OFFICIAL NEWSLETTER OF
SANDERSON FIELD R.C. FLYERS
SHELTON, WA
bigbird@quintex.com

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SANDERSON FIELD R.C. NEWS

Merry Christmas

AMA
CHARTER NO. 3079

CLUB MEETING

This months meeting will be held on Wednesday December 8th at 7:00 p.m.

at the Casino
in the Legends restaurant

DINNER IS THE PRIME RIB BUFFET

Happy Holidays everyone, hope your Thanksgiving was enjoyable too.

The casino would rather deal with one check for the Christmas party but will allow us, this time to pay separately. If we have the party there again we'll have to deal with that some how. Also there will be a no-host bar with pay as you go drinks.

A good share of the November regular meeting was taken up trying to get nominee's other than the current ones (without luck I might add) and the 2005 budget.

The budget for 2005 is as follows:

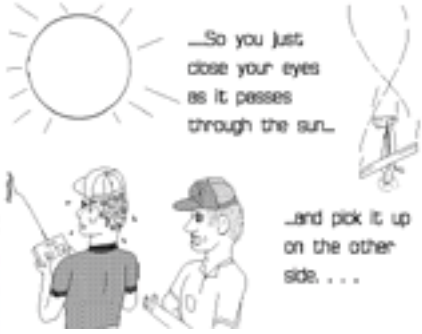
Fly-Ins	$450
Port-a-potty	$150
Port of Shelton	$950
Swap Meet	$100
Field Maintenance..	$50
Newsletter	$400
	$2100

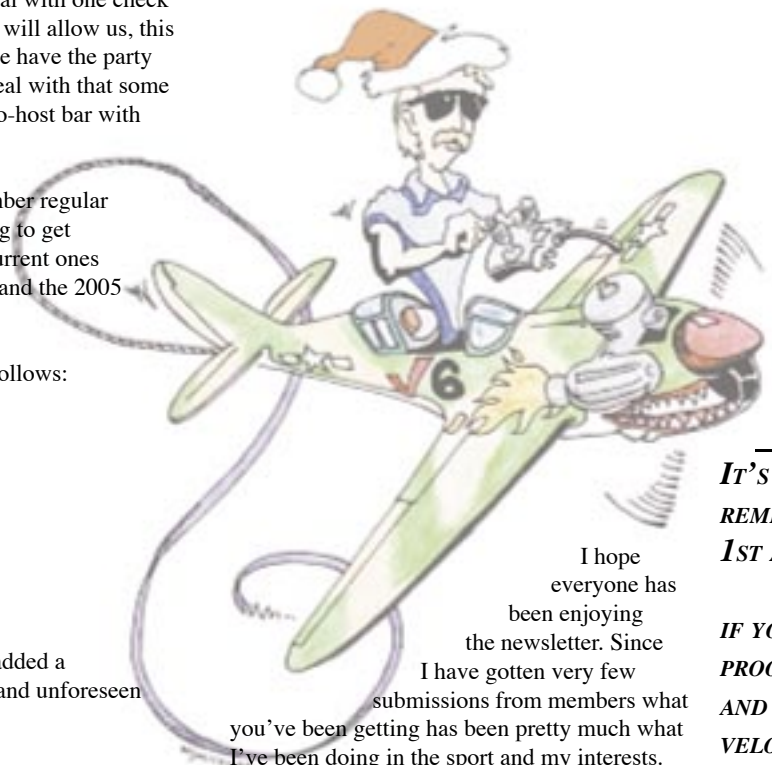
Most of the numbers are padded a bit to account for inflation and unforeseen circumstances.

Just a note on the newsletter costs, this cost is from stamps and copying. The electronic newsletter costs nothing except my time. The club could save a substantial amount if more people would take advantage of the electronic option. We currently have only 32 people getting the electronic version which leaves about 50 to mail via snail mail. I have gotten better control of the size of the thing and it's no longer so big, if you haven't tried it, check it out, look on the newsletter page of the web site. (the address is on your club card)

As of this writing the board has still not come to a decision on the jet issue, there is a board meeting the day before the Christmas party and it's number 1 on the agenda.

Stacy Myers picked up this permit from a street vendor on a recent trip to Washington D.C.





I hope everyone has been enjoying the newsletter. Since I have gotten very few submissions from members what you've been getting has been pretty much what I've been doing in the sport and my interests. I'm always open to ideas. If you'd like to see something else on these pages, let me know. Even if you only have an idea and not an article, let me know and I'll see what I can do.

IT'S TIME TO PAY YOUR 2005 DUES, REMEMBER IT'S $30 BEFORE JANUARY 1ST AND $40 AFTER.

IF YOU PAY BY MAIL SEND YOUR DUES, PROOF OF 2005 AMA MEMBERSHIP AND A SELF ADDRESSED STAMPED ENVELOPE TO THE TREASURER:

CHUCK KENTFIELD
6843 Gallagher Cove Rd NW
Olympia WA 98502

Basic Soldering

I know this is old hat to a lot of you but I've heard enough people ask about soldering that I thought it would be worthwhile [ED]

Turning to the actual techniques of soldering, firstly it's best to *secure the work* somehow so that it doesn't move during soldering and affect your accuracy. In the case of a printed circuit board, various holding frames are fairly popular especially with densely populated boards: the idea is to insert all the parts on one side ("stuffing the board"), hold them in place with a special foam pad to prevent them falling out, turn the board over and then snip off the wires with cutters before making the joints. The frame saves an awful lot of turning the board over and over, especially with large boards. Other parts could be held firm in a modeler's small vice, for example.

Parts which become hot in operation (e.g. some resistors), are raised above the board slightly to allow air to circulate. Some components, especially large electrolytic capacitors, may require a mounting clip to be screwed down to the board first, otherwise the part may eventually break off due to vibration.

The perfectly soldered joint will be nice and shiny looking, and will prove reliable in service. I would say that:

- **cleanliness**
- **temperature**
- **time**
- **adequate solder coverage**

are the key factors affecting the quality of the joint. A little effort spent now in soldering the perfect joint may save you - or somebody else - a considerable amount of time in troubleshooting a defective joint in the future.

The basic principles are as follows.

Really Clean

Firstly, and without exception, all parts - including the iron tip itself - must be **clean** and **free from contamination**. Solder just will not "take" to dirty parts! Old components or copper board can be notoriously difficult to solder, because of the layer of oxidation which builds up on the surface of the leads. This repels the molten solder and this will soon be evident because the solder will "bead" into globules, going everywhere except where you need it. *Dirt is the enemy of a good quality soldered joint!*

Hence, it is an absolute necessity to ensure that parts are free from grease, oxidation and other contamination. In the case of old resistors or capacitors, for example, where the leads have started to oxidize, use a small hand-held file or perhaps scrape a knife blade or rub a fine emery cloth over them to reveal fresh metal underneath. Stripboard and copper printed circuit board will generally oxidize after a few months, especially if it has been fingerprinted, and the copper strips can be cleaned using an abrasive rubber block, like an aggressive eraser, to reveal fresh shiny copper underneath.

Also available is a fibre-glass filament brush, which is used propelling-pencil-like to remove any surface contamination. These tend to produce tiny particles which are highly irritating to skin, so avoid accidental contact with any debris. Afterwards, a wipe with a rag soaked in cleaning solvent will remove most grease marks and fingerprints. After preparing the surfaces, avoid touching the parts afterwards if at all possible.

Another side effect of having dirty surfaces is the tendency for people to want to apply *more heat* in an attempt to "force the solder to take". This will often do more harm than good because it may not be possible to burn off any contaminants anyway, and the component may be overheated. In the case of semiconductors, temperature is quite critical and they may be harmed by applying such excessive heat.

Before using the iron to make a joint, it should be "tinned" (coated with solder) by applying a few millimeters of solder, then wiped on a damp sponge preparing it for use: you should always do this immediately with a new bit, anyway. Personally, I always re-apply a very small amount of solder again, mainly to improve the thermal contact between the iron and the joint, so that the solder will flow more quickly and easily. It's sometimes better to tin larger parts as well before making the joint itself, but it isn't generally necessary with p.c.b. work. (All *EPE* printed circuit boards are "roller-tinned" to preserve their quality and to help with soldering.) A worthwhile product is Weller's *Tip Tinner & Cleaner*, a small 15

SOLDERING (CONT)

gram tinlet of paste onto which you dab a hot iron - the product cleans and tins the iron ready for use. An equivalent is Adcola *Tip-Save*. Normal electronics grade solder is usually 60% lead - 40% tin or 40/60, and **it already contains cores of "flux"** which helps the molten solder to flow more easily over the joint. Flux removes oxides which arise during heating, and is seen as a brown fluid bubbling away on the joint. Acid fluxes (e.g. as used by plumbers) should never be necessary in normal electronics applications. Other solders are available for specialist work, including aluminium and silver-solder. Different solder diameters are produced, too; 20-22 SWG (19-21 AWG) is 0.91-0.71mm diameter and is fine for most work. Choose 18 SWG (16 AWG) for larger joints requiring more solder.

Temperature

Another step to successful soldering is to ensure that the **temperature** of *all* the parts is raised to roughly the same level before applying solder. Imagine, for instance, trying to solder a resistor into place on a printed circuit board: it's far better to heat *both* the copper p.c.b. *and* the resistor lead at the same time before applying solder, so that the solder will flow much more readily over the joint. Heating one part but not the other is far less satisfactory joint, so strive to ensure that the iron is in contact with *all* the components first, before touching the solder to it. The melting point of most solder is in the region of 188°C (370°F) and the iron tip temperature is typically 330-350°C (626°-662°F).

Now is the time

Next, the joint should be heated with the bit for just the right amount of **time** - during which a short length of solder is applied to the joint. Do **not** use the iron to carry molten solder over to the joint! Excessive time will damage the component and perhaps the circuit board copper foil too! Heat the joint with the tip of the iron, then continue heating whilst applying solder, then remove the iron and allow the joint to cool. This should take only a few seconds, with experience. The heating period depends on the temperature of your iron and size of the joint - and larger parts need more heat than smaller ones - but some parts (semiconductor diodes, transistors and i.c.s), are sensitive to heat and should not be heated for more than a few seconds. Novices sometimes buy a small clip-on heat-shunt, which resembles a pair of aluminium tweezers. In the case of, say, a transistor, the shunt is attached to one of the leads near to the transistor's body. Any excess heat then diverts up the heat shunt instead of into the transistor junction, thereby saving the device from over-heating. Beginners find them reassuring until they've gained more experience.

Solder Coverage

The final key to a successful solder joint is to apply an appropriate amount of solder. *Too much solder* is an unnecessary waste and may cause short circuits with adjacent joints. *Too little* and it may not support the component properly, or may not fully form a working joint. How much to apply, only really comes with practice. A few millimeters only, is enough for an "average" p.c.b. joint, (if there is such a thing).

CLUB OFFICERS 2004

President	Jody Diaz	(360)427-6102
Vice President	Dick Robb	(360)427-4521
Treasurer	Charles Kentfield	(360)866-9473
Secretary	Bob Beatty	(360)426-5601
Field Marshall	Charles Kentfield	(360)866-9473
Safety Officer	John Tupper	(360)426-6383

BOARD MEMBERS

Board Member	Jody Diaz	(360)427-6102
Board Member	Dick Robb	(360)427-4521
Board Member	Stacy Myers	(360)426-9367
Board Member	Darryl Casad	(360)275-8690
Board Member	Herb Coslett	(360)275-4158
Alt Board Member	Bob Beatty	(360)426-5601
Alt Board Member	Chuck Kentfield	(360)866-9473

SOLDERING (CONT)

Desoldering methods

A soldered joint which is improperly made will be electrically "noisy", unreliable and is likely to get worse in time. It may even not have made any electrical connection at all, or could work initially and then cause the equipment to fail at a later date! It can be hard to judge the quality of a solder joint purely by appearances, because you cannot say how the joint actually formed on the *inside*, but by following the guidelines there is no reason why you should not obtain perfect results.

A joint which is poorly formed is often called a "dry joint". Usually it results from dirt or grease preventing the solder from melting onto the parts properly, and is often noticeable because of the tendency of the solder not to "spread" but to form beads or globules instead, perhaps partially. Alternatively, if it seems to take an inordinately long time for the solder to spread, this is another sign of possible dirt and that the joint may potentially be a dry one.

There will undoubtedly come a time when you need to *remove* the solder from a joint: possibly to replace a faulty component or fix a dry joint. The usual way is to use a ***desoldering pump*** which works like a small spring-loaded bicycle pump, only in reverse! (More demanding users using CMOS devices might need a pump which is ESD safe.) A spring-loaded plunger is released at the push of a button and the molten solder is then drawn up into the pump. It may take one or two attempts to clean up a joint this way, but a small desoldering pump is an invaluable tool especially for p.c.b. work.

Sometimes, it's effective to actually *add more* solder and then desolder the whole lot with a pump, if the solder is particularly awkward to remove. Care is needed, though, to ensure that the boards and parts are not damaged by excessive heat; the pumps themselves have a P.T.F.E. nozzle which is heat proof but may need replacing occasionally.

An excellent alternative to a pump is to use *desoldering braid*, including the famous American "Solder-Wick" (sic) or Adcola "TISA-Wick" which are packaged in small dispenser reels. This product is a specially treated fine copper braid which draws molten solder up into the braid where it solidifies. The best way is to use the tip of the hot iron to press a short length of braid down onto the joint to be de-soldered. The iron will subsequently melt the solder, which will be drawn up into the braid. Take extreme care to ensure that you don't allow the solder to cool with the braid adhering to the work, or you run the risk of damaging p.c.b. copper tracks when you attempt to pull the braid off the joint.

I recommend buying a small reel of de-soldering braid, especially for larger or difficult joints which would take several attempts with a pump. It is surprisingly effective, especially on difficult joints where a desoldering pump may prove a struggle.

Here's a summary of how to make the perfect solder joint.

1. All parts must be clean and free from dirt and grease.
2. Try to secure the work firmly.
3. "Tin" the iron tip with a small amount of solder. Do this immediately, with new tips being used for the first time.
4. Clean the tip of the hot soldering iron on a damp sponge.
5. Many people then add a tiny amount of fresh solder to the cleansed tip.
6. Heat all parts of the joint with the iron for under a second or so.
7. Continue heating, then apply sufficient solder only, to form an adequate joint.
8. Remove and return the iron safely to its stand.
9. It only takes two or three seconds at most, to solder the average p.c.b. joint.
10. Do not move parts until the solder has cooled.

Troubleshooting Guide

- Solder won't "take" - grease or dirt present - desolder and clean up the parts. Or, material may not be suitable for soldering with lead/tin solder (eg aluminium).
- Joint is crystalline or grainy-looking - has been moved before being allowed to cool, or joint was not heated adequately - too small an iron/ too large a joint.
- Solder joint forms a "spike" - probably overheated, burning away the flux.

Club Scheduled Events for 2005

January 1st.....Annual 1st fly of the year
February .....
March .....
April 23rd .....Sanderson Field RC flyers annual swap meet 9:00 to 12:00 SHS Sub
May .....
June 11th .....Display at Walmart
June 12th.....Public Fly-In
July 9th.....fly-in 9:00 a.m. to ?????
August 20th.....Scale fly-in 9:00 a.m. to ????
September 10th.....Fly-In
October .....
November.....
December .....

Check out our web site at http://sfrcf.quintex.com

As you can see the officers will remain the same again this year as no one else stepped up to the plate to try their hand. If you are not coming to the Christmas party at the casino and wish to vote, you can cut this ballot out and mail it to:

Bob Beatty
83 SE Stroud Rd.
Shelton WA. 98584

The only change is that I will be replacing Darryl Casad on the board (Thanks Darryl, for serving) and John Tupper will be replacing me as an alternate board member. Please return your ballot by December 15th.

Sanerson Field RC Flyers

Voters Ballot

Officers

President ---------- Jody Diaz ---------- ☐

Vice President ---------- Dick Robb ---------- ☐

Treasurer ---------- Chuck Kentfield ---------- ☐

Secretary ---------- Bob Beatty ---------- ☐

Safety Officer ---------- John Tupper ---------- ☐

Field Marshall ---------- Chuck Kentfield ---------- ☐

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Stacy Myers ☐ Herb Coslett ☐

Bob Beatty ☐

Alt. Board Members

John Tupper ☐

Chuck Kentfield ☐