THE PROPAGATOR

MONTHLY NEWSLETTER OF THE ILLAWARRA AMATEUR RADIO SOCIETY

PO BOX 1838 WOLLONGONG NSW 2500

VOLUME 82, NUMBER 1

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MEETINGS ARE HELD ON THE SECOND MONDAY OF EACH MONTH (EXCEPT JANUARY) AT 7.30 P.M. IN THE CONGREGATIONAL HALL, CORNER OF COOMBE AND MARKET STREETS, WOLLONGONG. VISITORS ARE WELCOME TO ATTEND MEETINGS.

MEETING SPECIALS ...

THE FEBRUARY MEETING on Monday 8th February at 7.30 p.m. will feature as guest speaker ROGER HARRISON VK2ZTB, editor of "ETI" . His topic will be "The Amateur experimenter is dead". Is he right? If you don't think so, how about bringing along a home-brew GDO, PA, wavemeter or quad to wave about at suitable times during the meeting! Either way, don't miss the meeting - 7.30 p.m. in the Congregational Hall, corner of Coombe and Market Streets, Wollongong.

THE APRIL MEETING (Monday 12th April)... speaker will be Ray O'Grady, international satcom chairman... another one not to be missed.

NOTES FROM DECEMBER 1981 MEETING:

The meeting was preceded by an inspection of State Emergency Services Illawarra headquarters in Auburn Street, and included a talk and film on the role of S.E.S. with special mention of communications. (A brief outline of S.E.S. radio useage is included in this "Propagator".)

Attendance was good as usual, although the pre-meeting publicity broke down due to an unfortunate chain of circumstances, which included a last minute breakdown at Dave VK2VAV's printery, a mail strike, and the mislaying of all the address labels... let's hope for better luck this time. Instead of the usual mailing, "Propagators" for December were available at the meeting... if you haven't got your special 16-page December issue yet, there may be some at the February meeting.

In the raffle, Lyle VK2ALU won the prize of a quartz-iodide driving light, and re-donated it for a future auction... for the moment, he's sticking with low-frequency work in the centimetre-millimetre bands!

Amateur Radio Class 1982

Classes for Full, Limited and Novice Amateur licences will again run in 1982, on Friday nights from 6 to 9 p.m., on the top floor of the Mathews Building at Wollongong Technical College. The first class night will be Friday 19th February at 6 p.m. For further information, contact Keith VK2OB or Denis VK2DMR, or simply enrol on the first night. Last year, Keith had an 87% pass rate in his full-call group... considering that the Australia-wide pass rate is somewhere around 30-40%, it would certainly be worthwhile for any full-call students to go through Keith's class first!

Anger crackles across the amateur wavebands

New Scientist 30 March 1978

An internecine battle between Britain's radio amateurs—which has already erupted into violence—is disturbing the normal placidity of the hobby.

The fight centres around repeater-stations, which have been built around Britain for the benefit of radio enthusiasts who use the 144 MHz (2 metre) band. By rebroadcasting signals from a high point, repeaters extend the range on this band from 50 km to as much as 150 km.

But some in the hobby's "old guard" feel that widespread availability of Japanese made VHF transmitter-receivers, plus the increasing use of repeaters, is making the hobby too easy. So they are now jamming the repeaters. The worst hit is GB3LO at Crystal Palace, south London, where a hard core of a few people continuously broadcast music, tapes, funny voices, obscenities and electronic feedback noises to tie up the repeater.

And they have not stopped at jamming. Forged letters have been sent in the names of groups organising repeater stations. At amateur conventions, the anti-repeater lobby wears tee-shirts emblazoned with "Wreck your local repeater". And two people have been convicted of doing just that—burning down repeater GB3SN at Alton, Hampshire, last year (*Radio Communications*, Feb 1978, p 147).

The names and callsigns of the principal jammers are well known in amateur circles, and have been reported to the Home Office and the Radio Society of Great Britain (RSGB). Yet the normally speedy legal measures—which include RSGB's own police force, called Intruderwatch and designed to keep non-licensed amateurs and commercial stations off the air—have not so far been applied. The Home Office has, however, refused to license further repeaters, quoting jamming as the main reason.

Radio amateurs who support the use of repeaters are highly critical of the RSGB. One of the jammers—known as "Squeaky" and specialising in funny voices—is widely alleged on the air to be holding office in the RSGB. More generally, the RSGB is seen as holding back the hobby and of being subservient to existing government regulations about communications.

In Britain, amateurs, who have to pass an examination to get a licence, are prohibited from discussing politics or religion, or passing any information for third parties. Infringement results in loss of licence.

The result of these restrictions is that most conversation on British amateur bands is about technical topics, inane subjects like gardening and wives, or the list of radio contacts that have been made recently. In the US, these restrictions do not apply. Amateurs there arrange teach-ins on radio, hold discussion networks, and have set up the kind of emergency network which has also become common on US citizens band. □

SOME HANDY HINTS AND IMMUTABLE LAWS FOR THE AMATEUR ANTENNA BUILDER

Never climb a tree you can't get down if the ladder vanishes.

Never assume an RF path is cold unless you have checked it-- with someone else's finger.

No matter how much wire appears to be on the spool, it is alw at least 3" too short.

No matter how many trees you have, they are not in the right places--

--Or if they are in the right places they won't be big enough for another 50 years.

Anything will work as an antenna to some extent, but nothing works as well as it should.

The impedance of any new antenna is always outside the range of your ATU.

You can change ionospheric propagation paths-- if you build a V-Beam or Rhombic for a particular path, the path will move at least 20° by the time you fire up.

Breaking strain of a wire is easily determined-- it is always 10Kg less than the minimum force required to get it up in the air.

By reference to handbooks you can always prove that no useful antenna can be made from the materials at hand.

--VK2DXP

Which chemical compound has the following formula ?

(Answer at bottom of page).

CENTRAL COAST FIELD DAY:
THE CENTRAL COAST AMATEUR RADIO CLUB WILL CONDUCT THEIR ANNUAL FIELD DAY ON SUNDAY, 21ST FEBRUARY, 1982 AND IT IS EXPECTING AN ATTENDANCE OF RADIO AMATEURS AND OTHER INTERESTED PERSONS IN EXCESS OF 300.
THE FIELD DAY WILL BE HELD WET OR DRY AND THE REGISTRATION FEE IS FOUR DOLLARS FOR MEN, TWO DOLLARS LADIES AND CHILDREN 16 AND UNDER ONE DOLLAR. THIS FEE INCLUDES MORNING AND AFTERNOON TEA, EVENT ENTRY AND ANY OUTINGS ATTENDED. A FULL PROGRAMME HAS BEEN ARRANGED FOR EVERYONE.

(VK2TTY)

AN ACTIVE AUDIO FILTER USING LM747 I.C.'s

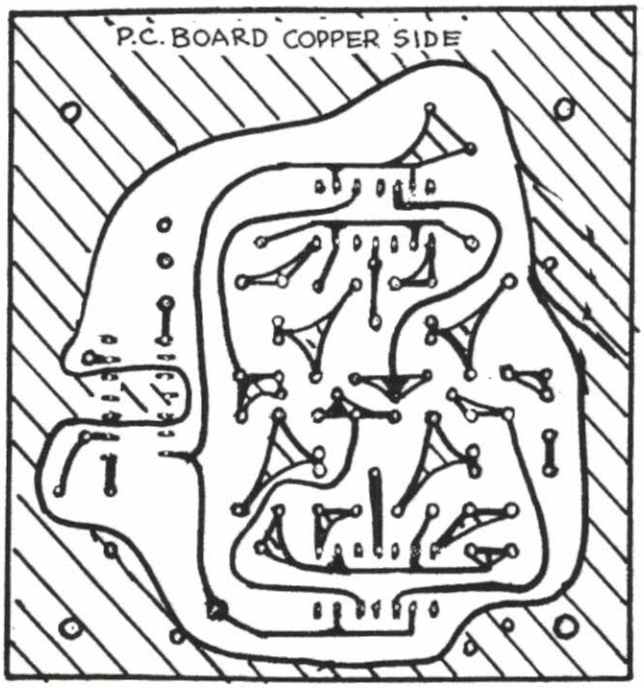
Ken Frost, VK2DOI

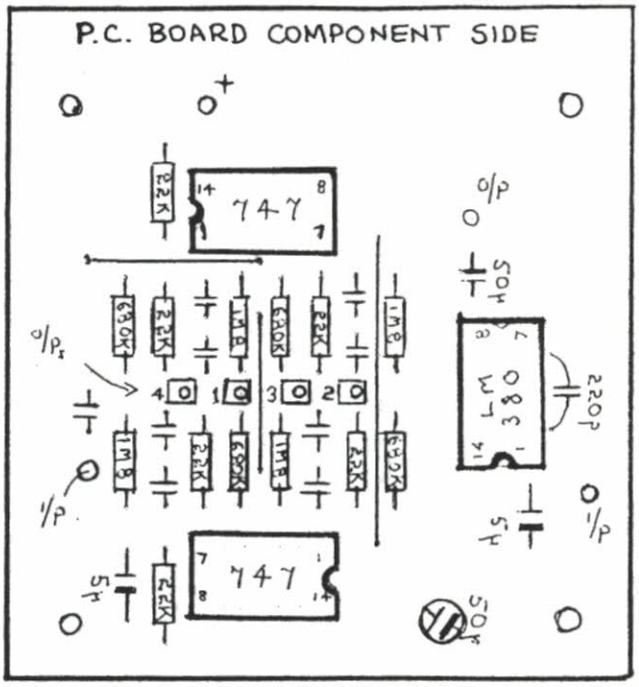
This project will be of interest to anyone who has LM747 i.c.'s removed from modem boards purchased at the "bulk store" at Bulli. It was developed from the Moorabbin and Districts Radio Club circuit given in Amateur Radio Action, Vol. 4, No. 6, which uses four separate 741 op. amps. The 747 consists of two of these in a 14-pin package.

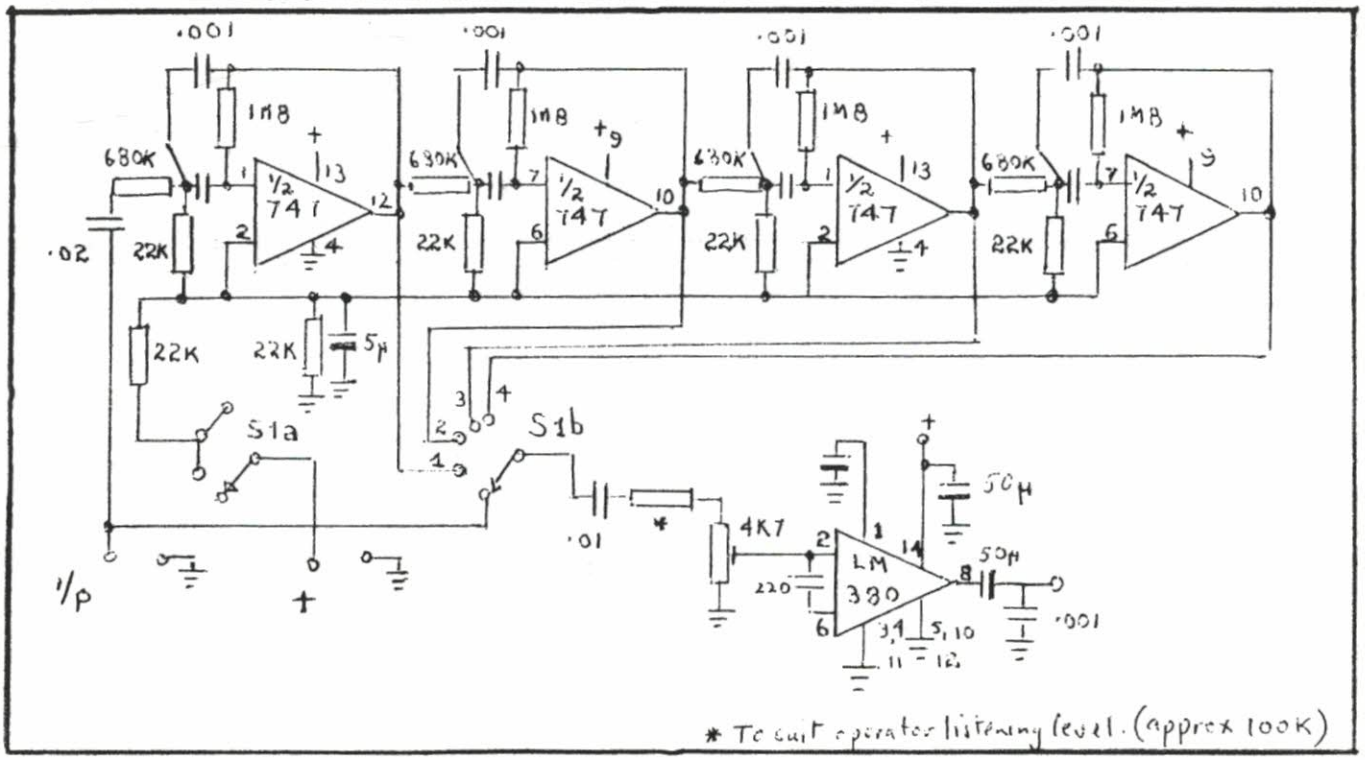
I have used 22k and 27k resistors for the two filters I've made, instead of the 24k specified, and I get a centre frequency of about 650 Hz. Otherwise the response is identical, being very sharp at output 4. I have brought all four outputs to the switch but the third can be omitted if only a 4-position switch is available.

The board can be marked out with an etch-resist pen, but please check it against the circuit before etching in case an error has crept in. Don't forget the three wire links on the component side of the board.

The LM 380 can of course be omitted and the filter alone built into an existing receiver before the audio amp. stage. This is in fact what I've done. The board can be reduced in size to suit.







KEEPING THEM HAPPY

- Brian VK2AXI

Many an enthusiastic amateur radio operator, with new licence clenched firmaly in hand, has launched himself into a grand station building scheme involving huge antennas, maximum legal power on all bands, teletype, TV, a palatial shack, and everything that goes with it. Unfortunately, he is headed for stormy waters. Local council restrictions, Department of Communications regulations, and irritable neighbours are all eager to swamp the boat. But the main impediment to a fair passage is the XYL! Inexperienced amateurs have frequently had their visions wrecked, or at least dampened, by this formidable obstacle. Observation indicates that the successful and happy amateur is the one who develops special navigational techniques to circumvent this disaster.

The basic requirement is to keep the little lady on side. Like most worthwhile things in life, it isn't easy to achieve, but any thought and effort devoted to the problem can reap rich rewards.

The first, difficult step is to listen to the complaints from the XYL. (Don't take too much notice, though, or you might just as well tear up your licence on the spot.) Chances are that the most frequent complaint is that you spend too much time on amateur radio and not enough on the house, garden, children, XYL, etc., etc., etc. Compile a list of the items which are mentioned most often. Then, tearing yourself away from 20 metres for a while, apply your amateur ingenuity to the problem of simultaneously keeping your XYL happy and the station flourishing!

The following case histories are presented to illustrate the innovative techniques of some successful and experienced amateurs.

Case History 1:

Joe Crystal's XYL kept complaining that the front of the house looked shabby, and that he spent too much time reading amateur magazines to fix it up. Ingenious Joe thereupon constructed and installed the largest and most magnificent letterbox in the street. The XYL was so lost in admiration for it that she forgot about the rest of the housefront. Of course, the larger letterbox keeps Joe's monthly mailings of QST, 73, AR, RADCOM, VHF News, HAM Radio, Orbit and the Propagator out of the rain and out of reach of the street urchins! Joe has satisfied the XYL and advanced his hobby at the same time.

Case History 2:

Fred Plate is a 6-metre buff, and his wife is a culture vulture who spends hours watching foreign-language movies on Channel 0 (Yes - Channel 0 - snow and all). Ten milliwatts from Fred's rig was enough to draw complaints, and whenever he wound it up to one watt, the XYL would get on the phone to an expensive divorce lawyer. Fred decided that a devious technical solution would be cheaper than a legal one. He promised to cease the operating she objected to, and treated her to a brand new TV set and special high antenna so that she could watch a snow-free picture. The new 20-metre tower sports a 6-metre beam at the top, with a UHF TV antenna at the 5 metre level. Fred can stand under the tower with the XYL, point up to the UHF Yagi and say, "That's the antenna bringing in your nice clear picture." The XYL thinks he is pointing at the big beam on top! The new TV set has a UHF tuner which produces a very nice picture on Channel 28.

Fred's wife is now watching TV undisturbed and is actually happy to have Fred out of her way - and Fred is happily running high power and a beam every night of the week.

Continued next page...

Keeping Them Happy - contd.

Case History 3:

Tom Tank spent too much time experimenting with aerials, and not enough tending to the backyard chicken run, according to his bird-fancier XYL. So Tom drew up plans for a brand new, multi-level fowl house with a feature which delighted his wife - a pigeon loft at the top of a climbable thirty foot tower. His better half was so happy about it all that she helped Tom to buy and carry home all the welding equipment, metal tubing, coaxial cable, baluns and relays needed to build the loft. The local pigeon enthusiasts admire Tom's unique "three-element tri-bander pigeon-landing rods" mounted above the loft.

Case History 4:

Kev Keyer's main amateur interest was low power morse contacts on 40 metres. About the time he realised his vertical antenna would need a good earth mat to work properly, his wife complained that he didn't spend enough time tending the garden.

Kev's response was to instal a complete automatic sprinkler system. He spent weeks digging parallel trenches at one-metre intervals over the whole yard, and laid kilometres of copper pipe. His wife was so enthused that she took a job to help pay for the pipe. Needless to say, Kev has earthed his antenna to the sprinkler system, and gets out really well. The XYL is happy, too - the garden gets plenty of watering, and her job keeps her too busy to worry about it anyway.

Case History 5:

Fred Filter was about to instal his 2-metre rig in the brand new family car when his wife put her foot down and absolutely forbade any external antennas! She said that the concealed broadcast receiver antenna (a thin wire set in the glass of the windscreen) was the only antenna she wanted on the car.

Fred responded over the next few weeks by progressively detuning the antenna trimmer capacitor on the broadcast receiver - to the point where even the local stations were getting lost in noise. Mrs. Filter was so disappointed by the poor radio performance that whe was delighted when Fred offered to instal "a proper outside aerial on the mudguard".

His new two-metre 5/8 antenna looks quite sporting, and of course he re-peaked the antenna trimmer on the broadcast receiver. Admittedly, Fred was less than honest when he told his wife that his 2-metre rig was running on the old built-in broadcast aerial, which explained the often noisy signals on two metres; but the XYL is happy with "her" aerial and radio, and Fred is happy with his!

So there you are... A few ideas to consider as you start to develop your own techniques! But whatever else you do, DO NOT allow this article to fall into the hands of That Certain Person...

WORST HOMING PIGEON: This historic bird was released in Dyfed, Wales, in June 1953, and was expected to reach its base that evening. It was posted home, dead, in a cardboard box, 11 years later, from Brazil. ("We had given it up for lost," its owners said.)

WORST BUS SERVICE: In 1976, it was reported that certain buses no longer stopped for passengers on the Hanley to Bagnall (England) route. Councillor Arthur Cholerton then made transport history by explaining that if these buses stopped to pick up passengers they would disrupt the timetable.

- Readers Digest.

THE ORIGIN OF "73"

The traditional expression "73" goes right back to the beginning of the landline telegraph days. It is found in some of the earliest editions of the numerical codes, each with a different definition, but each with the same idea in mind - it indicated that the end, or signature, was coming up. But there are no data to prove that any of these were used.

The first authentic use of 73 is in the publication "The National Telegraph Review and Operators' Guide", first published in April 1857. At that time, 73 meant "My love to you!" Succeeding issues of this publication continued to use this definition of the term. Curiously enough, some of the other numerals used then had the same definition as they have now, but within a short time, the use of 73 began to change.

In the National Telegraph Convention, the numeral was changed from the Valentine-type sentiment to a vague sign of fraternalism. Here, 73 was a greeting, a friendly "word" between operators and it was so used on all wires.

In 1859, the Western Union Company set up the standard "92 Code." A list of numerals from one to 92 was compiled to indicate a series of prepared phrases for use by the operators on the wires. Here, in the 92 Code, 73 changes from a fraternal sign to a very flowery "accept my compliments," which was in keeping with the florid language of that era.

Over the years from 1859 to 1900, the many manuals of telegraphy show variations of this meaning. Dodge's "The Telegraph Instructor" shows it merely as "compliments". The "Twentieth Centry Manual of Railway and Commercial Telegraphy" defines it two ways, one listing as "my compliments to you "; but in the glossary of abbreviations it is merely "compliments". Theodore A. Edison's "Telegraphy Self-Taught" shows a return to "accept my compliments". By 1908, however, a later edition of the Dodge Manual gives us today's definition of "best regards" with a backward look at the older meaning in another part of the work where it also lists it as "compliments".

"Best regards" has remained ever since as the "put-it-down-in-black-and-white" meaning of 73 but it has acquired overtones of much warmer meaning. Today, amateurs use it more in the manner that James Reid had intended that it be used - a "friendly word between operators".

- "ARRL Ham Radio Operating Guide".

HOW TO KILL SNAKES?

Snake-killing may not seem to have much to do with amateur radio - until one climbs the hill to the Wollongong repeater in summer. Therefore, the following information may be of assistance in providing snake-free maintainence of the repeater:

"A gentleman of veracity relates the following curious circumstance as fact:

"Having previously heard that the saliva, or spittle of the human species, was a powerful quick operating poison to snakes, he was induced to try the experiment on a very large viper; and accordingly spit on the end of a stick and applied it to the mouth of the serpent, who immediately imbibed a potion with his tongue or sting, and in two or three minutes after appeared in extreme agony, which he shewed by coiling, twisting and turning in a very strange manner; at last stretched himself out and expired, leaving no symptom of life behind."

- "The Gazette", 1798.

STATE EMERGENCY SERVICES - ILLAWARRA DIVISION - RADIO COMMUNICATIONS

S.E.S. Operations are conducted from 230 headquarters established in Local Government areas throughout N.S.W. These areas are grouped into 25 Divisions each controlled by a headquarters responsible to N.S.W. State Headquarters in Sydney.

Each Local and Division Headquarters is operated by volunteers under a volunteer Controller. Each Divisional Headquarters is also staffed by a full-time Divisional Officer and Secretary.

The Illawarra Division includes five local government areas - Wollongong, Shellharbour, Kiama, Shoalhaven and Wingecarribee.

S.E.S. use Telecom facilities for communication where and when available, and also has field telephone equipment.

Radio is used to provide:

(a) operational control and intelligence between headquarters and mobile units;
(b) liaison with other departments and services, for co-ordination of effort during an emergency;
(c) fixed links where no telephone lines are available;
(d) a backing for telephone and telex circuits which link headquarters;
(e) operational training.

High-frequency SSB channels are used in the ranges 3230-3900 KHz and 7310-8195 KHz as an essential backup for telephones and telex between headquarters and for mobile operations beyond VHF range. Tone-operated mutes are used to permit constant monitoring of channels without continuous background noise.

Hand-held portables between 26100 and 27500 KHz are used for communications training and operations over short ranges.

Divisional headquarters have stations between 117.975 and 132 MHz for direct communications with aircraft.

VHF channels between 150.05 and 174 MHz are used for tactical communications subject to the suitability of terrain and population density.

UHF systems between 450 and 470 MHz are already operating in the Sydney area.

S.E.S. always needs volunteers, and in particular, volunteers with specialist knowledge and ability. Communications requires staff with some understanding of the capabilities and operation of equipment, and the ability to set up links in an emergency. Staff also need to be familiar with S.E.S. operational and message-handling procedures.

Licenced Amateur Radio Operators have technical knowledge and skills which can be very valuable in S.E.S. communications, and can contribute to planning advice as well as routine checking and care of equipment. The Illawarra Divisional Headquarters has VHF facilities for the 2-metre amateur band, available for WICEN operation when needed.

BATTERY HAZARD: Do not smoke when using or examining lead-acid batteries. Hot tobacco ash can ignite the hydrogen/oxygen mixture produced during charging, and cause an explosion capable of shattering the battery case and throwing sulphuric acid several feet.

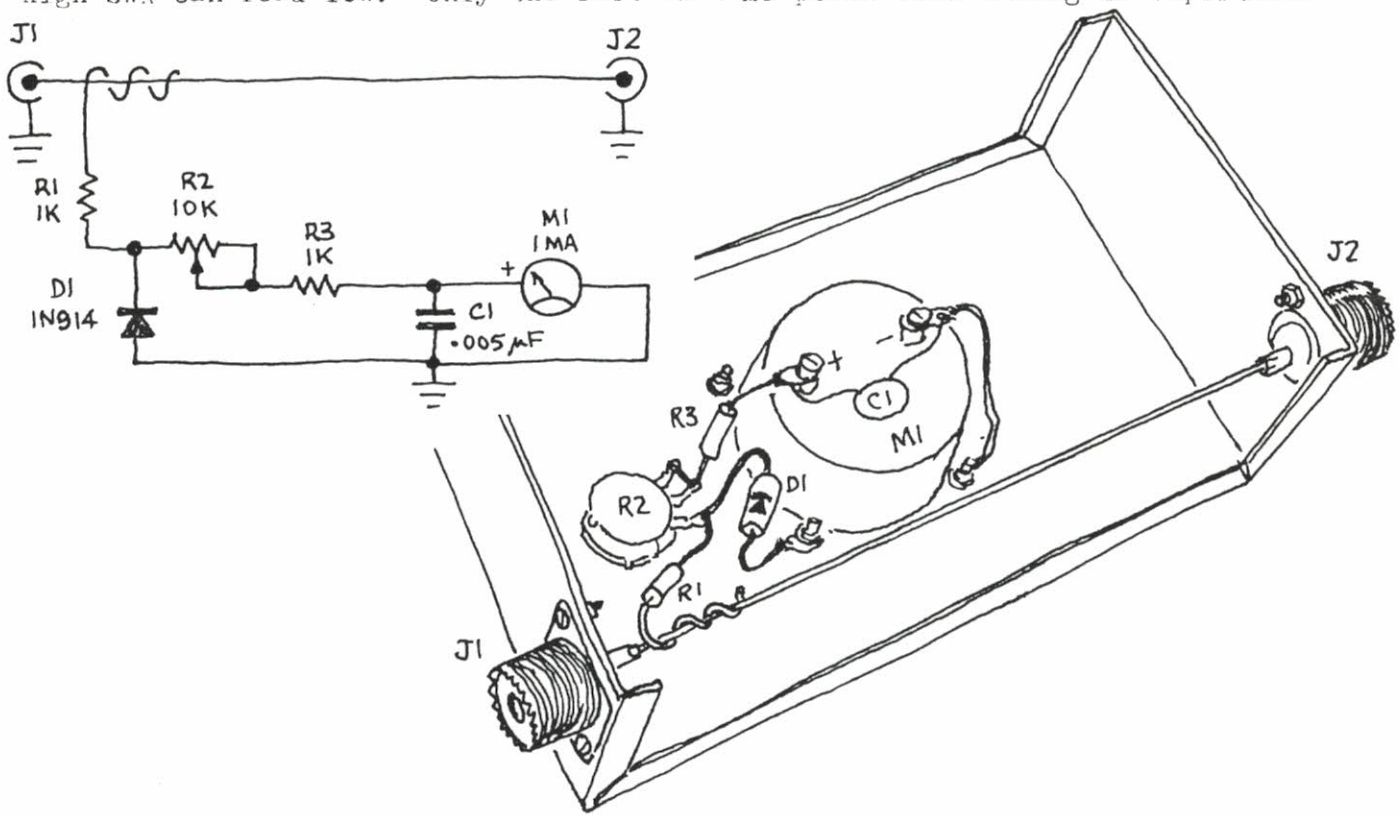
SIMPLE RELATIVE POWER METER

This simple meter samples power fed into the transmission line from a transmitter, and can be used as a "tune-up meter" provided the SWR on the line is known to be low.

The transmitter is connected to J1 or J2, and the antenna or dummy load connected to the unused socket. A small amount of RF is sampled by a small capacitor made by insulating R1's free lead with spaghetti and wrapping it three times around the bus bar connecting J1 and J2. The bus should be made of 16 gauge copper wire.

R2, the sensitivity control, is adjusted for a convenient M1 reading.

Note that M1's reading depends on both the power output and the transmission line's SWR. Its exact reading is unimportant since low power output and a high SWR can result in a high reading, while high power output and high SWR can read low. Only the fact that M1 peaks when tuning is important.

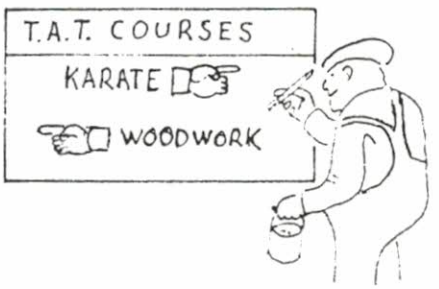


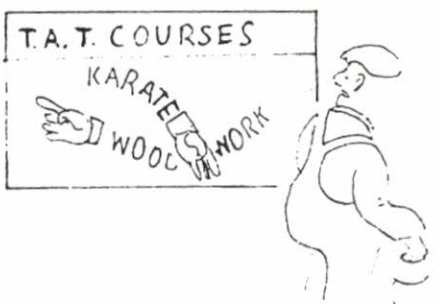
DOGGIE-DOO

It seems that a U.S. surplus company has rounded up a bunch of little transmitters which were made for use in Viet Nam. These are in the shape of ... er ... animal droppings. Other similar rigs are shaped like mud or little wads of clay. When you break 'em open, you find a miniature transmitter on about 150 MHz, a stack of little batteries we use in watches, a foil antenna, and a movement sensor.

The idea was to strew these devices along the Ho Chi Minh Trail. They would then start transmitting when anything shook the ground, letting us know by remote receiver when any cars or trucks or even troops were moving along the trail. These little rigs can be used for experimenting or even for doing what they were intended to do ... put around the house to let you know when you have unwanted visitors.

- 73 Magazine, April 1980.





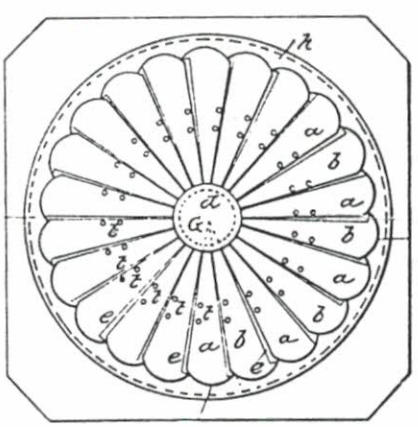
Pixilated Patents

By Mike Rivise

"Assault and Battery"

This is No. 128 in a series of odd and interesting inventions in the electrical/electronic field from the files of the US Patent Office.

The annals of medical history contain many shockingly ingenious devices, but none quite so shocking as this month's patent. You may be sure that A. C. Garratt's medical battery, patented on December 29, 1968 (No. 85,300), caused a great stir in its day —especially for the patients on whom it was tried.



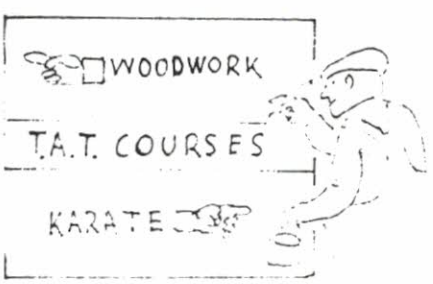
The drawing illustrated Garratt's battery, which looks disarmingly like a flower. The leaves of zinc and copper in contact with human perspiration were said to generate a beneficial circular current in the patient's body. In fact, electricity was thought to cure almost any disease—or at least the patients would stop complaining.

The battery illustrated is interesting in that it has no poles. This was even more interesting to the patient. The reason would come as a shock of insight as the battery began to operate. Worry over money problems, the family, or in-laws would fade under the stimulus of current events.

The patient might also notice that the battery needed no acid or energizing fluid. This might make him anxious; the idea of electrical therapy alone could spark quick breathing and trembling; it might even make him sweat—and this is just what Garratt had in mind. Garratt explains: "natural perspiration from the skin upon the dissimilar metals will comprise my battery."

These fine points would probably be lost on the patient with a headache or hangover. He would receive a jolting surprise and would probably give the doctor some static—all of which probably ended the popular craze for electrotherapy and a few doctors in addition.

In any event, it is apparent that even those early doctors could see the value in charging their patients. With the Garratt battery, however, it is likely the patients felt overcharged.



MORSE OPERATORS—A SKILLED BUT LONELY BREED

by J. EDWARD BROWN ZL2GE

This feature story is reproduced by courtesy of the Auckland Star and its author, J. Edward Brown, now Chief Radio Inspector at Christchurch, and who, as a former operator, tells about the strange departed world of the dits and dahs in the Auckland CPO telegraph office. Then, in its heyday, traffic was heavy, and at Christmas time it was chaotic; whereas in the present teleprinter age it is not so hectic. The introduction to the article also records that the old Morse-tappers made the telegraphic office an elite branch of the Post Office. In the best of them it could be in many ways an ability like music with some operators being really gifted. The job had a romance to it which has died somewhat. Then again, glass arm disease could strike and an operator would seize up, somehow losing the ability to produce dots and dashes. Here is the story . . .

The sending operators had to be good, because the only way the distant receiving operator could break you on duplex to get repeats was through your own receiving operator.

One day on Dargaville as I was sending press at high speed, faultless Morse — in my opinion — my receiving operator wrote a service telegram, "Remove sending operator." Oh the ignominy of it. I was taken off the circuit without question as commanded by the distant operator and dumped on Waiuku.

We worked until midnight at Christmas, everybody in those days sent Christmas greeting telegrams. We went back on Christmas Day to clear the backlog.

Staff were scarce and there were many retired superannuitant Morse operators with their brown bags of lunch, green eyeshades, their own cushions for the hard wooden chairs, rows of sharpened pencils in the pockets of old suit coats, an occasional alpaca jacket. They were a child-like crowd, paper darts often flew.

There was one woman Morse telegraphist, but she was a hang-over from World War I, incredibly ancient to my young eyes. There were a handful of female perforators who worked on the machines.

Flowing style

Telegraphists were the best handwriters in the country, no typewriters then. A flowing style was taught us by the P & T which could be written at high speed hour after hour, effortlessly, on the yellow telegram pads, though there was one old-timer who had an ancient typewriter, a huge machine with ornate gold scrollwork embellishment, with separate keys for capitals and lower case and punctuation and an upright basket of type with arms which fell forward to print. He played this machine like an organ.

The tea wagon was rolled into the office at 10 a.m., noon and 3 p.m. by a hari kari blonde as they called them in those days — dyed by your own hand — dispensing tea at one penny a cup, and three chocolate biscuits for a penny.

"Wire up!" was a cry when a circuit was lost, which was not uncommon because they were copper wires on poles up and down the country — no cable, no radio and no microwave.

"Stop all stations!" was another cry at 5 and no suburban post office which closed at 5 o'clock could be given 'NI', the goodnight morse signal, to go home, the telegraphist and his delivery boys had to wait until all circuits were cleared.

The staff were often hard drinking men, who could send and receive Morse drunk or sober, for hours, without mistakes, at least so it was alleged, I have my doubts, now.

All the cadets then were also taught touch-typing for the Murray Multiplex Quadruple Duplex system, to give its full title. The Murray printer was an old-fashioned brass contraption which chugged along at only 42 words a minute with a tocka tocka tocka as the purple printed tape jerked out with messages of sympathy and congratulations.

Boring, messy

The gummed tape had to be affixed to telegram forms by drawing it across a wet sponge. It was all done with scissors, snipping the pieces. Boring, and rather messy. It's only recently that this type of machine has ceased to be used.

There were "brushes" at 3 p.m. on the Murray Multiplex which for transmission used a mechanical arrangement of rotating brushes on a brass segmented plate, driven by an electric motor, to get a time division arrangement allowing four to be cleaned regularly. This meant a break of 10 minutes and the operators often disappeared across the street to the Ambassadors Hotel.

It was the heyday of the telegram sent for birthdays, weddings, anniversaries, business messages of orders and sales; Press telegrams.

In these days of telex machines, the last inland Morse circuit has long since closed. Morse telegraphy is obsolete, along with its appurtenance of brass Morse keys, tin-shrouded sounders, brass and ebonite resistance and capacitor boxes, double current keys, galvanometers and carbon filament resistance lamps.

Then, all day a great sea of noise washed over the football field-size room with harsh neon tube lights and hanging overhead clocks. Hundreds of fingers danced on the black knobs of brass Morse keys, flicking out the dots and dashes that made up the letters and words. Machine printing operators pounded the keyboards of Murray and Creed teleprinters.

Girls and boys walked up and down the aisles between the yammering Murray Multiplex and Creed printers and the clacking Morse sounders picking up received telegrams, putting down telegrams for transmission.

Supervisors with clipboards marched up and down the aisles, controlling circuit manning, directing relief staff for meal breaks, making technical adjustments to equipment, opening and closing circuits as traffic volume demanded.

The main business of the day started a few minutes before 9 a.m. when LS, meaning all stations, was sent continuously on all Morse circuits. Some mornings everybody in the office would send in unison, a great roar of clackers — dit dah dit dit, dit dit dit — and sometimes

an old-timer would stand up on a table and conduct this great electro-mechanical orchestra in rhythm.

At 9 a.m. exactly, simultaneously on all circuits, the word "TIME" was sent and post office doors would open all over the Auckland province. More prosaically on machine printing circuits, a piece of tape with the word "TIME" punched on it would silently flick through the transmitting head.

Strange clicks

Waiuku was a quiet Morse circuit. Te Awamutu moderately busy. I hated the north circuits to Okaihau, Ohaeawai and Kaeo which were tenuous connexions on very long lines. There were always strange clicks and one never knew if it was the telegraphist or the line.

We received radiograms from Auckland Radio on their Morse circuit from ships with names like Rangitata and Dominion Monarch, a Morse circuit I avoided if at all possible because the operators at the other end sent at high speed and sometimes used radio abbreviations.

There were separate forms for inland telegrams and cablegrams and before starting to send a cablegram the Morse operator transmitted "DB" an abbreviation for Doubtless Bay where the undersea telegraph cable came ashore in New Zealand, and the receiving operator would commence writing on the appropriate form.

Busy Morse circuits would sometimes go duplex with an operator sending and another receiving over the same pair of wires. This was common on the Dargaville circuit which had a daily newspaper, but wasn't on printer and all the Press was sent by hand speed Morse. Some days it would go to a quad with two sending and two receiving.

I was recently at a seminar on alcoholism, and one speaker spoke on the old days in the telegraph offices of New Zealand when men were actually rostered to cover other men who were over at the 'blood house' having a beer. Incredible, today.

Perhaps the drinking was caused by the strain of the job. The constant sending and receiving of dots and dashes could be nerve-wracking. Some operators had trouble with dots and dashes in certain combinations. There was one operator who could only send the letter 'h' if he stood up. It was quite a sight to see him bobbing up and down.

Some Morse operators broke down completely. In some circles it was called glass arm disease. A man simply became incapable of commanding his brain to tell his wrist to make the dots and dashes.

In a large telegraph office a man was a number on the duty sheet, a number in the time book, he was issued with a pair of numbered scissors, only noticed if he hadn't signed on for the shift, or was absent from his circuit, anonymous in the room and known at the other end of a circuit by the quality, good abysmal or indifferent, of his Morse. They were often lonely men, they might have been talking to themselves rather than to somebody at the other end of a line.

There was no real promotion. A few lucky men might make supervisor and fewer still the exalted position of superintendent. For most it was a lifetime as a telegraphist. Maybe that's why drinking was so common. They had nothing to look forward to, a lifetime of 9 a.m. to 'clear' which was around 5.30 p.m. when the work finally started to die, the suburban post office circuits closed, bigger circuits such as those to Hamilton and Whangarei running out of work. Here and there a telegraphist disposing of traffic to a stock sale, a wool sale, a big social wedding, the death of somebody prominent.

Press circuit

The telegraph office was different at night. The Morse circuits were closed, except that to Auckland Radio for telegrams to ships. The printer circuits to the provincial towns were closed and only the main circuits to Wellington Christchurch and Dunedin were open, and an operator on the Herald circuit punching Press.

Up the far end of the room was the old lady who checked that all telegrams had actually been transmitted, marking each of the daily thousands with blue pencil, and a couple of assistants sorting them into numerical sequences.

A cleaner was gathering up partly used telegram pads to glue together to make full pads. Nothing was wasted in those days. Pencils were used down to the last inch with stubs inserted into steel tubes. There was the occasional thump of the Lamson tubes where compressed air carriers from the despatch room, the public counters below, the cable room upstairs, thudded in or whooshed out.

The building's night watchman carrying an enormous bunch of keys clanked through the room.

Some operators were elevated to the cable room on the top floor, still run almost as a private business of Cable and Wireless. Here at this distant terminal of the British Empire, under incandescent lamps, dark wood-cased telegraph instruments were operated by faded men of strange nationalities — was one an Egyptian? Another Maltese?

Complicated

They were different, up there, their codes were different, they were very busy at night. The traffic came with office of origins such as Sydney, London, New York and had long complicated serial numbers.

Before my days as a cadet telegraphist, Morse was dying, the Creed machines already encroaching from their end of the room down by the toilets, but the old time Morse telegraphists, bearded, waist-coated in the group photographs on the office walls, were still talked about.

There is the story of a telegraphist named Jagger who for a wager backed himself to send at a rate of 40 words a minute for half an hour for a new hat — 20 words a minute is a good Morse speed.

A newspaper reporter was appointed judge of the contest. Jagger talked as he was sending and towards the end of the half hour he was told that if he did not stop fooling he would lose the bet. Jagger then sent at the rate of 45 wpm and easily won the bet with an average speed of 43 words a minute. Another operator once sent 42½ words a minute for 4½ hours.

In the march of communications, the Morse operator has been discarded, his skill of brain and fingers has no part in modern technology.

From "Break-In", April 1981
via "Mini Tuned-In".

LASERS

The name "laser" is derived from the term Light Amplification by Stimulated Emission of Radiation. Lasers are being used to an increasing extent in rapidly widening fields of application.

The very short concentrated pulse of light can cause very severe eye damage, e.g. irradiation of the cornea first kills the outer surface epithelial cells, which slough off after a few hours giving rise to an excruciatingly painful eye condition. When a light pulse from a laser system enters the lens of the eye, it is concentrated on the retina where tissue may be destroyed to give a permanent blind spot.

Animal experiments show that retinal damage begins at about 10^{-2} joule cm^{-2} received on the retina. The focusing of parallel light by the eye lens can result in the intensity of the light incident on the retina being 10^6 times greater than that received on the pupil. Thus, unless other special factors are operating, the maximum laser energy density at the pupil of the eye should not exceed 10^{-9} joule cm^{-2} (= 10 $\mu J\ m^{-2}$), (including a safety factor of 10).

Remember:

1. Any light reflecting surface will reflect laser pulses.
2. Work with lasers should be carried out in brightly lit rooms to avoid enlarging the pupils of the eyes.
3. Warning notices should be posted where lasers are being used.
4. Personnel in the area should stand behind the laser and at right angles to the proposed path of the beam before firing.
5. The danger area should be "fenced off" and a warning notice set up.
6. All workers regularly associated with laser systems are recommended to have a periodic ophthalmological examination.
7. The laser source should be rigidly fixed so that the direction of the beam cannot be inadvertently altered.

- Everett K. and Jenkins E.W., "A Safety Handbook for Science Teachers". John Murray, 1977.

PRINTED CIRCUIT BOARD TIP:

Before applying resist to a printed circuit board, it must be clean and free from any grease. Scrubbing with steel wool and/or various cleaning powders is advised. It seems however that some of these cleansers contain waxlike or silicone materials, since they leave the copper surface in a condition which sheds water instead of being wetted by it.

Something like silicone grease may be added to steel wool to reduce the rate at which it rusts, and wax may be present in some cleansers ("Jiff" is one) to help produce a shiny finish on household surfaces - but it doesn't help the P.C. board maker!

If the copper surface cannot be wetted - that is, if water doesn't stick in a thin layer to the whole surface - then it is more than likely that any etch resists will lift during etching.

"Ajax" powder seems to clean well and leave a "wettable" surface, and no doubt there are others. However, steel wool of uncertain brand and "Jiff", as mentioned, have caused considerable trouble.

Can anyone shed further light on this problem, or perhaps contribute their own experiences?

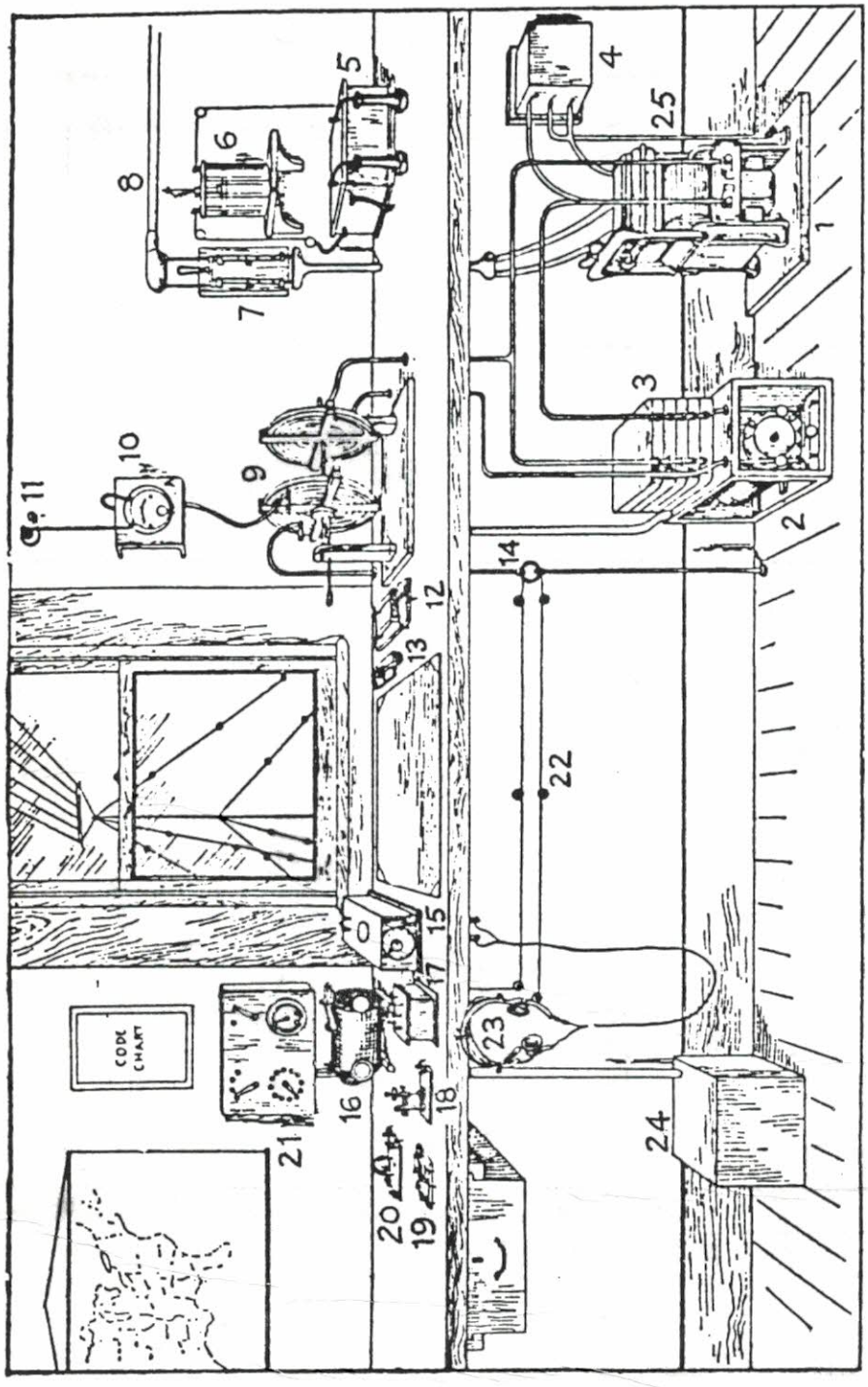
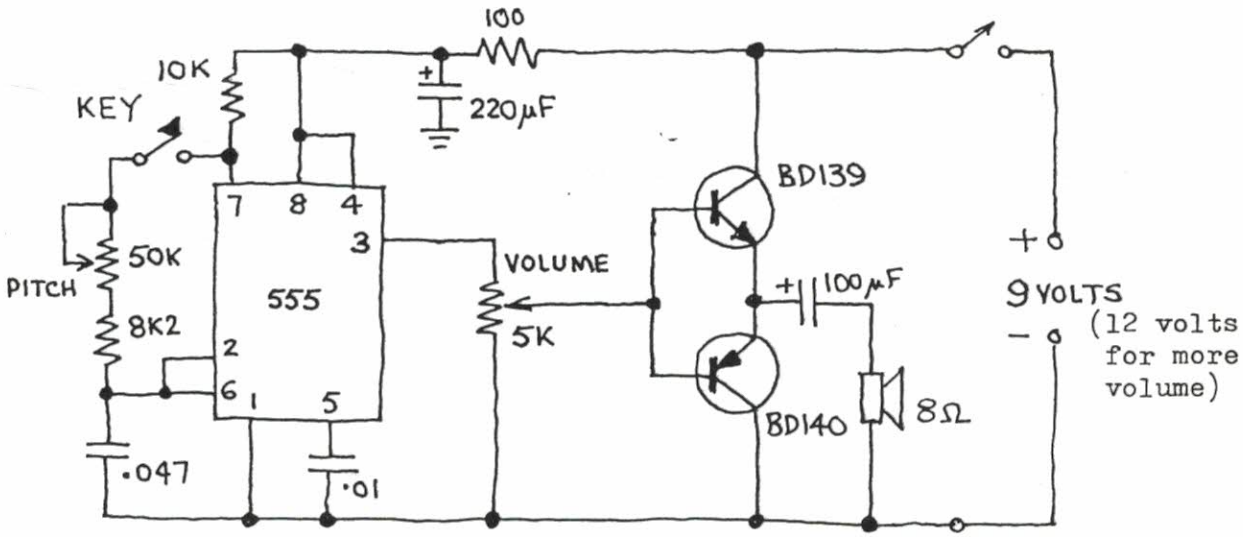
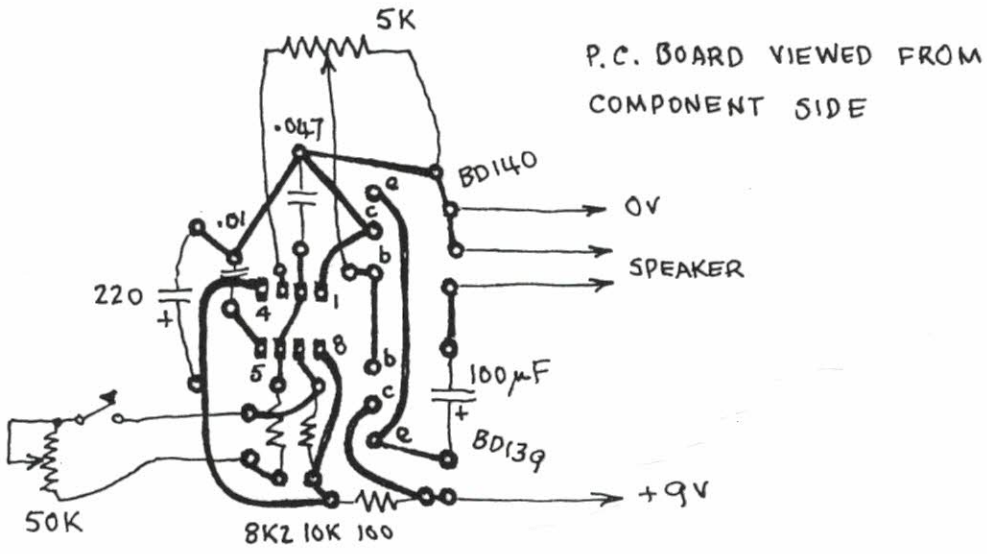


FIG. 3,189.—Modern amateur wireless station. 1, Thordarson flexible transformer on slate base; 2, rotary spark gap in box with glass side and end; 3, Murdock moulded sending condenser units; 4, Clapp-Eastman kickback preventer; 5, Electro Importing Co.'s ½ kw. transformer; 6, Gernsback electrolytic interrupter; 7, 25 ampere D P S T power switch; 8, power supply, A. C. or D. C. (in conduit); 9, oscillation transformer; 10, Brandes hot wire ammeter; 11, Electrose lead-in insulator; 12, 25 ampere D P S T switch controlling current to transformer and rotary spark gap motor; 13, Marconi wireless key; 14, anchor gap in ground wire circuit; 15, Gernsback rotary variable condenser; 16, Clapp-Eastman navy type tuner; 17, fixed condenser; 18, silicon detector; 19, 10 ampere 3 P D T switch for detectors and receivers; 20, De Forest audion detector bulb; 21, battery switchboard for audion; 22, leads from anchor gap to receiving set; 23, head receiver set; 24, battery box containing battery cells for audion lamp and head telephone receivers; 25, kickback ground wire.

Thanks to Paul VK2DTZ for contributing this magnificent piece of history.

A LOUD CW PRACTICE OSCILLATOR - VK2AXI





The circuit and board layout given can produce sufficient volume for a whole morse class (as the Friday night class can verify). Supply voltage is not critical, and can be between 6 and 12 volts. A PP3 midget 9-volt battery may not be adequate as a power supply; however, four or more penlight cells in series have been very successful.

TELEPRINTER NEWS BROADCASTS For those interested in "hard copy" news, here are the times and frequencies of the VK2TTY news bulletins, as printed directly from a broadcast.

RYRYRYVRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRY
THIS IS VK2TTY VK2TTY THE OFFICIAL STATION OF THE AUSTRALIAN NATIONAL AMATEUR RADIO TELEPRINTER SOCIETY WITH THE SUNDAY BROADCAST. VK2TTY TRANSMITS EVERY SUNDAY AT 0030GMT ON THE FREQUENCIES OF 7045KHZ, 14090KHZ 14095KHZ AND 146.6MHZ. THIS BROADCAST IS REPEATED AT 0930GMT ON THE FREQUENCIES OF 3545KHZ AND 146.6MHZ. THE SPEED IS 45.45 BAUDS AND THE SHIFT IS 170 HZ (INTERNATIONAL AMATEUR STANDARDS). VK2TTY RADIATES ON BEHALF OF MEMBERS OF THE AUSTRALIAN NATIONAL AMATEUR RADIO TELEPRINTER SOCIETY AND FOR THOSE INTERESTED IN RTTY.
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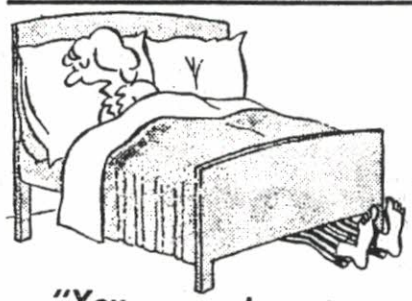


"You were dreaming about the car last night, Fred."

—::—

WINDSCREENS

You must have all noticed that film that develops on the inside of your car's windscreen and makes vision difficult when driving into the sun.

It has been proved to be caused by the evapoartion of a plasticiser from the vinyl seat covers.

A mixture of metho, detergent and water is advised as teh best agent to get rid of it.

—::—

8th JULY 1973

'Cats whisker' era back in Sydney

In an age of electronics, the ancient crystal set is making a squeaky comeback as it tunes in on Sydney's airwaves.

Young enthusiasts are combing flea markets, junk shops and disposal stores for components to make the sets—one of the do-it-yourself marvels of the 1920's.

One disposal store proprietor said this wek: "I can't explain this sudden craze, except perhaps, it's part of the ever-changing mood of young people today.

"They don't want to buy packaged, easy-to-assemble crystal-set kits which you can get in a toy shop.

"The kids want to follow in the footsteps of their fathers or grandfathers. It's a challenge."

But it's an even bigger challenge to find the odd "bits and pieces" required to build a set.

Headphones

The early crystal sets generally consisted of a galena crystal, a wound coil, a thin wire called a "cat's wisker," an aerial and "earth" and a set of 2,000ohm headphones.

Most electrical retailers who were questioned said they could supply all the parts except the headphones.

One said: "They just don't make them anymore."

I finally found a set in a suburban junk shop.

The owner parted with them for $2 and a few stories of his own.

By PETER SPOONER

"Blimey," he said, "crystal sets. Are they back?

"I made my first set back in 1924. We used to have the neighbours in for a bit of a listen.

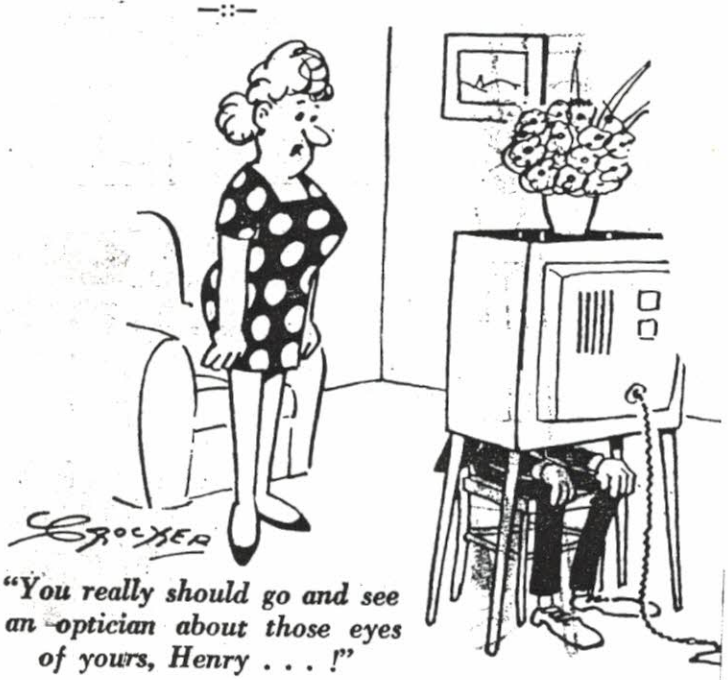
"I remember my father with his six pipes, his headphones and his rocking chair. You could shut out the rest of the world, he used to say.

"We called them the 'breadboard construction,' and the parts wouldn't have cost more than ten bob.

"One time I made a set you could fit in a matchbox."

A spokesman for a leading Sydney electrical retailer said: "We do not regard the crystal set as serious opposition to the transistor or the silicon.

"Still, it makes one ponder a little . . . "



"You really should go and see an optician about those eyes of yours, Henry . . . !"

"I know it would be nice to have a picture straight away, but that's one of the snags with our instalment system."

"IT'S POLARIZED IN EVERY PLANE!"

Macelec Pty. limited Professional and Industrial Electronics

99 Kenny Street, Wollongong
P.O. Box 1755, Wollongong. 2500
Telephone (042) 29 1455
Telex AA29232

*** N E W Y E A R S P E C I A L S. ***

THE FOLLOWING ARE AVAILABLE FROM STOCK

SUBJECT TO PRIOR SALE.

KENWOOD	AT130 ANTENNA TUNING UNIT	$110.00
KENWOOD	MC50 DELUXE BASE MICROPHONE	$55.00
KENWOOD	MC355 FIST MICROPHONE	$25.00
KENWOOD	LF30A LOW PASS FILTER	$35.00
KENWOOD	MB100 MOUNTING BRACKET FOR TS120	$20.00
KENWOOD	HC10 DIGITAL PROGRAMMABLE WORLD CLOCK	$99.00
KENWOOD	PS30 20 AMP POWER SUPPLY	$176.00
KENWOOD	PS20 4 AMP POWER SUPPLY	$99.00
KENWOOD	VFO230 DELUXE EXTERNAL DIGITAL VFO WITH 5 MEMORIES. SUIT 130,530, ETC	$299.00
KENWOOD	SP230 DELUXE SPEAKER	$65.00
KENWOOD	SP180 DELUXE SPEAKER	$33.00
KENWOOD	SP100 DELUXE SPEAKER	$30.00
KENWOOD	RD300 1KW DUMMY LOAD	$79.00
KENWOOD	TR2400 2 METRE HAND HELD	$299.00
KENWOOD	TS530S H.F. TRANSCEIVER 240VAC	$760.00
PALOMAR	R.F. IMPEDANCE TRANSFORMER 500 WATT IDEAL FOR MOBILE ANTENNA MATCHING WAS $65 NOW	$50.00
DAIWA	COAXIAL ANTENNA SWITCH CS201 2 POSITION	$24.00
HI-MOUND	MORSE KEY HK702 DELUXE	$45.00
DAIWA	TR7500R MEDIUM DUTY ROTATOR WITH WORLD MAR ILLUMINATED INDICATOR	$229.00
DAIWA	CNA-1001 AUTOMATIC ANTENNA TUNER WAS $269 NOW	$220.00
HANSEN	SWR-POWER METER. MEASURES R.M.S. AND P.E.P. 0-20 AND 0-200 WATTS 50 TO 150 MHZ WAS $76.00 NOW	$41.00
CENTURY	21 (SAME AS DRAKE SSR-1) GENERAL COVERAGE RECEIVER WAS $329 NOW	$250.00
LABGEAR	UHF-VHF MONOCHROME T.V. PATTERN GENERATOR, WAS $165 NOW	$99.00
DAIWA	SWR-PWR CROSS NEEDLE 1.8-150MHZ	$89.00