

EN



Parus2

MANUAL

Version 2/2019

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Congratulations on buying your
PARUS²

and welcome to the family
of **ICARO** - pilots!

Before you get to know your glider please read the manual, there is important information inside.

In accordance with the EN standard for classifying flight safety characteristics the glider is pattern tested in B. According this standard the tandem glider **PARUS²** is characterized as a

“paraglider with good passive safety and forgiving flight characteristics. It is relatively resistant to abnormal flight conditions. It is recommended for tandem pilots with several years of regular flying and no less than 50 hours/year in combination with adequate knowledge of extreme flying training”.

The flight maneuvers during the certification process should not be overrated. Homologation results provide only little information when you are flying in thermically active and turbulent air because the glider classifications serve to inform solely with regard to the performance of a paraglider during provoked extreme flight maneuvers in stable air conditions.

Effects of the glider after disturbances results in increased demands on the pilot. He should have sufficient practical knowledge of prevention and control of abnormal occurrences. With not sufficient experience, we recommend visiting safety training.

The use of this paraglider is entirely at your own risk. The glider may be only used for those purposes described in this manual and between minimum and maximum take off weight. This weight composed of the weight pilot + passenger + glider + harnesses + equipment. When you are flying with maximum take off weight the glider has more agility and dynamic.

It is strictly prohibited to fly PARUS²

- ***under the influence of drugs or alcohol (pilot and/or passenger)***
- ***without guilty license,***
- ***beyond the minimum and maximum recommended Take Off- Weight,***
- ***the glider is not checked at regular intervals or checked by not authorized personal***
- ***with damaged glider, lines, risers, loops, harness or spreader,***
- ***in the rain, in snow, in the clouds, fog and in turbulent weather conditions, with motor drive and aerobatics.***
- ***Missing mental fitness of the pilot and/ or passenger is also a risk factor.***

Each paraglider can be dangerous when you are misjudging meteorological conditions. Every pilot bears the responsibility of his/her own safety. If you cannot keep your glider under control use the rescue system in good time. Always pay attention to ground distance.

It is assumed that the pilot is in possession of the necessary qualifications and provisions of any relevant laws are observed.

Any changes being made outside the permitted range of adjustment invalidate any and all claims under the warranty.

Our products are made with great care and state of the art. Each paraglider before it is delivered to the dealer or flight school is checked by ICARO paragliders but test flights are made only on a random basis.

On that score an approved ICARO dealer or teacher of the flight school must inflate a new ICARO paraglider in the wind or should carry out the first flight before the wing is handed over to you. This date is entered in the identification plate and as well warranty as the first 2-year-check period starts.

In order to get to know your glider, we recommend that you practice with your glider on the ground. Pulling up in flat gradients is great practice for fine tuning your launch techniques. Here you can get to learn the reactions of your glider without any stress and hectic. Ground practice pays off in the air.

All technical data and instructions were drawn up with great care. ICARO paragliders cannot be made responsible for any possible errors in this manual. Should you decide to sell this glider at a later date, please pass on this manual to the new owner.

Important information in this manual is written in ***fat cursive writing***. Any important changes to this manual will be published in our homepage (www.icaro-paragliders.de).

Each alteration of the glider (lines, canopy, and riser) is dangerous and reactions of the glider are not predictable. Your glider will lose its pattern test result and warranty.

The manufacturer or distributor assumes no responsibility for accidents occurring while using it.

Every pilot must ensure that the paraglider is properly checked at regular intervals.

Many countries have specific regulations or laws regarding paragliding activity. It's your responsibility to know and observe the regulations of the region where you fly.

Environmental aspects:

The materials of which a paraglider is made require a special waste disposal. So please send disused gliders back to us. We will care about a professional waste disposal without costing for you. Please do our nature-near sport in a way which does not stress nature and environment! Please do not walk beside the marked ways, do not leave your litter, do not make unnecessary loud noises and respect the sensitive balance in the mountains.

ICARO paragliders

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To get to know your PARUS²

Allowed for training		yes	
Certified / allowed for towing		yes / yes	
Certified / allowed for tandem processing		yes / yes	
Certified / allowed for aerobatics		no / no	
Certified / allowed for flying with motor drive		no / no	
Technical data		35,5	41,5
Homologation	LTF/ EN	B	B
Number of cells		42	42
Number of risers		4	4
Weight of the glider	kg	6,5	7,2
Wing Area Flat	m ²	35,5	41,5
Wing Area projected	m ²	29,75	34,8
Wing Span Flat	m	13,9	15
Wing Span projected	m	11,6	12,5
Aspect Ratio		5,45	5,5
Aspect Ratio projected		4,6	4,6
Take Off Weight minimum	kg	100	130
Maximum symmetric steering way by minimum take off weight	mm	> 650	> 650
Take Off Weight maximum	kg	185	230
Maximum symmetric steering way by maximum take off weight	mm	> 650	> 650
Maximum way trimmer	mm	80	80
Maximum way accelerator	mm	none	none
Recommended storage temperature	Celsius		+ 5 ⁰ to + 30 ⁰
Recommended storage humidity	% rel. H.		55% to 75%
Check interval	24 months or 150 operating hours, depending on what occurs sooner. Commercial use 12 month or 100 operating hours		

The **PARUS²** is a one and two seater in size 35.5, in size 41.5 a two-seater paraglider with a maximum of passive safety and a forgiving flight behavior. It is a symbiosis of safety, performance and dynamics, making it ideal for stress-free flying. He is a safe companion not only for commercial tandem flying. He has good resistance to abnormal flight conditions. He is neither suitable nor approved for aerobatics.

Canopy

Sharknose profile, miniribs at the trailing edge and the sticks in the profile nose are nothing new. However, what differentiates the PARUS² from its predecessor are

the optimized suspension points on the A-level, a completely new calculated performance profile, an improved ear attachment aid and a further improved starting and flair behavior are the essential features of the new PARUS². In addition, the new material STA 15 reduces the weight by almost 1000 grams. This material is used on both the upper sail and the lower sail. V and Tension Tapes and ribs made of Skytex 32 hard ensure maximum form and aerodynamic stability as well as strength. The dirt outlet openings on both sides of the leech facilitate cleaning the inside of the cap.

Lines

The lines, a combination of different thicknesses and materials, consist of a stretch-resistant core that is surrounded by a plastic shell and thus protected. The lines and stitching are subject to rigorous production controls, to ensure high and consistent manufacturing quality.

The end control of all line lengths is documented for all paragliders produced by ICARO Paragliders. The complete geometry of the lines and the lengths is shown on the single line plan, which you find in the annex of the manual.

The PARUS² is delivered from the factory with the best brake position for most pilots. But tall or short pilots, or those with a harness with non-standard attachment points might consider it necessary to change the position of the brake handles. If the brakes are to be shortened, it is extremely important to avoid the adjustment affecting the glider's trim speed. There must always be some slack in the brakes when they are fully released. This can be checked with the glider inflated above the pilot's head. There should be a noticeable bow in the brake lines, and the brakes should be having no effect on the shape of the trailing edge. If the brake lines are to be lengthened, it is important to ensure that the pilot can still stall the canopy (i.e. during extreme maneuvers or landing) without the need to take wraps.

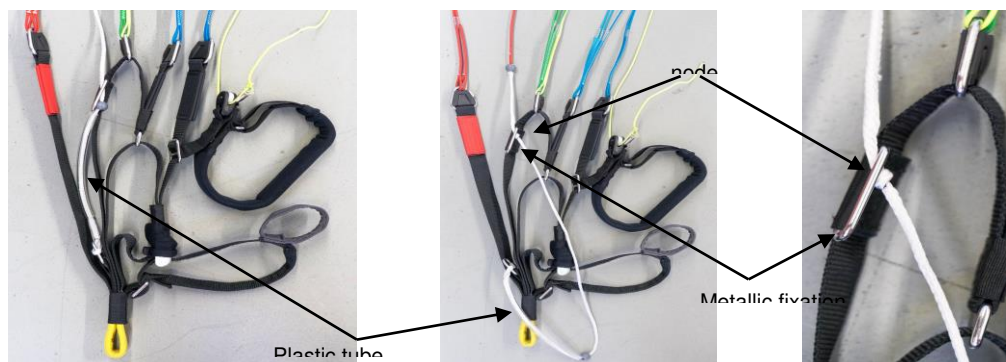
If you need to change the brake line lengths, do it maximum 5 cm at a time, and check it at an easy training hill. Check especially that both lines are the same length, as any asymmetry will lead to tiring and possible dangerous flying characteristics.

Risers

The glider has 4-fold risers equipped with a trimmer and a special “big ears system”. The risers are signified. The main brake line comes through a return pulley; the handle of the main brake line is mounted on the D- riser.

A description of the risers you find in the annex.

Big ear system



Normal flight

Big ears

"Big ears" is essentially facilitated by the "big ear system". Take the clear plastic hose into the hands and pull at the same time both sides the white rope obliquely backward until the node in the rope can be hooked into the metallic fixation. From this point you can unhand the white rope and big ears are remaining fixed.

To release the big ears, pull back the white rope slightly down. Thus, the node slips out of the fixation and big ears open automatically.

The spreader

The spreader allows pilot and passenger to be suspended with a little distance between them. In order to fulfill as many different demands to the overall operation of the tandem we redesigned the spreader. By correctly combining all the different suspension points it is possible to adapt the system to all pilot-/passenger configurations depending of the passenger weight and size.

A Velcro on the spreader prevents the twisting of the reserve connection line. This connection line must always be connected to the correct suspension point of the spreader. A description of the spreader you find in the annex.

Make sure to use only a certified spreader because only this spreader has the braking load which is prescribed and necessary.

How to vary the trim of the glider

With a very efficient trimmer which is mounted on the rear riser start off weight can be optimally adjusted by the position of the trimmer, and flight speed can be varied. Will be flown on the weight lower limit or low temperatures, the trimmer should always be opened slightly.

- ***It is very important to open the trimmer symmetrically on both sides.***
- ***In very turbulent air ambitious cap deformations with wide open trimmers can occur.***
- ***The completely opened trimmer must not be used in extreme, not flyable strong wind to force a start.***
- ***The trimmer which is completely opened should never be flown with less than 100 meters distance from the ground.***
- ***Landing completely opened trimmers is dangerous with a lot of risk and should be omitted.***
- ***When towing, make sure that the trimmers are closed or opened slightly during the towing process.***

ICARO Paragliders recommends following trimmer positions:

- Trimmers neutral: Used for normal takeoff and during flight, danger of unusual flying situations
- Trimmers open: For flying in stronger winds, for towing, for flying with Big-ears or when flying with low to medium hook-in weight.
- Trimmers closed: Around the maximum takeoff weight, for reducing takeoff and landing speed.

Harness

The glider is certified for use with harnesses GH type. Practically all modern harnesses are GH type harnesses. Older harnesses with fixed cross belts (GX type) are not certified and should not be used.

The adjustment of the harness chest strap controls the distance between karabiners and affects the handling and stability of the glider. Excessive tightening the chest strap increases stability but also the risk of twists following glider collapse, and it also increases the frequency of getting collapses due to poor feedback from the glider.

In the interests of safety for you and your passenger make sure to use a certified harness for tandem flying. Using a wrong harness could be very dangerous.

Flying with the PARUS²

Flight preparation

- When choosing an area to lay out the glider before launching, try to find somewhere that is relatively free of stones and sharp rocks. Pay particular attention to the top surface, where the canopy touches the ground.
- Never step on your glider – stepping on it will weaken the cloth.
- We recommend keeping an eye on other pilots, spectators and smoking people near of the glider. Many of them do not appreciate the fragility of the lines and cloth.
- Whilst unfolding your paraglider check the canopy and cell walls for damage. Always take into consideration that the paraglider may have become damaged during transportation.
- Make sure that no sand, stones or snow get inside the canopy as the extra weight collected in the trailing edge may slow down or even stall the glider. Sharp edges damage the canopy.
- Check the lines for knots, twisting and damage, the brake lines for knots, kinks and their symmetric. Loose or incorrect brake knots can cause serious accidents through loss of the steering of the glider!
- Separate the line groups carefully and bring the risers in order. All lines must run freely from harness to canopy. It is equally important that the lines are unhindered and cannot get caught up during the launch.
- There should not be any lines underneath the canopy. If the lines wrap around the canopy, this can result in injury or death!
- Check the rescue system (handle's pins fixed in the loops and the closed cover of your harness).
- Please ensure that both you and your passenger are wearing gear which offers both optimal comfort and protection (helmet with chin protection, boots, gloves and an overall).
- At last connect the karabiners of the harnesses and the risers to the spreader. The choice of the optimal hook up point is dependent on the type of harness used and also the weight and body size of both the pilot and passenger.

- Check that all karabiners are closed and cannot be opened accidentally in flight that the risers are not twisted and the position of the trimmer on both risers.
- Check canopy (all cells are open), wind direction and airspace.

Do not launch if there are any defects!!!

Launch

Before every launch you should carry out the standard 5-point checking procedure. Do the checks following the same sequence every time.

- Helmet, harness, carbines closed (pilot, passenger)?
- Lines, risers and accelerator/ trimmer/ spreader ok?
- Leading edge open?
- Wind direction and strength ok?
- Airspace and start area ok?

The most important thing during the take-off is, like at all other gliders too, not the force but the constancy of the pull.

Hold only the middle A risers and the handles of the brakes. When you pull on the A-risers, the lines in the middle of the wing should be under tension before the lines on the wing ends. This ensures an even easier start. Use progressive pressure on the A risers and the energy of our own bodies weight until the wing is fully inflated overhead. The canopy is inflated quickly due to the super short lines. When there is no pull from the lines and the wing is overhead, use slight pressure on the brake. Look up and make sure that the canopy is fully inflated. After a few accelerating steps and at the same time let go of the brakes gently, you will take off with your passenger.

By towing by winch there are no special techniques needed. Avoid large brake inputs until you are reasonably high if course correction is necessary close to the ground. Do not try to climb steeply during the first part of the tow.

The completely opened trimmer must not be used in extreme, not flyable strong wind to force a start.

Do not start with a passenger when wind force is very strong or without consideration to his physically and mental condition.

Active flying

The **PARUS**² has an extremely high stability. We advise you to apply the brakes at all times whilst flying in turbulences. You hereby increase the opening angle and the wing is more stable. At the same time the pilot has a better feeling for the canopy via the brakes. When flying into strong thermals please pay attention that the canopy does not remain behind the pilot. This is avoided by releasing the brakes when entering an up-wind to increase speed. Vice versa the glider must be slowed down with the brakes if the canopy falls before the pilot when entering a down-wind or exiting a thermal.

This type of flight technique is called “active flying”. The pilot may roll his body with weight shift to move with the glider when the glider rolls to the right or left. These subtle adjustments keep the glider flying smoothly.

Don't fly in wind forces which are too high (more than trim speed). To enhance the speed of the glider open the trimmer successfully and symmetrically on both sides until you reach the speed you desired

In very turbulent air can cause ambitious cap deformations with wide open trimmers.

Turning

A combined steering technique is suitable for every situation. The glider is agile and reacts to steering impulses quickly and directly. Strong, one sided pulling of the brakes brings the glider into an obvious side angle and the glider flies fast steep curves until spiral dive begins.

If the brake lines are pulled too fast or too far the glider will be stalled!!

Landing

When you begin the landing procedure advice the passenger about the landing procedure Always stand up in the harness in the landing position very early in order to be able to react as fast as possible to sudden events. Give yourself plenty of options and a safe margin of error. Set up your final landing leg to face into the wind to minimize groundspeed. If you leave the inflated leading edge bang on the ground, this can cause the cell walls to burst!

Do not brake it too much, to avoid a stall of the glider in this very low altitude! Do not reduce height by “pumping” with the brakes.

Landing completely opened trimmers is dangerous with a lot of risk and should be omitted.

Near the ground a deep/ parachute stall should not be exited. The oscillations which are possible are very dangerous for you and your passenger. Advice the passenger landing could require a special method. Sit up in the harness and prepare for a landing fall like parachute.

Descent Techniques

- ***Training of descent techniques and simulation of flight incidents (SFI) should only take place at professional safety training seminars with professional trainer and only while flying over water.***
- ***Before inducing any exercise control the airspace beneath.***
- ***During the exercises stay in contact with the canopy.***
- ***If the glider is out of control, use your reserve parachute.***

Big & Small Ears

The aim of this exercise is to descend in strong thermals. Take the clear plastic hose into the hands and pull at the same time both sides the white rope obliquely backward until the node in the rope can be hooked into the metallic fixation. From this point you can unhand the white rope and big ears are remaining fixed. Sink rate increases but not the forward speed. If you use the trimmer sink speed can be achieved.

Before landing, release the pulled down line to achieve normal sink speed for a gentle landing. To release the big ears, pull back the white rope slightly down. Thus, the node slips out of the fixation and big ears open automatically. If necessary then pump the brakes with short symmetric movements. For directional control while using the big ears, you should use weight shift.

Never attempt tight turns or spirals with Big Ears, as the A-lines will be over stressed.

B-Line-Stall

B-Line-Stall is not so effective, furthermore stresses the material of the glider and reduces operating life of the canopy. It is common knowledge that to enter and hold a B-line-stall requires considerable strength. Entering a B-line-stall in strong upward air movements may not be possible for weaker pilots, even with gliders equipped with easy enter B-line-stall aids.

It is very dangerous performing a B-line-stall incorrectly and following errors must be avoided:

- ***pulling too far on the B-line-stall aid, so that the A-lines are pulled too,***
- ***exit is too slow,***
- ***releasing the B-line-stall aid without simultaneously pushing up with your hands,***
- ***using brakes during or directly after exiting,***
- ***Brakes must not be shortened by twisting around your hand during the exercise.***

Spiral Dive

In a controlled spiral dive, the pilot applies an active flying technique in the same way as when circling in thermals. The strong centrifugal forces in a spiral dive, however, change the control pressure. It increases by a multiple of the force. Even in moderate spirals, the pilot reaches double acceleration of gravity (2G). Subsequently, the control pressure also doubles.

If the spiral is flown with an open trimmer, extremely high G-loads occur that can lead to unconsciousness! Always check the sink rate! Do not put the weight in the spiral inside, but follow the centrifugal force.

With heavy passengers and extreme sink rates it may be necessary to have outside counter steering with both hands. (This is not specific for the PARUS²; it is applying to all tandem gliders!)

To initiate a spiral dive, look in the direction you want to go, roll your body weight in that direction and at the same time smoothly pull down on the inside brake. The **PARUS²** will start to turn, speed up and then drop into a spiral.

In the spiral dive an uncontrolled acceleration of the canopy must be prevented. As the canopy always accelerates via the outside of the wing, the spiral speed is controlled via the outside brake by applying the active flying technique. If the speed increases in an unwanted manner, pull the brakes further to slow down. If the wing becomes too slow, it can be speeded up by releasing the outside control.

If you pull abruptly and too far on the brakes, the canopy may enter a negative spin. When entering a spiral dive keep the brake on the outer curve released.

The glider does not have a tendency for stable spiral dive. If under certain conditions, it should go into a stable spiral dive then actively exit the maneuver by bringing your weight into a neutral position, release the brakes of the inner curve side and brake gently on the outer curve side until you notice that the wing starts to level out. Then gently brake on the inside curve for several turns until normal flights returns.

Wingover

The **PARUS²** is an agile glider, and it is quite easy to get to an excessively high angle of bank in just a few turns. Practice wingovers gently at first, as there is a chance of quite large collapses at high bank angles.

What happens when happens?

Knots and tangles

The best way to avoid knots and tangles is to inspect the lines before you inflate the wing for take-off. If you notice a knot before take-off, immediately stop running and do not take-off.

If you have taken-off with a knot you will have to correct the drift by leaning on the opposite side of the knot and gently apply the brake line on that side too. You can gently try to pull on the brake line to see if the knot becomes unfastened or try to identify the line with the knot in it. Try to pull the identified line to see if the knot releases. If the knot is too tight and you cannot remove it, carefully and safely fly to the nearest landing place.

Be very careful when trying to remove a knot. When there are knots in the lines or when they are tangled, do not pull too hard on the brake lines, there is an increased risk of the wing to stalling or negative turn being initiated.

Deep / Parachute Stall

Your glider has been carefully designed to resist entering deep stall. Before exiting a deep stall please ensure that the brakes are fully released. Actively exit the deep stall by reaching up and push forward with both palms on both A-risers and pull on the risers. Avoid flying in very humid air or in rain. A wet canopy may have very unpredictable flying characteristics, one of which is a radically increased risk of deep stall.

Never pull the brake-lines during a parachute stall, because the glider would go into a full stall immediately. If you find yourself flying in unavoidable rain we strongly recommend that you avoid any sudden movements or radical brake line input, that you do not pull Big Ears or B-Line-Stall, and that you steer clear of turbulence and avoid a deep flare on landing.

Asymmetric Collapse

While flying in turbulent conditions it may occur that a portion of your glider deflates. However, just like in flying in turbulences, please pull gently on both brakes. Re-inflation is speeded up by counteracting the turning movement of the canopy until normal forward flight return. Then pump the brake line on the collapsed side.

If the canopy is in front of the pilot after an asymmetrical collapse, the pilot must immediately and decisively brake down the open side to prevent an uncontrolled rotation. The same rule applies here: If the wing is ahead, braking is a must. Sometimes, however, the angle of attack on the open, not-collapsed side is relatively high and the wing is behind the pilot. Then a significant control movement would definitely cause a stall and its potentially extreme reactions.

If the collapsed part of the canopy is very big, you have to brake the open side very dosed (not too much!) to avoid a stall.

Symmetric Collapse

Your **PARUS²** normally re-inflates promptly in a symmetric collapse without pilot input. Applying the brakes symmetrically will speed things up.

Emergency Steering

Should it no longer be possible to steer your **PARUS²**, for example due to a broken line, the glider may be steered by gently pulling on either rear riser.

By steering this way airspeed is reduced hardly. Therefore, for landing you must change to the rear risers to control your glider. Handling will be more direct so being careful not to pull too hard.

Negative Spin

If the pilot abruptly applies full brake to one side of the glider while the other side is at zero brake, the faster side may fly around the braked and stalled side resulting in a spin. Alternatively, if flying very slowly with almost full brakes on both sides, if one hand releases one brake suddenly, while the other continues with full brake, the glider may enter a negative spin. To exit a spin just do “hands up” to release the brakes and the glider will return to normal flight.

If you do not have control over your glider and you are running out of altitude, immediately deploy your reserve parachute.

Front stall

After a front stall of the canopy, the wing moves backwards while the pilot with his higher mass moves further ahead. Wing behind, pilot ahead, significantly high angle of attack – there is clearly only one thing to do:

Do not brake or you run the risk of a dangerous stall.

The pilot must not pull the control lines before the canopy is at least above him again. If the canopy then shoots forward dynamically, it is absolutely vital to stop the motion in a consistent and decisive manner via the brakes.

Full Stall

Spin and full stall are both dangerous and somewhat unpredictable exercises. Do not stall or spin your paraglider on purpose.

To initiate a full stable stall, apply both brakes to maximum arm extension. If possible grasp the seat of your harness to assist keeping your arms locked. The pilot will swing back under the canopy and finally the canopy will stabilize to a full stall. Once in a stable stall, the exercise can be completed. Release the brakes just a little and let the glider fill until it regains shape. Then release the brakes fully and your glider will return to normal flight.

It is imperative that the pilot fully completes this maneuver and holds on, as a premature release while the glider is still falling back may cause the glider to rapidly dive ahead past the pilot. There is a possibility landing in or entangling in the glider.

Care instructions, repairs, inspection

Care Instructions

- A new wing supplied from the factory is often compressed hard. The compression serves to reduce shipping costs but should not be repeated once the wing has been unpacked and flown for the first time.
- Note that the glider bag should not be used as a seat.
- Even with good care and maintenance, just like any item exposed to the elements, your glider can wear out after a certain amount of use. This can change flight behavior and safety. We recommend a regular safety inspection of the canopy and all lines.
- If you clean your glider it is best to use warm water and a soft sponge.
- Store your glider in a dry and dark place, ideally between 5° and 30° Celsius and humidity between 55 and 65%. Do not store it near chemicals or petrol.
- If you will not fly for longer period, store the glider releasing all compression straps and take it out of its backpack so that the fabric is not compressed, creased or stretched.
- Avoid storing your glider for days at a time in a hot car.
- Unpack your paraglider shortly before launch and pack away immediately after landing to avoid any unnecessary UV exposure.
- When unfolding the paraglider insure that neither the canopy nor the lines become too dirty. Dirt particles can damage the material and lines.
- Never use chemical cleaning agents, brushes or hard sponges on the material, as these destroy the coating and affect the strength of the cloth. The canopy will become porous and will lose structural strength.
- Never attempt to clean your paraglider in a washing machine. Even without using detergents the simple mechanical abrasion will quickly finish the canopy and render it useless.
- If you are flying near the sea most the wing may age faster because the air is humid and salty. In this case we suggest you have it checked more often than prescribed in this manual.
- Also avoid dipping it in a swimming pool; the chlorine will damage the cloth.
- If you must rinse or clean your glider do so with fresh water. Frequent cleaning will accelerate the ageing process.
- If the glider has become wet, lay it out so that air can get to all areas of the fabric.
- After landings in trees or on water you should check the length of the lines and the canopy.
- Flying all the descent exercise will not normally pose a structural problem but freestyle training accelerates the ageing process dramatically.
- There is no special method packing your glider. ICARO paragliders commends the "Cell to Cell-method bag because the reinforcements of the leading edge stay flex-free on top of each other and don't fold.

- When folding your glider make sure that there are no insects inside the canopy. Many insect species contain acids that could damage the cloth. Grasshoppers gnaw their way out of a folded canopy, making it full of holes in the process.
- When you did not fly for a longer period ICARO commends to check the glider (e.g. mildew stains, splice of the lines, corrosion of the shackles and carabines). If you are not convinced of the gliders airworthiness please send your glider to an authorized ICARO dealer to check your glider. The same is commended for harnesses.

Repairs

Only use original ICARO parts for repairing your glider. If you don't you lose the warranty for your glider.

Small holes in the canopy (max. 20x20 mm) can be repaired by the pilot by using self-adhesive sailcloth on both sides of the perforation. Damage to the lines or any other repairs should only be carried out at an authorized ICARO center. . If your glider needs to be repaired, please contact your local ICARO paragliders dealer.

Inspection

It is important to have your **PARUS²** inspected by a trained ICARO technician but it is also allowed to check your glider for yourself. In the annex you find the regulations for checks of certified gliders and items in order to perform a paraglider inspection you need.

Inspection interval

After **24** months or **150** operating hours, depending on what occurs sooner, commercial used gliders **12** month or **100** operating hours.

Without regular certified inspections, your glider will loose its pattern test result and warranty.

ICARO recommends having wings that are often used for training of descent exercises, acrobatics or flying in salty ore sandy conditions subjected to checkups all 100 operating hours or 12 month.

It is also important, that ground handling also will be considered. All gliders, especially gliders manufactured with light and thin material are mechanically more stressed than other gliders. Therefore ICARO recommends multiplying ground handling time with the factor 1, 5.

Not only gliders have a recurrent inspection interval. Airworthiness of harnesses, snap hooks and rescue systems must also be verified. Generally it is recommended to change aluminum snap hooks after 24 months or 150 operating hours.

According to German and Austrian aeronautical legislation the owner of a glider can check the airworthiness by his own or order a third person (for example manufacturer/importer) to do this.

To perform your own airworthiness check, ICARO paragliders must give you a briefing. Should you decide to check the wing by yourself you must make sure that our guidelines are adhered to. Failing to do so will void the certification.

ICARO paragliders highly recommend that you let the manufacturer or authorized supplier/ person do the check of airworthiness.

All inspections and repairs must be documented (manual page 2).

Terms of the warranty

ICARO warranty covers the cost of materials and workmanship on gliders accepted by ICARO paragliders to fall under the warranty.

Paragliders: **24** month or **150** operating hours, depending on what is first

Harnesses and rescue systems: **24** month

Warranty is only valid for ICARO products with LTF/ EN certification.

What is covered by the warranty?

Provided that ICARO paragliders accept the fault the warranty contains all necessary spare parts related to the replacement or repair of defective parts and working time.

ICARO paragliders accept no freight costs (outbound and return transportation).

What are the conditions of the warranty?

Provided that ICARO paragliders accept the fault the warranty contains all necessary spare parts related to the replacement or repair of defective parts and working time.

- ICARO paragliders needs to be informed immediately after the discovery of a defect and the defective product must be sent to us for testing.
- The glider/ harness/ rescue system was used in normal circumstances and maintained according to the instructions. This includes in particular the careful drying, cleaning and storage.
- The glider/ harness/ rescue system were used only within the applicable guidelines and all rules have been complied with all times.
- All flights must be accounted for within the flight book.
- There were only original spare parts used and checks, exchange and / or repairs were conducted by an authorized dealer or by ICARO Paragliders company / person and properly documented.
- The online form on www.icaro-paragliders.com must be sent at least 6 weeks after buying to ICARO paragliders.

What is excluded from warranty?

- Gliders and harnesses that are used for training purposes, Acro or other official competitions,
- Gliders / harnesses who were involved in an accident,
- Rescue equipment, which has been thrown for a emergency,
- Gliders / harnesses and rescue equipment, which have been changed by yourself,
- Gliders / harnesses and rescue equipment that were not purchased from an authorized dealer / flight school,

- Gliders / harnesses and rescue equipment where the required inspection intervals were not met and the verification of the glider was not conducted by a ICARO paragliders authorized operation / person
- Damage which has occurred due to improper treatment (i.e. storage in humidity, heat or direct sunlight)
- Parts that need to be replaced due to normal wear and tear,
- Discoloration of the cloth material used,
- Damage caused by solvents, salt water, insects, sun, sand, humidity or “debag-jumps”.
- Damage caused by force majeure.
- Damage caused by the motor (Oil, fuel, damage in cause of the prop) and towing by winch.

In case of a concluded claim the period of warranty carries on. The period of warranty and the connected claim are not prolonged and are only valid until the original date of expiry. The freight costs (transport to and from) are not paid by ICARO paragliders.

In conclusion

Customer satisfaction is the first priority of our efforts. Therefore, we are open to any suggestions for improvement and constructive criticism from you because only then we can incorporate them into our new products. We also want to be in a position to inform you about the latest technical developments and information about your paraglider. But we can only do that if you register with ICARO paragliders medium guarantee registration.

These can be found on our homepage at www.icaro-paragliders.com.

Annex

Warranty Card

Please fill in the warranty card which you find on our homepage www.icaro-paragliders.com and send it.

Users needs for Inspections

You will need the following items in order to perform a paraglider inspection:

- Standardized inspection report
- Porosity meter
- Spring scale
- Equipment for measuring line lengths
- Equipment for line strength testing
- Sewing machine
- Big, clean and bright room

Technical specifications about your glider (type, serial number, size and year of production). Please call ICARO paragliders for information.

A three week course at ICARO paragliders, specified to a glider type together with a legal flight license is the necessary prerequisites for permission to inspect ICARO paragliders.

Inspection Instructions

Record Information

Spread out your paraglider in a big bright room and make a note of information such as model, type and serial number.

Porosity Test

Use your porosity meter to perform porosity checks at 4 different places of the canopy. The results are recorded in the inspection protocol and are to be evaluated according to the internal guidelines of the workshop.

Visual Control of the Canopy

Hang up the canopy so that you can do a visual check of your canopy. Check for perforations in the upper and lower sailcloth, damaged stitching between the cells, and damage to the leading/trailing edge reinforcements.

Each cell must be checked.

Visual Control of the Risers and Lines

Check the risers, the trimmers, the stitching at each line loop, the brake lines, all seams and line contact points. Each line must be measured and inspected for kinks.

Strength test of the lines

The complete A-and B- line must be removed, measured and submitted to a strength test. The measured value of each individual line must be noted in the inspection protocol. The minimum of the lines strength are 125% of the normative guidelines.

Measurement of the lines

Measure every single line while stressing it with defined tractive force (5daN). The results are recorded in the inspection protocol and are to be evaluated according to the internal guidelines of the workshop.

Overall line length is composed of the line length + loop length; the length of the brake lines is composed of line length + length of the shorten system up to the ribbon is sewed up to the trailing edge).

Assessment

The measurements of all procedures are noted in the inspection protocol. When all facts have been recorded, the technician must make a general assessment. Check the backpack for damage to the zips, seams and straps and repair if necessary with a sewing machine.

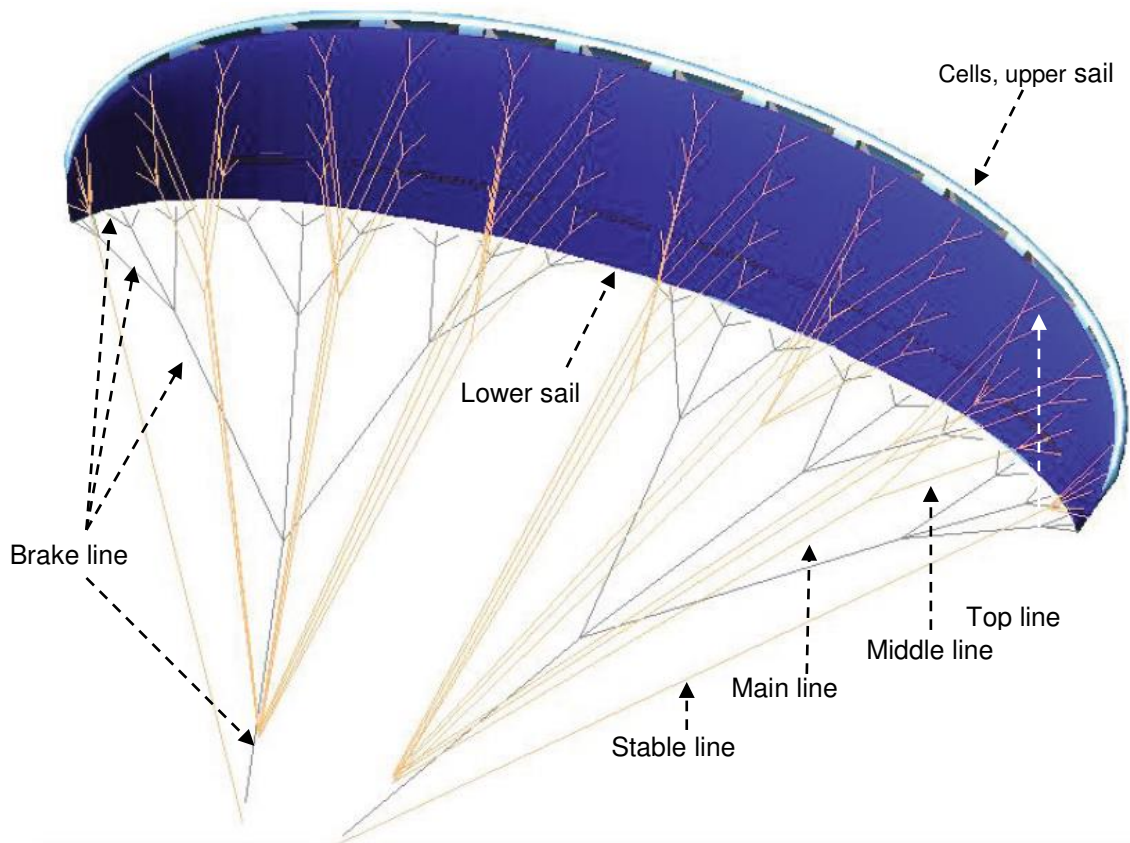
General Remarks

Any other repairs, corrections etc. to the general condition of the paraglider must be evaluated. A copy of the results of each inspection must be sent on to ICARO Paragliders. The technician must report any unusual faults to ICARO Paragliders within 3 days.


Inspection Reference

Only an authorized technician who has been trained by ICARO paragliders is authorized to sign and date the glider type label and sign the manual.

Description canopy (schematically)

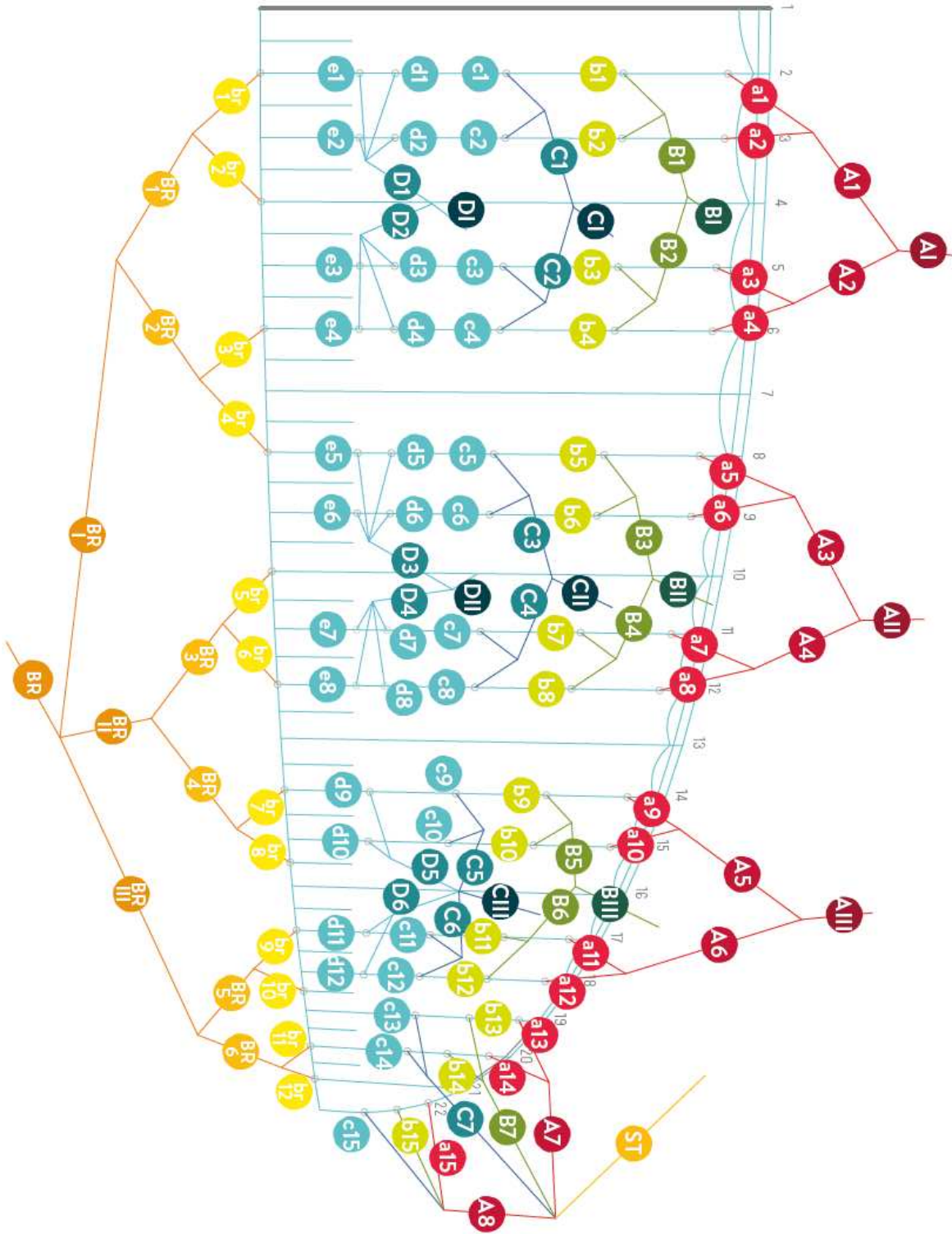


Partlist

					
STÜCKLISTE					
BEZEICHNUNG	BESTELL NR.	WERKSTOFF	OBERFLÄCHE	ABMESSUNG	HERSTELLER
Fangleinenschlöser	Triangle	Edelstahl	Edelstahl	Ø 3,5 mm	Mailion
Fangleinen (Stamm)	PPSL 350 / 275	Aramid	Ummantelt	Ø 2,25 / 1,9mm	Liros
Fangleinen (1 Gabel)	PPSL 200 / 160 / 120 /	Aramid	Ummantelt	Ø 1,42 / 1,4 / 1,15 mm	Liros
Fangleinen (2 Gabel)	DC 120 / 100 / 60 / DSL 70	Dynema	Nicht gemantelt	Ø 1,1 / 0,8 / 0,6 / 0,4 / 0,95mm	Liros
Tuch Obersegel	STA 15	Nylon	Beschichtet		Techfiber
Tuch Untersegel	STA 15	Nylon	Beschichtet		Techfiber
Tuch Profile	Skytex 32 HARD	Nylon	Beschichtet		Porcher Sport
Faden Segel	TEX 45				A&E
Faden Tragegurte	TEX 138				A&E
Schlaufenband	Schiffchenware	Nylon		12,5 mm	Schmahl
Profilverstärkung	Nylon Webbing	Nylon		Ø 2,7 mm	
Einfassband	Nylon 15mm Bias Binding Tape	Nylon	90g	15 mm	Porcher Marine
Hauptbremsleine	DSL 350	Dyneema	Ummantelt	Ø 2,0 mm	Liros
Bremsmittelleinen	TSL 140 / T	Aramid	Ummantelt	Ø 1,65 / 1,3mm	Liros
Bremsgalerieleinen	DSL 70	Dynema	Ummantelt	Ø 0,95 mm	Liros
Leinensammler (Schlöser)	Leinenschloß Clip	Kunststoff			

ICARO Paragliders ist eine Marke von Fly & More / Hochriesstraße 1 / 83126 Flintsbach
Datum 01.06.2019 / Unterschrift: Wolfgang Kaiser

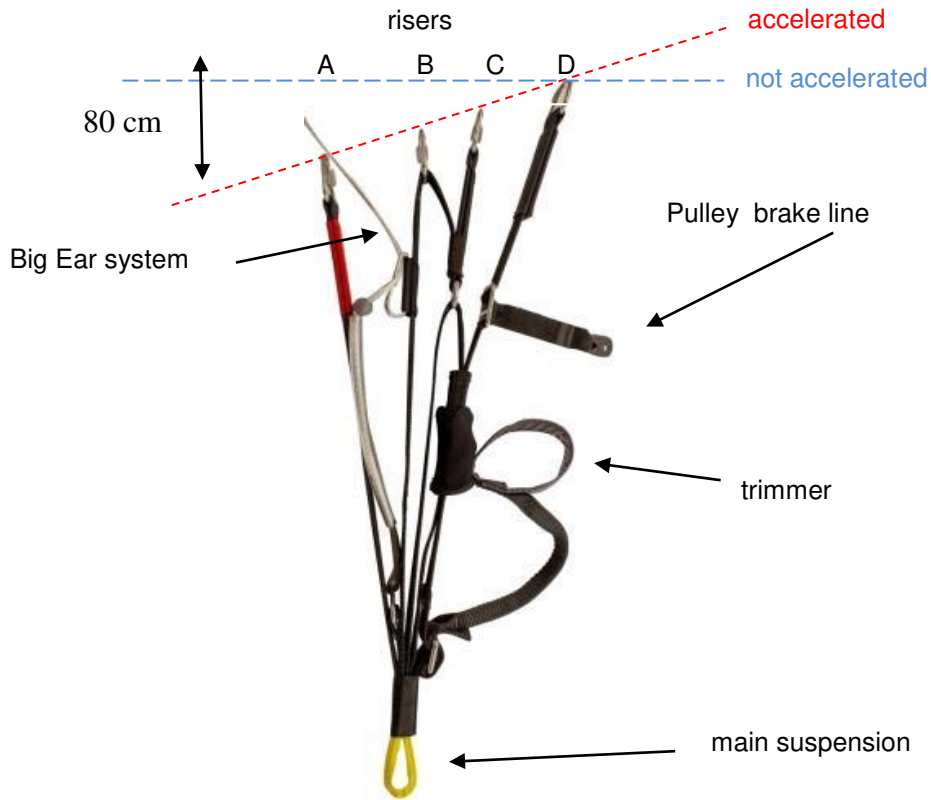
Line plan all over size 35,5 and 41,5



Description riser

Length of the risers not accelerated: A, B, C, D identical 390 mm).

Length of the risers accelerated: A: 390 mm, B: 410 mm, C: 430 mm, D: 470 mm



Description spreader

HOW IT WORKS

- ① MAIN SUSPENSION
- ② RESCUE SUSPENSION
- ③ VELCRO FOR RESCUE STRAP
- ④ PILOT SUSPENSION
- ⑤ PASSENGER OVER 110 KG
- ⑥ PASSENGER OVER 65 KG
- ⑦ PASSENGER UNDER 65 KG



Linlength, linetype und linename Parus 35,5

Line LENGTH				Line TYPE				Line Name				
A - LINES				A - LINES				A - LINES				
Rib	Total	Total	Total	Rib				Rib				
2	816		4188	2	DC 120			2	a1		AI	
3	826	3013		3	DC 120	PPSL 200	DSL 350	3	a2	A1		
5	751			5	DC 120			5	a3			
6	781	2988		6	DC 120	PPSL 200		6	a4	A2		
8	757			8	DC 120			8	a5		All	
9	725	2920	4234	9	DC 120	PPSL 200	DSL 350	9	a6	A3		
11	898			11	DC 120			11	a7			
12	710	2909		12	DC 120	PPSL 200		12	a8	A4		
14	824			14	DC 100			14	a9		AIII	
15	560	2679	3953	15	DC 100	PPSL 160	PPSL 275	15	a10	A5		
17	519			17	DC 100			17	a11			
18	454	2574		18	DC 100	PPSL 160		18	a12	A6		
19	526			19	DC 60			19	a13			
20	371	1600		20	DC 60			20	a14	A7		
22	1273	657		22	DSL 70	PPSL 120		22	st1	ST1		
B - LINES				B - LINES				B - LINES				
Rib	Total	Total	Total	Rib				Rib				
2	725		4188	2	DC 120			2	b1		BI	
3	673	3013		3	DC 120	PPSL 200	DSL 350	3	b2	B1		
5	658			5	DC 120			5	b3			
6	686	2988		6	DC 120	PPSL 200		6	b4	B2		
8	670			8	DC 100			8	b5		BII	
9	642	2919	4230	9	DC 100	PPSL 160	PPSL 275	9	b6	B3		
11	820			11	DC 100			11	b7			
12	840	2907		12	DC 100	PPSL 160		12	b8	B4		
14	594			14	DC 100			14	b9		BIII	
15	541	2665	4392	15	DC 100	PPSL 160	PPSL 275	15	b10	B5		
17	509			17	DC 100			17	b11			
18	448	2560		18	DC 100	PPSL 160		18	b12	B6		
19	469			19	DC 60			19	b13		STmain	
20	348	1621	5162	20	DC 60	DC 100	PPSL 275	20	b14	B7		
22	1242			22	DSL 70			22	st2			
C - LINES				C - LINES				C - LINES				
Rib	Total	Total	Total	Rib				Rib				
2	758		4184	2	DC 100			2	c1		CI	
3	702	3002		3	DC 100	PPSL 160	PPSL 275	3	c2	C1		
5	894			5	DC 100			5	c3			
6	714	2977		6	DC 100	PPSL 160		6	c4	C2		
8	694			8	DC 100			8	c5		CII	
9	661	2919	4230	9	DC 100	PPSL 160	PPSL 275	9	c6	C3		
11	844			11	DC 100			11	c7			
12	854	2907		12	DC 100	PPSL 160		12	c8	C4		
14	550			14	DC 100			14	c9		CIII	
15	468	1475	5671	15	DC 100	PPSL 120	PPSL 200	15	c10	C5		
17	427			17	DC 100			17	c11			
18	394	1385		18	DC 100	PPSL 120		18	c12	C6		
19	483			19	DC 60			19	c13			
20	356	1651		20	DC 60	DC 100		20	c14	C7		
22	1285			22	DSL 70			22	st3			
D - LINES				D - LINES				D - LINES				
Rib	Total	Total	Total	Rib				Rib				
2	666		4182	2	DC 60			2	d1		DI	
3	615	3163		3	DC 60	PPSL 120	PPSL 200	3	d2	D1		
5	621			5	DC 60			5	d3			
6	646	3124		6	DC 60	PPSL 120		6	d4	D2		
8	633			8	DC 60			8	d5		DII	
9	600	3066	4228	9	DC 60	PPSL 120	PPSL 200	9	d6	D3		
11	578			11	DC 60			11	d7			
12	590	3059		12	DC 60	PPSL 120		12	d8	D4		
14	600			14	DC 60			14	d9			
15	514	1477		15	DC 60	PPSL 120		15	d10	D5		
17	473			17	DC 60			17	d11			
18	440	1387		18	DC 60	PPSL 120		18	d12	D6		
E - LINES				E - LINES				E - LINES				
Rib	Total	Total	Total	Rib				Rib				
2	734			2	DC 60			2	e1			
3	689			3	DC 60			3	e2			
5	693			5	DC 60			5	e3			
6	713			6	DC 60			6	e4			
8	698			8	DC 60			8	e5			
9	666			9	DC 60			9	e6			
11	623			11	DC 60			11	e7			
12	622			12	DC 60			12	e8			
BR - LINES				BR - LINES				BR - LINES				
Rib	Loop Distance "A"	Total	Total	Rib				Rib				
r 2	100	1819	1965	2766	2	DSL 70	DSL 70		2	br1	BR1	
r 4	100	1549			4	DSL 70		TSL 140	4	br2	BR1	BRI
r 6	100	1537	1830		6	DSL 70	DSL 70		6	br3	BR2	
r 8	100	1537			8	DSL 70			8	br4		
r 10	100	1543	1835		10	DSL 70	DSL 70		10	br5	BR3	BRII
r 12	100	1465		2638	12	DSL 70		TSL 140	12	br6		brmain
r 14	100	1076	2061		14	DSL 70	DSL 70		14	br7	BR4	
r 15.5	100	1077			15.5	DSL 70			15.5	br8		
r 17	90	685	1424		17	DSL 70			17	br9		
r 18.5	80	581		3607	18.5	DSL 70	DSL 70		18.5	br10	BR5	
r 20	70	505			20	DSL 70		TSL 140	20	br11		BRIII
r 21	60	422	1363		21	DSL 70	DSL 70		21	br12	BR6	

Linlength, linetype und linename Parus 41,5

Line LENGTH				Line TYPE				Line Name			
A - LINES				A - LINES				A - LINES			
Rib	Total	Total	Total	Rib				Rib			
2	866			2	DC 120			2	a1		
3	810	3257	4510	3	DC 120	PPSL 200	DSL 350	3	a2	A1	AI
5	796			5	DC 120			5	a3		
6	828	3230		6	DC 120	PPSL 200		6	a4	A2	
8	808			8	DC 120			8	a5		
9	773	3157	4560	9	DC 120	PPSL 200	DSL 350	9	a6	A3	AI
11	742			11	DC 120			11	a7		
12	757	3145		12	DC 120	PPSL 200		12	a8	A4	
14	685			14	DC 100			14	a9		
15	615	2896	4308	15	DC 100	PPSL 160	PPSL 275	15	a10	A5	AI
17	567			17	DC 100			17	a11		
18	501	2783		18	DC 100	PPSL 160		18	a12	A6	
19	569			19	DC 60			19	a13		
20	401	1730		20	DC 60	DC 100		20	a14	A7	
22	1381	555		22	DSL 70	PPSL 120		22	st1	ST1	
B - LINES				B - LINES				B - LINES			
Rib	Total	Total	Total	Rib				Rib			
2	784			2	DC 120			2	b1		
3	727	3257	4510	3	DC 120	PPSL 200	DSL 350	3	b2	B1	BI
5	712			5	DC 120			5	b3		
6	741	3230		6	DC 120	PPSL 200		6	b4	B2	
8	729			8	DC 100			8	b5		
9	697	3156	4558	9	DC 100	PPSL 160	PPSL 275	9	b6	B3	BII
11	674			11	DC 100			11	b7		
12	696	3143		12	DC 100	PPSL 160		12	b8	B4	
14	627			14	DC 100			14	b9		
15	570	2881	4733	15	DC 100	PPSL 160	PPSL 275	15	b10	B5	BIII
17	535			17	DC 100			17	b11		
18	469	2768		18	DC 100	PPSL 160		18	b12	B6	
19	507			19	DC 60			19	b13		
20	376	1752	5566	20	DC 60	DC 100	PPSL 275	20	b14	B7	STmain
22	1343			22	DSL 70			22	st2		
C - LINES				C - LINES				C - LINES			
Rib	Total	Total	Total	Rib				Rib			
2	816			2	DC 100			2	c1		
3	759	3246	4508	3	DC 100	PPSL 160	PPSL 275	3	c2	C1	CI
5	748			5	DC 100			5	c3		
6	772	3218		6	DC 100	PPSL 160		6	c4	C2	
8	750			8	DC 100			8	c5		
9	715	3156	4558	9	DC 100	PPSL 160	PPSL 275	9	c6	C3	CII
11	696			11	DC 100			11	c7		
12	707	3143		12	DC 100	PPSL 160		12	c8	C4	
14	595			14	DC 100			14	c9		
15	506	1595	6117	15	DC 100	PPSL 120	PPSL 200	15	c10	C5	CIII
17	462			17	DC 100			17	c11		
18	426	1497		18	DC 100	PPSL 120		18	c12	C6	
19	523			19	DC 60			19	c13		
20	381	1784		20	DC 60	DC 100		20	c14	C7	
22	1368			22	DSL 70			22	st3		
D - LINES				D - LINES				D - LINES			
Rib	Total	Total	Total	Rib				Rib			
2	720			2	DC 60			2	d1		
3	665	3420	4507	3	DC 60	PPSL 120	PPSL 200	3	d2	D1	DI
5	672			5	DC 60			5	d3		
6	698	3377		6	DC 60	PPSL 120		6	d4	D2	
8	684			8	DC 60			8	d5		
9	649	3315	4557	9	DC 60	PPSL 120	PPSL 200	9	d6	D3	DII
11	625			11	DC 60			11	d7		
12	638	3307		12	DC 60	PPSL 120		12	d8	D4	
14	649			14	DC 60			14	d9		
15	556	1597		15	DC 60	PPSL 120		15	d10	D5	
17	511			17	DC 60			17	d11		
18	476	1499		18	DC 60	PPSL 120		18	d12	D6	
E - LINES				E - LINES				E - LINES			
Rib	Total	Total	Total	Rib				Rib			
2	793			2	DC 60			2	e1		
3	744			3	DC 60			3	e2		
5	749			5	DC 60			5	e3		
6	770			6	DC 60			6	e4		
8	754			8	DC 60			8	e5		
9	720			9	DC 60			9	e6		
11	673			11	DC 60			11	e7		
12	672			12	DC 60			12	e8		
Brake Loop Details				Brake Loop Details							
Rib	Loop Distance "A"	Total	Total	Checking							
r 2	100	2082	2124		9733						
r 4	100	1761			9410						
r 6	100	1720	1978		9223						
r 8	100	1644			9145						
r 10	100	1607	1984		8977						
r 12	100	1358			8726						
r 14	100	995	2228		8607						
r 15.5	100	1038			8648						
r 17	90	552	1539		8478						
r 18.5	80	437			8361						
r 20	70	326			8184						
r 21	60	227	1473		8083						
BR - LINES				BR - LINES				BR - LINES			
Rib				Rib				Rib			
r 2	DSL 70	DSL 70		r 2	DSL 70	DSL 70		r 2	br1	BR1	
r 4	DSL 70		TSL 140	r 4	DSL 70		TSL 140	r 4	br2	BR2	BRI
r 6	DSL 70	DSL 70		r 6	DSL 70	DSL 70		r 6	br3	BR3	
r 8	DSL 70			r 8	DSL 70			r 8	br4	BR4	
r 10	DSL 70	DSL 70		r 10	DSL 70	DSL 70		r 10	br5	BR5	BRII
r 12	DSL 70		TSL 140	r 12	DSL 70		TSL 140	r 12	br6	BR6	BRII
r 14	DSL 70	DSL 70	DSL 350	r 14	DSL 70	DSL 70	DSL 350	r 14	br7	BR4	
r 15.5	DSL 70			r 15.5	DSL 70			r 15.5	br8		
r 17	DSL 70			r 17	DSL 70			r 17	br9		
r 18.5	DSL 70	DSL 70		r 18.5	DSL 70	DSL 70		r 18.5	br10	BR5	BRIII
r 20	DSL 70		TSL 140	r 20	DSL 70		TSL 140	r 20	br11		
r 21	DSL 70	DSL 70		r 21	DSL 70	DSL 70		r 21	br12	BR6	