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# WATTS

04 - 2004

Year 69

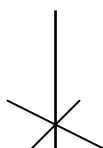
Monthly newsletter of the Pretoria Amateur Radio Club  
Maandelikse nuusbrieff van die Pretoria Amateur Radio Klub.



PARC, PO Box 73696 Lynnwood Ridge 0040, RSA



<http://www.qsl.net/zs6pta>



Bulletins : 145,725MHz 08:45 Sundays / Sondag  
Relays : 1840, 3700, 7066, 10135, 14,200 MHz  
depending on season

Swapshop: After bulletin 2m and 40m (also on-line)

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Vlooiemark verslag  
Ledenuus  
Dagboek  
Algemeen / Tegnies  
Bladsy agt

## Next meeting

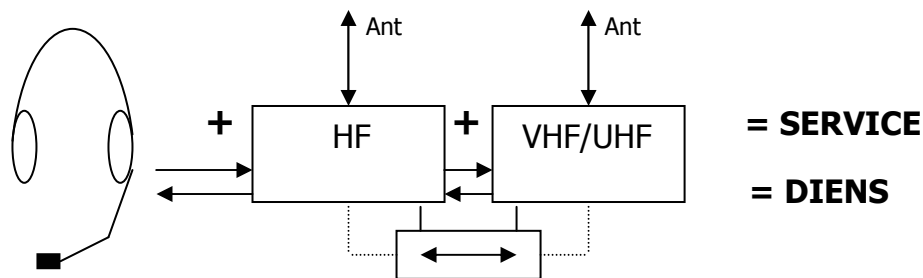
Date: 08-04-2004  
Time: 19:30 for 20:00  
PARC Clubhouse,  
South Campus,  
University of Pretoria.  
SE cnr University and  
Lynnwood roads.

## Editorial

This month as I don't have much at heart and seem to be in a bit of hobby depression. Do you also have such 73-down and out feelings? Various things can go wrong around the house, shack and work situation. My logbook shows virtually no operation this year. Recently my shack had a distinct smell of rotten eggs for several days and after first checking my socks I discovered that my big 12V (swap-shop!) battery went sick on me. The charger now only serves to heat up the battery. I guess I am unconsciously punishing my hobby as a result; though I did get an inspiration to build a useful accessory that you can read about on page 6 and 7.

On a more cheerful note I notice that Sunday morning activity with the various bulletins and swap-shop are the highlight of the weekly activity for many of us all over Southern Africa. I forget now when PARC started SS, but it is about the same length of time ago I started reading the English bulletins as well; first alternating with ZS6KPN until he became SK.

I might as well use this forum to appeal to you to consider a possible absence of yours truly – be it by absconding, sickness or otherwise! It is high time to evaluate the state of readiness of your HF station to also handle relays for your club with quality and efficiency. Surely this is a useful service project and almost a necessity that will cost very little. Study the audio- ins and outs of the rigs you have available and how they can be coupled. Make up the cables and control box and try it – Presto - after fixing a few bugs, a back-up is born – not to mention your increased capability to handle emergency communications or help provide coverage for SARL programmes where necessary.



## Redaksioneel

Hierdie maand het ek min op die hart en ly 'n bietjie aan stokperdjie-depressie. Kry julle ook sulke 73-af-en-uit gevoelens? Verskeie dinge kan verkeerd loop by die huis, hok en werksomstandighede. My logboek toon feitlik geen inskrywings hierdie jaar nie. Onlangs het my hok 'n duidelike vrot-eier reuk gehad en nadat ek my sokkies nagegaan het vind ek toe dat my groot 12V (ruilhoekie!) battery die gees gegee het. Die laaier dien nou net om hom warm te stook. Ek dink ek is besig om onbewustelik my stokperdjie te straf; alhoewel ek onlangs tog 'n bevlieging gekry het om 'n nuttige toebehore te bou wat u op bladsy 6 en 7 kan lees.

In meer vrolike luim merk ek dat Sondag-oggend aktiwiteite met die verskeie bulletins en ruilhoekie die hoogtepunt van die week vir vele amateurs in Suidelike Afrika is. Ek het nou vergeet hoe lank terug PARK die ruilhoekie begin het, maar dit is ook omtrent dieselfde tydperk gelede wanneer ek die Engelse bulletins begin lees het; eers nog om-en-om met ZS6KPN totdat hy SS geword het.

Ek kan seker ook hierdie forum gebruik om met u te pleit om in oorweging te neem dat die uwe moontlik kan verdwyn – sou dit deur 'n weglouery, siekte of iets anders wees! Dit is hoogtyd om die paraatheid van jou HF stasie te evalueer om ook doeltreffende, kwaliteit herleidings vir jou klub te kan hanteer. Dit is tog sekerlik 'n nuttige diensprojek en feitlik 'n noodsaaklikheid wat nie veel kan kos nie. Bestudeer die audio in- en uitgange van jou beskikbare stelle en hoe hulle gekoppel kan word. Maak 'n paar kables en 'n kontrolekassie en probeer dit – Presto – na so 'n paar wysigings is 'n rugsteun gebore – om nie te praat van u vermeerderde vermoë om noodkommunikasie te hanteer of te kan help om SARL programme dekking te gee waar nodig.

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## Thanks Nick ZS6BVR

Nick had everyone's attention at our recent club meeting with his practical demonstration of a WiFi network at 2,4GHz with two computers. Files were moved to and fro and music played left and right. The hardware involved to effect this is very neat and small, plugs into your USB port and operates with enormous data rates over as far as 500m assuming no obstructions. Data protocol is so devised that error checking and rate adaptation is applied automatically. Distance is however not the idea in most cases as there is a security risk of anyone tapping in on your network with a laptop down the street. Security hardware and software, directional antennas and lowering RF power to a minimum for the job are some of the necessary measures to be considered. Resource sharing and messaging can now easily be effected without wires and cables. Spend about R1k and you are on the air!

Go to GreenSleeves in Pretoria or the Mug and Bean in Johannesburg and have free internet access from your table before, during or after your meal!

(Guaranteed your companion will have disappeared when you lift your head to look over your PC screen)

For more information contact [nickm@worldonline.co.za](mailto:nickm@worldonline.co.za)

# Minutes of the monthly club meeting of the Pretoria Amateur Radio Club held at the South Campus of the University of Pretoria on 11 Mar. 2004

**Welcome:** Hans ZS6KR declared the meeting open and welcomed all who attended.

**Attendance:** The meeting was attended by 18 members(SIES!) and apologies were received for Willie ZS6EAE, Johan ZR6ANF, Almero ZR6RY, Brian ZR6BJS, Charl ZS6GN, Doreen ZR6DDB and Malcolm ZR6OLM.

**Personal Matters/Lief en leed:** Tjerk ZS6P sterk tuis aan nadat hy n ernstige operasie ondergaan het. Harry ZS6HRD is also back home.

Solly ZS6SV – wife in hospital.

Agnes, sw of Ivan ZS6AUT in hospital.

Callie ZS2CWP terug in Knysa.

Jac ZS6QA moet weer n operasie ondergaan.

**Minutes of previous meeting:** The minutes of the previous meeting as published in Watts were approved. Proposed by Ed ZS6UT and seconded by Egbert ZS6AZG.

**Matters arising from previous minutes:** None.

## Club Activities:

**DF Hunt:** Richard ZR6CK – No DF Hunt planned for this month.

**Fleamarket:** Hans ZS6KR – The Mega Fleamarket which took place on the 21<sup>st</sup> of February was once again a huge success. Thanks to everybody who assisted. Hans ZS6KR asked for photos of the Fleamarket so that he can publish them in Watts.

The West Rand Fleamarket is scheduled for the 27<sup>th</sup> March 2004. Start time 12h00.

**Rallies:** Johan ZR6JHB – Next Rally - 20<sup>th</sup> March 2004 – Middelburg Nissan Rally. To use 4 mobile stations only, Johan de Beer (JB) ZR6YV, Andre van Tonder ZS6BRC, Hans Gurtel ZR6HVG and Johan de Bruyn ZR6JHB.

The event will be run over 6 stages, starting in Middelburg at 9h00.

**Social:** Club braai 28<sup>th</sup> March 2004 at Pretoria Motor Club (PMC) in Silverton.

The club will provide braaipacks, pap & gravy and of course the fires.

Members who would like to attend must bring their own eating and braai utensils as well as their own drinks.

Tables and chairs will be available.

Please contact Willie ZR6WGR before 24<sup>th</sup> March if you want to attend as we need to know for how many persons we need to cater for.

Ham Dairy:

<b>March</b>	13-14	Commonwealth CW contest – 10:00 – 10:00 UTC.
	20 – 21	SARL VHF/UHF Contest.
	27 – 28	CQWW WPX Contest and President's net.
<b>April</b>	01	SARL 80m QSO party(1 <sup>st</sup> leg
	03	SARL AGM and Awards Dinner.
	11	SARL Hamnet 40m Contest.
	12	Family Day.

## General:

Ed ZS6UT - Interference on 20m.

Pine ZS6OB discussed VHF/UHF activity for 2005

**Presentation:** Wireless Networking and the 802.11 Standard (WIFI Networks) – Presentation by Nick ZS6BVR.

**Next meeting:** The next meeting is scheduled for 8<sup>th</sup> April 2004.

**Closing:** The meeting closed at 21h45. Thanks to Molly ZR6MOL for serving tea, coffee and a bite to eat.

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## VHF / UHF contesting

**an opportunity especially for (new) ZR's, to gain experience**

As discussed in our recent meeting (see minutes) **Pine ZS6OB offered to champion a ZS6PTA group for 2005** with specific emphasis on the annual two-part SARL contests that are 24 hours each spanning a Saturday-Sunday 12:00-12:00. This involves taking part in an organized away-from-home outing (somewhere high, away from QRN - but not necessarily far away) involving, say 5-6 people with various duties. If you like to get involved in 2005, contact Pine at the earliest opportunity at 012-345-1801 or 082-447-7823 or [janpienaar@ananzi.co.za](mailto:janpienaar@ananzi.co.za)

Soos bespreek by ons onlangse vergadering (sien notule) het **Pine ZS6OB aangebied om 'n ZS6PTA groep te lei in 2005** met nadruk op die jaarlikse tweedelige SARL wedstryde wat 24 uur beloop oor 'n Saterdag-Sondag 12:00-12:00. Dit behels deelname in 'n georganiseerde van-huis-af uistappie (iewers hoog, weg van QRN – maar nie noodwendig ver nie) wat sê maar, 5-6 mense betrek met verskeie pligte. As jy betrokke wil wees in 2005, kontak Pine by die eerste geleentheid by 012-345-1801 of 082-447-7823 of [janpienaar@ananzi.co.za](mailto:janpienaar@ananzi.co.za)

# Fleamarket

( Picture resolution on this page has been strongly reduced to reduce file size )  
(Pictures by ZS6SO and ZS6KR)

# Vlooiemark

As usual, we enjoyed a strong attendance from all over. Many serious deals took place including the auctioning by ZS6TIM of a mobile trailer with contents belonging to Pottie ZS6IC, to Ludwig ZS6WLC.

Soos gewoonlik was daar weer puik organisasie deur Almero ZR6RY en Willie ZR6WGR en die geriewe by die Universiteit natuurlik uitstekend. Eetgoed was verskaf deur MRK lede met name die van Wyk (PVW) familie asook Thys ZS6TVV en Gladys van Vollenstee ZR6GRV. Drinkgoed was weereens verskaf deur ons PARK klub danksy Richard ZR6CK bygestaan deur Molly ZR6MOL.



09:15 en dit raak besig..



Is dit Theo ↑ ZS6BDF wat probeer glimlag?



Trading here..



Trading there..



Even Roy ZS6MI came window shopping..



Connectors, connectors..

## Birthdays Verjaarsdae

April



01 Melanie, daughter of Ed ZS6UT  
 02 Fred ZS6MRA  
 03 Elsa, SW of Jorge ZS6JOR  
 04 Joe ZS6AIC  
 07 Tamzyn, daughter of Gary ZR6GK  
 08 Bertha, LV van Hans ZS6KR  
 08 Klasie, seun van Tjerk ZS6P  
 08 Ronell ZS6BRX, dogter van Freddie ZS6JC  
 09 Tanya, daughter of Frank ZS6GE  
 11 Susan dogter van Freddie ZS6JC  
 12 Marina, dogter van Hennie ZR6HEN  
 19 Anne, SW of Jac ZS6QA  
 22 Marieta, SW of Roy ZS6MI  
 22 Hennie ZR6HEN

## Anniversaries Herdenkings

April

02 Annemarie and Bernie ZS6ANU  
 02 Hannie ZR6JMP en Callie ZS2CWP  
 04 Dianna en Louie ZR6LVW  
 05 Chrissy ZS6JX and Dave ZS6JW  
 06 Lynn en Andre ZS6BRC  
 08 Jeanne and Sander ZR6SW  
 12 Rika and Errol ZR6VDR  
 30 Truus and Stan ZS6AAO

25 Erna, dogter van Freddie ZS6JC  
 25 Gerhard, son of Sander ZR6SW  
 27 Elsie, LV van Albert ZS6JU  
 28 Tracey, daughter of Vitor ZS6VG

## Sick Parade



Wally ZS5WP had a slight stroke but is OK  
 Jack ZS6QA is due for another operation.  
 Harry ZS6HRD has returned home from an operation  
 Agnes ZS6BAV, sw of Ivan ZS6AUT was recently in hospital  
 Mary, sw of Bill ZS6KO is due for a back operation

## Krukkelys

Tjerk ZS6P is amper weer sy ou self  
 Jenny, LV van Sollie ZS6SV is weer ernstig siek  
 Callie ZS2CWP is tans heelwat beter en terug in Knysna  
 'JB' ZR6YV se oogprobleem verbeter glo stadig

## Ham diary | Dagboek

**Mar** 27-28 CQWW WPX Contest  
 28 SARL President's net  
**28**  
**Apr** 01 SARL 80m QSO party (1<sup>st</sup> leg)  
 03 SARL AGM and Awards Dinner  
 11 SARL Hamnet 40m Contest  
 12 Family Day  
 15 Schools open – all provinces  
 18 World Amateur Radio Day  
 25 SARL President's Net  
 27 Freedom Day  
**May** 01 Workers Day - public holiday

**Braai**  
**Diarize Sunday, 28 March at the PMC premises, Pioneer Park, Siverton. Braaipacks, pap en sous will be supplied by the Club. You bring the rest.**  
**Are you coming? // Kom u?**  
**bevestig by / confirm with / Willie ZR6WGR**  
**Booking deadline 24 March**  
**082-940-2490 || 012-420-4029**

## Snippets | Brokkies

- Pieter ZS6KSA het op 13 Maart in die huwelik getree met Bernice. Baie geluk en voorspoed vir hulle!
- Spider ZS6SO se dogter het ook op 13 Maart in die huwelik getree. Baie geluk ook aan hulle.

**Neem kennis** almal wat 'oop' stelle het – PEARS berig in hulle Maart nuusbrieff dat OKOSA, nogal vergesel van 'n SAPD honde-eenheid, 'n plaaslike amateur kom besoek het om sy Icom 7E handstel te konfiskeer. Die was glo **100-999MHz oop op ontvangs**. Hulle het dit as 'n 'scanner' beskou en Amateur Radio lisensie voorwaardes gee nie vergunning om sulke apparaat te besit nie. Slegs 'n handelaar mag glo toegang tot so iets hê....

**HF Flagships rolling out:** On 17 March Yaesu announced their FTX9000 to be on sale from 1 April. (Do Ja's have April Fools' Day?) Will this outdo the recently announced Icom IC7800? The latter has been field-tested by JA7UDE and there is an informative webpage diary/overview/photos with emphasis on TTY and PSK capabilities, displays, interfaces etc.

<http://www.archi.is.tohoku.ac.jp/~ooba/ja7ude/ic7800diary.htm>

(cancel Japanese language pack request)

**General** The main purpose of regulating a solar panel output is to prevent battery overcharging when left unattended as most panels can reach 17-19V when fully illuminated. With a direct connection the battery is the voltage-determining component in the system and after reaching full charge it will be forced to rise further and cause severe gassing etc.

After consulting various references, one can come to the conclusion that there are umpteen possible ways to prevent battery overcharging when a solar charging system is left unattended. Much depends on the application, efficiency required and power capability of the panel. If consumption more or less equals input then you can connect direct; but if consumption is varied and your panel supplies a constant energy, there must be an automatic disconnection when the battery is full. Conversely the connection must be re-established when the voltage has dropped to a predetermined level. From an electronics point of view, this is a simple voltage detector function.

The author has examined one commercial comparator-type and came to the conclusion that it was a slapped together, poorly designed circuit; giving impetus to start this project and build a controller useful for HF or VHF field operation or - to monitor a shack battery charged from a panel outside.

**Efficiency** A supply voltage rising to 18,8V and only 13,8V being utilized points to a waste of energy while charging. At 4A charging current that means 20W is not utilized. A 60W panel can thus only transfer a maximum of 40W to the battery. This is the price paid when using simple regulators and only switching regulators will give a virtually 95% energy transfer, but are expensive and probably generate considerable noise on your HF radio in close proximity.

**Idle time** What to do with available energy after the battery is automatically disconnected? Charge another battery? It's there for you to use or not to use. More electronics may be needed to again regulate voltage or, if the load is heavy enough like a motor or such-like, the voltage will conveniently drop to 14V or so. The panel is also quite happy when left open circuit. It is even happy when short circuited but increases its temperature which makes it inefficient.

**Specifications for field use:**

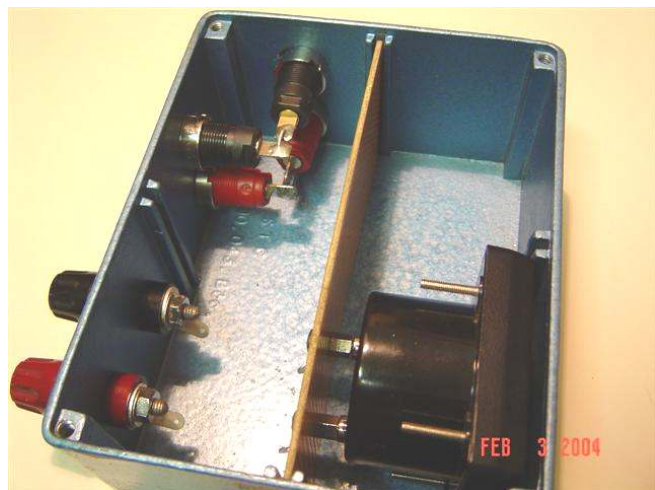
1. Sturdy construction with few protrusions or soft externals
2. Splash proof
3. Charging current indication
4. Battery full indication
5. Auxiliary output after battery is full
6. Unattended operation
7. Direct panel-battery option (attended operation)
8. RF proofing

**Junk box consultation:** Finding a suitable enclosure is the first step and the author purposely used the ugliest second-hand die-cast aluminium box in stock. Then a suitable meter that would fit was also found as well as banana sockets and a piece of Veroboard to fit across as shown.

**Construction:** Doing some reasoning about ergonomic placement of parts, a mechanical layout as shown was decided on. (the electronics is a minor aspect and we first do the dirty work)

Note that the meter is mounted on the Veroboard and two 5mm male-female stand-offs were used to bring its face within 3mm of the box wall. Solder lugs were also added under the mounting screws. The meter is upside-down so that eventually the whole unit uses the box lid as its bottom. The battery terminals were the binding-post type while the panel input and aux output can be ordinary- or shrouded banana sockets.

A neat window was made in the box wall for the meter face to show and a piece of 3mm Perspex slid in between the meter face and box wall to serve as a protective window.



**Electronic design:**

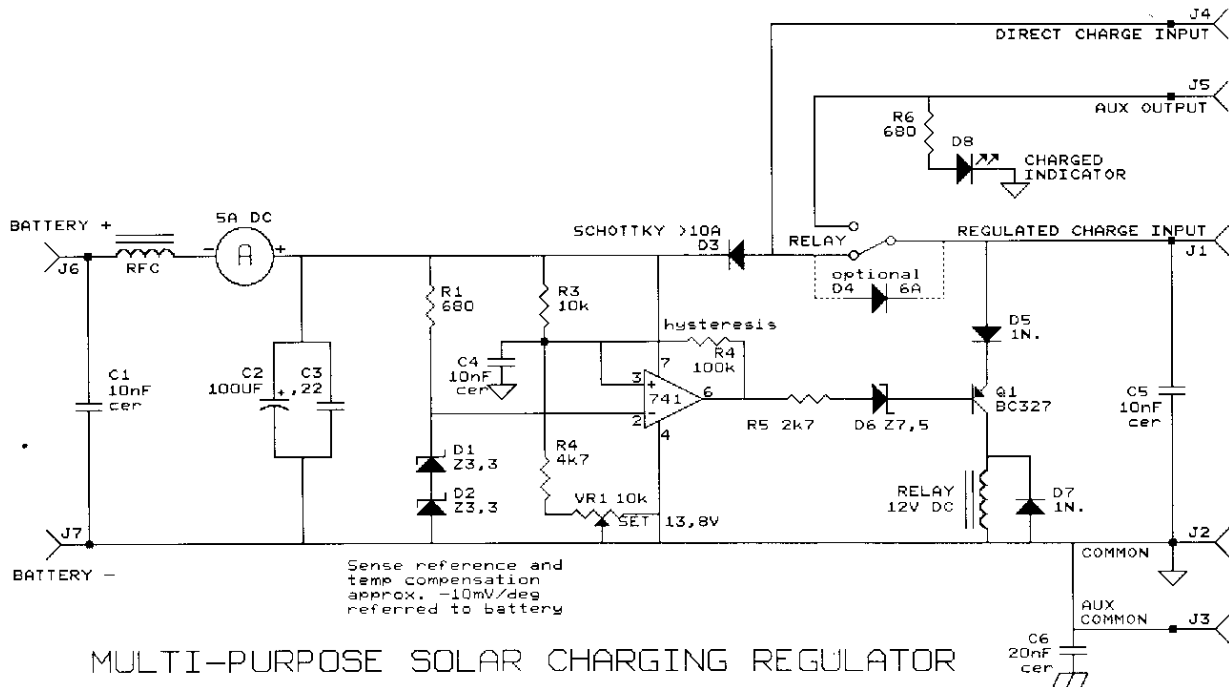
The circuit is shown on the next page and embodies all the specifications discussed. Starting on the left, we have the battery fed via a 5A DC meter (or a shunted 5mA meter) and ferrite cored choke. Assuming galvanic or induced RF to possibly come in via the terminals, C1, the choke and C2+C3 should be an effective low-pass network.

The comparator is a LM741 referenced by D1+D2= approx 6,6V and battery sensing is done via the network R3,R4,VR1. The output is low when charging. Q1 is thus on, the relay is on and its contacts are engaged as shown. The solar panel supplies energy from J1 via D3. The latter is a high-current type with low voltage drop and serves to isolate the battery when the panel is not outputting power in cloud or darkness conditions. Once the battery has reached the trip level as set by VR1, pin6 output goes high, D6 stops conducting, Q1 goes off and the relay switches over to AUX OUTPUT. An LED connected to that indicates to the user that the battery is now full.

The metal box is not earthed but RF grounded via C6. C5 can kill any RF picked up by the solar panel leads which are usually quite long. Finally, the panel +ve can be plugged in to J4 if so desired and the battery is again charged via D3 and, if the FULL indication is required, D4 must be fitted to keep Q1 as well as the AUX OUTPUT operational.

Lastly, low value zener diodes have a negative temperature coefficient. The total value for D1+D2 is about -5mV/deg C which, translates to -10mV/deg C at the battery terminals due to the fact that the total zener voltage is half of that of the battery. This is only an attempt at compensation as a 12V battery has a -24mV/deg C characteristic, (-0,1V every +4 deg C) but is better than nothing as encountered in most designs.

**Then there is the choice of hysteresis.** What differential between switch-off and switch-on do we decide on? The author contends that during field-day operation one would want as much energy replenishment as possible, as soon as possible. When using a small solar panel, overcharging is unlikely unless you go for an afternoon nap, and a direct coupling will be ok. Batteries fed by larger panels should rather be regulated but be subject to only a 1 volt hysteresis.



**Finally, some tips on components:**

**D3:** stripped from old XT/AT PC power supply. These have excellent 15-20A Shottky double diode rectifiers for the 5V supply. They are in a typical 3-legged power transistor type package with two diodes printed on them. Reverse breakdown was measured around 25-30V. The cathode is the centre leg and both outer anode legs can be connected together. Voltage drop will be very low around 0,2V. It was mounted just under the RHS disc capacitor on the bottom surface.

**RFC:** There are many of these to be found in the same supplies in all shapes and sizes. See an example used close to the left box wall.

**Meter:** Was a Minipa 5mA ex-fleamarket with a badly deformed spring that needed considerable TLC! A hole was carefully made into the side of the meter window for the BATTERY FULL LED to be pushed in horizontally. Being inside the box and inside the meter, the LED is quite visible in daylight. The shunt should be of thick wire to prevent it warming up and so altering the reading. It can be seen coiled behind the meter.

**Relay:** Ordinary SPDT 12A contacts 12VDC coil (240Ω) PCB-mount as shown. The one visible is a type 4051-12VDC.

**Direct:** The DIRECT socket (J4) is not shown and was added as an afterthought mounted directly next to J1.



## HF operating tips

1. *Using the RF Gain control under strong QRN conditions.* Most people set the RF Gain control to maximum and leave it there. Readability of weak signals in QRN can be greatly improved by reducing the RF Gain control. When atmospheric noise is moving the S meter, readability will be improved if the RF Gain is backed off to the point where it is no longer moving from the static crashes.

2. *Using the RF Gain control to improve readability (e.g. in pileups).* Normally the AGC will be in the FAST position for operation on CW and for contest type operating on SSB. When multiple signals are inside the RX pass band, the strongest one will control the AGC bus. In between the dots and dashes or speech peaks for SSB, the AGC voltage will decay quite rapidly down to the next strongest signal. When this occurs, the next strongest signal is amplified up to the same level as the strongest signal. It then is impossible to read either signal if they are essentially on the same frequency. This is due to the very fast decay time constant in the radio. SLOW AGC can improve matters, but the response time gets too long for contest style operating. The situation may be improved by reducing the RF Gain.

Here is an example of the results gained with 2 tones spaced 10 kHz:

RF Gain setting	TOI	Noise Floor	Dynamic range
Full CW	+14.5	-130 dBm	96.3 dB
Set to S7	+17.5	-126 dBm	95.6 dB

There is a 4 dB reduction in sensitivity that is negligible under strong signal conditions and the TOI increases by 3 dB. The IMD level will be down by 6 dB.

This is good advice for any type of receiver. ( Ed: I will believe it but the acronym TOI is not explained )

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**The amateur license fee is free in the US because the ARRL took the FCC to High Court, claiming that as the FCC is paid for out of general taxation, so FCC license fees are double taxation. The US high court agreed, and made the FCC refund all license fees.**

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**..... WE MANAGED TO PUT SMOKE IN THEM .....**

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### Reminiscences:

A computer was something seen on a science fiction show "of note"

Windows you hated to clean, and a RAM was the father of a goat.

Meg was the name of a girl, Gig was a job for the nights.

An Application was for employment, A Programme was a TV show.

To hell with the System, now we want to upgrade the System.

A Cursor used to swear, a Keyboard was a piano.

Cut you did with a knife, Paste you did with glue.

A Web was a spider's home, a Virus was when you had flu.

No one was ever killed in a Computer Crash, but now you sure wish you were dead.

If you had a 3½ inch Floppy, you made sure no-one found out.

Condoms were for sale and plastic bags free, now condoms are free and we pay for plastic bags.