

2AR

Q S X P E

*Port Elizabeth Branch of the
South African Radio League*

P.O. Box 462, Port Elizabeth. 6000.

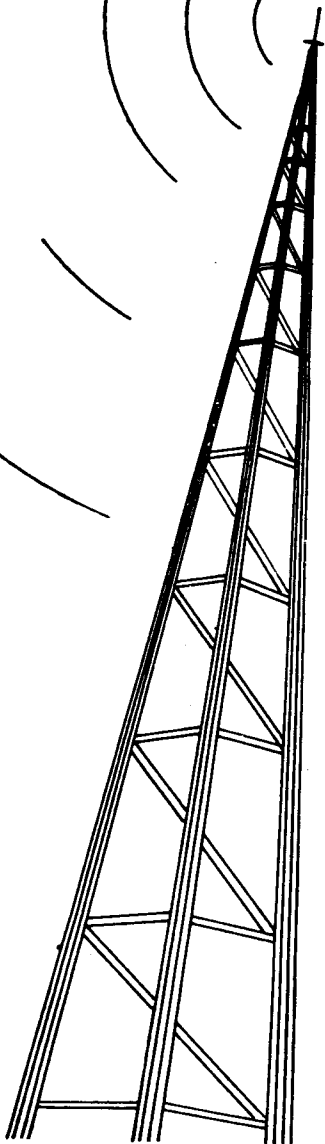


National Call	145.5 Mhz
P.E. Repeater	145.05/65
Grahamstown	145.15/75
Lady's Slipper	145.10/70

ZS2PE

Bulletin: Sunday 08h40
HF: 40m – 7098 KHz
VHF: FM-145,700 MHz

11 MAR 1975



Port Elizabeth Branch

NOTICE OF MONTHLY MEETING

MEMBERS ARE REMINDED THAT THE MONTHLY GENERAL MEETING WILL TAKE PLACE ON FRIDAY 18th MARCH, 1983, AT THE Y.M.C.A., HAWKWOOD STREET, CENTRAL AT 8p.m.

On the Agenda for this meeting, is the discussion of the motions which have been submitted for the 1983 A.G.M. and as there are 49 of these, members are urged to go through these before the meeting and decide on how they wish to vote. If these have all to be read through first, the meeting will take till midnight! Although many of you might consider this to be rather boring, there are a few controversial motions, some of which could cause an increase in subs. so the branch delegate would like to know YOUR opinion in order to be able to vote on YOUR behalf. Council at its December meeting, decided that the attendance at the meeting which voted on the motions, be tabled at the A.G.M. as it was considered that the motions were being decided on by only a few on behalf of many. We have 69 members in Port Elizabeth, which is more than 50% of the Branch, so we would love to see you there. We value YOUR opinions.

COMMITTEE MEMBERS.

Chairman: Dick ZS2RS (322111)	Vice Chairman: Trevor ZS2AE (321746)
Secretary: Marge ZS2GB (303498)	Treasurer: Brian ZS2AB (303498)
Projects: Lionel ZS2DD (321770)	Special Events: Colin ZS2AO (312471)
	Fred ZS2EQ (0422-3181)
Awards: Attie ZR2DY (331761)	QSOX-PR: ZS2GP and ZS2AF

*** GUIDELINES ***

Thanks to ...

DO NOT ride in an automobile - they cause 20% of all fatal accidents.
DO NOT stay at home because 17% of all accidents happen in the home.
DO NOT walk around the street - 14% of all accidents happen to pedestrians.
DO NOT travel by air, rail or boat - 16% of all accidents are the result of these activities.

ONLY .0001% of all accidents occur at Amateur Radio Club meetings.

Obviously the safest place to be on the 3rd Friday of each month is the Branch meeting, so see you there.

NEWS

WELCOME: to the following new members to the Branch, and we hope that they have a long and happy association with the League and the Branch:

Nigel Fitt, Andre le Roux, Daniel Villet, Jock and Gloria Kotze, John Chamen, Colette Rundle, Lemuel Dorfling and to Bill Parfitt and Lynne Crothall as social members.

CONGRATULATIONS: To Del Colson ZS2NS and Shirley on their marriage on 26th February. May they have a long and happy life together.

To Gordon and Joan Knapp on the marriage of their daughter.

GOOD LUCK AND BON VOYAGE: To Dick ZS2RS our delegate to the League A.G.M. Lots of success and a happy holiday to you and your family afterwards.

BAD NEWS: We were very sorry to hear that Peter Tiedt ZS5DX had a motor accident in Natal and badly injured his arm. We hope you will get well very soon Peter.

CONGRATULATIONS: To Athol ZS2CM and Viv ZS2VM who were heard on HF phone. Good dx-ing to you both.

DX-PEDITION: Waldie Bartie ZR2BL and two friends, well laden down with equipment, took a walk up the Cockscomb Mountain during the weekend of 5/6 March to operate on 6 meters and were heard well in Port Elizabeth. Well done.

MINUTES OF THE GENERAL MEETING OF THE PORT ELIZABETH BRANCH OF THE S.A.R.L.
HELD AT THE Y.M.C.A., HAVELOCK STREET, PORT ELIZABETH ON FRIDAY 18/2/1983.

PRESENT: 28 members and visitors.

The Chairman welcomed all to the meeting, especially the Chairman and most of the Committee of the Algoa Branch (Fred ZS2JS apologised for those who were unable to attend for various reasons), Andy Coetzee ZS2CC who was attending his first meeting, and to the "rare dx" Bert ZS2EA, Norman ZS2RI and John ZS2KD and to Langley Lookwhy and his son.

APOLOGIES: ZS2CZ.

MINUTES: The Minutes of the meeting held 21st January, 1983, having been published and circulated in QSX were taken as read, proposed by Clive ZS2GQ and seconded by Cyril ZS2KX.

ARISING: -

FINANCE: The Treasurer reported that all was quiet at the moment. Apart from the fixed deposits, the Branch had R1400 in cash and that interest on the deposits amounted to approx. R16 every month. The Chairman handed over a donation of R10 from Sam ZS2SI.

CORRES: The following was tabled:

- (1) 6 metre bandplan.
- (2) Thank you card from Jeff ZS2GJ.
- (3) Council Minutes 14/12/1982 and Financial Statement.

ARISING: The Chairman said that Mike ZS2FM was very much involved with 6 metres and would like to pass on his comments for discussion at the 1983 AGM. Viv ZS2VM said that it should be noted that we share the portion of the band 53 to 53,85 (experimental, all mode) with the radio-controlled aircraft operators. The Chairman said that at the next meeting the 49 motions for the AGM would be discussed, and although many might consider it too boring, it was necessary to discuss them, especially the controversial motions, in order that the delegate would be able to put the views of the Branch.

GENERAL: At this stage, Dick the Chairman, said that it was his pleasure to be able to say a few words about someone in the Branch who had done a terrific amount of work for the Branch, such as Committee work for many years, looking after the repeaters and running the technical classes, and it gave him great pleasure to be able to hand to Brian ZS2AB the Jack Twine Merit Award on behalf of Council. Brian accepted the award and said that he was shattered and taken completely unawares, but thought that there was someone else in the Branch who deserved the award and mentioned that Dick had for many years been on the Committee and had in fact been Chairman for the past seven years, and had done more than his fair share, financially and in other ways and said that he would be honoured to hand over the Jack Twine Merit Award on behalf of Council to Dick. Dick was just as astounded and taken unawares as Brian and said that he was very pleased and honoured to be given the Award. All present indicated their pleasure at the two awards, and Fred ZS2JS said he wished on behalf of the Algoa Branch, to congratulate Dick and Brian. The Secretary congratulated them both on behalf of the President and Council.

The arrangements for the 1984 AGM were then discussed. These included the hotel, and it was suggested that the Edward be approached as it was central, and had all the facilities for a conference. The idea was not to make a profit, but to give good value for money, so costs would be kept as low as possible especially for functions which could be arranged at venues other than the hotel.

GENERAL:
contd.

The Friday evening entertainment, would as far as possible, be at no cost to those attending, and it was hoped that as many of the local hams as possible would attend to meet the Council and delegates. 100 pens engraved with the League badge and "AGM 1984" had already been sponsored by Dick's company and the folders were being printed by the E.P. News-papers. Things such as transport, P.A. system, recording the meeting, counting the votes, HQ bulletins on Sunday morning, registration, entertainment for the wives and families of the delegates, entertainment on Sunday, Saturday evening dinner/dance and many other items were to be attended to, and most important of all, fundraising was also necessary. A tentative suggestion of a 50c levy on members of both branches was made, and this idea would be published in QSOX. Cyril ZS2KX asked if the hotel had been booked, and Dick said that he had contacted the management but they were not prepared to book two years in advance, but they would be kept informed. Viv ZS2VM suggested that a Committee be appointed with members from both Branches, and Dick said that as many as wanted to help would be welcome. Members would be approached to help in various categories. Fred ZS2JS asked about the entertainment for wives, and it was noted that Colin ZS2AO was employed at the Oceanarium and it was almost certain that a tour of that complex would be arranged. Fred ZS2JS said that it was his impression that Algoa Branch would nominate members for the Committee, and it was the intention to use the full P.E. Committee who could co-opt others to help. Dick said that he was very pleased to see that Wolfie ZS2WG, the Chairman of Algoa Branch, would be delegate for that Branch for 1983 AGM and he was prepared to support him fully. Andy ZS2CC was prepared to contribute financially to the AGM.

There being no further business, the meeting was closed and tea was taken. Thereafter a most interesting talk on Trap dipoles was given by Bill Browne ZS2BY.

sgd:
R.W. Schönborn ZS2RS
Chairman

sgd:
M.T. Weller ZS20B
Secretary

What is a Sirvayur

"A Sirvayur is something that grubs around in the woods looking for little sticks and stones. When he finds them he does some kind of weird dance around them with a funny-looking 3-leg crutch which he leans on and looks at. When he don't find them he walks around all day like he's lost. Sometimes you see them squashed by cars along roads, espeshelly in the summer when all the other bugs are out.

A Sirvayur has one big eye and one little eye like Popeye. He usually walks bent over all the time which is why he always looks so stopped. His face looks like old leather. He cusses terribul. He can't read because he measures between things and then puts down a number in a littel book wich is defrint than wat his littel map says. He always measures to a stick or stone, stops near it, and puts in another stick or stone. He is not too brite because he is always makeing marks on side-walks and roads to find his way home. His pants are allways tore from rock salt and his shoes look like they was made of mud. People stare at him, dogs chase him and he always looks wore out.

I don't know why anyone wants to be a sirvayur"

*Reprinted with the kind permission of
The Empire State Surveyor*



AGM'84

Easter Weekend and the 1984 Annual General Meeting of the League are now only 12 months away, and whereas most of the planning necessary to make a successful meeting is well in hand, the main topic is now to raise funds. We would like to make this a successful A.G.M. without having to charge exhorbitant prices for the various functions and so make it attractive enough for delegates and Councillors to consider bringing their wives along with them, and so they can say "Now, that was an enjoyable weekend, well worth remembering". So we come to you, the members of the Branch, asking you for your generosity - and from past experience, we know you are generous and can be relied upon for your help. At the March Committee meeting, it was decided to approach each member for a donation of R2 per month for the next year and in order to make it easier for you, we will enclose with each issue of QSX-PE, an addressed envelope for your contribution. If, however, you wish to pay in one or two lump sums, then this will be most welcome and the records will be kept accordingly. If each member does their "fair share", we will be able to raise sufficient funds to have a really good A.G.M. and you, the members, will not be left out when it comes to the various functions. Many thanks in advance for your generous help, which we are certain will be forthcoming.

JACK TWINE MERIT AWARD.

At the February meeting, the Jack Twine Merit Award was given, on behalf of Council to Dick ZS2RS, Chairman, and Brian ZS2AB, Treasurer for many years outstanding service to the Branch. Both have served on the Committee for many years in various capacities and have contributed both technically and financially to the smooth running of the Branch. Neither was aware that they were to receive the award, and it was with great hilarity that they handed them over to each other after a few words of tribute. Congratulations Dick and Brian and may you go from strength to strength.



Thanks to Clive Fife ZS2RT for the photograph.

PORT ELIZABETH.

Reg Abrahams
Darrell Andersson ZS2CZ
Colin Ashwell ZS2A0
Bill Atteridge ZS2V
Attie Barnard ZR2DY
Waldie Bartie ZR2EL
Ben Bennett ZS2QF
Ray Bentley ZR2BF
Mike Bosch ZS2FM
Bill Browne ZS2BY
Athol Bruyns ZS2CM
Percy Buckley ZS2RM
John Chamen
Andy Coetzee ZS2CC
Del Colson ZS2NS
Lionel Coombe-Davis ZS2DD
Clive Cornell ZS2GQ
Vi Cruickshanks ZS2BR
Lemuel Dorfling
Ronnie Drescher ZR2AD
Breda Dreyer ZS2DR
Nigel Fitt

Bert Ellin ZS2EA
Trevor Elliott ZS2TJ
Clive Fife ZS2RT
Johan Fourie ZS2KC
Piet Fourie
Basil Gibson ZS2PG
Bette Goodman ZS2L0
Cyril Goodman ZS2KX
Sam Hewitt ZS2HW
Bill Hodges
Fred Hurter
Gordon Knapp
Gloria Kotze
Jock Kotze
Langley Lookwhy
Louwtjie Louw ZS2HZ
Harry Manan
Roley Mash
Peter Neveling ZS2PD
Bill Parfitt
Norman Perelson ZS2RI
Andre le Roux
Daniel Villet

Roger Pitot
Paul Pretorius ZS2PR
P. Richards
Frank Roberts ZS2HE
Mike Robertson
Colette Rundle
Mitch Rundle ZS2DK
Trevor Scarr ZS2AE
Richard Schonborn ZS2RS
Gay Schonborn
Reg Shamley ZS2HV
Lambert Siebrits
Pete Smith ZR2EP
John St. Clair ZS2JR
A.O. Stephenson ZS2GU
Piet von der Berg
Wim van Vorstenbosch ZS2WV
Colin Ward ZR2AJ
John Watson ZS2KO
Brian Weller ZS2AB
Marge Weller ZS2OB
Gus Winter ZS2MC

UITENHAGE.

Kevin Eastwood ZR2EH
Eric Gertenbach ZS2CV
Gordon Harris ZS2GH
Wilf Lachenicht ZS2GR
Kelvin Naylor ZS2TX
Izak Viljoen ZS2ID

FORT BEAUFORT.

June Jones ZS2JJ
Mike Jones ZS2MJ
Jan Stark
Piet Wagener ZS2PC

JOHANNESBURG.

Brian Franz ZS6NX
Alan Smith ZS6BTI

ROODEPOORT.

Sel Staples ZS6AXO

DESPATCH.

Fred Bonthuys ZS2EQ

PORT ALFRED.

Tom Cockbain ZS2TC
Phil Hopper ZS2PP
Charles Thwaites ZS2PA
Rudy v.d. Elst ZS2EE

PRETORIA.

Brian Gruss ZS6AEB
Sheila Gruss ZS6BZX

GRAHAMSTOWN.

Paul Berwick ZS2B0
James Crichton ZR2CZ
Ron Levey ZS2Q
Dudley Forsyth ZS2AW
Mak Makkink ZS2M
Gerry Meaker ZS2K

QUEENSTOWN.

Neil Holmes ZS2AI
A. Labuschagne
Eddie Lane
Max Levin ZS2HR

JANSENVILLE.

Gerrit van Wyk

MIDDLEBURG. Cape.

Keith Trollip

VAN DER BYL. Tvl.

Andre van Deventer ZS6UF

CRADOCK.

Lou le Doux ZS2LL.

CAPE TOWN.

Woody Damp ZS1WD
Seymour Urry ZS1AAD
Dan van Gass

KLEIN BRAK RIVIER.

Alwyn Snyman ZS1GV

COLESBERG.

Jacobus Conradie

KNYSNA

Andre le Roux

HUMANSDORP.

Le Fras Mouton ZS2TW
Marie Mouton ZS2SW

EAST LONDON.

Jeff Bowes-Taylor ZS2GJ

NIEU BETHESDA.

Peet van Heerden ZS2BX

SWAZILAND.

Harry Stickley 3D6BP

UTAH. U.S.A.

Ray Connolly ZS2DX

SOCIAL MEMBERS.

Sam Abrahams ZS2SI - Uitenhage Andy Smit ZS4ME - Welkom
Viv Moore ZS2VM - Port Elizabeth Peter Tiedt ZS5DX - New Germany Ntl.
Lynne Crothall - Port Elizabeth.

Above is a list of all the members of the Port Elizabeth Branch. We thought it might be of interest to members to see just how far-flung the membership is. We try to keep in touch with all members by remembering their birthdays, anniversaries and wives birthdays - but if you don't get a card, it's just because you haven't told us the date. We are not trying to be snoopy! Just the date and the month will do!

TRANSISTOR CHECKER.

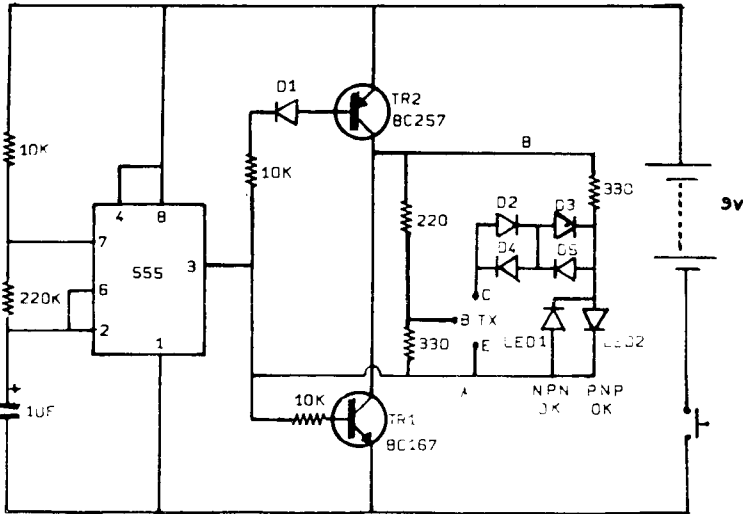
(With acknowledgements to Southern Transvaal Branch Newsletter "QRX".)

This tester tests both PNP and NPN transistors. It reverses the test terminals in order to do this. This polarity reversal is achieved by the Timer IC (555) and transistors T1 and T2, which together effectively form a double-pole, double-throw electronic switch. The IC is connected in the astable mode and is set to run at around three times a second, so causing the output to switch continually between the battery supply rails. When Pin 3 connects to the positive rail TR1 is biased on and when it connects to the negative rail TR2 is turned on.

If a good NPN transistor is connected it will conduct each time the supply line B is positive, so diverting current from LED 2 and preventing it from illuminating. On the negative half cycles the transistors being tested will turn off, allowing LED 1 to continue to flash, signifying that the transistor being tested is OK. When a good PNP transistor is connected, conduction occurs when B is negative causing LED 1 to extinguish leaving LED 2 to flash. If both LEDs flash or both remain off, the tested transistor is faulty.

The LEDs used in this circuit must be green or yellow. Red LEDs don't work.

The tester ignores the presence of in-circuit resistors as low as 40 ohms or so across either the base-emitter or the collector-base junctions and also electrolytics and reverse breakdown diodes. So try it as an in-circuit tester. D1 - D4 are 1N4148.



TIGER

Bud Blake



Thanks to Attie ZR2DY for the cartoon.

Some Thoughts on the Morse Code

By Victor C. Clark,* W4KFC

*President, ARRL

Persistent advocacy of a code-free Amateur Radio license by FCC and by some radio amateurs, and the emphatic opposition to the idea by a majority of the amateur community, suggest that certain aspects of this question may not have been fully understood or articulated.

All parties appear to be agreed on these points:

- An orderly growth of the U.S. Amateur Radio Service — perhaps at a rate of 7 to 8 per cent per year — is desirable.

- New ways need to be found to attract intelligent youngsters to this rewarding and educational avocation.

- The Amateur Radio Service, which has long enjoyed a reputation as orderly and efficient in its use of the radio spectrum, must continue to deserve that distinction.

The requirement to learn the Morse code is frequently cited as an effective screening device that tends to exclude the unmotivated and undisciplined from Amateur Radio activity. Having persevered to acquire the skill needed to qualify for an amateur license, according to this line of reasoning, the holder is unlikely to perform in a way that would place it in jeopardy. Why, then, would anyone want to change matters by experimenting with the requirement for Morse code proficiency?

Proponents of the codeless license offer the argument that many are denied access to Amateur Radio because of the requirement to learn the Morse code, a skill in which they have no interest and see little purpose. They contend that the Morse code in today's advanced technology is an obsolescent communications mode that has all but disappeared from commercial and military use, at least in this country.

As such, it is regarded as presenting an unwarranted barrier to individuals who would otherwise benefit from participation in Amateur Radio.

On the surface, these are, indeed, persuasive reasons for abandonment of a traditional requirement that many a budding aspirant has found to be difficult, if not indigestible. Thus, radio amateurs who protest against creation of a codeless license appear to be suffering from a "dog in the manger" attitude. Because *they* had to learn the code to obtain *their* license, they are unwilling to welcome newcomers who have not met this test of fire. And it is a fact that no more convincing argument has been put forth by some of the traditionalists among us.

But let us examine for a moment this hoary communications mode known as the Morse code. Is it truly obsolete in this modern and sophisticated age, particularly as a means of effective communications in the Amateur Radio Service? Time was when many amateurs could neither manage nor afford the complexity of other than a cw rig; nearly everyone used code. Today, however, nearly every amateur possesses the means for communicating by single sideband or fm voice. In these circumstances, some may find it remarkable that enthusiasm for use of the Morse code persists today among an impressively large segment of the amateur population, and that many amateurs rarely employ another mode, although their equipment would enable them to do so. Is there something strange or wanting about these folks?

Could it be that there are qualities present in Morse code communications that escape the perception of those who have never mastered the skill? There obviously is pleasure for its practitioners in

Morse code transmission and reception. They point out that the musical clarity of Morse, particularly on today's crowded bands, serves to project thoughts and ideas with a facility that far exceeds the expectation of the laboring apprentice, and is beyond the comprehension of the layman. Those who achieve true proficiency in the use of the Morse code claim it to be the great equalizer: Differences in age, voice pitch and timbre, accent and oratorical prowess are absent as a basis for prejudgment, while eloquence, expression and erudition are very much present.

The observation that the Morse code is slow and cumbersome is certainly valid during the learning process. There is drudgery involved in sending and receiving Morse, at least until one reaches the magic threshold where instant and effortless recognition first takes place, and it is no longer necessary to write anything down. For most individuals, this appears to occur somewhere in the range of 22-25 words per minute. Indeed, it is a regrettable fact that there are many Extra Class license holders today who have never really achieved true Morse code proficiency nor experienced its full benefit.

That those who have never undertaken even to learn the Morse code should regard the process disparagingly is understandable. Nor is it surprising that they should perceive code communications to be obsolete and awkward.

Is it really worth the effort? Well, let us consider a few of the virtues ascribed to the art of communications by Morse code, as set forth by those who have gained a measure of proficiency in its use:

- It is a unique, intimate, concise and effective communications skill employed throughout the world.

- It is the most efficient mode in terms of power required for long-distance communication, least susceptible to interference, and conserving of the radio frequency spectrum.

- It involves no accent or pronunciation problems, providing a widely understood international language.

- It employs simpler, more reliable and easily maintained equipment than any other communications mode.

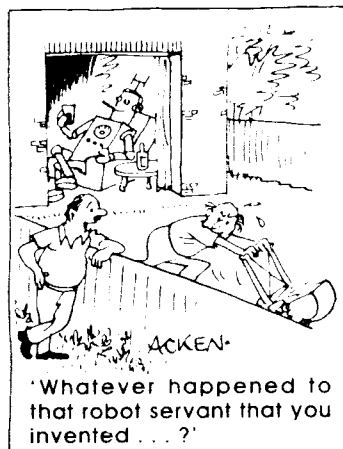
- It is an equalizer, negating age, speech impediments and dialectical differences; it provides for ready acceptance of youngsters in an adult environment.

- It is the *only* radio communications mode that is understood readily by both man and machine.

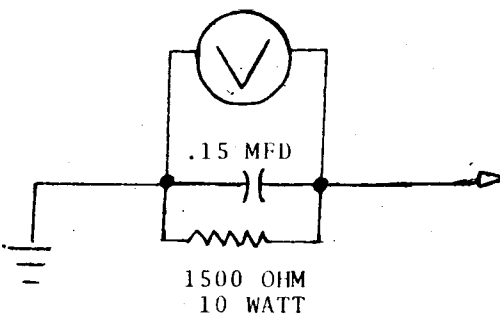
The announced objective of the code-free license is to recruit desirable newcomers to Amateur Radio — particularly young folks who now are entering the computer field. Is it reasonable to expect that a no-code license will attract large numbers of worthy applicants for Amateur Radio licenses? No one can be sure. While the Morse code has never appeared to be a significant barrier to the young, perhaps such a license could serve to attract some new blood. Most seem to agree that it will be essential to require a demonstration of technical knowledge comparable at least to that of General class amateurs, should such a new class of license be created.

Whatever the future holds, however, we would like to offer the thought that, in praising the intrinsic worth of the Morse code in Amateur Radio communications, the presumption of its obsolescence or inexpedience is shallow and has little foundation in fact. □

December 1982



GROUND EARTH
GROUND SUCH
AS THE
WATER PIPE
CONDUIT, ETC.



PLACE THIS PROBE
ON EACH EXPOSED
METALLIC PART.
(CABINET ETC.)

Safety against electric shock

Tom Rosica, W2GIR Thanks to Percy ZS2RM for this article

How many times have you worked on a piece of electrical equipment and received an uncomfortable shock? After further checks, you may have realized it was some simple "normal" AC leakage to ground, which sometimes must be tolerated for line-to-chassis bypass capacitors.

Have you ever wondered how much leakage was acceptable — where do you draw the line — and how can you make such a measurement?

The Consumer Electronics Group of Electronic Industries Association (EIA) has a guideline designed to be used by radio and TV service repair people. This covers their service obligation to deliver a safe unit to the user.

You should always be conscious of the safety aspects of each piece of equipment, and never be tempted to ignore any of them. The guideline covers the following:

AC leakage test

Do not use an isolation transformer during this test. Use an AC volt-meter having 5,000 ohms per volt or more sensitivity in the following manner:

Connect a 1500-ohm, 10-watt resistor paralleled by a .15mfd AC type capacitor

between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination 1500-ohm resistor and a .15mfd capacitor. Reverse the AC plug and repeat AC voltage measurements for each exposed metallic part.

The voltage may measure as much as 7.5 volts RSM. (This corresponds to 5 mA AC.) Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.

The lower this value, the better. Any value exceeding this limit should be corrected immediately, as a defect is indicated, which may lead to a potential shock hazard and potential death.

As amateurs, we often have contact with gear that should pass the above test. If the leakage is too high, we probably should look deeper into the cause, and naturally find a remedy. For extra protection, we should always ground all equipment, with a separate ground wire — to insure against any possible shock hazard.

Remember, you do not want to find out your equipment is a shock hazard when you are making antenna connections at the top of your tower, or on your wet lawn!



BULLETIN ROSTER.

20th March	Trevor ZS2AE
27th March	Marge ZS2OB
3rd April	Brian ZS2AB
10th April	Lionel ZS2DD
17th April	Colin ZS2AO

Tomorrow's Technology

Low frequencies harness natural amplifier

SCIENTISTS in California have discovered that the Earth's magnetic field can act as a giant natural amplifier for very low-frequency (VLF) radio waves. The discovery could improve global communications, particularly for military purposes, and allow greater control over solar disturbances in the ionosphere.

Low frequencies have the advantage that they naturally bounce around the world without satellite repeaters. They can also penetrate water, so are useful for talking to submarines. The disadvantage is that they need very large antennas, and very powerful transmitters.

But the work in California, reported at last month's meetings of the American Geophysical Union, could change all this. The researchers, who were working for Lockheed's missiles and space research laboratory and Stan-

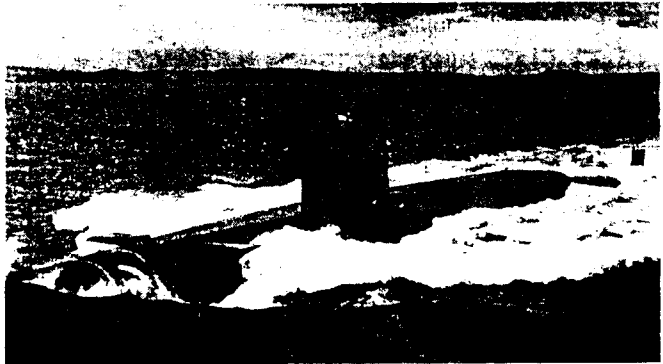
ford University, transmitted coded VLF signals 8500 kilometres into the Earth's magnetosphere. There, the signals dislodged electrons, which duplicated the signals—but amplified 1000 times. The researchers call the phenomenon "simulated emission of energetic particles".

The experiment confirms a long-held theory that the VLF waves are capable of dislodging electron particles from the radiation belts, and dumping them into the ionosphere. But up to now, it has not been possible to prove it.

The experiment began in earnest only last May, when the US Air Force launched a satellite from its Vandenberg base in Southern California. The satel-

lite, in low polar orbit, carried spectrometers to track what happened to coded signals that four transmitters sent out. The transmitters were at navy bases in Maine, Maryland and Washington, and at Siple Station in Antarctica.

The radio waves acted as predicted. They penetrated the Van Allen radiation belt (which is contained by the Earth's magnetic field) and loosened showers of electrons. The Air Force satellite picked up the signals.



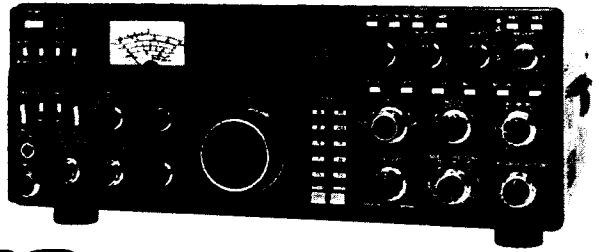
Submarines need good radios

The task is now to combine this knowledge with the ability to control the displacement of electrons. And according to Dr Joseph Reagan, the manager of Lockheed's Space Sciences Laboratory, a lot more research needs to be done. "We still don't understand why we sometimes get a thousand-fold amplification and sometimes we don't."

If scientists can crack this problem, it may become possible to mitigate solar disturbances to communications by modifying the ionosphere. If VLF waves could knock electrons out of the radiation belts, they could reduce the detrimental effects of sunspots on communications. □

Thanks to Colin ZS2AO for this article.

 **KENWOOD**



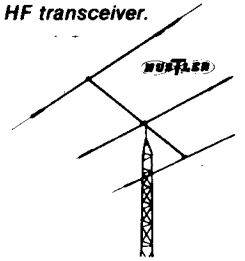
TR 2500

The TR-2500 is a compact 2 meter FM handheld transceiver featuring an LCD readout, 10 channel memory, lithium battery memory back-up, memory scan, programmable automatic band-scan and Hi/Lo power switch.

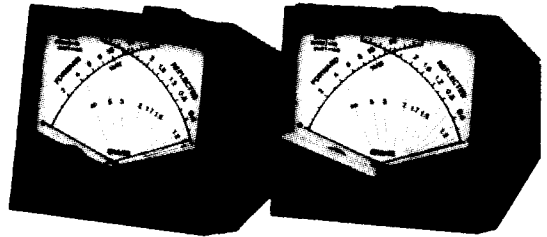
Kenwood's TS-930S HF transceiver.

 **KENWOOD**

hy-gain



DAIWA POWER METERS



CN540

50MHz · 150MHz

CN520

1.8MHz · 60MHz

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