



ZR6FD logo

Drukwerk ZS6UK
 Papier / Paper ZS6UK

WATTS

03-2014

Year 84 + 3m

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



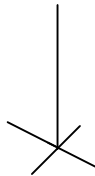
PARC, PO Box 73696, Lynnwood Ridge 0040, RSA



<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 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



SARL HF Field Day at Veekraal (some others were spread further away. See more inside)

ZS6PJH, ZS6TVB, ZS6JJJ, ZS6EK, ZS6CN, ZS6RVD, ZS6VDJ, ZS6RH, ZS6HVG, ZS6CMG combined effort



In this issue

- Member news and activities Lede-nuus en Aktiwiteite
- Technical | PARC Veekraal SARL HF Contest | Tegnies
 - ZS9MADIBA statistics
 - Cork your toroid
 - 12th wave transformer matchching
- Page eight -- Bladsy agt

In hierdie uitgawe

Next club events

Fleamarket at PMC
 1 May

Club social at U.P.
 6 March 7:00PM
 Social only

Club committee meeting
 20 March 7:00PM

PARC Management team / Bestuurspan Aug. 2013 – Aug. 2014

Committee members

| | | | | | |
|-----------------------------------|--------------------|--------|--|--------------|--------------|
| Chairman, Contests, Liason | Pierre Holtzhausen | ZS6PJH | zs6pjh@telkomsa.net | 012-655-0726 | 082-575-5799 |
| Vice Chairman, SARL liason | Fritz Sutherland | ZS6SF | fritz@icon.co.za | 012-811-3875 | 083-304-0028 |
| Secretary | Jean de Villiers | ZS6ARA | zs6ara@webmail.co.za | 012-663-6554 | 083-627-2506 |
| Treasurer, SARS | Andre van Tonder | ZS6BRC | andre.vtonder@absamail.co.za | 361-3292 | 082-467-0287 |
| Motorsport, Social | Johan de Bruyn | ZS6JHB | zs6jhb@gmail.com | 012-803-7385 | 079-333-4107 |
| Web co-ordination | Graham Reid | ZR6GJR | greid@wol.co.za | | 083-701-0511 |
| RAE, Bulletin co-ordinator | Vincent Harrison | ZS6BTY | zs6bty@telkomsa.net | 012-998-8165 | 083-754-0115 |
| Repeaters | Craig Symington | ZS6RH | zs6rh@hotmail.co.za | | 081-334-6817 |
| Fleamarket | Alméro Dupisani | ZS6LDP | almero.dupisani@up.ac.za | | 083-938-8955 |
| Clubhouse | Pieter Fourie | ZS6CN | pieter2@vodamail.co.za | 012-804-7417 | 083-573-7048 |
| Club activities | Richard Peer | ZS6UK | zs6uk@peer.co.za | 012-333-0612 | 082-651-6556 |

Co-opted/Geko-opteer:

| | | | | | |
|------------------------------------|----------------|--------|--|--------------|--------------|
| Auditor | Tony Crowder | ZS6CRO | tcrowder@telkomsa.net | 011-672-3311 | |
| WATTS newsletter/Kits | Hans Kappetijn | ZS6KR | zs6kr@wbs.co.za | 012-333-2612 | 072-204-3991 |
| Historian, Archives, Awards | Tjerk Lammers | ZS6P | zs6p@iafrica.com | 012-809-0006 | |
| Digital, photographer,sound | Theo Bresler | ZS6TVB | theo@bresler.co.za | | 082-698-1742 |

Reminder: Club Logo competition

The closing date for a new logo (without the SARL diamond) is the end of June 2014.

Let us see how creative you are.

All suggestions must be sent to the Secretary (address above)

Field Day photos



Birthdays Verjaarsdae

March



- 01 Francois, seun van Karin en Sarel ZS6EK
- 02 Jozua, seun van Erna en whitey ZS6JJ
- 07 Marilize ZS6MVD, LV an Rudi ZR6RVD
- 09 Helga, LV van Hans-peter ZS6AJS
- 12 Rita, SW of Victor ZS6VG
- 13 Rudi ZS6RVD
- 17 Gerda, SW of Roger ZS6RJ
- 21 Martie, LV van "JB" ZR6YV
- 22 Ivan ZS6CCW

Maart Herdenkings

Anniversaries

- 16 Marilize en Pierre ZS6PJH (18)

- 25 Doreen ZR6DDB, LV van Johan ZS6JHB
- 27 Sarel ZS6EK
- 28 Le Clue, seun van Elma en Gawie ZS6GJJ
- 28 Liezl, dogter van Elma en Gawie ZS6GJJ
- 31 Annatjie, LV van Pieter ZS6CN

Lief en Leed | Joys and Sorrows

Richard ZS6UK and Molly ZR6MOL were a granddaughter richer with the birth of Rachel, daughter of **Nina and Edwin ZR6ESP**.

Diary | Dagboek (UTC times)

Mar.

- 01-02 ARRL International DX Contest SSB 00:00-24:00
- 02 DARC 10m Digital Contest 11:00-17:00
- 02 SARL Hamnet Simulated Emergency Contest 12:00-14:00
- 08-09 RSGB Comonwealth Contest 12:00 12:00
- 14-16 SARL VHF/UHF Analogue/Digital Contest 16:00-10:00
- 15-16 Russian DX Contest 12:00-12:00
- 15 Deadline for youth essay competition.
- 29-30 CQWW WPX Contest SSB 00:00-24:00

Welkom aan nuwe lede:

Jaco Lubbe ZS6JLL
Gawie Marais ZS6GJM



Hans ZR6HVG measuring antenna lengths

More Field Day pics



Craig ZS6RH and kids



Rudi ZS6RVD en seun Jaun ZS6VDJ

... nog meer Velddag deelnemers



Het 'n mooi nooi verbygeloop? ----- ZS6xx, Sarel ZS6EK, Whitey ZS6JJJ agter, Martinus ZS6MHH, Pieter ZS6CN

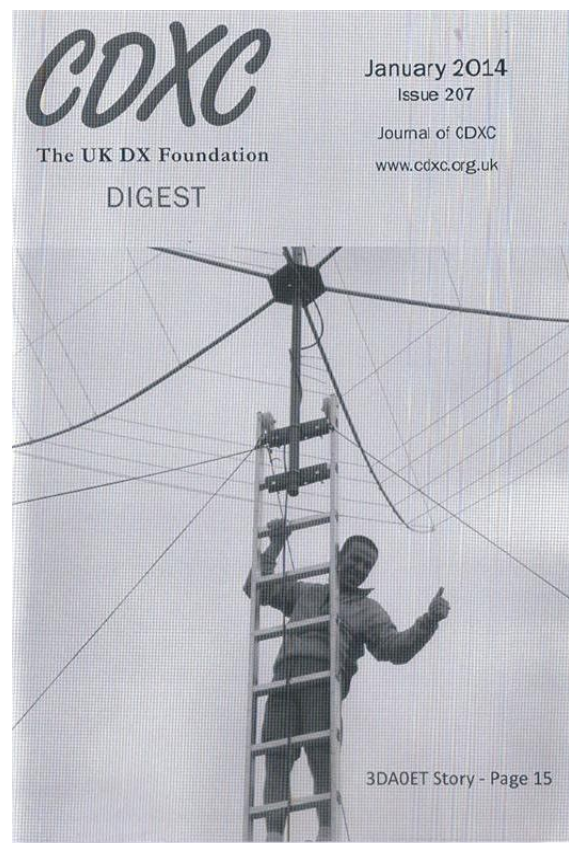


Jaco ZR6CMG stasie



News from From ZS6RJ:

3D0ET made the front page of CDXC digest.
The whole story can be found on this front page website.
Expedition scores were listed in January WATTS.



From ZS6OB: Here are some statistics with the ZS9MADIBA callsign

| | |
|-----------------------|-----|
| Total stations worked | 196 |
| VUCC | 133 |
| WPX | 138 |
| WAC | 6 |
| DXCC | 40 |

ALL QSOs were VIA EME only one operator ZS6OB as ZS9MADIBA [ZS9MAD]

STATION DETAILS

ICOM IC-9100
 ANTENNAS 4 by XP20 M² cross-yagis
 AMPLIFIER SSPA PHOENIX 1000 AR 144 MHz
 LNA ARR MGF 1302

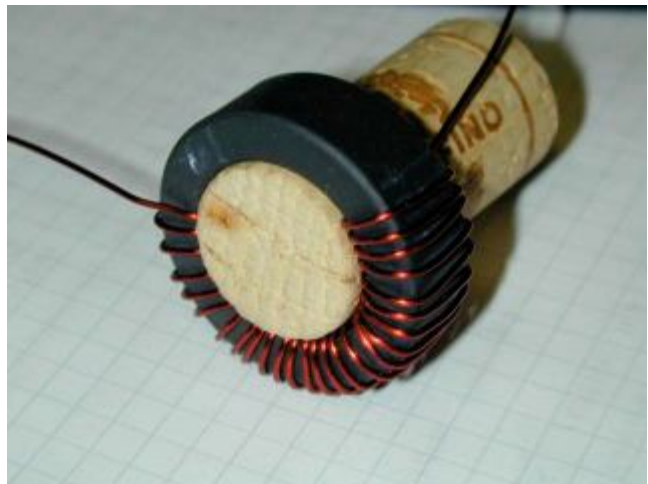


32 Meters of 7/8 low loss coax antennas 8 meters above ground

Wind toroids with ease

(info found on the Telepost wattmeter kit website)

Find yourself a suitable cork that fits snugly into the toroid inner diameter. You can make regular markings on the outer surface for the number of turns. When winding the wire you will find that none of the turns can slip away where they should not be.



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

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 SPECIALLY MANUFACTURED VHF/UHF EX60B ANTENNA SYSTEMS FOR:
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- MFJ 259/69 Analyzer repairs and calibration
- Ham radio and solid state amplifier repairs
- Valuation of ham estates and their disposal.

Products:

- Legal limit 30m and 40m dipole traps
- Linear power supply O.V. protection kits
- 30A DC switching supplies
- 30A DC Anderson Power Poles
- Connectors RF and Audio
- Plug-in triple sequential industrial timers

Contact Hans at 012-333-2612 or 072-204-3991

The Twelfth-Wave Matching Transformer

By Darrel Emerson.

(This is a summary. Last modified May 25 1997)
The full article appeared in QST, Vol 81, No.6,
June 1997, pp.43-44, published by the ARRL.

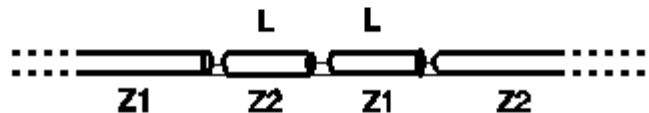
The Twelfth-Wave Transformer is often a more convenient alternative to the more well-known quarter-wave transformer. It is not a new concept, being first published in 1961, but it is relatively unknown in amateur radio circles.

With the quarter-wave transformer, two impedances Z_1 and Z_2 are matched by using a quarter-wave of transmission line of characteristic impedance $\sqrt{Z_1 Z_2}$.

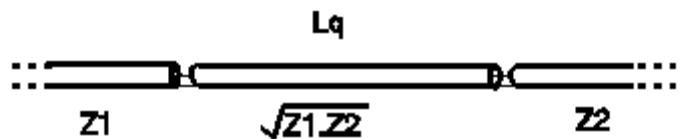
This works well, but often requires a non-standard characteristic impedance. For example, to match a 50-ohm load to 75-ohm cable, a quarter-wave transformer needs a length of cable of characteristic impedance 61.2 ohms.

With the twelfth-wave transformer, two lengths of cable are used in series, each electrically nearly one twelfth-wavelength, but of characteristic impedances equal to the two impedances Z_1 and Z_2 being matched. The figures below illustrate the difference between the twelfth-wave and a quarter-wave transformer.

The figure here illustrates the Twelfth-Wave transformer. To match impedances Z_1 and Z_2 , two lengths of cable are needed, each of length L close to one electrical twelfth-wavelength. The characteristic impedance of one length is Z_1 , of the other Z_2 .



As illustrated, with the quarter-wave transformer, only one matching cable is required, of electrical length L_q = one quarter wavelength, but this is very often a non-standard characteristic impedance.



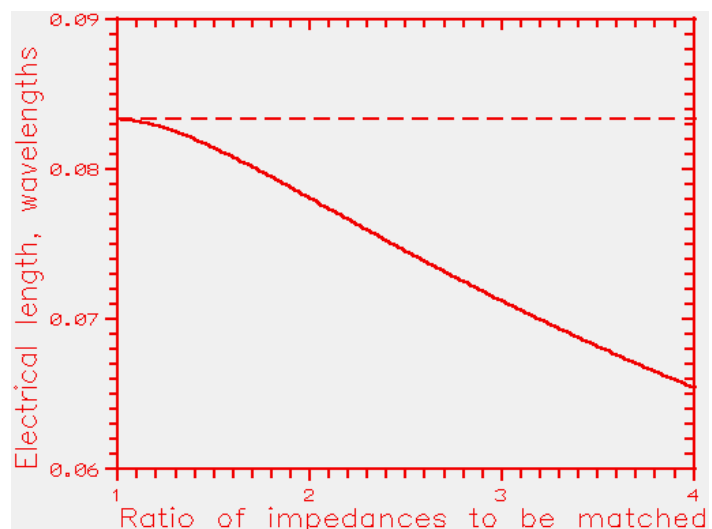
Precise length of a twelfth-wave section

The precise electrical lengths needed in the twelfth-wave transformer are just slightly less than an exact twelfth. When matching impedances Z_1 and Z_2 , if $B = Z_1/Z_2$, then the precise electrical length of the "twelfth"-wave section is given by:

$$L = [\arctan(\sqrt{B/(B^2 + B + 1)})]/(2\pi)$$

where the arctan function is assumed to return an angle in radians. L is the electrical length of each section of matching cable, measured in wavelengths.

The length L is plotted below as a function of the impedance matching ratio, Z_1/Z_2 . The horizontal dashed line corresponds to an exact twelfth length (0.0833333).



Bandwidth

The SWR bandwidth of the twelfth-wave transformer is very broad, and is comparable to the quarter-wave transformer.

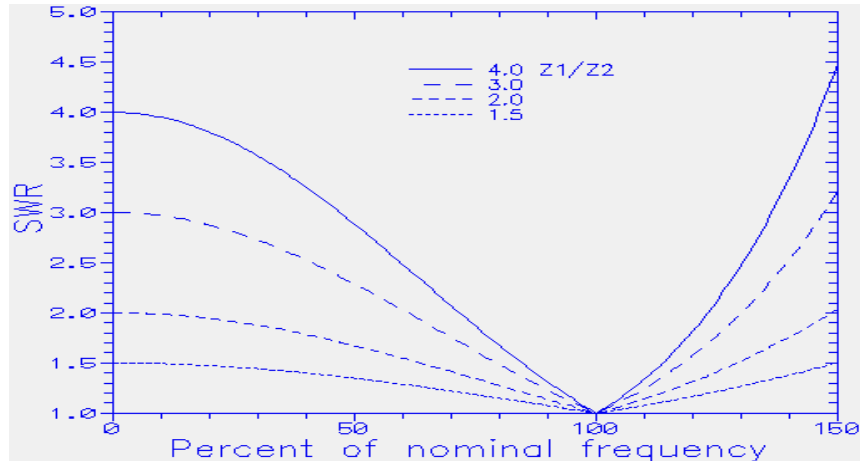
The plot shows the resulting SWR as a function of frequency, where a twelfth-wave transformer is used to match impedance ratios Z_1/Z_2 of 1.5, 2, 3 and 4. The frequency axis extends from D.C. to 50% higher than the nominal design frequency.

Examples

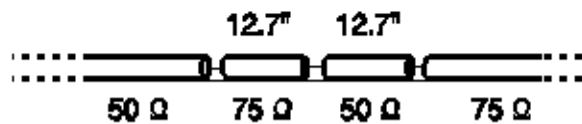
(1) A twelfth-wave matching transformer for 50 MHz

A transformer for 50 MHz, matching 75 to 50 ohms: From the figure, or the equation, the required length of matching section is 0.0815 wavelengths. At 50 MHz (=6-meter wavelength) this becomes 0.489 meters.

Allowing for a velocity factor of 0.66, the physical length becomes 0.323 meters, or 12.7 inches. The figure below illustrates the complete transformer.



50 MHz Twelfth-wave Transformer

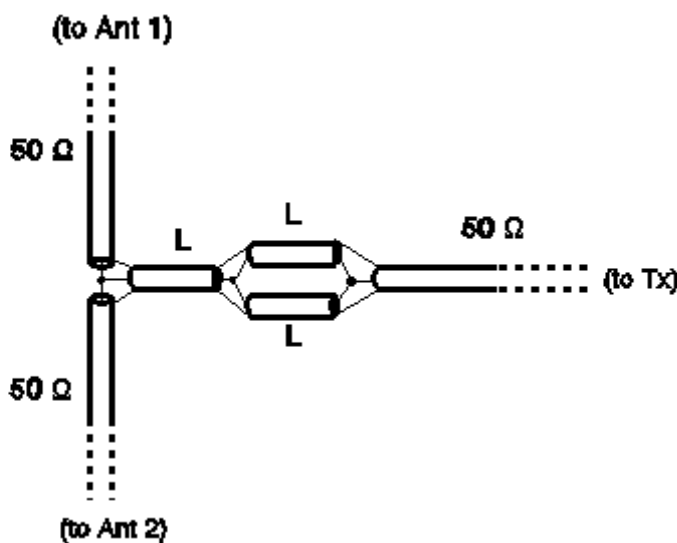


(2) Matching several equal impedances Z_0 , in parallel, to Z_0 impedance cable

Suppose we wish to match two elements of a phased array, individually fed by a matched 50-ohm cable. Putting the two feeders to the individual elements in parallel gives a combined impedance of 25 ohms. To match this 25-ohm impedance to conventional 50-ohm cable, we need a length of 50-ohm, and a length of 25-ohm cable.

The 25-ohm length can be constructed by putting two 50-ohm lengths in parallel. The figure below shows the general arrangement.

Matching two 50-ohm antennas to a single 50-ohm feeder

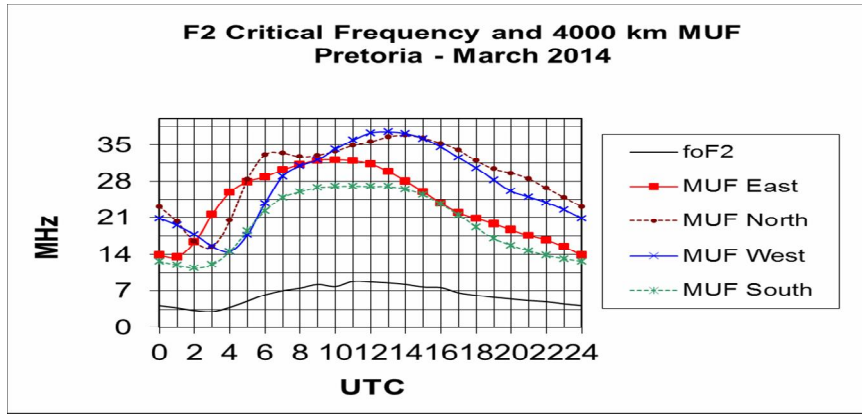


In this case, since we are matching an impedance ratio of 2:1, each length L is (from the above equation or the figure given the required length of matching section for a given transformation ratio) 0.0781 wavelengths.

If this were to be used at 28 MHz (10.7 meters) the length becomes 0.836 meters. Allowing for a velocity factor of 0.66, this becomes a physical length of 0.552 meters or 21.7 inches. All lengths L would be 21.7 inches, and all cables are of the same (e.g. 50 ohm) characteristic impedance..

Note that this is a perfectly general way of solving the matching problem of putting N feeders, each of impedance Z_0 , in parallel. The required matching section

impedances are Z_0 , and Z_0/N . It is always possible to make a feeder of characteristic impedance Z_0/N simply by putting N sections of impedance Z_0 in parallel.



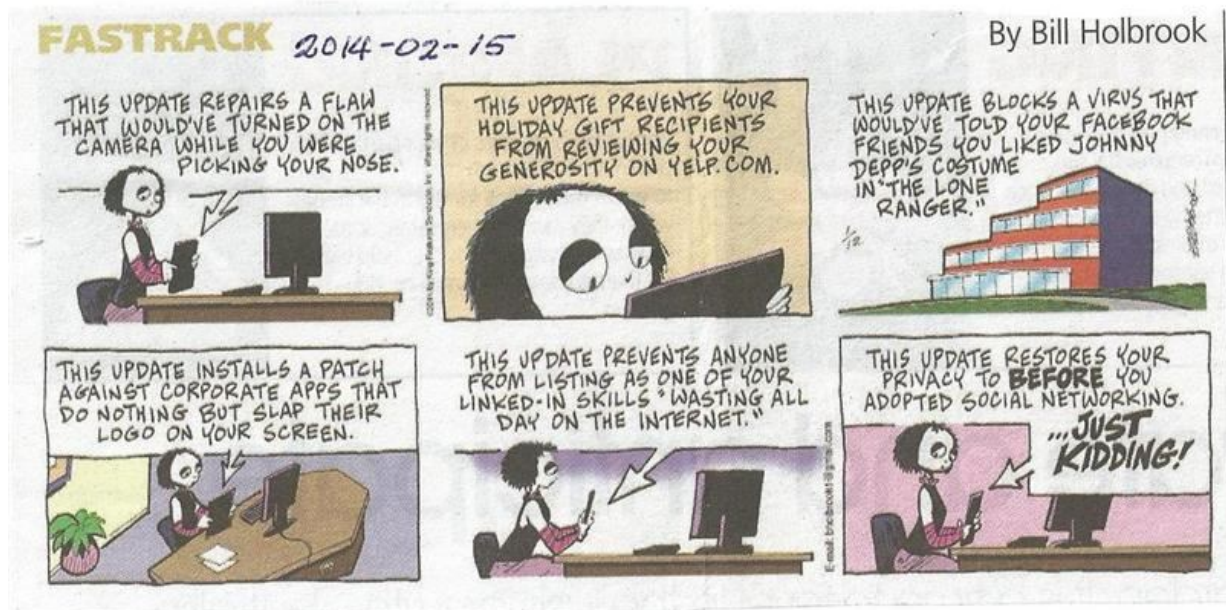
(see also our website propagation tab)

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.



A visitor at a Ford factory in Dearborn, Michigan had the good fortune of encountering Henry Ford himself, who, demonstrating a newly finished automobile, proudly stated that there were "exactly forty-seven hundred and nineteen parts in that model."

Impressed by Ford's exhaustive wealth of knowledge, the visitor located a company engineer and asked the man for confirmation: Were there in fact exactly forty-seven hundred and nineteen parts in that model?

The engineer shrugged his shoulders. "I certainly don't know," he replied. "I can't think of a more useless piece of information!"

Edison himself has played many a practical joke upon his employees, and in the early phonograph days he enjoyed many a laugh on them with the aid of his "talking machine." Sometimes, however, the joke was on him, as was instanced by the "fake cigar" story, which was a popular Edison anecdote twenty odd years ago.

Edison was always an inveterate smoker, and used to keep a number of boxes of cigars in his room, and these were a constant object of interest to his associates. First one man, then another, would enter the room, ask Edison some trivial question, and when leaving would manage, unseen, to insert his hand in one of the boxes and annex three or four choice cigars.

Edison began to suspect something of the kind, and one day he called on his tobacconist, explained things, and got the man to fix up some fearful "smokes," consisting of old bits of rag, tea leaves, and shavings, and worth about two dollars a barrel. These were done up in attractive-looking boxes, and delivered to the laboratory. Nothing happened, however; there was a falling off in the number of Edison's visitors, but no casualties were reported.

Then one day Edison again called at the store, and inquired of his dealer if he had forgotten to send up the fake cigars. "Why, Mr. Edison," replied the amazed tobacconist, "I sent up ten boxes of the worst concoctions I could make two months ago. Ain't your men through with them yet?" Then Edison made a rapid calculation, divided the number of cigars by his daily allowance, and was forced to the painful conclusion that he had consumed those "life destroyers" himself.