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WATTS

07 - 2009

Year 79 +7m

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



PARC, PO Box 73696 Lynnwood Ridge 0040, RSA



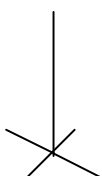
<http://www.parc.org.za> mail: zs6pta@zs6pta.org.za

Bulletins: 145.725 MHz 08:45 Sundays / Sondae

Relays: 1.840, 3.700, 7.066, 10.135, 14.235, 51.400, 438.825, 1297.000 MHz
Activated frequencies are announced prior to bulletins

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

Bulletin repeats Mondays | herhalings Maandae 2m 19:45



The Spiderbeam project

Aif ZS6ABA checking out parts and assembly .

More on p.5



In this issue

- Minutes 13 June Notules
- Member's pages Lede-bladsye
- Member news / Activities Lede-nuus en Aktiwiteite
- Technical Spiderbeam progress Tegnies
- Loading coils
- Page eight Bladsy agt

In hierdie uitgawe

Next Meeting 8 July 2009

Time: 19:30 for 20:00
PARC Clubhouse
South Campus
University of Pretoria
SE cnr University and
Lynnwood roads

PARC Management team / Bestuurspan Aug. 2008- Aug. 2009:

| | | | | | |
|-----------------------------------|-----------------|--------|--|--------------|--------------|
| Committee members | | | | | |
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| SARL liason, fleamarket | | | | | |
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| Social | Molly Peer | ZR6MOL | molly@peer.co.za | 012-333-0612 | |

Minutes of the monthly club meeting of the Pretoria Amateur Radio Club held at the South Campus of the University of Pretoria on 13 June 2009

- Welcome:** The vice chairman welcomed all present.
- Present:** See register, 12 members, 2 visitors.
- Apologies:** 4 as per register and the Ermelo Rally team.
- Minutes:** The minutes of the previous meeting were in Watts, and were accepted. Proposed by Alf ZS6ABA and seconded by Whitey ZS6JJJ.
- Matters Arising:** None.
- Finances:** The balance in the current account is now R291178 and R929 in cash. R530 subscriptions were received.

Activities

- Rallies:** Johan ZS6JHB and his rally team are away on the Ermelo rally this weekend. A regional rally on 7 August will be held in Witbank.
- Fox Hunts:** The fox hunt is in recess for winter.
- Web site:** The web site has suffered spam damage. Repairs are under way.
- Flea Market:** The next PARC flea market will be held on 1 August at the PMC premises. It was recommended and agreed that the antenna day be held over till the following flea market later in the Spring.
- Social:** There will be a bring and braai after this June meeting.
- Technical:** The Donkerhoek site now has Eskom power. Craig ZS6RH is doing some course and is less available at present. The repeater is, however, working well and Craig ZS6RH was thanked for doing a good job.

General:

1. Alf ZS6ABA and a team are working on the spider beam antenna and have a problem with certain required material. A source has been found for the wire. Construction is continuing. One unit is about 90% complete.
2. It was noted that we advertise certain frequencies for relays of our bulletins and that lately we have not been doing those relays.
3. Name tabs were asked about, Johan ZS6JHB is not present.
4. 40M Band: The long awaited gazetting of the extension to the 40 meter band has taken place on 10 June and a new band plan exists for this extended band. It was also noted that that not all radios could operate the new frequencies.

Next meeting: The next meeting will be Wednesday 8 July 2009 at 20:00. The meeting closed at 14:45 and the bring and braai was held.

Editorial

The expansion of the 40m band was truly inaugurated with the Boland Contest and much 40m activity was also heard during the 16 June Youth Sprint.

It is currently unknown however, how many of our club members cannot participate in the new privilege due to their radios still being limited to 7100kHz. Members in this position are invited to contact myself or the committee so that the problem with respect to their specific model can receive the correct technical assistance.

Redaksioneel

Die uitbreiding van die 40m band was behoorlik gevier met die Boland 40m kompetisie en baie 40m aktiwiteit was ook opgemerk gedurende die 16 Junie Jeug Naelloop.

Dit is egter huidiglik onbekend hoeveel van ons klubdele nie sal kan deelneem in die nuwe voorreg as gevolg van hulle radios wat dalk beperk is tot 7100kHz. Lede in die posisie word genooi om myself of die komitee te nader sodat die probleem betreffende hulle spesifieke model in die korrekte tegniese bystand kan ontvang.

Birthdays July Verjaarsdae



Anniversaries Herdenkings

- 01 Craig, son of Gordon ZS6AGV
- 05 Lynette, daughter of Bill ZS6KO
- 06 Helen, daughter of Retha and Roy ZS6XN
- 11 Peter ZR6FD
- 17 Lynn, LV van Andre ZS6BRC
- 19 Sarina, LV van Willie ZR6WGR
- 20 Roy ZS6XN
- 21 Kevin, son of Gordon ZS6AGV
- 21 Elmarie ZR6AXF, LV van Johan ZS6JPL
- 22 Rozanne, dogter van Sylvia en Tjerk ZS6P
- 25 Justin ZS6-262, son of Rika and Errol ZR6VDR

- 06 Julie and Paul ZS6BMF (46)
- 15 Ellen en Joe ZS6AIC (?)
- 23 Pamela and Harry ZS6HRD (55)
- 28 Pat ZR6AVC and Frank ZS6GE (25)

- 26 Frank ZS6GE
- 27 Rachel ZR6RDB
- 27 Julie, LV van Paul ZS6BMF
- 30 John ZR6JAO

Joys and Sorrows | Lief en Leed

Ivan ZS6AUT is reportedly improving such that he can now move around
 Molly ZR6MOL has improved and is home for weekends
 Richard ZS6UK spent a week in hospital

Diary | Dagboek (UTC times)

July

- 01 RAC Canada Day Contest 00:00-23:59
- 11-12 IARU HF World Championship 12:00-12:00
- 18-19 CQWW VHF Contest 18:00-21:00
- 19 RSGB Low Power Field Day 09:00-12:00, 13:00-16:00
- 25-26 RSGB IOTA Contest 12:00-12:00
- Aug** 01 PARC fleamarket at PMC

Snippets | Brokkies

- For those who don't yet know: the 40m band 7.000-7.200 MHz was officially opened to amateur operation on June10.
- An Antenna Brag Day has been postponed to coincide with a later fleamarket in October.
- Foxhunts are suspended until spring.
- Volunteers are needed for Sunday HF relays on various frequencies.

Forgot ? Vergeet

Parc subs | Ledegeld 30-06-2009

Please remit your subs in time to our treasurer or transfer to:

Betaal asb u ledegeld betyds aan by ons tesourier of per oorplasing na:

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Branch : 25 20 45
Account : 546 000 426 73

Ordinary members | gewone lede R70
Spouses, children, pensioners R50

Your callsign must appear on the statement text!

SARL Subs also due 30-06-2009

Bank : Absa R320 (R200 pensioners)
Branch : 632 005
Account : 407 158 8849

Times have changed ... (contributed by Raymond ZS6ALG)

When I saw the photos of Frank (ZS6GE) his neat shack and antenna in last month's Watts, I realised it was the first time I had seen any of Frank's rigs since the early 80's.

My memory is not perfect about the occasion when I last saw a rig of his, but some parts of that encounter stuck with me through the years: I had happened to look into his kombi to ask why the mobile HF whip on it had no tuning coil. I found the front passenger seat was occupied by a transceiver without its cover, and an antenna matching unit. The AMU consisted of an air-wound coil and high-voltage tuning capacitor, also lying loose on the seat. Coaxial cables from the transceiver and whip were connected to turns on the coil by means of alligator clips.

Something like the following conversation took place.

I: "Frank, shouldn't the coil be on the whip?"

Frank: "Ideally, yes, but we know that high standing waves on the feedline don't lose more than a few decibels at HF; not even one S-point. So why should I bother to match the whip to the feedline? I've just had a readability-5 QSO with a chap in Germany!"

I: "No more questions, m'lud!"

I guess that we were near the high of a sunspot cycle at that time, and Frank had no need to use high power to work DX mobile. Roll on the next cycle!

PARC Fleamarket 27 May some glimpses – 'n paar blikke – PARK Vlooiemark 27 Mei



Points to ponder:

(from the NARL NEWSLETTER May 2009 by Werner V51JP)

During my endless endeavours into the internet, I come across a very interesting article written by Bernd DJ1TO about the same argument that is currently on the mind of a lot of local hams:

Should ham radio be elite or real easy?

In a survey among youths in the Netherlands about what they enjoy about ham radio the following points were raised: Contests, Diplomas, QRP, Equipment and PC, Ham radio in groups, Emergency procedures, Ham and astronomy.

No Electronics!!! Some people are crying: "this is not right, electronics belong to real ham radio and it is the only way to survive if commercial radios are no longer available and a ham has to start building their own equipment" but times have changed! Electronics have turned to miniaturization and microprocessors so that electronics is only good for QRP and other small projects and buying good equipment has become the norm. Here the ability to understand and operate the new equipment counts as technical knowledge.

Another argument is: **"the youngsters don't want to work for what they want"** this should not be generalized and to a small part us hams can compensate for this in a way.

General technical unfriendliness and complicated equipment does not make life easy for the beginner and ever cheaper communication possibilities, the internet and other activities are in competition with ham radio! So who is willing to take the burden to conquer high hurdles for an ever decreasingly popular hobby? Although a lot is done to get young people into ham radio, the average age of the ham is rising.

Excessively high standards would mean that the youngsters lose interest and the numbers of hams would decrease naturally. It cannot be expected that any government will grant any privileges to a dwindling heap of geysers!

Another way: easy access with a decrease in status restricted operating possibilities for beginners. Also the British way of an easy technical exam and operation of only certified equipment seems in order. Parallel to this the traditional full Monty with all privileges. 2 Whether it suits us or not we will have to expect that **"class instead of mass"** will not work in the long run because with the hunger for commercial frequencies the few super-hams would soon have nowhere to go.

Just to soothe your mind, the permission of non CW operators on short wave did not cause a total collapse of ham radio on short wave as it was feared many moons ago!

The only alternative is to do your part to get the youth interested in ham radio and combine their interests with ham radio, may be this will wake their love for the technical aspect of ham radio and it might just work with **"class AND mass"**

73

Werner

--- Spiderbeam --- project progressing well | projek vorder goed



Gawie ZS6GJJ with centre support



Whitey ZS6JJJ and Gawie inserting a fiberglass spider leg



Sarel ZS6EK drilling balun box



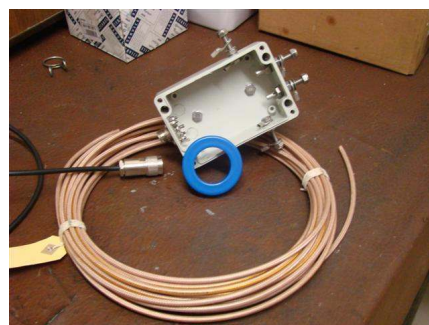
Alf and Whitey drilling tubing for centre support



Above: Slotted poly-ethelene spacers.

Left: Sarel cutting the spacers.

Right: Balun box, toroid and RG142 cable



Inductors and Loading Coil Current (Mobile and Loaded Antennas)

Condensed from the website of W8JI

The discussion below primarily deals with loading inductors used in mobile HF antennas rather than long radiating helices. If you read carefully you will see why a long helix behaves more like a radiating transmission line and less like a conventional inductor. The discussion below also applies to tank coils.

The most common questions are:

What does the coil do? A loading coil does not replace a missing fraction of a wavelength. The coil simply inserts a series inductive reactance that cancels capacitive antenna reactance. When a 150 ohm reactance inductor is inserted in series with a 150 ohm capacitive load (like an antenna), only the resistive parts remain.

What determines current distribution in a loading coil?

The capacitance to the outside world and the impedance above the loading coil. The current in any inductor would be equal at each end except for displacement currents. [Displacement currents](#) are "imaginary currents" that flow through a capacitance. A changing *electric field* is tied to these currents.

How much difference is there in loading coil current entering the coil and loading coil current exiting the far end?

If the antenna beyond the coil has low self-impedance compared to the impedance of the shunting capacitance from the coil to "ground", currents at each end of the coil will be essentially equal. This effect is not caused by the "missing antenna length" the coil makes up for. It is determined by the ratio of termination impedance to stray capacitance from the coil to surroundings. If the portion of antenna above or beyond the loading coil is long or has a large area compared to the physical size of the coil and stray capacitance to surroundings, coil current will be essentially equal throughout the coil and at each end.

What does significant current taper in the loading or tank coil indicate?

Large differences in source and load currents on an inductor are strong indicators of poor antenna design. An example would be a situation where a loading coil or tank coil has high stray capacitance to other areas of the system (like the ground plane or surrounding objects) compared to capacitive reactance of the system beyond the inductor. Significant current taper indicates poor inductor, layout, or antenna construction or design.

Clearly we do NOT want:

A large hat just above a large coil

A long large coil and a short whip

A coil near large sheet metal

The Incorrect Assumption

Another commonly misconception is, since voltage increases at the far end of the loading coil, current must logically decrease. After all, we have a fixed amount of power and voltage has increased. The assumption is:

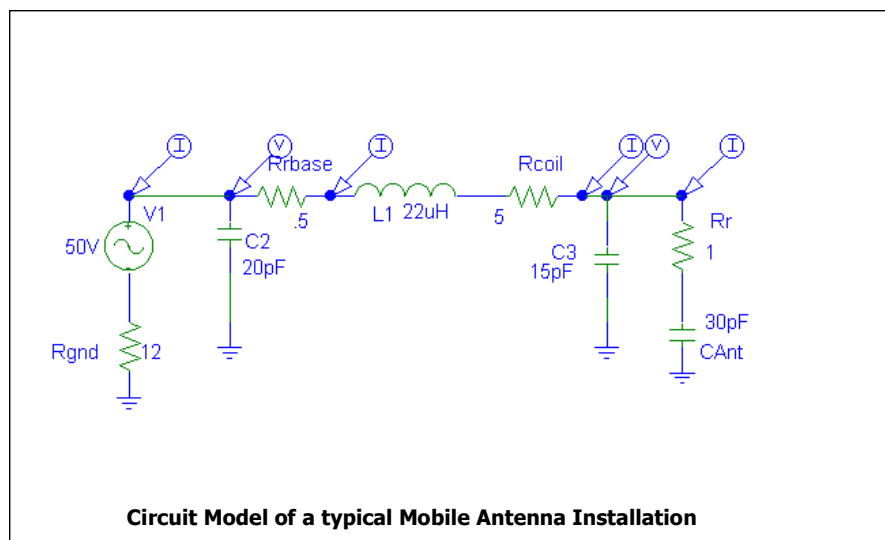
- 1.) We multiply voltage times current to get power.
- 2.) If voltage increases current must decrease.

Unfortunately, this is *not* correct in reactive systems! Simple P (power) = I (current) times E (voltage) only works when the system is non-reactive. This condition only occurs at resonance, and only *below* the loading coil at the antenna feedpoint!

In a reactive system, like in a mobile whip above a loading coil, voltage and current are no longer in phase. As a matter of fact, voltage and current can closely approach being 90 degrees out-of-phase when the whip is electrically very short. Since the antenna area above the loading coil is highly reactive (voltage is not in phase with current), we cannot multiply voltage times current without considering phase differences.

Circuit model

R_{gnd}= ground resistance of vehicle normalized to feedpoint
L1=loading coil
R_{coil}= coil equivalent series loss resistance
V1 =coaxial line
R_{base}= Radiation resistance of the base area of the antenna
C2 = base capacitance
C_{ant}= Equivalent antenna capacitance above coil area
C3= coil shunt C to ground
R_r= top area radiation resistance



Clearly there is no basis to the claim current is high only in the first few turns of an inductor, or that current tapers in relationship to "electrical degrees". The most accurate way to state the effect would be to say: "When the loading coil is short and the capacitance of the antenna beyond the coil is reasonable (in this case 3000 ohms Xc or less), there is an immeasurable reduction in current in the coil. When the required loading reactance is very high (in this case 8000 ohms), the reduction in current is about what we would expect for an equivalent length of antenna replacing the coil."

Efficiency

Efficiency in any antenna near earth is almost always dominated by ground related losses, short-height Marconi antennas are no exception. The overall effect of loading inductor Q and matching system losses are "diluted" or "swamped-out" by ground losses. Ground losses cause most systems to have greatly reduced sensitivity to inductor design. The only consistently predictable factor in efficiency in fractional wavelength antennas with limited size ground systems is radiation resistance. Efficiency increases almost directly in proportion to radiation resistance.

When inductive reactance requirements are large, as when short thin "stingers" without hats are used above a coil, the coil form factor should lean more towards long and thin. Capacitances near the open end of the coil (high voltage end) should be minimized. This would be true even when the coil length increase results in a small reduction in mutual turns coupling, since the stray capacitance may result in a larger loss penalty, than the slight increase in accumulated resistance from additional wire length.

A reasonable test for proper inductor and system design would be to remove the antenna above the loading coil, measuring system resonance. If resonance does not change substantially, the area above the coil is not correctly terminating the system. First-order self resonance of the inductor (parallel resonance), when removed from the system, should also be far above the operating frequency of the system. If self-resonance comes within three or four times the operating frequency range, the loading coil almost certainly will have needless performance shortfalls.

Conclusion

A normally functioning inductor has essentially equal currents throughout the inductor, loading coils are no exception. Any current difference requires a substantial current flow through undesired stray capacitances or leakage currents. Neither radiation or induction could change this - it is a basic rule of circuitry.

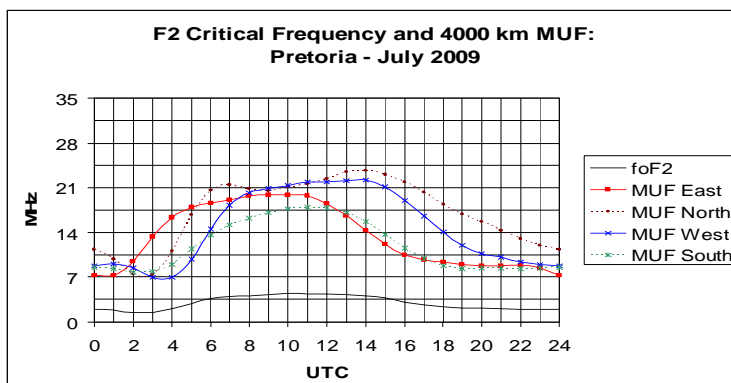
In a reasonably well-designed system, current into and out of the loading inductor should be substantially equal. Differences in current would indicate excessive and problematic undesired stray capacitance in the loading system design, or measurement errors.

Reduced sensitivity to coil Q is primarily a function of additional losses in the system, not reduction of current through the coil.

Long Term HF Propagation Prediction for July 2009

courtesy ZS6BTY

(see also our website prop tab)



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.

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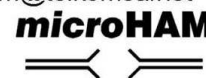
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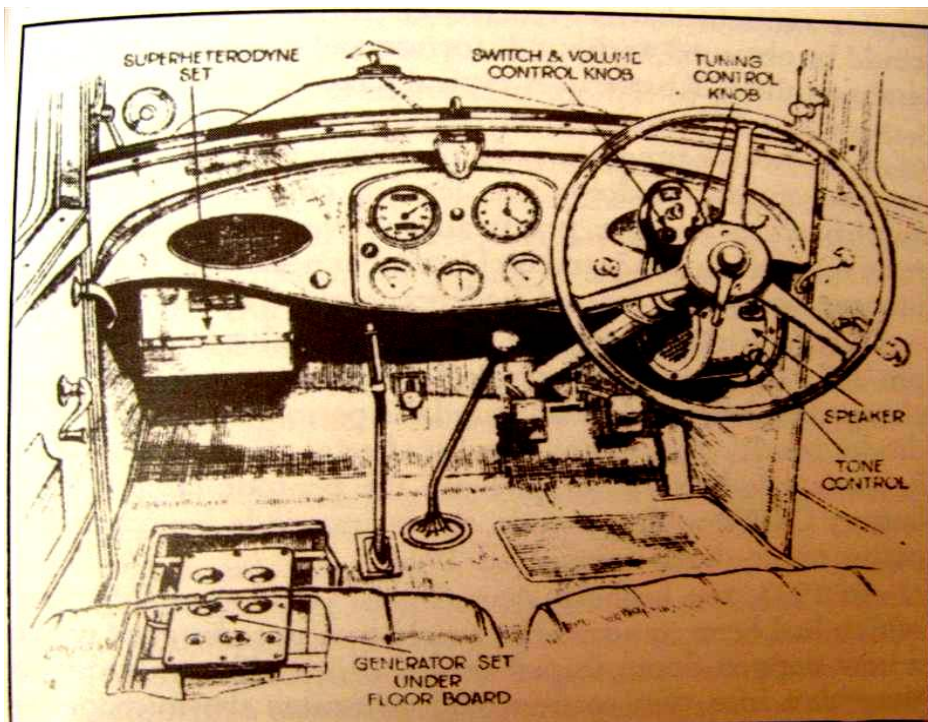


fig 282. The Philco 'Transitone' car radio installed in a 1932 Vauxhall.

Here's the final word on nutrition and health. It's a relief to know the truth after all those conflicting nutritional studies:

1. The Japanese eat very little fat and suffer fewer heart attacks than Americans.
2. The Mexicans eat a lot of fat and suffer fewer heart attacks than Americans.
3. The Chinese drink very little red wine and suffer fewer heart attacks than Americans.
4. The Italians drink a lot of red wine and suffer fewer heart attacks than Americans.
5. The Germans drink a lot of beers and eat lots of sausages and fats and suffer fewer heart attacks than Americans.

CONCLUSION

Eat and drink what you like. Speaking English is apparently what kills you.

Did you know that the earliest BBC microphones were held together with Vaseline?

Before broadcasting began in Britain, the only microphones available were those used in telephones, usually with the addition of a cardboard horn attached to the mouthpiece. That was the type of microphone the world-famous soprano Dame Nellie Melba sang into during her famous pre-BBC broadcast from Chelmsford on 15 June 1920. The small range of frequencies that it could handle, and the fact that it had to be held to the broadcaster's mouth, made it unsuitable for BBC use, so the new broadcasting company standardised on the Marconi-Sykes "Magnetophone". This was a moving-coil instrument in which the sound waves directly activated a flat coil of aluminium wire within the field of a strong electromagnet that was switched on immediately before the performance of any item, and switched off again immediately afterwards. For technical reasons, the flat aluminium coil's mounting consisted of four cotton wool pads upon which it was stuck with dabs of Vaseline. Unfortunately, the coil had a tendency to fall off during transmissions, whereupon the formally attired announcer would jab his finger into a jar of Vaseline that was kept handy, re-anoint the coil and stick it back into position.

Creative Puns for Educated Minds

1. A rubber band pistol was confiscated from algebra class because it was a weapon of math disruption.
2. No matter how much you push the envelope, it'll still be stationary.
3. Two silk worms had a race. They ended up in a tie.
4. Time flies like an arrow. Fruit flies like a banana.
5. A sign on the lawn at a drug rehab center said, 'Keep off the Grass.'
6. A chicken crossing the road - is poultry in motion.
7. When cannibals ate a missionary, they got a taste of religion.
8. Don't join dangerous cults: - Practice safe sects !
9. The man who survived mustard gas and pepper spray is now a seasoned veteran.
10. The roundest knight at King On Arthur's round table was Sir Cumference. He acquired his size from too much pi.
11. In democracy, it's your vote that counts. In feudalism, it's your Count that votes.
12. A hole has been found in the nudist camp wall. The police are looking into it.

Google prank (found approx end of May)



Recession Updates

1. Ali Baba and the forty thieves are now Ali Baba and the thirty thieves. Ten were laid off.
2. Women are finally marrying for love, and not money
3. Q: With the current market turmoil, what's the easiest way to make a small fortune? A: Start off with a large one.
4. Dow Jones is re-branded as "Down Jones".
5. Q: What's the difference between an American and a Zimbabwean? A: In a few weeks, nothing.
6. Quote from a Wall Street banker: This is worse than divorce. "I've lost half of my assets and I still have my wife"