FLYING THE REV

AND HOW TO DO IT

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The authors are not responsible for any accident or injuries that may occur as a result of an individual using any controllable kite or the information in this book.

As the Chinese are fond of saying,

"To fly a kite
is to hold the wind in your hands".

CONTENTS

INTRODUCTION

We are writing this book out of a desire to share what we have learned about flying the Revolution kite. Over the past several years, as we have gained more and more hours of fly time, we have realized that flying a four line kite, such as the Revolution, is extremely difficult when you are a beginner. To have had a book or teacher would have eliminated a lot of frustration for us. We did stick with it though and managed to master the flight of the Rev and now would like to share what we have learned with you. Hopefully we have explained it in a comprehensible way that will allow you to fly this, and any other four line kite, with the ease of a pro.

As you read through this book, and especially as you read the Chapter "Beyond Basic", you may find the information overwhelming and at times confusing. Our best advise is to take it one step at a time. As you progress from one basic move to the next, the advanced moves will make sense to you and when you are ready to attempt them they will not be as hard as they sound. Don't let the reading deter you from the flying, otherwise you'll be missing out on a tremendous kite flying experience.

SAFETY TIPS

Fly safe, have fun.

When people or animals appear below the kite or between you and the kite, walk the kite away from them, land it off to the side of the wind window, or stay flying high until they are out of range. The lines can cut and the rods within the kite are strong enough to seriously hurt someone.

Avoid power lines, trees, and all other obstacles.

Do not fly when thunder clouds are present or when it is raining. The rods are made of graphite and graphite conducts.

Kites are a wonderfully fun toy, but can cause serious injury. Use common sense and Enjoy.

CHAPTER 1

THE REV

-- HOW IT COMPARES --
-- PARTS OF --
-- SETTING UP --

-- HOW IT COMPARES --

Single line kites, the original kites, are designed to fly at the top of the wind window and to remain stable. They are difficult to design in order to remain stable and are generally some of the most beautiful kites you'll see. So beautiful, in fact, that they are works of art. Some of these kites have a bridle to attach your fly line to, some have a keel, and some of them you attach your fly line directly to the rods or sticks. These kites will rise very high and remain horizontal to the wind. Meaning they will remain at the top of the wind window in a flat position with the nose, or leading edge, directed straight into the wind. Diamond shaped kites generally have a tail for the purpose of stabilizing them. Fighter kites are designed differently in the sense that if you keep the line taught it will remain stable, but if you give the line slack the kite will become unstable and begin to turn or spin, thus becoming a maneuverable kite.

The need for balance in any kite is essential. The bowing of the rods, the weight of the kite, the measurements out from the center to either side, all play a factor in how well the kite flies. If the kite is, for instance, heavier on the right side it will fly more easily to the right than it will to the left.

Two line kites can be similar in size and shape to one line kites and are designed to fly strictly in a forward direction. To turn or spin the kite you pull one handle in toward you, which pulls that line in and, as a result, that side of the kite. This slows down that side of the kite causing the other side to continue flying forward around it.

Two line kites also have a different type of bridling system. The bridle allows adjustments to be made which can change the angle of attack, allowing for a variety of wind speeds, and they also have two fly lines attached as opposed to one. Think of the bridle as being in two separate parts, one part controls one side of the sail and the other part controls the other side. The bridle also takes pressure off of the sail and evenly disperses it along the frame of the kite.

You can adjust the bridle to either angle the nose of the kite into the wind, (for lighter wind conditions), or you can angle the nose of the kite away from the wind, (for heavier wind conditions). Angling the nose into the wind also gives the kite more forward speed but less turning speed. Angling the nose away from the wind does the opposite and causes the kite to have more pull which gives it less forward speed but faster turning speed. It also causes less lift making it easier to stall out, this provides hours of fun trick flying.

This stall out, or dumping the wind out of the entire kite slows the kite down enough to allow you to make irregular moves, like sliding, floating, stopping, or coming down backwards.

There are a number of different ways to achieve a stall. For example, in light wind you can bring your kite over to the far left or right edge of the wind window and, by either pushing your arms out straight in front of you, or taking a step or two toward the kite, (while at the same time turning the kite horizontally) you can actually spill the wind out of the kite. Another way to stall the kite is to do a fast pull/push snapping action with the handles. For instance, when flying from the right to the left, pull back the right handle and at the same time

push out the left handle, then quickly, and with a snapping motion, do the opposite, ending with both handles even with each other. This causes the kite to stop dead in it's tracks. Once stalled you can make it float in a backwards direction to the ground by walking towards the kite, if in a light wind, or running towards it, if in a heavy wind. This type of stall can be done right in the middle of the wind window making for a seemingly impossible move. Forcing a kite to do the opposite of what it is designed to do takes a great deal of practice and patience. But once there, you'll realize that this is where the true enjoyment of two line flying lies.

The four line Revolution kite, of all of the kites ever designed, appears to have a mind of its own. With an expert flyer at the controls this kite will literally appear to be dancing in the sky. Looking at it flying for the first time, you get a sense that you are watching a marionette perform. And in many ways, when flying it, you actually are manipulating it in much the same way as you would a string puppet.

At a kite festival, several years ago, in Long Beach, Washington we spotted a kite way down at the south end of the board walk that we just had to get a closer look at. As we moved closer and closer to it we could see it had eight sides, was a brownish color, enormous in size, and moved extremely slow. The person flying it was able to move it side to side and up and down. We thought that's pretty cool, we'll have to get one of those. When we had gotten close enough to really see what it was we discovered that it was a rain fly canopy from a dome tent. This person had seen the Revolution fly and had put together a make-shift four line flying machine. He had taken two sticks, attached a separate line to the top of each stick and a separate line to the bottom of

each stick and then had all four lines strategically attached to the canopy.This just shows that it doesn't take much to make a four line kite. If you had a 200 mile per hour wind and a 300 pound piece of steel, you could fly. (If you should decide to do this make sure you have witnesses).

To get serious about this though, the Rev is your best bet. It has been specifically designed to do the impossible at your command. Unlike the rain fly, the Rev is totally controllable. (Although it will not seem that way when you first start flying it). It will eventually become an extension of your arms, totally controlled by your brain. Scary thought!

The Revolution is designed to move in any direction, in any area of the wind window. For example this kite will hover in one spot, it will fly at top speed in an inverted position toward the ground and instantly stop dead in it's tracks just inches from the ground. It will fly up or down in it's upright position, and up or down in it's inverted position. It will fly up, down, forwards or backwards, in it's vertical position. What this kite can do literally has no bounds.

As a beginner, forward flight is the easiest with reverse flight being the hardest due to the wing tip design. Take it from us, reverse flight takes a lot of practice. But, once achieved, this kite will take you as far as you are willing to take it.

It is a kite that you can continue to grow with because once you've learned the basics the rest just keeps flowing in. As you progress on to something more difficult you will find yourself visualizing another move that the kite might be able to do. Your imagination

continues to go beyond what you have actually mastered in flying the Rev. Each step you take brings you more steps on the horizon. A little like life itself.

At first you are going to want to fly this kite every day, if possible. But eventually other things come knocking and you'll find that the kite must take a back seat. This is good though, not only for those involved in the thing that came knocking, but also for you and your Rev flying ability. Like many things in life, if left alone for awhile, can resurface being grander and easier than when you left it. You will find yourself learning all over again, to a degree, although the second time around is usually easier. In the meantime you will probably think of a few seemingly impossible moves to try. When you pick up that Rev again, Just Do It!

The most important things to remember when learning to fly a four line stunt kite is that you use your wrists when manipulating the handles and make all of your moves slowly and very slightly, (easier said than done, we know). This is also more difficult if you are an avid two line kite flyer and you may need to concentrate on it more, at least in the beginning. And last but not least your first flight should always be in a forward motion. When you have accomplished that then you can try reversing or stopping.

Keep in mind that eventually what your hands and arms are doing while flying will come naturally as if you are a part of the kite, or it is a part of you, and then you will be able to concentrate more on the kite itself and making it do the impossible.

When flying the Revolution the sky is
NOT EVEN the limit!

-- PARTS OF --

There are three sizes of Revolution kites to choose from. The original Rev. I, and the largest, is 9' across the leading edge from end to end. It is also the slowest of the three and probably the easiest to learn on.

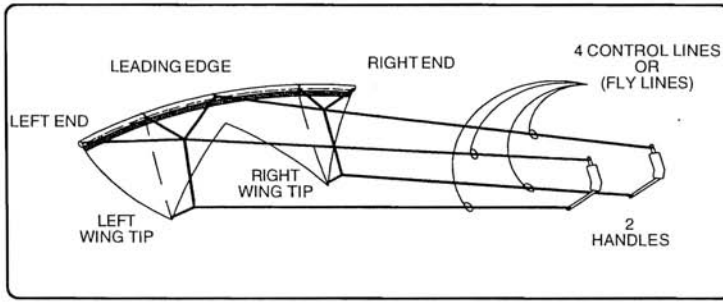
The Rev II is the smallest, at 6', and would seem to be the easier to maneuver but it's size causes it to be fast for the beginner. This is the one to fly when you have progressed enough to need a new challenge.

The Rev. 1.5 falls in between the other two in size.

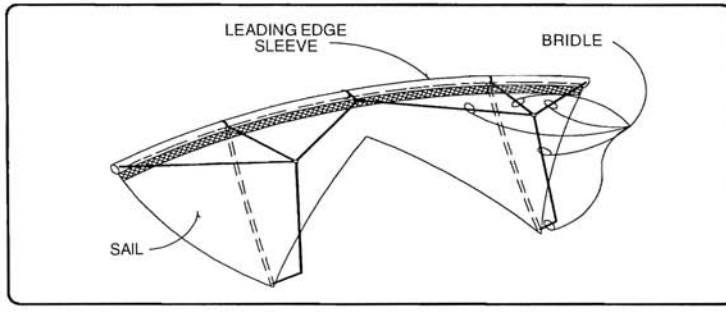
There is also an ultra-light Rev. Designed with that flyer in mind who can't always find wind when the urge to fly arises.

On the following page we have attempted to illustrate the different parts of the Revolution kite. The descriptions we use here will also be used throughout this book.

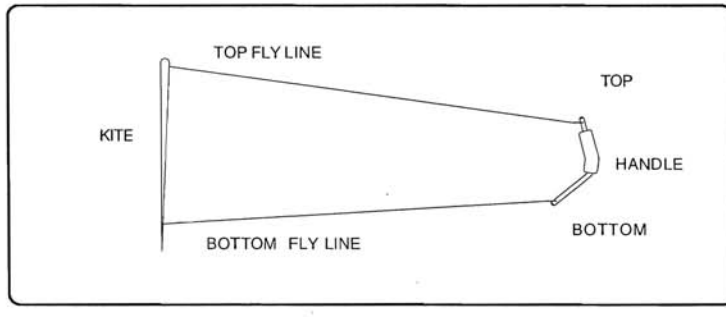
The following page illustrates the different parts of the Rev and will be referred to through out the book.



OVERALL KITE



KITE SAIL



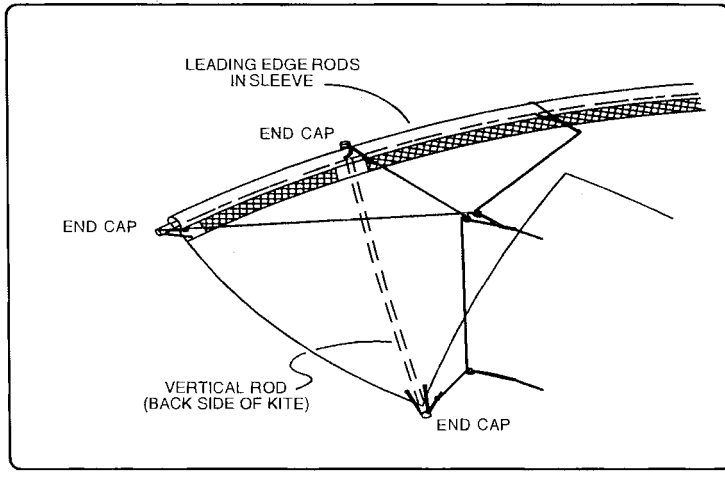
KITE HANDLE

PARTS OF REVOLUTION KITE

(As described in this book)

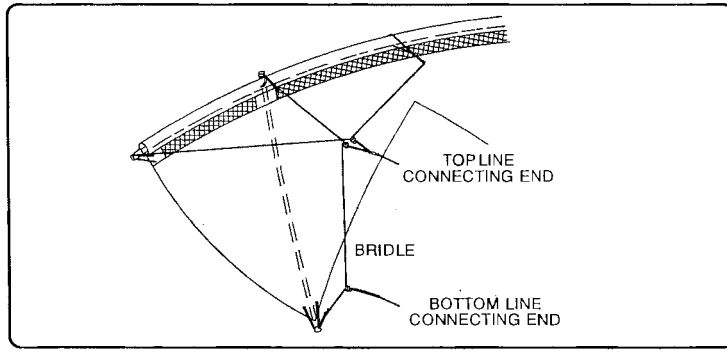
-- SETTING UP --

When setting up your Revolution kite, you must be sure that the leading edge rods are securely connected. The easiest way to do this, at least in the beginning, is to connect them outside of the kite. Make sure that each end rod is adjusted securely into the farrows of the center rod, then slip the connected rods into the sleeve of the leading edge keeping pressure on them to ensure that they stay together. Eventually you will be able to connect the rods by feel while they are in the leading edge sleeve. Next connect the two end caps, this secures the rods within the sleeve.



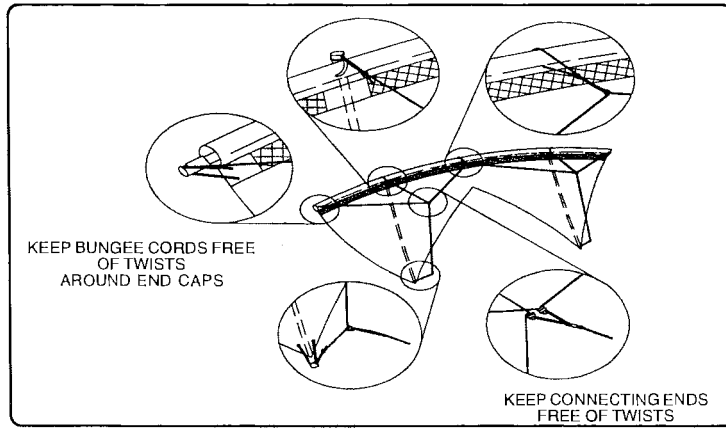
LOCATION OF RODS IN KITE

The vertical rods are much easier. With the kite laying out in front of you on the ground, and with the bridle side down, insert one end of each rod into the end caps. These are located about a quarter of the way in from each end of the leading edge. Then pull the end caps, located at each wing tip, onto the other ends of the rods.



CONNECTING ENDS OF THE BRIDLE

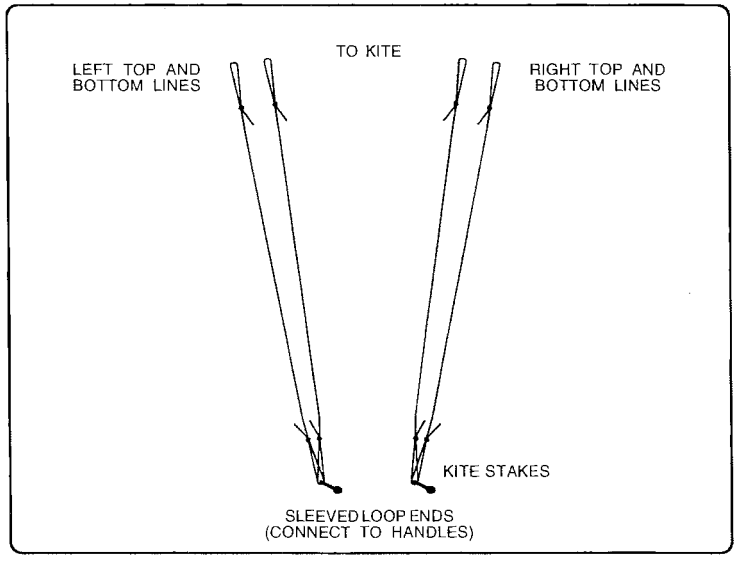
Next turn the kite over so that the bridle side is facing up. Slightly pull on the connecting ends of the bridle on each side of the kite, (this is where the fly lines will connect to the bridle). Look over the entire bridle to ensure that none of the bridle lines are twisted as this can throw the kite off balance. The top connecting end can twist within itself, as there are three lines running back from it to the kite. Also make sure that the bridle lines at the ends of the leading edge are coming out from around the bungee's in the same direction on both sides.



BRIDLE POINTS TO CHECK FOR TWISTING

As a beginner, when setting up your kite and lines for flight, you first need to have kite stakes of some kind. If you are a two line flyer you will already have these. If not you can purchase kite stakes from any kite shop or you can use any other form of stake that you can think of, such as tent stakes. Just be sure that they are at around 8" long or longer, this allows you to go deep enough into the ground to ensure that the wind on the kite will not pull it out and take off. This is especially true when flying on the beach. The winds are usually heavier than inland and the sand, obviously, is much more coarse than soil and will not hold a stake as well.

Stake through the sleeved loop on the ends of your lines and wind out, coming off of the winder the same way every time. Otherwise you'll find yourself with an hour of untangling lines ahead of you and you still haven't flown the kite.

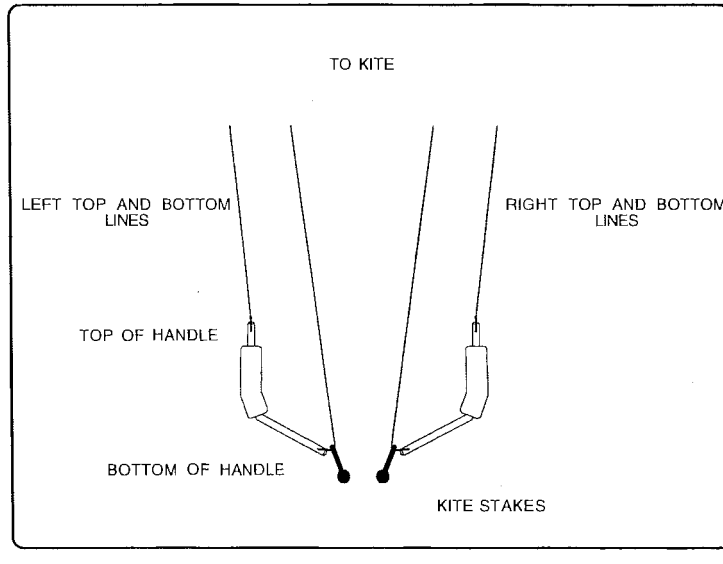


STAKING THE SLEEVED LOOPS

If you do find yourself with twisted lines, once you have completely un-wound them, go back to the staked end and pick up two of the lines, (leaving the ends staked down). Hold both lines with one hand, say your left, and pull slightly to put tension on the lines. With the other hand and with your forefinger between the two lines, walk down the length of the lines with your first hand leading. This will move all of the twists down to the open end and out.

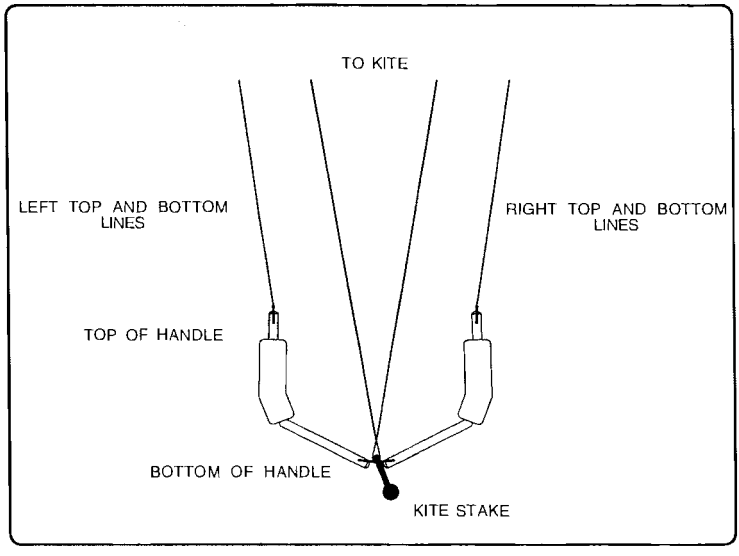
Sometimes each individual line will be twisted. To untwist them go back to the staked end, grab one line between your thumb and fore finger and move down the lines again. Just like untwisting a yo-yo string.

Once you are proficient at this you won't need to stake your lines, you can hook your lines directly to the handles and lay them around the stakes.



STAKING THE HANDLES SEPARATELY

You also have the option of staking your handles separately or together. Separately may be much less confusing and a better option than staking the looped ends of the lines without the handles. Once you are to a point where the lines are no longer a confusing issue then staking the handles together will be much easier for you as well as less time consuming.



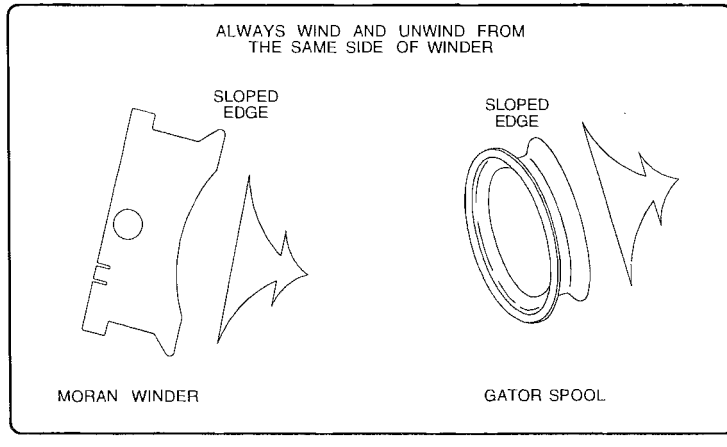
STAKING THE HANDLES TOGETHER

Just remember that when you stake your handles you must stake near the bottom of them. This will force the tops of the handles to lie out farther, (toward the kite), thence forcing the top fly lines to lie out farther also. Once you have the kite attached and setting upright, on it's wing tips, it will be much easier to lean the leading edge, or top, back away from the wind.

You will also need to choose a winder that works easily for you. What ever type of winder you choose to use be certain to keep the left top and left bottom lines

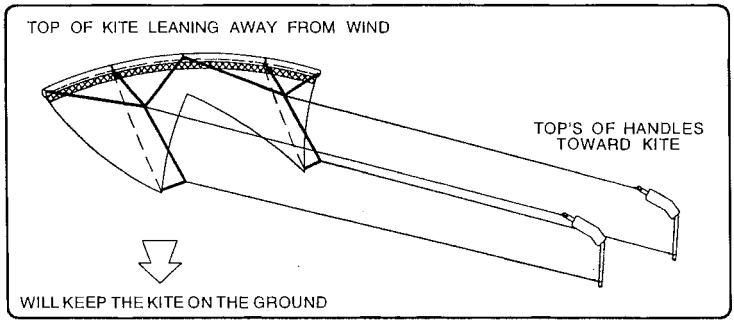
separate from the right top and right bottom lines, at least in the beginning. This will eliminate a great deal of frustration and will ensure a quicker and easier set up. Later you may find it easier to wind all four lines together onto one winder. You will also find that most winders will have one side that is sloped and one side that is square. The sloped side is the side to come off of as this allows the lines to slide off easily.

The Revolution crazy eight winder is a very good winder and is easy to use. It doesn't take up space in your kite bag either. There is also the Moran winder, (easy card winder). It is flat and simple in design and easy to use also. You can wind all four lines onto one or wind the left lines on one and the right lines on another. We use Gator Spools. These plastic hoops allow the lines to come off easily over the sloped edge and you can wind the left lines on one spool and the right lines onto another spool. This type of winder will put the least wear on the lines. The only problem with these are that they do take a lot of space in your kite bag.



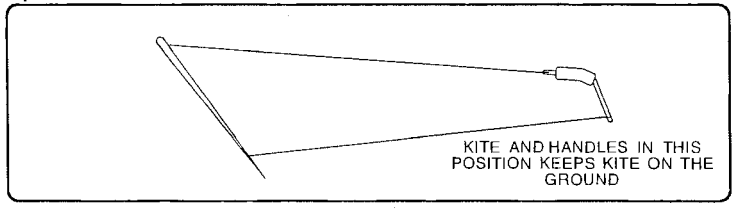
TWO TYPES OF WINDERS

To attach the fly lines to the kite we stand facing the wind with the kite standing on it's wing tips in front of us. Tilt the leading edge back, slightly, against your legs. With the wind putting pressure on the kite this will keep the kite stable while you attach the fly lines. Remember to attach your top fly lines to the top connections on the bridle and bottom fly lines to the bottom connections. Then lift the kite and step back with it until the fly lines are taut, set the kite on the ground on it's wing tips with the leading edge slightly tilted back then return to your staked handles. If you cannot lean the top of kite back than you will probably find that the lines are connected wrong.



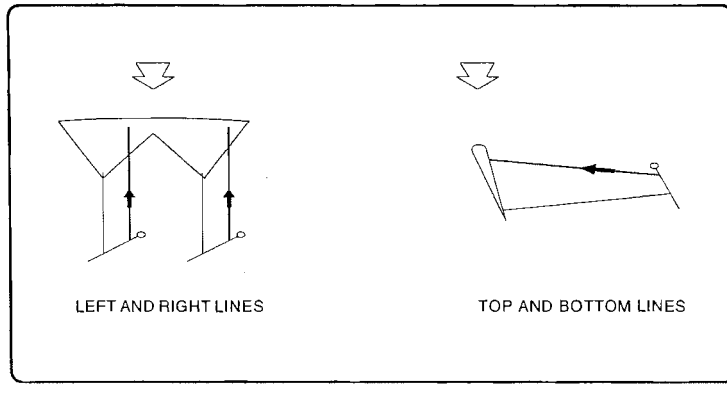
GROUNDED KITE

When picking up the handles be sure to keep the tops of them pointed slightly towards the kite, this will keep the leading edge of the kite tilted back enough to ensure that it does not take flight while you are picking up the handles.



SIDE VIEW

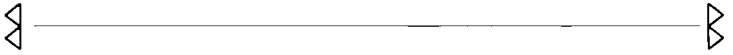
Once you are standing, in a flight ready position, and have the handles in your hands check to make sure that you have the left handle in your left hand and likewise for the right. Also look out along the fly lines from handle to kite. Make sure that, for instance, you don't have top and bottom lines twisted, or left and right lines twisted.



CHECK LINES FOR TWISTS

The top and bottom lines are the easiest to untwist, just rotate that handle until the lines become untwisted. If the left and right lines are twisted you will have to disconnect the kite, untwist (as we described earlier on pg. 21), and re-connect the kite.

The way in which you hold the handles is an individual preference, what ever feels the most comfortable to you is the right way. It is suggested that you wrap your hand around the blue or black rubber grip and place your thumb near the top of the handle along the rod. This allows for easily pushing the top of the handle toward the kite during reverse flight and seems to give added control of the kites movement in any flight path. You are now ready for take off.

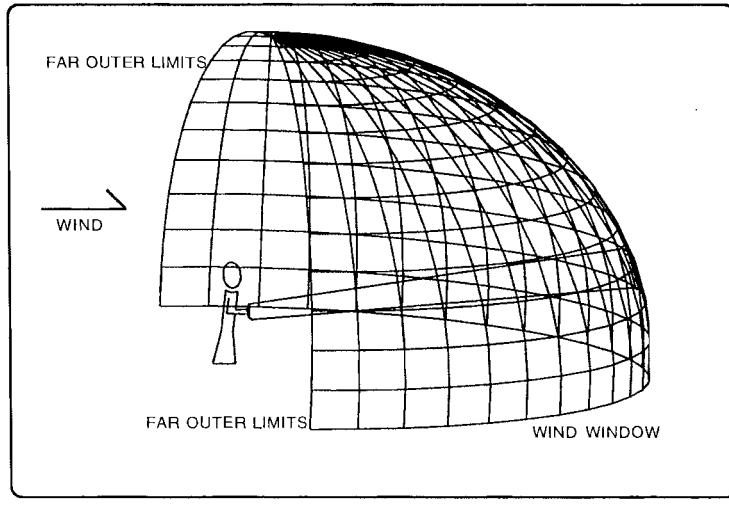


CHAPTER 2

THE WIND WINDOW

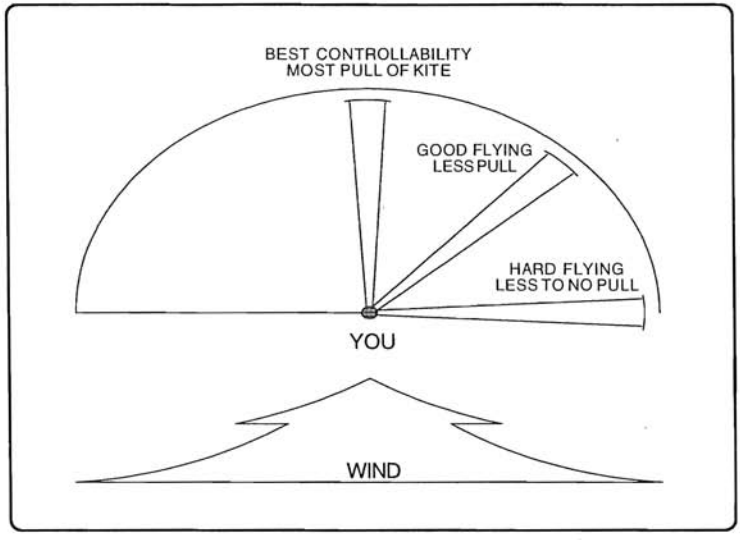
The wind window is the area out in front of you where the wind will make your kite fly.

A clear understanding of the limits of your air space and it's relationship to how the Rev flies and where it flies the best will greatly benefit you in your flying ability.

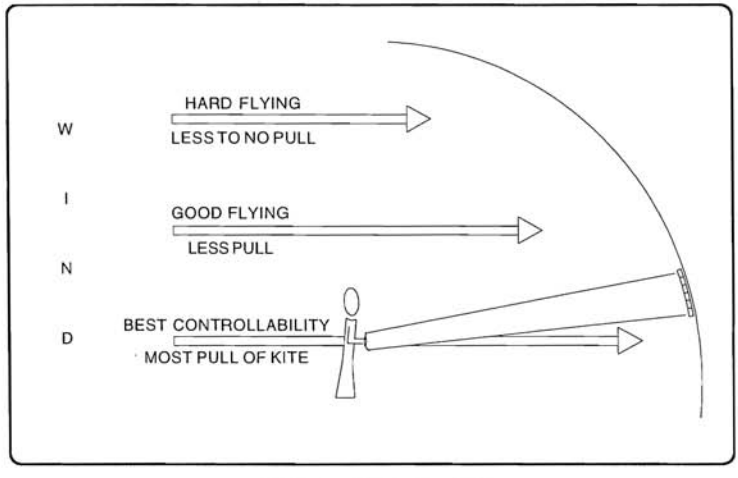


THE WIND WINDOW

At the outer edge of the wind window, whether above you or to your right or left, the kite will have less wind pressure and the controllability of the kite will be much harder. In the far outer limits, (so to speak), the kite will either hover or fall to the ground due to the lack of wind power. For an experienced flyer this area can provide hours of enjoyment. As a beginner, though, it is best to keep the kite in or near the center of the wind window.

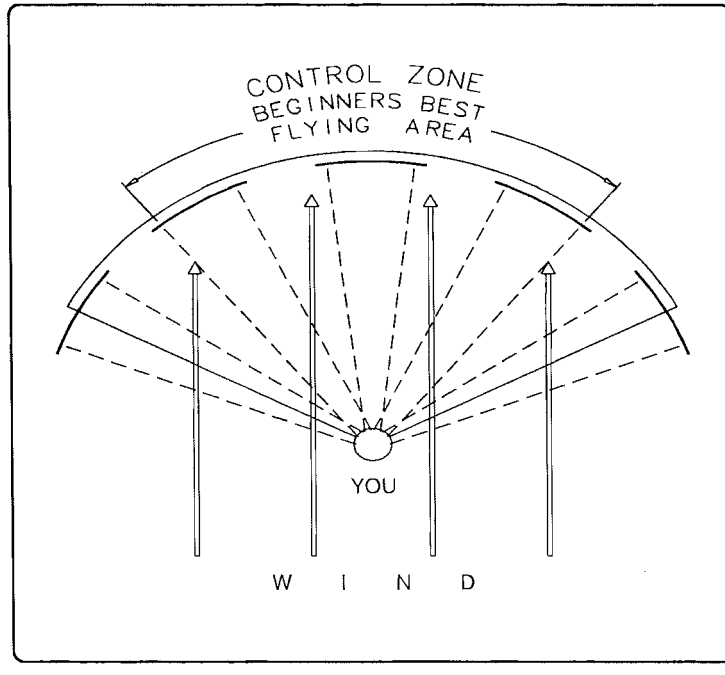


WIND WINDOW
PLAN VIEW



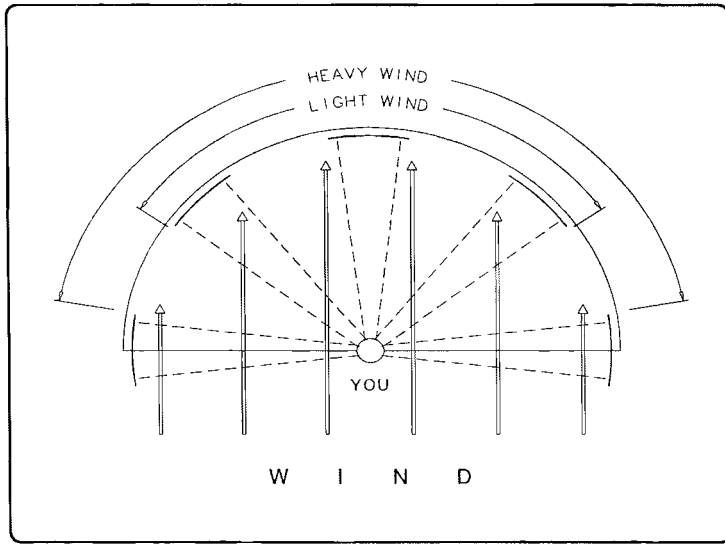
WIND WINDOW
PROFILE VIEW

The control zone is the center area of the wind window in which the kite flies the best. This is the small area straight ahead of you where the wind pressure on the kite is the greatest and where the controllability of the kite is at a maximum. This is where you want to stay when beginning.



CONTROL ZONE

The size of the control zone is effected by the wind speed. A light wind will narrow down your best flying zone, whereas a heavy wind will broaden it.



WIND SPEED

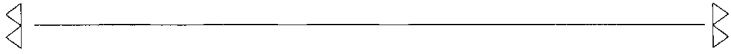
A coastal beach is, of course, the best place to fly a kite. The wind comes right off of the ocean and so has no obstacles. This makes it the purest wind. But this does not mean that you cannot fly a kite anywhere else on earth. If you are an inlander your best bet is to fly in a large grass field away from trees, and buildings. If you can't avoid having obstacles behind you than try to find a place where the obstacles are as low as possible. This will help to give you a cleaner wind and an easier time flying.

Wherever you decide to fly, use common sense, fly safe, and above all have fun.

CHAPTER 3

BASIC FUNDAMENTALS

-- HOW THIS KITE MOVES --

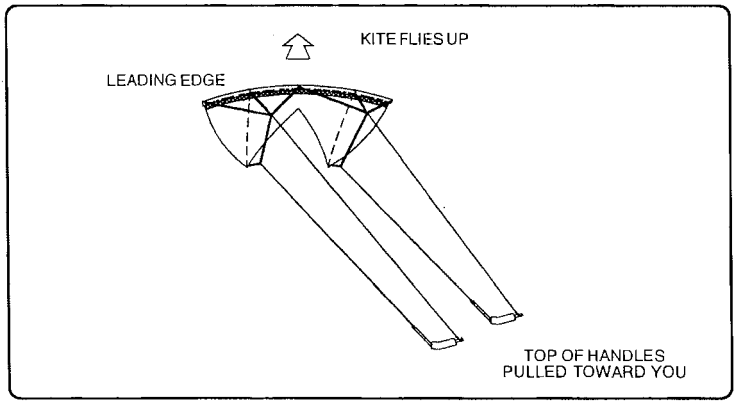


These basic moves of the Rev that we are about to explain can also be applied to any four line kite.

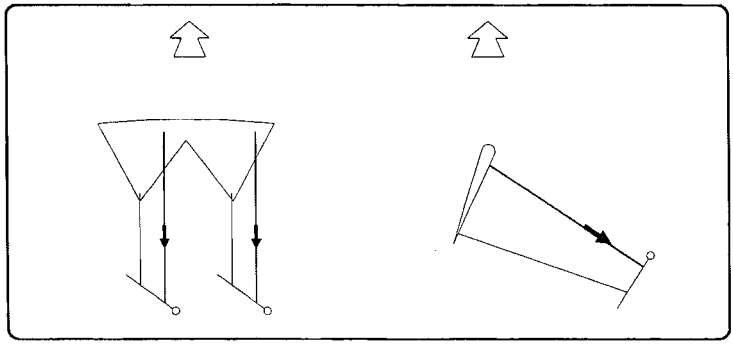
The Rev is at it's most stable and easiest to fly position when it is going in a forward direction, with the leading edge leading. The first aspect of forward flight is take off, getting the kite off of the ground and into the air.

From the ground position, with your kite directly down wind from you and in the middle of the wind window, extend your arms out in front of you. Slightly pull back the tops of both handles, evenly, in toward you in a very slight slow motion. At the same time pull your arms into you, elbows to your sides. If the wind is light you may also need to take a step or two back in order to give the kite enough lift.

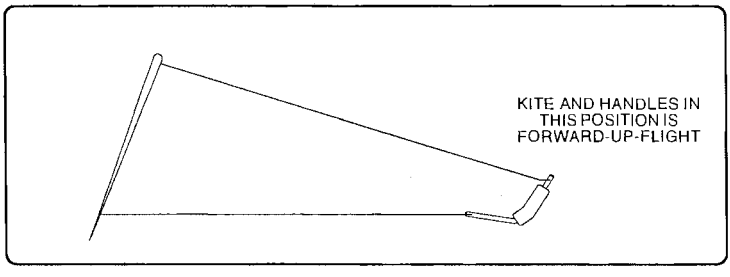
By pulling the tops of both handles in toward you, you are actually pulling in the top portion of the bridle. This is how a two line kite flies, with it's bridle adjusted forward. The difference is, that with the Rev you are constantly adjusting the bridle by manipulating the handles. The more you pull the tops of the handles in toward you the faster the Rev will move in a forward direction.



KITE IN FORWARD- UP- FLIGHT



TOP AND SIDE VIEW

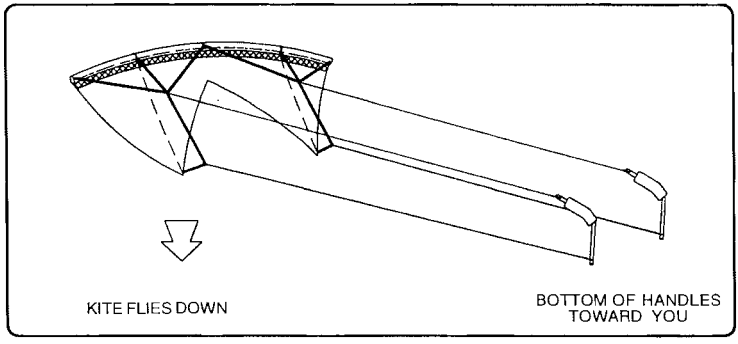


SIDE VIEW

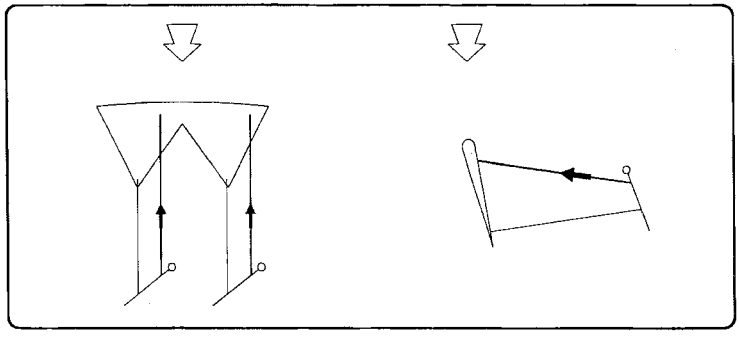
We must make a note here that the position of the handles in all of our drawings are greatly exaggerated in order to illustrate the moves. In actuality you can barely see the movement of, say, pulling back the bottom of a handle toward you in order to make a 90 degree turn. This, as with all moves, is very slight and you will have to concentrate on that when learning. If you were to actually pull the bottom of the handle back as far as our drawings show, your kite would go into a turbo spin and you would be wondering what had happened . This can also result in out of control behavior on the part of the kite. (They don't like it).

The Rev is at it's most unstable and hardest to fly position when it is going in reverse. The kite does not fly easily in this direction and is slower. Reverse is much harder to fly straight and smooth but will with an accomplished pilot at the controls.

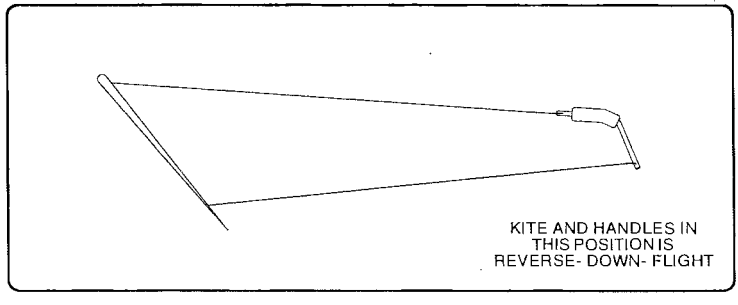
Reverse flight is accomplished by pulling back the bottoms of both handles slowly and evenly toward you. This also is a very slight movement and is easier to accomplish if you let the pull of gravity on the kite do most of the work. The secret here is keeping the handles even with each other and moving slow. This is also a move to try later in your flying career.



REVERSE- DOWN- FLIGHT

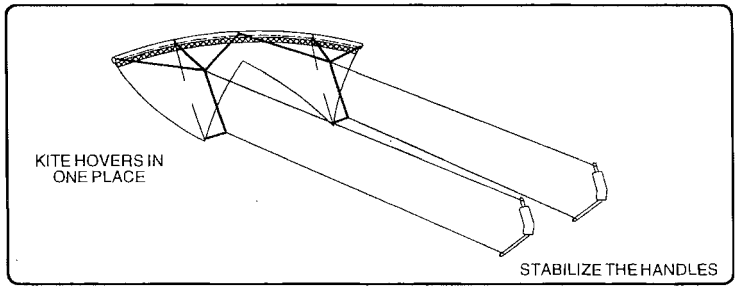


TOP AND SIDE VIEW

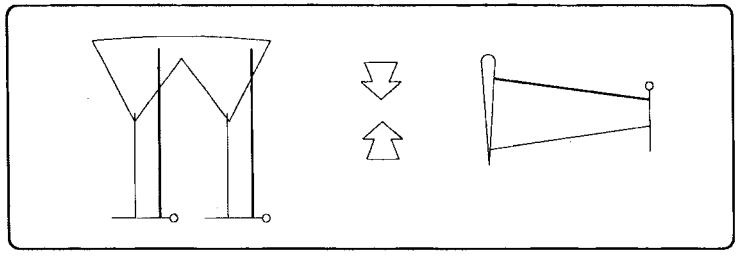


SIDE VIEW

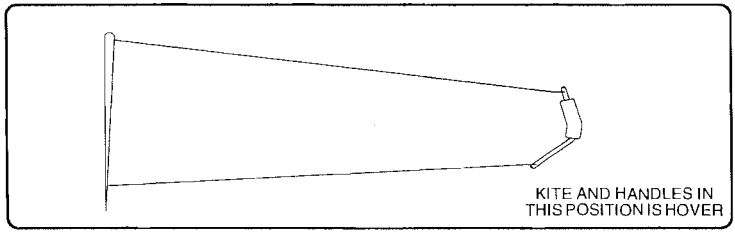
Between forward flight and reverse flight lies the hover position. This is accomplished by stabilizing the handles in-between the forward flight position and the reverse flight position. It is a very difficult move to master because you have to sustain complete balance of all strengths. When you are ready to try this move do it in a light wind. A further explanation of this maneuver can be found in Chapter 5, "Beyond Basic".



HOVER POSITION



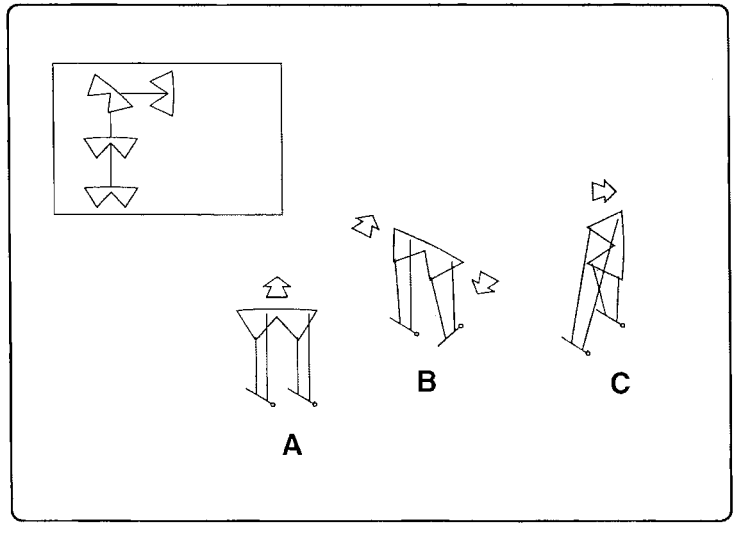
TOP AND SIDE VIEW



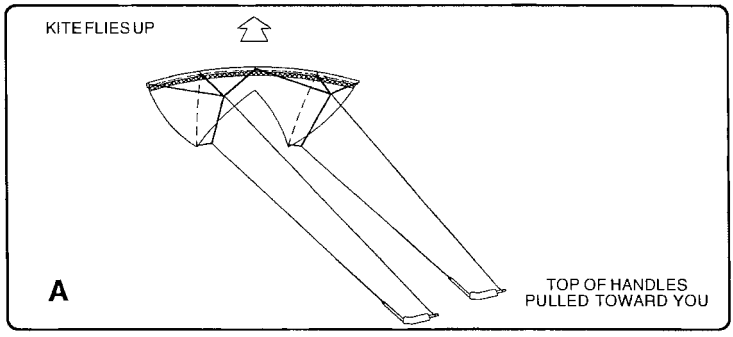
SIDE VIEW

Turning the kite 90 degrees is done with a slight tap back on the bottom of the right handle This turns the kite 90 degrees to the right. The kite is now in a vertical position flying in a forward direction, across the wind window from left to right. This tap is about a one second movement and allows the handle to return to it's previous position and at the same time allows the kite to become vertical and stay vertical. (The whole secret to turning is the minute tap with an immediate release.)

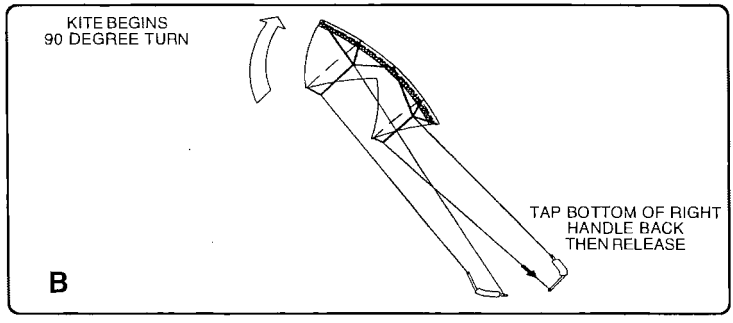
In this position, with the leading edge to the right and with the top of your handles pulled slightly in toward you, the kite will fly in a forward direction across the wind window. To maintain this forward flight you must concentrate on keeping the tops of both handles pulled in toward you.



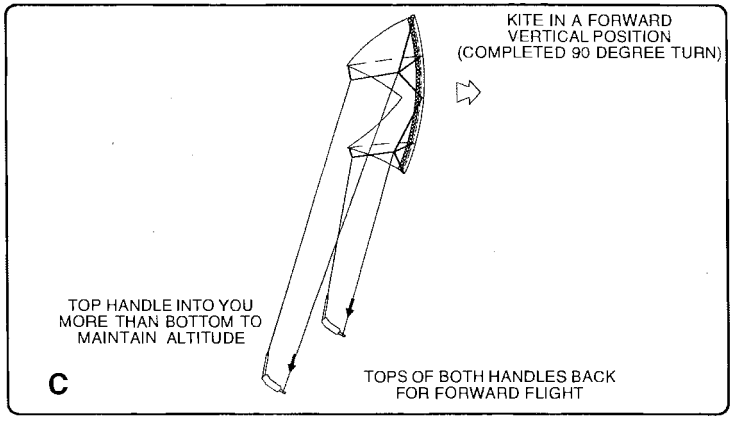
TURNING 90 DEGREES



KITE IN FORWARD- UP- FLIGHT



90 DEGREE TURN TO THE RIGHT



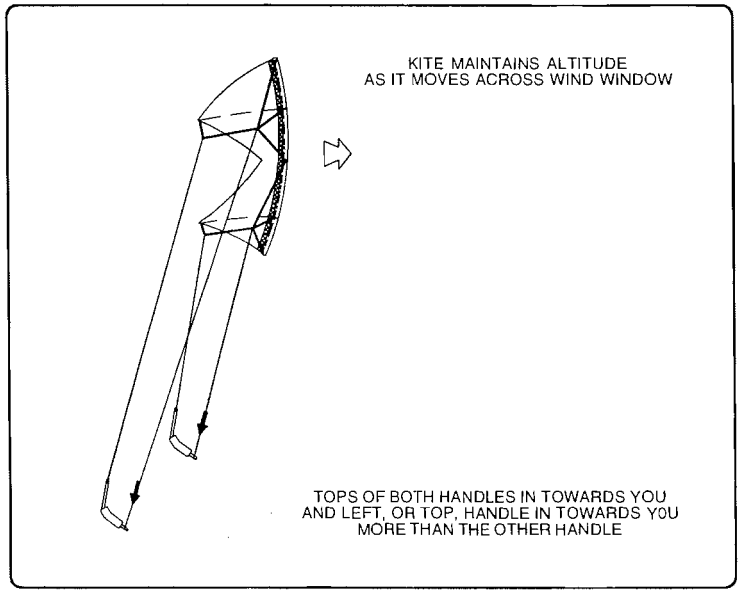
VERTICAL FORWARD MOTION

For you two line flyers the only similarity between this and a two line kite is the fact that the right handle manipulates the right side of the kite and the left handle manipulates the left side.

As you know, to turn a two line kite 90 degrees to the right, you pull the right handle back toward you. When the 90 degree turn is accomplished you return both handles to being even with each other and the kite resumes forward flight.

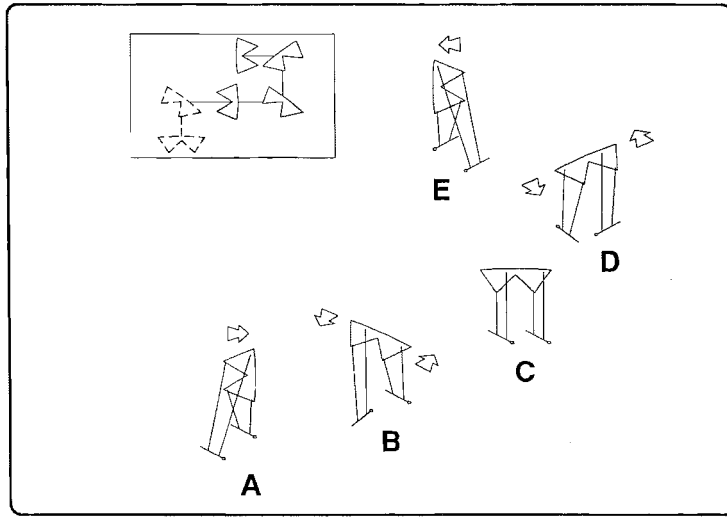
With the Rev, the difference is that you are manipulating the kite at two points on each side rather than only one. So to make this same 90 degree turn you only pull in toward you the bottom of the right handle. After the turn, you pull in the tops of both handles toward you to resume forward flight. At first this can be difficult to comprehend but in a short time your brain will make the adjustment and then this concept will seem easy.

Elevation control is extremely important when flying in this vertical position. When flying in a forward direction, lets say left to right, as the kite moves across the wind window it will lose altitude. This is mainly due to the pull of gravity and the weight of the kite. As you may have noticed in drawing C, pg 44, we have shown the left, or top handle, to be in closer to you than the other handle. This angles that side of the kite into the wind thus causing lift and allowing you to keep your altitude. In a light wind you'll be pulling that top handle in toward you considerably more than in a heavy wind, you could have a foot or more difference between your handles. The size of the kite makes a difference too. The smaller the kite, the less you need to pull back that top handle. The Rev I, the largest, (in a light wind) will require that you extend one arm out as far as possible and the other arm will be pulled in as far as possible.



COMPENSATING FOR PULL OF GRAVITY

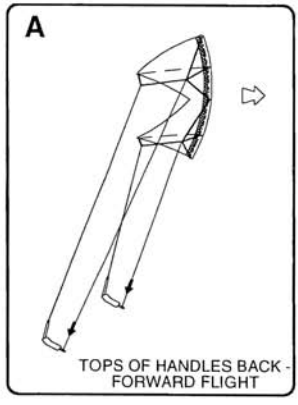
After turning the kite 90 degrees to the right, and before you reach the far right edge of the wind window you are going to have to turn the kite around and head back the other way. This is a 180 degree turn.



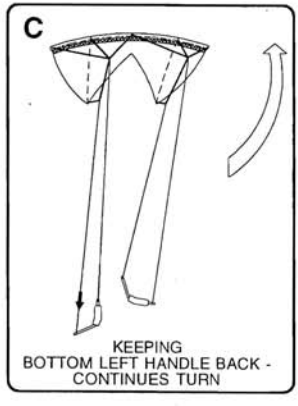
TURNING 180 DEGREES

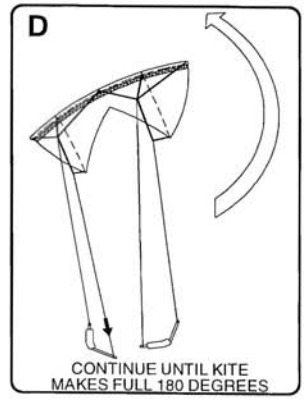
If you are an avid two line flyer your first instinct is to pull the entire left handle in toward you in order to turn the kite, with the Rev this will not work. Remember that with the Rev you are actually attached to four points on the kite rather than just two as with a two line. This means that you control the kite at those four individual points and you do this by manipulating the four points on the handles, the top of each handle and the bottom of each handle.

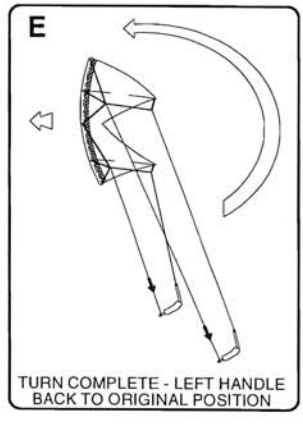
To turn 180 degrees to the left slightly tap back the bottom of the left handle toward you, this tap will be a little longer than the 90 degree tap, in order to rotate the kite that full 180 degrees. Just keep your eye on the kite and you'll know when to let off on the tap.

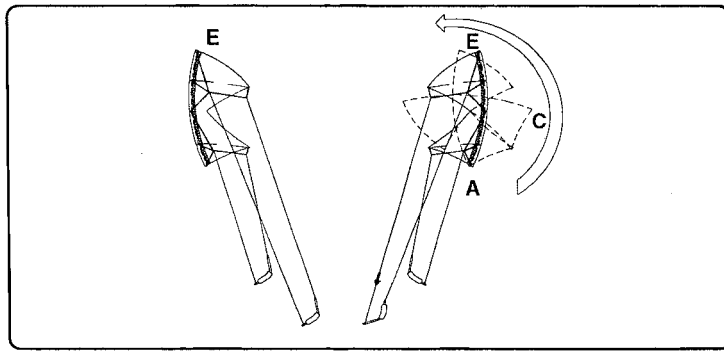

A
TOPS OF HANDLES BACK -
FORWARD FLIGHT


B
BOTTOM LEFT HANDLE BACK -
BEGINS 180 DEGREE TURN


C
KEEPING
BOTTOM LEFT HANDLE BACK -
CONTINUES TURN


D
CONTINUE UNTIL KITE
MAKES FULL 180 DEGREES

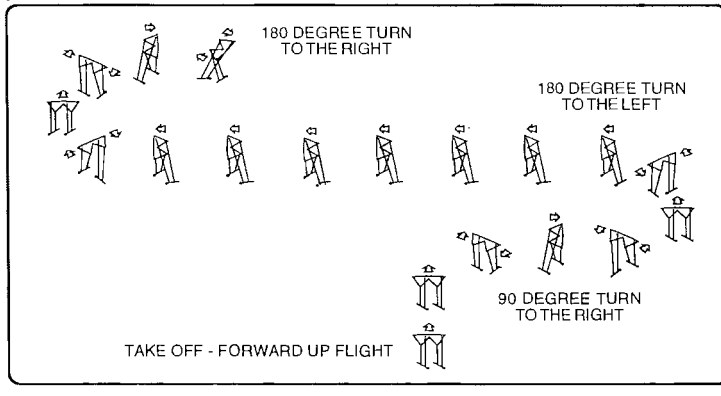

E
TURN COMPLETE - LEFT HANDLE
BACK TO ORIGINAL POSITION



TURNING 180 DEGREES

Once you have completed the turn you must pull the entire top handle in to you, which is now the right handle, and hold in order to maintain altitude. Also remember to keep the tops of both handles in toward you in order to maintain forward flight.

Before you reach the far left edge of the wind window, tap the bottom of the right handle to turn 180 degrees to the right. (As the kite turns also turn your hands as if following the kite around). This back and forth forward flight is the easiest flight path to accomplish.



BACK and FORTH - FORWARD FLIGHT

As you move across the wind window if you experience your kite moving up in a diagonal direction, just tap back the bottom of the bottom handle. This should bring it back down to your original elevation. If your kite is moving down in a diagonal direction, just tap back the bottom of the top handle.

Having succeeded at getting the Rev off of the ground, making a 90 degree turn and then a 180 degree turn, the natural flight pattern to go into next is the figure eight. At this point flying the figure eight will be quite easy, for you and for the kite.

Following the steps for take off, remembering that in light wind you may have to take a step or two backward, make a 90 degree turn, go forward a short distance and proceed with a 180 degree turn. As you begin the forward flight across to the other side of the wind window, try letting gravity pull the kite down toward the ground.

As with a two line kite, you don't want the kite and ground to meet, so you have to judge the amount of space that you will need to turn the kite another 180 degrees in order to avoid the ground and to begin a flight path back to the other side of the window.

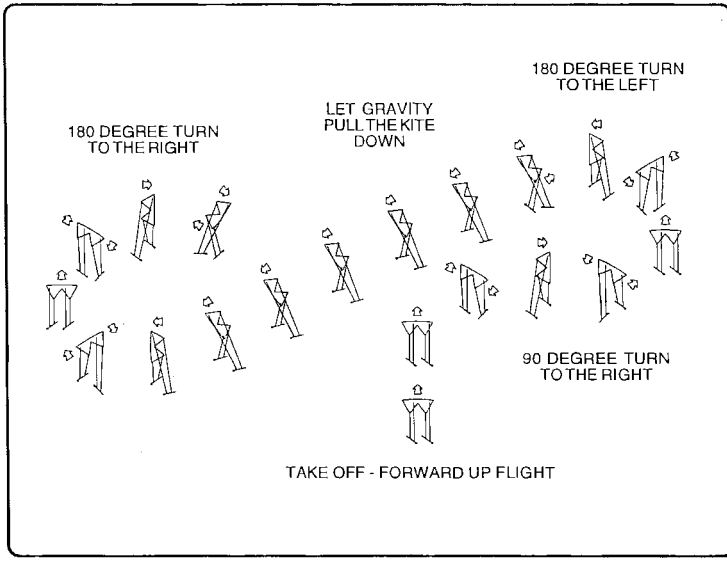
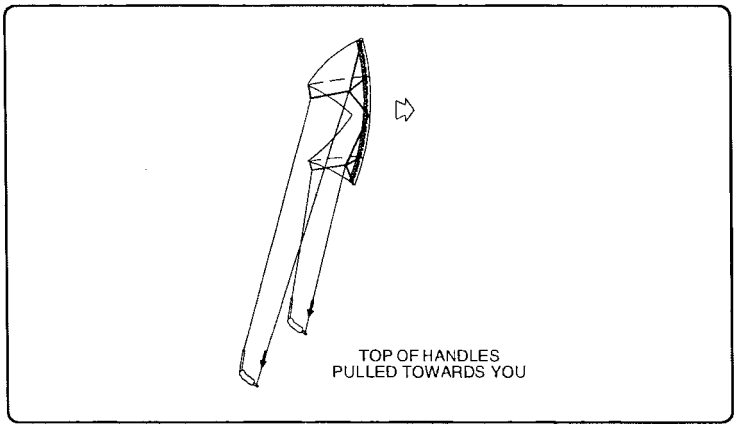


FIGURE EIGHT

If you should over compensate and the kite ends up going into a spin you can correct it by pulling back, toward you, the tops of both handles and give a slight jerk. This will put the kite back into forward flight and you can un-spin and then resume the figure eight flight path. This technique will help you in any flight where the kite is headed into a spin that you had not planned.

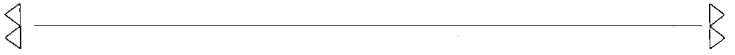
The figure eight flight path is where the Rev is the most comfortable and where you will acquire the most confidence in flying it. Just keep going in a forward motion, don't try stopping or reversing, and soon you'll feel like you are truly accomplishing something. It may even feel similar to flying a two line kite. As you become more comfortable, see how close to the ground you actually can get. Then it's on to bigger and better things.



FORWARD IN THE VERTICAL

When flying forward if you experience some rattling, in the skin of the kite, you are pulling the tops of the handles back too far. Slightly push the tops of the handles out toward the kite just a little and this will put more of an equal amount of pressure on the entire surface of the kite. In essence you are adjusting the Rev by using the handles rather than by adjusting the bridle, as on a two line kite. The main purpose of the bridle on the Rev is to disperse the wind stress evenly over the entire kite surface.

In light wind you will have to pull in the tops of the handles more than in heavy wind when flying forward. The slower you move the handles, the slower the kite will fly, (which is a definite must when learning). It is also a good idea to learn in light wind. You will have more reaction time and the kite will move slower. A heavy wind will have complete control and you will have none. This will only serve to frustrate you. Once you have mastered basic forward flight the heavy winds will be a welcome challenge.



CHAPTER 4

THE INEVITABLE

Sorry to break up the party but crashing is an important issue and will need to be addressed soon after your first take-off.

We video-taped our flying a number of times in search of how best to describe the movement of the handles for the different maneuvers and what we found amazed us. Our taps, for instance, on the bottom of a handle to start a turn and the pulling back of the bottom of a handle to spin the kite. Etc..., were so slight that at times you could hardly see it. This explains why it is so difficult to learn to fly this kite. When you are concentrating on a move as you are doing it, you naturally move too far and/or too fast. But once you have crossed that line between thinking and not thinking, so to speak, the kite will suddenly seem to do exactly what you tell it to.

In the meantime though, you are going to experience a number of crashes. No matter how hard you concentrate on using your wrists to manipulate the handles or how slowly you make every move, the crashes will happen.

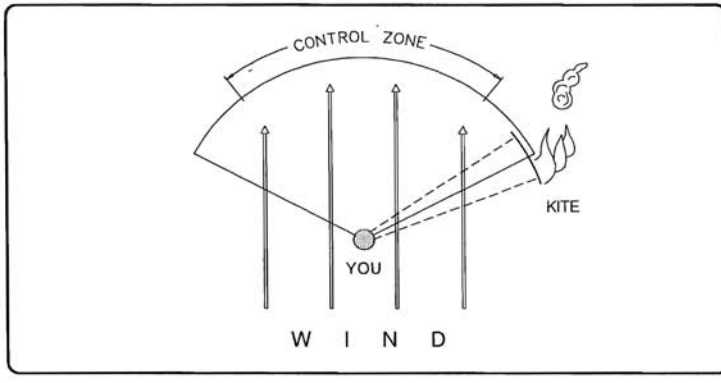
To make that crash a little softer, don't panic, walk toward the kite until it has landed. This eases the pressure on the kite causing it to slow down and land softer.

These crashes, in the beginning stages, make it a good idea to have a flying partner along. It makes life much easier to have someone down at the kite to do the untwisting for you. But if you do not have a flying partner, or cannot afford one. . . . (wish we could say, "one will be provided for you", but we can't afford it either), you can still manage on your own.

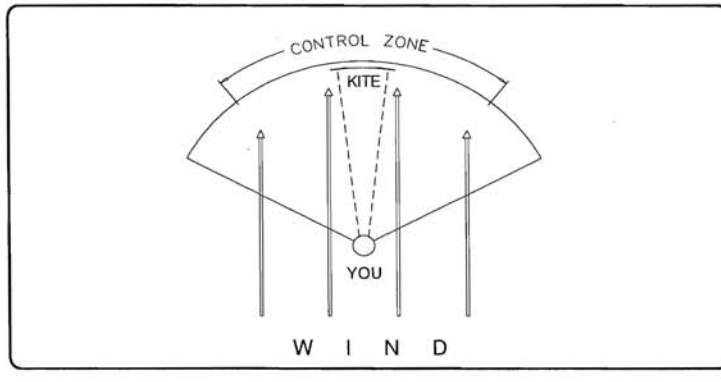
When you are alone and crash, leading edge down, stake your handles with the bottoms of them pointing out away from you toward the kite. This ensures that the kite will not take off. Go down to the kite, make sure a line has not wrapped itself around a wing tip, rotate the kite until the lines are untwisted, set the kite down on it's wing tips with the leading edge tilted back away from the wind, and return to your handles. There will be some slack in the bottom lines now because you have turned the kite around to it's upright position. When you pick up the handles also point the tops of them toward the kite to ensure, once again, that it won't take off before you are ready. Look down the fly lines from handle to kite. If these are twisted simply rotate that handle to untwist.

Please don't let this crashing business frustrate you to the point of no return. Believe us, if you can make it through this period of learning, (and it does not last long), you'll have years of enjoyable Rev flying ahead of you.

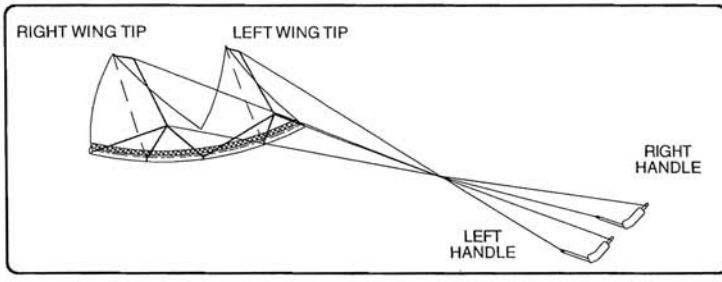
More than likely your kite is going to crash outside of the control zone area of the wind window. In this situation you will have to walk, with your handles, over to where you are directly down wind from the kite. Otherwise you'll never get it back to an upright position and ready to resume forward flight. You always want to take full advantage of the wind, especially when learning, and the center of the wind window is where it's at.



KITE HAS CRASHED AND BURNED OUT SIDE OF CONTROL ZONE



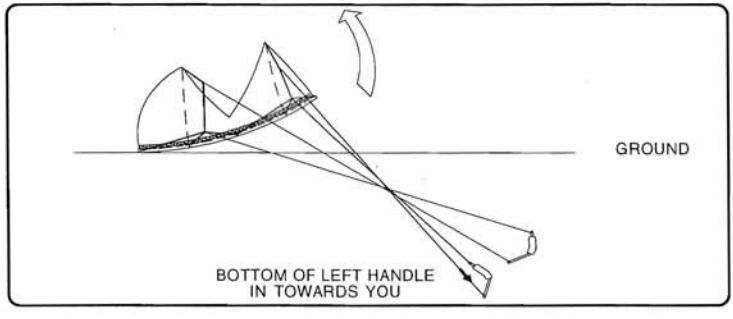
WALK OVER TO BEING DOWN WIND FROM THE KITE



CRASHED INVERTED

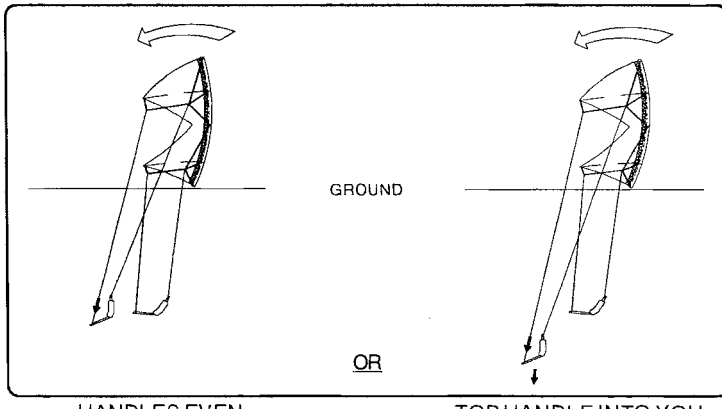
You can also recover from a crash landing by manipulating the handles. For example, by pulling back the bottom of the left handle in toward you, will raise the left wing just enough to start bringing the kite around to a vertical position.

A note of caution: Be careful to only pull back the bottom of one handle or the other. If both are pulled back you'll be putting the kite into reverse-up and as a beginner you will have problems with this. If this happens just let off on both and pull the tops of both handles in toward you to bring the kite back down, (or to fly the kite into the ground).



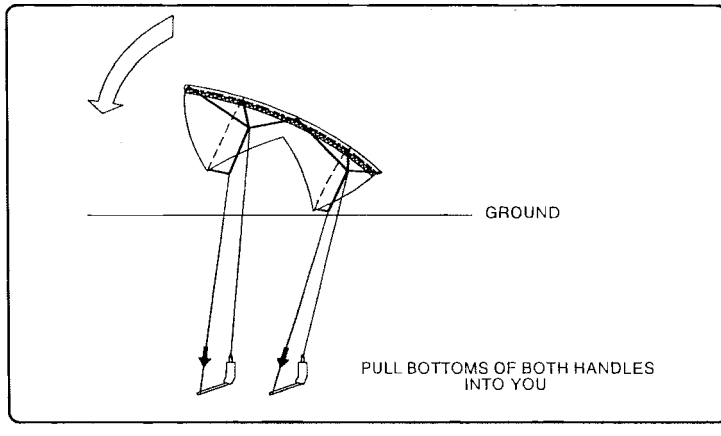
BEGIN 90 DEGREE TURN

Keep pulling the bottom of one handle in towards you to lift that side of the kite. The kite naturally wants to right itself and it will continue around until it is.



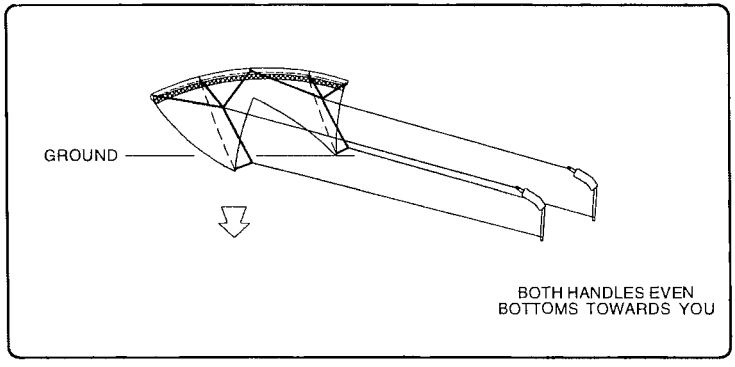
ROTATING TO THE VERTICAL POSITION

If the kite will not come around to the vertical position than pull the entire top handle into you. Hold this until the kite continues on around to the upright horizontal position. As the kite gets closer to this upright position, start pulling the bottom of the other handle in toward you, while at the same time bringing both handles even with each other.



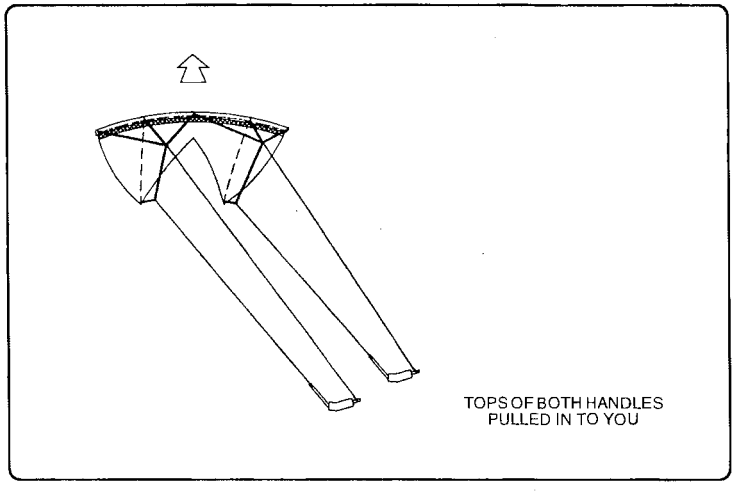
CONTINUE ROTATION TO UPRIGHT HORIZONTAL POSITION

This will bring the kite to a landing on it's wing tips with the leading edge up.



UPRIGHT HORIZONTAL POSITION AND LANDING

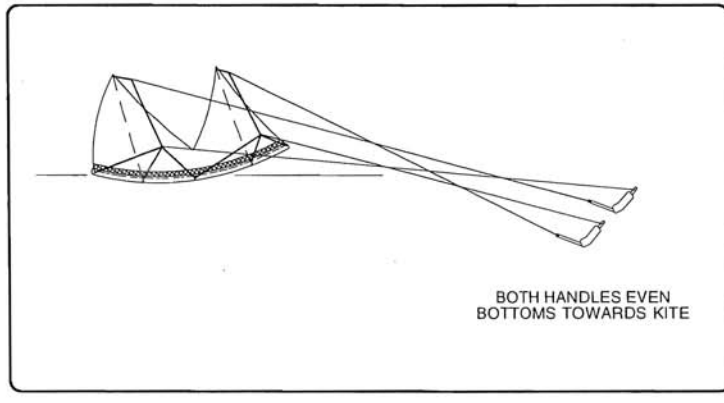
You are now in a position to easily take off again in forward - up flight. Just pull back the tops of both handles in toward you, slowly and evenly, and the kite will rise up.



FORWARD - UP TAKE OFF

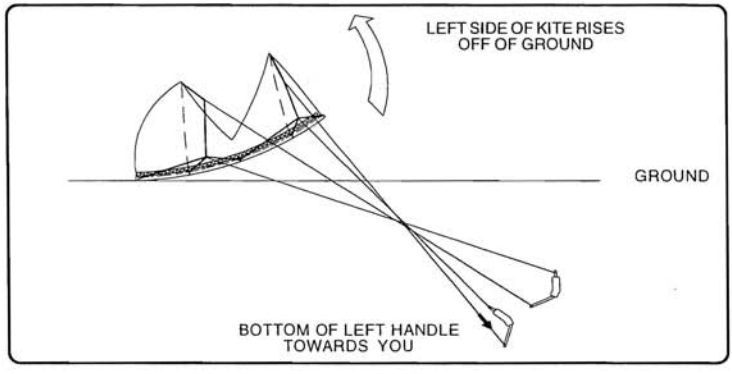
We know, we know, all you want to do is fly and all you can do is crash. And you're getting sick and tired of it, aren't you? Here's a confidence builder to learn while your kite is laying on it's back seemingly lifeless.

This move, called the inverted ground slide, is extremely easy to do and although you are not actually flying you are moving. It will boost your spirits as well as your confidence and you will feel that you have accomplished something. You can't crash while doing this move because you are already on the ground in the crash position and you are going slide along the ground, thence the name ground slide.



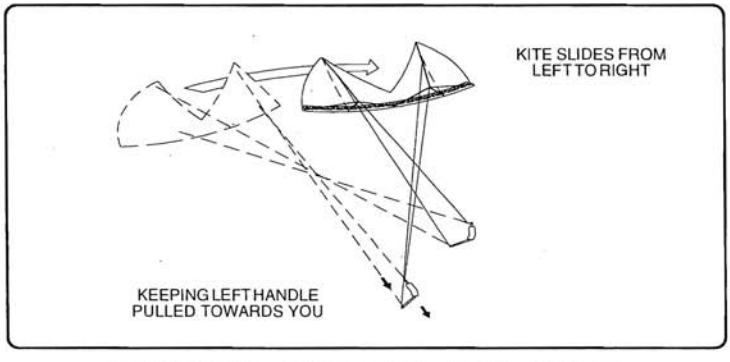
INVERTED and GROUNDED

To begin with pull back on the bottom of the left handle until the kite's left end, of the leading edge, rises. The more that you pull back on the bottom of that handle, the higher the kite will rise. To lower the kite back down, just push the bottom of that handle in toward the kite. Practice this up - down motion a few times to get a feel for what the kite is doing.



LEFT SIDE OF KITE RISES

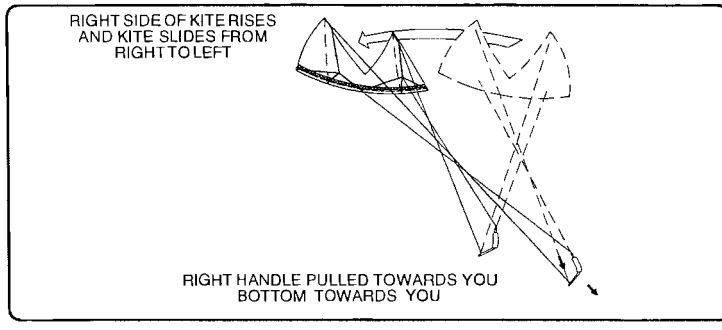
With that left edge just slightly up off the ground, try pulling back the entire left handle in toward you. Watch the kite slide along the ground from left to right.



INVERTED SLIDE TO THE RIGHT

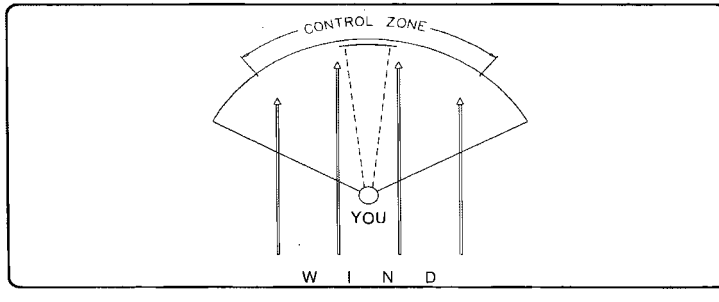
To stop the kite, return the handle to being even with the other one and push the bottom of it back toward the kite. Repeat the same procedure with the right handle and the kite will slide back to where it was.

(Due to the position of the kite and the fact that it is on the ground means that you must pull the handle into you considerably more than these drawings depict).



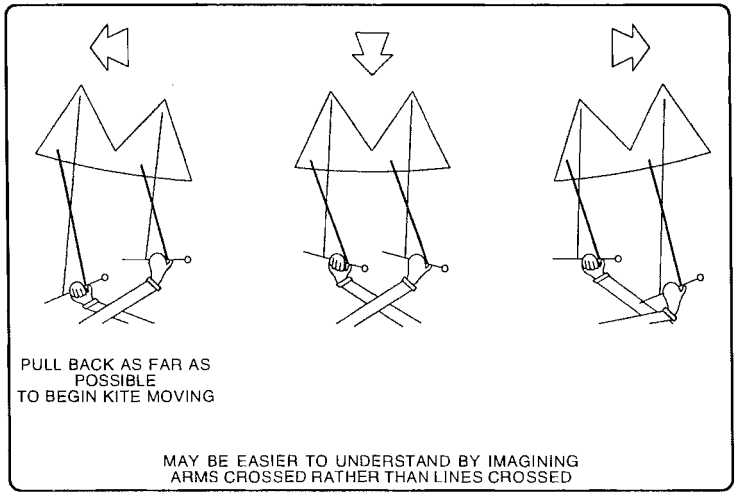
INVERTED SLIDE TO THE LEFT

Make sure that you stay within the control zone of the wind window, (as you will need all of the wind power that you can get to do this slide). You will also find that you will need more wind to do this if you are flying in a grass field, for instance, than you will if flying on beach sand. The smoother the surface the easier the kite will slide.



CONTROL ZONE

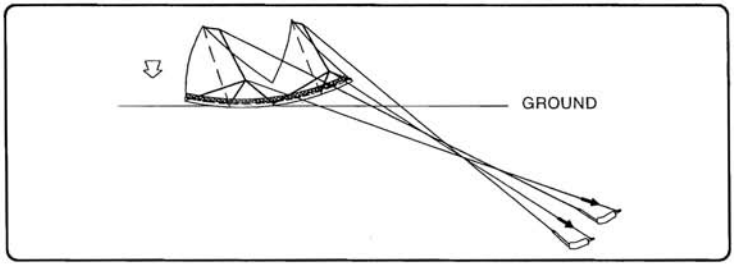
When the kite is in the inverted position, your hands are working the same sides of the kite as they did when it was upright but you are looking at the kite in the opposite. Don't let what you see confuse your hands, and ultimately your brain.



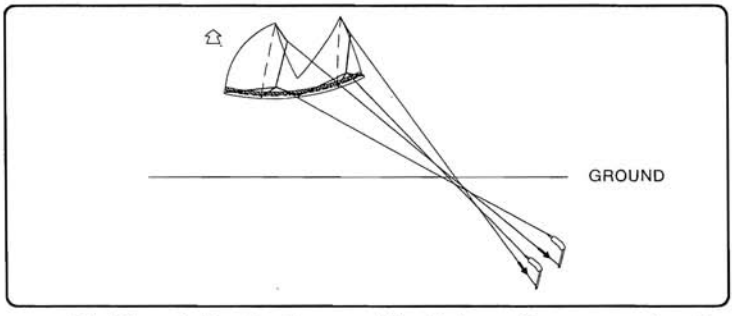
INVERTED GROUND SLIDE

If you have trouble with this, try crossing your arms as shown above. This could help as it will put your left hand in line with the left side of the kite and likewise for the right. Believe us it will be a "Happy Day" when you have moved beyond this state of confusion.

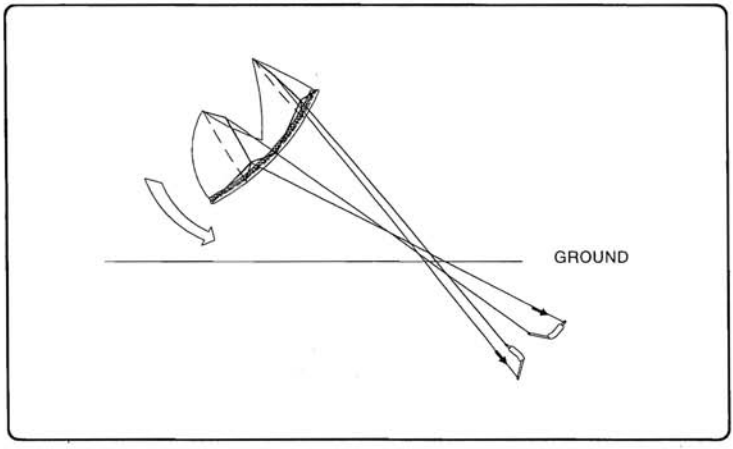
A more advanced way to recover from a crash, and this is after you have become proficient at inverted-reverse flight, (explained in Chapter 5, "Beyond Basic"), is to raise the kite up above eye level. This is similar to the ground recovery except that you will turn the kite around while in the air. This could also be called an inverted take-off.



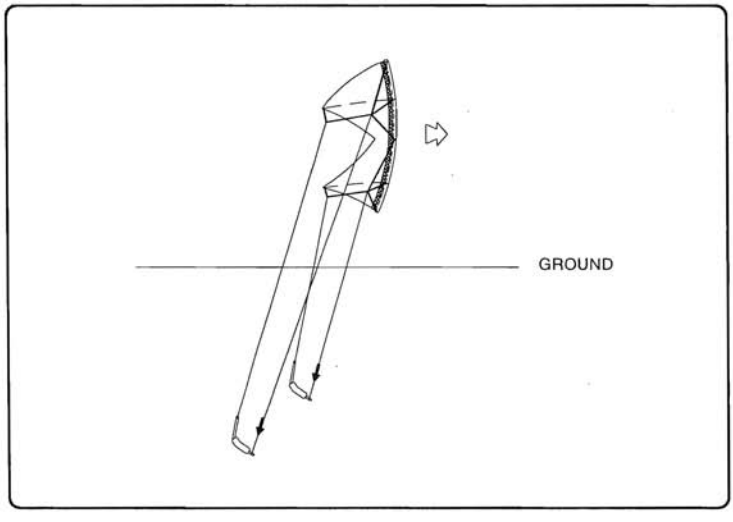
First of all you are crashed on the ground on the leading edge of the kite and you are keeping the tops of both handles in toward you in order to keep the kite on the ground.



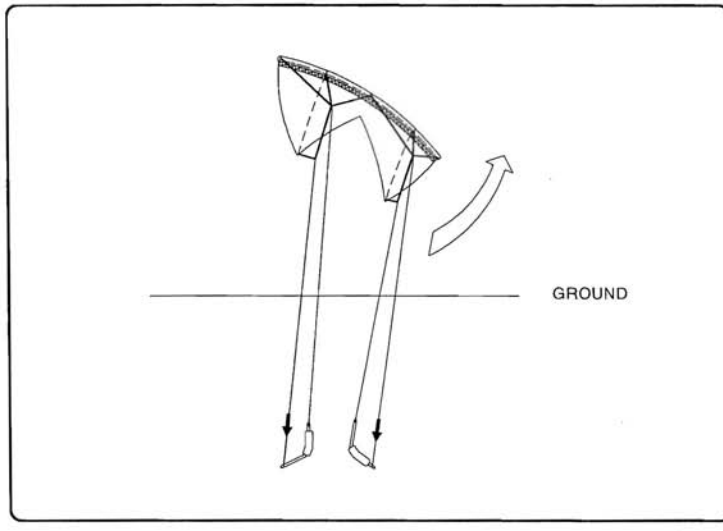
Pull back the bottoms of both handles very slowly, being sure to move both handles evenly. Raise the kite up enough to allow room for it to make a turn without hitting the ground. If the kite moves too fast, slightly push in the bottoms of the handles toward the kite until it slows down. Otherwise you'll be in a flipped wing situation and that's not good. (We will discuss this type of crash next).



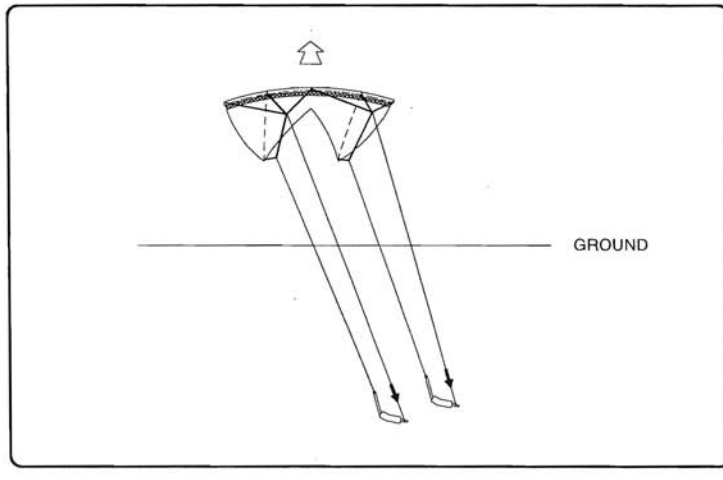
Next push in the bottom right handle in order to begin a 90 degree turn to the right and ultimately put the kite into a vertical position.



Once in this vertical position, pull the tops of both handles in toward you in order to fly forward across the wind window. Also pull the entire top handle into you for the elevation control.



If you want to fly forward - up just tap back on the bottom of the left handle to turn the kite 90 degrees again.



This puts the kite in the horizontal upright position and, with the tops of both handles pulled in toward you, it will fly up.

Another type of crash, which we mentioned earlier, that may occur is the wing flip. This is when one or the other wing tip will flip out (so to speak), and the kite will spin erratically, while at the same time losing altitude, and come crashing down. The kite may even continue flapping around after it has reached the ground. The cause of this is you, even though you don't know it. When making a 90 degree turn if you hold that tap a little too long the kite naturally goes into a spin and if you're not ready for it panic sets in and, voila ! This can also happen while flying in reverse to quickly.

There is nothing that you can do except to stake down your handles and run down to the kite, grab it, make sure that a fly line hasn't wrapped itself around a wing tip, and manually rotate the kite to untwist the lines. This is a dangerous situation because, until you have a hold of the kite it definitely has a mind of it's own. It will seem that the best way to control it is to just shoot it.

Here is when it's a good idea to have a stake on your person. The quicker, you can stake your handles and get to the kite, the better. This type of crash does not happen often, thankfully, and will only happen in the beginning.

We have heard, but have not tried, that you can correct a wing flip by pushing the bottom of the handle, (of the wing that has flipped out), toward the kite as far as you can and at the same time push that entire handle toward the kite as far as you can. This will take the pressure off of the kite and will possibly push the wing back to it's correct position. You may still have some twists in the lines but at least the kite has stopped the erratic spinning.

We have mentioned quite frequently, and much to your boredom by now we're sure, the importance of slow and slight handle movements in order to avoid detrimental crashes.

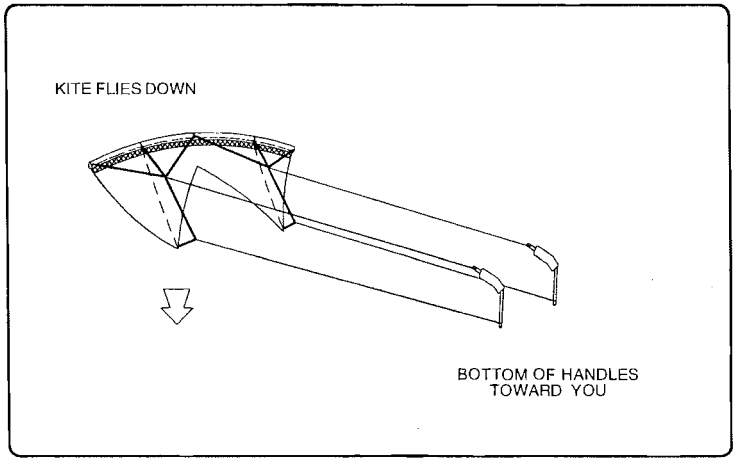
We would like to add that crashes will happen no matter how careful you are. The Rev is a very durable kite and most crashes will not harm it. A hard crash will at the worst only break a rod, and rods can be replaced at minimal cost. Even a ripped skin can be patched. Without crashing you cannot expand your flying horizons. So, "Pick yourself up, dust yourself off, and start all over again"'

CHAPTER 5

BEYOND BASIC

In this Chapter we are going to cover some of the more advanced moves that you can perform with the Rev. For example: In Chapter 3, "BASIC FUNDAMENTALS", we explained forward and reverse flight, in the horizontal position, but our main emphasis was on forward flight. Here we will attempt to explain reverse flight in this and in a number of other positions. We will also attempt to explain slowing down the kite, hovering, sliding, spinning, skipping, and inverted reverse. Most of these moves require proficiency at reverse flight, hovering in all positions, and the ability to slow down the kite when needed.

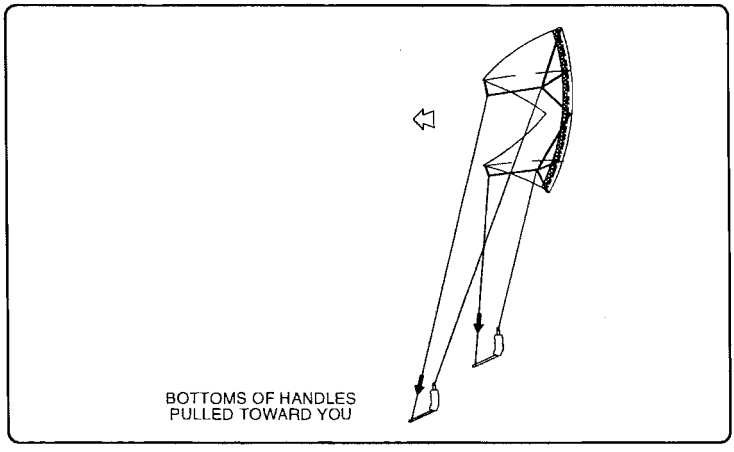
Reverse flight is the hardest flight to accomplish due to the design of the kite which makes it that much more exciting to conquer. Also remember that in any flight path where the kite is descending down towards the ground, allow the pull of gravity to do it's thing. You must get it started but then allow gravity to take over. You'll have a much softer landing and longer reaction time. Once you are experienced and in control you can force the kite to descend quicker by taking some of this control away from gravity.



REVERSE - DOWN FLIGHT

In reverse - down flight allowing the pull of gravity to do it's thing, actually slows down the kite. You can also slow down the kite in forward-up flight by not pulling back so much on the tops of the handles.

The main thing to remember when flying in reverse, with the wing tips leading, is that you must concentrate on keeping the bottoms of those handles even with each other or you'll be spending a lot of time in Chapter 4, "THE INEVITABLE".

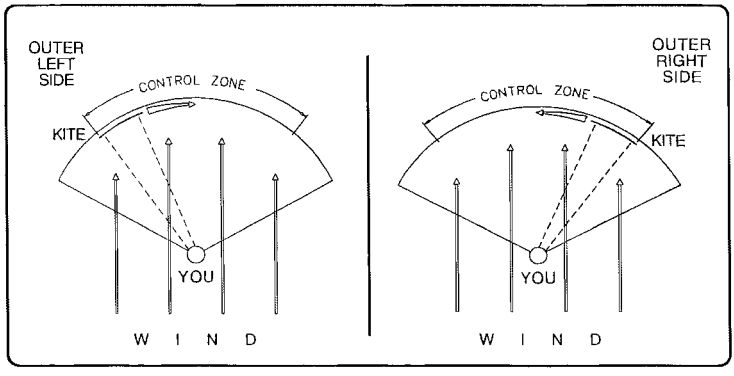


REVERSE IN THE VERTICAL

To put the kite into reverse while in the vertical position, slowly pull back the bottoms of both handles evenly toward you and watch your kite move backwards. WOW ! Just remember to move very slowly, too fast and you'll be experiencing the wing flip.

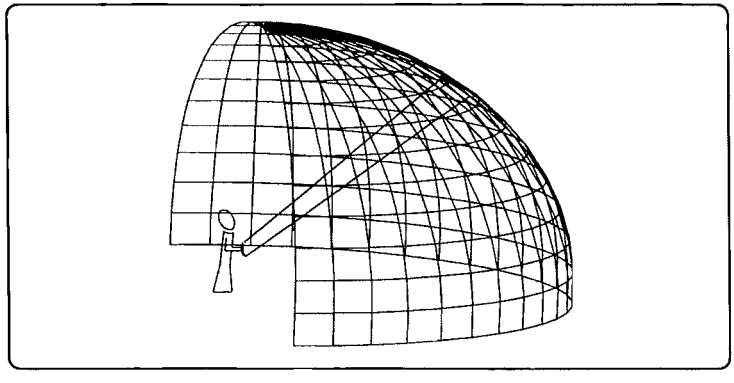
When we say slow here we mean slo o o w. At a snails pace is pretty accurate. Due to the design of the Rev it will only fly easily in a forward motion. This is not to say that you cannot make it fly easily and smoothly in a reverse motion. It just means that to do this you need to have a great deal of patience and be willing to put in hours of practice time. But the rewards are more than worth it because there is so much that you can do with reverse flight. And it is quite an accomplishment to have achieved it. In time you'll be able to speed up that snails pace to maybe a snails trot.

Utilize the wind whenever and wherever possible. A good example is this vertical - reverse flight path. The wind will naturally pull the kite into the center of the wind window so it is much easier to begin at the outer edge of the control zone. Either fly from the right side - in or from the left side - in.



REVERSE - OUT TO CENTER IN CONTROL ZONE

You also want to have the center of your kite above eye level, this will put it high enough above the ground so that you won't have to deal with kite and ground coming together.



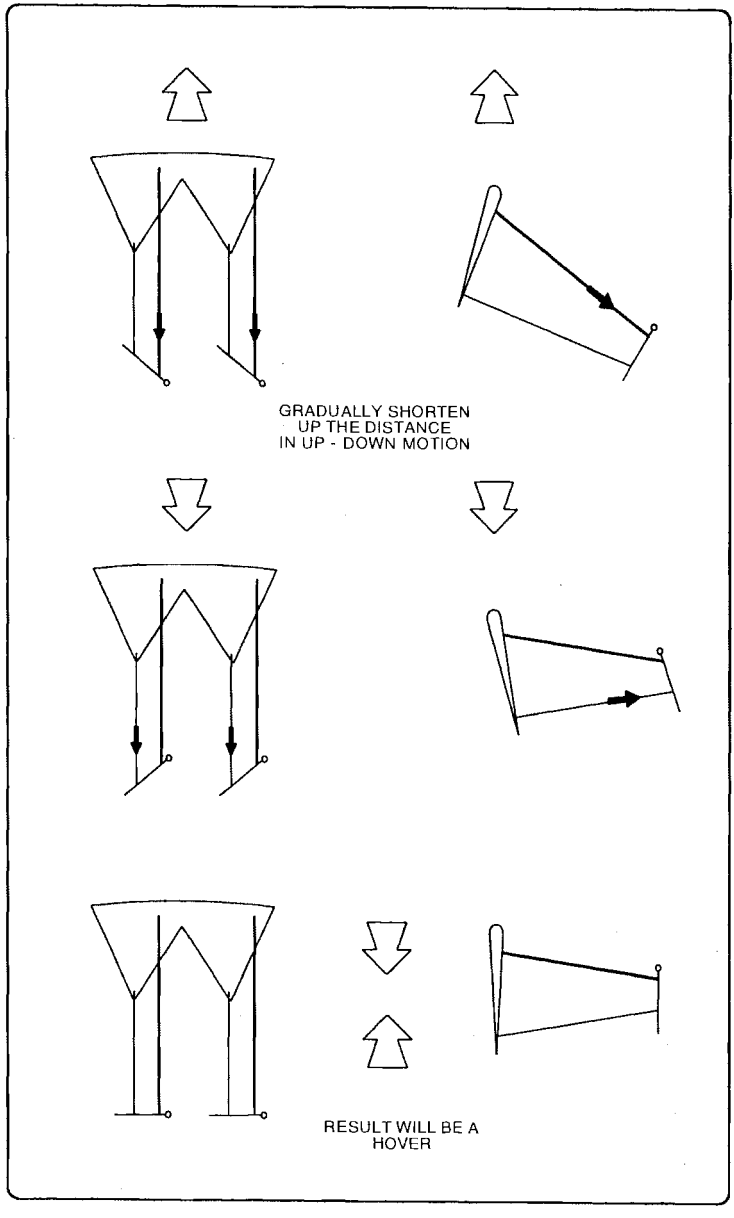
KITE ABOVE EYE LEVEL

(It is possible to fly in reverse from the center of the wind window to the outer edge but is also extremely difficult and should not be attempted yet).

When you have become more experienced, this vertical reverse and most other moves, can also be performed just inches off of the ground. This adds tremendously to the appeal of the kite and is a great challenge for you, the pilot, to see just how close to the ground you can actually fly.

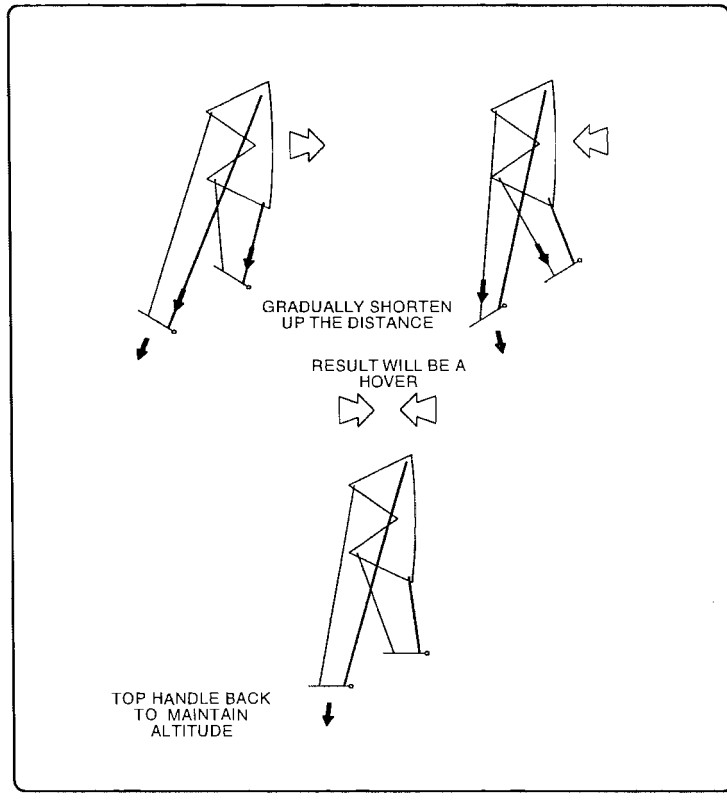
Hovering the Rev in one spot can actually just happen. One day, when you least expect it, while slowing down the kite your going to find yourself doing a hover, because you have reduced the speed of the kite to a stand still. This hovering is a challenge in itself just to see how steady you can keep it and for how long. In a hover, especially in an inverted position, everything must be in equilibrium and stay that way. Once you have control of this, and the previously mentioned moves, you'll be able to make this kite do all that it can do.

If you don't want to wait for this to just happen, try making it happen while practicing forward-up and reverse-down flight. Gradually shorten up the distance that you raise the kite and lower the kite. Eventually this distance will be reduced to nothing and you will be hovering the kite. Hovering in the vertical (90 degree) position and in the inverted position, is much more difficult.



UP - DOWN FLIGHT INTO A HOVER

To hover in a vertical position turn the kite 90 degrees and use the same concept of practicing the back and forth or forward and reverse motion (gradually shortening up the distance) eventually the kite will stand still. To make this easier, stay as close to the center of the wind window as possible. The more wind you have on the entire sail the easier it is to stabilize and the longer you can hold it. Remember to pull the top handle back toward you in order to maintain altitude.

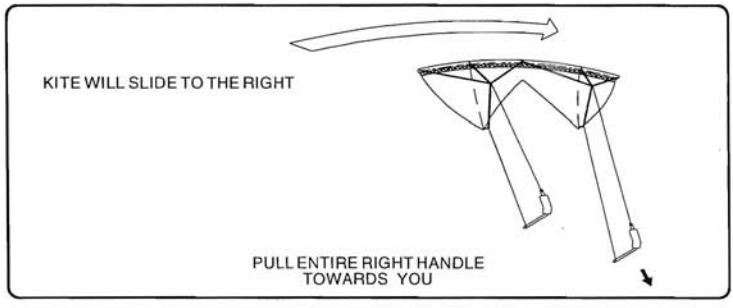


BACK AND FORTH FLIGHT EVENTUALLY INTO A HOVER

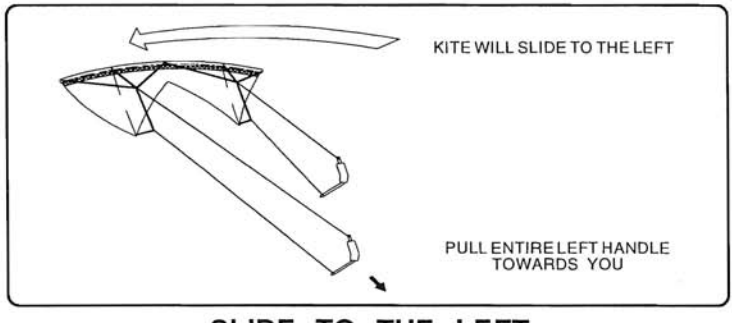
The rest of this Chapter will discuss moves that are possible with the abilities you've gained so far plus your ability to hover. You can now move right on into sliding and skipping, as both are quite easy.

Sliding back and forth, from left to right, in the horizontal upright position, begins with the hover. To slide from center to the right just pull the entire right handle into you, being sure to keep both handles stable in order to maintain altitude. The kite will slide to the right.

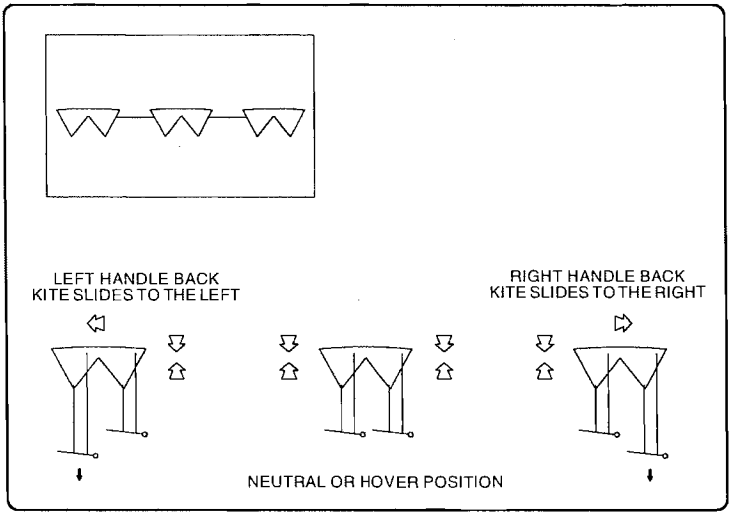
Pulling the left handle into you, while at the same time returning the right handle back to it's previous position, will slide the kite to the left.



SLIDE TO THE RIGHT



SLIDE TO THE LEFT

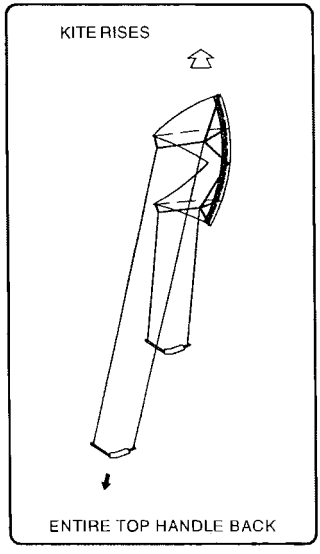


UPRIGHT HORIZONTAL SLIDE

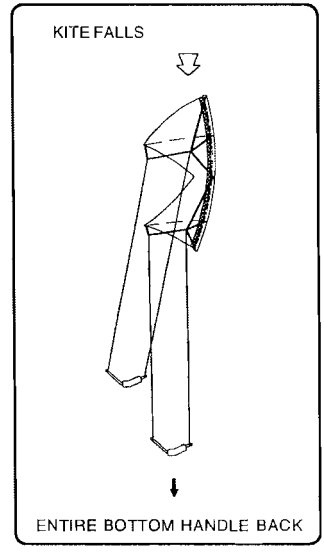
Sliding up and down in the vertical is also very easy. You have partially done this by pulling the entire top handle into you in order to maintain altitude. To cause the kite to rise higher just pull that same handle into you even more and at the same time push the bottom handle out toward the kite.

To cause the kite to descend just do the opposite. Pull the bottom handle into you and the top handle out toward the kite. (Top into you - rises, bottom into you - falls). While you are doing this if you concentrate on keeping the kite in that hover mode the result will be a straight line rise and descent. Once again this takes practice.

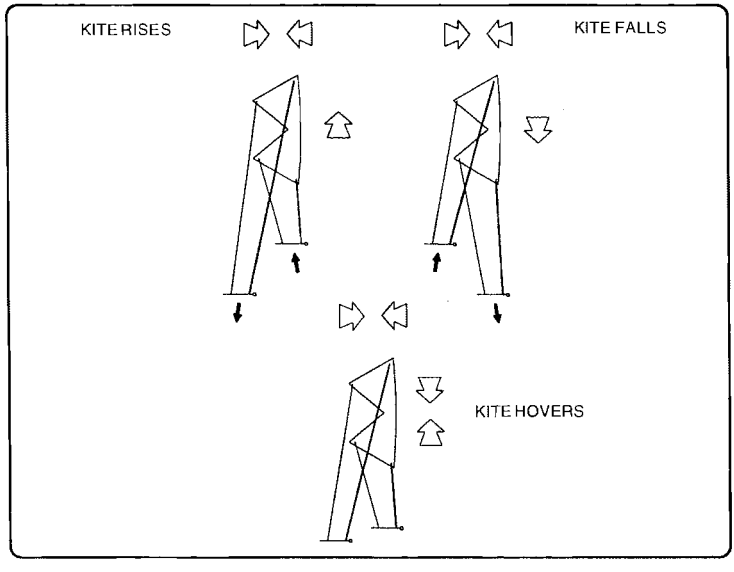
The pull of gravity is much more severe on the Rev I, being the larger kite. Which means that you will have a greater distance between your hands than you will with the Rev II or the 1.5 Rev.



VERTICAL SLIDE UP



VERTICAL SLIDE DOWN

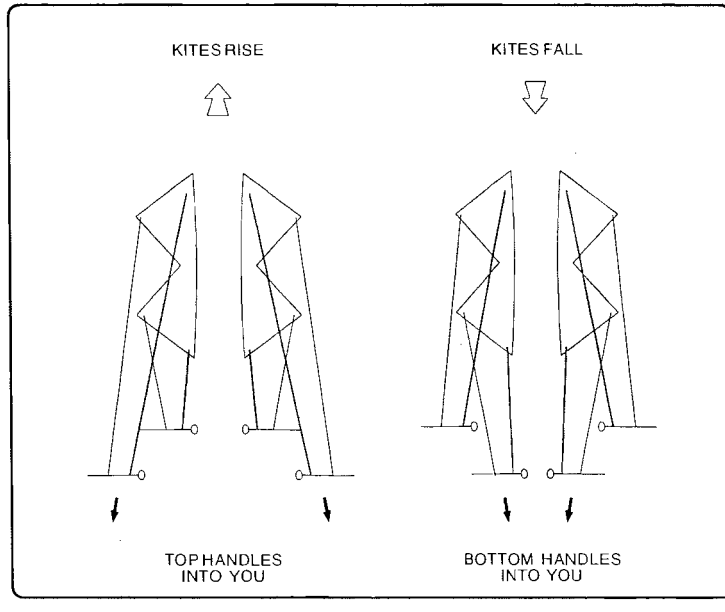


VERTICAL HOVER, SLIDE UP, SLIDE DOWN

Sliding two kites together is also fun and will improve your skills. If you have acquired a flying partner, who also flies, try it.

The partner on the left turns his/her kite 90 degrees to the right, the partner on the right turns his/her kite 90 degrees to the left. Both partners slowly move into the center, and each other, until the leading edge of each kite is touching the other. Now slide up together and down together.

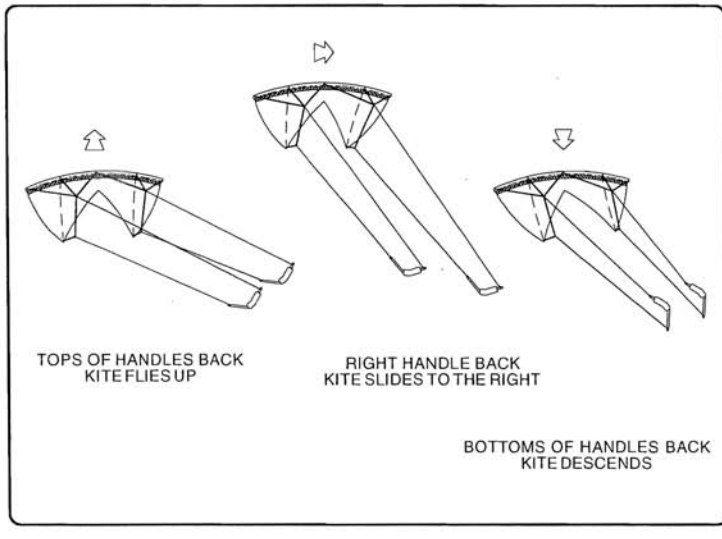
You can also perform forward and reverse flight in this mode. Forward for one will be reverse for the other, and vise-versa. Stands to reason you could also do a figure eight together, or if you're really good, a spin might even work.



TWO KITE VERTICAL SLIDE UP, SLIDE DOWN

Skipping is a movement that you'll see a lot of Rev fliers using when they touch the top of a post, for instance, with a leading edge tip. Of course this is with the kite in the vertical. Skipping can also be done with the kite in the horizontal, (upright or inverted). It is a technique that, again, uses all of the basic moves that you have learned up to now.

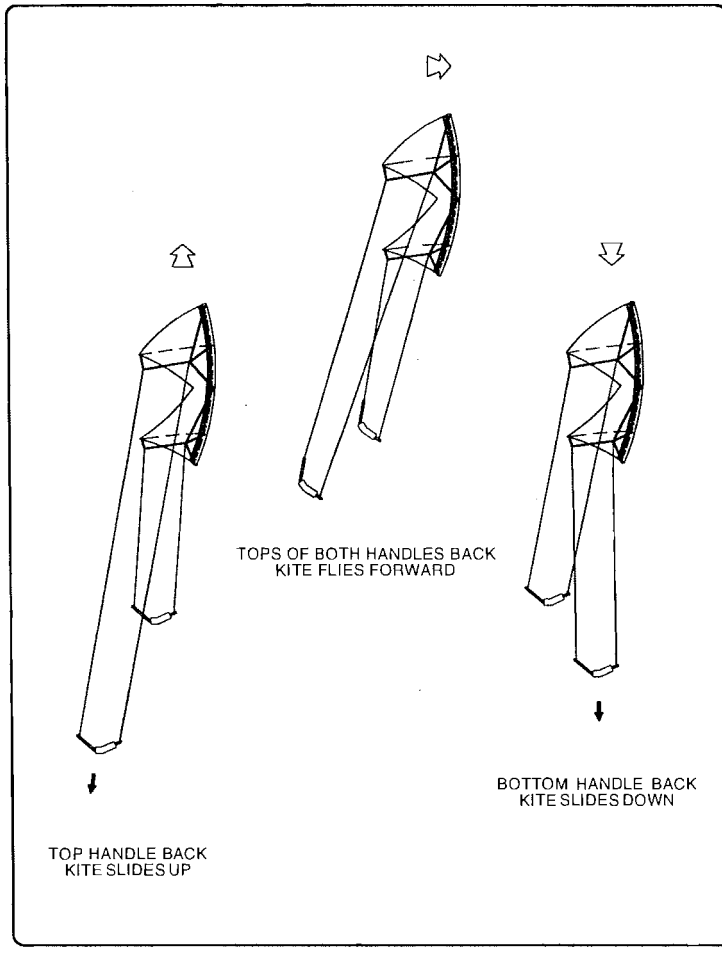
Start with the kite in the horizontal, as this is the easiest, grounded and on it's wing tips. Raise it up above eye level and do a slide to the right for a few feet and then lower the kite back to the ground. Do it again and again and the kite will appear to skip, or jump, as it moves across the wind window. You can also lift the leading wing tip a little more than the other as you rise, (if going to the right, lift the right wing tip). Bring the wing tips even as you slide, and land on that same leading wing tip with the other following. This will look like a galloping motion.



HORIZONTAL UPRIGHT SKIP

To skip in the vertical mode, slide up, fly forward, slide down, in a hopping motion across the wind window.

To touch the top of a post you slide up, then fly forward (or reverse depending on where the post is), then slide down to touch.

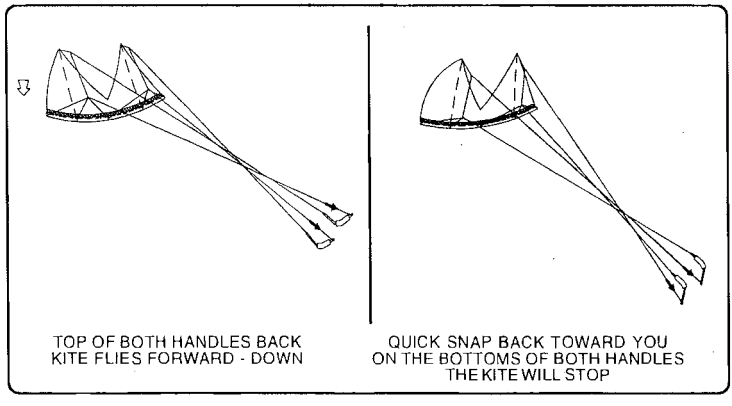


VERTICAL SKIP

Now that you have accomplished forward and reverse flight, hovering and turning the kite, and hopefully are to a point where crashes are almost nonexistent, you are ready to try these moves in the inverted position.

Inverted flight looks and sounds difficult, and at first it is, but with practice it will become easy and will bring you a great deal of enjoyment due to the challenge.

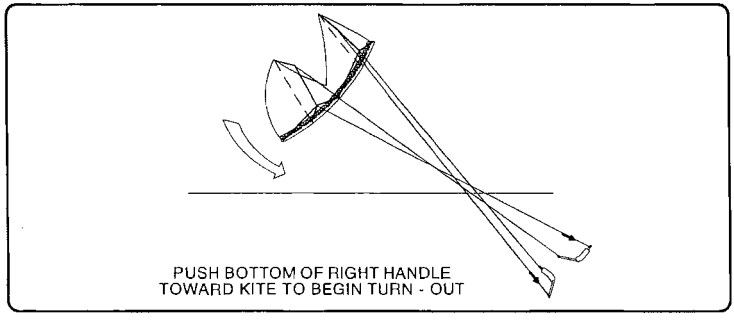
We'll begin with inverted - forward - down flight to a stop. To get the kite into position have it above eye level and in the center of the wind window. You begin by turning the kite either right or left and making two 90 degree turns, or a full 180, until the kite is upside down. In this inverted position, to fly down in a forward direction, you pull the tops of both handles in toward you slowly and evenly. Remember that the kite moves fast in forward flight and right now you are headed for the ground so take it slow. To stop the kite pull back on the bottoms of both handles in a quick short motion. This will bring the kite to an abrupt stop.



INVERTED - FORWARD - DOWN TO A STOP

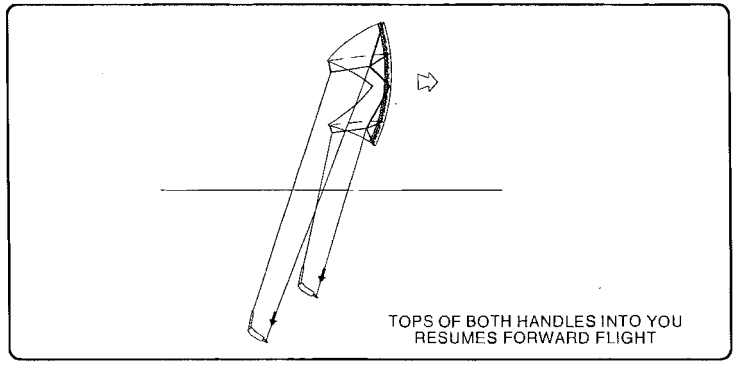
You are now in an inverted hover. Practice holding the kite in this position for as long as possible, as it will help you to do this entire move more accurately. With enough practice you'll be stopping the kite just inches from the ground.

While holding the hover if you begin to lose it just push the bottom of the right handle out toward the kite and it will turn out to the right. The same is true for the left.



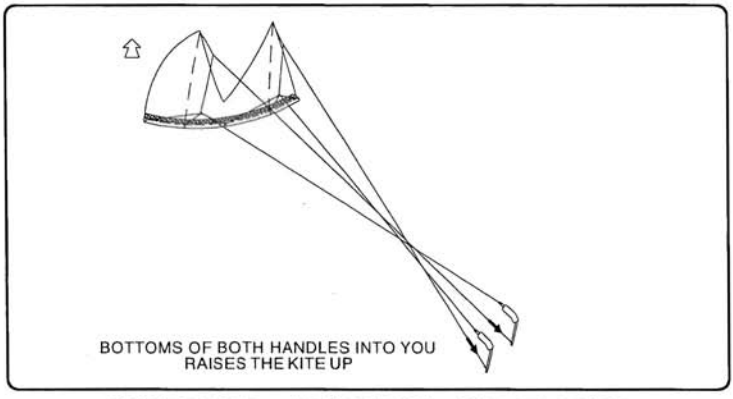
AVOIDING WING FLIP WHEN IN HOVER MODE

Once the kite has turned out, and is heading away from the around, you can then resume forward flight and try this move again.

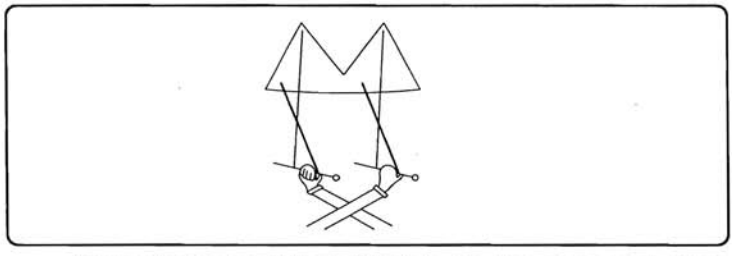


RESUMING FORWARD FLIGHT

The next move to try is an inverted - reverse - up. Be sure to start with the kite in the center of the wind window. Because the kite is inverted you must pull back the bottoms of both handles evenly in toward you in order to raise the kite up.

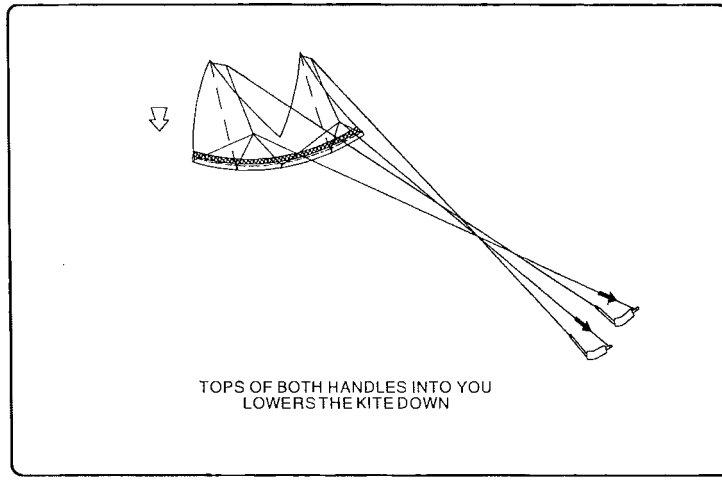


INVERTED - REVERSE - UP FLIGHT



If you have trouble with this do the crossed arms trick and see if that helps.

At first, raise the kite only a short distance and then pull the tops of both handles evenly in toward you to bring it back down to the ground. You must move the handles extremely slowly and evenly when reversing or you'll be in the flipped wing mode. Practice the short distance up and down to gain confidence. Gradually lengthen the distance.



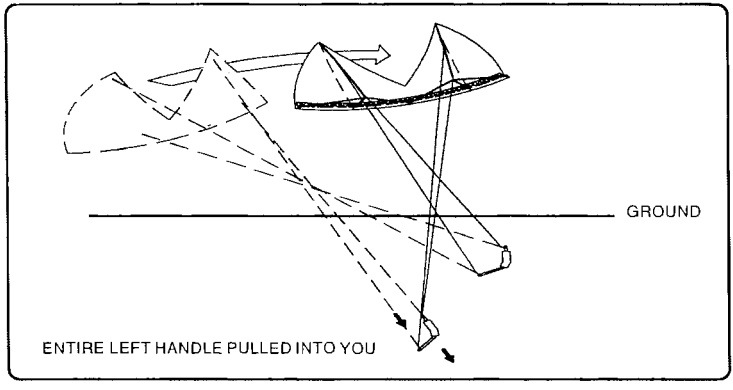
INVERTED - FORWARD - DOWN FLIGHT

With practice and perseverance you will make the kite fly in reverse and make it look easy. If you get into trouble just bring the kite around to where you can fly forward, (the Rev's comfort zone).

Here, in the world of reverse flight, it will seem that the kite just will not listen (resembling a child going through the terrible two's) only this is better because it is short lived and the kite does not talk back. Eventually reverse flight will come natural to you like riding a bike or driving a car and you won't even be thinking about your hands and what they are doing. Once you have crossed this line you will have entered into a whole new dimension in four line flying.

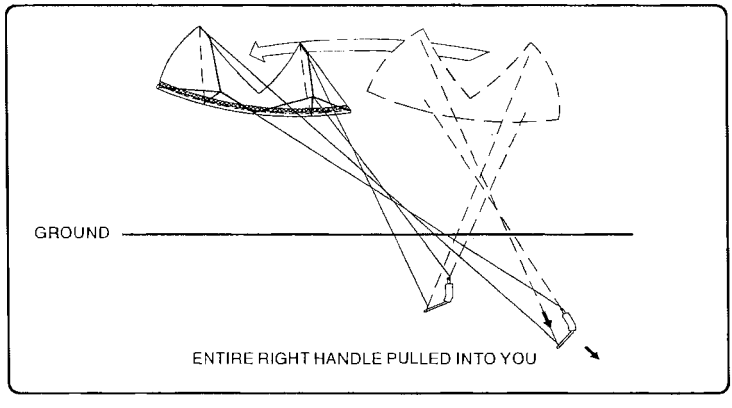
Conquering inverted - up - flight will also enhance your inverted slide because you can now do it in the air rather than on the ground. Refer to Chapter 4, pg 64, for an inverted Ground slide.

To accomplish a slide in the air you raise the kite up, as we have previously described, and hold in a hover. As with the ground slide you now pull the entire left handle in toward you to slide the kite to the right. Bring the handle back to being even with the other one and the kite stops.



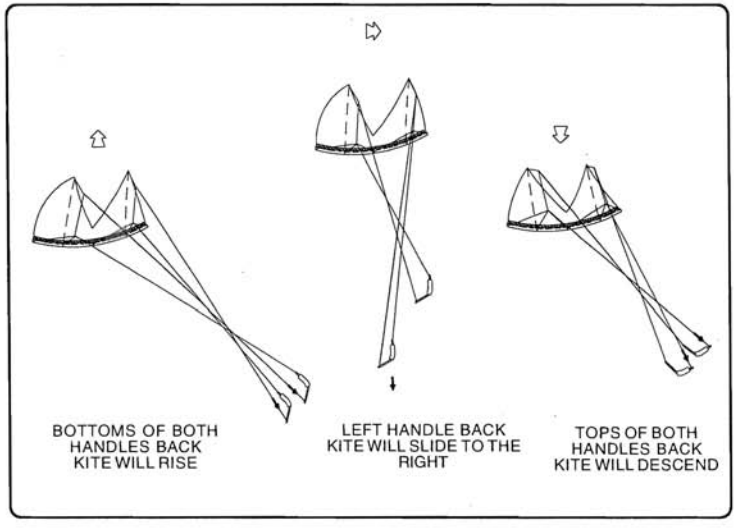
INVERTED SLIDE TO THE RIGHT

Pull the entire right handle in toward you and the kite slides to the left. Getting this move to maintain an even altitude all the way across and to look smooth is a tremendous challenge.



INVERTED SLIDE TO THE LEFT

In the inverted positionskipping is just a bit trickier. Remember that your kite is now upside down and so you have to think in terms of opposites. To do the basic straight up, slide to the right, and straight down movement you pull back the bottoms of both handles into you to raise the kite up, then slide to the right by pulling the entire left handle into you, stop by bringing the handles even with each other, and finally lower the kite to a landing by pulling the tops of both handles into you.



HORIZONTAL INVERTED SKIP

Skipping is also fun with two kites. Chasing or jumping over the top of each other has a nice playful appeal to the onlooker and can be done in any position whether it be horizontal, vertical, or inverted.

This is at the same time twisting your lines with your partners so keep the number of jumps low. In the inverted mode you could end up with a horrible mess if you're not careful.

In the inverted up maneuver you can tell if your fly line lengths are correct. If you pull back the bottoms of both handles toward you, almost as far as you can, and the kite barely moves up, than you have correct line lengths. When the kite has correct line lengths it will fly easier and will be less prone to wing flips.

If the kite starts rising before you have the bottoms of the handles back that far than you know that the top lines are too long. You can fix this by shortening those lines.

If the kite will not move at all when you have the bottoms of the handles back that far than you know that your bottoms lines are too long. You can fix this by shortening those lines.

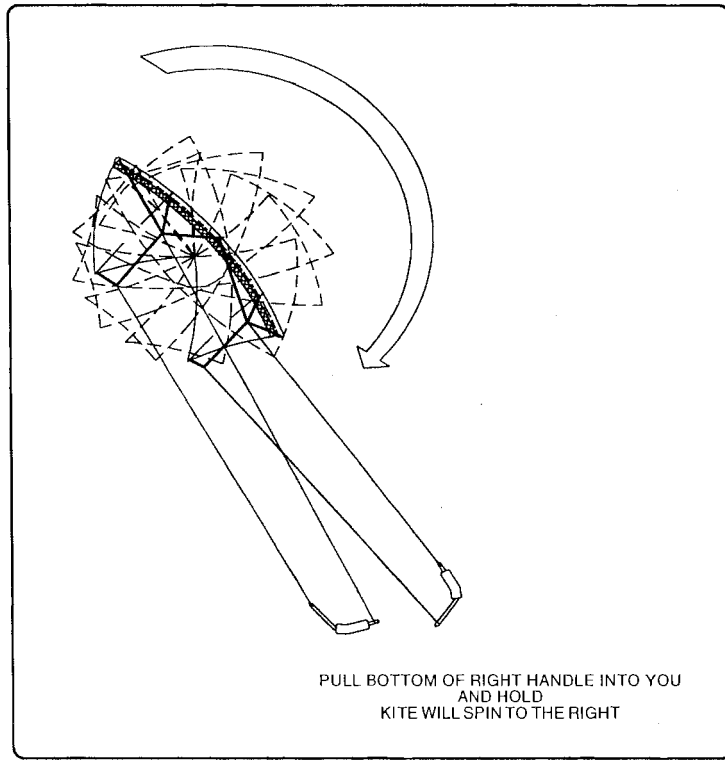
As you become more experienced you will want more control on the bottom lines. You will need to lengthen the top lines. This gives the kite greater responsiveness in the turns, as well as in the reverse and inverted moves.

We have found that the ultra - light Rev handles gives us that added length with the Rev I kite. In a medium wind these handles provide quicker response and control which allows for quicker turns and shorter response time. At the same time all of these added features also make it more difficult to fly, but the difficulty is half of the challenge, and half of the fun.

When we fly our Rev II's we use the regular Rev I handles for quicker response and turns, and better control.

Spinning is also a very easy maneuver, especially since the kite wants to go that way naturally. A controlled spin takes some skill, though, and is what you want to eventually master.

Make sure that you have the kite in the center of the wind window and above eye level. This portion of the wind window, as with all of the other moves, is where the kite will perform the best. To spin to the right just pull back on the bottom of the right handle. The farther that you pull it back the faster the kite will spin. The longer that you hold it, the more spins the kite will make.



SPIN TO THE RIGHT

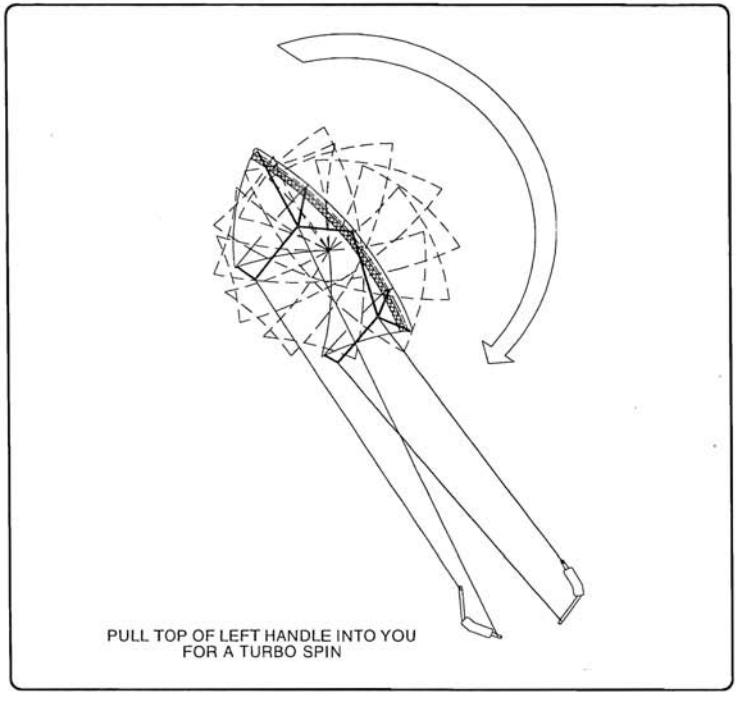
To spin on the very center of the kite you will need to employ a push - pull action. The side of the kite that is on top, that handle should be pulled in toward you and the other handle pushed out toward the kite. Yes, this is the altitude control move. The hard part is that the kite is spinning and in a very short time the other side of the kite will be on top. Thus the push - pull action. You could also call it a punching motion with your hands.

This takes a great deal of timing and practice but seeing your kite spin dead center is worth it. You can spin fast or, for a new challenge, spin slow. Slowing down the spin is difficult. You must have complete control and mastery of all aspects of flying the Rev.

To stop and reverse the spin, or spin to the left, return the bottom of the right handle to its previous position and pull back on the bottom of the left handle. And so on, and so on. This is similar to making 180 degree turns, except that you continue around and end up making several 360's.

A note of caution: Do not spin more than 3 or 4 times as this puts a great deal of stress on the fly lines and (on your ability to keep track of the number of spins).

If you want a turbo spin just pull back on the top of the left handle at the same time.

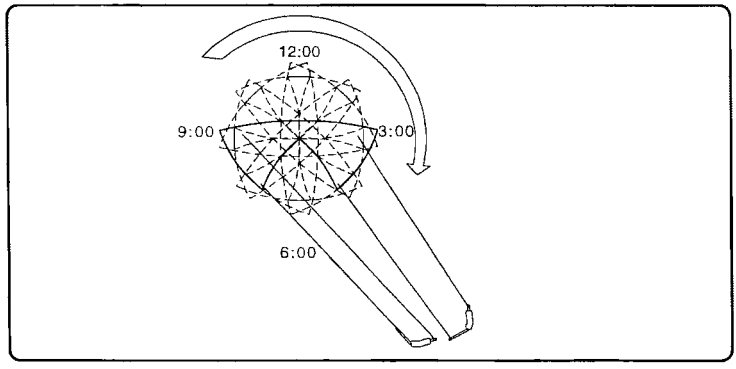


TURBO SPIN TO THE RIGHT

A Tic - Toc Spin, or hover rotation, is a total precision move that rotates on the center of the kite and takes a great deal of skill and patience to learn. It is definitely an advanced move to set your horizons on. The prerequisite for this move is your proficiency at hovering in each 90 degree position. These being the forward - up horizontal hover, (9 o'clock position), a vertical hover, (12 o'clock position), an inverted horizontal hover, (3 o'clock position), and a vertical hover with 1 twist in the lines, (6 o'clock position).

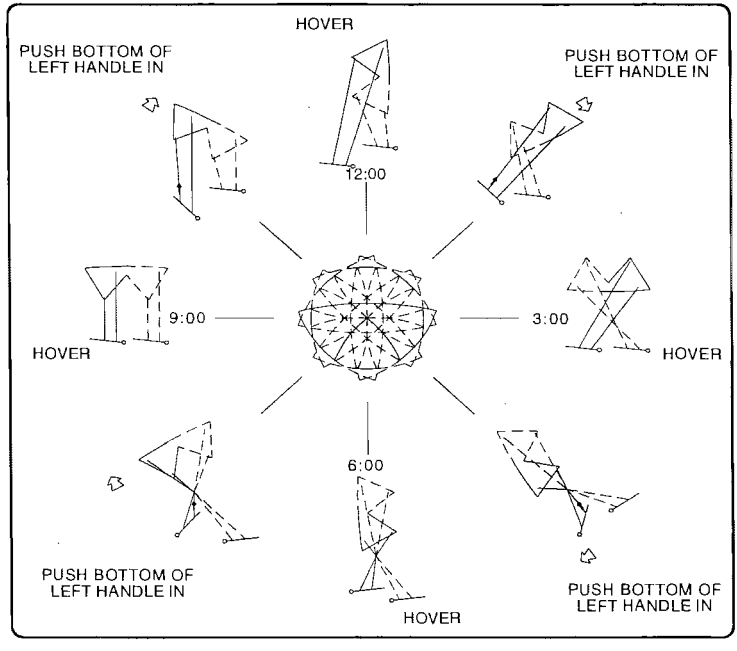
In essence it is a slow motion spin, making a brief but noticeable stop at every 3 hour mark, (or every 90 degree mark). From a hover at 9 o'clock make a 90 degree turn, right or left, to 12 o'clock, stop and hover. Make a 90 degree turn to 3 o'clock, stop and hover. Make a 90 degree turn to 6 o'clock , stop and hover. And finally a 90 degree turn back to 9 o'clock, stop and hover.

Up to now all of the turns have been accomplished by pulling back, or tapping, on the bottom of say the right handle in order to turn the kite to the right. In this Tic - Toc move you need more precision in the turns as well as in the stops. To do this, push in the bottom of the left handle to turn to the right. To stop, just pull it back to the hover position. This is how you create the short pause at each 3 hour mark. You will also notice a big difference in how exacting you can make the kite move and stop. This push instead of pull concept can also be used in your other moves when you want that precision look.



TIC - TOC SPIN ROTATES ON CENTER

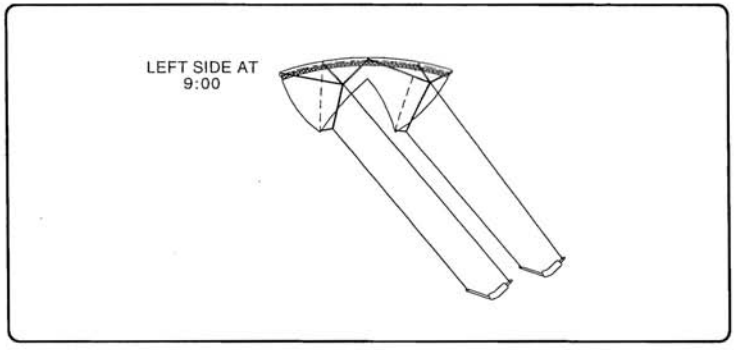
In order to show the individual turns we have illustrated this maneuver in a circle, below, as well as in an actual center spin, above.



TIC - TOC SPIN CLOCKWISE

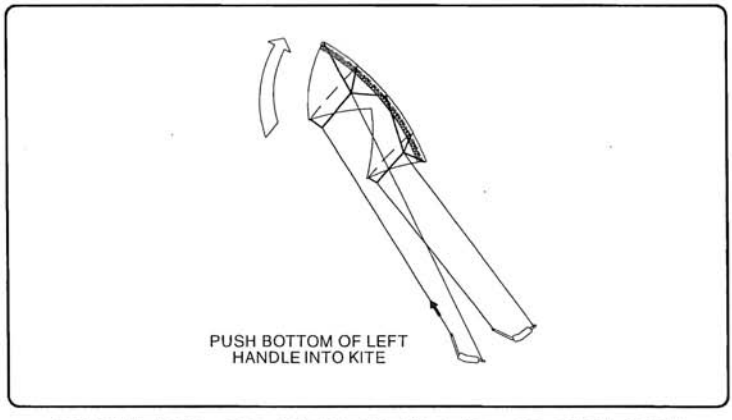
(RIGHT SIDE OF KITE, HANDLE AND LINES ARE SHOWN DASHED)

Think of this maneuver as being a series of 90 degree turns. Each one beginning at the 3 hour mark. To begin the tic - toc spin, bring the kite to a stop and hover at 9 o'clock.



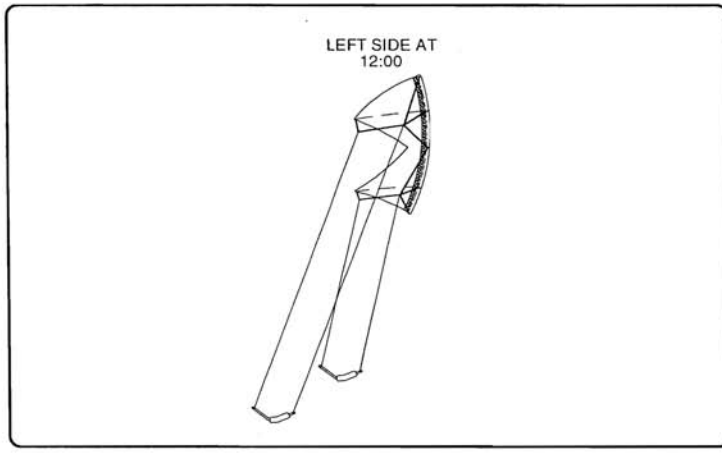
HORIZONTAL - UPRIGHT HOVER AT 9 O'CLOCK

Step 1: To begin the rotation of the kite, 90 degrees clockwise, you push in the bottom of the left handle. At the same time you must pull that entire left handle in toward you in order to compensate for the pull of gravity. This also maintains the rotation on the center of the kite, as shown in the first illustration.



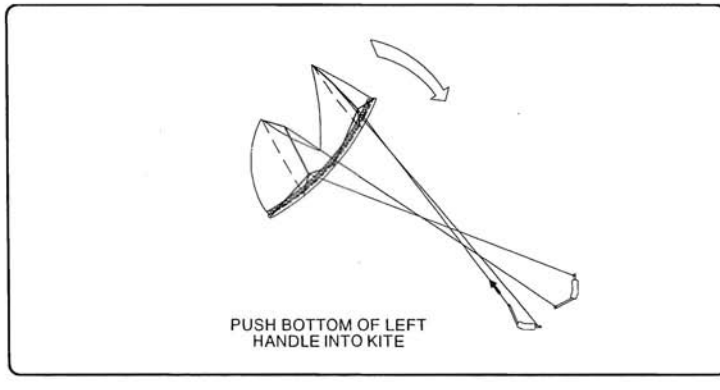
ROTATING 90 DEGREES TO 12 O'CLOCK

When the kite has finished the 90 degree turn and is at 12 o'clock pull back on the bottom of that left handle to the hover position. This will bring the kite to an abrupt stop. Maintain hover at this 12 o'clock position.



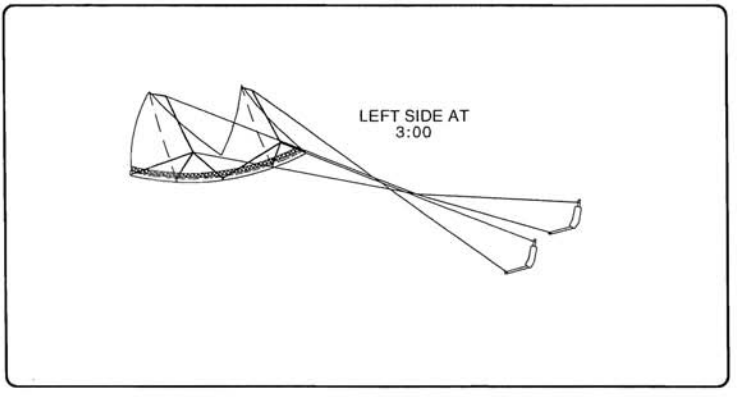
VERTICAL HOVER AT 12 O'CLOCK

Step 2: Again push the bottom of the left handle in toward the kite, also return that entire handle to being even with the other, (because at 3 o'clock the hover maintains altitude).



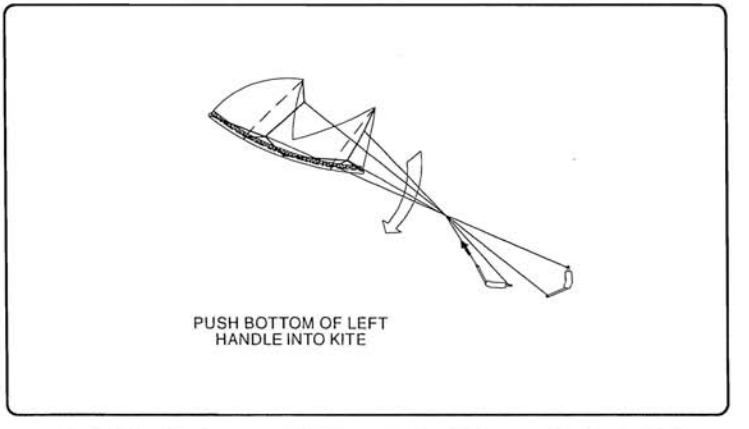
ROTATING 90 DEGREES TO 3 O'CLOCK

Again when the kite has finished the 90 degree turn and is at the 3 o'clock position pull back on the bottom of that left handle to the hover position. This will bring the kite to an abrupt stop. Maintain hover at this 3 o'clock position.



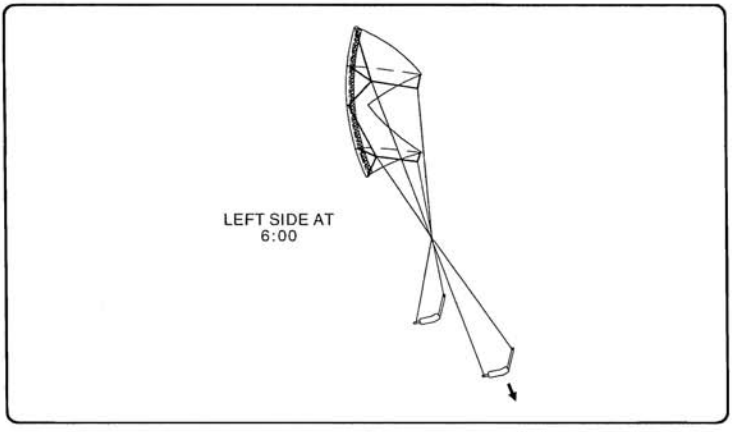
INVERTED HOVER AT 3 O'CLOCK

Step 3: Again push the bottom of the left handle in toward the kite and pull the entire right, (top), handle in toward you to maintain altitude.



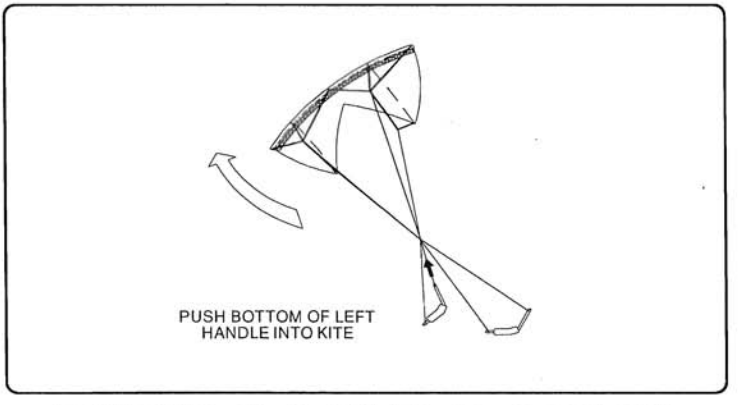
ROTATING 90 DEGREES TO 6 O'CLOCK

When the kite has finished this 90 degree turn and is at the 6 o'clock position pull back on the bottom of that left handle to the hover position. This will bring the kite to an abrupt stop. Maintain hover at this 6 o'clock position.



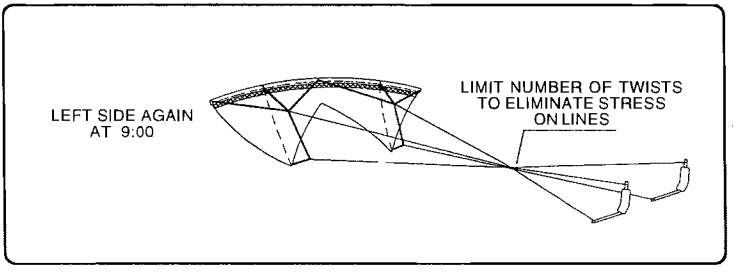
VERTICAL HOVER AT 6 O'CLOCK

Step 4: Again push the bottom of the left handle in toward the kite and bring that entire right handle to being even with the other.



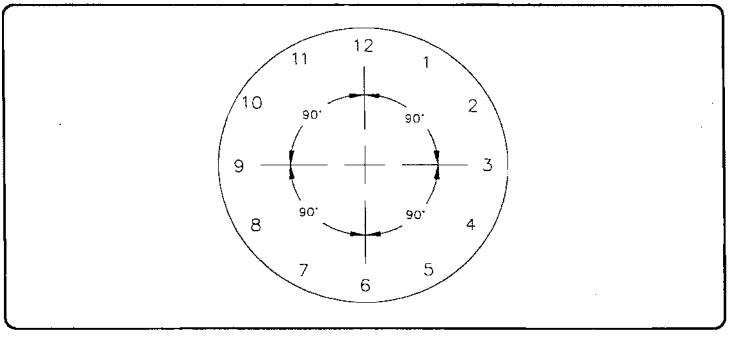
ROTATING 90 DEGREES TO 9 O'CLOCK

When the kite has finished this final 90 degree turn and is at the 9 o'clock position pull back on the bottom of that left handle. This will bring the kite to an abrupt stop. Maintain hover at this 9 o'clock position. You have now rotated the kite a full 360 degrees.



HORIZONTAL - UPRIGHT HOVER AT 9 O'CLOCK

Realize that each 90 degree maneuver is very quick and your only breather, short as it is, is at the hover positions.



90 DEGREES ON THE CLOCK

Remember that when the kite is hovering in any horizontal position your hands are together to maintain altitude. When the kite is hovering in any vertical position your top hand is into you to maintain altitude. This is a constant back and forth motion through out the Tic - Toc.

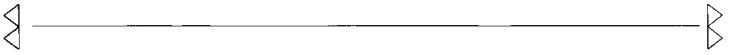
By the time that you are ready to attempt this move your altitude control and handle manipulation will be second nature to you and this will make it much easier to accomplish. To do the Tic - Toc accurately you must also be able to stop the kite in any position, anywhere in the wind window, and successfully hover the kite in any position.

Tic - Toc Summary:
(In a clockwise direction as illustrated.)

Push bottom of left handle to go.
Pull back to stop.
Hover (stabilize).
Maintain elevation control as needed

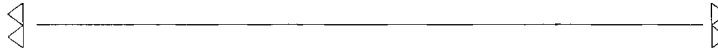
Next try a 1/8 turn tic - toc, or even 1/16. These will be easy after you have mastered the 1/4.

We hope that the information contained herein will help you to become a proficient four line flyer. Just keep in mind that the moves which seem confusing now, will not be when you are ready for them. Just take it step by step and relish each accomplishment along the way.



CHAPTER 6

TAILORING LINES and HANDLES



Whether you have a newly purchased Revolution kite or an older model, this chapter contains some helpful hints in the pre-flight department.

First a word about the recommended Spectra line. It does stretch some and you will find that it will do so to a greater degree in heavy winds than in light winds. You will also experience more of this stretch on the top two lines than on the bottom two. This is due to the fact that most of your flying will be in a forward direction, with the leading edge leading, and this puts more pull on these top two lines and consequently more stretch. You will also find that stretching diminishes over time because eventually you will have pulled all of the stretch out.

We have found that by rotating our top and bottom lines every time we fly allows for a more even stretch on all four lines. To keep from becoming confused on this issue we have marked our lines on the sleeving at each of the eight ends. Our top lines have one mark each and our bottom lines have two marks each. We also make the marks on the right lines in red and the left in black.

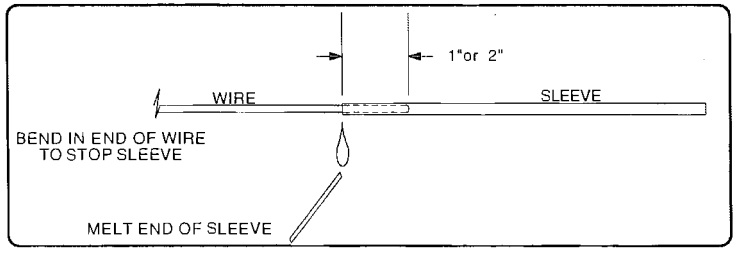
When first learning to fly this is an important step to take. If your top lines are more than a couple of inches longer than your bottom lines your kite will not be balanced and will not fly to it's maximum potential. Having even lines and bridle ensures balanced flight and makes learning the maneuvers much easier.

We use 150 lb. line in heavy winds and 50 lb. line in extremely light winds. Ninety Nine percent of the time we use 80 lb. line. This works well with our Rev I's and Rev II's. We learned to fly the Rev on 100' long lines and

eventually found that 65' lines worked to our advantage.

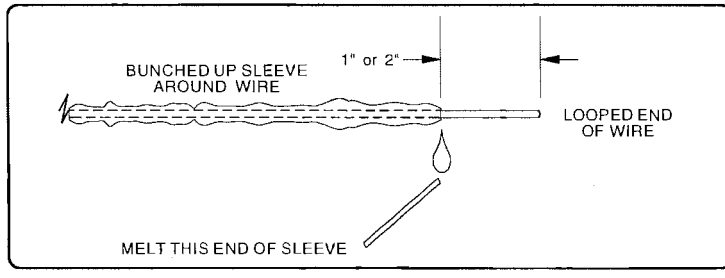
The following is the procedure that we use when cutting new lines and sleeves and is only a suggested way to do it. To begin with we cut all eight pieces of sleeving exactly the same length, about 16" - 20". Which ever length you choose be sure to cut all eight pieces exactly the same. If they are not you'll have problems later when you are adjusting for uneven stretch do to flying. You can also buy sleeving kits at any kite shop, or mail order, which will contain pre-cut sleeves. Sleeving line is hollow and most are made of dacron. If you are cutting your own make sure that the sleeving you choose will just fit over your fly line diameter. It is important that it not be too loose. You will also need a fine wire needle threader, about 6" or longer. You can also make one from a 20" piece of fine wire doubled over to form a loop. Make a short bend in the end opposite the loop, this will provide a stop for the sleeve.

We only sleeve 4 of the 8 ends and then we pre-stretch the lines and cut all even, (which we will explain later). To sleeve begin by threading the threader in a sleeve for about 1" - 2". Use a flame to melt this raw edge of the sleeving on the wire, turning the wire occasionally so that it does not stick. This will ensure no unraveling at the end of the sleeving and a tight fit around the fly line as it passes through. Wait for the

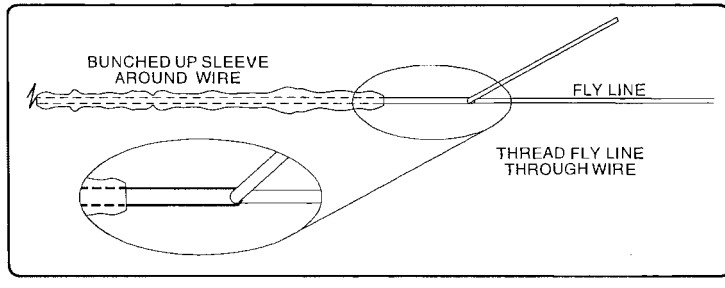


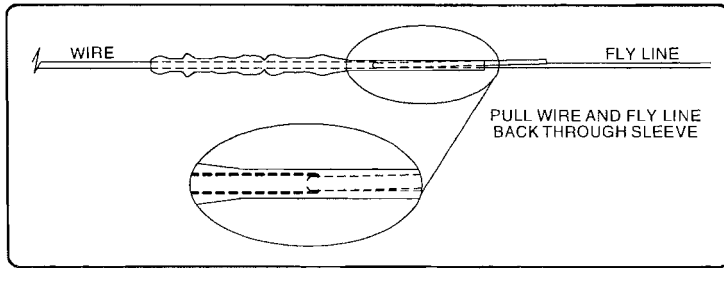
wire to cool before proceeding.

Thread the wire on through to the other end of the sleeve, pushing the sleeving down onto the wire as you go. The sleeving will bunch up against the bend that you made at the end. When the wire is sticking out passed the other end of the sleeving, about 1" or 2", melt this end also. If the end of the wire pokes out of the sleeving as you are threading just back it out, center it in the sleeve, and resume.

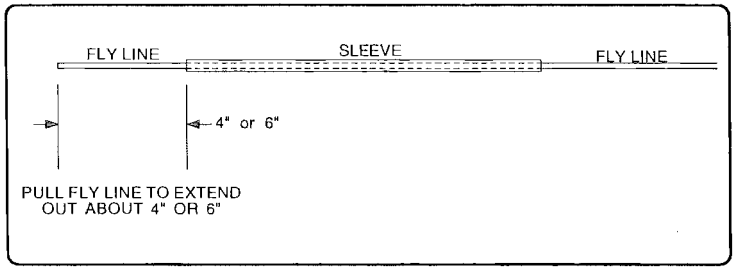


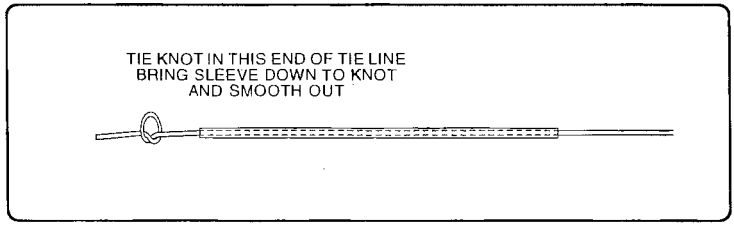
Thread the fly line through the loop in the wire and pull back out through the sleeve.



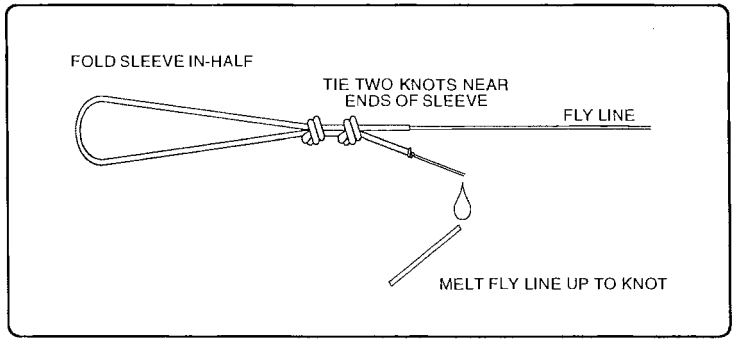


Once you have about 6" of fly line extended out past the sleeve remove the wire. Tie a knot in the fly line about 1" in. Smooth out the sleeve down to this knot.





Smooth out the sleeve again to ensure that it is snug around the fly line. Fold the sleeve in half, forming a loop, and tie two knots near the ends of the sleeve. Then melt the fly line back to the knot. If you are using less than 80 lb. fly line you may need to place more than 2 knots to keep it from slipping.



As we mentioned before, after we have sleeved 4 of the ends we then pre-stretch our lines. We make a loop at the non-sleeved end and attach to a spool or handle, this way if a line breaks it will not come flying back into you. (Wear protective glasses). With the sleeved ends attached to a stationary object we then physically pull on the lines until we feel that they are stretched as far as they are going to stretch. If you are stretching 80 lb. line, pull lightly, we have broken many a line in this process. We have heard of some people attaching the lines between two stationary objects in order to stretch them letting the objects do the work rather than themselves. Also stretching a non sleeved line is safer than a sleeved line as it loses about 40% of it's strength at a knot and this is where a break will most likely occur.

Before we sleeve the last four ends of our fly lines we make sure that all of our lines are cut exactly the same length. To do this we loop the sleeved end of two of the lines, one being the shortest of the four lines, over a nail hammered into the top of a sawhorse. We have a double pulley permanently and securely anchored to the bottom of another sawhorse. We then run the other end of these two lines through each side of the double pulley and attach them by larks heading them to knotted lines attached to sinkers. This puts exactly the same amount of tension on both lines. We then mark both lines with a marker at the distance we want our lines to be, remove one line, spool the other and repeat this process for line 3 and then again for line 4 using the first line as a guild.

Any method will work, even having someone holding a eye screw to thread the lines through. The main thing is to have even weight, or pull, on the two lines so

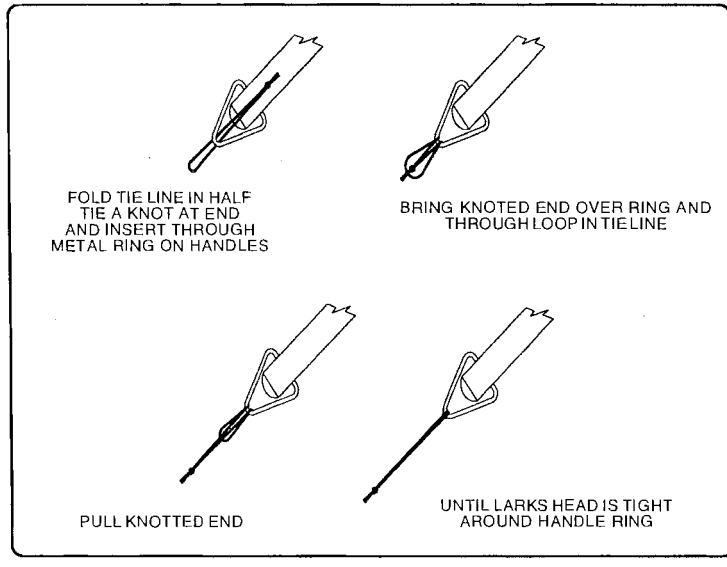
that when you mark them you know that they are the same length. With all four lines measured to the same length you can now sleeve the other ends, the same way that you did the first four, bringing the sleeving up to the marks that you just made on the fly lines.

This is the way that we do it and of course is only one of many ways. You will find easier and quicker methods of doing this and you should. What we offer here are only suggestions and suggestions can always be improved upon.

After you have flown the kite a few times you may want to use this process again as the lines will stretch unevenly, especially at first. Which as a beginning Rev flyer can make life extremely frustrating. One way to check the stretch is to anchor down one end of all four lines and with your fingers hooked into the loops at the other ends, pull two of the lines at a time and compare them to each other. It's a good idea to close your eyes while pulling as we all have more strength in one arm than in the other. When it feels like you are pulling with even pressure on both lines open your eyes and see if one line is longer than the other. This may seem unnecessary but, we have found that when learning to fly the Rev, line length seems to make a big difference in the performance of the kite and ones ability to fly it.

When you have reached the point where the kite is a part of you, (just an extension of your arms and you are not even thinking of how to fly), then you will be able to mentally compensate for uneven lines.

Our Revolutions are older versions and they came with the bottom bridles being 6" longer than the top bridles. To allow for this difference we have added tie lines to the top and bottom of each handle using a larks head. The top tie lines are longer than the bottom tie lines.

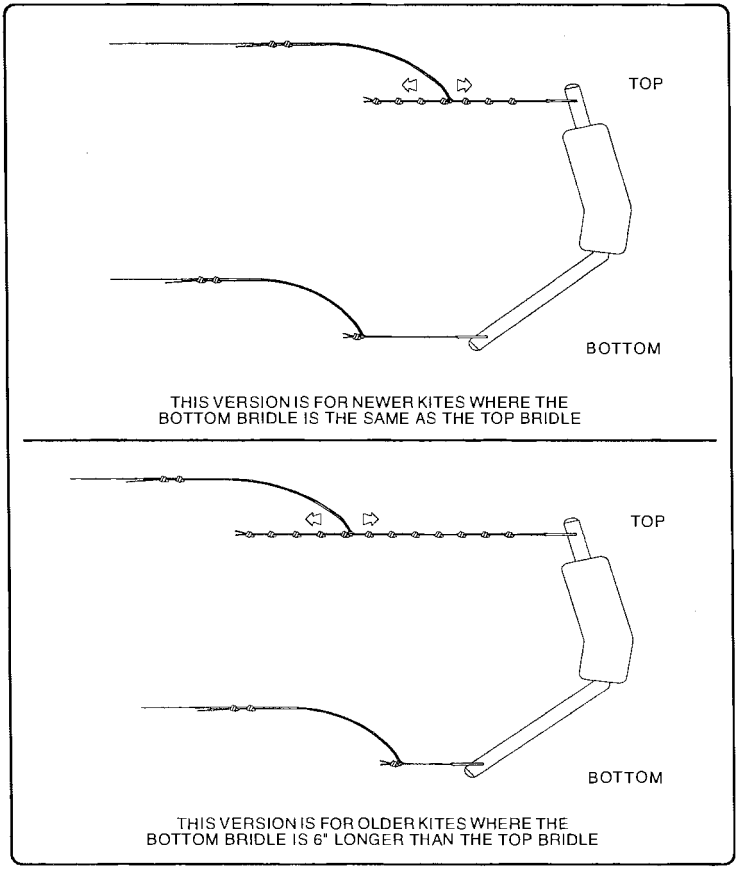


LARKS HEAD

(TIE LINES - TOP AND BOTTOM OF HANDLES)

On the top tie lines, at 1 1/2" from the handles, we tied knots at 1" intervals down the length of the lines. This allows us to attach our fly line at any knot in order to make up for the 6" longer bottom bridle.

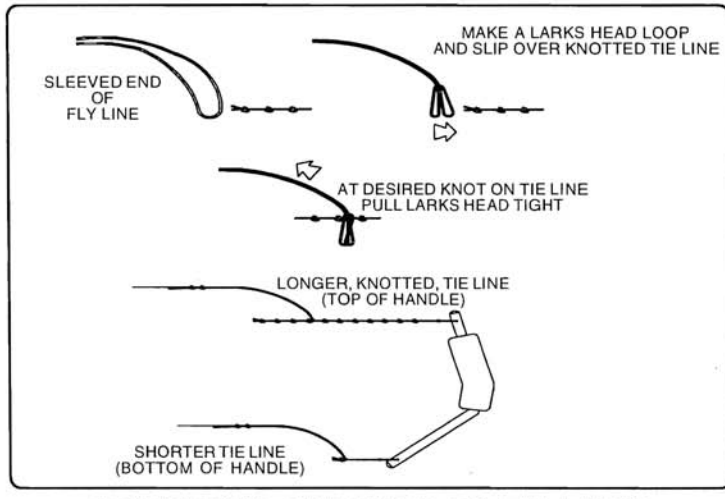
This also makes a convenient adjustment line for wind speed and you may want to try this later on even if you have a newer version of the kite.



KNOTTED TIE LINES

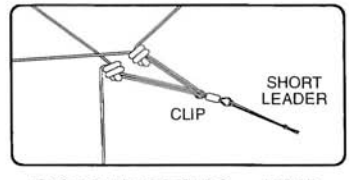
In heavier winds you want to back out the top of the kite, this will lower the speed of the kite and make for easier flying. In lighter winds you want to bring the top of the kite in. This improves the angle of attack which gives the kite the extra speed needed. With this in mind do the line length check, pg. 94, to determine your base knot. Then play with moving your fly line back 1 or 2 knots and forward 1 or 2 knots, to get a feel for how the kite flies at those positions.

The fly lines attach to these tie lines by larks head and with this being close to the controls, so to speak, it makes it quite easy to adjust. Well, easy may be too light a word. This adjustment does take some coordination. When you have flown, then landed, and need to adjust for heavier or lighter winds than originally thought, you will find yourself trying to hold onto two handles while adjusting one and concentrating on how you are holding them in order to keep the kite on the ground. A few practice runs and you'll have it down pat plus you'll have this added bonus of more control.



ATTACHING FLY LINES TO TIE LINES

We have also attached a short leader, by larks head, onto the clips at the four connecting ends of the bridle.



CONNECTING END

We hope that this book has given you enough correct information to enable you to learn to fly the Revolution Kite. We have tried to explain it in a simple, easy to understand format in hopes of easing your initial grief of not knowing how to get started. We want you to know the joy we've known in flying this kite and in conquering every challenge that it presents. The growth that you will experience in flying, not only this kite but also in your other kites, will astound you. We have found that flying the Rev actually enhances our abilities at flying two line kites. For example, in our two line pairs flying, we are able to fly much closer to each other and slow down and manipulate our kites much more than we could before. And the Rev never gets boring, due to the fact that, after you have acquired the basic flying skills, which are fairly easy, the advanced moves, such as hovering, reverse, and the tic - toc, are extremely exciting to accomplish. Though these moves take considerable practice, the rewards are well worth it. To be able to perform the advanced moves in straight and smooth accord is music to the eyes and joy to the heart. If you enjoy flying and enjoy a flying challenge then four line flying is a must to try and the Rev is the one to do it with.

If you find yourself with suggestions, a better way of explaining one or more of the moves, or would like to add a move or two, feel free to drop us a line at the address below:

Taylor's
P.O. Box 21052
Keizer, Oregon 97307

We will gladly print it and credit your name in our next addition.