



Air Brush Model Painting

Presentation & demonstration by:
Ian Welsh

Tutorial Handout prepared by:
Iain Moffatt
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Nigel Dogget

The following are the Tutorials in the Beginners series :

- #1 Beginners Lathe Work Part 1 (Jan 25th 2006) Iain Moffatt
- #2 Beginners Lathe Work Part 2 (Feb 1st 2006) Iain Moffatt
- #3 Simple Boat Electrics (Feb 15th 2006) Ian Greig
- #4 Beginners Yachts & Yachting including
Modifications to Northwind 28 Yacht (March 1st 2006) Sandy McLaren
- #5 Sheet Hull Construction (March 15th 2006) Iain Moffatt
- #6 Plank on Frame Hulls (March 29th 2006) David Jack
- #7 Airbrush Model Painting - Guest Tutorial (April 19th 2006) Ian Welsh
- #8 Making your own Boat Fittings (date TBA);
- #9 Beginners Box Kit Building (date TBA);
- #10 Beginners Yacht Building (date TBA)

Watch the Club Notice Board, the Web Site or read your Club Newsletters for more information on the Beginners Tutorials and on the Guest Presentations.

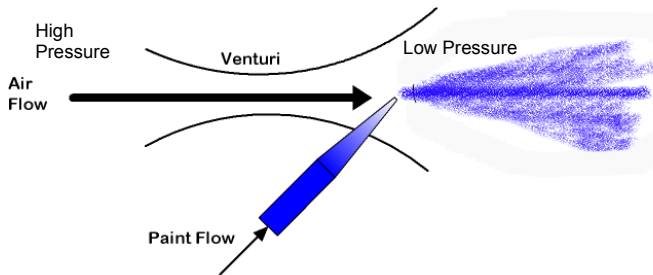
A copy of all Tutorial Notes are available for reference in the EMBC Boat Compendium kept in the Club House.

Airbrushes come in two main types "single action" and "double action"

All airbrushes work by blowing air across a fine nozzle, creating a vacuum that lifts the paint up into the airflow, breaks it into minute droplets and mixes it with the air thus producing a spray.

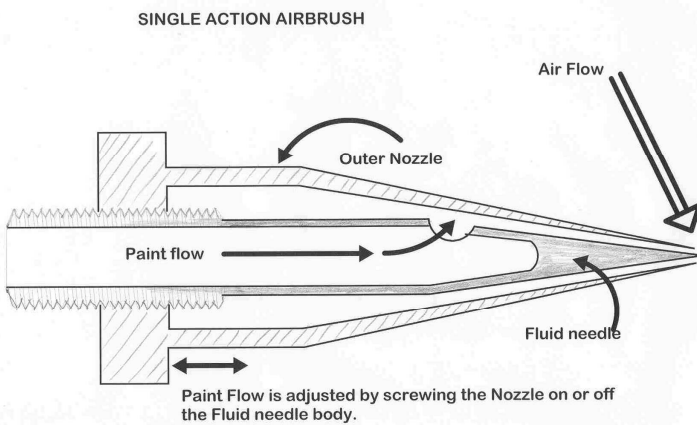
There are therefore three adjustments that may be made.

- 1 the Air Pressure to the brush - normally at the air compressor or bottle regulator.
- 2 the flow of air passing through the venturi, this being normally on or off.
- 3 the quantity of paint allowed to flow through the nozzle.



Air passing through the venturi tube has its velocity greatly increased in the throat of the venturi thus creating an area of low pressure (partial vacuum) in the exit tube. The higher the inlet pressure, the lower is the exit pressure. The paint nozzle is located in this area of low pressure thus sucking paint up the tube from the reservoir. High inlet pressure, lots of paint - low inlet pressure, less paint. (Bernoulli's Theorem and the Venturi Effect)

SINGLE ACTION AIRBRUSH



Single action Airbrushes allow 'in use' control over only the air supply via a trigger or push button.

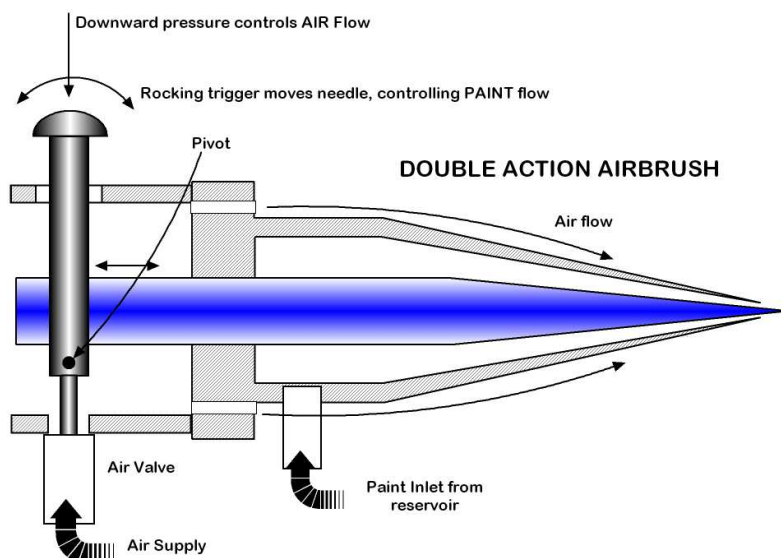
Paint supply is controlled by adjusting the relationship between the outer nozzle and the fluid needle.

On lower cost single action airbrushes this adjustment is made by screwing the outer nozzle on or off the threaded neck of the fluid needle (see left).

On more expensive models, the fluid needle is extended through the body of the airbrush and a knurled adjustment nut at the back of the airbrush allows the needle to be screwed into or out of the fixed outer nozzle.

Whilst superb results can be obtained from this type of brush, it does not give you the finesse and control that a double action can.

DOUBLE ACTION AIRBRUSH



Double action gives you total control of both airflow and paint flow from the trigger.

Pulling the trigger backwards or forwards increases and decreases the paint flow. Pushing the trigger down increases the airflow.

This then gives you unlimited control of the pattern you want to use from 1/64 fine line to about 1/4 inch broad pattern.

DeVilbiss Sprite; Iwata; Aztec; Badger 150; Paasche vjr. are all examples of such airbrushes.

THE AIR SUPPLY

Many if not all the lower cost single action airbrushes sold as a kit (I.e. including jars, adaptors etc.) are also sold with a small compressed air canister and a screw on regulator. In reality this regulator is simply a valve that allows airflow to be turned on or off although some degree of regulation can be achieved by partially opening the valve.

In general terms, propellant bottles are way too expensive !! (small can £4.00; big one £7.50)

You will be using 2 or three for even a small model boat and the costs soon add up!

You could get a CO2 tank but this requires to be re-filled at intervals and this costs both money and time.

In balance therefore, if you intend to use airbrushing as a routine part of finishing your models, buying an air compressor is most cost effective in the long term.

When deciding which to buy

1. Must have an air reservoir to prevent air pressure pulsation;
2. Should have a moisture trap on the air outlet (this can possibly be added later)
Compressing air causes its temperature to rise - hot air retains more moisture. When its pressure is reduced, the air temperature drops and moisture can form water droplets - not at all good for paint!! Also helps where you do not have an oil free compressor since it also traps any free oil;
3. Must have a adjustable pressure regulator - most airbrushes work at between 25 and 30 psig;
4. Noise levels - domestic use or garden shed/garage;
5. Last but certainly not least COST

My advice SHOP AROUND

For example - ALDI were selling a 2 HP air compressor with regulator, air reservoir, spray gun, blower gun, tyre inflation gun, single action airbrush kit and 10 metres of HP hose for around £60. It gives great results .. motor runs for around 10 minutes every half hour when spraying and the pressure variation is less than 2 psi over the period. Wouldn't suggest you use it in the house though and don't expect to hump it upstairs either!!!

Compare this to current prices in model shops!!

Prices range from around the £119 upwards, for which you get a smaller, lighter and quieter compressor. However not all come with an air reservoir.

QUOTE from Nigel_Ds' Airbrush Tutorial on Scale Models web site:

"The most important thing is airflow or a compressor!!!! Please, please, please don't skimp on this; a good silent type (i.e. fridge) type of unit will give you many years of service and will pay for itself many times over.

The most important aspect of it is that, unlike the diaphragm kind, you won't get the domestic authorities complaining about the racket! Seriously though a cheap compressor will be a mistake if it hasn't got a reservoir for the air the supply will pulse, resulting in uneven lines (almost a dot every couple of mills).

A moisture trap is also essential as compressed air is hot and this holds moisture which will spatter on your paint finish causing you much annoyance and expletives. A good moisture trap will also incorporate a pressure regulator which helps no end in being able to spray a variety of consistencies and finishes. "

WHAT CAN YOU SPRAY

Acrylic paint, Enamel paint, Polyester Varnishes, Yacht Varnishes and Inks (water based or spirit based) are readily handled.

Cellulose paint can be a bit of a beast since cellulose thinners can severely damage the plastic components of many of the cheaper air brushes.

One other thing to consider is 'What Goes With What'.

For example, cellulose should never be applied over enamels - the enamel blisters and rises;

Enamel can be applied over cellulose;

Paint Thinning ...

Quote from Nigel.D

What we need to look at first of all is paint thinning.

For enamels and acrylics the paint needs to be the consistency of milk.

This will allow you to spray a broad range of patterns from fine line to infill. Of course you can use a thicker mix with higher air pressure and a more open nozzle or a thinner mixture with less pressure and a more closed nozzle (gets simpler eh?).

The thing is as you get more experienced you can alter your mixes to accommodate the finish and the piece you are painting!

For instance if you use too thick a mix with too much pressure the finish will dry too quickly or even dry before it hits the surface, resulting in a coarse sandy texture on the surface; this is bad!!! (Unless this is what you want of course!)

Too thin and you will get paint runs.

Too much pressure, too close you will get spider legs.

Then again too thin is OK if you want a wash or tint.

The secret is in the air pressure and paint flow. In other words practice, experiment and be prepared to start again. Do not go out and buy an air brush thinking it will give you a great finish !! It wont - only you can do that with practice and perseverance. In the same thought if you buy a top of the range lawata Micron be prepared for frustration. It is an expensive bit of kit capable of producing lines a hairsbreadth thick line, but totally impractical for painting a large scale model. Its like buying a 000 sable and trying to paint your model with that.(great for fine detail but sod all use for anything else). Once you are happy with a mix you are ready to start spraying. Before you approach your model try it out on a bit of paper first of all so you know you have the correct pressure and paint flow. Believe it or not I have a bit of wall next to my bench where, much to the wife's displeasure, I tune my brush. It is covered with squiggles and signatures where I get the pressure and flow right before I approach the model. (This is not a general recommendation though as it does cause extreme discomfort on occasions)

Another important bit of advice is - if you are about to spray your model with your brush 2" from the surface , you press the trigger and pull slowly back to the point you set, and shock horror no paint flow!!!!

DO NOT repeat DO NOT keep pulling the trigger back as, if you're lucky nothing will happen, if you're not a huge wash of paint will erupt and ruin your day.

If the paint doesn't flow it's for three reasons :

- 1 the paint is too thick
- 2 the air pressure is too low
- 3 your nozzle is blocked because of paint lumps or foreign bodies in the mix.

The only answer is to empty and clean out before restarting.

However you can minimise this by filtering your paint through the mesh of a pair of old tights. but make sure the Mrs is not around before you liberate them!

For cellulose: FIRST check your airbrush instructions - cheaper ones will be damaged by cellulose thinners !!!

This needs to be a really wet mix i.e. thinned really well as it is so volatile it has a tendency to dry before it reaches the surface giving an orange peel effect to the finish. This can be countered by spraying thinners directly onto the surface to help even it out but it is not really recommended.

Much better to use very thin coats and build up the colour gradually. This should be done using a really low pressure whilst keeping the brush moving all the time, and remembering to lift the finger from the air trigger before moving the brush away from the model.

Trying to tell people all this is probably very hit and miss! You see the important thing is to get used to your brush, learn its limitations and its strengths.

Is it happy spraying spraying ultra thin lines or lines perhaps a couple of mill wide. Will it be capable of large amounts of infill?

Is the paint cup big enough not to have to refill it every 20 secs.

Does it feel comfortable to hold.

Does it make you want to paint???

All these points are something you may like to ponder, but in the end an experienced person with a cheap brush can produce work infinitely better than an inexperienced one with an expensive one.

Changing Colours

Quote from Nigel.D

So you have just used a colour and now you want to switch. There are 2 things that you can do

- 1 fill the paint reservoir with thinner and blow it through until it sprays clear
- 2 or as I do - I use a product called "Spray Away". This is an Aerosol can containing solvents and 1% machine oil that quickly blasts away any paint build up around the nozzle and will clean out the paint cup in seconds, then a final squirt in the cup blow it through and your ready to continue.

A few tips for you all to save future problems

- (a) don't use old paint it separates and it will clog up your brush as quick as cyno would.
- (b) make sure your paint is adequately thinned, the consistency of milk is about right! If not, use white spirit with enamels or distilled water or alcohol with acrylics (bear in mind though acrylics with some alcohol base will dry very quickly so don't stop spraying until you're finished!)

Keeping your Airbrush Clean

Quote from Nigel.D

If your airbrush has been unused for a while you may find it has seized or become blocked!

If this is the case just disassemble it and soak it in cellulose thinners; this will dissolve all kinds of dried paint, varnish, etc. *Editors Note : Check airbrush instructions - cheaper ones can be damaged by cellulose thinners !!*

Then use a pipe cleaner soaked in thinners to clean through the body; this will get rid of any last spots of crud.

A cotton bud is also indispensable for cleaning the recesses in your paint cup and nozzle (make sure your needle is withdrawn first though)

I then find it advisable to use a bit of sewing machine oil soaked in a kitchen towel to wipe the needle before reinserting it into the body.

If some of your brushes are as old as mine they will have leather or rubber packing glands and this stops them cracking! The newer ones have Teflon seals that need virtually no maintenance.

Getting the Right Colour

It can often be very difficult to get the right colour of paint to apply.

For this reason I refer you to a Colour Mixing chart available from the Humbrol web site (Humbrol_Interblends_Master_Document.pdf) a copy of which is available in the club.

To mix paint, you need to have patience - unless you are careful, it can involve numerous test sprays.

Remember that, when spraying, each coat is relatively light in density - usually at least 5 applications are necessary for a solid body coat that replicated the 'real' colour on a large area.

Another way if you have some model (or surface) that is the colour you want, pay a visit to your local DIY paint store and get them to scan the colour and mix up a ½ litre tin of domestic paint (enamel). I know it will cost a little more than buying small tins of ready made, but NOT if you have to experiment.

I was looking for a particular shade of dark blue for one project that had been previously painted with a 'standard' shade (Humbrol I think) that was no longer produced. After spending something like £8 buying wee tins and testing I went to my local Homebase and, for around £4 came away with an identical colour to the original. Suitably thinned it sprayed beautifully !!

Both mixing and thinning require consistency of application and this means MEASUREMENT !!

Buy a measuring pipette or dropper (even buy in bulk - i.e. a pack at a time).

Make a NOTE of your mixture strengths. That way you'll be able to do the same thing over and over.

Mix small quantities to get the thinning right or at least start off too thick and progressively thin until the spray operates and the pattern is right.

For enamels (Humbrol & domestic paints) I use a 50:50 mix and this usually works.

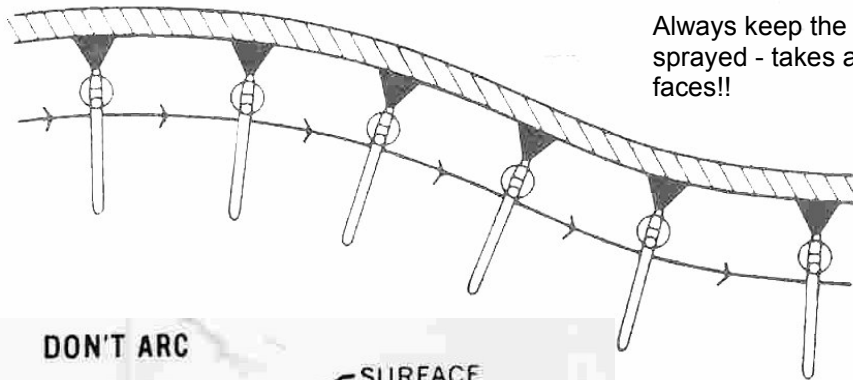
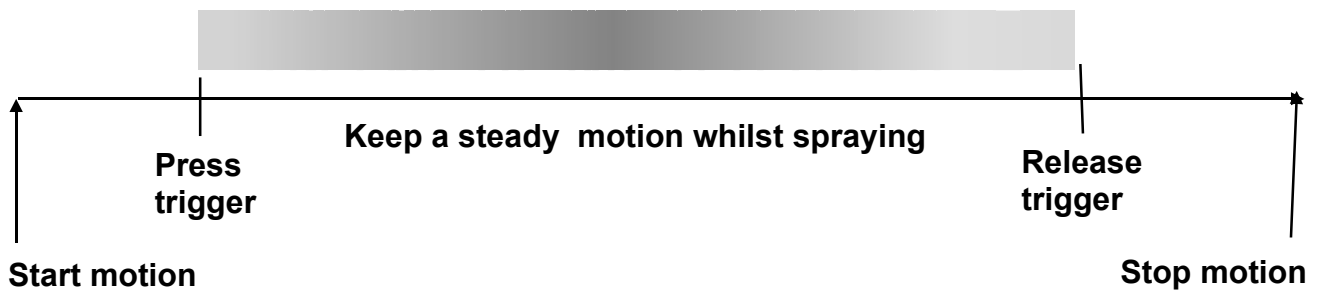
For mixing and storage containers be creative !!

When shopping for jam at the local supermarket, watch out for the small 'sample' size packs. The glass jars with a screw top make excellent mixing & storage vessels.

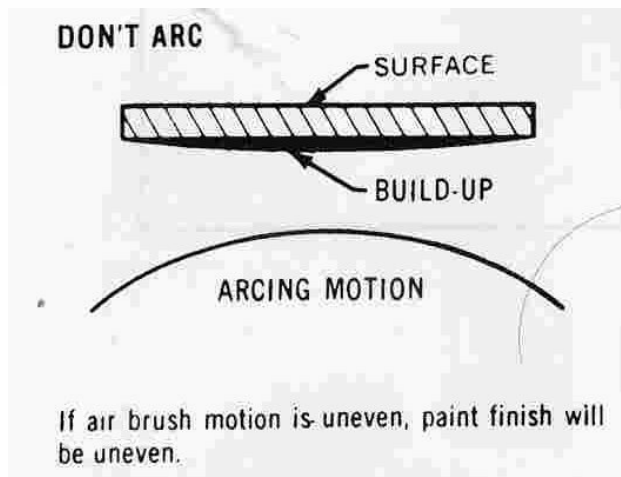
If you are out for coffee, collect the empty plastic containers for cream (milk); they make great mixing containers and most are also resistant to cellulose thinners!!

Painting Technique

Learn to Start and Stop the spray when off the workpiece and keep an even progression throughout the spray stroke



Always keep the airbrush at right angles to the surface being sprayed - takes a bit of practice when dealing with curved surfaces!!



Happens when you move the hand at the wrist only

If air brush motion is uneven, paint finish will be uneven.

Trouble Shooting

Many things can affect paint that is sprayed from the airbrush:

- hand movement,
- distance from the work,
- volume of paint,
- angle of spray,
- triggering,
- air pressure and more.

Depending on one or more of these factors, while learning airbrush technique, the beginner will likely encounter various undesirable effects. Following are some to watch out for:

Barbell Effect.

This is when globs of paint appear at the beginning and end of an airbrushed line. It is caused by hesitation of arm/hand movement at the beginning and end of the stroke.

Prevent this by keeping the hand moving before and after the line is painted, i.e., before you draw back on and after you release the trigger.

Another type of barbell is the flared stroke, and this is caused by two factors - the hesitation as described above and also the fact that the artist is not moving his entire arm when spraying (but is simply moving his wrist). This means the airbrush is closer to the surface in the centre of the movement and further away at both endings.

Freak Drops.

Every beginner makes these and at first they are fun to do. These are "spider" drops that you get by holding the airbrush in one place and spraying a large amount of paint, so much that the air blows the paint around into a "spider" shape. Again, this is fun for beginners, but you certainly don't want it to happen in the middle of a paint job.

The factors for this happening are three: holding the airbrush in one place, too much paint, and being too close to the work surface.

The "centipede" effect

This is an offshoot of the freak drop. Again, this elicits oohs and aahs when first done, but later is considered a mistake. The centipede resembles just that and is a line in which too much paint was applied, the hand movement was too slow and most likely too close to the work surface, thus blowing the paint into an undesirable configuration.

Blow Outs.

These occur in freak drops, centipedes and anything else when the artist accidentally applies only air, which then hollows out the wet paint that has been applied. This air pressure, in turn, causes the background or undercoat to show through.

Curved Stroke.

When you make a short, straight line but it ends up being curved, it is because you are airbrushing by moving just your wrist and not your entire arm. When using the airbrush, hold it directly at the work surface and move your entire arm as you spray. Keep your arm, hand, and airbrush straight toward the work -- the only way to achieve a consistent spray of a given width.

The Speck.

This is always an annoying occurrence. It's the glob of paint that comes out of the airbrush as you begin to spray and hits the work surface (when all you wanted was air)! Unbeknownst to you, this tiny droplet of paint was transferred to the front of the airbrush the last time you sprayed. When the trigger was released to shut off the airbrush, the droplet travelled forward with the needle; it was then blown off onto the work when you next began to spray. Therefore, whenever you start to spray, it is highly recommended that you do a test spray to insure that there is no droplet lurking. A couple spritzes of air and you will know that it's safe to continue. To prevent the speck in the first place, be cautious when turning off the airbrush spray. Don't just flick the trigger off; rather, gently lift it.

There are many variables in the proper use of an airbrush. Practice makes perfect, and having the knowledge to prevent potential mistakes will allow you to spray with ease and encounter minimal frustration.



paasche

F#1

INTRODUCTION:

F#1 Airbrush is the simplest in design with the least number of parts, supplying independent control of air and color. Ideal for use by students and hobbyists, also for touch up and decorating.

OPERATING INSTRUCTIONS: Pressures:

- 10 lbs. for stipple and granulated effects.
 - 20 lbs. for light consistency water colors, inks & dyes.
 - 30 lbs. for medium fluids, reduced lacquers, varnishes, paints or ceramic glaze.
- F#1 Airbrush will not handle heavy fluids.

1. Attach hose to air supply and allow to blow a few seconds at full pressure. Shut off before attaching to Airbrush. This procedure will remove dirt from airline and hose.
2. Attach AC-20 (1/8"-1/4"-40) Coupling to the Airbrush.
3. Attach Color Cup or Bottle to FN-1 Needle by exerting a firm twisting motion to fit taper tube securely into tapered Needle inlet. To remove Color Cup from FN-1 Needle, exert a backwards twisting and pulling motion.
4. Fill Color Cup or Bottle 1/2 to 3/4 full. Use eyedropper or brush for adding small amounts of color to cup. When using Color Bottle, vent hole must be kept open.
5. To Spray: Hold Airbrush like a pencil, comfortably between thumb and forefinger using middle finger as a guide and support.
6. Like writing, hold forefinger easily on H-155 Finger Button-press to open air valve.
7. Regulate volume of color and size of spray by rotating FT-1 Tip clockwise to increase, and counterclockwise to decrease, flow of color.
8. Stipple adjustment: For a very coarse stipple, loosen and slide back FN-1 Needle. Increase the volume of fluid until a free flow of color is achieved. Regulate air pressure and fluid feed for a variety of stipple effects.

CARE AND CLEANING:

1. Pour any remaining color back into its original container.
2. Wipe Color Cup or Bottle clean, using a cloth moistened with proper solvent.
3. Hold airbrush at a downward angle and put a few drops of solvent through the F-1 Color Adjusting Part Assembly. To flush out the remaining color in the F-1 Color Adjusting Part Assembly, apply pressure to the H-155 Finger Button.
4. Apply a tiny dab of petroleum jelly to the F-1 Color Adjusting Part Assembly and HC-1 Aircap threads every two or three months to prevent color build up and consequent freezing of the Color Adjusting Part Assembly and Aircap.

HOW TO OPEN CLOGGED FLUID PASSAGES:

1. Agitate color in Bottle Assembly by placing finger momentarily over HC-1 Aircap while air is passing through the Airbrush. (This will blow color back into bottle thus opening clogged fluid passages.) **Do not do this with a cup as color may blow out.**
2. Should F-1 Color Adjusting Part Assembly become clogged, loosen H-153 Set Screw, unscrew FT-1 Tip from FN-1 Needle, gently pull back through ball shaped support and remove Tip.
3. Clean Parts carefully, using nothing harder than a wooden toothpick.
4. To reassemble, reverse this procedure, making sure the shoulder of the needle seats up against ball shaped support.
5. If the needle and tip are completely clogged, soak in a closed bottle of proper solvent until clean.

A typical set of instructions for an airbrush in the medium to high cost range.