## INSTRUCTIONS: Freestanding Aerial Rig ACHILLE Model



Freestanding Aerial Rig ACHILLE, User Manual V 1.5 -Decembre 2015 Page 2 of 20


Congratulations on the purchase of your new Freestanding Aerial Rig from CircusConcepts! <

## Before using the product, you must read carefully this user manual.

## WARNINGS:

- Do not use the tripod outside if it's windy or forecasted high winds. In case of use outside, we hightly recommend putting stakes in the base legs( there is a large hole in the base legs for stakes ). Also beware of silks that can act like sails and pull the tripod sideways on high winds.
- Always warn anyone using or around the tripod not to pull a rope or apparatus( silk for example ) from outside it's legs, which will make it want to tip over and could cause serious injuries and breakdown of the tripod. If the tripod is not anchored with stakes or ropes, take it down carefully if high winds are present or arrive suddently.
- Never Exceed Working load. The Working load is the TOTAL load on all rigging points.
- The load of the rigging material you use could be LOWER than the working load of the tripod. The strength of the whole system is the strength of the WEAKER component in the system. Verify the load of your components first! ( Note that most climbing accessories have the ULTIMATE load written on them. You should never exceed $20 \%$ of the BL ( breaking load/ultimate load) of the accessories.
- Always consult a professional to help you design the rigging and cable system used.
- Always inspect all part of the tripod before each use and keep a record of it( see checklist).
- Always make sure the tripod is leveled before you use it.
- Always make sure to assembly all necessary parts of the tripod.
- NEVER use without the cables between the legs.
- Make yearly professional inspection of the welds.
- Only let professionals use your tripod to avoid accidents during use of circus props rigged to it.
- Never climb on the tripod structure. Only use attachment points.
- Change and verify your rigging equipment on a regular basis.
- Do not balance sideways outside the legs of the tripod to avoid tipping over.
- If there is any damage to the structure, do not use the tripod and replace the damaged part.
- If there is any bump, even very small, on the joint between the legs parts, you must sand it off to ensure smooth assembly and disassembly.
- IMPORTANT: If one piece of the leg does not slide easily into another, make sure no dust, debris or bumps are present. If it's clean but does not slide easily, attempt a different part/combination. If not, the part might get stuck there and you cannot disassemble your tripod. There is a manufacturing tolerance on the parts, so it possible that one leg piece is tight on the connection with the head, but then an other leg piece will slide in easily. If tight, attempt different combination.

TAKING CARE OF YOUR TRIPOD:

- Be extremely careful of all the parts of the tripod, but especially the ends of the tube legs that is smaller( the joint ). Theses ends are precision machined. Any impact on them could damage them and make assembly of your tripod impossible, or create a blockage and you won't be able to disassembly some parts after. Always put the protectors on when not assembled.
- The tripod is made of Aluminium, so it is weather proof. Blackening of the aluminum is possible with time. Eyebolts and nuts are of galvanised steel, so with good durability against corrosion
- If any rust appears on the cables, replace them.
- It is always good in salty environment to rinse the tripod and all parts with fresh water on a regular basis.


## 1-ASSEMBLY:

- Ideally, 2 persons are needed to set-up the tripod ( three or 4 is even better )
- Using a pulley block system is highly recommended, and mandatory to build it up at the highest setting.

IMPORTANT ADVICE : We highly recommend using gloves to assemble your tripod. There are some sharp edges, possibilites of pinching and grease involved. Any hand injury or grease on the hands can be problematic if you are the artists and will perform with it after assembly!

1-First, you have to decide at which height you will use your Tripod. See the $1^{\text {st }}$ page drawing for possible heights and cable lengths to be used. Cables are marked according to size with tape.

1 mark of tape - 16' ( 4.9 m ) height
2 mark of tape - 20' ( 5 m ) height
3 marks of tape - 24'( $7,3 \mathrm{~m}$ ) height
There are 3 legs to your tripod. 2 are identical( fixed legs ), and one is a pivoting leg. The Longer cable should always be used between the 2 fixed legs, this cable will have black marks on both ends.

2-Now, take the tripod's head and put it sideways on the ground, with the Pivot leg nearest to the ground.


Prepare to insert one leg section at a time into the two fixed legs adapters of the tripod's head. When you receive your tripod, the inserting end of each leg section will be protected with a black plastic covering. Take the covering off just before use and make sure you don't let any dirt stick to the joint.

Make sure both parts of the joint (outside of the male part and the inside of the female part) is free of dirt or any residues. For the first assembly, add anti seize to the male part of the joint( see picture on the right ). Add a good quantity to the tip of the joint, and spread with a rag over the
 joint.

Insert legs into the fixed legs receptacle one piece at a time( they are all identical so the order does not make a difference ). Turning the legs while inserting will facilitate the insertion.

- IMPORTANT: If one piece of the leg does not slide easily into an other, make sure no dust, debris or bumps are present. If it's clean but does not slide easily, attempt a different part/combination. If not, the part might get stuck there and you might not be able to disassemble your tripod. There is manufacturing tolerance on the parts, so it possible that one leg piece is tight on the connection with the head, but then another leg piece will slide in easily. If tight, attempt different combination.

Note: If dust or debris stick to the anti seize(or you see that there is not enough anti-seize anymore), you need to wipe the anti seize-off the legs, and then re-apply some.

3-Insert 4 to 6 legs(PLEASE SEE NOTE 1 at the end of this section) on each fixed leg, depending on the tripod height's you want. When inserting the leg, push the little push button, align carefully both parts and slide them in until the button pops up in the hole completely.

4-Once you have put the desired amount of legs pieces, add the fixed foot part(without wheels one. Note that the wheels attachment can be slided in an out, so the complete wheel assembly can be easily removed when not in use. )

5-Then, attach both of the fixed legs together with the cable that has the black lines of tape. You have to put the cable from under the foot, trough it's slot, and put the loop onto the pin and lock it in place with the hairpin. Use the
 slots that are facing each other.

Now attach the 2 other cables with red markings to the free pins on the fixed leg and bring the other end near the head of the tripod. At the free end of theses cables put the triangular quick link and then the carabiner.


7-Then, assemble the Pivoting leg. Starting with the base (with wheels on ) adds legs part, one at a time, just like you did with the others. Lay this leg to the ground. DO NOT ATTACH THE PIVOTING LEG TO THE HEAD AT THIS TIME.



MAKE sure the wheels of the pivoting base are in the activated positions (you can change that by moving the little stick next to the wheel)


9- Raise the Tripod's head on the pole provided (see image) or ladder. Make sure it is well balanced before you let it go.

10-Bring up the end of the pivoting leg and inset it into the pivoting part of the head, ALWAYS HAVE ONE PERSON SECURING THE HEAD so it does not tilt and fall back to the ground (or on someone!).

11-Once all of this is in place, make sure the structure is well balanced on the support pole.


If you will be using the Trapeze bar adapter, install it now. You have to put it into the 'U' Shaped at the top of the tripod, and put the 2 bolts provided with it into their holes, and tighten them lightly.

If you will be using props fixed directly onto the center Eyebolt or onto the eyebolts of the trapeze adapter, fix your prop to the rig now( SEE NOTE A about Loads Versus attachment method!! )

If you will be using a top pulley(s ), attach the pulley in place, and put your rope trough it, fixing the rope ends into a loop or weighing it down so it stays on the ground( SEE NOTE A about Loads Versus attachment method!! ).

13-Attach one end of a pulley block( or simply a rope if you have nothing else ) securely to the first hole between the the shackle and the pivot leg.


14-Make sure the wheels are in the 'activated' position using the small levers.

15-Then, attach the other end of a pulley block or rope to the carabiner that was attached to the 2 cables previously.

16-NOW IS TIME TO RAISE YOUR TRIPOD.
Make a final inspection of your tripod to make sure all the parts are well assembled, all bolts tightened and in position.

Start pulling on the pulley block, or on the rope after it went through the carabiner(upwards). This will raise the tripod. Pull on it until the rolling leg reaches the carabiner. DO NOT LET GO OF THE ROPE at any time.
Having someone give an initial push near the head will help.


16-When the base reaches the carabiner, put the wheels in the inactivated position.

17-Attach the carabiner to the shackle on the base (a shown on picture). Always leave the pulley system or rope attached while doing this.

18 -You can now remove the pulley block system or rope between the carabiner and the leg and use it to rig the performer!
Note : Pull on the legs to make sure the steel cable is taking the tension and not the rubber under the legs


CONGRADULATIONS! You have assembled your tripod!
NOTE 1: If you use the tripod with 4 sections legs sections, you could lift the tripod without rope or pulley system if you have one person lifting the rotating leg and one pushing it. Do not attempt this by yourself. If you use the 6 sections legs, the use of a pulley systems is required. If you do not have one, for safety reasons, you should be at least 4 people to lift it.

## Assembly option 2

You can assemble the tripod with out the block and tackle using the blocking plate shown on the right.

This way to assembly the tripod can be done by 1 person in good physical condition but it's hard and risky. We recommend at least 2 person to build the tripod this way.

1-First, you have to decide at which height you will use your Tripod. See the $1^{\text {st }}$ page drawing for possible heights and cable lengths to be used.


Cables are marked according to size with tape.
1 mark of tape - 16' ( 4.9 m ) height
2 mark of tape - 20' ( 5 m ) height
3 marks of tape $-24^{\prime}(7,3 m)$ height
There are 3 legs to your tripod. 2 are identical( fixed legs ), and one is a pivoting leg. The Longer cable should always be used between the 2 fixed legs, this cable will have black marks on both ends.

2-Now, take the tripod's head and put it upside down on the ground. When you receive your tripod, the inserting end of each leg section will be protected with a black plastic covering. Take the covering off just before use and make sure you don't let any dirt stick to the joint. Make sure both parts of the joint (outside of the male part and the inside of the female part) is free of dirt or any residues. For the first assembly, add anti-seize to the male part of the joint( see picture on the right ). Add a good quantity to the tip of the joint, and spread with a rag over the joint.

Now insert 1 section of each legs in the tripod head.

- IMPORTANT: If one piece of the leg does not slide easily into an other, make sure no dust, debris or bumps are present. If it's clean but does not slide easily, attempt a different part/combination. If not, the part might get stuck there and you cannot disassemble your tripod. There is manufacturing tolerance on the parts, so it possible that example, on leg piece is tight on the connection with the head, but then an other leg piece will slide in easily. If tight, attempt different combination.

Note: If dust or debris stick to the anti seize(or you see that there is not enough anti-seize anymore), you need to wipe the anti seize off the legs, and then you should re-apply some.

3-Before you flip your first tripod assembly make sure you have something to prevent dirt or debris from entering the female part of the legs for the whole assembly. On the picture I'm using cardboard box. You can easily build slip-on leg cover using cardboard tube and tape to seal one end.

4-Flip the tripod over on it's leg. Making sure the legs don't touch the ground and gather dust in the female part

5-Now add the blocking plate to the hole at the top of the pivoting leg adapter. Make sure the blocking plate in set in the small "U" shape so it doesn't flip to the side during assembly (shown on the left )

## 6-RIGGING your material

If you will be using the Trapeze bar adapter, install it now. You have to put it into the 'U' Shaped at the top of the tripod, and put the 2 bolts provided with it into their holes, and
 tighten them lightly.

If you will be using props fixed directly onto the center eyebolt or onto the eyebolts of the trapeze adapter, fix your prop to the rig now( SEE NOTE A about Loads Versus attachment method!! )

If you will be using a top pulley(s ), attach the pulley in place, and put your rope trough it, fixing the rope ends into a loop or weighing it down so it stays on the ground( SEE NOTE A about Loads Versus attachment method!! ).

7-Make a final inspection of your tripod to make sure all the parts are well assembled, all bolts tightened and in position.

8-Start raising the tripod by adding 1 leg section at a time. I recommend doing the 2 fixed legs then the blocked pivoting leg.

It's easier working with a partner. One person lifting the tripod leg and the other inserting the leg and making sure the tripod protection from the ground dirt and dust is in place before it is set down.

9-Repeat until you reached the chosen height.
10-Install the base of each legs so they are facing inward.

11-Then, attach both of the fixed legs together with the
 cable that has the black line(s) of tape. You have to put the cable from under the foot, to the top of the foot plate, and put the loop onto the pin that is standing up and lock it in place with the hairpin. Use the slots that are facing each other.

12-Attach now the other 2 cables with red makings to the other pins and bring the other end near the head of the tripod. At the free end of theses cables put first the Triangle link and then the Carabiner

13-Attach the carabiner to the shackle on the base (as shown on picture).

Note : Pull on the legs to make sure the steel cable is taking the tension and not the rubber under the legs.


## 2- DISSASEMBLY:

Be very careful when disassembling the tripod. False manoeuvre can cause a fall of the tripod and serious injuries, and damage to the structure! Three people are recommended at all time to lower the tripod.

1-Use the same method as for assembly. First attach the pulley block or rope to the carabiner(without detaching the carabiner from the shackle! ) and to the leg base.

## 2-Activate the wheels

3-Before starting, you must know that for the last 2 meters, the pulley block or rope cannot stop the tripod from going to the ground. You should have someone ready that is always with a hand on the pivot leg as high as they can touch it, going toward the center while it go down. This person has to hold the tripod's head when it comes at shoulder height, OR put a ladder/pole under it to keep it in place.

4-Standing next to the pivot leg's base and have someone else hold the pivot leg in place,

5-Put tension on the pulley block or the rope.
6-Carefully remove the carabiner from the shackle

7-Now stand OUTSIDE of the tripod's area, and let go slowly the rope or pulley block to let the tripod go down, keeping a slow and steady peace. Your second helper should push the
 rotating head to keep it from sliding too fast.

8-Make sure your third helper will stop the tripod's head when it comes at shoulder lever. Have this person lower the tripod's head onto the pole (as it was on point 9 of last section)

9-Disassemble all the parts, being extra careful not to hit the joint ends. Put the black pvc caps on the joint as soon as you disassemble them.

Separate all the parts and store and stow them safely until next use.

## DISSASEMBLY option 2:

1. To disassemble the tripod with the blocking plate. Start by removing the steel cable.
2. Then lift a leg, once it is off the ground remove the base. And place the protection from the dust and dirt under the leg.

While disassembling all the parts, being extra careful not to hit the joint ends. Put the black pvc caps on the joint as soon as you disassemble them.
3. Repeat for all the legs until the tripod if levelled again.
4. Next remove a section of the leg, then repeat for all the legs until the tripod if levelled again.
5. Repeat until you only have one section of the leg attached to the head.
6. While holding the pivoting leg remove the blocking plate from the head and lower the tripod to the ground.
7. Disassemble all the remaining part, separate them and store them safely until next use.

## 3 UNDERSTANDING YOUR TRIPOD

This tripod is designed to be used only in a certain way.
There are ONLY 2 possible ways to attach equipment.

- The center eye-Bolt
- The 2 eye-bolts at each end of the trapeze attachment bar

WARNINGS:

- The tripod has not been certified to use all 3 points at the same time.
- You cannot attach equipment to only one of the 2 eye-bolts of the trapeze spread bar.
- You cannot attach any load anywhere else on the tripod without further certification.
- Using Pulley on the attachment point multiplies by two the load applied to the tripod. See below NOTE A

If you use your tripod with a top pulleys, there is only two holes that can be used to attach the loose end of the rope.

You can only attach rope on the 2 big holes ( $3 / 4^{\prime \prime}-19 \mathrm{~mm}$ ) on the pivot Leg. Never attach any loads to the other legs.

The Total load that can be handled by this leg is 5500 Lbs Breaking Load, so 1100 LBS working load. The total load of both holes must be used. But, if you have Zero load on one hole, a single hole can also handle the full load.

## WARNING:

- Never attach rope directly onto the hole as the metal could cut the rope. Use a carabiner or shackle.



# UNDERSTANDING Load differences between using a Pulley or the top eye-bolts (NOTE A) 

This Tripod has a Minimum Breaking Load of $5500 \mathrm{Lbs} / 2500 \mathrm{Kg} / 24.5 \mathrm{kN}$ at full height. Safety standards limits the actual load to a 5:1 safety factor, meaning that you can only apply a maximum load of $1100 \mathrm{Lbs} / 500 \mathrm{Kgf} / 4.9 \mathrm{Kn}$ to your tripod's attachment point(s).

When fixing your props directly to the Eye Bolts, 4.9 kN is the total maximum Force that the artist, multiplied by a dynamic factor, plus the weight of the props can generate. See example below

When fixing your props with a rope attached at the bottom of the tripod, trough a pulley to your props, 2.45 kN is the total maximum Force that the artist, multiplied by a dynamic factor, plus the weight of the props can generate. See example below.

Here is a Schema of the forces to help you better understand this principle:


## Examples:

\#1 - Situation: One artist of $68 \mathrm{~kg} \mathbf{- 1 5 0}$ Lbs attached to the rig, using a 50 Lbs Trapeze, and doing very hard dynamic moves.
The prop is attached directly to the EyeBolts
Load:
Artist Weight * Dynamic Factor + Weigh of Trapeze = Total Load
$150 \mathrm{Lbs} * 3050 \quad 500$ Lbs force Total Load to the Tripod.
Load is OK for the Tripod
\#2 - Situation: One artist of 68 kg - 150 Lbs attached to the rig, using a 50 Lbs Trapeze , and doing very hard dynamic moves.
The prop is attached trough a pulley to the bottom of the Tripod.
Load:
( Artist Weight * Dynamic Factor + Weigh of Trapeze ) * 2( we double the load due to the Reaction force at the bottom = Total Load
( 150 Lbs * 30 ) $\mathbf{~} \mathbf{~} 2=1000$ Lbs force Total Load
Load is OK for the Tripod but near the recommended limit

One has to understand that a dynamic factor of 3 is very high. Often, dynamic forces will be lower, but as a rule of thumb 3 is a safe factor to use.

To determine the load applied by the Artist and props, you should always test it using a Load Cell. See the ENFORCER Load Cell from Rock Exotica on our website.

The next 2 situations show well the difference it can make. Both are the same artists and prop, but rigged differently
\#3 - Situation - Duo Working trapeze on the Tripod , each artist of $68 \mathrm{~kg}-150$ Lbs NEVER both artist will do dynamic moves at the same time( one is the porter(fixed weight) and the flyer creates forces by swinging ) Only one of them will do a Dynamic move while the other artist is 'stable'. The prop is attached directly to the Eyebolts

## Load:

| Dynamic Artist Weight |  |  |  | Weigh of Trapeze = Total Load |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 150 Lbs | 3 | + | 150 | +50 Lbs | $=650$ |
| Load is OK for the Tripod |  |  |  |  |  |

\#4 - Situation - Duo Working trapeze on the Tripod, each artist of 68 kg - 150 Lbs
NEVER both artist will do dynamic moves at the same time( one is the porter(fixed weight) and the flyer creates forces by swinging ) Only one of them will do a Dynamic move while the other artist is 'stable'.
The prop is attached directly to TROUGH PULLEYS
Load:
( Dynamic Artist Weight * Dynamic Factor + Fixed Artist Weight + Weigh of Trapeze )+Reaction Force = Total Load
( 150 Lbs $3 \quad+\quad 150 \quad+50$ Lbs $) * 2$ = 1300 Lbs force Total Load is NOT OK for the Tripode - It exceeds the recommended safety factor.

## TYPICAL SET UP of Rigging for the Tripod.

We recommend to avoid to tie the ropes directly onto the metal holes. Use carabiner of Shackles to avoir premature use of the ropes while in contact with sharp edges of metal.

## INSPECTION of your tripod

Here is a list of points to inspect on your tripod before each use. A good practice is to keep a record/checklist of your inspections.

Points to inspect before each use.

- Make sure all cables all locked onto their pins and carabiners safely.
- Inspect the attachment hole for damage, cracks
- Make sure your rigging is in good condition
- Make a general visual inspection

Points to inspect regularly( depending on use. Every week if constant use)

- Visually inspect all the welds on the tripod's head, and on the tripod's feet.
- Look for damage, wear and tear of attachment points
- Inspect your rigging material( ropes, carabiners) for kinks on ropes, damages etc etc...
- Makes sure all bolts and nuts are secured
- Make sure all push pins are popped-out.
- Look out for cracks in the tubes near every joint of the legs. It should not happen, but if a crack will appear it will be there.
- Look out for cracks or wear marks on the tripod's head.
- Inspect the cables for kinks.

Yearly inspection:

- We recommend to ask a professional to inspect all the welds and parts of the Aluminium Tripod on a yearly basis, especially if used a lot. This is standard practice on all touring shows equipment.


## RESPONSABILITY:

You, the user, have the responsibility to ensure the product is in perfect condition before using it to ensure safe use of it.

Circusconcepts, any of its affiliates, owners or employees cannot be held responsible for any injury, damage or death that result in the use or misuse of this product.

Replacement parts can be ordered directly at info@,circusconcepts.com
Enjoy you Tripod! And, do not hesitate to contact us if you have any questions, concerns or comments. We love to hear back from you!

