

JULY
1993

Last months meeting, with a talk by OM Vernon, ZS1KS proved that antennas are still high on the interest table. It is a very complex subject and although Vernon tried to cover as many as possible 105 minutes wasn't enough and Vernon was left with a very dry throat making the tea a very welcome break. Maybe at some future date OM Vernon will address us again with a little more detail on some of the items he mentioned. Ragchew will also endeavour to get some copy from him.

Another point about the meeting was the fact that once again we had the pleasure of some wives. Maybe with the appropriate subject we will attract more of these good ladies who are welcome to bring their knitting to prevent their OM's from being blamed for that "wasted evening"!

These branch meetings are always open to visitors and we certainly see visitors on most occasions. Some of these visitors are not members for some reason or other and although we would like to see them as members it is not our policy to put pressure on anyone to join. To make this position a little more sociable it has been proposed that we have a new form of membership for the branch, namely Social Membership. Many other branches have Social membership so this item will be added to the agenda for our coming AGM.

A social member would not be a member of the league and would not enjoy the privileges such as QSL bureau, Radio ZS or voting rights. The social member would be able to vote on branch domestic affairs and would receive Ragchew.

Membership would be by invitation only and the member would be expected to make a donation of at least equal to the branch share of the League subs. These details will be discussed and decided at the Branch AGM. And that AGM is just around the corner. Remember, the future of the branch is in your hands and is only as good as the hands that guide it. Ros and her present committee have made significant changes and the branch has gotten back on an even keel with increasing membership and a general all round improvement. Lets make sure it remains so by getting the right people in those seats. Some members of the committee have indicated their retiring and will have

to be replaced at this coming AGM. Look around you and choose who you would like, to see sitting there. Its your choice, but remember the party must be a willing one. You can lead a horse to water but you cannot force him to drink.....ED

LETTERS

I suggest that one or more technical questions from the radio exam be included each month with suitable answers provided. This will give some insight as to what standard is required for the exam and also give us older hams something to work out and keep us interested. I'll bet that there are many questions that some of us are unable to answer, simply because we never had to. The exercise would benefit many.

Thanks for the idea Harold. Modern exam papers are now multiple answer type and are not too freely available but we will see what can be done.....to help you old timers to refresh the grey matter in the meantime read the constructors corner Hi!.....ED

When I started reading last months Ragchew, (May) I really felt bad, insulted, and touched. How could he have the audacity to call us all those names, and that on the air, sorry paper. After a while I cooled down by a few degrees and realised that the guy was right, we just sit there and pass comments and demand a decent Ragchew every month - after all we do pay our subs, don't we ?? Well, I for one shall endeavour to pass on some suitable material to help fill in those pages. We do appreciate the hard work that goes into it, even though we know you love it in spite of the moans and groans - Thanks again.....John ZS1AGH

I hate it.....But moaning brought results. Thanks John.ED

Thanks also to Helmut ZR1AGE who not only submitted the article on EMI even sent copy from a lazer printer. Must moan more often.....ED

WHEN ALL ELSE FAILS

Read the instructions

ANOTHER SECOND GENERATION CALL

In 1926 the call A4G became ZS1K. This call now belongs to OM Ronnie Gilmour but it was first issued to his dad way back in the good old days. His dad began his 'Ham' career in 1920. Ronnie took over the call in 1963 and relinquished his original call ZS1EV. (This call now belongs to Chris Latskey). Congratulations Ronnie and what about the 3rd. generation.....?

WORLD TIME

In order to keep our watches and clocks in time with the universe the powers that be have, from time to time, adjust the world time.

This event happens again this year and at midnight on June 30th you must advance your clocks by ONE second.

In order to maintain that beauty. All YL's must not daudle in going to bed less they loose one seconds worth of beauty. (That goes for OM's? too.)Ed.

BIRTHDAYS

Appologies to Denis ZS1R....He was missed last month and this was a most serious omission because it was his 90th Birthday. Says he doesn't feel any older. Sorry Denis.

For July.....ZS1023..ZS1228..ZS1237.
ZS1242..ZS1249..ZS1301..ZR1BFM..
ZS1AAQ..ZS1AAX..ZS1AAY..ZS1ABE..
ZS1ADS..ZS1AEH..ZS1AGH..ZS1CL..
ZS1HB..ZS1HL..ZS1IF..ZS1LM..ZS1MPP..
ZS1P..ZS1PH..ZS1PM..ZS1QL..ZS1QM..
ZS1TK..ZS1UJ..ZS1UM..ZS1WC..ZS1ZF..
Have a happy day all of you.

Our database still has gaps in the birthdates so if you arn't listed in your particular month then please pass me a note to get it updated.

NEXT MEETING

The next meeting of your branch will be held at the

Chess Road venue
at 20h00 on

MONDAY 28TH JUNE 1993

Listen to bulletins for information on the subject for this meeting. It WILL be interesting. Guaranteed!

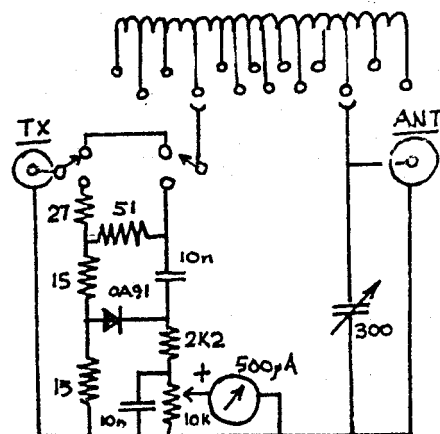
SIMPLE LOW POWER ATU/RF BRIDGE

For your transceiver to work at its best it needs to see the sort of load that it was designed for. Obviously the antenna should provide that load for maximum performance in which case the ATU shouldn't be needed but we are not always in a position to have that perfect antenna so this little project will be handy for those times and will do no harm being kept in the antenna circuit simply for the bridge reading. Experiments have shown the 'L' match to be the most consistent and is featured here. The bridge provides the transmitter with a constant load of approx. 46 ohms through the resistor network of R1,2,3,5, something many commercial, and home brew, SWR meters are lacking. For the beginner this is an ideal project for a breadboard layout and once perfected can then be built into a suitable box. To start off build the bridge section. This can be easily tested with a small amount of RF into the circuit. Adjust R6 for full scale on the meter, then place a 50 ohm dummy load across the output and the meter should fall to zero.

For the coil, use 40mm PVC waste pipe or similar. Windings are as follows using 22#swg. Wind on a total of 70 turns with taps as follows. (If you use bare copper wire use fishing nylon to separate the turns). For the first 10 turns put a tap in each turn, thereafter, one tap in each 10 turns. This will leave you with ten taps on the first 10 turns and six taps over the rest of the coil. If you are using enamel covered wire the taps must be scraped clean and tinned with solder. These taps can be selected by using a suitable switch, one for the first 10 taps and another for the remaining six, but in the good old home brew tradition make these taps available for manual connections using miniature crocodile or similar clips. A simple antenna for this completed unit can be made by using a quarter wave counterpoise (radial) on each band to be used, connect these to the earthy side of the output (ground). Then couple a 20m length of antenna wire to the coil and you will be able to load this on all HF bands. Use the following guide for the tapping points.

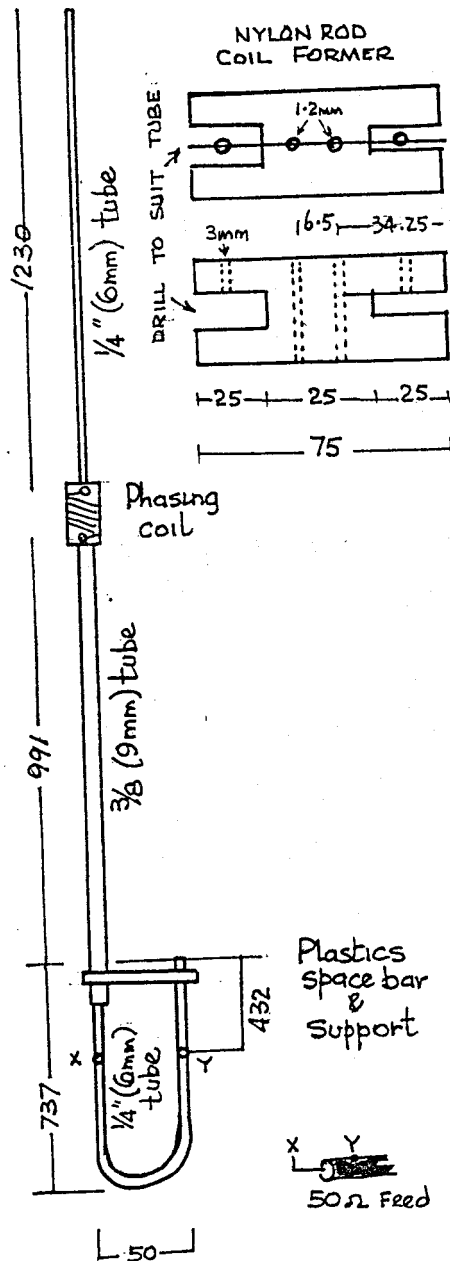
Freq	Tapping point.
1.95Mhz	16 turns
3.56Mhz	0 turns
10.14Mhz	3 turns
21.1Mhz	4 turns
28.1Mhz	1 turn?

Remember to switch the bridge out before transmitting as this will result in mini-grp power. Here's to some good DX!
PW Sept 1992



COLLINEAR FOR TWO

Collinear antennas offer advantages over normal quarter or half wave antennas. It gives good all round coverage and increased gain. The overall construction is shown in Fig. 1. It consists of the following:-
1M x 10mm Aluminium tube
1.23M x 6mm
1.7M x 6mm
160mm x 15mm dia nylon rod (or similar)
750mm x 20s.w.g. copper wire
Self tapping screws etc
Polyurethane varnish.
Refer to the drawing in Fig.1 for details of drilling the nylon rod. At the holes drilled for attaching the wire and clamping the elements file off a flat section to allow better clamping of the wire. The coil is formed by winding on 6 close spaced turns of 20# enamel covered copper wire. Leave long enough ends for connecting to elements. Remember to bare these ends. From your shopping list allow slightly longer lengths of tubing to allow for fitting between the two diameters and bending. The curve at the feed end should be 45 - 50 mm. When construction is completed the resistance between feed point and tip should be in the region of 0.1 ohm. Anything higher should be corrected. Waterproof the coil with two or three coats of varnish or similar waterproofing. Using clips for the feed points, connect your coax at the points shown in Fig. 1 and adjust for minimum SWR. At a frequency of 145,300 it should be possible to achieve a V.S.W.R of 1.1:1 or lower. Waterproof your feed points then mount the antenna as high and as clear as possible for a good all round performance.
PW Mar 1990



SMILING FACE COLLECTION

Packet users may be familiar with these faces but as most of you are not into that mode here is something that might interest the rest of your family.....

- :-) basic smily face.
 - B-) man with sunglasses.
 - 8-) lady with sunglasses.
 -]-) long hair in eyes.
 - (:-(bald man.
 - P:-(with left eye patch.
 - b:-(right eye patch.
 - :-(not so happy.
 - :-[robot face.
 - :-(long face.
 - :-) double chined.
 - :-[closed mouthed.
 - :> a sly guy.
 - B-> sly guy with sunglasses.
 - :) something smells.
 - :0 loud mouth.
 - :0 loud mouth digital expert.
 - :o talks out the side of mouth.
 - :-[extremely sad.
 - d-) smily wearing a baseball cap.
 - q-) baseball cap other way round.
 - d-(he just lost the game.
 - :>)- Smily wearing a tie.
 - B->)- Joe cool wearing a tux.
 - :>)... wearing shirt with buttons.
 - (:-[>.. Extremely sad wearing shirt w/buttons.
 - H-H--[] (:-(bald Ham is happy with his new rig, coax and stacked beams.
- *****
Can you add more to this list. I,d like to hear from you if you do....ED

WHAT'S IN YOUR MICRO?

Unlike other appliances, microwave ovens are rated according to their output, and not their input (or consumption). The stated 'wattage' is the power available to do the work - I wonder how a vacuum cleaner would be rated using the same method. There seems to be about 500w of heat and noise alone coming from the one around here!

The RF output of your micro oven is about half its power consumption, the rest being converted into heat, light, sound and motion. You can easily measure this output, provided that you have an accurate thermometer. Basically, what you do is measure the temperature rise of a precise quantity of water over a precise period of time. There are two standards that apply here so we will deal with the Japanese standard which applies to most micro ovens around. This uses two separate litres of water, and a heating time of two minutes. The temperature rise in C deg is then multiplied by 70 to give the power output in watts. You want the details?

Carefully measure the water into two low mass, non-metallic containers. Its temperature must be 20 deg C +/-5deg. Stir it and note the actual temperature to within an accuracy of 1/10th of a degree, and stand the two containers in the oven where the food normally goes. Heat for two, precise minutes, (not using the built in timer, set this in excess!)

Within 30 seconds of switching off the power, stir the water, and note the respective temperatures. Subtract these from the starting temperature, add together the results, and divide by two to arrive at an average temperature rise. Multiply this figure by seventy to arrive at the output, in watts J.I.S.

There are two points to watch. The heating period must not include the two seconds which your magnetron takes to warm up, so if you start your timing when you start the oven, make up for it by leaving the power on for two seconds at the end. Then there is the mains voltage to consider. If the output test is to be fair to your oven, you must carry it out at a time when the mains power is within 1.5% of normal (on load). Mains voltage can seriously affect the output of your oven; the drop in output power, expressed as a percentage, could numerically equal six times the percentage drop in supply voltage. In practical terms, this means that if your supply is down 5%, things can take 30% longer to cook. It does vary from one oven to another so there is no hard and fast rule. Some ovens will still work with the voltage as low as 198V where others will stop oscillating when the voltage drops to only 215V. If you find that your 650W oven is only pushing out 600W. If this is the case there is no need for concern because it probably came from

the factory like that. The output of an oven cannot be adjusted and ovens of the same make and design will vary because of different tolerances in the components. Factory standards allow a 15% difference. If your oven performance has dropped away significantly there is nothing that you can do to improve it. If it is a faulty component then it must be serviced by a fully trained microwave technician. The innards of a microwave oven are a prohibited area for everyone except those who are skilled in that particular line of work. Voltages inside these boxes are extremely dangerous and for this reason you cannot buy a spare lamp if it entails removing the case to fit it. So now you know why you need not measure your ovens performance. There is nothing you can do to improve it anyhow. Simply cook and enjoy.

CONSTRUCTORS CORNER

by One Decibal

I was recently asked by a friend to have a look at a receiver he had built up from a kit bought from a local (Div 6) source. All he had been able to receive was all the SABC VHF FM stations all on top of one another. The receiver is intended to receive the Airband signals which are AM and are between 118mhz and 127mhz.

After many hours of checking and replacing of some of the components, I came to the conclusion that the problem was that the signals from Constantiaberg were swamping the front end and that there was a design problem. The friend who had made up the kit lives very close to Tygerberg.

This experience prompted me to have a go at building a receiver to monitor these frequencies. After a little experimenting I have ended up with what I consider to be a very simple unit that does, however, work very well. It consists of :-
Front end (RF amp and tuned circuit) consists of a BFR 91 amplifier and a five stage band pass filter which is tuned by 5 varicap diodes by setting the voltage with a variable resistor (pot).

I did not actually build this section but removed it (by hacksaw) from one of the Servitek VHF boards from my junkbox. A lot of these boards are lying around the shacks of Cape Town. This is the most critical part of the receiver and it works magnificently and overcomes any breakthrough problems. The peaking is very sharp.

Mixer and local oscillator consists of a NE602 and is very simple to build. The oscillator is tuned by a varicap diode and a 10k pot. Because of the wideness of the AM signals stability is not all that critical.

The first IF is a very basic circuit using a 40673 and a manual gain control. I used 450khz AM type IF transformers on each side of this stage to give some filtering

and this proved to be adequate.

Second IF and detector stage with AGC uses a ZN414 chip which is of course a complete AM radio.

Audio is catered for by a LM386 as a preamp and a LM380 as the final amplifier. I have found that no squelch is necessary as AM at VHF is incredibly quiet. Like all my projects (I never finish them) I am now busy with an additional section that will provide for various fixed channels to be scanned automatically but I will leave details of this for a later article - if it works.

AIR-CORED BALUN

By John ZSLAGH.

It is well known that the most practical load for a transmission line is an antenna, which will normally be balanced i.e. constructed symmetrically with respect to the feed point. A balanced antenna should be fed by a balanced feeder system. We often manufacture 'home brew' dipole antennas and then feed them with co-axial cable. The dipole antenna, if carefully made, is a balanced load, where as the co-axial cable constitutes an unbalanced feeder. To correct this balanced to unbalanced state we use a 'BALUN'. Balun is an acronym from BALanced to UNbalanced. Not meaning to insult anyone, I feel that the commercially available baluns are much too expensive.

We can reduce our expenses by making a balun that is just as good if not better than the well known models moulded in plastic. What is under that plastic moulding? Who knows? Maybe we should ask OM Bob ZSLABO to open one, he has two that are cracked.

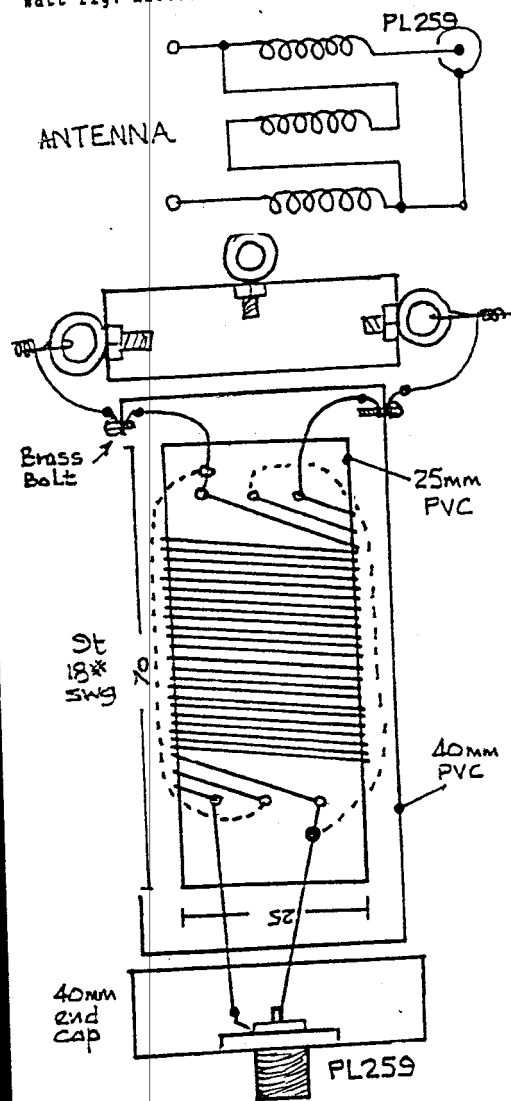
Requirements as follows.....

- 3 x 1mtr pieces of #15AWG(#18BSWG) wire
- 1 x 70mm piece of 25mm PVC pipe
- 1 x 150mm piece of 40mm PVC pipe
- 2 x PVC end caps for 40mm PVC pipe
- PVC Weld (Tube is best, longer shelf life)
- SO-239/or suitable coax socket
- Suitable screws/bolts for socket
- 3 x 5mm brass eye bolts
- 6 x 5mm brass nuts

A few simple calculations of the above will show that your balun will certainly be inexpensive.

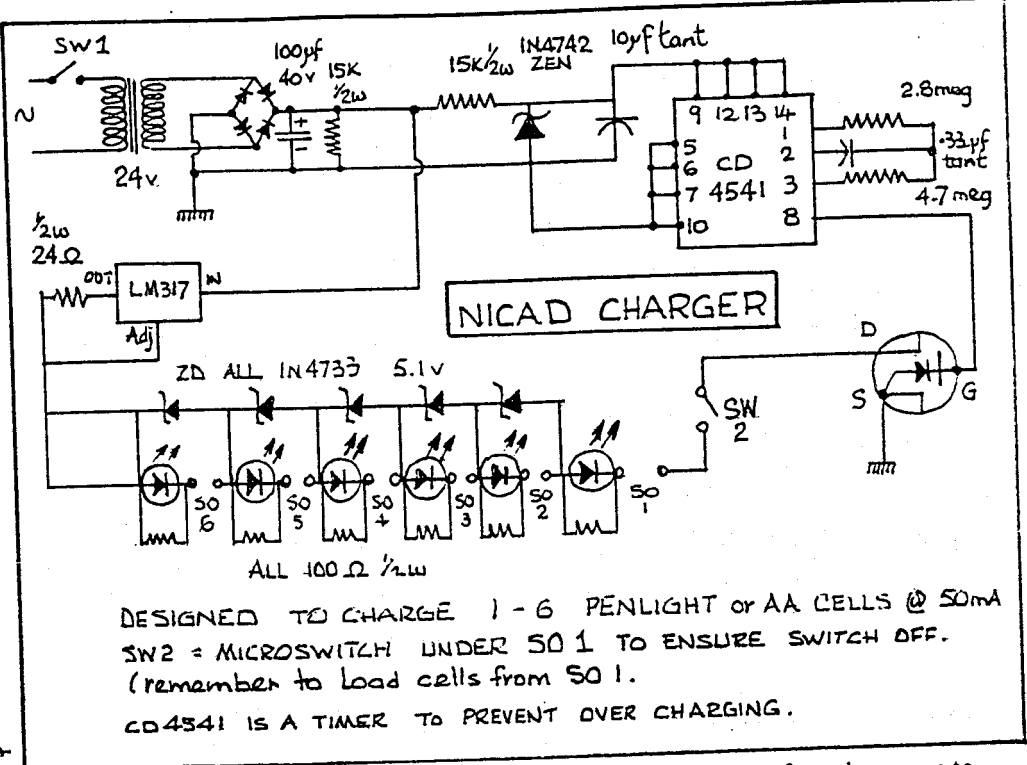
Study the accompanying drawing and when you are absolutely certain of yourself drill the 6x1.5mm holes in the 25mm PVC pipe. Next you need to stretch the copper wire slightly to ensure there are no awkward kinks or bends. Place the three pieces of wire next to each other and wind 9 tri-filler turns on to the 25mm PVC pipe feeding the ends of the wire through the 6 1.5mm holes and pulled tight. Configure these ends to correspond with the drawing. The windings can be sealed with a suitable adhesive. The antenna anchors (2 eye bolts) are secured at one end of the 40mm PVC pipe allowing space for the end cap.

attach the appropriate ends of the windings to these eye bolts using solder tags. The third eye bolt is mounted in the top end cap as a support for the whole antenna. Ensure a good bond when fixing cap. The other end of the bi-filler winding is attached to the coax socket which in turn is attached to the bottom cap. On completion of this neat, waterproof and cheap balun attach the antenna to the eyes, hoist it up and get on the air for those 5x9 reports from a happy, loaded 100 watt rig. Hic!.....



NICAD BATTERIES

In the January edition of Ragchew we looked at the upkeep and care of nicad batteries. There was supposed to be a follow up in February but alas the book from whence the article came has done a mysterious disappearing act so unless I can come to grips with it again the article will have to be shelved. However there are several very good charger circuits available so don't despair. Those of you who attend the meetings will remember the charger that John ZSLAPY brought to a 'home brew' evening. I have the details for that one. Being rather big for reproduction in this newsletter I shall have copies made for whoever would like to have a go at building it. John is very happy with its performance.



DESIGNED TO CHARGE 1 - 6 PENLIGHT or AA CELLS @ 50mA
 SW2 = MICROSWITCH UNDER 50 1 TO ENSURE SWITCH OFF.
 (remember to load cells from 50 1.
 CD4541 IS A TIMER TO PREVENT OVER CHARGING.

Electromagnetic Interference

This Information is conceived in close co-operation between Maritime and Industrial Services and Interference Control Technologies, Inc. (ICT).

Requirement for electromagnetic compatibility and its crucial role in operational performance of electronic systems used to be largely underestimated if recognized at all. Some still think that EMI (electromagnetic interference) will go away if swept under the carpet while the others develop a syndrome called "it is not going to happen to me".

What Is Electromagnetic Interference

Electromagnetic interference (EMI) is an electrical noise which creates a disturbance or undesired response in one or more circuits, equipment or systems. EMI is a generalization of an older term, radio-frequency interference (RFI) which is defined as covering the 10kHz to 300GHz part of the spectrum. The term EMI was selected about 20 years ago to broaden the meaning and usefulness of RFI and cover the whole spectrum from dc onwards.

How EMI Problems Evolve

An electromagnetic interference problem can result when there is a source, victim and a coupling path for interference energy to flow from the source to the victim. Any time these three elements are brought together, an EMI problem will result.

Coupling paths account for many ways

EMI energy can get from the source to the victims. Both conducted and radiated coupling are involved and these are the most difficult part of EMI.

Degrees Or Levels Of EMI

EMI comes in all degrees from barely perceptible to catastrophic. In general, EMI is divided into three levels: nuisance, intermediate, and catastrophic. Nuisance EMI is illustrated when an electric shaver or food mixer causes disturbance to portable telephone, radio or TV services. The nuisance usually lasts only for seconds or a few minutes and causes no damage.

Catastrophic EMI exists when radiation from a radar triggers ordnance on an aircraft carrier or when two 747's collide on the ground due to garbled radio messages from the tower. loss of life or extensive property damage is usually involved.

Most of situations fall in between these and are classified as an intermediate EMI. Examples include radiation from pagers causing interference to computers, electrostatic discharge (ESD) disturbances to microprocessor based industrial controls and lightning upset conditions to sensitive equipment.

(This information is reproduced with the kind consent of Maritime and Industrial Services Ltd. For further information please contact the editor)

Next time: EEC directives on EMC and more.....

Regards
 Helmut ZRIAGE