



DORSET AMATEUR RADIO

SOCIAL NETWORK



Welcome to the December edition of the Technical supplement Newsletter. I hope you like the more technical and in-depth articles this month. Contact details are listed below.

I feel compelled to give a shout out to Helen Moore. Helen has a lot of photographic talent so please go and check out her [Facebook page](#). I can personally vouch for and recommend her fantastic calendars Thanks Helen

On with the show!



Lindsay - 2E0VDD
Secretary / Treasurer



Bill - 2E0WEG
Chairman



Tim - 2E0TPH
Editor

Events in December

Christmas Dinner
10th December 2025

Hamworthy Club
Wimborne

Meet up from 12 noon.
[The Hamworthy Club](#)

Nets

Monday	145.375 FM
Tuesday	70.375 FM
Wednesday	144.375 SSB
Thursday	Zoom Session
Sunday 15:00	144.375 SSB

All details can be found on our
Facebook page



Contact Us:

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(Via Lindsay)

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DX NEWS for December

Start	End	Location	Call
01/12/25	10/12/25	Maldives	8Q7HT
07/12/25	05/01/26	Guatemala	TG9/AF4CZ
10/12/25	17/12/25	Palau	T88AC
21/12/25	27/12/25	Bangladesh	S21DX
21/12/25	02/01/26	Surinam	PZ5OZ
26/12/25	03/01/26	Azerbaijan	4K/DL4XT
30/12/25	03/01/26	Mariana Is	KH0/AJ6VJ
30/12/25	03/01/26	Monaco	3A/MM0NDX

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.

We have a club call sign!



We are pleased to announce our new club call sign **G3DAR** held by Dave (MOKYN). We will be able to use the call sign **GX3DAR** during special events and outings.

G3DAR

About the Editor



Hi, I'm the Editor of the DARSN newsletter. Tim (2E0TPH)

I first got involved with radio communications back in 1979. I, like many others, started as an avid Short Wave Listener, filling out signal report forms for some pretty big AM Broadcast stations like Radio Budapest, Radio Luxembourg and many many others. I was tuning around in between the big guns one morning and discovered a signal "Beeping" away through the 1960's Gramophone I was using. I later told my friend about it. He said it must be something called Morse Code.

Of course, I was fascinated by it all and my friend introduced me to his father who in turn, invited me around and demonstrated it! That was it, I had to know more and my journey had begun.

I started making my own circuits for level shifting radio data to RS232 and decoding Ambulance mobile data terminals and getting up to all sorts of both legal and not so legal endeavors. My biggest achievement in radio was being pulled over on Westbury White Horse by Chiltern Air Support, then being summonsed to court under the "Wireless Telegraphy Act 1949" in which I represented myself and won my case. Who knew that listening to the police helicopter down link on 133.600 was perfectly legal!

I got my equipment back almost there and then (Radioshack 2026 communications Receiver in my Vauxhall Chevette) I still have the "producer" in a box somewhere. Happy Days indeed. I live a bit more ethically these days, spending most of my time decoding data over the air and playing about with MITM attack vectors.

I also started hosting talks at Yeovil Amateur Radio Club to fill in the gaps in their schedule. Something which I have become quite good at, even if the subject matter sends John (M3YTQ) to sleep. It does give me great pleasure and enjoyment to pass what little knowledge I have, onto others. I also enjoy learning about the areas I know little about. I hope you learn something from me and vice versa..

Until next time, 73's and catch you further down the log



Martin M7HQU

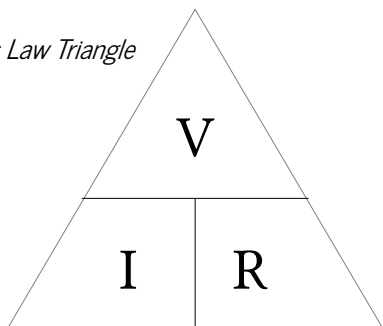


Martin is the Webmaster for www.darsn.co.uk and we would like to thank him for his efforts and support. His Bio will appear next issue.



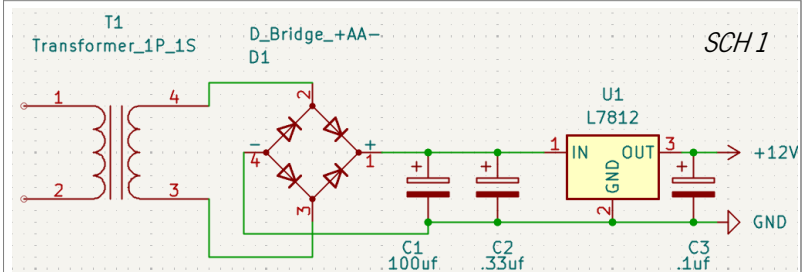
FIG 2

Fig 3. Ohms Law Triangle



Basic Power Supplies

In a recent talk that I presented at Yeovil Amateur Radio Club, I discussed some basic power supply design and considerations. I have decided to share with the readers of this months newsletter. Hopefully some of these design considerations will make it into your version of home brew power supply units.



The above image shows a very basic power supply unit which at best will supply around 1Ampere (depending on the model of voltage regulator used in the circuit). The power supply will be able to power low power devices. The limitation here is in several places. It's not often a simple case of changing the voltage regulator for a larger rated part. Other considerations must be granted. Firstly, the 7812 device will get rather hot and must be mounted on a suitable heat sink, this should be quite obvious to the more experienced builders among us but can be a little daunting for complete beginners to get their head around. Lets split the circuit down and find out the role that each part plays.

Lets start with knowing what we want out of the regulator. If a simple 12V 1A supply is required then we need to look at the data-sheet of the 7812 and find out its minimum voltage supply in order for the regulator to remain stable. Most 7812 devices, in fact most devices, require around 1.2V above the rated output voltage. The exception to this are Low Drop Out rated parts (LDO).

In order to supply enough voltage to the regulator we must consider using a transformer capable of supplying 13.2V minimum. The transformer required is therefore 240V Primary and 15V Secondary winding's. Most transformers will have a secondary output of around 15V and this will be plenty to start out with. Do not be tempted to employ a higher voltage secondary, the result of dropping voltage through the regulator and the diode forward loss will cause heat to accumulate! An 18Volt secondary would be fine to use too.

The choice of transformer is entirely your choice. You can sometimes find a source of good transformers in electronic goods like Amplifiers from charity shops of Ebay listings "Spares or Repairs" etc. Just be careful when wiring the transformer up. Mains voltage can kill if not treated properly.

So, you have a suitable transformer, EI construction or Toroid, you need to now consider the bridge rectifier. Fig2 (Left) Shows an affordable high current device. You may think a device like this is a waste of money but lets not forget that this one is in a metal can package designed to dissipate heat. You can mount these types using a small bolt through the center hole. Normally 4mm or 6mm diameter. This method of mounting will give a better thermal dissipation into the case giving better longevity and a better chance of being able to re use the part at a later date should you wish to make a higher power output supply. You can of course use separate diodes in similar configuration, just make sure to read the data-sheet for Voltage and Current limitations!

Lets now consider the next component in the chain. The smoothing capacitor. This is often an Electrolytic type that tends to hold charge for longer than a ceramic capacitor. The purpose of the smoothing capacitor is to fill in the drops in voltage from the bridge rectifier. When the AC comes through the diode, and is thus rectified, you will find a naturally occurring drop in the voltage. We need to fill in that drop in voltage and smooth it out. We will not go into the fine print of calculating it.

The formula is shown
Here for those interested.

$$C = \frac{I_{load}}{2 \times f \times V_{ripple}}$$

Smoothing capacitors are polarized, they must be fitted the correct way around or the magic smoke will escape.

The general consensus between hobbyists is to use a value of greater than 100uf. The norm for this type of supply is often higher, depending on the load at the output of the regulator.

You can aim for higher than 470uf at 25v working voltage.

Check the side of the capacitor if you are unsure, the details will be on there.



Quite obviously, try to match or exceed the working voltage. We are using a 15v secondary output voltage so I would use a 25Volt marked part, not the 16V version as above. This is too close to the permissible rating in the data sheet. Build in a little bit of safety! Capacitor C2 (SCH 1) is there for transient spike suppression. I feel that this newsletter is perhaps not the best place to go in depth with that subject matter. The same goes for capacitor C3 (SCH 1) which acts as a noise decoupling capacitor.

I intend on going in depth in a future issue about decoupling capacitors. The only remaining part to address is the voltage regulator used in the example schematic. We have used a 7812 marked part. This will give you a 1Ampere rating. The 7812CT however, will allow 2.5Amperes! The part is in the same package too!

Always check the available data sheets for information. That is why they exist

[7812 Datasheet](#)

We have looked at a basic low power supply for one voltage, now lets take a look at deriving multiple voltages using additional voltage regulators.

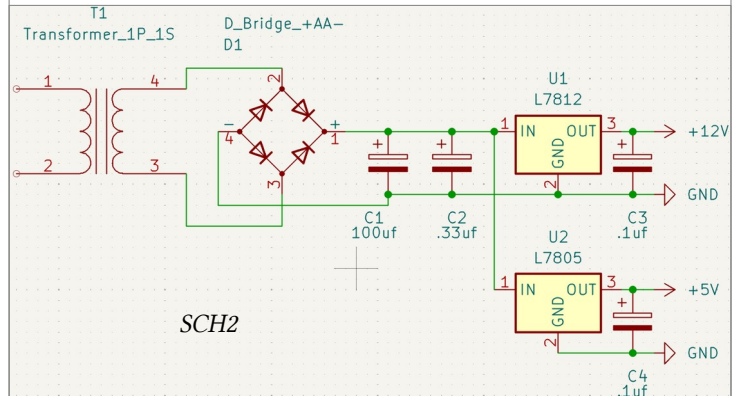
Why would we need multiple voltage outputs?

Consider the following:

We have an Arduino project we would like to build. The Arduino might require 3.3V or 5V and in turn, the device could be powering a 12v output for signaling or maybe its driving a 12v relay in order to switch on mains!

The requirement for a multi voltage output starts to become apparent. How would we achieve this?

Take a look at (SCH2) below.



At first glance, this circuit may seem to fit the requirement. It seems logical doesn't it.

The trouble is this: The 7812 only has to drop minimal voltage, the voltage from the bridge rectifier is close enough to the minimum requirements for the 7812 to be stable.

What about the 7805? Well, that device has to drop a lot of voltage and will quickly turn hot, in fact, I have seen these smaller regulators start to smoke due to heat build up.

So what is the answer? I'm glad you asked.

The easiest and most efficient way of getting multiple voltages is to use a multi tap transformer. Countless thousands exist and are readily available and inexpensive.



The above transformer has one primary (230v) and 2 12V secondary outputs. We will look at this in our next issue with a complete schematic and take a look at variable voltage supplies
Until then, stay safe.

Steep Holm Activation

Steep Holm is a small Island in the Bristol Channel.

The Island is uninhabited by human life, the seagulls are the native species and abundant in numbers. So, why would anyone take a three man team and activate it?

The answer is quite simple, why the hell not!

The island is a recognised "Parks on the Air" entity and had only been activated previously once by CW. We saw a perfect opportunity to activate it using SSB.

On the 14th of June 2025, my alarm went off at 5am. Bleary eyed I met John (M3YTQ) in the car park, we then ventured 25 miles away to pick up Colin (M7LLT).

The combination of strong coffee and huge excitement set the stage for success. We got into Weston Super Mare and parked up. We were due to meet the RIB craft that was going to convey us to the Island. We had all the kit in bags, wrapped securely to avoid damage.

We took several handhelds for local comms. The main workers were the Xiegu G90 and a Yaesu FT-891. Colin supplied power in the form of a Lithium battery and a suitable dipole type antenna.

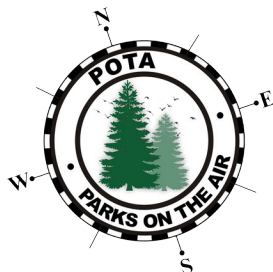
After we landed on the beach we made our way up to the top of the Island, a most arduous walk I must admit. Pack lightly was the thought every few steps!

We noticed a trig point, the highest point of the Island and got briskly set up. We started calling and started working stations shortly after. The phone signal was not good but I managed to spot myself on the POTA app to gain wider attention. It worked out ok!

Enough contacts were made to count as a successful activation. Everyone enjoyed the day and after another boat ride back to shore, we made our way back home, arriving at around 11pm. A very long day indeed. Would I do it again? Of course I would.



Maidenhead: IO81KI
POTA: GB-0673
IOTA: EU-124
WAB: ST26
CQ: 26
ITU: 27
Trig Point GPS:
51°20'24.3"N 3°06'28.7"W



Basic Audio Amplifiers – LM386 Style!

There are many ways of Amplifying audio signals. You can use darlington pairs, single transistors with a small gain or custom Audio chips. By far the easiest method is to use an off the shelf solution like the LM386. The LM386 has been in production for a very long time and is inexpensive, popular and noisy!

Lets take a look at the pin outs and develop a small Audio Amplifier board / circuit.

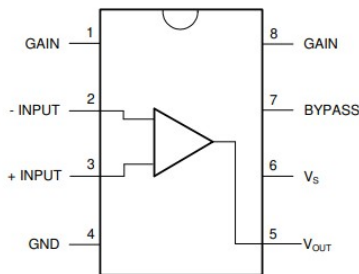
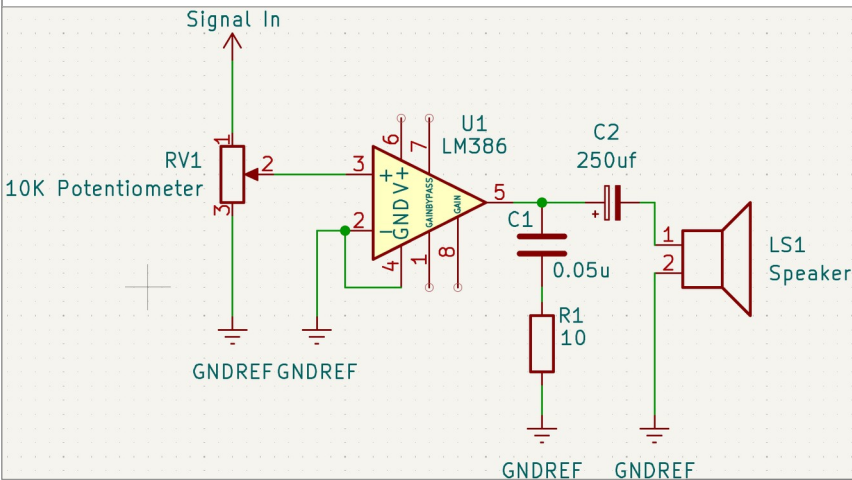


Figure 5-1. D Package 8-Pin MSOP Top View

Table 5-1. Pin Functions

PIN		TYPE ⁽¹⁾	DESCRIPTION
NAME	NO.		
GAIN	1	–	Gain setting pin
–INPUT	2	I	Inverting input
+INPUT	3	I	Noninverting input
GND	4	P	Ground reference
V _{OUT}	5	O	Output
V _S	6	P	Power supply voltage
BYPASS	7	O	Bypass decoupling path
GAIN	8	–	Gain setting pin



A very basic but usable circuit (*LEFT*)
The amplifier gain is set for 20 x
You can choose any figure between 20x and 200x,
the more gain, the more noise

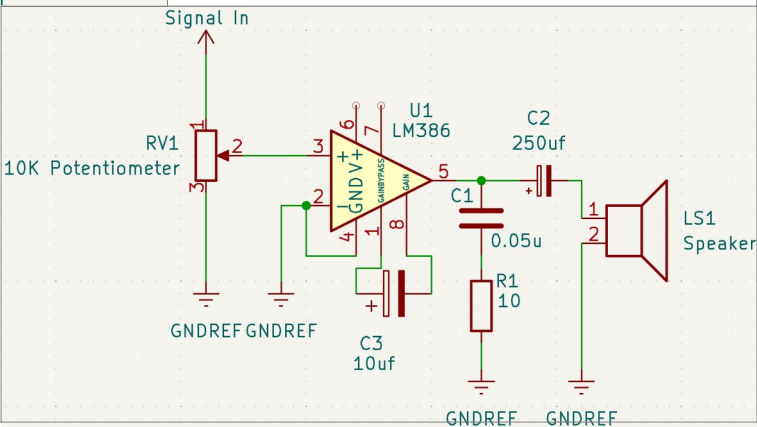
Input voltage should be between 5 and 12 volts DC
Maximum. Total current draw will be around 700mA
making it possible to use this circuit with a PP3
source.

High gain Amplifiers for incredibly low signal inputs
can be made more efficient by using Operational
Amplifiers or FET emitter follower style circuits. I
have included a circuit (*Below*) with a gain factor of
200 by using the gain control pins (1 and 8)

It should be worth noting that many perfectly good circuits
can be found in the device Data Sheets available from the
manufacturer. All of the relevant details are listed, including
thermal characteristics and frequency response and THD
figures

The LM386 is inherently noisy and might not give the results
that you require, I mean sure, you can use one as a headphone
amp or maybe a short wave receiver but what about more
demanding applications?

Lets take a look at some much better Audio Amplifiers that
you can also make at home. I will avoid Surface Mount parts...



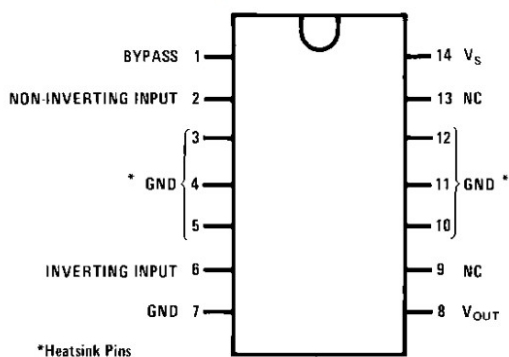
More Audio Amplifiers! - The LM380

We will keep to a simple single ended supply as there are no immediate requirements to design Dual Rail versions.

Single ended Audio Amplifiers are always the easiest, quickest and simplest to design and troubleshoot.

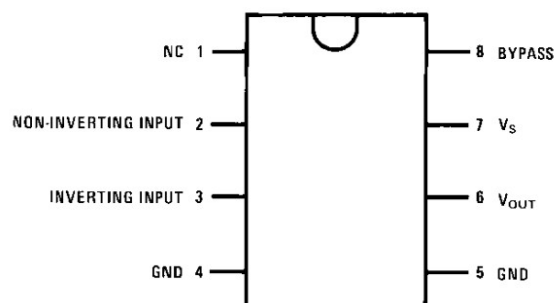
The only expectation is for them to work! This also means working non efficiently. Not the end of the world for low power devices.

Connection Diagrams (Dual-In-Line Packages, Top View)



Order Number LM380N
See NS Package Number N14A

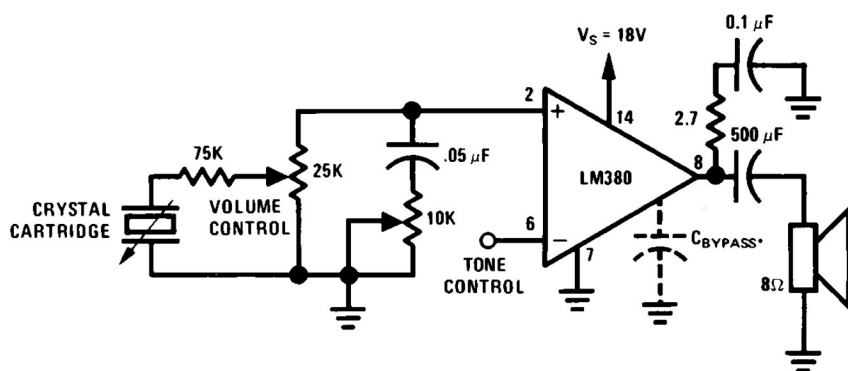
TL/H/6977-1



Order Number LM380N-8
See NS Package Number N08E

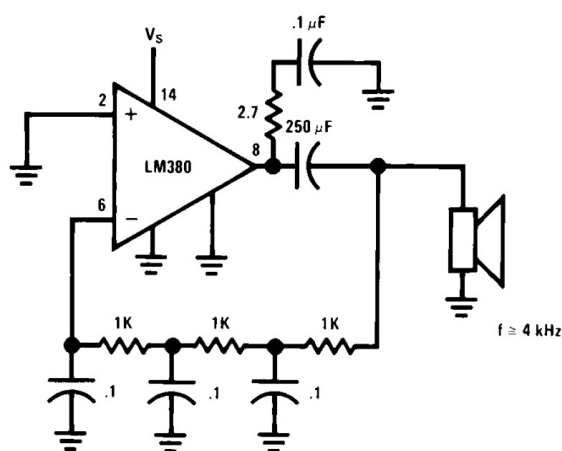
TL/H/

Phono Amplifier

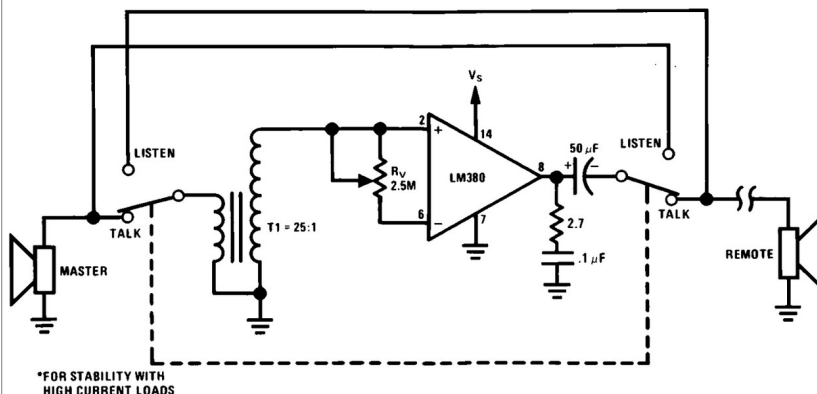


Some typical application circuits taken from the LM380 Datasheet. You will find example circuits and all the technical data that you need inside such a Datasheet. Admittedly a Phono amplifier has little use nowadays, it is still a valid method where older equipment may be using such a circuit to bring low levels of Audio to a flat response curve! Ideal for low signal record players.

Phase Shift Oscillator



Intercom



The two circuits above also star in the Datasheet and are included for completion rather than to produce something worth building. It is, however, always handy to keep a compendium of circuit ideas to hand whilst considering the design stage of a project. You just never know when you might need a Phase Shift Oscillator. Why not build one and see what you can do with it! Maybe you could turn one into a code practice oscillator? The intercom idea also gives a slight "outside the box" twist to it but please note that the LM380 and LM386 devices are ideal for headphone or small speaker use but will more than likely not give good performance in other applications.

Better Audio Amplifiers

There are many thousands of IC Audio Amplifiers on the market, ready for public consumption. Most hobbyists would, quite naturally, use a Potentiometer to control the amount of signal to be passed on for amplification. This has been the preferred use case for many years. Just recently however, we have seen many leaps and bounds in the design and use case. For example, your TV, Laptop or Music playback device, may well have a Digital controlled Potentiometer inside.

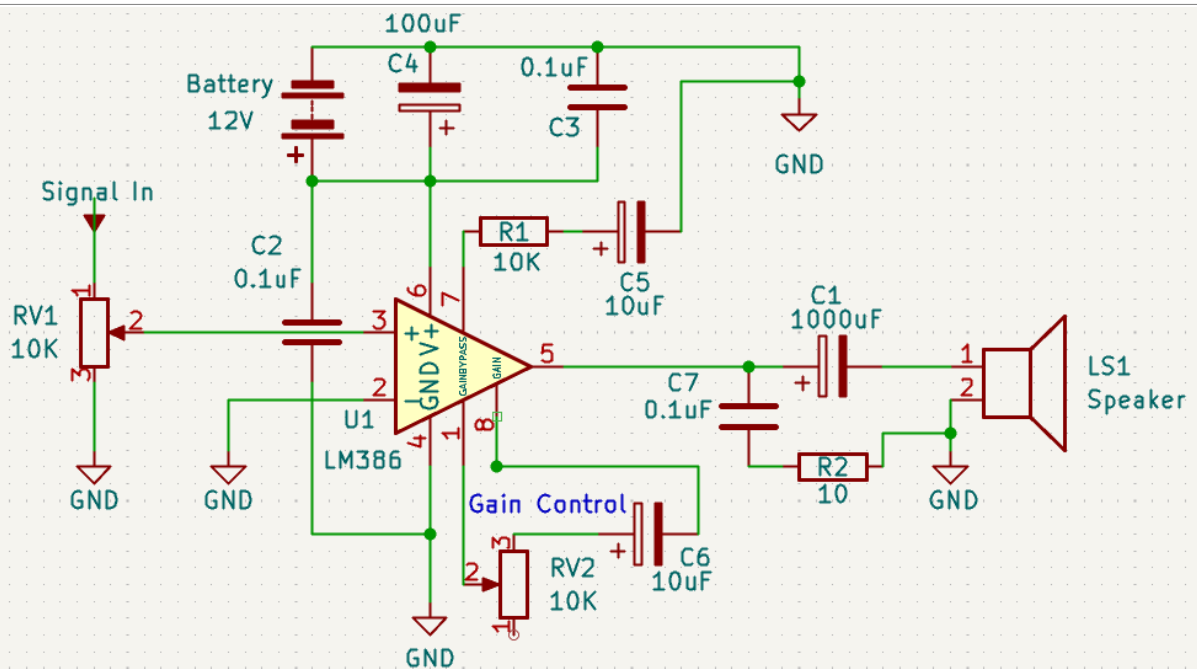
Most Digital Potentiometers are controlled using I2C Control signals from a central controller or processor. I2C is a very fast communications protocol that enables devices on a board to communicate and pass data, values and information of choice between each other. Such devices are not necessarily complex or expensive but can be tricky for a newcomer to get “the head around”. Most hobbyist level controllers use Arduino or ESP32 devices to control hoards of other items. We will look at “I2C for Beginners” and “Arduino for Beginners” in a future issue as a series that you can follow along with.

In the meantime, lets show you what I mean by a “Better Audio Amplifier”, especially for quick and easy construction.

There are three available designations for the LM386

LM386N-1: 0.325 Watts, LM386N-3: 0.700 Watts, LM386N-4: 1.00 Watts

Lets use the LM386N-4 which should, at 9Volts DC give us around 1Watt of audio.



Tim Hazel

WaveWizards.org

Sheet: /

File: LM386 DIP8.kicad_sch

Title: LM386 DIP8

The circuit (ABOVE) will give adjustable gain control and can be powered with a 12volt source. You could use a 9v PP3 if you intend on having this as a portable headphone amp but the results will vary with the lower voltage. It has also been noticed that a Bass Boost effect can be applied by taking a 10K Potentiometer on pin 6 into a .033uF ceramic Cap to pin 5. If you try this make sure the wiper of the Potentiometer is on the Pin 5 side. Any doubts just send me a message, there are plenty of ways to contact me. We will pick up on some other Audio circuits next month so you have no excuse to build something during the quieter, cooler months.

Royal Signals Visit - Nov 29th 2025

ROYAL SIGNALS MUSEUM



The Royal Signals Museum at Blandford is the home of the Royal Corps of Signals. A vast array of Historic communications equipment and practical displays that highlight the work that goes in to something that us “Common Folk”, take for granted.

A group of the G3DAR crew met up at the Royal Signal Museum on Saturday 29th November, a great time was had by all as they toured the museum and met up for lunch and a chat in the cafe. We also met two new people who came along to join us. John Weyman G4DRS and Alan M6CBO. We hope you all enjoyed the visit and thank you all for supporting the G3DAR group.
Lindsay 2E0VDD



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

In the January issue we will continue our look at power supplies, in particular, higher currents using the 2N3055. Audio Amplifiers and circuits are also coming along with how to make your own boards at home and a surface mount beginner guide.

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

Seasons Greetings to all of our members and we hope you have a very happy new year.

[Make a Donation](#)

Lots of merchandise available check out the website for details, let me know if you would like anything. Caps, t-shirts, key rings, sweatshirts, hoodies, chopping boards, pens, lanyards, note books, mugs etc

We are a not for profit club and all proceeds go towards keeping the club going.

Thank you for your support 2EOVDD