OFFICIAL NEWSLETTER OF THE

BORDER RADIO CLUB

EAST LONDON

APRIL 2010

FEEDBACK

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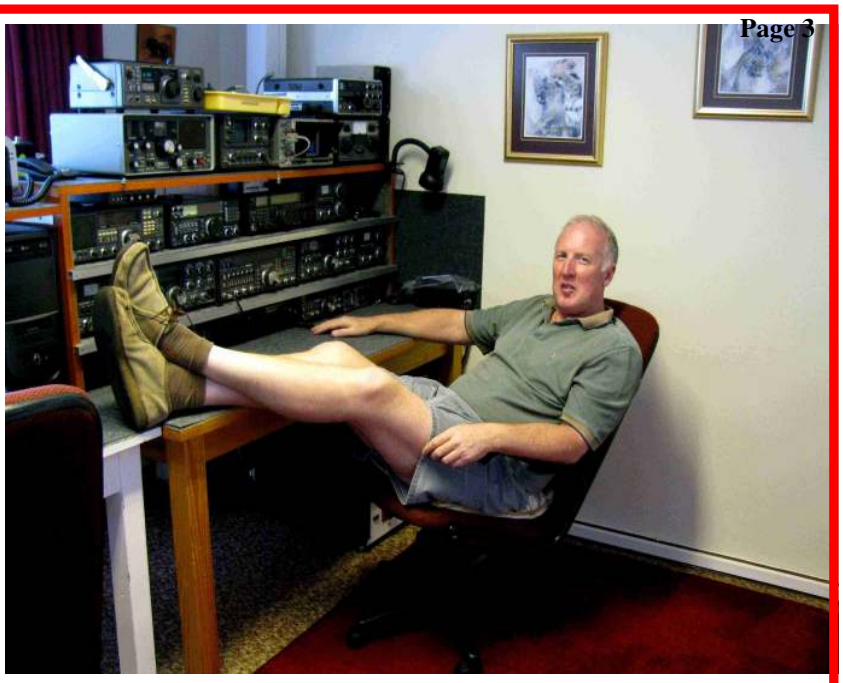
HOW LAYBACK CAN YOU GET

Garth ZS2AAR

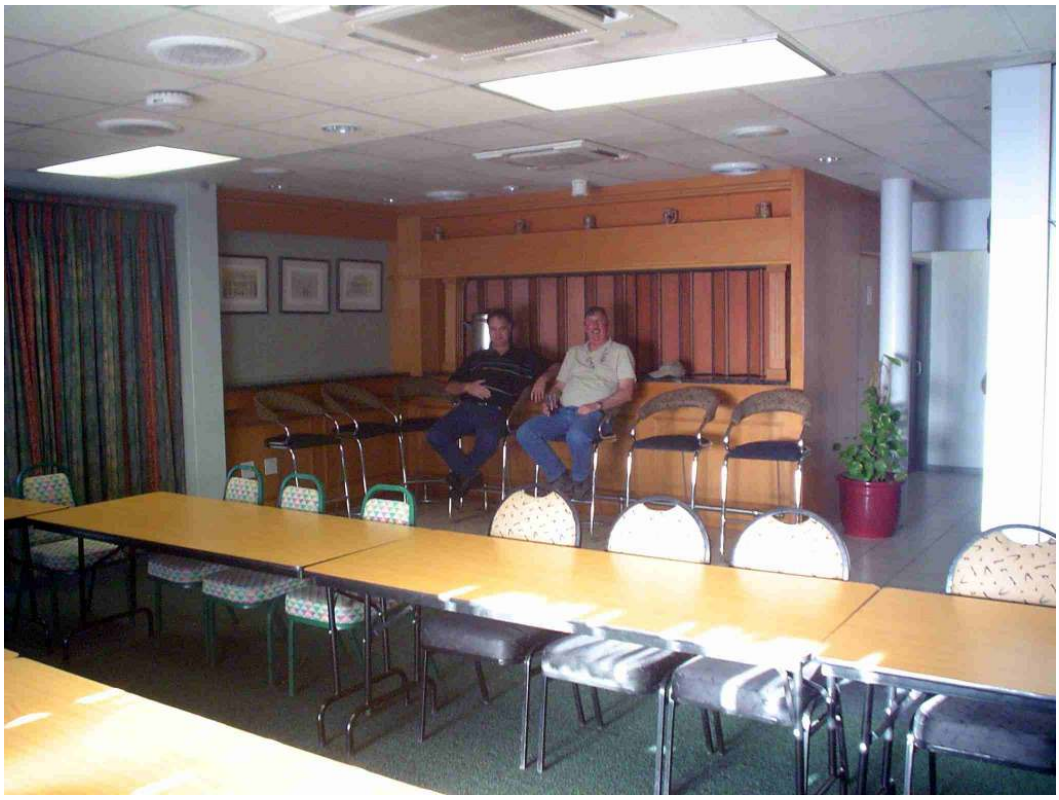
RELAXING WHILST RELAYING THE BULLETIN ON A SUNDAY MORNING

"Life gets easy when you know how"



Ken wood ZS2KW
Went to the doctor for a routine check up last month and ended up in hospital where he underwent Triple Heart bypass surgery. He is doing as well as can be expected. We all send him our sincere greetings and a speedy recovery.

Clarence ZS2CDC resigned last month as Secretary and committee member.
We thank him for his support and service to the club.



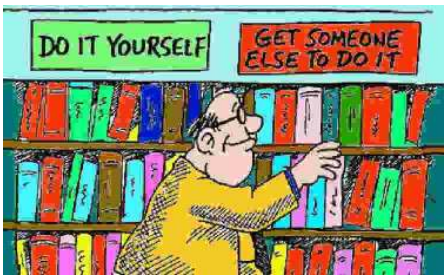
Ivan ZS2ILN and **Anthony ZS2BQ** waiting for the Pub to open (we had all gone home). They will have a long wait as the Venue's management have banned all alcohol on their premises and closed the bar.
The club would like to move to a new venue where a licensed bar is available (It helps to make the boring speeches go down easier, Hi). If you know of any place that would accommodate our clubs monthly meeting then give your chairman the details. Don't forget, it must be cheap or for free, have a bar and over head projector facilities preferred

BIRTHDAY

APRIL	10		Sandy	Miller	Jim ZS2JM
	15	ZS2LEN	Len	Lotter	
	17		Hennie	Barnes	Chris ZS2S
APRIL	8	ZS2NB/ ZR2AW	Nick & Aloma	Basson	
	9	ZS2BQ	Anthony & Suzette	Forteath	

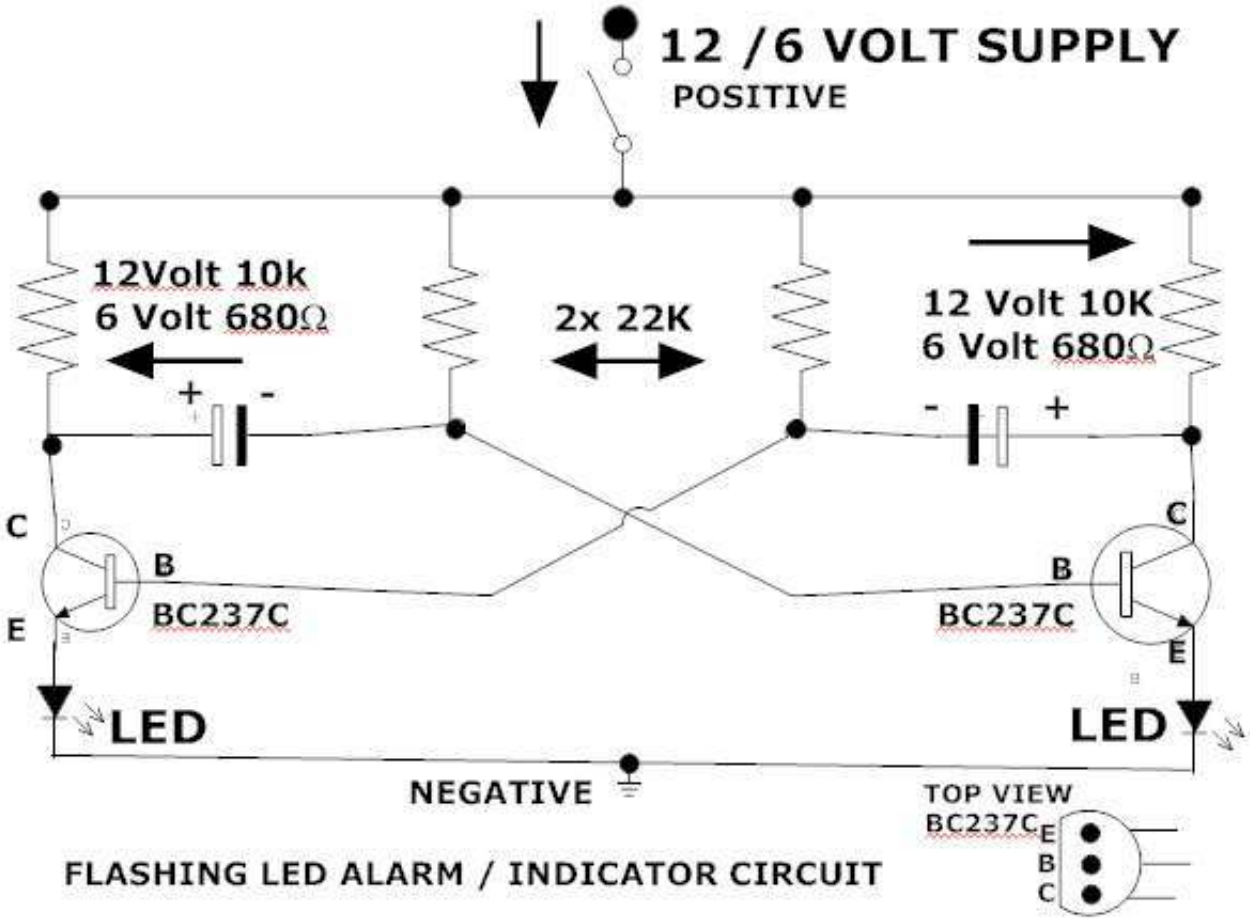
ANNIVERSARY

DON'T BE ALARMED



This is a small gadget I put together many years ago and it has been working day & night ever since.
It can be used as an imitation alarm or as an indicator for a real alarm.
By changing two resistors it will work off 6 or 12 volts making it very versatile.
The transistors and other components are cheap and common therefore affordable and easy to find. Experiment with the R & C values and the Flash rate will alter to suit your own requirement. The LED's can be any colour
Cheers Peter ZS2ABF.

WHY DON'T YOU BUILD SOMETHING SIMPLE



FLASHING LED ALARM / INDICATOR CIRCUIT

ZS2ABF

FIELD STRENGTH METER

D-I-Y

A field strength meter is perhaps the simplest piece of RF test equipment that can be built. Used for checking transmitters, antenna experimentation, and testing RF oscillators, field strength meters provide an indication of the presence of RF energy. They are not frequency sensitive and are useful where indication of a change in level is more important than the actual strength of the signal indicated.

Figure One shows a schematic of an RF field strength meter. Like a crystal set, it requires no power source. However, unlike a crystal set, the meter has no tuned circuit. It responds to signals of any frequency.

The meter works by converting any RF signal present at the antenna to a DC voltage. This voltage drives a meter movement to give an indication of relative RF. The meter includes a control to reduce its sensitivity where required.

Because it uses few parts, a printed circuit board is not necessary; components can simply be soldered to one another. However, a box is desirable for operating convenience. The case and aerial from a discarded toy walkie-talkie was used in the prototype (see photograph), though any small plastic case will suffice. The meter movement need not be large; we are only detecting the presence of RF, and not making precise measurements.

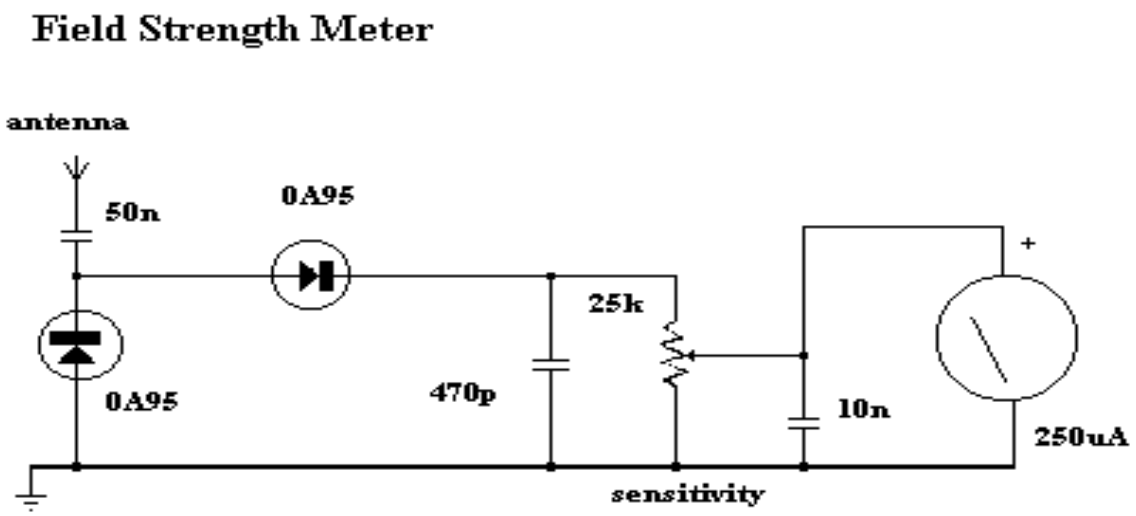
A meter from an old radio or tape recorder should work fine. The diodes can be any germanium type; the actual part number is not important. Germanium diodes can be recognized by their 6mm-long clear glass case with two coloured bands towards the cathode end. None of the component values shown are critical; a 50 percent variation would have little effect on circuit operation.

To test the operation of the meter, a transmitter is required to provide a source of RF. Placing the field strength meter's extended antenna near a handheld VHF rig should produce an indication on the meter, assuming that the sensitivity control has been set to maximum. No indication means that the meter is not working. Common construction errors include connecting the diodes or the meter wrongly and using silicon diodes in place of the germanium diodes specified. In this case, the meter will still work, but with reduced sensitivity. The earth wire is optional; when working with low-powered oscillators, it is useful to clip it to ground (of the circuit under test) to ensure a better indication on the meter.

Those without a transmitter can use an RF signal generator or crystal oscillator (such as that described later) for testing purposes. In this case, place the meter's antenna directly on the output terminal to verify operation. However, only attempt this with transistorised circuitry; component ratings and safety considerations make the meter described here unsuitable for poking around valve equipment.

The field strength meter is a useful instrument in its own right, but it can be made more versatile. Modifications include adding an amplifier (for greater sensitivity), including a tuned circuit (so it only detects signals in a particular band), or converting it into an RF wattmeter and dummy load. Circuits for such instruments are found in the standard handbooks.

Figure One



Thanks to VK1PK

INTRODUCTION TO PACKET RADIO - Part 16 - by Larry Kenney, WB9LOZ

In this part of the series, let's do some reviewing. I'm going to present a short quiz on packet radio covering the basics that I've presented in the past parts of this series. Let's see how well you can answer the following questions without looking back for the answers. In Part 17 I'll discuss each question and give you the correct answers.

1. What are the three TNC modes of communication?
   a. Connect, Converse, Terminal b. Command, Converse, Terminal
   c. Command, Converse, Transparent d. Command, Connect, Transparent

2. What TNC command is used to set the transmit path for beacons and CQs?

3. What is the TNC command CHECK used for?

4. While you're connected to another station, what command is used to monitor other traffic on the frequency?

5. If you saw one of the following lines on your screen when in monitor mode, what would the asterisk indicate?
   W6ABC-3>N6XYZ,W6PW-1*: Hi Bob W6ABC-3>W6PW-1*>N6XYZ: Hi Bob
   (Displays vary with various TNCs, so both common types are shown.)

6. Why does the packet node network improve communications compared to the use of digipeaters?

7. If you're connected to a station in New Mexico using the node network, how do you disconnect?

8. If N6ZYX-2 connected to you via a node, what would the SSID of the station become at your end of the connection?

9. When you're connected to another station, what are the two most probable causes for packets to NOT be received by the other station?

10. There are several basic commands used on a packet bulletin board system. Indicate what you would enter to perform the following: a. Receive a list of messages.
    b. Read message 47134. c. Download a file in the General (ID G) directory called FCCEXAMS.LST.
    d. Enter a personal message to Jim, WA6DDM, who uses the W6PW BBS in San Francisco, California.
    e. Change your home BBS from W9ABC to W7XYZ.

11. To send an NTS message via packet addressed to Tom Smith, 123 Main Street, Keene, NH 03431, telephone (603) 555-4321, what would you enter at the BBS prompt?

12. If a message has a STATUS of BF, what does that indicate?
13. When sending a bulletin, what is the most important thing to remember when entering the SUBJECT?

14. If you wanted to send a message to your friend John, W4IP, but you didn't know what the call of his home BBS was, what could you do to try to find out what the call is?

15. What is the maximum value for MAXFRAME? If you're working a station on 30 meters and are sending a lot of retries, should you increase or decrease MAXFRAME?

Well, how did you think you did? We'll take a look at the answers to these questions and more in part 17.

- - - -

ZS2J

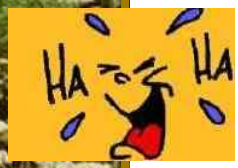
ZS2NP LOOK ALIKE

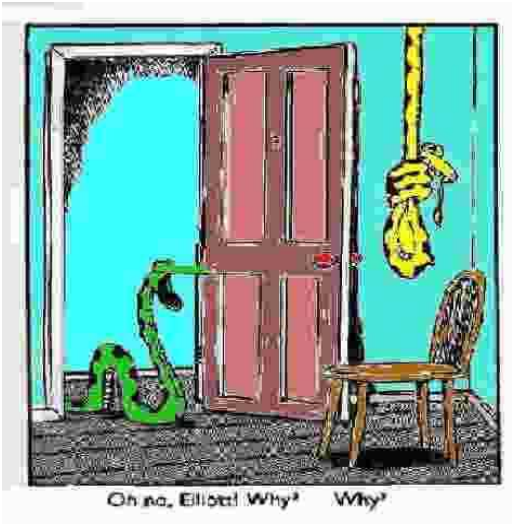
Phil did you loose your
Cap, Shirt and Coat ?
Don't forget, Finders Keepers.

Which only leaves you with your
Nylon Panties to wear at the BRC

ZS2NP

WE ARE NOT POLITICAL BUT, A PICTURE IS WORTH A THOUSAND WORDS





Laws Newton Forgot

LAW OF QUEUE: If you change queues, the one you have left will start to move faster than the one you are in now.

LAW OF TELEPHONE: When you dial a wrong number, you never get an engaged one.

LAW OF MECHANICAL REPAIR: After your hands become coated with grease, your nose will begin to itch.

LAW OF THE WORKSHOP: Any tool, when dropped, will roll to the least accessible corner.

LAW OF THE ALIBI: If you tell the boss you were late for work because you had a flat tyre, the next morning you will have a flat tyre.

BATH THEOREM: When the body is immersed in water, the telephone rings.

LAW OF ENCOUNTERS: The probability of meeting someone you know increases when you are with someone you don't want to be seen with.

LAW OF THE RESULT: When you try to prove to someone that a machine won't work, it will!

LAW OF BIOMECHANICS: The severity of the itch is inversely proportional to the reach

LAW OF COFFEE: As soon as you sit down for a cup of hot coffee, your boss will ask you to do something which will last until the coffee is cold

When you are allowed to say the "F " word

Contributions made by South Africa to the development of telecommunications

DATED 1972

CONTINUED AS PART 3

A F Bennett

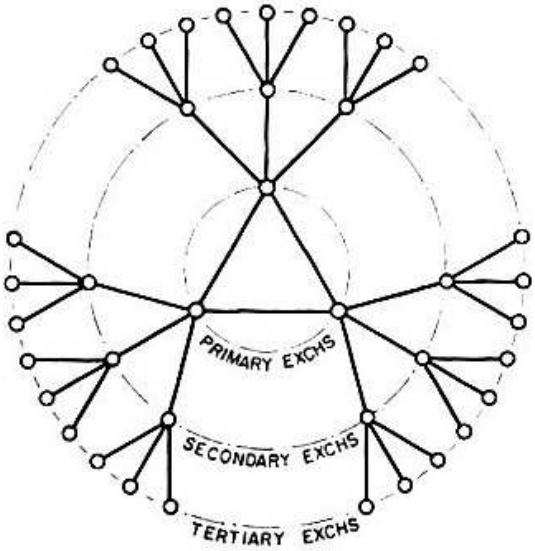


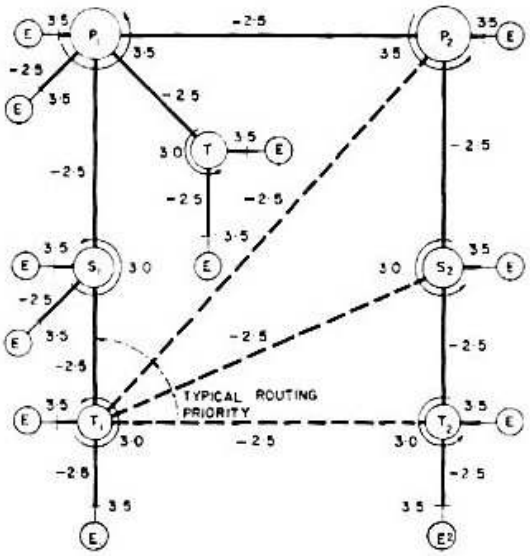
Fig 6 Basic national dialling plan

There are (including South West Africa) six primary switching centres each with a number of secondaries and tertiaries.

Switching is carried out on a 4 wire basis on all trunk circuits. This improves the stability of the system and greatly facilitates the maintenance of the planned transmission equivalents. The overall target transmission equivalent is 16 dB. This is achievable except in a small fraction of cases where the cost of rigid compliance would be economically unrealistic. The plan is designed to realise the best practical equivalent on every call rather than a uniform figure. The basic 4 wire transmission plan is shown in Figure 7.

Right at the outset, the plan had to include a complete national numbering scheme, a signalling system which will ensure reliable operations over all types of circuit and a charge structure based on the well-known variable time interval system.

The plans laid in the early 1960's are still being implemented today and at this stage about 60 per cent of all trunk calls are dialled by the subscribers themselves. Public response to the system has been so great that it would seem there are never enough circuits no matter how lavishly they are provided.



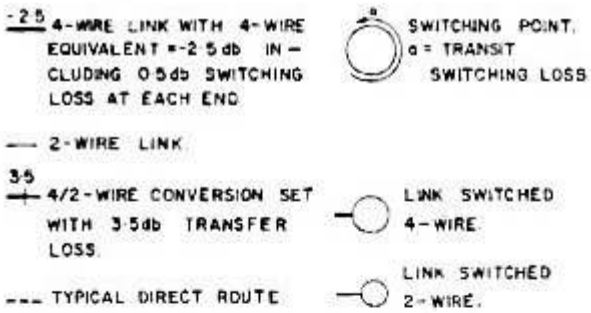


Fig 7 Basic four-wire transmission and routing plan

8 VHF Broadcaster

In the years following the Second World War, the South African Broadcasting Corporation commenced a study with the object of providing complete interference-free broadcasting coverage of South Africa at will, with 5 or 6 simultaneous programmes radiated on a National or Regional basis. The work that led up to the decision to use very high frequencies is well covered in H O Collet's Presidential Address to this Institute and published in full in the April issue of its Transactions in 1966. However the project had to wait, in the post war era, until a transistor capable of operation up to 108 MHz was available. The receiver intended for the Bantu had to be transistorised because they could only afford the batteries required by such a receiver and could not have afforded the batteries necessary for a valve receiver. This transistor became available in August, 1959 and this triggered off intense activity on the part of the SABC in an endeavour to find a frequency assignment plan which would be able to serve the whole country and be capable of providing the whole population of South Africa with high quality interference-free reception of several programmes simultaneously. The standards set for such a system were soon determined but as no country had yet put into operation any really satisfactory frequency assignment and transmitter distribution scheme it was difficult to know how to tackle the problem. Broadcasters had merely attempted to replace the old medium wave system by a VHF system with somewhat haphazard distribution of transmitters and not a very carefully planned frequency selection. No-one, it seems, had planned for as many as 5 or 6 simultaneous programmes to be radiated from each transmitting station.

H O Collett and the late B J Stevens made a tour of Europe in search of inspiration but, only when they came to the Institute for Ründfunk Technik in Hamburg, Germany, did they feel they really had found the answer. The engineers and mathematicians in the institute had evolved a methodical scheme which our two South Africans were quick to realise offered a solution to their

problems. It offered a geometric distribution of transmitters and a very handsome frequency channelling scheme.

This scheme involved the development and checking of some 2 000 to 3 000 possible frequency assignment plans. All but 5 were abandoned for one reason or another. Only a computer could decide which of the 5 was to be the best. A very powerful computer in Stockholm spent 4 hours working on this assessment and finally it nominated one as being as much as 20 per cent better than the best of the others. Thus this scheme was adopted for South Africa. Later, the African VHF/UHF Broadcasting Conference held in Geneva in 1963 accepted the same scheme for the whole of the African Broadcasting Area.

Of course no purely geometrical grid scheme of transmitter distribution could be applied blindly but, with a little distortion here and there, it was applied in South Africa. This was the first time in the world that such a geometric distribution of transmitters had been used and it met with outstanding success.

South Africa's broadcasting requirements were most exacting and demanded a high degree of ingenuity and vision on the part of the engineers trying to meet those demands. Very few administrations have attempted to provide 5 to 6 simultaneous programmes of a varied regional and national character. The studio equipment required to meet the high technical standards set by the SABC engineers could not easily be obtained overseas nor could it meet the requirement of early delivery which always seems to be the most important factor. The SABC was forced to design and build its own studio equipment, an approach which met with outstanding success, over the years since the end of the Second World War.

9 Radio frequency predictions and the study of the ionosphere

Until the advent of the Cape Town-Lisbon submarine telephone cable, South Africa was entirely dependent on high frequency radio for its external (other than to adjacent territories) communications For the successful operation of such systems on a 24 hour-a-day basis, it is important that frequency predictions be available not only on a day to day basis, but also for the long term so that frequency complements can be planned and registered and equipment prepared. To be able to do this, the National Institute for Telecommunications Research, or the Telecommunications Research Laboratory as it was known when it was established in 1946, undertook the study of the ionosphere and the publication of predictions to various organisations using radio waves.

One of the first requirements in the study was the building of an ionosonde to probe the ionosphere and measure the heights of the various reflecting layers. Before the single sweep ionosonde developed by T L Wadley, ionosondes had been mechanically clumsy instruments operated by switching from one waveband to another. However, the new NITR instrument, which has been widely copied, could now cover the entire frequency range in a single sweep.

The ionosondes set up in Cape Town and Johannesburg are still in daily use. Data obtained from them are sent all over the world and maps are prepared for the purpose of obtaining optimum frequencies for worldwide high frequency radio propagation predictions. While on the subject of ionosphere measurement, it should be recorded that a world first was achieved by J A Fejer who was at that time working with the NITR in the study of the D-region of the ionosphere. Because medium and low frequency radio waves are reflected with enormous absorbtion and high frequency waves penetrate the D-region, it is extremely difficult to make height measurements of the region. Rockets can be used but they are expensive and cannot give information continuously. Fejer devised a novel and ingenious method of obtaining height resolved measurements of the D-region parameters by studying the cross-modulation between two high frequency waves.

J A Fejer, from meticulous observation made by the NITR of Russia's first Sputnik, calculated, very early in its relatively brief flight around the earth, the date when it would re-enter the earth's atmosphere and burn out. While the rest of the world's scientists were constantly amending their predictions, Fejer steadfastly stuck to his prediction, which eventually proved to be substantially correct.

The study of the ionosphere nevertheless goes on with South African scientists well in the fore. Here the work of Professor J A Gledhill of Rhodes University and D G and M R Torr is of considerable importance. The earth's magnetic field is at its lowest in the South Atlantic region, thus the radiation belt particles descend lower into the atmosphere in this region than anywhere else around the world, consequently their effects are likely to be more pronounced. South Africa and its research base, 'Sanae' in the Antarctic, is very favourably situated to study this particular phenomenon and has been able to provide the world with much valuable data in this connection.

10 Radio frequency generation

Soon after his success with the single sweep inosonde T L Wadley[7] commenced work on a communication radio receiver with continuously variable tuning but with the stability and accuracy of a crystal. At the beginning this receiver did not stimulate much interest until the British Armed Forces became interested and a British Company commenced manufacture under licence in 1956. In a period of 11 years, some 10 000 receivers of this type in various forms have been sold to various customers around the world while a small number have been built in the USA and in India. A very small number of these receivers was made by a South African firm, but it was left to the British firm to take manufacture seriously and earn R7 500 000 from the invention. Although this receiver turned out to be most successful, the basic principles involved when employed in a frequency synthesiser evoked immediate interest. They have been used as the basic transmitter frequency determining modules most successfully in numerous radio stations and in particular in the Post Office transmitting station at Olifantsfontein. Both the receiver

and the frequency generator owe their success to an ingenious method of selecting any desired harmonic from a relatively low frequency crystal. In the case of the receiver the crystal frequency is 1 MHz while the generator uses a 100 kHz crystal. Interpolation with good stability between crystal harmonics is relatively easy and thus a receiver or generator of near crystal stability is achieved.

The design of the frequency generation circuit is such that whether used as the basis of a communication receiver or a frequency synthesiser for radio transmitter operation, frequency setting aids have effectively long linear scales and can be calibrated to read the frequency directly. As long ago as 1954 a paper was presented to this Institute describing in detail the principles on which the device is based.

11 Radar

By definition, radar can be classified as telecommunications in that it involves the transmission and reception of signals. However, the signal itself conveys no intelligence, but the time taken for the signal to pass from transmitter to receiver can be measured and information extracted from that measurement. This then is radar and the purposes for which it is used in the guidance of ships and aircraft are well known.

T L Wadley used the radar technique to produce his now world renowned Tellurometer. This invention was the direct result of a request made in 1954 by Colonel Baumann, then Director of Trigonometrical Survey, for a man-portable equipment for distance measurement over ranges from 5 to 50 km with an accuracy of 1 in 100 000. A brief six months later a prototype equipment was ready for field trials and after a further six months, the 'Tellurometer' was ready for final pre-production development. This equipment weighed 14.5 kg and was accurate to within 5 cm ±3 parts per million. In 1956 a company was formed in South Africa to manufacture these devices and in January, 1957, the first Tellurometer was completed. Since then, although there have been improvements, variations and copies, there has been no fundamental change in the basic system and no alternative radio system has as yet been devised to compete. This equipment is manufactured under licence in a number of countries, but South Africa remains the main supplier, and the sole supplier of the military version which has been supplied to the armed forces of six major countries. Total sales of this highly specialised equipment exceed R15 000 000.

The accuracy of the microwave device was more than adequate for its purpose i.e. the measurement of relatively long lines of from 5 to 50 km, but it was recognised that for measurements in the field of civil engineering even greater accuracy was necessary. This led to the development of an infra-red system with an accuracy of 1 to 2 mm. Such a system was developed in 1968 and is now in on the world market.

Another application of radar principles, but having a very different objective, is a device developed by M C Hodson[10] for the measurement of rainfall over a wide area to assist the study of terrain for catchments, dams and waterways. This equipment, while not yet in production, has evoked considerable interest in other countries and will be a useful tool in this water-starved country of ours.

12 Conclusion

I have attempted to show that over the whole field of telecommunications South African scientists and engineers have made a remarkable contribution to the art. As one would expect in a small young country, more work has been done on application rather than on basic pure scientific research, but whether the ideas were original or not, South Africa's engineers were quick to assess the possibilities and if found good, to adopt them. Many new ideas have made their debut in South Africa and it is no idle boast to say that techniques employed here are as modern as tomorrow.

END

Fig 8 Infra-red distance measuring device

EDITOR: Please excuse the poor copy of this article. It was published in 1972 and was very difficult to reproduce. In future this quality of material will not be printed

SLOW SCAN TV - known as - SSTV

Are you tired of doing the same old chatting and nothing new to talk about? Yes I am sure you may be. Then to put that extra Spice back into your Radio life join the ranks of the SSTV enthusiasts.

You must have a Transceiver and nearly all of you have a Computer. Now all you need is to connect both together with the appropriate interface that joins and isolates to two. If you wish to transmit as well as receive ,then you will have to connect a simple one transistor and a couple of components that will switch the PTT on/off . Next you will need to install some Free SSTV software onto your computer. Start with MMSSTV or SSTV Pal Multi- Mode for XP and you will be able to capture and TX in the Analogue mode.

Of cause you will have to add a few pictures to the software's directory so that they can be transmitted. If you are a little artistic you can draw/design your own unique picture.

The most popular place on the bands to look for "Picture Signals" Is 14.230 MHz USB.

This is one of those dedicated spots that everyone heads for. We operate above and below this frequency after contact is made. In my neck of the woods, as traffic is very sparse we seem to stay in one place during the exchange of pictures. Sometimes you receive 599 signals that give good results and at other timers the pictures are poor and not always readable.

This is part of the fun hoping that Conditions will improve allowing you to receiver a perfect picture. The further the two stations are apart, the more chance there is of interference being picked up and added to the SSTV signal so giving marks and lines on the picture. Examples are shown above and below.

This is my favorite mode of operation on the digital modes. It also gives me a chance to hone my artistic skills when putting together a self composed picture. I have over 300 in my transmit directory.

Here are examples of signals that were received "On Air".

This is not intended to show you how to do it all. It is just an article to get your interest. My SSTV friend Chris ZS2CH and I invite you ALL to join us on 20 MTs (14.230MHz USB) from 0800Z to 10:30Z every Sunday morning and swap pictures. We will also walk you through the setup of the above programs if you so require.

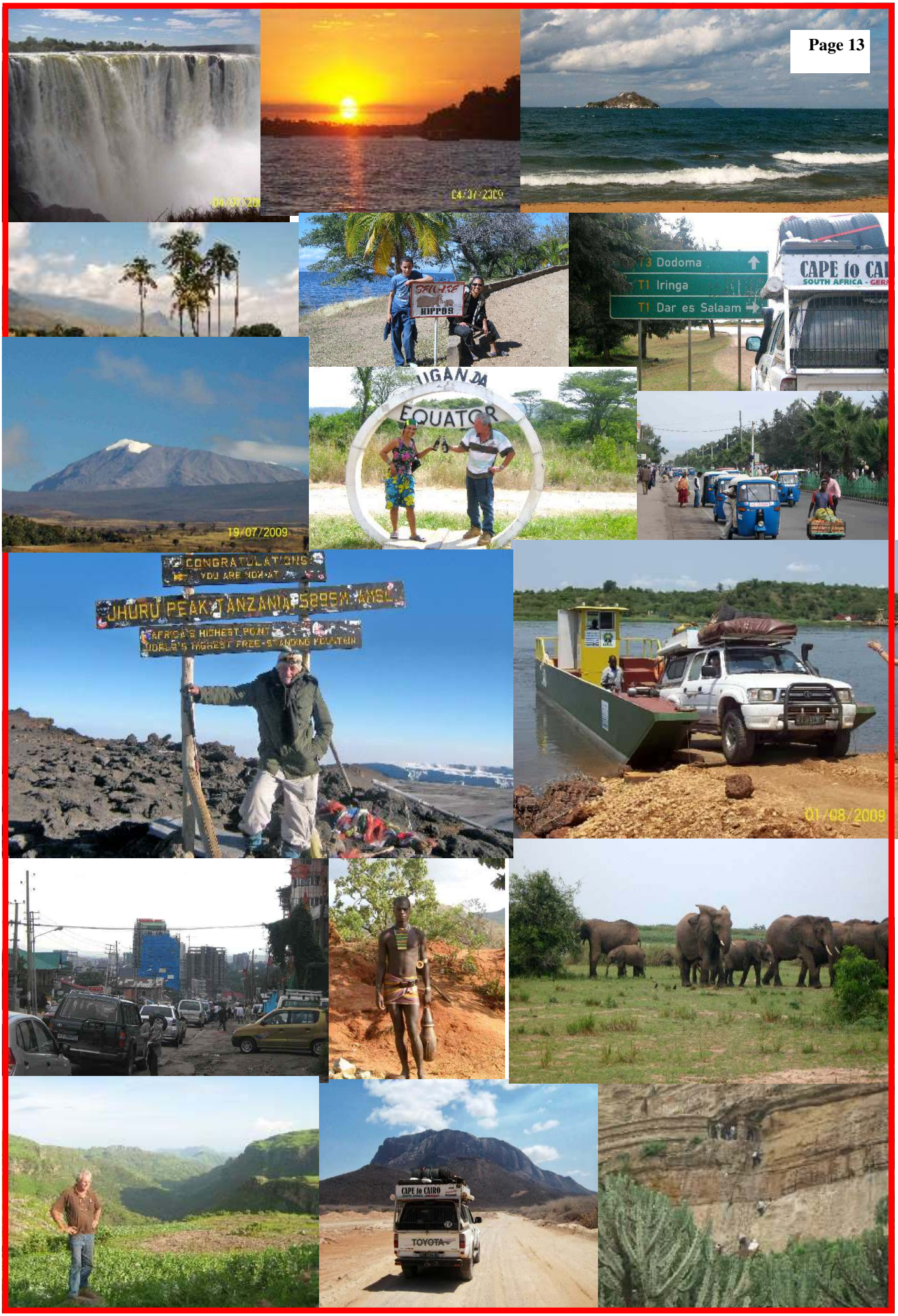
The Hardware required and the circuits, showing all the required connections have been published in the February 2009 issue of our "Feedback" magazine. Look it up on The Border Radio Club's web site at http//www.zs2brc.co.za.and follow the link to FEED-BACK.

73's, Peter ZS2ABF (I'm looking for your picture on the 20M band).

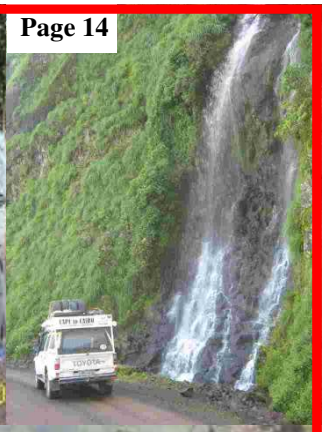
From the International Space station rotating the earth

CAPE TO CAIRO ++ with ZS2BC

In 2009 Karl - Heinz ZS2BC set out with his family in a Toyota Pickup to drive the length of Africa. Then on through the middle East, and Europe to his home town in Southern Germany. It was an ambition that he had to "Do It" before he got to old. Off he set from East London with a rooftop tent, 5 spare tyres, petrol cans, lots of positive vibes and much bravery.
The first boarder to be crossed was at Aliwel North in to the Orange Free State, but with no customs or immigration it was a doddle. Botswana, Zambia and Malawi were the first countries that they toured. In to Kenya, Tanzania and down to the coast to the coastal town of Dar es Salaam. On and on they travelled through Rwanda, Uganda, and back to Kenya where he crossed the equator for the second time. The highlight in this region (Tanzania) was conquering the highest mountain in Africa, Mount Kilimanjaro which is 5895 M high. This look several days and temperatures of -21°C on top.
At Nairobi his family said good bye and Karl-Heinz commenced a long lonely journey throughout the rest of Africa.
After the Greenery of Southern Africa the countries to the north were a sharp contrast. Ethiopia and the Sudan brought into sharp relief the harsh scrub land and deserts. The famous White and blue Niles were seen. Khartoum, Dongola passed him on to Egypt and the city of Wadi Halfa. Before him lay the famous and tourist area of the great Nile. Lake Nassa, Aswan Dam, Luxor and the Great Pyramids. At long last Cairo appeared at the top of Africa. his ambition had been accomplished.
A detour was made to El Alamein and the German and South African WWII war graves were visited .
What next you may say. Germany here we come, but it is still a long way away to go.
Through the Gulf of Aquaba into Jordan, through Syria, cross into Turkey. Visit Azerbaijan and Georgia for the hell of it.
No entry into Russia, so back across Turkey around the Black Sea, over the Bosporus to Bulgaria, on to Romania, Hungary and down to Italy. Press on to Austria and at long last Karl-Heinz was very happy, his birth land of Germany has arrived.
Burr its cold, it's all snow and ice, but who cares, there's German Beer by the bucket load just around the corner.
28000 Km later he has completed his final mission, with no mechanical breakdowns, and no punctures. But that is not the end of the story. He had to leave his Toyota in Germany. Episode II will be, "I return back down West Africa with the Toyota"
(Story written by ZS2ABF)

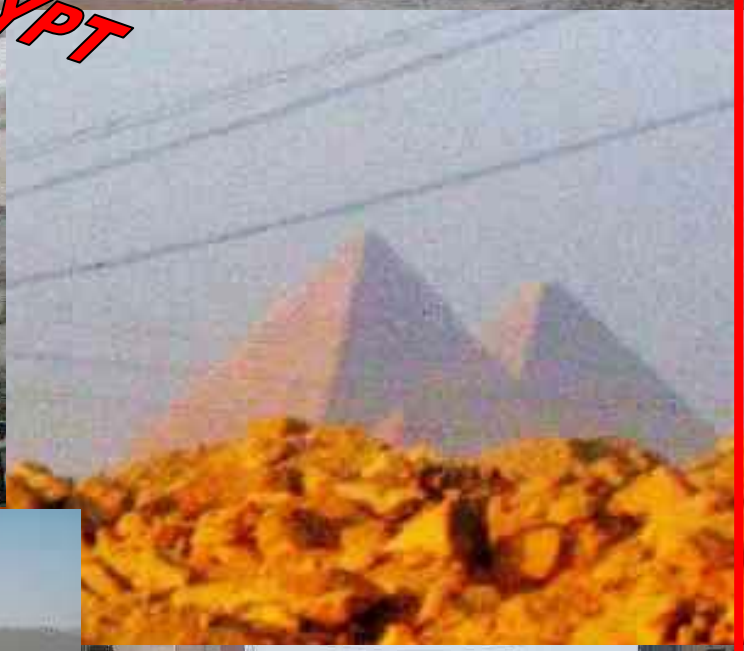

T3 Dodoma
T1 Iringa
T1 Dar es Salaam
CAPE to CAI
SOUTH AFRICA - GERI
HIPPOS
EQUATOR
19/07/2009
CONGRATULATIONS
YOU ARE NOW AT
UHURU PEAK TANZANIA 5895M ANSL
AFRICA'S HIGHEST POINT
WORLD'S HIGHEST FREE-STANDING MOUNTAIN
01/08/2009
CAPE to CAIRO
TOYOTA

27/07/20



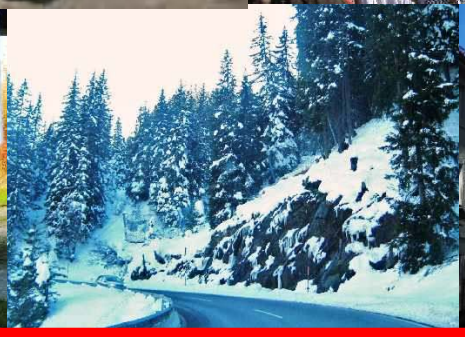
TOYOTA

THE WHITE DESERT


EGYPT

Bata
AFRICA

CAPE to CAIRO
TOYOTA
Bundes-
republik
Deutschland



EUROPE

BORDER RADIO CLUB COMMITTEE

Soccer fever!

ready to burst into life with the BRC

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The Border Radio Club holds monthly General Meetings every third Tuesday of the month at The Gatehouse, Eskom's Sunilaws Office Park, Quenera Drive, Beacon Bay 19:30 for 19:45.
Anyone and everyone is welcome to attend. The Club can be contacted via e-mail at:
info@zs2brc.co.za or news@zs2brc.co.za or feedbacknews@zs2brc.co.za
Visit our Border Radio Club Website at address, http://www.zs2brc.co.za/ (do not use a search engine)

Listen to our Sunday bulletin at 07:45 on 145. 650 Mhz. FM Local, and relays on 145. 675 Mhz. FM, 3.575 Mhz. FM, 7. 074 Mhz LSB, and 3.615 Mhz LSB.

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