WATTS 02 - 2008

Year 78 +2m

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

PARC, PO Box 73696 Lynnwood Ridge 0040, RSA

web http://www.zs6pta.org.za mail:zs6pta@zs6pta.org.za

Bulletins :145,725MHz 08:45 Sundays / Sondae
Relays : 1840, 3700, 7066, 10135, 14235, 51400, 438825, 1297000kHz
Activated frequencies are announced prior to bulletins
Swapshop:Live on-air after bulletin 2m and 40m
Bulletin repeats | herhalings : Mondays 19:45 on 145,725 MHz

ZR6FD logo

Drukwerk printing ZS6BJPL

Papier / Paper ZS6JPL

Luther ZS6E (links) besoek Jhb/Pretoria. **Kyk bl.3 vir meer besonderhede van hierdie jolliefikasie..**

In this issue

In hierdie uitgawe

Next Meeting
02 Feb 2008

Time: 13:30 for 14:00
PARC Clubhouse
South Campus
University of Pretoria
SE cnr University and
Lynnwood roads

PARC Management team / Bestuurspan Oct. 2007- Sept 2008:

Committee members					
Chairman, Fleamarkets	Alméro Dupisani	ZS6LDP	chairman@zs6pta.org.za	012-567-3722	082-908-3359
Secretary, Vice Chairman Rallies, Social, Hamnet	Johan de Bruyn	ZS6JHB	secretary@zs6pta.org.za	012-803-7385	082-492-3689
Treasurer, Database, DF hunts	Richard Peer	ZS6UK	treasurer@zs6pta.org.za	012-333-0612	082-651-6556
Repeaters, Technical	Craig Symington	ZS6RH	technical@zs6pta.org.za	083-259-3233	083-259-3233
SARL liaison	Pierre Holtzhausen	ZS6PJH	zs6pjh@qtsp.co.za	012-655-0726	082-575-5799

Co-opted / Geko-opteer:					
Repeaters, technical	Johan Lehmann	ZS6JPL	jlehmann@csir.co.za	012-804-6173	083-300-8677
Auditor	Position open				
Newsletter/Kits	Hans Kappetijn	ZS6KR	editor@zs6pta.org.za	012-333-2612	072-204-3991
Asset control	Andre v Tonder	ZS6BRC	andreh.vtonder@absamail.co.za	361-3292	082-467-0287
Klubfasiliteite, **vlooimark**	Willie Greyling	ZR6WGR	willie@up.ac.za		082-940-2490
Webmaster (non-member)	Wesleigh				
Hamnet, projects	Roy Newton	ZS6XN	newtonr@telkomsa.net	012-547-0280	
Historian/Awards	Tjerk Lammers	ZS6P	zs6p@iafrica.com	012-809-0006	
Public Relations	Graham Reid	ZR6GJR	greid@wol.co.za		083-701-0511
	Thobile Koni	ZS6TKO	toko40@mweb.co.za		082-493-2483
Tea	Molly Peer	ZR6MOL	molly@peer.co.za	012-333-0612	
	Doreen de Bruyn	ZR6DDB		012-803-7385	082-857-9691

Minutes of the monthly club meeting of the Pretoria Amateur Radio Club held at the South Campus of the University of Pretoria on 9 Jan. 2008

Welcome: Almero ZS6LDP declared the meeting open and welcomed all who attended.

Attendance: The meeting was attendend by 23 members and 1 visitor, Vlasta sw of Ivan ZS6CCW.

Apologies : Apologies were received from Bill ZS6KO, Jean ZS6ARA, Edwin ZR6ESP and Hilary ZR6HAP.

Personal Matters/Lief en leed: Mary sw of Bill ZS6KO passed away on December the 30th. To Bill and daughter Lynnette our sincere condolences with their loss.

Minutes of previous meeting: The minutes of the previous meeting as published in Watts were approved. Proposed by Alf ZS6ABA and seconded by Willie ZR6WGR.
Matters arising from previous minutes: None.

Club Activities:

Rallies : Johan ZS6JHB – Rally season starting 16th February with the Subaru Rally in Belfast. Members who will be performing mobile duties is Tony Crowder ZS6CRO, Clerk of the course, Johann de Beer ZR6YV, Deputy clerk of the course, Pierre Holtzhausen, ZS6PJH Safety Officer and Johan de Bruyn ZS6JHB who will be opening the stages.

Social: Next social event will be a lunch on the 17th February 2008. Venue to be announced. Thus far 10 members indicated that they will attend the lunch. Please be reminded that everybody is welcome to attend the lunch and if you want to join us. Contact Johan ZS6JHB at cell phone number 082-492-3689 or at home in the evenings at 012-803-7385 to make your reservations. Members who will be attending our Saturday club meeting on 2nd February are reminded of the bring & braai afterwards.

Fleamarket: Almero ZS6LDP - Next Fleamarket will be on the 8th March 2008.

Financial Report. – Richard ZR6CK – Reported on the club's finances.

Fox Hunt – Next Fox hunt will be on 9th February. Please contact Richard ZS6UK to confirm your participation. Starting time 14.00 at the Botanical Gardens in Silverton.

Contests. Pierre ZS6PJH – SARL HF Field Day Contest: 9 and 10th February 2008. Venue to be announced .

General /Algemeen: Membership cards . In need of a membership card? Please contact Johan ZS6JHB.

HF Constructors Trophy – Pieter van Wyk ZS6MVW het met die HF Konstruksie Trofee weggestap vir sy volledig tuis-geboude Marchwood kragbron. Die kas en hitte-putte was ook alles sy handewerk.
VHF/UHF Constructors Trophy – Hans Kappetijn ZS6KR showed his Precision on-air 2m Frequency Standard which uses a GPS-disciplined 10MHz frequency reference. This was published in WATTS 3/2007. This unit can transmit 8W 144-146MHz in 12,5kHz steps and can also be audio-modulated.

Presentation. No presentation was planned for this meeting.

Next meeting: Saturday 2nd February 2008. Starting time 14:00. One week earlier than planned due to various member- and club commitments.

Closing: The meeting closed at 21:15.

Voorblad: **Goeie kennise van Luther almal saam vir middagete by 'n Pretoria restaurant.**

L>R: Luther ZS6E, Pieter ZS6LC, George ZS6NE, Gary ZS6YI, Tjerk ZS6P, Marten ZS6ZY, Mike ZS6AFG, Hennie ZS6ALN

Luther (90) is by sy QRA in Wakkerstroom gehaal deur Gary ZS6YI met sy "extended" Rolls Royce en het die naweek by Gary gekuier. Vandaar Pretoria toe vir persoonlike sake.

Luther ZS6E en Sakkie ZS6ID staan by die Rolls

Hierdie mikrofoon is 'n vreeslike ding!

Nog 'n paar ou kêrels – Some more oldies refurbished by Stan ZS6SDZ:

(these have had all their arthritis removed and work like new ones)

NATIONAL MOD. NC 173

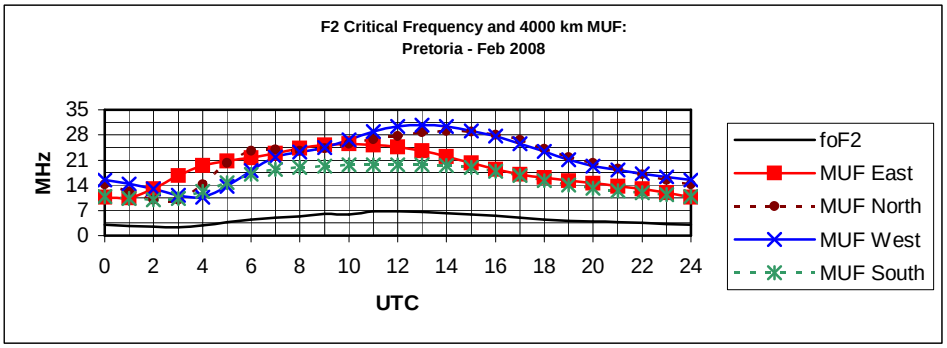
Over 30 of these beauties will in time to come, need to find a new home for posterity to admire and operate.
If you have any constructive suggestions in this regard, Stan would like to hear from you.
His phone number is 012-460-8487

NATIONAL MOD. NC 125

HAMMARLUND MOD. HQ-129X

Long Term HF Propagation Prediction for Feb. 2008 **(courtesy Vince ZS6BTY)**

DX Operating
The graph shows the 4000 km maximum useable frequency (MUF) to the East, North, West and South from Pretoria for the first hop using the F2 layer.
Local Operating
The F2 critical frequency (foF2) is the maximum frequency that will reflect when you transmit straight up. E-layer reflection is not shown.



Birthdays Feb
Verjaarsdae

03 Willie ZS6WGR
03 Aletta, lv van alf ZS6ABA
06 Ellen, lv van Joe ZS6AIC
06 Ada, sw of Jay ZS6BUD
07 Andre, son of Andre ZS6GCA
08 Melvyn ZS5MF
09 Davis, seun van Ellen en Joe ZS6AIC
09 Kenny ZS6KMM
10 Paddy, sw of Kenny ZS6KMM
11 Leanne, sw of Allan ZS6AVC
12 Yvette, dogter van Rika en Errol ZR6VDR
13 Sander ZS6SSW
15 Phil, sw of Craig ZS6RH
16 Pat ZR6AVC, sw of Frank ZS6GE
17 Freddie ZS6JC
20 Ivo ZS6XT
23 Arrie ZS6IRA
23 Peter ZS6PJ
24 Claire, daughter of Anne and Jac ZS6QA

Anniversaries Feb
Herdenkings

03 Heather and Vince (18)
18 Sarina en Willie ZR6WGR (8)
27 Paddy and Kenny ZS6KMM (43)
28 Martie en 'JB' ZR6YV (32)
28 Phil and Craig ZS6RH (?)

Simpathy **Mary, sw of Bill ZS6KO** passed away in hospital on 30 December. Our sincere condolences go out to OM Bill and family. Mary's funeral took place in Benoni on 3 January.

Diary | Dagboek (UTC times)

Feb	**02**	**PARC club meeting 14:00** There will be a live radio-control model helicopter demonstration and presentation of its operation by Deryck ZS6KQ.
	09-10	SARL HF Field Day part 1
	16	Last day for nominations for SARL Awards (see below)
	17	**PARC Sunday Lunch** (out of your pocket)
Ma	**08**	**PARC flea market 08:00**

FUTURE MEETING DATES

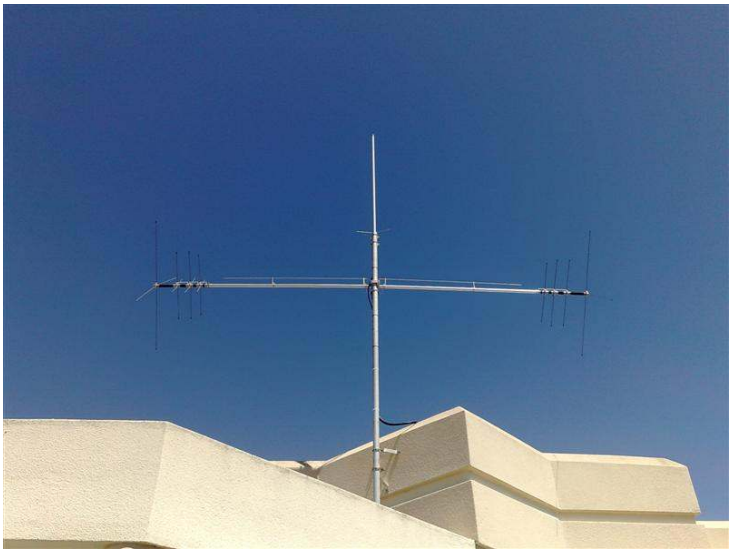
Even months: Saturdays 14:00			**Odd months: Wednesdays 20:00**		
Apr	12	2008	Ma	12	2008
Jun	14	2008	May	14	2008
Aug	09	2008	Jul	09	2008
Oct	11	2008	Sept	10	2008
Dec	13	2008	Nov	12	2008

Willie Wilson Gold Badge –	for exceptional and meritorious service to the League
Jack Twine Award –	for exemplary qualities desirable in a radio amateur
Arthur Hemsley 2m Trophy –	extraordinary performance on EME or tropo work
Barney Joel Trophy –	best performance working HF Mobile
Icom Excellence Award –	to the amateur having brought international recognition to South Africa
Joseph White Plaque –	exceptional achievements on 432MHz
Bert Buckley 6m Trophy –	for individual achievements in 6m work

Short motivations to: secretary@sarl.org.za

Snippets | Brokkies

- **Various members have already booked plastic ID cards.**
  Please book yours with Johan ZS6JHB ASAP.
- **Johnny ex ZR6BAJ is now ZR1BAJ is now living in Tableview** and is working on his upgrade. He says he ragchews on occasion with Kobus ZS1DC for company. He currently has an MFJ1775 6-band rotatable mini-dipole with an X-50 dual-band vertical on top. >>>>
- **Pine ZS6OB** is nog baie aktief op digitale modes. Sedert Jan 2007:
  2m EME: 52 DXCC lande
  Ruitverwysings 218 waarvan 126 bevestig is.
  (VUCC toekenning bekom op 100)
  536 EME QSO's totaal (282 vir eerste keer)
- **The EME for Africa Group** clocked up some 750 million QSO miles during 2007. Various plans for 2008 are in the offing.



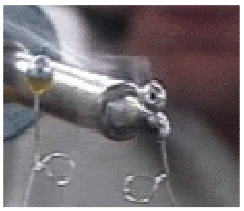
- Die **onaangekondigde kragonderbrekings** het verskeie van ons lede geforseer om te belê in kragopwekkers. Die wat op dit - of battery krag – HF kan bedryf, sal agterkom dat die geraasvlakke op die lae bande wat veroorsaak was deur hulle onmiddelike omgewing, skielik aansienlik minder kan wees! **Go for low-band DX during power cuts!**

Soldering Surprise

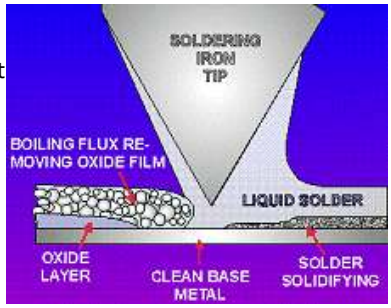
There's nothing routine about working in space, as astronaut Mike Fincke found out recently when he did some soldering onboard the International Space Station.

August 16, 2004: Richard Grugel, a materials scientist at the Marshall Space Flight Center, watched his video monitor in disbelief. A transmission from the International Space Station was playing. The scene: Astronaut Mike Fincke touches the tip of a soldering iron to a wire wrapped with rosin-core solder.

Here's what happened:



Above: In July 2004 astronaut Mike Fincke melts solder onboard the International Space Station. See the full length movies: Windows media format (2 MB), Real video (2 MB), mpeg format (15 MB).



The solder, heated, became a molten blob with a droplet of rosin clinging tight to the outside. Solder melts: that's not too surprising. It's the behavior of the rosin that amazed. As the temperature increased, the droplet began to spin, round and round, faster and faster, like a miniature carnival ride.

"What a surprise," says Grugel. "I've never seen anything quite like it."

Grugel is the principal investigator of the In-Space Soldering Investigation, or "ISSI" for short, which Fincke was doing at the time of the discovery. ISSI's purpose is to find out how solder behaves in a weightless environment. This is important information for astronauts. If something breaks during a long trip to Mars, they'll likely reach for a soldering iron to repair it.

(Editor's Note: ISSI isn't the first experiment to investigate reduced-gravity soldering. See, *e.g.*, "Gravitational Effects on Solder Joints" by R. D. Pettegrew *et al.*.)

The solder Fincke used for ISSI is a mixture of lead, tin and rosin. The purpose of lead and tin is to form an electrically conducting connection. What does the rosin do?

Grugel explains: "When metals are exposed to air, they become coated with oxides." Iron, for example, rusts: iron oxide. "One purpose of rosin," he says, "is to wash away any oxides before the lead and tin solidify, clearing the way for a good strong connection."

Right: The action of rosin, from Integrated Publishing's Electrical Engineering Training series. [More]

Rosin has another purpose, too. On Earth and in space, surface tension tends to hold solder in awkward blobs. Rosin breaks the tension, an action called "wetting," allowing molten solder to flow.

But, as the video shows, weightless rosin doesn't always do what's expected. Is this a problem?

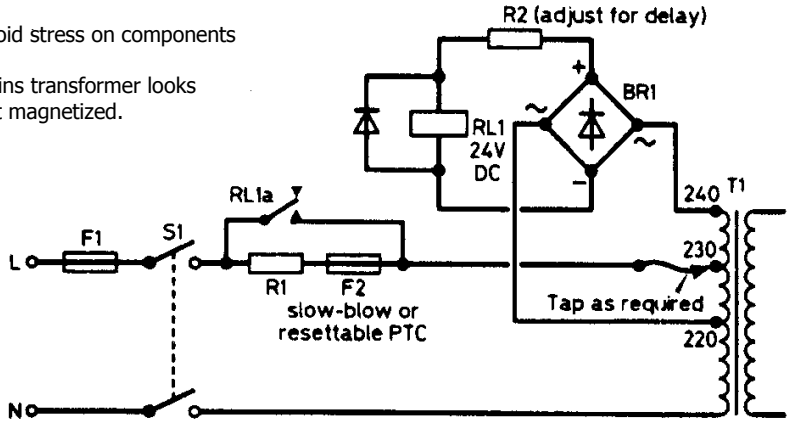
To find out, Grugel plans to slice the solder-blobs created by Fincke and examine what lies inside. He'll be able to see whether the solder made a clean connection to the wire. He'll also look for tiny bubbles of vaporized rosin inside the blobs; such bubbles, which also appear in solder joints on Earth, lessen the electrical and thermal conductivity of the connection.

The samples will be returned to Earth by astronauts in a Soyuz capsule or, perhaps, after the space shuttle returns to flight. The date isn't set.

Meanwhile, Grugel and his colleagues are brainstorming, trying to understand what causes the rosin to twirl. "We almost have it," Grugel says, but he's not ready to announce a solution yet. He does, however, have some advice for astronauts bent on soldering: wear your goggles and watch out for flying rosin.

Soft starting a Power Supply (extracted from RadComm Dec 1998)

…is a way of turning on a supply gradually to avoid stress on components due to a sudden voltage or current surge.
At the moment of switch-on the primary of a mains transformer looks like a very low resistance because the core is not magnetized.
Mechanical movement inside the transformer is responsible for an audible loud thump when switched on.
Beyond the transformer the uncharged reservoir capacitor also looks like a short-circuit amd the initial current stresses all the components upstream of it.
Hence the use of slow-blow fuses in the primary of small supplies to handle initial surges without blowing.



In larger supplies the first few moments at swich-on should rather be made artificially "soft" to avoid component stress. Some manufacturers include a Negative Temperature Coefficient (NTC) resistor in a primary lead. This has a high resistance when cold and falls to a low resistance when hot. Careful selection of its value and rating is required for a particuar load and fast cooling is necessary to safeguard for switching on and off with short intervals.

The figure above is more elegant and can be applied to any primary with 220-230-240V taps. A 24V DC relay coil is supplied from the 20V-25V AC available at the primary taps. A series resistor R1 causes this voltage to build up slowly as the transformer is magnetized and the main reservoir capacitor is charged . The series resistor R2 is adjusted sothat the relay pulls in after a suitable time and short-circuits R1. R2=200Ω 2W is a good starting value. F2 is required to prevent R1 overheating in case something goes wrong and RL1 cannot pull in. R1 determines the soft start time and its value and rating must be chosen to suit the supply under consideration.

Simple balun for a portable (QRP) station (from CQ Magazine March 2006)

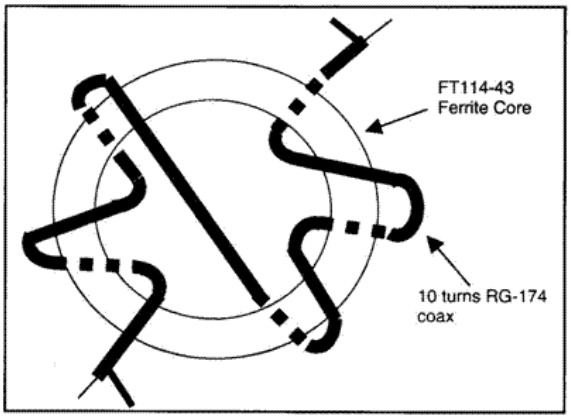


Fig. 1– Balun winding details. There are five turns per side (not all turns are shown here).

Photo D– The balun (see text) performs double duty, helping minimize RF "bites" in areas with poor or no ground, and providing a center support and feedline connection point for the antenna.

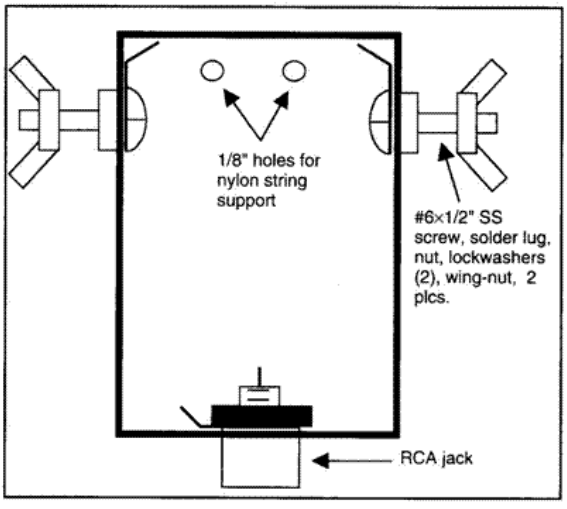


Fig. 2– Balun/center-support box details.

Rod- versus Toroidal baluns

Because the toroidal core has a closed magnetic path and the permeability μ plays a direct role in the reactance of the coiled winding (rod transformers are independent of this*) a LF response better by a factor 2,5 (which is also a ratio of their inductances) over the rod is possible.

*LF performance of a rod using μ ≥125 is independent of μ and only mildly dependent on the length of the rod. It compares favourably with a toroidal transformer with a μ=50. Efficiency is also quite independent of μ due to the influence of the high reluctance air path around the rod.

(Quoted from "Transmission Line Transformers" by W2FMI)

Extremely low frequency (ELF)

From Wikipedia, the free encyclopedia.

Extremely low frequency (ELF) is the band of radio frequencies from 3 to 30 Hz. (Wavelength 100.000km – 10.000km)
ELF was used by the US Navy and Soviet/Russian Navy to communicate with submerged submarines.

Explanation

Because of the electrical conductivity of salt water, submarines are shielded from most electromagnetic communications. Signals in the ELF frequency range, however, can penetrate much deeper. Two factors limit the usefulness of ELF communications channels; the low data transmission rate of a few characters per minute, and to a lesser extent the one-way nature due to the impracticality of installing a huge transmitter on a submarine. Generally ELF signals were used to order a submarine to rise to a shallow depth where it could receive some other form of communication.

Difficulties of ELF communication

One of the difficulties posed when broadcasting in the ELF frequency range is antenna size. This is because the antenna must be at least a substantial fraction of the size (in at least one dimension) of the wavelength of the frequency of EM waves you wish to create. Simply put, a 1 Hz (cycle per second) signal would have a wavelength equal to the distance EM waves travel through your chosen medium in 1 second. For ELF, this is very slightly slower than the speed of light (in a vacuum). Though ELF is defined as 3-30Hz the Russian and American Navies actually used aprox. 50-85 Hz. Therefore, for this purpose the antenna needs to be ~299 792 (kilometers per second) divided by 50-85, which is 3,450km to 5,996 km long. The earth's diameter varies from 12,715 km (pole to pole) to 12,756 km (equatorial).

Because of this huge size requirement, and in order to transmit internationally using ELF frequencies, the earth *itself* must be used as an antenna, with extremely long leads going into the ground. The US maintained two sites, in the Chequamegon-Nicolet National Forest, Wisconsin and the Escanaba State Forest, Michigan (originally named Project Sanguine, then downsized and rechristened Project ELF prior to construction), until they were dismantled, beginning in late September 2004. Both sites used long power lines, so-called ground dipoles, as leads. These leads were in multiple strands ranging from 22.5 to 45 kilometers long. Because of the inefficiency of this method, considerable amounts of electrical power were required to operate the system.

Ecological impact of ELF signals

There have been some concerns over the possible ecological impact of ELF signals. In 1984 a federal judge halted construction requiring more environmental and health studies. This judgment was overruled by a federal appeals court on the basis that the US Navy claimed to have spent over 25 million dollars studying the effects of the electromagnetic fields with results indicating that they were similar to the effect produced by standard power distribution lines. The judgement was not accepted by everyone and during the time ELF was in use, some Wisconsin politicians such as Herb Kohl, Russ Feingold and Dave Obey called for its closure.

There are similar concerns about the health effects of electromagnetic radiation at other frequencies. electromagnetic radiation and health

Other uses

Transmitters in the 20 Hz range are also found in pipeline inspection gauges, also known as "pigs". The transmitted signal is often used to track the pig should it become stuck in the pipeline.

Some radio hams record ELF (or even lower) signals from very large homemade antennas, and play them back at higher speeds in order to catch the natural fluctuations in the Earth's electromagnetic field. Increasing the speed of the magnetic tape increases the pitch, so that it is brought into the audio frequency range.

Natural ELF waves

Naturally-occurring ELF waves are present on Earth, resonating in the region between ionosphere and surface. They are initiated by lightning strikes that make electrons in the atmosphere oscillate[1]. The fundamental mode of the Earth-ionosphere cavity has the wavelength equal to the circumference of the Earth, which gives a resonance frequency of 7.8 Hz. This frequency (and higher resonance modes: 14, 20, 26 and 32 Hz) appear as peaks in the ELF spectrum and are called Schumann resonance.

They have also been tentatively identified on Saturn's moon Titan. Titan's surface is thought to be a poor reflector of ELF waves, so they may be reflecting instead off of the liquid-ice boundary of a subsurface ocean of water and ammonia predicted by some theoretical models. Titan's ionosphere is also more complex than Earth's, with the main ionosphere at an altitude of 1200 km but with an additional layer of charged particles at 63 km. This splits Titan's atmosphere to some extent into two separate resonating chambers. The source of natural ELF waves on Titan is unclear as there doesn't appear to be extensive lightning activity.[1]

Finally, huge ELF radiation power outputs of 100,000 times the Sun's output in visible light may be radiated by magnetars. The pulsar in the Crab nebula radiates powers of this order at the frequency 30 Hertz [1] . Radiation of this frequency is below the plasma frequency of the interstellar medium, thus this medium is opaque to it, and it cannot be observed from Earth.

Understanding Engineers:
The graduate with a science degree asks, "Why does it work?"
The graduate with an engineering degree asks, "How does it work?"
The graduate with an accounting degree asks, "How much will it cost?"
The graduate with an arts degree asks, "Do you want fries with that?"

From the 1980's..

How to ask your Boss for a salary increase.

One day an employee sent a letter asking for an increase…

Dear Bo$$,
In thi$ life, we all need $omething mo$t de$perately. I think you $hould be under$tanding of the need$ of u$ worker$ who have given $o much $upport including $weat and $ervice to your company.
I am $ure you will gue$$ what I mean and re$pond $oon.

Your$ $incerely,
Marian $hih

The next day, the employee received this letter of reply :
Dear Marian

I kNOw you have been working very hard. NOwadays, NOthing much has changed.
You must have NOticed that our company is NOt doing NOticeably well as yet.
NOw the newspapers are saying the world`s leading ecoNOmists are NOt sure if the United States may go into aNOther recession.
After the NOvember elections things may turn bad.
I have NOthing more to add NOw. You kNOw what I mean.

Yours truly,
Manager

Filipino Monkey

A heckling radio ham known as the Filipino Monkey, who has spent years pestering ships in the Persian Gulf, is being blamed today for sparking a major diplomatic row after American warships almost attacked Iranian patrol boats.

The US navy came within seconds of firing at the Iranian speedboats in the Strait of Hormuz on January 6 after hearing threats that the boats were attacking and were about to explode.

Senior navy officials have admitted that the source of the threats, picked up in international waters, was a mystery.

The US lodged a formal complaint with Iran over the incident, and the president, George Bush, warned Tehran of "serious consequences" unless it stopped such aggression.

During the 20-minute incident, five Iranian patrol boats swarmed around three US warships and came within 200 metres, putting the ships on alert.

The US navy said its gunners came within seconds of firing on the speedboats.