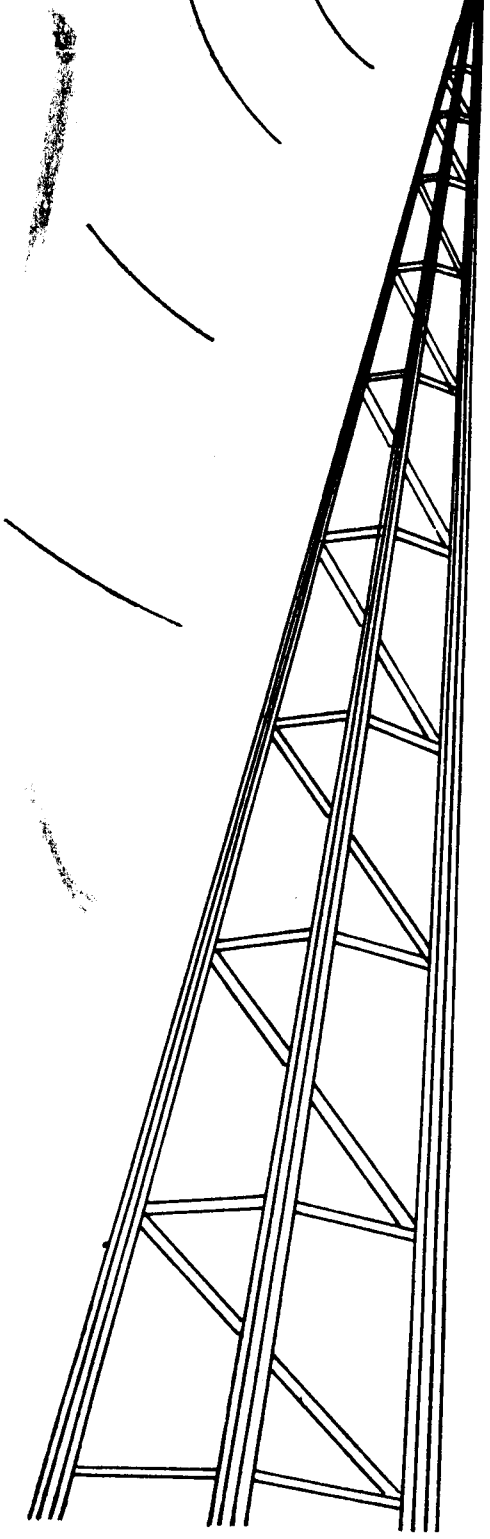
QSX PE



ZS2PE

FREQUENCIES:

Bulletin	3640 Khz
	7098 Khz
National Call	145.5 Mhz
P.E. Repeater	145.05/65
Grahamstown	145.15/75
Lady's Slipper	145.10/70

Port Elizabeth Branch of the South African Radio League

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

MAY 1982

PORT ELIZABETH BRANCH.

THE NEXT MEETING OF THE PORT ELIZABETH BRANCH OF THE SOUTH AFRICAN RADIO LEAGUE WILL BE HELD AT THE Y.M.C.A., HAVELOCK STREET, PORT ELIZABETH ON FRIDAY 21ST MAY, 1982 AT 8p.m. IT WOULD BE NICE TO HAVE YOU THERE.

****

BULLETIN ROSTER.

23rd May Colin ZS2AO 312471
30th May Fred ZS2EQ (0422) 32429
6th June Dick ZS2RS 322111
13th June Brian ZS2AB 303498

Don't forget the bulletin is for the Branch, about the Branch, and the bulletin reader would love to have any snippets of news. Thanks to all those who DO let us have news and info in time.

****

PERSONAL NEWS.

A sad note to start with this month. We were very sorry to hear of the passing away of Ken Heath ZS2NO a pensioner member of the Branch, and we wish his family and friends deepest sympathy.
CONGRATULATIONS to Sel ZS6AXO on being awarded the League's V.H.F. Trophy for his 6 meter activities as ZS2SS. Sel has already set up his 6 meter station in Div 6 and only needs one more continent for W.A.C. Well done!
Tess Bruyns, the XYL of Athol ZS2CM was recently in hospital for an operation, and we trust she is out and about now.
HAPPY BIRTHDAYS TO:
1st May Marge ZS2OB, 5th Gerry ZS2K, 6th Wim ZS2WV, 9th Langley, 10th Attie ZR2DY, 11th Shirley Cockbain, 22nd Bill Hodges, 24th Vicki Ansell, 29th Brian ZS6NX, 29th Darrell ZS2CZ.
HAPPY ANNIVERSARY TO;
2nd May Gus and Shirley Winter. 23rd May Geoff and Priscill Bowes-Taylor.

****

A.G.M. 1984 FUND.

Many thanks indeed to Basil ZS2PG for a very generous donation of R25 towards the fund. Perhaps this will inspire a few more members.
Many thanks also to Geoff ZS2GJ for a donation of three cases of tinned foods to be disposed of for funds. This will be done at a Branch meeting as soon as they arrive.
Dick ZS2RS still has a few tape-recorders on hand which are being sold for R15 also for A.G.M. funds. Contact Dick at 322111 before these are all sold out.

****

Don't forget that the Treasurer, Frank has a supply of Great Circle Maps at 50c each, log books at R1 each and QSL stickers at R3 per 100. Phone no 511259.

****

This is truly an era of technological marvels, having given us the microfiche and the silicon chip. In fact, the 1980's may become known as the decade of the fiche and chip.

Confucious says: The older a Ham gets, the faster he could copy Morse when he was a young man.

Sara says: If we are not part of the solution, we are part of the problem.

MINUTES OF THE GENERAL MEETING OF THE PORT ELIZABETH BRANCH OF THE SOUTH AFIRCAN RADIO LEAGUE, HELD AT THE Y.M.C.A., HAVELOCK STREET, PORT ELIZABETH ON FRIDAY 16th APRIL, 1982

PRESENT: 15 members and visitors.

APOLOGIES:ZS2KX, ZS2LO, ZS2SI, ZS2AO, ZR2ED.

The Chairman welcomed all to the meeting, especially Mr. Tom Garner, the guest speaker, ViV ZS2VM, Athol ZS2CM and Alan ZS2AJ.

MINUTES: The Minutes of the meeting of 19th March, 1982, having been published and circulated in QSX-PE,were taken as read, proposed by Brian ZS2AB and seconded by Bill Hodges.

ARISING: With regard to the Veteran Car Rally to be held on 4, 5, and 6th of May, a few helpers were still required and volunteers were asked to contact the Chairman. The time of operation was from approximately between 2 and 3p.m. with the base station at the Edward Hotel. The station on Monday will be at the Beach Hotel, Jeffries Bay; on Tuesday, the Kommando Kraal Hotel in Addo and on Wednesday from Wyndomayn Tea Gardens. Athol ZS2CM offered to help out on all three days.

FINANCE: There was nothing to report.

CORRES: Letter from H.Q. confirming the award of the V.H.F. trophy to Sel ZS6AXO.
Council Minutes.

GENERAL: The Chairman congratulated Bill ZS1J and Sel ZS6AXO on their recent marriages.
Tess Bruyns was going to hospital for an operation and the.Secretary was asked to send her a card.
The Chairman reminded members that the Hobbies Fair takes place again this year, and help would required with building and manning the stand.
The Branch had almost 100 I.R.C.'s for sale at 25c each. Please contact Brian or Marge at 303498.
The Chairman told the members that, on their behalf, he had offered that the League A.G.M. be held here in 1984 to be hosted by the Port Elizabeth Branch and Algoa Branch were to be invited to co-operate. He hoped that we would be able to put on a better show and keep the costs down to the minimum as everything had been very expensive in Johannesburg. It was hoped to set up a committee of ten for the two-year period to cover all the aspects of the A.G.M. One of the most important items was a good P.A. system and bulletins on Sunday morning.
It would be necessary to collect a sum of about R2500 and to start the ball rolling, the Chairman said that he had a number of battery/mains cassette recorders which were in A1 working order and these were being offered for sale at R15 for funds.
Alan ZS2AJ and Trevor ZS2AE were wished birthday greetings for 17th and 20th and both thanked the Branch for the cards which they had received.

There being no further business, the meeting was closed and tea was taken. Thereafter, an interesting and entertaining talk on communications through the ages on the Railway and Harbour system was given by Mr. Tom Garner. The Chairman expressed his thanks on behalf of all those at the meeting.

sgd;
R.W. Schönborn ZS2RS
Chairman

sgd;
M.T. Weller ZS20B
Secretary

£ 18 ordinary members
£ 8 juniors

CONTINUATION AND FINAL PART OF TWO METER ANTENNA ARTICLE.

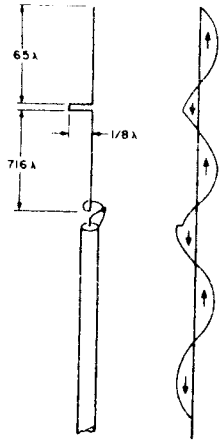


Fig. 10. Ringo Ranger and its current distribution on both the monopole and the feedline.

The 1/4λ sleeve on the sleeve antennas and the Isopole ensures the proper phase for the remaining current on the outside of the coax while minimizing that very current, thus ensuring that the radiation pattern is both predictable and on the horizon. The double-sleeve antenna, Fig. 9(a), is a simple collinear which provides 1- to 2-dB gain over a 1/2λ dipole because of the proper phasing of the small current which does flow on the outside of the coax. The addition of more than two sleeves does little to improve the gain because the current below the second sleeve is very small. Other types of collinear antennas can provide additional gain as shown in Fig. 9, with the gain over a dipole, dBD, provided in the caption. The basic objective for obtaining gain is to provide multiple radiating elements

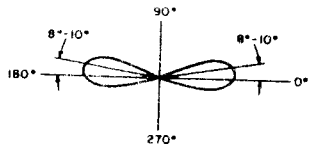


Fig. 11. Radiation pattern of the Ringo Ranger, from the manufacturer's literature. Note that the major lobes are 8°-10° above the horizon.

in which the currents are as large as possible and in phase.

The phasing can be obtained by:

- Using feedline currents as in the sleeve collinear in Fig. 9(a), as described earlier.
- Spacing the radiating elements as in the collinear dipole in Fig. 9(c).
- Using lumped L and C phasing networks as is done for the low-frequency ground-mounted antennas in Fig. 9(d).
- Folding a half wave of wire or cable up as in the Franklin antenna in Fig. 9(e). Note that folding is also used to provide loading in beams, in particular 40-meter beams and the KLM KT34A and KT34XA triband beams.
- Using alternate 1/2λ sections of coax connected so that the current on the outside of the coax elements is radiating in phase, as in the coax vertical in Fig 9(f).

Some comments on these various phasing techniques will illustrate the relative merits and trade-offs in these different designs.

Number of 1/2λ Elements	A Close Spacing	B Optimum Spacing
2	2.0 dB	3.1 dB
3	3.0	
4	4.0	6.2
5		
6		
7	5-7	
8	6-8	9.3

Table 1. Gain of collinear antennas consisting of 1/2λ sections for close and optimum, 0.3λ to 0.5λ, spacing for different numbers of 1/2λ sections. The close-spaced numbers are approximate and depend on the type of antenna.

First, spacing four or more folded dipoles as in Fig. 9(c) is a straightforward way to provide phased current flow. The optimum spacing for collinear arrays, between 0.3λ and 0.5λ, is easily obtained by placing the dipoles on a vertical mast. This type of antenna will provide single directional gain of 9 dBD by placing all the dipoles on that side of the mast, or 6 dBD omnidirectional gain by distributing the dipoles around the mast. A phasing harness is required to distribute power to the dipoles in the proper phase. (Details for building such an antenna for 2 meters are given in Reference 2.)

Gain from a low-frequency ground-mounted vertical with a radial system may be obtained by either making it 5/8λ long or by stacking two 1/2λ sections on top of each other, with insulators between the sections. The sections are coupled through an LC network so that the currents in the two sections are in phase; see Fig. 9(d). Since the spacing between the 1/2λ sections is not optimum, the gain is less than one would get if they were spaced 0.3λ to 0.5λ apart. The gain of collinears for different numbers of 1/2λ elements for close and optimum spacing is given in Table 1.

The Franklin antenna uses a folded section in the monopole so that the radiation from that length is cancelled and the currents on the radiating parts of the antenna are in phase. The outside of the coax feedline carries the radiating return currents. The coax is also folded to ensure that currents on all sections of the coax are in phase with each other and the radiating sections of the monopole. Again, the spacing between sections is not optimum, so approximate gain is given in column A of Table 1.

The coaxial collinear, Fig. 9(f), is an antenna that has become very popular as a repeater antenna because it can provide good omnidirectional gain (6-9 dBD) and is relatively easy to make. It can be thought of as the ultimate in using the feedline as a radiator. The goal of the design is to propagate the signal through the coax in 1/2λ sections so that the outer conductors of the coax sections carry a current which radiates. Remembering that electrical 1/2λ in coax depends on the propagation velocity of the cable and is always less than the free-space length, this is accomplished by connecting the 1/2λ sections of coax so that the shield of one section connects to the center conductor of the adjacent section, thus ensuring that the coax radiates a signal which is in phase with that in the adjacent section. Any number of 1/2λ sections can be used with more sections providing more gain. The gain is limited, however, by the fact that the current diminishes as the signal propagates up the antenna, since each section radiates some of the applied energy. Also, the close spacing of the sections further limits the gain. Thus, the gain shown in Table 1 for this antenna can be obtained by considering the number of 1/2λ sections only and not counting the top and bottom sections even though they do radiate. The bottom 1/4λ section ensures the proper phasing for the current fed to the first 1/2λ section. The 1/4λ ground plane on the bottom, which often is replaced by a balun, provides an image for the 1/4λ section and isolates the feedline from the antenna. The top section terminates the wave propagating up the antenna so that the phasing is preserved and the last 1/2λ of radiation occurs.

Coaxial collinears can be mounted either in fiber-

glass radomes on top of a mast or suspended from the side of a tower inside plastic drain pipe. The only difficulty is that the lower sections which carry the greatest radiating current are closest to the ground. See Reference 2 for further information on this antenna.

Performance

Now that the theoretical basis for the poor performance of my homemade 5/8λ antenna was established, I decided to test some of the other popular 2-meter antennas on my simple test setup. Probably the most popular and easiest to use 2-meter base-station antennas are the Ringo™ and Ringo Ranger™ by Cushcraft. The Ringo is described by the manufacturer as a 1/2λ monopole while the Ringo Ranger is described as two 1/2λ elements in phase. The physical dimensions of the Ringo Ranger indicate that it is really a bit longer than 1/2λ, as shown in Fig. 10. Also, the phasing stub is 1/8λ rather than 1/4λ as in the Franklin collinear and is located so that the higher-current portions of the reverse antenna current are in the stub, also as shown in Fig. 10. Also note that the phasing is such that the feedline and/or mounting structure are carrying radiating current. Since this current is not specifically phased, and because the phasing stub is 1/4λ rather than 1/2λ, some compromise in on-the-horizon performance appears to have been made to get a solid, simple antenna. The extra out-of-phase current is probably responsible for the slight elevation of the radiation pattern (about 9 degrees) as given in the manufacturer's literature reproduced in Fig. 11. Thus, one may expect that the Ringo and Ringo Ranger on-the-horizon performance would be less than that of some other antennas and that their performance may be improved by adding a ground plane.

Well, armed with my SO-239, 1/4λ ground plane, my home-brew 5/8λ on the 1/4λ ground plane, a Ringo, a Ringo Ranger, a Ringo Ranger with six 19-1/2-inch radials drooping at 45°, and an Isopole, I went out in the cold of February to find out what worked best.

Note that radials made from aluminum ground wire can be added to the Ringo or Ringo Ranger easily by bending three 40-inch pieces of aluminum ground wire around self-tapping screws in the base of the antenna making six 19-1/2-inch radials. The radials have a negligible affect on tuning.

I used the same testing techniques I had used earlier—measuring the relative received strengths of repeaters and locals in all directions and getting signal reports from locals. The data taken for each station were then normalized by dividing the reading for the best antenna into the readings for each antenna. I then averaged the normalized numbers for all stations for each antenna. This allowed me to get an unbiased relative performance metric across each antenna. The results are plotted in Fig. 12 for received signals from both repeaters, which tend to be at higher elevations around me, and local stations. The averaged values in each direction for signals from repeaters also are plotted. Basically, Fig. 12 indicates that neither direction nor elevation affects the relative performance of these antennas tested at my location, and that the Isopole is the best of the antennas tested. The rest of the antennas were tested with the original four and the results in both receiving and transmit modes are given in Fig. 13. Again, the results are consistent.

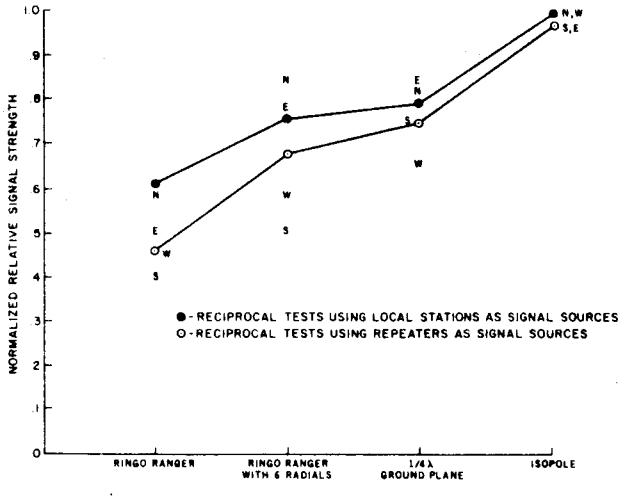


Fig. 12. Relative signal strength of four antennas for repeaters and local stations in different directions. Normalized strengths for each direction are given by N, S, E, and W.

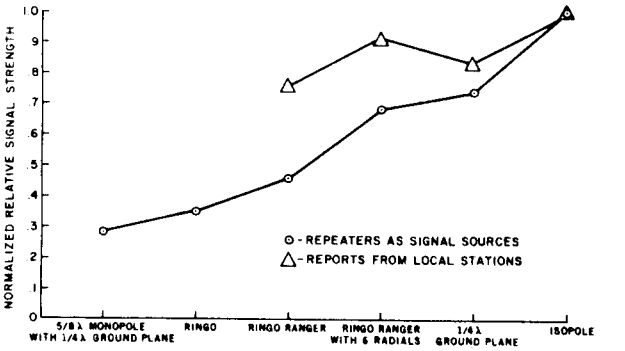


Fig. 13. Relative signal strengths of six antennas in both transmit and receive modes. Wider variance from reports from other stations is expected because S-meters are independently calibrated.

Conclusions

From these tests it is clear that:

1) The 5/8λ radiator on a 1/4λ ground plane is a poor antenna—do not bother with it.

2) The 1/4λ cheap (less than $2.00) SO-239 ground-plane antenna of Fig. 1 is a very cost-effective antenna.

3) Radials do improve the performance of the Ringo Ranger.

4) The Isopole performed better than all the other antennas in almost every case.

It is interesting to note that since these tests were run, Cushcraft has come out with a decoupling kit consisting of a ground plane which mounts some distance below the base of the Ringo Ranger to improve its performance. I will try it as soon as I can get one to my test site.

Acknowledgements

I thank the following for their help in running these tests: Roy K1GSK, George W1DA, Dick AB1F, Bob W1QMN, Russ WA1RKO, Tom WA1MBA, Bruce WBØOFC, Shawn WB1AEL, and Tom KA1AIG. ■

References

1. Jasik, Henry, *Antenna Engineering Handbook*, McGraw-Hill, 1961.
2. ARRL, *The ARRL Antenna Book*, 1977.

THANKS TO LIONEL ZS2DD FOR PROVIDING THE DX NOTES AS COPIED FROM W1AW BULLETINS, INFO. PROVIDED BY K1MM,K1MEM,N1AJO and WB1GOO.

Upper Volta.
XT2AW has been active recently on 10 metres CW. Look for him on or about 28040 kHz at 0000Z. QSL's go to KN1DPS.

Macquarie Island.
VKØAN makes an almost daily appearance on 14220 kHz around 0600Z with VK9NS. QSL's go to VK9NS.

Malagasy Republic.
Listen for 5R8AL on Fridays at 1830Z on 21325 kHz.

Crozet.
If you still need Crozet, give a listen on 14015 kHz on Mondays at 0330Z for FB8WG.

Jordan.
JY3ZH has a big signal on 14220 kHz at 0300Z nearly every day.

Lord Howe Island.
VK9ND/LH has been worked on 28418 kHz at 0000Z. QSL's to DJ5CQ

Franz Josef Land.
From Alan Leith VE3FRA, publisher of the DX Report, 10 Fairington Crescent, St. Catharines, Ontario, Canada L2N 5W3, comes word that UA1PAM has been worked on 14022 kHz at 2300Z and on 7002 kHz at 0530Z. QSL's to UK3SAB.

Macao.
Alan VE3FRA also reports that CR9BK was worked on 14026 kHz at 1700, on 14195 kHz at 0600Z and on 28025 kHz at 0130Z. QSL's to JA1HGY.

Trinidade and Martin Vaz Islands.
PYØAC will be the SSB call and PYØAD the CW call for a Dxpedition that is scheduled to start around 12 April for an as yet unspecified length of time. KA9KUH passes on the following operating schedule: 1000Z to 1300Z 28500kHz and 28025 khz, 1300z to 1500z 21300khz and 21025 khz, 1700z to 1900z on 14250khz and 14025khz, 2000z to 2300z 7080khz and 7005. 2300z to 0100z on 3795 khz and 3505 khz. QSL's to PY1VOY.

****

FROM THE SILVERCREEK AMATEUR RADIO ASSOCIATION NEWSLETTER thanks to Ed Robertson K8EMI:

I have yet to find a person who did not put forth greater effort under a spirit of approval than he would ever do under a spirit of criticism.

FLUORESCENT LIGHTS.

Fluorescent light operation is a mystery to most if not all persons. Basically it is very simple but also most ingenious.

The light seen radiating from a fluorescent tube is in fact the glow from a powdery substance, Phosphor, which coats the inside of the thin glass tube. The chemical name of the phosphor powder is Calcium Halophosphate.

Let us look at the construction of the tube. The physical size and length depends on the design and application. There being four inch to twelve foot tubes.

When the tube ends are studied, we find on the outside two pins, connected to what appears to be a filament, on the inside of the tube. This we find on either end, but not connected to each end. The two pins either end make contact with the contacts inside of the end fittings on the unit. The unit consists of a fancy or plain holder, a starter, end fittings and a ballast, which is very similar to a choke. The starter is a glass encased bi-metal neon gas filled switch.

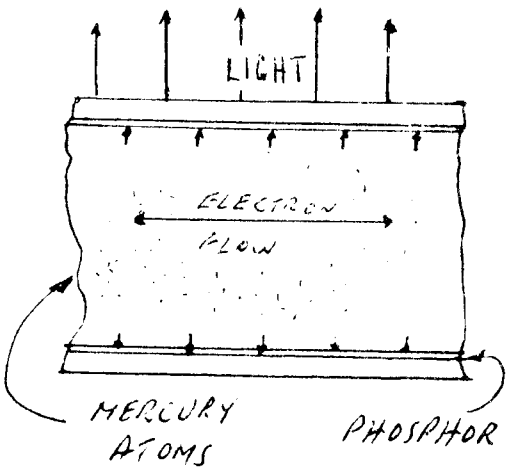
You still with me ??? Light giving action occurs when the phosphor powder is bombarded by Ultra-Violet rays, a type of light energy in itself but not visible to the human eye. The ultra-violet rays come from the Mercury Vapour which fills the tube, and which is IONISED. This activates the phosphor and presto, light with no heat.

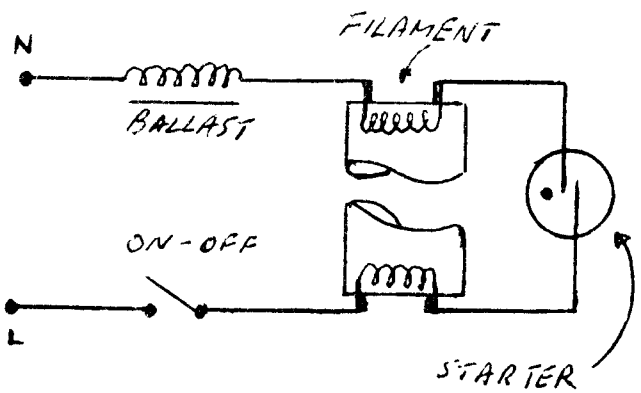
Switch On.

When the on-off switch is turned on, line voltage reaches the starter whose contacts are normally open. Neon gas within the starter tube conducts thermonically, heating up the gas. The bi-metal contacts bend, and line voltage flows through the two end filaments, heating up the mercury gas. Since the neon gas is no longer conducting, it cools and the bi-metal contacts open, removing the heating source of the mercury gas. This sudden drop in line voltage now cause a very large Back-EMF to be generated, upwards of 800 volts. This induced surge STRIKES the mercury gas causing ionisation, radiation of Ultra-Violet light and visible light.

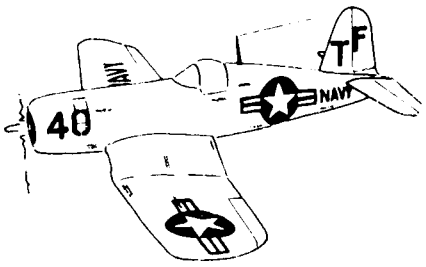
With line voltage applied the tube now acts thermonically and light remains radiating, due to Electron flow. The ballast now limits the line current through the tube and the voltage drop across it keeps the voltage across the starter tube below the ionisation potential of the neon gas. When the switch is turned off you are in the dark, same as you are now.

This interesting article is taken with acknowledgement to Cape Town Branch's latest issue of "RAGCHEW". The author is OM CLAUDE ZR 1 CU.





DON'T FLY AROUND WITH FLY BY NIGHT OPERATIONS.



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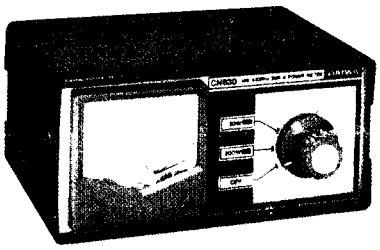

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Forward Power and Reflected Power.

Frequency Range: 140—450 MHz
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Power: 2 Ranges (Forward, 20/200 Watts)
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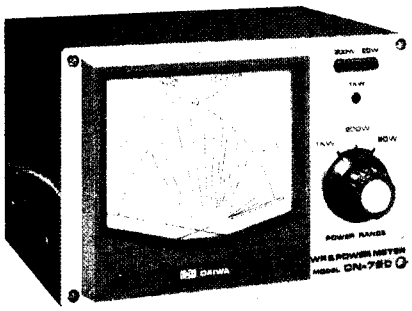
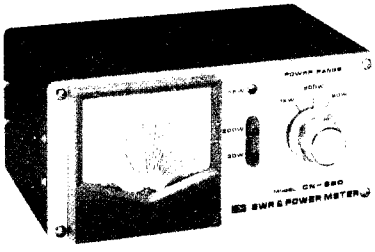
Tolerance: ± 10% full scale
Input/output Impedance: 50 Ohms
Connectors: SO-239
Dimensions: 180 x 85 x 120 mm;
7.12 x 3.37 x 4.75 in.



CN-720

SAVE MONEY



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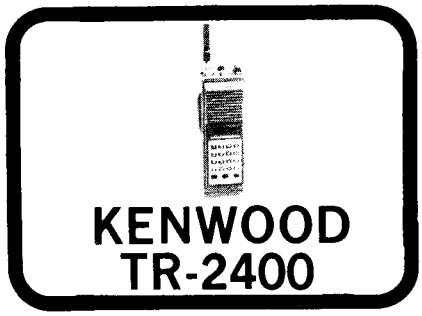
Tolerance: ± 10% full scale
Input/output Impedance: 50 Ohms
Connectors: SO-239
Dimensions: 180 x 120 x 130 mm;
7 x 4.75 x 5 in.
165 x 75 x 97 mm;
6.5 x 3 x 4 in.

KENWOOD TS-130S



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