



# WATTS 07-2017

Year 87 + 07m

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.parc.org.za>      [zs6pta@zs6pta.org.za](mailto:zs6pta@zs6pta.org.za)



**Bulletins : 145.725 MHz on Sundays / Sondag at 08:45**  
 Relays: 1.840, 3.700, 7.066, 10.135, 14.235, 51.400, 438.825, 1297 MHz  
 Activated frequencies are announced prior to bulletins  
**Swoptshop : 2m and 7.066 MHz live on-air after bulletins**  
 Bulletin repeats on Mondays / herhalings op Maandae : 2m 19:45



## PARC Veterans Tea / PARK Veterane Tee

**From Left to Right - Back Row:** Jurgen "JB" de Beer ZR6YV, Hans Kappetijn ZS6KR, Whitey Joubert ZS6JJJ, Karin Stapelberg, Sarel Stapelberg ZS6EK, Elma Basson, Gawie Basson ZS6GJJ, Etienne Naude ZS6EFN, Julie Sterling, Paul Sterling ZS6BMF, Pieter Fourie ZS6CN, Poppie Meyer ZS6BCP, Hansie Meyer ZS6AIK, Elaine van de Groenendaal, Hans van de Groenendaal ZS6AKV, Jan "Pine" Pienaar ZS6OB and Menno Havelaar ZS6AGC  
**Middle Row:** Erna Joubert, Martie de Beer, Joey Reid, Roy Alexander ZS6MI, Annatjie Fourie, Tjerk Lammers ZS6P, Joe Katzman ZS6TB, Erika Pienaar and Sandy Wolliatt ZS6ICE  
**Front Row:** Johan de Bruyn ZS6JHB (PARC Vice Chairman), Louis de Wet ZS6SK (PARC Secretary & Watts), Graham Reid ZS6GJR (PARC Chairman) and Nico van Rensburg ZS6QL (SARL President)

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### Club Meetings / Klub Vergaderings

#### Club Social Meeting :

Saturday the 1<sup>st</sup> of July from 14h00  
 at SAM

#### Committee Meeting :

Wednesday the 12<sup>th</sup> of July 2017  
 from 19h00 at SAM or per Skype

**Next PARC Flea Market dates for 2017 / Volgende PARK Vlooiemark datums vir 2017**

**29 July / 29 Julie (From 10h00)**

For more information please listen to the Sunday Bulletins or contact Almero Du Pisani  
 ZS6LDP at 083-938-8955 or [almero.dupisani@up.ac.za](mailto:almero.dupisani@up.ac.za)

## Birthdays / Verjaarsdae - July / Julie

06 Helen Newton ZR6HN  
13 Pieter Human ZS6PA  
17 Pine Pienaar ZS6OB  
19 Theo Bresler ZS6TVB

20 Roy Newton ZS6XN  
26 Frank Schneider ZS6GE  
29 Lian McAllister ZS5IE

### Spouse's Birthdays / Gade Verjaarsdae - July / Julie

01 Avida, gade van Theo Bresler ZS6TVB  
12 Sharmaine, gade van Louis de Wet ZS6SK  
17 Lyn, gade van Andre van Tonder ZS6BRC (Erelid)  
17 Judy, sw of David Botha ZS6O  
22 Ria, sw of Pete Smith-Curren ZS6PJ

### Anniversaries / Herdenkings - July / Julie

06 Elsa en Fritz Sutherland ZS6SF

## Lief en Leed / Joys and Sorrows

Johan du Bruyn ZS6JHB het sy ribbes gebreek en is tans besig om aan te sterk. Sterkte Johan!  
Etienne Naude ZS6EFN was af siek met griep. Ons wens hom alle sterkte toe.  
Pierre Holtzhausen ZS6PJH was af siek met brongitis. Ons wens hom 'n spoedige herstel toe.  
Menno Havelaar ZS6AGC het ten volle herstel van die operasie aan sy voet.

## Birthdays / Verjaarsdae - August / Augustus

03 Paul Sterling ZS6BMF  
05 Hans Gürtel ZR6HVG  
07 Whitey Joubert ZS6JJJ

07 JB de Beer ZR6YV  
08 Marnix Claeys ZS6MCM  
28 Jean de Villiers ZS6ARA

### Spouse's Birthdays / Gade Verjaarsdae - August / Augustus

No Birthdays

### Anniversaries / Herdenkings - August / Augustus

07 Peggy and Edmar Willers ZS6UT

## PARC Bulletins / PARK Bulletins

PARC Bulletins are presented on Sunday mornings at approximately 08h45, after the SARL Bulletins in English and Afrikaans, from 08h15. The Bulletin Presenters for the following two months are presented below. Please do contact the applicable presenter beforehand if you wish to make a contribution to the Bulletin. PARC Bulletins are broadcast on the 2 meter repeater on 145.725 MHz, and 70 cm on 438.025 MHz. Relays are done on 7.060 MHz by Hans Kappetijn ZS6KR and on Echolink by Johan Lehman ZS6JPL.

PARK Bulletins word op Sondag oggende aangebied om 08h45, na die SARL Bulletins in Engels en Afrikaans, vanaf 08h15. The Bulletin aanbieders vir die volgende twee maande word onder aangedui. Kontak gerus die toepaslike Bulletin leser indien u 'n bydrae tot die Bulletin wil maak. PARK Bulletins word uitgesaai op die 2 meter Herhaler op 145.725 MHz, en 70cm op 438.205 MHz. Herleidings word gedoen op 7.060 MHz deur Hans Kappetijn ZS6KR, en op Echolink deur Johan Lehman ZS6JPL.

### PARC Bulletin Presenters : June - July 2017

Date	Presenter	Date	Presenter
04 June 2017	Tjerk Lammers ZS6P	09 July 2017	Tjerk Lammers ZS6P
11 June 2017	Johan du Bruyn ZS6JHB	16 July 2017	Johan du Bruyn ZS6JHB
18 June 2017	Louis de Wet ZS6SK	23 July 2017	Louis de Wet ZS6SK
25 June 2017	Almero du Pisani ZS6LDP	30 July 2017	Almero du Pisani ZS6LDP
02 July 2017	Etienne Naude ZS6EFN	06 August 2017	Etienne Naude ZS6EFN

*Please do contact Etienne Naude ZS6EFN for more information or any Bulletin arrangements*

### PARC SUBS : PARK LEDEGELD : FROM / VANAF : 30-06-2017

Bank	First National Bank	<b>Ordinary Members / Gewone Lede : R160</b> <b>Spouses / Pensioners : R60</b>	<b>Your call sign must appear as statement text!</b>
Branch Code	25 20 45		
Account No	546 000 426 73		

**Please remit your subs in time to our Treasurer, or pay per transfer into the PARC account**  
**Betaal asb. u ledegelde betyds aan ons Tesourier, of betaal per oorplasing in die PARC rekening**

**Please Note : If your Club fees are not paid up to date, birthday details cannot be displayed in Watts**



## PARC Committee Members / Komiteede : 2016 - 2017

<u>Elected Members</u>	<u>Name</u>	<u>Callsign</u>	<u>Email Adress</u>	<u>Tel No</u>	<u>Mobile No</u>
Chairman, Web co-ordination	Graham Reid	ZS6GJR	<a href="mailto:greid@wol.co.za">greid@wol.co.za</a>	012-667-2720	083-701-0511
Vice Chairman, Repeater & Rallies	Johan de Bruyn	ZS6JHB	<a href="mailto:zs6jhb@gmail.com">zs6jhb@gmail.com</a>	012-803-9418	079-333-4107
Bulletins, RAE & Liason	Etienne Naude	ZS6EFN	<a href="mailto:etienne@afgrid.com">etienne@afgrid.com</a>	012-661-6745	082-553-0542
Treasurer	Andre van Tonder	ZS6BRC	<a href="mailto:andre.vtonder@absamail.co.za">andre.vtonder@absamail.co.za</a>	012-361-3292	079-869-0753
Clubhouse Manager	Pieter Fourie	ZS6CN	<a href="mailto:pieterzs6cn@gmail.com">pieterzs6cn@gmail.com</a>	012-804-7417	082-573-7048
Social	Whitey Joubert	ZS6JJJ	<a href="mailto:zs6jjj@gmail.com">zs6jjj@gmail.com</a>	012-993-2267	072-120-4516
Secretary, Watts & RAE	Louis de Wet	ZS6SK	<a href="mailto:louis.zs6sk@gmail.com">louis.zs6sk@gmail.com</a>	012-349-1044	072-140-9893
<u>Co-Opted Members</u>	<u>Name</u>	<u>Callsign</u>	<u>Email Adress</u>	<u>Tel No</u>	<u>Mobile No</u>
Fleamarkets	Alméro Dupisani	ZS6LDP	<a href="mailto:almero.dupisani@up.ac.za">almero.dupisani@up.ac.za</a>	012-420-3779	083-938-8955
Auditor	Tony Crowder	ZS6CRO	<a href="mailto:tcrowder@telkomsa.net">tcrowder@telkomsa.net</a>	011-672-3311	
Historian, Archives, Awards	Tjerk Lammers	ZS6P	<a href="mailto:zs6p@iafrica.com">zs6p@iafrica.com</a>	012-809-0006	083-976-4387
Contests	Jaco Cronje	ZR6CMG	<a href="mailto:jacocronje@yahoo.com">jacocronje@yahoo.com</a>		081-474-2220
Contests	Pierre Holtzhausen	ZS6PJH	<a href="mailto:zs6pjh@telkomsa.net">zs6pjh@telkomsa.net</a>	012-655-0726	082-575-5799

### Contests and Diary of Events - July 2017 / Kompetisies en Dagboek van Gebeure - Julie 2017 (UTC Times)

01	RAC Canada Day Contest : 00h00 - 23h59
01	Venezuelan Independence Day Contest : 00h00 - 23h59
01	SARL Newbie QSO Party ; Start of the ZS6ZU Hammies RAE Course
02	ZS5 Sprint
01 - 02	Marconi Memorial HF Contest : 14h00 - 14h00
01 - 02	DARC 10-Meter Digital Contest : 11h00 - 17h00
03	RSGB 80m Club Championship, CW : 19h00 - 20h30
08 - 09	IARU HF World Championship : 12h00 - 12h00
12	RSGB 80m Club Championship, SSB : 19h00 - 20h30
14 - 16	Ham Radio 2017, Friedrichshafen, Germany
14 - 17	ZS2ZU Hammies RAE Boot Camp
15	RADAR Challenge and ZS2 Sprint
15 - 16	CQ Worldwide VHF Contest : 18h00 - 21h00
22	Winter QRP Contest
23	ZS2 Sprint
27	RSGB 80m Club Championship, Data : 19h00 - 20h30
29	PARC Flea Market from 10h00
29 - 30	RSGB Islands on the Air (IOTA) Contest : 12h00 - 12h00

### Contests and Diary of Events - August 2017 / Kompetisies en Dagboek van Gebeure - Augustus 2017 (UTC Times)

5 - 6	10-10 International Summer Contest, SSB : 00h01 - 23h59
6	SARL HF Phone Contest : 13h00 - 16h30
9	SARL YL Sprint
12 - 13	WAE DX Contest : 00h00 - 23h59
19 - 20	International Lighthouse and Lightship Weekend
20	SARL HF Digital Contest : 13h00 - 16h30
26 - 27	YO DX HF Contest : 12h00 - 12h00
27	SARL HF CW Contest : 13h00 - 16h30

More information can be obtained from the SARL website, as well as the WA7BNM contest calendar at the following website: <http://hornucopia.com>

## Rally News 2017 : Tydren Nuus 2017

### 2017 Rally Calendar / 2017 Tydren Kalender

*Round	Date	Province	Location
5	18/19 August	Gauteng	Bronkhorstspuit
7	21 October	Free State	Welkom

\*Other rounds 4 and 6 are in Port Elizabeth and Caledon

### 2017 Cross Country Championship Calendar

Round	Date	Location
4	28/29 July	TBC
5	15/16 September	Sun City
6	27/28 October	TBC

Indien u sou belangstel om met radio ondersteuning betrokke te raak, kontak gerus vir Johan de Bruyn ZS6JHB by 079-333-4107 of [zs6jhb@gmail.com](mailto:zs6jhb@gmail.com)

## PARC Pensioner's Tea ; PARK Pensionaris Tee



The annual Pretoria Amateur Radio Club Veterans Tea Event was held on the 10<sup>th</sup> of June 2017 at Bianca's Bed and Breakfast. In addition to the lovely weather experienced, the event was well organised by Etienne Naude ZS6EFN and Johan du Bruyn ZS6JHB. The event was opened by the PARC Chairman, Graham Reid ZS6GJR. All the guests present, including the President of the South African Radio League, Nico van Rensburg ZS6QL, and the President of AMSAT SA, Hans van de Groenendaal ZS6AKV, were welcomed by Graham. An excellent meal was presented to the guests, which was followed by a photo session in the garden.



Graham Reid ZS6GJR welcoming all guests present



Hans van de Groenendaal ZS6AKV, sw Elaine and Nico van Rensburg ZS6QL, President of the South African Radio League



Sarel Stapelberg ZS6EK and sw Karin ; Gawie Basson ZS6GJJ and sw Elma ; Whitey Joubert ZS6JJJ and sw Erna



Joe Katzman ZS6TB, Roy Alexander ZS6MI, Poppie Meyer ZS6BCP and Hansie Meyer ZS6AIK





Martie de Beer, sw of JB de Beer, Paul Sterling ZS6BMF and "JB" de Beer ZR6YV



Hans Kappetijn ZS6KR, Jan "Pine" Pienaar ZS6OB and sw Erika



Some of the very tasty treats which were presented to the guests



Sandy Woolliatt ZS6ICE and Menno Havelaar ZS6AGC



Hans van de Groenendaal ZS6AKV and sw Elaine, and Jan "Pine" Pienaar ZS6OB and sw Erika



JB de Beer ZR6YV and sw Martie, and Paul Sterling ZS6BMF and sw Julie





Sandy Woolliatt ZS6ICE and Menno Havelaar ZS6AGC and Pieter Fourie ZS6CN and sw Annatjie



Hansie Meyer ZS6AIK and sw Poppie ZS6BCP



PARC Chairman Graham Reid ZS6GJR and sw Joey



A final group photo of some of the gentlemen who were unaccompanied (except Graham Reid): Hans Kappetijn ZS6KR, Roy Alexander ZS6MI, Joe Katzman ZS6TB, Johan de Bruyn ZS6JHB, Graham Reid ZS6GJR PARC Chairman), Etienne Naude ZS6EFN, Nico van Rensburg ZS6QL (SARL President) and Tjerk Lammers ZS6P

Pretoria Amateur Radio Club hereby thanks the organisers of the event, as well as everyone who has attended, sincerely for their inputs and participation. PARC believes that this great tradition will last for many years to come.



**Theo Bresler ZS6TVB : Winner of the 2016 World-Wide DX Contest SSB**



Pretoria Amateur Radio Club hereby sincerely congratulates Theo Bresler ZS6TVB for his remarkable achievement of winning the 1<sup>st</sup> Place in South Africa, 2<sup>nd</sup> place in Africa and 16<sup>th</sup> place World Wide in the 2016 World-Wide DX Contest SSB. A total score of 155 530 was obtained by Theo during this competition over a 48 hour period where he deprived himself of sleep and kept body functions to a minimum! Theo mentioned that a well-known energy drink and cigarettes kept him going during this time. Theo, we are extremely proud of your achievement and encourages all PARC Members to follow his example of how competitions should be done!



**Pretoria Amateur Radio Club Annual General Meeting : Proxy & Nomination Forms**  
**Pretoria Amateur Radio Klub Algemene Jaarvergadering : Volmag en Nominasie Vorms**



**87<sup>th</sup> ANNUAL GENERAL MEETING**  
**87<sup>ste</sup> ALGEMENE JAARVERGADERING**  
**Pretoria Amateur Radio Club**



**Pretoria Old Motor Club**  
**Keuning Str. Silverton**

**Venue**  
**Saturday 26 August 2017**  
**Time : 11h30**  
**Agenda : To be published**

**Plek**  
**Saterdag 26 Augustus 2017**  
**Tyd : 11h30**  
**Agenda : Sal gepubliseer word**

**NB**

Nominations awaited. Latest acceptance by 11h00 on 26 August 2017  
 Nominasies word afgewag. Laatste indiening teen 11h00 op 26 Augustus 2017  
 Contact details on page 3 of WATTS / Kontakdetails op bladsy 3 van WATTS

**PROXY Form (cut out) || VOLMAG Vorm (knip uit)**

Only paid-up members may submit proxies || Slegs opbetaalde lede mag volmagte indien

I/Ek .....being ZS/R/U..... give/gee .....ZS/R/U.....

Proxy to vote on my behalf at the 2017 PARC AGM

Volmag om namens my te stem tydens die 2017 PARK AJV **Geteken/Signed**.....

**NOMINATION Form (cut out) || NOMINASIE Vorm (knip uit)**

**Committee Nominations** must be in writing and signed by both the Proposer and Nominee and be handed in on **26 August 2017 at 11h00 at the latest**. Use the Nomination Form below. The Proposer and Nominee must both be paid-up members.  
**Komitee Nominasies** moet skriftelik wees en deur beide die Voorsteller en Voorgestelde geteken word en moet **op laaste teen 11h00 op 26 Augustus 2017** ingehandig word. Gebruik die Nominasievorm hieronder. Beide Voorsteller en Voorgestelde moet opbetaalde lede wees.

Proposer: ZS Signature:  
 Voorsteller:.....ZR..... Handtekening:.....  
 ZU

NOMINEE GENOMINEERDE	CALLSIGN ROEPSEIN	NOMINATION ACCEPTED NOMINASIE AANVAAR
1		
2		
3		
4		



## Notice of motion to amend the constitution of Pretoria Amateur Radio Club

The amendments are proposed for the following reasons:

To add certain key governance principles currently omitted from the club's constitution.  
To align the club's operational and fiduciary responsibilities with best practices.  
To correct certain spelling and syntax errors

Changes are highlighted in **bold print**. Insertions and deletions are printed in **red**.

### CLAUSE 31

31. General meetings shall be held by the Club ~~which shall decide the month in each year when it's~~  
Compulsory Annual General Meeting will be held **within 60 days after the club's financial year end** in  
substitution OF its ordinary meeting. Special general meetings may also be convened under these Rules.

*Reason for change: The current constitution does not mention any specific date/timeline by which an Annual General meeting has to be held. Not stating a date/timeline leaves the decision on a AGM open-ended and which can lead a prolonged final decision on an AGM date.*

### CLAUSE 34.2

34.2. the bank or ~~building society~~ with which the funds of the Club are to be deposited and, subject to the provisions of the Rules, the manner in which such funds shall be administered.

*Reason for change: building societies are no longer a financial services organisation and therefore propose to remove the reference to building society from clause 34.2*

### CLAUSE 37

37. Nominations for election to the committee shall be made by the members **and should be submitted to the club secretary in writing on the nomination forms provided. Such committee nominations shall reach the club secretary latest 14 days before the date of the AGM;** provided, however, that any member who will be unable to attend the meeting may address his nomination to the secretary as to reach the secretary at least two clear days before the date of such meeting

*Reason for change: Currently there are no specific deadlines by which committee nominations are to be submitted at. This cause for an open-ended approach and late nominations been created just to fill committee positions.*

### CLAUSE 38.4

**38.4. Nominations are received after the closing date of nomination submissions which is 14 days before the date of the AGM.**

Reason for deletion: Submission of nominations will not be valid if the nominations are received after the closing date of the such nominations.

**CLAUSE 66**

**66. The Chairman's report, AGM Agenda, Audited Financial results and minutes of the previous AGM must be published on the club's web site and distributed to members latest 21 days before the date of the scheduled AGM each year.**

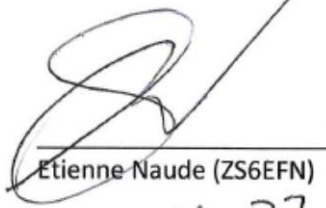
Reason for changes: Currently no financial results, Chairman reports or minutes of the previous AGM are being distributed before the start of the scheduled AGM. This is a) not according to best practises and b) does not allow members to prepare for the meeting if information pertaining to the AGM is not received within time before hand.

**CLAUSE 49**


**49. The club's treasurer shall publish the quarterly, half year and year end Financial Management Reports on the club's web site.**

Reasons for changes: In order to become more transparent and to provide our members with insight to the financial matter of the club, regular publication of the financial status of the club is necessary.

Proposed By:

  
Etienne Naude (ZS6EFN)  
2017-06-27

Seconded By:

  
Louis de Wet (ZS6SK)  
2017-06-27





## Die Desert 1000 Tydren Botswana : Irene Myburgh ZS6IEA

Hierdie was heeltemal 'n ervaring in 'n ander klas. Van ons het al die 22 Junie 2017 deur gegaan en ander het die 23 Junie 2017 deur gegaan.

Vir party van ons was die grenspos baie maklik gewees en vir ander nie so maklik nie. Graham en Joey Reid moes nadat hulle in Botswana se kant van die grens was weer terugkeer na die Suid Afrikaanse kant, hulle moes hulle rekenaars verklaar.

Dit het nogal rof gegaan die Saterdag vir Pieter en Irene Myburgh want hulle was by "refuel 1" vir die motorfietse. Hulle sal so amper ses tot sewe gelyk arriveer en almal moet 'n tyd gegee word en verder verwerk word. Peter Setcliff van SANORA het darem handtjie by gesit. Die Saterdag het almal hulp ook gehad van die "locals". Die Sondag het dit heelwat beter gegaan alhoewel die "locals" nie op gedaag het nie.

Die kultuur in Botswana is anders. Die toeskouers by die rally het sommer vanaf Donderdag aand tot Sondagmiddag net daar langs die pad gekamp, geëet, gekuier, en die rally dop gehou. Hulle het nie huis toe gegaan en dan weer terug gekom nie. Hulle was die hele tyd daar reg langs die pad.

Dit was baie warm deur die dag en koud in die aande. Daar is gesê dat Botswana is die land van die uiterste, dit is of baie warm of baie koud. Ons het almal die 26 Junie 2017 terug gekeer na ons verskillende wonings.



Die wegspring punte by die 4-wiel aangedrewe veldmotors en motorfietse was 'n stowwerige afferre!



Brandstof hervul punt vir motorfietse



Joey op soek na koffie..



Nabetragting na 'n dag se aksie

## RAE October 2017 Syllabus and Lectures

Lectures for the October 2017 Radio Amateur Examination will be presented by PARC from the 1<sup>st</sup> of July 2017. The course presented by PARC is free of charge. For more information on the lectures, please do contact Etienne Naude ZS6EFN at [etienne@afgrid.co.za](mailto:etienne@afgrid.co.za).

Week	Date	Material	Tutor	Chapter	Tutor
1	01-Jul-17	RAE Information Session	E/LdW/VH	1	Overview of Amateur Radio
2	08-Jul-17	Chapter 1 - 4	E	2	Operating Procedures
3	15-Jul-17	Chapter 5 - 7	E	3	Basic Electrical Concepts
4	22-Jul-17	Chapter 8 - 10	E	4	Resistance and Ohm's Law
5	29-Jul-17	Chapter 11 - 13	LdW	5	The Resistor and Potentiometer
6	05-Aug-17	Chapter 14 - 16	LdW	6	Direct Current
7	12-Aug-17	Chapters 17 - 19	LdW	7	Power in DC Circuits
8	19-Aug-17	Break		8	Alternating Current
9	26-Aug-17	Chapters 20 - 22	LdW	9	Capacitance and the Capacitor
10	02-Sep-17	Chapter 23 - 25	LdW	10	Inductance and the Inductor
11	09-Sep-17	Chapters 26 - 27	VH	11	Tuned Circuits
12	16-Sep-17	Chapters 28 - 30	E	12	Decibel Notation
13	23-Sep-17	Chapters 31 - 33	E	13	Filters
14	07-Oct-17	HF Assessment	E/LdW/VH	14	The Transformer
	21-Oct-17	RAE		15	Semiconductors and the Diode
				16	The Power Supply
	E	Etienne Naude		17	Bipolar Junction Transistor
	LdW	Louis de Wet		18	The Transistor Amplifier
	VH	Vincent Harrison		19	The Oscillator
				20	Frequency Translator
				21	Modulation Methods
				22	The Transmitter
				23	Receiver Fundamentals
				24	The Super Heterodyne Receiver
				25	Transceivers and Transverters
				26	Antennas
				27	Propagation
				28	Electromagnetic Compatibility
				29	Measurements
				30	Digital Systems
				31	Digital Communication Modes
				32	Safety Considerations
				33	Before You Go

Lecture notes for the RAE can be obtained from the SARL website at <http://www.sarl.org.za/public/licences/rae.asp>. The various files which can be downloaded required for study for the RAE include the following:

The following documents are available. Click on the document title to download a copy.

Reference Date	Document Title	File Type	Size
2016-06-14	<a href="#">SARL Inleiding tot Amateurradio - Klas A Studiegids</a>	PDF	980 kB
2016-05-06	<a href="#">ICASA Regulations - Effective for Oct 2016 examination and onwards</a>	PDF	286 kB
2016-05-05	<a href="#">SARL RAE Class A Study Guide - 2016 Effective for Oct 2016 exam and onwards</a>	PDF	4.6 MB
2016-05-05	<a href="#">HF Assessment Preparation Guide - Effective for Oct 2016 Exam and onwards</a>	PDF	1.3 MB

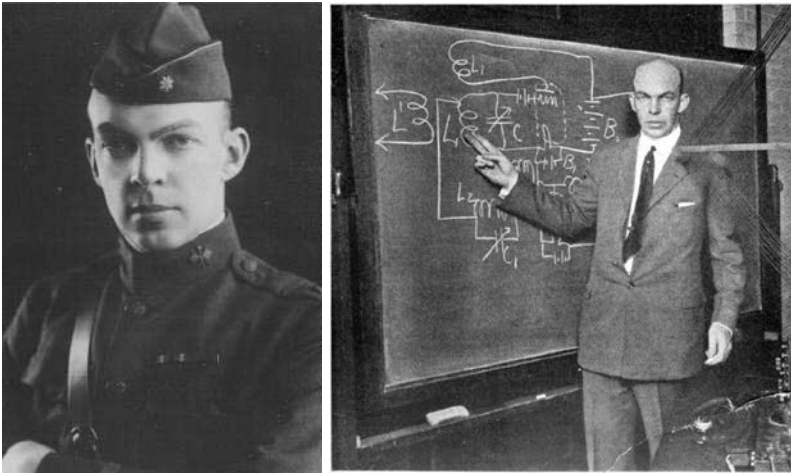
### Venue and times:

Lectures will be presented in the Board Room of Waterlab (Pty) Ltd from 9h00 - 12h00 each of the dates (Saturdays) listed above. The address of the venue is 23B de Havilland Crescent, Perseus Park, Pretoria. Please do contact Louis de Wet ZS6SK at [louis.zs6sk@gmail.com](mailto:louis.zs6sk@gmail.com) if you require more information on the venue.



## Edwin Howard Armstrong : Inventor of the Superheterodyne and FM Radio (Part1)

"Be it known that I, Edwin H. Armstrong, a citizen of the United States, residing at 1032 Warburton Avenue, Yonkers, county of Westchester, State of New York, have invented certain new and useful improvements in Wireless Receiving Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention"... such were the introductory words of US Patent No 1,113,149, issued by the United States Patent Office on the 6<sup>th</sup> of October 1914, for the regenerative circuit. Born on the 18<sup>th</sup> of December 1890, Armstrong was an electrical engineer and inventor known as the inventor of FM (Frequency Modulation) radio.



Earning a degree in electrical engineering from Columbia in 1913, Armstrong served in the Signal Corps as a captain and major during World War 1, where after he was appointed as Professor of Electrical Engineering at Columbia, a position he held for the remainder of his life. Armstrong held 42 patents and received numerous awards, which included the first Medal of Honor of the Institute of Electrical Engineers, the French Legion of Honor, the 1941 Franklin Medal and the 1942 Edison Medal. In addition, he was inducted into the National Inventors Hall of Fame, and included into the International Telecommunications roster of great inventors.

Armstrong has always been known for his four principal inventions: regeneration, super regeneration, the superheterodyne, and frequency modulation. Of all, the superheterodyne always seemed to be the least controversial. The controversies which seemed to have plagued his entire life, and the bitter end after losing his superheterodyne patent will not be discussed article, but his research and developments in the field of Frequency Modulation (FM) will be presented in some detail. In a paper entitled "A method of Reducing Disturbances in Radio Signaling by a System of Frequency Modulation" in 1936<sup>[1]</sup>, Armstrong describes in much detail his theoretical and practical approaches of achieving Frequency Modulation. In his paper he states conditions which must be fulfilled in order to place a FM system upon a comparative basis with an Amplitude Modulated (AM) system; as the main aim of his research was to prove that FM is superior to AM:

- 1) It is essential that the frequency deviation shall be about a fixed point. That is, during modulation there shall be a symmetrical change in frequency with respect to this point and over periods of time there shall be no drift from it.
- 2) The frequency deviation of the transmitted wave should be independent of the frequency of the modulating current and directly proportional to the amplitude of that current.
- 3) The receiving system must have such characteristics that it responds only to changes in frequency and that for the maximum change of frequency at the transmitter (full modulation) the selective characteristic of the system responsive to frequency changes shall be such that substantially complete modulation of the current therein will be produced.
- 4) The amplitude of the rectified or detected current should be directly proportional to the change in frequency of the transmitted wave and independent of the rate of change thereof.
- 5) All the foregoing operations should be carried out by the use of aperiodic means.<sup>[1]</sup>

Armstrong continues to describe an FM transmitter system which will be used during tests where the capabilities of FM and AM receivers will be compared during a set of tests. The transmitter system employed the modulating current to shift the phase of a current derived from a source of fixed phase and frequency by an amount which is directly proportional to the amplitude of the modulating current and inversely proportional to its frequency. The resulting phase shift was then put through a sufficient number of frequency modulations to insure 100% modulation for the highest frequency of the modulating current. Substantial linearity was achieved by keeping the initial phase shift below thirty degrees. The phase shift was achieved by using a source of fixed frequency, a balanced modulator excited by this source, as well as arrangements for selecting the side frequencies from the modulator output, and combining them in the proper phase with an unmodulated current derived from the initial source.

The schematic arrangements of the transmitter circuits are shown in Figures 1 and 2, indicating the master oscillator which may be in the order of 50-100 thousand cycles per second, depending on the frequency of the modulating current. An electromotive source derived from this oscillator is applied in like phase to the grid of an amplifier and both grids of a balanced modulator. The plate circuits of the modulator tubes are made non-reactive for the frequency applied to their grids by balancing out the reactance of the transformer primaries as shown in the figures. The plate currents are therefore in phase with the EMF applied to the grid.

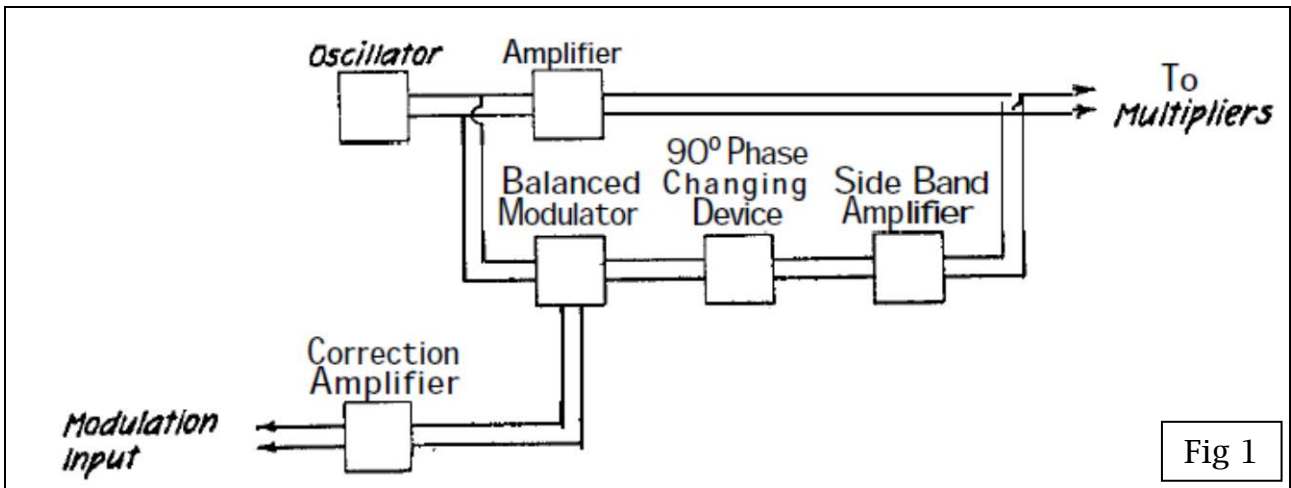


Fig 1

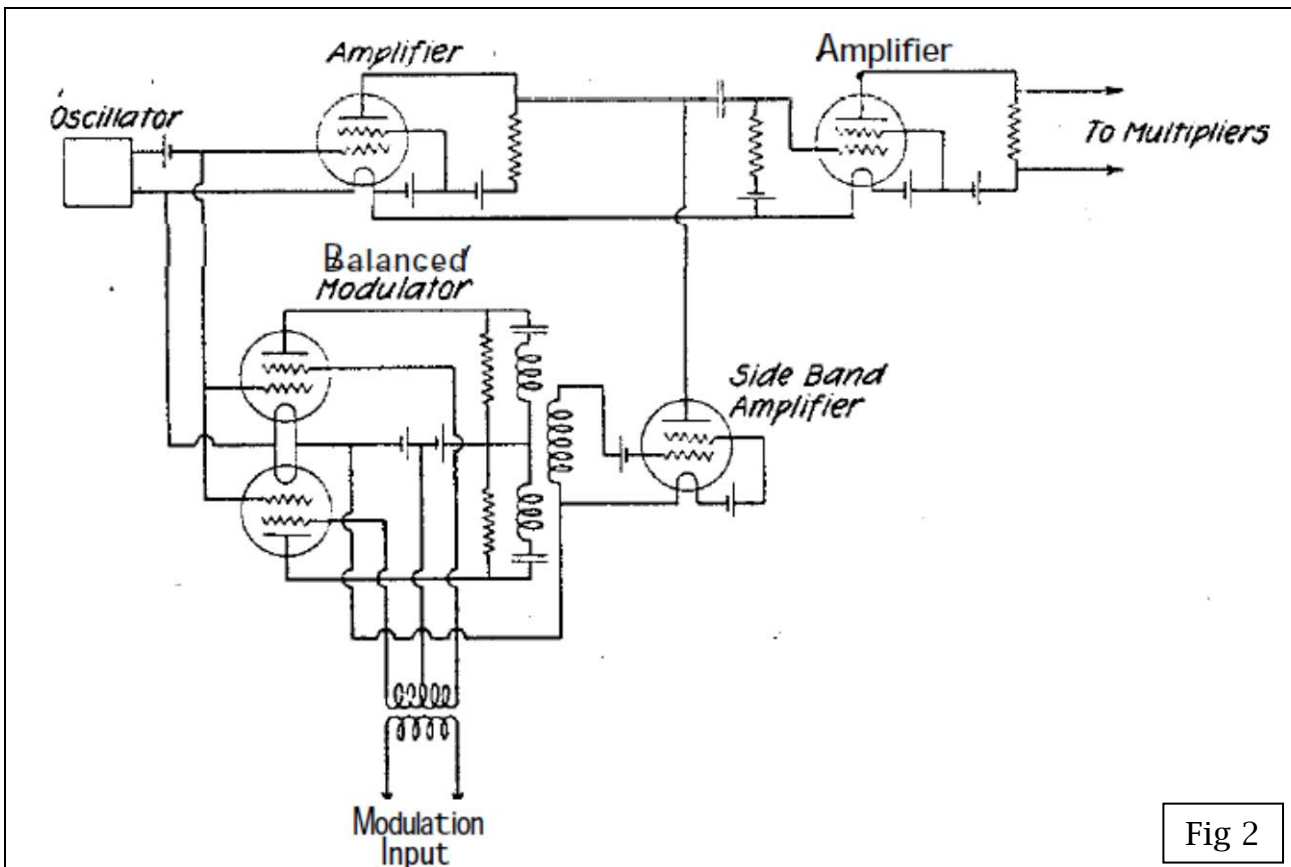


Fig 2

The succeeding amplifier is coupled to the output transformer by a coil whose natural period is high compared to frequency of the master oscillator, and the EMF applied to the grid of this amplifier when the modulator tubes are unbalanced by a modulating voltage applied to the screen grids is therefore shifted in phase ninety degrees (or 270 degrees) with respect to the phase of the EMF applied to the grids of the balanced modulators. Subsequently, the phase of the currents existing in the plate circuit of the amplifier of the output of the balanced modulator (at the peak of the modulation voltage) is either ninety degrees or 270 degrees apart from the phase of the current existing in the plate circuit of the amplifier of the unmodulated master oscillator current. Therefore the voltages which they develop across the common resistance load will be ninety degrees apart.<sup>[1]</sup>

The resulting effect on the phase of the voltage developed across the resistance in the plate circuits of these two amplifiers when modulation is applied, compared to the phase of the voltage which would exist there in the absence of modulation is shown in Figure 3. From the vector diagrams it is apparent that the phase of the voltage across the common resistance load is alternately advanced and retarded by the combination of the modulated and unmodulated components, and that the maximum phase shift is given by an angle whose tangent is the sum of the peak values of the two side frequencies divided by the peak value of the unmodulated component.<sup>[1]</sup>



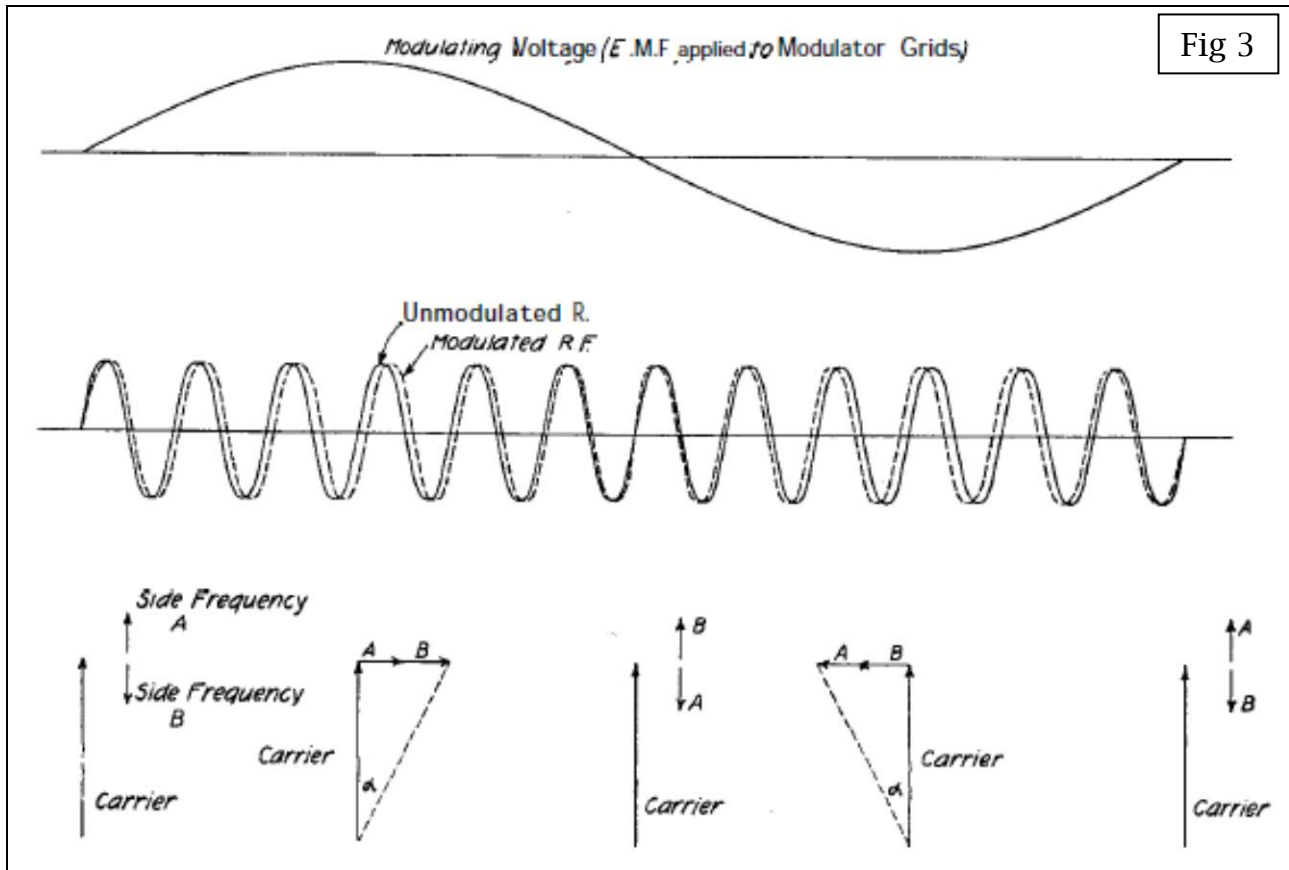


Fig 3

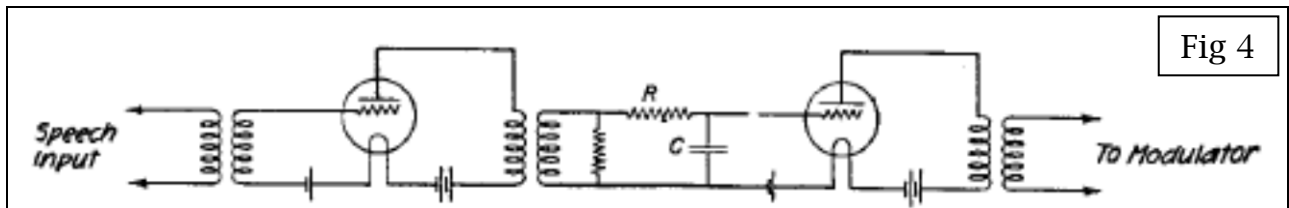
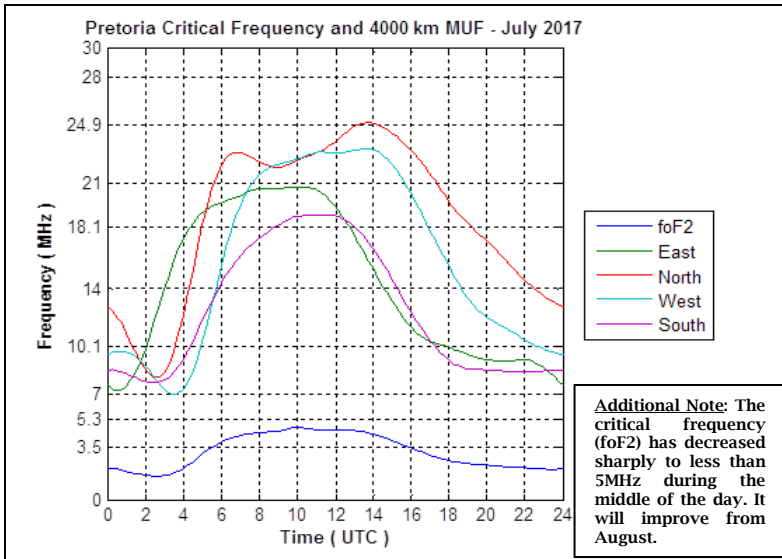


Fig 4

By keeping this angle sufficiently small (not greater than 30 degrees) it may be made substantially proportional to the amplitude of the two side frequencies and hence to the amplitude of initial modulating current (*For the large angular displacements there will be an appreciable change in amplitude of the combined currents at double the frequency of the modulating current. This variation in amplitude is not of primary importance and is removed subsequently by a limiting resistor*).

If the angle through which the phase is shifted to be same for all frequencies of modulation, then the rate of increase or decrease of the angle will be proportional to the frequency of modulation, and hence the deviation in frequency of the transmitted wave will be proportional to the frequency of the modulating current. In order to insure a frequency deviation which is independent of the modulation frequency it is necessary that, for a constant impressed modulating EMF, the angle through which the phase is shifted be made inversely proportional to the frequency of the modulating current. This is accomplished by making the amplification of the input amplifier inversely proportional to the frequency by means of the correction network shown in Figure 4. This network consists of a high resistance in series with a capacitor whose impedance for the lowest frequency of modulation is relatively small with respect to the series resistance. The voltage developed across the capacitor which excites the succeeding amplifier stage is therefore inversely proportional to the frequency and hence it follows that the angle through which the current is advanced or retarded becomes directly proportional to the amplitude of the modulating current and inversely proportional to its frequency. The resulting phase shift must be multiplied by a great many times before a frequency modulated current which can be usefully employed is produced. Subsequently, a frequency multiplication of 500 times is required in order to produce a wave which is fully modulated and capable of being effectively handled by a receiver in the presence of disturbing currents. Next month we will look at the FM receiver and tests conducted.

<sup>11</sup>ARMSTRONG, E.H. 1936. A method of Reducing Disturbances in Radio Signaling by a System of Frequency Modulation. *Proceedings of the Institute of Radio Engineers*. Vol 24, No 5.



## Long Term HF Propagation for July 2017

### 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 F-layer frequency for short range communications.

For worldwide propagation see: <http://www.parc.org.za/index.php?page=propagation>

Courtesy Vincent ZS6BTY

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**"WE CAN COMPLAIN BECAUSE ROSE BUSHES HAVE THORNS, OR REJOICE BECAUSE THORN BUSHES HAVE ROSES."**  
*- Abraham Lincoln*

**"A day without laughter is a day wasted."**  
*- Charlie Chaplin*

**If it wasn't hard, everyone would do it. It's the hard that makes it great.**  
*- Tom Hanks*

**"You're only given one little spark of madness. You mustn't lose it."**  
*- Robin Williams*

**You miss 100% of the shots you don't take.**  
*- Lee Harvey Oswald*

**"Have the courage to follow your heart and intuition. They somehow know what you truly want to become."**  
*- Steve Jobs*

Quotes by some famous people..