Radio ZS

Volume 62 No./Nr 3

May - June 2009
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Africa's first EME
A 2 m / 70 cm diplexer
STS-9, First Ham in Space

Amateur Radio - Communication Technology in Action

Amateur Radio...
Professional Technology

amateur• n. 2.a. one who cultivates anything as a pastime
radio• n. 1. the transmission and reception of radio-frequency electromagnetic waves

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Front Cover / Buiteblad

Bert Howes, ZS6HS, receives the President's Award from Rassie Erasmus, ZS1YT. Bert has been a member of the SARL for more than 70 years! And he is still active on the bands - look at the set-up behind him.

Bert Howes, ZS6HS ontvang die Presidentstoekenning van Rassie Erasmus, ZS1YT. Bert is al meer as 70 jaar 'n lid van die SARL! En hy is nog steeds aktief, let op die toerusting agter hom.

SOUTH AFRICAN RADIO LEAGUE
SUID-AFRIKAANSE RADIOLIGA

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CQ de ZS1YT

The address by the President of the SARL, Rassie Erasmus, ZS1YT, at the 2009 SARL National Convention

Dames en Here, Ladies and Gentlemen.

Did you know that this year the SARL is celebrating its eighty fifth birthday.

During our 85 year history Amateur Radio has encountered many cross roads which required careful consideration before deciding which turn to take and which direction to travel in. Fortunately our forefathers have always managed to make the right decisions and have steered our hobby into the right direction. If they had been complacent we would not today have had such a wide range of frequencies available for our use, many on an exclusive basis and some on a shared no interference basis.

Net vir 'n oomblik dink daaraan wat amateurradio sonder frekwensies sou wees?

Daar sou geen amateurradio gewees het nie! Ons sou nie vanaand hier saam gewees het om die kameraadskap van amateurradio te geniet het nie. Ook nie om die toekennings wat sommige van ons mede amateurs vanaand verwerf saam met hulle te kon vier nie.

Amateurradio is 'n omvattende stokperdjie met so baie vertakkings. Of jy nou oor die plaaslike herhaler gesels of met 'n vriend in 'n vêr land, of met satelliet eksperimenteer, of nuwe modusse uittoets of jou eie antennas bou, of aan kompetisies deelneem, jy kan dit slegs doen as jy 'n radioamateur is. Geen ander tydverdryf kan jou so baie keuses bied nie, selfs nie die duurste skootrekenaar of blackberryfoon kan jou so 'n wye keuse van ondervindings bied as amateurradio nie.

Ladies and Gentlemen, but once again we are standing at the cross road, the one that will continue to take amateur radio into the future. You may say it is obvious which direction we should travel in and that is true, but will every Radio Amateur in

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(CQ de ZS1YT from page 5)

South Africa support the SARL to enable the organisation to point the way to the road that takes us into the future?

Today we have to deal with lots of complacency, the notion that why should I do something as others will do it for me. Complacency is a dangerous past time.

AS you probably all know by now the ANC will lead the government in South Africa for the next 5 years. At their Polokwane congress they made some very important policy decisions. One of the policies is how they see the frequency spectrum and I quote from article 124 of the Polokwane policy document:

The ANC and its Government should ensure that the allocation of spectrum - which is a scarce national public resource - must contribute to the promotion of national interests, development and diversity. This should involve increasing the amount of spectrum and licenses dedicated to public use; for example, community radio and TV and mobile technologies.

Die frekwensiespektrum wat aan amateurradio toegeken is moet heel duidelik bydra tot Nasionale belang.

'n Senior amptenaar van die Departement van Kommunikasie het 'n rukkie gelede gesê dat amateurradio in die kategorie van gemeenskapradio val aangesien sy HAMNET noodkommunikasie aktiwiteit 'n reuse bydrae tot die gemeenskap maak wanneer dit die meeste benodig word.

Maar behalwe HAMNET, wat anders kan ons as radioamateurs in Suid-Afrika doen om te voldoen aan hierdie artikel 124 wat vereis dat ons tot Nasionale belang moet bydra?

I can tell you - Nothing than what we are doing already, we just need to do more of it.

I would like to highlight some of the activities that the Council of the SARL has been planning for the coming year:

Expand our activities to create a greater understanding of what amateur radio is and how it contributes to the country, not just in terms of disaster communication, but also the value in the classroom to develop the interest of learners into Science, Engineering and Technology.

To continue to experiment with new technologies and contribute to the country's body of knowledge.

Three of our programmes address these issues directly:

- the Public Information Network,
- the Radio Technology in Action Symposiums
- and Amateur Radio Seminar for Public Officials

Ek wil u ernstig vra om die RTA's te bevorder sodat ons rekord bywoning kan sien. Ek wil ook 'n beroep op die klubs doen om die Publieke inligtingsnetwerk te ondersteun.

Die SARL beplan op-die-lug aktiwiteite tydens die 2010 wêreld-

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(CQ de ZS1YT from page 6)
beker sokker. Klubs gaan die geleentheid kry om die spesiale roepsein ZS10WCS te gebruik met spesiale QSL-kaarte. Die SARL gaan die geleentheid gebruik om toekennings soos die WAZS aan die wêreld bekend te stel.

The SARL will be hosting the International Amateur Radio Union Triannual conference in August 2011 in Sun City when representatives from the ITU, other IARU Regions and IARU Region One National Societies will converge on South Africa.

While all the planning is in place, we need the support of all radio amateurs, firstly by joining the National Body for Amateur Radio, the SARL, and secondly by giving some of your time and expertise to make our programmes work.

I am certain that we have chosen the right road and with your support we can build up the right momentum to get to the top.

Can we count on you?

Thank you.

Message from IARU Region 1

Hans Blondeel Timmerman, PB2T
President, IARU Region 1

Dear participants of the AGM of the South African Radio League,

First of all my apologies for not being present at your AGM. With about 90 Member Societies in Region 1, all having their AGMs during weekends, one IARU Region 1 President is not enough to attend all AGMs. I hope you will understand that I can only attend AGMs on special occasions. I trust that my secretary, ZS4BS, will form a more than acceptable replacement.

With pleasure I noticed that SARL is back in the international scene. This led to a double success at the 2008 Cavtat conference: Not only is the IARU Region 1 secretary post assigned to a South African radio amateur, you will also organise our 2011 General Conference in Sun City. I am glad that for the first time we will have a Region 1 conference in the African continent. The preparations for Sun City 2011 have started and I trust that this conference will be a success and will add to the visibility of amateur radio on the African continent.

The main objective for IARU is spectrum defence and one of the major events is World Radiocommunications Conference 2011. For favourable decisions at WRC-11 one needs the support of the six Regional Telecommunication Organisations. We have four of these RTO's in our Region, namely ASMG (the Arab Group), ATU (the area where you live), CEPT (Europe) and RCC (the former Soviet Union countries).

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Where it comes to an African position for WRC, South Africa is a key role player and we need SARL to ensure support for our amateur radio case.

SARL is doing well: Looking at your objectives with “growth” as common theme, I can only conclude SARL is successful and in many cases an example for other IARU member societies. Communication with members, often a problem for the IARU Region 1 EC and its member societies, does not seem to be a problem for you, at the same time using traditional and modern media to pass your message.

I wish you a successful annual meeting and “geniet die pap en wors”.

SARL Awards

During the Awards Dinner at the 2009 SARL National Convention, members were acknowledged by the presentation of awards for services rendered to amateur radio, or through it to the community, and for achievements in competitions.

Honorary Life Membership, the SARL's highest honour, awarded to Henry Chamberlain, ZS1AAZ.

The Willie Wilson Gold Badge for the amateur that gave exceptional and meritorious service to the League, was awarded to Francois Botha, ZS6BUU, for his work as the Hamnet Manager and his support to the SARL office.

The Jack Twine Merit Award, which recognises qualities such as unselfishness, clean operating and a genuine interest in Amateur Radio and its affairs and who, in the opinion of their fellow amateurs and the League's Council, exemplify the qualities desirable in a Radio Amateur, was awarded to Bernie van der Walt, ZS4TX, Barney Fourie, ZS4U, John Smith, ZS4S, and Jan Botha, ZS4JAN.

The award is for the work that these amateurs did with the establishment of the ZS9X contest station and the international reputation that it achieved.

Icom Excellence Award, the "premier" award of the SARL, awarded to Andre Botes, ZS2ACP and Paul Smit, ZS6NK, for their work on 4 m Meteor Scatter - they made the first 4 m MS QSO outside of Europe as well as setting the meteor scatter record and distance record in South Africa.

The President's Award was awarded to Bert Howes, ZS6HS, for being a SARL member for more than 70 years. See the front cover.

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The Hamnet Shield, a new award, was awarded to Glenham Duffy, ZS5GD, for his support of the 84 Signal Unit, HF relays, assisting in the operation of the Joint Operations Centre in Durban and the key role he played in the development of HAMNET training modules.

Arthur Hemsley 2 metre Trophy for extraordinary performance on EME or modes such as Tropospheric propagation. It is not for the longest distance worked but rather for persistence in achieving something special on 2 metres, awarded to Glenn Kraut, ZS2GK, for his contact with Philippe Mondon, FR5DN.

Joseph White Plaque for exceptional achievements in the 432 MHz band awarded to Willem Badenhorst, ZS6WAB, for his 70 cm EME and Tropo activity.

Bert Buckley Six metre Trophy for individual achievements with transmissions in the six metre amateur band awarded to Paul Smit, ZS6NK, for his QRP (100 W and single Yagi) 6 m EME QSO with W7GJ.

Radio ZS Shield for best support to Radio ZS during the year awarded to Hans van de Groenendaal, ZS6AKV.

JJ Pienaar Trophy for the best article published in Radio ZS during the past year went to Vidi La Grange, ZS1EL for his articles on modifying the "Force 12" antennas .

Gary Immelman RA Heritage Award Floating Trophy and a gold pen, for the best article of an historic nature, awarded to Dennis Wells, ZS1AU, for his series "These Really were the Good Old Days."

Arland Ussher Gold Pen Award for the highest marks in the RAE, awarded to Carol Defty, ZS1MOM, who achieved an average of 95% in the May 2008 RAE.

SARL HF Contest Awards

Silent Keys Memorial Trophy SSB for the amateur who achieves the highest score during the annual HF Phone Contest awarded to Gary Potgieter, ZS5NK.

Silent Keys Memorial Trophy CW for the highest score achieved during the annual HF CW Contest awarded to Hans Kappetijn, ZS6KR.

Joseph White Trophy for the highest score achieved on any one band, during the annual HF Phone Contest awarded to Jan Botha, ZS4JAN.

Fred Mills Trophy for achieving the highest score during the annual HF Phone/CW Contest and never having won a SARL HF Contest Trophy before, awarded to Pierre van Deventer, ZS6BQS [now ZS6BB].

Anon Trophy for the amateur who

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(SARL Awards from page 9)

achieved the highest score on any one band, during the annual HF CW Contest awarded to Vidi La Grange, ZS1EL.

HOS Trough for the amateur who achieved the highest aggregate score in both annual HF Contests awarded to Jan Botha, ZS4JAN.

The Club Participation Award for the Club who achieves the highest participation in both annual HF CW and Phone Contests awarded to the Bloemfontein Radio Amateur Club, ZS4BFN.

Africa's First EME

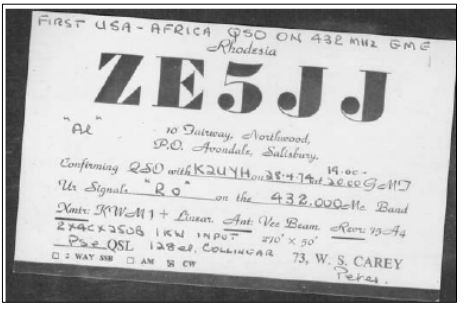
Hans van de Groenendaal, ZS6AKV

Earth-Moon-Earth [EME] communications remains one of the most exotic modes of amateur radio, even today with the availability of sophisticated software to enhance weak signal reception it remains a challenge. In this article, I would like to pay tribute to the late Peter Carey perhaps best known as ZE5JJ, the call sign he had when living in the then Rhodesia. In January 1984, he moved to Centurion and obtained the call sign ZS6JT

Peter Carey, ZS6JT / ZE5JJ

An Electrical Engineer by profession Peter was fascinated by the prospect of bouncing signals off the moon and in 1966, he set out to build his own equipment, a road he later said no one should ever take. It took him 8 years of frustration to hear his own echoes. It was in 1974 that he heard his own signals coming back from the moon, "I was walking on cloud 9!" Peter became the first moon bouncer, the term used in those days, on the African continent and a much sought after station by moon bouncers elsewhere in the world. He made the first EME contact between Rhodesia and the USA on 28 April 1974.

"One has to have special CW skills (Continuous wave transmission keyed using Morse code) to succeed to winkle out the weak ones from the noise) In a lecture in Johannesburg he said "If you are not prepared to do this then rather stick to the two metre FM band where you can talk with 59 signals



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(Africa's First EME from page 10)
all-day.

Today things are different. Sophisticated software like Jo Taylor's WSJT software for weak signal operation makes reception a lot easier with on screen display of the signal and decoded messages. However, for people like Peter Carey that would amount to cheating and taking away the mystique that radio offers. It however does not replace the large antenna array; a sophisticated low noise pre-amplifier and the use of maximum allowable transmit power.

Peter's long road to frustration started when he decided a build a parametric applier for 70 cm. "It eventually worked but was very unstable and full of hum modulation that I had to give it up. If it was not for a good friend, Joseph Reisert, W1JR, in the USA, I may never have got any further. Hearing about my lack of success, he sent me several low noise bi-polar transistors with which I built a pre-amp with equivalent noise figures to my parametric amplifier. Without his help I may never have achieved EME."

"The support of the amateur fraternity never ceased to amaze me. I recall on one occasion I received a surprise packet from Japan. In it were two GasFET transistors from an NEC Engineer. At that time these devices cost $250 each, not something a person living in Rhodesia could afford. With them I was able to dig down to even lower noise temperatures and receive very weak signals better."

Peter Carey passed away at the age of 83 on 11 July 2008. In a tribute Al Katz, K2UYH, wrote in 432 and Above EME News: "He put Africa on the EME map as ZE5JJ back in the 70's on both 432 and 1296. His EME activity and life was disrupted with the demise of Rhodesia. He started over in South Africa and was able to return to EME operation as ZS6JT. In recent years, Peter's activity was limited by his health. He was a wonderful man, a great EMEer and an award winning radio amateur. We will dearly miss him."

Peter held a BSc in Electrical Engineering from the University of the Witwatersrand. His interest in space communication took him to the Iowa and John Hopkins universities working on Space programmes. He also spent time at the Hartebeeshoek tracking station and worked at Rice University as a space scientist. On his return to Rhodesia, he worked at the Salisbury (now Harare) municipality and the Electricity Supply Commission.

Parametric Amplifier

This unusual device is an early Electron Beam Parametric Amplifier (EBPA), also known as a Cyclotron Wave Parametric Amplifier (CWPA), and

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as an Adler Tube after its inventor, Robert Adler (Zenith Radio Corp., Chicago).

The main market for the EBPA was in military radars, specifically for use on AN/FPS-37 and AN/FPS-71 L band military search radars operating in the 1 250 - 1 300 MHz range. These used glass tubes similar to the one pictured here. Versions that are more modern use metal/ceramic constructions. The ceramic/metal tubes were designed to work at S band or approximately 2 500 MHz; however, semiconductor parametric amplifiers were starting to appear and of course would replace the EBPA a few years later.

Acknowledgement to "Virtual Valve Museum"

What is Amateur Radio?

By Mike Bosch, ZS2FM

This is an interesting question posed on the SARL Discussion Forum by Johan Terblanche, ZS1I, of Mossel Bay. Most newcomers view Amateur Radio as just another form of CB Radio, a means of chatting with a handheld or mobile via repeaters. Initially two-way commercial radio introduced repeaters, which eventually spread to Amateur Radio and killed simplex operation. You could do the same by chatting via your cell phone, but you may have to pay for the extra calls after your free time is up. Even digital data modes such as FSK441 can be duplicated on cell phones by sending SMSs without the need for meteors. Has Amateur Radio degenerated into a copycat show as seen by the public? I do not believe it – it is much more than the above.

Amateur Radio is Based on Experimentation, Pioneering and Research

So let us go back and see how it all started. Guglielmo Marconi was the first Radio Amateur and he personally claimed that honour. When he transmitted the first low frequency (LF) spark signals across the Atlantic Ocean on 12th December 1901, it inspired many electrical enthusiasts in the world to also experiment with radio transmission. In 1904, F. Dixon-Bennett, FO-4AV, of Pretoria became the first licensed Radio Amateur in the Union of South Africa. At that time you could not purchase radio spares from anywhere – you had to make your own! Dixon-Bennett constructed his first spark transmitter around a model T-Ford car ignition coil and a spark gap; the receiver consisted of a tuned circuit, a coherer type of detector and a set of earphones and the antenna was a large umbrella type. The wavelength was around 600 metres (500 kHz) and the range about 160 km at night. When he replaced the coherer with a more sensitive galena crystal, he could pick up the powerful spark transmis-

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sions from ships in Delagoa Bay and Swakopmund at night. After building a bigger spark transmitter using an X-ray transformer, he could communicate with a few ships in South African waters. At the start of WWI, there were only about twenty Radio Amateurs in the country.

When the War broke out all amateur activity ceased throughout the world. During the war years, a young radio engineer Edwin H. Armstrong (of FM Radio fame) invented the continuous wave oscillator, the regenerative and super-regenerative receivers as well as the superheterodyne, which forms the basis of all modern receivers. Unlike the damped spark oscillations, the continuous wave oscillations could be amplitude modulated (AM) for phone operation.

Two years after the war ended many AM broadcasting stations came on the air on the low frequency (LF) and medium frequency (MF) bands. Radio Amateurs were not allowed to come on the air again! Hiram Percy, the president of the ARRL, battled a long time to persuade the US Congress to permit Amateur Radio operation once more in the USA. Finally, the wartime ban was lifted in the USA, but Radio Amateurs were restricted to the "useless" wavelengths below 200 metres (above 1,5 MHz). Later the rest of the world also followed suit.

In December 1921, the ARRL sent Paul F. Godley, 2ZE, to Ardossan, Scotland, to conduct the first Trans-Atlantic Test with the latest equipment including the superheterodyne receiver. Godley heard thirty American stations on 160 metres at night, one of them being the strongest signal from Armstrong. During the second Trans-Atlantic Test a year later, some 315 American stations were heard in Europe, including one French and two British stations in the USA. Finally, in November 1923 John L Reinartz, 1AXM, and Fred Schnell, 1MO, established a two-way contact with Leon De Loy, 8AB, in France that lasted for hours on 110 metres.

Radio Amateurs Discovered Shortwave Propagation

The shortwave era had begun as many broadcasting stations rushed down to the shorter wavelengths. KDKA in Pittsburgh was the first to operate on a wavelength as low as 60 metres and it could be received in South Africa after midnight. Then in 1924, the dream of DAYLIGHT DX came true when 1AXM on the east coast of the USA worked 6TS on the west coast at noon on 20 metres! At the Washington Convention of 1927, Radio Amateurs were allocated dedicated amateur bands on 160, 80, 40, 20, 10 and 5 metres for their contribution to radio science; they could also use any wavelength such as 2,5 metres and lower.

Ross Hull, VK3JU, an Australian amateur, immigrated to the USA where he joined the ARRL and

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(What is Amateur Radio from page13)
improved the design of amateur equipment. His greatest contribution was the discovery of Tropo propagation on 5 metres, when he extended the line-of-sight range to 160 kilometres and later to several hundred. In 1937, Grote Reber, W9GFX, pioneered radio astronomy, mapped the radio sky and discovered discrete radio sources. In the same year, Bert Howes, ZS1AL, (ZS6HS) in Cape Town picked up TV sound on 41,5 MHz from Alexandra Palace London. It was a world distance record for TV at the time as confirmed by the BBC. In the post war period Henry Rieder, ZS1P, and brother, Charles, ZS1T, pioneered VHF communications to Europe on 6 metres in South Africa when they worked David Saayer, PA0UN, in the Netherlands. Henry successfully received TV picture and sound from the BBC in London in 1948 over a distance of about 9 000 km.

Around this time, Argentinean and Mexican amateurs discovered that they could regularly work each other at night on 50 MHz via an unknown form of propagation. Later it was established to be Trans-Equatorial Propagation (TEP), a mode that was also present on 144 MHz and 220 MHz. In 1999, Han Higasa, JE1BMJ, discovered a new mode of propagation on 50 MHz – the Short-path Summer Solstice Propagation (SSSP).

Therefore, Amateur Radio has a great past and one to be proud of, therefore amateurs should honour their pioneers and try to follow their example. Radio Amateurs of today should accept the challenge to experiment in the various fields of Amateur Radio on either analogue or digital; they should improve their equipment especially the antenna systems, and add those extra kilometres to the range of VHF or UHF or Microwaves.

What about the future?

Amateur Radio could expect a major space event about 2020 CE when the first moon settlements are established. The Moon settlers would be very keen to talk to us Earthlings and it should be possible on VHF using SSB or even FM. The next quantum leap will occur only on digital modes around 2030 CE, when Martian landings take place. The younger generation of Radio Amateurs will accept this communication challenge.

Please remember that amateur radio is not just a chat hobby, but also a non-professional field of radio science and covers experimentation, pioneering and research!

Mike Bosch, ZS2FM, PO Box 1614, Port Elizabeth, 6000. mcbosch@telkomsa.net

SARL Membership expires on 30 June, by now you should have received the renewal notice for the 2009/10 membership fees.

You can pay by cheque, credit card, internet transfer or cash. Do it today!

A 2 m / 70 cm diplexer with a difference

By Frank, ZS6TMV / PA3GMP

based upon a design by Henk, PA0HVA, published in Elektron, June 1994

Diplexers-filters intended to split and combine signals on different frequency bands -generally use conventional L/C networks: a low pass filter for the 2 m band and a high pass filter for the 70 cm band, each consisting of several coils and capacitors with a cut-off frequency around 250 MHz or so. The maximum RF power that the diplexer can handle depends mainly on the breakdown voltage of the capacitors. Your average ceramic capacitor is rated at 50 V, so your diplexer will start to burn out at about 50 W. High voltage (trimmer) capacitors can be hard to find, and can be bulky enough to interfere with optimal filter construction, thereby increasing the diplexer's insertion loss and reducing its suppression.

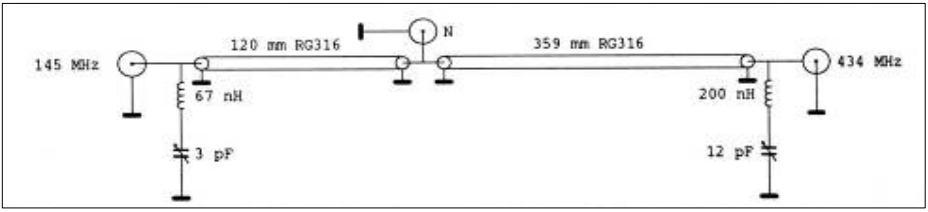
The diplexer described below takes a different approach to the task at hand. It is based upon two quarter wave coax stubs, each combined with a simple filter that only requires one trimmer capacitor each. At resonance, the filter grounds one end of the stub, this results in a high impedance for that frequency at the other end of the stub.

For example, a 145 MHz signal connected to the left hand side (2 m) terminal will traverse the left hand side coaxial line to the common terminal, virtually without experiencing any loss. The left hand side filter resonates at 434 MHz, and will therefore not affect the 145 MHz signal. The right hand side L/C circuit is resonant at 145 MHz, though, and the right hand side end of the right hand side coaxial stub will therefore be grounded. The right hand side coax stub will present a very high impedance to the common terminal as a result, thereby stopping the 145 MHz signal from continuing into the right hand side coaxial line. The same (in the opposite direction) applies to signals at 434 MHz.

This results in a diplexer that can be used to connect two antenna's to a dual band transceiver, or two single band transceivers to a dual band antenna.

Construction is simple, but must be done accurately, and it is important to use the proper components.

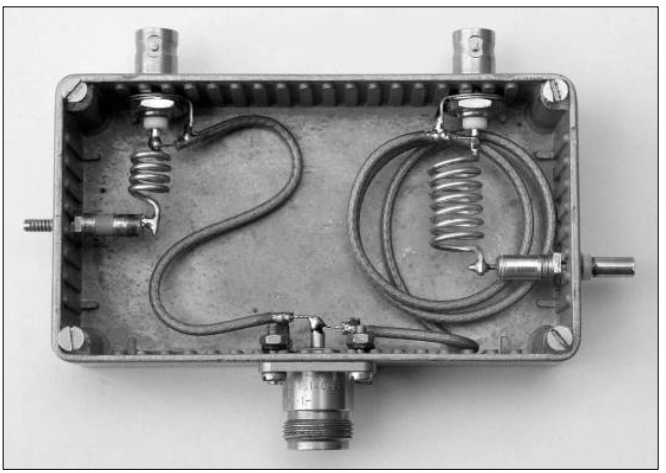
(Continued on page 16)



(2 m/70 cm diplexer from page 15)

The coaxial cable should ideally be RG-316, which is a very thin, 50 ohm coax with Teflon insulation and dielectric. Its velocity factor is 0,695, which means that a quarter wave stub for 145 MHz will be 359 mm, and 120 mm for 343 MHz. The main advantage of RG-316 over RG-174 (another thin but non--Teflon 50 ohms coax) is that good, short soldered connections can easily be made to the braiding, which is essential for the filter's performance. Other coax could be used as well, but thicker cable (such as RG-58) makes it more difficult to solder the cable and fit it in, while non-Teflon varieties are much more difficult to solder close to the dielectric. Some alternatives are RG-142 (more or less a Teflon variety of RG-58), RG-174 (thin, non-Teflon, with a higher insertion loss than RG-317) or, if you really have no other option, RG-58. If you use anything else than RG-316, though, YOU MUST OBTAIN THE EXACT VELOCITY FACTOR for the cable you use from the manufacturer's data sheet. Do not guess, do not use rule of thumb, do not use the specs for the same type of cable from another manufacturer. Then recalculate the length of the stubs to the millimetre.

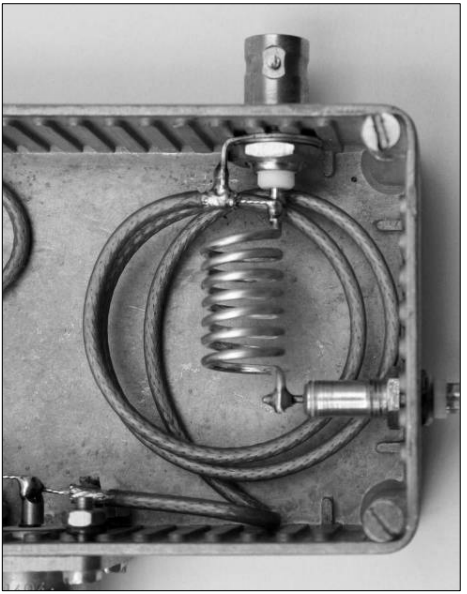
The trimmer capacitors should be of the best quality you can get. Ceramic types are preferable because they can take higher voltages (and therefore more RF power) while tubular capacitors are preferred from a construction standpoint because they can be mounted directly into the chassis of the box. (Hint: that old valve radio stuff that you passed up on, the last time you were at a ham radio flea market generally has the caps you need!) I used tubular trimmer capacitors of 6 and 12 pF for 70 cm and 2 m, respectively. It does not really matter if the caps you use are a few pF over the 'desired' capacity -that is why they call them "variable." The ones I used are rated at well over 200 V, which means that the diplexer allows for more power than my ham radio license.



The coils are made out of 1,5 mm solid copper wire. I used silver plated wire, but you can also use enamelled copper wire without any appreciable loss of filter quality. The coil for 2 m (200 nH) consists of 7 windings on the smooth

(Continued on page 17)

(2 m/70 cm diplexer from page 16)



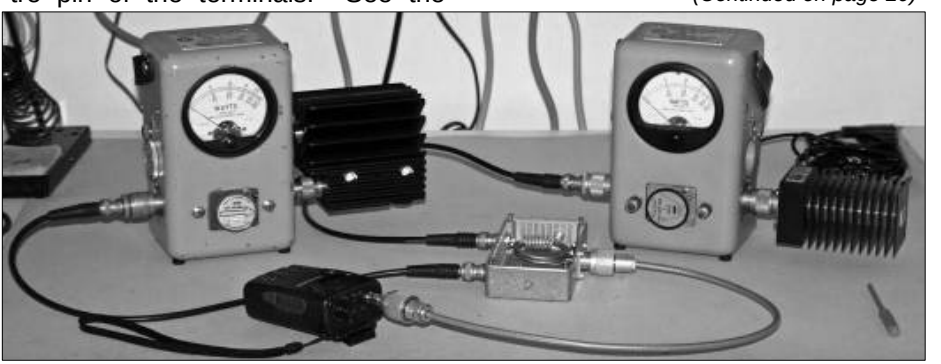
end of a 9 mm drill bit, stretched until the length of the coil is 20 mm. The one for 70 cm (67 nH) has 5 windings on a 6 mm drill bit, stretched until the coil is 10 mm long.

The shield of the coax is soldered directly to the lugs, while the core is clipped off at a length of 5 mm or so, and connected to the centre pin of the terminals. See the photo for construction details.

Note that the length of the wire between coax and centre pin is not counted as part of the length of the stub, i.e. the 70 cm stub should be 120 mm along the length of the shield, plus 5 mm of bare centre lead at each end.

Alignment is simple. Apply a 145 MHz signal to the common terminal. Connect a power meter (SWR meter, directional watt meter or RF volt meter) to the 434 MHz terminal, and a 50 ohms dummy load to the 2 m terminal. Adjust the 145 MHz variable capacitor until the RF signal at the 434 MHz terminal dips to zero. Then move the power meter to the 2 m terminal and the dummy load to the 70 cm terminal, apply a 434 MHz signal to the common terminal, and adjust the 434 MHz variable capacitor until the RF signal at the 145 MHz terminal dips to zero. (Don't get confused here: you should connect the Wattmeter to the 2 m terminal when adjusting the 70 cm filter using a signal at 434 MHz, and vice versa!) I used two separate Wattmeters, but this is by no means necessary.

(Continued on page 20)



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(2 m/70 cm diplexer from page 17)

Measured performance

The suppression of the diplexer is especially important when you use the diplexer to connect one dual band antenna to two single band transceivers. A single band radio can be expected to have an input filter providing at least 20 to 30 dB of suppression of out- of- band signals. That brings the minimum total suppression to 45-55 dB or so, which means that if you use two single band transceivers and one dual band antenna, 100 W at 145 MHz will result in only a few mW into the first stage of your 70 cm transceiver, and vice versa. Both transceivers will be able to handle this with ease.

Frequency	Suppression	Insertion loss	SWR
144 MHz	26 dB	0,15 dB	1,05 : 1
145 MHz	40 dB	0,15 dB	1,02 : 1
146 MHz	26 dB	0,15 dB	1,05 : 1
432 MHz	29 dB	0,25 dB	1,03 : 1
434 MHz	40 dB	0,25 dB	1,04 : 1
436 MHz	29 dB	0,25 dB	1,06 : 1

Description of the Maidenhead Locator System

Hal Lund, ZS6WB

There are still a few VHF operators out there who may not completely understand the grid locator system and the following is for their benefit. The following description is taken from The ARRL World Grid Locator Atlas.

The earth's surface is divided into 18 x 18 = 324 "fields", each one 20 degrees longitude x 10 degrees latitude. Each field is divided into 10 x 10 = 100 "squares", each one 2 degrees longitude x 1 degree latitude. Each square is finally divided into 24 x 24 = 576 "sub-squares", each one 5 minutes longitude x 2,5 minutes latitude.

The fields are indicated by 2 letters AA - RR, the squares by 2 digits 00 - 99 and the sub-squares by 2 letters AA - XX. The first character is the longitude character and the second character is the latitude character on each level. The numbering direction is everywhere west to east and south to north. The complete locator is the sum of all six characters, for example "FN43MJ." Recommended abbreviation for the word "locator" on CW is "LOC."

The ARRL World Grid Locator Atlas is inexpensive and if you do not have it available on your com-

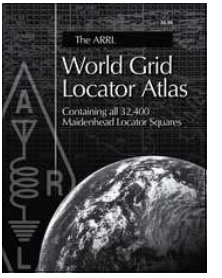
(Continued on page 21)

(Maidenhead locator from page 20)

puter, it is recommended that every VHF operator try to get a copy. It contains a world map showing all 324 fields and more detailed maps showing the locations of all of the 32 400 squares.

It is general policy in VHF circles throughout the world to use "Squares" as VHF contest multipliers and for VHF award purposes while the small "Sub-squares" are used only for determining distances.

As a point of interest, grid fields and squares are now used for a number of HF awards including some recently introduced by CQ Magazine and even our own WAGS Award for contacts with South African grids on either HF or VHF.



The ARRL World Grid Locator Atlas © 1984 - 2007, published by The American Radio Relay League, Inc. #2944 - $5.95 www.arrl.org

Amateur Radio in Space

By Eddie Leighton, ZS6BNE

I pulled out a box of Radio ZSs from the year 1996 last night to browse for satellite articles that were written in those days and was incredibly impressed with the articles that appeared there. Amateur radio boasts a few years of satellite communications! It was good to read an article by Mike Bosch, ZS2FM, published in two (or more) parts. See Radio ZS April (part 1) and June (part 2) 1996, truly EXCELLENT articles! "Oscar 1 was launched on 12 December 1961 and lasted 20 days." We have truly come a long way in as little as 48 years!

OSCAR 7 "The veteran satellite"

Interesting, OSCAR 7 was mentioned amongst many others. Launched in November 1974 and "survived for about six years." In those days, OSCAR 7 worked two days in mode B, followed by a day in mode A. AO-7's batteries went faulty (short circuit), but the satellite is still operational today, while sunlit. After the internal batteries went open circuit, the satellite power was restored by its solar panels! This satellite is attracting a lot of activity lately from hams wanting to work DX and many long distance contacts have been made recently.

A summary of South African AO -7 distance records from available web information (two maximum distances per call sign):

Andre, ZS2BK / LU2DPW 7 540 km (World record!)

Pierre, ZS6BB / PY1UNU 7 171 km

(Continued on page 22)

(Amateur Radio in Space from page 21)
Eddie, ZS6BNE / PY4AJ 7 168 km
Keith, ZS6TW / PY1UNU 7 155 km
Eddie, ZS6BNE / SV1EEK 7 130 km
Etienne, ZS6Y / PY1UNU 7 123 km
Keith, ZS6TW / SV1EEK 7 107 km (New)
Andre, ZS2ACP / PY4AJ 6 994 km
Allen, ZS1LS / CX1TH 6 746 km (New)
Hal, ZS6WB / 4Z1WS 6 445 km
Chris, ZS1TX / PY4ZBZ 6 354 km
Allen, ZS1LS / PY4AJ 6 339 km (New)

An interesting thing is that this satellite has been orbiting the earth for 35 years! It is still one of the favourite satellites to use. The altitude of the satellite has stayed quite constant over the years; I quote Andre, ZS2BK, from the SARL Forum, "The AO-7 never had any retro booster fuel or the magna-torque mechanism on board, only magnets that controlled the spin for temperature control. Therefore, these Permanent Magnets do not need power. The altitude after Launch in 1974 was given as 1 460 km. Guess what, it currently varies between 1 482 and 1 442 km which is an average of 1 462 km. Amazing that it has not, after so many years, really got any significantly closer?"

Visit www.planetemily.com/ao7/main.php for up to date information on AO-7.

RTA Feedback

The first 2009 RTA was held in Gauteng the past weekend and those that attended all went home with a lot more knowledge. The satellite presentation was also a success and I hope to see more hams joining in having fun on the satellites soon. The next RTA will take place in Natal on 30 May and we hope to spread the word amongst more newcomers to the amateur fraternity. ZS5 has quite a few active satellite enthusiasts already! The Eastern and Western Cape RTAs will take place a little later in the year. It was really great to meet hams in person with whom I had made contact with via the satellites. Satellites are a very attractive dimension of ham radio. I hope that the presentations will make it easier to get started using the satellite modes.

Satellite portable operations

Portable operations with the FM LEO satellites is not too difficult and requires at minimum, a handheld Yagi for 70 cm and an antenna such as a 5/8th or better for 2 metres as is the case with AO-51 and SO-50. You would also need two handheld radios, one for the uplink and the other for the downlink (except in the case of a duplex radio such as the famous Kenwood TH-D7A(g). What about portable operations with the SSB satellites like VO-52, FO-29 and our veteran satellite, AO-7? For this, SSB equipment is necessary and preferably one should work duplex but maybe with short overs one can get away without being able to hear oneself on the downlink. I did en-

(Continued on page 23)

(Amateur Radio in Space from page 22)
quiries on a portable SSB rig, the Yaesu FT817nd. I believe Sarel, ZS6AC, has used such a rig during his overseas trips for satellite operations. The Icom 706 MKIIG also works pretty well with the satellites but you need to take a good (heavy) battery pack along for the ride!

Portable satellite operations are an ideal way of activating rare grids and in so doing, helping others to make contact with these grids at the same time. Satellite operators are in a good position to take part in the South African ZS-WAGS initiative and can give access to even more grids, like the "wet squares." Hal, ZS6WB, gives constant updates via the ZS-Sat mailing list concerning grid activations from radio hams communicating from ships at sea.

ZS-WAGS is eighty-three South African grid squares that could be worked **"Via satellite"** (to be mentioned on all QSL cards - ref Barry, ZS2EZ.) For additional information, visit www.zs6stn.org.za/zswags/default.htm

A request from Hal ZS6WB

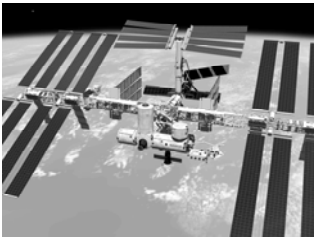
"We need help in locating some AO-51 loan equipment. Donations of old VHF and UHF handhelds that have been replaced by newer and smaller models and are no longer being used, would be welcome. Four loan systems would be a good target with one based in Cape Town, one near Kruger National Park and one in the Johannesburg area to be made available to South African radio amateurs travelling to neighbouring countries and rare grids in South Africa. A fourth could be dedicated for use in nearby countries and circulated to places like Nairobi and Windhoek to be used for a short while and then passed on to another country. More local publicity is needed and we need to keep up our activity levels so those, that have been encouraged to bring their satellite equipment on African holidays, find some activity when they get on the air.

Help is also needed in doing demonstrations and training new operators to use the equipment we lend them. We must find bases for the loan equipment in each area with someone willing to take responsibility for keeping the equipment in good operating condition so it is ready for use any time it is needed."

Keplerian elements

You may have noticed lately that programmes like HRD and SatPC32 download their amateur.txt files from the Internet, and that the satellite names are prominently displayed. Maybe a good thing. One generally knows the OSCAR number, but it is always good to know the satellite's real name too.

CU on the Sats! 73



STS-9, First Ham in Space

William D. Mc Dowell, K4SWJ
Article provided by Marinus Willemstijn, ZS6MAW

Richard Allen Garriott (born 4 July 1961), also known as Lord British in Ultima and General British in Tabula Rasa, is a significant figure in the video game industry. He was originally a game designer and programmer, but now engages in various aspects of computer game development. On 12 October 2008, Garriott launched aboard Soyuz TMA-13 to the International Space Station as a self-funded tourist, returning safely 12 days later aboard Soyuz TMA-12.

The space shuttle Columbia, STS-9, was launched on 28 November 1983 after a long delay due to a repair that required it to be transported from the launch pad back to the Shuttle hanger. The primary mission was a package called "Space Lab" where hundreds of experiments dealing with material science and the effects of ionization on shuttle communications were conducted. More importantly (at least to us hams), there was a 2 metre ham station on board and astronaut Owen Garriott, W5LFL, would be making contacts with hams around the world during the mission as time permitted. Columbia was scheduled to be in orbit for 9 days, but was extended to 10 days when problems with on-board computers developed prior to re-entry. Columbia would complete 167 orbits at an altitude of 150 nautical miles.

Hearing that a ham would be operating aboard was too much of a temptation…. talk to the space shuttle? WOW! I discussed the upcoming mission with my ham friend Carey Fisher, WB4HXE, now K8VZ. It was about 5 months before the scheduled launch and all kinds of possibilities raced through our minds. After a short deliberation, we decided that we would remiss not to pursue trying to make contact with the shuttle. We knew that this would attract thousands of hams around the world and hundreds within the footprint of the shuttle when it was in range of our station. Therefore, this was not going to be a "walk in the park." If we were to get through, we needed to have a top-notch operation to assure we would succeed.

Planning and Preparation

Both Carey and I were heavily into computer programming and at the time had Commodore VIC 20 computers (this was 1983!) So our first challenge was how to track the shuttle to know where it was at all times and generate azimuth and elevation pointing angles to steer a directional antenna. Today, it is simple, there are numerous excel-

(Continued on page 25)

(First Ham in Space from page 24)
lent tracking programs available but at the time, there was no tracking software available for the VIC 20 computer. No problem, we will write our own!

First, we had to learn about orbital mechanics and Kepler's Laws before proceeding with writing a tracking program. We had to learn the math and the terms! So, we got busy studying everything we could find at the local library. Remember, the Internet was not yet operational so acquiring information was not as easy as it is now. Once we mastered Kepler's Laws we could start programming…..but, wait…we have to generate a world map to visually display the location of the shuttle on the computer screen ….what map projection should we use? Back to the library to study maps and the different map projections. Once the projection was decided on, (Mercator won out) we now had to manually digitise a map of the world. This meant taking X-Y coordinates for thousands of points on a world map in order to display it on the computer screen. All of this was being written in VIC 20 BASIC.

Because we were both interested in the challenge of writing the tracking software, we decided that each of us would write a tracking program and then choose the best one prior to the launch.

But, there was a long list of other preparations that also had to be accomplished prior to launch. In addition to the tracking, software we decided to make the station completely automated including transmitting and receiving. The procedure that was published was for W5LFL to call CQ on even minutes on 145,550 MHz and listen on 144,930 MHz on odd minutes. So another program was written to call W5LFL on odd minutes when the satellite was in range and listen on the primary calling frequency on even minutes. This would allow the station to function automatically and enhance our chances of making contact. No problem, a couple of tape recorders, one for transmitting our call and the other to record the downlink frequency, both tape recorders and radios controlled by the computer, should do the trick!

The antenna system would be important and neither of us had the proper antennas for the mission. We determined that we would use a dual polarization 2-metre Yagi with a gain of about 14 dBd. Additionally, we would need an omni directional antenna perhaps for acquisition in case the Yagi was not properly pointed and we would need two transmit frequencies as well.

So, off to the local ham store to buy one dual polarized 2 m Yagi, a 15 ft roof mount tower, azimuth and elevation rotators and other miscellaneous supplies. We decided to build a turnstile antenna from the handbook for the omni-directional antenna. This type of antenna was chosen since it is not sensitive to changes in signal polarization often encountered in space communica-

(Continued on page 26)

(First Ham in Space from page 25)
tions. So, off to the hardware store to pick up the necessary materials.

The radios we planned to use were all 10 - 20 watt radios and we decided that we needed a little more power to assure that we would be on top of the pile-up. So, back to the local ham store where we picked up a 2 m 100 watt amp. This would yield an Effective Radiated Power (ERP) of 631 watt when using the 14 dBd Yagi. How could we not be heard? This is all beginning to be expensive even splitting the cost two ways! With this investment, failure was not an option!

Pulling it all Together

Time was running out, the launch date was coming up fast and we were still feverishly trying to complete the software and put together the station in time. Things began to fall in place. Finally, the first versions of the software were competed. We decided to go with Carey's tracking and control software as the primary software since he had integrated the control software in the tracking program and thus would not require an additional computer. My software would be used as a backup.

We also solicited additional help from a non-ham friend, Fred Purvis. Fred was a microwave engineer and was able to help with many aspects of the remaining tasks. Fred would also serve as our "Tracking Specialist."

The dual polarization Yagi was assembled along with the az/el rotator and hoisted up on top of the 15 ft tower, which was ground mounted in the backyard. The station was assembled in short order and testing began.

Our intention was to have the tracking computer control the az/el rotator to automatically point the antenna. However, time was not on our side and we had to accept the idea that we would have to steer the antenna manually. To prove the validity of the tracking software, the orbital parameters of several existing satellites were loaded into the program. Success! The tracking program was right on the mark! Both the dual polarized Yagi and the homebrew turnstile antenna were also tested on existing satellites.

The automated tape recorders controlled by the computer also functioned as expected. It is now less than one week until lift-off!

We decided to take NASA's lead and create a "pre-flight" checklist. The list would include the settings of all equipment, clocks (accurate time was very important), computer settings, initial antenna pointing angles, etc. This would help ensure that we did not miss an opportunity due to faulty equipment set up or malfunction. Those guys at NASA are full of good ideas!

Station Operation

The station was designed to operate in two modes. The first mode was a semi-automated manual operation while the second was fully automated. The purpose of the automated mode was to allow a single

(Continued on page 27)

(First Ham in Space from page 26)
operator to man the station when the full crew of three was not available.

The team of three operators was organized into individual responsibilities. Again, taking NASA's lead, the positions of a mission controller, mission specialist and tracking specialist were created. The mission controller would oversee and coordinate activities during an orbital pass while the mission specialist manned the computers and radio equipment. The tracking specialist's job was to steer the antennas based on computer readouts of the azimuth and elevation angles (not an easy task!)

As the shuttle broke the horizon, the computers would take over (except for tracking) and make transmissions on the odd minutes while switching to receive on even minutes to listen for a response. On direct overhead passes, we would switch to the turnstile antenna to avoid the fast changing pointing angles when the shuttle passed overhead. Besides, the higher gain of the dual polarization antenna was not necessary (so we thought).

In the automated mode, the turnstile antenna would always be used since it was impossible for one operator to run the station and simultaneously track the shuttle with our directional antenna.

It seems that we had all the bases covered … or did we?

Count Down to Lift-off

The Columbia spacecraft lifted off from Kennedy Space Centre at 11 AM EST on 28 November 1983 with a six-man crew (the largest crew to go into orbit at the time) which included Owen Garriott, W5LFL.

We acquired the orbital parameters about 30 minutes after lift-off and loaded them into our computers…..we were ready!

Of course, we had no way of knowing which in-range passes that Garriott would have time for ham operations. The only answer was to be operational for every pass and hope that Garriott would be on the air. We gathered information from as many sources as possible as to their work schedules aboard the shuttle hoping for a clue to the times the ham station would be on the air. We watched TV broadcast, listened to shuttle communications rebroadcast by NASA, listened to AMSAT nets and the like. Darn, if we only had the Internet!

We maintained our vigil and on the third day we caught an active pass and actually heard W5LFL aboard the shuttle…."This is W5LFL aboard the spacecraft Columbia." The pass was low on the horizon and only lasted 4 or 5 minutes. No joy!

The next day there was to be a pass that would take the shuttle just north of Atlanta and looked very promising…..only if he was on the air for this pass. With our antennas at the horizon and pointed toward the Gulf of Mexico, we anxiously waited as we watched the mission clock.

(Continued on page 28)

(Digital Modes from page 27)

There he was, right on time…a crackle in the speaker and the familiar voice of W5LFL. His signal now was loud and clear as he approached from the southwest headed to the northeast. Computers were running and functioning properly, calling on the odd minutes and listening on the even minutes. We were dead on track with the antenna and his signal was full-scale….surely he will hear us!

There were many local stations calling…..more than anticipated….a lot more than anticipated! The calling frequencies were nothing but chaotic. Garriott also had abandoned the published procedure for transmitting on the even minute and listening on the odd minute! So we had to switch to manual operation. We still used the tape recorder to transmit our calls but had to execute it manually. We intently listened, as Garriott would read off the call signs he had heard. There must be some mistake; he did not mention K4SWJ or WB4HXE (the calls we were using). There must be something wrong…are we transmitting the full 100 W? Has the antenna failed? Something is wrong!

The near overhead pass was over as the shuttle dropped below the north-eastern horizon and he had not acknowledged our call! What a disappointment! Ok, time to regroup and get ready for the next pass. We checked out all of the equipment and antennas and everything was in fine working order. Why hadn't he heard us? What we didn't know at the time was that there were thousands of stations all over the south-eastern US that were participating in this historic ham radio event….and the chances of him acknowledging any one individual station was a kin to winning the lottery. Of course, if you don't buy a "ticket" you have no chance of winning!

On to the next orbital pass, there is still plenty of time to make contact. Orbit after orbit passed with similar results….no joy! The ten days passed rather quickly and at the end, we were more than disappointed….he must have heard us but with so many stations calling was unable to acknowledge all of them. Fortunately, he was recording all of his listening time on tape. There was one more chance to get the sought after shuttle QSL. The ARRL was going to sell the tapes after his return from space. I was sure we would be on them somewhere.

Almost a Tragic Ending

Aboard Columbia, there were bigger problems than worrying about tape recordings and QSL cards. As Columbia was preparing for re-entry, a guidance computer failed when the RCS thrusters were fired. Moments later a second computer failed but was rebooted successfully. John Young, shuttle commander, delayed the landing and allowed the shuttle to drift. Later, it was found that he had made a crucial decision since restarting the guidance computer at that time would have resulted in the loss of the shuttle and crew. Good

(Continued on page 29)

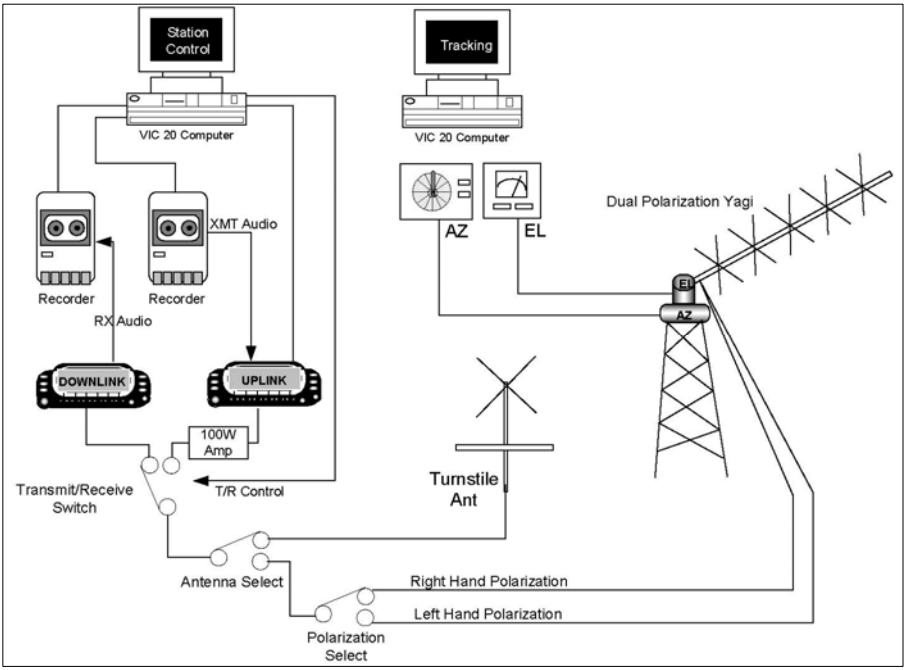
(First Ham in Space from page 28)

call, John! If that wasn't enough, minutes before landing at Edwards AFB, California, a hydrazine leak caused two auxiliary power units to catch fire. Thankfully, the shuttle landed safely after an otherwise very successful mission.

The Confirmation

A couple of months went by before the STS-9 tapes from Owen Garriott's tape recorder made their way to ARRL. Finally, I was able to purchase the tapes and start listening to the multitude of signals that had been captured. There were literally thousands of call signs on the tape and it became obvious why Owen was unable to acknowledge all the calls he had heard over the air. After hours of listening, there it was nestled between static and other stations calling. Success! The rest is history and the QSL card from W5LFL aboard the spacecraft Columbia hangs proudly in my shack. Of course, that was just the beginning of a long history of ham radio aboard shuttle flights, MIR and more recently the International Space Station.

VIC 20 Station Control



Sending Data by Radio

Henry Chamberlain, ZS1AAZ

ARRL stands for American Radio Relay League and some years ago, members of the ARRL discussed whether there should be a name change and leave the second R out. The need for relaying messages has diminished since it has become possible to send messages by connecting the radio to a computer, usually through some kind of interface.

In early days, messages were relayed from operator to operator using voice or CW and I often wondered how reliable that was, taking into consideration that conditions could make copy of a message difficult. Nevertheless, it was all that was available and there were many amateurs who made themselves available for message handling. I have no idea whether South African amateurs used a similar system. Perhaps our old-timers could tell us.

Sending messages by landline was done by using the teleprinter, where I worked there was such a machine and the typists could type a hand-written message into the machine so that a perforated tape was produced. This tape had rows of holes, grouped in fives in the Baudot code. When the typing was finished, the destination number could be dialled and once contact was established, the paper tape was fed into the machine and the data transmitted in a short time. It was a wonderful invention at the time. Amateurs soon learned how they could adapt such a machine so that they could send text by radio. The machine was rather bulky and I soon got rid of the one I had because I had no room for it.

News agencies such as Reuter and others also sent data by radio and the teleprinter had a bell that could be rung when an urgent news item was received. I purchased a Spectrum computer and obtained a program from a local amateur for sending and receiving Baudot code. He wrote the program in Basic. I wish I could remember who that amateur was! As a result of the Spectrum being made, a whole cottage industry sprang up in the UK; people were writing software and providing peripherals. It was probably the start of the UK's IT industry. You may remember that the Soviets shot down a passenger plane in 1983 that had strayed into their air space and I remember reading it by radio before it appeared in print the next day. I doubt that this method is used much today, the Internet is more efficient. The last transmission I remember seeing was from Cuba and was mostly of political nature.

Using Baudot code for sending data by radio was not immune to static and poor reception which

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caused errors, but in spite of that, amateurs are still using Baudot code, mostly referred to as RTTY, and there are still contests every year using that mode. A good program can be downloaded from the Internet, called MMTTY and it is free. Various baud rates can be used by amateurs but the standard for RTTY is 45 Baud. This is fast enough so that one can keep up if you are typing by hand, although the MMTTY program allows you to send standard messages at a press of a key. If your computer has a sound card, it is easy to operate on RTTY with just about any old SSB radio.

The first radio bulletin boards I saw in operation were those of the late Hofie, ZS6CC, in Pretoria and a 2 m BBS run by John, ZS1AGH, in Cape Town. I could regularly read bulletins with my Spectrum. Hofie also forwarded messages to other BBS's in the East and Australia.

There were other systems for sending data by radio. SITOR, the marine system and the amateur equivalent AMTOR, had a system of correcting errors, which worked quite well. One seldom hears an Amtor station on HF nowadays.

There was always a need for greater speed and accuracy and this led to the development of packet radio, used even today. A group of German amateurs invented the Pactor mode. They made the first Pactor mode for general use and several companies like the makers of the KAM, PK232 and MFJ, produced so-called multimode data controllers, machines that could handle CW, RTTY, Pactor and Packet. Later versions of Pactor were retained as proprietary modes. Other companies like Hal Communications invented Clover and there was competition between different companies to be the fastest and operate under the noisiest conditions.

In this race for speed, the machines became less suitable for keyboard to keyboard communications; the latest Pactor machine can outstrip the fastest typist by miles! I have experimented with programs for converting speech to text and transmitting the text and the person who reads it has a hard time keeping up reading it! Modes such as PSK31 that are not error free, are much more suitable for keyboard to keyboard and use very narrow bandwidth, require low power, and are slow enough so that one can type at about three characters per second. The ideal mode for persons with poor locations who still like to do HF communications. A suitable program is called Digipan, but there are others as well.

There is a world-wide network of stations called Winlink and they have standardised mostly on the faster Pactor modes. They allow amateurs who are in remote places to send messages, like yachtsmen and missionaries. There are two such stations in Africa, both in the RSA. In such circumstances one wants to send as fast as possible to

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accommodate as many users as possible.

If you hear chirping sounds at the lower end of the 20 and 40 m bands, those will most likely be some sort of digital mode sending messages. It is easy to read some of those signals, especially PSK31, you just need your computer, radio, sound card and suitable software, mostly free.

New version of MULTIPSK released

PSK data enthusiasts will be pleased to learn that a new version of the popular data modes software MULTIPSK has been released.

The new version can be downloaded from http://f6cte.free.fr. It includes a number of enhancements including new experimental PSK modes for HF.

Radio, Museums and Scouting

Dave Gemmell, ZS6AAW

with the Old Timers and the Broomstick Warriors

A Special Request to all Clubs

I don't even blush when I repeat myself and ask … Please do not cancel or change your plans for any Club events you have made for 16, 17 and 18 October 2009. If you have not already made plans, do so now! This will be the CQ Hou Koers and Jamboree on the Air weekend and a few more stations on the air to chat and demonstrate different modes to the Voortrekkers, Scouts and Guides will be more than welcome.

As I write this column in the middle of May, I am reminded of the short time left before the CQ Hou Koers and JOTA weekend in October. You will probably be getting your copy of Radio ZS about the end of June thus making it fifteen or sixteen weeks to go!

Part of your planning will deal with the call sign for your station. If you do not have a special call, then you must start the process of getting a call from ICASA. If you already have a call sign, please ensure the licence is paid. Also, register your station as an educational station with the SARL. Visit www.sarl.org.za

It sounds contradictory but any radio amateur or Club could even decide to run a JOTA or CQ Hou Koers station as late as Thursday 15 October, that is, if the venue is to be the Club House.

I would like know beforehand whom we could expect to hear on the air. There is no formal registration as such, on the Scouting side, it helps me when I compile the SA National JOTA report for the World Bureau and I am sure the Voortrekker organisation would like this information as well.

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Activities

I believe it is an important topic, especially when a temporary station has been set up in public. Suitable activities are required to keep the young (and parents) suitably occupied while they wait to have a word on the airwaves. The bottom line therefore, should be …. Is my station user friendly? This applies to the displays and activities forming your amateur radio exhibit. What about suitable handouts? Will you have suitable circuits and descriptions of simple circuits, which the scholars can build themselves? Better still will you have a few working models of these on display so that these people can try them out.

Ask yourself, "How many people could use amateur radio at any moment?" To have a decent demonstration, the onlooker, preferably young, should be able to operate or at least, take part in whatever is going on, not just standing and watching… now think of what the rest are going to do.

World Amateur Radio Day

Saturday 18 April turned out to be quite an interesting morning even though there did not seem too much activity. Not too many stations were around, but I did work the chaps in Kathu who were operating ZS3NC (Northern Cape ARC) from a shopping mall. Then I ran into ZS08TV operated by Dior, ZS6DJD, from Vereeniging. A short while later, Val, ZS2VJJ, in East London, Steven, ZS6SKY, in Kempton Park and Garth, ZR6SUN, in Muldersdrift was added to the log.

Francois, ZS6BUU, operated from the NARC using ZS6SRL and made 54 contacts with stations in all six call areas, with a good mix of ZU, ZR and ZS calls.

Digital Radio and Amateur Radio

By "digital" radio I mean a complete rig, not just an amateur rig coupled via a modem to an amateur transceiver.

An interesting thought struck me! How will the advent of "fully digitized" radio affect the world of amateur radio? I received a small FM radio as a present from my daughter. The only controls it has are – On/Off switch and volume control, two buttons for channel/ station select and reset and an earphone socket. The earphone lead is probably screened twin with the actual screen acting as the antenna!

I plucked up enough courage and I carefully opened it to have a closer look. Inside there was a PC board with enough connections for the controls but the actual electronics were covered by a protective blob of what looked black toffee about 0,5 mm thick and 15 mm dia. It would be fun to have a SW receiver this size even if it only covered the ham bands!

The questions that puzzle me are - what effect will this technology have on amateur radio? In addi-

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tion, how will it affect the homebrew section of our hobby?

Former Scout Net

Is there any chance of starting a SA Scout Net or Former Scout/Radio Amateur Net?

Any one who was invested as a Brownie, Guide, Cub or Scout are known as former Scouts. Remember, this is especially true if you were a Scout or a Guide in the last Century! Sounds odd but even men and women born after 1980 can claim this "honour." Actually, a former Scout, as this title implies is some one who has been through the Scout ranks but is now no longer actively connected with the Movement. It matters not, whether he/she was a Cub, Scout and Rover Scout or was a member only one of the sections.

If there is interest, contact me at the address below.

Dave Gemmell, ZS6AAW, is the National JOTA Co-ordinator for the SA Scout Association and is also involved with the SA Air Force Museum at AFB Swartkops. Dave can be contacted at dave@zs6mus.org.za or davegemmell@bmknet.co.za. By snail mail to PO Box 77, Irene, 0062 and tel 012 667 2153.

T68 Transmitter and Receiver

SILENT KEYS STIL SLEUTELS

They shall grow not old as we that are left grow old
Age shall not weary them nor the years condemn
At the going down of the sun and in the morning
We will remember them."

Hulle word nie oud soos ons wat bly vergrys,
Die jare sal hulle nie raak nog die tyd se eis
En, soos die son sak of die more ontvou,
Eer hul herinnering – ons sal onthou."

Dr Ivy Matsepe-Casaburri
George Jillings, ZS1YZ **John Fuller, ZS6JHF**
Melvyn Slater, ZS5MF **Frederick Strutt, ZS2JS**
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EZ10-GPS-ZS

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+Integrated u-blox LEA-4P GPS receiver module
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