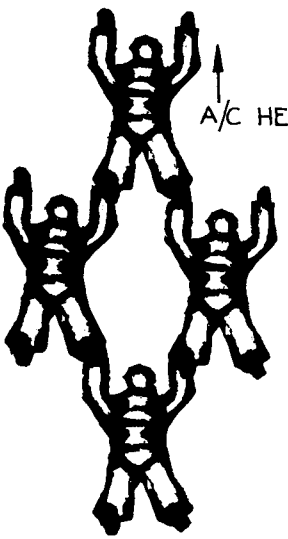
Even better imagine the jumpers you know well doing it. In this way you should correctly allocate people within their known abilities.

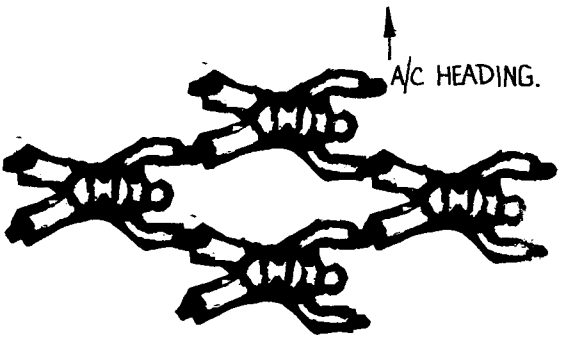
Do not be swayed by personal friendships or D.Z. politics. If someone is not up to a particular task, then do not give him that task to do.

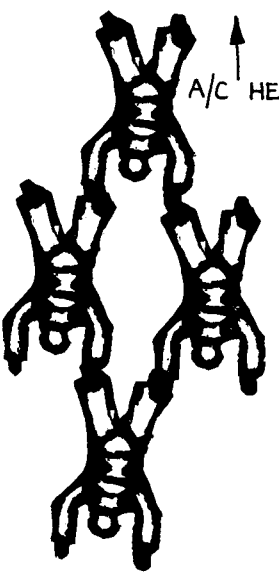
Do not underestimate the flying ability of female jumpers!

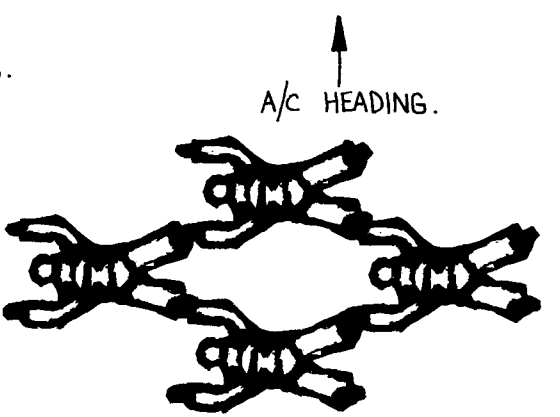
So you now have your first formation. How will you build it in relation to aircraft heading. Look at the following examples of a simple diamond.

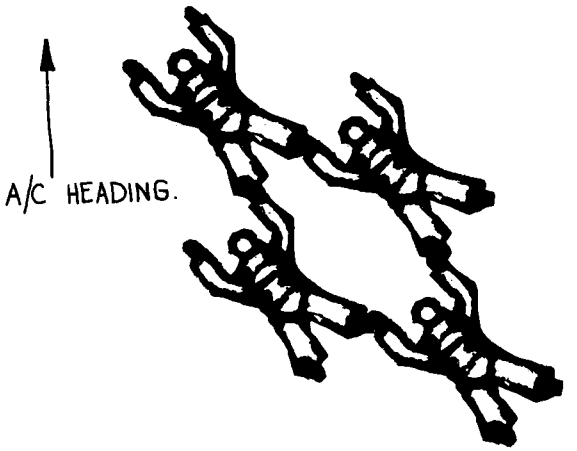
Building a Diamond

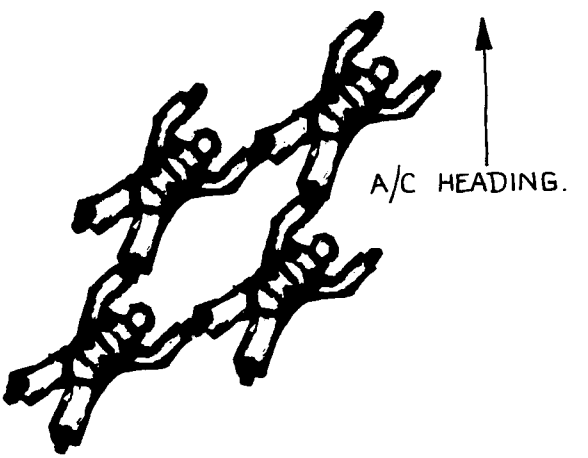









A/C HEADING.


A/C HEADING.

You may build a formation back towards an aircraft or away from it. How do you anticipate building it? Will you have "side-ins" being used, is someone doing a back in, will floaters close first or last? Does your lead get a poised exit, is he stable on heading, or does he dive down wind. Consider all of these things.

This basic approach applies to all dives. If it is a large dive you will be considering the far side of the formation.

Can you cut down on unnecessary flying, by positioning people on the far side initially? Do alternate people on exit go left and right? How far up the exit line up is your base formation?

If you have two aircrafts you must plan in depth.

The location of your formation in relation to aircraft heading is a key factor in the difficulty of the initial building of the formation. Study it carefully and remember the ability levels you have.

Decide where your floaters will be, and where your lead should go. Think of the people you have, and what position <u>they</u> are happiest in. Where do <u>you</u> think they will feel most comfortable.

If it is a sequential dive look at the later formations and transitions, and look at the people you have. Have you given someone too difficult a task to do. If the answer is <u>yes</u>, then either:-

1. Change the jumper.

2. Change the dive.

Organise around ability and you should have reasonable success.

If it is a single formation "Megablob", then carefully select your "waves" of "flakers" and "clusters", closely examining each with regard to his own ability and <u>exit order</u> in the load.

On large record attempts do not under any circumstances have inexperienced jumpers in the base formation.

This base formation is vital to the success of the load. It should carry several thousand jumps worth of experience inside it. Thus if anything goes wrong you have the experience level for an immediate and competent salvage.

On any dive you organise instil the need for discipline and docking in correct sequence and correct slots.

If you have inexperienced people on a large load, then put them at the back end and brief them carefully. It is better not to indulge in "unknown quantities" on large formation dives. Nevertheless we all have to learn somewhere, but a record attempt is not the place to do it.

So you now have your dive on paper. Before you actually get your people together, study it again. How are you going to transition? Do you want a grip change, or will you free fly everything. Are there points on the dive where you could "centre-point"? Is there a requirement for a vertical transition? Are there mirror images? In short, can you, with a little intelligent application of known techniques make the dive more efficient, smoother, easier, and thus guarantee success!

Get your people together, show them you masterpiece on paper, and ask if anyone has any ideas. You can always turn them down, but someone may see something you have missed.

Start dirt diving, and keep you eyes open for fault finding. Now is your time to erradicate mistakes, on the ground, not in the air!

Is someone not quite happy in a particular slot? If so, change them. Dirt Dive at high speed in an imaginary "stress situation", has everyone still got it?

By now if you are a good organiser, there should be quite an atmosphere going.

Put your kit on an go through the exit several times. You will go through the dive a couple more times and everyone should now be feeling confident, and happy and eager to just go up there and do it.

Use your personality, be enthusiastic and instil this enthusiasm into your group. Wherever possible use the D.Z. character on your load. This tomfoolery and general humour will inevitably spread and cause a nice atmosphere within the group.

After all we are trying to enjoy ourselves!

NON CONTACT R.W.

AND

VERTICAL TRANSITIONS

NON CONTACT R.W. AND VERTICAL TRANSITIONS

Firstly let us examine exactly what we mean by non-Contact. It is a bad description, in that there is contact between jumpers. They should strive to be in a position where they are either touching each other, or could easily do so. There are however NO GRIPS as such.

Generally speaking once you have linked with a falling formation, your personal effort and skill at flying your own body, is hardly taxed at all. So if you are on a 70 second delay and join the single formation 20 seconds out of the aircraft you will virtually waste the next 50 seconds of free fall time, during which individually, the flying requirement for you is almost insignificant.

However in non-Contact, once you are in the formation then you cannot stop flying. The opposite happens. You have to work even harder to maintain altitude, attitude, direction, proximity and fall rate with other individuals and the group itself. This means working inside the "wash" or "burble" of other jumpers. It is quite difficult at first, and immediately emphasizes on you, your own level of control, or lack of it! The importance and finesse of fine, smooth, pure, control, and a whole new arena of skydiving awareness will open up to you in non-contact R.W.

In my opinion it is the fastest route to success, that I know of, at all levels of training, whether that is basic student R.W. or 16 man sequential.

When you do a non-contact dive you use every valuable second of free fall time in practising your own individual flying ability. Ten to twenty consecutive non-contact dives will have an enormously beneficial effect on both your own sky diving ability, and your group or team as a whole.

Sequential non-contact is of extreme value. If one man is "out" on one formation, you do not waste the whole dive waiting for him, but merely move into the next formation. As and when he arrives, he joins in. Again more flying time and maximum relative work per dive for everyone.

You can utilize non-contact in any way you wish. You may have 3 manoeuvres non-contact and then go to contact for your final one. You may have every alternate manoeuvre non-contact.

It is particularly a good idea to have your first formation on an 8 man dive as non-contact, this tends to settle people down and smooths their flying for the formations to follow.

In 2 man training jumps non-contact is ideal and should be interspersed between exercises. Finally the last word on non-contact, is that above all it is extremely enjoyable and lots of fun!

VERTICAL TRANSITIONS

As you fall through the air you will create a trailing vortex effect behind you. It can be defined as a narrowing Column of Air. Behind an individual jumper this "burble" effect may well extend up to 12 ft. On larger formations it obviously is larger and not so smoothly defined. All the individual Columns of air, join together to create a massive area of turbulence.

A vertical transition is a deliberate attempt to use this turbulence to your advantage. In its simplest form one jumper may pass over another and as he goes into the "burble" he will lose altitude and be dragged down to the same level as the man below.

Conversely one jumper may fly under another with the deliberate intention of dropping the top one down to his own level, by inflicting his own burble effect upon the top man. The principle then can be applied further to pieces flying, or pairs flying, or separate groups flying.

Individually you need about a metre vertical separation and reasonable lateral momentum in order to pass over one mans burble and reappear on his altitude.

If you individually wished to fly over three men then you would require 3 metres approximately in vertical separation.

Common problems are lack of momentum, and flying too close to the other person. Both of which, will result in a glorious funnel.

Large formations do not generally survive vertical transitions because often the individual judgement concerned is usually wrong. However, moderate sized groups can almost certainly perform vertical transitions without too much trouble.

What, you may well ask, is the point? Well firstly as a 2 man exercise it teaches you immediately to become intensely aware of not only the vertical dimension, but also the apparent danger area above someone. Secondly, it teaches you how to use this danger area to your advantage.

Someone learning R.W. will derive immense pleasure and personal satisfaction from a controlled and successful 2 man Vertical Transition Dive.

In certain circumstances, a vertical transition, has got to be the fastest most efficient method to your next slot. In another situation, it may not only benefit you but other members of your team.

It is a new dimension and one which should not be ignored. To-date it has not been efficiently exploited in sequential events, which are still dominated by "Lateral" thought. However I feel sure that it will eventually be used, probably in conjunction with some form of pulsation method, and completely revolutionize sequential R.W.

So if you guys want to win the next "World Meet", THINK VERTICALLY!!

R.W. TECHNIQUES

R.W. TECHNIQUES

What exactly constitutes everyday knowledge and what is a little known technique is difficult to define. However I believe most of the following subjects to be relevant and of value in varying degrees. Virtually all of the R.W. dives that go wrong can usually be attributed to a basic lack of knowledge. This discrepancy usually concerns a concept or a technique.

MATCHING FALL RATES

This is so fundamental that it is almost universally ignored and yet remains a basic cause of failure. It is linked to your potential envelope but in a group environment. You must be able to set up a fall rate within which the whole group can operate efficiently and has maximum manoeuverability, on either side of this fall rate.

The problems you will encounter here are the following:

Equipment of different weight and size, different jumpsuits, different surface areas, different size jumpers, and last but not least different size, shape and style of wing areas and swoop cords. Ten pounds in weight is equivalent to 3 mph which in turn equates to 1 square foot of surface area. So a fine movement of an inch or so, by arms and legs, in either, a fast fall or slow fall configuration would easily compensate for a 10lb difference. Thus the weight and equipment situation is not so critical as it would first appear.

The secret lies in the surface area and the ability to control it at will. The modern tendency towards large wing areas, causes far more problems than it alleviates.

Look at your surface areas! I would recommend adjustable swoop cords and medium sized controllable wing areas.

You may have to make small corrections to your jumpsuits and wing areas and swoop cords in order to maintain a good fall rate for everyone within the group.

A team who all use similar jumpsuits are thinking along the right track. One individual with a surface area slightly beyond his control, will prevent his group from achieving the fall rate that they desire, and need for success.

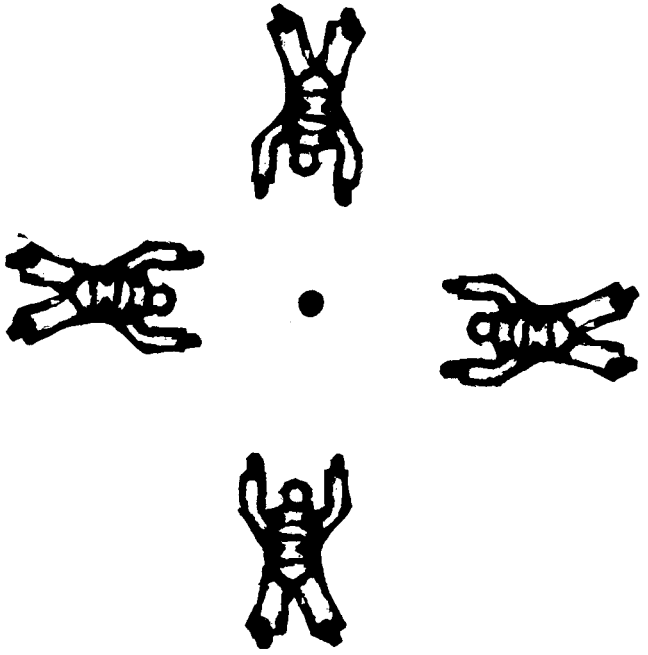
CENTRE POINTING

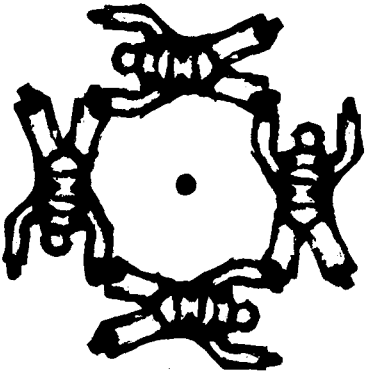
I can think of three applications of this technique, laterally, vertically, and in a salvage situation.

Let us look at it laterally first. Whatever the formation is you must examine it and see if it is suitable for centre pointing. Instead of flying to a grip, or a slot, or flying opposite to another jumper, you all simultaneously fly to an

imaginary centre point, and as you arrive you take up your grip incidental to being there.

Round to Donut.

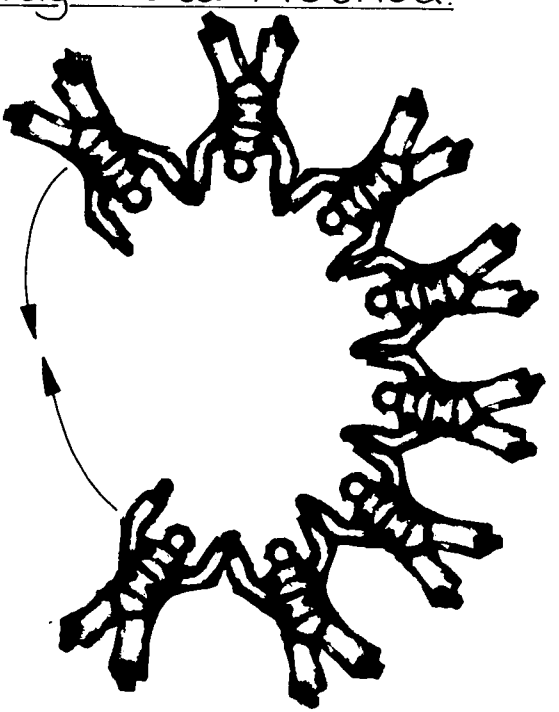




This is the most efficient way of building the formation. Thus a large formation load to-day will have the base formation somewhere in the line up. The floaters and first guys out will come up. The last to leave the aircraft go down, and the base formation is almost centrally placed as far as this is possible.

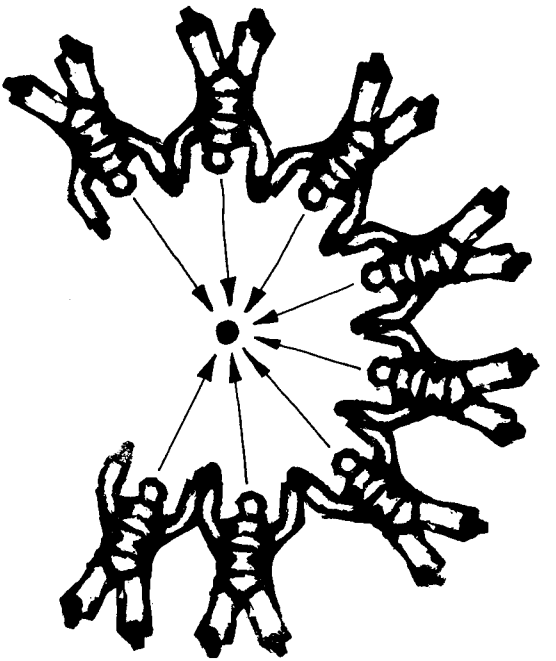
In a salvage situation a centre pointing technique will save vital time. Look at the following problem of a lost grip on a star.

Salvage Old Method.



A BROKEN GRIP, ATTEMPTING TO FLY AROUND TO REJOIN. THIS IN FACT INCREASES THE CIRCUMFERENCE. A DIFFICULT MANOEUVRE.

Salvage Centre Pointing.



EVERYONE *FLIES* TO THE *CENTRE POINT*, THIS IN FACT DECREASES THE DIAMETER AND THE FORMATION REJOINS QUICKLY AND EASILY.

PULSATION

This is a requirement for sequential transitions. It really incorporates, symmetry, flow, timing, eye contact, and discipline. In a transition phase which is free flying, all the jumpers move up, back, and out, from the centre point. They pause, make eye contact with everyone else and then go into the next formation simultaneously. If you have for example, a base 4 formation, and 4 flakers, and the transition is for the flakers to change. Then they come out and up onto a "Perch" and pause, make eye contact and then simultaneously close and take grips. The centre formation, base 4, individual, piece or pair, may be required to speed up the fall rate slightly to assist the outside flakers.

Technically it provides smooth transitions and stable formations. It assists memory recall, and deliberately induces teamwork and unison.

If you dirt dive a Pulsation technique properly, the whole flow of the dive will suddenly become ingrained. It will assume a natural grace and beauty of its own.

It is a fundamental of sequential as we know it, yet very few teams actually dirt dive with a pulse. Try it and you will be amazed at the results. It will initially strike you as being somewhat slow. In reality it speeds up your transitions. It is the old story of "going slowly, to get there faster!"

EYE CONTACT

You are standing on the side of the road waiting to cross over to the other side. A car is parked and the driver is sat in it.

You are unsure whether or not to step off from the relative safety of the sidewalk. You look the driver straight in the eye. He mentally acknowledges your presence and communicates this to you with his eyes. As you maintain eye contact with him you suddenly know, it is safe to cross the road and he is not going to move off and run you down.

That is a practical example of eye contact. It is an absolutely essential requirement for relative work especially sequential.

The object of the exercise is for every man in a team to have eye contact and comparitive awareness with all the other members. This eventually produces a state wherein everyone moves and acts simultaneously, in the exact knowledge, of everyone elses location and intention.

On certain jumps a key man may be designated on the ground to be the controller. Thus all jumpers will maintain eye contact with him in the air waiting for his initiation of movement, and transitions. The eye contact here, maintains discipline, control and teamwork.

It can be said that when rotating pieces of flying pairs, eye contact will be of utmost benefit. If you wish to re-dock two pieces, then even if they are turning away from each other, eye contact must be maintained till the last possible second of the turn. At the last possible second, the head should be swung around violently to pick up eye contact again, in much the same manner as a ballerina dancing pirouettes.

If you lose eye contact, you lose concentration. You will drift apart, and also up or down, and thus reduce your efficiency.

Finally if you have someone who insists on wearing dark glasses on your load. It will not assist you as a group and can be disconcerting for other sky-divers trying to communicate with him.

SIGNALS AND INITIATING TRANSITIONS

If symmetry, flow and timing are our essential ingredients, the problem we are now looking at is timing. How to get everyone to move at the same time. How many of us have been on disastrous dives because someone just was not with the rest of us at a certain point in time. How often have you hung on to that grip a second too long, or broke it too early, or moved early, or arrived late?

Obviously different levels of experience and different types of jumps require a different system of communication. Here are a few which I have used in different circumstances.

Firstly student R.W. type hand signals.

1. Finger pointing upwards - "Go Up!"
   Slow Fall.

2. Finger pointing downards - "Come Down!"
   Fast Fall.

3. Tonge sticking out - "Relax your body position".

You can of course use many more, but it is best to keep signals to a minimum and keep them simple.

For the more advanced a controller may use the following.

1. Shake of the Head - Transition Now!

2. Shake of the Arms or legs - Formation Complete
   Transition Now!

3. Thumbs Up - Formation Complete
   Transition Now!

The last may be used if a formation is such that only the end elements can see what is happening. i.e. an 8 man accordian. In such cases the formation may be deliberately bent to assist communication.

By far the most efficient method of transitioning is the following:

1. THE SIGNAL FOR THE MOVEMENT TO THE NEXT MANOEUVRE IS THE PROPER COMPLETION OF THE LAST.

To achieve this everyone must maintain eye contact and be totally aware of the whole group. This requires everyones concentration and thorough dirt diving.

It can be used at the student R.W. stage. Once the first exercise is complete. This completion in itself is the signal to move to the next exercise or manoeuvre.

Perception, awareness, and correct use of your vision are required.

There are then, ultimately NO SIGNALS JUST AWARENESS, if you need a signal for the next manoeuvre, you shouldn't be on that load!!

INTERPRETATION OF THE RULES

Here, I am looking briefly at competition Sequential. One could quote specific examples but I prefer to examine the principles concerned.

The advent of Video will slowly eleminate judging errors. Eventually you will have very little leeway in that respect. However your interpretation of intermediate manoeuvres and exactly how you are going to build, break and transition, leaves you much scope for ingenuity and creative efficiency.

Can you use a "Mirror Image" of the formation laid down. Which way will you turn your "pieces" if given a choice.

One direction may only provide you with a possibility of only 1 grip coming together in the early stages. Yet the opposite direction may give you better eye contact and two grips passing close together. Thus increasing your chances of success, should you miss one of the grips.

The rules may ask for a 360 degree turn. You may find it more efficient to do 270 degree and have the opposite "piece" or individual accommodate the other 90 degree into movement.

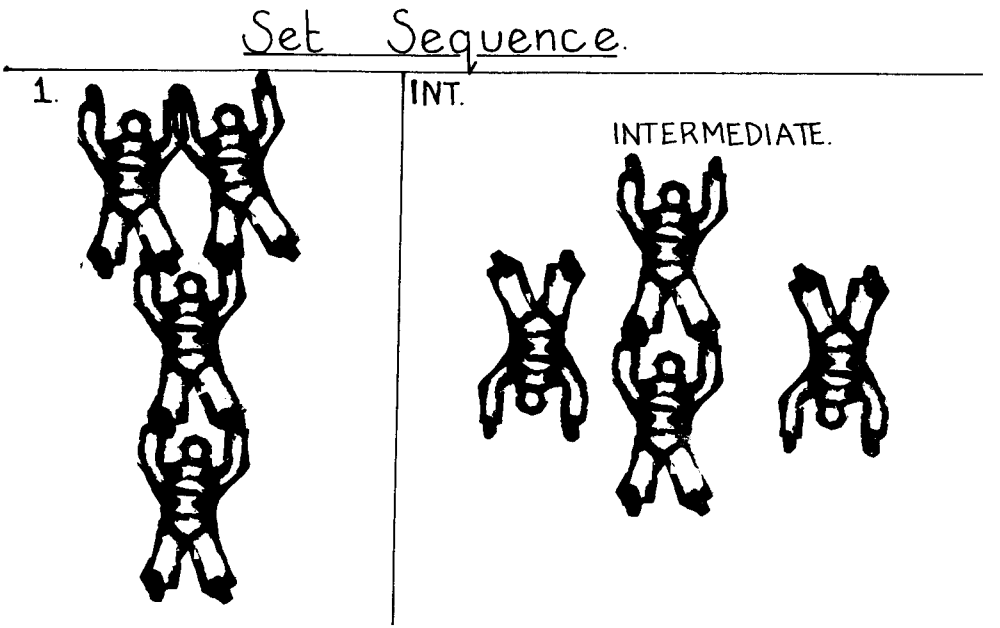
A 30 degree variation in heading, can really increase your efficiency. If you have the impression that the end result can only be achieved in one way, then think again!

For example, a four man formation requires two people to come off it leaving two linked in the centre. The rules

give the impression that the two free flyers have to now fly to the far side and rejoin. Thus they must come off, go up, turn around, fly straight, turn and redock. Time wasting and not efficient. Another way of satisfying that requirement is the following.

The two outside flyers come off, and turn 180 degree, where they are. The centre rotates 180 degrees and stops. The flyers then redock.

Thus, more efficient movement but less flying is required, and the end result is still exactly what the judges required.



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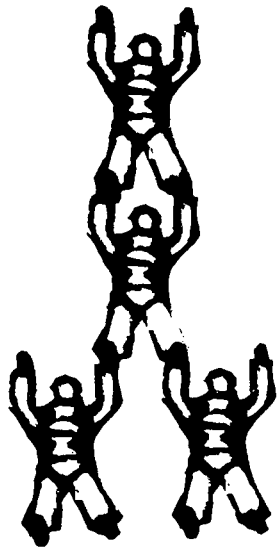
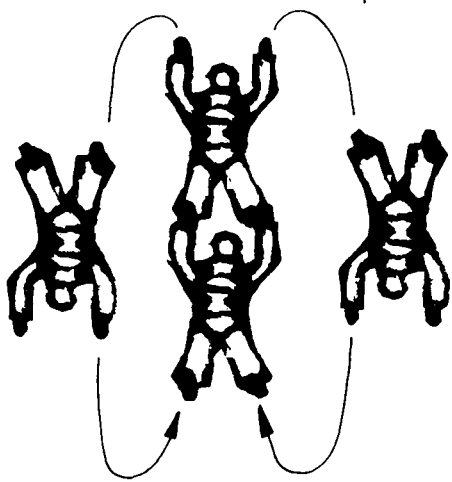
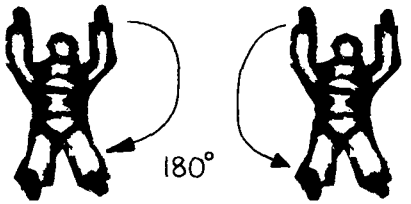


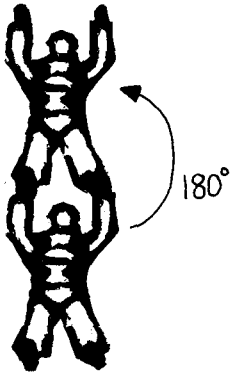
Standard Interpretation.



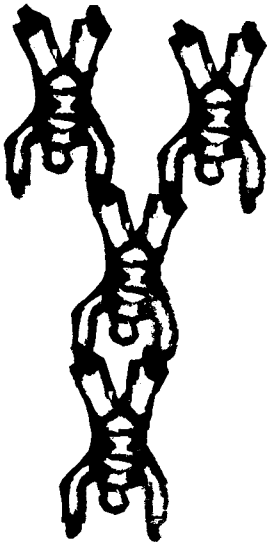
Your Interpretation.



REDOCK



Result an Acceptable Mirror Image.



Generally, have an enquiring mind. Get your sky-diving friends together and examine all the possibilities. There are short cuts and more efficient methods to every jump and you can still stay within the parameters of the judges requirement.

If there is more than one way of skinning a cat than there is definately more than one way of making a competition sky-dive!

CENTRE OF GRAVITY AND PIVOT POINTS

"Why on earth did it move to the left?" "What started that moving?" Common enough comments at the end of the dive that didn't quite go as planned.

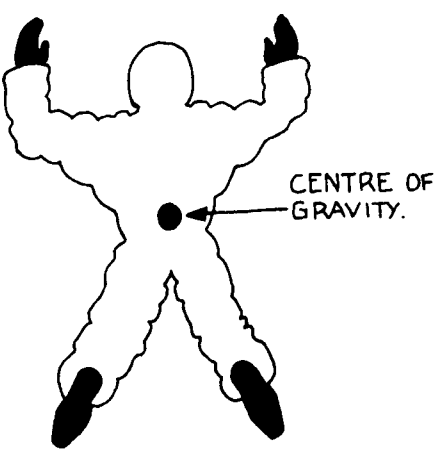
Have you ever found yourself in a half built rotating formation thinking, "Now how on earth do I stop this? Is it an arm or a leg or a body flare or should someone else stop it, or should I backslide?"

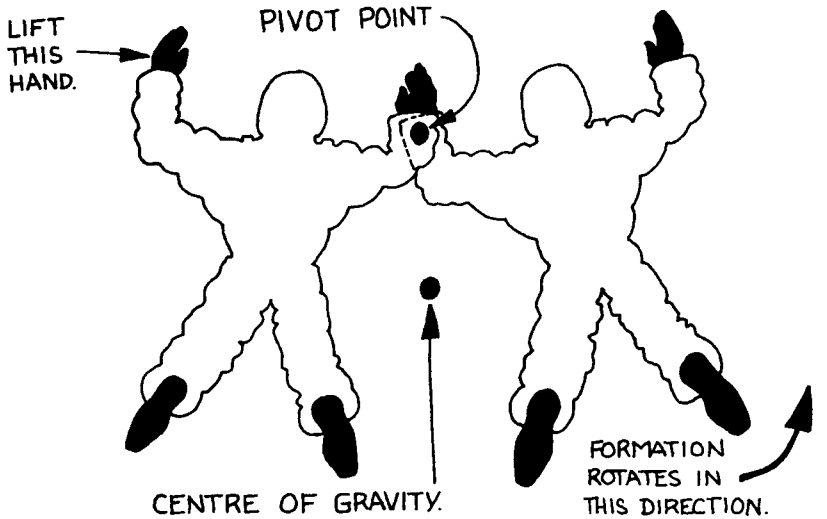
As we build formations we alter their centre of gravity. As each new jumper fills his slot we also move the pivot point.

Lets look at the following examples.

With the single figure the centre of Gravity and the pivot point are the same. Look what happens when we add another jumper.

Centre of Gravity and Pivot Points.





There are a few methods of rotating this particular two man line. One person could Backslide and initiate a turn, or the other could fly forward, or you could combine both forward movement and a backslide.

Every formation requires different techniques for both starting and stopping it both in lateral and vertical movement whether that be a rotation or not.

Look at the formation in question. Work out where the centre of gravity is. Decide where the pivot point is and then decide how you will move it and who is responsible for what.

Always nominate tasks to individual jumpers. Practise "involuntary formation rotations" in both directions. Who will stop it. Figure this out on the ground before you go up.

A different combination of abilities may permit you to rotate a formation in an unconventional manner. Experiment and see what suits your group, and the technicalities of the dive in question.

Finally most involuntary rotations on formations are the result of two things.

1. Piecemeal haphazard building techniques with no sequence or disciplined order.

2. No centre-pointing.

As the formation's pivot point and centre of Gravity Change, in a formation that is building unsymmetrically. So will the formation's velocity and direction in both the lateral and vertical planes also change. However with correct techniques you can build a formation that will remain relatively in situe!

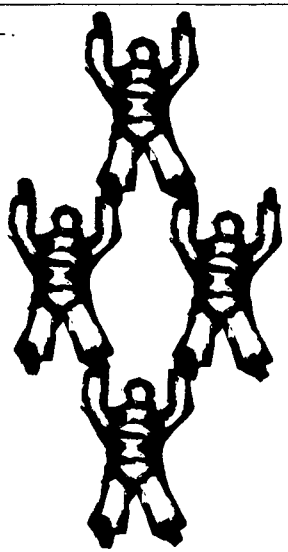
TORQUE AND TENSION

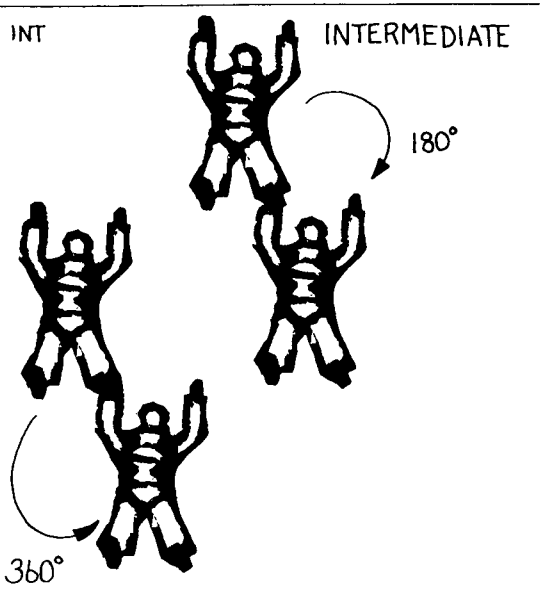
After being forever told to avoid tension, here we have the concept of deliberately using it. Two pieces joined together are about to split and rotate before rejoining. What happens is that instead of grips being dropped simultaneously. One is held fractionally longer than the other, thus generating tension, while the other is dropped. This results in neutral velocity which assists the piece to turn more efficiently. In other words the momentum for the turn is generated by use of torque and tension, before the last grip is finally dropped.

Look at the following sequence and the possible use of a Torque and Tension technique.

Torque and Tension.

1.





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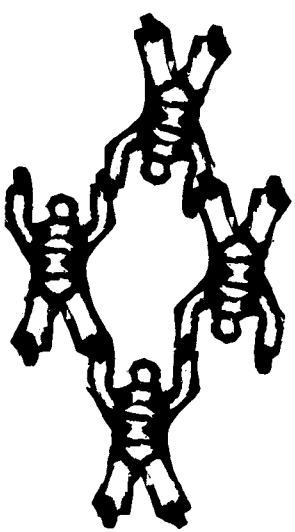
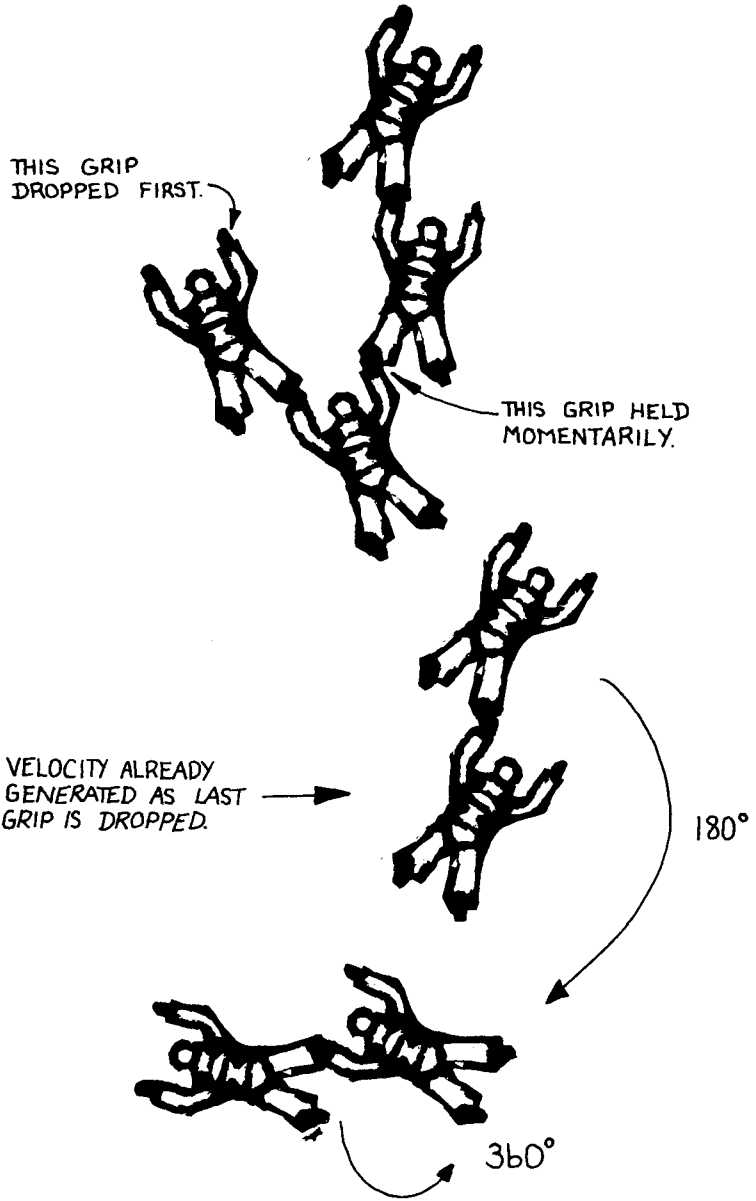


Let us closely examine the intermediate, with reference to the order of dropping grips.



You can apply this technique to a two man, four man or whatever size group you like. The principle remains the same.

Examine your transitions and see if you can assist yourself by deliberate use of Torque and Tension.

RELEASING UNWANTED TENSION

If you have just taken a bad grip and you are flying in such a configuration that you can see you are about to drastically effect the formation. Let Go, turn loose, back out and come in again, this time make it smoother and get it right!

If however you can slowly feel tension building up at your grips, then try and fly towards the grip. This should release the tension smoothly.

QUADRANTS AND JUMPSUITS

The old concept of having a quadrant around the formation which was yours, is now firmly dead! Work on jumpsuit colours and Equipment. However, large formation sequential dives and 8 man competitive sequential dives do use quadarants.
Relative Work whether it be a single formation dive or a sequential dive, will be more successful with disciplined allocated slots. To achieve this you work on your designated jumpsuit colour, and closing order. You cannot seriously attempt a modern sky-dive in a haphazard manner. If it is a single formation dive and the jumpsuit you are following has not arrived, then you may have no option but to take his place. It then becomes Jungle rules. You would only do this in the firm knowledge that the person you were watching could not possible make it. In a sequential dive you must be in the correct slot, or wait until your slot appears. Because of the complexities of the dive you can not just "go-in" anywhere.

Use jumpsuit colours as your designated entry points and become familiar with disciplined Relative Work which is for the benefit of everyone.

Obviously to sky-dive like this you require a disciplined experienced base formation. They must be able to guarantee their formation, built both correctly and on aircraft heading. They should also have the ability to stop rotations and put themselves back on heading where necessary.

FLYING INDIVIDUALLY

We all have our own style and personal idiosyncrasies which mark us as individuals in flight. Generally where possible fly small, and try to use a combination of negative stability and the dihedral effect. Keep yourself closed up and be aware of your wing area. Remember you have a vast vertical range, if you can collapse that wing area by using your elbows.

As an individual in bodily flight, do not become totally engrossed in your own world. Be aware of other flying bodies and other formations. Anticipate not only your own flight path but also theirs. Be aware of those things which are happening outside of your field of vision both behind and above you. Make a physical and mental effort to maintain your mental concentration on the job in hand. Lastly enjoy yourself!

FLYING IN A FORMATION

Your position in different size and types of formations will require you to do different things. As tail man on a diamond you may be largely responsible for braking forward momentum and assisting and controlling rotations. Generally tail positions have a high degree of control. Front men on small formations generally initiate turns with exaggerated arm and upper body movement. The tail men are also responsible for starting and stopping forward movement. This is done by either extending the legs to initiate forward movement, or dropping the knees to brake forward movement.

Wing men generally keep eye contact with the other wing men in both, their own formations and ones they may be flying towards. They help maintain the right attitude and heading of their own formation. If you wish to re-dock more than one separate formation then use the centre point technique and dock simultaneously.

If you are a flaker, or on a cluster in a single large formation, watch the horizon, on the opposite side of the formation. You must not go below or rise above the general level of the formation.

As a general rule be relaxed and in tune with the formation. Do not fight it, move with it. You are part of one single unified body. The same rules apply to it, as would a single sky-diver.

Relaxation is the key to flying inside a large formation, but you must fly. Do not just hang on and give up. Once you are inside, make sure that your grips do not impede anyone elses flying ability.

Anticipate possible problems and look at your location. Know before the dive, whether or not you are in a position to assist in the event of any unplanned movement!

Finally at all times be aware of your legs and your wing area!

MENTAL PRACTISE

What do you do in the aircraft on your way up. No doubt at some point you will certainly sit still and become engrossed in what "Carlos Castenedas" would term "the internal dialogue". Talking to yourself or just listening to your own thoughts.

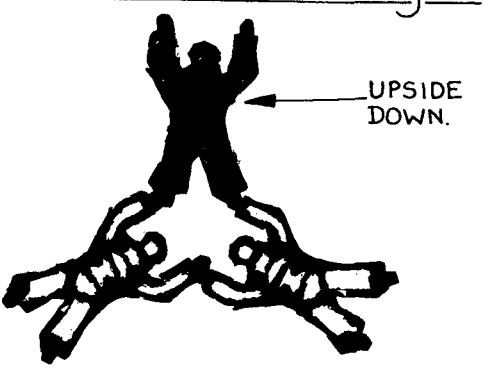
You have a moment in time here, to reinforce your memory recall. Close your eyes and imagine yourself in the exit line up. Take yourself through the whole dive you have just dirt dived. Do it several times until you have mentally got it right. If there are any parts you consider difficult go over these and emphasise your exact performance at this point.

This habit of mentally practising your sky dive will assist you greatly. It demands no more than a minute or two of your time in a period where you have little else to do! I strongly recommend it to sky divers at all levels of ability.

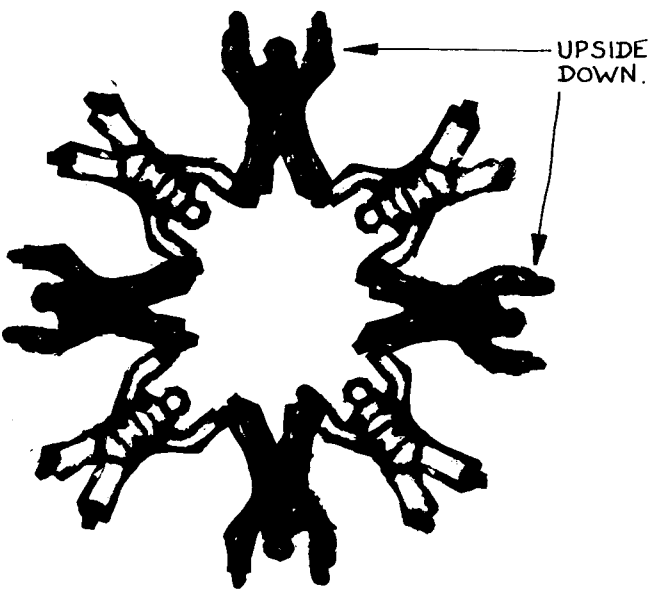
UPSIDE DOWN AND INSIDE OUT FORMATIONS

There are several dives which involve jumpers flying upside down or inside out in the final formation. For example the following two formations.

3 Man With One Inverted Flyer.



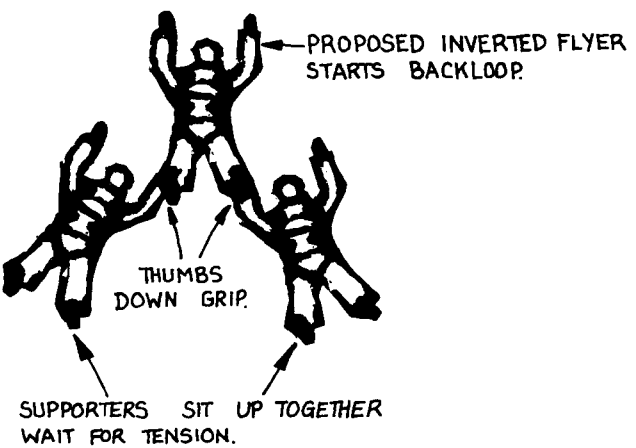
Sunburst.



In the present "state of the art" people do not generally "close" in an upside down mode. Thus all of these formations involve a vertical rotation or "loop" of the "would be" inverted flyer.

Here is where most funnels occur. Either side of the jumper who is looping, there are other "supporting jumpers" (Flakers or Clusters).

It is their action which is the key to either success or failure. A supporting jumper should first have a THUMBS DOWN GRIP on the proposed inverted flyer. Thus as he rotates the grip tightens and locks. The rotation in a large formation must be simultaneous and the "supporters" must all be ready for it. As the flyers invert the supporters pull up their knees and sit up slightly. Thus being able to accept the resultant violence and tension caused by the rotation.



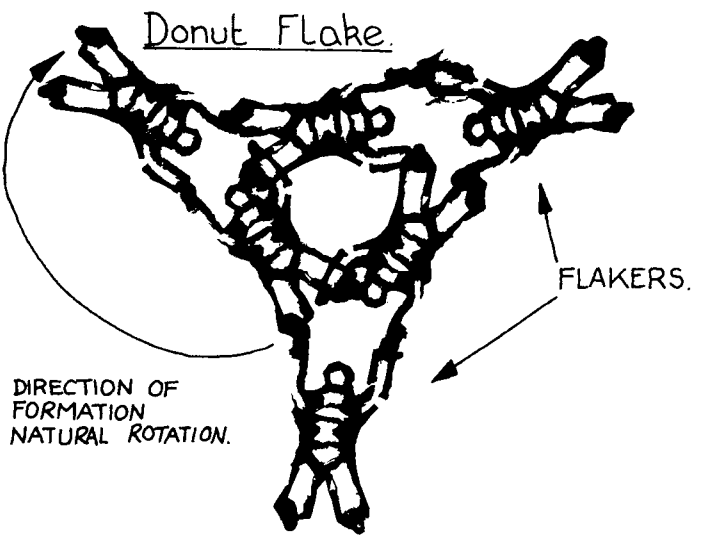
AVOIDING ROTATIONS

Most unintentional rotations are caused by formations building unsymmetrically and by jumpers who "close" with too much momentum.

Pre-planned use of disciplined Waves and good eye contact by flakers will prevent these problems.

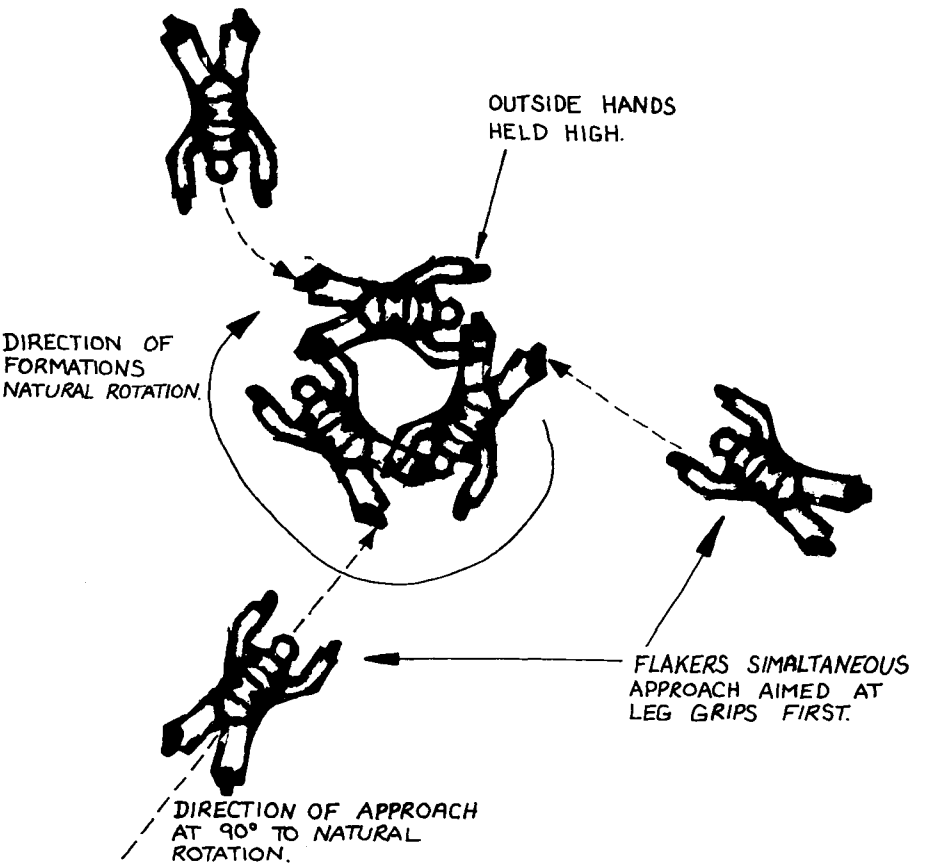
Some formations lend themselves to rotations by nature of their shape.

For example donuts and compressed accordions can be difficult. Take a donut flake formation.



The approach of the flakers and the sequence in which they take their grips is important, as all Donuts have a natural tendency to rotate anyway. The jumpers in the main formation ie the Donut, should keep their outside Hands High to prevent this.

The flakers should all maintain eye contact and "dock" together. They should aim at the leg first and take that grip first. Thus their directional momentum on closing opposes that of the formations natural tendency.

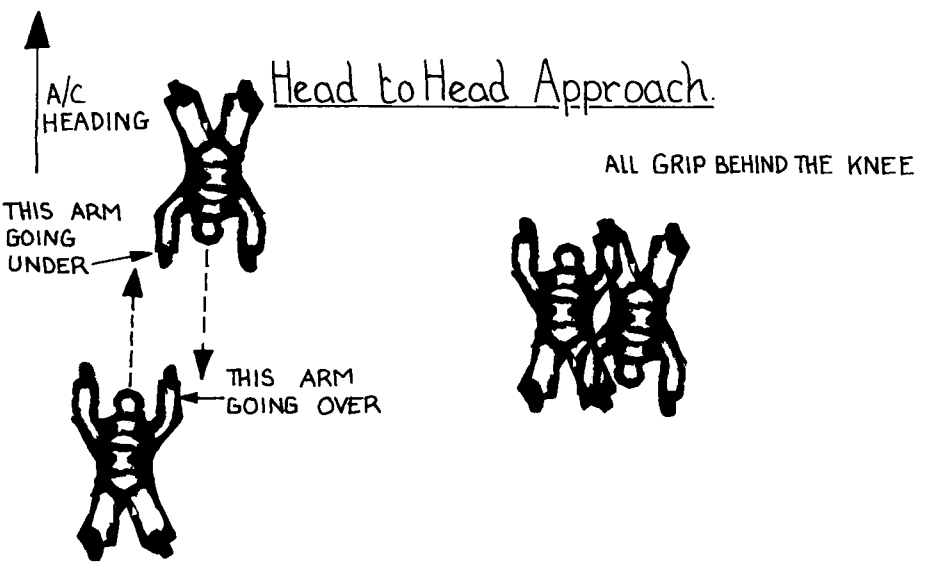


A two man compressed accordian base, likewise can be prone to problems of rotation. The rotations occur when building the base. Here are a few examples of different ways of building a compressed accordian base.

HEAD TO HEAD

Here the two jumpers approach head to head and as they dock they have literally gone into a non-momentum configuration. Before you attempt this you must decide whose arm is going to pass under the opposite jumpers arm and whose arm will go over. A clumsy mix-up at this point will give you a rotating compressed accordian.

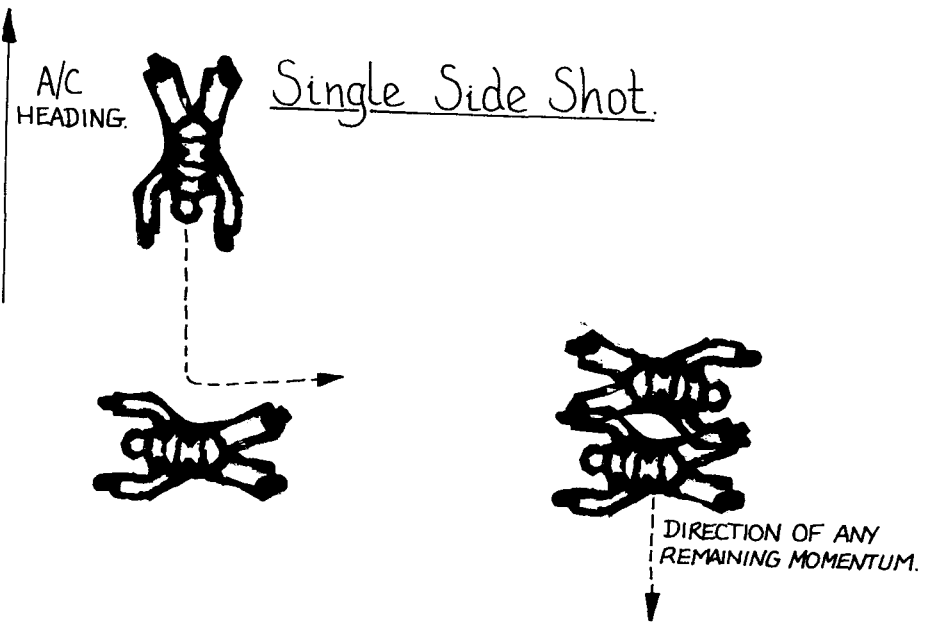
You should only attempt this method of building the base if you both have good fine control when flying.



SINGLE SIDE SHOT

You have a virtually passive base here. The one skydiver merely turns 90 degrees off aircraft heading and waits for the second one to dock. The attacker then does a "side-in" onto the lead or base. Because of the lead's position and the way in which he is "hit" no rotation is caused. This remains true, even if the final closing speed is too high.

The method is excellent for your first attempt at building an accordian base. If you are a little unsure of your abilities, try this one and prevent that rotation!



DOUBLE SIDE SHOT

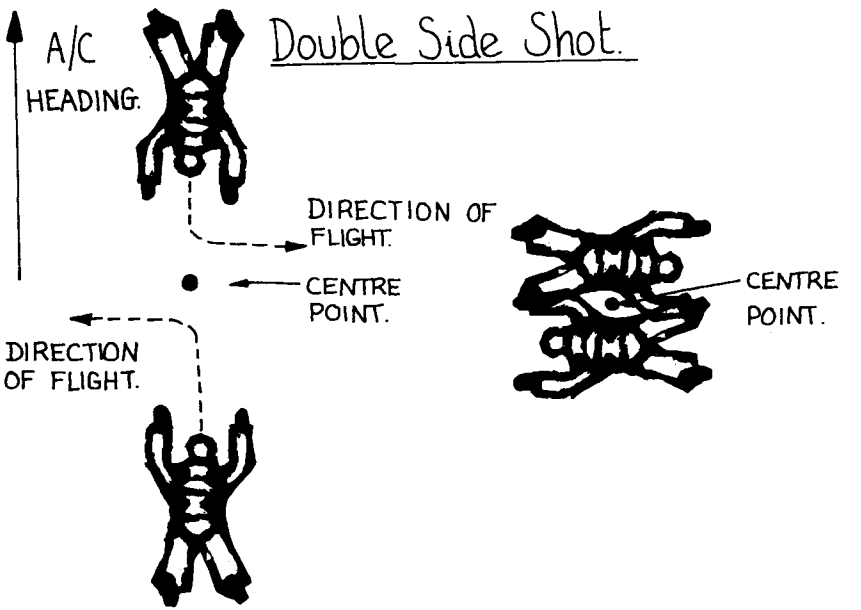
Both sky-divers involved in this method are acutely aware of two techniques we have already discussed.

1. EYE CONTACT

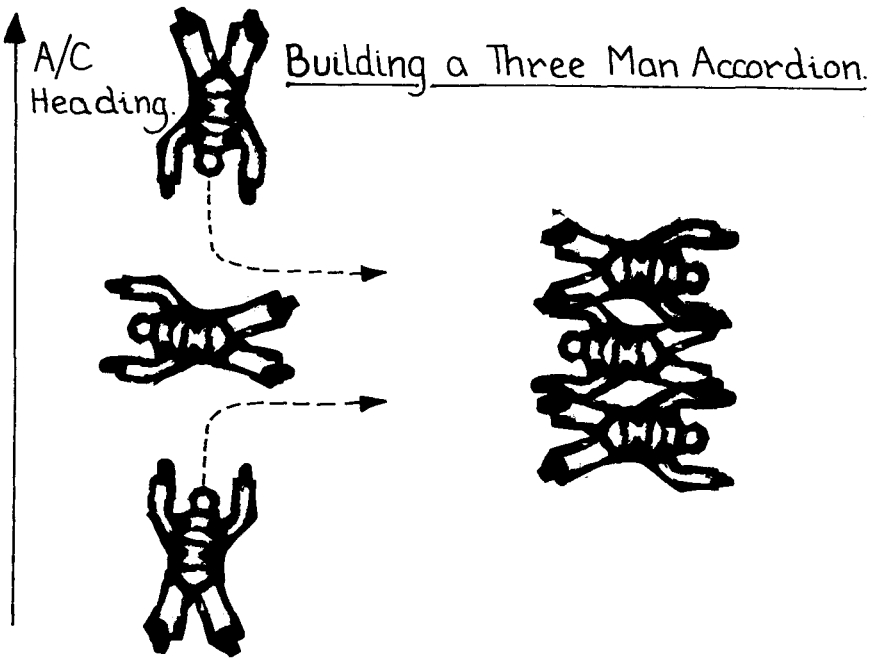
2. CENTRE POINTING

They approach each other head on at reasonable speed. They maintain eye contact and are aware of the centre point between them.

So eye contact is acute, they will both do simultaneous "side-ins" turning in opposite directions.



You can of course combine these different techniques into a single formation. Dive organisations rears its ugly head again. In the following three man accordian you will see that the work load of the control man is considerably easier than that of the outside flyers. Thus you can mix abilities and techniques and still avoid a rotation.



"CLOSING" HINTS (BACK-INS AND SIDE INS)

We have already discussed in some depth, the intense mental concentration and seemingly opposed physical relaxation, needed at this critical time.

The common problems of "back-ins" and "side-ins" have also been discussed. However there is one other significant point to remember, whenever you are performing one of these manoeuvres.

ALWAYS ALWAYS TURN INTO THE FORMATION.

If you turn away from it and fluff it, then you will have lost sight of it. Consequently your salvage will be more difficult.

If you are backing in "pieces" ie a two or three man group, then be prepared to switch responsibilities. The lead man may initiate the turn, but at a certain point the rear element takes over.

If you find yourself lead on something like a two man Caterpillar, then remember the distances involved. You have become a 12 ft. man. Judge the distance and clearance you need to perform with your new 12 foot body.

Remember if you are tail man, on a Caterpillar, use leg turns as well as your shoulder and upper body, to turn the formation.

R.W. LEARNING DIVES

LEARNING CONCEPTS

Every dive we ever do, teaches each of us something. In that respect all dives are learning dives.

If it has taken me 10 years and 1500 jumps to attain my knowledge and mediocre R.W. ability. It does not naturally follow that it should be the same for someone learning to-day.

My present standard could be surpassed in 100-200 jumps, by a student relative worker using to-days techniques. In fact a basic twenty to thirty planned instructional dives will acquaint anyone with the necessary knowledge and ability.

The problem that confronts most early relative workers, is their own savage enthusiasm, coupled with an insatiable desire to be in a LARGE formation. You can waste valuable time and money on 4 man, 5 man, and larger formation dives, most of which will probably be abortive.

Maximising your free-fall time and learning processes is what you MUST ATTEMPT TO DO. The secret, believe it or not, is in LOTS OF TWO-MAN SKY-DIVES. In these you can really do an incredible amount of relative work. For example you could spend 70 seconds of free-fall time trying to build a 6 man, and end up, in a 4 man funnel. On the other hand, two of you working together, could learn three NEW AND DIFFERENT TECHNIQUES and complete 8 MANOEUVRES on a 70 second dive. With two people the unknown variables are considerably less. The chances of success therefore are considerably higher.

BASIC PRINCIPLE

Use a reference point. This may be an instructor or it may be your friend who is a better sky diver than you are. Your reference point is closely watched by you. He makes a body movement. You see the resultant changes in direction, velocity, altitude and attitude. You then imitate this on the same dive. So you can select the particular techniques you wish to learn and build you dives around them.

LEARNING PROCESSES

1. EXPLANATION
2. COMMITTMENT TO LONG TERM MEMORY
3. DEMONSTRATION
4. IMITATION
5. ANALYSIS

1. EXPLANATION

This takes place on the ground and should involve theory and dirt-diving prior to the jumps.

2. COMMITMENT TO LONG TERM MEMORY

This is the dirt diving itself. This is probably the most important facet of the whole process. Even if you are unable to do the technique in the air, you have still commmitted it to memory. At a later time and place you will subconsciously be aware of your knowledge and use it in that particular situation.

3. DEMONSTRATION

This takes place in the air and is really the proof of the theory.

4. IMITATION

This takes place in the air and is your attempt at the technique involved. It is immaterial whether you are successful or not. You now have it in long term memory for later use.

5. ANALYSIS

This is the dirt dive after the jump, of exactly what happened. This again is exceptionally important. The "Why and How" of what went wrong, comes out here. Other techniques and other concepts may appear. The Dives that go completely wrong usually present you with a considerable amount of useful information in the analysis stage. It is here that you learn your mistakes, and hopefully erradicate them for ever.

WORKLOADS

Always plan for more than you can possible do. This ensures that you obtain maximum work throughout the dive.

Have an alternative manoeuvre if things go wrong i.e. a normal head to head 2 man.

EXPOSURE AND INCENTIVE

Your instructor or buddy should aim to expose you to new techniques or concepts on each jump. You should never do the same jump twice. Remember it's your memory process we are interested in. Your sky-diving ability will come naturally.

Each dive you make should have some form of incentive about it. Your first Side In. Your first back in, your first vertical transition. Your first attempt at floating. There must be something in there, which is new and will stimulate your enthusiasm.

NATURAL FLOW ABILITY AND CONFIDENCE

These three topics are all inter related within a single learning dive. Initially you should strive to work close together and employ non-contact flying as much as possible.

Natural flow is quite a topic really, let us have a look at it. In the Martial Arts world there are various ways of teaching certain techniques. Imagine a defender stood stock still. Towards him comes a fast running aggressor. The exercise involves the defender throwing the aggressor.

Here are two ways of teaching that throw. The first one is the conventional method. For example the defender is shown a rigid body position. He is told how to stand. He is instructed on a fighting stance, balance and pivot points. He is directed, where to take a grip on the aggressor. How to move his feet and in what order. Step by step the whole movement of the throw is broken down into small segments and taught separately piece by piece. This tends to produce a learning problem. A difficulty in assimilation of the technique and a clumsy and jerky imitation of the throw. The student has not been given any consideration with regard to his own unknown ability, nor is he allowed to use it.

Here is the second method used. This involves an element of spiritual awareness.

The defender is told to consider himself a Whirpool. He is made to stand still close his eyes and relax completely. He assumes a calm and peaceful manner. Gathers his thoughts and energy together. As his eyes close, he is told that his body is radiating energy waves. These energy waves form the Whirpool. He imagines this whirpool swirling around him at ever-increasing speed.

He is made to think of a stick, which tries to enter the whirpool, but which is gripped by it's current and thrown aside.

The defender now has a complete mental picture of the Whirpool and the stick. He is now ready. The attack starts and the aggressor pushes in. In a completely natural manner the defender throws the aggressor using his conception of energy and flow and his own as yet untried ability.

The moral of the story is that "step-by-step" rigid body positions is not the way to learn R.W. We all have an uncanny sense for Natural Flow. We all know we can fly our bodies. The ability is already there. It is just a question of easing it out into the open.

The key to this problem is your confidence. A group or pair must be confident with each other. A teacher should inspire confidence and a learner should become confident.

Design dives with natural flow. Learn new techniques with natural flow. There is grace and beauty in every sky-dive. You just have to be aware of it and use it to your advantage.

You all have the ability. The problem is how you try to bring the ability out of it's hiding place.

QUALIFYING DIVES

We have all seen the poor guy who climbs into the aircraft for his S.C.S. load. The local instructor and all his friends stood around watching. The pressure here is focussed on the learner and in consequence his performance may falter.

It is generally not a good idea to make a big thing of a qualifying dive. Whether that be an SCR. or SCS or a British Catergory X Jump.

The way round this is to just sky-dive normally and make no illusion to the fact that someone will gain a qualification from the Dive. The learner should be so involved and engrossed in the many facets of the dive he is about to do, that he doesn't even realise the ulterior motive.

It is a lot of fun to walk up to someone after the dive and say "oh by the way, congratulations, you just got your SCS".

SAFETY

Both learners and teachers must be aware of the safety side of learning dives.

Emphasis should be made on ALTITUDE AWARENESS. The BREAK-OFF, TRACK, WAVE OFF and PULL must be covered in some depth. Don't involve too many unknown ability levels on a single load.

You require a nice balance here.

It is difficult to do R.W. at your best, if you are scared to death of frapping! You must be nice and relaxed and yet safe! Try and remove unknown variables from your dive. A new exit, a new aircraft, new equipment, a new pilot, a new drop zone, a new sky-diving partner, or anything of this nature tends to be "off-putting".

Remove these and you can relax into your jumping. Be thoroughly familiar with your EQUIPMENT and its LIMITATIONS. PRACTICE AND KNOW YOUR EMERGENCY DRILLS FOR EVERY CONCEIVABLE SITUATION.

The major cause of fatalities over the last few years has not really changed. PEOPLE WHO DON'T PULL HANDLES, DIE!

Let us move on from that gloomy note and look at a selection of learning dives. These dives come from several different sources. Roger Hull, Scratch Garrison and Gary Carter and many others being contributors. They are not by any means the whole spectrum of possibilities. The scope is endless just use your imagination and make up your own dive.

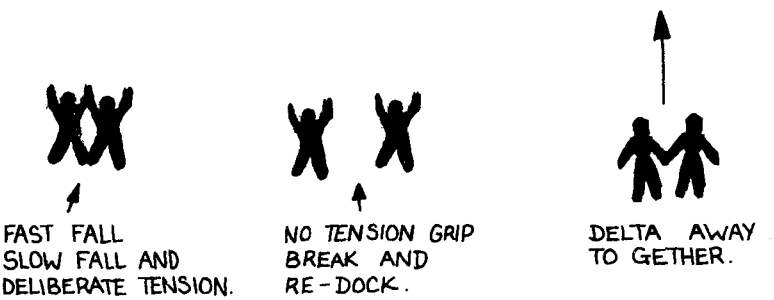
MIMIC DIVE

The learner exits first and watches the other guy approach. The teacher should do a smooth approach, kill off all speed

and slip in sideways into a 2 man line.

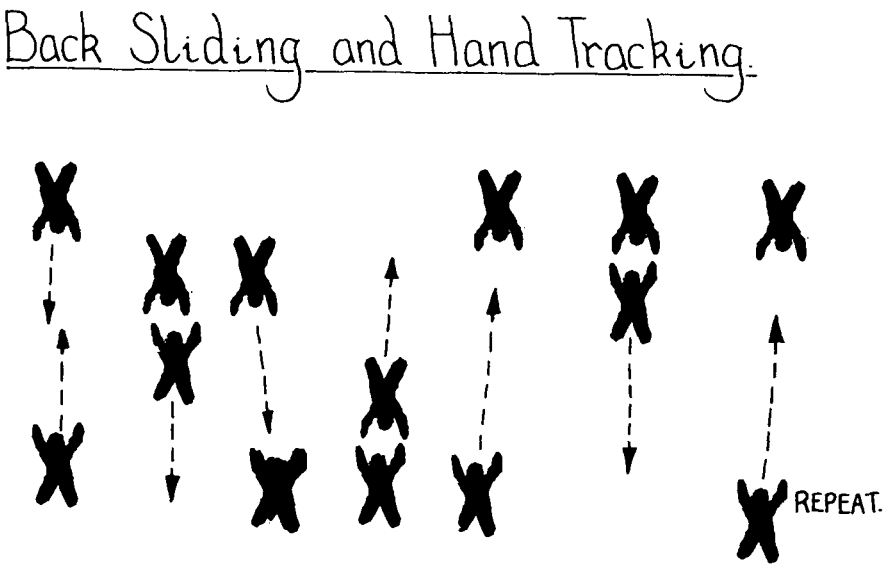
The teacher maintains the link and does a fast fall. The learner "mimics" this to drop down to the same height. The teacher then slow falls and rises up. The learner again follows. Once the line is level again, the teacher should push and pull to create tension. After this both learner and teacher fly towards the Grip to reach a "no tension grip" situation. The teacher lets the grip go and should be able to remain in a non-contact configuration. The Grip is taken up again. Both Sky-divers slowly move into a delta and delta away together maintaining the Grip. Break-off at 3,500 ft and track away separately.

Mimic Dive.



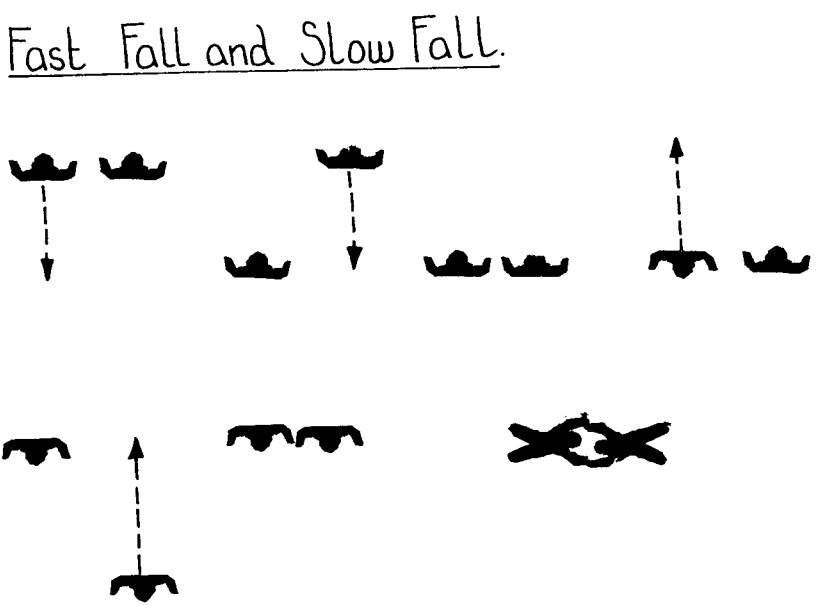
BACK SLIDING AND HAND-TRACKING

The learner sets up an aircraft heading and watches the teacher's slow approach. The approach starts from non-momentum a few feet out and is a hand track. The teacher lightly touches the learners hands and then backslides away and below a few feet. The learner then hand tracks to the teacher and lightly touches him and then backslides away. The process is repeated. A link may or may not have been incorporated at the end. Many other manoeuvres can be inserted into this basic dive, if required.



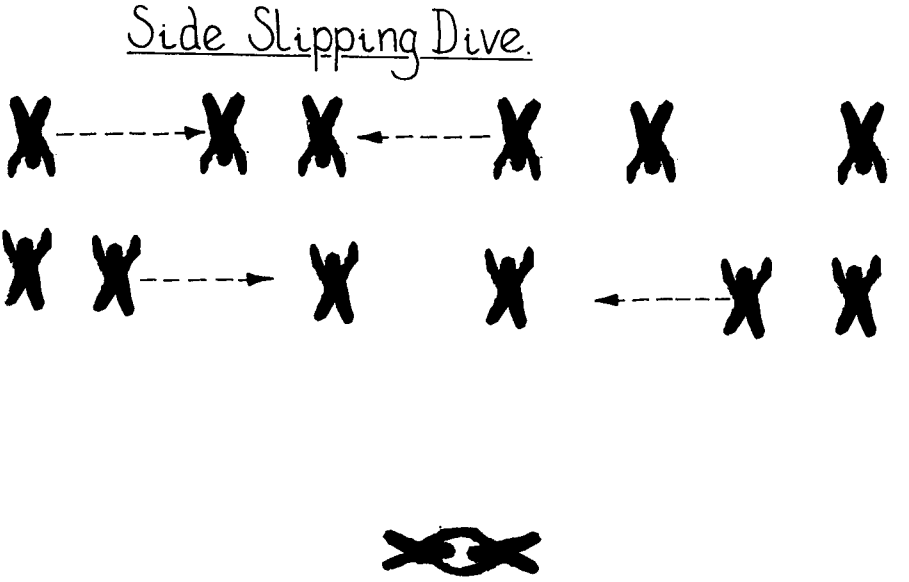
FAST FALL AND SLOW FALL

This dive is working mainly in the vertical plane. The learner and teacher set up side by side non-contact. The teacher fast falls a few feet below the learner and then goes to his normal fall-rate. The learner imitates and comes down alongside the teacher. The teacher then slow falls and rises up a few feet. The learner follows. You may repeat the dive ad-infinitum or have a normal link at the end.



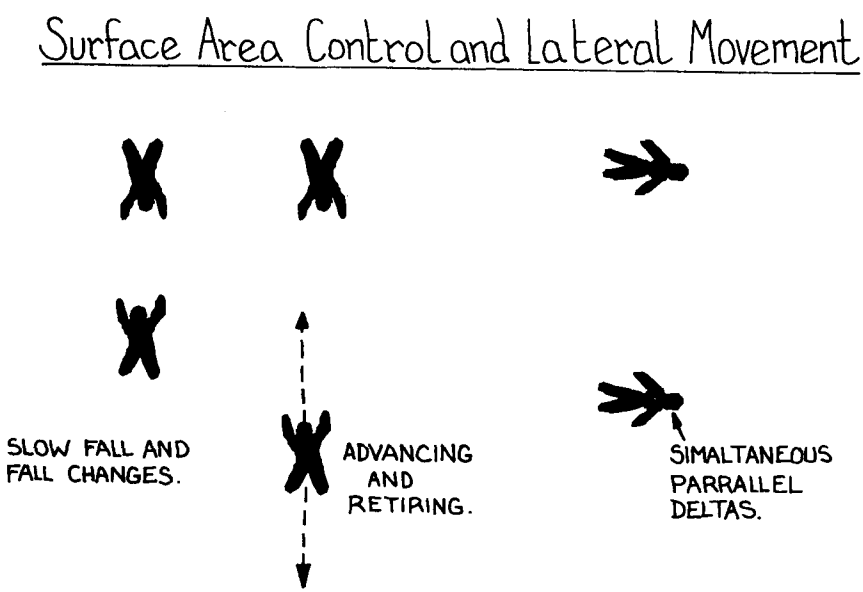
SIDE SLIPPING DIVE

The learner and teacher exit together and set up a non-contact head to head two man. The teacher side slips left and stops. The learner side slips across and opposite and stops. The teacher goes the other way. The learner follows. You may repeat this ad infinitum or put in other manoeuvres or a link.



SURFACE AREA CONTROL AND LATERAL MOVEMENT

The learner and teacher set up a non-contact two man. The teacher makes small changes in the vertical rate of descent, keeping within the learners ability range. The learner repeats these and maintains altitude with the teacher. The teacher then moves either toward or away from the learner, forcing him to either "back-up" or "advance". A signal is given to turn onto parallel headings and then delta away simultaneously to 3,500. From here, both sky-divers delta apart!



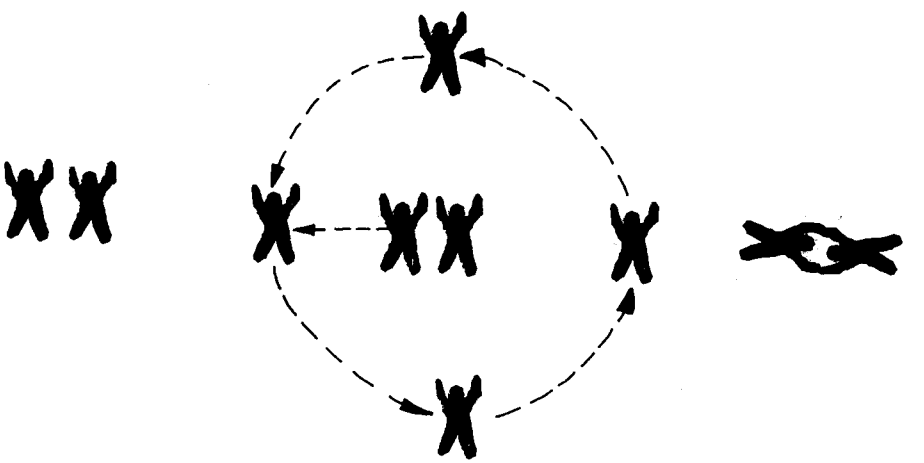
FLYING AROUND

The learner and teacher set up a non-contact two man. On a given signal the learner flies a circular flight path around the teacher and re-docks. You may introduce other manoeuvres if you like or alter the second or third mode of link.

CONSTANT HEADING AND ALTITUDES

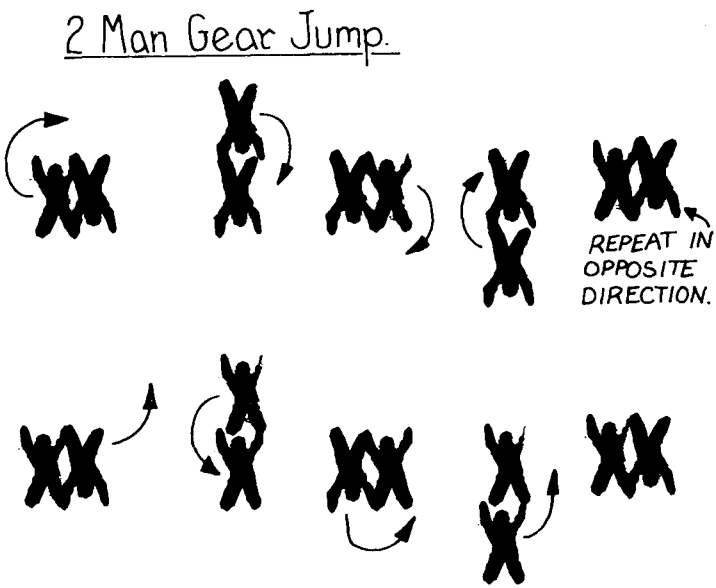
The learner and teacher exit simultaneously side by side. They set up a two man non-contact line. On the given signal the learner moves around the teacher but maintains a constant heading. In other words he has to side slip, back-slide, side-slip, and hand-track and side slip again to re-position himself. The learner tries to maintain the same altitude as the teacher, even though he is working! A link may be made at the end of the dive. Other manoeuvres can be inserted if required.

Constant Heading and Altitude.



2 MAN GEAR JUMP

Learner and teacher build a two man compressed accordian. Then by releasing grips utilising small amounts of Torque and Tension with grip changes, the formation transitions from accordian to caterpillar to accordian and repeat. On the Second Cycle the opposite jumper does the movement around.



IMAGINATION DIVE

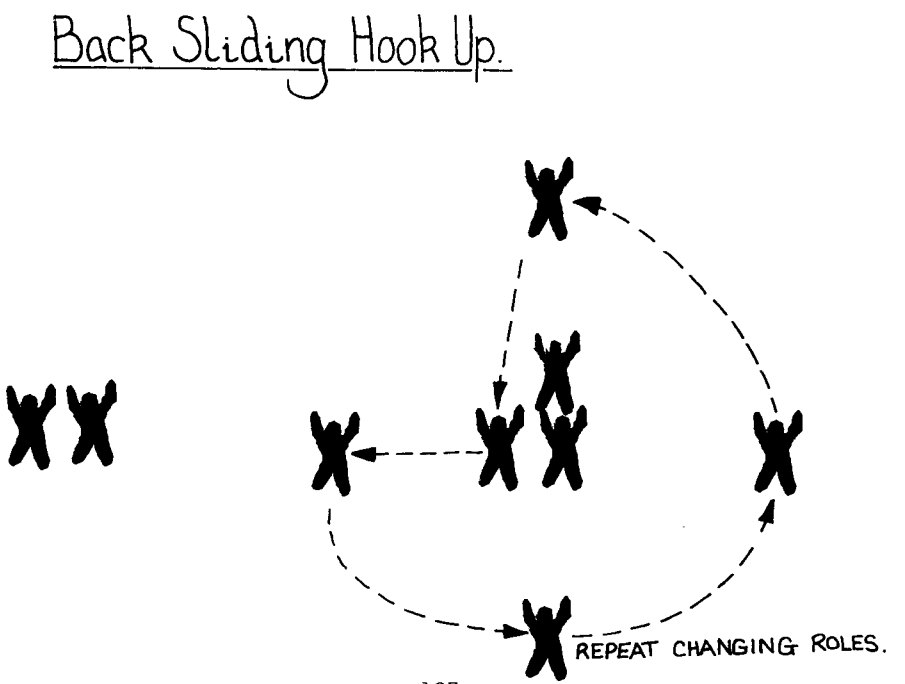
You find that there is only one slot left on the aircraft. You want to sky-dive but you can not find a partner. Well just use your imagination. Give yourself a floater position, or imagine you are coming out 23rd on 40 man "Megablob". Dive down, swoop, flare, and stop. Do your "slide-in" or "back-in" onto the imaginary formation. Hold it for a few seconds, and then come-off and transition and go in again into the next formation with a different docking.

There is no limit to what you can do. Of course the real good thing about sky-diving alone like this is that you can not make mistakes. All your approaches are good. All your "back-ins" are clean. All your dockings are on time. In fact you were just brilliant!

You don't necessarily need other bodies in the air with you, to practice R.W. procedures. Never miss an opportunity to spend free fall time doing R.W. With or without other people!

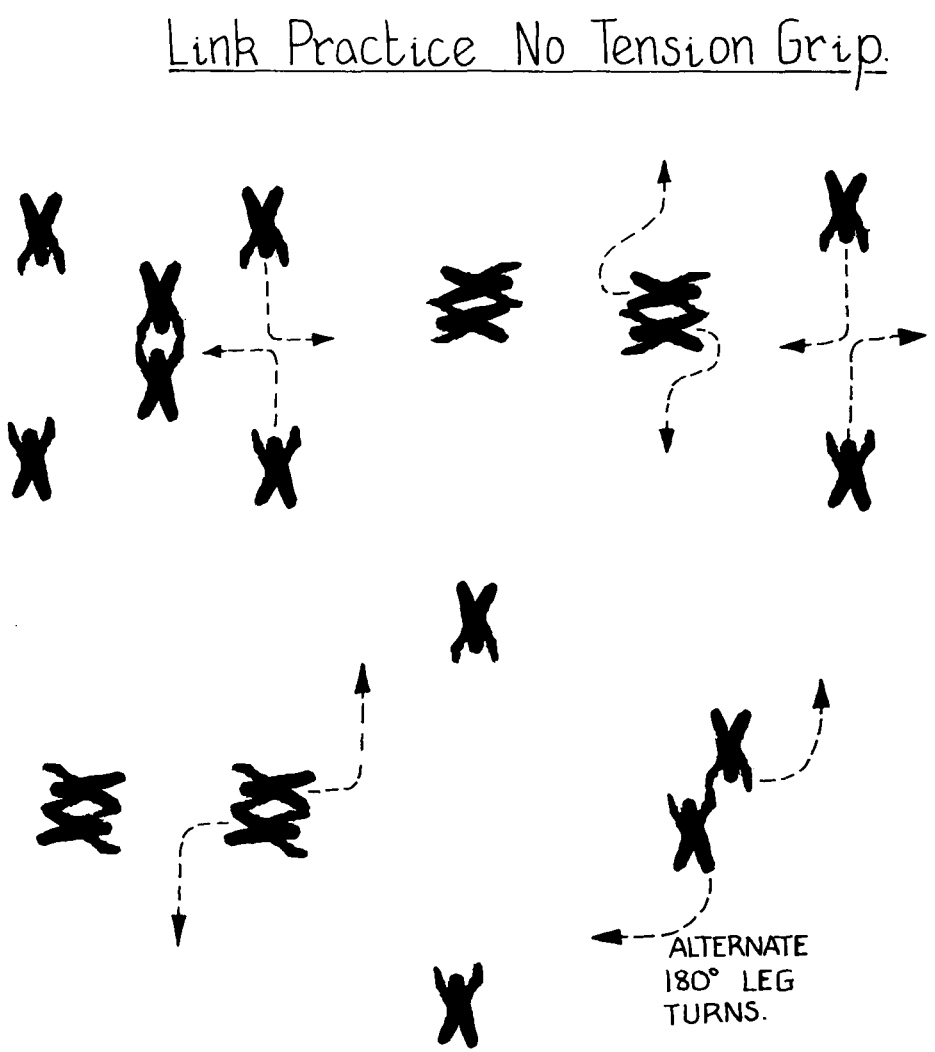
BACK SLIDING HOOK-UP

Set-up a two man line. The learner then "side-slips", "back-slides", "hand-tracks" and positions himself in front of the teacher. He then back-slides in for a Caterpillar. You may break here and let the teacher have a go!



LINK PRACTICE NO TENSION GRIPS

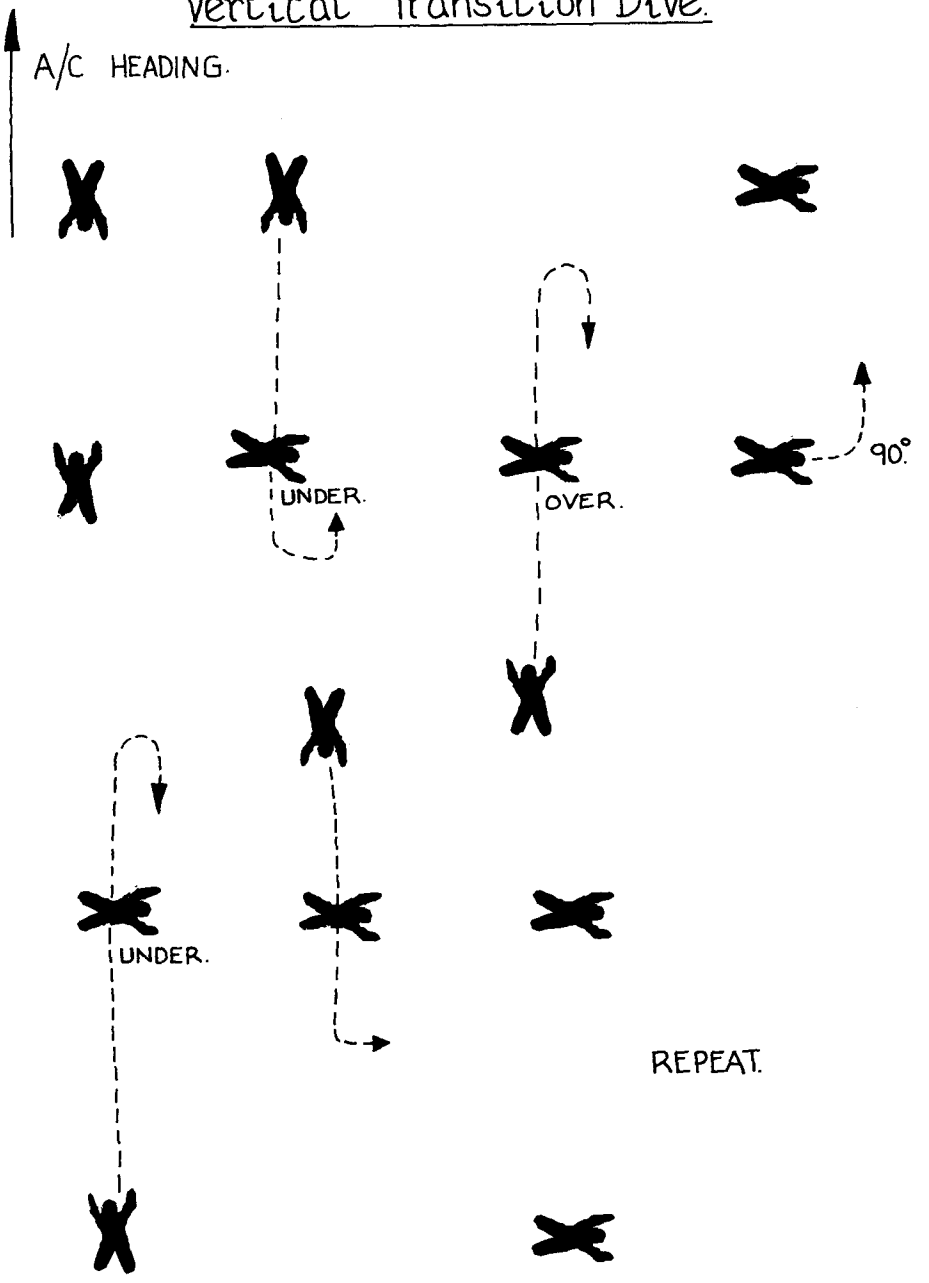
Set up a head to head two man. Link for a normal two man. Make all contacts "no tension grips". Break and do not push off. Re-docks with simultaneous "side-ins" for a compressed accordian. Break and back out. Re-dock for another compressed accordian this time doing a "side-in" in the opposite direction. Break and back-off. Re-dock for an opposed stairstep. Take alternate turns to initiate and stop 180 degree leg turns.



VERTICAL TRANSITION DIVE

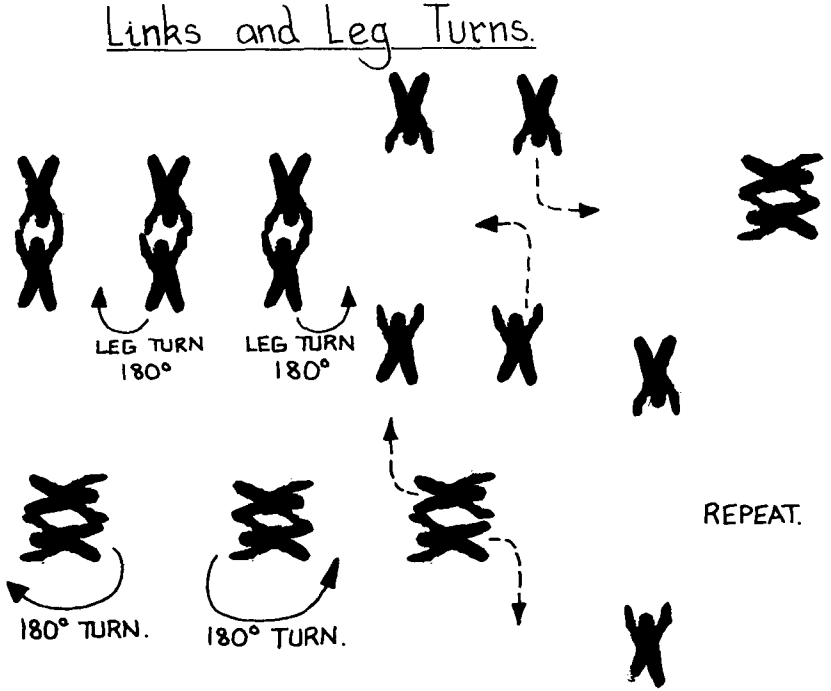
The teacher exits last after the learner. The learner turns 90 degree off aircraft heading and watches the teachers approach. The teacher uses moderate speed and flies about one metre under the learner thus inflicting his "burble" upon the learner and so dropping him down. The teacher quickly stops and does a 180 degree turn and now flies over the learners back thus dropping down himself as he comes out of the learners "burble". He stops and turns 90 degree to present himself for the learners approach. He may have to make a slight adjustment in altitude. The learner then does exactly the same thing to the teacher using moderate speed and about 1 metre clearance each time.

Vertical Transition Dive.



LINKS AND LEG TURNS

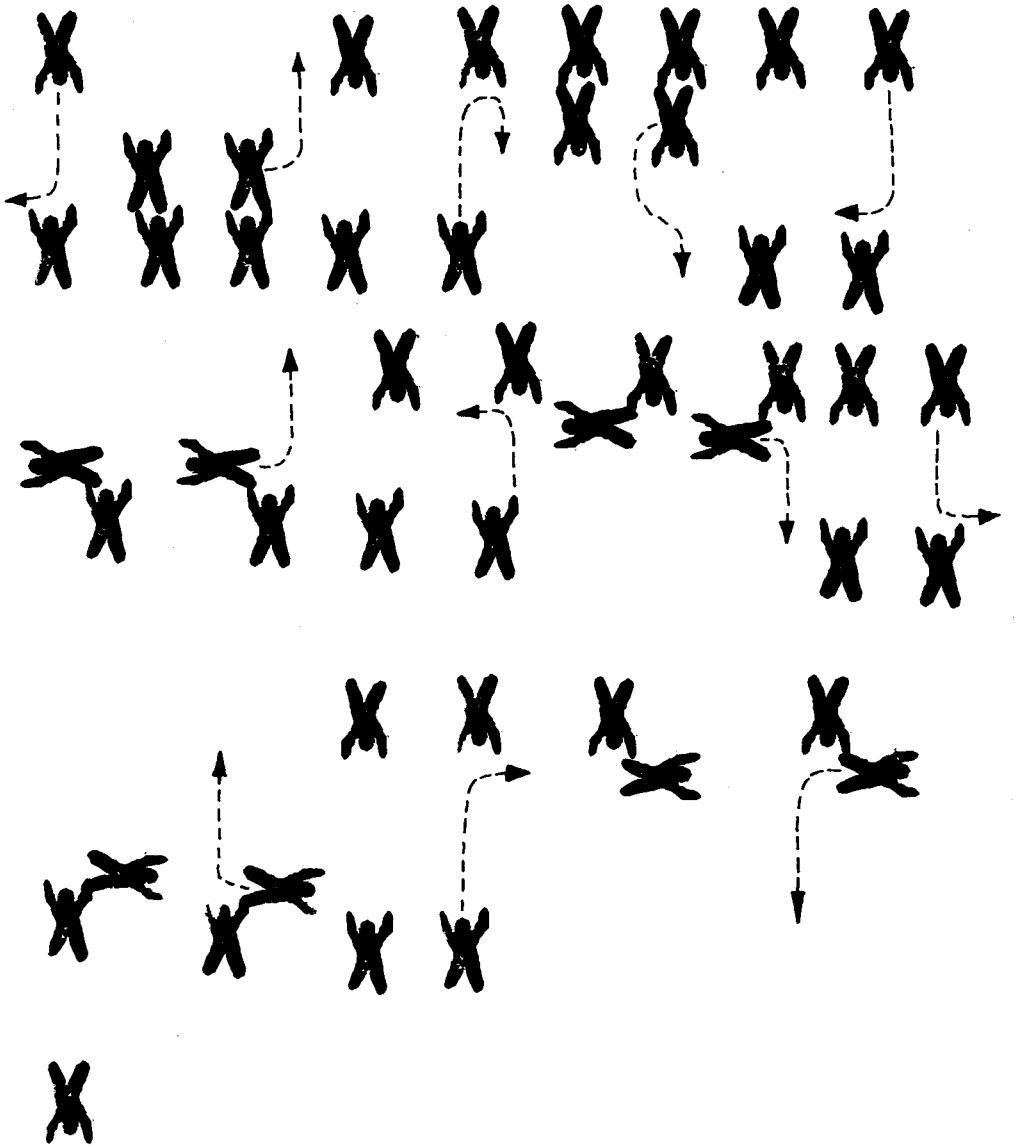
The teacher and learner build a normal head to head two man and then take alternate turns at rotating and stopping using legs. They Break and side slip in for compressed Accordian. They then take alternate turns at starting and stopping the accordian rotation. Arms, legs and slight backslide configurations may be practiced or used here. Decide how you are going to rotate the accordian and who will stop it and how. Think about it? There are quite a few different methods of rotating and stopping a 2 man compressed accordian.



"BACK-INS' AND "SIDE-INS"

The learner exits and sets up as a "catcher". The teacher does a slow to moderate approach followed by a "back-in". The Caterpillar Settles and the teacher moves out and turns around to become the Catcher. The learner does a back-in and then once Settled moves out and around to become the Catcher for a side-in from the teacher. The process continues with both learner and teacher doing "side-ins" to the left and the right. You may split this dive down and only do one of the techniques alternately.

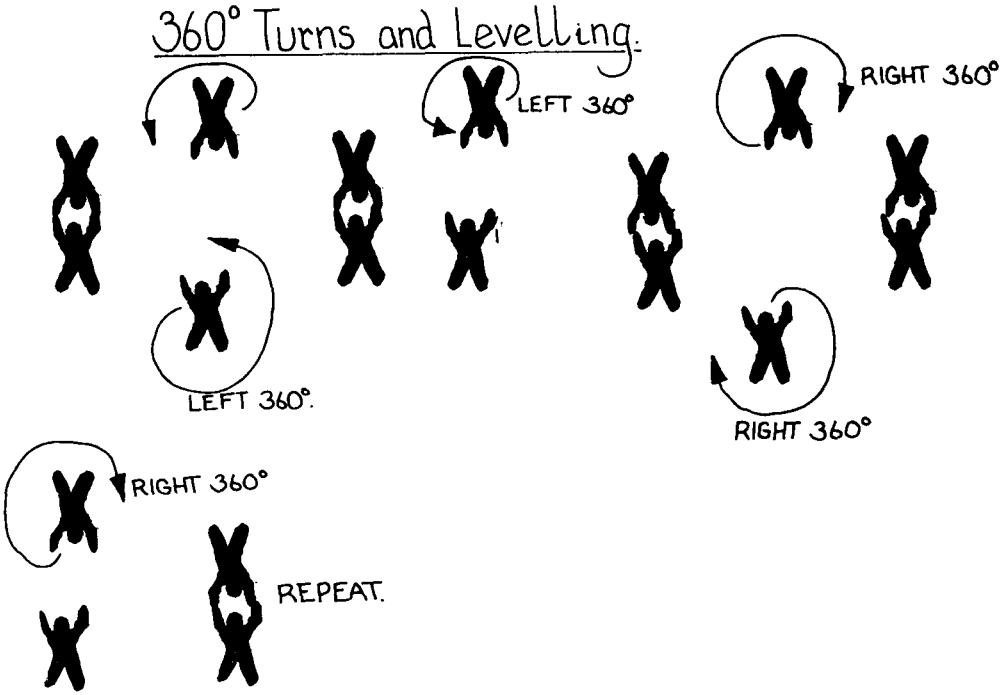
Back-ins and Side-ins.



REPEAT.

360° TURNS AND LEVELLING

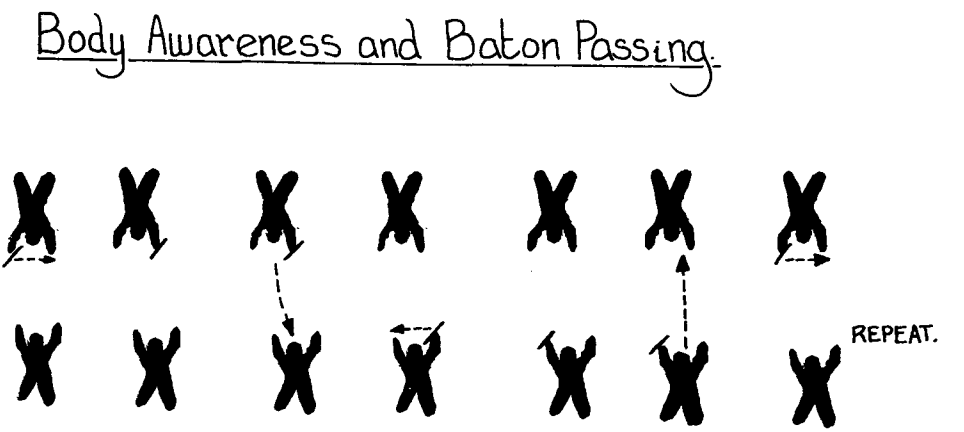
This is such a fundamental requirement in general for relative work. The ability to turn and adjust altitude while doing so. The learner and teacher set up a "tensionless" 2 man head to head link. They break and both turn 360 degree and relink. Both making altitude adjustments. They separate again but this time the teacher stays still and makes no adjustments and the learner must make his own, without any help. The teacher does not turn. In the next phase both turn and then only the learner. Alternate the jump and the direction of turn how you like, depending on what you wish to emphasise.



BODY AWARENESS AND BATON PASSING

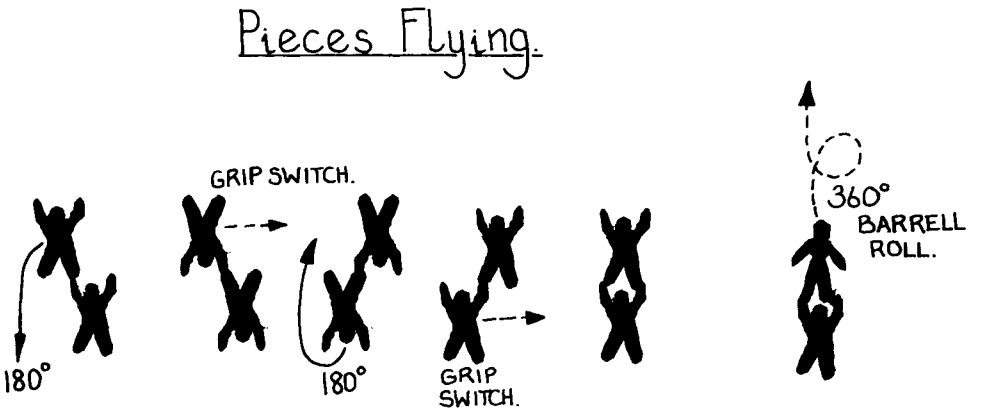
The learner exits first and sets up on aircraft heading. The teacher follows with the baton in his right hand. The teacher sets up in a non-contact position in front of the learner. He carefully and smoothly passes the Baton from his right hand to his left without sliding away. He then gives the baton to the learner who does the same. The learner passes the baton back to the teacher who repeats the action. See how may times you can get the baton around. A rolled up newspaper or wind drift indicator makes an ideal baton.

If you don't like the idea of a Baton, try a Cigarette Packet or small coin or similar object. The smaller the object the more concentration and effort required.



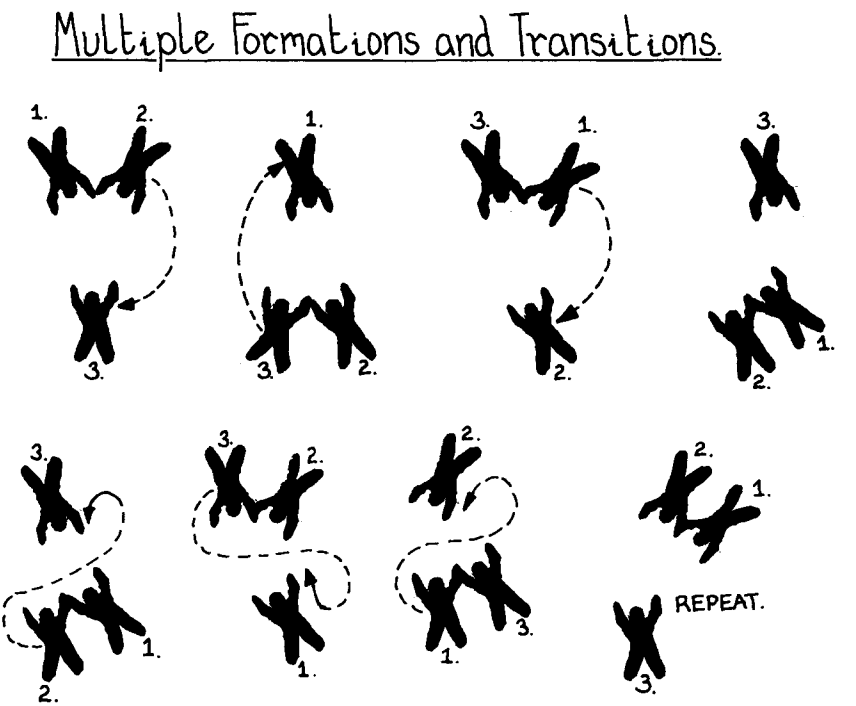
PIECES FLYING

Teacher and learner exit together and build a stairstep with the teacher on the front. The teacher then does a 180 degree turn towards the learner and stops. The learner then grip switches across to the opposite side. The teacher then turns 180 degree the opposite way with the learner concentrating on levelling and tensionless grips, and keeping parallel to the teacher. The teacher stops the turn and the learner grip switches to a Caterpillar. The teacher and learner initiate forward movement and slowly the teacher initiates a 360 degree barrell roll of the Caterpillar.



MULTIPLE FORMATIONS AND TRANSITIONS

The teacher exits after two learners who set up face to face and non-contact. He joins one of them in a line. Once in this formation you rotate continuously changing the composition of the lines in a circular motion. Once one cycle has been completed each flyer crosses in front of the person he has just left and "S" turns into place on the opposite flyer. You can do this with stairsteps if you like. The formations must stay close to each other and maintain the same level.

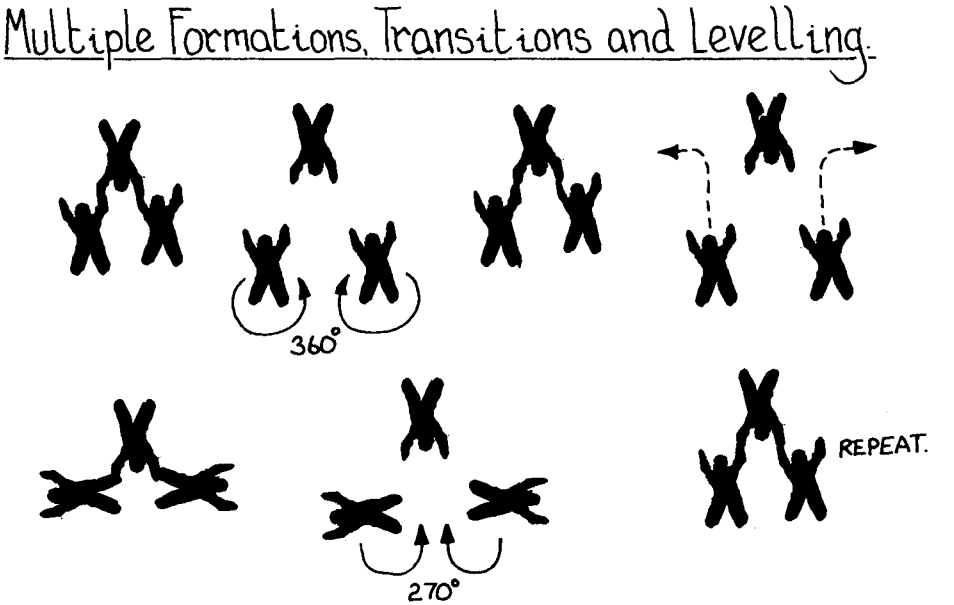


MULTIPLE FORMATIONS, TRANSITIONS AND LEVELLING

The teacher exits and sets up an opposed wedge with tensionless grips by the two learners. The teacher initiates the transition and both learners "pulse-out" and do 360 degree turns and redock. The teacher initiates again and the learners pulse out and do simultaneous "side-ins". The teacher initiates again and the learners do 360 degree turns and the cycle starts again.

The teacher maintains the same fall rate all the time. The learners are forced to make their own levelling adjustments. If things go well the teacher may move to another location half way through a transition.

From here he can monitor the learners reaction and capabilities in an unplanned situation!



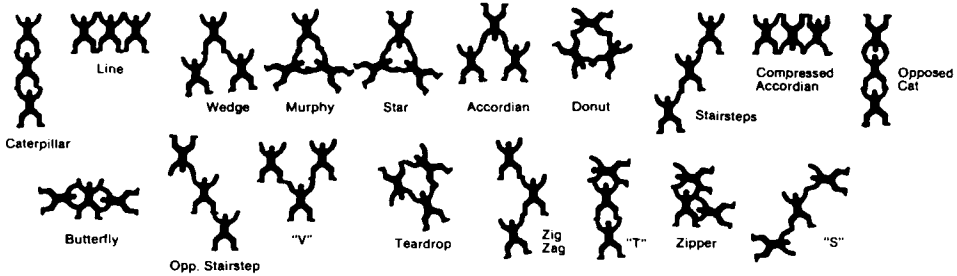
FORMATION POOLS

NOTE In our efforts to give you the latest up to date world meet sequences. The reproduction of this section is less than we would have liked. As the only copy available at the time of print is a photo-stat, 28/6/79.

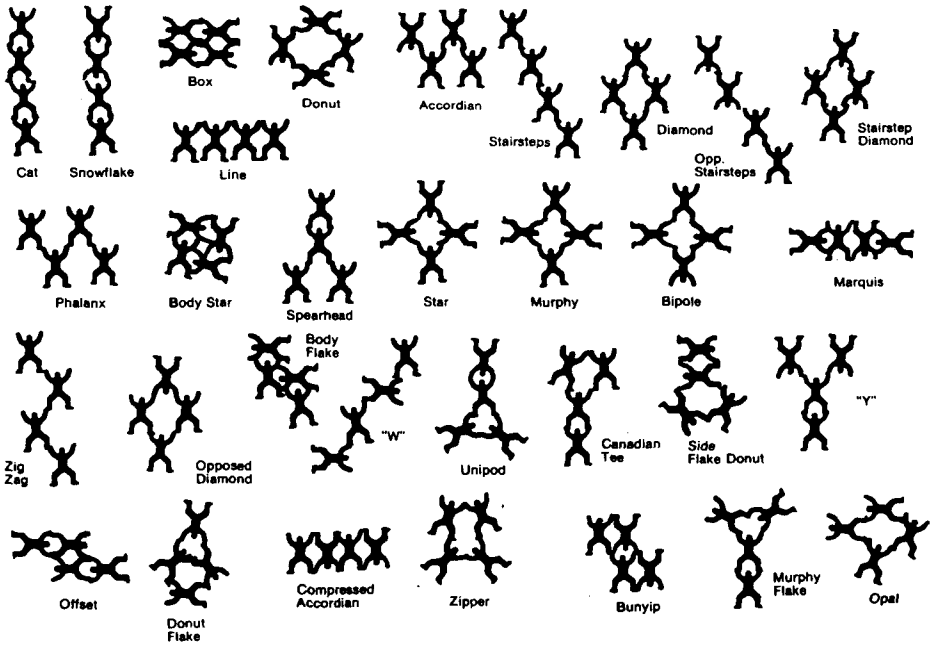
The following pages contain formation pools for 3, 4, 5, 6, or 8 persons. The world meet formations are also included. No matter what number of people you have, you can always design a dive for them. There are never too many or too few sky-divers!

These pools are merely an aid to stimulate your imagination.

THREE-PERSON FORMATIONS



FOUR-PERSON FORMATIONS



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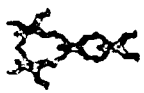
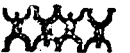
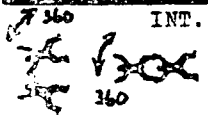
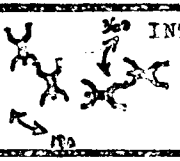
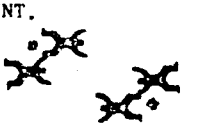
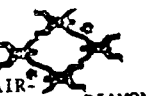
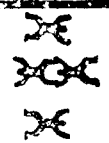
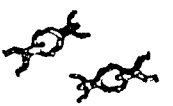
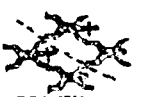
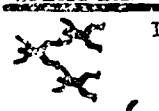
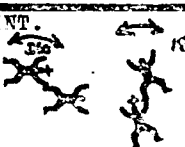
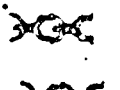
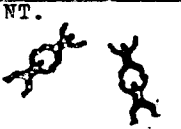
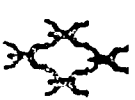
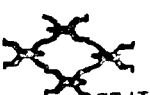
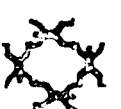
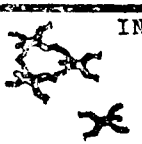
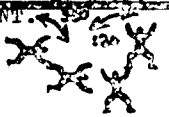
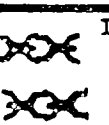
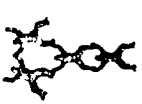
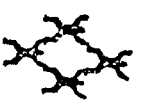
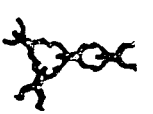
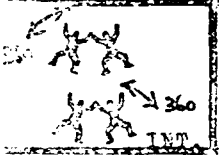
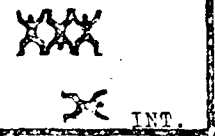
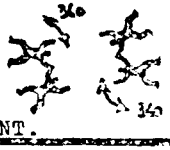
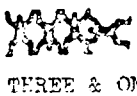
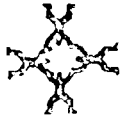
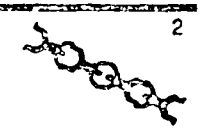
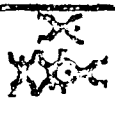
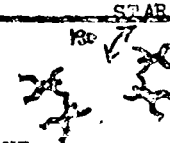
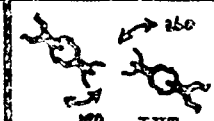
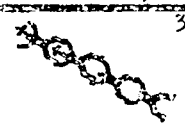
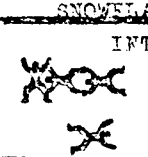
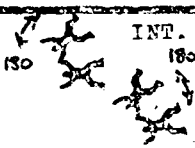
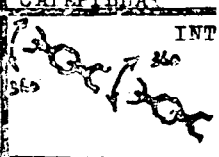
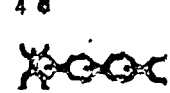
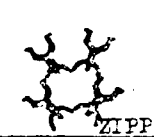
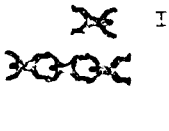
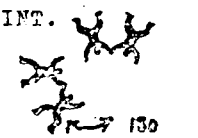
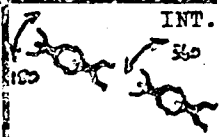
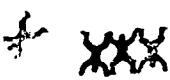
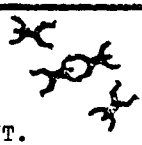
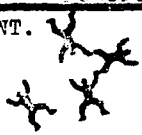
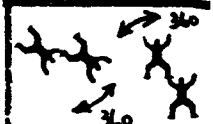
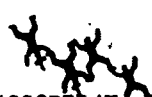
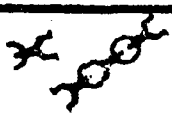
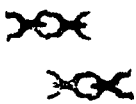
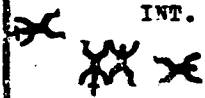
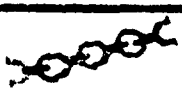
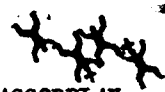
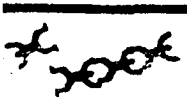
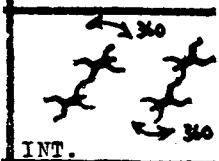
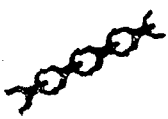
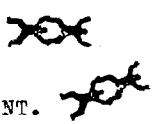
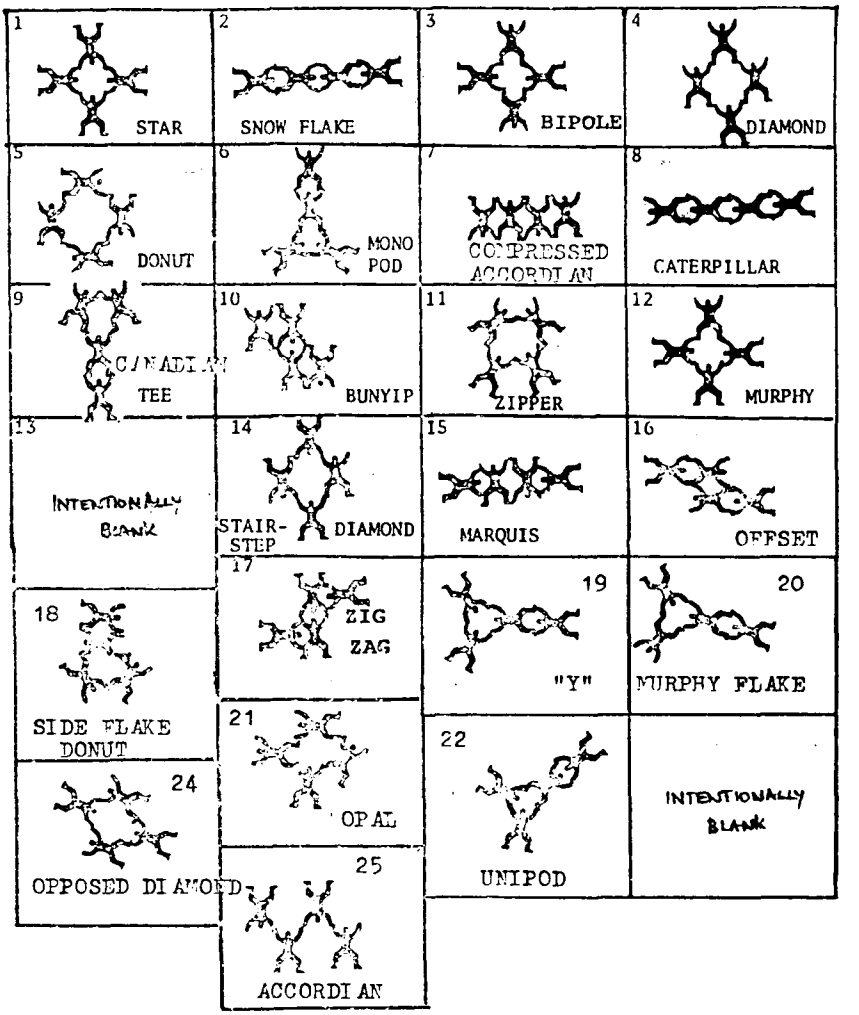
1  CANADIAN TEE	1  DIAMOND	1  COMPRESSED ACCORDIAN	1  BIPOLE	
 INT.	 INT.	 INT.	 INT.	
2  CANADIAN TEE	2  STAIRSTEP DIAMOND	2  SNOWFLAKE	2  STAIR- STEP DIAMOND	
 INT.	 INT.	 INT.	 INT.	
3  SPEARHEAD	3  DIAMOND	3  CATEPILLAR	3  ZIPPER	INTENTIONALLY BLANK
 INT.	 INT.	 INT.	 INT.	
4  DIAMOND	4  STAIRSTEP DIAMOND	4  DONUT	4  OFFSET	
 INT.	 INT.	 INT.	 INT.	
5  CANADIAN TEE	5  DIAMOND	5  MURPHY FLAKE	5 CATEPILLAR	
CONTINUE FROM 1	CONTINUE FROM 1	FREE TRANSITION	FREE TRANSITION	

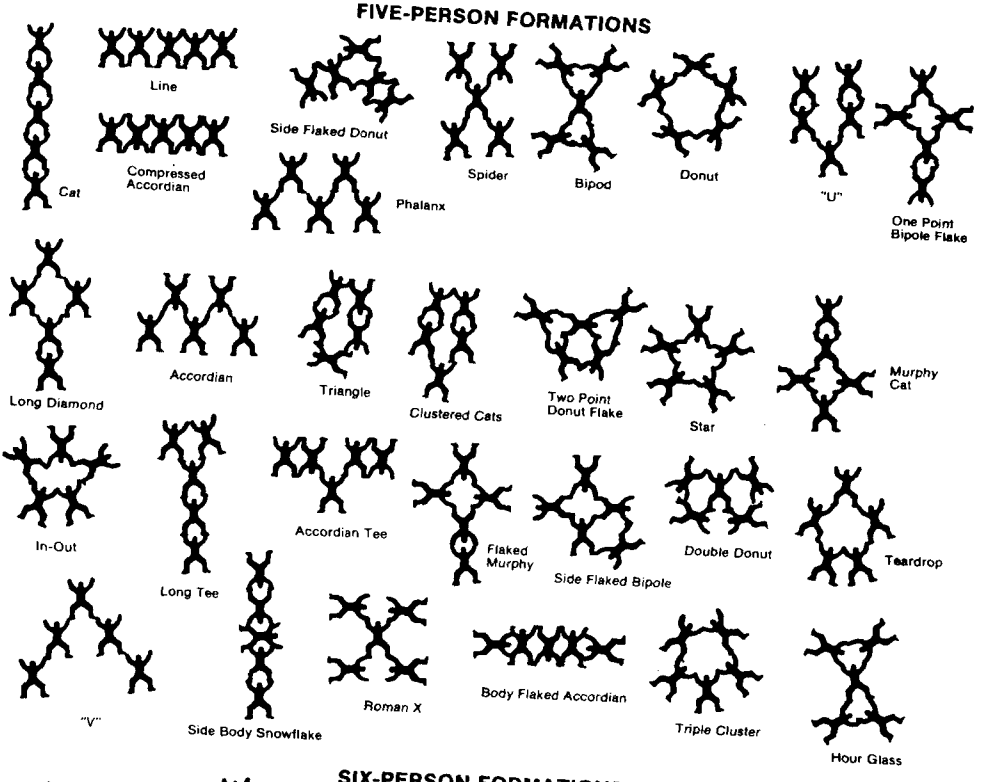
NO. 6	NO. 7	NO. 8	NO. 9	NO. 10
 ZIPPER	1  COMPRESSED ACCORDI AN	1  STAR	1  CATEPILLAR	1  SNOWFLAKE
 INT.	 INT.	 INT.	 INT.	 INT.
 ZIPPER	2  THREE & ONE	2  STAR	2  CATEPILLAR	2  SNOWFLAKE
 INT.	 INT.	 INT.	 INT.	 INT.
 OPAL	3  ACCORDI AN SNOWFLAKE	3  ZIPPER	3  CATEPILLAR	3  CATEPILLAR
 INT.	 INT.	 INT.	 INT.	 INT.
 SNOWFLAKE	4  ONE & THREE	4  ZIPPER	4  CATEPILLAR	4  CATEPILLAR
 INT.	 INT.	 INT.	 INT.	 INT.
OPAL	5 CATEPILLAR	5 STAR	5	5
INT.	FREE TRANSITION	CONTINUE FROM 1	CONTINUE FROM 1	CONTINUE FROM 1

NO. 11	NO. 12	NO. 13	NO. 14	NO. 15
1  COMPRESSED ACCORDI AN	1  CATEPILLAR			1 OPPOSITE STAIRSTEPS 
 INT.	 INT.			 INT.
2  CCORDI AN 2 MAN	2  MONOPOD			2  OPPOSITE STAIRSTEPS
INT. 	INT. 			 INT.
 ACCORDI AN CAT	3  BIPOLE	INTENTIONALLY Blank		3  ACCORDI AN STAIRSTEPS
 INT.	 INT.			INT. 
 CAT 2 MAN	4  OFFSET			4  ACCORDI AN STAIRSTEPS
 INT.	 INT.			 INT.
5  CATEPILLAR	5  DONUT			5 OPPOSITE STAIRSTEPS 
FREE TRANSITION	 INT.			CONTINUE FROM 1

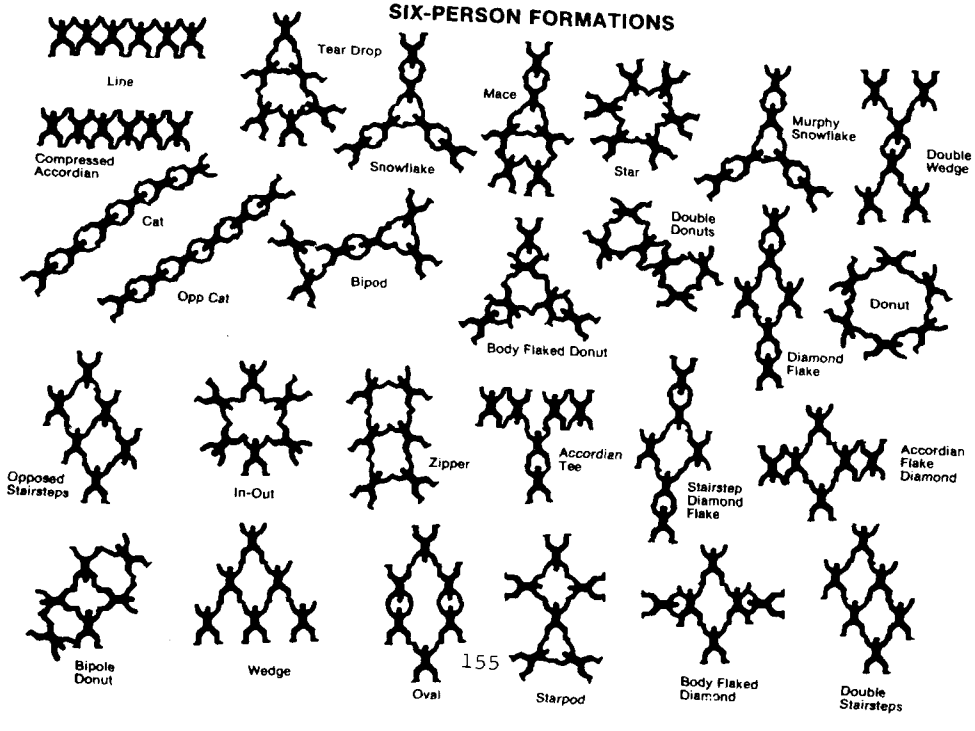
4-MAN EVENT - RANDOM FORMATIONS (1979)



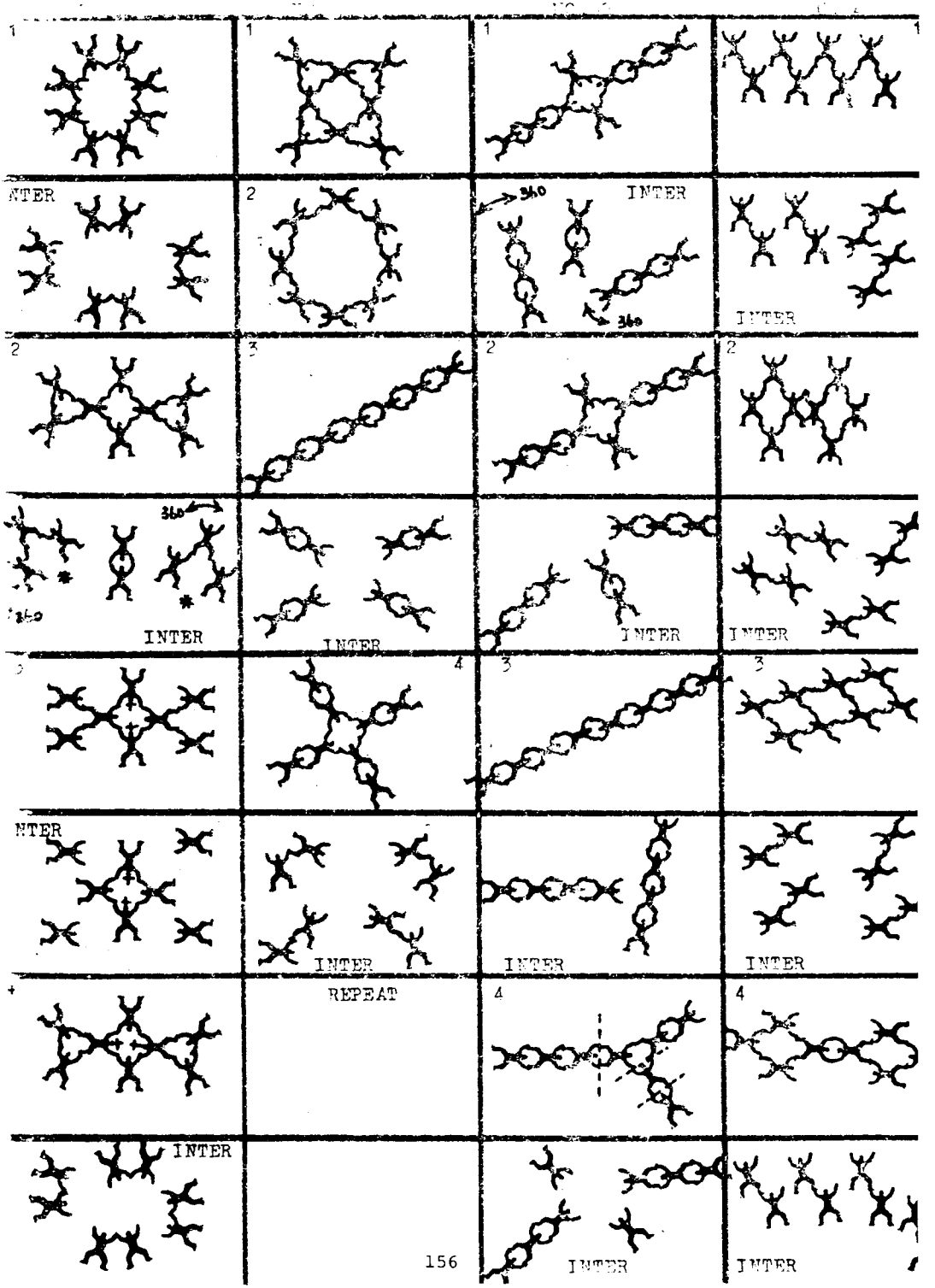
FIVE-PERSON FORMATIONS

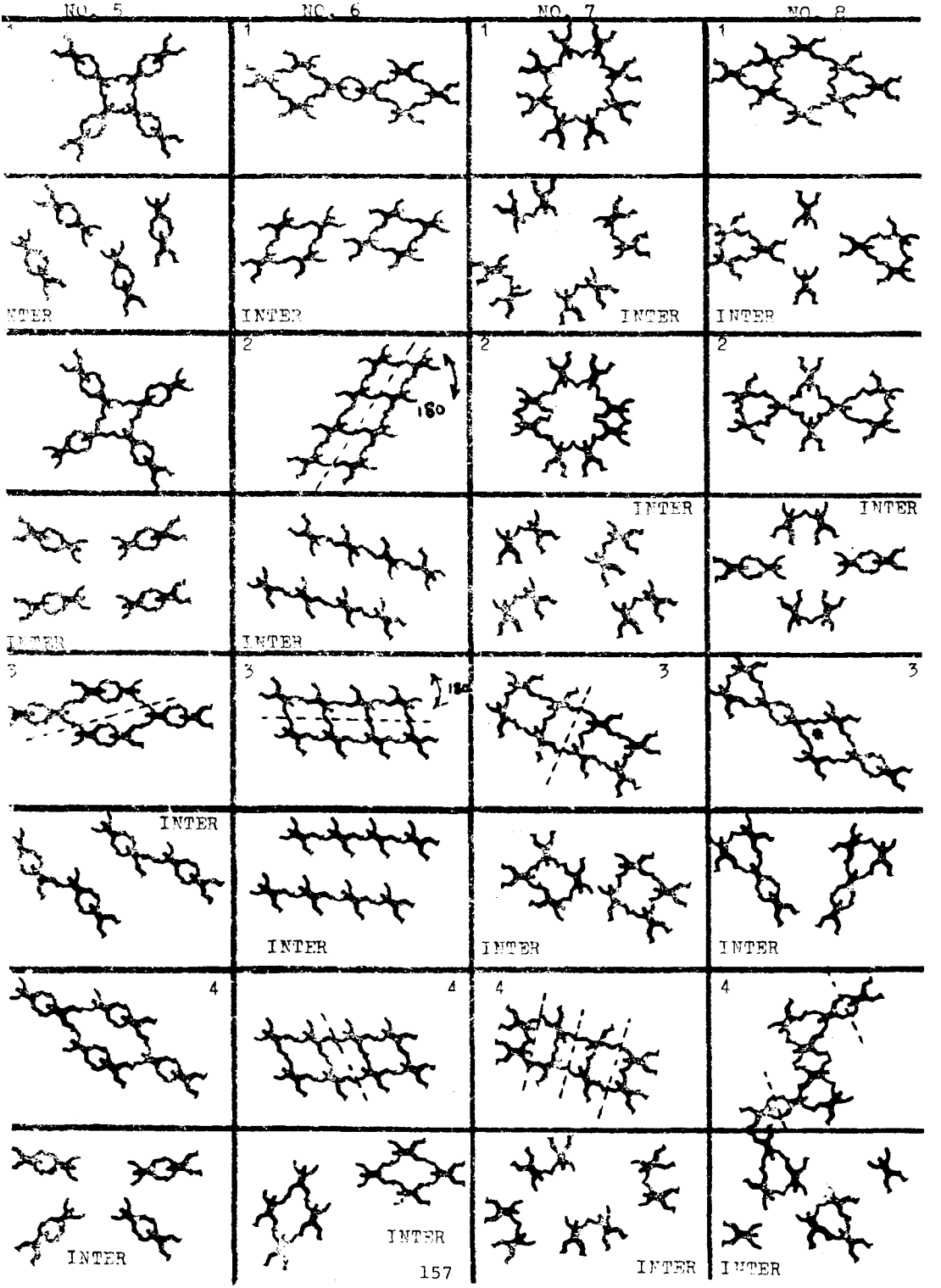


SIX-PERSON FORMATIONS



8-MAN EVENT - SET SEQUENCES (1979)




NO. 5
NO. 6
NO. 7
NO. 8
1
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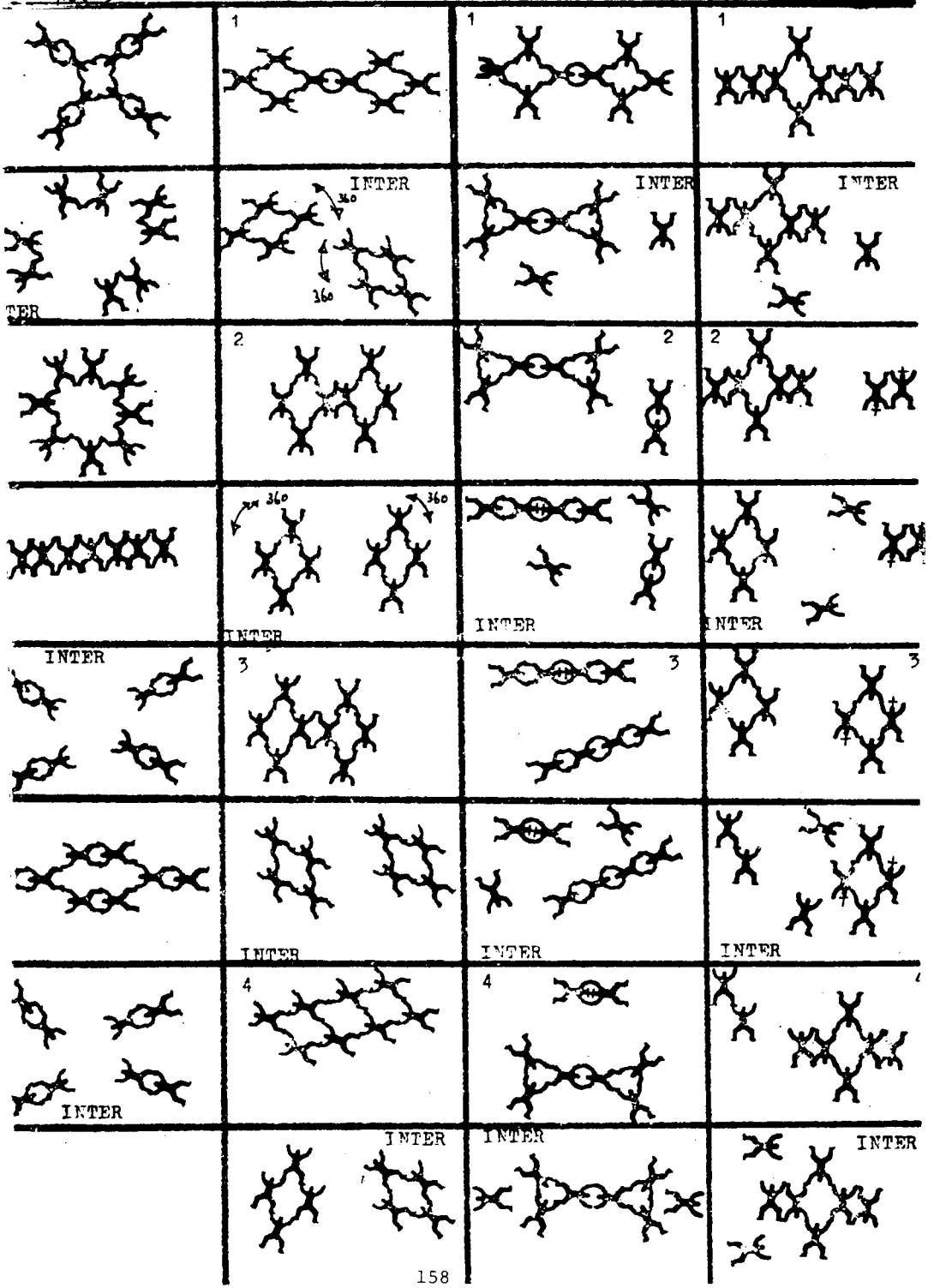
1
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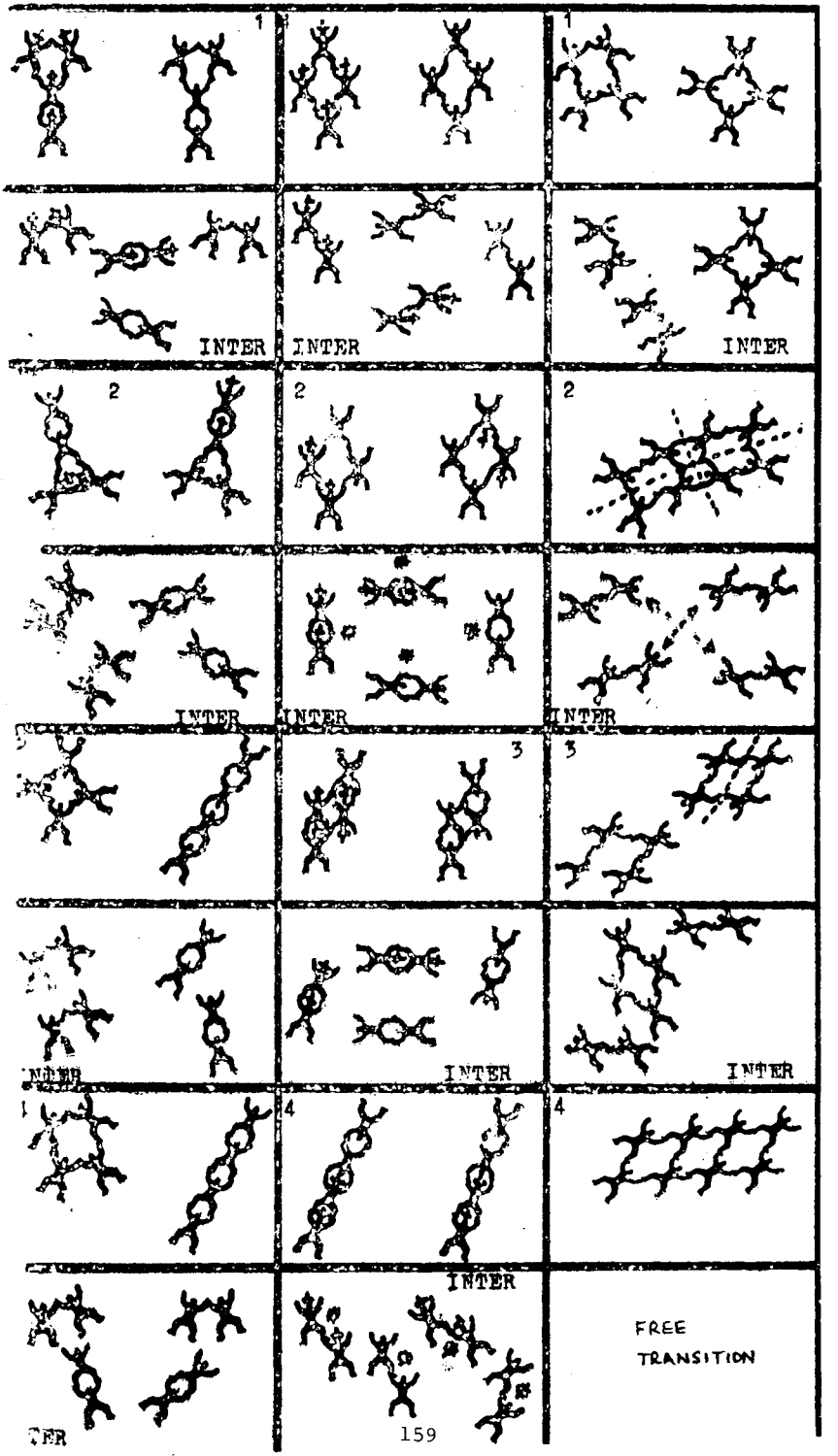
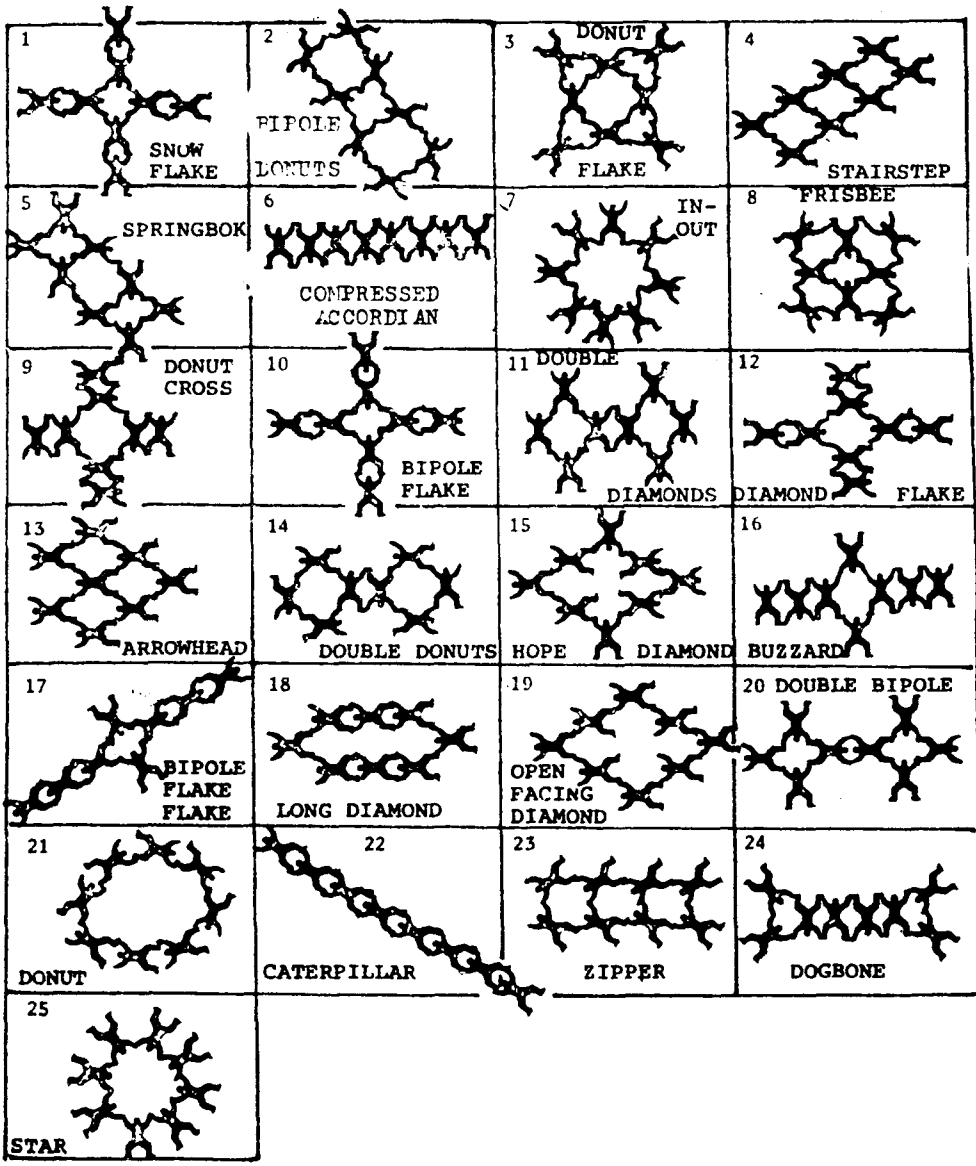
INTER
INTER
360
160
TER
2
2
2
360
360
INTER
INTER
INTER
3
3
3
INTER
INTER
INTER
4
4
INTER
INTER
INTER

NO. 13 NO. 14 NO. 15



8-MAN EVENT - RANDOM FORMATIONS

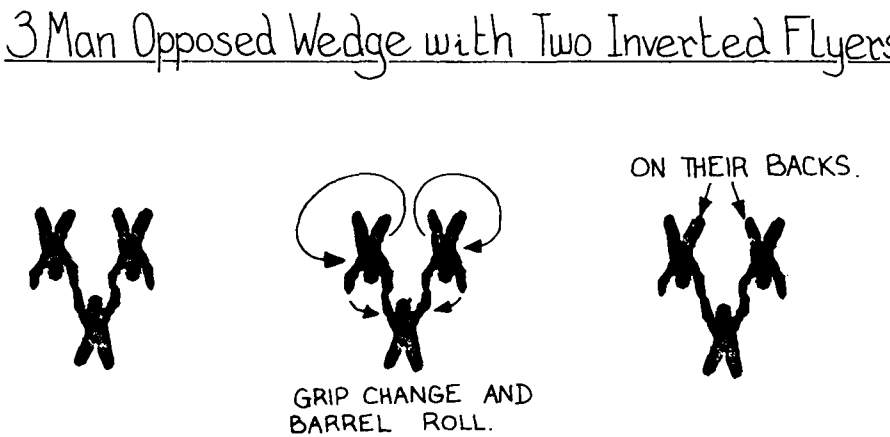


A COLLECTION OF DIVES

One could produce volumes and volumes of different dives. The intention of this small collection listed here is to provide you with food for thought. The phrase "Variations on a theme" springs to mind. So many facets of any dive can easily be extracted and applied to other dives with either less people or more people. There may well be ideas or concepts here, that you personally haven't been aware of until now. I certainly hope so.

3 MAN OPPOSED WEDGE WITH 2 INVERTED FLYERS

Your lead sets up and the two wing men take grips normally on him. Once settled the point man gives the signal and the wing men reach in with outside arms and barrel roll out simultaneously. A good fun single formation 3 man dive.



The following dives are three person sequential dives. They are grouped into sets of 3, 4, 5, and 6, manoeuvres. You can grip change or free-fly where applicable or completely change the sequences. Three people dives are usually very successful and lots of fun!

3 Man Sequential.

3 Manoeuvres.



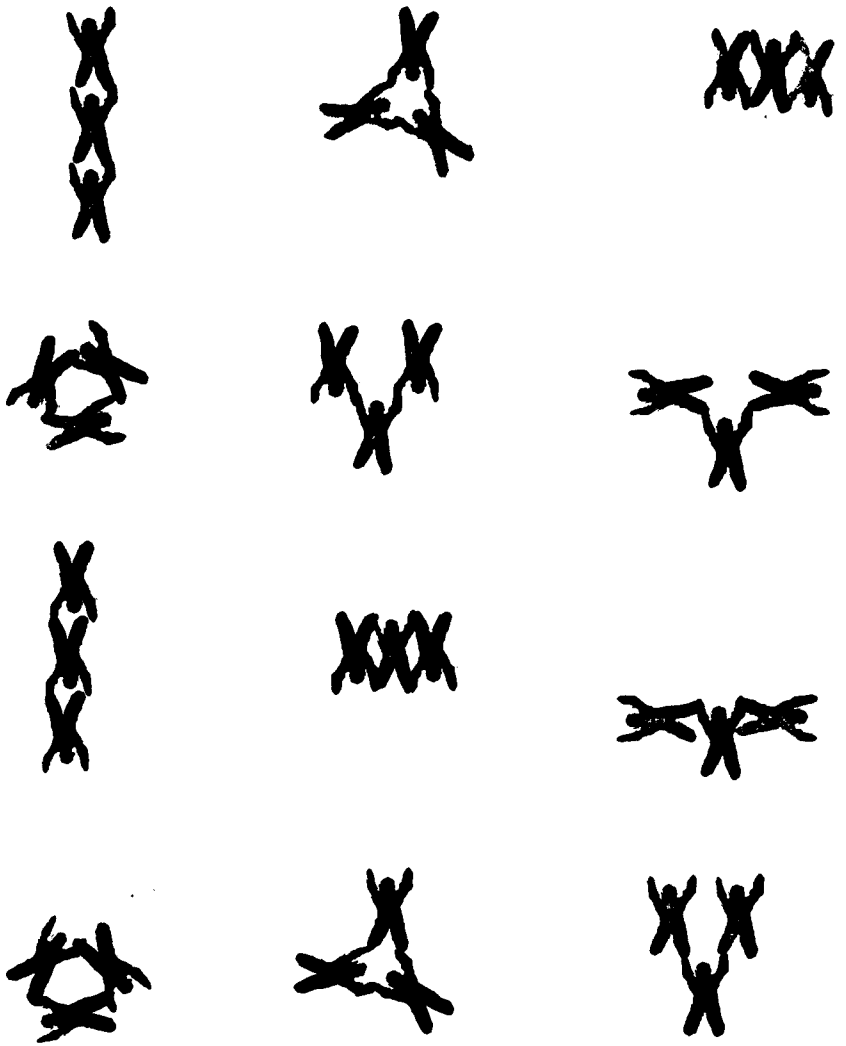




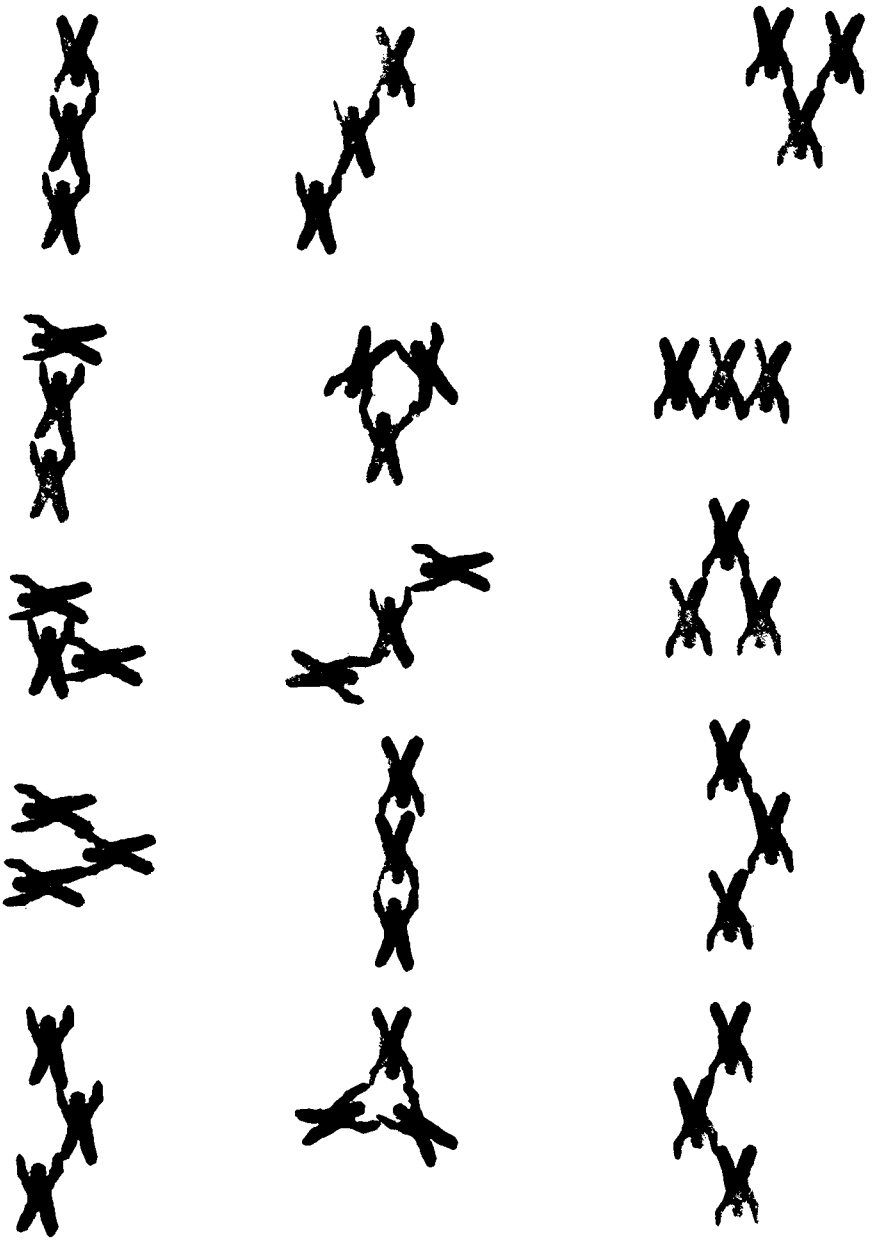


3 Man Sequential.

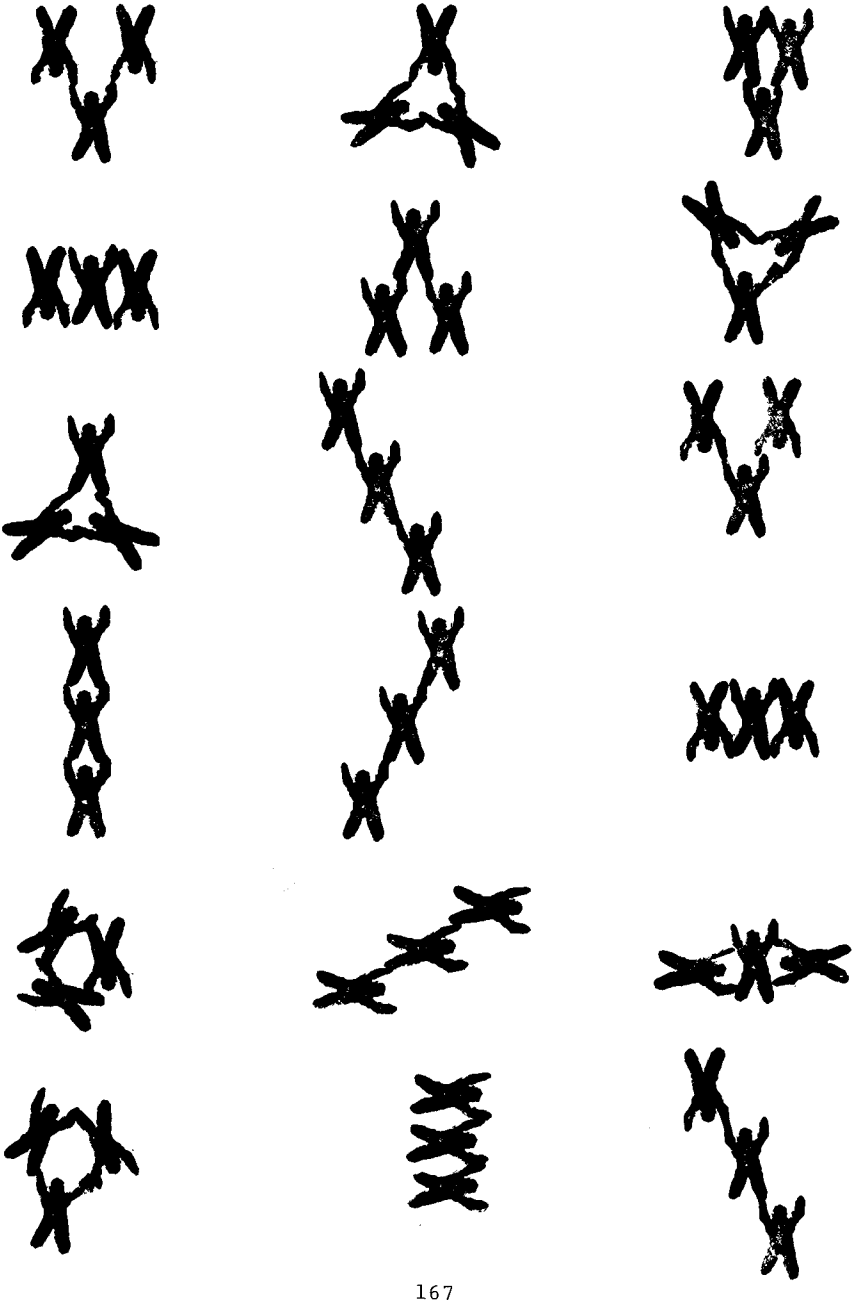
4 Manoeuvres.



3 Man Sequential - 5 Manoeuvres.

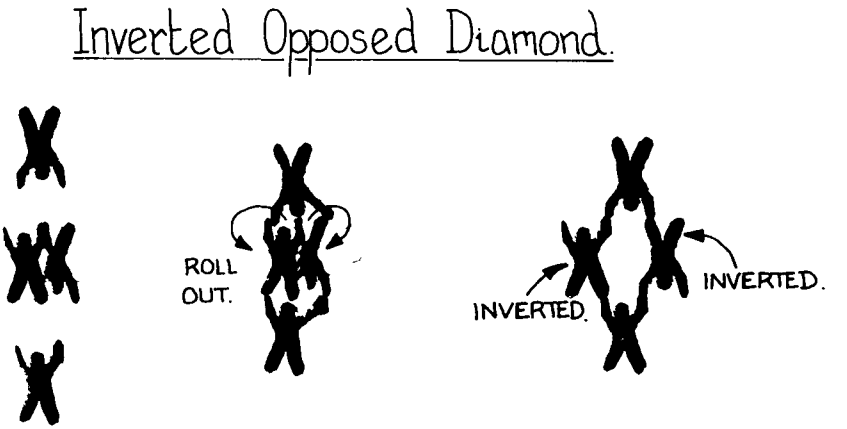


3 Man Sequential - 6 Manoeuvres.



INVERTED OPPOSED DIAMOND

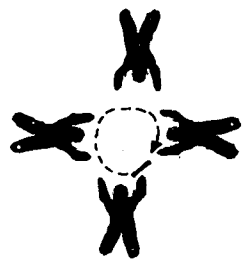
This is a pure fun single formation dive. You build an accordian base. The point and tail men take outside arm and leg grips. On a given signal the wing men roll out simultaneously onto their backs!



4 MAN BATON PASS AND BODY AWARENESS

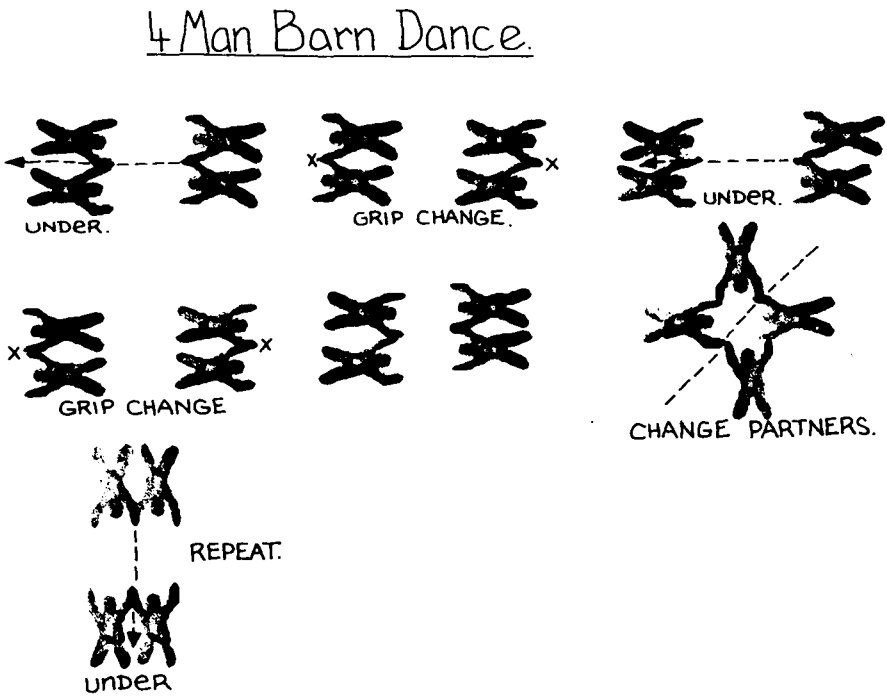
Set up a 4 man non-contact star. One person carries the baton. He starts by passing the baton from one hand to another and then to the next man. It continues around the star. You centre-point and concentrate on flying close enough together to be able to "pass" without having to move laterally.

4 Man Baton Pass and Body Awareness.



4 MAN BARN DANCE

Set up 2 x 2 man lines facing each other. Fly one line underneath the other. Grip change both lines back to face each other. Then fly the other line underneath and grip change back to face the centre. Centre-point for a 4 man star and change partners into 2 new 2 man lines. Repeat the process.



MYSTERY DIVE

This can be any number of people. The easiest type of mystery dive is a single formation dive.

You design the formation and secretly allocate slots. You then write all the jumpers names down on separate pieces of paper with their instructions for the dive, i.e.

"PETE SMITH YOU ARE CENTRE FLOATER YOUR TASK IS TO GRIP MIKE'S RIGHT KNEE WITH YOUR LEFT HAND AND FLY THERE UNTIL SOMEONE PICKS UP YOUR RIGHT HAND. MIKE IS WEARING A BLUE JUMPSUIT WITH RED STRIPES AND HAS A BLACK RIG."

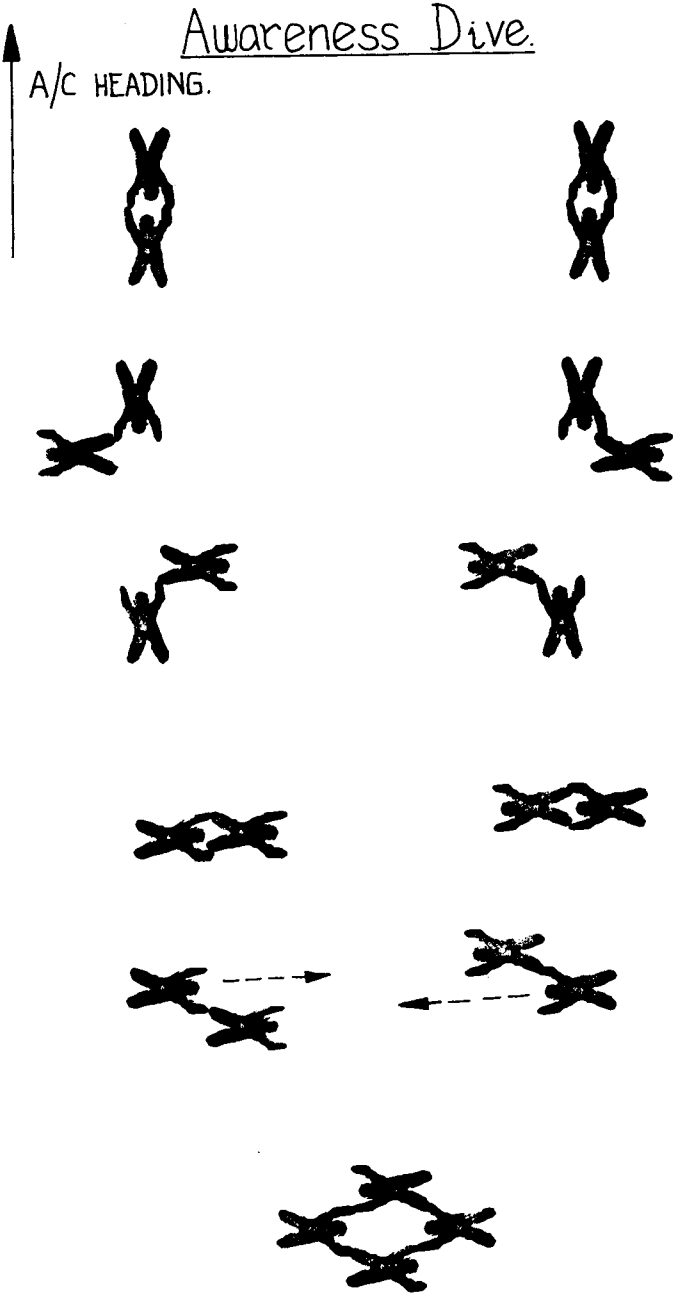
Each jumper receives his paper about 2000 ft before jump run. There is no dirt-dive. You ensure that everyone reads their instructions and then throws them out of the aircraft door. These dives are great fun and an ideal way of relaxing if your normal sky diving is becoming too intensive!

Try it, you will enjoy it and so will the sceptics who go with you!

AWARENESS DIVE

These can also be of a metamorphis type as well. As I understand it, any dive that makes you concentrate on levelling with another formation as well as your own comes into this class. It can be any number of people and any number of formations. The following example is for 2 x 2 man formations. The simplest.

Awareness Dive.

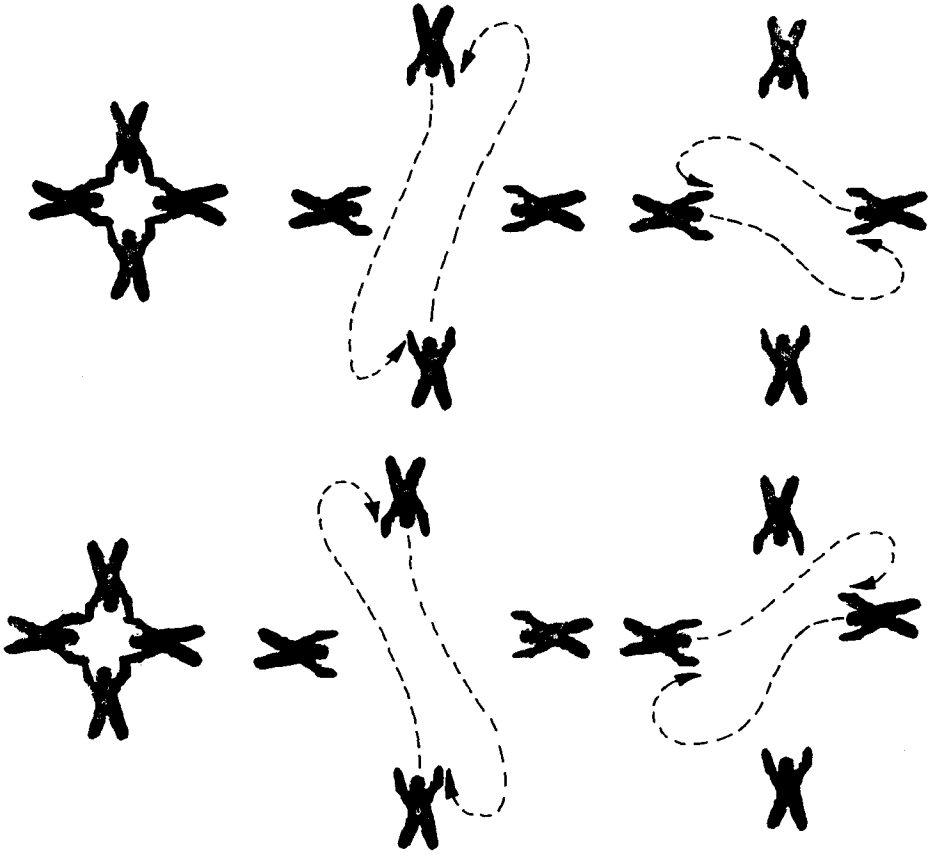


MOVEMENT DIVES

Sequential discipline, slots, exit order and all of that, sometimes becomes tedious. Pick a formation that is symmetrical that you can build in any order. Now you can exit how you like and build it with happy ill-disciplined random.

Now find a single MOVEMENT that everyone can do that rebuilds the same formation. Include non-contact flying and a pulse. The following is a simply 4 man movement dive. But you can do this with any number. Movement dives are the essence of control in the air. They are also tremendous fun.

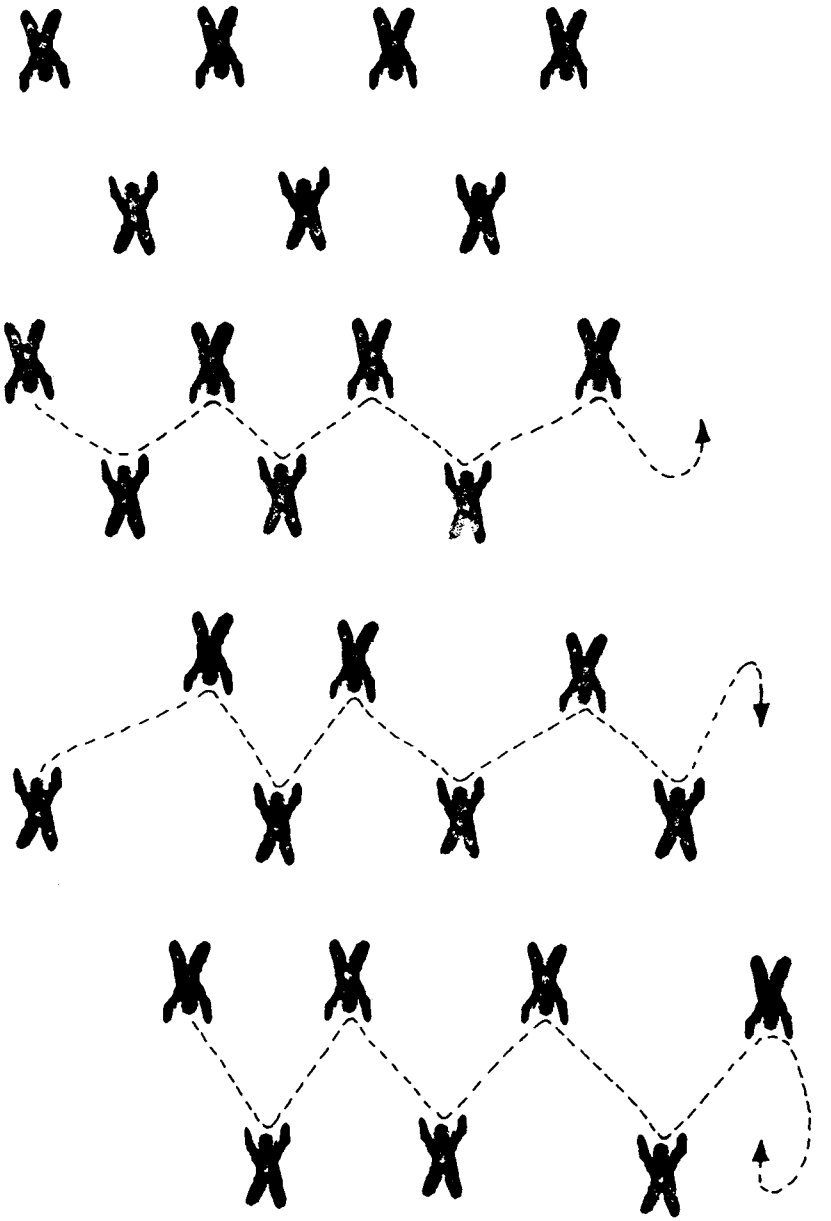
Movement Dives.



TIG DIVE

This can be done with any number of people. Set up two lines non-contact and staggered as well as opposed. The end flyer zig-zags down the lines touching everyone and assumes a position on the end. The next man follows and so on. It is amusing and relaxing and taxes your flying ability in a "Slalom" like race!

Tig Dive.

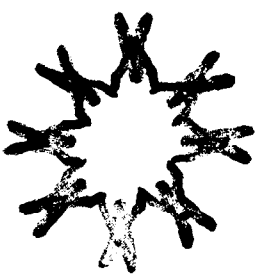


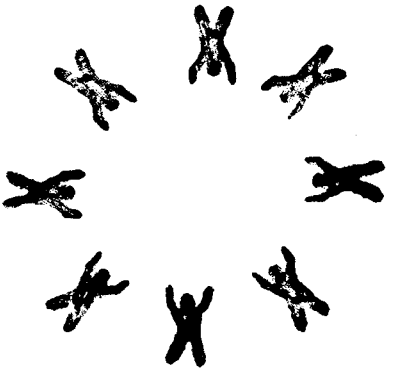
CONTINUE.

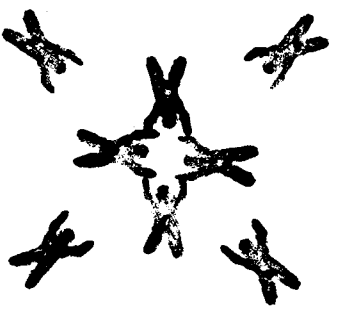
SKY DANCE

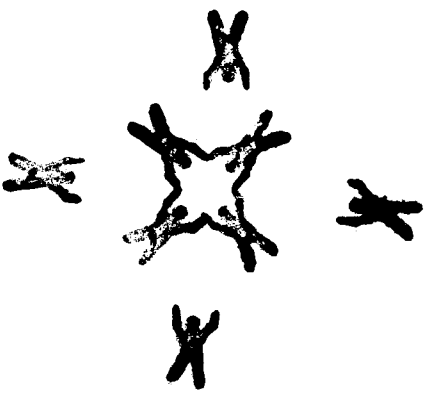
Nearly all dives are dances in the sky. The term sky dance is usually applied to dives where groups meet in the centre of a formation and then move out again. Some of these dives may be done vertically and are then referred to as fountain dives. The following example is an 8 man sky-dance. You will notice extensive use of non contact and a mixture of many of the techniques we have been looking at. This dive is very beautiful to perform and to be part of.

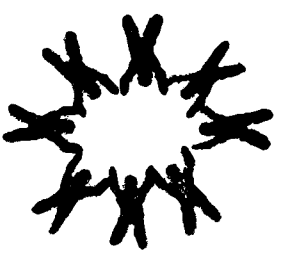
Sky Dance.

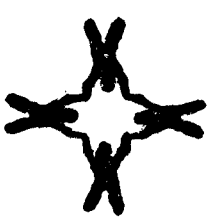


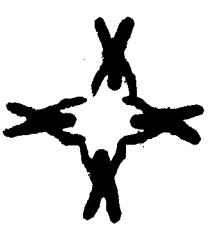


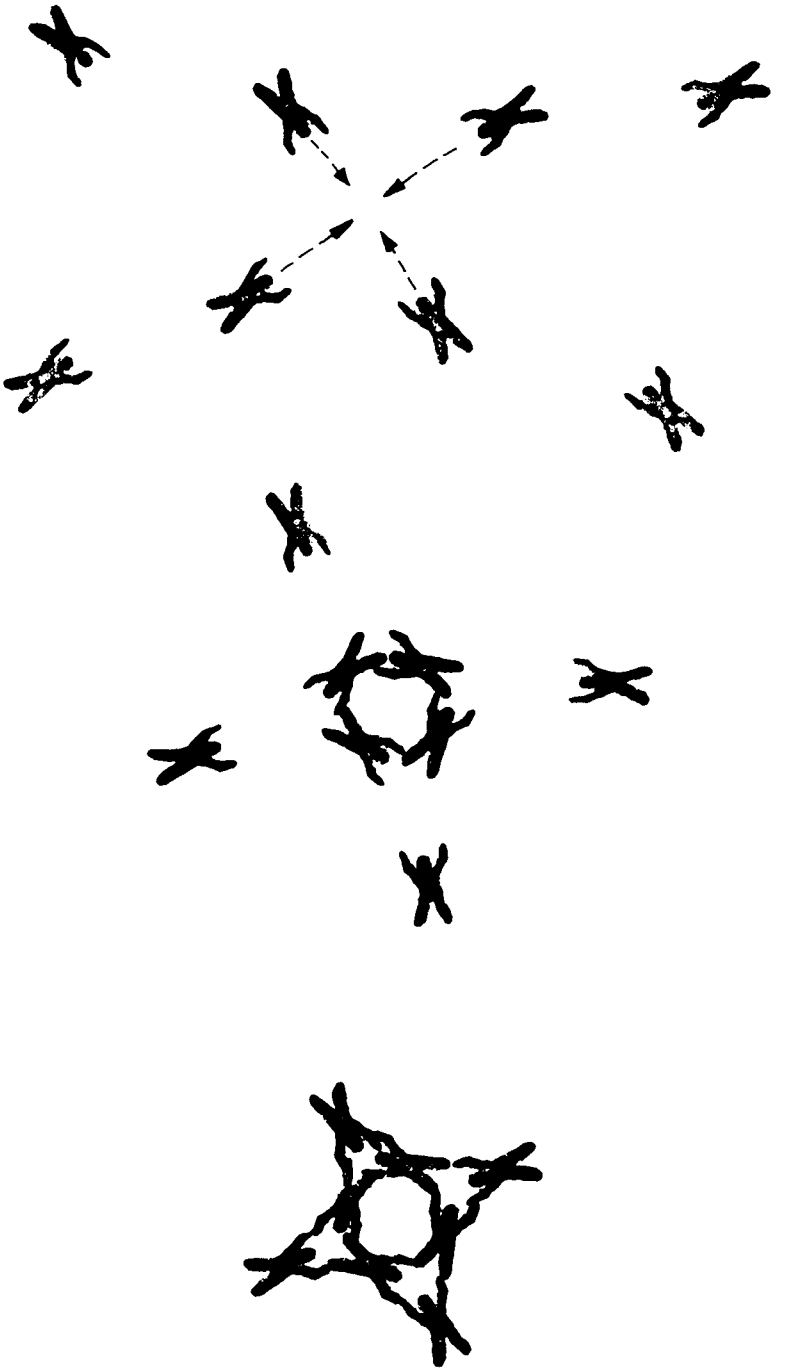








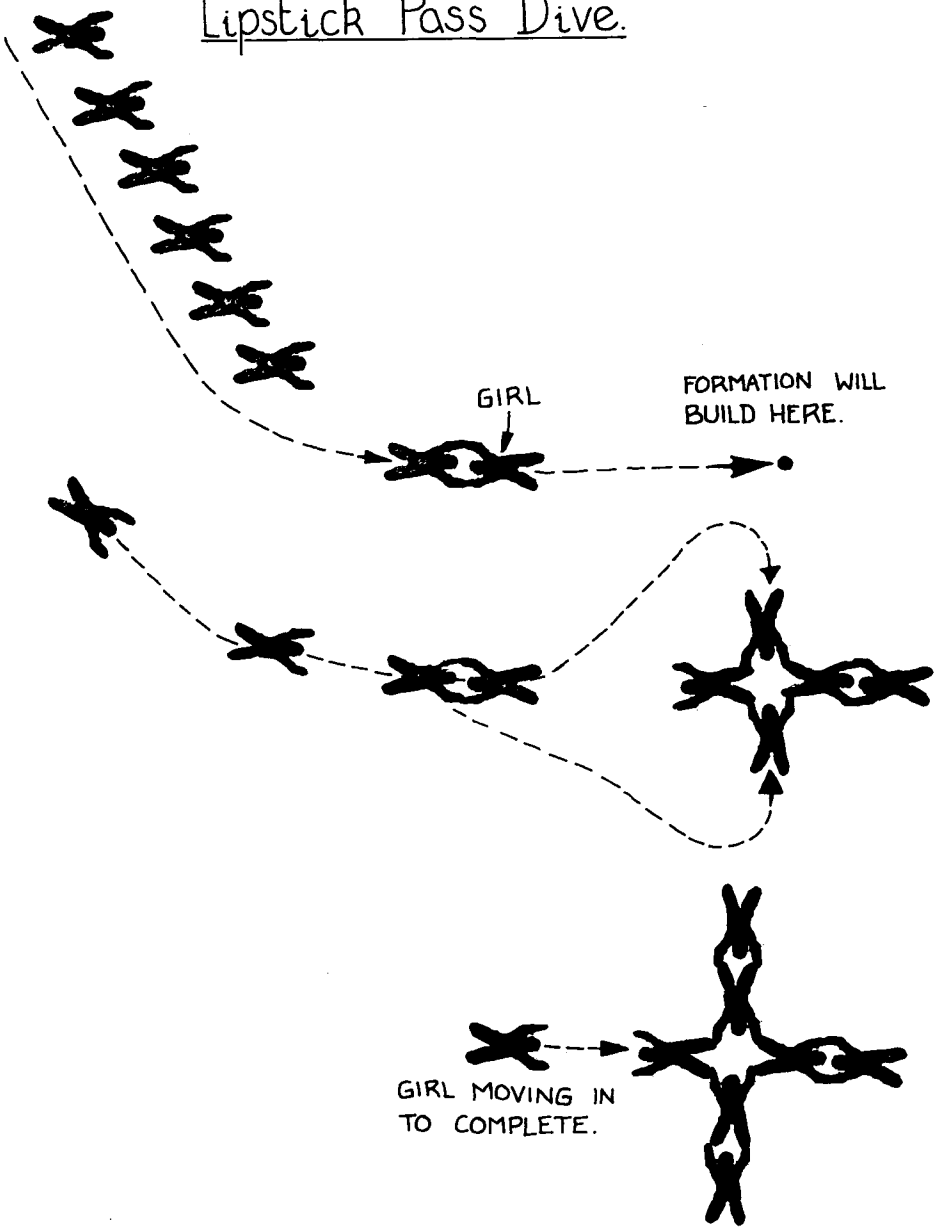




LIPSTICK-PASS DIVE

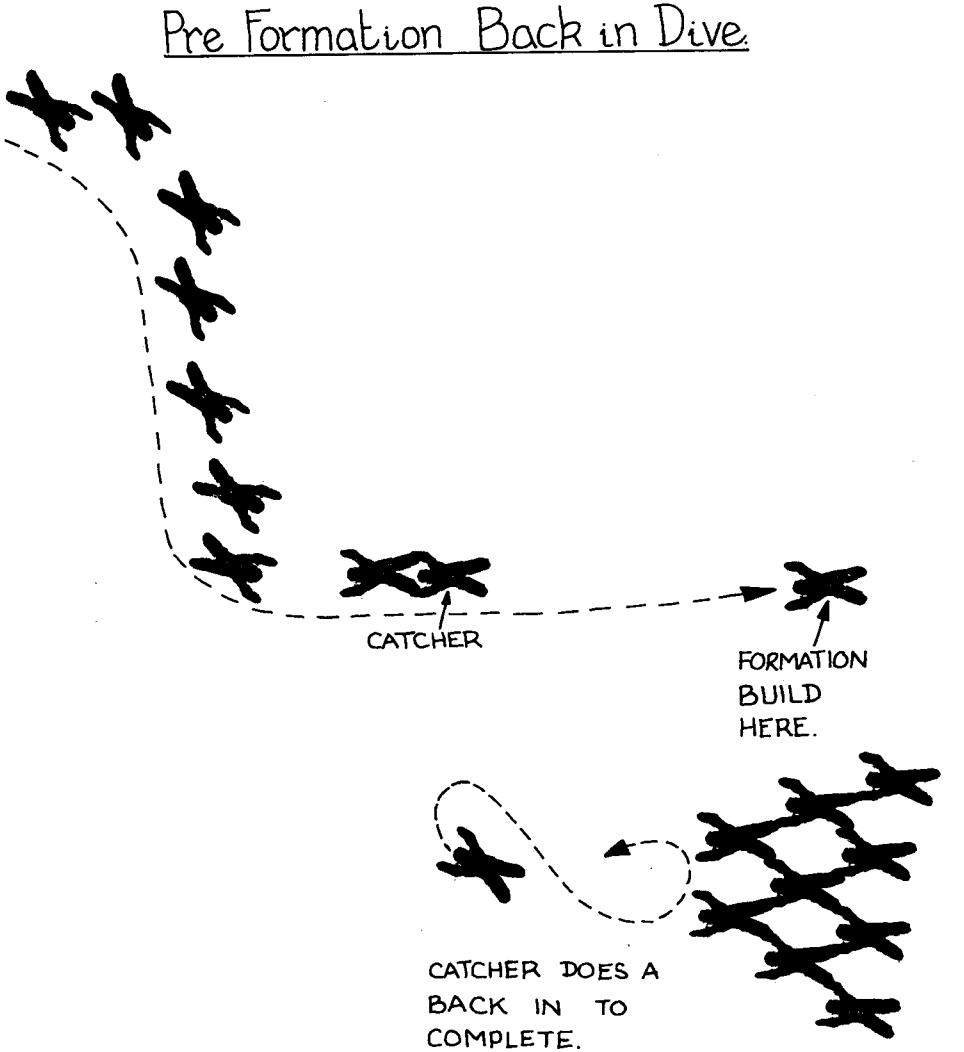
Basically you need 7 man and one girl for this. The Girl sets up an aircraft heading and the men stack up facing her. The object of the exercise is for everyone to kiss the Girl first and then go across to the formation which is building once the first man is through. The girl closes on the formation last. It is an ideal dive for a girls SCS load. It also seems to have a very beneficial effect on the mens eagerness and flying speed!

Lipstick Pass Dive.



PRE-FORMATION BACK-IN DIVE

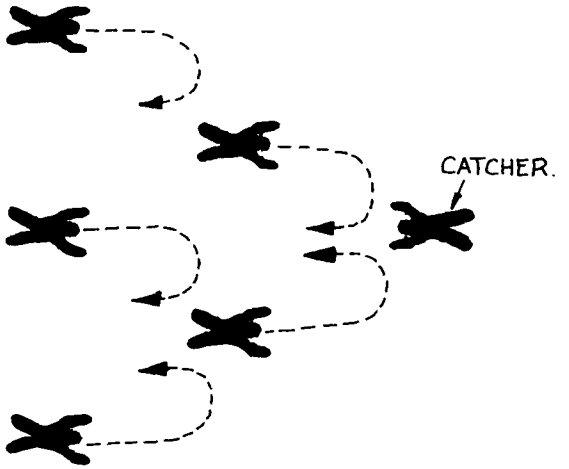
You can use this technique to practice anything and with any number of people. You get up a catcher who receives a back-in from every one on the sky dive. After the "back-in" each individual moves across to the formation building alongside the catcher. The difficulty in maintaining proximity and altitude with the two groups. It is a very good dive and lots of fun. You are guaranteed a lot of practice at least at your "back-ins".

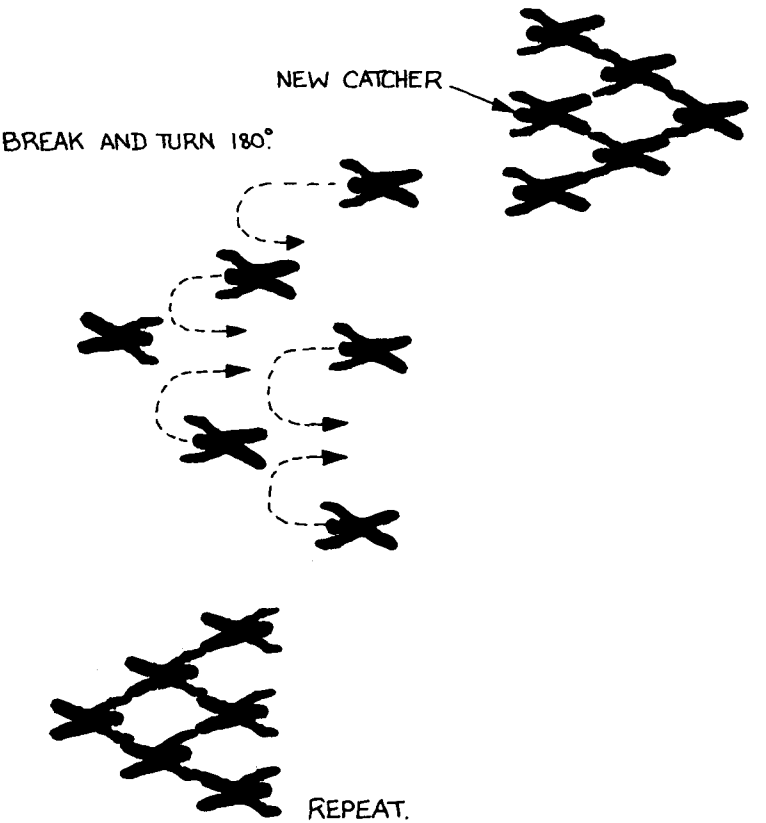


"BACK-IN" WEDGE DIVE 6 MAN

This is basically a Six man wedge built with everyone backing in to a catcher. Then it breaks and another person on the far side becomes the new catcher. Everyone does a 180 degree turn and another back-in to rebuild a new wedge. It is also an infinity dive as there is no end to it. Again it is tremendous value and good fun!

Back in Wedge Dive 6 Man.

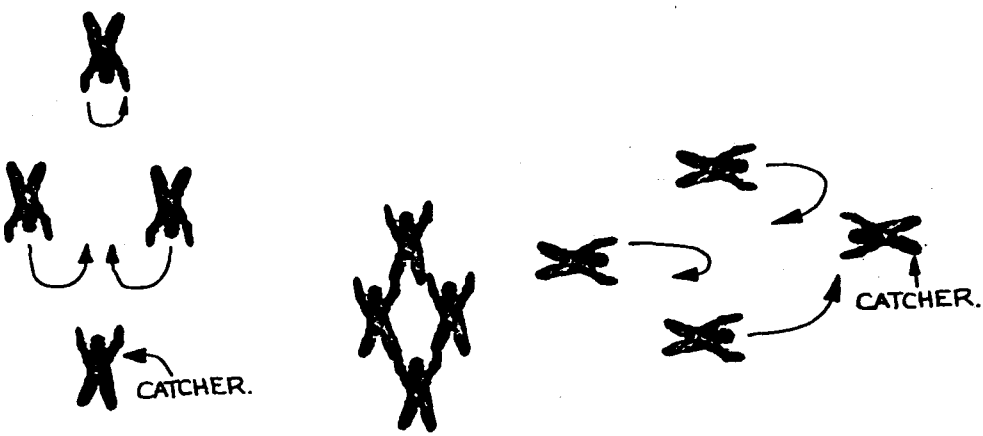


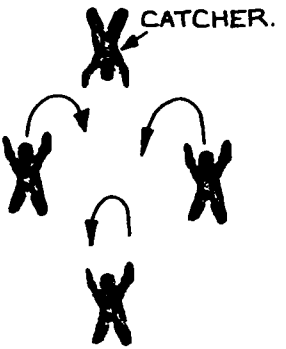

NEW CATCHER
BREAK AND TURN 180°.
REPEAT.

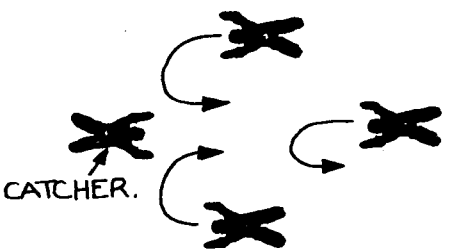
DIAMOND BACK IN DIVE

The basic principle here is just rebuilding the same formation on different headings using back ins all the time. It's a good fun dive and of great training value. Everyone gets a chance to practice either "Catching" or "backing in" or both.

Diamond "Back in" Dive.



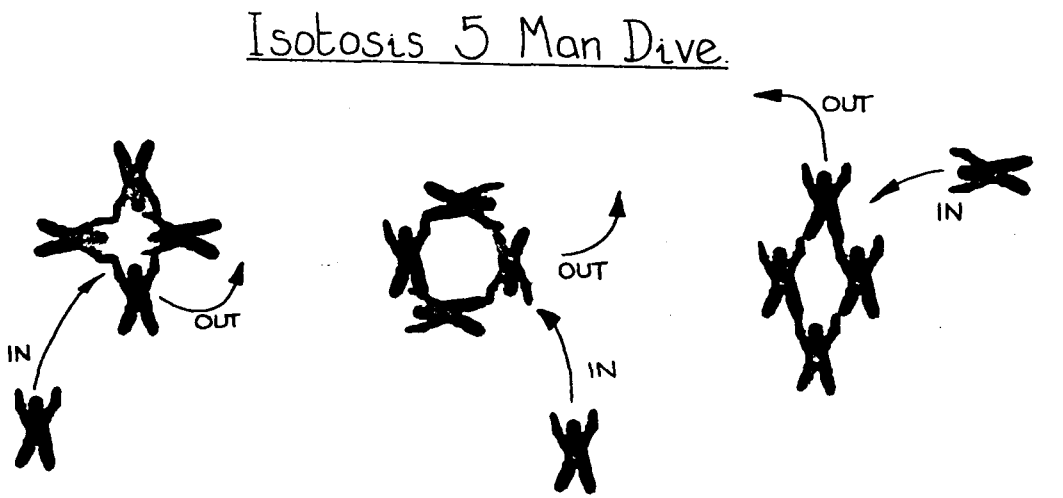

CATCHER.

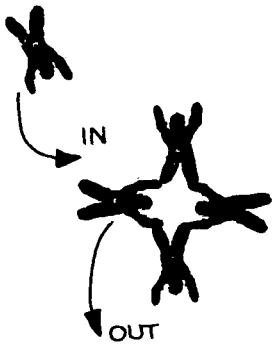

CATCHER.

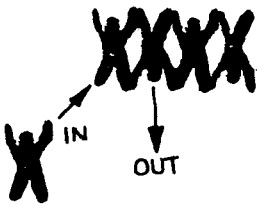

REPEAT.

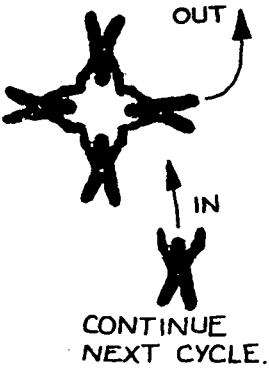
ISOTOSIS DIVE 5 MAN

A four man dive with 5 people. A way of practising your team alternate. This dive requires quite a high degree of concentration. You can make up your own isotosis dive quite easily. The principle is that you have one person out on each formation, but, he or she comes in on the next formation. With each completed "cycle" you change places in the different formations and thus your memory and dirt diving has to be very good.



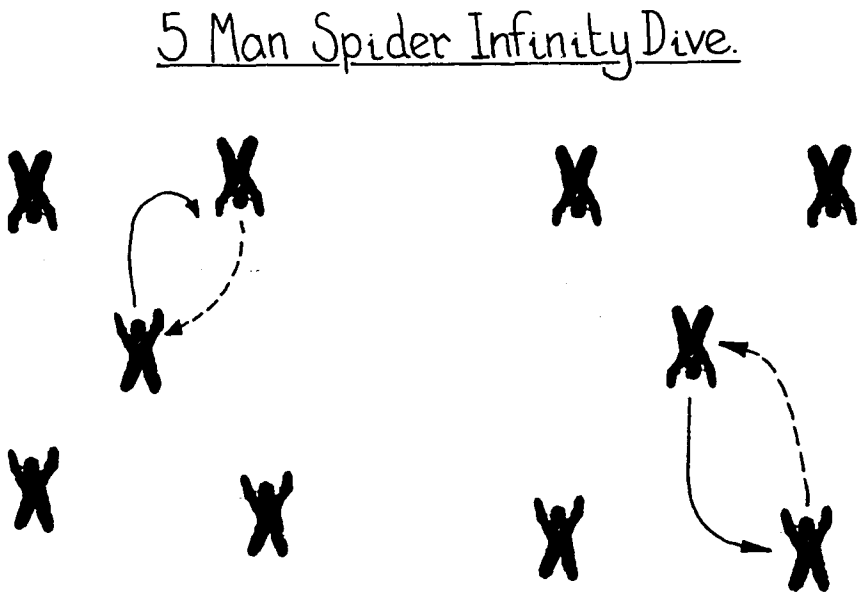

IN
OUT

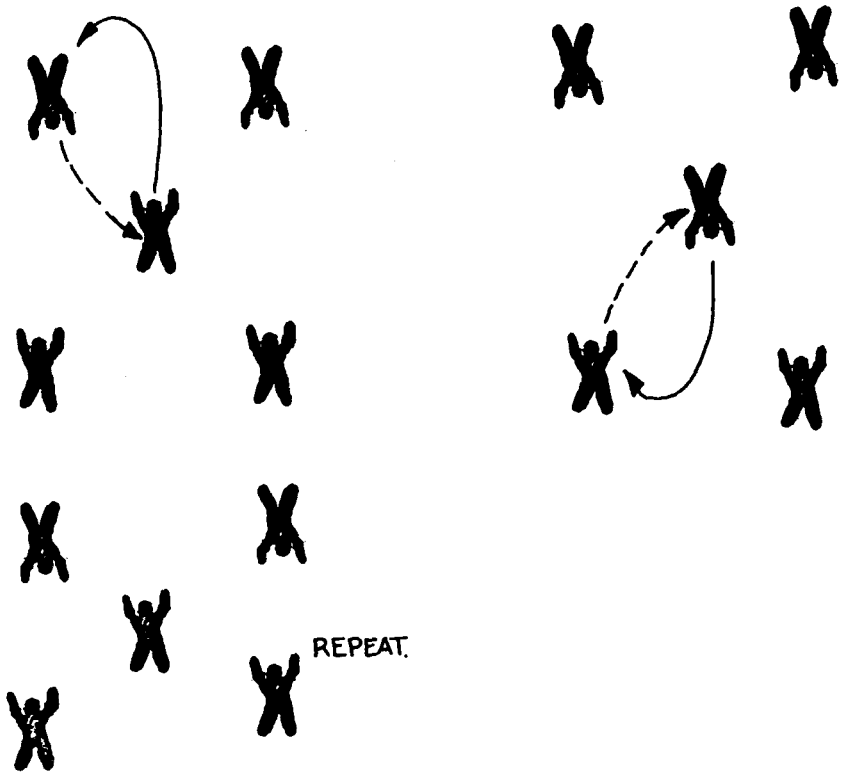

IN
OUT


OUT
IN
CONTINUE
NEXT CYCLE.

5 MAN SPIDER INFINITY DIVE

Set up a non-contact 5 man spider. Take it in turns to move into the centre. If you are moving into the centre you move straight forward into position. If you are moving out of the centre you must do a 180 degree turn to match the formation again. It is all non-contact flying and levelling and everyone gets to move. This is a very good training dive and really helps to improve your flying. Maintain eye contact with your opposite number and the centre man throughout the dive.

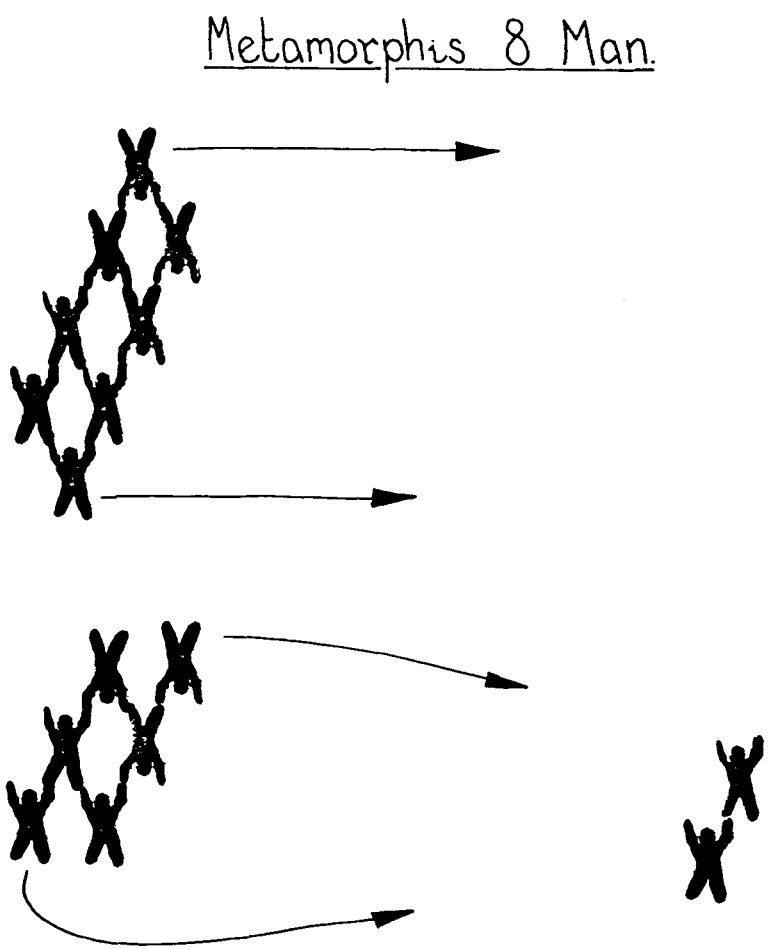


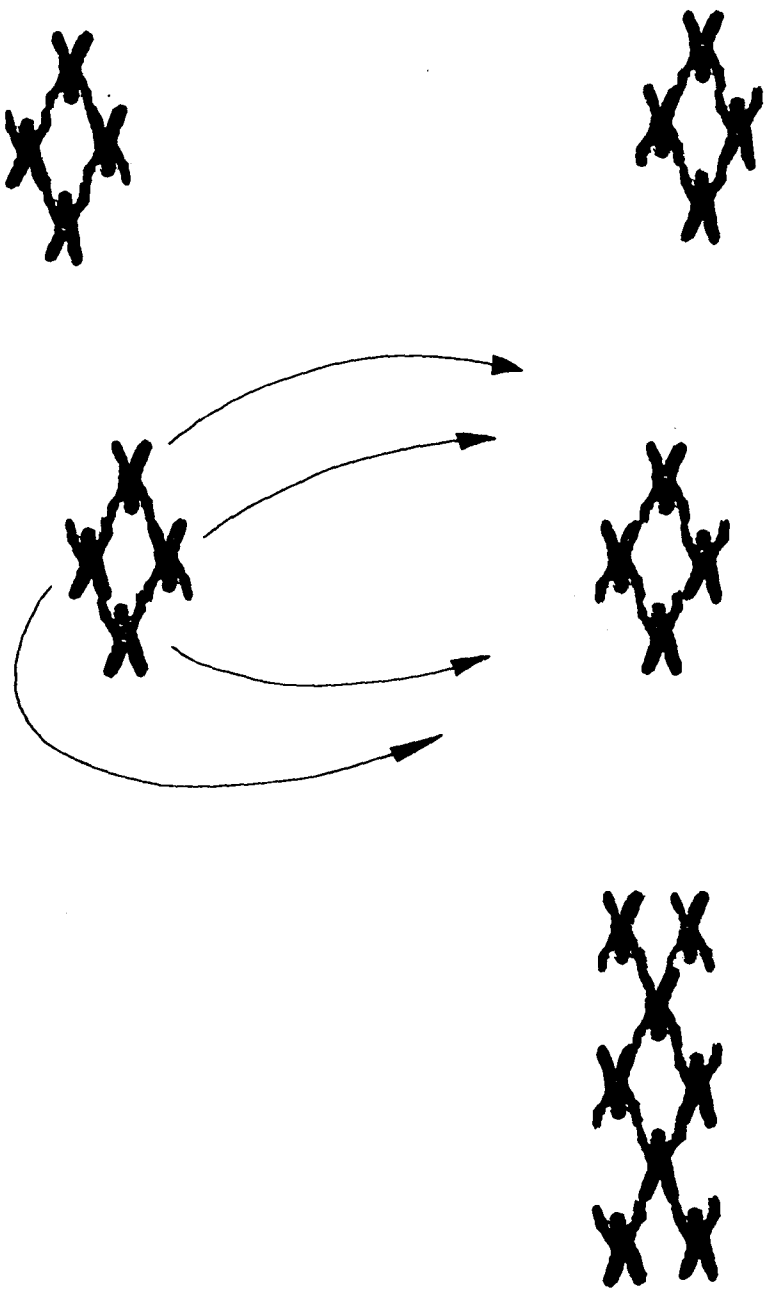

REPEAT.

METAMORPHIS 8 MAN

A dive in which one formation changes slowly to another, but in a different location to the first. So as the first formation decreases and changes shape, the second formation builds and takes shape.

You can do this with any number of people. It is lots of fun and very creative!





THE FUTURE

Mans imagination never ceases to surprise him. We now have sky-divers building formations in 3 dimensions. There are various types of 3 D dives currently being tried. Visual Game dives seem to be catching-on too. Sky divers form bats, and balls, snookercues, nets and all other sorts of sporting equipment. The falling bodies visually represent the "shape" to a ground-bound onlooker. The spectator actually watches "the Game" in progress.

Races of various types seem to be in vogue. Long pieces of paper are used in free fall in much the same way slalom poles dictate courses to downhill skiers.

People are generally having lots of fun in the air. Competition is after all only one small facet of our sport.

The relatively small amount of time, that your life-span, allows you to spend in free fall, reminds us, that we are only scratching the tip of the iceberg.

Relative Work has an incredible future infront of it. As I write these words, sky divers all over the world are dreaming up new ways, means, ideas and concepts, to have fun in the air.

The competition of the future may well be judged on grace, beauty, timing, imagination and pure spiritual content of the dive!

The whole subject is virtually untouched. Everybody has something to contribute. It is so new that we can all make discoveries and findings every time we jump.

You are your own explorer, and your realm is free-fall!

ARTWORK BY
R. W. THOMASSON