BOLAND AMATEUR RADIO KLUB

November 2017

CQ BOLAND

Van die **VOORSITTER**

Ons laaste ledevergadering van die jaar vind plaas op 2 Desember 2017 te Fort Ikapa, (KVA), Goodwood. Soos almal seker reeds weet moet ons by die vergadering besluit of ons die fasiliteit in die toekoms wil gebruik en dit is dus belangrik dat u die vergadering bywoon. Daar word beoog om 'n gehalte HF stasie by KVA op te rig, vir die gebruik van ons lede, wat alle aktiwiteite (Kompetisies en Vryetydsbesteding) sal insluit.

Bly asseblief ook vir die gebruiklike 'bring en braai' na die vergadering. Ons beplan ook om 'n spesiale geleentsheidstasie op te sit om die die toestande by die fasiliteit te toets.

KVA beskik oor 'n raadsaal, kroeg, kombuis, braai-area en 'n swembad en is dus familie vriendelik. Onthou dat u nie die basis met drank mag betree nie maar dit is in alle geval goedkoper om die nodige in die kroeg te koop.

Ek maak van die geleentheid gebruik om almal wie hierdie jaar betrokke was by BARK se bedrywighede te bedank. U teenwoordigheid by vergaderings en ander aangeleenthede word waardeer.

Ons ledetal staan tans op 91 en ek doen 'n beroep op u om nuwe lede, veral jonger lede, vir die klub en natuurlik ook vir amateurradio te werf.

Onthou dat u op hoogte kan bly deur BARK se Facebook blad facebook.com/bolandamateurradioklub.

'n Geseënde Kersfees en 'n voorspoedige Nuwejaar aan u en u gesin.

73
Conradt
ZS1ES

24ste IARU-Streek 1 konferensie – September 2017

Deur **Rassie Erasmus ZS1YT**

Die 24ste IARU streek 1 konferensie is hiedie jaar aangebied deur die Duitse Amateurradioklub – DARC- te Landshut Duitsland. Landshut is sowat 70km oos van Munich geleë.

Die konferensie het afgeskop op Saterdag 16 September met ‘n verwelkoming deur die visie-president van DARC, Christian Entsfellner, DL3MGB. Verwelkoming tot Landshut is ook gedoen deur Robert Mader,’n lid van die plaaslikke regering van Landshut.

Verwelkomingstoesprake is ook gelewer deur Don Beattie, G3BJ, president van IARU Steek 1 en President van IARU, Tim Ellam, VE6SH.

Die gasprekers vir die aand was Mnr Thomas Weilacher van CEPT en Mnr Mario Maniewicz van die ITU.

‘n Totaal van 43 lidlande met 13 volmagte het die konferensie bygewoon.

Verteenwoordigers van IARU streek 2 en 3 was ook teenwoordig.

Die konferensie het afgeskop met die eerste voltallige vergadering Sondagoggend waarna verskeie werkgroepe vergader het. Vanaf Maandag tot Woensdag het die verskillende komitees vergader. Komitee 2 is verantwoordelik vir die Finasies van die IARU, Komitee 3 vir Administrasie van die IARU, Komitee 4 vir HF sake, Komitee 5 vir BHF en UHF, Komitee 6 vir Verkiesings en stemmings en Komitee 7 vir Elekormagnetiese Versoenbaarheid.

Op Donderdag 21 September het die finale Voltaligge vergadering plaasgevind. Tydens hierdie vergadering is al die terugvoer vanaf die verskillende komitees geevalueer en deur die volle vergadering ingestem.

Na afloop van die vergadering is die verkiesing gehou vir die komiteelede en verskeie werkgroepvoorsitters van die IARU streek 1 vir die volgende termyn van 3 jaar.

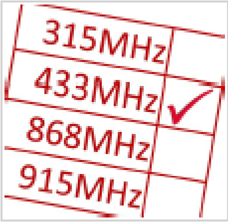
Donderdagaand is die amptelikke IARU streek 1 konferensie afgelsuit met ‘n banket dinee.

Vrydag het die DARC die afgevaardigdes trakteer op ‘n besoek aan die BMW fabriek buite Landshut en die aand is afgesluit met ‘n besoek aan die Oktober fest in Munich.

Die SARL is verteenwoordig deur Nico van Rensburg ZS6QL en Rassie Erasmus ZS1YT.

‘n Volledige verslag van die streek 1 konferensie kan afgelaai word by https://www.iaru-r1.org/index.php/general-conference

A Brief History of Radio Frequency



Since it's infancy, the use of radio has been subject to extensive controls. These controls often fall at the feet of Government agencies, who are responsible for sanctioning these frequencies. These controls include:

- Frequencies which can be used
- Who can use the different frequencies
- The duration a frequency can be used
- Where a frequency can be used

In the early days radio regulatory powers were generally vested in the postal authorities. This caused a strong conflict of interest, as some authorities ran the rapidly growing telecommunications systems , and there was fear that the success of radio would damage the revenue of the telephone industry. In more recent times however, this has not proven to be the case. The various regulatory bodies now act as a means of allocating precious frequencies to the many and varied applications to which radio is put.

The regulations and controls are necessary for radio work. If you did not ensure there were harmonic frequencies, then items could be transmitted, on not only the frequency you require but various other ones. This would not only lower the chance of your transmission being received, by the intended receiver, but your signal could also be blocked by other transmissions in the area or received by an unintended recipient.

Monitoring Radio Worldwide.

Radio frequencies are used worldwide by different organizations, for a range of different reasons; television stations, emergency services and car manufacturers to name a few.. each different licensed frequency is allocated to a company or service and can only be used by them. The allocation of frequencies is carried out on a worldwide basis by the 'International Telecommunications Unions – Radio' (generally referred to as the ITU-R)

In addition to allocating frequencies, the regulatory bodies have the task of ensuring that a transmitter being used in one band does not interfere with one being used in another. Such problems would render the use of radio unworkable in many applications.

Radio for the Masses

License free frequencies are available to be used by anybody wishing to use them, the most commonly include ISM (Industrial, Scientific, Medical) frequencies. Though they are 'unlicensed' there are still regulations which must be abided by. Restraints include; where they can be used and for how long at a time. It is important to bear in mind that every country or region has specific frequencies they can use and its own set of rules.

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Second SDR Workshop in Cape

Following on the first SDR Conference hosted by CPUT in Belville, a second Workshop was arranged by AMSAT SA in conjunction with the SARL. This took place on Saturday the 4th of November this year, at the conference venue of the Oakdale Club in Bellville.

The general principles of SDR, spelled out at the first conference, was put into practice at this Workshop. Here participants were introduced to the set-up of the now very popular RTL-SDR dongle as a receiving module in conjunction with a PC. The required software packages for the manipulation of the received RF signals were supplied ready for use on a memory stick, and a step by step process were followed by Johan, ZS1RX and George, ZS1GFL, in explaining all that was necessary for the setup of the system. It did not take long before spectrum and waterfall displays appeared on the laptop screens.

As with our previous conference, radio amateurs active in the well established small satellite space industry in the Western Cape, were also in attendance. This further strengthened our ties with the broader space community where communication by means of software systems are becoming the norm.

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UTC and its Inception

Coordinated Universal Time abbreviated to **UTC**, is the primary time standard by which the world regulates clocks and time. It is within about 1 second of mean solar time at 0° longitude. For most purposes, UTC is considered interchangeable with Greenwich Mean Time (GMT), but GMT is no longer precisely defined by the scientific community.

At the 1884 International Meridian Conference held in Washington, D.C., the local mean solar time at the Royal Observatory, Greenwich in England was chosen to define the Universal day, counted from 0 hours at mean midnight. This agreed with civil Greenwich Mean Time (GMT), used on the island of Great Britain since 1847. In contrast, astronomical GMT began at mean noon, 12 hours *after* mean midnight of the same date until 1 January 1925, whereas nautical GMT began at mean noon, 12 hours *before* mean midnight of the same date, at least until 1805 in the Royal Navy, but persisted much later elsewhere because it was mentioned at the 1884 conference. In 1884, the Greenwich Meridian was used for two-thirds of all charts and maps as their Prime Meridian.] In 1928, the term Universal Time (UT) was introduced by the International Astronomical Union to refer to GMT, with the day starting at midnight. Until the 1950s, broadcast time signals were based on UT, and hence on the rotation of the Earth.

In 1955, the caesium atomic clock was invented. This provided a form of timekeeping that was both more stable and more convenient than astronomical observations. In 1956, the

U.S. National Bureau of Standards and U.S. Naval Observatory started to develop atomic frequency time scales; by 1959, these time scales were used in generating the WWV time signals, named for the shortwave radio station that broadcasts them. In 1960, the U.S. Naval Observatory, the Royal Greenwich Observatory, and the UK National Physical Laboratory coordinated their radio broadcasts so time steps and frequency changes were coordinated, and the resulting time scale was informally referred to as "Coordinated Universal Time".

The first Coordinated Universal Time was informally adopted on 1 January 1960, but the official abbreviation of UTC and the official English name of Coordinated Universal Time (along with the French equivalent), was not adopted until 1967.

The system was adjusted several times, including a brief period where time coordination radio signals broadcast both UTC and "Stepped Atomic Time (SAT)" until a new UTC was adopted in 1970 and implemented in 1972. This change also adopted leap seconds to simplify future adjustments. This CCIR “Recommendation 460 "stated that (a) carrier frequencies and time intervals should be maintained constant and should correspond to the definition of the SI second; (b) step adjustments, when necessary, should be exactly 1 s to maintain approximate agreement with Universal Time (UT); and (c) standard signals should contain information on the difference between UTC and UT."

A number of proposals have been made to replace UTC with a new system that would eliminate leap seconds, and the decision to remove them altogether has been deferred until 2023

The current version of UTC is defined by International Telecommunications Union Recommendation (ITU-R TF.460-6), *Standard-frequency and time-signal emissions*[and is based on International Atomic Time (TAI) with leap seconds added at irregular intervals to compensate for the slowing of Earth's rotation. Leap seconds are inserted as necessary to keep UTC within 0.9 seconds of universal time, UT1.

Time zones around the world are expressed using positive or negative offsets from UTC, as in the list of time zones by UTC offset.

The westernmost time zone uses UTC−12, being twelve hours behind UTC; the easternmost time zone, theoretically, uses UTC+12, being twelve hours ahead of UTC.

UTC is used in many internet and World Wide Web standards. The Network Time Protocol, designed to synchronise the clocks of computers over the internet, encodes times using the UTC system. Computer servers, online services and other entities that rely on having a universally accepted time use UTC as it is more specific than GMT. If only limited precision is needed, clients can obtain the current UTC from a number of official internet UTC servers. For sub-microsecond precision, clients can obtain the time from satellite signals.

UTC is also the time standard used in aviation, e.g., for flight plans and air traffic control clearances. Weather forecasts and maps all use UTC to avoid confusion about time zones and daylight saving time. The International Space Station also uses UTC as a time standard.

Amateur radio operators often schedule their radio contacts in UTC, because transmissions on some frequencies can be picked up by many time zones.

UTC divides time into days, hours, minutes and seconds. Days are conventionally identified using the Gregorian calendar, but Julian day numbers can also be used. Each day contains 24 hours and each hour contains 60 minutes. The number of seconds in a minute is usually 60, but with an occasional leap second, it may be 61 or 59 instead. Thus, in the UTC time scale, the second and all smaller time units (millisecond, microsecond, etc.) are of constant duration, but the minute and all larger time units (hour, day, week, etc.) are of variable duration. Decisions to introduce a leap second are announced at least six months in advance in "Bulletin C" produced by the International Earth Rotation and Reference Systems Service. The leap seconds cannot be predicted far in advance due to the unpredictable rate of rotation of the Earth.

Nearly all UTC days contain exactly 86,400 SI seconds with exactly 60 seconds in each minute. However, because the mean solar day is slightly longer than 86,400 SI seconds, occasionally the last minute of a UTC day is adjusted to have 61 seconds. The extra second is called a leap second. It accounts for the grand total of the extra length (about 2 milliseconds each) of all the mean solar days since the previous leap second. The last minute of a UTC day is permitted to contain 59 seconds to cover the remote possibility of the Earth rotating faster, but that has not yet been necessary. The irregular day lengths mean that fractional Julian days do not work properly with UTC.

Since 1972, UTC is calculated by subtracting the accumulated leap seconds from International Atomic Time (TAI), which is a coordinate time scale tracking notional proper time on the rotating surface of the Earth (the geoid).

As with TAI, UTC is only known with the highest precision in retrospect. Because of time dilation, a standard clock not on the geoid, or in rapid motion, will not maintain synchronicity with UTC. Therefore, telemetry from clocks with a known relation to the geoid is used to provide UTC when required, on locations such as those of spacecraft.

It is not possible to compute the exact time interval elapsed between two UTC timestamps without consulting a table that describes how many leap seconds occurred during that interval. By extension, it is not possible to compute the duration of a time interval that ends in the future. GPS time always remains exactly 19 seconds behind TAI (neither system is affected by the leap seconds introduced in UTC).

For most common and legal-trade purposes, the fractional second difference between UTC and UT (GMT) is inconsequentially small. Greenwich Mean Time is the legal standard in Britain during the winter, and this notation is familiar to and used by the population.

In 1961, the Bureau International de l'Heure began coordinating the UTC process internationally (but the name Coordinated Universal Time was not formally adopted by the International Astronomical Union until 1967). Time steps occurred every few months thereafter, and frequency changes at the end of each year. The jumps increased in size to 100 ms. This UTC was intended to permit a very close approximation to UT2.

In 1967, the SI second was redefined in terms of the frequency supplied by a caesium atomic clock. The length of second so defined was practically equal to the second of ephemeris time. This was the frequency that had been provisionally used in TAI since 1958. It was soon recognised that having two types of second with different lengths, namely the UTC second and the SI second used in TAI, was a bad idea. It was thought that it would be better for time signals to maintain a consistent frequency, and that that frequency should match the SI second. Thus it would be necessary to rely on time steps alone to maintain the approximation of UT. This was tried experimentally in a service known as "Stepped Atomic Time" (SAT), which ticked at the same rate as TAI and used jumps of 200 ms to stay synchronised with UT2.

There was also dissatisfaction with the frequent jumps in UTC (and SAT). In 1968, Louis Essen, the inventor of the caesium atomic clock, and G. M. R. Winkler both independently proposed that steps should be of 1 s only. This system was eventually approved, along with the idea of maintaining the UTC second equal to the TAI second. At the end of 1971, there was a final irregular jump of exactly 0.107758 TAI seconds, so that 1 January 1972 00:00:00 UTC was 1 January 1972 00:00:10 TAI exactly, making the difference between UTC and TAI an integer number of seconds. At the same time, the tick rate of UTC was changed to exactly match TAI. UTC also started to track UT1 rather than UT2. Some time signals started to broadcast the DUT1 correction (UT1 − UTC) for applications requiring a closer approximation of UT1 than UTC now provided.

Source: Wikipedia.