THE MUSE

----------APRIL 2025----------

The newsletter of the MUSICK POINT RADIO GROUP (INC.) NZART BRANCH 86
***Incorporating* The Society for the Preservation of Amplitude Modulation (SPAM)**
***and* Green Radios On The Air (GROTA) News.**

Musick Memorial Radio Station, Bucklands Beach, Auckland. Call Sign-ZL1ZLD.
BRANCH 86 *NZART* NET- TUESDAYS, 7.30PM, 145.775 MHz, Musick Point Repeater. All welcome!
SPAM WEB SDR Remote Receiver - http://spamnz.zapto.org:8901/
SPAM KIWI SDR Remote Receiver- http://musickpoint.ddns.net:8073/
Musick Point Website- https://musickpointradio.org Webmaster-Neil ZL1NZ.
SPAM ZL6AM or ZL1ZLD AM Nets- Fridays 8.30PM, 3.850MHz, Wednesdays at 11.30Hrs, 7.125MHz
Museletter Editor- Martyn, ZL3CK.
Meeting- Second Sunday of the Month (Except May-Third Sunday, to avoid Mothers' Day)
NEXT MEETING- AGM- Sunday April 13th 1pm. Coffee and tea provided. Please make an effort to attend this one- we need your vote for the new constitution.

The new "Meshtastic" Node installation at Musick Point Radio Station. (details below)

Musick Point News-

AGM- Sunday April 13th (after the usual monthly meeting) - we need YOU!

As we are all tired of hearing about the **new constitution**, and the secretary is tired of rewriting it (!) hopefully, we will get a good turnout of financial members so we **can approve it** and send off to the registrar of Inc. Soc's. Job done!
The **AGM agenda**, last year's **AGM Minutes** to be approved, and the **latest version** of the proposed new constitution are attached.

Meshtastic Node installed by Ethan ZL1EK-

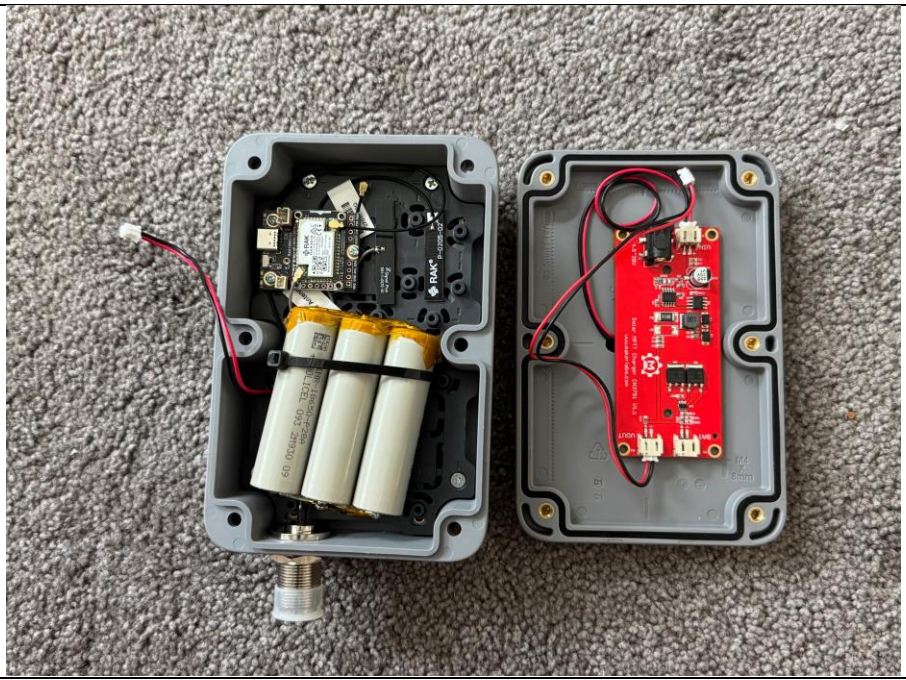
A few notes about the Meshtastic node installed at MP on a recent weekend.

This is an experimental firmware built on top of the 'Lora' protocol which is famous for low power, long distance telemetry for sensors and IoT uses. The difference here being that there is a messaging function baked in, and as it works on the unlicensed ISM band (915 MHz in NZ) it has attracted a reasonable amount of interest around the world. Meshtastic is a pure mesh network with no routing baked in, so this install is a 'set it up and see' project.

This node consists of a RAK Wireless radio, a solar panel with MPPT, a 7500mAh battery and a commercially available LoraWAN antenna. I've also added a high Q band pass filter to keep the neighbours happy.

If it proves to be of some use in the greater Auckland mesh I'll leave it up, and hopefully get a few more updates for the newsletter if there is anything of interest.

Link to the status of the node (as heard by other internet connected nodes): https://meshtastic.liamcottle.net/?node_id=1489086528
A good primer on what Meshtastic is: https://youtu.be/0A7A-CSd3e4?feature=shared



Meshtastic node in a box, complete with solar regulator, batteries and GPS receiver.

GROTA/AM News- ZC1 Vertical Aerial Trials at Musick Point

(a very unscientific investigation on a recent Sunday…)

Recent attempts to operate a ZC1 'portable' (a relative term, given its weight) at Musick Point led to the conclusion that the reason that the standard ZC1 Vertical aerial at 34 feet high wouldn't work is because it is near to ¼ wavelength thus a very high impedance feed. The ZC1 was designed to work at (usually) lower frequencies, where the vertical is electrically shorter than ¼ wavelength. The inbuilt tuner has a switched inductance, only suitable for a lower impedance output, said to be nominally 12 ohms.

Experiments were carried out using the nearby remote SDR receiver to measure the ground wave signal strength. The radio and aerial were set up at the top of the reserve, 165 meters away from the receiver aerial (an 80 meter dipole). Frequency 7.125MHz or thereabouts. The height of the aerial was varied by removing one, 3, or 4 of the 4-ft long top whip sections, giving total height of 30 ft reducing to 18 ft.

The set was tuned to max. output by the addition of a variable series or parallel capacitor, or a fixed series plus parallel variable. The variable cap being measured after use with a capacitance meter, the ZC1 being tuned for maximum field strength and/or maximium cathode current reading on the set. A three meter long feeder wire was stretched straight across to the aerial base. (thus being part of the aerial). An earth stake and/or 'counterpoise' wire was also tried.

A VNA was then used to see what it showed after the various settings were made.

*Trooper Maurice ZL1MPU checking for RF**…..***

*ZC1 with variable cap and earth wire. (The rolled up wire is being used only to insulate the capacitor from the set***)**

First Trial-
Aerial with 3 top whip sections, 4 meter ground wire, with or without earth stake. In series 10- 500 pf variable capacitor. ZC1 inductance setting 0-4-0-, a slight kick up of cathode current meter from "resting' 17Ma with cap set at 100pf.
Signal at Web SDR = -15dB.

Tried the variable cap across aerial and earth terminals with a series 68pF cap- similar to above, still only a minimal peaking of current. Signal str.= -15dB

VNA (clipped direct on to aerial lead) showed 2 'dips', about 6.3MHz, and smaller dip at 7.1MHz. Altering the variable cap shifted the smaller dip around the target frequency, suggesting the aerial was naturally tuned at 6.3MHz.

Second Trial-
Aerial with one top section whip, 22 feet height.
Tuned a little better with ZC1's inductance settings 0-4-0 and meter kick up to 30mA.
Signal strength at SDR unchanged at -15dB, VNA similar pattern to above. (Very hard to see the VNA in bright sunlight)

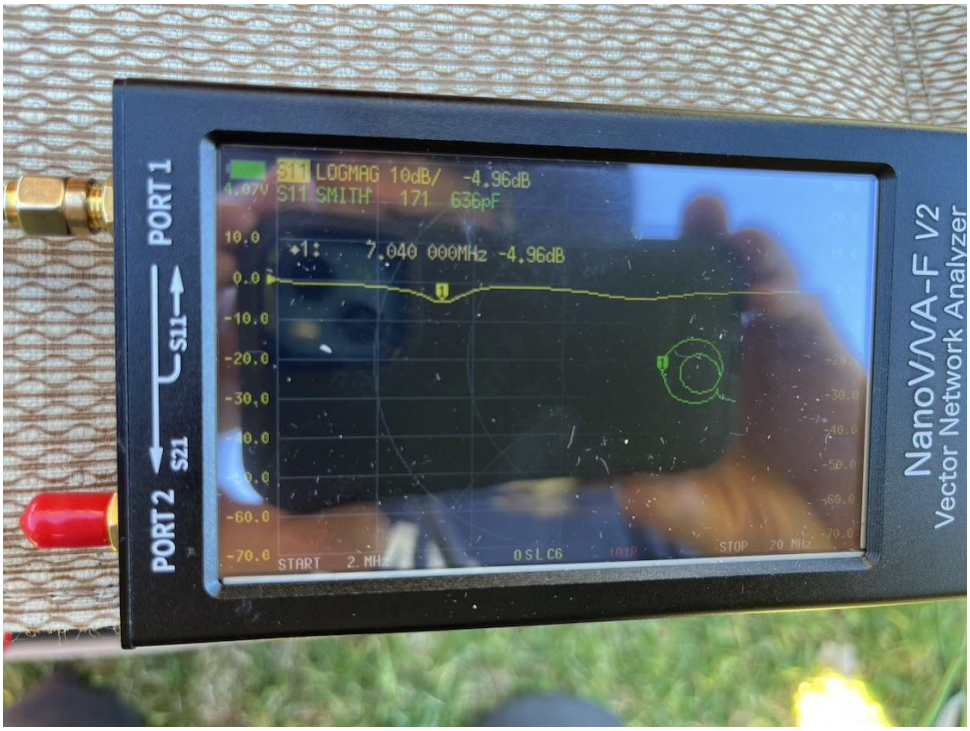
Third trial-
2 sections top whip (26 feet)- much the same result as above, **ZL1BK** at home measured -39 dBm
Fourth trial-
No top whip at all i.e. 3 lower sections only, 18 feet total length.

Much more pronounced and ‘sharp’ peak of meter up to 38mA with series capacitor almost at minimum but not critical, anywhere between 20pF and about 100pF, could be tuned up by varying the inductance, final setting was 0-6-0. Signal strength at MP SDR now -11dB. i.e. at least 10 times the strength of previous configurations.
Harry ZL1BK confirmed this set up with the best signal received at his place at -31 dBm, and the FSM allowed slightly better tuning than the set’s meter. The variable capacitor measured 20pf when disconnected from set and aerial, 48pf when connected to the aerial.

Removing the ground wire and/or earth stake made no difference to SDR signal strength but the FSM showed a stronger signal with wire removed (measured 3 meters away from aerial base).

Sky wave propagation was estimated by the signal received at Marahau SDR, approximately 600Km to the south, where a strength 3-4 signal was seen, which appeared a little stronger *without* the earth wires connected.

VNA (below) showed one small dip at target frequency, varying appropriately when tuning the series capacitor.



VNA connected to series capacitor and earth using crocodile clips.

Conclusions-

For 40 meters using a ZC1 vertical aerial, forget the whip and use the 3 lower sections only. An earth stake is of no apparent benefit, the earth “counterpoise’ wire likewise.
The set must be placed close to the aerial base and the lead wire kept short and above ground as it is part of the aerial. The series capacitor can be variable 20-100pF, or fixed, a 68pF 2Kv was to hand and worked well. Varying the inductance setting will permit tuning a fixed capacitor of between 20 and 100pF, but needs to be HV.
Tuning is to maximum cathode current, but a slightly better indication of output is a field strength meter placed near the aerial where you can see it.

Note- “Aerial” and Feet” are archaic terms, used when the ZC1 was in production.

Some Wellington Radio History-

A recent trip to the Capital city was an opportunity to explore some old sites of radio production. Looking through a 1946 Break-In, several manufaturers addresses were identified in the city centre. The writer was conveniently accommodated opposite the closed and (in Wellington) controversial Reading Theatre, which is the site of the famous Radio Corporation of New Zealand, makers of Columbus and Courtenay radios.

80-90 Courtenay Place, site of the Radio Corporation of New Zealand.

No. 1 Dixon Street

A short walk took one to Nos. 1 and then 65 Dixon St, where Collier and Beale were in the 1930's, then to No. 11 Manners, the site of the much lamented 'Lamphouse", source of Hiker's One kitset radios which kept schoolboys busy in the 1950s. This one is the only one of the group still intact. Around the corner was 31 Willis St, where Fear's Radio once were. There were numerous other radios suppliers in Wellington in those days-now taken over by appliance stores-with the one notable exception of Jaycar, thank goodness for them!

11 Manners St. until the 1960's "The Lamphouse".

A view towards Shelly Bay on the Right, where our Collier and Beale T98 Non Directional Beacon (NDB) transmitter probably came from. The T98 is now operating on 40m. AM.

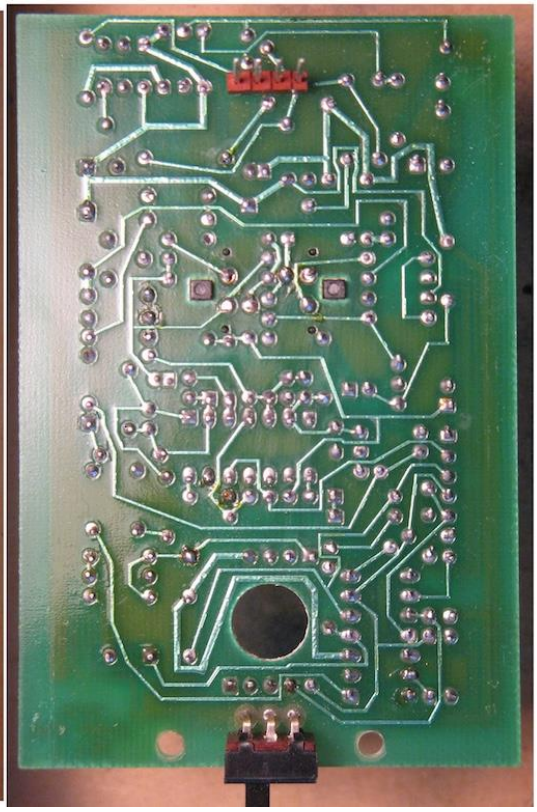
Next on the list of sites to be explored is Christchurch, home of Silver Radio and Tricity House, both world famous in New Zealand in their day.

PIR Sensor Switch Post Mortem by **Graham, ZL1TOF-**

In the last *Muse* there was a comment that I would figure out what was wrong with the sensor switch. The HPM Automatic Light Switch, Infrared Movement Detector Cat 631 was made at the end of 1988 or a little later in Korea. This model is no longer available and has been replaced by more modern models. The PCBs are both double sided plated through hole technology without vias and no surface mount components.

We are told that we should use it or we will loose it. Exercise keeps the body in good nick. Exercising the brain cells, memory and other brain skills keeps the brain in good form. I have tried to keep my brain busy with all sorts of activities including tracing circuits and understanding how they work.

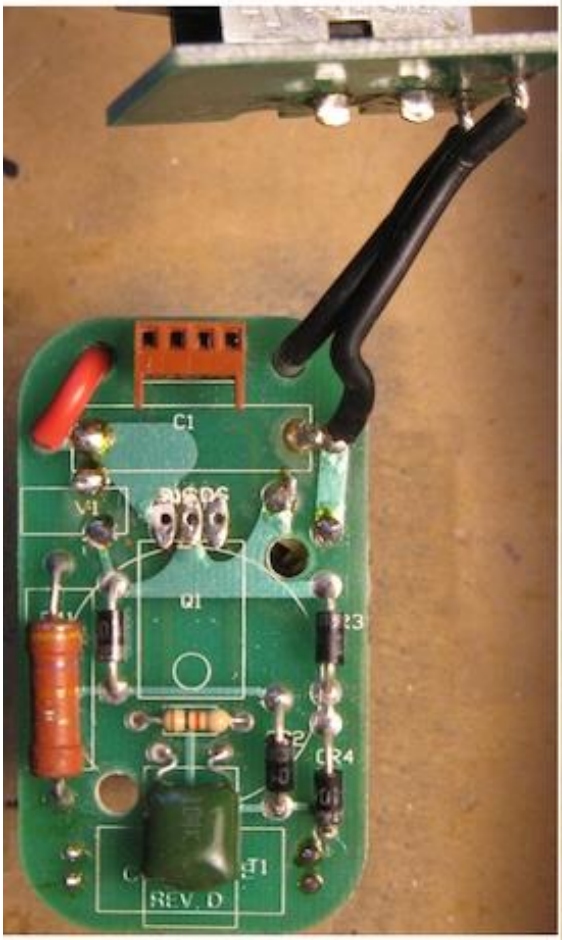
On first inspection there was no evidence of the smoke leaking out. As you know electronics works on concentrated smoke, so, when smoke leaks out then the widget doesn't work. (I never knew that!-Ed.) I have seen this model a long time ago, but, I didn't have the time to trace the difficult layout. There are three basic parts to the circuit: the mains control; the power supply; and the passive infrared (PIR) sensor and timer circuit.

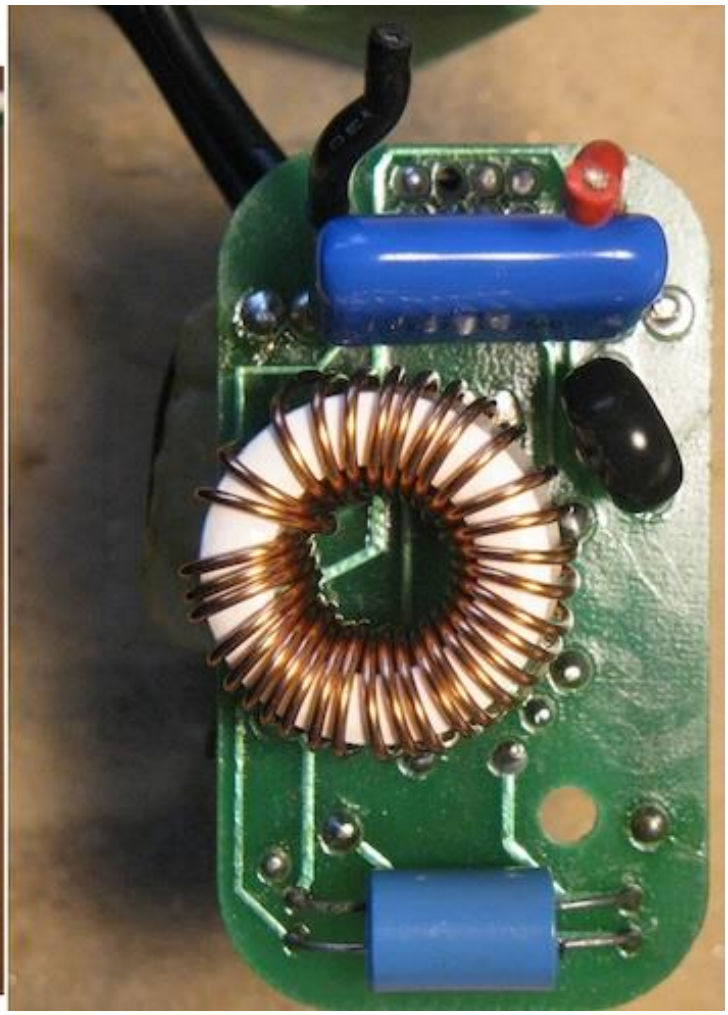


The 230 volt section consists of an RFI filter and triac to turn the light on and off. The circuit is simple for sparkies, just put this in place of a light switch like a light dimmer. The module fits the one gang flush box. That makes the power supply complex as it has to manage full mains voltage when the light is off and not a lot when the light is almost full on. The triac is pulsed on through a transformer when the mains voltage reaches about 60 volts and stays on while the current is above the triac hold on current. That's why you need at least a 60 watt incandescent lamp as a load and the need for the RFI filter to round off the sharp rise and fall in the current and voltage.

The power supply consists a bridge rectifier, no high voltage filter capacitor, two dropper resistors and two small SCRs, one for when the light is off and both for when the light is on. How this works is when the circuit voltage is above about 12 volts the SCR held off, otherwise it is switched on by the pulsating voltage form the rectifier through a high value resistor to charge the 12 volt reservoir capacitor.

The last part of the circuit is the PIR sensor, amplifier, window comparator and time delay, the same as a modern sensor light or burglar alarm sensor. This circuit has two PIR sensors, one is fed as usual into the positive input of the first op-amp. The other sensor is fed through an emitter follower onto the negative input of the same op-amp. The rest is the application note circuit that can be found on the internet. The light on timer was found to have a long duration, in the test mode about 15 seconds an in run mode about 15 minutes.





One part in the circuit puzzled me for some time. The Daewoo DBL339 seemed to have the inputs transposed on two of the four gates. I downloaded the Daewoo data sheet and found the '339 had the same pin-out as the National Semiconductor part.. When I powered the circuit that section worked as expected. Then I remembered the same problem occurred in the early days of ICs. Logic gate chips were many but different pin-out, so, not standard between manufacturers. A real problem for servicing equipment from that time when the part makers had gone out of business.

What stopped it working? I don't know. I cleaned a film off the silicon window on the PIR sensors. Cling film and hair spray will blind the sensor. On the top there is an "off – auto" switch and there is a delay of 10 to 30 seconds while the op-amps stabilise. The usual failure mode in intruder alarm PIR sensors causes false alarms in hot weather. This is caused by the coupling capacitors at the front end of the op-amp circuit becoming leaky due to contamination in the aluminium foil degrading the oxide layer and the reforming current trips the timer and a false alarm generated. The other problem is when the same capacitors dry out and alarm is not triggered by the intruder.

The "But Why" Dept. by **Dave ZL1DL-**

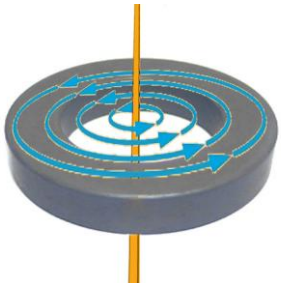
Answers to Questions You Never Asked - This Month: Toroids

One advantage of toroidal cores as used in transformers inductors etc, is that they do not have significant external flux, and as such, can be used in close proximity to components that might otherwise be sensitive to such. So how can they possibly work at all, given the windings are external to the core?

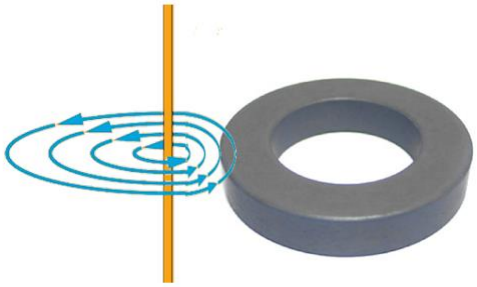
So let's visualise a toroid as having 4 faces: top, bottom, outside and inside. The reality is only the inside face couples [significantly] to external flux (from a winding). Yes, when you wind a balun or filter inductor, only the wire on the inside face is contributing to the magnetism in the core – the wire around the other three sides is simply there to get to the next inside turn – what a waste!

So how does that work? Well, if you take a wire and pass a current through it, you will create a magnetic field (flux) around the wire – imagine this flux as a series of varying sized concentric circles around the wire.

If we now put our current carrying wire through the inside of a toroid, we can see that the magnetic flux circles are coincident with the circular shape of the toroid, and so some magnet flux will travel through the toroid material. In fact, owing to a characteristic known as permeability, the toroid core becomes a more attractive magnetic path than air, so most of the flux chooses to travel through the core – just what we want!
This is in agreement with Dave's 2nd rule of electronics: "Current (or magnetic flux in this case) will seek out the easiest route".

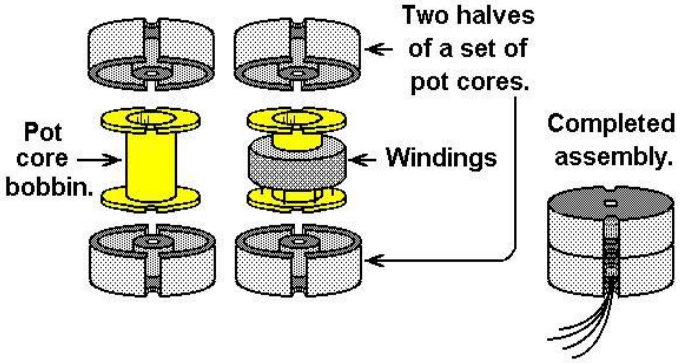


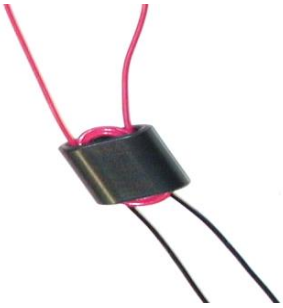
Now if we take our current carrying wire and hold it near the outside the toroid, the circular path of the toroid is no longer coincident with the path of the flux circles around the wire. There is no reason for the flux to extend itself to travel around the "long path" and so it essentially doesn't. The same holds for the top and bottom faces of the toroid – the toroid circular path is not in line with the flux circles around the wire and so the flux doesn't travel around the toroid. In reality, the flux on the three "inactive" sides of the toroid does interact to a small degree with toroid material – it dips into the core but comes out again in short order without travelling around the complete core.



Given the utter waste of 3 sides of a winding not doing anything useful – is there a better way?

Well maybe…
A winding can be made inside the magnetic material, so all the wire is contributary to the magnetic flux in the core. This style is commonly known as a "pot core" (where a winding on a bobbin has a central ferrite core that is attached to ferrite half shells that then enclose the winding). This is probably the most efficient magnetic core design. Unfortunately, it is typically only useful at low frequencies.





Another option is the “pig nose” or “binocular core” ferrite. This has two parallel holes that a wire is threaded through alternately. Typically, the holes are much longer than the distance between them, resulting in a large percentage of the wire being active in the ferrite. These are again, highly efficient, but are limited in the number of turns that can be wound through the holes and so have limited applicability.

So, in third place, comes the typical donut shape toroid that is widely used in Ham circles. It may not be the ultimate, but it works.

Recent Visitor to Musick Radio Station Stewart Robinson ZL2STR

Stewart ZL2STR *(L) with* ***Dave ZL1DL*** *checking out the repeater room at Musick Point*.

While testing out the No.38 set in the station car park, a VERY loud SSB signal was heard! Investigation by Dave ZL1DL found **Stewart ZL2STR** with portable dipole hard activating a lighthouse in the public car park, 200 m. away. Stewart was readily persuaded to have a look around the station. Stewart is the NZART Awards Manager, so it was extra special to show him our set-up. So we can add LOTA to your POTA!

STOP PRESS

Newly licenced Amateur Radio Operator **Edward Cheeseman ZL1EC**, passed his written test at the Station on Sunday last.
Congratulations from us at the Musick Point Radio Group Edward, we hope you will get as much enjoyment from our fantastic hobby as we do!

This month's **O'Flattery award** (All Irish readers please look away) goes to **Dave, ZL1DL** who when purchasing a box of ice creams, inadvertently selected the vegan option.

Dave reluctantly admitted that "Actually, they weren't that bad..."

Free Amateur Radio Buy, Sell and Wanted website-

See "ZL Ham Ads" at- https://ZLham.net.nz

Recently listed items for sale include -a BC211 frequency meter, a genuine No. 19 set linear amplifier and a for free: a 2.4m dia antenna dish with tracking controller.

Also "The Machine", the MPRG Blog is found at- https://MPRG.zlham.net.nz

Your Advertisement Could be Here!

Contact the editor if you have something you need to find a new home for.

Musick Point Radio Group Inc. Branch 86 NZART
Agenda for Annual General Meeting to be held at Musick Memorial Radio Station
on April 13th 2025.

Welcome to Visitors.

Present: Per attendance book – Quorum present?

Apologies:

Minutes of previous AGM 14 April 2024 - As circulated

Errors & Omissions / Matters arising:

Finance

- Annual Accounts: Treasurer's report
- Set annual club member subscription for the current year

Reports

Chairman, Secretary, Newsletter Editor, Webmaster

Election of Officers

Nominations - No prior nominations have been received.

Position	*Proposed*	*Proposed by*	*Seconded by*	*In Favour*
Chairman				
Secretary				
Treasurer				
Newsletter editor				
Webmaster				
AREC				

General Business

Approval of new Constitution

Other general business, open to the floor.

Musick Point Radio Group Inc. Branch 86 NZART
Minutes for Annual General Meeting held at Musick Memorial Radio Station
on April 14th at 1320 Hrs 2024

Present-

ZL1DL, ZL1KFM, ZL1 CJB, ZL1NZ, ZL1EK, ZL1FTH, ZL1TOF, ZL1MPU, ZL1DRV, ZL3CK, ZL2MOH.

Apologies received: ZL1LNB, ZL1 TGS, ZL2JDH, ZL4ROB.

Minutes of previous AGM May 21 2023- No errors, omissions or matters arising were tabled.

Minutes accept as circulated- *Proposed* - ZL1KFM, seconded ZL1DL. -Passed unanimously.

Finance- The Treasurer's report for YE 31 March 2024 was circulated and read out by ZLL1DL. Income exceeded expenditure for the year by $424.95. Total Balance was $10,623.82

Inquiry to the ANZ revealed that the minimum Term Deposit amount would be $10,000 so beyond the means of the club.

Proposed- accept financial report, subject to Reviewer's satisfactory report which is expected to be completed in the next 2 weeks- ZL1DL. Seconded ZL2MOH . -Passed unanimously.

Annual Subscription Setting- For a number of years, the subscription has been held at $40. After discussion on the merits of raising or holding the amount, it was decided to continue with $40 for the annual subscription. Many members add a donation to their annual contribution, and it was thought this was preferable to raising the sub.

Moved that subscription for 2024-2025 remain at $40 - ZL1DRV, seconded ZL1TOF.

- Passed by majority show of hands.

Reports from the Chairman, Newsletter Editor (verbal) Webmaster were read out. . Discussion followed regarding the replacement of the repeater antenna.

Moved accept Chairman's report- ZL3CK, seconded ZL1FTH -Passed unanimously
Moved accept Newsletter editor's report- ZL1DRV, seconded ZL1MP -Passed unanimously
Moved a vote of thanks to the Webmaster Neil ZL1NZ and to accept his report-
ZL1DL, seconded ZL1EK. -Passed unanimously

Election of Officers No prior nominations were received. All position holders agreed to continue in the respective portfolios – no other nominations were received. Elected and other positions were confirmed as below, and as agreed by the meeting, voted in one group-

Position	*Nominee*	*Nominated by*	*Seconded by*	*In Favour*
Chairman	David ZL1DRV	ZL1FTH	ZL1MRT	All
Secretary	Martyn ZL3CK	ZL1FTH	ZL1MRT	All
Treasurer	Dave ZL1DL	ZL1FTH	ZL1MRT	All
Newsletter editor	Martyn ZL3CK	N/A	N/A	All
Webmaster	Neil ZL1NZ	N/A	N/A	All

General Business- Setting up an AREC group of the MPRG-. Rob ZL4ROB has agreed (in absentia) to act as leader of such a group. Further discussions to take place along these lines. ZL1CJB, ZL1EK, ZL1DL and ZL3CK indicated willingness to be part of the group.

The Annual General Meeting was declared closed at 1350Hrs.

Minutes of the General Meeting of the Musick Point Radio Group
March 9, 2025 Commenced at 1300.

Present- 8 financial Members as per attendance book.

Apologies- nil

February minutes- Nil arising-
Accept as published- Moved- ZL1DRV, Seconded- ZL1TOF -Passed.

Finance- ZL1DL- Summary for 1/4/24 to 28/2/25 (attached). - $11629.93 in bank.
Includes $249 interest
Accept financial report- Moved ZL4ROB. Seconded- ZL1OJ -Passed

Correspondence-
From Kay Overton, Art Deco Society for a site visit- referred to Spark. Nothing back yet.
From Robyn Clark, a Driving Miss Daisy driver- Requests bring retired station operator Ken Jacobs to look over- agreed, nothing back yet.
From Barbara Bryant- has ?ZLD wartime photos from her late father Walter Stanley Bryant, she would like to give to us to keep- agreed, will post to our PO box & we will scan for website.

General Business-
Discussion re. draft constitution- re. reference to IRD if winding up- seems not needed, we are not a charitable society and also, is not in the already approved Papakura constitution we have copied.
Despite what's in current constitution about not removing this IRD reference, decision is to delete this reference from the new one. Action-secretary to remove.

New Constitution has been circulated several times and will be presented for approval at the AGM in April. A separate SGM not needed as can be done at an AGM.

AGM Agenda to be circulated shortly.

Meeting concluded at 1330.

Minutes taken by ZL3CK