Bulletins : 145.725 MHz on Sundays / Sondae at 08:45

Swopshop : 2m and 7.066 MHz live on-air after bulletins

WATTS

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12-2016
Year 86 + 12m

Monthly Newsletter of the Pretoria Amateur Radio Club
Maandelikse Nuusbrief van die Pretoria Amateur Radio Klub

Ou Radio Vriende : Louis de Wet ZS6SK en Sakkie Coetzee ZS6BPA

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Club Meetings / Klub Vergaderings

Club Social Meeting :

Saturday the 2nd of December 2016 from 14h00 at SAM

Committee Meeting :

Wednesday the 7th of December from 19h00 at SAM

PARC Committee Members / Komiteelede : 2016 - 2017

Elected Members	Name	Callsign	Email Adress	Tel No	Mobile No
Chairman, Web co-ordination	Graham Reid	ZS6GJR	greid@wol.co.za	012-667-2720	083-701-0511
Vice Chairman, Repeater & Rallies	Johan de Bruyn	ZS6JHB	zs6jhb@gmail.com	012-803-9418	079-333-4107
Bulletins, RAE & Liason	Etienne Naude	ZS6EFN	etienne@afrigrid.com	012-661-6745	082-553-0542
Treasurer	Andre van Tonder	ZS6BRC	andreh.vtonder@absamail.co.za	012-361-3292	079-869-0753
Clubhouse Manager	Pieter Fourie	ZS6CN	pieterzs6cn@gmail.com	012-804-7417	082-573-7048
Social	Whitey Joubert	ZS6JJJ	zs6jjj@gmail.com	012-993-2267	072-120-4516
Secretary, Watts & RAE	Louis de Wet	ZS6SK	louis.zs6sk@gmail.com	012-349-1044	072-140-9893

Co-Opted Members	Name	Callsign	Email Adress	Tel No	Mobile No
Fleamarkets	Alméro Dupisani	ZS6LDP	almero.dupisani@up.ac.za	012-420-3779	083-938-8955
Auditor	Tony Crowder	ZS6CRO	tcrowder@telkomsa.net	011-672-3311	
Historian, Archives, Awards	Tjerk Lammers	ZS6P	zs6p@iafrica.com	012-809-0006	083-976-4387
Contests	Jaco Cronje	ZR6CMG	jacocronje@yahoo.com		081-474-2220
Contests	Pierre Holtzhausen	ZS6PJH	zs6pjh@telkomsa.net	012-655-0726	082-575-5799

Birthdays / Verjaarsdae – December / Desember

01 Pieter Fourie ZS6CN
07 Hansie Meyer ZS6AIK
08 Hans Kappetijn ZS6KR
15 Alméro Du Pisani
27 Pierre Britz ZR6ADZ
28 Allan De Souza ZS6AVC
30 Hans van de Groenendaal ZS6AKV

Spouse's Birthdays / Verjaardae – December / Desember

06 Sylvia, lv van Tjerk Lammers ZS6P
12 Elsa, lv van Fritz Sutherlan ZS6SF
23 Dienkie, lv van Pierre Britz ZR6ADZ

Anniversaries / Herdenkings – December / Desember

08 Avida ZS6AVB en Theo Bresler ZS6TVB
29 Estelle en Pierre Duminy ZS6FPS

Lief en Leed / Joys and Sorrows

Hans Kappetijn ZS6KR het 'n breuk operasie ondergaan. Hy is onlangs ontslaan en sterk tuis aan.
Jaco Cronje ZR6CMG het hart chirurgie ondergaan. Hy is ontslaan en dit gaan goed met hom.
Kenny Martin ZS6KMM ondergaan chemoterapie en bestraling. Ons wens u alle voorspoed toe.
Pierre Britz het hospital behandeling ondergaan. Hy is onlangs ontslaan en sterk tuis aan.

Contests and Diary of Events – November 2016 / Kompetisies en Dagboek van Gebeure – November 2016 (UTC Times)	
01	Annual Youngsters on the Air (Yota) event starts.
02 - 04	ARRL 160-Meter Contest : 22h00 – 16h00
03 – 04	UK/EI DX SSB Contest
04	SARL Digital Contest and the 10-Meter RTTY Contest : 13h00 – 16h00
10 - 11	ARRL 10-Meter Contest : 00h00 – 24h00
11	SARL Youth Net
17	OK DX RTTY Contest : 00h00 – 24h00
17 - 18	Croatian CW Contest : 14h00 – 14h00
27	Closing date for January 2017 Radio ZS articles
31	Annual Youngsters on the Air (Yota) event ends.

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

Bank	First National Bank	**Ordinary Members / Gewone Lede : R160** **Spouses / Pensioners : R60**	**Your call sign must appear as statement text!**
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

Preliminary PARC Flea Market dates for 2017 / Voorlopige PARK Vlooimark datums vir 2017

26 March / 26 Maart ; 6 May / 6 Mei ; 29 July / 29 Julie ; 28 October / 28 Oktober

For more information please listen to the Sunday Bulletins or contact Alméro Du Pisani ZS6LDP

RAE May 2017 Syllabus and Lectures

Lectures for the May 2017 Radio Amateur Examination will be presented by PARC from the 21st of January. The course presented by PARC is free of charge. For more information on the lectures, please do contact Etienne Naude ZS6EFN at etienne@afrigrid.co.za.

Week	Date	Material	Tutor
1	21-Jan-17	RAE Information Session	E/LdW/VH
2	28-Jan-17	Chapter 1 - 4	E
3	4-Feb-17	Chapter 5 - 7	E
4	11-Feb-17	Chapter 8 - 10	E
5	18-Feb-17	Chapter 11 - 13	LdW
6	25-Feb-17	Chapter 14 - 16	LdW
7	4-Mar-17	Chapters 17 - 19	LdW
8	11-Mar-17	Break	
9	18-Mar-17	Chapters 20 - 22	LdW
10	25-Mar-17	Chapter 23 - 25	LdW
11	1-Apr-17	Chapters 26 - 27	VH
12	8-Apr-17	Chapters 28 - 30	E
13	15-Apr-17	Break	
14	22-Apr-17	Chapters 31 - 33	E
15	29-Apr-17	Break	
16	6-May-17	HF Assessment	E/LdW/VH
17	13-May-17	Revision	E/LdW
	21-May-16	RAE	
	E	Etienne Naude	
	LdW	Louis de Wet	
	VH	Vincent Harrison	

Chapter		Tutor
1	Overview of Amateur Radio	E
2	Operating Procedures	E
3	Basic Electrical Concepts	E
4	Resistance and Ohm's Law	E
5	The Resistor and Potentiometer	E
6	Direct Current	E
7	Power in DC Circuits	E
8	Alternating Current	E
9	Capacitance and the Capacitor	E
10	Inductance and the Inductor	E
11	Tuned Circuits	LdW
12	Decibel Notation	LdW
13	Filters	LdW
14	The Transformer	LdW
15	Semiconductors and the Diode	LdW
16	The Power Supply	LdW
17	Bipolar Junction Transistor	LdW
18	The Transistor Amplifier	LdW
19	The Oscillator	LdW
20	Frequency Translator	LdW
21	Modulation Methods	LdW
22	The Transmitter	LdW
23	Receiver Fundamentals	LdW
24	The Super Heterodyne Receiver	LdW
25	Transceivers and Transverters	LdW
26	Antennas	VH
27	Propagation	VH
28	Electromagnetic Compatibility	E
29	Measurements	E
30	Digital Systems	E
31	Digital Communication Modes	E
32	Safety Considerations	E
33	Before You Go	E

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	SARL Inleiding tot Amateurradio - Klas A Studiegids	PDF	980 kB
2016-05-06	ICASA Regulations - Effective for Oct 2016 examination and onwards	PDF	286 kB
2016-05-05	SARL RAE Class A Study Guide - 2016 Effective for Oct 2016 exam and onwards	PDF	4.6 MB
2016-05-05	HF Assessment Preparation Guide - Effective for Oct 2016 Exam and onwards	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, Persequor Park, Pretoria. Please do contact Louis de Wet ZS6SK at louis.zs6sk@gmail.com if you require more information on the venue.

AWASA AGM : 2016 (Jacques Scholtz ZS6JPS & Louis de Wet ZS6SK)

2004-2014 *Antique Wireless Association of Southern Africa*

The Annual General Meeting and Swop-meet 2016 of the Antique Wireless Association of Southern Africa (AWASA) took place on Saturday, the 19th of November, at the headquarters of the South African Institute of Electrical Engineers (SAIEE), Observatory, Johannesburg.

The AGM was chaired by the Jacques Scholtz ZS6JPS, President of the AWASA. Jacques reported that the membership of AWASA increased from 224 to 264 since the 2016 AGM, which is indeed an excellent growth in the interest in AWASA activities! Jacques reported healthy finances, especially with the sales of goods donated by the SAIEE, as well as donations of goods by Richard ZS6TF and Sakkie ZS6BPA.

The Valve QSO Parties resulted in some new top scorers taking away our prized certificates. The May QSO Party AM session top scorers were AM : ZS6SVJ, Barry ZS2NF and Sam ZS6BRZ. The SSB top scorers were Barry ZS2NF, Sydney ZS1TMJ and Theunis ZS2EC. October top scorers were AM and SSB : Daniel ZS6JR, Thanie ZS4AZ – 2ND SSB and Barry ZS2NF 2nd AM and Third SSB.

The Geoff Wright (ZS6FIX – SK) floating trophy was awarded to Barrie Brokensha ZS6AJY, the AWASA member who contributed the most to CW in a single year.

AWASA Members busy with AGM

Jacques Scholtz ZSJPS, President of AWASA

In closing, Jacques thanked everyone sincerely for their involvement in the AWASA Museum: in particular in his absence, Richard ZS6TF, Oliver for his hard work every Thursday, as well as Henry and Sakkie (reconditioned rotator) and Renato (reconditioned VHF radio).

Thanks was also expressed to the SAIEE for the use of their facilities, specifically Max Clarke (chairman of Historical Section committee at SAIEE) and Gerda Geyer (Events Planner at SAIEE)

The AGM closed with an invitation to everyone to attend the braai, and a visit to the AWASA and SAIEE museums. If you wish to join the AWASA, or obtain more information on membership, please do contact Jacques ZS6JPS at jscholtzp@gmail.com or Andy ZS6ADY at andyzs6ady@vodamail.co.za. Please see next two pages for some photos of the museums.

Cliff Smyth ZS6BOX, founding member of AWASA

Barrie Brokensha ZS6AJY, winner of the Geoff Wright Trophy for best contributions to CW

Radio mast and antennas of AWASA

AWASA members enjoying a braai after the AGM

Of course, I could not resist the temptation to visit the AWASA and SAIEE museums, armed with a camera. I was really in for a very pleasant surprise, enjoying the excellent presentations to the utmost. The AWASA museum contains quite a large number of classic ham radios presented in well-furnished glass displays. The FRG-7, FRG-7000 and the FRG-7700, as well as the first Barlow-Wadley receivers and the Racal RA17 transceivers in particular caught my eye, which were developed by Dr. Trevor Wadley, assisted by Dave Larsen ZS6DN.

The FRG-7, FRG-7000 and FRG-7700 receivers

The Racal RA17 receiver

The original Barlow-Wadley receiver, and an example of a commercially available model (1960's)

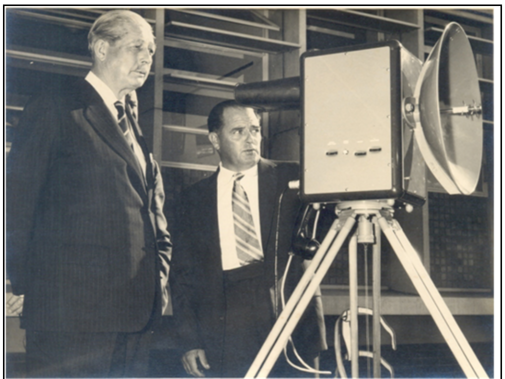
Some of the numerous excellent displays at AWASA and SAIEE

The story of a Tellurometer, a postage stamp and a Radio Receiver

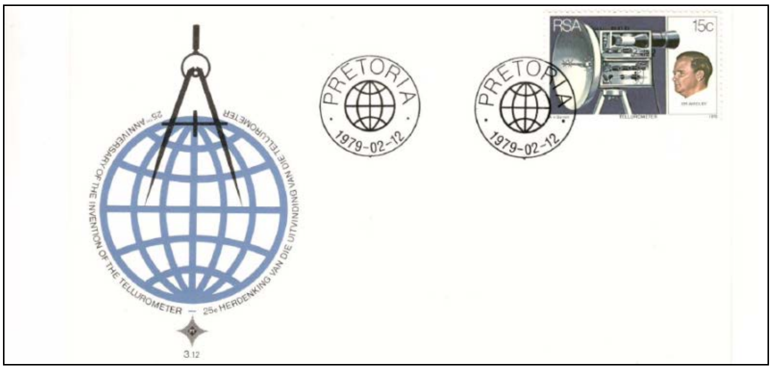
My recent visit to the AWASA Annual General Meeting was indeed filled with numerous pleasant surprises, and as any Radio Ham, or techno freak would do, would be to stand in front of the display cases drool without any self-shame. Indeed, I enjoyed with utmost pleasure looking at the Barlow-Wadley and Racal receivers developed by Dr. Trevor Wadley during the 1950 to 1960's.

However, nothing could surpass my pleasant surprise walking up to a display containing the original Tellurometer developed by Dr. Wadley during the 1950's.

Consulting the AWASA website, which elaborates on the story behind the Tellurometer, it is said that on 9 November 1958, the New York Times reported that through the use of the Tellurometer it had suddenly become possible for two men to measure the island of Manhattan in three-and-a-half hours, whereas previously it would have taken four men, five days with traditional surveying methods.



Dr. Wadley demonstrating the Tellurometer to the British Prime Minister, Howard Macmillan during his visit to South Africa in 1960



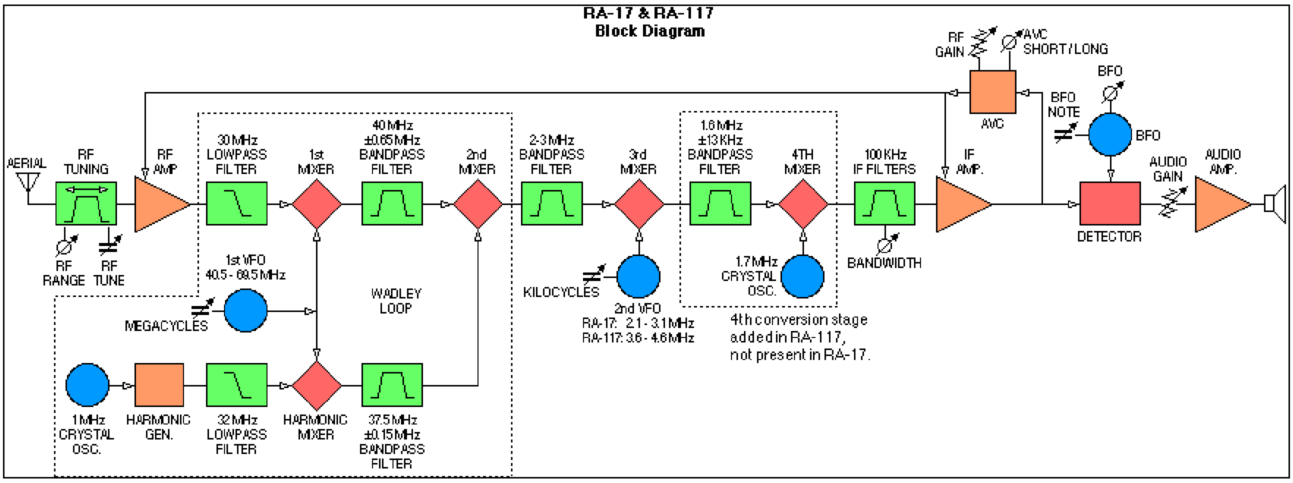
Trevor Lloyd Wadley, born in 1920 in Durban, arrived in the spring of 1957 in England to conduct measurement trials of the Tellurometer on the so-calles Ridgeway Base. These trials were extremely successful, and he presented a paper on his instrument at the Royal Geographical Society in London. He was given a standing ovation by delegates from all parts of Europe. News of his success spread rapidly over 48 countries, describing feats of survey that had previously been impossible, or that had suddenly involved hugely reduced costs. Soon, over 20 000 Tellurometers were produced and distributed worldwide under the patent for this instrument held by the South African Council for Scientific and Industrial Research (CSIR). Eventually, production was taken over by Plessey, South Africa.

On 12 February 1979, the South African Postal Authorities in Pretoria issued a 15c stamp to commemorate the 25th anniversary of the Tellurometer, showing a clear representation of the Tellurometer on the stamp alongside a profile of the inventor. All members of the South African Institute of Electrical Engineers were presented with a first day issue.

Ref: http://www.awasa.org.za/index.php/articles/219-the-story-behind-the-tellurometer-story

When recieving the degree D.Sc. (Eng) in 1959 from the University of the Witwatersrand, Dr. Wadley's famous Wadley-Loop Radio was already standard equipment in the British Army, Royal Navy and Royal Air Force. In 1954 it was regarded as one of the greatest advances in high quality receivers in the preceding 20 years. Later the Barlow-Wadley reciever appeared after Wadley had left the CSIR and had moved to Warner Beach in Natal.

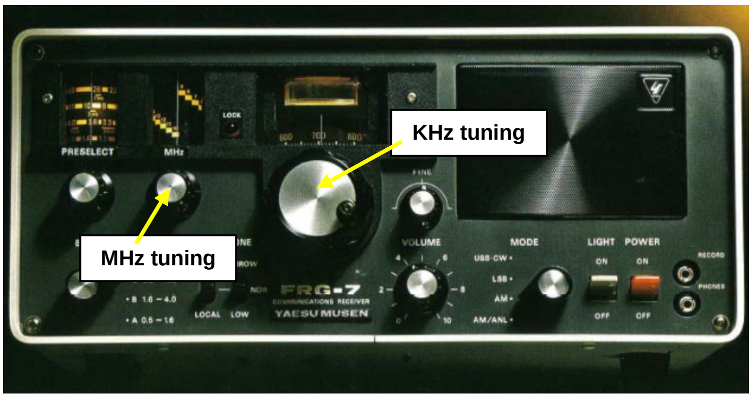
The Racal RA-17, a triple conversion reciever, and the RA-117, using 4-stage heterodyne conversion stages, are recievers utilizing the Wadley loop tuning system. A block diagram of the RA-17 and RA-117 is shown below, indicating the Wadley Loop and other aspects of the reciever in a simplified version.



In a superheterodyne receiver, for a given channel bandwidth, oscillator stability becomes more critical as the received frequency increases. It is not too difficult to produce a stable receiver for the standard AM broadcast band, where a channel bandwidth of 10 KHz is 1% of the signal at 1 MHz. However, at 10 MHz, a 10 KHz channel is only 0.1% of the signal, requiring oscillators and circuitry of considerably improved precision and stability to discern such a channel.

The Wadley Loop adresses the issues of tuning precision and stability. The objective of the Wadley Loop is to shift a portion of the spectrum from a high frequency down to a lower frequency, which is accomplished relative to a crystal-controlled reference to obtain the required precision and stability. At the lower frequency the shifted spectrum can be tuned by a high quality but conventional superhet section. In most or all recievers using the Wadley Loop, the portions of spectrum were 1 MHz wide, which was convenient for the user as one would tune the "MHz part" of the signal, while a second dial would tune the "KHz part". This is clearly seen in the classic FRG-7 shown below.

Ref: http://www.cs.ubc.ca/~hilpert/e/radio/RacalRA117/technical.html (Racal RA-17 & RA-117 Technical Description)
Ref: https://lennartb.home.xs4all.nl/wadley.html (The Wadley Loop)



The Wadley Loop is seen in the first half of the block diagram. In the RA-17 and 117 the process begins with the production of a comb of 1 MHz markers spanning 1 to 32 MHz, accomplished by a 1 MHz crystal oscillator feeding a harmonic generator. The output of the manually-tuned 1st VFO is mixed with both the RF input and this comb of 1 MHz markers. The output of the RF mixer is fed to an IF filter with a band-pass a little wider than 1 MHz and centered on 40 MHz

The ouput from the harmonics mixer is fed to a fairly narrow band-pass filter tuned to 37.5 MHz. As the 1st VFO is tuned, at particular frequencies 1 MHz apart, the output of the harmonic mixer will make it through the 37.5 MHz filter. This is mixed with the 1 MHz wide RF spectrum coming from the 40 MHz filter to produce a 2nd IF signal through the 37.5 MHz filter. The key to the Wadley Loop is that the mixing is arranged in such a manner that the 1st VFO is both an addend and subtrahend in the net equation and so eliminated: the 1st VFO drift within the limits of the bandpass of the 37.5 MHz filter is cancelled out. For more detailed information regarding the Wadley Loop, and what happens after the Loop, please consult the above listed refences.

How much water in South Africa's Dams?

We often hear in the media about large potential shortages of natural and artificial resources such as fuel, electricity, water, etc. The sharp rises in the prices of these commodities are often a great source of worry to the general public. Given the recent conditions prevailing in South Africa with regards to the current drought, sewage pollution, waterborne diseases and Acid Mine Drainage (ARD), one cannot help to wonder how scarce and expensive water is going to become.

Due to the limited freshwater resources available currently in South Africa, and potable water reservoirs increasingly being threatened by pollution, the awareness of water quality amongst the general public has increased significantly. More often reports appear in the media covering incidents of sewage-, industrial- or mining pollution, or spillages of potentially toxic chemicals into the environment. We are bombarded by reports of fish- and crocodile mortalities, as well as infant deaths in hospitals due to polluted water. Often, the *Cholera* bacterium has been instrumental in a large number of deaths in Zimbabwe and the northern parts of South Africa. Each one of us, whether we are a user of water, or use water for sport, does have an obligation towards the water environment. This is a cultural-educational process where we as parents need to transfer this knowledge and compassion towards water conservation towards our children and grandchildren.

Again often we hear in the media how water-scarce South-Africa is, and how we should conserve water, and invariably one asks one-self: "how much water is actually in our country"? it would obviously put our situation in perspective when we compare our situation with the state of dams and lakes in other countries and continents. Before we can really appreciate the magnitude of water volumes, a number of concepts need to be explained: A cube having the dimensions of 1X1X1cm or 1cm^3 contains 1 milliliter of water. For a cube to contain 1 liter of water, the dimensions thereof should be 10X10X10cm or 1000cm^3. Should a tank containing 1000 liter be required, the dimensions thereof could be 1X1X1m if a perfect cube is needed. In order to understand dimensions of dams, volume needs to be expressed as billions of cubic meters. If a cube of 1000X1000X1000 cubic meters is constructed, it will contain 1 000 000 000 or 1 billion or 10^9 cubic meters of volume. This is equivalent to 1 000 000 000 000 or 10^{12} or 1 Tera-liter of water. This may sound like an incredible amount of water, but this is more or less the volume of water contained by Bloemhof Dam in the Orange Free State. To be precise, this dam contains approximately 1.24 cubic kilometers of water at full capacity, and is ranked to be the 7th largest dam or reservoir in South Africa (DWAF, 2008).

In comparison, the Vaal and Sterkfontein Dams are more or less double in size than Bloemhof Dam, containing 2.60 and 2.62 km^3 respectively, while the Gariep, which is the largest dam in South Africa, contains 5.34 km^3 of water (Table 1). This may sound as reasonable impressive figures, and one could be self-assured that sufficient amounts of water are available in South Africa, especially when all the volumes of dams are added together. According to Department of Water Affairs and Forestry figures, the total amount of water in South African dams on 2009-02-02 was 34.12 km^3, representing an average capacity of 81%, when there was not a drought as we currently experience.

Should we compare the amount of water available the amounts of water present on earth (fresh- and seawater), the figures are quite astounding. The sea contains approximately 1 320 000 000 km^3 of water, which represents 97.2% of all water present on earth. Glaciers, ice-caps and the poles contain approximately 25 000 000 km^3, or 1.8% of water, while 13 000 000km^3 or 0.9% is found as subterranean or underground water. Freshwater in lakes, inland seas, dams and rivers represent only 250 000km^3 (0.02%), while the moisture in the atmosphere represents a volume of 13 000km^3 or 0.0001%.

Table 1 South-African man-made Dams (Reservoirs) ranked according to volume (Top 10)

Name of Reservoir	River	Province	Full Storage Capacity (FSC) (km^3)	% Full on 2009-02-02
Gariep	Orange	Orange Free-State	**5.3406**	82.3
Vanderkloof	Orange	Orange Free-State	**3.1713**	82.6
Sterkfontein	Nuwejaar Spruit	Orange Free-State	**2.6169**	98.8
Vaal	Vaal	Orange Free-State	**2.6035**	79.0
Pongolapoort	Phongolo	Kwazulu-Natal	**2.2671**	71.5
Katse	Malibamatso	Lesotho	**1.5191**	100.8
Bloemhof	Vaal	Orange Free-State	**1.2402**	88.3
Mohale	Sequnyane	Lesotho	**0.8571**	63.5
Thee Waters Kloof	Riviersonderend	Western-Cape (winter rainfall)	**0.4802**	88.1
Woodstock	Tugela	Kwazulu-Natal	**0.3733**	96.8

Reference: Department of Water Affairs and Forestry : Weekly State of the Reservoirs. Data available on internet: http://www.dwaf.gov.za

These figures would place the amount of water in South Africa in context to some extent on a global scale. However, to really establish the magnitude (or lack of) in comparison with that of other countries, let us start by flying over the northern border and visit the Cahora Bassa Dam. This dam, which is ranked as the 17th largest man-made dam in the world, contains 55.8 km^3 of water, which is approximately 1.6 times more than the total amount of water available in South Africa. Upstream of the Cahora Bassa Dam, Lake Kariba contains a massive 180.6km^3 of water, which places this dam in the 2nd place of largest dams in the world. The largest man-made dam in the world is the Owen Falls dam in Uganda, which contains 204km^3 of water (Table 2). This, one would say, places the South-African water situation well into perspective, when compared to other dams in other countries. However, even the relatively large volume of the Owen Falls Dam pales into insignificance when the volume of this dam is compared to the large natural lakes of the world.

Table 2 Largest man-made dams (Reservoirs) ranked according to volume (Top 10)

Name of Dam	Reservoir	River	Country	Year Completed	Nominal Volume (km^3)
Owen Falls	Victoria Lake	White Nile	Uganda	1954	**[1]204, [2]205**
Kariba Dam	Kariba Lake	Zambezi River	Zimbabwe	1959	**[1]180.6, [2]160.3**
Bratsk Hydroelectric Plant	Bratsk Resrvoir	Angara River	Russia	1964	**169 – 169.3**
Aswan High Dam	Nasser Lake	Nile River	Egypt	1971	**[1][2]157**
Akosombo Dam	Volta Lake	Volta River	Ghana	1965	**[1]150, [2]148**
Daniel Johnson	Manicouagan Reservoir	Manicouagan River	Canada	1968	**[1]141.85, [2]141.7**
Guri Dam	Guri Lake	Caroni River	Venezuela	1986	**[1]135**
W.A.C. Bennet Dam	Williston Lake	Peace River	Canada	1967	**[1]74.3**
Krasnoyarsk Hydroelectric Dam	---	Yenisei River	Russia	1967	**[1]73.3**
Zeya	Zeya Reservoir	Zeya River	Russia	1978	**[1][2]68.4**

[1]International Commission on Large Dams Database
[2]Avakayan, A.B. & Ovchinnikova, S.P. (1971). Foreign experience and techniques. *Hydrotechnical Construction*, 5(8) : 773-777.

The largest freshwater lake in the world is Lake Baikal in Russia, which contains approximately 20% of all freshwater on earth. This is equivalent to a massive 23 000km^3 of water! This lake is also the deepest (Max Depth : 1 637m : Average Depth : 749m) and second longest (630km) lake in the world. At a height of 1100 km above earth, this lake is easily observed by satellite (Figure 1). The largest inland water-body is the Caspian sea in Asia, which has a volume of approximately 78 200km^3. However, this lake is a saltwater lake, but is still considered per definition as a lake (Table 2). Lakes, in contrast to storage dams, are created by natural phenomenon such as tectonic movements, glacial action, or large tears in the earth's crust. Lake Baikal, as well as Lakes Malawi and Tanganyika in the rift valley of Africa, are examples of long and deep lakes formed in the crust of the earth's crust (Table 2).

The largest volume of freshwater is found in the northern hemisphere, while 60% of the world's lakes are found in Canada. The state of Manitoba harbors more than one hundred thousand lakes, while Finland is known as the "land of a thousand lakes" – in fact, there are 187 888 lakes in this country, of which 60 000 are considered as large lakes. It is interesting to note from Table 2 that the top 2 largest lakes are in Russia, while the larger lakes are in Canada and America. The two rift valley lakes, Malawi- and Tanganyika in Africa, count amongst the largest in the world.

To really comprehend the enormous size of Lake Baikal, in comparison with the absolute relative water scarcity in our country, the outlines from this lake traced from a satellite photo of this lake, super-imposed on South Africa, is shown in Figure 2. If we were blessed with a Lake Baikal in South Africa, it would have stretched from Gariep Dam in the south, through the Orange Free State to Johannesburg in the north. Indeed, our largest dams look like mere specs when compared to the enormous size and volume of this lake. If we compare the volume of Lake Baikal (23600 km^3) with the total volume of water available in South Africa (31.72 km^3), this lake is a massive 744 times larger in volume. One can only speculate what the positive social and economic impact on South Africa would have been, should this lake have been present in our country.

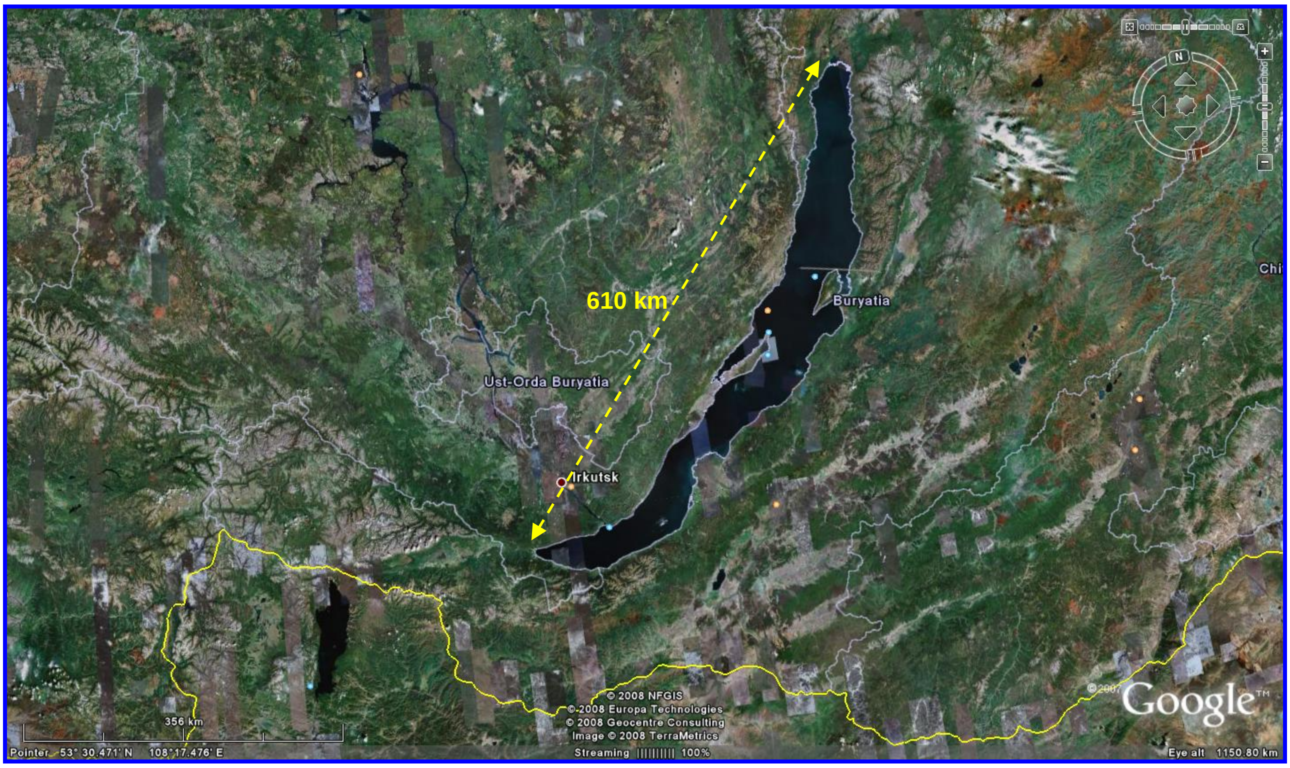


Figure 1 Lake Baikal in Russia from a height of 1100km. (Photo : Google Earth)

Table 2 Top 10 largest lakes in the world according to volume

Lake	Region	Surface Area (km^2)	Length (km)	Maximum Depth (m)	Volume (km^3)
Caspian Sea[saline]	Azerbaijan-Russia-Kazakhstan-Turkmenistan-Iran	371 000	1 199	1 025	**78 200**
Baikal	Russia	31 500	636	1 637	**23 600**
Tanganyika	Tanzania-DRC-Burundi-Zambia	32 893	676	1 470	**18 900**
Superior	Canada – U.S	82 414	616	406	**12 100**
[3]**Michigan-Huron**	Canada – U.S	117 702	710	282	**8 458**
Malawi	Malawi-Mozambique-Tanzania	30 044	579	706	**8 400**
Vostok	Russia	15 690	250	900-1000	**5400 ± 1600**
Victoria	Kenya-Tanzania-Uganda	69 485	322	84	**2 750**
Great Bear	Canada	31 080	373	446	**2 236**
Great Slave	Canada	28 930	480	614	**2 090**
Ontario	Canada – U.S	19 477	311	244	**1 639**

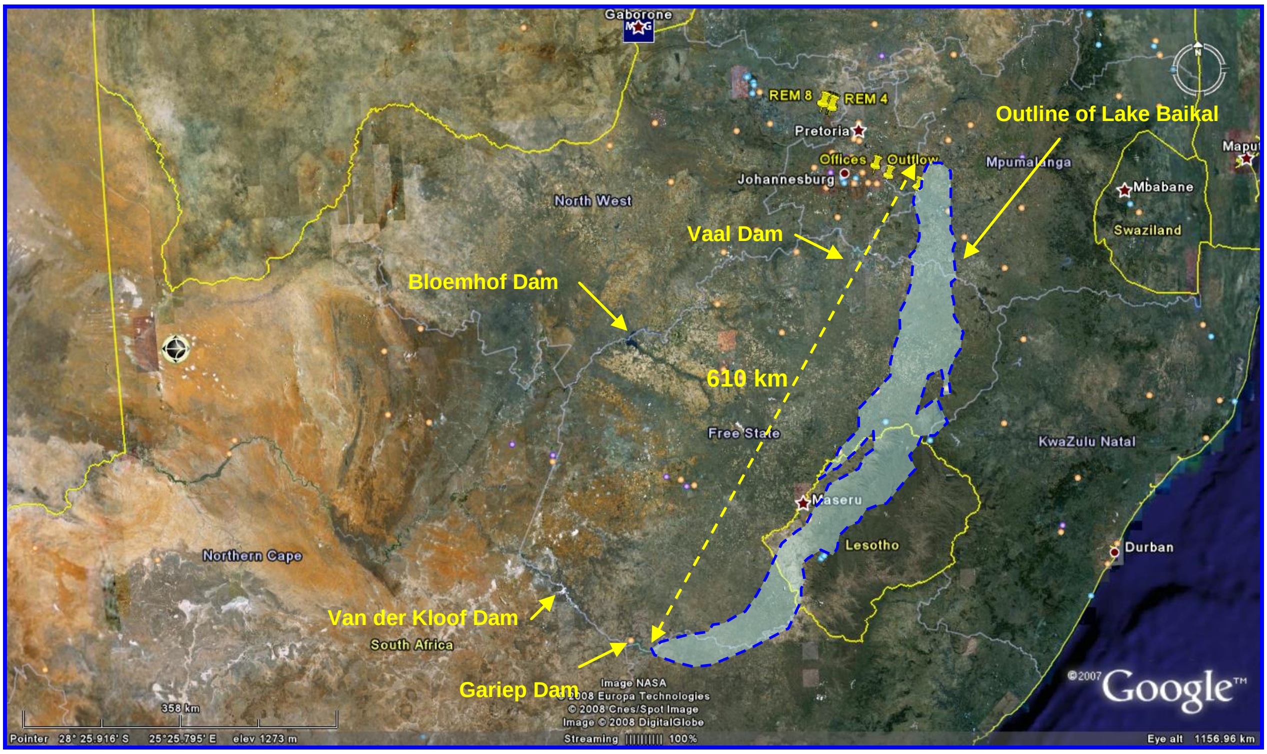


Figure 2 **South-Africa from a height of 1100km showing the relative size of Lake Baikal in comparison of SA as whole and our largest dams. (Photo : Google Earth)**

In our efforts to conserve water and supply this precious resource to a fast-growing population, every effort is being made to contain as much possible water in dams. The development of the Lesotho Highland scheme was aimed at supplementing water to the demands of Gauteng with the highest human population, and an extremely high concentration of industries and mines. However, even this source would not in the coming future be sufficient to comply in the demands of this area. Any significant prospects of the construction of large water storage dams in South Africa is indeed remote, and we are indeed dependent on further developments of the Lesotho Highlands Scheme to supplement our water supply.

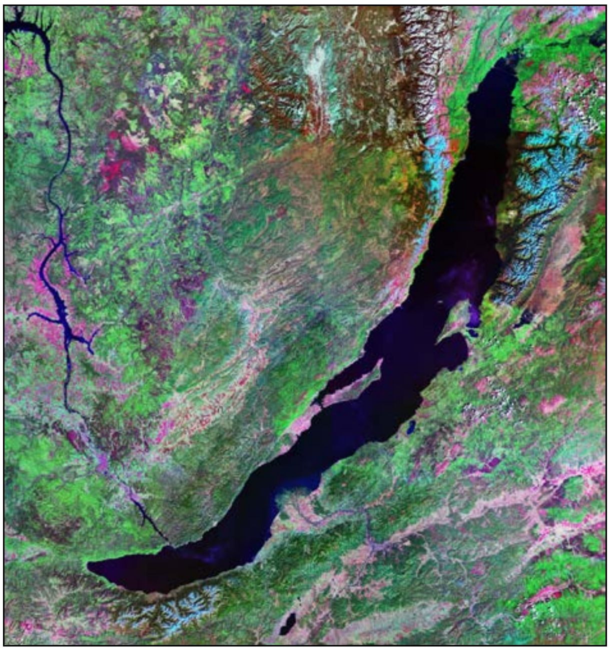
Indeed most of us live in a world where a false sense of security is a driving factor. As long as there is water in our taps, and the lights work, the real world outside does not really matter. We don't want to think of these things, and do not try to place orders of magnitude into perspective with our own small world we live in. We are not lucky that we live in a geographical area or climatic region (as the northern hemisphere) where we have a high rainfall and sufficient storage dams. In addition, we are not blessed that tectonic or glacial action has supplied us with great natural lakes. Even if we had the only the smallest of the Great Lakes, Lake Ontario, with a volume of 1 640km^3, in South Africa, we never would have any problem with water supply in our country. And yet still, the majority of us have this don't-care attitude towards water. By letting the tap run when we brush our teeth or shave in the morning, over-filling our baths, or using too much water when we wash our cars, we exhibit a culture most of us practice without any thought or conscience. These things may seem small, but the additive effect by a total population practicing the same bad habits share the same guilt as the mine, factory or sewage treatment works discharging untreated effluent into a river.

We have indeed reached a cross-road in South-Africa as far as water availability and pollution is concerned. There are a significant number of practical and socio-cultural factors which work negatively against South-Africa and it's population, and may in future become factors which may mean the difference between life and death for many of us:

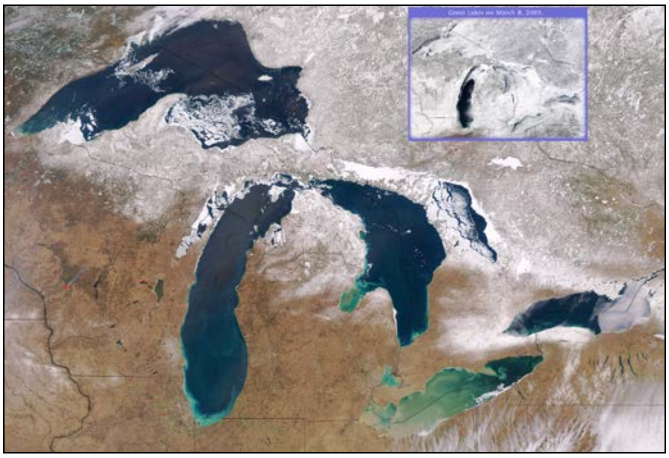
- Low rainfall over most of South Africa
- Surface and underground water resources are limited
- No large natural lakes
- Any available water is stored in relatively small dams
- South Africa has a rapidly growing population
- There is a high water demand by mining, industry, etc.
- Water cannot be piped from neighboring countries such as Zimbabwe (Cahora Bassa)
- Pollution of limited water resources is increasing significantly
- Education on water conservation is still insufficient
- Indifferent attitude of South Africans towards water conservation.

In retrospect, South-Africa is indeed not blessed with an abundant water supply. The little water we have, is increasingly being placed under severe pressure both by increasing demand, as well as a social culture amongst South-Africans which leaves a lot to be desired.

óЗеро Байкал (Ozero Baikal), the “Pearl of Russia”, at 25 million years old, is the oldest lake in the world. At 1637 meters at it’s deepest point, Baikal is the deepest lake in the world. Lake Baikal contains more water than all the American Great Lakes combined. Lake Baikal sustains approximately 60 fish species, 2500 species of animals and the Baikal seal or nerpa, which is one of only three entirely freshwater seal populations in the world.

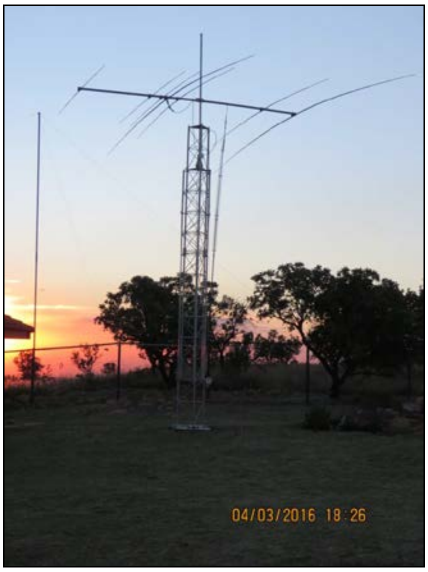


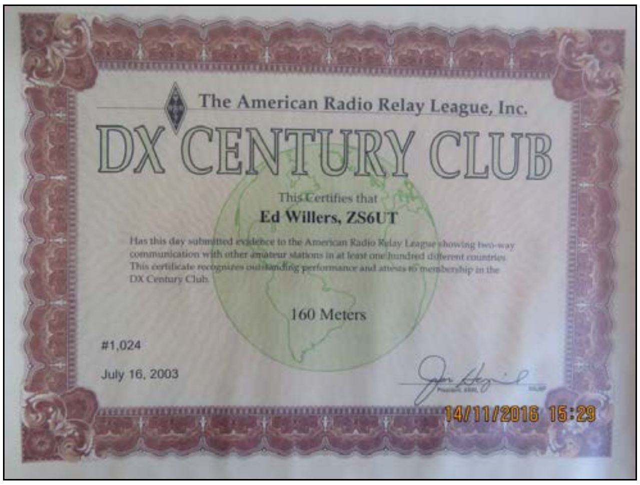
The total volume of all the US Great Lakes combined is 22 560 km^3, compared to that of Lake Baikal, which is 23 600 km^3. The average depth of Lake Baikal is 758 m, and the maximum depth is 1637m.

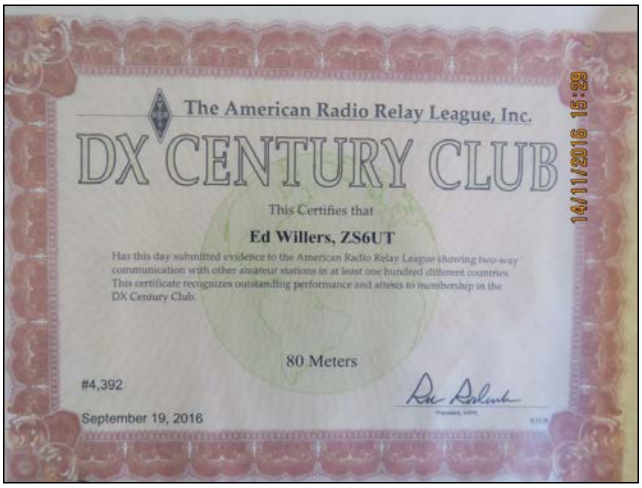


From the Shack of Ed Willers ZS6UT

Ed Willers ZS6UT, a regular voice on the PARC Bulletins providing HF news, has done a number of major improvements on his radio mast and antenna system. Ed send Watts a number of photographs, showing the erection of his new mast, as well as some of the awards he received from the DX Century Club for working on the 160m, 80m, 40m, 30m, 20m, 15m, 17m, 12m and 10m bands.





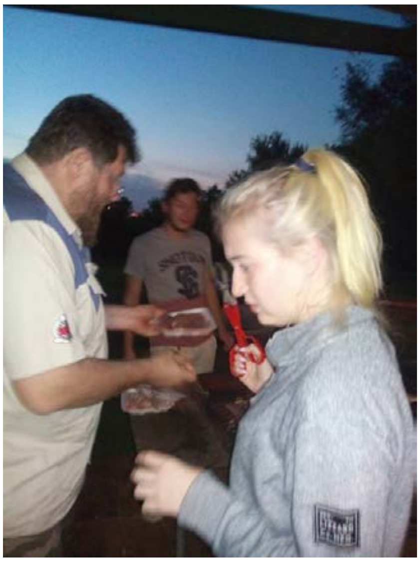


Please feel free to send photographs to Watts of your shack or any projects you are busy with for inclusion our new series “From the Shack of..”

Tydren Nuus

Die 2016 seisoen wat in baie opsigte ‘n opwindend was, is onlangs afgesluit met die Bronkhorstpruit tydren. Die jaar is op gepaste wyse afgesluit met ‘n afskeid funksie op die 26ste November by die Pretoria Old Motor Club (POMC). Graag wil ons van harte Johan en Doreen, en Graham en Joey bedank vir hul harde werk met die reelings en die heerlike kos wat bestaan het uit vleispakkies en regte stywe boerepap so na almal se smaak!







	2017 Rally Calendar		
Round	Date	Province	Location
1)	10/11 March	KZN	Scottburgh
2)	21/22 April	Mpumalanga	Sabie
3)	19/20/MAY	Mpumalanga	Secunda
4)	21/22 July	Eastern Cape	Port Elizabeth
5)	18/19 August	Gauteng	Bronkhorstspruit
6)	22/23 September	Western Cape	Caledon
7)	21/21 October	Free State	Welkom

Die 2017 tydren seisoen beloof om weer net so opwindend te wees. 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

‘n Huldeblyk aan Radio Amateurs

Baie van ons radio amateurs het heel moontlik die voorreg gehad om in ‘n huis van radio amateurs groot te word, en die kultuur van amateur radio te beleef. Talle van ons het radio amateurs vroeg in ons lewens geword, maar baie soos ek, het eers nadat die saadjie stadig maar seker gegroei het, besluit om die RAE te gaan skryf. Ek het besef dat jy nie iemand kan dwing, of probeer oortuig om ‘n radio amateur te word nie. Dit is net te spesiaal. Dit kom van binne die dag dat jy besef maar ek wil n radio amateur word. En slegs dan sal jy die belangstelling en motivering beleef om die boeke te pak en te studeer vir die eksamen. Amateur Radio is nie net ‘n stokperdjie nie, dit is ‘n kultuur van besondere mense wat ‘n duidelik positiewe impak op jou lewe het. Die amateurkode strek verder as net radio prosedures, dit is ‘n leefwyse wat ‘n toepassing het op jou persoonlike lewe. Pas die beginsels van die amateur kode in jou daaglikse lewe toe, en jy sal besef dat dit die terme “gentleman” en “gentle-lady” omskryf.

Met my onlangse besoek aan die AWASA Jaarvergadering het ek weer met groot blydskap ‘n groot vriend, gentleman en radio amateur by uitstek, Oom Sakkie Coetzee ZS6BPA raakgeloop en soos altyd, oor die “ou dae” op die Oos-Rand Tak gesels, waar hy en my ouers, Louis en Geraldine, asook Mike Rowland ZS6AFG, Arno (Duppie) du Plessis ZS6BDD, Nico Michael ZS6BVR en Ernie Jacobson ZS6ATQ lede was. Aan julle almal wil ek graag ‘n huldeblyk en woorde van waardering uitspreek. Julle het die amateurkode uitgeleef en ‘n voorbeeld gestel vir ons generasie van radio amateurs. Mag julle nalatenskap voortleef!

Louis de Wet ZR6AA met sy bekende pyp

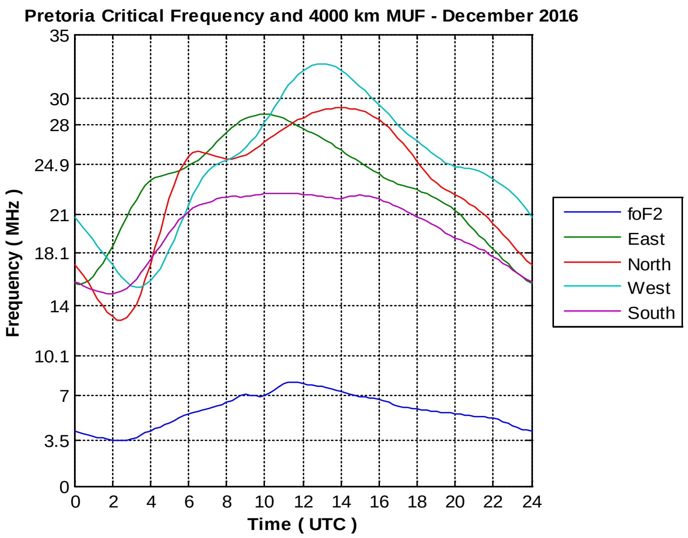
Geraldine de Wet ZR6GQ besig met Bulletin

Sakkie Coetzee ZS6BPA werk HF

Arno (Duppie) ZS6BDD en Mike Rowland ZS6AFG

Louis ZS6SK (1983)

Nick ZS6BVR, Louis ZR6AA, Ernie ZS6ATQ Mike ZS6AFG, Duppie ZS6BDD



Long Term HF Propagation for December 2016

DX Operating

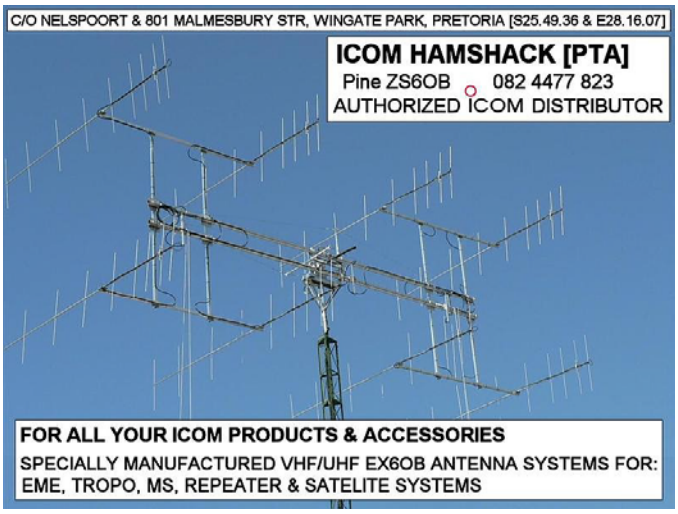
The graph shows the 4000 km maximum useable frequency (MUF) to the East, North, West and South from Pretoria for the first hop using the F2 layer.

Local Operating

The F2 critical frequency (foF2) is the maximum F-layer frequency for short range communications.

See also the Propagation tab at http://www.parc.org.za/

Courtesy Vincent ZS6BTY



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- 3rd Party scrutiny of projects and documents
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Contact Hans at 012-333-2612 or 072-204-3991