



WATTS

07-2015

Year 85 + 7m

Monthly Newsletter of the Pretoria Amateur Radio Club
 Maandelikse Nuusbrief 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 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

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

Bulletin repeats on Mondays / herhalings op Maandae : 2m 19:45



The "Three Musketeers" of PARC: Kenny ZS6KMM, Sarel ZS6EK and Whitey ZS6JJJ

In this Issue / In hierdie Uitgawe

PARC Committee Members	Page 2
Birthdays, Anniversaries and Joys & Sorrows.....	Page 2
Diary and General Information & News.....	Page 2
PARC Club Meeting & RAE Successful Candidates.....	Page 3
KARTS and AWA Flea Market.....	Page 4
Nixie Tube Displays for Antique Radios.....	Page 5
SA AMSAT Symposium.....	Page 6
The October RAE.....	Page 7
Solar Activity and Geomagnetic Storms.....	Pages 8-9
Technical.....	Page 10

Next Events

Club Social Meeting :

Saturday 4th of July at 11:00 AM at
 the Pretoria Motor Club

Club Committee Meeting :

Thursday 16th of July at 19:00 per
Skype

PARC AGM : 25 October 2015 after the Fleamarket

Proxy and Nomination forms will be send with Watts and can also be downloaded from the PARC website. Please contact Louis de Wet (ZS6SK) for any enquiries.

PARC Committee Members / Komiteelede : 2014 – 2015

Chairman, Social & Rallies	Johan de Bruyn	ZS6JHB	zs6jhb@gmail.com	012-803-7385	079-333-4107
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Contests	Jaco Cronje	ZR6CMG	jaco.cronje@moboxgroup.com		076-319-1057

Birthdays – July / Verjaarsdae – Julie

01 Avida Bresler ZS6AVB
 06 Helen Newton ZR6HN
 13 Pieter Human ZS6PA
 17 Jan (Pine) Pienaar ZS6OB
 19 Theo Bresler ZS6TVB
 20 Roy Newton ZS6XN



22 Roxanne, dogter van Sylvia en Tjerk ZS6P
 26 Frank Schneider ZS6GE
 29 Iain McAllister ZS5IE

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

Spouse's Birthdays – July / Julie

01 Avida ZS6AVB, sw of Theo Bresler ZS6TVB
 12 Sharmaine Kathleen, sw of Louis de Wet ZS6SK
 17 Lyn, sw of Andre van Tonder ZS6BRC
 17 Judy, sw of David Bazil Botha ZS6DBB
 19 Theo ZS6TVB, husband of Avida Bresler ZS6AVB
 29 Ria, sw of Peter Smith ZS6PJ

Anniversaries / Herdenkings – July/Julie

06 Elsa and Fritz Sutherland ZS6SF
 06 Julie and Paul Sterling ZS6BMF
 21 Pat ZR6AVC and Frank Schneider ZS6GE

Lief en Leed / Joys and Sorrows

Bertha, the Wife of Hans Kappetijn is progressing well after hospital treatment
 Mollie Peer ZR6MOL was released from hospital and is doing well

Contests and Diary of Events – July 2015 / Kompetisies en Dagboek van Gebeure – Julie 2015 (UTC Times)

06	RAC Canada Day Contest : 00h00 – 23h59
04 - 05	Venezuelan Ind. Day Contest : 00h00 – 23h59
05	SARL ZS5 Sprint
05	DARC 10-Meter Digital Contest : 11h00 – 17h00
05 - 06	Marconi Memorial HF Contest : 14h00 – 14h00
11 - 12	IARU HF World Championship : 12h00 – 12h00
18	SARL Winter QRP Sprint
18 - 19	CQ Worldwide VHF Contest : 18h00 – 21h00
25 - 26	RSGB Islands on the Air (IOTA) Contest : 12h00 – 12h00
25	PARC Flea Market : 8h00

PARC SUBS / LEDEGELD FROM / VAN 30-06-2014

Bank	First National Bank	Ordinary Members / Gewone Lede : R150 Spouses / Pensioners : R50	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

Next PARC Flea Market : Saturday 25 July 2015 : 8h00
 Please contact Almero Dupisani (ZS6LDP) for any enquiries

PARC Club Meeting : 6 June 2015

The past PARC Club Meeting on the 6th of June was braved by 7 members and the "Club Mascot", Liza. Despite the cold, a nice campfire and grilled meat, rolls and a couple of beers ensured a pleasant atmosphere. Various issues were discussed by Johan ZS6JHB. The next meeting is on Saturday 4 July.



May RAE : Successful Candidates

The following candidates were successful during the May 2015 RAE:

David Bazil Botha ZS6DBB
Leon Fouche ZS6LEF
Alfred Newman *ID *HF

Lukas Dorfling ZS6LMD
Amanda Greeff ZS6AGR

Quintin Forster *ID *ICASA
Gert Jansen van Vuuren ZS6GBD

Congratulations and welcome to the world of Amateur Radio!

KARTS and AWA Flea Market : 6 June 2015

The KARTS fleamarket and AWA (Antique Wireless Association) exhibition was held in Kempton Park on the 6th of June. PARC was well represented by Hans ZS6KR having a stand, while Almero ZS6LDP Etienne ZS6EFN, Andries ZS6SCH and Louis ZS6SK were going through the stands, looking for bargains. The AWA had a very interesting exhibition with a variety of antique transceivers and test equipment. The highlight was a Marconi T1154 transceiver which was used in the Second World War in the Lancaster Bombers. Even a bottle of beer named after the famous bomber was on display.



Nixie Tube Displays for Antique Radios : Raymond Vaughan



The name “Nixie” was trademarked by Burroughs in 1955. “Nixie” is an acronym (or backronym) for Numeric Indicator Experiment No. 1.(Ref. Wikipedia). The Nixie tube is an evacuated Neon impregnated tube comprised of 10 cold cathode elements (0-9) fixed to +170VDC common anode and excited by the application of 0V on the single desired elements individual cathode.

In the 1950's this technology and associated digital electronics was expensive so it only found application in professional electrical measurements and early computing. There was no significant domestic application mainly because household appliances were analogue and to add a digital display was impractical and cost prohibitive. The first commercial applications began in the 1960's and were widely used in lift floor displays, clocks, public transport displays and by the gaming industry (for their slot machines), which are all digital in their nature. The arrival of the semiconductor 7-segment display in the 1970's rendered the Nixie virtually redundant although production carried on into the 1990's. Nixies are becoming rarer and more expensive as limited stocks deplete.



Nixie-za is a South African sole proprietor, semi-retired electronics engineer/hobbyist who has a passion for restoring vintage furniture, clocks and radios. The kits are designed and prepared locally but are unfortunately subject to Rand/Dollar fluctuations.

Nixie-za have merged modern electronics (real time clock and digital FM receiver) to these veteran Nixie displays to create kits that can be retro-fitted into old valve radio or mantle clock casings. The intention is to bring old valve radios and mantle clocks back to life with uniquely interesting displays although some prefer a modern or SteamPunk appearance with the “retro” Nixie display. Clocks and radios were never made like these in the Nixie heydays, so what you create now will be unique.

The chiming clock kit only uses “thro-hole” components and is ideally suited to the electronics enthusiast.

The radio/clock is a combination of FM radio and clock and features a wake-up (alarm) function. The Nixie display shows tuned frequency and then reverts to displaying time. The radio/clock “kit” is pre-assembled and tested before dispatch. This is because the micro-processor SMD chip has pins 0.8mm center-center pitch which is beyond the capabilities of most electronics enthusiasts. The next version will replace the processor with a “friendlier” footprint permitting the radio/clock to be shipped as a kit.

Both kits feature battery backed Dallas real time clocks (RTC) where the time is retained during power failure. The radio is a digitally tuned FM receiver which has the advantage of locking on to the tuned frequency. The last tuned frequency is retained in non-volatile memory and will restore after application of power.



Some examples of restored sets with Nixie tube indicators installed.

Please visit <http://www.nixie-za.com/#!specifications/c5jn> for full specifications

Raymond Vaughan

75 Violet Rd, Primrose, Germiston, Gauteng, South Africa P O Box 2819, Bedfordview 2008, South Africa

Tel: +27 82 920-5331 Fax: +27 86 689-5499

Mail: info@nixie-za.co.za

Report Back on the SA AMSAT Symposium : Etienne Naude ZS6EFN

20 June 2015, and time for the South African Amateur Satellite Association Space Symposium held at the Innovation Hub in Pretoria.

SA AMSAT is a specialist organization that focuses on amateur satellites and weak signal communication. SA AMSAT is affiliated to the South African Radio League, the national body for Amateur Radio in South Africa. It also has strong links with other AMSAT organizations worldwide.

The program for the day was packed with interesting topics and discussions with specific reference to the role of amateur satellite communication within the radio amateur environment. Apart from networking opportunities and catching up with fellow amateurs delegates were treated to insightful presentations. An interesting observation was that the content of the symposium were aimed at the normal man in the street without being too overwhelming technical of nature, which we all know could run the danger of delegates losing interest in the subjects under discussion. Instead the content were to the point and delegates being kept interested throughout the presentations.

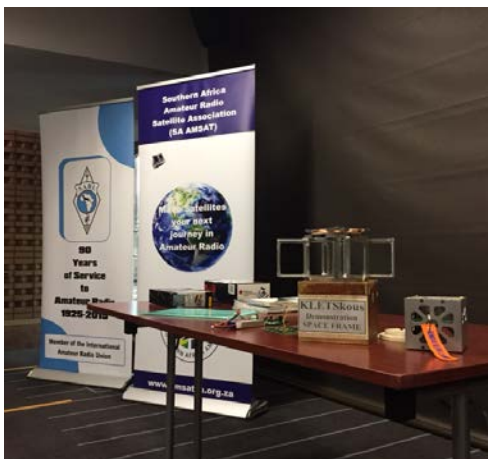
Hans van de Groenendaal's opening address put a new perspective on the possibilities and innovative ways radio amateurs can use to make satellite communications part of their day-to-day radio operations. Satellite communication is no longer just accessible for a selected few, with the correct planning and infrastructure satellite communication is now in reach to almost all radio amateurs.

Raoul C Hodges, managing director of SANSA Space Operations and keynote speaker for the day talked about South Africa's contribution to space observation. The evolution of the Hartbeeshoek project, the use of meteosat and earth observation imagery as part of a service oriented delivery mechanism, this aside, South Africa's development further grew into space observation being the first country to track deployment of French satellites. The first KU and KA band antenna in the world was built by South Africa. South Africa is indeed in a very unique position geographically to monitor, engage in and support worldwide satellite and antenna services for commercial and tactical service providers worldwide.

With all the satellites and other orbiting objects out in orbit, our space is cluttered with debris. There are just over 1200 satellites in orbit and more than 16,000 orbiting objects in space. So a program has been developed to track satellite lifecycle, which includes a deorbiting strategy once the satellites reach end of life.

ZACube-2 is the successor to Africa's first nanosatellite. Danie de Villiers shared with us the next generation nanosatellite applications. Land observation and technology is still the two most prominent reasons for using nanosatellites.

Christo the project leader for BACAR (Secunda Amateur Radio Club - Balloon Carrying Amateur Radio Equipment Initiative) gave a very interesting presentation of the Secunda Amateur Radio Club's BACAR project. For me this was the presentation of the day. This initiative has really captured the entire being of amateur radio as a science, a hobby, a sport and the excitement projects of this nature can bring to a community. The club has through innovative thinking broaden the impact of this initiative by involving surrounding schools to take part in the science and technology making it part of their school syllabus and further learning objectives. Two scholars from Secunda High School presented their experience and what they have learned from this project. Indeed a great initiative and again a show and tell of practical ways to extend the amateur radio hobby to involve the community.



The remainder of the day, after lunch was dedicated to project updates on the KLETSKOUS project, Getting Africa into space. Hannes Coetzee the project leader of KLETSKOUS gave us a brief overview of the project and what KLETSKOUS is all about. There after presentation were given touching almost all aspects of the project from the frame design, planning and building of the power supply, payload and much more. The project is well under way and again it is a show case of how normal radio amateurs can get involved in amateur satellite communication.

The SA AMSAT Space Symposium 2015 was indeed an interesting event which was thoroughly enjoyed by all delegates.

October RAE : Information for prospective candidates

The Pretoria Amateur Radio Club hereby wishes to sincerely thank and express our appreciation to Vincent Harrison for the years of hard work and dedication he has put in with the preparation of candidates for the Radio Amateur Examinations. However, Vincent has indicated, that due to work and personal commitments, he needs to hand this task over to someone who is willing to take over this task.

Etienne Naude ZS6EFN has indicated that he will henceforth act as Coordinator of the RAE classes and preparation of prospective candidates. Etienne will be assisted by Fritz ZS6SF, Pierre ZS6JPH and Louis ZS6SK. PARC hereby expresses it's sincere appreciation to these gentlemen for volunteering. Below is a schedule for the weekly classes for preparation for the RAE.

Week	Date	Subjects	Tutor
1	14 July	1. Introduction to Amateur Radio 2. Basic Electrical Concepts 3. Resistance and Ohm's Law	Etienne
2	21 July	4. Resistors and Potentiometer 5. Direct Current Circuits 6. Power in DC Circuits	Etienne
3	28 July	7. Alternating Current 8. Capacitance and the Capacitor 9. Inductance and the Inductor	Louis
4	4 August	10 Tuned Circuits 11. Decibel Notation 12. Filters 13. The transformer	Pierre
5	11 August	14. Semiconductors and the Diode 15. The Power Supply 16. The Bipolar Junction Transistor	Louis
6	18 August	17. The Transistor Amplifier 18. The Oscillator 19. Frequency Translation 20. Modulation Methods	Pierre
7	25 August	21. The Transmitter 22. Receiver Fundamentals 23. The Superheterodyne Receiver	Fritz
8	1 September	24. Transceivers and Transverters 25. Antennas 26. Propagation	Fritz
9	8 September	HF Assessment	Pierre, Etienne, Louis
10	15 September	27. Electromagnetic Compatibility 28. Measurements 29. Digital Systems	Etienne
11	22 September	30. Operating Procedures Regulations	Etienne, Louis
12	29 September	Revision	Etienne, Louis
13	6 October	Revision	Etienne, Louis
14	13 October		

The RAE Classes will commence on Tuesday, the 14th of July at 18h00, and not 19h00, to provide time for an introduction. After that, all other classes will be on Tuesdays from 19h00 to 21h00.

The classes are based on the RAE manual that can be downloaded from the website of the South African Radio League (SARL) at no cost.

RAE manual http://www.sarl.org.za/Documents/SARL_RAE_Manual.pdf

Regulations http://www.sarl.org.za/Documents/Radio_Regulations_GG34172_1Jan2013_Extract.pdf

Lectures are free and informal and no registration is necessary. They cover both the technical aspects and the regulations of the RAE syllabus and include the operating assessment for the RAE.

The address for the classes is: Waterlab (Pty) Ltd,
23B de Havilland Crescent,
Persequor Park 0020

Solar activity and Geomagnetic Storms : By Johann W

We continue our series on Geomagnetic storms, and will focus this month on Coronal Mass Ejections and Solar Wind.

Coronal Mass Ejections

Since Carrington's accidental flare observation in 1859, it was established that geomagnetic storms are linked to solar activity and come in a very irregular fashion. More than one hundred years later, a different category of highly energetic transient events on the Sun was discovered, in the course of which huge amounts of gas are ejected from the Sun into interplanetary space. After some years of unclear terminology, the use of the name Coronal Mass Ejections (CMEs) became common. Their pronounced significance for the Earth was soon revealed. Although the discovery of coronal mass ejections was made only some 39 years ago, a very vast literature has been piled up, and the flood of new publications is still growing.

The shapes of the vast majority of coronal mass ejections appear to be consistent with a nearly perfect cross section. Indeed, halo coronal mass ejections moving exactly along the Earth–Sun line exhibit generally a circular and smooth shape. Some authors claim that there are two (or more) kinds of coronal mass ejections:

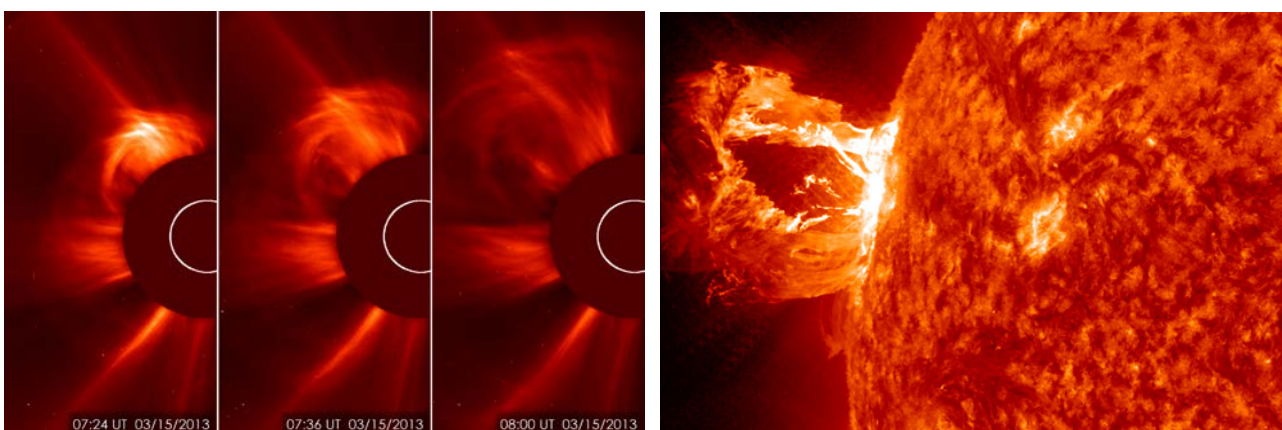
- Gradual coronal mass ejections, with balloon-like shapes, accelerating slowly and over large distances to speeds in the range 300 to 600 km/s, and
- Impulsive coronal mass ejections, often associated with flares, accelerated already low down to extreme speeds (sometimes more than 2000 km/s).

It is not clear yet whether these are really fundamentally different processes or whether they represent just the extrema of an otherwise continuous spectrum of CME properties.

A coronal mass ejection can be described in a three-phase scenario: the initiation phase, the impulsive acceleration phase and the propagation phase. The initiation phase (taking some tens of minutes) always occurs before the onset of an associated flare, and the impulsive phase coincides well with the flare's rise phase. The acceleration ceases with the peak of soft X-ray flares.

Several processes have been observed during coronal mass ejection but still needs further investigation:

- Right at the launch time of several coronal mass ejections rapid solar spikes were discovered at radio sub-millimeter wavelengths that might be representative of an early signature of coronal mass ejection onset.
- Coronal "dimmings".
- Moreton waves (named after their discoverer, see G.E. Moreton in 1960).
- EIT waves (named after the EIT instrument on SOHO that made them visible).
- Various types of radio bursts.
- Coronal inflow.



Some examples of Coronal Mass Ejections

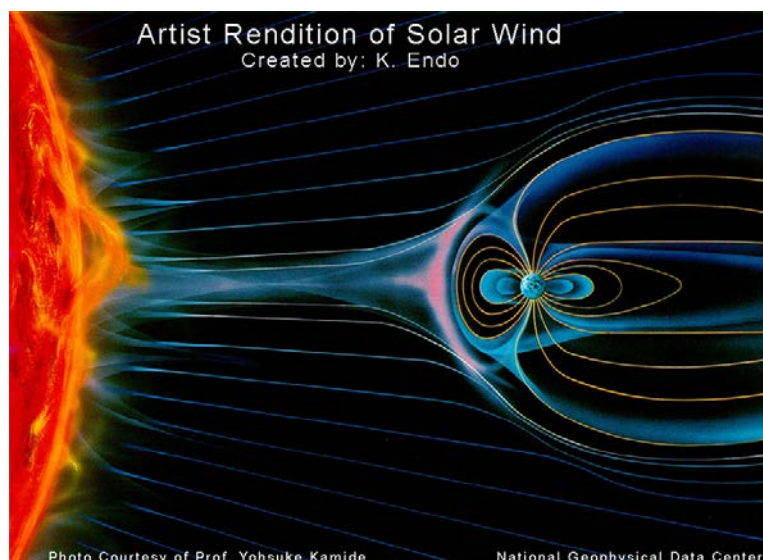
Scientists have to admit that some fundamental questions about coronal mass ejections are still unsolved. Most importantly: What causes a coronal mass ejection to erupt in the first place? The situation is similarly embarrassing as for flares. Many researchers around the world are intensely tackling this problem. However, the essential ingredients for coronal mass ejection onset are not yet identified. In order to disentangle the various processes around coronal mass ejection initiation new observations with significantly better resolution (spatially and in time) and even supported by spectroscopic diagnostics are needed. There is hope that the new Hinode and SDO missions with their excellent instruments will allow major progress in the field.

Solar Winds

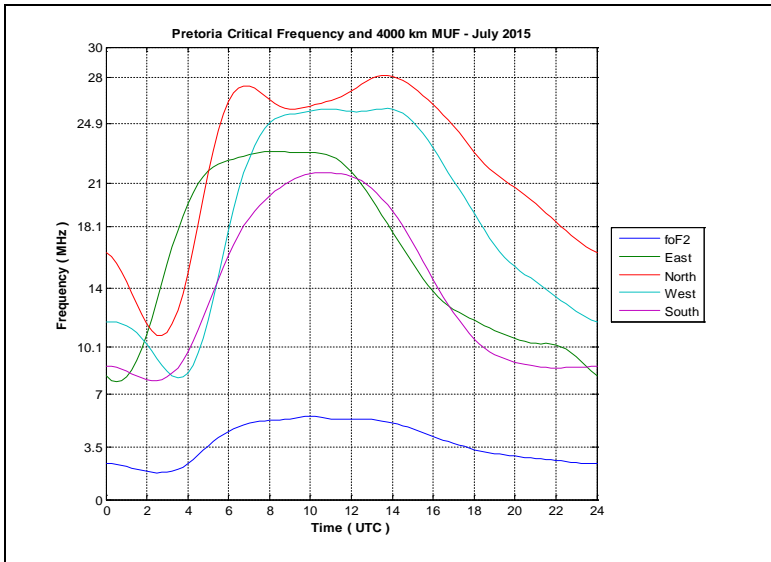
Space between the Sun and its planets is not empty as had been generally thought until the 1950s. It is filled by tenuous magnetised plasma, which is a mixture of ions and electrons flowing away from the Sun: the solar wind. In fact, the Sun's outer atmosphere is so hot that not even the Sun's enormous gravity can prevent it from continually evaporating. The escaping plasma carries the solar magnetic field along, out to the border of the heliosphere where its dominance finally ends.

From eclipse observations it has been well known that the solar corona is highly structured and dynamic. It changes its shape enormously during the solar activity cycle. Hence, it was no great surprise when both these properties (spatial structure and temporal variability) were found to be reproduced in the corona's offspring; the solar wind. It was not until the Skylab era in 1973/74 when so-called coronal holes were discovered to be the sources of long-lived solar wind high-speed streams. Coronal holes are usually located above inactive parts of the Sun, where "open" magnetic field lines prevail, eg, at the polar caps around activity minima. In contrast, the more active near-equatorial regions on the Sun are most often associated with closed magnetic structures, such as bipolar loop systems and helmet streamers on top. From here, the more turbulent slow solar wind emerges. The embedded density fluctuations allow visualization of this type of solar wind. It is important to note that both: the coronal holes as well as their offspring, the high-speed solar wind streams are representatives of the inactive or "quiet" Sun. Thus, the only state of the solar wind that may deserve the label "quiet" is the high-speed wind, rather than the more variable slow wind from above active regions.

The solar wind (and the interplanetary magnetic field carried with it) proves to be one key link between the solar atmosphere and the Earth system. Although the energy transferred by the solar wind is minuscule compared to both sunlight and those energies involved in Earth's atmosphere, the solar wind is capable of pin-pricking the Earth system which eventually may react in a highly nonlinear way. There are indications of effects reaching down as far as the troposphere, and our increasingly sophisticated high-tech civilization can indeed notice them and does, at times, even suffer from them. That is why the role of the Sun and the solar wind as the drivers of space weather have gained particular attention in the recent past.



Solar wind travels from the Sun and envelops the Earth's magnetic field. High-energy pulses of solar wind from sunspot activity ("solar bursts" or "plasma bubbles" travel from the Sun to the Earth at speeds exceeding 800km/s. The pulses distort the Earth's magnetic field and produce geomagnetic storms that disrupt the Earth's environment.



Long Term HF Propagation for July 2015

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

C/O NELSPOORT & 801 MALMESBURY STR, WINGATE PARK, PRETORIA [S25.49.36 & E28.16.07]

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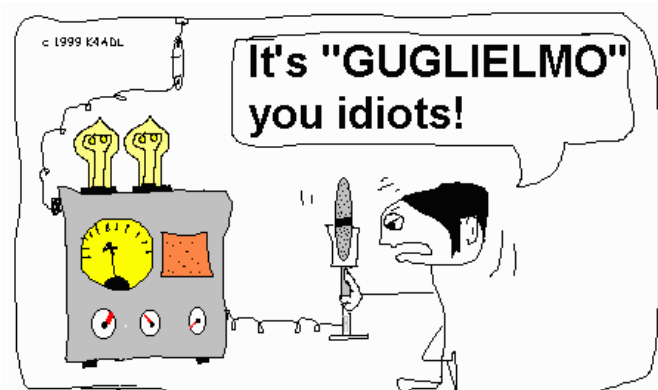
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 - Plug-in triple sequential industrial timers
- Contact Hans at 012-333-2612 or 072-204-3991

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"Harold!!! What are you doing wasting money on more USELESS radio equipment!!!"



THE ONLY REASON MARCONI INVENTED WIRELESS BROADCASTING WAS TO TEACH PEOPLE HOW TO PRONOUNCE HIS FIRST NAME.

For the birth of something new, there has to be a happening. Newton saw an apple fall; James Watt watched a kettle boil; Roentgen fogged some photographic plates. And these people knew enough to translate ordinary happenings into something new. *Sir Alexander Fleming*

James Watt patented his steam engine on the eve of the American Revolution, consummating a relationship between coal and the new Promethean spirit of the age, and humanity made its first tentative steps into an industrial way of life that would, over the next two centuries, forever change the world. *Jeremy Rifkin*