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HAMS Waywite News

MIDLANDS AMATEUR RADIO CLUB
P.O.Box 1076, HILTON, 3245

November 2007



AFFILIATED TO
THE SARL & IN
ASSOCIATION
WITH THE NATAL
CARBINEERS

Chairman & Clubhouse Manager

Bert Cornell, ZS5MQ
(033) 344-3659

Committee Members

Mike Boast, ZS5BGV

Secretary / Treasurer

■ (033) 342-1241

✉ mboast@pmbnet.co.za

Robin Seal, ZS5MRS

PRO & Media Liaison

■ (033) 343-1942

Shaun Rudling, ZR5S

VHF/UHF & Digital

■ (033) 342-1609

**Mickey Esterhuysen,
ZS5QB**

*Technical Adviser & Club
Bulletins*

■ (033) 386-4808

Wessel du Preez, ZS5BLY

Vice-chairman & HHN Editor

■ (033) 702-1968

✉ dupreezw@futurenet.co.za

The Chairman's Fax

Well, the holiday season has caught up with us all with Christmas just six weeks away. I wonder what the new year holds for us all with crime rate at its peak, food prices and petrol going through the ceiling. Somehow I think it's all happened before but we just don't remember. Do hope you bought some gold shares when they were really cheap! I can still remember buying a Kruger Rand in 1967 for a mere R27.00 (\$35.00)!!

The committee has decided to go ahead with the Gilboa project which will couple the Greytown and Estcourt repeaters together a la Pinewood style. It has also been agreed at the last meeting to approach members for a contribution to make the project really viable (R4 500.00). Should the donation be large enough, it is possible that the site would be named after that benefactor. Just imagine it, a whole site being called after you!

Contributions may be sent to the Hon Secretary at our box number or directly to the club's bank account as indicated elsewhere in HHN. In order to enable amateurs (hams) who are not members of the club but do make use of our repeater facilities to partake in this important project, a copy of HHN will be posted from the current list of call signs which we have, so that they might also contribute to what is going to be known as the Gilboa Repeater Fund, dig deep chaps, it is for a good cause. Don't forget to check the SW's sugar bowl - some of them keep the household cash there!!

A boot sale will be held on Saturday the 17th November 2007 at the Natal Carbineers in lieu of the monthly meeting. Try to be there with your unwanted bits and pieces, and plenty of spare cash to purchase what you have always dreamed of owning. A bring and braai will take place at the same time

Why don't you join in on the Thursday MARC net at 19:00 on 3,620 MHz

NEXT MEETING ON THE 17/11/2007

CU THERE

PS! Don't forget to send your apologies if you can't make it!

73 DE ZS5MQ

The club meets on the third Saturday of every month, except December at 13:00 at the Natal Carbineers Conference Center, Geere Street, PMB. Sunday Morning Bulletins (MARC and SARL) as well as the Club Net from 07:45 on 3620 kHz and the 145.750 MHz repeater.

Sunday Club Net Controller: Mickey Esterhuysen, ZS5QB
National News Bulletin: Robin Seal, ZS5MRS

CLUB BANKING DETAILS

Bank: First National Bank

Branch: Bank Street

Branch code: 220-825

Account holder: Midlands Amateur Radio Club

Account Number: 625057756507

Type of account: Current

Reference to use is your call sign

From the Editor

The poet W.H. Auden wrote of human development that:

"between the ages of twenty and forty we are engaged in the process of discovering who we are, which involves learning the difference between accidental limitations which it is our duty to outgrow and the necessary limitations of our nature beyond which we cannot trespass with impunity."

If we therefore say to ourselves "I cannot do..." we should ask ourselves whether it is a limitation of our nature or simply an accidental limitation that we have failed to outgrow. The scientists tell us that a living organism is either growing or it is dead so if we are still alive, we must grow and outgrow those limitations that we may have mistakenly classified as being beyond our nature. We learn, and therefore grow, only by exposure: be it seeing, hearing, feeling or reading. As radio amateurs we have the ability to speak to many people all over the world and thus have more opportunity to grow ourselves even if we are long past forty! We can send and receive images and we are constantly faced with technical problems that we have to solve without sophisticated test instruments and develop a "feeling" for many things. In theory therefore, we should be well developed. Are we?

Wessel, ZS5BLY

News and Views

① The Underberg repeater has been damaged during a severe electrical storm and is not operational at present. The radios are now fine again but the antenna needs to be repaired or replaced - we'll know as soon as we can get it down.

① The November meeting to be held on the 17th November will take the form of a flea market/boot sale. Our neighbouring clubs have been invited, so there should be some new goodies available to take up the space of your recently cleared storage area.

① No further reports have been forthcoming on the 750 repeaters' performance and, not being able to monitor it, one has to assume that it is in good working order. What about a monthly report for this column, Shaun? As a matter of fact, you can have your own column!

① The club banking details appear on the top of this page. You can now pay your subs (and any donations as requested by the Chairman!) by transfer instead of having to post a cheque.

① In cricket terms: 80 and not out! Congratulations to Alex, ZS5AH. May the batting to the century contain many boundaries !

Back to Roman days

"The greatest remedy for anger is delay." Seneca - Roman politician, philosopher and dramatist who lived about AD 55. He was the tutor of the young Nero but, as the emperor's conduct regenerated, he retired to pursue his literary interests.

Satellite Orbits

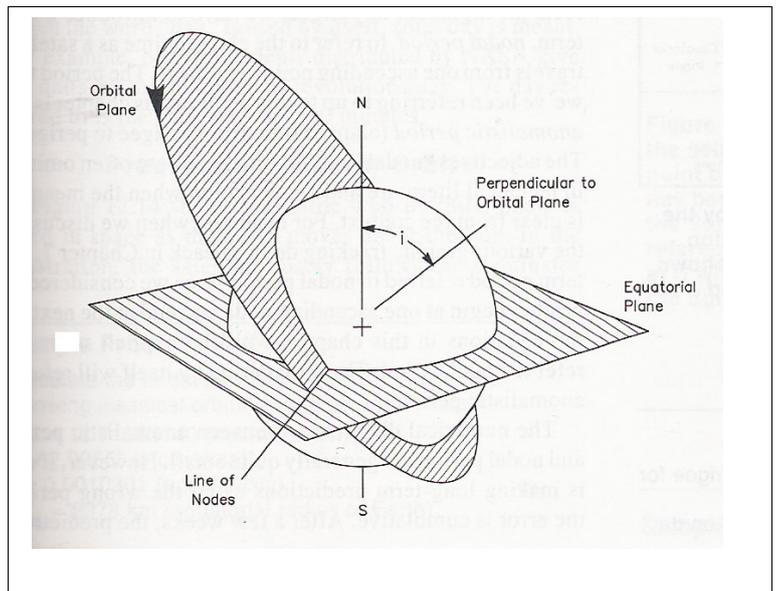
As with all new subjects that we wish to learn about, we will need to understand the terminology that is used in the subject being considered. Maybe you have had a look at the orbital element sets that you have downloaded and come across some weird and wonderful words. What do they mean? I wish to emphasize that you do not need to understand all of this to operate via a satellite, but that it will greatly enhance your enjoyment thereof if you go into it a bit deeper.

In order to describe the motion of a satellite as seen by an observer on the earth, we have to establish a terrestrial frame of reference. We will simplify this by assuming that the earth is a sphere. The rotational axis of the earth, that is the North-South axis, provides a unique line through the geocenter which intersects the surface at two points which are called the geographic *north-* and *south poles* respectively. Any plane taken through the earth and containing the geocenter is called a *great circle*. The great circle that is formed by the equatorial plane and is also perpendicular to the N-S axis is called the *equator*. Great circles that contain the two poles are divided in two halves which are called *meridians*. The meridian passing through the original site of the Royal Greenwich Observatory in England is used as the *reference* or *prime meridian*, indicated by 0° . From there we go 180° east and also 180° west which covers the 360° circumference of the circle. As far as latitude is concerned, it constitutes the angle between the equatorial plane and the pole. Thus we go north to 90° and south by 90° to cover the 180° of the half circle. By international agreement longitudes towards the east are positive and those towards the west are negative. Similarly, movement towards the north of the equator is positive while those towards the south are negative.

Having established a reference for our observation post, we may turn our antennae towards the sky and start looking for satellites.

Most amateur satellites are of the Low Earth Orbiting (LEO) type and are placed in an elliptical but almost circular polar orbit. The degree to which an elliptical orbit deviates from a circle is called its *eccentricity* and for a circle this is 1. By polar

orbit we mean that the plane of the orbit is almost perpendicular to the equatorial plane. The degree to which it differs is known as the *inclination* of the orbit and we can define it as the angle between the line joining the geocenter and north pole and the line through the geocenter perpendicular to the orbital plane. This is the angle i in the diagram. The line of intersection between the orbital plane and the equatorial plane is known as the *line of nodes*. The *ascending node* is that when the satellite crosses the equatorial plane from south to north. Furthermore, the position of the satellite when it is at the furthest point from the earth is called the *apogee* while the closest point is known as the *perigee*. The angle between the line of nodes and the major axis of the ellipse (that is the segment joining the geocenter and perigee) is known as the *argument of perigee*.



Rather than going into the mathematics of celestial mechanics, we may simply define some of the terms that appear in the orbital data files. Here are some:

Anomistic period: The elapsed time between two successive perigees of a satellite.

Mean motion: Number of revolutions completed by a satellite in a solar day (1440 min.)

Mean Anomaly: (MA) A number that increases uniformly with time, used to locate a satellite position on orbital ellipse. MA varies from 0 to 256. When MA is 0 or 256, satellite is at perigee and when MA is 128, satellite is at apogee. Between 0 and 128 it is heading toward apogee and between 128 and 256 it is heading toward perigee.

[More definitions next month. Thereafter we will understand our orbital data files!]



Standard Resonators		
Power Rating 400 Watts		
Part Number	Description	Approximate Bandwidth
		2:1 SWR or better
RM-10	10 Meter	150-250 kHz
RM-12	12 Meter	90-120 kHz
RM-15	15 Meter	100-150 kHz
RM-17	17 Meter	120-150 kHz
RM-20	20 Meter	80-100 kHz
RM-30	30 Meter	50-60 kHz
RM-40	40 Meter	40-50 kHz
RM-75	75 Meter	25-30 kHz
RM-80	80 Meter	25-30 KHz



Ameritron's SDA-100 is without a doubt the best built, best looking, best performing HF Mobile Screwdriver Antenna in the world! When properly installed on your vehicle this antenna will provide continuous coverage from 10 Meters through 80 Meters with a 6 foot whip. Remove the whip to get 6 Meters through 40 Meters coverage.



Stop tuning, start talking.

The SG-230 Smartuner was the first product in the HF market to offer fast, flexible tuning without any user interface. This unit works with ANY radio and ANY antenna without any special interface, making it the most versatile tuning product available. The SG-230 can be used in base station, mobile, marine and aviation and has been the "Gold Standard" of automatic antenna tuning for nearly twenty years. The SG-230 is built in a rugged ABS plastic enclosure which is sealed to protect it, and allows ultimate versatility in installation.

X200
 144/430MHz(2m /70cmz)
 Gain:6.0dB (144MHz) ,8.0dB(430MHz)
 Max. power rating:200W
 Impedance:50ohms
 VSWR:Less than 1.5:1
 Length:2.5m
 Radial length:approx.52cm
 Weight:1.2kg
 Rated wind velocity: 50m /sec.
 Mast diameter accepted:30mm to 62mm
 Type:2 x 5/8wave(144MHz),4 x 5/8wave(430MHz),FRP outershell



Radio Accessories & Data Modems

9 Carnation Street,
 Gallo Manor,
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 Gallo Manor,
 Rep. of South Africa
 2052

The Olympic Games

This was the major athletic festival of the ancient world. Traditionally founded in 776 BC, the games were held every four years at Olympia in honour of Zeus for about 1 200 years until the late 4th century when they were closed either by the command of Theodosius I in 393 or when the temple of Zeus was destroyed c. 426.

According to Pindar the games were founded by Heracles to commemorate the successful completion of one of his labours (the cleaning of the stables of Augeas). Another theory is that they developed out of the funeral games held to honour the local hero Pelops. A local festival may well have existed before the traditional date of the games' foundation but it is unlikely to have been organized on an international basis much before the early 8th century BC.

An important and unique element of the games was the Olympic truce. This was an armistice, originally for one month, later extended to two and then three months, by which participating states were forbidden to take up arms or pursue legal disputes. Its purpose was not to stop wars but rather to ensure that wars did not stop the the games and that participants and pilgrims could be guaranteed a safe passage to and from Olympia. The festival was held around the time of the second or third full moon after the summer solstice, i.e. in mid-August or mid-September when the harvest was complete.

At first there was only a single event, the stade, a foot race of about 180 m (the length of the stadium). But by the mid-7th century the 'canon' of nine principal events was established: the stade, the double stade, the *dolichos* (about 4 500 m), the *pentathlon* (discus, standing jump, javelin, stade and wrestling), wrestling, boxing, chariot race, horse race, and *pancratium* (a violent form of all-in wrestling). Similar events for boys (from 12 to 18) and a few others for men, such as the race in heavy armour, were added later. By the 5th century BC the games lasted for five days which included various religious ceremonies, social events, and the parade of champions on the last day.

The competition was open to male citizens from all over the Greek world. Women could not compete (though they had their own games at Olympia in honour of Hera) and married women could not even watch. Participants were mostly aristocrats and full-time athletes: they were not amateurs.

Training was intensive and the last month had to be spent at Elis under the eye of the 'judges of the Greeks' (Hellanodikai), as the official supervisors were known. The event itself was regarded as a paramilitary exercise and the rivalry between states for Olympic success was warfare by another name. The prize for the victor was a crown of wild olive, but the rewards in terms of prestige and even political advancement could be immense.

In 364 BC the Arcadians violated the sacred truce and the decline of the games may be traced back to that date. The sanctuary was destroyed by the Roman general, Sulla, and the games transferred to Rome in 80 BC. In spite of this, the festival continued to be celebrated. Its increasing secularization was not sufficient to save it from the purge of pagan institutions conducted by a Christian emperor and ended the classical Olympic games.

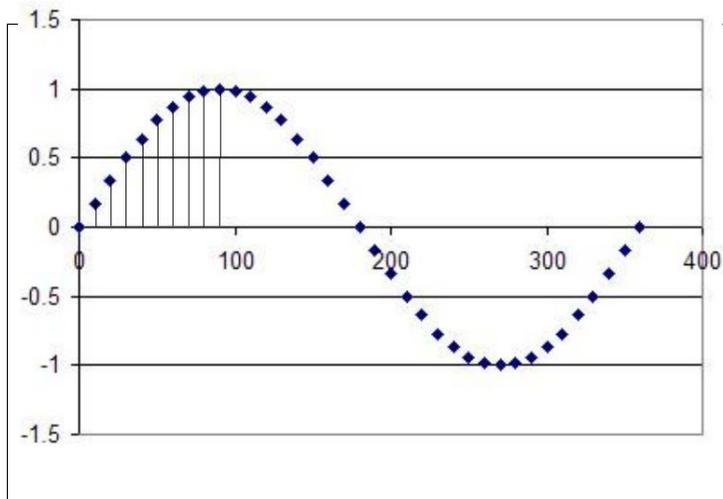
An Introduction to Direct Digital Synthesis

Most modern transceivers used by radio amateurs use Direct Digital Synthesis to generate the local oscillator signals required for both reception and transmission of the final operating frequency. The speed and noise performance of DDS make an attractive combination in many applications. DDS also has simplicity and inherent stability going for it. The term "*direct*" means that no feedback is involved as with the classic Clapp or Collpits oscillators. There are also no tuned circuits involved in the process.

The operation of the system is based on the fact that for a sine wave, there is a direct relationship between the phase (or time) of the wave and its amplitude. Referring to the figure shown, the amplitude of the wave was calculated every 10° from 0° to 360° (i.e. one full cycle) using the formula:

$$y_t = \sin\theta_t$$

where y_t is the amplitude of the wave at the phase angle θ_t (you can do this with any scientific calculator by entering 10 and then sinfunction and repeat for 20,30, etc) as shown by the vertical lines in the figure. As phase is directly



proportional to time, we could just as well have taken our samples at regular time intervals to produce the same wave. Now to make use of this information we use a counter, called the phase accumulator, that we can increment by a constant at regular intervals. The value of that constant is directly proportional to frequency and the higher frequencies will use closer spaced intervals. We then need to create a look-up table that uses the accumulated phase value (our counter) to index a digital amplitude value at each sample time. The values in the look-up table are kept in read-only memory for they do not change. From the figure it is also clear that the values are cyclic so we need only store the values from 0° to 90° ($\sin 80^\circ = \sin 100^\circ$, etc.). After reaching 180° the same pattern is followed except that the values are now negative. The look-up table therefore maps the phase information from the phase accumulator into a digital amplitude word which, in turn, drives a digital to analogue converter (DAC) producing our output wave. In most cases the DAC is followed by a low-pass filter (in some cases by variable band-pass filters) to get rid of the unwanted by-products that are also generated. Now that we have the basic principle, we can put together a block diagram and show how it is possible to tune your 145 MHz transceiver accurately to 1 Hz.

Due to lack of more blank pages, this will stand over for the December issue of HHN

Bulletin Readers

18th November	Bert	ZS5MQ
25th November	Wessel	ZS5BLY
2nd December	Mickey	ZS5QB
9th December	Mike	ZS5BVG
16th December	Robin	ZS5MRS
23rd December	Bert	ZS5MQ
30th December	Wessel	ZS5BLY

On the Giggle-Hertz bands

Sally was driving home from one of her business trips in Northern Arizona when she saw an elderly Navajo woman walking on the side of the road. As the trip was a long and quiet one, she stopped the car and asked the Navajo woman if she would like a ride. With a silent nod of thanks, the woman got into the car. Resuming the journey, Sally tried in vain to make small talk with the Navajo woman. The old woman just sat silently, looking intently at everything she saw, studying every little detail, until she noticed a brown bag on the seat next to Sally.

"What in bag?" asked the old woman. Sally looked down at the brown bag and said, "It's a bottle of wine. I got it for my husband." The Navajo woman was silent for another moment or two. Then, speaking with the quiet wisdom of an elder, she said: "Good trade....."

They said it

Millions long for immortality who do not know what to do with themselves on a rainy Sunday afternoon.

Susan Ertz

Nothing you can't spell will ever work.

Will Rogers

Man is not a circle with a single centre; he is an ellipse with two foci. Facts are one, ideas are the other.

Victor Hugo
(*Les Miserables*)

NEXT MEETING

The next club meeting on Saturday, 17th November will be a boot sale cum flea market affair at the usual venue. There will also be the usual bring-and-braai so bring whatever you need for this activity.

Please note the starting time of 13:00

SWOPSHOP

Come to the flea-market and get it there!