RAGCHEW

MAY 2018

FROM THE EDITOR - G4CIB

As I write this the rain is lashing down and all thoughts of portable operating put on hold! But the forecast for the May Day Bank holiday is promising so hopefully the regular attendees at Crickley Hill will be able to enjoy some outdoor operating. **Anne 2E1GKY** and I recently attended the RSGB AGM in Birmingham. After the formal proceedings we received an update from **Joe Taylor K1JT** regarding further development being carried out on FT8 software - see my report in this issue. End fed antennas - you either love them or hate them! In this issue **Tony G4HBV** now turns his attention to the theory and practice of the end fed and next month will be describing a 160/80m antenna we used on club operating evenings. **Dave G4BCA** updates us on the Club HF and VHF Spring Challenges. FT8 mode is taking the Amateur Radio world by storm, indeed several club members are using the mode to great advantage in the Spring Challenge. The Amateur Radio press has been full of articles discussing the pros and cons of digital modes and even posing the question what is Amateur Radio, along with the old problem of attracting newcomers into the hobby. By kind permission of **Kirk NT0Z** I have reproduced an article he wrote in his regular "Amateur Radio Insights" column in "The Spectrum Monitor" which is a paid monthly digital magazine. Entitled "Did Joe Taylor K1JT, Destroy Amateur Radio?" I'm sure it will provoke some discussion both on our cnets and down at the club! On a similar topic I have spotted an item in the **Irish Radio Radio Transmitters Society (IRTS) Newsletter** under the heading **"VHF in Ireland"** asking where have all the VHF operators gone? To that end **John EI7GL** has proposed that Tuesday evenings should be VHF Activity Nights from 7pm - 10pm clock time, with the following rota - 1st Tuesday in the month 2m, 2nd Tuesday 70cms, 3rd Tuesday 4m & 6m, 4th Tuesday Digital modes. Worth beaming west to try and work some EI counties!

I know contests are not every-ones cup of tea so I will only mention in passing that club members are continuing to support the VHF UKAC Contests and as I write this GARES is in 17th position out of 33 clubs listed in the Local Clubs table.

Articles from members on any aspect of amateur radio are more than welcome! Email your article to me at g4cib@outlook.com

73 and good DX!

Brian G4CIB

GARES SPRING CHALLENGE

The Challenge has been running for nearly five weeks now and we have processed four weeks' worth of entries. There are two sections, HF and VHF, and in the HF section there are seven entrants in the 100W section and two in the 10W section. It is pleasing that we have one 'newcomer' to the Challenge, new club member **Steve G7ITD.** In fact, Steve is leading the 100W section with his FT8 entry.

There is no doubt whatsoever that activity on FT8 is high on all bands, and that it has drawn people away from other modes. It is even proving to be popular on 2m, as **Gary M0XAC** found out when he participated in a recent MGM (Machine Generated Modes) contest on 2m and shot to the top of the VHF table. It is no surprise, then, that the first two positions in the 100W table are both from FT8 participants.

It is rather disappointing that the VHF section has only attracted four participants and that none of these are newcomers to the Challenge or recently licensed amateurs. This section was designed with modest (25W) power level so as not to put off Foundation or Intermediate level licensees, who have restricted permitted power levels. Nonetheless, it has been fun chasing DX stations in Scotland, Northern Ireland and the Isle of Man (and other continentals) for the extra points.

It's not too late to join in – the Challenge runs to the end of June. Why not have some fun and chase those CQ Zones on HF or counties on VHF?

Dave G4BCA

RSGB AGM

Anne 2E1GKY and myself recently attended the RSGB AGM held at Jury's Inn, Birmingham. It was pleasing to meet up with **Steve Hartley G0FUW** also our Region 5 Regional Manager **Martyn Vincent G3UKV.** The formal business was quickly completed and following this we were given an update on FT8 by **Joe Taylor K1JT.** The latest upgrade (currently on beta test) is aimed at Dxpeditions where maximum qsos/hour is the goal - the target is 200/hour with the DX station simultaneously working five separate stations. Following on from this we heard a presentation on the National Radio Centre detailing the proposed updates to the various displays.

Brian G4CIB

RF NOTES BY TONY, G4HBV

Having discussed dipoles and doublets, we can now take a look at end-fed antennas. These have acquired something of a reputation as “difficult” antennas, though they possess advantages and disadvantages. On the low frequency bands of 160 and 80 their big advantage is that they only occupy half the length required by a dipole (assuming the end-fed is a quarter wavelength). But herein lies a disadvantage because end-feeding means bringing the feed-point into the property, which can cause RF problems in the station itself.

Having dispensed with one half of the dipole/doublet, this has to be replaced by either a ground connection and/or a conducting plane in the vicinity of the antenna. It is somewhat ironical that to make a successful end-fed, great effort has to be put into making the ground/ground plane effective - a simple earthing rod will not meet this requirement. To understand why this is so we need to examine how the end-fed works.

The ground/ground plane has to perform as the “missing half of the dipole”. Some books and articles describe this action as forming “a virtual image” of the antenna beneath the antenna proper. I have always thought that this is a somewhat arcane description as the ground/ground plane simply reflects radiation from the antenna.

However a more important function of the ground/ground plane is that it must carry the return current,caused by the local induction field around the antenna, back to the transmitter.

If there is appreciable resistance in this path, it appears in series with the radiation resistance of the antenna and can thus seriously limit the antenna’s performance by wasting power. Hence the single earthing rod will not provide what is needed. A good distributed conducting plane underneath the antenna (whether this is horizontal or vertical) is necessary to act as a low-loss return path. When I operated a horizontal, end-fed on 160 and 80 metres I made up a screen of wires on several rollers which could be unwound beneath the antenna.

This return path to the TX will almost certainly have some reactance and this can be tuned out with a capacitor/inductor network (MFJ used to make one). I used a home-made one which worked out quite well, but I found that, not surprisingly, there was some interaction between the tuning of such a network and the antenna tuning/matching network itself.

It is possible to include loading inductance at the feed-point to bring a short antenna to the resonant quarter wave. It is however, more efficient to include some inductive loading nearer the far end of a short antenna, leaving the inductance at the feed point to be just sufficient to adjust resonance within the operating band.

My own experience of using an end-fed for 80 metre sky-wave contacts is that it appeared to be about two s-points (12dB) down on a dipole.

In the next “Notes” I shall describe a 160/80 metre end-fed that we used at club and was erected only on club evenings when we were operating.

My Entry in the Spring Challenge - Brian G4CIB

Just for a bit of fun, I’ve decided to go “Retro” for the challenge on both HF and VHF. For the HF table I have pressed into service my Heathkit HW8 (built by me from a kit in 1981) which boasts a direct conversion receiver and 2 watts CW output on 80,40, 20 and 15m. I had not used the rig for quite a long time and although it still worked when I switched it on, the dial calibration was about 20kHz out so an interesting hour or so was spent recalibrating it - luckily the Instruction Manual had been carefully filed away! Every qso on this little rig brings a sense of achievement. For VHF I have been using a Yaseu FT480R - a 2 metre multimode which dates from the early 1980s and runs about 15 watts on SSB, FM and CW and still performs well although it has none of the bells and whistles of a modern rig.

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Amateur Radio Insights

By Kirk Kleinschmidt NT0Z - nt0z@stealthamateur.com

Did Joe Taylor K1JT Destroy Amateur Radio?

Did Joe Taylor K1JT, Nobel Laureate and noted friend of hams everywhere, accidentally destroy amateur radio?

Having just returned from a trip in my time machine, I can unequivocally say that history attributes the death of amateur radio to Joe Taylor in the year 2017. So, yes, he did. In fact, 2018 AD marks the beginning of the "hampocalypse," and becomes known among former ham operators as 1 AT (the first year "After Taylor").

The distinguished scientist had some help, of course, but just like the "flu" epidemic of 2027 (you'll see), in which an attenuated pathogen that was only supposed to be experimental in nature escaped into the population at large and quickly replicated itself, Taylor's FT8 digital mode grew exponentially, suffocating other modes as it mushroomed beyond any practical limits.

By the time FT9 and FT10 were released - modes that allowed a small amount of real-time interaction (formerly known as conversation) - it was too late. Hams, the few who remained, refused to exchange personal pleasantries, focusing instead on machine-verified signal reports and grid square exchanges.

In 2 AT, non-machine QSOs were outlawed and rules prohibiting unattended operations at HF were rescinded worldwide. Amateur allocations were reduced to 5kHz-wide slices every 2MHz (from dc to daylight) so computerized stations could map optimized frequency-hopping and ALE schemes in real-time. With machine-only modes, additional bandwidth was simply wasted. The CQWW contest (renamed the CQJTWW contest) was the first major outing to offer certificates to operators who didn't even know that their computer-controlled stations had participated in the contest and had turned in noteworthy scores - the ultimate in unattended operation!

By 3 AT, AI-driven networks saw that humans were completely unnecessary for contesting and propagation mapping operations, so amateur services were disbanded worldwide. An AI from Italy, rumoured to be running an illegally "high-powered" FT11 beta processor, worked DXCC in 478 milliseconds, the fastest to date. Also of note, once occupying 48 hours, the CQJTWW contest, now worked only by competing AI participants, has been reduced to 8.5 seconds, freeing the contestant AIs to map additional ionospheric sub-modalities.

In an attempt to recreate a "freeband-like" clandestine radio system that allowed human-ham interaction on a personal level, some former amateurs began experimenting with gravity-gradient modulation and quantum entanglement transceivers - technologies that don't require, or even benefit from, FT8, FT9, or FT10 style restrictions (well, maybe FT10).

I'd like to share more, but my time in the future was limited by the power constraints of my device. If you have access to a more powerful time machine, please tell us what happened next.

Irreverent, but Not Necessarily Irrelevant

Yes, my fictional narrative is sassy and irreverent but, unfortunately, it's probably not irrelevant. The number of global QSOs using Joe's FT8 "machines only" digital mode have exploded, and these effects can clearly be felt on the bands.

Although I didn't know exactly why at the time, my first exposure to the JTxx/FTxx effect was during last summer's E-skip season on 6 and 2 meters (or lack thereof). The two previous years saw plenty of SSB and CW QSOs, with a nice increase in the typical number of non-contest CW QSOs. I was working on my VUCC totals and things were looking up.

In 2017, however, traditional activity tanked. There was nobody home. I didn't know it at the time, but everyone was JTing and FTing when I was looking the other way. The lack of SSB and CW signals wasn't simply noticeable, it was incredible. And just last week I went looking for PSK31 signals, as I had been "away" from that mode for quite a while. In short, there were none. Yikes!

Several months ago columnists in CQ and QST began detailing the magnitude of the paradigm shift. I was somewhat skeptical at first, but no longer.

What Hath Joe Wrought?

In a recent ARRL Letter, expert observers note the explosive growth of FT8 QSOs and the commensurate decline of just about everything else. So far, K1JT has publicly expressed surprise about how quickly his new digi-modes have taken off. But, perhaps like Robert Oppenheimer, who grew to feel quite despondent about creating the atom bomb after the devastation in Japan, I wonder how K1JT might feel if his creations become "apocalyptic?"

Most coverage of K1JT's software creations and contributions to amateur radio's technical art have focused on the technical merits alone - which is a no-brainer. Joe's WSJT-X software suite is a bona-fide technical masterpiece.

But I'd like to take brief look at the potentially broader implications of what might happen to amateur radio as a whole in the wake of a globally disruptive event like FT8. My apologies to Mr. Taylor, as I find that equal measures of sass, exaggeration, and irreverence are good tools to highlight latent issues and spark debate!

I don't really think that FT8 will supplant all other aspects of ham radio, but the downsides of machine-only QSO technologies such as JTxx and FTxx may dramatically intersect with other issues facing amateur radio as a whole. So, let's pick off the scab a bit and dig in (in no particular order).

Hams Aren't Talking Anyway

Our individual experience of amateur radio - and most everything else - is built upon our accumulated experiences, and often seems to "stand still" or "remain the same," or mostly so. But nothing really stays the same, and everything is constantly changing. The "change delta" - the apparent speed of change - is noticeable mostly when we experience jarring, disruptive change, such as 2017's "JT explosion."

With the benefit of hindsight I can see that I have been a part of the problem. As a teenage ham in the '70s who didn't have a Callbook or even a CW filter (let alone an Internet or a packet cluster), I happily sent my full name and address via slow CW to the other ops during most CW QSOs. We all did, because if we didn't, we couldn't collect QSL cards, which were required for all of the operating achievements we were all so diligently working toward! No eQSL. No LoTW. Just USPS-QSL!

Now, ragchews are still ragchews, if you can find them, but back in the day our casual, quickie QSOs, even with DX ops, always contained pleasant, friendly remarks, and operator names and locations, even if they involved Q-signals and Morse abbreviations. Casual SSB QSOs were even "wordier" with pleasantries. Whether 73, 88, HPE CU AGN, TNX QSO, GUD DX, FB SIGS, DSW, TU, GL GD, etc, outside of established contests we didn't just grind out contest-style QSOs.

But we do today, and it's a blessing and a curse. Yes, more contacts can be made (perhaps a necessity now that machine-gun-style QSOs are driven by global packet spotting networks and year-long operating incentives such as the ARRL's grid-square thingy and CQ magazine's DX Marathon thingy), but a large measure of camaraderie and personal touches are lost.

Unlike my early years, until recently I didn't have many voice-mode QSOs because I was living (13 years) in a condo and operating with stealthy antennas at QRP power levels. I didn't want my voice to be heard coming from someone's clock radio, but I was OK with Morse dits and PSK31 warbles, as those would likely be indecipherable by mere mortals.

It's tough to successfully, consistently ragchew via SSB while running low power to compromised antennas, and I discovered soon after my teenage years that I didn't really enjoy ragchewing via CW. Contest-style operating, yes. Conversing at length, no. I don't use any repeaters, and if I need to ragchew with my local ham buddies I will call them on the phone or chat in person at Saturday morning ham breakfasts. I did do a bit of ragchewing via PSK31 a few years back, but even then I was met with an endless series of "brag files" and surprisingly little conversation! Even if the information in the brag file is interesting, it's still essentially automated if nobody's "talking." Now, PSK31 is a somewhat scarce, treasured memory...

Now that I have no practical antenna restrictions and can run power outputs up to the legal limit, I look forward to chatting via SSB - just as soon as I find a 100-W rig that I like as much as my Elecraft KX3 (or build an amplifier)! Even when I don't have to, I'm still running QRP. How many other excuses can I think of? We are slipping toward a non-conversational ham radio future, and I seem to be part of the problem!

Do Kids Just Wanna WSPR?

These days, everything's about "the kids." Think of the kids who have to be driven to suburban schools in armoured SUVs, who have no opportunity to play with sticks along the way (walking) or splash around a bit in a mud puddle! The poor little buggers have to deal with "Nintendo thumb syndrome" and, because of it, many couldn't hold a stick in their cramped-up little hands anyway!

I'm going to step down from this soapbox before I get carried away (actually and literally), but someone is thinking a lot about kids, and that someone is the ARRL. The League has a massive "think about the kids" initiative underway, and it's ostensibly all about making amateur radio more accessible to the smartphone generation.

We can't properly address this issue here for a variety of reasons, but I think it's interesting how FT8-style operation fits in nicely with generations - new and old - of introverted hams who ostensibly joined a communications hobby, but don't want to actually communicate! Let me explain. Newfangled digital modes such as JTxx and FTxx use space age encoding, modulation, and DSP/decoding techniques to eke out fantastic improvements in signal-to-noise ratios that allow radio communication over propagation paths that won't support SSB or CW contacts. That's the cool part!

The downside is, taking advantage of these techniques requires long "integration" times that preclude real-time communication. Most JTxx and FTxx QSOs require accurate time syncing and back and forth transmission windows from 15 seconds to several minutes. Limited bits of information can be transmitted back and forth, but there's no chatting allowed. That's perfect for sending data back to earth from deep space, which is where the techniques originated, but not so good for real-time communication.

The only thing that keeps the entire process from being completely automated is the often-ignored FCC rule that limits unattended operation on most HF frequencies and the fact that the software has a "send" button that has to be clicked in real time every now and then by the control operator (if that option has been selected in the setup menu).

K1JT's WSPR software (weak signal propagation reporter) is similar. Many ops run their WSPR stations unattended 24/7 whether it's legal or not. Because many WSPR stations run milliwatts instead of kilowatts, the effects are minimized, but the rules are the rules, right? I would rather be shot with a BB gun instead of a .44 magnum - but I'd rather not be shot at all.

WSPR, when done right, is an amazing tool that has already added to our understanding of global propagation science and practice. It's like a public, hi-tech chirp-sounder network that can map existing propagation modes and paths in real time, while uncovering details we hadn't even imagined. But WSPR isn't really a QSO mode because the integration periods are even longer than those for JTxx and FTxx, which allow for "limited" data exchanges. Still, among hams who don't really want to "talk" anyway - these new modes may be just what the doctor ordered!

I can imagine a youngster asking a parent about joining the local after-school "ham radio WSPR club."

"Mom, mom!" the excited child exclaims, "remember when we talked about ham radio, and you were concerned about me having to talk to strangers? Well, I just learned that I can now join the WSPR club and get on the air like we talked about - and I'll never have to talk to anyone, ever!"

"Well," says mom, with a bit of a wrinkled brow, "what about interfering with the neighbours, interfering with your schoolwork - and what about those big, ugly ham antennas we looked at?"

"That's the best part, mom," says the excited child, "WSPR uses tiny power, so it won't bother anyone. And because it uses super new technology, I won't even really need an antenna! Schoolwork will still be my main focus - after online gaming - because my WSPR box talks to my game system - and it tells me where my signals have been heard and posts them on the Internet!"

Mom, now starting to smile, says, "Wow, you've really done your homework, haven't you? But, what about getting your FCC license? Won't that be difficult?"

"No way, mom!" says the still excited child, "My teacher says that, thanks to a new program by some organization called the ARRL, I can simply go to a class for three afternoons to get my WSPR license. There isn't even a test anymore. Cool!"

Far-fetched? I don't think so. If you look at historical trends, something like this seems almost inevitable. The ARRL, which seems to be switching to a kids first, "lowest common denominator" approach to everything it does, is pushing hard for increased HF privileges for Technician- class hams, for example, so they can take better advantage of digimodes and, hopefully, want to get further into the hobby by upgrading.

My sarcasm aside, a test-free WSPR-class license might actually make perfect sense (especially in middle school science classes), as long as we restrict WSPR operation (and power levels) to tiny slivers of little-used parts of existing bands (and there are plenty of them).

Is the drive to "save" amateur radio at all costs worthwhile? Does everything have to be saved and/or packaged so it's accessible to every kid, everywhere? By my standards, amateur radio license tests are already so easy to pass that they pose no barrier for the vast majority of potential applicants. I recently prepped one of my friends over a casual two-hour lunch, after which he went from civilian to General-class operator with no additional study. All without ever owning or using a radio or even keying a mic.

Taken to its logical conclusion, before long there may only be one license class - just like before incentive licensing! It took me years to fully understand that, for most things, we only truly appreciate things that require effort, time or money - or all of the above.

Modern kids are still investing time, effort, and money into the things that interest them. Video games. Coding. Software development. Hardware hacking. Dating. Boys. Girls. Bikes. Cars. Ham radio. What do you think?

Antenna Here is 6-Foot Loaded Dipole

Because of deed restrictions, etc, entire generations of hams have come up without knowing what it's like to operate with "real" antennas. I can no longer count the number of times newbies have asked me whether the small, expensive, portable antenna systems designed to be used by backpackers from mountaintops, are "good" for use at home in their backyards. Heck no, they're not good. They're horrible!

As highlighted later in this column, our antennas define our experience of amateur radio. Crap antennas equal crappy experiences overall. And while hams from my generation are dreaming about tall towers with stacks of big Yagis (already having real outdoor dipoles and loops), many newbies are dreaming about a too-low wire dipoles hidden in their backyard trees, or outdoor antennas of any type. And while they dream they're messing with what are essentially expensive non-antennas, and they're wondering why ham radio isn't so nifty.

These new hams are often surprised when I tell them that, if I could have a stack of killer antennas on top of a killer-high tower, I'd gladly trade my fancy new transceiver - any fancy new transceiver - for a 1970s Kenwood, Heathkit or Yaesu rig, which they view as anachronistic and completely useless. No questions asked. You can make up for a compromised radio, but you can't make up for a compromised antenna. Or can you?

Actually, if the machine-only aspects of emerging digital hamming can be addressed, the crappy antenna scenario can be somewhat mitigated by emerging digital technology. Technologies such as JTxx and FTxx offer 20-30 dB improvements over SSB and CW - and that's huge. Unlike the keyboard-to-keyboard digimodes such as PSKxx and MFSKxx, however, which allow conversations to take place with a 10-20 dB advantage over SSB and CW, you're still mostly in the WSPR club.

Teeny Bands Are All We Need

The ARRL and other groups fight tooth and nail to preserve spectrum space, but if everything migrates to JTxx and FTxx style operation, ham bands can be tiny slivers of their former glory. Lots of digimode QSOs fit inside the space of a single SSB QSO, and because you often can't hear the signals with your ears, you have to hover around a calling frequency anyway, so who needs all that empty space?

No Need to Call CQ on Big Bands

Even if the ham bands "stay big," we wouldn't need to cluster around calling frequencies if we simply have our PCs coordinate our QSOs on the Internet before automatically switching our radios to the agreed-upon frequency so our PCs can work each other and tell us all about it.

By doing so we could easily limit our QSOs to a group of "whitelisted" friends, members of a certain ham club (rifle association, sports team, political party), or hams who have sent us "greenbacks" (Bitcoins?) for our rare virtual "QSL cards." DXpeditions might be quite profitable that way, and while your robo-transceivers are churning out QSOs, you can be fishing, swimming or surfing!

Between global spotting networks, the reverse beacon network, the WSPR net, IFTTT, and PSK Reporter, etc, we can already do most of these things with existing technology, so although I'm being somewhat speculative (and more than a little sarcastic), bringing amateur radio into the "digital digital age" isn't as easy as it once looked.

Toward an Uncertain Future

The future - where ham radio is going and what it's becoming - is a product of what exists now and what has already come before. Today's amateurs exist on the leading edge of a continuum that started (very slowly) a few hundred years ago with basic explorations of electricity and magnetism, but is rushing forward at an exponential pace.

This rapid evolution of technology in general isn't radio exclusive, of course, but it's still amazing to simply step back and take it all in. It's easy to "miss the magic" because we're surrounded by it every minute of every day. But even if we don't usually notice it, the technology train is barreling down the tracks at an ever-increasing pace. Ham radio is also streaking forward and, in some ways, is approaching a point of no return - an event horizon from which there's no turning back.

Unlike the equestrian arts, for example, in which riding a horse under an English saddle is substantially the same today as it was 100 or even 500 years ago, ham radio isn't the same. Spark-gap transmitters have been duly outlawed and, save for a relatively small cadre of enthusiasts, plate-modulated AM isn't heard much anymore, either. Regenerative receivers are all home-brew these days, lovingly crafted by a few caretakers who still safeguard the Major's gift. The elegant mechanical designs that made earlier radios so special - and frustrating - with ganged capacitors, clever synchronized cam-and-lever assemblies and robust mechanical dials, have all been replaced with software and programmable logic arrays.

For better or worse, amateur radio is firmly embedded in the digital domain, and if you think that emerging future systems won't supplant what we now think of as amateur radio, evolution will certainly prove you wrong!

Ham radio's first hundred years witnessed dramatic change, and in another hundred years we probably won't even recognize what ham radio has become - if ham radio exists at all. In "geologic time," ham radio will likely have come and gone in a finite, and rather small, window of evolution.

With what we know about the evolutionary progression of other technologies, species, etc, and all of the evidence we've collected to date, there's a good chance that the phenomenon we call amateur radio will have been born, matured, evolved and "died," in a 150-250 year period. Period!

And as if this isn't unsettling enough, let's not forget to marvel at the quirks of solar and planetary physics that enable radio at the fundamental level. Electricity and magnetism - still largely unfathomable even though we take them for granted on a practical level - comprise radio on a local level, but "global radio" requires an ionosphere, which is itself powered by the sun, whose output varies in mysterious cycles, etc. The list of dependencies and "coincidences" is really starting to add up! And if you take away even one part of the whole interdependent system - poof! - no radio.

Therefore, if you love amateur radio as it's practiced today, you'd better get busy enjoying it - today! - because our entire hobby likely exists in a precious, precarious evolutionary bubble, never experienced before and probably never to be experienced again.

Whether it's an inflection point or the point of no return, when you woke up today (or any day in the past few years), amateur radio was different. There's no wondering about whether it will someday be different - that day is today and amateur radio is different. Joe Taylor "caused" the present, local disturbance, but if he hadn't, someone else would have.

In the present moment, though, even if we have crossed the event horizon, amateur radio is still alive and well, and our far-off future - albeit closer than ever as evidenced by JTxx and FTxx digital technology - is yet to be determined.

The full breadth of past and present radio is available for exploring (spark gaps excepted!). We can build a classic regenerative receiver or buy a state-of-the-art synthesized radio. We can use Morse code or the most advanced computerized digital signal modulation. Or we can use a primitive regen to copy the most advanced digital signals (perhaps stabilizing the oscillating detector via GPS?).

But it won't stay that way - guaranteed!

FROM THE GARES ARCHIVE

Tony G4HBV and Brian G4CIB

NFD 1986 - Gordon League Rugby Ground

SWL Nick, Pat G3MA and Trevor G4XQK

NFD 1986 - Gordon League Rugby Ground

G4AYM/P - May Hill - November 1982

144MHz CW Contest

The club operated several times from the summit of May Hill having obtained permission from the National Trust

G4CIB/P - Meldon Hill, near Chagford

29th August 2005

Leta and I had just returned from Lundy and were spending a few days in Devon before returning home. It's Bank Holiday Monday and I'm working GARES members at Crickley