



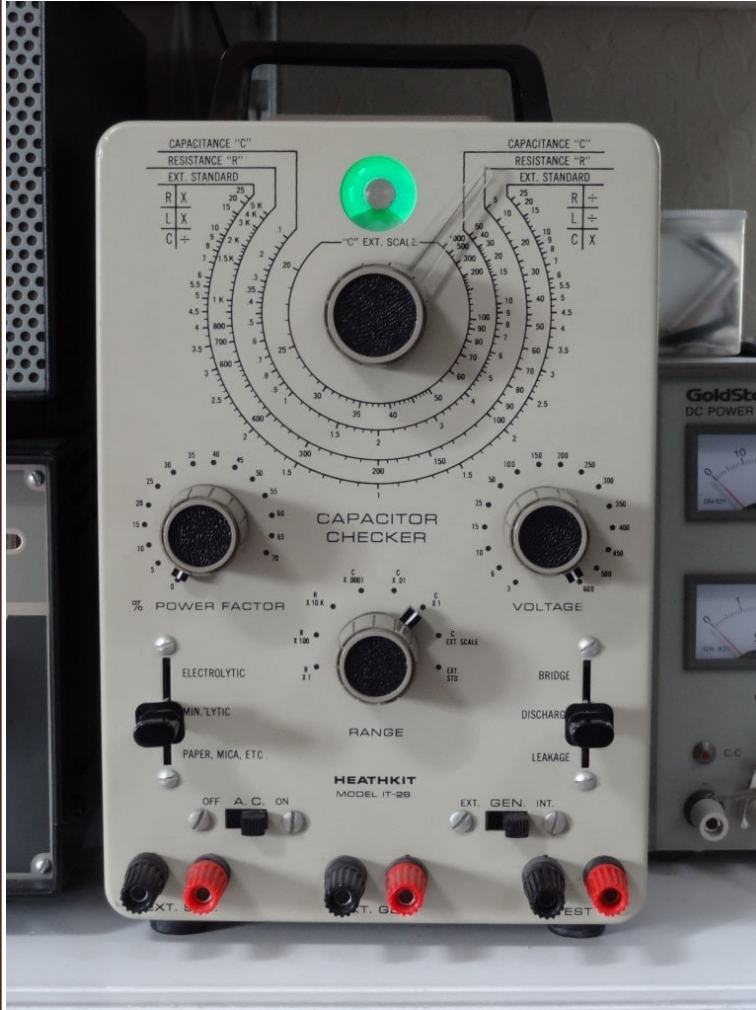
Antique Wireless Association of Southern Africa Newsletter



237

April 2026

Heathkit IT28 Capacity Checker.



Heathkit introduced an earlier version of this tester in 1961 as the IT-11. Minor changes were made in 1968, and the updated model became the IT-28. The IT-28 was available until 1977—a 16 year life for the line. The IT-28 featured Heathkit's tan color scheme, a grounded three-wire power cord, a spring-clamp on the 6AX4 rectifier tube socket, and a power transformer that could be wired for 240 volts. Unlike the earlier IT-11, which used adjustable set-screw knobs, the IT-28 used less desirable push-on knobs that can't be easily re-adjusted.

The Heathkit IT28 Capacity Checker is a general purpose instrument designed for use by servicemen, engineers and technicians in checking capacitors for value, leakage, shorts and opens. The checker may also be used to check resistance, inductance and transformer turns ratios.

A bridge circuit and eye tube indicator are used in making quick, accurate tests. Precision resistors and capacitors in the bridge circuit provide a high degree of accuracy and stability.

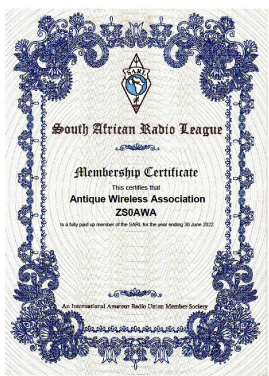
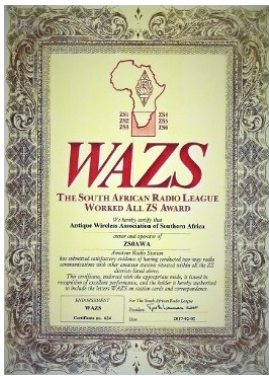
Terminals are provided on the front panel for the components under test (TEST), an external generator (EXT GEN) and external standard (EXT STD)

The heart of the Capacitor Checker is the AC powered bridge. Balance control R13 is used to vary the resistance of the two arms of the bridge.

The third arm is the standard (internal or external), and the fourth arm is the component being tested.

The secret to this tester's usefulness lies in its ability to measure capacitor leakage *under working voltages from +3 to +600 volts*. The IT-28's green eye tube can easily show if a capacitor is leaky. The unit provides standardized leakages tests from a front panel switch marked "Electrolytics", "Miniature Electrolytics", and "Paper, Mylar, Etc." Even if one intends to replace an old paper capacitor with a modern Mylar, running a leakage test on the old cap at its working voltage satisfies ones curious nature. You can't do leakage tests at working voltage with most digital testers—not unless you buy a much fancier one than is commonly available. And you've got to admit, the glowing green eye tube is just cool to use. Something utterly magical about it.

A second great use of this tester is to season electrolytic capacitors. Many NOS modern electrolytics have been sitting on the shelf for years since they were manufactured. Put one in a radio and then hit it with full working voltage, and you sometimes get the sound and smell of an instant barbeque—one you'd rather avoid. You can use the IT-28 to easily bring an electrolytic up to its full working voltage in incremental steps, all the while monitoring the eye tube for leakage. The IT-28 will save you from all those unnecessary radio fireworks.



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AWA Committee:

- * President—Chris ZS6GM
- * Vice President—
- * Technical Advisor—Rad ZS6RAD
- * Secretary/PRO—Andy ZS6ADY
- * KZN—Don ZS5DR
- * WC—John ZS1WJ
- * Historian—Louis ZS6SK
- * Members—Renato ZS6REN
Wally ZS6WLY

Reflections:

When I think about it, I am quite fortunate to have been born in the early 50's. Some may think it put's us at a disadvantage with the modern technology of today, but if one just kept your finger on the pulse you never get left behind.

From the production vinyl's to 4 track tapes to 8 track tapes to VHS to CD's to blue tooth, we have been through it all.

Plus of course all the other things that go with it.

It was always great for me to see the changes that came in and I was quite fortunate to be exposed to nearly all of them. My only regret was that I did not get involved with Amateur Radio until late in life, but it did not deter me from getting involved in it when I had the opportunity.

From model railways to record players to the first advent of black and white television in Zambia, long before it came to SA. From V8 Fords and Chevies with their massive bodies and space to throw a party inside to spending days on a train trip from Zambia to SA travelling to boarding school, (because air travel was just so expensive then).

There were no laptops/cell phones/ Xboxes etc to detract us from playing with dinky cars on home made mud roads, climbing trees, falling out of them and breaking bones. Movies at the local movie house on a Saturday afternoon, riding bicycle with 3 speed gears or pedal brakes.

Disco's/sokkies swimming in the dams or quarries. Hunting birds with a pellet gun, roasting rock doves over a fire, eating mopani worms cooked in oil, wild fruit. Should I go on.

There was so much to distract us from life itself that there was no time for sitting around staring at a screen. I guess you can gather I had a very busy childhood.

I learned to drive a car at the age of 7 and to ride motorbike at the age of 8. None other than a Matchless 500 single cylinder which would pull away in fourth gear. No need to change gears. Motorcycles became my first love.

Could I imagine any other way of growing up? Not really.

My late brother was into rebuilding old cars, not for anything else than to use them as transport. He was an appie auto electrician and could not afford anything else. Mostly V8's, and what pleasure they gave us.

We spent a lot of time outdoors, going on picnics, riding bicycle, swimming.

But then I suppose the kids of today believe that the way they are growing up is no different. There are things that they get absorbed with, as we did, and find great pleasure in it.

I wonder how many of them are attracted to the electronics side of technology today?

One thing though is that amateur radio has not changed from the first QSO's that were made way back then. The simplicity of it still remains the same. Yes, radio's have changed, the technology behind them has changed, but the protocol of being a radio enthusiast hasn't.

It still becomes overwhelming to sit and have a conversation with someone on the other side of the world using a little box of electrical components connected to a piece of wire. Nothing else in between except open air.

The thrill of making one's first QSO, I'm sure is the same for everyone. I have never sweated so much in my entire life as I did the day I called my first CQ in morse code, only to have someone come back to me.

After that it was like riding a bicycle, but there was always the expectancy of hearing someone new who you could share your interest with. Someone on the other side of the world who was as interested in radio as you were.

Lets face it. It's a great way to make friends and a great way to spend your time. Enjoy it and the most of it while you can.

Best 73

Andy ZS6ADY

Chris's Musings

I was reading about Artemis II, Nasa's new moon rocket and comparing the technology with that of Apollo. As many of us enter our autumn years, we have seen a lot of life. We have seen great technological growth and things are very different to our care free youth.

Moore's Law an observation and projection made by Intel co-founder Gordon Moore in 1965, stated that the number of transistors on a microchip doubles roughly every two years, while the cost of computers is halved. This exponential growth in transistor density has driven the rapid advancement of computing power, efficiency, and miniaturisation for over 50 years.

When I started out in electronics, semiconductors were in their infancy and computers filled a whole room. There is more computing power in modern mobile phone than in the entire Apollo space capsule. While computing has become ever more powerful and technology has advanced, the basic laws of radio communication, propagation and antennas have not. Radio broadcasting has remained relatively unchanged for over a hundred years. SSB, though 70 years or more old, is still the dominant voice communication mode on the HF bands.

So where am I going with this? Even though many of us are well into retirement age, we are fortunate to have amateur radio as a hobby. We can still dig out those old radios, blow the dust off, throw a wire in the sky and talk to people all over the world. When all else fails, short wave radio, CW and SSB will probably still be around. Amateur radio remains a rewarding hobby and provides mental stimulation and enjoyment in a way that many other hobbies or activities don't. So, don't dispose of those old radios just yet. Like the older generation they still have value and lots of life in them yet.



**HEATHKIT
DX-100
PHONE AND CW**

transmitter

KIT

FEATURES

- Design proven through actual signal reports.
- ★ Only top-quality components used throughout.
- ★ 5-point TVI suppression, and pi network output to match 50 to 600 ohms.
- ★ Detailed construction manual for simplified assembly.
- ★ 100 watts output on 160, 80, 40, 20, 15, 11, and 10 meters.
- ★ Attractive and functional physical design.

The Heathkit Model DX-100 Transmitter is rapidly becoming the "standard" ham rig in its power class. The high quality and outstanding performance it offers can be matched only in equipment costing many dollars more. It features a built-in VFO, modulator, and power supplies, and is bandswitching for phone or CW operation on 160, 80, 40, 20, 15, 11, and 10 meters. The kit includes a detailed construction manual, the cabinet, all tubes, pre-wound coils, and all other parts necessary for construction.

Push-pull 1625 tubes are used to modulate parallel 6164 tubes for RF output in excess of 100 watts on phone, and 120 watts on CW. May be excited from the built-in VFO or from crystals. Features pi network output circuit, illuminated VFO dial and meter face, and 5-point TVI suppression. High grade, well-rated parts supplied. Schematic diagram and technical specifications on request.



**MODEL
DX-100**

\$189⁵⁰

Shpg. Wt. 107 Lbs.

Shipped Motor Freight unless otherwise specified. \$50.00 deposit required on all C.O.D. orders.

Antique Wireless Association SSB QSO Party

1. Aim

The aim of the AWA Valve QSO party is to create activity on the 40m and 80m bands. It is a phone only contest using SSB. Preferably, valve radios or radios with valves in them may be used. No linear amplifiers may be used.

2. Date and Time

13:00 to 17:00 UTC 1st Sunday of May and October

Sunday 3 May 2026 - 13:00 to 17:00 UTC

Sunday 4 October 2026- 13:00 to 17:00 UTC

3. Frequencies

3.1. 40m SSB: 7 063 to 7 100 kHz and 7 130 to 7 200 kHz

The segment from 7 100 to 7 130 is contest free.

3.2. 80m SSB: 3 603 to 3 650 kHz

The segment from 3 651 to 3 699 kHz is contest free

4. Power

The output power may not exceed 100 w, unless the rig itself has a higher output power (FTDX400, etc.)

5. Exchange

5.1. Call sign, RS report, a consecutive serial numbers starting at 001 and the type of radio used, eg HT37 TX.

5.2. Each QSO claimed for competition credit must comply with the rules found under General Rule "5. Contacts".

6. Scoring (Your radio)

There are 4 classes you can enter:

All valve radio (Mostly valve that is 80/20)

Hybrid radio (Valve finals and driver)

Solid State Radio - Pre 1970

Solid state radio - Post 1970

All score 1 point per contact.

7. Log Sheets

7.1. The log sheets must be submitted by Friday 8 May and Friday 9 October 2026 to andyzs6ady@vodamail.co.za.

Log sheets can be downloaded from the SARL Website in the "Contest Resources".

7.2. Certificates will be awarded for the highest score in each category.





...heart of the deluxe mobile rig!

POWERFUL all-band operation through 420mc, top performance in double or single sideband service and more watt-hours per dollar make the Eimac 4X150A radial-beam power tetrode a tube for the deluxe mobile rig. The advantages offered by the versatility, power and reliability of the Eimac 4X150A make the necessary simple forced-air cooling well worth while—with an Eimac Air-System Socket an automobile defroster type blower is all that's needed to do the trick. With 1000 volts on the plate in typical plate modulated service, the Eimac 4X150A delivers 150 watts of useful plate power output with 200 watts of power input and only 2 watts driving power. The high power gain Eimac 4X150A is also ideal for increasingly popular Single Sideband mobile application. In typical AB₁ operation at 1000 plate volts, it delivers 150 watts of peak

TYPICAL OPERATION

	Class AB ₁	Class C Phone
D-C Plate Voltage	1000 volts	1000 volts
D-C Screen Voltage	400 volts	250 volts
D-C Plate Current	250 ma	200 ma
D-C Screen Current	30 ma	20 ma
D-C Grid Current	0 ma	15 ma
Driving Power	0 watts	2 watts
Plate Power Input	250 watts	200 watts
Plate Power Output	150 watts	150 watts

The plate power output shown does not allow for circuit losses. The 4X150A may be operated at maximum ratings up to 500mc.

envelope power output with virtually no driving power requirement. Maximum ratings show a peak envelope power output of 350 watts with 2000 plate volts. This outstanding performance can be yours by taking incomparable Eimac quality on the road with you in the heart of a deluxe mobile transmitter.

For further information about Eimac tubes and applications write our Amateur Service Bureau.

EITEL-McCULLOUGH, INC. SAN BRUNO
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The World's Largest Manufacturer of Transmitting Tubes

Audio Recording Through the Ages: A History of Audio Technology

Last Updated On : July 30, 2025



Here is a guest post from Rebecca Armstrong of McGowan Transcriptions.

Just 200 years ago, no human voices had been recorded. Ever. Music, rousing speeches and even just day to day conversations were essentially lost forever, surviving only in written records at best.

The first real technological developments in audio recording materialised in 1859, when Edouard-Leon Scott de Martinville invented the phonautograph. By our standards today it was pretty primitive in that it could record sound but not actually play it back. Instead, it displayed sound waves as squiggles and lines on sootblackened paper and glass.

The phonautograph did - despite its limitations - set the stage for far more groundbreaking innovations and a total change in society. The progress in audio technology from the late 19th century onwards resulted in the birth of the modern music industry, the invention of sound films, and a far greater ability to record and document important speeches and events.

Following the phonautograph came Thomas Edison's phonograph in 1877, and with it the first ever musical records which took the form of hollow wax cylinders. An upgrade arrived just ten years later in the form of the gramophone, and the new disc format used essentially doomed Edison's cylinders to extinction.

Throughout the 20th century, these developments continued in earnest as humanity moved from basic acoustic recording to electrical recording, magnetic recording, and finally to today's advanced digital recordings. Our ability to store, edit and transform sound has increased exponentially - the first 7 inch gramophone discs could only store around 2 minutes of sound in total. Compared to today's smartphones and computers, this is miniscule!

To find out more about these incredible developments in audio technology over the past 160 years, take a look at this infographic designed by McGowan Transcriptions. It will take you through all the key developments in audio technology history, along with some fascinating stats and figures that show just how groundbreaking these changes have been.

(This article is reproduced with permission from The Homebrew Audio.com)



Recording Speech Before Technology: Shorthand

There was still a need for recording speech before the advent of audio recording technology. From ancient times, clerks and scribes were responsible for transcribing speech, often using shorthand.

What is shorthand?

A system of rapid writing that uses symbols or abbreviations for letters, words & phrases. It's sometimes called 'stenography'.



First Latin shorthand system created by **Marcus Tullio Tiro** in **63BC**. Lasted for over **1000 years!**



The earliest known example of shorthand is from the **Parthenon** in Ancient Greece, where a marble slab from **400 BC** was found.



Emperors **Titus & Julius Caesar** were accomplished shorthand users.



In the Middle Ages, shorthand became associated with witchcraft and largely disappeared.



Timothy Bright eventually created an English system in **1588**, consisting of straight lines, circles and half circles.



In the 17th century, other inventors created their own systems – e.g **William Mason**, whose method was used to record sermons and translate the Bible.



Later, **Sir Isaac Pitman** was knighted by Queen Victoria for his contributions to shorthand. In 1889, an investigation showed that **97% of shorthand writers** used the Isaac Pitman's system.

The Acoustic Era – 1877 – 1925

The first examples of modern audio recording devices were invented in the second half of the 19th century:



Édouard-léon Scott de Martinville invents the Phonograph

This turned soundwaves into 2 dimensional squiggles on soot-blackened paper or glass. Used as a lab instrument, so he did not figure out a way to play the sounds back. In fact, his recordings weren't played back until 2008!

Thomas Edison invents the Phonograph

- > This was the first instrument that could record sound AND play it back. Sound was captured and stored in hollow wax cylinders.
- > The initial target market for phonographs was business communication, but entertainment use proved to be the real source of profits.



The copies created from phonograph recordings were lower quality, and only about **25** copies could be created before the original was too worn down.

Despite these limitations, between its invention and 1928, **845,000 phonographs** were sold. **48,000,000** cylinder records were sold.

To make **500** cylinder copies, the performers would have to perform **25** times in front of **20** phonographs.



Emile Berliner patents the Gramophone

- First to use the disc format, which doomed Edison's cylinders to extinction.
- It had one machine to record and a turntable to play sound back.
- Disc records were more durable, smaller and easier to store, and easier to mass produce.
- Only about **2 minutes** could fit on each single-sided 7 inch disc.



Effectively overtook the phonograph by **1912**.



Founded the Berliner Gramophone Company – received a **\$25,000** investment or around **\$645,000** in value today. Essentially, this was the birth of the modern day record industry.



The well-known image of 'Nipper' – a dog listening to a gramophone – was used for more than **70** years.



Gramophones remained dominant until the **1980s**, with vinyl becoming the main material for records in the **1950s**.

The Electrical Era (1925-1945)

Before 1925, sound recording did not rely on electricity. At this point, this changed...

Bell Telephone Laboratories & Western Electric



Engineers **Henry Harrison & Joseph Maxfield** developed an electrical phonograph recording system using the Condenser Microphone invented by Edward Wente.



An integrated system of electrical microphones, signal amplifiers and recorders was developed.



Frequency range on old acoustic recorders was **250-900Hz**. This was increased to **50-6000Hz** in the new system, which added another octave of sound and reduced distortion.

Western Electric didn't make records, but sold the technology to record companies.



In **April 1925**, the Victor Talking Machine Company used the technology to make the first electrical recording of a symphony orchestra.



Amplifiers now enabled quieter instruments like guitars and string bass to compete with louder instruments in recordings.



Sound-on-disc technology was named the **Vitaphone**.



Sound On Film - The Vitaphone



- > **Warner Bros** acquired the Vitaphone from Bell Laboratories.
- > The studio used the technology to create the first film with sound - **Don Juan in 1926**, which they spent **\$3,000,000** promoting. This was followed by their landmark 1927 film, **The Jazz Singer**.
- > They initially thought it would be a novelty that would let them secure short term profits.
- > The adoption of sound-on-film helped audio engineers to make big advances in multi-tracking which let them create new blended audio tracks - including the famous '**Tarzan Yell**' in 1932.

The Loudspeaker

Invented in **1925**
by **Edward Kellogg** and
Chester Rice.



Amazingly, this technology has remained practically unchanged for the past **90 years!**

The Magnetic Era (1945-1975)

This third wave of audio development happened after the war ended in 1945, as the allied nations could use a German invention – **magnetic tape recording**.



Invented in *1930s* by the Germans, who used it in broadcasting.



Another dramatic leap in audio fidelity and quality – the audio quality of pre-recorded programmes was almost indistinguishable from live broadcasts.



Recordings could also be far longer than before.



Sounds on tapes could be easily edited and combined – this had been impossible with discs.



From *1950*, this became the standard medium for audio master recording in radio and music.



In the *1950s*, **Les Paul and Mary Ford** used tape editing and multi-tracking to create large virtual ensembles of voices & instruments, using only taped recordings of their own voices and instruments.

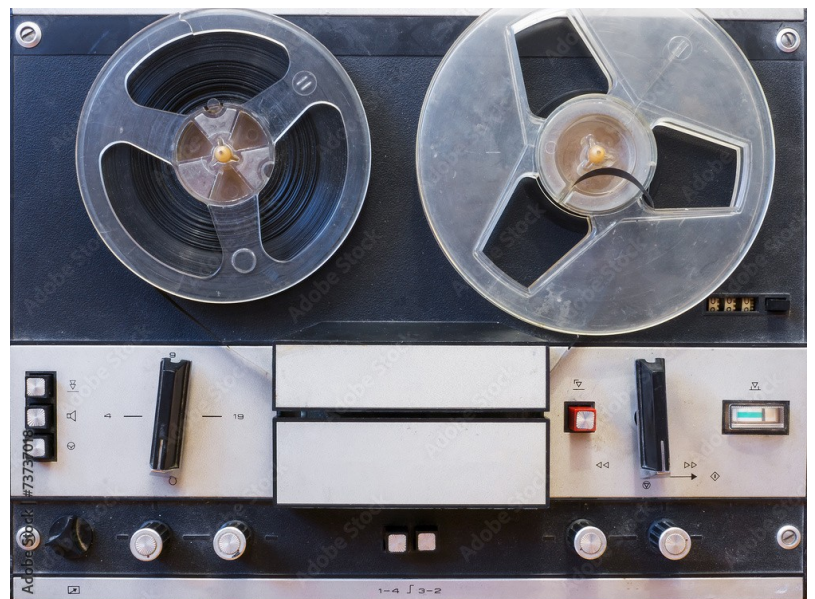


Pre-recorded tapes in the form of cassettes and cartridges were in wide use by the late



Magnetic tape could also be used for data – around *48,000* bits of information can be stored on one inch of tape. This really helped the computer industry to advance too.

1960s.






The Digital Era (1975-Present)

The most revolutionary and drastic changes took place in less than 20 years, with the rise of digital.


Digital Sound Encoding and CDs

SONY Digital sound encoding perfected by Sony in *1970s* by converting sound samples into binary numbers.

The very first digital audio recording machine was the size of a fridge and weighed *250kg!*   



First all digital album Ky Cooper's **Bop 'Til You Drop** released in *1979*

Introduction of the **CD** which rapidly replaced 12" albums and 7" singles as new standard format. Created in *1982*. 



CDs did not degrade, but could be played over and over again. It could represent the entire audible sound spectrum with perfect clarity.

In *1986*, *140,000,000* CDs were sold. In *1992*, sales hit *1 billion* and by *1996* this had doubled to *2 billion*. 



CD sales overtook vinyl in *1988* and cassettes in *1991*.

LPs could hold about **50 minutes** of audio. CDs are half the size but held about double the amount of audio – up to *80 minutes*. 

Digital Audio Files

 Although CDs had dominated the market by the end of the 20th century, in just **10 years** they were made redundant by the invention of digital audio files.

 Formats included **.wav**, **.mp3** and others.

 New **digital signal compression algorithms** greatly reduced file sizes.

 Innovations like **Apple's iTunes** application & immensely popular **iPod** allowed audio files to dominate the market.



Over *400 million* iPods have been sold.



Consumers can now easily acquire and store huge quantities of high quality digital media – as many as *100,000s* of songs. This would have previously been impossible.



Standard CDs could hold about **0.73GB of data**. By contrast, even the first iPod could hold **5GB of data**. This is an increase of *710%*. By 2010, CD sales had fallen by **50%**.

However, vinyl has resurged in popularity, with *15 million units* sold between 2003 and 2012. 



Today, audio recording systems are widely available, with most smartphones having a voice recorder – *2.53 billion* people use smartphones.



WITH NEWER INNOVATIONS IN TECHNOLOGY, THINGS WILL BE AT A CONSTANT CHANGE. HOWEVER, PEOPLE'S LOVE FOR AUDIO PLEASURES OR THE NEED TO RECORD AUDIO WILL NEVER CEASE. WITH THAT, WE WILL KEEP DEVELOPING OUR METHODS OF CAPTURING THE ACOUSTICS.

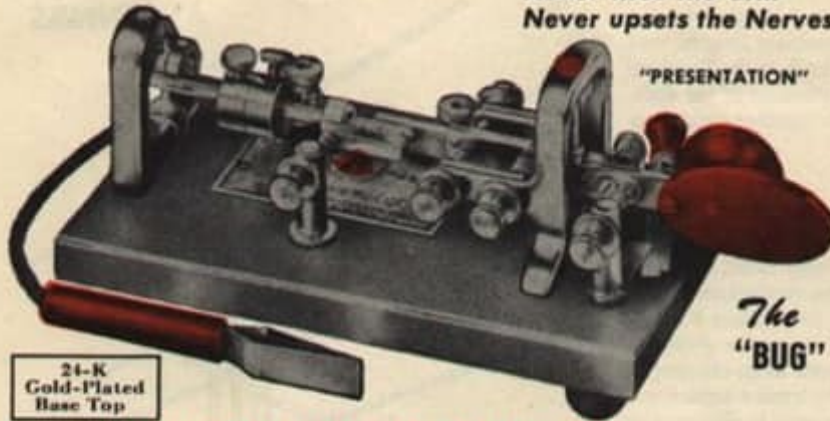


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The Super DeLuxe model's **JEWEL MOVEMENT** completely revolutionizes sending. Makes it easy for every operator.

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RICHLY DESIGNED — 24k gold-plated base top, polished chromium machine parts, red trim and jeweled movement. DeLuxe, only \$39.95.

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SEND FASTER — Vibroplex gives you greater speed. More speed than you can ever use. But it's there if you need it.

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Vibroplex Lightning Bug

Improved design with slotted weights that can't work loose. A bridged damper frame that protects key against damage. Instantly adjustable dot contact spring may be removed without disturbing speed weights. Precision machining, trouble proof and adjustable to any speed. Standard, with circuit closer, gray base and chrome top parts, priced at Std. \$23.95. DeLuxe model priced at \$29.95.



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Acclaimed by thousands of the world's finest operators for ease of operation, clean signals and all around sending excellence. Precision machined, trouble-proof and efficient. A strong favorite of the elite. Standard, with circuit closer, grey base and chrome top parts. \$24.95, DeLuxe, with polished chromium base and top parts, red trim and jewel movement, \$29.95.

Replace your old-fashioned key with all its annoyances with an improved **NEW VIBROPLEX**. Enjoy sending as never before. Choose yours from those illustrated here.

"VIBRO-KEYER"

Supplies the answer to many years of requests for Vibroplex parts for a keying mechanism to be used with **ELECTRONIC TRANSMITTING UNITS**. Features a beautiful base, size 3 1/4" by 4 1/2" and weighing 2 1/2 pounds. Red finger and thumb pieces, same large 1/4" contacts on main frame and trunion lever as used in Vibroplex. A real beauty, adjustable to suit your speed requirements. Standard model, priced at \$18.95; DeLuxe model, with Chrome Plated Base, priced at only \$24.95.

*Cord and wedge, \$2.75 additional.



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Keeps key like new, Black simulated morocco. Flexible leather handle. Protects key against dust, dirt and moisture, and insures safe-keeping when not in use. With lock and key, \$4.75.

**NEW SPECIAL ENLARGED Edition of
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IF YOU SEND YOU SHOULD USE THE VIBROPLEX
 Buy Vibroplex for the easiest sending of your life

Carl and Jerry—The Girl Detector

January 1964 Popular Electronics

Ah, they grow up so fast... It seems like just yesterday Carl and Jerry were two high schoolers who spent their spare time thinking up and building electromechanical gadgets to satisfy their primal instincts. Whether it was for Ham radio, school projects, helping police catch bad guys, flying radio-controlled airplanes, or troubleshooting appliances, John Frye's technical dynamic duo filled every day with adventure. Graduation day is a couple years behind the boys (men?) by the time this *Popular Electronics* story was published in 1964. Girls were now a recurring theme in their escapades, as the title suggests. It is part of the natural process. As always, woven within the main theme is a lesson on aspects of electronics and mechanics. The "Girl Detector" scheme could actually have worked. Mr. Frye had a habit of doing that - and was darned good at it.



THE GIRL DETECTOR

By
JOHN T. FRYE
W9EGV

By John T. Frye, W9EGV

A late hour of an evening in January found Carl and Jerry busy in the electronics laboratory of Parvoo University. Carl was seated in front of a TV set looking intently at the glowing screen. The picture that interested him so much was ne of the back of his own head. He was cutting his own hair, aided by Jerry, who was manipulating the camera of the laboratory closed-circuit TV system so that it was kept focused on the point where Carl was gingerly and awkwardly using the electric clippers.

"How'm I doing?" Carl mumbled without raising his chin.

"I've seen worse jobs - I just can't remember where or when," Jerry replied. "What started you on this do-it-yourself haircutting kick?"

"Two things. First, the local barber shops have upped haircuts another two bits; second, my friend Ray Thompson gave me this idea for beating them out of it. I can't see paying a barber, who learns the business in nine months, more dough per hour than I'll be able to make when I finish four grinding, expensive years in college."

"Yeah, but don't forget that your extra work and education will start paying off fast as soon as you get a little experience, and there's no ceiling on how much you can make - if you're good, that is. The barber can only make so much - he's got a ceiling."

"A darned high ceiling, if you ask me! Well, I guess I'd better quit while I'm ahead. Let's see how it looks over my left ear. Hmmm. All kidding aside, this doesn't look too bad, does it?"

"Not if you keep your hat on," Jerry replied mercilessly. "Say, how about coming over to the Union with me and helping me check out my Girl Detector?"

"Your what? It sounded like you said 'Girls Detector.'"

"That's what I did say. While you were in Chicago at your cousin's wedding last week end, the Triangle fraternity boys asked me to dream up an interesting gadget for their dance tomorrow night. They wanted something scientific, but simple enough to intrigue the non-engineers in the crowd. Come along and see what I worked out."

A few minutes later the boys were standing in the nearly empty ballroom on the third floor of the Memorial Union Building. Four or five Triangle fraternity men were putting finishing touches on the decorations. Jerry led Carl over to a corner of the room in which a man-size papier-mâché "wolf" was seated on a raised platform.

"Walk up to the platform, stand there a few seconds, then push down on that button near the wolf's foot," Jerry instructed.

Carl did as he was told, and instantly the wolf's bulging eyeballs scanned Carl's figure up and down twice with deliberation. Then a voice that seemed to come from the lecherous-looking creature said contemptuously, "Go away, boy!"

Jerry turned to a hulking youth standing nearby and said pleadingly, "Please, Buzz; just once more?"

"Aw, not again, fellows!" the 240-pound varsity tackle protested, but he good-naturedly allowed himself to be propelled out of the room by his fraternity brothers who closed in on him. A few minutes later he came back, his powerful hairy legs protruding from beneath a skirt improvised from a towel. With one hand on his hip, he minced toward the wolf with a ludicrous, affected feminine walk that brought howls of laughter from the watchers. After standing at the edge of the platform for a few seconds, he reached over and pushed down on the button.

Instantly the papier-mâché creature's eyes began boldly sweeping up and down the brawny figure of the football player; then its eyes lighted up with a bright red glow, and it emitted the longest, most admiring, most libidinous wolf-whistle Carl had ever heard. As his fraternity brothers collapsed with laughter, the towel-clad youth turned around and walked away, and in a few seconds the red light disappeared from the eyes of the wolf.

"Neat, neat!" Carl exclaimed. "How are you doing it? Is it really automatic, or is somebody hiding around here and pushing buttons?"

"It's automatic. Some of the guys taking art courses did the nice job on the wolf. His eyes are painted on the ends of little red light bulbs, and a motor and cam setup makes them sweep up and down a couple of times whenever the button is pushed. It works just like the motor arrangement on those Westminster doorbell chimes you have at home. Every time the button is pushed, the motor and cams make one complete cycle and stop."

"Tell him about the voice," one of the fraternity members suggested.

"Well," Jerry began. "at the end of the cam's movement, a vane passes through a beam of light and momentarily cuts it off. Normally, this beam of light shines through a hole in an endless loop of tape on a stereo tape recorder onto a photocell. As long as the light shines on the cell, current through it and a solenoid holds the recorder's 'pause' control depressed, and the tape doesn't move. When the light is interrupted, the solenoid releases the 'pause' button. and the tape recorder plays the tape loop through to the point where the light shines through the hole again and actuates the solenoid to stop it.

"The wolf-whistle and the brush-off speech are recorded on separate tracks of the loop of tape. One track amplifier or the other is selected by a relay to drive a small speaker mounted in the wolf's head. When a fellow pushes the button, the relay is not actuated, and the top contacts feed the brush-off bit into the speaker. But when a girl hits the switch, the relay closes, and the speaker is transferred to the wolf-whistle amplifier. Also, when this relay is actuated, an extra set of contacts cause the eyes to light up."

"But how does the wolf know whether a guy or a gal is pushing the button?" Carl demanded impatiently.

"That's the gimmick I'm proud of," Jerry said. "Notice that the bottom edge of the platform holding the wolf is just about level with the bottom of a skirt. A thermistor is mounted behind the front edge of the platform, and another matched thermistor is hooked up away back in the corner. The two thermistors and two resistors form a bridge, both legs of which have the same resistance as long as they are at the same temperature. When one thermistor gets warmer, the bridge is unbalanced, current flows, and is amplified by a transistor. This cuts in a sensitive relay that operates the speaker-transfer relay I was telling you about."

"But how on earth ... ?" Carl started to ask, but Jerry cut him short.

"It's simple. When a fellow stands in front of the platform, his heavy trousers keep his body heat from escaping and materially affecting the thermistor just in front of his knees; but this is not true when a girl wearing a dress and sheer stockings is standing there. When the temperature of the thermistor changes, the bridge but you know what happens from there on."

"That's doggone clever - I couldn't have done better myself!" Carl said admiringly. "I'd like to see what happens at the dance."

"You will," Jerry promised. "As part payment for my help, the Triangle boys have invited us and our dates. I've already fixed things up with Jodi and Thelma - hey, are you listening to me? Why the faraway look?"

"Sure I'm listening," Carl retorted thoughtfully, feeling his rough, do-it-yourself haircut. "I was just wondering how I was going to squeeze in a visit to the barber shop between now and tomorrow night."

When the boys and their dates arrived at the dance the next evening, a red velvet curtain stretched across the corner hid the wolf from view. A card fastened to the front of the curtain said simply: "Girl Detector." Naturally this aroused considerable curiosity among the uninformed - especially among the female uninformed - but the curtain would be pulled before the dance was over.

At ten o'clock the president of Triangle made a little speech explaining that the fraternity had created, at terrific expenditure of time and money, a creature "half scientific, half magic" that could unerringly tell girls from boys. The curtain was pulled, and a gasp went up from the crowd as they saw the leering wolf illuminated by a small spotlight. Ropes formed a narrow aisle that permitted access to the platform at only one spot-the spot where the front thermistor was concealed.

The president explained that those wishing to test the wolf were to approach it and to read aloud an invocation fastened to the platform. The invocation consisted of the word "ABRACADABRA" written as an inverted pyramid in which each lower word dropped the first letter of the word written above until the last word pronounced was only "A." The invocation was positioned and written in sufficiently small type so that the reader had to stand very close to the platform to see it. The time it took to read it, of course, gave the thermistors time to respond to minute temperature variations.

The wolf was an immediate hit. Each wolf-whistle and every curt dismissal was greeted with laughter. The engineers in the group immediately tried to figure out how the wolf determined the difference. Some thought the size of the hand pushing the button had something to do with it, so they tried pushing the button with a stick. Others decided that the pitch of the voice reading the invocation was the clue, and they tried reading the magic words in a high-pitched voice. Still others concluded that light beams were being cut off by the girls' wide skirts, so they improvised skirts out of suit coats. But none of these ruses, naturally, fooled the wolf. When the dance broke up, not a single person had guessed how the trick was performed.

Car, Jerry, Jodi, and Thelma were scarcely back in the car when the girls went to work on the boys to learn the secret. Carl and Jerry held out teasingly for a while, but when the girls started delivering ultimatums, the boys gave in.

"You know," Jodi remarked in her rich Southern accent, "it's fun knowing things that other folks don't - I mean scientific things. When I go shopping in the supermarket and an electric eye opens the door at my approach, it makes me feel very superior to realize I know something probably not another woman in the store knows exactly how the door operates."



"Listen to the confessions of a technical snob!" Jerry gibed. "I must admit, though, I feel a little the same way when I hear people marveling at the 'mystery' of how radio, color TV, radar, remote control, or even garage door openers work. I guess all of us have got a streak like that just like the little boy shouting 'yah, yah, yah!' I know something you don't know!"

"When you stop to think about it," Carl chimed in, "you realize that somebody with no knowledge of electronics today is just about as puzzled by the gadgets he comes in contact with as the caveman must have been by thunder and lightning. It's O.K. to be proud about what you know, but, on the other hand, there are times when I feel very humble and grateful for the education I'm getting. I want to share my knowledge and do something with my education to deserve this privilege."

"Hear! hear!" Jerry exclaimed.

"So how do they share their knowledge?" Thelma asked rhetorically after a long silence. "They build Girl Detectors!"

The four of them immediately burst out laughing.



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