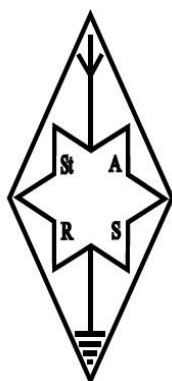


STARLITE

THE NEWSLETTER FOR THE STOURBRIDGE AND DISTRICT A.R.S.



**G601
G6SRS**



ISSUE: MAY 2019



G4CVK

**STOURBRIDGE & DISTRICT AMATEUR RADIO SOCIETY
INCORPORATING
OLD SWINFORD HOSPITAL SCHOOL RADIO CLUB**

MEETINGS HELD AT

**OLDSWINFORD HOSPITAL SCHOOL
HEATH LANE
STOURBRIDGE
[8:00 TO 10:00 PM]**

VISITORS ALWAYS WELCOME

**THE SOCIETY HOLDS ITS FULL MEETINGS
ON THE 1ST AND 3RD MONDAYS EACH MONTH**

BUMPER ISSUE

RSGB AFFILIATED SOCIETY

STARLITE

Telephone Enquiries to:-

Hon. Secretary
John Clarke M1EJG
[01562] 700513

Or by Email to:-
honsec@g6oi.org.uk

StARS Website URLs:-
www.g6oi.org.uk
<http://g6oi.ross-lewis.co.uk/index.html>

StARS Facebook Page:-
<https://www.facebook.com/groups/stourbridge.ars/>

All correspondence/enquiries should
be addressed to the Hon Secretary at:-

StARS
c/o The Mill House
21 Mill Lane
Blakedown
Kidderminster
DY10 3ND

Forthcoming Meetings

May 6 th	Bank Holiday – No Meeting
May 13 th	On Air. Informal. Digi Modes Group.
May 20 th	Main Meeting – Subject t.b.a.
May 27 th	Bank Holiday – No Meeting
June 3 rd	On Air. Informal. Digi Modes Group.
June 10 th	On Air. Informal. Digi Modes Group.
June 17 th	Annual BBQ @ No Man's Green
June 24 th	On Air. Informal. Digi Modes Group.
July 1 st	On Air. Informal. Digi Modes Group.
July 8 th	On Air. Informal. Digi Modes Group.
July 15 th	Main Meeting – Subject t.b.a.
July 22 nd	On Air. Informal. Digi Modes Group.
August 5 th	On Air. Informal. Digi Modes Group.
August 12 th	On Air. Informal. Digi Modes Group.

Editor's Comment

Firstly, I must admit to making a mistake in the last issue. Wayne M5LLT was awarded the Constructors' Trophy, **not** the Bristol Trophy. Thanks to John G8UAE for correcting me on this point.

During a recent purge of the StARS cupboard, the discovery of several trophies was a surprise to some members. The above-mentioned Bristol Trophy, the Senior Trophy (previously awarded to a transmitting member), the Junior Trophy (previously awarded to a receiving member) and some contest trophies awarded to the Society for its successes in HF NFD in the 1960s.

This month, we have a **MUCH** larger issue with **THREE** featured articles:

- The first one was sent by John G8UAE and is entitled "*Here is the story of the Civilian Wireless Reserve, nicknamed "Early Birds" by the RSGB*", by ZL1AH. There is a complementary article in the May issue of RadCom.
- Second is a technical one, *The Effects Of VSWR On Transmitted Power*.
- The third being a reminiscence from Geoff G0KVK, *A Confession Of A Television Engineer*.
- Also, a snippet from Jim G4WAO, towards the end (*sorry it's at the back, Jim, but the space was just right. Ed.*).
- Finally, just prior to publication, I inserted an item entitled *Prepare yourselves for Windows 10 May-hem*, for you Windows 10 users. I hope you find them of interest.
- And I am hoping to send an extra attachment for your reading pleasure. I won't say what the subject is – I'll just let it be a surprise!

This space left intentionally blank for your contribution.

There is very little input from the membership, so your Editor has been forced to play radio instead of editing!



Memories, photos, projects, general chit-chat, etc., would all be very welcome.

Send input to: g4xom@g6oi.org.uk



"Early Birds" 25th reunion Dinner, 1964. Clockwise from far left: Bert Allen, G2UJ, (SK), Jim Pollard, G3IY (SK), #Vernon West, 2DYW, #Vernon Rayner, G6FZ, *Bernard Wynn, G8TB, Les Coupland, G2BQC (SK), Maurice Brookes, G5OI, *Merton Trier, G8VH, Geoff Mason, G5BR, Roy Stevens, G2BVN (SK), John Clarricoats, G6CL (SK) Courtesy guest – Gen Sec RSGB, Les Hill, G8KS (SK) (partly obscured), Ernest Dolman, G2DCG, (SK) Organiser of the dinner, #Ted Howard, G4FZ, Harry Willetts, G2FPI (partly obscured), *Vic Flowers, G8QM, Doug Legge, G3MP, *Archie Davies, G4JY, #Maurice Newman, G3DZ, NB.

Those marked with an asterisk WERE still listed in the 2003 RSGB Yearbook. Those with a hash mark were NOT in the 1965 Call Book and presumably did not renew their call-signs post war.

Some of those active on the bands after the war did not attend the dinner for various reasons. (G2FMF was in the USA, GW6KY in Malaya, and myself G3AH 1937 - 1950, ZL1AH).

Here is the story of the Civilian Wireless Reserve, nicknamed "Early Birds" by the RSGB. by ZL1AH

WORK ON FRIDAY, FRANCE ON TUESDAY

By 1938 the Armed Services in Britain had realized that, in the event of war, they were going to face a serious shortage of wireless operators. With the co-operation of the Radio Society of Great Britain, the Civilian Wireless Reserve was set up and radio amateurs were encouraged to join. Very shortly, however, the CWR was absorbed into the R.A.F. Volunteer Reserve and, at the time of the so-called Munich Crisis in September, we all

received mobilization instructions and travel warrants to report to our designated places of assembly.

At the end of August, 1939, war appeared to be inevitable. In that final week, I talked twice to the operators at the amateur station SP1ZK, located at the Warsaw Radio Exhibition, and they were in no doubt. At 11 pm on the 31st August I listened to the BBC News and heard that all British radio amateurs were to close their stations from midnight. I went back to my transmitter, had two final contacts with the USA and then pulled the plug for over six years.

Next morning, 1st September, we awakened to the news that Germany had invaded Poland. I went to work as usual in the city of Manchester but, when I returned from lunch there was a phone message from my mother. A telegram had arrived, telling me to report to London. This was completely different from what I was supposed to do but the telegram obviously overrode my orders, so I took myself off to London by train and eventually arrived at the Air Ministry at about 10 pm, almost the last of our group to get there. (There were about forty of us, of whom thirty-seven were radio amateurs.) I was partly kitted up and then taken to a very nicely appointed hotel, where I spent my first night in the Air Force in a private room. The following morning a three-course breakfast and a choice of newspaper but, green as I was, I knew this sort of caper wouldn't last long. How right I was! We were collected and taken to draw steel helmets, gas masks and identity discs. We were assured that the latter were fireproof, so that even if we were burned to crisps, we could be identified for our grieving relatives. This was an early introduction to the gallows humor which is such a feature of the Services.

We were marched through the streets to the nearest tube station and thence to Liverpool Street Railway Station, where we entrained for Saffron Walden in Essex. This was the nearest the railway came to our destination, RAF Debden, one of the Fighter Command sector stations which was responsible for defending London against attacks which came in from north of the Thames.

The rest of Saturday was spent in queues, collecting various things. The worst queue was for injections - three of them; Paratyphoid, Anti-tetanus, the third I forget. We took off tunics, rolled up shirtsleeves and ran the gauntlet. It was two injections in the left arm and one in the right. In these days of AIDS and Hepatitis-B, it seems incredible that the orderlies used the same syringes and needles throughout, pausing only to put in a new ampoule at intervals! And were those needles blunt by the time the last victims were done! I was amazed to see some of those ahead of me fainting, odd ones even before they reached the needles. Perhaps fortunately, I had had two or three courses of flu injections in the years before the war, so I was not adversely affected. However, worse was to come. Debden was not equipped to handle more than its normal complement of personnel so there was no accommodation for us, not even mattresses. We slept Saturday and Sunday nights on the concrete floor of an empty hangar, with just two blankets and a ground sheet. Like everyone else, my arms were swollen and painful, so sleep was fitful and disturbed. Then at 4.30 am we were blasted awake when a flight of Spitfires took off on the first patrol of the day.

The British Government had given Hitler until 11 am on Sunday the 3rd September to withdraw from Poland but of course no reply was received. Promptly at eleven the Prime Minister, Neville Chamberlain, broadcast the declaration of war and we sat and listened to it on the PA system. It is said that in America everyone remembers what he was doing when President Kennedy was assassinated. Presumably everyone of my generation

remembers what he was doing when the Second World War was declared. I was sitting on the grass outside our hangar and enjoying the warm sunshine, aware that this was a defining moment in my life but I had no concept of just how much of an upheaval was in store for the world. The rest of that day was spent packing kit and getting ready to move, though nobody said where.

On Monday, 4th September the 4.30 am Spitfires did not bother us because we were up already. After an early breakfast we were taken by truck to Saffron Walden station to await our special train. This was another learning experience - how the military mind works. We were delivered to the station at 6 am but the train did not arrive until nearly mid-day. When we finally got away, the sun indicated that we were traveling north and this caused a flutter. If we were heading for Grimsby or Hull, then we must be bound for Poland, a prospect that thrilled none of us! Eventually our route turned west and tension eased. At this remove my memory is uncertain of the exact route but most of it was undoubtedly on lines which no longer exist (part of the thousands of miles of railways which were closed in the 1950's). With this proviso, I will say that I think the route was Saffron Walden - Cambridge - Bedford - Oxford - Reading - Southampton.

Eventually at about 9 pm, we detrained on the quay at Southampton. No doubt about our destination now! We boarded one of the Channel Island ferries, "Isle of Guernsey", in company with a large number of troops and sailed at about 11 pm. Since breakfast at Debden, all we had had to eat was bully beef and "hard-tack" biscuits washed down by water. However, when we were bedded down, an angel appeared in the shape of our senior NCO, and the only "regular" in our outfit. He had bullied the ferry cooks into making a dixie of tea for us and he brought it round to us in our bunks. That was one of the best cups of tea I ever had. I often thought of this episode when, later in the war there was a comic song :-

"Kiss me goodnight, Sergeant Major. Tuck me in my little wooden bed."

Before I dropped off to sleep, I peered through the porthole and could just see the shape of a destroyer escorting us. I think this finally brought it home to me that not everyone out there was disposed to be friendly. However, I had no trouble in falling into a deep sleep, having been on the go for about twenty hours.

Tuesday, 5th September was another eventful day. We berthed at Le Havre before daylight. The two destroyers which had escorted us, turned back just short of the port, no doubt to go and pick up another ferry load. We were one of the first units of any of the services to set foot on the Continent in WW2 and were later nicknamed "The Early Birds" by the Radio Society of Great Britain. Once off the ferry we were placed aboard a train which was standing at the quayside and there we sat, and we sat, and we sat. It was now more than twenty-four hours since breakfast at Debden and apart from that mug of tea on the ferry, all we had was that damned bully-beef in those trapezoidal tins, those tooth-breaking biscuits, and water. (No food was provided on the ferry). Now sitting on the platform was a pile of wooden boxes and according to the stencils, these contained tins of crab. One of our unit was not a radio amateur but a former naval telegraphist (God knows why he had joined the RAFVR). Unlike us innocent ex-civilians from sheltered homes, he was skilled in the art of converting things for his own use. Making sure he was unobserved, he nipped out, grabbed a case and was back on the train in a flash. The army guys, further up the train, saw this and repeated the operation but with much less skill and were spotted. All hell broke loose among the French railway officials; the train was shunted out of the station; we were marched back and made to wait while the carriages and our kit

were searched. The soldiers were caught red-handed but we were as blameless as choirboys. While the train was being shunted out of the station, our telegraphist friend smashed up the wooden case and threw it out of the window (As the train was moving, no way of knowing which window the wood had come from). Then he proceeded to hide the tins of crab. The coaches had "concertinas" for access between adjacent ones and each concertina had two steel plates which folded down to form a floor. The crab nestled cozily under these plates and the railway staff did not have the gumption to look underneath. Once we started our journey, out came the crab and instead of bully-beef and biscuits, we had crab and biscuits. Our RAF issue knives, equipped with a tin-opener, did a sterling job of opening those tins. I was rapidly developing a part of my education which had been neglected in my previous life.

Eventually the train deposited us at Amiens which was to be our base for a couple of weeks. We were accommodated in an unoccupied convent completely devoid of furniture. We slept in the refectory on a parquet floor with no mattress - just two blankets. The only good thing was that the blankets were new French Army issue and were magnificent - roughly twice the size and thickness of the RAF ones we had used at Debden. (The only other French issue we got was tinned meat for emergency rations and we were grateful we never had to make use of it because dates embossed on the tins indicated that it was fifteen years old.)

That evening we were let loose in the city but it was a case of, "Look but don't touch," because we had no French money. Of course, I had damned little English money either. But give the RAF credit; the next day we were paid and could also change our own money into francs (about 240 to the pound). So that evening it was out on the town in a big way. Food, glorious French food! With our rates of pay we in were in much the same position as the Yanks in Britain later on. From now on we went out for dinner each evening to a good hotel. We discovered that we could buy a five-course meal, including wine, for the equivalent of one shilling and sixpence, which was about the cost of a seat in a London suburban cinema in those days. It was here that I first encountered the heavenly "escargots en aspic" served as hors d'oeuvres.

As soon as we had settled into the convent, we were informed in strict secrecy that we were now part of No.1 Wireless Intelligence Screen and that we should soon be going out on location. Our days were spent in driving around the countryside in the vicinity of the Belgian and Luxembourg borders. I found myself co-opted as a driver of one of the new Renault vans, which had been delivered to us, direct from the factory in Paris. It was an interesting experience! Not only was it the first time I had driven on the "wrong" side of the road and used my right hand to operate the gear lever, but the said gear lever went through a hole in the dash board. The whole area was very fascinating, because it had been fought over with great ferocity during the First World War and British troops had been heavily involved. We took time out to visit places like Arras, Cambrai, Vimy Ridge, etc. It was eerie to see the old trenches winding across the countryside and often still quite distinct, even though the outlines had been blurred by weather and cultivation over the previous twenty years.

At the end of two weeks we were split up into individual stations and spread out along the Belgian border. This was obviously a dry run because after a fortnight, we were recalled to base and the whole unit was moved to a new HQ at Metz. This was the centre of another very historic area which had been the scene of bloody battles and sieges involving French troops; places like Verdun and Douaumont. Our HQ was in the "caserne" at Metz but we were rapidly deployed to our posts and I finished up at Station N, which was at the south

end of our screen. As a twenty-year-old (just), I was senior wireless operator, with an eighteen-year-old as my second op, plus four Royal Artillery spotters to feed the plots to us. We established our station in an empty cottage in the village of Bellange, just eight kilometers down the road from the town of Morhange. This was in the Maginot Line defence area so, apart from us, all the troops were French. We were just dumped down with our equipment, a two-burner cooker and some ration money and told to get on with it.

We were given what the RAF called "Higher Rate Ration Allowance", with which to buy food locally. This was quite generous and each of us was receiving more money for food than we were getting in pay. We made little use of the cooker as the cottage had a wood-burning stove which did double duty for heating and cooking. As there were six of us, we did duty in pairs on a three day roster. It was a most interesting experience! One day I made a jam tart for dessert - a real work of art, with twisted strips of pastry across the top. Sadly, after cooking, it was impossible to cut it and, when banged against the corner of the stove in frustration, it shattered like glass. I was not aware that fat had to be rubbed into the flour and water mixture! One of the others made a milk pudding - he took a large bowl, poured in rice up to the rim and filled in the spaces with milk. After a while a smell of burning came from the oven and when the door was opened, the pudding billowed out.

Strangely enough, our salvation was cigarettes. The British ones were as superior to the French variety as home-made bread is to hamburger buns, so our Players, Capstan, Gold Flake and Senior Service were extremely popular with the French troops. We were each issued with a free tin of fifty every week and could buy extra at duty free prices from our support van which called several times a week. As bribes went, cigarettes were cheap.

Across the road from our cottage was the officers' mess cookhouse of the French battalion occupying the village and the senior NCO was formerly the chef at a large hotel in Anger. We put him on the payroll - a tin of fifty twice a week and in return he acted as adviser and supplier. Most evenings he sent over a large dish of whatever the officers were having for dinner but if we were having something special, e.g. goose, suckling pig, etc., he would come over and supervise its cooking. He kept us supplied with fresh vegetables and gave us a crash course in cooking. One of the exotic dishes he showed us was a rum omelet for dessert. (The last one I made used twenty-three eggs.) The total cost of the two tins of cigarettes was less than one day's ration allowance for one man.

If we went as far as Morhange we could buy liquor and, at that stage of the war, there was a wonderful range available at low prices. I did very little drinking, but, as the winter advanced, our cottage gave a fair imitation of an icebox at night and I took to having a rum toddy on retiring - three fingers of Jamaican rum in a large tumbler, a desert spoon of sugar, the juice of a lemon and topped up with boiling water. I used to get into bed before drinking this and then slept like the proverbial top all night. It's laughable to think that the lemon was more expensive than the three fingers of rum. One other delight in the cold weather was morning tea at any small cafe, except that it was not tea but coffee, thick and black, with a shot glass of brandy on the side.

This was the period known as the "phony war" because nothing very much was happening. We were located in the Maginot Line defense zone, which was checked out regularly by German reconnaissance aircraft, with the occasional one shot down. For some time I kept a piece of the Heinkel He111 which came down close by. I did not know then that, a few months later, when I was in Kent, downed German aircraft would barely raise a flicker of interest. Propaganda leaflets were dropped on us by these same planes and I donated mine some years ago to the archives section of the Tauranga library.

To use one of Winston Churchill's figures of speech, this was "The End of the Beginning", though he said it later at a quite different stage of the war. There have been a number of accounts of the adventures of this group of thirty-seven radio amateurs and each raconteur seems to remember different details. In 2009 there are pitifully few of us left.

This is an extract from material I wrote for the NZART magazine "Break-In".

As a pre-war member of the RAFVR (Civilian Wireless Reserve) from 1938, I was mobilized within hours of Hitler's troops invading Poland. After a hectic few days I found myself in Amiens, France, two days after Britain's declaration of war, along with approximately 35 other hams. We were told we were to form No.1 Wireless Intelligence Screen, which was essentially a chain of Field Day stations, reporting on the sighting of Luftwaffe aircraft. Each station had two operators and the Royal Artillery supplied four observers, all intelligence being reported back to the HQ station in Metz. The gear consisted of the T1083 / R1082 duo, powered by lead-acid batteries and a small petrol-electric set for charging. Up to the minute the gear was not. The 1083 transmitter, like most if not all British military gear of the time was MO/PA and of course the MO drifted - and drifted. The antenna system consisted of a random length inverted L - known to hams in Britain pre-war as the AOG. (Act of God - because no-one knew how the hell it worked.) I cut ours to a half-wave long and I guess, being hams, the other stations did the same. The antenna was supported by two guyed steel masts which came in four foot sections in a canvas bag with assorted guy ropes. Power was from lead-acid batteries which we re-charged with a portable petrol electric set.

Some inspired individual had decided that we should use a frequency in the 6 Mc/s band (no Hertz then) and at certain times the band was full of US broadcasters. We became quite familiar with shows like "Amos 'n Andy". At this remove my senile memory cannot recall the power out from the PA but it was just a few watts. Efficiency was poor. Remember when we used to tune for "minimum dip" with no load, as a rule-of-thumb measurement of efficiency? The 1083 had just a small variation in plate current at resonance.

As we were located within the Maginot Line defence zone, there were few civilians left in the village and we occupied an empty cottage, the observer post and the antenna being in the garden.

John Wightman, ZL1AH, ex – G3AH.

Info and Photo courtesy of ZL1AH

The Effects of VSWR on Transmitted Power

No matter how long you have been a ham, sooner or later you will be involved in at least one discussion of something called the Voltage Standing Wave Ratio, or VSWR, of an antenna system. There is a lot of good information available on VSWR as well as a lot of misconceptions about what it is and what it signifies. Probably the most often misconception is that your VSWR should be as close to 1:1 as possible, otherwise "you won't get out very well." A 1:1 VSWR implies a perfect match between all elements of the antenna system. The only problem is that it is possible to have a low VSWR and still have some very serious things wrong with your antenna system. Other misconceptions such as a high VSWR causing television interference, or other unwanted problems are often heard and can cause unnecessary worry. The concept of VSWR is easy to grasp and its importance in an antenna system does not require an engineering degree to understand.

WHY VSWR EXISTS

Early in electronics you learned that to get maximum power into a load required that the load impedance match the generator impedance. Any difference, or mismatching, of these impedances would not produce maximum power transfer. This is true of antennas and transmitters as well but, except for handie-talkies, most antennas are not connected directly to a transmitter. The antenna is usually located some distance from the transmitter and requires a feedline to transfer power between the two. If the feedline has no loss, and matches BOTH the transmitter output impedance AND the antenna input impedance, then - and only - then will maximum power be delivered to the antenna. In this case the VSWR will be 1:1 and the voltage and current will be constant over the whole length of the feedline. Any deviation from this situation will cause a "standing wave" of voltage and current to exist on the line.

There are a number of ways VSWR or its effects can be described and measured. Different terms such as reflection coefficient, return loss, reflected power, and transmitted power loss are but a few. They are not difficult concepts to understand, since in most instances they are different ways of saying the same thing. The proportion of incident (or forward) power which is reflected back toward the transmitter by a mismatched antenna is called reflected power and is determined by the reflection coefficient at the antenna. The reflection coefficient "p" is simply a measure of this mismatch seen at the antenna by the feedline and is equal to:

$$P = (Z_1 - Z_0) / (Z_1 + Z_0)$$

Here Z_1 is the antenna impedance and Z_0 is the feedline impedance. Both Z_1 and Z_0 are complex numbers so "p" is also a complex number.

You remember from elementary AC mathematics that a complex number has a "phase angle" associated with it. The phase of the reflected signal will be advanced or delayed depending upon whether the antenna appears inductive or capacitive to the feedline. If the antenna appears inductive the voltage will be advanced in phase, and if the antenna is capacitive, the voltage will be retarded. The reflective signal travels back to the transmitter and adds to the incident signal at that point.

Thus, any mismatch at the antenna gives rise to a second 'travelling wave' which goes in the opposite direction from the incident wave. When $Z_1 = Z_0$ the reflection coefficient is zero and there is no reflected signal. In this case all power is accepted by the antenna and this is the ideal situation where VSWR is concerned. The problem is that this condition is rarely, if ever, achieved and so "p" will have a value different from zero. Note that "p" can have negative values, but in calculating VSWR from the reflection coefficient, only the "absolute value" is used - which is a positive value lying between 0 and 1.

As the two travelling waves pass each other in opposite directions, they set up an interference pattern called a "standing wave". At certain places on the feedline the voltages will add producing a voltage maximum, and at others their relative phase difference will cause a voltage minimum to exist on the feedline. These maximum and minimum points occur 1/4 wavelength apart. In the days when open-wire feedlines were used these points could easily be measured with simple indicators. Coax cable however presents another problem since the "inside" of the cable is not readily available for measurements. Consequently, VSWR measurements on coax are usually made at the transmitter end of the feedline. Therefore you are presented with the VSWR of the entire system which includes all losses associated with the entire system.

INTERPRETING WHAT YOU HAVE READ

Many VSWR meters are calibrated to read FORWARD power as well as REFLECTED power. They may actually be measuring voltage, and simply have the scales calibrated in power. The important point is to understand what the meter is actually telling you. Assuming for the moment that the VSWR meter contributes no errors, the FORWARD reading is the SUM of the forward power and the reflected power. As a result, it is greater than your actual power output. The REFLECTED power reading is that amount of power which was not initially absorbed by the antenna and has been sent back down the feedline. At the transmitter end it encounters the transmitter output circuitry and is re-reflected back towards the antenna. This happens because you do, in fact, have a VSWR greater than 1:1 as seen by the transmitter. When the re-reflected power encounters the antenna, a portion of it is absorbed and the whole process starts over again.

Ultimately then, most of your signal is eventually absorbed by the antenna. You might be tempted to think that all of this bouncing back and forth would cause "smearing or blurring" of your signal but this is not so. The average transmitted signal appears as a "steady-state" signal to the feedline and antenna. Remember your signal is travelling at a significant fraction of the speed of light. For instance, the velocity of propagation of RG-8/A is 0.66 or 2/3 the speed of light. The speed of light is close to 1000 feet per microsecond, and a dot or voice peak takes milliseconds to complete. If the speed of light were 20 miles-per-hour then the situation would be completely different and we probably wouldn't have radio transmission at all. (Ed. Note, it would be as fast as the mail then.)

Given the reality then that almost all power launched down a feedline reaches and absorbed by the antenna, one has to wonder why VSWR is all that important. The importance is due to the fact that feedlines have losses and, antennas have something called radiation efficiency. They are what make proper interpretation of VSWR important. Power is lost due to feedline attenuation and this loss goes up as the VSWR goes up. The efficiency of an antenna is determined by the ratio of its "radiation resistance" to its "loss resistance". Antenna efficiency can simply be described by the following equation:

$$\% \text{ Efficiency} = [R_a / (R_a + R_{\text{loss}})] \times 100$$

The radiation resistance is R_a , and R_{loss} is made up of any associated losses of the antenna such as loading coils and ground systems. How well you "get out" therefore depends more on low losses and efficient antennas than on what your actual VSWR is as the following example will show.

THE EFFECTS OF ATTENUATION ON VSWR

Early in this discussion the statement was made that your VSWR may appear to be very low and yet there could be serious things wrong with your antenna system. Figure 1 shows how this can happen. The curves in the figure represent the forward and the reflected voltage on an antenna which has a feedline loss of 3 dB. and a reflection coefficient of $p=0.5$. In this example the actual value of voltage is inconsequential and can be considered to be "E". We are only interested in relative values

of "E" in any case. The length of the feedline is also arbitrary since we are only concerned with its total loss between transmitter and antenna.

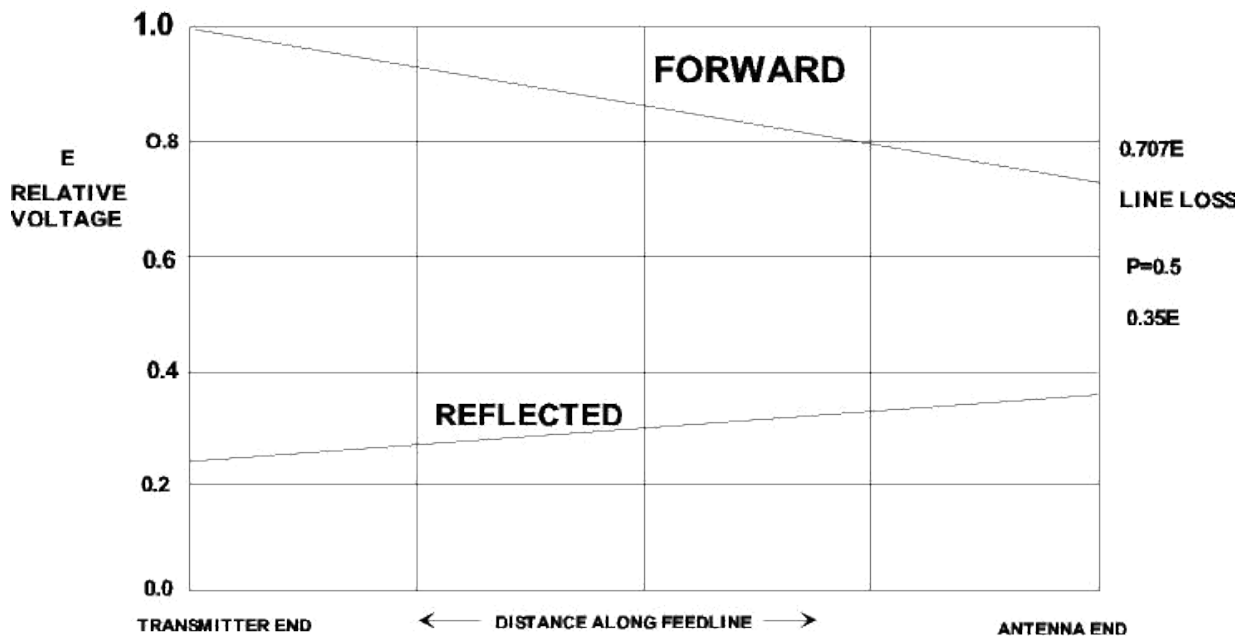


FIGURE 1: EFFECT OF LINE LOSS ON SIGNAL AMPLITUDE

The signal voltage "E" starts out at full value -1.0 E - on the feed line and is attenuated at a 3-dB rate. This means that the voltage will only be 71% - or 0.707E - when it reaches the antenna terminals. Remember that while 3-dB is a factor of two for power considerations, power is proportional to E-squared, consequently E will be only 0.71E when it arrives at the antenna input. The top curve in Figure 1 shows the FORWARD voltage decay as it travels down the feedline to the antenna input.

Since the antenna in this example has a reflection coefficient of 0.5, this means that 1/2 of the incident voltage will be reflected back down the feedline. This value is (0.5 X 0.71E) or 0.35E volts. The feedline has no way of knowing which way signals are traveling, so this reflected voltage will suffer the same 3-dB attenuation on the return trip. When it arrives back at the transmitter end of the feedline its value is only (0.71 X 0.35E) or 0.25 volts. The VSWR meter sees this value and since

$$VSWR = (E_{fwd} + E_{ref}) / (E_{fwd} - E_{ref})$$

the VSWR meter will read 1.67:1

That value of VSWR is guaranteed to make almost everyone happy, but your antenna system is not very good. The 3-dB loss down the feedline means only 1/2 of your output power reaches the antenna, and if your antenna has significant losses, something less than 1/2 of your power will be radiated depending upon how bad the losses really are. If for instance, the loss resistance equals your radiation resistance, the antenna is only 50% efficient meaning only 1/4 of your output power is actually radiated. Yet that reading of 1.67:1 looks fine. A reflection coefficient of $p = 0.5$ means your antenna is not well matched to the feedline. VSWR can be calculated from the reflection coefficient by the following:

$$VSWR = (1+p)/(1-p)$$

Using this formula shows your VSWR at the antenna is 3:1, quite a different value than your VSWR meter reads. The difference in the input and output VSWR values is due to the loss introduced by the feedline. Figure 2 shows how this loss can cause you to get a different VSWR depending upon where you measure VSWR in a feedline. You can measure VSWR at the antenna end of the feedline, but it is usually impractical to do.

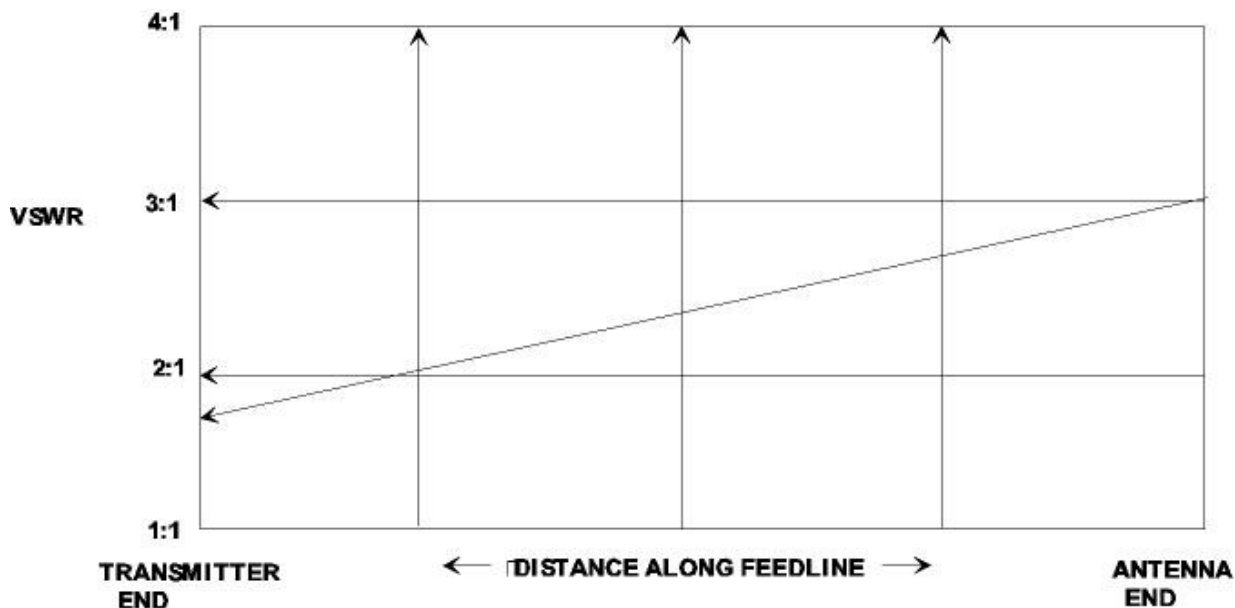


FIGURE 2 EFFECT OF LINE LOSS ON VSWR

You can use 1/2 wavelengths of coax between your VSWR meter and the antenna because a 1/2 wavelength of cable repeats the impedance it sees. The only problem is that you are introducing other possible elements into your measurements. But let's assume that your VSWR measurement at the feedline is reasonably close to what is actually occurring on the feed line, and that your feedline losses are not great. The burning question still is "how good or bad is the VSWR reading?"

VSWR AND TRANSMITTED POWER

Let's assume you have an efficient antenna, fed with a low-loss feedline so that the VSWR meter at the transmitter gives you a true reading of 1.65:1. There is no real reason to try to lower it, in fact the same would hold true if the reading were 2:1. Figure 3 is a chart showing the equivalence of VSWR to RETURN LOSS(dB), REFLECTED POWER(%) and TRANSMISSION LOSS(dB). Return loss is related to reflection coefficient by the equation:

$$\text{Return Loss} = -20\log_{10}(p)$$

It is just another way of measuring VSWR. For example, with a perfect 1:1 VSWR there would be no reflected power consequently the return loss on the feedline would appear to be infinite. A short or open circuit at the antenna is the worst case scenario since the reflection coefficient would be $p = 1.0$. All incident power would be reflected, and with a lossless feedline the return loss would be 0-dB. this is what the RETURN LOSS (dB) column refers to

The most informative columns in Figure 3 are the REFLECTED POWER(%) and the TRANSMISSION LOSS(dB) columns since they provide an answer to our question of whether further reduction of VSWR is worthwhile. Figure 3 shows that for a VSWR of 1.65:1 the reflected power is only 6.2% of the incident power, and the transmission loss is only 0.27 dB. In more familiar terms, if you count an S-unit as 6 dB, then the 0.27 dB loss is only 1/22 of an S-unit. A reduction of the VSWR to 1.5:1 would provide only a 0.09 dB reduction in transmission loss. This is not worth the effort it would take to achieve such a miniscule increase in power.

Figure 3

VSWR	Return Loss (dB)	Reflected Power (%)	Transmiss. Loss (dB)	VSWR	Return Loss (dB)	Reflected Power (%)	Transmiss. Loss (dB)
1.00	∞	0.000	0.000	1.38	15.9	2.55	0.112
1.01	46.1	0.005	0.0002	1.39	15.7	2.67	0.118
1.02	40.1	0.010	0.0005	1.40	15.55	2.78	0.122
1.03	36.6	0.022	0.0011	1.41	15.38	2.90	0.126
1.04	34.1	0.040	0.0018	1.42	15.2	3.03	0.132
1.05	32.3	0.060	0.0028	1.43	15.03	3.14	0.137
1.06	30.7	0.082	0.0039	1.44	14.88	3.28	0.142
1.07	29.4	0.116	0.0051	1.45	14.7	3.38	0.147
1.08	28.3	0.144	0.0066	1.46	14.6	3.50	0.152
1.09	27.3	0.184	0.0083	1.47	14.45	3.62	0.157
1.10	26.4	0.228	0.0100	1.48	14.3	3.74	0.164
1.11	25.6	0.276	0.0118	1.49	14.16	3.87	0.172
1.12	24.9	0.324	0.0139	1.50	14.0	4.00	0.18
1.13	24.3	0.375	0.0160	1.55	13.3	4.8	0.21
1.14	23.7	0.426	0.0185	1.60	12.6	5.5	0.24
1.15	23.1	0.488	0.0205	1.65	12.2	6.2	0.27
1.16	22.6	0.550	0.0235	1.70	11.7	6.8	0.31
1.17	22.1	0.615	0.0260	1.75	11.3	7.4	0.34
1.18	21.6	0.682	0.0285	1.80	10.9	8.2	0.37
1.19	21.2	0.750	0.0318	1.85	10.5	8.9	0.40
1.20	20.8	0.816	0.0353	1.90	10.2	9.6	0.44
1.21	20.4	0.90	0.0391	1.95	09.8	10.2	0.47
1.22	20.1	0.98	0.0426	2.00	09.5	11.0	0.50
1.23	19.7	1.08	0.0455	2.10	09.0	12.4	0.57
1.24	19.4	1.15	0.049	2.20	08.6	13.8	0.65
1.25	19.1	1.23	0.053	2.30	08.2	15.3	0.73
1.26	18.8	1.34	0.056	2.40	07.7	16.6	0.80
1.27	18.5	1.43	0.060	2.50	07.3	18.0	0.88

1.28	18.2	1.52	0.064	2.60	07.0	19.5	0.95
1.29	17.9	1.62	0.068	2.70	06.7	20.8	1.03
1.30	17.68	1.71	0.073	2.80	06.5	22.3	1.10
1.31	17.4	1.81	0.078	2.90	06.2	23.7	1.17
1.32	17.2	1.91	0.083	3.00	06.0	24.9	1.25
1.33	17.0	2.02	0.087	3.50	05.1	31.0	1.61
1.34	16.8	2.13	0.092	4.00	04.4	36.0	1.93
1.35	16.53	2.23	0.096	4.50	03.9	40.6	2.27
1.36	16.3	2.33	0.101	5.00	03.5	44.4	2.56
1.37	16.1	2.44	0.106	6.00	02.9	50.8	3.08

Further examination of the chart shows that a VSWR of 2.6:1 results in only about 1 dB of transmission loss. A high VSWR of 6:1 shows just a 3 dB transmission loss, but this is 1/2 an S-unit. You will still be getting out but this is becoming a significant loss. Your feedline will be dissipating more power than it should, and there may be other serious things wrong with your antenna system.

Throughout this article you've noticed the use of the term "antenna system". The word "system" means you must pay attention to other things besides just the VSWR and your power output. Each component of your antenna system must be optimized to get the best results. Many factors must be considered such as operating frequencies, bandwidth requirements of the antenna system, heights, and directivity, all of which affect its efficiency. Since the height of your antenna, and your operating frequency determine both the length of the feedline and its losses the interfaces become very important. So there are a number of trade-offs which must be considered when you contemplate putting up a good antenna system, but these are tales for other times.

You can build or buy your own VSWR meter, but make sure that you understand what it is measuring and what it is really telling you. Then once you are satisfied that you have put up a really efficient antenna, fed with a low loss feedline, you can sleep well knowing that to try to reach the ultimate 1:1 VSWR is only an ego trip. As a rule of thumb, any accurate VSWR reading under 2:1 is probably not worth the effort to achieve if the other elements of your antenna system are the best you can make them. In fact you might be surprised to find that you really do have a low VSWR when you put up the best antenna and feedline you can. There is an old saying in ham radio that "a dime in the antenna is worth a dollar in the transmitter any day". Try it and see if you don't agree.

A Confession Of A Television Engineer - Geoff G0KVK

When I left school at the fine old age of fifteen, I had the choice of either being a car mechanic or a television engineer. As I did not fancy looking under cars, I chose to be a TV engineer, and as ITV 1 was just starting transmitting, it seemed that it would be a good choice into electronics. My first job was at a small company called MTM. This was a small shop situated the top of Worcester Street, by the Island (it is now a private house). It was run by three partners, one whom happened to be a radio amateur, Ken Willmot G3BFQ. Funny how I can still remember his call sign. He was the one person that gave me insight into it. Every day I had to cycle between there and home at Amblecote. My job was to make the tea and take payments, (most people could only rent TVs or radios, due to the high cost of a them). And when it was quiet he would show me how to repair them and how to build a radios.

My first radio was a one valve regenerative receiver built out of scrounged parts from a scrapped radio. It had a 1.5volt heater and 90volt anode (this was obtained via a single battery). The coils were wound with copper wire taken from a scrap transformer. I would start winding them and a customer would come in and I hadto leave it to serve them and when I went back the coil would have fallen apart or I had forgotten how many turns I had got to.

Ken used to bring in a monthly magazine called Practical Wireless and it was edited by a man named F. J. Camm and it was effectively known as Camm's comic. This had circuit diagrams and adverts of new and second hand radio gear, so many happy hours were spent poring over it. I spent two years there before moving on to a company called Multi Broadcast as an aerial rigger's mate. We would arrive at the workshop, load up the van with televisions and aerials, then round to the caravan for our breakfast, as the transmission did not start till ten o' clock . Our shop was at the top of the arcade (which was situated near the bottom of the High Street) and there was a passage, which went from the arcade past our workshop, which was a two storey building, and into Coventry Street.

We had to rig two aerials, one for BBC1 and one for ITV. The aerial feeds were combined into one lead, which was stapled down the window frame and into the TV, via a hole drilled into the window. This was done with a brace and bit - no electric drills in those days. You always used staples, as the alternative was lead headed nails, which was a wedge shaped 1 inch length of steel with a lead tail fixed at the top. The Idea was to knock the nail into the cement and then bend the lead tail over the cable. Unfortunately, 9 times out of 10, the lead tail would fall off, which just left the steel nail sticking out. Sometimes the customer already had a BBC1 aerial, so we only had to install the TV and clamp the ITV aerial to the mast.

One such job was in Heath Lane, by the park. We got there and installed the TV. After setting up the ladders, we began to assemble the ITV aerial and found that we had not got a small stub mast, so on looking round we found that the next door neighbours had left the yard broom leaning up against the fence. The stale was just the right size, so it was taken to the van. The broom head was removed, a foot was cut off it and the broom was reassembled and replaced. The cut off piece of wood was painted silver clamped to the aerial and taken up the roof and fitted. Checked the TV - everything working OK , so onto

the next job. As the years went by, I would often go past that job and the aerials were still up, but I often wondered when the neighbour came to use the broom how come it was a foot shorter than the last time they used it?

I spent a few years as an aerial rigger (and a few that scrapes we got into) and then I was promoted to a service engineer repairing radio and TVs. Now that I worked for a large company the workshop stock was an Alladin's cave compared to the first place I worked. You could order anything without any problem. So the first big project was a nine valve stereo amp (stereo had just started up on LP records). The only things I had to buy were the transformers and the B.S.R. auto turntable, complete with the stereo cartridge. This I built at home, and was fitted into a old fashioned wooden radio cabinet. The speaker system was a piece of five-ply wood, three feet by four feet and had a fifteen inch bass, eight inch mid range and a four inch tweeter. I had not yet got a speaker enclosure.

The only time I managed to let it rip was when the local youth club, that I went to, the record player went faulty, so I loaded this onto my van and fixed it up. Within half an hour the local policeman, who lived in the police house next door to the church hall which we were using, came in and told us to turn it down or he would confiscate it!

When Multi Broadcast first started, the radios that were rented out, consisted of a coil pack selected by a switch, which gave you the stations and a separate chassis with two valves on, one a rectifier and one audio amp and output. When these relay boxes were replaced with the normal superheterodyne type, these relay boxes were brought back to the workshop, packed up and sent back to Thorn Electronics. Not all of them went back, so sometimes the amplifier pack was taken out and put to a different use. The manager had his office next to our workshop and he used to talk to the receptionist via an old ex WD Telephone, so we thought it would be a good idea to use one of these amps to listen to what he was saying. Unfortunately we could not turn the volume down, so it was louder in the workshop than in his office.

Our shop was at the top of the Arcade. It was quite small; two TVs, two customers and a receptionist and it was full. One day a new company arrived in the arcade and they had the biggest shop. It had two windows in the arcade and one facing the High Street. This gave them plenty of space to display all makes of TVs. The problem was, that as only ITV was allowed to transmit the sports reports and football matches, most of the husbands would bring their wives shopping and stand outside the windows and watch the match, so no-one came up to our shop. So a cunning plan was hatched. As we were on the second storey, the new shop's aerials were right in line with our workshop window, so once again, another little chassis was bought out and this time turned into a little transmitter tuned to the ITV frequency, put in the workshop window and pointed at the shop aerials. This gave black bars going up and down on all the televisions, much to the annoyance of the shop staff. That was my first encounter with transmitters. After this, the men would stand outside *our* shop window and watch the football.

In June 1974, I joined Dudley radio club and they told me about how to become a radio amateur, so I enrolled at Wombourne college and studied there for 9 months and took the exam in the following June. It consisted of ten questions, two on the licence, of which the answers had to be written down correctly, and six questions out of the other eight. I passed the exam and had the call sign G8KVK. This was known as a B licence and allowed you to

use the frequencies Two Meters and upwards. As I was using the company car, I had to first get permission to fit a mobile rig in it. So, with a two meter FM rig fitted and a five eighth whip on the roof, I was on my way. One day I was pulled over by the police - not for driving one handed, but they thought I was an illegal Cber! - so I had to show them my radio licence, which I kept in the car.

I then went on to Kidderminster college for two years, then to Wolverhampton, which gave me all my certificates in Electronics. An old friend, Dennis Oakley G0DAA, whom I had met at Kidderminster and who worked there, offered me a job there as a part time teacher. I was there for over twenty five years! Thirteen years later, after passing my amateur exam, I decided to study Morse code to get my A licence. This I did at Kidderminster. The chap who taught us Morse lived and worked in Bromsgrove. After we had learnt the code, he would send us passages from a book of Bromsgrove school. Then we would take it in turns to send a passage back to him. One time he (I think his name was Bob), said to go home and rehearse a small passage of text and the next week you could send it and everybody could see if they could read it. Me being me, decided to send it in Black Country dialect, part of it went "*ar doe no abaht yo lot but this morse kode doe arf gimme a yed erk*", which left a few scratching of heads. We had to get up to sending and receiving Morse at the magic twelve words per minute. I took my test at a community centre in Coventry, as that year they had just stopped using Portishead radio station from giving Morse tests. Having passed the test, I hung onto my pass slip and with the help of Dennis managed to reserve the same three letters of my old sign.

I took redundancy from Multi Broadcast, as the rental trade was going down, due to the reduction in the price of TVs and people were buying instead of renting. I began working with Geoff Downing, as I had known him since we used to meet round at the caravan and he always said if I wanted a job come and see him. While working for Geoff Downing, I bumped into Nick & Sean and they said I should come along on Monday night and meet some fellow amateurs at the Stourbridge radio club. I am more into construction than operating, so having my interest awakened, I am back to building things. Unfortunately, a few years ago I cleared out the shed, which I used to as my radio shack, until the kids moved out (yea!). I now have the luxury of the front bedroom. I threw a lot of stuff away, but I managed to find enough parts, as well as finding a local company that supplied me with the rest, I managed to construct a little radio transmitter receiver. So it looks like I shall be visiting a lot of rallies in the near future, to top up the junk box So watch this space.

I received this from **Jim G4WAO**, who commented, "*This could make somebody smile.*

The WIA wireless institute Australia lost the right to manage the foundation licence instruction and exams. It was put out to tender and was won by a college that deals with all maritime licences and now amateur licences. Amateurs were quite concerned about this and didn't know when foundation licence instruction could start again. Sorted now but !!!!! .. how good will it be hence the you tube show".

See the video here:

<https://www.youtube.com/watch?v=wBH6dde57dQ&feature=share>

Prepare yourselves for Windows 10 May-hem.

Or is it June, no, July?

Microsoft's latest update for its ageing OS due to hit Soon

The Windows 10 May 2019 Update is inbound, but not before it has spent a bit more time in the hands of testers excluded from the disastrous October 2018 Update. Microsoft is taking its time with this one. It was widely expected to be given the April 2019 Update moniker, but now looks like Windows fans can expect to see it in May.

Maybe.

This time around, the gang is "taking further steps to be confident in the quality of the May 2019 Update" by flinging the code at the Release Preview ring of the Windows Insider programme next week to shake out any issues before commercial customers get their hands on it towards the end of the month.

This is in stark contrast to the position taken prior to the launch of the Windows 10 October 2018 Update, where additional testing in the Release Preview ring was deemed unnecessary.

Festooned with bugs, including one that deleted user data, the Windows 10 October 2018 Update – aka The Update of the Damned – turned out to be a distressing experience for some.

The May 2019 Update is going to spend "increased time" lurking in Release Preview, and Microsoft intends to chow down on its own dog food with employees encouraged to put the code on their own personal devices. We'd have to admit to a certain amount of surprise that this wasn't the norm.

The team is also splitting Feature Updates (such as the May 2019 Update) from the usual day-to-day patching malarkey that occurs when users hit the "Check for Updates" button. Feature Updates will now be offered via a separate control. This means there is less scope for an accidental install.

Updates may also be paused for up to 35 days (seven days at a time) for all users, including those on Windows 10 Home. Alas, once those 35 days are up, you'll have to take your medicine before pausing again.

Feature updates, on the other hand, can be ignored until the Windows 10 installation in question hits end of service. At that point, Windows Update will have a crack at automatically initiating a feature update.

After the early adopters have had their fun, users on a currently supported version of Windows 10, on devices that Microsoft reckons have no compatibility issues, will be able to opt to download and install the May 2019 Update. This means that users on Windows 1803 and earlier can simply skip that whole 1809 thing.

May will also mark the start point for the release's 18-month servicing period.

The OS still retains the 1903 version number, even though March 2019 has been and gone.

It is looking increasingly likely that Build 18362, currently in testing in both the Fast and Slow Rings of the Insider programme, is going to be the May 2019 Update. Microsoft has

been busy patching this build, which now stands at 18362.30, over the last few days.

One of the notable fixes this time concerns PCs being left unbootable after installing a cumulative update and then installing an optional feature on demand. Presumably the lesser-known "brick my box" component.

The caution shown for this release is an indicator that, while there has been little in the way of handwringing mea culpas from the Windows team after 2018's annus horribilis, some lessons, at least, have been learned.

Whoops. I didn't have anything to fill this space!

YOUR COMMITTEE



PRESIDENT

Tim Childe

G7TAC

VICE PRESIDENT

Nick Moss

G6DQN

SECRETARY

John Clarke

M1EJG

TREASURER

John Scott

G8UAE

COMMITTEE MEMBERS

Wayne Mocroft

M5LLT

Geoff Cooper

G0KVK

Mark Cadman

M0TCG

Keith Dixon

M0HPY

Ross Lewis

M6RLZ

STARLITE EDITOR

Bob Egan

G4XOM

Email:

g4xom@g6oi.org.uk