

DORSET AMATEUR RADIO

SOCIAL NETWORK

Technical Supplement

March 2026

www.darsn.co.uk

Welcome to the March edition of the Technical supplement Newsletter.

In this issue: Make you own Boards at home, Surface Mount for Beginners

Also keep an eye out for a GPS portable receiver project – [Coming Soon]

On with the show!



Lindsay - 2E0VDD
Secretary / Treasurer



Bill - 2E0WEG
Chairman



Tim – 2E0TPH
Editor

Events in March

14th March
G3DAR Meet Up
The Coach and Horses
Wimborne
12 Noon

“Getting Started”
28th March 2026
12:00 until 15:00

Hosted by Tim (2E0TPH)

See page 5 for more.

Nets

Mondays	No Darsn Net
Tuesdays	145.400 FM
Wednesdays	70.375 FM
Thursdays	Zoom Chat
Fridays	No Net
Saturdays	28.375 USB
Sundays	144.375 USB

All details can be found on our Facebook page



Contact Us:

Lindsay
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Bill
(Via Lindsay)

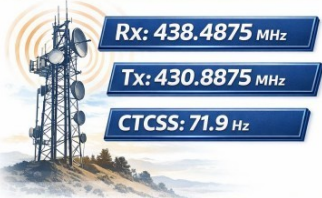
Tim
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GB30F



NEW REPEATER NOW ACTIVE!

GB30F



Your Projects Wanted !

Have you got a project that you would like to share with us?

You can submit articles / projects for inclusion here by sending them to the Editor.

Submissions should be tested and be of your own work. We cannot and will not publish anything we feel is Copyrighted material.

Anything is considered.

DARSN NETS!

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Thursdays	Zoom Chat
Fridays	No Net
Saturdays	28.375 USB
Sundays	144.375 USB

No DARSN Net on a Monday BUT, you are all welcome to Join in the Monday Evening Net on 145.375MHz (FM) hosted by [Poole Radio Society](#).

Check out the [NETS](#) Page for more details on Nets in the area.

DARSN would like to thank all of our volunteers who give up their time and resources to run the Nets. You are very much appreciated.

DARSN Shop.

We are pleased to announce our new [Shop](#) which can be found at <https://www.wavewizards.org/shop> We offer free local pickup for DT3 DT4 and DT5 postcodes. All other postcodes can obtain flat rate postage and this is subject to change as we get better deals on postage sorted out. Most payment methods are accepted (See Last Page) Not only will you find DARSN related products but you will find other items like Electronic Kits (Coming Soon) and Parts and 3D Printed Goodies [Thanks to Reece M7DVX] Take a look and see what is available!



Beanie

£4.00

Select options



Carry Bag

£8.00

Select options



Soft carry pouch

£5.00

Add to basket



Notepad

£3.00

Add to basket



Torch

£12.00

Read more



Vintage style Plain Base Ball Cap

£9.99 **£7.99**

Select options



Baseball Cap (Printed Logo)

£9.99

Select options



Ham Radio Hoody (Blue)

£25.00 **£18.00**

Add to basket

Other Website News

Cloudlog has accidentally shot itself in the foot and is no longer in operation on [Wavewizards.org](#). Cloudlog has been replaced with Wavelog, a fork of the original Cloudlog code base but with an emphasis on usability for beginners.

Any references to Cloudlog in this Newsletter should read "Wavelog"

I am also working on a [Buy and Sale](#) section where you can search for items across various sites. This is not going to be complete for a while but I am busy working on it.

As always, you can always download the Newsletter from: [Wavewizards](#), [DARSN](#) or [Facebook](#)

Bio of the Month – David (MOKYN)

My interest in electronics started at an early age. My parents were completely non-technical but loved going to auction houses in search of antique furniture. Whenever they encountered an old and broken radio or TV set, they would bring it home for me to fix so at the age of 14 or so, I was obsessed with books on TV servicing and building a small workshop.

Both of my parents were musicians and I would sometimes accompany them to recording studios. I remember attending the pre-release audition of Wagner's opera "Tristen and Isolde" at EMI in London: In an analogue age, this was one of the first digital recordings made, using a modified analogue VCR. Meeting engineers and discussing this 'experimental' technology blew my mind yet when it came to career choices, I decided to keep electronics a hobby and completed a degree in Biochemistry. As a practising Biochemist, lab-life left me cold. I simply didn't enjoy it and so after much soul searching, spent another 3 years re-training in electronics. I joined the BBC and specialised in transmitters / RF working with everything from 1MW shortwave and 20KW klystron-based UHF amplifiers to lower-powered solid- state systems.

When the digital revolution started, I joined an equipment manufacturer building the industry's first digital video encoders, multiplexers and modulators to build satellite and terrestrial broadcast systems. I travelled the world helping Broadcasters make the transition to Digital and I guess still do this today although the technology has changed beyond recognition to software, cloud and IP.

My interest in Amateur Radio is quite recent and started by accident. My partner bought me a 'tuner kit' to build with the expectation it was some type of radio receiver. It wasn't: It was an MFJ antenna tuner (the one at the bottom of the photo!). I built it but couldn't use it so this justified the purchase of an FT991A, some antennas and the license I needed to really test things out! A few years on and I keep saying the radios, antennas and cabling that now adorn the house is my partner's fault (and not mine!!)

My first passion is HF; I love building and testing antennas and it takes me back to the start of my career. I love operating at the many camping events the club organises; I feel 20 years younger when embarking on a radio-camping adventure with the club. It has some terrific, fun people and DARSN has really enriched my love for this hobby.

[It is worth noting that David is also the holder of the club Callsign G3DAR / GX3DAR and we all thank you for your contribution and attendance at the Camping Weekends and other events where time allows.- ED]



DX News

The following screen captures comes from the Wavelog server that I host and is open for everyone to use. To get a username and password for Wavelog simply use the [Contact form](#) and I will get you an account setup.

Some events run across February, March and April hence the screen captures below.

Date from	Date to	DXCC	Call	QSL Info	Source	Info
12/01/26	03/03/26	Desecheo I	KP5	LoTW	MM0NDX (Dec 26, 2025)	By NP4G and team as KP5/NP3VI fm FK68gj; 160-6m, incl 60m; CW SSB FT8; QSL via M0OXO
12/01/26	23/03/26	Martinique	FM	LoTW	TDDX (Jan 20, 2026)	By F6BWJ as FM/F6BWJ; 12 10m; CW; 100w; groundplane
15/01/26	28/02/26	Kenya	5Z4	LoTW	OPDX (Dec 23, 2025)	By OZ6ABL as 5Z4/OZ6ABL fm Watamu (LI06ap); 80-6m; CW SSB FT8 FT4; holiday style operation; QSL via OZ6ABL or Club Log OQRS
22/01/26	31/03/26	Curacao	PJ2	LoTW	OPDX (Sep 8, 2025)	By W2APF as PJ2/W2APF; 80-10m; CW SSB FT8; QSL via W2APF direct
26/01/26	04/03/26	Curacao	PJ2	eQSL	OPDX (Jan 24, 2026)	By PD1DRE as PJ2/PD1DRE fm Willemstad (IOTA SA-009, FK52nc); 40 20 10m; SSB FT8 FT4
01/02/26	27/02/26	Belize	V31DJ	LoTW	TDDX (Jan 20, 2026)	By W0CP; also K0ZV using V31DK; fm Placencia; 160-10m; CW SSB FT8 FT4; 800w; wires; QSL via Club Log OQRS
04/02/26	09/03/26	St Kitts and Nevis	V4	LoTW	K0YA (Jan 3, 2026)	By K0YA as V4/K0YA and W5RCX as V4/W5RCX fm St Kitts; 160-6m; CW SSB FT8 FT4
10/02/26	01/03/26	Mali	TZ1CE	LoTW	OPDX (Feb 2, 2026)	By DK1CE fm Bamako; 160-6m; SSB FT8; QSL via DK1CE
14/02/26	28/02/26	Falkland Is	VP8TM	LoTW	OPDX (Aug 16, 2025)	By DC8TM fm IOTA SA-002; HF; SSB FT8; QSL via DC8TM (B/d), eQSL
17/02/26	28/02/26	Uganda	5X4TA	eQSL	OPDX (Feb 18, 2026)	By HB9FHV; 20 15 10m; 1500-1600z; vertical w/ elevated radials

Date from	Date to	DXCC	Call	QSL Info	Source	Info
17/02/26	30/03/26	Mauritius	3B8G	VU3OPT	OPDX (Feb 21, 2026)	By VU3OPT fm LG89tx; 20 15 10m; CW
19/02/26	27/02/26	Guyana	8R1WA	LoTW	OPDX (Jan 12, 2026)	By IZ0EGA IZ0EVI IZ0EWJ IZ6DSQ; 160-6m; SSB FT8; QSL via IZ0EGA (B/d)
19/02/26	03/03/26	Senegal	9G5ZZ	LoTW	OPDX (Feb 20, 2026)	By DL1CW fm Cape Coast (IJ95jc); 80-6m; mainly CW, possibly RTTY; 100w; dipole; QSL via DL1CW Buro
21/02/26	28/02/26	Barbados	8P9XB	VE2XB	OPDX (Dec 10, 2025)	By VE2XB; 80-6m; holiday style operation
21/02/26	07/03/26	St Kitts and Nevis	V4	LoTW	MM0NDX (Dec 10, 2025)	By WA7RAR as V4/WA7RAR fm St Kitts; 20-10m; SSB CW; QSL via WA7RAR direct
22/02/26	15/03/26	Guinea Bissau	J51A	LoTW	OPDX (Feb 22, 2026)	By DA1DX DK9IP DL8LAS DM5EE DM6EE fm Bijagos Archipelago, Guinea-Bissau (IOTA AF-020), HF, incl 60m; SSB CW FT8; QSL via Club Log OQRS
26/02/26	15/04/26	Minami Torishima	JD1	JA8CJY	OPDX (Feb 10, 2026)	By JG8NQJ as JG8NQJ/JD1 fm IOTA OC-073 (QL64xg); 17 15 12m; mainly CW, some FT8; 50w; spare time operation; exact end date uncertain
27/02/26	04/03/26	Honduras	HR9	NG7E (B/d)	OPDX (Feb 12, 2026)	By NG7E as NG7E/HR9 fm Roatan I (IOTA NA-057 EK66rh); 80-6m; CW SSB RTTY FT8, focus on digital
27/02/26	04/03/26	Honduras	HR9	LoTW	OPDX (Feb 12, 2026)	By K6VHF as K6VHF/HR9 fm Roatan I (IOTA NA-057 EK66rh); 80-6m; CW SSB RTTY FT8, focus on digital; QSL via K6VHF (B/d), Club Log OQRS, eQSL
27/02/26	09/03/26	Bonaire	PJ4	LoTW	TDDX (Feb 24, 2026)	By WD8R as PJ4/WD8R fm western Bonaire; 40 20 15m mainly; CW (15WPM) SSB perhaps FT8; 20w; holiday style operation

DARSN / G3DAR Events

We are planning lots of events for 2026. I will try to dedicate a full page every issue so you can see whats coming up!

14th March 2026 at Noon (12:00)
G3DAR Meet Up

Coach and Horses
Wimborne

[Driving Directions](#)



The Handsome Chap pictured on the Right, will be holding a talk on the 28th March at Sturminster Marshall Memorial Hall

Churchill Close
Sturminster Marshall
Wimborne
United Kingdom
BH21 4BQ

The talk will be about “Getting Started” in Electronics and Repair and is primarily aimed at those who are new to this wonderful hobby and dives into various areas such as Test Equipment, including building your own, How not to blow yourself up, Electrical Safety, Designing Circuits and we will also have a 4K Digital Microscope that I will demonstrate.

Everyone is welcome. Refreshments will be provided.
Donations are welcomed but not Mandatory [See last page - ED]



Your Host – Tim (2E0TPH)

The talk is not just for beginners, why not come along and find out what Multimeter “Counts” are and the difference between Resolution and Accuracy. I will also be talking about Oscilloscopes and why you could benefit from having one in your arsenal.

Topics for discussion also include: Soldering – What solder to use on what equipment.
Soldering tools, from basic stations and SMD tweezers to re-flow ovens
Solder and Flux Information, cleaning fluids and applications
What is a CAT rating and why a cheap multimeter potentially could put you at risk.

Pcb Creation

How to get your project from Prototype to Production

How to choose components and how do you decode the markings?

Hopefully this gives you an idea of what the talk is going to cover. Hopefully we will see you there.

I also intend on running a “Drop in” clinic online if you have any further questions. More information will be released when I work something out. This Talk is provided to you for free, Zero Cost but please remember that we would appreciate a small Donation to help out with the cost of hall rental. No Pressure.

You can find all our Events on our [Facebook Group](#), [Darsn Website](#) or [Wavewizards.org](#)

145Alive



The “145Alive” and “More on 144” was a huge success.

For the first time in the Events history, we had the chance to operate SSB and not just FM. We are currently awaiting feedback from the Event Organisers as to see if this is to become a permanent feature. I would like to say a huge thank you to the Organisers, the Hunters and to anyone who got involved.

I would also like to extend my personal heart felt thanks to Reece (M7DVX) for his enthusiasm and dedication and for allowing me access to his IC-7100 (again). Anybody would think I was getting attached to it.... [I am but don't tell him - ED]

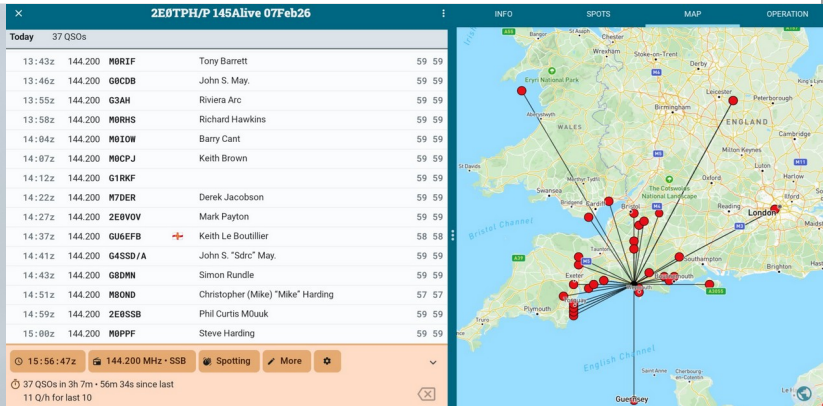
I invite them to put out a CQ on the Net Frequency so that they have the opportunity to work some of the other stations. A few stations Mark (2E0VOV), Andrea (2E0MIZ) and Phil (2E0SSB) [and others - ED] managed to work each other as a courtesy. I believe that this method of Net Control gives everybody the chance to work each other and promotes the Spirit of Amateur Radio



Moonraker Telescopic Mast (Aluminium) supporting a Vertical VHF/UHF Whitestick. Blustery conditions meant that I was unable to fully extend the mast to it's full 10m (33') Height.

Coaxial Cable is RG58U (Mil Spec)
Radio: IC-7100

I normally use my TR-9000 but I do need to give it a full service and Alignment due to previous “Screwdriver Experts” getting into it during it's previous life.



I use Ham2K Polo as my primary portable / mobile logging system. This in turn connects to my Cloudlog Server which enables me to upload my log directly. When received by the server, the log is then exported directly to QRZ.com, Hrdlog, LoTW and others.

The Ham2k Polo app is one of the best “no-nonsense” logging apps I have found.

I run the app on a modified Kindle Fire Max. The keyboard, which doubles as a case also enables rapid entry of the callsign data.

The Kindle also supports OTG over USB-C which also means I can plug straight into my FT-891 for Digimodes like SSTV, RTTY, Amtor amongst others.

Would anyone care to try SSTV on 2m?

I can assure you it's great fun but be warned, I have lost many days on the hills due to the addictive nature of it.

Tank Museum Visit

Our visit to the Tank Museum on the 21st February was well received by our guests. We all thoroughly enjoyed the massive display of Tanks and exhibits that were on show. The following photographs have been supplied by Helen Moore and we thank her for the use of her images. [Helen happens to be our resident professional photographer – Ed]

For more information on the Tank Museum, please visit their [Website](#)

More Photographs can be found on the [DARSN Facebook Page](#)



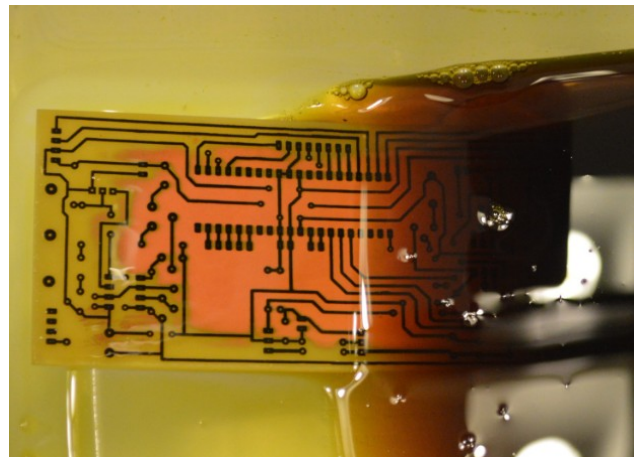
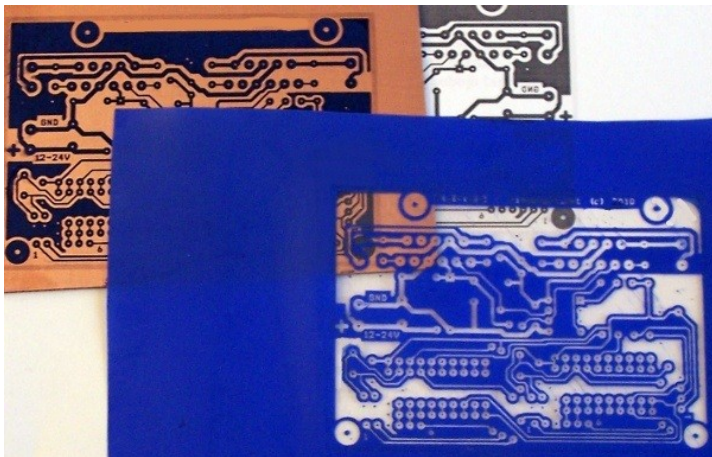
Getting Board? – Make Your Own Custom Boards at Home.

Making your own printed circuit boards at home has never been more accessible. Whether you're prototyping a new design or creating a one-off project, several methods allow hobbyists to fabricate PCBs without expensive equipment or professional fabrication services.

This guide will walk you through the most popular home PCB manufacturing methods, their pros and cons, and when you might want to consider professional services instead.

Method 1: Chemical Etching with Toner Transfer

How it works: The toner transfer method uses laser printer toner as an etch resist. You print your PCB design onto special transfer paper (or even glossy magazine paper), then use heat and pressure (typically with a clothes iron or laminator) to transfer the toner onto copper-clad board. Once transferred, you submerge the board in an etching solution that dissolves the exposed copper, leaving your circuit traces protected by the toner.



Process overview:

- Print your PCB design mirrored onto transfer paper using a laser printer
- Clean the copper board thoroughly with fine steel wool or sandpaper
- Apply heat and pressure to transfer the toner onto the copper
- Soak in water to remove the paper backing
- Etch the board in your chosen etching solution
- Remove the toner with acetone or alcohol
- Drill holes for through-hole components

Pros:

- Very low equipment cost (iron or laminator, printer)
- Quick turnaround for simple designs
- Good for single-layer boards
- Minimal learning curve

Cons:

- Inconsistent toner transfer can cause broken traces
- Limited resolution (typically 10-15 mil traces)
- Single-sided boards are easier; double-sided requires careful alignment
- Surface finish isn't as clean as professional boards
- Best for: Simple, single-layer prototypes and learning PCB basics.

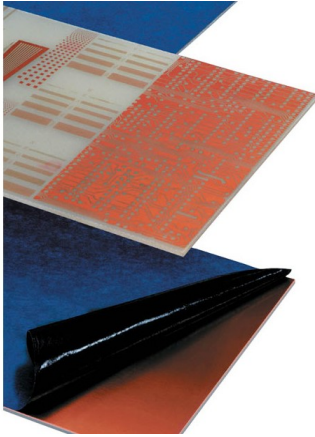


Ferric Chloride MUST be treated with Respect and must NEVER be disposed of down the Toilet

Getting Board? – Make Your Own Custom Boards at Home. (Cont...)

Method 2: Photoresist PCB Etching

How it works: Photoresist boards come pre-coated with a light-sensitive layer. You print your design onto a transparency, place it over the board, and expose it to UV light. The UV light hardens the photoresist where light passes through, while areas covered by your design remain soft. A developer solution removes the unexposed resist, leaving copper ready for etching.



Process overview:

- Print your PCB design onto transparency film
- Place transparency on pre-sensitized board
- Expose to UV light (specialized UV box or strong UV lamp)
- Develop in sodium hydroxide or proprietary developer
- Etch the board
- Remove remaining photoresist
- Drill holes

Pros:

- Higher resolution than toner transfer (down to 6-8 mil traces)
- More consistent results
- Better for complex designs
- Can achieve finer pitch components

Cons:

- Requires UV exposure equipment
- Pre-sensitized boards have limited shelf life
- More steps in the process
- Slightly higher cost
- Best for: More complex single or double-layer boards where trace quality matters.

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Getting Board? – Make Your Own Custom Boards at Home. (Cont...)

Etching Solutions: What to Use

Ferric Chloride (FeCl_3)

The most common hobbyist etchant. It's a dark brown liquid that dissolves copper relatively quickly.



Pros:

- Inexpensive
- Readily available
- Works at room temperature

Cons:

- Stains everything permanently (clothing, sinks, countertops)
- Corrosive
- Disposal requires special handling
- Etch time: 15-45 minutes depending on temperature and freshness

Cupric Chloride (CuCl_2)

A regenerable etchant that can be reused indefinitely with proper maintenance (adding hydrochloric acid and air bubbling).



Pros:

- Reusable, faster than ferric chloride
- Transparent (easier to monitor progress)

Cons:

- Requires maintenance
- More complex chemistry
- Needs ventilation
- Etch time: 10-30 minutes

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Getting Board? – Make Your Own Custom Boards at Home. (Cont...)

Ammonium Persulfate

A crystalline powder mixed with water to create etchant.



Pros:

Clean (doesn't stain)
Easy to dispose of
Clear solution

Cons:

Works best when heated (40-50°C), shorter shelf life once mixed
More expensive
Etch time: 5-20 minutes when heated



Sodium Persulfate

Similar to ammonium persulfate but slightly different chemistry.



Pros:

Cleaner than ferric chloride
Good etch rate

Cons:

Also requires heating for best results, can be harder to find Etch time: 10-30 minutes.

Safety note: All etching chemicals are corrosive. Work in a well-ventilated area, wear gloves and eye protection, and keep a neutralizing agent nearby (baking soda for acids). Never pour etchants down the drain—check local regulations for proper disposal. Store in clearly labeled, chemical-resistant containers away from children and pets.

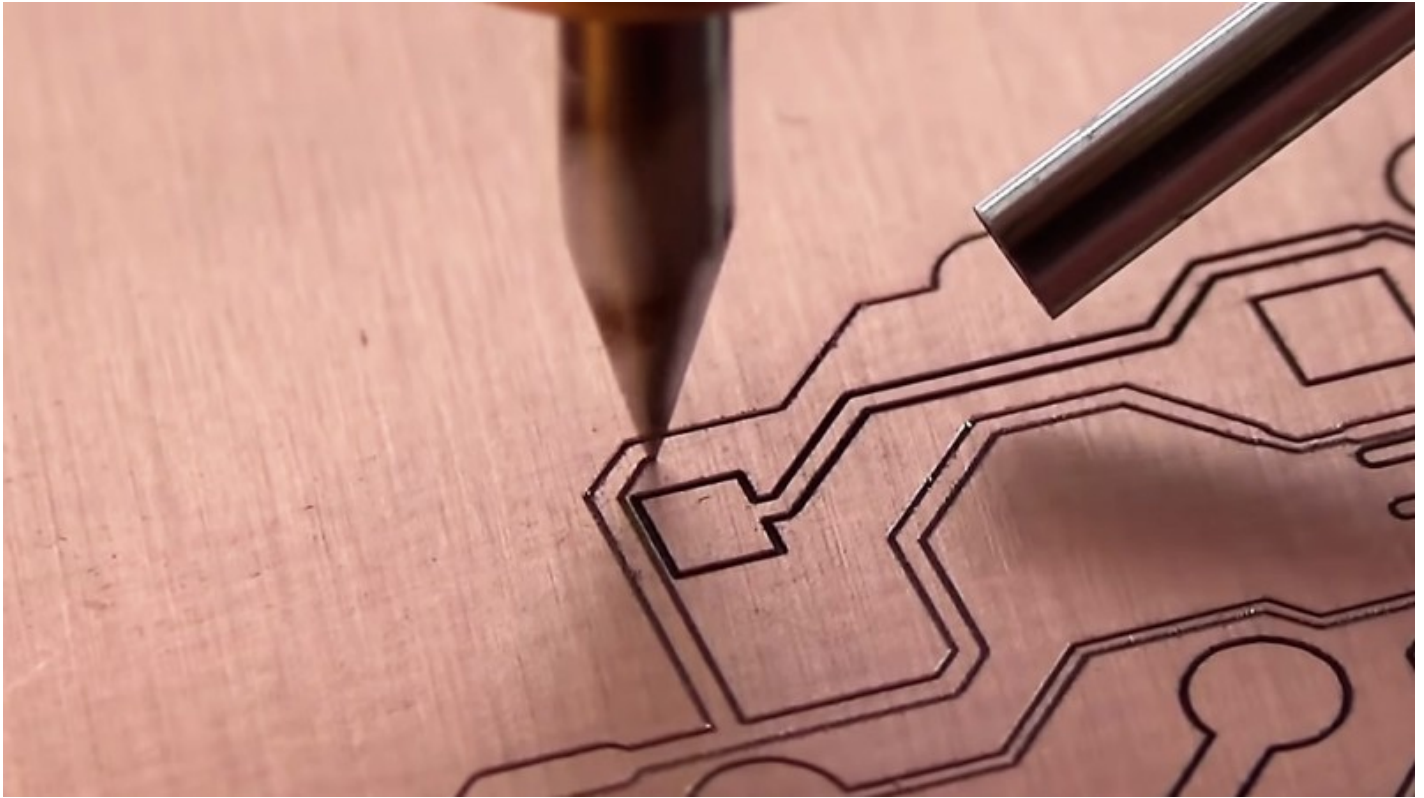


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Getting Board? – Make Your Own Custom Boards at Home. (Cont...)

Method 3: CNC Milling

How it works: A CNC mill with a specialized engraving bit mechanically removes copper from the board, carving out the spaces between traces. This is a subtractive process that doesn't use chemicals.



Process overview:

Generate isolation routing toolpaths from your PCB design

Secure copper board to CNC bed

Mill away copper between traces

Drill holes with appropriate bits

Optional: Mill board outline

Pros:

No chemicals required

Immediate results (no etching wait time)

Can create board outline in same process

Repeatable and precise

Can do double-sided with proper fixturing

Cons:

Requires CNC machine (significant investment: \$200-\$3000+)

Noisy process

Creates copper dust (requires cleanup/ventilation)

Bit wear affects quality over time

Minimum trace width limited by bit size (typically 6-10 mil)

Can't create plated through-holes

Best for: Hobbyists who already own a CNC machine or need chemical-free production with quick turnaround.

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Getting Board? – Make Your Own Custom Boards at Home. (Cont...)

When to Use Professional PCB Services

While home methods are great for learning and quick prototypes, professional services make sense when:

You need multiple copies - Services like JLCPCB, PCBWay, and OSH Park offer incredibly low prices for small quantities

Complex designs - Multi-layer boards (4+ layers), blind/buried vias, impedance-controlled traces

Plated through-holes - Home methods can't create plated vias for reliable double-sided connections

Surface mount density - Fine-pitch components (0.5mm or smaller) require professional quality

Solder mask and silkscreen - Professional appearance and protection

Reliability matters - Production runs or products for others

Time vs. cost - For £5-20, you can get professional boards in 1-2 weeks, saving hours of home fabrication

Typical costs: 10 small PCBs (10x10cm) from Chinese manufacturers: £2-5 plus shipping.

The screenshot shows the PCBWay website interface. At the top, there's a navigation bar with links like 'Home', 'PCB Instant Quote', 'CNC | 3D Printing', 'PCB Assembly', 'PCB Design', 'OEM', 'Product & Capabilities', 'Why Us?', 'Feedback', 'Shared Projects', and 'Module Store'. Below the navigation, there's a 'PCB Prototype' section with a 'Quote Now' button. To the right, there are promotional banners for 'HDI PCB' (starting from \$349.68 for 10-10cm) and another for '10 pcs 1-2 layer' (€4.26, 24-hour build time). The website also features a 'Sign in / Join My PCBWay' button and a 'New here? Get a \$5.00 Coupon!' offer.

The screenshot shows the JLCPCB website interface. At the top, there's a navigation bar with links like 'Home', 'PCB Instant Quote', 'CNC | 3D Printing', 'PCB Assembly', 'PCB Design', 'OEM', 'Product & Capabilities', 'Why Us?', 'Feedback', 'Shared Projects', and 'Module Store'. Below the navigation, there's a 'Select Product' section with buttons for 'Standard PCB/PCBA', 'Advanced PCB/PCBA', 'SMT Stencil', 'Flex Heater', 'Mechatronic Parts', '3D Printing', and 'CNC Machining'. Below this, there's an 'Online PCB Quote' section with a 'Add gerber file' button and a 'Charge Details' section showing a 'Special Offer' of €1.48. The 'Calculated Price' is shown as €2.96, with a 'SAVE TO CART' button.

Home PCB fabrication is an excellent way to understand the manufacturing process and create quick prototypes. Toner transfer offers the lowest barrier to entry, photoresist provides better quality, and CNC milling eliminates chemicals entirely. Each method has its place in the hobbyist's toolkit.

And remember—there's no shame in using professional services when the project demands it. The best PCB makers know when to DIY and when to outsource.

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Surface Mount for Beginners

1. What Are Surface Mount Components?

Definition: Small electronic components mounted directly onto the surface of a PCB.

Common Types:

Resistors, capacitors (0402, 0603, 0805 sizes)

Integrated circuits (ICs) – SOIC, QFN, BGA

Connectors, LEDs, transistors

Advantages:

Smaller board size

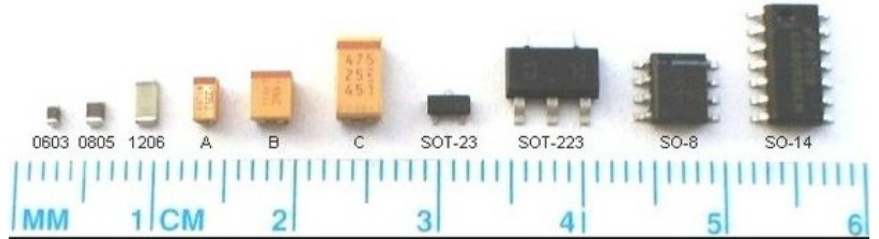
Higher component density

Better performance at high frequencies

Disadvantages:

More difficult to handle and solder

Require precision tools and techniques



Tip: Use a magnifying glass or microscope to identify component types and markings.

2. Key SMD Component Types & Identification

Passive Components:

Resistors/Capacitors Size codes (e.g., 0402 = 0.04" x 0.02") indicate physical dimensions.

Markings: Use EIA-96 or 3-digit code (e.g., 103 = 10k Ω).

Active Components:

ICs: SOIC, TSSOP, QFN (quad flat no-leads), BGA (ball grid array)

Transistors/Diodes : SOT-23, SOT-89

Connectors & LEDs:

Headers : 0.6mm, 0.8mm, 1.0mm pitch

LEDs : 0603, 0805, 1206 (size-based)

3. Tools & Equipment for SMD Work

Essential Tools:

Soldering Iron: Fine tip (0.5–1mm), temperature-controlled (300–350°C)

Solder Paste: For reflow or hand soldering

Solder Wick / Desoldering Pump: For removing excess solder

Tweezers: Fine-tipped, non-magnetic (preferably anti-static)

Magnification: 5x–10x magnifier or microscope

Flux Pen / Paste: For improving solder flow

Optional but Helpful:

Reflow Oven / Hot Plate: For consistent soldering of multiple components

SMD Rework Station: For BGA/QFN rework

ESD-Safe Workstation: To prevent static damage



Pro Tip: Always use flux –it prevents oxidation and improves solder flow.

With the Correct Equipment, you too can become proficient with Surface Mount Devices!

Surface Mount for Beginners

4. Handling SMD Components

Storage:

- Keep in “anti-static bags” with desiccant
- Avoid exposure to moisture (use a desiccator or sealed container)
- Use “vacuum-sealed bags” for long-term storage

Handling

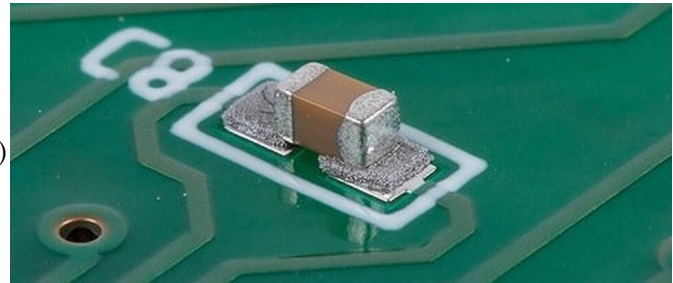
- Use “anti-static tweezers” or “tweezers with non-conductive tips”
- Avoid touching the leads or pads
- Handle components by their body, not the leads

Advanced Practice : Use a “solder paste stencil” for consistent application when working with multiple SMDs.

5. Soldering Techniques

Manual Soldering (Hand Soldering)

1. Apply flux to the pad
2. Place component with tweezers
3. Use a small amount of solder (0.01”–0.02” diameter)
4. Heat pad and solder simultaneously
5. Check for bridges (shorts) and cold joints



Reflow Soldering:

1. Apply solder paste using a stencil or syringe
2. Place components on the board
3. Use a hot plate or reflow oven (180–220°C)
4. Monitor temperature profile (ramp up, peak, cool down)

Reflow Oven Settings:

- Ramp-up: 1–2°C/sec
- Peak: 210–230°C
- Cool-down: 1–2°C/sec
- Soak time: 60–90 seconds

Advanced Practice: Use thermal paste for better heat transfer when reflowing large ICs.

6. Common Soldering Problems & Fixes

Issue	Cause	Solution
Bridges	Excess Solder	Solder Wick
Cold Joints	Insufficient Heat	Reheat – Add a little more flux
Lifted Pads	Too much Heat!	Use Solder Paste and Flux to Re-Attach
Solder Balls	Excess Flux or Contamination on Board	Clean (IPA)
Misaligned Components	Poor Placement	Reposition – Add Flux

With the Correct Equipment, you too can become proficient with Surface Mount Devices!

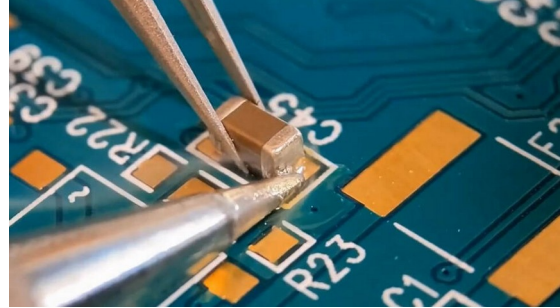
Surface Mount for Beginners

7. Advanced Soldering Practices

- Use Flux : Always apply flux before soldering to improve wetting
- Check for Shorts : Use a multimeter to test continuity between pads
- Clean Up : Use isopropyl alcohol (90%+) to remove flux residue
- Use a Heat Sink : For sensitive components, use a heat sink clip to prevent overheating
- Practice on Scrap Boards : Test new techniques on old PCBs before using them on projects

8. Safety & Best Practices

- Wear Safety Glasses to protect eyes from solder splashes
- Work in a Well-Ventilated Area to avoid inhaling fumes
- Use a Fume Extractor to remove harmful vapors
- Avoid Touching Hot Components after soldering
- Store Tools Properly to prevent damage



9. Final Tips for Beginners

- Start Simple : Practice with 0603 or 0805 components before moving to smaller sizes
- Use a Magnifier : Even a 5x magnifier helps immensely
- Be Patient : SMD soldering takes time to master
- Keep a Notebook : Track what works and what doesn't
- Practice Regularly : The more you do it, the better you'll get

10. When to Use Professional Services

- For Complex Boards : Multi-layer, fine-pitch BGA, or high-density designs
- For High-Volume Production : Automated pick-and-place machines and reflow ovens
- For Sensitive Components : BGA, QFN, or high-precision ICs

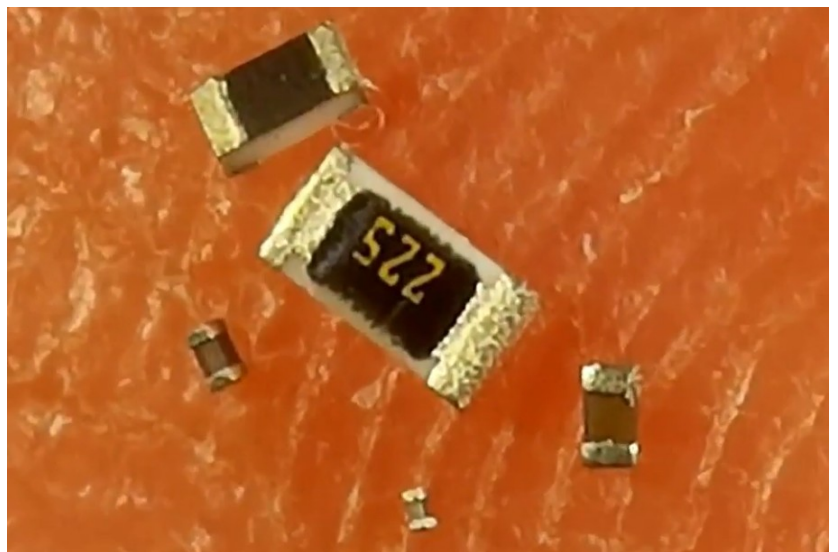
Bottom Line : SMD soldering is a skill that improves with practice. Start small, stay safe, and don't be afraid to make mistakes—every failed solder joint is a learning opportunity.

Consider this a basic introduction to Surface Mount Electronics. In a later issue we will be diving in to the practical aspects rather than just the printed word.

In the meantime there are many resources that you can find online that go into the depths of things like Pick and Place, Tin Whiskers and Eutectic / Exotic Alloys often found in Aerospace / Military and yes, spacecraft.

If you have any questions about Surface Mount and the practical applications, please do NOT hesitate to contact me. Please use the Contact Form on the Website or Email me.

You might find the slides of a previous talk that I hosted at Yeovil Amateur Radio Club about Surface Mount Devices and the Advantages / Disadvantages useful. You can find the slides on the Wavewizards.org Website.



With the Correct Equipment, you too can become proficient with Surface Mount Devices!

Well, that's this end of the March Newsletter. I hope you have enjoyed this issue.

Coming in the next issue:

An Introduction to Arduino (Leads up to a GPS tracker with Display)

A 30Watt 2m Linear Amplifier

Behind the Scenes of a Newsletter Editor!

Join the [Facebook Group](#) to get the newsletter or download it from <https://www.darsn.co.uk>.

If you would like to contribute articles please get in touch.

Why not submit your story about how you got into this hobby?

Got some pictures of a project you have done and tested?

As usual, a huge thanks to everyone who go out and participate in events and meet ups.

Until next time, keep those finals warm. 73's Tim [2E0TPH - Ed]

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