Many thanks for choosing a Rhino greenhouse.

We have tried to make these instructions as user-friendly as possible, we realise you want to get on with gardening not building greenhouses! Please read through them before you start, it really will pay dividends. Work through the instructions methodically step by step.

We have included a “TROUBLESHOOTING” section which addresses the questions we are most commonly asked in the Service Dept. You will find this page at the back of the instructions.

Happy gardening
Terry Rose
is it likely to flood? Water on the outside of an oversize concrete pad is likely to make its way under the aluminium base unless steps are taken to seal the base or drain the water away.

PROXIMITY TO FENCES, BUILDINGS etc
If at all possible leave adequate room all round the Rhino to ease initial construction and any subsequent maintenance for the greenhouse and adjacent walls or fences.

CONSTRUCTION ORDER
It is important to construct the Rhino in the correct order. You may expect to have to position the integral base as the first job but this would in fact greatly complicate matters later on. Once again it will help to have read the plans in advance.

OPEN & IDENTIFY THE PARTS
We suggest that you are careful to lay out parts in an orderly fashion - grouping sections that are made of the same profile together but in their different lengths.

CONSIDER THE WEATHER
Erecting a large greenhouse will take more than a day. Before you start please consider what steps you will take to protect the greenhouse if you are leaving it overnight or for a few days without the frame being fully glazed and anchored. Even a completely unglazed frame will need to be anchored down in some way if there is a possibility of strong winds.

DECIDE WHERE YOU WILL FIT THE 2 LOUVRE VENTS.
This will help you fit the correct number of bolts to the glazing bars in the first stage of construction. They will fit in any side bay except at each end next to a corner bar. Why not draw them on the plan on your right as a memory aid.

GREEN POWDERCOAT FINISH
The optional green finish is strong and durable. Unlike traditional paint finishes it will not flake and is very resistant to fade. Don't be concerned if you notice some areas on a few profiles where the paint is less dense. This is due to some of the profiles being very intricate with channels & cavities on both sides. The decision of where the primary and secondary painting surfaces and jig points are situated is deliberate. This takes into account how visible the profile will be on the finished greenhouse.

CAUTION
The edges of the extrusion can be extremely sharp. You may wish to consider wearing thin gloves at certain stages. During glazing and handling glass we advise you to wear protective eye goggles.

6 & 8ft side models

Thoughts & considerations
Where you choose to site your greenhouse will usually be dictated by the design of your garden and personal choice so we will confine ourselves to considering the different types of ground that it is built on. Rhinos can be sited on either soil or a hardstanding. Either way the main requirements are that the greenhouse is erected both SQUARE & LEVEL.

SOIL SITES
SOIL SITES are perfect provided that the soil is compacted so that it doesn’t subside or get washed away, avoid freshly dug soil for this reason. If sitting on a lawn we would recommend that the turf is cleared from the an area at least 300mm (1ft) greater than the size of the greenhouse - you won’t want grass inside and this will allow you to mow over rather than cut right up to the greenhouse base.

Rhinos all include integral aluminium bases which sit directly onto the soil and have sturdy ground anchors which can be concreted in to the ground at strategic points. The concreting is done last of all once the greenhouse is glazed.

HARDSTANDING SITES
HARDSTANDING SITES are no problem for the Rhino as the integral base has a wide lip both inside & outside which can be drilled and used as a reliable fixing point. There are issues to consider with hardstanding areas – is it level? If not find some means of packing underneath the aluminium base IT MUST BE LEVEL.

CONSTRUCTION METHOD
The greenhouse is assembled using aluminium bolts & nuts because they will not rust. These can be tightened reasonably tight but be careful not to overtighten, as being much softer than steel they will eventually shear.

The method used mostly in the construction of your greenhouse is shown below. The head of a bolt is slid up the channel in the glazing bar where it is held captive and cannot turn.

The instructions will tell you when to go round and tighten the bolts.

Is your level, level?
This may sound a daft question but it is surprising how often it crops up. You will have real difficulty erecting your greenhouse if your level is giving the wrong readings.

Check it before you start: Try it on a surface you believe to be level, note the bubble position, turn it round (180 degrees) and check that the bubble gives the same reading. If it doesn’t buy a new one quickly –you’ve just saved yourself a lot of work!

Plan ahead....
See page 17 point 10. The roof vents are slid into the end of the ridge section so enough clearance must be allowed when siting the greenhouse.

If you have ordered a 16, 18 nor 20ft greenhouse, then ideally you would slide the vents in from both ends as these models have a heavy duty roof glazing bar in the roof (page 6 point 3) and the vent will not pass over this. If this is a problem then the heavy duty bar could be fitted once the vent is in position.
Bolt the flat stay to the glazing bar where they cross. All 3 nuts on the stay should be left loose at this stage.

Construct the sides

YOU WILL NEED ……..

Base side R01
eave R03
Glazing bar R06/1
Stay side/roof R33/1
Heavy glazing bar R05/2 (16, 18 & 20ft only)

You will make the frame with the outside face of the frame facing down. For example, the eave bar will have the gutter part facing down as will the other parts.

The flat stays are the same part for the side & roof. Note that they have 2 holes approx halfway along their length, one is used when the stay is fitted to the side, the other when fitted to the roof.

Slide extra bolts in the glazing bar channels. Each bar needs at least one extra bolt for the attachment of the heavy duty eave brace. In addition slide one extra bolt in the each of the end bars for the stay and two for each louvre side (in the position you have chosen).

CHECK... & before moving on

That each glazing bar is pushed tight against both the eaves and the base.

That you have tightened all nuts - as the bolts slide in channels when building the sides you cannot leave them loose otherwise the frame would fall apart when moved.

Well done! When you have completed both sides you can move these out of the way and move on to construct the rear - see the next section.

METHOD ……..

Lay the parts out as shown below then bolt together. Make sure that the glazing bars are pushed tight against both the eave and the base.

Slide and extra bolt in each glazing bar for the eave brace and a further two for each louvre side when you have decided on their positions.

The heavy glazing bar is only used on 16, 18 & 20ft models. Its position is shown by the thick black line on these drawings. If you have a partition, the heavy bars are not required.

Note that on the 8x18 the heavy glazing bar is 4th from the left so when you make the other side it will have to be 4th from the right. It is important that all the heavy glazing bars are aligned (roof as well as side to assist with load bearing).

This finished side is from a 16ft model
Construct the rear (1st of 2 pages)

YOU WILL NEED ……..

Base rear R01/9
Top stay rear 1x R31/2
PLEASE SEE “TROUBLESHOOTING” PAGE FOR NOTE ABOUT THIS PART.
End stay R33/2

Corner side 1x R07/1 LH Corner side 1x R07/2 RH
Corner roof 1x R07/3 LH Corner roof 1x R07/4 RH

Heavy duty glazing bar 1x R05/1
Glazing bar 2x R06/2
Eave plate 2x R91/3
Ridge plate 1x R91/4

Base corner brackets 2x R32/4

The Plates and Brackets listed above are to be found in the “plate pack” in the end pack box.

PLAN AHEAD ……..

We have spread this section over 2 pages.

Carefully study the diagrams on this page before continuing with laying out the rest of the parts on the next page.

If you have constructed a greenhouse before, please pay special attention to the drawing on the right. The corner sections on a Rhino are fitted in a very different manner to other makes. The eave and ridge pass through slots in the corner section and bolt on the outside, this gives the Rhino more rigidity than conventional greenhouses (this can be seen on page 6, photo 2).

Just as with the sides you will make the frame with the outside face of the frame facing down. You have already used some of these sections so we will concentrate on the corner section.

You have to get the corner sections the right way round at this early stage so have a look at the illustration below to make sure you have set them correctly.

This is the corner section.

The drawing right, may look as though you are viewing the inside face of the corner section. In fact it is the outside face you are looking at.

Lay the corners this way up when you lay them on the ground to start construction. Refer to the large drawing on page 4 for the layout.

![Diagram of corner sections]

The ridge & eave plates fit on this side, nuts this side too.

8ft wide models

This is the corner section.
METHOD ........

Lay the parts out as shown right then bolt together. Leave the bolts loose at this stage.

The corner side profiles are cut square at both ends. The corner roof profiles are mitred at one end. Mind you don’t get them muddled up.

The mitred end fits at the ridge.

Note that the bolt is always on the outside and the nut on the inside of the frame.

If the top stay rear R31/2 appears to be too long:
Bolt the stay at each end and allow it to bow out slightly.
Then bolt it to the centre glazing bar, then to the other two glazing bars.

The eave plate should be fitted this way up.

The corner roof will fit to these holes.

The corner side will fit to these.

Finally ........

When you have constructed the rear frame turn it over and fit 6 nuts & bolts in the bolt channels ready for stage 5 when the sides are all to be connected together.

Fit these as shown and tighten so that they stay in place.

Their positions are shown in the main drawing by this symbol and arrows.

Finally ........

CHECK... & before moving on

That nuts have been left loose and that you have fitted the 6 nuts and bolts at the ridge and eaves.
All nuts must be fitted to the inside of the frame.
You will need .......

- Base door end: R02/1
  Note that this is a different profile to the other 3 sides
- Corner side: 1x R07/1 LH, 1x R07/2 RH
  Cornerside: 1x R07/3 LH, 1x R07/4 RH
- Door post: 2x R12/1
- Glazing bar: 1x R06/3
- Door track mount: 1x R17/1
- Door track: 1x R18/1
- Woolpile draught excluder: R18/1
- Door track mount: 1x R18/1

Plan ahead .......

Just as with the sides & rear you will make the frame with the outside face of the frame facing down. You have already used most of these sections so we will illustrate the door end base section which is different to the other 3 sides.

Unlike the previous sections you have built you must construct the door end in the correct order. Please follow the numbered sequence.

1. Fit the woolpile draught excluder to the door posts.

Note that this side of the door post is the doorway, the other side retains the glass in the same way as a standard glazing bar.

2. Construct the outer frame exactly as you did for the rear section - if necessary turn back a page for reference.

Now fit the door posts & angle stays to the base. The layout of the stays will be as shown in drawing 7.

Note that the door posts have to be fitted with the plain sides (see drawing 1 above) facing each other. Slide 3 bolts down the bolt channel in the door post then fit the angle profile - top stay front, leaving one bolt above & 1 below the stay.

3. At this stage the top of the door posts are not yet fixed.

Fit the door posts to the door track mount before bolting the door track mount to the corner bars. Loosely fit a nut and bolt to each end of the door track mount and push this down onto the door posts so that the bolts slide in the channel in the normal way (arrow 1).

Leave this nut loose.

Bolt the door track mount to the corner bars, (arrow 2).

Tighten the nut at arrow 1

Now turn the frame over or stand it upright – whichever you find easiest to fit the door track - see No 4.

4. The door track can now be fitted to the door track mount.

This diagram shows the way they are attached.

There are two ways to achieve this – either:
A. slide bolts into the channel in the back of the door track and offer it up to the holes in the mount, then fit and tighten the nuts. Or
B. Fit nuts & bolts to the door track mount and slide the door track along from one end – see diagram 6.

5. Fit the small glazing bar above the doorway. The finished door end will look like the next diagram when viewed from the inside.

Now fit the 6 nuts & bolts to the corner sections exactly as you did on the rear section – see page 4 for a reminder.

6. Check... & before moving on

That nuts have been left loose at both eave & ridge plates.

That you have fitted the 6 nuts and bolts at the ridge and eaves on the outside.

That you have fitted the woolpile draught excluder to the door posts.

Well done, have a cup of tea!
Hold the rear end upright, lift the side into position and slide the eave section through the gap in the rear frame. This will be a fairly tight fit which is why we left the nuts loose at the eave & ridge plates. The 2 slots in the eave section should be aligned with the bolt channels in the rear corner frame (remember that you slid a total of 6 nuts & bolts in these channels earlier). Loosen 2 of these and slide the nut & bolt into the slot in the eave to secure it in position. See view 2 for more details.

Before trying to connect these 2 sections, study the end of the eave bar circled here. You will see that there are 2 slots rather than holes. The bolts & nuts that you left in the end section will be loosened & slid into these slots as you can see in photo 2.

Bolt the base corner brackets to join the end and side frames. These can be tightened. You will note that the brackets are punched with slots rather than round holes so that you have adjustment to help the mitred corners to fit.

Repeat steps 1 to 3 for the second side and then connect the door end in the same way.

CHECK... & ✓ before moving on
That the nuts have been left loose at the eave plates.
That you have fitted the 2 nuts & bolts at each corner eave as shown in photo 2. These should be left tight.
That you have bolted the 4 sides of the base together tightly and that the mitres are fitting snugly.
You will be required to slide a number of EXTRA bolts into the roof glazing bars during this task so that they are in position for fitting the braces, hanging basket rails and roof crossbars. The drawings of the roof layout will show how many EXTRA BOLTS you need.

Don’t be too concerned if you get your sums wrong as it is not difficult to quickly undo a glazing bar and slip another bolt in the channel.

**Fit the ridge & roof bars**

**YOU WILL NEED ……..**

* after the part number = either the quantity or the part length varies with the greenhouse size – check the parts list for details.

- **Ridge** 1x R04/1 to 8*
- **Glazing bar side & roof R06/1** for 8ft wide models
- **Heavy glazing bar side & roof R05/2** for 8ft wide models 16ft, 18ft or 20ft long

**PLAN AHEAD ……..**

You will be required to slide a number of EXTRA bolts into the roof glazing bars during this task so that they are in position for fitting the braces, hanging basket rails and roof crossbars. The drawings of the roof layout will show how many EXTRA BOLTS you need.

Don’t be too concerned if you get your sums wrong as it is not difficult to quickly undo a glazing bar and slip another bolt in the channel.

**1** With the ridge on the ground fit nuts and bolts to each of the holes (with the exception of the first two and the last two which are used for the roof stays). The nuts should be on the underside and left very loose.

Position your step ladder on the inside of the greenhouse just at the point where the ridge will connect to the door end. It would be really useful if you could borrow another step ladder for the other end as your assistant will need to support this end of the ridge to keep it level for a few minutes.

**2** The ridge fits to the front and rear sections in exactly the same way as the eave bars did in the previous section. Push the ridge bar through the gap in the corner roof sections. Secure it by loosening the 2 nuts & bolts that you slid into these sections when you constructed the ends, slide them up into the slot in the ridge and tighten.

**3** Begin fitting the roof glazing bars – these are the same part as you used while constructing the sides. Always start with the bars in the centre as this will take the whip out of the ridge – check the number of bolts you need to slide up the bars, this is detailed later in this section. The roof layout varies with the size of the greenhouse. Refer to the diagram to identify the position of the vents and heavy glazing bars which are fitted to buildings 16ft and longer. The roof vents will not fit in positions different to those shown with the exception of 14ft and 18ft models. With the 14 you can choose to opt for the vents staggered as shown or symmetrical. With the 18ft you can fit the 2 bay vents either towards the front or swap their positions with the 3 bay vents.

**Plan ahead………..**

You will be required to slide a number of EXTRA bolts into the roof glazing bars during this task so that they are in position for fitting the braces, hanging basket rails and roof crossbars. The drawings of the roof layout will show how many EXTRA BOLTS you need.

Don’t be too concerned if you get your sums wrong as it is not difficult to quickly undo a glazing bar and slip another bolt in the channel.

**Glazing bar side & roof R06/1** for 8ft wide models

**Heavy glazing bar side & roof R05/2** for 8ft wide models 16ft, 18ft or 20ft long

**8ft wide models**

**R06/1** to 8*

* after the part number = either the quantity or the part length varies with the greenhouse size – check the parts list for details.

**Glazing bar side & roof R06/1** for 8ft wide models

**Heavy glazing bar side & roof R05/2** for 8ft wide models 16ft, 18ft or 20ft long

**R04/1** to 8*

**1x R04/1 to 8***
YOU WILL NEED ……..

Some sellotape or bluetack would be useful for this section to hold the bolts in place for the ridge braces but is not essential if it is not readily to hand.

* after the part number = either the quantity or the part length varies with the greenhouse size – check the parts list for details.

1. Fit the 4 flat stay bars diagonally to the roof. Bolt it LOOSELY to the ridge & then the eave. This may well require some effort as you will be pulling the building square by fitting these braces. Do not bolt the centre hole of the stay to the glazing bar at this stage.

If these stays are difficult to fit please refer to the Troubleshooting page at the back of these instructions.

2. The diagrams in Section 3, Page 7 show whether to slide 4 or 5 EXTRA bolts up each glazing bar. This photo is taken from inside the greenhouse looking up at the roof. It shows what each of the extra bolts is used for. You will see that where 5 are required the extra one is for the diagonal cross brace.

Fit the ridge braces (these are the longer of the 2 types of heavy “T” section brace) to the glazing bars immediately below the ridge. Leave these fairly loose at this stage.

3. Fit the eave braces (these are the shorter of the 2 types of heavy “T” section brace) to the glazing bars immediately below the ridge. Leave these fairly loose at this stage.

4. The simplest way to fit the vent crossbars in the correct position is to take a pane G (605x903) and place it temporarily in position. Make sure that you have the crossbar the right way up (see drawing below) you will notice that each end has a cut out which will fit around the side of a glazing bar. Slide each end over the glazing bar and move it into its approximate position. In doing this you will slightly flex the crossbar downwards so that it bends at the point where the cutout is –not too much as you don’t want to damage it.

When you have fitted all the roof vent crossbars remove the temporary pane of glass for reasons of safety.

5. Fit the 4 hanging basket rail brackets to the holes in the corner roof sections.

Bolt the hanging basket rails to the brackets & to every roof glazing bar.

With the exception of the roof windows and autovents (which will be fitted later) your roof should now look like this, with the ridge and eave braces in place as well as the hanging basket rails and vent crossbars.

Check... & ✓ before moving on

That the nuts have been left loose at the eave plates & the diagonal braces at the eave & ridge.

That you have fitted all the vent crossbars (2 or 4 depending on the model) and that the hanging basket rails are bolted tightly.
If the greenhouse is being sited on soil it is sensible to attach the ground anchors now & make the preparations now for them to be concreted in at the end of the installation.

Ground anchors should be positioned half way along each of the 4 sides. With the larger models this will ensure that they are attached to all 3 heavy glazing bars and on models 8x14 and smaller they attach to the heavy bar at the rear whilst giving good support to the long sides.

Climb on your stepladder and look along the line of the top of the ridge. If there is any bow in it now it must be removed – this is why we have left the ridge & eave braces loose. A very slight upward bow in the centre on longer buildings would not be a problem because the weight of the glass in the roof is considerable & this force is likely to level the ridge.

If the greenhouse is being erected on a hardstanding then the greenhouse should already be level but it is important to check it again now and make any necessary adjustments.

The door cill is also supported by a ground anchor in the centre of the opening. If your greenhouse has a flush door please refer to the separate instructions as the anchors at the door are fitted in a different position.

If you have ordered a Growbed with your Rhino use longer bolts at the bottom of the doorposts. The arrow illustrates the 4 anchor points. See section 2 for an explanation of the corner blocks.

Check also that the greenhouse is square. Measure the diagonals across the corners. The measurements must be equal. Another method is to fit a pane of long glass in each of the roof corners. Ensure that the bottom edge of the glass is sitting level with the eave and check to see if the long edge is reasonably parallel with the glazing bar.

BE CAREFUL NOT TO DISLODGE THE GLASS WHILE YOU DO THIS!

If the greenhouse is not square, with the aid of your assistant you can push it into the correct position – THIS IS WHY WE HAVE LEFT THE CORNER PLATES FINGER TIGHT, SO THAT THERE IS SOME ADJUSTMENT. Be aware that one corner being a little higher than the others will give the impression that the building is not square so keep using your spirit level (indeed check that that is accurate if you are getting inconsistent readings).

Be sure to remove the glass from the corners before continuing.

IGNOR THIS SECTION IF YOU ARE BUILDING YOUR GREENHOUSE ON A HARDSTANDING,

When all is square & level, tighten all corner & ridge plates but not the eave, ridge & side braces.

Check & before moving on

By now you are probably fed up with checking for level & squarness so just ensure that all nuts, with the exception of side and roof stays, (these will be tightened on P13 section 2) are tight before moving on.

Are you happy with the preparations & precautions you have made for concreting the ground anchors & preventing any subsidence at the corners?

Have you fitted the downpipe brackets (this is tricky once it is glazed so make sure you have done it now).
Assemble & glaze the doors

YOU WILL NEED ……..

- Door stile
  - For rhinos with a standard base: 3x R14/1
  - For rhinos with a flush door: 3x R14/2

- Meeting stile
  - For rhinos with a standard base: 1x R13/1
  - For rhinos with a flush door: 1x R13/2

- Door crossmember top: 2x R15/1
- Door crossmember bottom: 2x R15/2
- Door transom: 4x R16/1

- From the door fittings pack you will need:
  - 4x door knobs
  - 4x door wheels
  - 4x door guides – these are black nylon blocks with a groove cut in them.
  - 4x M8 bolts stainless steel
  - 8 x M8 flat nuts stainless steel
  - 4 x M8 Nylon nuts stainless steel
  - 4 x M4 x 25 bolt stainless steel
  - 4 x M4 Nylon nuts stainless steel

- Other items you will need:
  - Glazing rubber
  - Drill bit 4.5 mm (not supplied)
  - Drill bit 7mm (not supplied)
  - Glass – 4 x pane E & 2 x pane F for standard base models
  - 2 x pane K for flush door models

PLAN AHEAD ……..

The door assembly instructions are on 2 pages, please read them both before commencing assembly.

This section could be tackled at any time so if you get a wet spell while building your greenhouse you could still be making progress by building the doors.

You have 4 small holes to drill so you will need a hand, battery or mains drill.

1. Lay out 2 of the 3 door stiles as shown below. Leave the meeting stile for the next door.

2. Fit the glazing rubber to the fins as shown below.

3. Bolt the top door section to the sides and tighten the 4 nuts. Be sure to push the stiles right up to the stop as shown by the arrow A (left) otherwise the door will end up the wrong length.

   Fit the transom (left) approx 620mm below the top door section but leave the nuts loose.

   **Note that pane E is fitted here with the 610mm edge running vertically along the door stiles.**

   Take glass pane E (605x610) and push the shorter 605 mm edge up into the "U" groove on the top door section (as shown by arrow C left). Slide the transom up to the glass and ensure that it is pushed fully home.

   Now you have fitted the first pane of glass, the rest of the door can be finished in the same way.

   **FOR RHINOS WITH A STANDARD BASE**
   Fit the smaller pane F(605x421) as the centre pane and bolt the transom into position exactly as before.

   **FOR RHINOS WITH A FLUSH DOOR**
   Fit pane K(605x512) as the centre pane and bolt the transom into position exactly as before.

   **BOTH STANDARD AND FLUSH DOOR RHINOS FOLLOW THE SAME DOOR CONSTRUCTION FROM HERE.**

   Do the same for the bottom pane E. Note that the bottom door crossmember is the same profile as the one used at the top but without the two 9mm holes.

   Note that you still have one more job to finish the doors but this is done just before hanging them, see page 16 point 2. This involves clipping the glass in position with the "W" clips but you will use these temporarily whilst glazing the front and rear.

The door assembly instructions continue on the next page.
Congratulations! You’ve made and glazed one door—well almost. The bottom door guides and door knobs still need to be fitted but leave them until you have finished the second door, it will be more efficient to do them all together.

Lay out the other door as shown in the main drawing. Make sure that the door stile & meeting stile are in their correct positions otherwise the doors will not overlap when they are fitted to the greenhouse.

Meeting stile has an extra fin.

Fitting the door knobs

Drill a 7mm hole in the higher of the two door transoms at a convenient point as shown above and right.

Screw the male and female handle together.

Photo A
Fit the door guide with the slot facing the bottom of the door. It should be touching the bottom lip of the bottom door cross-member and also the inside of the door stile.

The nylon blocks are stepped, as shown in the photo on the right.

The longer leg will be positioned against the bottom door cross-member and the shorter one remains visible).

Sorry, photos B and C, below, both show an earlier version of the door guide, which was not stepped.

Photo B
Using a 4.5mm drill bit, drill through both the door stile & the door guide.

Use an M4 x 25mm stainless steel bolt to secure the block.

Photo C shows the finished door guide. Do the same for the other 3.

CHECK... & ✓ before moving on

Turn the doors over & check that the door sides are correctly fitted so that they overlap.

Are the door wheels held securely whilst still turning freely?
YOU WILL NEED ..........

1. Vent Side  R23/1
2. Glazing bar Centre Roof Vent  R06/5
3. Vent Hinge single bay  R22/1*
4. Vent Hinge double bay  R22/2*
5. Vent Hinge triple bay  R22/3*
6. Vent Cill single bay  R21/1*
7. Vent Cill double bay  R21/2*
8. Vent Cill triple bay  R21/3*

* The length and quantity of the vent hinges and vent cills will depend upon the size and layout of your Rhino.

Begin by fitting nuts and bolts loosely to the vent hinge and vent cill as shown below. Be sure that the bolt is fitted as shown or the vent sides will be upside down and it will be impossible to fit the glass correctly.

Slide the vent side onto the bolt on the vent cill as shown below.

One customer has managed to construct his vents slightly wrongly which meant that the glass would not fit. Whether it is possible to make this mistake will depend on the tolerance of the two parts. We explain it in the next two drawings so that this error can be avoided.

Slide the other end of the vent side onto the bolt on the vent hinge as shown below. Repeat this so that you have a rectangle. Make sure that the sides are pushed fully home and tighten the nuts.

The nut channel on the vent side as circled in drawing A (see above) should be fitted up to the dotted line in drawing B but no further.

In some cases it may be possible to force the vent side home so that the circled nut channel in drawing A is pushed under the lip on the vent cill so that it is positioned in the shaded area on drawing C (see below). This is wrong and will make the vent sides too short for the glass to fit.

If you are constructing a single vent you have finished and can move on to page 11.

If you are constructing a double vent then you will need one vent centre glazing bar.

If you are constructing a triple vent then you will need two vent centre glazing bars.

You will have noticed an extra section to the plastic bag containing the nuts and bolts which warns you to keep these small items safe. You will need them now. Please construct the next part of the vent on a flat surface such as a patio or the cardboard box so that the small nuts can be found if you drop them, they are a bit fiddly.

You will note that both the drawings in section 2 are viewed from the underside of the vent. The glazing bar should be fitted to the top side. The small bolts will be inserted from the underside through the holes in the vent hinge and cill into the glazing bar. The small rectangular nuts fit into the slot as shown above. Tighten the bolts using a screwdriver.

Complete the remaining frames and move on to glazing them on page 11.
You will need ……..

Glazing beads – there are 2 sizes of bead, leave the 8 long ones, you need the smaller ones.
Glazing rubber
Glass – panes E

You will need a hacksaw – a junior may be best but a full size one will be quite adequate.

Plan Ahead ……..

Glazing the windows now is actually a bit premature as they will be one of the last jobs to be done. The reason for glazing them now is that it will allow for the opportunity to try out the glazing method before starting on the main greenhouse.

If space is limited or for some other reason you prefer not to glaze the windows now, just read this section and then press on with the main greenhouse.

If you are building your greenhouse in the winter and have bought the winter window stay kit then you may wish to fit these rather than the autovents. If so then fit the stays & pins before you glaze the windows.

See point 3
Be sure to fit the glass this way round

Glass

80 wide models

Glaze the windows

1. Start by fitting the rubber glazing strip to the glazing fins (as indicated by the arrows) exactly as you did with the door.

2. Cut the glazing beads to the length of the sides of the windows (the section shown above). Use a new bead each time & keep the long offcut. You will need this later when you glaze the pane below the vent during the glazing of the greenhouse frame.

3. Lay the first piece of glass into the frame but be careful to get it the right way round or you won’t be able to fit the beads. The glass measures 610 x 605mm. The narrower side is the width to allow the beads room to clip into place. Slide the glass fully up into the recess in the vent hinge as in arrow A.

Now slide the glass back down towards the vent cill as in arrow B. This will be a fairly tight fit and you may well have to spring the frame a little to get it past the lip on the vent cill. Once the glass is in the frame, slide it fully down so that it seats flush into the vent cill.

4. Now you are ready to try the first glazing bead.

Whichever profile you are clipping the bead into, throughout the whole greenhouse it is important to note that the glass needs to be reasonably square within the frame so that the back leg of the bead has room to fit behind the glass as you can see in drawing E.

Similarly it is just as important to ensure that the glass is centralised within the glazing bars otherwise one of the beads will be far too sloppy and the other difficult to clip into place.

As a rule it is better to begin one bead off (start at one end or the other not in the middle) and then move to the other starting that off too. This way you avoid pushing the glass completely to one side and having trouble clipping the second bead in.

The soft black fin is the edge which seals against the glass. Start by tucking the other end under the lip on the vent side glazing bar as shown in C.

Now push the bead back as in D.

The back leg of the bead will tuck in behind the glass as in E.

Drawing F shows how the bead will look when clipped in.

The rest of the vents can be finished now. Don’t worry about the automatic vent openers at this stage they are fitted once the windows are installed in the greenhouse.

If you have a “glazing Paddle” and rubber mallet you may find them useful here to ensure that the beads snap home. Place the end of the paddle against the soft rubber fin on the bead (see arrow) and tap it with the mallet. Be sure to tap a few inches one side then move to the opposite bead, this will keep the glass centralised.

If you are having difficulty fitting the glazing beads please refer to the troubleshooting page at the rear of these instructions.
1. Begin by attaching the Trimseal 10 x 6mm to the corners. This is the only place that this is used and note that it is only used on the front and rear facing parts of the corner sections not on the side of these profiles. The thick black line shows where to attach the glazing rubber on the fin on the corner section (arrow 1 below) and then stick the Trimseal (the large reel of sticky backed foam) on top of it as shown by arrow 2. The sticky side is shown by the thick line. It is important to get this right first time, you won’t be able to reposition the Trimseal so we strongly recommend that you have a look at the Troubleshooting page where you will find a larger version of this picture.

2. Fit the 2 louvre frames. Back on Page 2 you chose where to fit them. The louvre consists of 2 parts, a right hand side which incorporates the handle & a left hand side which has no handle. These are designed to fit in any bay on the sides of the greenhouse except next to a corner bar. Louvres are designed to let cooler fresh air in low down so that your greenhouse will benefit from good circulation of air. They have to be fitted at the bottom of the bay with the side jambs resting on the top edge of the base. If you did not fit the 2 bolts in the glazing bars for each louvre side earlier, you can unbolt them now at the bottom before you start glazing.

3. Next attach the Trimseal 20 x 10mm length above the doorway. Cut this into 2 lengths of 600mm and apply the adhesive side to the top of the door track mount. Measure 20mm from the centre glazing bar and apply the Trimseal from there towards the corner roof bar. Please see the next 2 drawings.

4. Fit the glazing rubber. Having glazed the doors & windows you will be familiar with the fin that the rubber attaches to. Every profile to be glazed has this apart from the horizontal ones where rubber is not required. Fit the glazing rubber to the rest of the frame. The following do not need rubber:
   - Base
   - Eaves
   - Ridge
   - Vent crossbar
   The glazing bars above the vent crossbar where the windows will fit.

   It is sometimes the case that the glazing rubber is prone to slipping off the fin on the glazing bar. Numerous factors affect this, not least the ambient temperature. Once the glass is fitted the rubber will be securely held.

   If the rubber is tending to slip off before glazing then it will not hurt to fit it immediately before glazing each bay rather than fitting it all at once.
While you are moving & handling the glass be aware that the toughening process makes it vulnerable to knocks on its edges. Catching an edge on concrete or brickwork whilst carrying it can easily cause it to break. Of course, when it is installed in the greenhouse the edges are all well protected.

We hope this section hasn’t alarmed you. There is no need to be worried when you know the areas to take care over.

Of course take care when working on your stepladder, especially when the ground is soft.

Caution – glazing suckers
These are very useful at manoeuvring the glass within the frame or as a third hand on the glass but we would advise you not to use it as the primary means of carrying the glass in case it slips.

And finally note about the weather.
At this stage your greenhouse is not anchored down and is therefore vulnerable to damage by high winds.

An unglazed or partially glazed greenhouse is far more vulnerable than a fully finished model. If you are leaving a partially finished greenhouse overnight do take steps to anchor it more securely. If not place a hand on each face of the glass by putting your hand through the next bay.

By now you are familiar with the method of fitting the beads so we won’t repeat that instruction here (refer to the window page if you need a refresher).

REMINDER:

ensure that the bottom edge of the glass is seating down fully on with the horizontal profile. Whether that is the base, or eave.

ensure that the sides of the glass are parallel to the glazing bars.

centralise the glass within the glazing bars.

If you have trouble clipping the beads into place see our TROUBLESHOOTING page at the back of this manual.

Start by glazing the 4 corners of the sides and roof. As indicated by G in the glazing plan, bottom right, as this will show you whether you have the greenhouse set perfectly square.

ONCE YOU ARE SURE IT IS SQUARE, TIGHTEN THE REMAINING LOOSE NUTS ON THE SIDE AND ROOF STAYS

Slide the top edge of the glass up under the recess in the eave immediately below the gutter – as shown by the arrow.

Let the glass gently down so that the bottom edge is resting on the base and the sides are pushed in tight against the glazing bars.

A glass sucker would be useful during this process if you have one as it would allow you to control the operation more accurately. If not place a hand on each face of the glass by putting your hand through the next bay.

The front & rear pane C can be glazed in exactly the same way as the side but note that there are two differences with the

A. use the standard 1489mm bead next to the corner but this will need to be cut short to 1470mm because of the nuts and bolts at the eave.

B. Use the longer 2347mm bead on the other side. Start this off at the bottom but stop clipping it into place 150mm from the top of the glass at this stage. C

C. Continue glazing pane C & D all the way round before starting on the corner pieces.

GLAZING PLAN

The glazing plan above is for models with a standard base. If your greenhouse has a flush door then pane F in the centre of the doors will be replaced by pane K.

The glazing plan below is for an 8x14 – other sizes vary only in the number of windows.

CHECK THE REMINDERS IN SECTION 1

Start clipping the beads in from the bottom. They are the correct length & will not require cutting. Clip the glazing beads into position using the method described in the window section. Make sure that the beads are fully snapped in otherwise they are not retaining the glass. You can tell if part of the bead is not fully clipped in because there will be a slight bulge in the bead.

Fit pane D over the louvre in exactly the same way. You can either cut the beads down to fit the length above the louvre or keep them the full length.

Well done, hopefully that wasn’t too bad. Have a break & Imagine how many panes you would have fitted already if you were using the standard 24” x 18” glass!

In a moment you can proceed to the corner panes.
Glaze the shaped panes

4
Glaze the corner panes S.
Start at the rear end in the left hand corner. Fit the "H" section glass joining strip on top of the pane C already in position in the frame. Make sure that it is this way up. The longer downward leg is to be on the outside.

Outside
Place pane S on top of the "H" section. You will note that the corner of this pane has a cut-away to help it pass behind the nut & bolt at the eave.

4
Glaze the corner panes S.
Outside

5
Glaze the next end bay using pane F & corner pane S.
Fit the "H" section glass joining strip on top of the pane C already in position in the frame.
Clip in the glazing beads a bit further up to retain the glass. Note that the "H" section will fit between the soft black fins on the beads so that they do not have to cover part of it.
Fit pane S as described in section 6 again using 2 "W" clips on the corner roof profile. Cut the beads as previously described.

5
Glaze the next end bay using pane F & corner pane S.

6
Cut a standard bead 1489mm down to 1450mm and feed it behind the glazing bar as shown below (in fact this photo is of the door end but the principle is exactly the same).
Use 2 of the "W" glazing clips to fit on the roof corner to hold the glass temporarily while you make progress elsewhere.
Still on this pane clip the long glazing bar into position further up the glazing bar. As you reach the "H" section slide this out of the way of the bead so that it buts up to the bead but is not covered by it.
As the bead is clipped in towards the top of the glazing bar cut the bead off at an angle which is parallel with the corner roof profile and does not protrude beyond the height of the glazing bar.

6
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The glazing plan above is for models with a standard base. If your greenhouse has a flush door then pane F in the centre of the doors will be replaced by pane K.

The glazing plan below is for an 8x14 –other sizes vary only in the number of windows.

Glaze the front using panes S.
Cut the last two long beads down to 1900mm and use these for the door posts.
Proceed in exactly the same way as for the rear but note that the top point of the corner panes pass through a cutout in the door track mount just behind the door track.

Door end glass & beads all fitted.

That’s the hardest part of the glazing completed, well done.

8ft wide models

There is an alternative method if you find this difficult. The beads could be cut to shorter lengths to fit one per bay. This is only a cosmetic issue really, either method will retain the glass perfectly well.
Continue to glaze the rest of the rear in the same way.

SAVE THE “W” CLIPS YOU WILL NEED THEM IN THE DOOR LATER ON.

16 of 19
Start the bead level with the end of the glazing bar, not the end of the glass.

You may wish to apply a bead of silicone to ensure a good seal between the ridge and the top of the glass, although we do not believe this to be necessary in normal conditions.

Silicone should be applied to those areas marked by the wavy line & the arrows in the drawing below & is optional for the dotted line. Fit the windows before sealing the vent crossbars in case they require slight adjustment.

When you fit pane G below the roof vent you may well need to make a final adjustment to the vent crossbar which you fitted earlier in approximately the right position. Move it up or down in order that it is close to the top of pane G.

You will recall that when you glazed the roof vents you cut the glazing bead and saved the offcut. Use this now on pane G.

Once the beads are clipped in apply a bead of silicone to seal between the top of the glass & the underside of the vent crossbar.

If the glass is slightly more to one side than the other you may find that one of the beads is tightly in position while the other is loose. Don’t worry, if it has been fully clipped in then it won’t fall out but it may slip down the glass towards the gutter.

To prevent this, apply a little silicone to the upper part of the inside of the glazing bead at the exposed end at the eave.

Try & avoid sealing the whole of the bead as you would block any water from draining that may find its way inside the bead from the top.

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That completes the glazing so the roof can be completed by sliding the windows into position.

If you are fitting the optional winter window kit ensure that you have already fitted the stay and cranked pin to the window before sliding it into the ridge.

The diagram shows the vent hinge and the circular section of the ridge in which it will slide. See also the next photo for the method.

Note that the vent hinge has to be slid into the ridge from the end of the greenhouse (as in the photo) it does not clip into the ridge from underneath.

If this is a tight fit apply some WD40 to the circular part of the ridge.

That the roof vents do not foul on the vent crossbars –if they do catch then after centralising the vent move the vent crossbar up a few mm. Ensure that the vent crossmember is sealed with silicone.
Fix the greenhouse down.
Either Concrete the base anchors into position
Or if you have installed your greenhouse on a hard-stand –drill and plug the base at this stage. The base on a Rhino is ideally suited to fixing onto a hardstand because it is well balanced with the wide flat bottom section. Drill through this at an angle so that you are fixing close to the centre of the base. The position & number of fixings will be dictated by the individual site.

Fit the door supports
2x R31/4 (16mm angle)
On page 12 you fitted the long bolts & 3 nuts into the roof corners for the door support stays. Fit the stays now & bolt them to bolt channels in the back of the door track.

Fit the downpipes to the clips you fitted earlier (page 8 section 1. Note that the gutter stopends are identical to the outlets except that they have no hole. Simply push them into the gutter ends and seal the inside with a little silicone.

Fit the door stops to the door posts.
Much earlier you left 2 bolts free in the door post, use these to bolt 2 angle brackets per door post.

Fit the “W” clips to the panes of glass in the door.
With the doors lying with the inside up, fit 2 “W” clips on each side of each pane using the same method as when you fitted them temporarily to the shaped panes.
Slide the doors onto the door track (check that you have them on the right way round so that the meeting stile overlaps the door stile of the left door). You may wish to apply a little grease to the door track and bottom guide to make the doors glide really smoothly.

Corner roof profile R07/3 &4

See the next photo for a view of the door stop in position.

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Fit the autovents (unless you have fitted the winter window stays). The instructions are contained within the box. As you are fitting 2 vents per window be sure to adjust them to open together to avoid twisting the vent frame. Although this sounds complicated you will find that it amounts only to screwing the cylinders in by the same amount on each vent and then observing whether they do in fact open together.

If you have not ordered the winter window kit you may wish to do so in order to preserve the life of your autovents.

If you wish to lock your greenhouse the most simple & effective way is to drill a hole in the door track & fit a small padlock. This is a very effective way of keeping the doors closed in high winds & keeping un-welcome guests out too.

Finally, draughts. The Rhino, because of its glazing system is remarkably free of draughts but there is a gap in the centre of the vent crossbar which you may wish to seal. We have provided some Trimseal pads which you can cut to fit here Stick them to the side of the glazing bar, seal with a little silicone if required.

Fit the “W” clips to the panes of glass in the door.

With the doors lying with the inside up, fit 2 “W” clips on each side of each pane using the same method as when you fitted them temporarily to the shaped panes.

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Well that’s it, you have finished, we hope it all went well. Many thanks for buying a Rhino, we very much hope you will get enormous pleasure from using it.

If you have ordered a flush door model then you still have a little more work to do. Please see the Flush Door Instructions at the back of this manual.
This page includes tips and notes which cover questions previous customers have raised with us. We hope you find them useful.

Page 7
FITTING THE 4 FLAT ROOF STAYS
Refer to point 1 on Page 7

These are likely to be difficult to fit if the ground is uneven or the frame is out of square. They are designed to be a tight fit so that they pull the greenhouse square.

In rare instances it could be that a combination of manufacturing tolerances result in the holes in the eave and ridge being one at the maximum and the other at the minimum with the result that the holes in the stay appear marginally too close together. In this event it is acceptable to file the holes in the stay in order to fit the bolts.

Page 11
GLAZING ROOF VENTS
Refer to point 4 on page 11

If you have trouble fitting the glass into the roof vent frame then flex the vent cill away from the glass and ease it into the frame.

GLAZING BEADS WILL SNAP INTO POSITION MORE EASILY IF SOAPY WATER IS USED AS A LUBRICANT - DISPENSED WITH A SPRAY BOTTLE FOR EXAMPLE.

It is easier to fit the glazing beads on a warm day when they are more pliable. In cold weather it may be worth doing this job in a warmer environment such as a garage.

If the glazing beads are really tight and impossible to clip in it is likely that you have fitted the glass the wrong way round. There is only 5mm difference between the height and width of this pane so this is an easy mistake to make. The 610mm measurement is the height, fitting between the hinge & the vent cill. The narrower measurement is the width which allows room for the beads to be clipped in.

Page 12
FITTING THE TRIMSEAL
Refer to point 1 on Page 12

Fit the pvc “U” channel glazing rubber to the fin on the corner as shown by arrow 1.

The Trimseal is then applied over this glazing rubber (the sticky side is indicated by the thicker dark grey line) as shown by arrow 2.

GLAZING BEADS WILL SNAP INTO POSITION MORE EASILY IF SOAPY WATER IS USED AS A LUBRICANT - DISPENSED WITH A SPRAY BOTTLE FOR EXAMPLE.

This can be difficult in cold weather because the plastic glazing bead is much less pliable when it is cold and because there is less “give” in the heavy glazing bar than in the standard bar.

There isn’t one easy answer to this. You could try:

A) clipping a greater length of the bead next to the heavy glazing bar at centre rear or in the centre bays of side & roof on 8x16, 8x18 or 8x20.

B) warming the bead, but be careful. If heat is applied with a hot air gun it is possible that the bead will deform. The same would happen if the bead was subjected to boiling water. Warm soapy water would probably be the best option but you will find that the bead cools rapidly.

C) We sell an item called a “Glazing Paddle” which is made of a hard plastic and shaped like an oversized chisel with a blunt end. This can be positioned against the rubber fin on the glazing bead and tapped with a rubber mallet. This will ensure that the bead is pushed fully home without great effort.

Page 13

PARTITION

If you have also ordered a partition you will need to read the separate Partition Instructions before commencing construction of the main greenhouse.