Newsletter of the Cape Town Branch - PO Box 5100 Cape

RAGCHEW

SEPTEMBER
1993

TOGETHERNESS

There is a popular saying - THOSE THAT PRAY TOGETHER, STAY TOGETHER. This saying has stood the test of time. Lets now make a slight change - THOSE THAT PLAY TOGETHER - STAY TOGETHER.

I came across an article in a magazine recently that had a theme "Sharing the Rig". That applied to OM/YL combinations and there are quite a lot of these combinations around, not so many here in the Cape but never-the-less they are there. In some cases one of the team is more evident than others. What do these 'teams' say about their togetherness? "We make time to be on the radio. I think it's a fantastic way for having togetherness. We do a lot of sharing and reminiscing with friends. Later, we talk about the contacts and the people we met. We've found a lot of pleasure as a team". Another couple - "We enjoy working the contests together. I used the excuse of raising the children for not getting in sooner. When I saw how valuable ham radio was as a safety factor, I got my OM into the hobby". Nancy says "I get excited when I make a first contact with a new country". Her OM replies - "She's like a little girl when it comes to getting someone new or contacts a new country. I really enjoy watching her". Nancy,s' final comment - "We enjoy operating together. One of the worst things is to hear a man say he has to get off the air, because his wife's giving him a hard time for being on. I think these women are missing out".

Playing together doesn't stop with just the YL/OM combination. It applies to the hobby as a whole and goes along with another saying 'Unity is Strength'. Something everyone is saying today and will need to remember in the times ahead.

My final over, Have you paid your Subs.....Its overdue, and time is running out.....Cheers - Editor.

BRANCH AGM

Will be held on Monday 23rd. at Chess Road, Rondebosch. 8pm

QLP LEMONISED

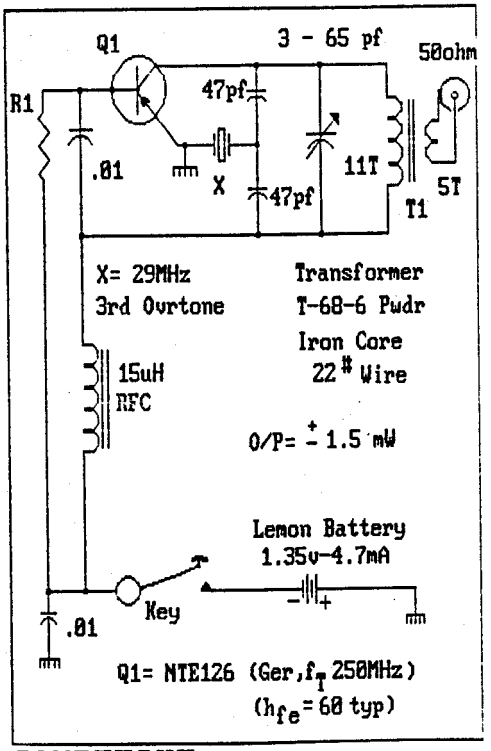
The litmus test of a good operator is making a contact under extremely low power conditions. This is the basis of what we might call 'Sport QRP' operation.

Lets put some fun back into Ham Radio, at the same time showing everyone just what can be achieved with even lower than normal QRP. There are additional motivations for doing low-power experimentation. One of great contemporary significance is the exploration of alternative energy sources. The first solar powered Ham contact occurred in 1955. Solar-powered stations are now common. In the spirit of potato-powered clocks and orange-powered motors, this project stems from the appealing idea of a two-way radio contact with both transmitters powered by one lemon. The TRANSMITTER, designed by W7ZOI, uses a single transistor, 10 meter oscillator. This overtone circuit uses a germanium transistor and will operate with a supply voltage as low as 0.33 V.

The 'BATTERY'. N7PKI experimented with lemons and discovered that by piercing a standard lemon with a zinc-coated nail (the negative terminal) and a 3/16 inch copper tube (positive terminal) produced an open circuit voltage of 0.93 V. The voltage dropped to 0.6 V with a 2-k ohm-resistor load. A standard DMM was used for these measurements. Although interesting, the primitive lemon battery was not very effective. Clearly the lemon battery did not have the zest needed to power a practical transmitter.

A more practical battery was constructed by layering a 5- x 7- inch zinc-coated shingle, a similar sized paper towel separator soaked in lemon juice from the first 'battery',and a slightly smaller rectangle of copper-clad circuit board material. Two of these cells, series connected, yielded an open circuit voltage of 1.9 and an initial short circuit current of 64mA. This battery produced 1.35 volts with a 4.7mA output, enough to power the transmitter to an RF output of greater than 1.5 mW.

Using a battery of this type was given the acid test and resulted in a QLP QSO completed over a distance of 2 miles. The signals were strong enough to overcome considerable QRM. The QSO was terminated when battery polarisation effects took over; it was not our intent to propagate rotten signals. Hopefully, this experiment will plant the seeds of interest in doing simple experiments that demonstrate the true flavour of Amateur Radio. Clearly, large signals are not needed to make juicy contacts.



COMPUKINK

Most computer keyboards come with a plastic cover, but how many of you kept it and even use it. Look behind your rig and see the accumulation of dust. This same dust is getting in between the keys and building up. When it arrives at the actual membrane that tells the computer something, the computer may not get the message because dust or other foreign bodies are blocking the traffic. Keep your keys covered when not in use. Every time you or the XYL vacuum the shack run the tube over the keys. This will ensure there is not build-up. NEVER eat or drink over your keyboard.

Another hint! When sending a floppy or stiffy through the post, wrap it in oven foil. This will help protect it from external interference.

SUPPLY/CHARGER

You can safely float-charge a 12v lead-acid battery indefinitely. This keeps the battery fully charged without overcharging it. Because float-charging doesn't require nearly as much current as a 100 watt rig, you can power such a rig from a battery that's float-charged by a supply incapable of running the transceiver on its own. Wanting to avoid having to disconnect my charging supply every time I operated the rig from the battery, I needed a circuit that would automatically ensure that the battery supplied the additional current demanded by the radio. In other words, I needed a current limiter between the power supply and the battery. Several attempts to design a solid state circuit using standard 3 terminal voltage regulators proved unsuccessful. I needed a circuit capable of limiting current at a safe, constant value greater than zero. Finally, I realised that a component with this characteristic already exists: an incandescent lamp.

The resistance of a #93 auto bulb is 0.8 ohm cold, and 7 ohm hot. As long as the current flowing through it is small, the lamp's filament exhibits a very low resistance. When the current increases, the filament heats, and its increasing resistance limits the current - in my application, where the source is a regulated supply - to about 1Amp. The battery recharges when the radio doesn't draw much current. Fig 1. shows a simple circuit whilst fig 2. shows a modified version I built for our repeater. The MOV's Z1 & Z2 are for protection against lightning-induced surges. D1 keeps the power supply's bleeder resistors from discharging the battery in the event of a prolonged power outage. To compensate for the diode's 0.6V drop, I adjusted the power supply output to 14.4V. At this voltage, two #93 globes in parallel limit the maximum current into a dead short to 2.1A. In normal use, the lamps do not pass enough current to light up, so they should practically last forever. (When they do light, though, you know they are doing their job!) Rather than use sockets, I soldered them in place to keep the system resistance to a minimum.

Michael Covington, N4TMI.....QST MAR'92

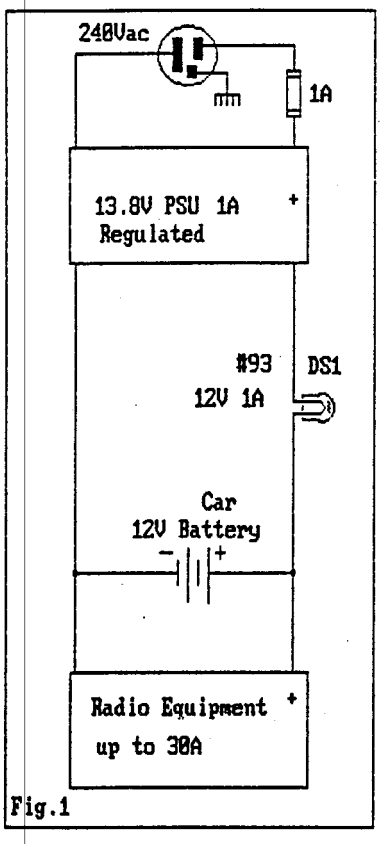


Fig.1

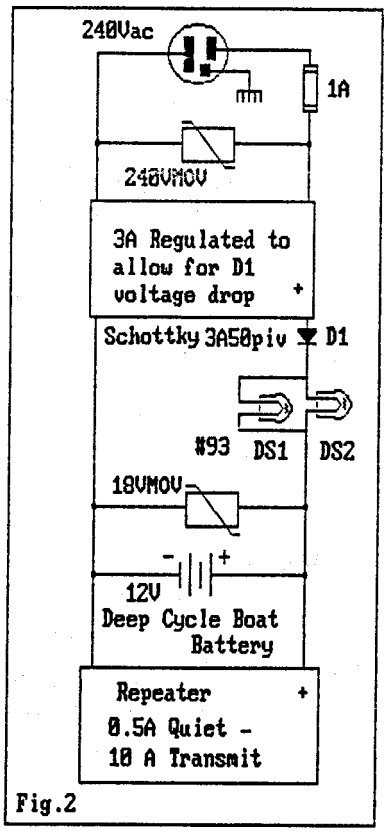


Fig.2

BIRTHDAYS

Another year, another hike in the rates and taxes. We hope there is enough over for the following to celebrate their aniversary in September:-

ZR1ABV - ZR1AF - ZR1FS - ZR1RMB - ZS1251 - ZS1252 - ZS1AGS - ZS1013 - ZS1016 - ZS1041 ZS1JR - ZS1046 - ZS1231 - ZR1YP - ZS1050 ZS1VH - ZS1CC - ZS1EF - ZS1MP - ZS1VV ZS6ALQ . Happy birthday to you all. FF

HINTS & KINKS

Sensitive IC's are sometimes protected by a conductive foam. If you have some of these chips in foam you are advised to swop the foam for metal foil. It has been found that over a period of 8 years these devices' pins were corroded and brittle, breaking of very quickly.

DID YOU KNOW?

That when radio was first introduced to the aeroplane the manufacturers would not allow the radio to get power from the engine power generator. They had to use wind driven dynomos and 200 foot long wires trailing with a lead weight.

BEATING STATIC

As net controller of a year-round 80-meter QRP net, I've had my share of finding weak stations between the crashes of static. Note that I said 'between crashes'. Effectively dealing with this noise is greatly helped by making the crashes as short as possible and by sending quickly enough to get full characters between crashes. Fact is, narrow CW filters lengthen static crashes, making the static more annoying than necessary. By using a wide filter, such as that for SSB, pulses get through the receiver system quickly. Due to the way I've learned CW, if a station is sending fast enough to squeeze characters between the crashes, I can usually get decent copy even from very weak stations sending from 25 to 35 WPM. However, I can't copy moderately strong signals at slow speeds if the crashes take out a piece of every character - I miss everything. As a result I open the net at a high speed to encourage callers to copy my speed, allowing me to copy all, rather than useless pieces of characters.....Zack - KH6CP - QST 6/92.

DOCUMENTATION

One often hears on swop shop a request for certain documentation on older equipment. Sometimes the request is answered but many are not. If you are in need of a document to restore an 'old faithful' help is only a letter away. The biggest collection of the older docs is held by a company in Indianapolis. The address is:-

Howard W Sams & Co.
2647 Waterfront Parkway East Dr.
Indianapolis, IN 46214-2041
Telephone - 800-428-7267 - USA

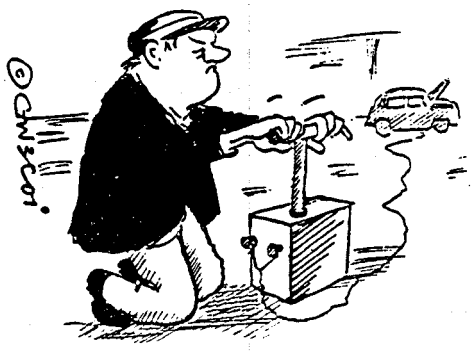
The library service is called 'Photofacts' and covers most consumer electronic items manufactured since 1945. A photocopy service for manufacturers' manuals is also available. If you are a collector of older equipment, you could have this and a lot more info and addresses by getting a copy of pages 67,68,69 of the June 1992 edition of QST.....ED

CARTRONICS Pt.2

The HF Rig.

This time conditions were rather different. The HF rig no longer affected the indicators but the engine still stopped. Clearly, with the greater power of the HF rig something more was needed. As far as I could see the problem was occurring as a result of induction into the pick-up coil which had replaced the points and other distribution components. We are now dealing with 100 watts of RF so we must ensure effective screening of the engine compartment. Bonding bonnet lid to chassis, and whilst you are at it the exhaust as well. Then re-routing these cables again improved the situation but was not a complete cure. The engine didn't stop but now misfired on every transmission. Next I fitted a filter in each of the power leads to the transmitter, close to the rig. These filters consisted of about 20 turns of the supply cable around a 130mm length of ferrite rod. This completely cured the problem. If your negative supply to the rig is direct to the chassis you will not need a filter in the negative side but if any wire is used then put in the filter.

Conclusion..... The computer itself, although also in a plastic case, seemed to be completely unaffected by the RF. However, a burst of RF could affect the computer in such a way, that far from ensuring maximum efficiency and economy, a drop in performance in these areas could occur for some considerable time without the driver becoming aware of it. Some items seem particularly susceptible to RF pick-up. The pick-up coil for the ignition timing, senses a small magnetic field of the rotating distributor or flywheel magnet. So it obviously takes little stray RF to effect it, to the extent of stopping the engine. Until manufacturers realise that high powered transmitters carried in some vehicles can effect engine performance and take the necessary steps to shield these sensors, the problem is going to persist. PW FEB '90



EDDYSTONE USERS

This one time Great is still gracing one or two shacks. Several collectors probably have more than one model, still working but another maybe requiring either dope or parts. The Eddystone User Group in the UK have all the literature from the Eddystone company. They publish a newsletter six times a year for over one hundred members around the world. The US subscription rate is 16 Pounds, surface, or 18 Pounds by air. Write to Ted Moore, G7AIR, Eddystone User Group, 112 Edgeside Ln, Waterfoot, Rossendale, Lancs, England, BB49TR.

GOOD SOLDERING

Good soldering is absolutely essential for successful circuit construction. Even the simplest projects may contain 100 solder joints. A 99% success rate on soldering joints means that one will be wrong, and that could make the whole project fail.

If you don't have experience of soldering electronic boards, you should practice before building a kit or important project. Most problems experienced by beginners are due to badly soldered joints. The soldering will make or ruin the project.

Use a good soldering iron. It's worth paying a little more for a well known make in the 15 - 30 watt range with a bit (or 'tip') of about 3mm in diameter.Whichever iron you choose, a proper stand is essential for safety. The coil-spring type stands also help keep the bit cooler during the resting periods between soldering. A wet sponge cleaning pad is also necessary to ensure a long life to the 'tip' and to ensure good solder-flow on the joints. Many stands now include the sponge as standard.

Use good resin-cored solder. The most commonly used solder is 60% tin, 40% lead alloy with a melting temperature of around 180 deg.C. Buy a good sized reel, it's not cheap but the larger reels are the least expensive way to buy it. A few tips to remember whilst soldering.

1. Soldering is **not** glueing, the joint must be firmly secured before applying heat.

2. Solder only on to clean surfaces. Solder will only run freely on a clean joint. Scrape the surface with a knife until the metal shines before soldering. Tinning both surfaces beforehand will ensure a good joint.

3. Make the 'job' melt the solder. Don't melt the solder with the tip of the iron. Good joints require the parts being joined being hot enough for the solder to flow. Iron placed on one side of the joint, and solder applied to the opposite side.

4. Allow enough solder to flow and cover the joint without smothering it. It will solidify with a clean and bright surface. A dull grey surface indicates a 'dry' or bad joint and should be remade.

SORTING FERRITE

Sooner or later many home constructors will accumulate unmarked ferrite cores of different mixes and wonder how to identify them without making test coils and measuring inductances. You may be able to grade the mixes by resistivity. Just stick your ohmmeter across the torroid or bead in question and measure its resistance! The readings you get may not be narrowly definitive, but you may be able to separate one mix from another according to the following table:

Material	Resistance
43	10Mohm
61	>30Mohm
63	>30Mohm
64	>30Mohm
72	>30Mohm
73	20kohm-100kohm
75	5kohm-20kohm

Its a good idea to colour code your ferrite material as you acquire them, 43 red, 61 = blue, 75 = green.

To ensure positive i d spread each mix on newspaper and spraypaint them (one face only). Be sure to record your colour code.

KH6CP, Lab Engineer.....QST Mar '92

Coaxial Cables RG	Ohms	RG	Ohms
220/u	50	21A/u	50
218/u	50	20A/u	50
213/u	50	19A/u	50
83/u	35	18A/u	50
74A/u	50	17A/u	50
62A/u	93	16/u	52
59B/u	75	14A/u	50
59A/u	50	13A/u	75
58C/u	50	12A/u	75
58/u	53.5	11A/u	75
55A/u	50	10A/u	50
55/u	53.5	9B/u	50
54A/u	58	9/u	51
35A/u	75	8A/u	50
34B/u	75	6A/u	75
34A/u	75	5B/u	50
29/u	53.5	5/u	52.5

QSL - QSL - QSL

The final courtesy of a QSO is a QSL. At least that is or rather was the order of the day. These days we see and hear about the lack of QSLs. The cost of postage is one reason for a drop off in QSL response but the cost of having 1000 or so cards printed is probably the main contributor to the problem. We, or maybe I should say I, am trying to get a plan together for the printing of quality cards, at a reasonable price. If you have any ideas please contact me.....ED 732011

My Wife is Temperamental

90% Temper 10% Mental

GRID DIPPER

Every shack should possess one of these units, particularly if you are a keen home-brewer. What is a Grid Dipper? A dip meter shows resonance by indicating the energy transfer that occurs when one resonant tuned circuit couples to another. Because the tuned circuit under test can be anything from a resonant cavity to an antenna, a dip meter can be as useful in antenna experiments as it is on the test bench. The G.D.O, (Grid dip oscillator) to give it the full name can be expensive to buy, less expensive to build but unless it is going to be used often maybe doesn't warrant the expense or time to get it into the shack. You already have the ingredients for a dip meter and here's how to improvise a dip meter with your transceiver.

Make a coupling assembly like that shown in Fig. 1 - two coaxial connectors joined with a brass machine screw and nuts (or mounted on a board and connected, shell to shell, by a heavy wire). Solder a short length of flexible, insulated wire between the centre-contacts and form it into a loop an inch or so in diameter. Using a short coaxial-cable jumper, connect the assembly's TRANSCEIVER connector to your transceiver (or if your transceiver does not sport a built-in SWR meter, to the transceiver via a separate SWR meter).

Whether you connect the LOAD connector to an antenna or a dummy load depends on whether you are going to use the transmit or receive mode.

Resonance is somewhat easier to detect in transmit than receive, but transmit-mode use requires that your transceiver be capable of transmission at the test frequency; that your transmitter allows for power adjustment to QRP levels (+- 5 watts or less); that you be able to meter reflected power at that power level; and that a dummy load is available that's capable of handling the transmitter power. If you do not have a dummy load, you can use a suitable resistor of approximately 50 ohms and of suitable power dissipation. The resistor can be wire wound.

(CAUTION: Transmit-mode testing couples power into the circuit under test. If the circuit under test contains active devices susceptible to damage by overdrive, test for resonance in the receive-mode only.)

Although receive-mode testing is simpler, detecting resonance in receive is harder than in transmit-mode because of the relatively wide bandwidth of most circuits under test, and because extraneous signals can be confusing. Try receive mode first; if you don't get the results you want, try transmit-mode.

In the receive-mode test, connect the load to an antenna. Tune the receiver to a strong, non-fading signal. Bring the circuit under test to the loop coupling and tune the circuit under test through its range. An S meter dip, or a distinct noise decrease, indicates resonance. Finding resonance in a fixed tuned circuit is difficult during receive because you must be able to perceive its dip whether or not it occurs in the presence of man-made signals.

Transmit-mode testing is more definitive because it avoids interference by other signals and results in a sharper dip. Connect a dummy load to the LOAD connector. Initially your SWR bridge will show a moderate amount of reflected power. If the indication is very small, replace the dummy load with another value or introduce an antenna tuner to reduce the reflected power. Tune you TX to minimum power and the SWR to maximum sensitivity. Put the TX in the CW or FM mode and adjust the power until the meter deflects. If testing a fixed-tuned circuit, vary the TX frequency until you see a dip in the reflected power. This means that you have found resonance. To get a precise frequency in the circuit under test readjust the tuned circuit until you get a dip on the frequency required.

This method, compared to a true GDO has two disadvantages: Reduced portability, and the inability to change frequency as fast as is possible with most grid dip meters.

WOJF.....QST Jan.'93

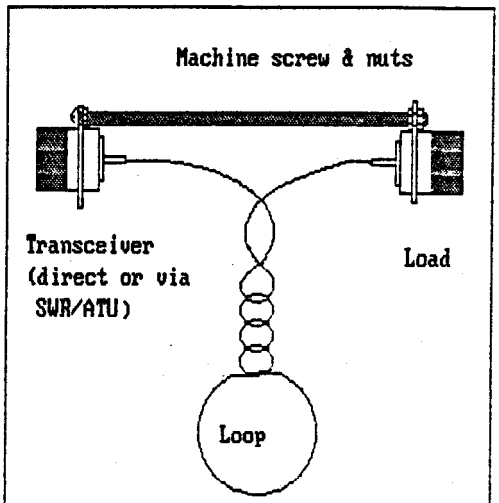


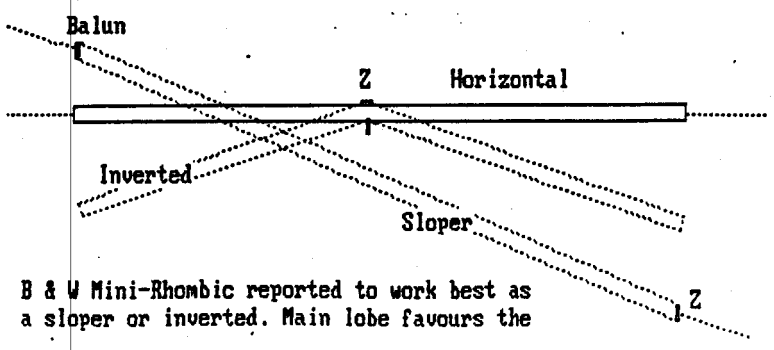
FIG.1

HOW CAN I BE WRONG

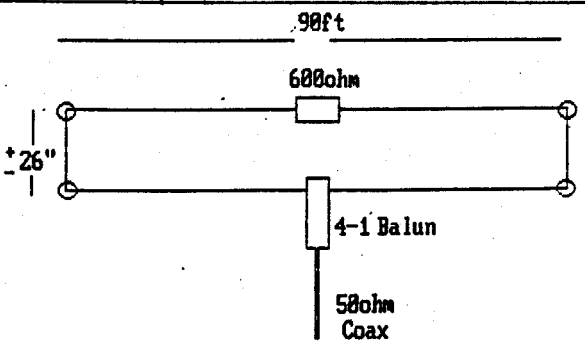
WHEN I AM SO SINCERE?

B&W BROADBAND ANTENNA

How many of you are familiar with a rhombic antenna. A lovely antenna, if you have the room. Well this antenna is a type of mini-rhombic and should fit into most average plots. You will loose nothing if you make it up because the lengths of wire are easily converted to a dipole.



B & W Mini-Rhombic reported to work best as a sloper or inverted. Main lobe favours the



Barker & Williamson

Best used as a sloper or inverted V.

Ideal for todays general coverage transceivers.

Typical SWR 1.4 : 1 to 2.8 : 1 depending on freq used, ground system and surrounding objects.

Best results by using an ATU.

Mount balancing network (600ohm resistor) inside a plastic cover (provide drain holes if sealed at ends)