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# WATTS

04-2010

Year 80 + 4m

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> mail: [zs6pta@zs6pta.org.za](mailto: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 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



## ZS6PTA SARL VHF/UHF Contest participation - more on p.4



### In this issue

- Minutes 10/03 Notules
- Member's pages Lede-bladsye
- Member news / Activities Lede-nuus en Aktiwiteite
- SARL VHF/UHF contest report
- Technical Transistor and SCR tester
- The German quad
- Page eight Bladsy agt

### In hierdie uitgawe

### Next Meeting

Date: 10 Apr. 2010  
Time: 13:30 for 14:00  
PARC Clubhouse,  
South Campus,  
University of Pretoria.  
SE cnr University and  
Lynnwood roads.

## PARC Management team / Bestuurspan Aug. 2009 - Aug. 2010

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## Minutes of the monthly club meeting of the Pretoria Amateur Radio Club held at the South Campus of the University of Pretoria on 10 March 2010.

**Welcome:** The chairman welcomed all present.

**Present:** See register, 15 members, 1 visitor

**Apologies:** 7 as per register.

**Joys & Sorrows:** Molly ZR6MOL is back home. Alf ZS6ABA is experiencing severe back pain. Jac ZS6QA is back in hospital for a repair to his replacement hip joint. Craig ZS6RH has changed his QRA.

**Minutes:** The minutes of the previous meeting were in Watts, approved by Charel ZR6GN and seconded by Mark ZS6USA/KW10.

**Matters Arising:** None.

**Finances:** We have a bank balance of R5829.78. The unauthorised debit orders by Virgin mobile for January and February totalling R1163.67 together with the bank charges associated with those debit orders of R66.50 have been recovered. Virgin mobile was very unco-operative.

**Membership:** There are 113 paid up members of the total of 140.

**Rallies:** The Belfast rally is has been postponed till June. The off road event is a week earlier. The off road in Lydenburg has been moved from October to April 16/17 and the weekend of 23/24 will be the Sasol event.

**Flea Market:** The next PARC fleamarket is on 27 March 2010 from 08:00 till about 11:00 at POMC. It will be followed by the day in the sun social event.

**Contests:** The SARL VHF/UHF contest takes place on 20-21 March, the venue is a mealie field SW from Pretoria and NE from Johannesburg. The club will concentrate on the SARL contests.

**Next meeting:** The next meeting will be on Saturday 10 April 2010 at about 14:00.

**Close** at 20:55

## Editorial

Our club has interest "groups" in various aspects of our hobby viz. VHF/UHF EME, digital modes, satellites and contesting but their driving forces are mostly loners continually appealing for more joiners. For those who always wanted to - but were afraid to ask, come forward and join these activities to enrich your knowledge and skills.

## Redaksioneel

Ons klub het belange "groepe" in verskeie aspekte van ons stokperdjie soos BHF/UHF AMA, digitale modusse, sateliete en kompetisies maar hulle dryfvere is meesal enkelinge wat gedurig pleit vir meer om aan te sluit. Vir die wat nog altyd wou - maar te bang was om te vra, kom vorentoe en sluit aan by hierdie aktiwiteite om julle kennis en vaardighede te verryk.

## Birthdays

## April Verjaarsdae



- 01 Melanie, daughter of Peggy and Ed ZS6UT
- 04 Joe ZS6AIC
- 07 Tamzyn, daughter of GaRY ZR6GK
- 08 Meryllyn and Deryck ZS6KQ
- 08 Bertha lv van Hans ZS6KR
- 08 Ronell ZS6BRX, dogter van Susan en Freddie ZS6JC
- 08 Klasie, seun van Sylvia en Tjerk ZS6P
- 10 Joey, sw of Graham ZR6GJR
- 10 Callan, son of Phil and craig ZS6RH
- 11 Susan, dogter van Susan en Freddie ZS6JC
- 12 Jan ZS2LJ
- 13 Liam ZR6RAF, son of Heather and Vince ZS6BTY
- 16 Tobie, seun van Margriet en Tobie ZS6ZX
- 19 Anne, sw of Jac ZS6QA

April

## Anniversaries Herdenkings

- 02 Pieter ZS6PVW en Magda ZS6MVW (27)
- 06 Lynn en Andre ZS6BRC ( ? )
- 12 Rika and Errol ZR6VDR (41)
- 14 Carol en Hein ZS6Q ( ? )
- 30 Joey and Graham ZR6GJR (27)

- 21 Wynand ZS6ARF
- 22 Marieta, sw of Roy ZS6MI
- 25 Erna, dogter van Susan en Freddie ZS6JC
- 25 Gerhard, son of Sander ZS6SSW
- 28 Tracey, daughter of Rita and Vitor ZS6VG
- 29 Heather, sw of Vince ZS6BTY

## Joys and Sorrows | Lief en Leed

**Jac ZS6QA** had to have his hip prosthesis re-attached  
**Craig ZS6RH** is settling into his new QRA

## Diary | Dagboek (UTC times)

- Apr 01 SARL 80m SSB QSO Party 17:00-20:00**
- 03-04 SP DX Contest SSB+CW 15:00-15:00
  - 10-11 Japan International Contest CW 07:00-13:00
  - 11 Hungarian Straight Key Contest 15:00-17:00
  - 11 President's Net at 19:30 local**
  - 16-17 Holyland DX Contest all modes 21:00-21:00
  - 17 ES HF Open Championship CW SSB 05:00-08:59
  - 18 YU DX Contest 09:00-17:00
  - 21 MOON Contest 18:00-20:00 any mode
  - 23-25 SARL National Convention in Port Elizabeth
  - 24-25 SP DX RTTY Contest 12:00-12:00

### Notice – Kennisgewing

Lede kan nog steeds die sekretaris in kennis te stel van u voorkeur oor watter dae en tye vir u geskik sal wees vir klubvergaderings.

Members can still notify the secretary about your preference as to which days and times club meetings should be held.

## Snippets | Brokkies

- **Hans ZS6KR** took part in the RSGB CW Contest during the 13-14 March weekend. Band conditions were fair and 386 contacts were made with the following proportions:  
10m 8%, 15m 43%, 20m 26%, 40m 19%, 80m 4%.  
Operators situated in the Mediterranean area and Canada had much more opportunity judging from their serial numbers.  
The ZS call sign is always popular in international contests as there seem to be so few ZS stations that make an appearance!
- You can get a **free ARRL Antenna Handbook** if you subscribe to ARRL Membership for the following 3 years. The cheapest option is the one with the CD containing QST, QEX etc. at the end of every year. Approximate cost for this 3-year option is R865.-

### Mark ZS6USA has set up a Kantronics KAM XL Packet Mailbox.

The VHF (FM - 1200 baud) frequency is 144.675 MHz and the HF (USB - 300 Baud) frequency is now 3595 kHz. The HF side was moved down to 80m from 40m because there was just too much traffic on 40m.  
The KAM XL can be accessed using a TNC or with a sound card using AGWPE.

ZS6USA has tested both VHF and HF using a sound card with AGWPE and OutPost software. (The software is available on the Web.) If your HF is setup to operate Sound Card PSK-31, using VOX or serial port for TX control, all you should need is the AGWPE and OutPost software to operate HF Packet.

For VHF, you probably still have an old TNC stuffed away in a closet. If not, you can easily fabricate a VHF-computer interface and also use AGWPE to emulate a TNC.

The KAM XL sends out a beacon every ten minutes on both VHF and HF to make the PBBS easy to find, but both are operating on low power - about 10 watts.

ZS6USA's QTH is just off the N1 near the Menlyn Mall in Menlo Park. The VHF coverage will be limited as the VHF antenna barely clears the tree line. The HF feeds a loop antenna through a tuner, and NVIS coverage on 80m should be good locally and out to a few hundred miles. The mailbox call sign is: ZS6USA-11

**Pieter ZS6PA rapporteer : ZS6PTA deelname aan SARL BHF/UHF kompetisie (analoog)**

Deelname was baie teleurstellend,meeste van ons eie klublede stel geensins belang om enigsins punte weg te gee nie. Glo nie ons het 'n 100 kontakte gehaal nie. Ons het 'n hele paar besoekers gehad van ander klubs. ZS6JPY Koos en Michelle, ZS6RSA -Pieter en gesin , Andre ZS6GCA en Johan ZS6JHB het kom kuier.

Die weer was goed en ons het slegs Saterdagdag reën gehad. Een ding waaroor almal gekla het was die muskiete - hulle het ons baie gepla!!! Ons is nie bewus van enige ander klub- of veldstasies wat nog deelgeneem het nie.



3:32pm Sunday. Packed up and ready to go home



## Go/no-go tester checks SCRs, npn and pnp transistors

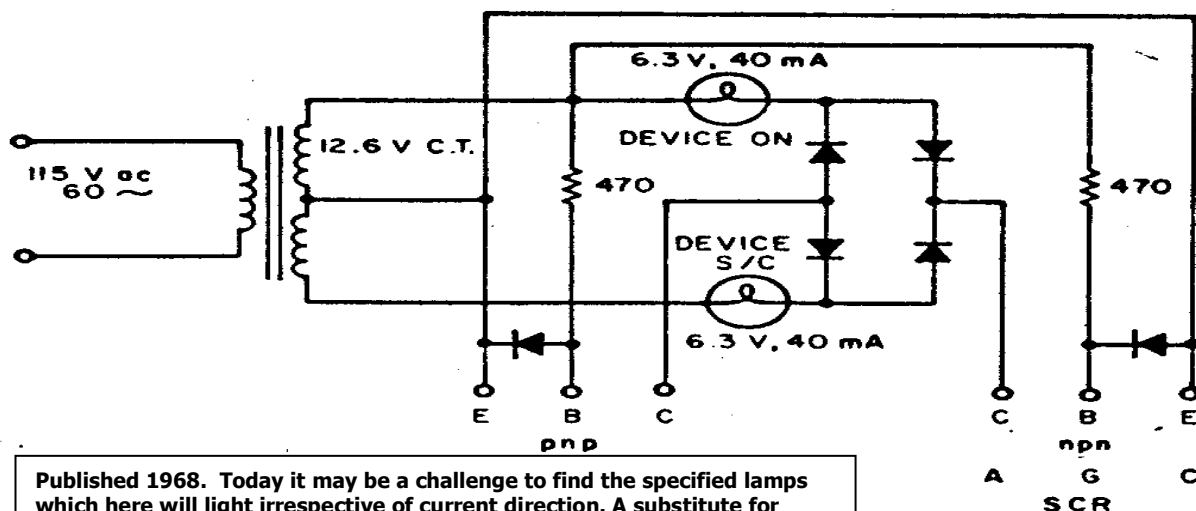
This tester (see schematic) is designed to give go/no-go indication of transistor action in transistors and SCRs. It will detect any internal short or open circuit between the three terminals of the device under test, and will also, in many cases, perform in-circuit tests. It has no controls, and enables a device to be checked in a couple of seconds.

Circuit operation is as follows. Half cycles at supply frequency are applied to the collector of the device under test through the "Device On" and "Device S/C" lamps alternately. "Device S/C" stands for "device short-circuited." During the "Device On" phase, current is fed to the base

of the device under test, while during the "Device S/C" phase, the base is reverse-biased by approximately 0.60 V. Fault conditions cause both (short circuit) or neither (open circuit) of the two lamps to light. A good device causes only the "Device On" lamp to light. SCRs, GCSs and similar devices are tested as npns. In-circuit testing is possible where external impedances are not low enough to affect the correct operation of the tester.

It is recommended that devices having collector-to-base voltage of less than 12 V, peak  $I_c$  less than 100 mA, or dissipation less than 50 mW should not be tested with this unit.

None of the components are critical. In the absence of a suitable 12.6 V center-tapped transformer, two 6.3 V windings may be strapped, care being taken to obtain the correct phasing.



Published 1968. Today it may be a challenge to find the specified lamps which here will light irrespective of current direction. A substitute for each lamp can be two LED's back-back with a 1k ohm resistor in series.

**Transistors and SCRs are tested for shorts and opens with a simple circuit. Connect npn's, pnp's and SCRs as shown.**

# The "German" Quad

— six bands with one antenna

Original article by Christof Janke WD4CPK / DF3TJ. (From the website of PA1HR)

Technical development leads to new and better amateur radio devices all the time, but it seems that in the field of allband antennas a stagnation has been reached. The hams who work all five SW bands mostly have two antennas for this purpose: a longwire for 80 and 40 meters and some kind of a three-band beam (which means "ugly things" on a tower in the garden). From the ham's viewpoint this is ideal, but most do not want to give their neighbors a reason to move at least three blocks away.

In his weekend shack near Bremen (a harbor city

in northern Germany), DL3ISA developed a new amateur radio allband antenna. He tested a lot of different configurations and forms until he found a solution which is simple and operates well on 80, 40, 20, 15, and 10 meters—and is even useful for 2 meters.

He took 83 meters of antenna wire and mounted it in the form of a big quad about ten meters (30 feet) above the ground in a horizontal position, so that the ground serves as a reflector for 3.5 and 7 MHz. Each leg of this big quad has a length of 20.7 meters. The feedline is a

60- or 75-Ohm coax cable which is connected to the beginning and the end of the antenna wire in one of the four corners of the quad.

A balun (1:1) may be used at the connecting point in case of TVI/BCI, but a long or a deeply ribbed glazed porcelain insulator does an even better job, because it allows for no power loss. The whole connection point should be sprayed with acrylic or otherwise protected against corrosion. DL3ISA put the whole connection into a plastic cup to protect the end of the coax cable against wet weather. (See Fig. 1.)

The length of the transmission line is random, and impedance checks resulted in an impedance of 60 to 90 Ohms at the feed-point, so that a 75-Ohm coax would be more favorable than 60-Ohm cable.

As a good material with sufficient strength, a 2.5 mm-diameter soft-drawn copper wire with an enamel coating was chosen for this antenna. The guy lines are weather-proof, rayon-filled, plastic

clotheslines.

For a European amateur radio station, this antenna should be mounted in an east-west/north-south direction, because the four preferred directions are the extensions of the quad's diagonals. This way, QSOs can be made to the north-east (South Pacific, Japan, etc.), to the northwest (North America), to the southwest (West Africa, South America), and to the southeast (East Africa, Arabia). Of course, this antenna can be fixed in any other direction to work any desired country. On the 15 and 10 meter bands especially, several side lobes between the four main lobes were measured with a beamwidth of 10 to 20 degrees in the horizontal plane.

As a horizontal full-wave loop, this antenna receives only a negligible amount of electrical interference from the surrounding area.

The standing wave ratio was determined by DL3ISA and is shown in Fig. 2. There may be small deviations from the swr due to the local ground conditions. The influence of other antennas is negli-

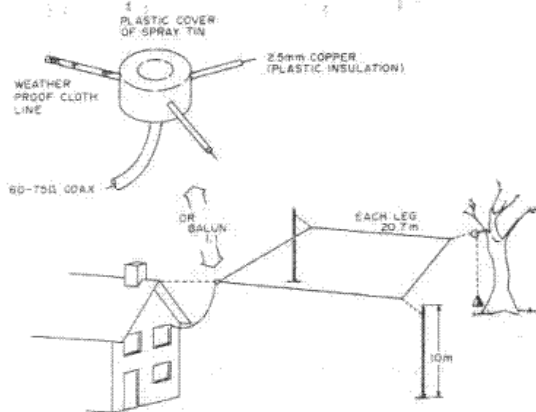


Fig. 1.

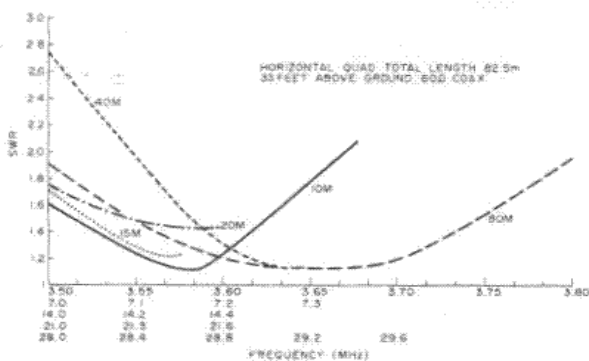


Fig. 2.

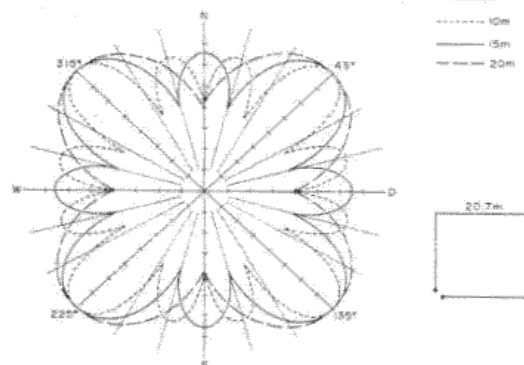


Fig. 3. Antenna height: 10m.

gible if these antennas are in the center of the quad. Parallel mounted antennas outside the quad gave a negative influence on the antenna data in the higher bands. Other antennas should be kept at a distance of at least seven meters from the quad.

The radiation pattern on 80 meters generally is at a high angle, and a radius of 600 miles has been found to be the area covered under normal conditions. The gain relative to a dipole mounted at the same height is around 6 dB; the quad has no directivity on 80m. On 40 meters, the radiation pattern is actually at a lower angle than that on 80 meters, and has no directivity.

On the 20, 15, and 10 meter bands, the radiation pattern is at an extremely low angle (similar to a rhombic antenna). On these bands, four preferen-

tial directions have been figured out in poor-to-medium conditions, but with an open band no remarkable directivity has been observed. The horizontal angle of the main lobes is about 30 degrees; the gain was 6 to 10 dB better than a two-element three-band beam at the same height and 12 to 18 dB better than a ground plane antenna. (See Fig. 3.)

Most of the above is just theory. In my practice, the antenna has worked as described only on 10, 15, and 20 meters. On 80 and 40 meters, the radiation has to be almost as low as on the higher bands. My log shows that within a couple of days in December, 1977, I worked the following stations, all on 80 meters SSB: 4Z4, TA1, W3, YK, VO1, JA1, 9M2, CT3, EA9, and C31. The transmitter used had

an rf output of about 40-50 Watts PEP, and no clipping or processing was used. The antenna worked just as well for short distances. A gain of at least 2-3 S-units could be observed as compared to a dipole. The antenna could not be tested in QSOs on 40 meters, but comparable results are probable.

DL3ISA found that the antenna works satisfactorily at a height of at least 5 meters above ground. However, the bandwidth on 80 meters becomes insufficient under these conditions.

Near Frankfurt-am-Main, this antenna had been mounted according to the instructions of DL3ISA around a little house at a height of 9 meters. Experimental measurements at this place showed the same results as we had before, even though there was a whole house with all

its electrical wiring inside the antenna.

Due to the extremely low angle of radiation, it was possible to work 15 and 20 meter DX to the US east coast and Brazil at a time when Europe was expected to be down from the west for 30 minutes.

A 2 meters test was made with a swr of 1:1.2 to 1:2.0, so that the antenna could be declared as a "six bander" without even a balun. However, the test was only run from 144-146 MHz. The North American band portion running to 148 MHz was not tested.

Taking into account the fact that this allband antenna is good for DX work in the higher bands, works most favorably on 80 and 40 meters, and is no spectacular monster to your neighbor's eyes, it is a real gain for almost any ham. It's also not a bad idea for Field Day. ■

## Long Term HF Propagation Prediction for April 2010

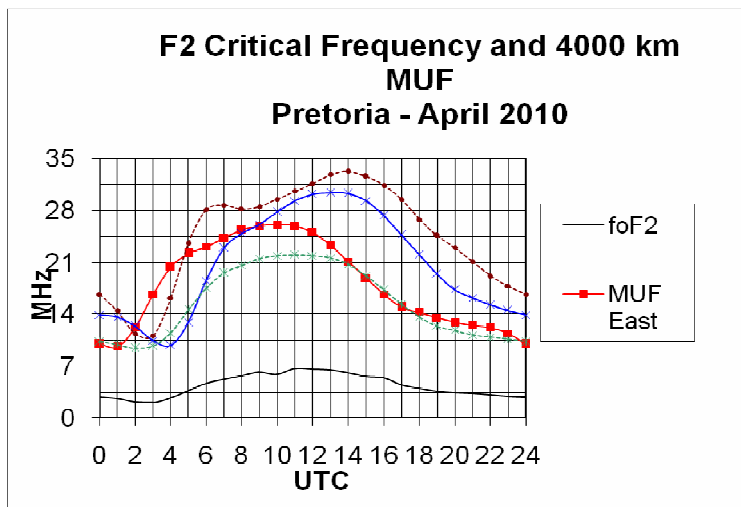
courtesy ZS6BTY (see also our website propagation tab)

### 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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## DEVIOUS DEEDS IN THE WIRELESS BUSINESS... (Condensed from PW Jan 1989)

When the first wireless signal bridged the Atlantic to Signal Point, Newfoundland in Dec 1901 it was understandable that the cable companies would be dismayed. They had watched Marconi's progress first with disdain then with alarm. As the wireless range increased so did the apprehension of the telegraph organizations.

The Anglo-American Telegraph Company reacted swiftly. Amongst the first batch of congratulatory messages to the Italian inventor came a curt letter from the solicitors representing Anglo-American. It stated that they held the monopoly for telegraph operation in Newfoundland and implicitly forbade further violation with a threat of legal action if ignored.

Marconi decided not to challenge the issue and was subsequently pleased to be offered a different site in Nova Scotia together with a Canadian Government grant of 16000 Pounds. This did however put his two stations further apart by 530km.

The situation nevertheless developed into a cold war between the cable firms and the Marconi Company. Early in 1902 the Eastern Telegraph Company commenced a form of industrial espionage. They commissioned a certain Neville Maskelyne, who was given a free hand to operate against the Marconi organization. A 50m mast was erected some 29km distant from Marconi's transmitter in Poldhu, Cornwall. Subsequently they recorded signals from various sources with a receiver called a 'Brown Chemical Radioscope'. Marconi did know about this spy station from the outset and actually transmitted a message to them that an antenna had been observed and queried their capability to receive.

Maskelyne's first operation was to publish telegrams that he "overheard" to a liner en-route to Italy. There was no Wireless Telegraphy Act at this time and therefore, theoretically no breach of secrecy was taking place. A Marconi Company senior executive foolishly denied that the published messages were authentic and accused Maskelyne of forgery. Obviously an indignant Maskelyne strongly refuted the allegation and demanded an apology from Marconi himself. Marconi again chose to ignore the whole issue.

Another attempt at disrupting the Marconi image occurred in 1903 at a lecture given at the Royal Institution by Professor Ambrose Fleming. He was appointed to the Marconi Company as a scientific advisor in a part-time capacity and was to give a demonstration to an audience of dignitaries on the merits of tuned circuits now installed in all their equipment. The issue here was to prove the absence of interference from nearby stations and the secrecy now available in single channel transmissions. This would be demonstrated with two receivers receiving signals from two different transmitters.

The lecture started on time and the Professor was soon deep into his address prior to the demonstration. Shortly before summing up he was distracted by relay movement from the table. Turning, he saw the astonished face of his assistant who was reading the paper tape from the ink recorders.

The audience waited expectantly, but Fleming was confused as this was not the scheduled time for the demonstration.

Collecting himself he asked his audience to excuse him and walked over to the demonstration table. He frowned when he made out the first word "RATS". He was further upset when he read the rest of the text: "THERE WAS A YOUNG MAN FROM ITALY WHO DIDDLED THE PUBLIC SO PRETTILY".

Fleming breathed heavily. The only explanation he had was that the Poldhu operator was drunk. After a few more facetious offerings, this time from Shakespeare, the ink recorder stopped. He went back to his audience and went on with a resume, of the points he had made earlier. In the background, the assistant was stuffing the telegraph tape into his pockets.

A few minutes later one of the receiving systems became active, followed rapidly by the second. Fleming walked over and breathed a sigh of relief and invited the audience to join him. The group then examined the tapes that now showed an exchange of greetings between the two stations.

Fleming later burst into print with a letter to The Times stating that he was a victim of "scientific hooliganism" Two days later The times published a letter by Maskelyne where he confessed to instigating the interruption. Luckily his timing and choice of frequency were not as disruptive as they could have been. Londoners were by now familiar with Maskelyne's antics and most sympathized with Fleming who was a much respected figure in the scientific arena.

Another undercover operation was effected by one a rival of Marconi in North America. Reginald Fessenden, Canadian, had much success with telephony as far back as 1902. In 1906 he managed to broadcast music on Christmas eve using a 50Khz alternator source to generate a continuous carrier.

He could thus be forgiven for resenting the publicity given to Marconi's North Atlantic Service when opened in October 1907.

The amount of traffic passed by the new service soon overloaded the landlines on both sides of the Atlantic.

Fessenden alleged that the weak link was the radio path and that the Marconi Service was to blame. He monitored the American side with a receiving station which at the time was quite legal.

He stated the effective message rate to be 3 wpm due to operators having to repeat messages as much as six times, while Marconi claimed it to be 20 wpm.

He made this allegation as public as possible by writing a letter to The Electrician, the foremost technical journal of the day covering communications.

