



WATTS 2020-09

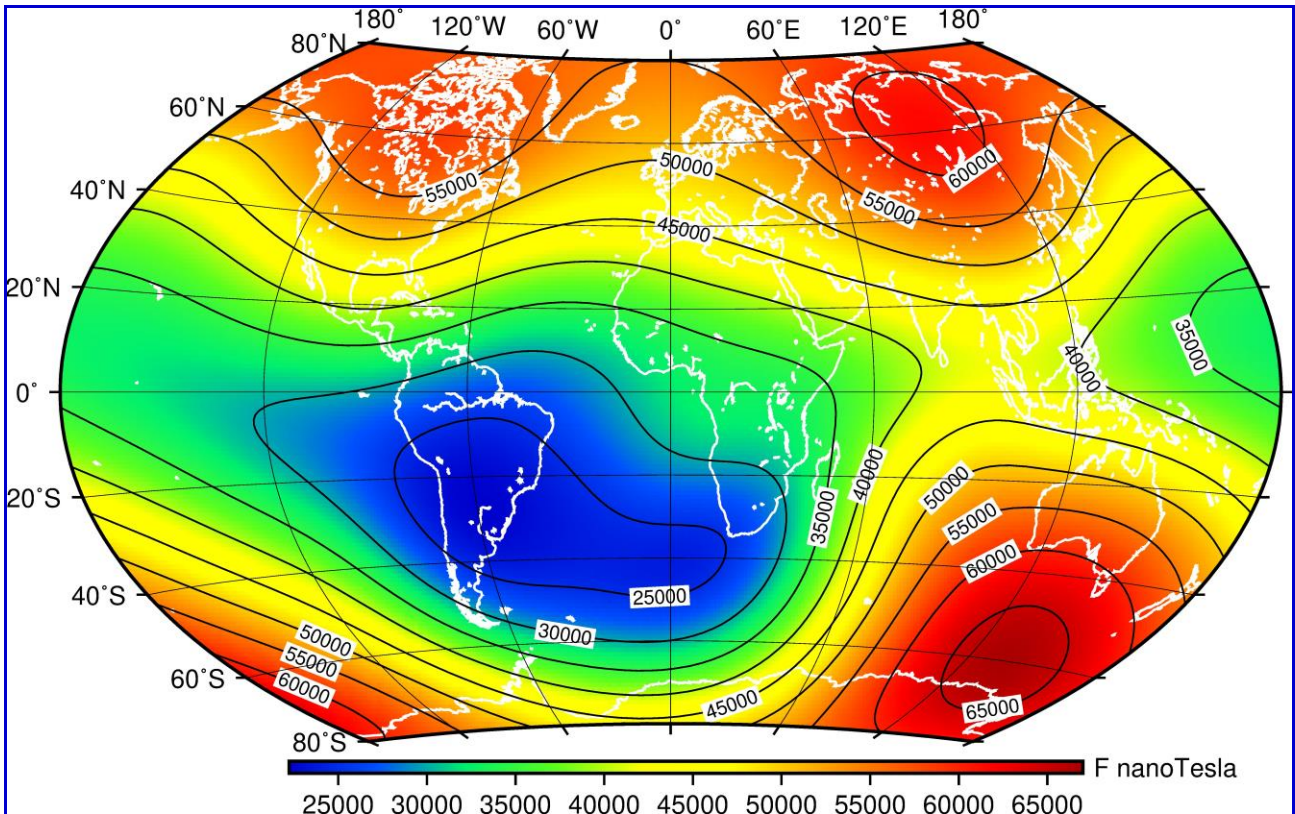
Year 90 + 09m

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



Bulletins : 145.725 MHz : Sundays from 08h45 / Sondag vanaf 08h45
 Relays: 1.840, 3.700, 7.066, 10.135, 14.235, 51.400, 438.825, 1297 MHz
 and Echolink. Activated frequencies are announced prior to bulletins
Swoopshop : 2m and 7.066 MHz live on-air after bulletins
 Bulletin repeats on Mondays / herhalings op Maandae : 2m 19h45



In the previous edition of Watts, the structure of the Earth was discussed, and how the magnetic field of the Earth is generated. In this issue, the focus will be on the secular variation and westward drift of the Earth's magnetic field, and the manner the magnetic field has an impact on global climate. The illustration above shows the intensity of the Earth's magnetic field. (British Geological Survey)

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Club Meetings / Klub Vergaderings

Club Committee Meeting :

The date of the next Meeting for the 2020/21 PARC Committee will be on the 24th of September at 19h00 via zoom.

PARC Committee Members : 2019 – 2020 / PARK Komiteede : 2019 - 2020

Name & Callsign	Portfolio/s	Email Address	Tel No	Mobile No
Louis de Wet ZS6SK	Chairman, Watts, SARL, ICASA	louis.zs6sk@gmail.com	012-349-1044	072-140-9893
Graham Reid ZS6GJR	Vice Chairman, Treasurer, Website	greid@wol.co.za	012-667-2720	083-701-0511
Johan de Bruyn ZS6JHB	Rallies, Repeaters & Membership	zs6jhb@gmail.com	012-803-9418	079-333-4107
Irene Myburgh ZS6IEA	Club Secretary & Social	irene.myburgh@outlook.com	012-304-5109	082-462-6001
Albert Schreuder ZS6SE	Contests, Social & Taxation	albert.schreuder.za@gmail.com	012-361-6133	082-562-3825

PARC Co-opted Members : 2019 – 2020 / PARK Ge-koopteerde Lede : 2019 - 2020

Name & Callsign	Portfolio/s	Email Address	Tel No	Mobile No
Alméro Du Pisani ZS6LDP	Flea-markets, SARL Bulletins	almero.dupisani@up.ac.za	012-420-3779	083-938-8955
Tony Crowder ZS6CRO	Auditor	tcrowder@telkomsa.net	011-672-3311	
Pierre Holtzhausen ZS6PJH	Contests	zs6pjh@gmail.com		082-575-5799
Pieter Myburgh ZS6PAM	Repeaters	wooden@mweb.co.za		076-140-7562
Hans Kappetijn ZS6KR (Hon.)	SARL Bulletins, Swop Shop	QRVservices@gmail.com	012-333-2612	072-204-3991
John Minter ZS6LED	RAE Training, Technical	john.minter.za@gmail.com	012-349-0019	083-291-5422

Birthdays and Anniversaries / Verjaarsdae en Huweliks Herdenkings

Member's Birthdays September 2020 / Lede Verjaarsdae September 2020

02 Vernon Fryer ZS6AIG	26 Pieter Malan ZS6OP
06 Danny Liebenberg ZS6AW	26 Jacques Snyman ZS6QS
11 Johan Lehman ZS6JPL	26 Graham Reid ZS6GJR
13 Zack Pienaar ZR6ZAK	27 Ryan Gibson ZS6GGR
20 Hugo Pretorius ZS6HP	28 Irene Myburgh ZS6IEA
21 Johan de Bruyn ZS6JHB	

Spouse's September 2020 / Gades September 2020

06 Danny ZS6AW, husband of Antoinette Liebenberg ZS6D
 16 Annelize, gade van de Jager Burger ZS6ZO
 27 Liezel, gade van Sybie van der Spuy ZS6SY
 28 Irene ZSIEA, gade van Pieter Myburgh ZS6PAM

Anniversaries September 2020 / Herdenkings September 2020

03 Selma and Joseph Katzman ZS6TB
 03 Sanette en Dennis van Schalkwyk ZR6JET
 20 Corrie en Johan de Bruyn ZS6JHB
 25 Aida en Hugo Pretorius ZS6HP
 27 Rika en Dideon van der Merwe ZS6GJV
 28 Erika en Jan Pienaar ZS6OB

Member's Birthdays October 2020 / Lede Verjaarsdae Oktober 2020

01 Evan Seligmann ZS6ELI (50)	10 Roy Alexander ZS6MI
02 André van Tonder ZS6BRC (Erelid)	25 Gawie Marais ZS6GJM
02 Hans-Peter Knoepfler ZS6AJS	30 Andre Coetzee ZS6GCA
09 Ed Willers ZS6UT	31 Pieter Myburgh ZS6PAM

Spouse's October 2020 / Gades Oktober 2020

01 Geraldine, gade van Jurie Ferreira ZS6JFE
 12 Juanita, gade van Ryan Gibson ZS6GGR
 14 Wilma, gade van Nic Louw ZS6NWL
 21 Louise, gade van Alméro Du Pisani ZS6LDP
 28 Sanette, gade van Dennis van Schalkwyk ZR6JET

Anniversaries October 2020 / Herdenkings Oktober 2020

09 Annatjie en Pieter Fourie ZS6CN
 13 Wilma en Nic Louw ZS6NWL
 15 Annelize en de Jager Burger ZS6ZO

DIS HEERLIKE LENTE: G.G. CILLIÉ

Dis heerlike lente, die winter's verby;
 weer nooi berg' en klowe vir jou en vir my.
 Hol-la-dri-o-ha, hol-la-dri-o.
 Hol-la-dri-o-ha, hol-la-dri-o!

Die bergklim is heerlik, dit hou mens gesond.
 Die vroe-, vroeë môre het goud in die mond.
 Hol-la-dri-o-ha, hol-la-dri-o.
 Hol-la-dri-o-ha, hol-la-dri-o!

PARC Membership Fees / PARK Ledegelde

For the 2019-2020 year, there will be no increases in Club Membership fees. Club Fees therefore remain at R160 for Ordinary Members, and R60 for Pensioners and Spouse. Vir die 2019-2020 jaar sal daar geen toenames in die Klub Lidmaatskap gelde wees nie. Dus bly die gelde op R160 vir Gewone Lede, en R60 vir Pensionarisse en Gade.

PARC SUBS : PARK LEDEGELD : FROM / VANAF : 30-06-2018

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 oorpasing in die PARC rekening

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

PARC Bulletin Roster / PARK Bulletin Rooster

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. A re-broadcast of the Bulletin is done the following Monday evening at 19h45 by Hans ZS6KR.

PARK Bulletins word op Sondagoggende 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. 'n Heruitsending van die Bulletin geskied die opvolgende Maandag aand om 19h45 en word behartig deur Hans ZS6KR.

PARC Bulletin Presenters : August - November 2020

Date	Presenter	Date	Presenter
30 August 2020	Albert Schreuder ZS6SE	18 October 2020	Louis de Wet ZS6SK
6 September 2020	Alméro Du Pisani ZS6LDP	25 October 2020	Albert Schreuder ZS6SE
13 September 2020	Johan de Bruyn ZS6JHB	1 November 2020	Alméro Du Pisani ZS6LDP
20 September 2020	Louis de Wet ZS6SK	8 November 2020	Johan de Bruyn ZS6JHB
27 September 2020	Albert Schreuder ZS6SE	15 November 2020	Louis de Wet ZS6SK
4 October 2020	Alméro Du Pisani ZS6LDP	22 November 2020	Albert Schreuder ZS6SE
11 October 2020	Johan de Bruyn ZS6JHB	29 November 2020	Alméro Du Pisani ZS6LDP

PARC Flea-Market 2020 / PARK Snuffelmark 2020

SPRING FLEA-MARKET: 31st OCTOBER 2020 FROM 10H00 AT THE PRETORIA OLD MOTOR CLUB (Covid hygiene rules will be applied)

LENTE SNUFFELMARK: 31^{ste} OKTOBER 2020 VANAF 10H00 BY DIE PRETORIA OU MOTORKLUB (Covid maatreëls sal toegepas word)

For more information, contact / Vir meer inligting, kontak
Alméro Du Pisani ZS6LDP at 083-938-8955 or almero.dupisani@up.ac.za

Diary of Contests & Events / Dagboek van Kompetisies en Gebeure

Contests and Events - September 2020 / Kompetisies en Gebeure - September 2020 (UTC Times)	
05	CWops CW Open Contest: 00h00Z - 23h59Z
05 - 06	Region 1 SSB Field Day
05 - 06	RSGB SSB Field Day: 13h00Z - 13h00Z https://www.rsgbcc.org/hf/rules/2020/rnfd.shtml
12-13	SARL National Field Day
12 - 13	WAE DX Contest, SSB: 00h00Z - 23h59Z
13	North American Sprint, CW: 00h00Z - 04h00Z
16	SARL 80m Wednesday Club Sprint
19 - 20	Scandinavian Activity Contest, CW: 12h00Z - 12h00Z
19 - 20	SARL VHF/UHF Digital Contest
19 - 20	All Africa DX Contest: 12h00Z - 12h00Z
24	ZS SOTA Party / Heritage Day / National Braai Day
26 - 27	CQ Worldwide DX Contest, RTTY: 00h00Z - 24h00Z
Contests and Events - October 2020 / Kompetisies en Gebeure - Oktober 2020 (UTC Times)	
01	SARL 80m QSO Party: 17h00Z - 20h00Z
01	10-10 International 10-10 Day Sprint: 00h01Z - 23h59Z
03 - 04	Oceania DX Contest, Phone: 08h00Z - 08h00Z
03 - 04	Antique Wireless Association: QSO Party
10	Pretoria Amateur Radio Club: Veterans Breakfast: 10h00Z - 12h00Z
10 - 11	Oceania DX Contest, CW: 08h00Z - 08h00Z
17	CQ Hou Koers
17 - 18	10-10 International Fall Contest: 00h01Z - 23h59Z
17 - 18	Worked All Germany Contest: 15h00Z - 14h59Z
17 - 18	Jamboree on the Air: 09h30Z - 17h00Z https://jotajoti.scouts.org.uk/
25	PEARS HF Contest
24 - 25	CQ Worldwide DX Contest, SSB: 00h00Z - 24h00Z
31	Pretoria Amateur Radio Club: Flea-Market: 10h00Z - 11h30Z
31	Pretoria Amateur Radio Club: Annual General Meeting: 11h30Z - 14h00Z
The Pretoria Amateur Radio Club does not accept responsibility for the accuracy of contest details listed above. For verification and more information, please visit the SARL website, www.sarl.org.za , as well as the WA7BNM international contest calendar at the following website: http://hornucopia.com	

Pretoria Amateur Radio Club: Dates of Social Activities: 2020 Pretoria Amateur Radio Klub: Datums van Sosiale Aktiwiteite: 2020

Veterane Ontbyt: 10^{de} Oktober from 10h00
Veteran's Breakfast: 10th October vanaf 10h00
Annual General Meeting: 31st October from 11h30
Algemene Jaarvergadering: 31^{ste} Oktober vanaf 11h30
PARC 90'th Anniversary Celebration: 14th November
PARK 90 Jarige Viering: 14^{de} November

For more information, contact / Vir meer inligting, kontak
[Irene Myburgh ZS6IEA at 084-544-0618](mailto:irene.myburgh@outlook.com) or irene.myburgh@outlook.com

Please note: Due to National Lockdown regulations, dates can be changed or postponed.

Neem asseblief kennis: As gevolg van Nasionale inperkings regulasies, kan datums verander of uitgestel word.

Invitation: Pretoria Amateur Radio Club: Veterans Breakfast
Uitnodiging: Pretoria Amateur Radio Klub: Veterane Ontbyt



Venue: Jan se Skuld – 545 3rd Road, Montana, 10th October from 10h00
(Covid Safety & Hygiene rules will be applied)

Plek: Jan se Skuld – 545 3de Straat, Montana, 10^{de} Oktober vanaf 10h00
(Covid Veiligheids & Higiëne reëls sal toegepas word)

Invitation: Pretoria Amateur Radio Club: Annual General Meeting
Uitnodiging: Pretoria Amateur Radio Klub: Algemene Jaarvergadering



PRETORIA AMATEUR RADIO CLUB
90TH ANNUAL GENERAL MEETING
Saturday, 31st October 2020
From 11h30 at the Pretoria Old Motor Club

PRETORIA AMATEUR RADIO KLUB
90^{STE} ALGEMENE JAARVERGADERING
Saterdag, 31^{ste} Oktober 2020
Vanaf 11h30 by die Pretoria Ou Motor Klub



Covid safety rules will be applied during meeting
Covid veiligheids reëls sal toegepas word tydens vergadering



**90th ANNUAL GENERAL MEETING
90^{ste} ALGEMENE JAARVERGADERING
Pretoria Amateur Radio Club**



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

Venue

**Saturday 31 October 2020
Time : 11h30
Agenda : To be published**

Plek

**Saterdag 31 Oktober 2020
Tyd : 11h30
Agenda : Sal gepubliseer word**

NB

Nominations awaited. Latest acceptance by 11h00 on 31 October 2020
Nominasies word afgewag. Laatste indiening teen 11h00 op 31 Oktober 2020
Contact details on page 2 of WATTS / Kontakdetails op bladsy 2 van WATTS

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

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

I/Ekbeing ZS/R/U..... give/geeZS/R/U.....

Proxy to vote on my behalf at the 2020 PARC AGM

Volmag om namens my te stem tydens die 2020 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 **31 October 2020 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 31 Oktober 2020** 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		

Introduction

Theo Bresler ZS6TVB designed the FA Tester as an Amateur Radio weekend project to provide a means of simple and easy testing of QRP Labs™ filter board kits and other filters or attenuators in a similar physical format.

Connecting cables and connectors to the filter kits for testing or calibration of a Vector Network Analyser (VNA) is challenging. The FA Tester is designed to enable filter kits and attenuators to be tested accurately and repeatedly with a VNA, providing the correct calibration plane with on-board calibration jumpers and termination resistors. The design was kept simple with a single-layer PCB. Tracks were kept as short as possible for accurate testing at higher frequencies.

The design is not intended as a commercial product. It is for testing personally acquired QRP Labs™ kits. Use the board at your own risk. Accuracy is not guaranteed.

Connecting to your Vector Network Analyser

The FA Tester features two standard SMA-F RF connectors: One each for the S_{11} and S_{21} ports on your VNA. Depending on your test equipment or requirement for the device being tested, the FA Tester may be connected to only the S_{11} port or to both ports of your VNA.

Your VNA should have been supplied with two SMA-M to SMA-M pigtails that may be directly connected between the FA Tester and your VNA without the need for any extra connectors. Connect the FA Tester S_{11} port to your VNA S_{11} or CH0 port. Connect the FA Tester S_{21} port to your VNA S_{21} or CH1 port.

Should you have a modern VNA such as the Nano-VNA range with the 4" display, you may use the pigtails supplied with your VNA or connect directly to the VNA with the use of two SMA-M to SMA-M barrel connectors. The FA Tester was designed with the same spacing between the two SMA connectors as provided on the more modern VNAs, so that the FA Tester can be connected directly to the VNA. Refer to Figure 1 below for more detail.

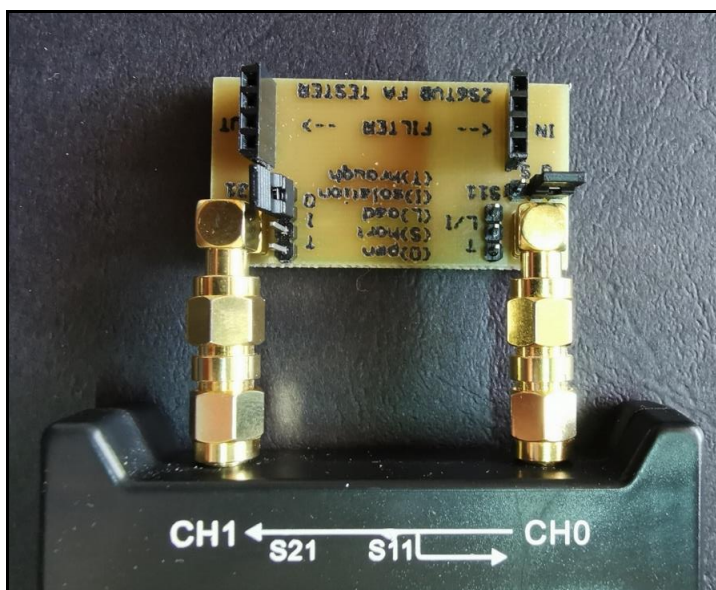


Figure 1: FA Tester connectors to VNA

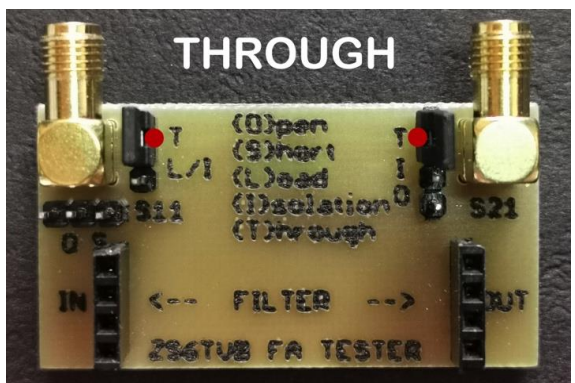
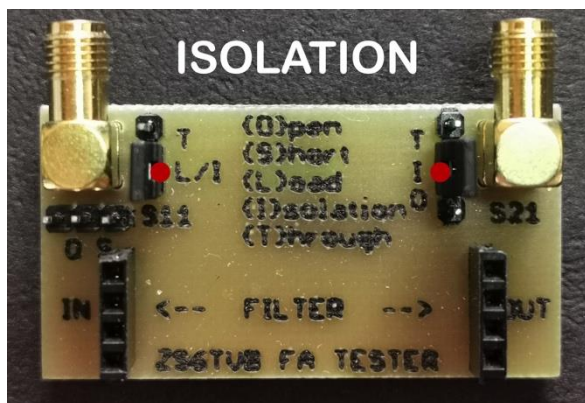
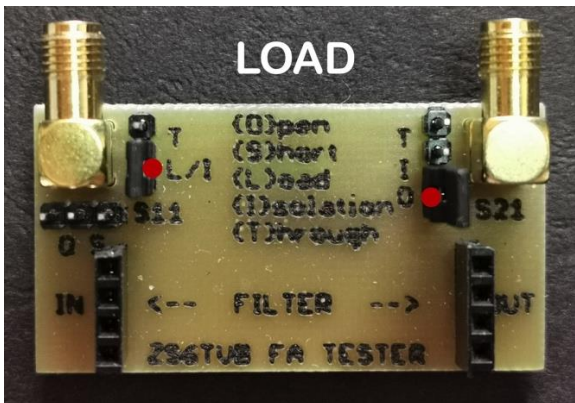
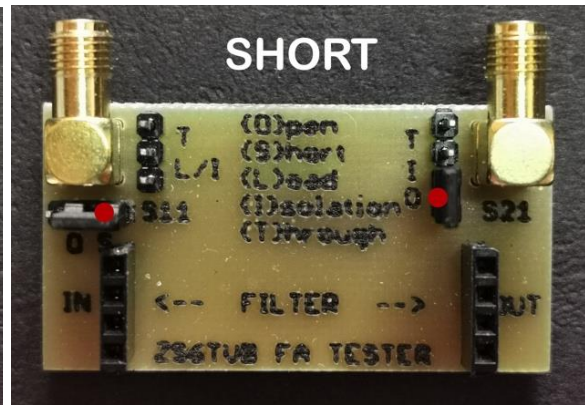
VNA Calibration

To aid accuracy, the FA Tester is equipped with matched 50 Ω resistors on both the S_{11} and S_{21} ports. A complete calibration sequence for Open, Short, Load, Isolation and Through may be done by simply by placing the S_{11} and S_{21} jumpers at their correct locations. Jumper positions are clearly marked on the board for correct placement. Refer to Table 1 below as a reference of where jumpers should be placed during the calibration sequence of your VNA or VNA software. Figures 2-6 below should provide more clarity.

 **Note:** Once the calibration process is complete, remember to place both jumpers back into the Open (O) position.

Table 1 Jumper positions as marked on PC board

Calibration Sequence	S_{11} Jumper Position	S_{21} Jumper Position
Open	O	O
Short	S	O
Load	L/I	O
Isolation	L/I	I
Through	T	T



Figures 2-6: Placement of jumpers during calibration sequence

Test your device

Finally! Time to start testing.

1. Ensure both S_{11} and S_{21} jumpers on the FA Tester are placed in the Open (O) position.
2. Ensure the filter is plugged into the FA Tester and that the IN and OUT sides of your filter are aligned with the IN and OUT markings on the FA Tester.
3. Proceed with testing of your device.

Actual tests are outside the scope of this document.

Additional Applications

Although originally designed to test filters, the FA Tester may also be used to accomplish the following tasks.

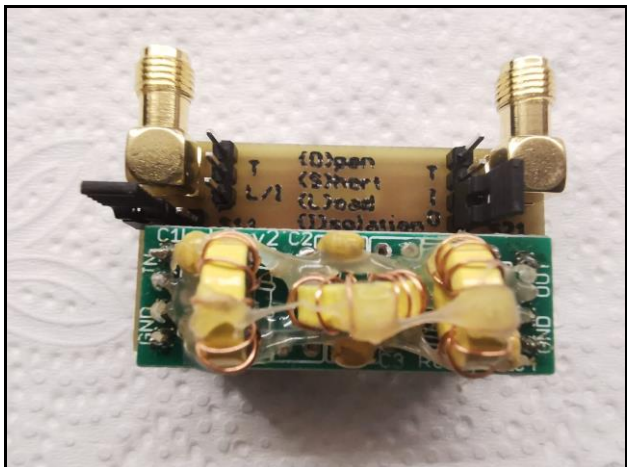
- With both jumpers in the Open (O) position, connect your filter to a coaxial transmission line.
- Use it as a calibration standard for your VNA or Antenna Analyzer.

Acronyms and Abbreviations

PCB:	Printed Circuit Board
RF:	Radio Frequency
SMA:	Sub-Miniature version A
SMA-F:	Female SMA
SMA-M:	Male SMA
VNA:	Vector Network Analyzer

Contact me: Should any of the content in this document not be clear you are welcome to contact me. I am on QRZ.com. Theo Bresler ZS6TVB

Some more construction photographs below:



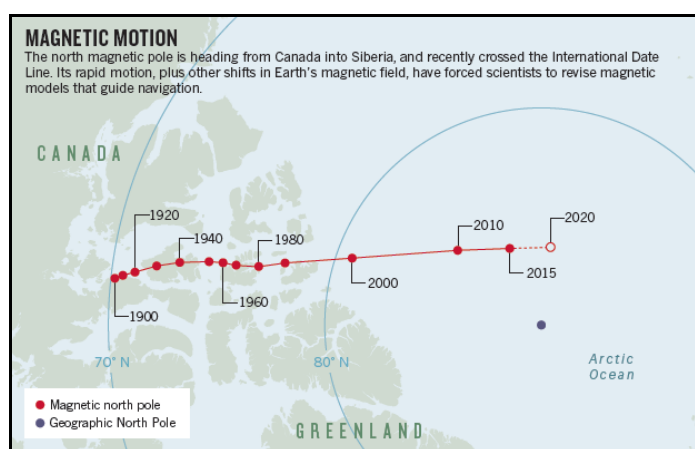
Structure and Secular Variation of the Magnetic Field of the Earth: Part 2

Introduction

In the previous issue of Watts, the structure of the main layers of the Earth, as well as the effect of the magnetosphere was discussed. A drift in the magnetic field of the Earth has been observed the past two hundred or more years, and the possibility of a switch of the magnetic poles of the Earth is even being speculated. The observed time-changes of the field is referred to as secular variation^[1]. The best known and well documented feature is the westward drift^[1,2], which has been observed as much as three centuries ago by Sir Edmund Halley^[3,4]. Research by Bauer^[5] and Carlheim-Gyllensköld^[6] two hundred years later have confirmed that secular variation had persisted since the mid-16th century^[1].

Rate and Duration of Secular Variation

With and improvement in the quality of measurements the last century, a more accurate quantification of a westward drift could be obtained. Magnetic field maps^[7] compiled from 1905 to 1945 enabled investigators^[8] to conclude that the average drift of the non-dipole of the magnetic field over the entire planet during that period was 0.18° yr⁻¹. However, the rate of global westward drift of the Earth's magnetic field, which is a well-known feature of secular variation, has not found to be constant^[1]. Currently, the general view is that the westward drift is a surface expression of the movement of localized field features at the Core-Mantle Boundary (CMB), and is not a global phenomenon. It is however also not clear whether the pattern of westward motion of the magnetic field in the Atlantic hemisphere at the CMB is a persistent feature of the geodynamo, or whether different patterns of azimuthal motions have occurred in the past^[1].



Migration of the Earth's magnetic field: 1900-2020

(Illustration: World Data Center for Geomagnetism: Kyoto University)

According to Dr. Arnaud Chulliat, a geo-magnetist at the University of Colorado Boulder and the National Oceanic and Atmospheric Administration's (NOAA's) National Centers for Environmental Information, the error in the model is increasing with time^[2]. The problem can be ascribed to partly the moving pole, and partly with shifts deep within Earth^[2]. The molten liquid rock which generates the magnetic field of the Earth may vary and accelerate over time, resulting in changes and movement of the magnetic field. Such a phenomenon was observed in 2016 a temporary acceleration of the magnetic field was observed deep under South America and the Eastern Pacific Ocean^[2]. The resulting effect in 2018 was that the World Magnetic Model was in trouble, urging researchers from the NOAA and the British Geological Survey to verify their data they have been capturing of the variations in the Earth's magnetic field. To their dismay they realized that the model was so inaccurate that it was about to exceed the acceptable limit for navigational errors^[2].

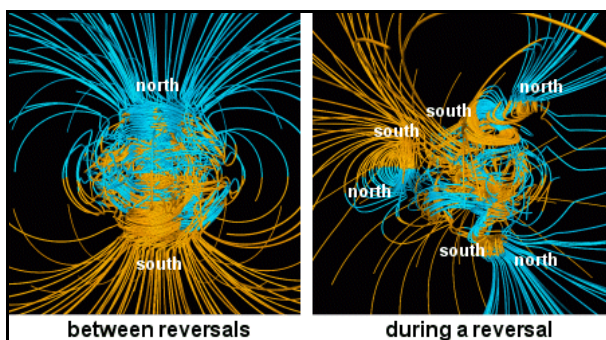
A recent paper^[2] in Nature has indicated that the Earth's magnetic pole has moved away from Canada into the direction of Siberia. The current movement is so rapid that it forced geo-magnetism specialists to update the World Magnetic Model, which is a description of the Earth's magnetic field, and underlies all modern navigation^[2]. The most recent version was released in 2015, and should have lasted until 2020. However, the magnetic field is changing so rapidly that another change to the model is required.

Dr Chulliat reported at the American Geophysical Union in December 2018 in Washington that the answer may be twofold: (i) The 2016 geomagnetic pulse beneath South America appeared at the worst possible time, which was just after the update of the World Magnetic Model in 2015, and (ii) The motion of the north magnetic pole made matters as the it was wandering in an unpredictable fashion. The speed of the movement of the north pole has increased from the mid 1990-s from 15 kilometers per year to 55 kilometers per year. Subsequently, the north pole has entered the Arctic Ocean in 2001, and had forced a team including Chulliat in 2007 to land on sea ice by plane in order to locate the pole. Since 2018, the movement of the north pole has been eastward, such that it crossed the International Date Line, entering the eastern hemisphere, and is currently moving towards Siberia^[2].

This strange westward-eastward nature of the north pole is not a new phenomenon, and has even fascinated explorers and scientists since James Clark Ross first located it in 1831 in the Canadian Arctic^[2]. This is confirmed by the analyses of archaeomagnetic data which suggested that a surface westward drift has been taking place for at least the past 700 years^[9,10]. However, other studies have shown evidence of a dominant eastward motion under Europe roughly between 900 AD and 1350 AD^[11,12]. It can generally be accepted that during the past three millennia a globally averaged drift at the CMB may have been sometimes eastward and at other times westward^[13].

Reversal of the Magnetic Field

An article available on the NASA website^[14] indicates the north and south poles may completely flip. Such reversals, recorded in the magnetism of ancient rocks are characteristically unpredictable, occurring at irregular intervals of approximately 300 000 years, with the last one occurring 780 000 years ago. We can argue that we may be due for another polar switch, but there are no current indications of such an event. Professor Gary Glatzmaier and colleague Paul Roberts, specialist scientists in the field of magneto-hydrodynamics, have created a supercomputer model of the Earth's interior, which calculates a magnetic field based on variations in the heat of the inner core and movements of the fluid metallic layer above it. Their model showed that the magnetic field waxes and wanes, and that poles drift and occasionally flip.



Their model showed that a magnetic flip takes a number of thousands of years to complete, with significant complications as a result. Magnetic lines of force near the Earth's surface become twisted and tangled, and magnetic poles show up in unexpected places. A south magnetic pole may emerge over Africa, or a north pole over Tahiti. The picture on the left shows a normal dipolar magnetic field as we know it, with a complicated magnetic field Earth may experience during the upheaval of a reversal^[14].

Climatic Impacts

A paper entitled “*New perspectives in the study of the Earth's magnetic field and climate connection: The use of transfer entropy*”^[15] explores the possible relationship between the Earth's climate and geomagnetic field, a subject which has been debated the past fifty years. The first definite proposals which quantified this possible link^[16] pointed out that low geomagnetic intensities are generally associated with warm climatic periods. It was also suggested that drifts of geomagnetic poles could have been responsible for displacements of a large low-pressure region of the Earth's atmosphere associated with an increase of cyclonic activity and sudden climate changes^[17]. Another phenomenon relates to the rate at which galactic cosmic rays reach the Earth's surface.

The flux of galactic cosmic rays is modulated by the intensity of the Sun and the Earth's magnetic fields, which act as a protective shield. High values of solar and Earth magnetic field intensity reinforce the protective shield, resulting in an expected lower density of galactic cosmic rays reaching the Earth. Once cosmic rays have entered the Earth's atmosphere, it could play an important role in cloud formation, and hence play an important role in the climatic processes of the Earth. Hence, a decrease in the geomagnetic field intensity would allow a higher entrance of galactic cosmic rays to the Earth which would in turn enhance the formation of low-lying clouds, or increase the global cloud cover, leading to tropospheric cooling.

Other studies have shown a possible relationship between increases and decreases of the geomagnetic field intensity and the advance and retreat of Alpine glaciers. The effect of geomagnetic intensity on CO₂ solubility has been demonstrated with low intensity values reducing CO₂ solubility in the ocean, displacing more CO₂ to the atmosphere and increasing the temperature, resulting in the melting of glaciers. Similarly, for the past 300 years a temporal trend has been observed between the growing South Atlantic Anomaly (SAA) area extent on the Earth's surface and the Global Sea Level (GSL) rise.

Please note: *This is not a scientific research paper and is intended for informative purposes only. Consultation of the references is encouraged to obtain detailed information.* Louis de Wet ZS6SK

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The Secunda National Rally 2020: Johan de Bruyn ZS6JHB

The 2020 Secunda National Rally took place on the 11th and 12th of September 2020 in the Secunda area. The event kicked off on Friday at 11h00 at Lake Umuzi and four stages, Janneman 1&2 and Kosie 3&4 were completed. Saturday morning Rally HQ moved to Tjorrie Farm and again four stages, Tjorrie 5&7 and TW Stene 6 and 8 were completed.

All competitors, service crews, rally marshals, and radio marshals reported in at Rally HQ each morning to sign in and had their temperatures check. Luckily all went well and nobody was sent packing.

Communications was done on 145,525 simplex and Graham Reid ZS6GJH had no problems to get the times from the end of stages.

Thank you to:

- 1) Graham ZR6GJR and Joey for running Control.
- 2) Menno ZS6AGC - Car 0
- 3) Chris ZS6BCM-Chief Marshal, assisted by Mellie.

Field stations:

- 1) Pieter ZS6PAM and Irene ZS6IEA
- 2) Willie ZR6WGR who ran the show at the stages where we were involved and I do not mention this in a bad way.

Willie had to train Marshals doing the time cards who had no experience what so ever. On request of the Post Chief Willie and I agreed to assist them again on Saturday which meant that we had to swop stages on Saturday with Pieter and Irene. Thank you Willie, you have done a great job. Last but not least it need to be mentioned that Willie ZS6WVN and Annelie ZS6AVN did their stint as road marshals on the event. In closing, thank you to all for a great event.

Johan de Bruyn ZS6JHB





Long Term HF Propagation for September 2020: Courtesy Vincent Harrison ZS6BTY

The graph below shows the predicted F-layer Maximum Usable Frequency (MUF) for propagation from Pretoria^[1] using monthly sunspot numbers from SILSO^[2].

Local Propagation (up to 500 km): The F or F2 critical frequency (f_oF_2) is the MUF for short range, near vertical incidence sky-wave (NVIS) propagation.

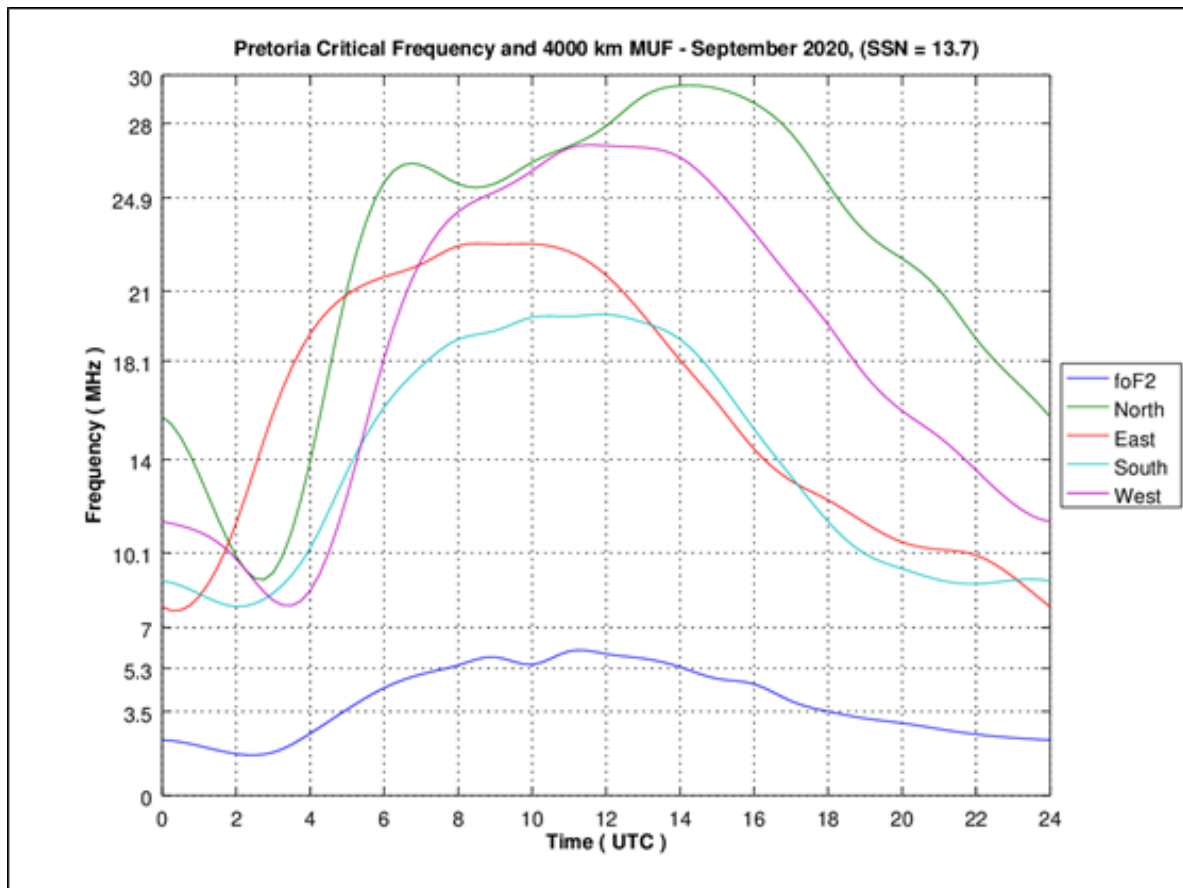
Long Distance Propagation: The MUF for a first hop of 4000 km in the cardinal directions is labeled North, East, South and West. They indicate the direction that propagation may be expected.

Worldwide Propagation Maps: <http://www.parc.org.za/index.php?page=propagation>

"Prediction is difficult, especially when dealing with the future". . . Danish Proverb. 73 Vincent, ZS6BTY

^[1]FTZMUF2: A simple method of estimating the ionospheric parameters of f_oF_2 and M(3000) with the aid of a home computer - Thomas Damboldt and Peter Süßmann, Deutsche Bundespost, December 1988.

^[2] Silso 12-month forecasts of the monthly sunspot number (<http://sidc.oma.be/silso/FORECASTS/prediML.txt>)



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