



ZR6FD logo

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WATTS

07 - 2006

Year 76+7m

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

✉ PARC, PO Box 73696 Lynnwood Ridge 0040, RSA

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

Bulletins : 145,725MHz 08:45 Sundays / Sondag

Relays : 1840, 3700, 7066, 10135, 14,200 MHz (Seasonal)

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

Bulletin repeats : Mondays 19:45 on 145,725 MHz only

PARC assists Kopanang Project – details p5

Thobile ZS6TKO



In this issue

- Minutes of meeting 06/2006 Vergadering notules
- Editorial Redaksioneel
- Upgrade rules ZR>ZS Reëls vir opgradering
- History and present ZS6PTA Geskiedenis en nou
- Technical Tegnies
- Let's go complex part 3
- Page eight Bladsy agt

in hierdie uitgawe

Next Meeting 5 July 2006

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

PARC Management team / Bestuurspan Aug 2005- Aug 2006:

Committee members

Chairman, SARL liason, Fleamarkets	Alméro Dupisani	ZS6LDP	almero.dupisani@up.ac.za	012-567-3722	082-908-3359
Vice Chairman, Secretary Rallies, Social, Hamnet	Johan de Bruyn	ZS6JHB	johandbr@absa.co.za	012-803-7385	082-492-3689
Treasurer, Clubhouse, Database, DF hunts	Richard Peer	ZS6UK	peerrk@safrica.com	012-333-0612	082-651-6556
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Repeater custodian	Pine Pienaar	ZS6OB	janpienaar@ananzi.co.za	012-345-1801	082-447-7823

Co-opted / Geko-opteer:

Repeater, technical	Johan Lehmann	ZS6JPL	jlehmann@csir.co.za	012-804-6173	083-300-8677
	Hans Gurtel	ZR6HVG	adele123@absamail.co.za	082-940-0623	082-940-0623
	Pieter Human	ZR6AHT	humanp@telkom.co.za	012-800-2888	082-565-6081
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Auditor	Position open				
Asset control	Andre v Tonder	ZS6BRC	andre.vtonder@absamail.co.za	361-3292	082-467-0287
Tydenne	Johann de Beer	ZR6YV		011-918-1060	082-857-1561
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Webmaster,	Edwin peer	ZR6ESP	zr6esp@peer.co.za	012-333-0612	
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Hamnet, projects	Roy Newton	ZS6XN	newtonr@telkomsa.net	012-547-0280	
Morse testing	Bill Ingleson	ZS6KO		012-331-2327	
Tea	Molly Peer	ZR6MOL	molly@peer.co.za	012-333-0612	
	Doreen de Bruyn	ZR6DDB		012-803-7385	

Minutes of the monthly club meeting of the Pretoria Amateur Radio Club held at the South Campus of the University of Pretoria on 7 June 2006

- Present: 29 Members as per attendance register, 2 visitors being Kobus Conradie ZS6UZ
- Apologies: Johan ZS6JHB, Hal ZS6WB, Lizette ZS6LZT, Hilary ZR6HAP, Edwin ZR6ESP, Malcolm ZR6OLM, Helen Newton, Pierre ZS6PJH, Elmarie ZR6AXF.
- Minutes: These were published in Watts. Approval proposed by Charel ZR6GN and Louis ZS6LVW
- Matters arising: None.
- Rallies: Andre ZS6BRC spoke about the KZN rally last weekend. 13 Amateurs from Highway club and a few from PARC took part. Communications went well using the mobile 725 repeater over a fairly large area. The next rally is in Witbank on 21/22 July.
- DF Hunt: The latest DF hunt was poorly attended. Edwin ZR6ESP was the fox.
- Social: No News
- Finances: The treasurer ZS6UK is preparing a motion on subscriptions for the AGM.
- Projects: Hans ZS6KR has brought various goodies including the Andersen Power Poles. Roy ZS6XN showed a 12volt distribution system using power poles and a circuit breaker box.
- Technical: Pine ZS6OB reported that development at the repeater site is continuing. He requested the members to advise him of any coverage problems but requested also that amateurs check that their own systems were clear of faults first.
- DF Antenna: Pieter ZR6AHT showed a practical version of a very useful DF antenna constructed using measuring tape.
- Fleas: The next flea market will be on 1 July at 09:00 at the usual place. Magda burgers and usual liquid refreshments will be available. Almero ZS6LDP has spoken to Chris ZS6FCS regarding the Magalies event on 24 July, and it was agreed that the flea market will go ahead as planned.
- Demo: Pine ZS6OB talked at a demo at MRK using EME (earth-moon-earth) using a 9 element yagi antenna.
- Ham diary: The SARL ham diary was displayed.
- Kopanang: 32 members of the department of communications Kopanang project will be attending classes on Thursdays from 14:00 to 16:00 at their premises on the corner of Park and Duncan Roads in Hatfield. Available to help are Hennie ZR6HEN, Vince ZS6BTY and also possible are Richard ZS6UK, Hans ZS6KR and Almero ZS6LDP.
- RAE: Tim se vrou passed the RAE and is now ZR6TSV.
- General: Trophies received at the 2005 AGM must please be returned to a committee member by 5 July latest.

Minutes by acting secretary Richard ZS6UK

----- PRODUCTS AND SERVICES FROM OUR MEMBERS -----

- ICOM in Pretoria:** Pine ZS6OB has most of the whole ICOM line-up for demo/sale at his QRA. Phone 082-447-7823
- VHF/UHF antennas:** Pine ZS6OB builds to your requirements. Best performance and materials guaranteed.
- Battery condition indicator kits:** Roy ZS6XN has 3-LED indicator kits available at R20 each. Phone 012-547-0280
- Connectors and adapters, legal limit 40m traps, Nissei SWR/wattmeters and component bargains:** Hans ZS6KR always has stock. Also **Radio Protection kits:** Build this over-voltage sensing electronic circuit breaker into your 12V supply and prevent 12V radio burn-out in case of supply series-transistor failure. New: 30A **Anderson powerpole connectors.** Phone 012-333-2612.
- J-poles 2m, 70cm:** Pieter ZS6PVW se netjiese 'J' antennas is nou al welbekend. Bel 012-386-4901.

Editorial

Our financial year has ended and our AGM is only a month away. Who will lead- and be in the club management? Who cares enough to help maintain *Premier Club* status for the PARC and establish the necessary infrastructure for an efficient Amateur Radio Service as well as encourage members to participate in its activities?

It means making some time for physical and mental contribution - and if you love your hobby - and wish for continuity, you must seriously consider making a sacrifice for a good cause.

Much comment about amateur radio has been heard in recent times. Whether jokingly or in earnest or whether it is boredom brought on by poor conditions on HF, it must rub off somewhere and dampen further ambitions or investment in the hobby. Yet no one has let go of it - which is encouraging.

Let us go for a pro-active 2006-2007. Make yourself available for committee and let PARC benefit from your skills and enthusiasm. I am especially appealing to our technical members - we need you all.

Due to personal circumstances I can only make myself available as a co-opted member but will continue with WATTS as usual. In the thirty days to follow, the onus is on you to volunteer as- or canvass members for committee prior to the AGM.

Redaksioneel

Ons finansieële jaar is ten einde en ons AJV is slegs 'n maand vorentoe. Wie sal die klub lei en in die bestuur dien? Wie gee genoeg om - om *Premier Klub* status te bly behou vir die PARK en die nodige infrastruktuur daar te stel vir 'n doeltreffende Amateur Radio Diens sowel as om lede aan te moedig om in sy aktiwiteite deel te neem?

Dit beteken om tyd in te ruim vir fisiese en geestelike bydrae - en as jy lief is vir jou stokperdjie - en wens vir deurlopendheid, oorweeg dan ernstig om 'n opoffering te maak vir 'n goeie doel.

Daar was die laaste tyd heelwat kommentaar oor amateur radio. Of dit nou 'n grappery of ernstig was, of as dit van verveeldheid was vanwee slegte kondisies op HF, moet dit iewers afvryf en verdere ambisies en belegging in die stokperdjie demp. Tog het niemand dit laat vaar nie - wat bemoedigend is.

Kom ons gaan vir 'n pro-aktiewe 2006-2007. Maak uself beskikbaar vir komitee en laat PARK voordeel kry van u vaardighede en entoesiasme. Ek doen spesiaal hierdie versoek aan ons tegniese lede - ons het julle almal nodig.

As gevolg van persoonlike omstandighede sal ek my slegs kan beskikbaar stel as ge-kopteerde lid maar sal met WATTS voortgaan soos gewoonlik. Die onus is op julle om binne die volgende dertig dae jou beskikbaar te stel- of lede te werf vir komitee nog voor die AJV.

UPGRADING FROM ZR TO ZS? PROCESS OF CONSTRUCTION PROJECT TO QUALIFY CLARIFIED (SARL)

The SARL has received several requests to clarify the requirements for an electronic project to qualify for upgrading from a ZR to a ZS licence. Details are also available on www.sarl.org.za. The candidate must construct and demonstrate one of the following:

1. A working direct conversion or super heterodyne radio receiver that can receive and demodulate transmissions on any frequency allocated to the amateur service in any of the modes used by the amateur service. The sensitivity and selectivity of the receiver must be sufficient to be able to receive typical amateur signals, or
2. A working crystal-controlled transmitter that can transmit modulated signals with a power of at least 1 watt on a frequency allocated to the amateur service using any modulation method used by the amateur service. This includes CW. The emission of an unmodulated carrier does not fulfil this requirement. The emitted signal must be of good quality in all respects including frequency stability, bandwidth, key clicks and harmonic radiation.

The project may be constructed from a kit. Although the candidate may receive advice from other amateurs, all physical construction work (soldering, etc.) must have been performed by the candidate him- or herself.

Included with the built project, the candidate must submit a properly drawn circuit diagram of his/her apparatus. This circuit must accompany the assessment documentation to the SARL.

Construction can be on perfboard (Vero board) or on etched PC-board. The completed project must be built into a proper enclosure, which can be associated with a radio. Sockets must be provided for antenna/key/battery/speaker connections etc. (Whichever applies.)

Two clear and detailed printed colour photographs, digital or otherwise, of the project, clearly showing the PC-board with components and the completed project, must accompany the assessment documentation to the SARL.

The candidate will be required to submit an affidavit stating that the project is entirely his or her own work.

Tech Tip found on Dutch website: Aluminium - Aluminium tube jointing is preferably done with Molycote Graphite grease instead of grease with copper dust (Copperslip). With the latter the grease is squeezed out of the clamped joint leaving a copper-aluminium contact which causes electrolysis if any dampness reaches it. Electrolysis cannot happen with graphite. They further recommend to spray the outside of the aluminium surfaces with acrylic laquer. Burndy (now FCI) Penetrox P8A was found to be another excellent protection/sealant spray that is also conductive.

Birthdays

Verjaarsdae

Julie



05 Lynette, daughter of Mary and Bill ZS6KO
06 Helen ZS6-2507, daughter of Retha and Roy ZS6XN
11 Peter ZR6FD
13 Pieter ZR6AHT
17 Lynn, lv van Andre ZS6BRC
17 Pine ZS6OB
19 Sarina, lv van Willie ZR6WGR
20 Roy ZS6XN
21 Elmarie ZR6AXF, lv van Johan ZS6JPL
22 Rozanne, dogter van Sylvia en Tjerk ZS6P
24 Brittany, dogter van Diana en Louis ZS6LVW
25 Justin ZS6-262, son of Rika and Errol ZR6VDR
26 Frank ZS6GE

July

Anniversaries Herdenkings

01 Marlene ZS6SMA, sw van Kalie ZS6KCS ()
06 Julie and Paul ZS6BMF (43)
15 Ellen and Joe ZS6AIC ()
23 Alta and Johnny ZS6BAJ (29)
23 Pamela and Harry ZS6HRD (52)
23 Lorraine and Stan ZS6SDZ (53)
28 Pat ZR6AVC and Frank ZS6GE (22)

27 Rachel ZR6RDB
28 Julie, sw of Paul ZS6BMF

Sick Parade | Krukkelys

Daar was bronchitis in die van Wyk familie wat Magda ZS6MVW en Suzette in die bed gehou het

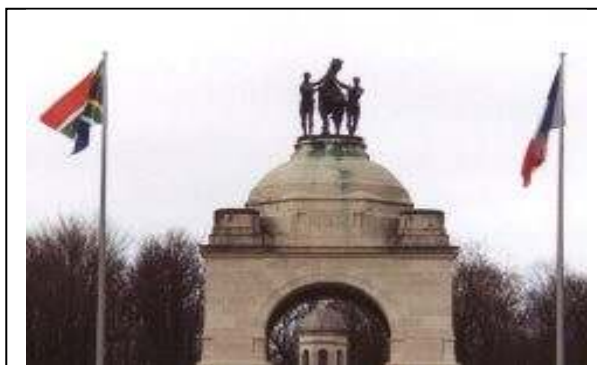
Welkom | Welcome

New member Roger Jones ZS6RJ

PARC Diary | Dagboek

July 01 PARC Mega-Fleamarket 10:00
01 SARL subscriptions
01 Canada Day contest
08-09 IARU HF World Championship 1200-1200 UTC
15 RTA in Durban
15-16 CQWW VHF Contest 1500-2100 UTC
16 Delville Wood remembrance ZS90DW -----
16 RSGB Low Power Field Day 0900-1600 UTC
17 Schools open
23 Boland ARK contest
24 Highveld Motor Club Rally
24 MRK fleamarket
29-30 RSGB IOTA Contest

Aug 02 PARC AGM



Delville Wood memorial to missing SA soldiers

Of 3153 men of the South African Brigade only 755 survived between 15-20 July 1916. Only 113 lie in identifiable graves. The memorial was unveiled on 10 October 1926.

Snippets | Brokkies

- **Richard ZS6UK** is now doing the bulk e-mailing of WATTS as your editor's new ISP blocks mass mail.
- **Johan ZS6JHB en Doreen ZR6DDB** gaan grootouers word.
- **SOS:** Your club needs presentations/videos for club meetings.
- **Satellite news** on our bulletin is currently done by Johan ZS6JHB. He is already burdened with many functions. Is possibly one of our (new) members active in satellites? We would appreciate your contribution on a regular basis on Sunday mornings.
- **Letter from Carlos in Portugal (CT1JGM ex ZS6AJW):** I don't have UHF rig here. Actually the only rig I have is the 2 meter and I can access the local Echolink Repeater with it. I normally use the computer when I access the 750 on Sundays and sometimes during the week. That repeater is very quiet during the day. Some times I get someone talking on it. The other day I spoke to a G3 station that was also connected to the 750. It was a very long jump. If it wasn't for the Echo Link program I wouldn't have access to South Africa during the day. Than you very much. South African Hams are still the greatest. Here there are no activity whatsoever. These guys only talk and most of all, out of the repeaters. Almost all repeaters have tones, I don't have them and the ones without tones I can't access them, too far away. Best 73's, Carlos.

Father's Day has come and gone and according to the Book of Useless Information more reverse charge calls are made in the US on Father's Day than during the year. So while children appear at pains to assert their independence, it looks like dad is still expected to pick up the cost!

ZS 6 PTA

1930-2006

July 1952

The 2 metre gang are getting places—two-way communication has been established between Pretoria and the Rand. The Hams responsible for this are ZS6AAO and ZS6WW. Nice work, chaps.

There seems to be a lot of building going on in the Branch and on all sides you hear of portables, hi-power rigs, and rxs being discussed and the best way to get them to perk without the maximum of work and trouble.

The DX bands seem to be about dead up here, although ZS2MI is regularly worked by the local gang, who pass on the news to ZS6ZU's SW.

The membership is gradually increasing in the Branch, and it is pleasing to note that more SW's are joining; the line of least resistance, I expect.

There is some talk of having a stall at the show, whether this will materialise is another story. I do think that we should go cracking and show what can be done. Quite a few volunteers will be needed to man the station if we decide to go through with it.

Social Notes.

We welcome these newcomers to the Branch: ZS6PMI, ZS6PZU, ZS6PMH, ZS6PMG; hope to hear them on the air soon.

Visitors to Pretoria were ZS5C, and we hope ZS6EN.

ZS6AK is still working on his portable. It might get finished one day we hope.

ZS6AAS has the designs of a super-doooper portable, which he hopes will be the answer to the Ham's prayer. It certainly looks good on paper.

ZS6PTA

YOUTH DAY – 16 TH JUNE 2006.

Report by Johan de Bruyn ZS6JHB

Youth Day was celebrated on Friday 16th June and amateur radio was demonstrated country-wide by members of the licensed amateur community in various Kopanang Project schools with equipment sponsored by the Dept. of Communications (DOC) under the auspices of the SARL.

Kopanang Project schools are mainly in previously disadvantaged communities and were recently been equipped with HF, 2m and 70cm radios as well as antennas, power supplies and computers.

The aim of the project is to introduce Amateur Radio to these communities as a hobby and so stimulate technical careers.

The Pretoria Amateur Radio Club was involved with the Nic Mpshe High school in the Winterveld area. Johan ZS6JHB, Jaco Lubbe ZR6JLL and Thobile Koni ZS6TKO explained and operated amateur radio during the day.

Jaco manned the HF radio while Thobile informed the youngsters on what amateur radio is about and answered questions.

Some 65 QSO's were made on 145,725 and 145,750MHz. Almero ZS6LDP, Thys ZS6TVV and Rad ZS6RAD were some of the contacts made. When we eventually managed to establish contact on 7,070MHz (we could not get comms on the allocated frequency) the youngsters had a ball chatting to pupils of the Kwasante Secondary school in Pine Town Durban. This station was operated by Louis ZS5D and was also very well attended .

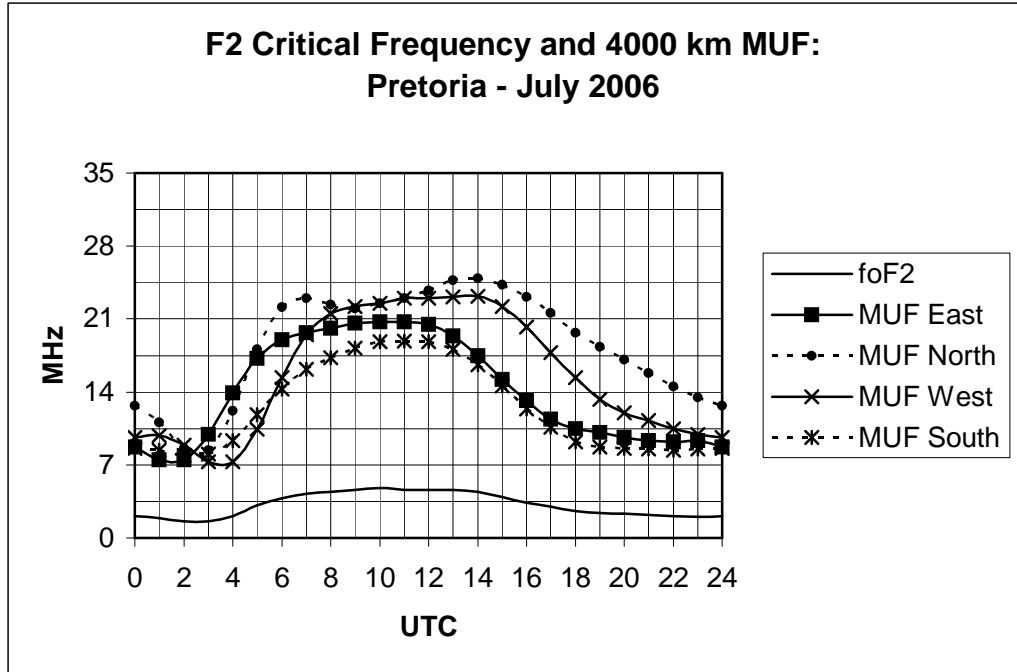
In closing, the day was a huge success. I counted 85 visitors to the school and I sincerely hope that the Pretoria Amateur Radio Club will stay committed to this wonderful project staged by the Dept of Communications and the South African Radio League .



Some of the pupils that came for the occasion

DX Operating
 The graph shows the 4000 km maximum useable frequency (MUF) to the East, North, West and South from Pretoria for the first hop using the F2 layer.

Local Operating
 The F2 critical frequency (foF2) is the maximum frequency that will reflect when you transmit straight up. E-layer reflection is not shown.



Feeding a masthead preamp for VHF/UHF

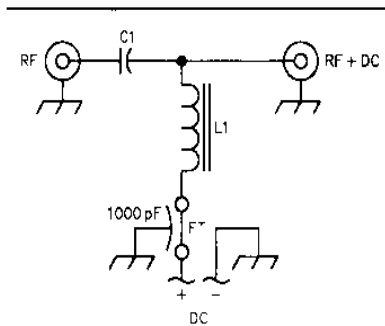


Fig 1—A schematic diagram of the bias tee.
 L1—An RF choke wound on a Micrometals T25-6 ferrite core. For VHF, use 16 turns of #28 AWG wire. For UHF, use 9 turns of #28 AWG wire.
 C1—Dielectric Labs chip capacitor. For VHF, 1000 pF (#C22AH102J7PXL). For UHF, 330 pF (#C22AH331JAPXL).

Table 1—Microstrip Widths for various Board Materials and Thicknesses

Board Material	H	W
Rogers 4003	0.032	0.073
GML 1000	0.030	0.071
FR4	0.031	0.055

ground plane of copper. Table 1 lists some 50-Ω line widths for several common PC board materials. There are also several programs available on the Web to calculate a line width if a different board material is used.

It is very important to insure a good ground between the connectors and the ground plane of the PC board. Fig 3 shows one method of transition

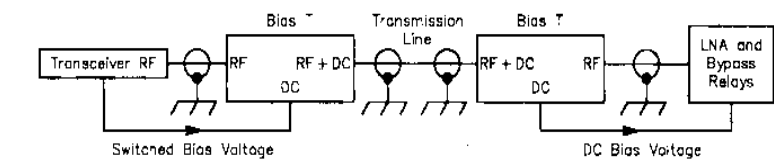
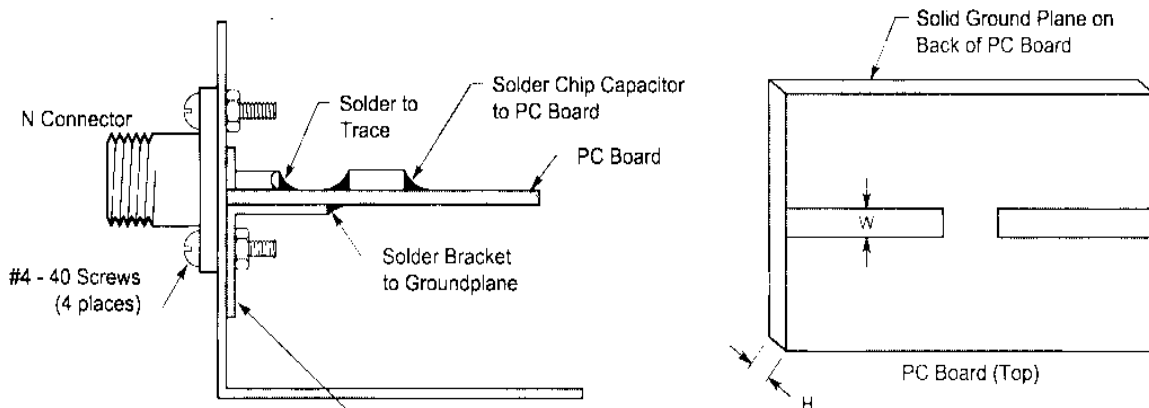


Fig 2—A block diagram of a typical station setup.



5. CIRCUITS WITH R, L, C COMBINED

We shall now examine more intricate complex circuits. You should by now be able to write down an impedance equation with just a mental picture of the vectors.

5a. SERIES L AND C

We shall assume to be using practical components with some coil loss but negligible capacitor loss:



Fig. 8

When feeding with a zero impedance voltage source

$$Z = R + jX_L - jX_C$$

This will reduce to a two term equation depending which reactive component is largest. If however they are equal

$$Z = R \dots\dots\dots [13]$$

which is the special condition called series resonance and the current is only limited by R. Said otherwise; a series resonant circuit can act like a virtual short-circuit. Due to the higher current the voltage across each L and C are now larger by Q:

5b. PARALLEL L AND C

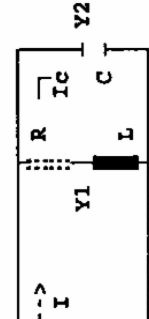


Fig. 9

Assuming the feed to be a high resistance current source:

$$Y = Y1 + Y2 = 1/R + jX_L + jX_C \dots [14]$$

A high circulating current I_c now flows inside the LC loop limited only by the value of the coil resistance R.

$$I_c = I_L = QI$$

In the limit, for Q much greater than R, the voltage across the circuit is $V = QI \cdot X_L$

and the DYNAMIC IMPEDANCE seen by the source is

$$Z_d = V/I = Q^2 R \dots\dots\dots [15]$$

The source only has to make up for circuit losses and thus the supply current need only be very small to just maintain the circulating current. Said otherwise; the dynamic (resonant) impedance is high and will not load the source to any great extent.

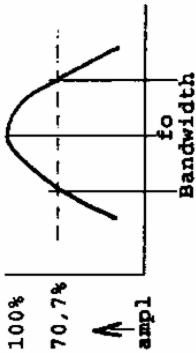
6. IMPORTANT PROPERTIES OF RESONANT CIRCUITS

- a) The impedance seen by the source is always resistive (real)
- b) Resonance occurs when all reactances cancel:

$$2\pi f_0 L = 1/2\pi f_0 C \dots\dots\dots [16]$$

and resonant frequency $f_0 = 1/2\pi\sqrt{LC}$

- c) Resonant circuits exhibit BANDWIDTH properties or SELECTIVITY. $BW = f_0/Q \dots\dots\dots [17]$ which is true at the half power (-3dB) point where the voltage or current will have reduced to 0.707 or 1/√2 of its value at resonance due to reactances not any more cancelling and thus impeding current flow. This occurs when the total reactance shift with frequency = R or alternatively when the total X shift is twice that of any single reactance ie: $\delta X = 2.2\pi(\delta f)L$ Proof of this is beyond the scope of this article but the graphical result well known and shown in fig.10



It is indeed this selective property on which all radio antenna, front end and further analogue circuitry is based. Critical lengths of transmission lines (coax or other) can also behave as high Q resonant circuits.

Variable tuning can be effected by varying any one of the reactive components whichever is the most practical. At VHF and beyond the reactive values can be unwittingly altered by the effect of stray capacitances to nearby objects and stray inductances due to lead lengths.

- d) Resonant circuits in electrically equivalent form also hide behind all types of filters. For instance,

- Quartz crystals are piezo-electric devices which when excited at their mechanical resonant frequency behave like very high Q resonant parallel circuits.

- Collins electromechanical filters in their simplest form comprise a disk driven with an axially applied oscillating force exhibiting a resonant mode like parallel resonance. A series of disks and rods inter-connected to form a ladder network and electrically driven through magnetostrictive couplers can form an excellent bandpass filter generally operating in the 100 KHz region.

- Ceramic filters are akin but the resonant components are disks of a piezo-electric ceramic such as barium titanate. The ceramic disks provide their own electro-mechanical conversion and separate transducers are not necessary. Size and cost are generally less.

A lovely intro to "Everyman's Wireless Book"
by FJ Camm (1942)

GENERAL PRINCIPLES OF WIRELESS RECEIVERS

THE principles upon which wireless reception is based have long since passed from the stage where they were the guarded secrets of the scientist and the stock-in-trade of the journalistic hack, who, in endeavouring to explain them, only succeeded in making them even more incomprehensible. In the early period of every science there are always those who, having that most dangerous possession, a little knowledge, seek to surround themselves with an academic yet spurious aura, that they may enjoy the adulation of those of their fellow men who may know even less. Their explanations bristle with diagrams and formulas, which it is doubtful whether they really understand, and the result is generally a typographical caricature, camouflaged between tastefully garnished covers, which lampoons the subject they seek to elucidate. The most abstruse subjects lend themselves to simple explanation, and mathematics (the armoury and smoke-screen so often used to hide lack of knowledge) are quite unnecessary.

Teenagers 350 BC....

"Teenagers these days are out of control, they eat like pigs, they are disrespectful of adults, they interrupt and contradict their parents, and they terrorize their teachers" (Aristotle, ca. 350 BC)

Senior hams are valuable

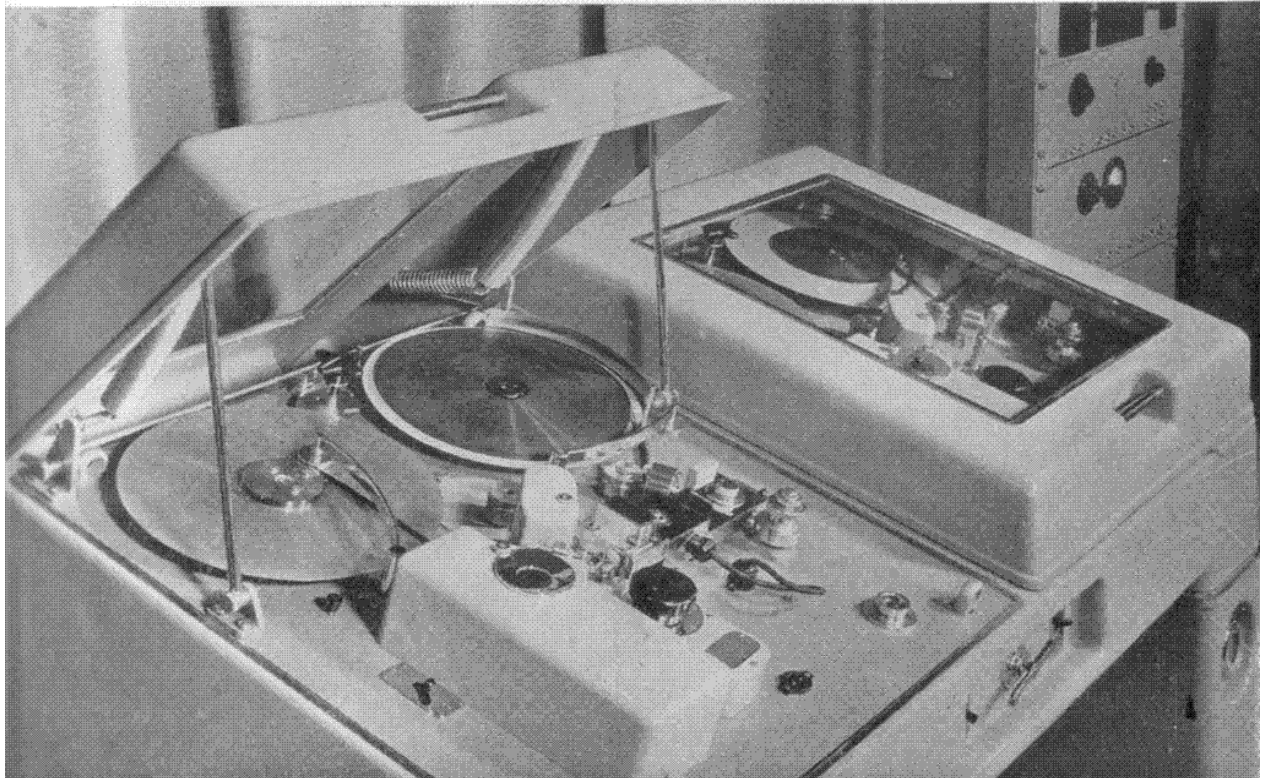
We are more valuable than any of the younger generations:
We have silver in our hair.
We have gold in our teeth.
We have stones in our kidneys.
We have lead in our feet and
We are loaded with natural gas.

2006 World Cup: Company directors face fines of up to £1,000 if staff watch matches on their work PCs and their employers do not have a TV licence, the TV Licensing Authority has warned (England)

**Professional sound recording
1949**

PHILIPS MILLER SYSTEEM ★ 41 ★

Onder: Dubbele Philips-Miller opname- en weergave-machine. De rechtse opname loopt; op de linkse helft is een nieuwe spoel klaar voor de start.



1895: The Royal Society (England) passed a resolution to the effect that man's knowledge of the universe was complete and that everything worthwhile had been invented.