The DX HUNTER

AUGUST 17

MDXA CLUB INFO

MEETINGS: 2nd SATURDAY OF EACH MONTH 7:30 AM @ GOLDEN CORRAL HWY 49 GULFPORT

MDXA WEBSITE: MDXA.org

Net Frequency: 147.375 Tuesday @ 8:00 PM

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"More than a Club – We are Friends"

CLUB NEWS

How to solder

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.

Solder joints may need to possess some degree of mechanical strength in some cases, especially with wires soldered to, say, potentiometer or switch tags, and this means that the wire should be looped through the tag and secured before solder is applied. The down side is that it is more difficult to *de-solder* the joint (see later) and remove the wire afterwards, if required. Otherwise, in the case of an ordinary circuit board, components' wires are bent to fit through the board, inserted flush against the board's surface, splayed outwards a little so that the part grips the board, and then soldered.

In my view - opinions vary - it's generally better to snip the surplus wires leads off *first*, to make the joint more accessible and avoid applying a mechanical shock to the p.c.b. joint. However, in the case of semiconductors, I often tend to leave the snipping until *after* the joint has been made, since the excess wire will help to sink away some of the heat from the semiconductor junction. Integrated circuits can either be soldered directly into place if you are confident enough, or better, use a dual-in-line socket to prevent heat damage. The chip can then be swapped out if needed.

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 fiber-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 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 now "lead free" and typically contains Sn 97 Ag 2.5 Cu 0.5 (i.e. 97% tin, 2.5% silver and 0.5% copper). **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. The use of separate acid flux paste (e.g. as used by plumbers) should NEVER be necessary in normal electronics applications because electronics-grade solder already contains the correct grade of flux! Other solders are available for specialist work, including aluminum 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). The latest lead-free solders typically require a higher temperature.

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 aluminum 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).

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.

ANNOUNCED DX OPERATIONS

August					
2017 Aug01	2017 Aug10	**Faroe Is**	**OY**	EA4URE	By CT1BWW as OY/CT1BWW; 40-10m; CW SSB + digital; QSL OK via Buro or direct
2017 Aug01	2017 Aug31	**Galapagos**	**HC8**	LotW	By G8OFQ as TBA Isabela I (IOTA SA-004, EI49mb); 160-6m; SSB; QSL also OK via G8OFQ direct or Club Log; operation to continue until Oct 31
2017 Aug03	2017 Aug12	**Ogasawara**	**JD1BOI**	JI1LET Direct	By JI1LET fm Chichijima I (IOTA AS-031); 160-6m; CW SSB RTTY; QSL: Koji Iijima, 7-12 Tenma, Gyoda-city Saitama 361-0076, Japan
2017 Aug03	2017 Aug13	**Georgia**	**4L0GF**	LotW	By UR5EAW F5RAB F5RAV 4L6QC 4L6DL fm Zeda Tkhilnari, Batumi; 160-10m; CW SSB RTTY; 1kw; AV680 and Delta Loop; QSL also OK via F5RAV direct or Club Log
2017 Aug05	2017 Aug11	**Jersey**	**GJ4PVM**	LotW	By G4PVM; HF; CW SSB; QSL also OK via Club Log and eQSL (no paper QSLs)
2017 Aug07	2017 Aug07	**Ascension I**	**ZD8RA**	WW6RG	By WW6RG; SSB; 5w; 14205 kHz 0800-1030z, 1530-2000z
2017 Aug07	2017 Aug25	**South Cook Is**	**E51GHS**	F4GHS	By F4GHS fm Aitutaki I (IOTA OC-083) 8/7-16 and Rarotonga I (IOTA OC-013) 8/16-25; HF; holiday style operation
2017 Aug09	2017 Aug28	**Alaska**	**KL7**	LotW	By VE7ACN as AL3/VE7ACN fm Hinchinbrook I (IOTA NA-042, 8/9-15) and as NL6/VE7ACN fm Kayak I (IOTA NA-157, 8/18-28); 160-10m; CW SSB; QSL also OK via VE7ACN
2017 Aug12	2017 Aug19	**Market Reef**	**OJ0**		By youth team as TBD; 80-6m
2017 Aug15	2017 Sep05	**French Polynesia**	**TX5EG**	LotW	By F6BCW F6DTZ F1TCV fm Moorea I (IOTA OC-046); 80-12m; CW SSB; QSL also OK via F6BCW (Buro or direct), Club Log, eQSL
2017 Aug17	2017 Aug17	**Wake I**	**KH9**	WW6RG	By WW6RG as WW6RG/KH9; SSB; QRP; 14205 kHz 0330-0600z, 14235 kHZ after 0600z
2017 Aug17	2017 Aug22	**Tonga**	**A35JP/p**	LotW	By JA0RQV fm Niuatoputapu I (IOTA OC-191); 80-6m; CW SSB; QSL also OK via Club Log; contingent on flight availability

2017 Aug21	2017 Aug21	**Marshall Is**	**V7**	WW6RG	By WW6RG as V73/WW6RG fm Kwajalein; SSB; 100w; 14205 kHz 0330-0600z, 14235 kHZ after 0600z
2017 Aug18	2017 Aug21	**Lesotho**	**7P8**	LotW	By ZS2VR as 7P8VRR and ZS2KU as 7P8QM fm the Sani Pass region; 40 20 15m; 100w; dipoles; QSL also OK via home_call + perhaps Club Log
2017 Aug21	2017 Aug25	**Macedonia**	**Z38**	LotW	By IZ7GXB as Z38/IZ7GXB; HF + 6m, focus on 6m; 500w; QSL also OK via IZ7GXB (Buro or direct)
2017 Aug23	2017 Aug23	**Marshall Is**	**V7**	WW6RG	By WW6RG as V73/WW6RG fm Kwajalein; SSB; 100w; 14205 kHz 0330-0600z, 14235 kHZ after 0600z
2017 Aug25	2017 Aug29	**Albania**	**ZA**	LotW	By IZ7GXB as ZA/IZ7GXB; HF + 6m, focus on 6m; 500w; QSL also OK via IZ7GXB (Buro or direct)
2017 Aug28	2017 Sep04	**Micronesia**	**V63KS**	LotW	By JA6REX fm Chuuk I (IOTA OC-011); 160-6m; CW SSB RTTY
2017 Aug29	2017 Sep03	**Montenegro**	**4O7GXB**	LotW	By IZ7GXB; HF + 6m, focus on 6m; 500w; QSL also OK via IZ7GXB direct or 4O Buro
2017 Aug29	2017 Sep14	**Vanuatu**	**YJ0AT**	KQ2I Direct	By KQ2I fm Efate I; 40-10m, focus on 40m; CW; 100w; vertical; holiday style operation; QSL also OK via Club Log

CONTESTING NEWS

AUGUST

5- 6 Sat 0001 - Sun 2359	**ARLHS Lighthouse Activity - All**
5- 6 Sat 1800 - Sun 0600	**North American QSO Party - CW**
12-13 Sat 1600 - Sun 0400	Maryland-DC QSO Party (1) - CW/Digital/SSB
13 Sun 1600 - 2400	Maryland-DC QSO Party (2) - CW/Digital/SSB
19-20 Sat 1800 - Sun 0600	**North American QSO Party - SSB**
20 Sun 1800 - 2359	**ARRL Rookie Roundup - RTTY**
26-28 Sat 0400 - Mon 0400	Hawaii QSO Party - CW/PSK/RTTY/SSB
26-27 Sat 1200 - Sun 0300	W/VE Islands QSO Party - CW/Digital/Phone
26-27 Sat 1400 - Sun 0200	Kansas QSO Party (1) - CW/Digital/Phone
26-27 Sat 1600 - Sun 0400	Ohio QSO Party - CW/SSB
27 Sun 1400 - 2000	Kansas QSO Party (2) - CW/Digital/Phone

If you have info or articles you would like in the Newsletter, e-mail them to me and I will get them published.

K1AR CONTESTING HINT

Don't ever get so intimidated by the size of a pileup that you simply tune by the station without calling. We all have a story about the time we broke through a pileup without a clue how our station pulled it off. Here's the answer: operating skill! There's one guarantee when chasing DX: If you don't at least try to call them, you absolutely won't work them!