



ZR6FD logo

Drukwerk  
printing  
ZS6JPL

Papier / Paper  
ZS6JPL

# WATTS

02-2010

Year 80 + 2m

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](mailto:zs6pta@zs6pta.org.za)

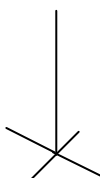
Bulletins: 145,725 MHz 08:45Sundays / Sondag

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



## Sig-gestremde amateurs – Jean ZS6ARA – Partially sighted amateurs. Page 4



### In this issue

- Minutes 14 / 01 Notules
- Member's pages Lede-bladsye
- Member news / Activities Lede-nuus en Aktiwiteite
- Hoe maak sig-gestremde amateurs
- Technical ZS6RJ Hex-beam project
- Wolf in sheeps' clothing
- Page eight Bladsy agt

### In hierdie uitgawe

### Next Meeting

Date: 6 Feb. 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

Committee members					
<b>Chairman</b> , Rallies, Hamnet	Johan de Bruyn	ZS6JHB	<a href="mailto:chairman@zs6pta.org.za">chairman@zs6pta.org.za</a>	012-803-7385	082-492-3689
<b>Vice-Chairman</b>	Alméro Dupisani	ZS6LDP	<a href="mailto:almero.dupisani@up.ac.za">almero.dupisani@up.ac.za</a>	012-567-3722	082-908-3359
SARL liason, fleamarket					
<b>Treasurer, Secretary</b>	Richard Peer	ZS6UK	<a href="mailto:treasurer@zs6pta.org.za">treasurer@zs6pta.org.za</a>	012-333-0612	082-651-6556
<b>Repeaters, Technical</b>	Craig Symington	ZS6RH	<a href="mailto:craigsym@global.co.za">craigsym@global.co.za</a>		083-259-3233
<b>Contests</b>	Pierre Holtzhausen	ZS6PJH	<a href="mailto:zs6pjh@telkomsa.net">zs6pjh@telkomsa.net</a>	012-655-0726	082-575-5799
<b>Public Relations</b>	Graham Reid	ZR6GJR	<a href="mailto:greid@wol.co.za">greid@wol.co.za</a>		083-701-0511
<b>Social</b>	Doréén de Bruyn	ZR6DDB		012-803-7385	082-857-9691
Co-opted / Geko-opteer:					
<b>Auditor</b>	Elma Basson				
<b>Newsletter/Kits</b>	Hans Kappetijn	ZS6KR	<a href="mailto:editor@zs6pta.org.za">editor@zs6pta.org.za</a>	012-333-2612	072-204-3991
<b>Asset control</b>	Andre v Tonder	ZS6BRC	<a href="mailto:andre.vtonder@absamail.co.za">andre.vtonder@absamail.co.za</a>	361-3292	082-467-0287
<b>Klubfasiliteite, vlooiemark</b>	Willie Greyling	ZR6WGR	<a href="mailto:willie@up.ac.za">willie@up.ac.za</a>		082-940-2490
<b>Rallies</b>	Johann de Beer	ZR6YV		011-918-1060	082-857-1561
<b>Rallies, Hamnet, Projects</b>	Roy Newton	ZS6XN	<a href="mailto:newtonr@telkomsa.net">newtonr@telkomsa.net</a>	012-547-0280	083-575-7332
<b>Webmaster</b>	Nico v Tonder	ZS6AQ	<a href="mailto:nico@admin.co.za">nico@admin.co.za</a>		082-326-9345
<b>Hiistorian/Awards</b>	Tjerk Lammers	ZS6P	<a href="mailto:zs6p@iafrica.com">zs6p@iafrica.com</a>	012-809-0006	
<b>Public relations</b>	Thobile Koni	ZS6TKO	<a href="mailto:toko40@mweb.co.za">toko40@mweb.co.za</a>		082-493-2483
<b>Social</b>	Molly Peer	ZR6MOL	<a href="mailto:molly@peer.co.za">molly@peer.co.za</a>	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 Jan. 2010.

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

**Present:** See register, 12 members, 1 visitor

**Apologies:** 6 as per register.

**Joys & Sorrows:** Alf ZS6ABA is in hospital with a back operation, and was visited by Whitey ZS6JJJ on Sunday. Molly ZS6MOL is out of hospital. A warm welcome to Henry Swanepoel ZR6SRK

**Minutes:** The minutes of the previous meeting were in Watts, approved by Johan ZS6JHB.

**Matters Arising:** None.

**Finances:** The balance in the current account is now R5906.78. The radio licenses are now due for payment.

**Membership:** There are 110 paid up members of the total of 139.

### Club activities

**Rallies:** The next season starts in February with the Belfast rally on 20 February. Five members are booked for the event, being Tony ZS6CRO, JB ZR6YV, Graham ZR6GJR, Roy ZS6XN and Helen ZR6HN. Johan ZS6JHB will be on the recce on 23 January.

**Flea Market:** The next PARC flea market is on 27 March 2010 at POMC.

**Technical:** Craig ZS6RH gave a lengthy report on the repeater. The license is for Radcliffe and requires amendment. A work party is required for Radcliffe and a date will be set.

**Contests:** The SARL HF field day takes place on 13-14 February and those interested in assisting should talk to Pierre ZS6PJH. The meeting agreed that the next meeting should be moved to avoid a clash with the contest.

**General:** Andre ZS6GCA is glad to be back. Mark ZS6USA (KW10) is working on an HF packet setup on 7054 kHz.

**Next meeting:** The next meeting will be on Saturday 6 January 2010 at about 14:00 and will be followed with a bring and braai social.

## Editorial

Judging from news received from some of our members and also the grapevine, it appears that some are seriously upgrading their shack, radio equipment and antenna systems.

It is good to know that the technical side of the hobby is not dead and that especially HF still features as important.

WATTS will report on as much information that comes to hand so as to incite others to do the same!

## Redaksioneel

Na gelang van nuus ontvang vanaf sommige lede en ook die skindernuus, kom dit voor dat van hulle besig is ernstige opgraderings van hulle hok, radio toerusting en antenna stelsels.

Dit is goed om te weet dat die tegniese kant van die stokperdjie nie dood is nie en dat spesifiek HF nog steeds as belangrik beskou word.

WATTS sal poog om soveel as moontlik te rapporteer as nuus ter hand kom en kan dalk ander aanspoor om dieselfde te doen!

## Birthdays

## Verjaarsdae

Feb.



03 Willie ZR6WGR  
03 Aletta, LV van Alf ZS6ABA  
03 Nico ZS6AQ  
06 Ellen, LV van Joe ZS6AIC  
09 David, seun van Ellen en Joe ZS6AIC  
09 Kenny ZS6KMM  
10 Paddy, SW of Kenny ZS6KMM  
11 Leanne, SW of Allan ZS6AVC  
12 Yvette, daughter of Rika and Errol ZR6VDR  
13 Sander ZS6SSW  
17 Freddie ZS6JC  
20 Ivo ZS6AXT

Feb.

## Anniversaries Herdenkings

03 Heather and Vince ZS6BTY ( 20 )  
18 Sarina en Willie ZR6WGR ( 10 )  
27 Paddy and Kenny ZS6KMM ( 45 )  
28 Martie en 'JB' ZR6YV ( 34 )  
  
22 Christopher, son of Joey and Graham ZR6GJR  
23 Arrie ZS6IRA  
23 Peter ZS6PJ  
23 Claire, daughter of Anne and Jac ZS6QA

---

## Joys and Sorrows | Lief en Leed

**Ed ZS6UT** became grandpa for the first time.

**Dwight West ex ZS6NT** has passed away in the US. He was PARC chairman 1981-1982.

---

## Diary | Dagboek (UTC times)

**Feb.** 06-07 AWA CW activity Day  
13-14 SARL HF Field Day 1200-1200  
13-14 CQWW RTTY WPX Contest 0000-2400  
13-14 Dutch PACC Contest 1200-1200  
20-21 ARRL Int. DX Contest CW 0000-2400  
26-28 CQ 160m SSB Contest 2200-2159  
27-28 French REF Contest SSB 0600-1800  
27-28 UBA CW DX Contest 1300-1300  
28 High Speed Club Contest 0900-1700  
28 SARL 80m Club Contest  
28 Final date for ARISS-SAT project suggestions  
28 Closing date for SumbandilaSat essay competition

---

## Snippets | Brokkies

**Pine ZS6OB** reported that the ZS ham community involved in EME activity were in good standing in the rest of the world for their professional approach and performance.

The DX-pedition to Namibia was very much appreciated and another is planned for the future.

Antenna systems, trailer mobility and stability will be improved involving a lot of work and dedication.

More amateurs are invited to join in EME activity as currently only a handful are active.

He also paid tribute to **Hal ZS6WB** who has been the main instigator for VHF/ UHF and satellite activity in South Africa and his EME for Africa project.

**There will be a Mauritius EME effort on 15 May-27May.**

**Foxhunts:** Richard ZS6UK recently put out an appeal for all foxhunters to come to the fore as well as newbies who will be very welcome to learn the skills.

**Repeater:** we require a floor-standing 19-inch rack cabinet 38-45U high. Contact Craig ZS6RH. if you have one that is in your way.

**Rubidium standard:** A recent email received from **Ian Roberts ZS6BTE** informs us that Johannesburg TV1 is back on Rubidium: 247159300.0 Hz. Also Potgietersrus on 175276089.6 and 199.276040.6Hz. Your editor has successfully verified his comms analyzer with the Jhb frequency to within its resolution of 0,33Hz. There is enough signal from a 2m beam pointing south.

A **Rubidium standard** is a [frequency standard](#) in which a specified [hyperfine transition](#) of [electrons](#) in [rubidium-87](#) atoms is used to control the output frequency. A rubidium standard consists of a gas cell, which has an inherent long-term instability. This instability relegates the rubidium standard to its status as a [secondary standard](#).

All commercial rubidium frequency standards operate by disciplining a [crystal oscillator](#) to the rubidium hyperfine transition of

**6 834 682 610.904 324 Hz**. The amount of light from a rubidium [discharge lamp](#) that reaches a [photodetector](#) through a resonance cell will drop by about 0.1% when the rubidium vapor in the resonance cell is exposed to [microwave](#) power near the [transition frequency](#). The crystal oscillator is stabilized to the rubidium transition by detecting the light dip while sweeping an [RF synthesizer](#) (referenced to the crystal) through the transition frequency. ([http://en.wikipedia.org/wiki/Rubidium\\_standard](http://en.wikipedia.org/wiki/Rubidium_standard))

**SARL HF Field Day:** Our club will again put in an effort and **Pierre ZS6PJH** is the organizer. The venue will most likely again be Roo-de-plaat Dam and Pierre will appreciate any help. Visitors and campers are also welcome and will find it a very pleasant outing.

## Die Gesiggestremde en Amateurradio - Jean De Villiers ZS6ARA

Graag wil ek van die geleentheid gebruik maak om die leser n kykie te gee in die hok van 'n gesiggestremde radioamateur.

Ek is nie blind nie maar deelsiende en daarom het ek 'n verskeidenheid van hulpmiddele in my hok van ontskatbare waarde wat my totale vryheid gee wanneer ek in my hok in stap.



Die eerste hulpmiddel is my "flipper" kamera op klein wieletjies wat ek hier vashou. Dit is 'n klein kamera gekoppel aan 'n monitor waar voor elke stukkie toerusting in my hok verby beweeg. Die toerusting word in kleur, wit en swart, positief, of negatief op die monitor geprojekteer. Die kamera kan nou die beeld van 'n voorwerp of 'n gedeelte daarvan tot sestien keer vergroot.

Dus ontglip niks my oog nie, nie eers die kleinste besonderhede op my Kenwood TS 2000, of Kenwood TS 950SDX, se skerm nie. Ook geen ALC of SWR lesing nie.

Die tweede hulpmiddel is my "Merlin" leesapparaat. Die apparaat werk op dieselfde beginsel as die kamera. Ek lees en skryf sonder enige probleem met die hulp van hierdie apparaat. Ek gebruik dieselfde "Merlin" by my soutmyn ook.

Soos u oplet, gebruik ek nie my rekenaar om my stasie te beheer nie, omdat ek nog self aan my radios wil vat, en betrokke wil wees. Vandag het my hondjie Lucky ook kom kuier wat slegs een hand oorlaat!

Die installering en instandhouding van antennes kan soms 'n probleem wees, maar dan maak ek van my broer Pierre se hulp gebruik.

# Building the broadband version of a 6 Band (6 – 20 metre) Hexagonal Beam

by Roger Jones, ZS6RJ

This article is part 1 of a two part series intended to provide all the essential information (measurements, tips for materials etc.) to home-brew a 6 band hexagonal beam.

Part 1 will concentrate on the essential measurements so you can get going on building a hexbeam using your own imagination when it comes to materials, construction and sourcing.

Part 2 will be a shorter article with some hints and tips on construction technique and material sourcing with associated pricing. Part 2 will also contain some useful web links to hexagonal beam information.

## Basic structure

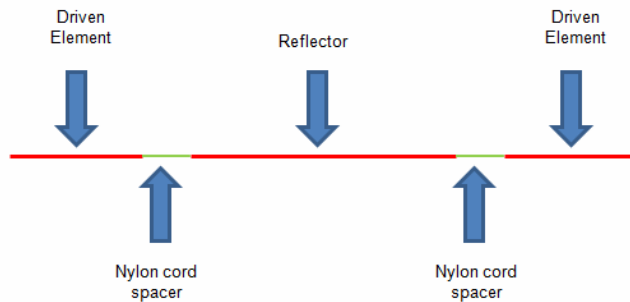
The hexagonal beam resembles an “inside-out” umbrella, and consists of a central hub, a non-conductive pole (PVC usually) rising from the centre of the hub, and six non-conductive spreaders (normally fibreglass) radiating outward equidistantly from the hub. The hexagonal beam consists of two wire elements (a driven element and a reflector) per band and these are strung on the spreaders. The spreaders are pulled upwards into the inside-out umbrella form to provide tension for the antenna elements, as well as depth required to separate the different band elements from each other. A picture’s worth a thousand words, so here’s what a completed hexbeam looks like.

The 20 metre elements are at the top of the spreaders (being the longest), with the subsequent bands (17, 15, 12, 10 and 6) spaced at intervals down the spreaders toward the hub in the middle.



## Getting started - constructing elements

You need to construct an element “set” per band. This means you will end up with one long wire to string to the spreaders for each band, incorporating the reflector and both sides of the driven element.



Graphically this looks as shown (Later this will make sense and we’ll string and form the one long wire into the hex beam shape)

The element lengths I’m supplying assume the use of #14 AWG (American Wire Gauge) insulated stranded wire. In our language, that is 1.63mm or 2.08mm<sup>2</sup>.

As with all antennas, increasing or decreasing the diameter of the wire (and using insulated opposed to non-insulated wire) will change the length of wire required for resonance on a given frequency.

Diameter variations (<0.25mm or so) will not matter, as the antenna is inherently broad-banded.

The wire you should use for your elements this looks something like below:



The spacers should be made from strong non-conductive UV-resistant cord. UV treated nylon works well. In terms of connecting the wire segments to the nylon segments, you can adopt any method you want. I went with the crimping route as shown here.



All Measurements are in Centimetres					
Band	1st Half of Driven Element	Nylon Spacer Cord	Reflector	Nylon Spacer Cord	2nd Half of Driven Element
20	543.5	61	1026	61	543.5
17	421.5	47	799	47	421.5
15	359.5	40.5	683	40.5	359.5
12	303	34	577	34	303
10	265.5	30.5	508.5	30.5	265.5
6	145.5	16.5	280	16.5	145.5

Table of measurements to construct six sets of elements

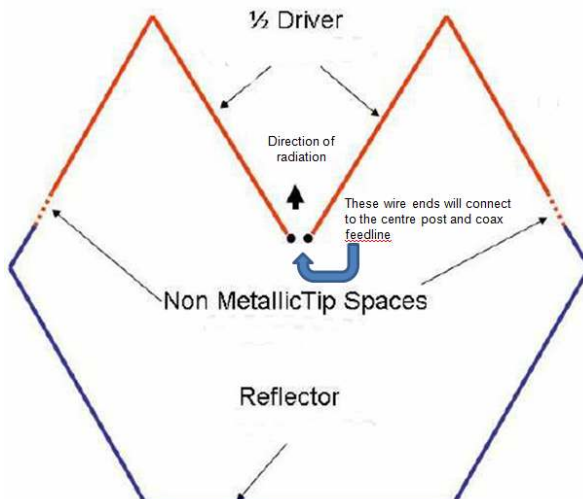
Alternatively you can also keep it simple and merely make (small) loops in the end of your antenna element wires, soldered to make them robust, through which you can thread and tie the lengths of nylon required for the spacer section.

In this case, make sure you measure and cut your wire so the resonant lengths are measured to the **end of the loop** you have formed each side of the wires.

The same goes for the total length of nylon spacers – measure from the apex of the loop on each side. In other words, you’re going to have to add a bit of length to the figures in the table to make your loops if you use this method.

When you finally string your elements through loops on your beam spreaders, you are going to end up with this shape per element set on each band (looking at the antenna from the top – bird's eye style):

You will notice that there is a bend and small part of the reflector each side just before it meets up with the non metallic nylon spacers. This is where the reflector is strung through the two horizontal spreaders and it's intentional. For all bands, you should allow 10cm of the wire at the ends of the reflector to protrude forward of the spreaders, per the picture below:



### The connector post in the centre of the hub

The three pictures below illustrate its construction and ties the ends of the two halves of the driven elements to a common feed point.

The first shows the bottom of the centre post with the feed line coax connector in place and directly above that the bolts to which you will connect the ends of your 6 metre elements.



Start of driven element

Nylon spacer

Nylon crimped to reflector

10cm of reflector protruding forward from the spreader

Fibreglass spreader

Reflector



20M terminals must be 44cm above 17M terminals

17M terminals must be 10cm above 15M terminals

15M terminals must be 10cm above 12M terminals

12M terminals must be 10cm above 10M terminals

10M terminals must be 10cm above 6M terminals

6M terminals must be 2cm above coax connector

Coax connector

The second picture shows the rest of the elements for the other bands attached progressively above, with 20 metres at the top. The diagram below shows the spacing you should use on the centre post between elements. Like element lengths, these spaces are critical in order to avoid interaction between the elements.

The post can be made of any non-conductive material.

50mm PVC pipe is ideal.

My post shown in the picture is a split pole, with the two halves able to slide into each other.

Thus I could open it up and "hide" the wiring from the connecting bolts to the coax feed point. This is not necessary, and you can use wire, terminal blocks and coax on the outside of a 50mm pipe.

(This article will be continued next month)

**CQ Magazine Columnist Dave Ingram, K4TWJ (SK)** (He also published in radio ZS) - *Info received from from Evan ZS6ELI*  
 Dave Ingram, K4TWJ, who penned the "World of Ideas" and "How It Works" columns in *CQ Magazine*, passed away January 20, from complications due to a heart attack late last year. He was 67. A writer and columnist at *CQ* since 1981, Ingram -- an ARRL member -- began his career at the magazine writing the amateur television "World of Video" column that later morphed into the "World of Ideas" column that covered code keys, stealth antennas, building "new vintage" tube gear, mobiling and more. Ingram also served as *CQ's* QRP Editor. "His enthusiasm for whatever caught his interest was contagious and spread widely through his informal, yet educational writing style," recalled *CQ* Managing Editor Rich Moseson, W2VU. Ingram also wrote for *RadCom* -- the Radio Society of Great Britain's member journal -- and other international ham magazines..

*CQ Magazine*

## ZS6ICS homebrew

Ivor removed all the 'disgusting' content of a Zetagi CB amplifier and consulted his fleamarket acquisitions to turn it into a ham radio amplifier.

The final amplifier PCB board on the far end is from a stripped Transworld HF radio and the supporting hardware is a homebrew pcb- and junkbox components.

Existing switches and sockets were re-employed so it now is a wolf in sheep's clothing..



These photos were taken prior to final testing.

## Long Term HF Propagation Prediction for Feb. 2010

courtesy ZS6BTY

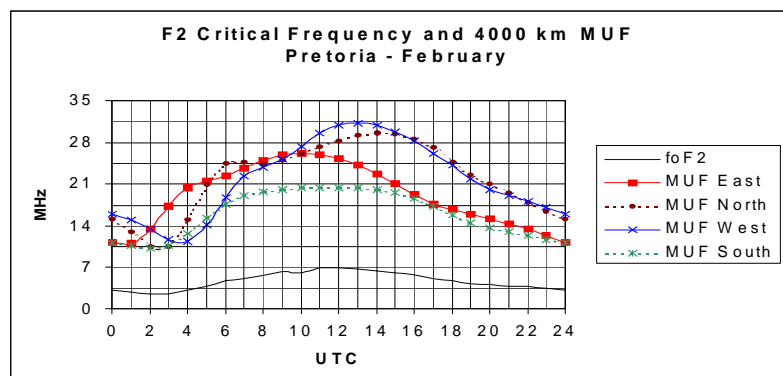
(see also our website propagation tab)

### 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.



### QRV Tech cc offers the following services:

- General equipment repairs and calibration
- Small-scale design and manufacturing
- Technical writing
- 3<sup>rd</sup> Party scrutiny of projects and documents
- Expert TV repairs and second-hand TV sales
- MFJ 259/69 Analyzer repairs and calibration

### and products:

- Morse Reader PCB, PIC and LCD kit
- Legal limit 40m dipole traps
- Radio power supply OV protection kits
- Nissei SWR/Power meters HF and VHF/UHF
- Connectors RF and DC
- Plug-in triple sequential industrial timer

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



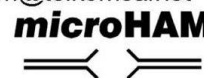
## Amateur Electronic Supplies

Your Affordable Amateur Radio Dealer

Johan Lehmann ZS6JPL

083 3008677 / 012 8413648

aesham@telkomsa.net



CABLE & INTERCONNECT SOLUTIONS  
FOR TELECOMS, BROADCAST  
AND MIL/AERO MARKETS



**Power Buddy**

**GUARANTEED SAVING OF UP TO 50% ON YOUR ELECTRICITY BILL**

Stabilizes currents and voltage  
 Plug into any wall socket  
 No service needed  
 No maintenance  
 60 day money back guarantee  
 2 year warranty  
 Environment friendly

Beneficial to electrical appliances  
 Suitable for homes, shops, offices, schools, etc

**Guaranteed saving of up to 50%**  
**Start saving from day one**  
 Actual client: paid **R1317.45** before power buddy  
 He now pays **R838.61** pm after power buddy  
**A Saving of R478.84 p/m**

Promotional launch for **only R690.00**  
 (Cod)

**CALL TODAY TO PLACE YOUR ORDER!!**  
 Reference  
**DAVID VD MERWE**  
 W/h (012) 756 1319 Cell: 074 1138 784  
 20 million households need our product now.

REALLY?

**Good-bye forever to aerials**

**No more radio noises**  
**ICA INSULTENNA**  
 does the job... **\$2.50**

Say good-bye right now to the ugliness, the fuss and bother and the inefficiency of aerials. Cut out those

REALLY?

## A use of unstable radio - The Electro-Theremin

In the West Leon Termen became famous as Leon Theremin, who in 1919 created an instrument named after him, a radio-sized box that, with a carefully precise wave of the hands over its antennas, produced sounds that Depression-era listeners found uncanny, heavenly, astounding, unsettling or puerile.

As composer Albert Glinsky rightly insists in his exhaustively researched and revealing biography, this frequently clumsy instrument was the first foray into the brave new world of electronic music.

Essentially a radio-feedback device, it was impossibly sensitive, often screeched out of tune, required ridiculously deft technique while being advertised as the perfect instrument for the musically illiterate, and was plagued with problems from irreducible portamento (gliding) to unvarying tone and timbre. Still, its magic captured the imagination of millions and has since invaded pop culture, from the eerie theme for the 1930's radio show "The Green Hornet" to movies like "Spellbound."

The Beach Boys' "Good Vibrations" features Theremin-like sounds produced by an Electro-Theremin, played by its inventor, Dr. Paul Tanner.

The Electro-Theremin is heard often in Hollywood movies, songs and in TV theme music. Unlike its original inspiration, one plays the Electro-Theremin by physically touching it. Electronic instruments, like Dr. Tanner's Electro-Theremin (Tannerin) and Robert Moog's many synthesizers, trace their roots to Leon Theremin.

Theremin's are still available (kit or assembled) from several sources.

