

# Fifty years of transmitting at BBC Woofferton

1943 - 1993

A social and technical history  
of a Short Wave Station





# CONTENTS

<b>CHAPTER</b>	<b>THE EARLY DAYS :</b>	<b>Page 1</b>
<b>1</b>	<b>1943 - 1947</b>	
<b>CHAPTER</b>	<b>THE RED MENACE AND THE BLUE STARS</b>	<b>Page 9</b>
<b>2</b>	<b>1948 – 1961</b>	
<b>CHAPTER</b>	<b>A NEW BEGINNING</b>	<b>Page 18</b>
<b>3</b>	<b>1961 – 1971</b>	
<b>CHAPTER</b>	<b>ONLY THE NAMES ARE CHANGED</b>	<b>Page 24</b>
<b>4</b>	<b>1972 – 1979</b>	
<b>CHAPTER</b>	<b>MARCONI RETURNS</b>	<b>Page 28</b>
<b>5</b>	<b>1979 – 1982</b>	
<b>CHAPTER</b>	<b>RING OUT THE OLD RING IN THE NEW</b>	<b>Page 37</b>
<b>6</b>	<b>1983 -1986</b>	
<b>CHAPTER</b>	<b>WATER BUT NO FIRE</b>	<b>Page 43</b>
	<b>1987 - 1988</b>	
<b>CHAPTER</b>	<b>A STRIKING YEAR</b>	<b>Page 50</b>
<b>8</b>	<b>1989</b>	
<b>CHAPTER</b>	<b>THE NINETIES BEGIN</b>	<b>Page 56</b>
<b>9</b>	<b>1990 – 1991</b>	
<b>CHAPTER</b>	<b>DOWNHILL TO THE GOLDEN JUBILEE</b>	<b>Page 65</b>
<b>10</b>	<b>1992 – 1993</b>	
	<b>WOOFFERTON MANAGERS</b>	<b>Page 71</b>

# Fifty Years of BBC Woofferton

1943 - 1993

## A social and technical history of a Short wave Station

This story began life in 1990 as a brief internal station history at the request of BBC Transmission Management at Warwick. Since my retirement I have been attempting to fill in the gaps and make the story more acceptable to the general reader and to honour the previously unsung heroes of the Woofferton story. Without the tireless efforts of the staff at transmitting stations none of the great television and radio events would have been seen, or heard. Not for them the back-slapping of fellow thespians, no applause rolling towards them from a vast audience. Their only reward was knowing that they had done their best in a field where perseverance, loyalty and diligence matter more than the fleeting transitory sparks of brilliance.

To them this story is respectfully dedicated.

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## CHAPTER 1 - THE EARLY DAYS – 1943 to 1947

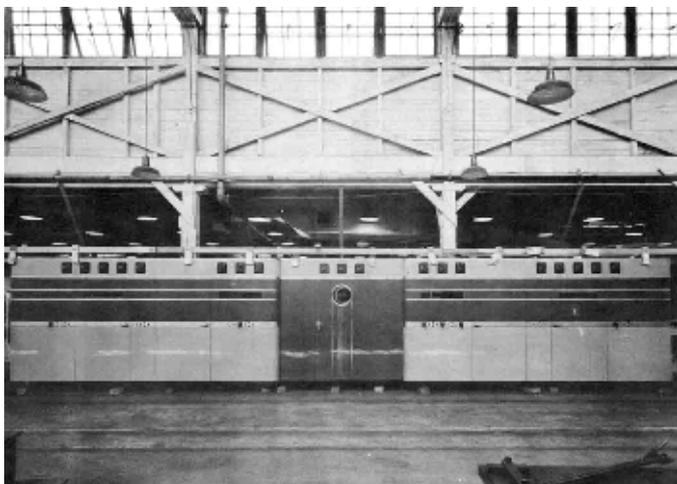
This little history attempts to tell the story of the British Broadcasting Corporation's transmitting station at Woofferton near Ludlow in Shropshire during the first 50 years of its existence. That statement, like many others in this story, needs to be qualified. The county boundary between Herefordshire and Shropshire runs through the aerial site and so the station is actually situated in two counties. However the nearest village is Brimfield which provides the postal address for the station, Woofferton being little more than a railway station where the long vanished tracks of a branch line to Kidderminster once joined the rails of the Hereford to Shrewsbury main line.

When and why did the BBC appear in the Welsh Border landscape with a vast array of masts and wires strung up in the air? The story began in 1932 when the BBC Empire Service in English opened from the first station at Daventry in Northamptonshire. Originally this service, to link the Empire by wireless, was intended to be transmitted on Long Wave or low frequency. Following the discovery by radio amateurs that long distance communication was possible using high frequency (HF) or short waves the plan was changed. Although Daventry had a distinguished name in the broadcasting world it was never technically the best place for a short wave site, being on a hill and close to a growing town.

Later during the turbulent Thirties, as international tension increased and in an attempt to counter the growing power of Fascist propaganda, the BBC expanded their overseas services. The Empire Service in English, intended mainly for ex-patriates, was joined by services in other languages. The first foreign language service, in Arabic, opened in January 1938 with Latin-American and European Services starting later that same year.

By the time the war broke out in 1939, the BBC Overseas Service had a total of nine senders, all at Daventry. The term "senders", used as a nomenclature only for short-wave transmitters, seems to have been adopted by the BBC sometime in mid-1938, when presumably it was used to avoid confusion between "transmitter" and "transmissions".

Lack of funds pre-war from the Treasury had prevented any matching of Germany's lead in high-power short wave broadcasting. However the outbreak of the war released the much-needed funds, but nearly eighteen months elapsed before the first new HF station was opened at Rampisham near Bridport in February 1941. This was equipped with four Marconi 100 kilowatt senders of the latest design. With an aerial field of 15 masts and twenty nine curtain arrays the station was designed to put a good signal into a service area outside Europe. In the BBC nomenclature of the time Rampisham became OSE3 or Overseas Station Extension 3, always referred to by Transmitter Department staff as "ozzy-three".



In November 1940, the Ministry of Information told the BBC that it was their desire to treble the output of overseas broadcasting, especially in foreign languages. (Seen on the left: RCA Type MI-7330 at the RCA factory in Camden, New Jersey, USA) The BBC was required to make plans for this project assuming that money and facilities would be made available. In terms of HF transmitting equipment the BBC decided that 18 new

senders were required. In order to fire a signal into occupied France and Germany a site was

needed in the north of England. Two stations designated OSE8/9 were built about a mile apart near Penrith in Cumberland. One station, OSE8, would have six Marconi SWB 18 senders and the other station was equipped with six twin-channel CS8 senders made by STC, Standard Telephones and Cables Ltd. The station at Woofferton, designated OSE10, was built to house six Type M1-7330 senders of an American design made by RCA and is situated almost half way between Rampisham and Skelton.

According to Edward Pawley, author of "BBC Engineering", the other Overseas Station Extensions were Senders 4-7A & B at Daventry which became OSE1, OSE2 being used for Senders 8-11 at that site. OSE4 denoted Sender 22, a Marconi SWB 18 100kW transmitter installed at the MF station at Start Point. The giant station at Ottringham near Spurn Head in Yorkshire, broadcasting on long or medium waves, was OSE5. The high power medium wave at Droitwich became OSE6 and Sender 51, another SWB 18 at the Lisnagarvey MF site in Northern Ireland, became OSE7.

In January 1941, the BBC gave the Ministry of Information their plans to treble the output of overseas broadcasting and warned them that fullest priorities would be needed in money, men and materials. Other items such as planning, and hard graft would be needed before Woofferton opened in October 1943. However, it must be remembered that, during this period, providing extra senders was just a small part of this massive BBC expansion in both hours of broadcasting and diversity of languages. Monitoring and editorial staff for the creation of more news bulletins, provision of programme staff, writers, musicians and studio facilities were also needed at a time when the whole nation was already stretched with great demands from the military and industrial sectors.

For the new station to be opened at Woofferton, aerial parts were ordered from the Marconi company in October 1941 and in June 1942 seven sets of VFO-4 and HMG-4 equipment were ordered for the Drive Room. These were Variable Frequency Oscillators and Harmonic Generator Multipliers which were used to produce the RF drive frequencies for the RCA transmitters. Crystal drives were of no use because of the many varied operating frequencies used by the HF senders, dependant on the state of the reflecting ionised layers surrounding the earth.

A short break from our chronological narrative is needed to explain a little about the transmission of short wave signals. The ionised layers, mentioned above, are dependent on radiation from the sun and reflection is thereby a feature of time of day, seasonal variation and the longer term 11 year sunspot cycle. The optimum frequency for any given transmission therefore has to be selected with all these variables in mind. If the frequency is too high the waves penetrate the ionosphere and are lost in space; if the frequency is too low the waves are attenuated by absorption before reaching the ionosphere. Best results are obtained by using the highest frequency which is reflected by the ionised layers, known in the propagation business as the maximum useable frequency (m.u.f.). The prediction of this magical m.u.f. for a particular service area, time of day, time of year and sunspot number is part science, part experience and part guesswork. This is just one of the headaches for the programme scheduling people, as are the requests of the various language organisers who obviously also want their particular programmes to arrive at the time when the largest possible audience is available. Different areas of the world lie in different time zones and so short wave broadcasting is carried on around the clock. Thankfully these problems are not the responsibility of Woofferton and only the completed schedule is sent to the station for operation. Large seasonal changes are normally made four times a year with small adjustments being requested when reception reports are received or if a political crisis demands extra coverage.

We return to wartime Woofferton, where a Fordson tractor was ordered for the Aerial Department on 5th August 1942 to work on the site. The actual area was 180 acres of low lying land which had been a lake in pre-historic times, It had a high water table and flooded quickly before the land was drained. When the snow melted in April 1947 the site once again became a lake. The riggers and aerial switching assistants had to be provided with fishing waders and crossing the streams on the site became quite dangerous. In some areas only 10 feet below the surface a very difficult stratum was discovered which was almost like quicksand and this made the construction of mast bases difficult. However, it is the damp aerial field with its high electrical conductivity which makes Woofferton an ideal short wave site.

John Richardson, the newly appointed Senior Maintenance Engineer in charge of aerals, arrived at the site on Monday 5th October 1942. He met the surveyors and Mr. Smith, the representative of construction firm J. L. Eve. Eleven men and one ganger had been on site clearance since the previous Friday. Problems began at once for the Aerial SME, when Mr. Smith informed him that the mast positions shown on the site plan were incorrect. They then started from H mast as the datum mast and set out the field from that position. To identify masts on site they were given letters with the southernmost one being A mast. The problem was caused by an incorrect position shown for the switching tower and the original fields were not as shown on the Ordnance Survey maps.

Trees were marked, felled and valued as the site was gradually cleared for the feeder lines and mast bases to be constructed. The six senders fed their output to a switching tower and thence via long runs of spaced feeders to the switching frames at the base of each curtain array. On 14th November erection of the feeder system was started but the erection of the aerals was delayed by the non-completion of the masts which were held up by a shortage of steel. The masts were of lattice stayed construction with the base resting on a 3 inch diameter steel ball. This enabled the mast to be accurately located and move slightly when the tension in the stays was adjusted to ensure vertical alignment. The masts ranged in height from 150 to 325 feet and apart from three four sided masts they were all triangular. The three sided 325 feet mast weighed some 21 tons and according to experts contained some 2,800 nuts and bolts. The mast base weighed 22 tons and supported a total load of 99 tons when the mast was stayed. In this case there were 9 stays, each set of three being fastened to a concrete base weighing some 64 tons. *(Picture above shows the building, feeder runs and switching tower in August 1944)*



The first section of the building was ready for plant installation on 1st February 1943, and by this time the first of the RCA senders had arrived and was installed. The front of the building contained the administrative offices and the Control Room, with the standby generating plant at the opposite end. The Main Hall, in between, was divided by strong brick blast walls and had a large span roof supported by heavy reinforced concrete ribs. These ribs were hinged at the centre and their feet rested on the stout outside compartments containing the power and modulation transformers for the senders. Each external door was protected by a blast wall, all features to give some protection against attack from the air.

There was then some delay before the arrival of the subsequent senders, the next of which arrived on 15th May. During the intervening period, furniture, the emergency 240 volt battery and the essential Gent's clock system had been delivered. The clock was most important because the BBC

had developed a schedule for HF broadcasting which had to be accurate to within a couple of seconds to allow for programme switching, and sender interchange between stations. The remaining four senders arrived in quick succession between 10th June and 17th July. In all over



180 tons of equipment contained in nearly 600 cases ranging from 200 lb. to 3<sup>1</sup>/<sub>2</sub> tons were handled in the goods station at Woofferton railway junction. These had to be transported to the site and off-loaded before installation work could commence. *(Picture on left shows the scene outside OSE10 taken in 1943)*

Installation of the senders went very smoothly as the erection began, ducts being made in the floor, copper sheet for screening fixed to the floor and channel irons already fixed to take the main framework. The first sender took 5 men

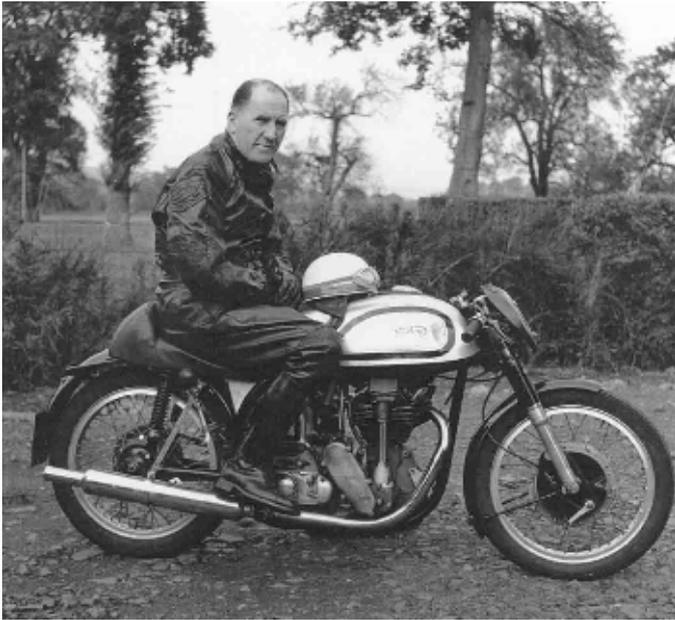
working 10 hours a day some 3 weeks to erect but the men soon became experienced and the final sender took only 7 working days by 6 men. Not much transit damage had occurred despite the long journey from RCA at Camden, New Jersey across the U-boat infested waters of the North Atlantic.

By 31st August, the last of the 15 lattice support masts was erected. They carried 26 curtain aerials, most of which were the HRRS4/4 type. The aerials consisted of two identical curtains each comprising in this case 4 dipoles wide and 4 dipoles high. For maximum flexibility the groundwork of each array enabled each curtain to be fed with its partner earthed to stop backward radiation. The arrays were split in two horizontally so that one half could be fed slightly in advance which caused the signal to be slewed at an angle to the normal radiation. Hence HRRS meant the dipoles were **H**orizontal, the array had a **R**eversible **R**eflector and could be **S**lewled. Between K and L mast were arrays 819 - 823 which were of the fixed HR1/2 and HR1/1 type. These were all replaced in 1947 by a single 4/4 type which was numbered Array 831. Each array at Woofferton was given a number starting with 8, the first array 801 being closest to A Mast. Arrays at other stations were similarly given a numerical prefix which denoted the particular station.

Staff, drawn from all parts of the BBC, began to arrive to man the station and on 7th October a 26 seater coach began to run to the site three times a day for the operational shift staff. It was hired from Primrose Motors at Kingsland and ran from Leominster via Orleton to the station at a cost of £4/11/- a day. Later, in July 1945, Ludlow became the base town and a shift bus hired from the Corvedale Motor Company ran from that location.

Owing to the delay in the completion of the aerial system it was decided to put four senders into service on 17th October. The last two senders went into service on 21st November, the day after the aerials had finally been completed. These two were Sender 85 and 86, the Woofferton units being numbered Sender 81 to 86. As previously noted the aerials were connected to a large circular frame outside the building surrounding a large switching tower with six levels, one for each sender. An interlocked motorised arm could be driven round from inside the building to select one of seven outlets. This enabled each of the six senders to have any seven arrays connected to it but if one array was in use by more than one sender an operation called "biffing" (short for bifurcation) was performed. The feeder from each array could be selected on the outside ring to one or more levels of the tower. All these operations were performed with the sender off

power and a strict system of key interlocks, tallies and a written log had to be followed to ensure the safety of personnel.



After the acceptance of the equipment there was still a period of hard work to clear up outstanding items and iron out all the bugs. The station staff were driven in this task by the first Engineer in Charge, Laurence Frederic Ivin who had arrived in April. *(Seen left on his Norton motorcycle in 1956)* L. F. Ivin had worked with the Eastern Telegraph Company and then the GPO at their Rugby station. He joined the BBC in 1928 at Daventry where he spent the first fifteen years of his career, rising to become the Assistant Engineer in Charge, before his appointment to Woofferton. Ivin arrived with a reputation. His nickname at Daventry was “The Tiger” and it was rumoured that he could be very short-tempered and had been known to threaten

physical violence if annoyed. Whilst working on a sender, where he had bypassed the safety interlocks, he received a 10 kV shock. He was too tough to die and was resuscitated by E. W. Hayes, then SME Aerials. Allegedly the question came from London as to “who was the B.F. that pressed the OFF button?”

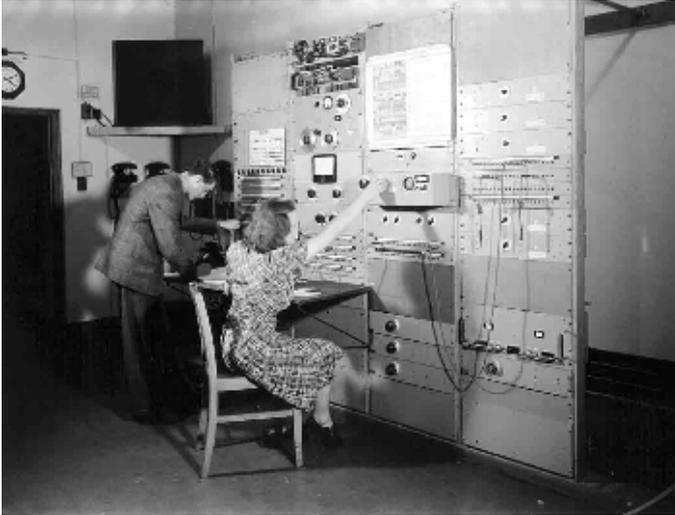
Once at Woofferton, “Ivin the Terrible”, as he was known to his staff (but not to his face), proved to be an uncompromising hard taskmaster of the old school. He was scornful of pen-pushers in the BBC Head Office, a typical remark being “I was tuning 5XX at Daventry while he was still in short pants”. In those days the EiC was a paramount king and ran his station with a rod of iron. Staff, whose performance or character did not agree with the EiC, found themselves moved very quickly to other stations.

The RCA 50 kW senders were not designed for rapid wavechanging because the original factory configuration was two RF units with a common modulator. This enabled the spare RF unit to be wavechanged while the other RF unit was in use. Popular rumour, which seems unsupported by any evidence, was that the spare channels were actually shipped but lost at sea when the freighter was sunk by a German U-boat. However spares for the transmitters were difficult to obtain and it was a case of make do and mend with what materials were available. By this time, almost everything in Britain was rationed or available only with special permits. Even U2 torch batteries for the Aerial Switching Technical Assistant were impossible to obtain locally and had to be specially ordered.

The station was supplied from the local electricity board’s 11 kV system but three Harland and Wolff 750 bhp supercharged diesels were installed as standby. They could provide 1.5 Mw which was more than enough as the maximum demand for the station was 900 kW. Throughout the spring of 1944 the EiC and staff battled on to get the diesels working correctly and to clear up the usual outstanding items found on a new station. By 18th May L. F. Ivin finally accepted the standby plant with its Metrovick alternators and the synchronising equipment.

According to a requisition in January 1944 there were three Diesel Maintenance Mechanics working at Woofferton, with three riggers in the Aerial Field. Other manual staff included two

indoor cleaners, one of whom was Eric Charles, still brewing tea for the night shift workers in the early 1960s. One of the two electricians was Jack Price who later opened Castle Garage in Ludlow's Mill Street. He died in 1998 at the age of 82, still keeping an eye on his expanded garage and showrooms now situated in Corve Street. There was a uniformed Transport Driver for the station, one Jack Caseley, the former Commissionaire at the Clifton Cinema. Les Fury recalls that Jack wore his BBC uniform cap at the same jaunty angle as the one he wore when he patrolled the cinema queues and advertised that there were seats in the one-and-nines.



The station was in continuous use 24 hours a day and not all of the operational staff were men, some TA(F)s, Technical Assistants (Female) were employed at Woofferton and they proved to be just as efficient as the male staff. *(Left is a scene in the Control Room in August 1944)* A visitor recalls seeing “a tiny brunette in a fur coat standing on tip-toes, tuning a sender with meters being higher than her head”. Though the Ludlow area was well off the beaten track, a RAF station was a few miles away at Shobden and occasionally the war did intrude on the station. On 25th March 1944 a Bristol Beaufighter serial EL167, from

the Telecommunications Flying Unit at Defford, attempted a crash landing in a large field opposite the Woofferton Saw Mills. Unfortunately the aircraft collided with some trees and burst into flames. Miss Jones, later Cynthia Scott, a junior typist at the time, was among those who raced to the crash but the navigator, Flying Officer Silvester was trapped in the burning wreckage and died from his injuries. The Dutch pilot Flying Officer C. Sipkes fortunately suffered only minor injuries.

For some time prior to D-Day the BBC had been broadcasting coded messages to the underground resistance forces on the Continent and at last their patience was rewarded. The Allies landed in Normandy on 6th June 1944 to begin the liberation of Europe. The Germans were not finished yet and had several tricks to play before the war could finally be won. Shortly after D-Day, flying bombs known as the V-1 began to be fired towards London causing severe casualties. Eventually radar controlled guns firing radio-proximity fused shells together with souped-up fighters gained mastery of these pilotless aircraft.

The other, still secret threat, which had occupied the thoughts of the British Intelligence authorities was the liquid fuelled V-2 rocket. Very little was known about this weapon or its guidance system. One clue was obtained when a stray test shot of a V-2 had landed in neutral Sweden where the wreckage was examined and found to be fitted with what appeared to be a radio guidance system.

A secret and high level British Committee, was formed to work out counter measures to this threat which was soon expected to be in operational use. Details of the rocket and its expected performance were highly confidential and due to the size of the projectile it was given the code name of “Big Ben”. The Big Ben Committee had a very short time to produce some form of counter-measures against this new and unique weapon. Amongst other recommendations, the committee decided to use a number of high powered short wave transmitters to jam the guidance system of the rocket. In desperation any available suitable transmitters were acquired for this

purpose. According to the book “Marconi : A War Record” the company collected sixteen of their 8 kW SWB 11 transmitters, refurbished them and installed them near Deal.

On 18th August, the BBC was requested to release transmitters for this purpose, but they pointed out that this would mean loss of Overseas programmes. Despite this objection, the order was given and on 28th August a party of Royal Air Force technical personnel of four NCOs and eleven airmen under Flight Lieutenant Beeson arrived at Woofferton and the station was closed down. Removal of the RF sections of the recently installed senders began immediately and was carried out at top speed. The Operations Book for 26 Group RAF notes that by 19th September two RCA units modified for jamming were operational at the Government Communications Centre at Crowborough in the middle of Ashdown Forest.

The records during this hectic period both for the BBC and the RAF are rather confused, memories are vague and written records sparse and ambiguous. According to one report the station was stripped, all senders were removed and re-erected ready for service. A member of the RAF team, James Wood, thinks that only two RF units were actually modified. He also thought that the remaining units were sent to Crowborough but never unloaded, being returned intact.

The plain facts are that two units were operational in a short time. The procedure was to detect the firing of the V-2 rocket at a receiving station on the South coast of England and by land line sweep the drive to the modified RF unit of the RCA sender and jam the required frequency. Examination of many wrecked V-2s failed to find any remote radio control and in fact a sophisticated type of gyro-stabilised inertial guidance system was used by the Germans. This was totally self-contained and unjammable. The radio equipment found on the Swedish rocket was completely experimental and was not used on operational V-2 rockets.

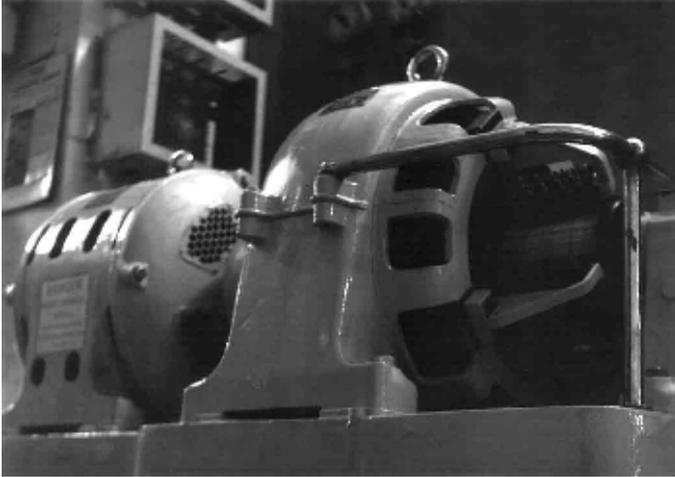
When this fact was realised, the RAF lost interest in the ex-Woofferton senders and eventually orders were given that they should be returned and re-installed. The sequence of events is not clear but S85 and S86 were put back in service on 8th October 1944 and by the start of the New Year S83 and S84 were also carrying BBC programmes. *(Photograph on right shows the RF unit as originally fitted to the RCA senders)* It is not clear if S83 and S84 actually left the station but S81 and S82, sitting in a hut at Crowborough, were heavily modified by the RAF. Hence there was a long delay before they were returned and an even longer time before they were re-installed. Unfortunately many parts of the RF units were missing when the RAF returned them in early spring 1945. In fact S82 ended up with a very modified final RF output circuit, possibly designed by L. F. Ivin. The sophisticated RCA chain driven parallel plate coupling was replaced by a wire lifting up the pivoted output coil, known as the “bedstead”.



S81 was a total rebuild to a design by Mr. B. N. MacLarty which was never totally stable in operation. Instead of a push pull triode circuit with a neat Scott transformer filament supply it was single ended with a dummy valve. This meant that this one sender had a different final RF valve and required a large DC generator for its filament supplies. The standard RCA transmitters used two RCA 880 valves in the Final RF stage and two similar valves in the Modulator. In S81,

however, the two Final RF valves were CAT 14 valves, the modulator valves being the same as the other senders.

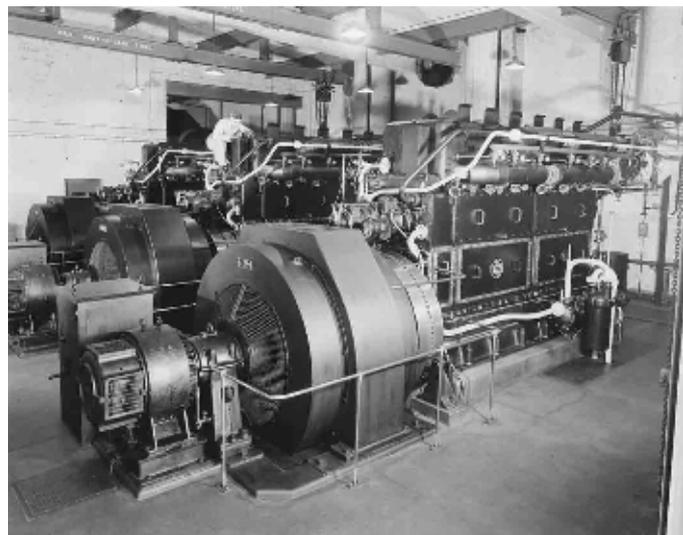
S82 returned to service on 31st May when it carried S84's commitments while maintenance was done on one level of the aerial switching tower. S81, now rebuilt, was back in service during June. In November spare parts started to arrive for a second RF channel to be fitted to S81. As previously mentioned, the RCA senders were designed for twin RF channel operation which made



quick wavechanges unnecessary but the spare RF channel had not been provided for the Woofferton installation. Presumably there were no spare RCA parts but an equivalent of the MacLarty design could be built by BBC resources. *(Left is the original DC filament generator for S.81)* During the first half of 1946 work proceeded on this second channel for S81 and on 15th June it was handed over as working equipment. However on 30th December the second large DC filament generator was removed, but it is not known what use was made of twin channel working operationally. Allen

Herbert, the AEiC at the time, remembers nothing of this and it may be that the movement of the generator was merely part of the commissioning of the much-modified S81.

Due to worn out generating plant and a general shortage of coal, the winters following the Second World War put a great strain on the Public Electricity Supply Authorities. In order to help the situation BBC stations, including Woofferton, were instructed to carry their own load on standby diesels for certain periods during the day. From October 1947 to May the following year the diesels carried the station load from 0800 - 1200 hours. However it was known that the engines had never completed a continuous 200 hour acceptance run and Fred Goldsmith, the diesel mechanic was fully occupied keeping the engines operational. *(The picture shows Fred on top of his beloved engines in 1947)*



## CHAPTER 2 - THE RED MENACE AND THE BLUE STARS – 1948 to 1961

The year of 1948 saw the second traumatic experience for Woofferton staff and the problem again involved Germany. On 24th June the Russians halted all freight, passenger and water traffic into West Berlin. Two days later the United States Air Force began the Berlin Airlift to supply the beleaguered city and 80 tons of supplies were flown into Tempelhof Air Base. Meanwhile, at



Woofferton, for economic reasons the station was closed down and staff sent away. However, help was at hand and on 18th July Woofferton re-opened again, financed by VOA, the US State Department's radio arm, the Voice of America. *(Left, is the original layout of the RCA senders in 1944 with the cubicle in the centre of the hall containing control desks)* Two programme streams designated Blue Stars and Grey Stars were radiated on a single shift basis between 1400-2200 daily. Programmes were received at the BBC Receiving Station at Tatsfield and routed to Woofferton via Bush House, the BBC

Overseas programme studios in London. This was the start of the Cold War and the beginning of Woofferton's use as a relay station for the Voice of America. The American view was that "the initial use of facilities from 18th July were on a modest basis and accomplished by purchasing time on BBC European Services Facilities. On 20th August 1948 a formal contract was negotiated and signed providing for VOA usage of short-wave facilities at Woofferton consisting of five 50 kW transmitters and 26 curtain arrays. Usage of an additional 50 kW transmitter began in September of 1958."

The Russians found that the wartime Allies were not going to allow the people of West Berlin to starve. Conversely the Russians were unwilling to use force, so they climbed down and the blockade was lifted on 12th May 1949. However the "War of Words" continued with increasing jamming used by the Russians. In an attempt to combat this development Woofferton started to carry BBC Russian programmes in addition to the 8 hour block of VOA from 11th July. Once more, electricity load shedding was operated throughout the winter months.

In the summer of 1950, the EiC was approached by the newly formed local committee of the BBC Staff Association with a request for permanent paths round the aerial site. His reply was that the provision of paths depended on the permanence of Woofferton as a transmitter site. Working at OSE10 during the first ten years of its existence must have been very unsettling for the staff. Apart from L. F. Ivin's autocratic rule, there was the possibility of a third closure. Local staff had been made redundant in 1948 and the future did not look very promising. However technical improvements went on despite the uncertainty.

At the end of 1949, the second UK television station had opened at Sutton Coldfield and television in Band 1 had become available in the area around Woofferton. Efforts were made locally to reduce the levels of radiated harmonics from the senders, some of which fell into the 60 MHz region and which were causing interference with the TV sets coming into use in the area. Once again, S81 being single-ended was proving to be very troublesome but L. F. Ivin had the drive to get the job done and he felt sufficiently proud of his work to publish a small internal monograph on his findings. It was during this period, around 1950, that LFI spent some time seconded to Research Department, investigating the problems of harmonic radiation.

Unfortunately this caused troubles for the AEiC, Allen Herbert, who was appointed acting EiC during this period. LFI was working full time on the suppression of harmonics problem but was reluctant to give up his facilities in the building. Even after LFI was told by Head Office to relinquish his office to allow Allen to get on with the job of EiC, he still monopolised the workshop and its staff in his work. In Allen Herbert's words "Broadcasting was, with difficulty, carried on between experimental and modification works on all six senders, with 'breathing periods' during which 'The Tiger' was away at Daventry." However, despite the problems, by Spring 1951 all the RCA senders were completely screened, the roof of the RF units being covered with aluminium sheeting, and large tubular "dustbin" filters had been installed in the RF feeder outlets to reduce the effects of spurious radiation. (see picture to right)

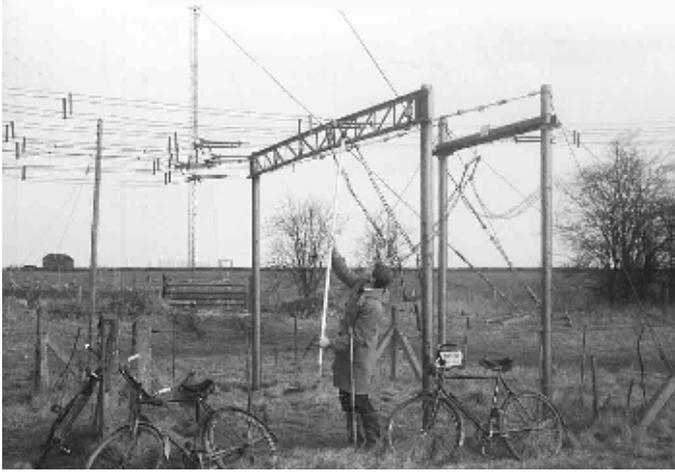


Again during the winter of 1951/52, load shedding was in operation but things had obviously got better for the Supply Authorities as they only expected trouble between 1600-1730 during the week. Mains failures did occur from time to time and shift staff were expected to run up the diesels and repower the station without the aid of the redoubtable Fred Goldsmith, the Diesel Maintenance Mechanic. He was only to be called in if faults occurred on the engines, but not to run them operationally.

Normal routine was that the General Supervisory Engineer, the SME's deputy, would prime the diesels on his walks around the building and check that the engines were ready to run. When the lights went out and a deathly hush fell on the station, the Technical Assistants from the sender hall would run to the engine room and start the diesels using compressed air. The Control Room TA would be watching the clock to keep a note of the shutdown times. The GS would help the TAs and switch the filaments on the voltage regulator gear to warm it up. The SME would walk down to the Power Control Room and open the incoming mains supply. Then the first engine would be warmed up, the excitation wound up to give 11000 volts and the frequency adjusted to 50 cycles. The SME would close the engine circuit breaker to get some lights on and allow the sender filaments to be started. He would then adjust the frequency of the subsequent engines using the synchroscope and close the other engine breakers.

Three 750 bhp diesel engines and a large water cooler consume a fair amount of air and the external roller shutter doors would be opened to ventilate the engine room. The engines ran at 500 rpm and made a thunderous noise, with the additional high pitched scream of the exhaust turbo-superchargers. There were no ear defenders in those days and the fire proof metal door between the engine room and the Power Control Room was pulled tight shut, to enable any kind of conversation to take place. On test runs in the daytime, Fred Goldsmith could be seen through the tiny glass inspection window in the door, standing on top of the thundering diesels calmly oiling the injectors. When the public mains supply was restored there would follow the close down sequence and finally the GS retired to the engine room in the deafening silence to bar the 5 ton flywheels round to the starting position for the next run.

A useful feature of the RCA senders was the spare unused RF unit which provided a large storage area. S82's spare channel was converted into the Aerial Changing Room in September 1952 and for ten years provided a safe though smelly haven for wellington boots, mackintoshes, sou'westers and rather old greasy Barbour jackets. There were no personal issues of wellington



weary Aerial man to snatch a few minutes sleep after trudging around the aerial field on night shift. *(The picture by Dick Buckby shows Rod Viveash changing the bearing at the 'C' frame of Array 828 in 1964.)*

boots until 1969, but a pair of thick white sea boot socks were provided for each Technical Assistant. The only other personal issue was a brown Japanese Army type cap with a bracket on the peak. This was to enable a miner's lamp to be worn on the head fed by a serpentine cable from a metal rechargeable battery pack strapped to one's waist belt. The wooden benches around the walls, under which lived the communal wellington boots, provided a comfortable couch when piled with duffel coats and waterproofs. This enabled the

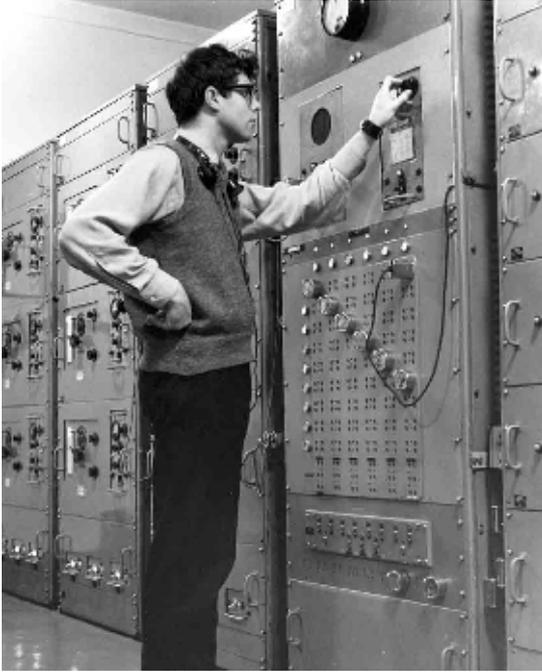
At this time OSE10 was considered to be on a reduced 24 hour working using a skeleton third shift. By 1st January 1953, the staffing was three SMEs Grade B1-, two Grade C- engineers, seven Technical Assistant Is and nine Technical Assistant IIs presumably paid for by VOA. Additionally one SME, one Grade C-, three TA Is and nine TA IIs were costed against the BBC Russian Language budget.

The full shift complement used since the installation in 1943 was 10 men. In overall charge was a Senior Maintenance Engineer assisted by a General Supervisory Engineer. The last was responsible for the inspection of all the auxiliary equipment on the station, stand-by facilities, ringing machines for the telephones, batteries, diesel priming and routine checking of the sender drives. Before the modernisation of Woofferton in 1963, there was an emergency control position at the far end of the building where three spare crystal drives were located. There were also stand-by facilities for plugging programme lines to senders. These arrangements were part of the war-time provisions, which also included a substantial brick wall between pairs of senders to contain any blast, should the station be bombed. *(Woofferton senders picked up the required array using rotating switches on this tower shown at right)*



The drive was the RF frequency of up to 18 watts output which the sender amplified to produce the short wave carrier. It was initially derived from the VFO-4 unit. This was a BBC designed variable frequency oscillator giving 0.7 - 1.4 Mc/s in 4 ranges, mounted in a temperature controlled box. The output from this oscillator was compared with a series of accurate 5 kc/s markers derived from the Droitwich long wave transmitter in the FRM.4 Frequency Monitor. The short wave frequencies were all multiples of 5 kc/s. The output between 0.7 - 1.4 Mc/s was cross plugged to a Harmonic Generator which produced the final frequency of 5.6 - 22.4 Mc/s. This was fed to the sender and amplified to give the required 50 kW carrier power. These drives were set up by the Control Room TA who was supposed to check each frequency as the sender came up and then periodically throughout the transmission.

The BBC Receiving Station at Tatsfield checked all BBC transmissions whenever possible.



Incorrect frequencies and non-appearance of programmes were soon made known to the station concerned. The EiC was very keen to ensure that Woofferton staff maintained accurate frequencies and copies of the Tatsfield log book were sent to the station to be used to create a 'Drive League'. The Control Room man had to note down the Woofferton frequency errors and check them against the shift rota so that an individual's performance could be recorded. *(Left is a very young Jeff Cant at the Drive Patch panel in 1961)* League Tables were issued on a regular basis and individuals were encouraged by the EiC to improve their standard if it fell below the grade. One official document on the VFO-4 system, published in 1948, states that "in the previous year 13,000 Woofferton frequencies were logged by Tatsfield with an average departure of  $\pm 3$  parts in a million." The Drive League Table issued for the 5 months ending December 1960 included at Number

8, a certain A. E. Gallon with 173 operations and an average error of 5.63 c/s. Shortly afterwards, this young TA left Woofferton for promotion and later rose steadily through the ranks to become the BBC's Chief Engineer in the 1990s.

Operationally, the routine service settings on the VFO system moved slightly due to ageing and consequently every frequency on every VFO was checked monthly and the settings recorded. Taking of these "Steered Settings" was a boring and lengthy job for the Control Room TA and the GS Engineer. The room resounded to the sound of the VFOs being brought to zero beat via a loudspeaker. Someone, taking pity on the staff, had suggested a better idea and for a few weeks in the early 1960s the Control Room was home to a Rohde und Schwarz Frequency Synthesiser. This piece of equipment came in a large cabinet, the size of a domestic refrigerator, but much hotter as it contained over 50 small valves. Being a laboratory standard it was a difficult machine to use operationally, with three vertical vernier scales for the frequency selection. In fact, it proved to so easy to set up the wrong frequency and so difficult to check quickly that it disappeared, un lamented, after a short time in service. It was rumoured that another station, built on a hill, had managed to set the "beast" up to 15.007 Mc/s instead of the correct 15.07 Mc/s. As this was one of the frequencies used for almost 24 hours broadcasting, the error lasted for some time, unnoticed both by the listeners and the staff.

The Control Room was referred to as "The Box" because its original war-time form contained no windows and was a pretty claustrophobic place in which to work. In there, the Control Room TA also switched the programmes manually by means of double ended Post Office line cords, logged line faults and answered the telephone in the Control Room. There was an art to the manipulation of the programme switching cords. It was to start at the end of a batch of transmissions and work a programme forward to the beginning. Done this way, switching was done by removing plugs rather than pushing them in, giving minimal breaks.

The incoming programmes were sent from Bush House by Post Office lines. There were three of these, each routed separately via Hereford, Shrewsbury or Kidderminster, a wartime requirement to ensure that enemy action could not easily disrupt all the programme sources. In addition there was a direct Control line to London, rented as were the programme lines, which was often used in the daytime by Head Office staff. L. F. Ivin would only speak to certain people and would always

want the caller's name before taking the call. If annoyed, by incorrect telephone procedure or the failure to obtain a caller's name, he had a habit of suddenly appearing in the Control Room doorway like some rampaging bull. One story, allegedly true, was that LFI, when AEiC at Daventry, had once issued a memo to all staff on how to answer the telephone. This stated that the correct procedure was to say in a clear voice, "Sender 6, Johnson speaking". It was said, that for several months at Daventry, any person answering any telephone, anywhere in the building would say in a clear voice "Sender 6, Johnson speaking". Strangely enough, there was nobody on the station called Johnson. (*The programme equipment and telephone jackfields at Woofferton can be seen in the photograph below*)

Among LFI's other peculiarities was an obsession with the state of the Gents Master clock kept in the Control Room. This was a pendulum clock which was kept in motion by a gravity arm powered by an electric battery. It was quite accurate in operation and could be adjusted by tiny weights added or removed from the pendulum. In the Control Room at Woofferton the glass case containing the machinery had a tiny heating mat to maintain a constant temperature. It was the duty of the TA in the Control Room to check the station clock with the Greenwich Time Signal throughout the day and record any error in a little note book. Any adjustments were also recorded



so that LFI could check at any time how his pet mechanism was behaving. This master clock drove all the other operational clocks displayed the building in a series circuit. Senders were switched off and on for the scheduled transmissions by the TAs who used the clocks in each sender hall.

One night a young TA disappeared down to the Emergency Control Room to get his ration of sleep. He was not a popular young man, thought by many to be rather too cocky, with an exaggerated opinion of his own knowledge. Obviously he found the ticking of the clock movement not conducive to sleep and so he pulled out the plug. Peace, perfect peace, at last. The SME, at the other end of the building, was gradually going spare trying to find out why all the clocks in the building had stopped. When the offending young man was apprehended the SME delighted in exposing his ignorance to all concerned. The young man left Woofferton shortly afterwards. A little knowledge can be a dangerous thing. The SME read out the golden rule "If you are not completely sure of what you are doing, then don't do it."

The provision of programme lines was in the hands of the BBC Lines Department who liaised with the Post Office. Breakdowns due to amplifier faults and accidental damage were handed over by Woofferton to Bush House for action. However, routine checks were carried out on the performance of the lines by station staff. Line Quality Tests (LQTs), known in the trade as "squeaks", were done regularly. The busy Control Room TA was responsible for making measurements of the frequency response, harmonics and noise levels of each line. The programme lines were mostly buried underground and seasonal corrections were made on the line equalisers to compensate for changes in the general soil temperature. Monthly records were also kept of Post Office Terminated Levels (POTLs) with the only BBC equipment in circuit being the repeater coils at each end of the line.

All TAs rotated through each of the eight duty positions and the next one was the outside job of the Aerial Switching TA. He did selections at the Switching Frame, aerial slews and reversals, as well as providing meal reliefs for the Sender TAs who were not permitted to leave their assigned duty positions in the sender control kiosks. As there were 6 transmitters there were six sender TAs employed to do the wavechanges and monitor the sender output, switching the senders on and off according to the operational schedule. They also did maintenance and technical cleaning during scheduled transmission breaks.

Wave-changing was itself an art form which looked so easy when performed by an expert. Due to the restricted nature of the RF unit it was usual for the beginner to emerge covered in bumps and bruises. Done correctly with ducking and weaving, the hands instinctively reaching for the wing nuts, the coils seemed to flow in and out with apparent ease and grace.



Tuning the sender could also appear surprisingly simple until one's first solo attempt. With the RCA senders "neutralising" was essential. According to the technical notes, 'neutralising is necessary to ensure that any feedback from anode circuit to grid circuit via the internal capacity of the valve is cancelled by an equal amount of negative feedback, via an external capacity'. This entailed simultaneously operating two key switches whilst watching two different meters to judge the correct neutralisation. Maximum grid current should coincide with minimum anode current which offered a good test of hand and eye co-ordination. If the neutralisation was wrong, the circuit would be provided with too much positive feedback which could cause instability and a shutdown. *(Left is Dick Buckby tuning an RCA sender in 1964)*

The term 'shutdown' as applied to BBC stations needs a little explanation. Any break in transmission over one minute was a shutdown and had to be reported to Bush House as soon as possible. This enabled an apology to be radiated at the end of the transmission. The SME in charge of the shift would subsequently write all the details of the incident for perusal by Transmitter Head Office with an explanation and in the case of L. F. Ivin, a culprit. The prevailing attitude was that components did not break, they were broken by somebody and it was usually the last person to touch them. A culprit was necessary who could be castigated as an example 'to encourage the others'. Hence it would be advantageous for all concerned if the breakdown was less than 55 seconds. It saved paperwork, L. F. Ivin's wrath, and all sorts of nasty recriminations.

Later in the history of Woofferton, this reporting omitted the hapless individual except in the case of an operational error. The reports were eventually coded and tabulated and were to produce large numbers of figures for managers to juggle about to prove any pet theory. There were monthly and yearly programme summaries giving percentage shutdowns with outside and local causes. Outside shutdowns were caused by failure of the incoming mains electricity, Post Office line faults, operational errors at Bush House or Tatsfield, anything over which Woofferton had no control. All breakdowns were treated seriously and it became a matter of pride for the shift to clear any fault as quickly as possible.



By September 1954, a new system had been installed and the kiosks removed from the sender hall. The sender desks had been modified to permit control of two senders and the shift staff was reduced by 3 TAs. The monitoring of programmes was now done by a sequential system in the Control Room which fed a 10 second burst of each transmitter's de-modulated output to a loudspeaker. A system of carrier lights was fitted to the drive bay and control position to show when the transmitters were radiating. (*Gary Nicholls is seen on night shift at the sender desk in 1961*)

With the start of the new schedule in September 1954 the EiC became worried about the increases in aerial switching done at Woofferton. In a survey done by the AEiC he found that some 20 miles were walked daily, of which 9 were done on night shift. He attempted, unsuccessfully however, to get permission to construct decent paths to make travel easier and safer for the Aerial Switching TA on his cycle. In July 1955 he again pleaded the case to Head Office and a start was made to build paths round the aerial field. The site was very dark, in winter it became very soggy and patches of low lying mist made navigation sometimes a problem. There are tales of staff finding themselves climbing onto the railway, having lost their bearings on a foggy night. L. F. Ivin's uncharacteristically humanitarian project did not seem to be inspired by any union request so perhaps he had a soft spot for his staff that normally remained very well hidden.

The staff at this time had all been in the Armed Forces, and were determined to enjoy themselves in spite of L. F. Ivin. The BBC were happy to spend some money on a Staff Club under the auspices of welfare. Even L. F. Ivin agreed with that and allowed the club cricket team to travel around to matches in the station van with Stan Ruscoe, the station driver or his deputy Reg Wadeley. One of L. F. Ivin's interests at the time was small bore rifle shooting and a range had been constructed on site in a redundant hut. The club team was quite successful in local matches but it must have been slightly unnerving to spend one's off duty hours with L. F. Ivin, especially with a rifle in his hands.

There also seemed to be a bit of horseplay even on the station. Once, a slightly-built young engineer called Arthur Morris was bet he couldn't get inside a metal locker. Of course when he did the door was locked and the locker stood upside down with Arthur inside, hammering to be let out. After he left Woofferton, Arthur went on to become a legend, first in Scotland where he learned to play the bagpipes. Then later, as TM, at Droitwich where he would serenade the staff from the transmitter balcony on his beloved pipes. The workshop staff at this time consisted of one Les Fury who was as meticulous as his boss, 'Lofty' Lewis was harum-scarum. It so happened that one day George Cooke left his lunch box on the work bench. George returned to find that the box was screwed to the bench from the inside and the lid had been soldered shut. In later years 'Lofty' Lewis became a Jehovah's Witness and developed into a much more sober character. He was skilled in improvising repairs and developing ways to make the equipment more reliable. His premature death in 1979 was regretted by all the staff at Woofferton.

George Cooke, a small scruffy character, had a reputation for being careful with money. It was strictly cash for George and he carried around a large roll of dirty notes in his pocket. He would spend nights shifts at work and during the day crawled about on rooftops in Ludlow erecting television aerials. When he was doing neither, he repaired radios in his council house in Ludlow.

George had been made redundant as a TA in 1948 and re-employed so he probably did not think of the BBC as a permanent job.

In March 1956 the name of the union was changed to the Association of Broadcasting Staff, ABS and the Woofferton branch became bolder in their approach to local matters. Request for improvements in the working conditions were now being put to the EiC who tried to oblige but relations sometimes became stormy.

The transmission schedule became more and more hectic with Woofferton seemingly being used to do all the short odd transmissions which no one else wanted. Inserting a different frequency for a 15 minute transmission sometimes entailed two quick wavechanges and possibly two quick slews on the aerial field before returning to the other programme. One exception was the lengthy daily Arabic programme in the Brown network starting at 1045 until 1400, complete with readings from the Koran.

Unfortunately the highest daily activity corresponded with the human frame's lowest point, the ebbing away of the will, the psychological bottom. This was the period from 0300 when the General Overseas Service ended with news headlines. The programme schedule note 11 said "Closes after National Anthem at 0303 approx." Following this, the large arrays had to be reversed and transmitters retuned to start again for 0320 Green Stripes Programme Parade. This produced a large work load for the aerial man who had to take the clears for aerial switching by phone in the field. Once he was certain that it was safe, he had to peddle about on his bicycle from one side of the field to another to get the reversals done in time. Not much fun on a cold black night when it was raining. At the same time, inside the building, the senders would be set up for the new frequencies but had to wait for the return of the array clears. It was always a relief to all concerned when the magic words, "This is London" were heard from all the sender audio monitors. *(Below, a young Technical Assistant on nightshift waiting for the next wavechange or the tea trolley in April 1961)*



When people learn that Woofferton runs round the clock and staff do shift work, the question always arises about how to cope on nights. The Woofferton rota traditionally started with night shifts 2300-0900, five in all, then a blessed sleeping day off, then another five evening shifts 1700-2300, another day off, then five days 0900-1700 followed by a three day break and back to nights again. Some people thrived on it or gave the appearance of not being affected while others loathed nights and just survived as best they could.

The next question is, did you sleep on nights? Some hard men thought it was better not to sleep, these could usually be seen at 6 am, looking like zombies, nodding in their chairs and exhibiting very little enthusiasm for life at all. Most people slept as much as the SME would allow, dossing down in corners, no rest room then, sleeping on door mats and in the spare channels of the senders. Some brave souls dragged themselves into the entrance of the Mod Unit, close to the chattering and clattering relays and only inches from the sender alarm bell. Handel Rees used to sleep behind the drive bays in the Control Room, even the 10 second snippets of programme from the monitor speaker couldn't disturb him. The SME used to hand out the array keys and shut his little flap and nod off. If the

sender misbehaved there were plenty of loud bells to summon the shift. Its amazing how the brain worked, the author remembers suddenly waking up when the sender 10 minute cooling delay had run its course. It was the silence that had woken him. Tea was provided in great quantity in the old days by the night shift labourer. Sometimes at 7.30 am, one's taste buds suggested that the tea had been sitting on the boiler for the previous 8 hours. There was nothing quite like the exquisite smells which came from the kitchen when Bill Gilmour was the SME. He would produce his own fried breakfast and send mouth-watering smells into the sender hall to remind one that many hours had passed since the last cooked meal in the digs.

Then in 1958, a problem occurred over the water supply to the site, coming from a bore hole which had become contaminated and was "as bad as possible" The EiC, who lived on site in a bungalow converted from a wartime hut, was naturally keen to get the problem sorted out. Eventually a new bore hole was sunk to 60 feet and apart from pump problems seemed to satisfy the EiC. The huts around the Aerial Department and including the EiC's bungalow were hastily erected in war-time of single brick wall construction. They were only intended to provide temporary accommodation during the building of the station but are still in use over 50 years after their erection.

Saturday 14th July 1959 was an Open Day at Woofferton and this meant a great deal of extra work for all the staff. Exhibits had to be prepared, notices made up and schedules arranged so that the local population could see the station in action. St John's Ambulance Staff were on duty and tally marshals instructed to keep an accurate total of all visitors.

From a technical point of view the station ran smoothly for the next year but relations between the union and the EiC began to deteriorate at local level. However this problem was overshadowed by the news that the BBC were to relinquish their use of Woofferton. This entailed another large reduction in staff and once again the station reverted to transmitting only VOA programmes from 1400-2200 GMT.

On 26th March 1961 reduced programme working commenced with no night shift, just a labourer who cleaned and patrolled the site. A shift of SME and two TAs worked from 0800 to 1600, doing maintenance and getting the senders ready for the full shift of seven coming in at 1330. There was a strange feeling at 2200 when the senders were switched off and isolated, leaving the once humming station silent and forlorn. Shortly afterwards the weekly hours were reduced to 42 and on 24th June Woofferton was again open to the public. Due to the reduced staff most people worked long hours that day but engines were run up, a small mast was erected by the riggers and demonstrations of sender tuning took place. L. F. Ivin's counters checked 880 visitors which was very good considering the isolation of the station from large areas of population.

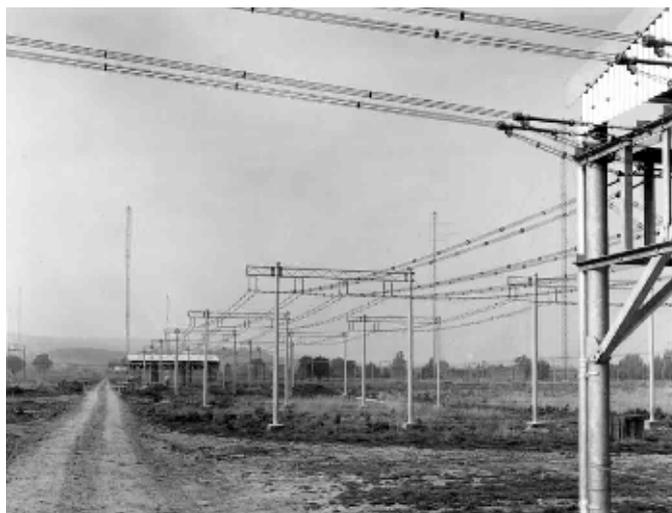
## CHAPTER 3 - A NEW BEGINNING – 1961 to 1971

During 12th and 13th August 1961, the border between East and West Berlin was closed and the construction of the Berlin Wall was started. Once again the Germans and Russians had saved Woofferton and at great haste staff, who had six months ago been dispersed like chaff to the wind, were recalled to man the station.

On 13th September night shifts were started again at Woofferton and the station was back to a full 24 hour schedule. Not all of the OSE10 staff who had escaped from L. F. Ivin returned and many innocent young men were hastily transferred to what popular Corporation rumour had alleged was a cross between a prison camp and a mental asylum. As it happened Woofferton was to be the best posting for a short-wave engineer as the new age of HF broadcasting arrived.

Even before the building of the Berlin Wall and while staff were being drafted away from Woofferton, the American authorities had decided that the state of the Cold War necessitated increased propaganda to the Soviet Bloc. During the summer, while the depleted and depressed staff at Woofferton had been running the reduced schedule, plans were being made to re-equip the station and the Voice of America had agreed to fund the scheme to the sum of £1,400,000. The plans were for the installation of six new Marconi BD272 transmitters of 250 kilowatt output feeding new arrays with a remote aerial selection system. It was considered essential that the station output was maintained despite the building and installation work.

One of the first jobs was to erect two temporary switching frames on either side of the old switching tower and demolish the old structure. This was to make way for a wide trunk feeder run with 4 switch stations where the aerial selection would be performed by pneumatic switches. At last Woofferton would move from being the poor relation to the newest HF station with the most modern and most powerful transmitters. *(Right is the view down the yet to be completed 'M1' with the main feeder runs and switching stations in 1963)*



However, the EiC's relations with the local ABS Branch had reached rock bottom over a question of rotas and in March 1962 local liaison machinery was suspended. Fortunately the ABS Branch Secretary at this time was Bill Lane, a wartime radio operator who had earned the DFC over Germany in RAF Bomber Command. His refusal to be intimidated by L. F. Ivin and his calmness in the face of provocation gave the branch members strength to take this decision. There was also a feeling that it was time for a change at Woofferton, not only in equipment but in management. This problem was one of many, facing the staff at OSE10, who were now attempting to keep the station running with scrapmen filling the sender hall with acrid fumes as they destroyed the old RCA senders, Marconi installation engineers in the middle and working senders on either side.

All through the summer of 1962 the outside work of constructing extra masts and new sausage feeder runs and the switch stations proceeded in the enlarged aerial field. Behind Array 828 was a large copse which had loomed dark and sinister at night and was believed to be the home of a

“man with spongy fingers” who awaited unwary Aerial Switching men. This was removed and a new view of Barns Farm could now be seen from the station.

Inside the main building it was necessary to remove a wartime blast wall which separated the sender halls containing S81/S82 and S83/S84. By moving the cooling plant outside the building it was possible to enclose this space with a hardboard partition and begin the erection of the first Marconi BD272 transmitter, soon to be designated S93. In January and February 1963, the station



suffered very heavy snowstorms and temperatures well below zero for almost six weeks. This had the effect of making work inside the building very cold as large apertures had been knocked in the outside walls. What seemed like the entire stock of old rusty BBC electric fires appeared, which produced no heating effect but a rather frightening smell of hot rubber as extension cables littered the sender hall floors. *(The photograph left, shows the hardboard partitions, Dave Driver at the rear, several Marconi engineers, and John Harris the station liaison engineer, putting settings on the first transmitter, Sender 93)*

The sub-zero temperatures combined with the exposed position of the cooling equipment in a hardboard shed outside in the snowdrifts was bound to have some effect and S82's cooling system froze up one night. As expected L. F. Ivin was furious and the SMEs on shift received a good portion of his wrath.

Spring brought some relief for the Marconi engineers as temperatures rose and in May 1963 L. F. Ivin left Woofferton for good. After a delay of two months he was replaced by George Turner, *(right)* who had previously been at Droitwich. George's relaxed attitude disguised a keen brain but his gentlemanly demeanour was much appreciated by the local staff. Within the week the local ABS Branch resumed liaison meetings with the new EiC and morale among staff climbed. Curiously enough, some older staff felt that the esprit de corps, which had been so high during Ivin's 'reign of terror', declined somewhat, but this may have been due to an influx of newer and younger staff.



A new Control Room had been constructed in what had been the old office with a large picture window looking out on the sender hall. This was equipped with a control desk for sender operation and programme selection. At the rear of the room stood the array selection bays where the switch station matrix switches were remotely operated. To the rear of this were drive facilities for synchronised working, soon to be equipped with Racal Decade Frequency Generators. By 4th August the new Control Room was manned, and on 30th September 1963 Sender 93, the prototype BD272, started to carry its service commitments. By moving transmissions about as new senders came into service, old ones were removed and by 28th October 1964 all the 250 kW senders were in use. S85 and S86 were left in situ as spares but were not used very often.

One or two major teething troubles had to be overcome before the BD272 senders settled down. The first problem involved the sender cooling system which started to suffer blockages. The large valves sat in boilers where the heat was dissipated by allowing the water to boil. Steam and excess

water drained into a separator where the steam was taken to a condenser by a large diameter fibre glass pipe. Eventually it was found that the fibre glass pipe, which was proof against lots of corrosive materials, was being eroded by the wet steam. Once the cause was found a start was made on 11th November 1964 to replace the epoxy pipes by lagged copper tubes. It took some time for the system to recover from the effects of this as tanks and pipes were emptied and cleaned several times before the blockages ceased.



Percy Winsor (*left*), one of the SMEs, once remarked that most transmitter faults were “water, wind and fire”. The water problem had been cured but the fires started to appear. In order to reduce the radiation of unwanted frequencies the rear of the BD272s contained a Television Interference Filter. Rumour has it that the man designing this unit was told all the details except the power it would have to handle. He had seen nothing bigger than a 100 kW sender and assumed a maximum power handling capacity of 200 kW. Hence the BD272’s output of 250 kW was just too much and not infrequently this filter unit

had a nasty habit of catching fire, producing very loud noises and wonderful green lighting effects. Not so wonderful was the job of cleaning the molten aluminium plates and rebuilding the filter. However modifications were produced, spacing was adjusted, corona shields fitted and the problems became less in this area.

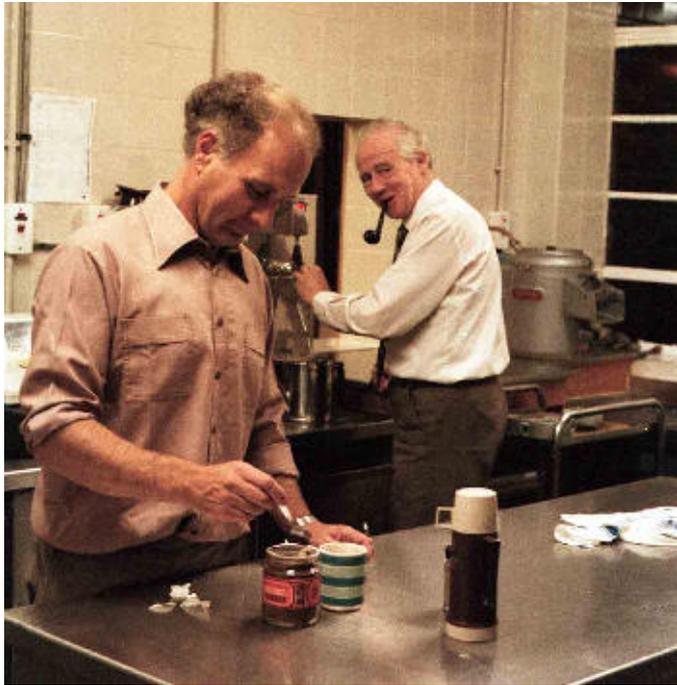
Disposition of the six shift staff in March 1966 was as follows. One SME and two GS engineers, who by this time were working four nights, four evenings and four days with one man filling the gaps in both rotas. The General Supervisory Engineers took turns to sit either in the Sender Hall where they assisted in wavechanges and started initial fault finding or in the quieter surroundings of the Control Room, where they checked programme switches, aerial selections and periodically inspected equipment round the building. (*Right, new Control Desk in 1963*)



The Technical Assistants were reduced to three in number, the Control Room man who sat at the new control desk and did all the transmitter powering, switched the programme sources and did the array selections. The Aerial TA was still employed to switch arrays in the field, the number having been increased to 35. Seven new masts had been erected and three old ones repositioned. The field had almost doubled in size to 320 acres and had a straight asphalted road running parallel to the trunk feeder lines. This was referred to as the M1 and was a help to the Aerial TA in speeding up his work. To complete the trio was the Sender Hall TA who was responsible for wavechanging the senders, selecting the frequency on the Crystal Drive unit and powering the senders for transmission. He then switched the sender to remote for subsequent operation by the Control Room TA.

VOA programmes for Woofferton were picked up by the BBC Receiving Station at Tatsfield on HF receivers and fed to Bush House where a new control position had been installed. This had nine Leever-Rich tape machines and was clock switched to a pattern determined by coded plugs inserted for each  $\frac{1}{4}$  hour period over the 24 hour day. Some programmes were on pre-shipped tapes flown from the USA, some direct broadcast programmes were taped for repeat later on and

recorded announcements together with standby fill-in music were available. By 1964 VOA were utilising the facilities at Woofferton overnight between 0200 and 0730 GMT in addition to the day and evening transmissions. BBC programmes were broadcast in the gaps between VOA commitments and in 1965 the General Overseas Service carrying English language programmes world wide was renamed the World Service.



A welcome feature of Woofferton was the canteen on evening shift when a cooked meal could be obtained until 7.30 p.m. One of the old timers, Mrs Harris, a kindly white haired old lady would shuffle up the sender hall with a mammoth fry-up on a tray saying “Sorry its a bit late but the electric isn’t very good tonight”. This facility was dropped in the autumn of 1966 but the weekend facilities were still retained. (*John Chantler is making the tea for the night shift in the canteen. while Dave Truscott prefers his own coffee.*)

Night shifts were the times for tall tales and sometimes endless debate. The fact of being awake, when everyone else is asleep, relaxes the inhibitions and releases subconscious thoughts. There was an amazing

collection of raconteurs and debaters, Bill Abell and Dick Pritchard could weave gripping and hilarious stories that appeared in the cold light of day to have no substance at all. Gerry Griffiths and Tom Smart would provide an interesting display of verbal fireworks when they argued. (Known as the Tom and Gerry Show). The experiences of service in the Armed Forces provided a fascinated audience of youngsters with unbelievably exaggerated stories. Did Bill Abell ever fight the Fakir of Ipi in Iraq? Was Gerry Griffiths really Lord Mountbatten’s right hand man? Was Joe Gill a disc jockey on Forces Broadcasting in Palestine? Bill Lane would never tell of his exploits over Germany with Bomber Command but Trevor Madoc-Jones told of silver dollars in Bute, Montana when he was in America learning to fly for the RAF.

The oil circuit breaker (OCB) which controlled the 11 kV supply to each sender was an English Electric OLX unit. This had been designed for high current, low usage situations such as required by local supply authorities where a maximum of a dozen operations a year was anticipated. However the OCBs at Woofferton were closing and opening every time an array was switched and this was causing excessive numbers of operations. Hence there was great relief for the workshop staff, who had to maintain them, when a suppression circuit was fitted to the senders in January 1967. By this means the sender HT was suppressed by the control circuit when array changes were done and the OCB remained closed. This reduced the number of OCB operations and the mechanical wear on the linkages.

In July 1966 the BBC adopted the hertzian system of denoting frequencies and the term megacycle was replaced by Megahertz. The senders were normally fed with RF drive from a crystal unit in the H1100 driver. Miniature crystals were now considered suitable but needed a separate power supply to keep the oven temperature steady. Synchronised working with two Woofferton senders on the same frequency became rather difficult and eventually Racal Decade Frequency Generators were supplied and fitted in the Control Room. Even with a direct display these were a trap for the unwary as they were designed to operate with receiver equipment having

an Intermediate Frequency of 1.6 MHz. This meant that the nice clear display showed a frequency which was 1.6 MHz different from the actual RF output. “DFG speaks with forked tongue” as someone said at the time. Following complaints and not a few wrong frequencies, the DFG displays were modified to read direct and they became operationally more acceptable. In October 1967 a Racal Frequency counter was procured making checking of frequency much easier for the Control Room TA.

The construction of shift rotas was a very deep and intricate process and in the course of reducing the weekly hours to 42 it had been necessary to leave gaps in both the SME and GS Engineer rota patterns which were filled by one man. Joe Gill, one of the long serving GS Engineers, was the fill-in man who worked this strange procession of odd shifts. He would do two nights, two evenings, and two days, sometimes being second in command and sometimes the SME. He made up his hours by also working days on maintenance. Joe had worked as evening shift SME on 25th November 1967 but collapsed on the bus going back to Ludlow. Medical help was obtained but Joe died the following day. *(This 1961 photograph of Joe was taken in the old Control Room with the HGM4s in the background)*



In August 1968 there was a brief flowering of “Communism with a human face” in Czechoslovakia before the Russian tanks rumbled in to crush it. The VOA responded and in November an additional White Stars network was added to the schedule and a fourth programme line provided.

The year of 1969 produced a domestic conflict for the BBC when industrial action was taken for the first time by members of the Association of Broadcasting Staff union. Two years previously the ABS had withdrawn from a 20 year old agreement which had bound it to seek arbitration and not to strike during a serious dispute. Woofferton was involved when staff withdrew their labour on 11th and 21st October. The 3½% pay offer by the BBC was increased to 4% to be backdated to 1st July 1969. However, the BBC on one hand was restrained by the licence fee whereas staff were being offered salaries which were below those paid outside the Corporation. A Court of Enquiry was set up. Manual staff were given larger pay increases and night shift pay with other allowances were greatly improved.

On 2nd April 1970 there was a meeting at Woofferton to discuss the temporary installation of a new Marconi B6123 100 kW transmitter intended for the BBC Far Eastern Station at Tebrau in Malaysia. On 27th August the 11 kV panel was fitted and by January 1971 Marconi engineers were installing what was named Sender 107. The four rented Post Office lines were renumbered from 16,17,18 and 19 to become Chains 31, 32, 33 and 34 on 7th March 1971.

To make control room operations easier VOA had funded enough money to install Marconi frequency synthesisers on the station. The Racal DFGs were not totally reliable and were beginning to show signs of wear. By May 1971 the installation was complete and the old crystal drive units became redundant. The synthesisers were fitted into a bay at the side of the H1100 which also contained the programme input equipment. This permitted the control room to switch

between BBC limiters and the VOA-preferred signal processing Peak Clipping Amplifiers. In 1976, these Langevin Amplifiers were replaced by Audio Peak Limiting Amplifiers made by United Recording Electronics Industries.



A problem of short wave transmission which had concerned engineers and designers was that in order to make the HF signal intelligible to the listener it was necessary to introduce some form of emphasis at the transmitter end. Unfortunately most of the intelligibility of the audio signal is carried in the sibilants, but most of the power is wasted on the less necessary parts of the audible spectrum. The American technique was to pre-distort the signal for speech and ignore the deleterious effect on music. The BBC, mindful that music was a necessary part of the entertainment, did not take such a

thrusting attitude to this problem. However, both sides agreed that the average level of modulation needed to be kept high and George Turner regularly walked the sender hall after lunch to make sure the needles of the modulation monitors were banging away at the top end of the scale. (*The publicity photograph above shows from the left John Sidebotham, Marconi Sales Manager, William Brady, VOA Project Engineer, George Turner Engineer in Charge, and Arthur Lord, BBC Project Engineer.*)

A story going the rounds at the time, was that VOA sent a monitor around the Soviet Union to record transmissions which were to be followed by a special schedule of bursts of tone. It was found difficult to strictly adhere to this sequences of tones at Woofferton and it turned out to be a shambles. Staff were expecting to be severely shouted at but they were saved because all the recording tapes were supposedly wiped when being taken out of Russia.

Work on S107 was progressing and by 29th March tests were being carried out on the transmitter using a test dipole with unpublicised World Service Programmes. Station staff operated the transmitter and for a couple of months the testing was continued until S107 was disconnected from the 11 kV supply. The sender was then removed from its temporary home in S85's spare channel and despatched to Tebrau.

By this time the diesel alternators were only just sufficient to run the station load if all the BD272 senders were put on 50 kW output which was a lengthy procedure. There had been an explosion in an OCB at Droitwich in the summer of 1971 and because the HV switchgear for the diesels at Woofferton was similar, precautions were quickly taken to prevent a repetition. On 23rd June 1971, entry to the Power House Switch Room was forbidden unless the 11 kV busbars were dead. Later in the year the diesels were banned from being run unless a total power failure of over 1 hour was forecast or in case of a national emergency. No more engine runs were to be made for test purposes and paralleling with the incoming mains supply was forbidden.

## CHAPTER 4 - ONLY THE NAMES ARE CHANGED – 1972 to 1979

Great changes were made in the organisation of Transmitter Department during 1972. A new system of grades was introduced and by September the shift complement was reduced to five, one Senior Transmitter Engineer, one Transmitter Engineer and three Engineers who were Grade C or HF Conditional. This was an attempt to increase the technical complement of the shift. Technical Assistants, who actually did all the operational work usually without assistance, were now to become extinct. Previously, personal initiative (or a lavish lifestyle) had driven ambitious TAs to attend the BBC Training School at Wood Norton to pass the Grade C Course. Future promotion in Transmitter Department was always dependant on passing this course. Further promotion then depended on attending Selection Boards to find out “who was the best man on the day”. Now the remaining Technical Assistants no longer had the choice. Those who failed the C Course were sent on a special HF course where Bill Denny, later to become the BBC’s Chief Engineer, gave them a thorough grounding in HF techniques and circuitry. These HF Conditional Engineers would only be able to work at HF stations. As most of them were older men who had been based at stations like Woofferton for many years, this was no hardship.

The few remaining Technical Assistants who were left from this plethora of intensive courses and exams were taken off shift. Bill Lane went across to the Aerial Section, while Ray Jennings, and Albert Gleed joined Jack ‘Paddy’ McKernan to form a maintenance team on the station. These men had a wealth of experience to offer the BBC and still did much to keep the station running. By reducing the shift staff there was often little spare effort to complete the very essential maintenance which the senders needed. It also became easier for projects to be organised with some continuity which was lacking for the constantly rotating shift staff.



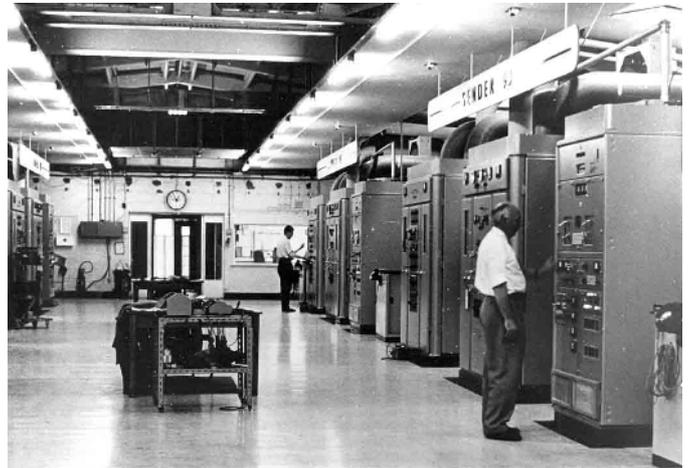
By 1st January 1972 the re-organisation was complete but while this upheaval was taking place Woofferton was about to lose George Turner. On 25th February George left to return to Daventry as Engineer in Charge and he handed over to the AEiC Bill Gilmour for three months. Eventually in May, Jack Atkins (*seen left at a BBC Club Dinner Dance in 1975*) arrived to take up the post as Woofferton’s third EiC. Jack had served as an SME at Woofferton during the 1940s after previous pre-war service with Imperial Airways. He had been a radio operator during the period when it was tradition to fly a small union flag above the cockpit of the Handley Page Hannibal as soon as the aircraft landed. The story was that the radio operator was responsible for lowering the flag before take-off, on one occasion this was forgotten and the Captain had to land again before the flag was torn to shreds. During his previous service under L. F. Ivin, a volunteer SME was asked to go to Skelton, whereupon Jack replied “I’ll go today!”.

The diesel saga continued and eventually in September 1973 permission was granted for their operation once more. However, the ban on parallel operation with the mains remained and entry into the HV Switch Room was still prohibited if the OCBs were energised.

Frequency checking of BBC stations and reception of HF feeds for relays had been carried out at Tatsfield since September 1929. The monitoring of foreign broadcasts for information and intelligence had been transferred from Wood Norton towards the end of the Second World War to a new site at Caversham near Reading. Close to Caversham, was a site used for reception of difficult signals called Crowsley Park. In 1974, plans were made to transfer the frequency monitoring and HF reception facilities from Tatsfield to Crowsley. After some false starts the changeover took place on 11th June, the VOA Continuity Suite at Bush House closed down and the four VOA programme streams were provided from Crowsley. A new control line was provided which suffered from the fundamental problem that it was impossible to guarantee to

whom one was speaking. Ringing Bush would sometimes raise Crowsley and sometimes both. The Monitoring Unit at Caversham produced a vast output of information taken from the news bulletins of most other foreign broadcasting organisations. At that time, they told of a transmission that emanated daily from Communist China directed to Russia in what sounded like an unknown language. After much head-scratching it turned out to be the news in Russia but the tape was being played backwards. No one ever worked out why the Chinese should have insulted the Russians by daily playing the news at them in this fashion.

In the autumn of 1974 another attempt was made to clear up the difficulties of nomenclature. Since the Second World War all BBC programme streams had traditionally been given an identifying colour, General Overseas Service was always Green Network, Arabic Service was Brown etc. The identifying colours for VOA had been Indigo, Violet, Grey and White Stars. With Bush House seemingly out of the VOA loop a change was made and the networks from the United States were identified by letters. Network A was the VOA English programme, Network C was VOA Russian and other Networks carried vernacular services. *(Photo above shows Bill Abell tuning the H1100 on S93 during the 1970s)*



The programme lines had to be re-organised to cope with the Crowsley move and to provide BBC programmes as well as the VOA feeds two lines were dedicated from Bush to Crowsley and then four from Crowsley to Woofferton. This was satisfactory providing no more than two BBC programmes were required at Woofferton. Normally this was avoided when planning the operational schedule but sometimes Woofferton was requested to provide cover for a sender which had broken down at another station. To cover this eventuality a Direct Exchange Line was provided in December 1974 which made it possible to dial to Bush House direct and use an ordinary Post Office line for programme. The quality was variable but it did help in cases of emergency cover.

Some temporary buildings erected during the wartime 30 years before were still in use at Woofferton. One such was the bungalow occupied by L. F. Ivin which had been subsequently used as storerooms and a temporary canteen when refurbishment of that took place. The Woofferton Club was in a very dilapidated state in the Advertiser Buildings in Ludlow and a deputation was sent to see the Managing Director External Broadcasting, Gerard Mansell, to ask for funds to refurbish the EiC's bungalow. The money was found by World Service and during 1975 and 1976, club members led by Albert Gleed and Bernie Vaughan worked away to convert the building into decent club premises. This came to fruition on 9th June 1976 and the first pint was drawn by Gerard Mansell when he officially opened the club.



In May 1975 the EiC changed once more when Jack Atkins retired and his replacement Alastair Malcolm *(left)* took over. Jack was a bit of a mystery man during his final service at Woofferton and left the station in a typically laid back manner. He tidied up his desk one day before lunch, gave his keys in and said that he was going. The staff were not aware of his departure and neither were Head Office, who rang later that day

asking for him, to be told he had retired and gone away. He has never been seen since.

More flexibility in the array selection was finally achieved in October 1975 when the trifurcation of the system was completed. Originally each array was only available to two transmitters and this produced problems at the quarterly schedule changeover. Now three outlets were available and this permitted easier rollovers from one schedule to another and increased the number of arrays which could be used for station cover.

Communication in the 320 acre aerial field at Woofferton was always difficult. Field telephones at strategic places and at the switch stations provided some assistance as did a siren at Switch Station 3 operated from the STE's office. Unfortunately pick-up on the overhead telephone wires proved to be very good at filling the handset with VOA programmes to the detriment of the telephone conversation. One of the saturnine D. I. Price's contributions to Woofferton was the arrival in August 1977 of a Pye UHF radio system. This consisted of several portable pocket phones and a base station. Quick slews and reversals were much less of a problem now as clears could be given to the Aerial Switching Engineer by R/T and the cycling back and forth to the nearest phone was eliminated. *(The photograph below shows riggers Bill Mackie and Dorian Legg with the Aerial STE Gerry Griffiths in the early 1980s)*

Another occasional duty which fell on the Aerial Switching Engineer was the hoisting of flags on ceremonial occasions. The BBC had its own house flag, proudly inscribed with the motto "Nation shall speak peace unto nation" and this was flown when specially important visitors were expected from Head Office. The Union Flag was flown on special days of national importance, usually at the request of the EiC. However this ceremony had lapsed for some years but with the Queen's Jubilee in 1977 it was thought appropriate to hoist the Union Flag once again. Hence on 2nd June, Gerry Griffiths climbed onto the roof of the main building and prepared to pull up the flag. Unfortunately, the years of weathering had taken its toll and Gerry narrowly escaped a sharp blow when the bracket snapped and the top pulley arrangement fell off and whizzed past his head.



Service Messages concerning schedule alterations were now arriving by ADX teleprinter, a noisy French Sagem mechanical beast in the Control Centre. However it did save the necessity for long hand-written messages taken by phone, addressed in the old days to TOM, TATS and All Short Wave Senders.

The Midlands Electricity Board supply to the station was fed underground from a Sub Station in the corner of the aerial field where it was transformed from 33 kV down to 11 kV. A start was made during the autumn of 1977 to duplicate the 33 kV supply which ran on overhead poles from Squirrel Lane in Ludlow.

During the previous two years a Government wage freeze had put a stop to pay rises and BBC salaries had fallen well below the going rate for the industry. In some desperation, the Association of Broadcasting Staff called a strike and Woofferton was among the stations affected during 5th

and 6th November 1977. The Corporation was unwilling to break the Government guidelines but a threat of a TV blackout over the coming Christmas period forced them into action. The two parties approached the Advisory Conciliation and Arbitration Service where it was agreed that BBC salaries were well below those of staff in comparable organisations. As a Christmas present the staff received the largest wage rise ever of some 17%.



One of the features of the BD272 senders was the RF pick-up which was sometimes encountered in the Final RF unit. It arose when one sender fired through an array connected to another sender. The effect varied from a slight tingle to a spectacular arc which could be drawn off the output coil with the earthing wand. In the latter case hand-held fluorescent tubes could be made to glow and nasty RF burns could be experienced by the unwary. *(Left is Rod Viveash demonstrating the effect in a photograph by Dick Buckby 1964)* It was sometimes necessary to deselect the array or even postpone the wavechange until the offending sender finished its transmission. This had occurred on the RCA senders but their output was considerably less than that of the BD272s and the pick-up correspondingly smaller. During 1978 a new feeder earthing and isolating switch was fitted in the Final RF unit which removed this hazard. It disconnected the TVI filter from the feeder and earthed it when the sender interlock system earthed the power supplies. However, to do this involved removing the reflectometer unit from the TVI filter and refitting it in the feeder trunking above the sender.

The old unused 300 kVA auxiliary transformer had been sent to the scrap yard and the transmitter stores moved again into the vacated area. This was part of the expansion of the Daily Maintenance section who were provided with a new workshop in the old transmitter stores. The DM section were involved in another scheme during the year to change all the Pyrex steam pipes in the BD272 transmitters. Metrication was the cause and a change in size of the replacement pipes meant that all existing 60 Pyrex pipes had to be replaced which entailed refurbishing all the joints, gaskets and electrolytic targets in this area.

## CHAPTER 5 - MARCONI RETURNS – 1979 to 1982

The first few weeks of the new year of 1979 were characterised by inclement weather. January began with low temperatures and snow. Later on it became milder and foggy with snow again falling at the end of January. *(The picturesque scene of the trunk feeders belies the difficulties of working outside in such conditions)*

The paths around the site had been covered with a blanket of snow and the Aerial Engineers had been forced to abandon their bicycle. The switching had now to be done on foot but unfortunately one of the aerials routinely switched on nights was A926, at the far end of the aerial field. Trudging along to the switching frames, with previous guiding footprints being covered by drifting snow and the possibility of falling down large gullies or into the stream, made this part of the job very hard work.



On the morning of 25th January the Corvedale shift bus had great difficulty getting out of Ludlow as lorries had skidded on the falls of snow and blocked all the main roads. By going up Sheet Road and past Ashford Carbonel the bus reached Woofferton only 15 minutes late. Tony Nicholas spent that day on a tractor, clearing snow from around the building. The last blizzard was on 9th March when snow falls were followed by freezing conditions. *(Below, Pryce Edwards and Tony Nicholas were more involved with the site as later the riggers travelled to outstations)*



As the snow melted, the aerial field became very boggy and it was found extremely difficult to move the winches into position to lower broken aerials for repair. Any broken dipole tended to cause sparking which resulted in bright lights in the sky and a flurry of complaints from local TV viewers whose picture had become degraded by intermittent flashing. To replace the dipole a motorised winch had to be positioned at each end of the bay of aerials and the copper airwork lowered to the ground. Once a repair was made the

whole assembly, which by now had wrapped itself around the switching frames on the ground, had to be slowly hoisted back into position.

Gerry Griffiths, who had been acting Aerial STE, was made substantive in February and the responsibility of the masts and antennas was carried on his broad shoulders until his retirement in 1985. Shortly afterwards he was interested to be contacted by the Ordnance Survey people who told him that the Woofferton aerial site had apparently been built on the grounds of a medieval deer park. The signs of the earth bank which was originally surmounted by a wooden pale could be seen by A907 and A908 running parallel to the stream on the northern side. The OS people had picked up this feature from recent vertical aerial photographs. There was heightened security that month following the news that a group of Welsh Nationalists had broken into a TV station at Midhurst and smashed equipment. Being on the border, Woofferton would have been a likely target but fortunately the site was unmolested.

Early in 1979 VOA signed a contract with the BBC for an extension of their facilities at Woofferton to improve coverage of Central Europe, Asia and Africa. This news came as a surprise to the staff at Woofferton who had assumed that satellites would replace HF broadcasting for the future in international communications.

Al Malcolm, the EiC, issued an informative instruction to staff on 28th February, giving the welcome news for Woofferton. The proposal was to equip the station with four new Marconi B6124 transmitters, build four new arrays and install a new microprocessor controlled switching system to replace the control desk. The project plan was to cost £4<sup>1</sup>/<sub>2</sub> million and take some 2<sup>1</sup>/<sub>2</sub> years to complete. So Woofferton was set to become the scene of some exciting and nerve-racking improvements.

The job involved quite a large amount of work by the scrap man and once again the nostrils were assailed by acrid smells as the last two RCA senders were disembowelled and removed. Similarly the three large diesel alternator sets were laboriously and noisily dismembered and soon no trace, save oil stains, remained.

Before this gutting of almost half the building Alan Dick, the aerial contractors had started work in September out on the aerial field. (It was not true that there was a sign outside saying "Mast Erection by A Dick"). R Mast was dismantled and work commenced on the construction of mast bases for four new masts and one self-supporting tower. Four new computer designed 4 band arrays, products of an American firm TCI, were to be erected. They were to be non-reversible but had an aperiodic screen to act as a reflector. The screened spur feeders for these arrays were to be connected to a new switch station called 1A to be erected just outside the building. In addition all sender trunk feeders would be screened and thus entry to this switch station during transmission was possible.

The transport for the shift staff had been provided by Corvedale Motors in Ludlow since 1945, but in the autumn new Government regulations for bus drivers had caused an upheaval which affected this service. It was no longer possible for Corvedale to provide the three times daily shift transport for the same price. In fact the price would have to be raised from £18 to £30 a day, (in 1945 the daily cost was £2/10/-). A new arrangement was necessary and it began on Sunday 8th November when the late night and weekend service was operated by Ludlow Taxis. By this time, many staff lived outside Ludlow and drove to work, so the highest number of passengers was seldom more than four and often less. However, day shift and evening shift runs during the week were still done by the coaches of Corvedale Motors.



So the year ended and 1980 began, a year of trial and tribulation both for the installation team and the operational staff. Building work started in earnest during March and the space created by the removal of S85 and S86 became the new sender hall to contain the four Marconi 300 kW senders. After the disastrous problems in 1963, a dust proof partition was fitted between the hall containing the old operational senders and the new sender hall (*see photograph at left taken in January 1981*). Brick dust from the

construction phase in 1963 had played havoc with the relay sets in the control circuits of the BD272 senders. This partition had the effect of permitting the engineers from Marconi led by

Gary Platts to work without too many interruptions. It did, however, mean that an insular attitude was taken by his staff who seemed to resent any BBC intrusion. Since the operational staff worked nights they tended to tip-toe into the erection shop and scout about in the small hours, thus getting some idea of the transmitter layout.

This was not necessary in the aerial field where Alan Dick's work was becoming more and more visible. The new masts were finished by 20th June and looked fine except they were made of tubular steel construction rather than the angle sections used on older masts. As one old rigger remarked wisely, "You canna see rust inside a tube". The odd man out was the large 78 metre tower erected close to the front gate. Not aesthetically pleasing at all but stays could not be used so close to the road. Screened feeders were installed from the BD272 senders to the outlet of Switch Station 1A during June and July.

Inside the sharp end of the building the existing Control Centre equipment was reorganised in order to create a screened Apparatus Room for the expected solid state switching system. After much hard work by Andy Martin and Arthur Lawton, the Programme Input Equipment was installed and tested by 29th September. To maintain the isolation of the Apparatus Room, the supplies were all filtered and a new termination system was built in the HV Switch room annexe. This eventually was to contain the incoming Post Office lines, the aerial selection and remote slewing circuits together with all the sender control, indication and revertive wiring.

The power arrangements had to be much modified to cope with the increased station load. The two incoming MEB supplies were divided and each used separately, one to feed the 6 x 250 kW senders and the other 4 x 300 kW senders. A new HV switch room was created at the east end of the building and fitted with Whipp & Bourne vacuum circuit breakers for the B6124 senders. One of the two HV incoming cables was re-routed to feed the new switchboard and an interconnector fitted to join the two switchboards. Failure of one HV supply meant that the interconnector could be used to supply the rest of the station but a power restriction of 4.85 MW was necessary to avoid overheating the MEB's 33/11 kV transformers.

General opinion of the new B6124 senders was optimistic because, unlike S93 which was a prototype, these had been installed by Marconi in Switzerland, Dubai and Nigeria. Two of the senders were delivered on 4th and 11th August and the others on 3rd and 25th September. HV supply was connected on 10th December and full power of 300 kW was obtained on S81 shortly afterwards.



The new year of 1981 opened, a year full of promise with the old Aerial Switching bay in the Control Room still working but swung round to permit the installation of the screened Apparatus Room. *(The photograph shows John Chantler at the soon-to-be defunct Control Desk at the end of April 1981)* Marconi men working in the hardboard covered sender hall, S81 working with the occasional assistance of Marconi engineers and everything in the usual building chaos. The Control Centre had become one large room into which people, desks and equipment appeared to

have been thrown. The first glimmer of automation appeared when a VDU, keyboard and monitor was delivered in February. These were the first items of the WATCH system, an acronym for

Woofferton Automatic Transmitter Control HF equipment, a term reduced to ACS or Automatic Control System when later versions were fitted at other stations. A selection of computer games had been put on the first disc by the engineers at BBC Designs Department, providers of this system. Much work was done on the Scott Adams adventure games during evening and night shifts. This was an immediate attraction and the keyboard became less of a threat and more a way of talking to what was described in the handbook as the Intelligent VDU. It became possible to estimate the age of staff very accurately by their proximity to the keyboard. The younger members were drawn to this but the older people approached it with some trepidation.

In March a changeover was made to the new array switching panel and the old bays were eventually removed on 12th April. During this month a start was made in moving remote control of the transmitters to the Sender Interface Panels in the Apparatus Room. Little by little the eighteen year old Control Desk became redundant as red tape covered the bits not functioning any longer. On 31st April it was gone but one problem, not foreseen by the designers, was that suddenly there seemed nowhere to put a cup of tea.

During May and June, the automatic switching and monitoring units were installed and the WATCH came to life. Like most new-born babies it was not without problems and needed nursing and attention. Some faults were due to the newness of the equipment, others were due to staff with little experience of sophisticated systems. However, for a first try by Designs Department, it was very good and the engineers appreciated the technical back-up from the designers. A departure for Woofferton was that John Scotland was sent up from the BBC Engineering Training School at Wood Norton to run a course on the system and hand out a very good manual which he had produced.

Gone now were the small operational errors caused by tired or distracted engineers. Now the faults were amazingly bizarre and sometimes overwhelming. As someone remarked at the time, "To err is human but for a really big cock-up you need a computer". In extremis the only way was to take hand control and reset the system. For example, one small error in programming by Designs Department on a newly received EPROM caused a strange fault where the whole system decided at 0000 hours on 1st October that it really was 0000 hours on 1st January the following year. In ignorance, it was assumed to be an aberration or glitch in the system but when the WATCH did the same thing at 0000 hours on 1st November it was time to call in Designs Department for a new EPROM. Once during a fault finding session a caption appeared on the Alarms Page for Sender 18. The system seemed to be taking control over Daventry so it was reset before megalomania developed.

To operate the WATCH, the operational schedule was typed out, sender by sender with each action timed and detailed. (*Right, Katryn Bateman scheduling the WATCH system*) Thus filaments on, HT on, cut line-up tone, programme on, pick up new array, finally HT off, filaments off. This was done for 24 hours for each sender and then validated to prevent illegal time sequences and simultaneous array usage by two senders. This was loaded into the system and the Sender Controllers operated their particular sender and the two Supervisors checked the operation and each other. The



system could run without the Supervisors but no slewing of the TCI arrays was possible and revertive checking was lost.

The indication of the state of the senders and programmes was shown on the VDUs which were distributed around the control room and sender hall. Two switchable pages were available, a Status Page and an Alarms Page. The Status Page showed what was actually happening to the system, whether the senders were off, on Auxiliaries, (that is all supplies on and ready for HT), or actually radiating. It also showed the programme and array selected to each sender. Any conflict with the schedule would produce an inverse video display at the appropriate location on the screen. The Alarms Page showed in brief details what the alarm was, "Aux. Not Coming On", "Wrong Array Selected", "Sender Not Ready". These visual alarms were accompanied by an insistent buzzer which demanded attention.

The problem arose when staff were attempting to run the system manually and this made the alarms operate and generated captions on the Alarms Page. When this was done in order to cover a broken sender, which was also generating its alarms, there was a great scope for confusion. In the excitement of fault finding and wavechanging, the first response to the loud buzzer was to cancel the alarm just to provide a few minutes silence for thought. It took a great deal of training and self control to learn that each line on the Alarms Page had to be checked to ensure that it was understood and recognised as either a valid or a spurious alarm. The keyboard could be used to give the WATCH system manual commands which would pacify the system and remove some alarms but this was usually only done when a long period of cover was running.

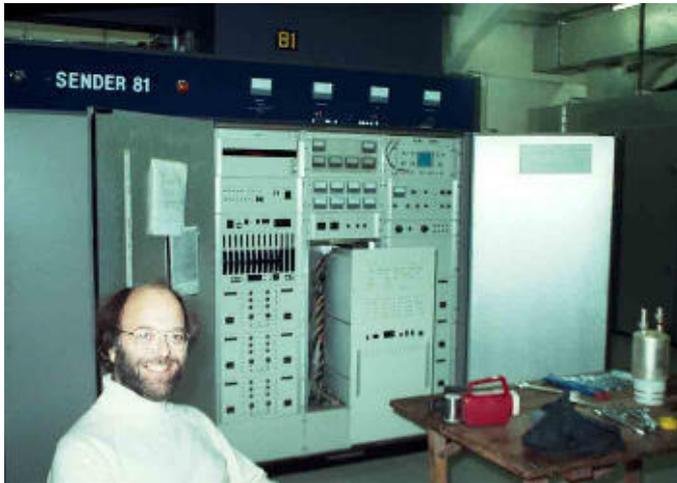
It was generally acknowledged that initially there were too many alarm captions generated which made the identification of the correct urgent alarm difficult. Designs Department did their best to modify the software to get the minimum alarms compatible with the proficient operation of the system. With a fixed schedule and no shut-downs the WATCH was excellent. Like the Adventure games really. Follow the schedule, keep the Alarms Page clear and you have won. Any deviation from the normal demanded an awareness of what was happening and what alarms were likely to be displayed. Failure to identify serious alarms could lead to disaster and there was no escape because all alarm captions were printed out for future embarrassment.

By May the HV system had been sorted out when the OCBs supplying S91 and S92 were moved to the other side of the HV Switch Board to complete the isolation of the two halves of the station. The standby diesel was operational on 20th June. This supplied emergency lighting, battery charging for the 50 volt WATCH supplies and essential monitoring supplies for the Control Room.

Throughout the spring and summer of 1981, TCI, Alan Dick and TCPD worked on the new arrays to get them operational. Many insulator failures were noted and a more ominous note was created when arcing was seen in a TCPD hut which caused a small fire. In view of this occurrence it was felt that Array 952 should not be powered until there was some assurance of safety because it would fire through a private property only 112 metres away. A design error of 2 metres in the distance between the curtains of the low band arrays 951 and 954 also caused some embarrassment. This was just one of the problems facing the aerial engineers as they tried to meet the acceptance specifications for the TCI arrays.

Marconi engineers worked away inside the building and interim acceptance of the senders took place as follows, S81 on 29th May, S83 on 16th July, S84 on 7th August and finally S82 on 7th September. As usual in these complex installations there were outstanding items to be cleared up. In a note to staff in November, Al Malcolm, the STM noted 38 points which were still under

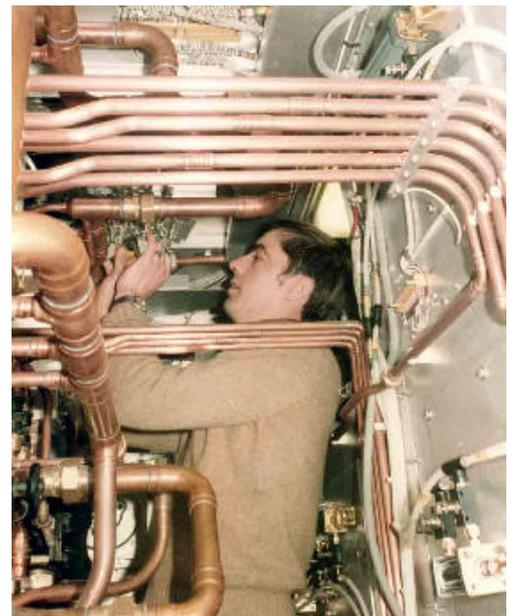
investigation. Marconi were actively involved in sorting these out and eventually most of them were cured. One small note, which appeared to be perfectly innocuous at the time, was that self-draining of the heat exchangers had not been proved. This was later to cause much work for the station staff.



The B6124 was a great step forward in transmitter design and produced 300 kW of RF output power using just one very large and expensive French valve. *(Left, John Harris is seen relaxing after a Pen RF valve change in October 1981)* The BD272 sender of the previous generation had needed two valves to give 250 kW output. The production of large amounts of RF power in thermionic devices is accompanied by the need to cool the anodes of the valves. The RCA used a simple water cooling circuit with each valve having a flow of 10 US gallons per minute. The

BY1144 valves in the BD 272 were vapour cooled which meant that the heat was dissipated by boiling. Theoretically each valve needed only 1.5 gallons per minute to replace the evaporated steam, in practice the flow was slightly higher. The French Final RF valve was cooled by a Hypervapatron system in which water was forced across radial slots cut round the valve anode at the rate of 19 gallons per minute. There were two slightly smaller valves in the modulator which were similarly cooled. The second difference was in the method of wavechanging. To allow for wavechanges the BD272 had interchangeable coils and time to go from one end of the short wave band to the other was about 7 minutes with two experienced operators. This new sender would do the job automatically in 20 seconds by using a system of changing the length of the trombone-like Final RF coil with pneumatically operated shorting bars. To cool these cross-heads and the contacts on the big coil required them all to be fed with copious supplies of water. *(Below, Phil Sandell is inside the 'submarine section' changing a filtercon in the roof in January 1982)*

So the water system of the B6124 started to look complicated. In fact almost every thing was water cooled from grid damping resistors to the filament rectifier diodes. The fine tuning was done by variable vacuum capacitors which were again water cooled. Despite the provisions of leak detectors the two 4 feet high pumps could provide a flow of Niagara proportions in the twinkling of an eye. Following maintenance it was the STE's policy to operate the start switch at the front of the sender, well away from any possible leaks, and an engineer to be placed near the pipework, sometimes to receive a good shower with de-ionised water. One of the most useful pieces of technical equipment purchased during this phase was a vacuum cleaner which could suck up water. A large stock of plastic containers and string were also obtained. In the RF unit the water supply hoses were secured to the pipes using a boy scout whipping technique, winding nylon fishing line round the hose.



As a complete contrast to this rather archaic plumbing work the control circuits were to most older staff totally black magic. The use of CMOS logic had arrived in one fell swoop and the Avo multimeter was discarded for a logic probe. Staff were told that the senders were automatic but the only automatic tuning was the load matching which constantly tweaked the sender to accommodate changes in aerial impedance. The B6124 had a 32 channel memory in which all the settings for a particular frequency were stored after it had been manually tuned. Instead of a card with writing on, this sender kept its settings to itself. Once the information had been stored it could be recalled at the appropriate time by the WATCH system in the Apparatus Room. The sender could work out which of the pneumatic switches had to be moved and where the variable capacitors should be positioned. It would then power itself up at reduced power, then full power and display all indications on the front panel. Naturally the staff were impressed by this sudden influx of technology and the younger members of staff found their knowledge eagerly sought by the older STEs as faults occurred. People rallied round and there was a great deal of information gathering and dissemination as staff shared their experiences and expertise.

Prior to 1960, most of the staff at Woofferton had been in the Armed Forces and were experienced in service electronics before joining the BBC. With the cessation of National Service this source of manpower would be removed. There had always been a small group of Graduate Apprentices who arrived with degrees but they tended to be posted to Designs and Research Departments where their talents could be fully utilised. So the BBC advertised for Sixth Formers with 'A' levels and eventually the majority of transmitter staff had that sort of background. There were no women at all despite the use of TA(F) during the war. When hostilities ceased most of them left or moved to studios. It was therefore quite a surprise on 29th June 1981 that Woofferton found its first trainee woman engineer on site. Her name was Cathleen Bunney and she was introduced to the delights of wavechanging and aerial switching. She was the first of several lady engineers who proved to be the equal of the male recruits.

Another face to appear, familiar to some, was visitor Tommy Tomlinson, the Marconi engineer who had been responsible for the installation of the BD272 senders in 1962 and 1963. He was gratified to see that the senders, now about nineteen years old, were still working well and that they had obviously received lots of loving care.

The summer and autumn of 1981 flew by, S81 was put on the schedule in July for 5 hours during evening shift. The following month three of the B6124 senders were scheduled and staff gained valuable experience in fault finding. The replacement of the water cooled capacitors was an interesting job as it entailed one man holding a very heavy and expensive capacitor at arms length whilst bent double against a bulkhead while a man on the other side, who could not be seen, and sometimes could not be heard, tried to insert bolts around the flange. *(Right is a broken Comet vacuum capacitor which fell apart on 1st June 1981)*Tempers sometimes became frayed but ways and means were found to get these jobs done. There was also a great deal of swapping of parts from one sender to another to keep the transmissions going.



Then a small disaster occurred when both S81 and S82 both blew holes in the HT cable to the Penultimate stage due to excessive RF on 21 MHz. Marconi came back with a modification and all senders were done. It also became apparent that the previous purchasers of these senders had

not operated them on a constantly changing schedule. Trouble began to be experienced with the cross head contacts which had got burnt and needed replacement. Sometimes the contacts were found to have welded themselves to the coil and they were very difficult to replace. The servo driven vacuum capacitor system was also a cause of problems. At a wavechange the servo motor had 20 seconds to reach the correct position before the control circuit repowered the sender. If the servo loop gain was incorrect the control system would time out and the sender would not power up again. Setting up the servos and modifying the system took John Harris and R. Glyn Jones many man-hours but it was essential work if the senders were to be regarded as automatic.

Then it was winter with a vengeance. After a fall of snow a few days earlier the temperature dropped rapidly and on 11th December RAF Shawbury recorded  $-22^{\circ}\text{C}$  and it felt equally as cold at Woofferton. The senders with their secondary cooling just could not cope with this sort of temperature. It was 1961 again, luckily without the spectre of L. F. Ivin. It now became apparent that the secondary cooling radiators for the B6124 were definitely not self draining and the ice formed in the radiators caused massive splits in the pipework. There was a physical problem too, these units were 15 feet above the floor of the cooler rooms and only removable by using rigger's manpower and block and tackle. It was bitterly cold work but people kept at the job to try to restore some semblance of normality to the transmissions. The riggers led by foreman Derek Ward and Gerry Griffiths, the Aerial STE, came in on Sunday 13th December to repair the feeders which had broken due to the snow and make the frozen pneumatic array selection switches operate.

In the early days of transmitters the HT of 11,000 volts DC was produced by a large continuously evacuated steel tank rectifier containing a pool of mercury. The BD272 transmitters had a refined development of this where the rectifier output power of some 600 kW was produced by 12 individual AR64 excitrons. These were complicated glass bottles containing a dipper in the mercury pool to produce an arc which was taken up by the anode voltage as the input AC commutated round the 6 phases. For twenty years this system had been fairly reliable provided the complicated relay sets were looked after and the bottles were changed regularly. Any fault could usually be cured by either replacing the relay sets which suffered initially from brick dust or by manual agitation of the bottle to free the dipper. It was not unusual to have to rush up the sender hall to thump the rectifier cabinet with one's fist, known as a "unidirectional digital input". Eventually these AR64s became obsolete and a design was drawn up to modify the rectifier unit to take large rectifier diodes and replace the old control relays with improved enclosed types. The first conversion began on S96 in December 1981. *(Ray Jennings can be seen with the last AR64 in May 1982)*



The winter weather returned in early 1982. Heavy drifting snow started falling on 7th January and the station, though not cut off, was lacking staff as people were unable to even get out of their houses. S81's radiator froze up again. There was another problem when its HV Rectifier unit became ice-encrusted in the transformer enclosure. The warmth of the building had melted the snow on the roof which had then leaked, thus allowing water to pour on top of the unit and subsequently freeze. By 14th January RAF Shawbury recorded  $-15^{\circ}\text{C}$  and this had adverse effects on both the aerials and senders. In all the snow fell for about 36 hours and caused chaos both inside and out of the building.



After that bad patch there were just the usual problems of climbing the learning curve of the B6124s and taking each BD272 out of service for the rectifier conversion. Advantage was taken of this period and the Daily Maintenance team under Geoff Francis set to work to service the entire BD272 sender water system. The outage gave them the chance to drain the water out, repair, refurbish and replace components where necessary. *(Tom Smart hoisting a TH537 Final RF valve into Sender 83 in February 1982)*

During the installation of the new PIE system the BBC Limiters and VOA Clippers had been removed from the senders and returned to the Apparatus Room. Among many other jobs, the DM section had constructed new RF wide band amplifiers for the H1100. This enabled the old bulky Marconi amplifiers to be removed and the synthesisers to be fitted in their place on the H1100. The bays which had contained the PIE and synthesisers had now become redundant and were thus removed.

The end of this eventful year was marked by the celebration of 50 years of External Broadcasting and Woofferton was host to some 100 visitors on Friday 19th November. As well as BBC External Services and Engineering staff many local dignitaries attended with Woofferton personnel acting as guides. This celebration entailed a lot of extra effort but was considered to be a great success. This official party was followed the next night by an invitation to all ex-Woofferton staff to see the displays in the Sender Hall followed by a party across at the club. Many old but familiar faces were seen in the hallowed EiC's old bungalow.

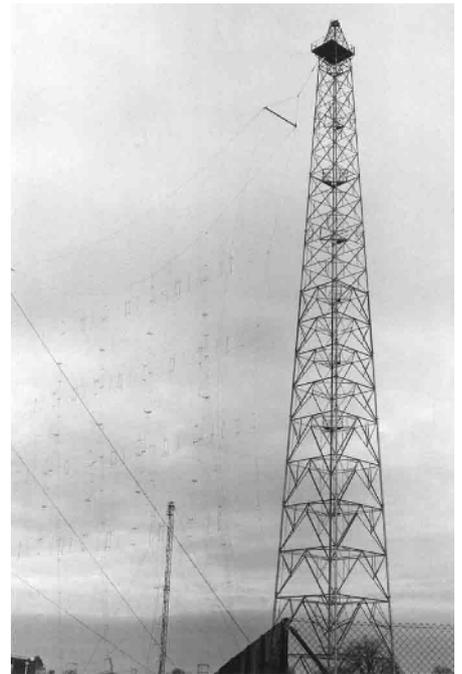


## CHAPTER 6 - RING OUT THE OLD, RING IN THE NEW – 1983 to 1986

There was a general feeling that 1983 would see the problems on the new senders cured and that comparative peace would at last return to Woofferton after four years of chaos. It was not to be. Even greater upheavals were in store for the staff during the next few years.

It became apparent that all was not well with the Marconi BD272 transmitters as they were using many more final RF valves than normal. The expense was worrying because the BY1144 valve cost some £6500 and supplies tended to run short with the increased demand. After a thorough investigation it was found that the new solid state rectifier system was the cause of the problem. An internal valve fault, such as a momentary flashover, caused an increase in the overload circuit which tripped the HT. With the AR64 system the overload caused a negative bias to be applied simultaneously to each of the 12 rectifiers. This caused the HT to be removed fast enough to save the valve from permanent damage. Under the solid state system the power to be dissipated was greater and most of it continued through the valve thus causing greater damage. The solution was to fit a crowbar circuit to short the HT to earth and divert it from the valve.

On the aerial field the TCI arrays were causing some problems being unreliable in winds over 40 mph. On nine occasions during the year an array had to be lowered for repairs. The branch feeder wire was soft aluminium and tended to snap off where it was connected to the vertical feeder. This wire was replaced by alumoweld wire which seemed to be much more robust. By now there were only 3 TCI arrays in use. Excessive field strength from A952 in the nearby private house had made this array unusable. In September 1983, the tower mast standing by the station entrance, (*seen on the right*) like a great white elephant, was dismantled.



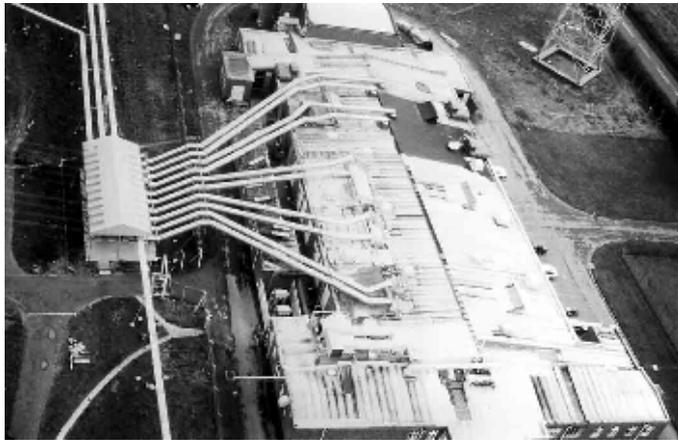
One of the better features of the B6124 was the protection circuits devoted to the actual output of the sender. A problem with the RCA transmitters was that an aerial or feeder fault would often have little effect on the transmitter inside the building. The Aerial Switching TA would be on his rounds in the field during the small hours of the night when he would discover a smoking fire,



shouting at him in some guttural East European language. Closer inspection would reveal a broken feeder being slowly eaten away as 50 kW of RF travelled into the soil. The BD272 senders were equipped with reflectometers which did work and once they were calibrated accurately these faults were reduced. There was also a Feeder Protection circuit which frequently operated when components in the monitoring circuit failed inside the FRF unit. It was then necessary to disconnect the trip circuit before it could be sure that a fault was actually on the feeder or aerial. (*Above, Derek Ward and Dorian Legg are faced with a burnt-out feeder window*) However, the B6124 had an accurate reflectometer with VSWR,

Backward and Forward Power metering. In fact, the protection circuits sometimes operated so quickly that it was impossible to tell from the sender meters what was actually happening.

As well as breakages on feeders and aerials due to wind and wear, wild birds provided some of the problems. The birds, usually crows, owls or kestrels would use the trunk or spur feeders as a perch.



On the mains power lines they would be unharmed by the 50 Hz current but radio frequency was a different matter. When power was applied to the sender the birds would have their feet cauterised by the RF and drop away leaving the legs on the wire to arc and cause coronas. Without some feeder protection the sausage feeders would quickly part and repairs would be necessary. There were many ideas put forward to stop this happening but none could be applied to the miles of open feeder runs all over the Woofferton site. The most

modern antenna, subsequently installed at Skelton, have coaxial feeders which seems to be the safest and most bird-proof way to send RF into the aerials. *(Left, the protected trunk feeder runs can be seen going into Switch Station 1A)*

Facts and figures tend to impress the general public and it was a revelation to visitors at the 50th Anniversary of the External Services to see that the annual electricity bill for Woofferton in 1981 was £626,343. Following the installation of the four B6124 senders, the RF output of the station and hence the consumption of electricity had doubled. However, as a major user of electricity in the area, a special contract had been offered to Woofferton by the Midlands Electricity Board. This Load Management system offered reduced annual electricity charges if a reduction in power could be made on request for up to 50 hours each winter. In 1983 only two hours in December were requested and a saving of some £69,000 had been made. A receive only Telex was fitted in the Control Room to receive requests from the MEB control at Tipton. To enable a check to be kept on consumption, a Ferranti Energy management system called CEDREC was also fitted during the year.

There were two rather spectacular water faults on the B6124 senders during 1983. During the first in April, there was an audience of some visitors from TCPD who watched as men swarmed all over S82. A flash-over in the balun unit had punctured a water pipe but there were no leak detectors in this area above the transmitter, some 15 feet in the air. Naturally water flowed down into the main unit and eventually bells began to ring. It proved quite difficult to mop up the mess in the air but the water sucking vacuum cleaner came in useful.

The other water problem was much more serious when a valve cooling hose blew off in S83's modulator unit in September. The valve bases filled up with water and so did the Sub-Modulator unit which objected to this treatment by burning up many components. There was so much damage that replacement and rebuilding work was necessary and it was a full 26 hours before the sender was back on schedule.

It was about this time that the ABS Committee received notice of the proposed Reorganisation of Transmitter Group. The plans for a management restructure would not affect Woofferton unduly but the suggestion for the integration of HF and TV engineers was such a fundamental change that time was needed to assimilate the idea.



Fortieth Anniversary October 1983  
 Standing: Unknown, Ray Jennings, Gerry Griffiths, Jack Caseley, Jack Price,  
 Robert Allen Herbert, Dougie Gifford, Trevor Madoc-Jones, Les Fury  
 Seated: Cynthia Scott (nee Jones), Jock Walker, Mr Frazier

While these proposals were still current the BBC Club prepared for the celebration of Woofferton's 40th Anniversary. A party was held at the Club on 15th October and many old members of staff, both retired and from other stations made an effort to attend. It was gratifying to see many old faces, to talk over old times and reminisce. Obviously the next ten years were going to produce possibly more changes than Woofferton had seen in all of the previous forty.

During 1984 many newly recruited young reserve engineers passed through the station during their training while Woofferton staff were battling to come to grips with the expected TV work. While the station was kept running, staff were sent on training courses to Sutton Coldfield and visits were made to such romantic places as Ridge Hill and Oakley Mynd, Whittingslow and Clun. Back at base, development work went on with the senders and the fitting of new air release valves on the secondary cooling circuits of both types of Marconi senders was hoped to cure the freezing radiator problems.

The weather improved and in April a Royal Air Force Wessex helicopter arrived to carry out measurements of the near radiation pattern from the TCI arrays (*right*). The results of these tests were never seen on the station but the flying programme proved interesting for staff, some of whom were given trips in the helicopter.



The last vestiges of the standby generating plant disappeared when the buried fuel tanks were emptied, uncovered and dismantled. The engine room had by this time been turned into a ground floor workshop and stores with a new first floor area. At last Woofferton, like other stations, had stairs which led to a fabulous rest room with a big picture window, a library and more spare rooms. In May, the library upstairs was turned into a class room when equipment arrived to enable staff to learn the fundamentals of the TV system.



Towards the end of 1984 the first members of staff who had been given early redundancy terms due to re-organisation began to take their leave. Old familiar faces such as Ray Jennings and Charlie Andrews, Tom Smart and Geoff Francis would no longer be seen at Woofferton. It was time for the collective experience of the station to gradually disappear. Ray Jennings whose good humour and ready wit enlivened many a shift had served the BBC for some 41 years. Charlie Andrews, who for some perfectly incomprehensible reason would not use spectacles and preferred a magnifying glass, had joined the BBC at Stoke-on-Trent H Group station in 1941. Tom Smart had also done 41 years service and had been at Woofferton at the tail end of L. F. Ivin's reign where he received all the blame for the famous S82 freeze-up. Geoff Francis, (*left*) who had run the Maintenance section

joined the Corporation at Guildford in 1942 before serving in the Navy. He was one of L. F. Ivin's blue eyed boys due to his skill with the small-bore rifle.

And so 1985 arrived with Integration looming closer and more old timers retiring. There was a klystron course at Wood Norton in the spring before the arrival of Reg Gay (*left*) to take up one of the newly created management posts. In view of the number of outstations, as the TV sites were called, the Assistant Engineer in Charge became two men. Transmitter Manager (Operations) concerned himself with the HF site and management of the riggers, and the Transmitter Manager (Maintenance) looked after the soon-to-be-created TV team and the workshop staff. The Engineer in Charge now became the Senior Transmitter Manager and he reported to a Transmitter Area Manager at Sutton Coldfield. The last AEiC, Neville Pickering who had been Aerial SME in the 60s, retired in March. Dave Green, a long time TV man from Redruth, was posted to Woofferton as TM(M) with the unenviable job of teaching HF staff the different approach to the maintenance of TV equipment.



The old timers kept leaving. In April the Club gave a party to Gerry Griffiths and Percy Winsor as they 'absquatulated', to use Gerry's term. Gerry had been a long standing thorn in L. F. Ivin's side and together with Bill Lane provided the guts behind the ABS in those days. Percy had come from Rampisham as an SME and had run a tight shift for well over twenty years. One effect of the retirements was that the complement of the shifts at Woofferton were totally random. An STE would find himself on night shift with 3 other engineers having a total of nearly a hundred years experience between them. The following night the STE might have as many years service as the engineers had in months. Sometimes the more recent arrivals were unsure where any of the spares were kept or even where the stores were. It was also difficult for older STEs on a TV team when their engineer had more TV experience. Soft words, tact and a respect for each other's knowledge was needed at this time.

Towards the end of April two engineers set off in a hire-car and Sutton Coldfield's second best Takeda spectrum analyser to do a routine (!) visit to Lydbrook TV site. There was a certain amount of learning to be done, how do you ask interested bystanders on a council estate how to get to that mast over there, without appearing stupid. Later that week several other stations were inspected, half the battle was actually finding the sites and getting test equipment into the cabin without personal injury. This was the start for Woofferton. An old TV man from Sutton Coldfield likened TV visits to games. "Play for a draw, so that the output and site is no worse than when you arrived. You will very rarely win because the spare part you need will be back at base and someone else will return and win tomorrow. Sometimes you will lose and what was a reasonable signal will be pretty awful when you leave." Prophetic words for the fledgling team at Woofferton.

On the station a new MF transmitter for Shropshire Local Radio was installed next to the MV Switch Room with miles of coaxial feeder running out to an aerial hung from W mast. Ian Calvert spent many hours in the new sender hall measuring the output of the B6124 transmitters with a Brown Boveri test load. The results suggested that the 300 kW output promised by the Marconi Company was only available at certain frequencies.

Many of the large oil-filled capacitors in the smoothing circuits of most older transmitters throughout the BBC had been filled with Polychlorinated biphenyl (PCB). This substance was selected because it had a reduced fire risk but the fumes which arose in the event of a fire were subsequently found to be very toxic. The dangerous properties of PCB had been brought to the



attention of Transmitter Group and the sheer size of the problem together with the cost had worried both the union and management. For safety sake, the union preferred Transmitter Group staff to remove the capacitors and so a group of volunteers took part in a course at Woofferton on 30th July. The next day, the practical part of the exercise, was the removal of capacitors from two of the BD272 senders. (*Hauling away the PCB-filled capacitors for storage*) It proved that replacement of these items could be done safely by BBC engineers and subsequently teams moved around the country fitting replacements, as and when supplies of non-PCB components became available.

17th August saw a party at the Club for Bernard Keenan and Alastair Malcolm as they retired from the BBC. Al had finished his career in the BBC at Kranji and Neil Wilkieson (*below*), who had been acting while Al was abroad, finally became substantive STM. Bernie had joined the Corporation at Woofferton in 1944 and spent part of his

National Service with Forces Broadcasting in Palestine. He was fined £9 for neglect of duty when his rifle, together with others of his unit, was stolen by Arabs. The visit of a Chinese delegation on 10th September was an unusual honour for Woofferton as overseas visitors to the station were normally American experts from VOA.

Apart from visitors, many students from overseas were taken under the wing of Woofferton and given valuable experience of the BBC way of doing things. Some were attending courses at the Engineering School at Wood Norton but one set of students caused a certain amount of annoyance. The students themselves were not to blame but their origin. When the Caribbean Relay Station was set up on Antigua, several of the Woofferton staff were keen to experience the West Indian connection and applied for the posts when they were advertised. In the event, no staff from Woofferton were selected for the posts and most successful candidates came from another station, situated on a hill. Disappointment all round, but the final straw was that the locally recruited Antiguan staff were sent to Woofferton for training, not to the station on the hill where their future co-workers could be found.



During the summer of 1985 staff were sent to Sutton Coldfield for a week's TV team experience. There was still a feeling on the HF side that the general increase in pay for both types of engineers was not justified for the TV teams because they would continue to do the same sort of job after integration. However TV and HF did unite at other Short Wave stations and the Sutton Coldfield team were eventually given responsibility for Droitwich when that station was destaffed.

The year of 1986 proved to be one of consolidation, the rotas had been amended to include TV days after HF days and before a return to night shift. Many visits were paid during the year to Ridge Hill, the biggest site on Woofferton's patch. The fledgling teams also carried out routine visits to the smaller relay stations scattered around the area. They were all situated in odd places: by the side of a road, in the corner of a ploughed field and at Peterchurch, what looked like a scrapyards.

The final RF valve on the B6124 senders, a Thompson CSF TH537, was only lasting for an average of 5000 hours at Woofferton with other stations getting a much longer life. It was decided to leave the filament supplies on permanently unless maintenance precluded it and reduce the level to 17 volts. The valves cost over £16,000 and the extra outlay on the electricity used should be more than saved by the reduction in valve costs. The fader controls for the sender tuning were already showing signs of wear and modifications were done by Nigel Garnett to the servo system and reduced power facilities during April.

During May a test was made for X-ray radiation on the senders with the B6124 causing higher than normal readings. These senders were run on reduced power until further tests were done. There were still continuing problems with the water cooled resistors because the end contact silver plating was quickly eroded away.

The synthesisers on the BD272s were becoming unreliable as the wafer switches had become worn. New equipment was promised but the synthesisers would have to last until money was available for these replacements. In August 1986 modifications were done on the rectifier units of the BD272 to provide crowbar trip protection and to wire up a previously installed DC motorised isolator box. This was one of the first cases where the finalised diagram was available months before the equipment was installed. Usually hand written notes were the only documentation following a modification.

*(Below is a sylvan scene as Iain Baillie opens up the cabinet at the relay station above Slad, birthplace of Laurie Lee and “Cider with Rosie”)*



*(The rather derelict looking site at Peterchurch with lots of scrap and a rather old but still restorable lorry)*



## CHAPTER 7 - WATER BUT NO FIRE – 1987 to 1988

Soon after the New Year of 1987 opened, there was trouble due to bad weather. On 12th January the temperature dropped to  $-10^{\circ}$  F and S81 froze up once more. When the sender shut down after its evening shift transmission the radiators had failed to drain back and water was left in the unit. The intense cold had caused water in the small copper elbows in the radiators to freeze, expand and split the pipe. Two radiators were replaced during the day which should have cured the fault. However, unknown to the incoming shift, the inlet cocks had been left shut so that it proved impossible to keep the water temperature down during the night with only four of the eight radiators working. The shift suspected blockages elsewhere and covered the transmission, leaving the sender for inspection by the workshop staff. To complete a night of woe it started to snow about 7.30 am. By nightfall, deep snow covered the site. During the next few nights, when transmissions were not scheduled, the BD272 senders were powered on test frequencies with World Service programme. This kept the antennas clear of ice, stopped the radiators from freezing and the sender pipework from leaking.

There were some 9 days of below freezing temperatures and a week of deep snow at Woofferton. Together with the sender cooling system, there were problems with non-functioning frozen aerial and matrix switches. The work in keeping the senders and aerials operational during this period was not pleasant, to say the least, and all credit was due to the workshop and aerial staff who battled along with shift staff, in very uncomfortable conditions, to keep the service going.

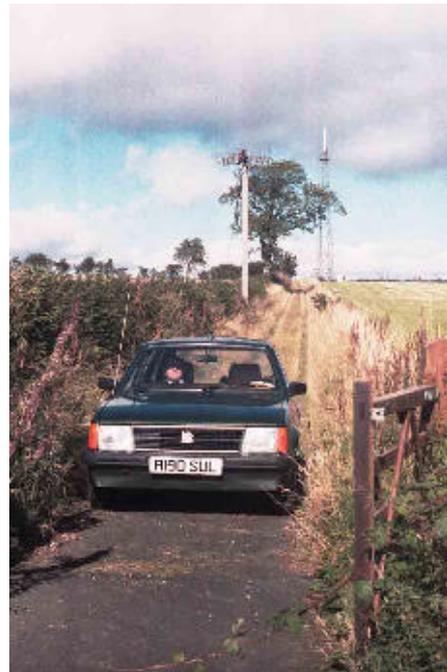


By Saturday 17th January the cold conditions had moderated but the programme lines started to give trouble. The STE, Dave Porter (*seen left with a B6124 sender*) lost two chains and was unable to get any help because British Telecom workers were in dispute with their management. Fortunately, Dave was able to change some of the lines over and use the direct exchange line (DEL). This used a normal telephone circuit as a temporary programme line. It was an expensive substitute and the audio quality was very variable. However it was better than no

programme at all. This loss of two lines and non co-operation by BT happened again on the following Wednesday. Things got worse on Thursday afternoon when all incoming VOA programme feeds disappeared completely. In desperation the DEL phone was used to contact the VOA control desk in Washington for some direct programme feeds. Attempts were also made to use the STE's phone for another line but that had been barred from making overseas calls. The General Office phone was tried but there was now congestion on the transatlantic circuits. To complete the chaos, while all the programme alarms were buzzing, the Technical Operations Manager (TOM) at Bush House rang up and started talking about White Bars programme which did not make sense at Woofferton as the programme streams were all designated as Network A, Network C etc. Eventually the STE fought his way, through a tangle of temporary line cords and a knot of people, into the Apparatus Room to find that all the Peak Programme meters were flicking on the lines bay. In desperation, he normalised all the audio links which had been taken out, and the service was resumed.

The TV team had its own troubles and in March a pair of engineers, who were re-directed to the transposer at Oakley Mynd from a routine visit at Whittingslow, managed to get the team Ford

Sierra stuck in snow drifts. It was policy not to try to get to stations when snow was a problem. In this case the snow had melted at Whittingslow but the higher road to Oakley Mynd was blocked. Luckily, with the help of two workmen, the car was rescued but the STE had to walk up the snowy track to attend to the power supply which had failed. *(The photograph shows Oakley Mynd in warmer days)*



A better feeling was engendered by the replacement of the UHF “winepress” transposer at Garth Hill, near Knighton. This primitive unit, prone to erratic faults and consisting of several modules squeezed together in a primitive vice until it worked, was replaced by a state of the art “Silver Streak” unit and the obsolete equipment removed. The people in Knucklas, close by, were also happier when they were given a new source of programme from their own transposer fed from Garth Hill. This site at Skyborry Green came into operation in the spring of 1987 and was surrounded by a wooden stockade of a “Wild West” appearance.

Back on site at Woofferton, the builders had returned. In April the firm of Hickman arrived and started work on the front entrance hall. The intention was to provide bigger offices for the administration staff, a new STE’s Office and improved toilet and mess room facilities. It is impossible to make any building alterations without noise, dust and dirt so the General Office Staff were relegated to a Portacabin by the old engine room. It was quiet and secluded and they spent a pleasant summer while the builders produced a very dramatic change to the entrance hall. This was quite imposing but the alterations had left the General Office and STE’s Office as long thin rooms which were not easy to equip or work in. The STM had his own rather nice square room which was large enough to prompt one STE to dub it as “The Ballroom”. The kitchen staff even had their own dry goods store where the freezers could be kept. and the Mess Room was significantly enlarged. It was October before the General Office staff moved back into the building and another 6 months before the STEs occupied their new quarters.

There were some more farewells to retiring staff during 1987. John Chantler, after service with the RAF at Scampton joined the BBC in 1953. He had been a staunch union member, and was the Branch Secretary following Bill Lane where he maintained a stout defence of the rights of staff. Alan Goodsell was next to go, a very practical engineer, he had impressed all the staff with his common-sense approach to the job. The radio in the STE’s Office could always be found tuned to Radio 3 when Alan had been in charge. Les Fury finally left the workshop in November after nearly 40 years at Woofferton. Les *(seen left)* was a meticulous worker and if any refurbished item in the stores had the initials LEF on it, one could be sure that it would be as good, if not better, than new.



The house magazine for Transmitter Group appeared in January 1988 with a new name “Transmission Times” which reflected the changes which were occurring to the management structure of the organisation. In the magazine the amalgamation of departments to produce the new organisation, the cuts in budget of 2% and the proposed move to a new headquarters based at Warwick, spelled out some of the great changes which were to come to pass. The possibility of

“privatisation” of Transmission Group was also mentioned which gave the staff plenty to think about as the new year of 1988 began.

In order to maintain good relations with the local population it had become tradition for station staff to log complaints about Television Interference (TVI) and try to alleviate them. These had occurred from a very early stage in the life of the station. L. F. Ivin had pioneered the fitting of filters to the RCA senders in order to reduce spurious frequencies. The BD272 senders had a harmonic filter installed in the RF output which reduced the overall level and two extra filters were fitted in the output feeders to remove any emissions at the spot frequencies of Channel 4 and 8, the local VHF television channels. With the arrival of UHF television in the Woofferton area the complaints reduced somewhat until the wide-spread acquisition of transistorised hi-fi units and cheap telephones. It was also an unfortunate fact that the installation firms tended to blame any cases of poor reception on the short wave senders. It was found by Woofferton teams that many problems were caused by aerial plugs left unsoldered and sometimes inadequate signal strength. Answering machines and sophisticated alarm systems often responded adversely to the small amounts of spurious radiation which were emitted.

Naturally, increasing the power of the senders to 250 kW with a harmonic output of -60 dB below the carrier, still left sufficient radiation to cause problems if domestic equipment was not properly screened and earthed. One particularly bad area was in an estate at Orleton where the interference was picked up by overhead mains cables which then entered the domestic properties. The provision of mains input filters and ferrite rings by station staff was responsible for reducing the annoyance of the interference. The removal of the Daily Maintenance section and the creation of a

team area for the Aerial Department had left the problems of TVI to the Woofferton TV team. At the weekends, when maintenance on the equipment was completed, it was the unenviable job of the team to try to clear up any outstanding TVI complaints. Diplomacy and tact was necessary for these visits together with a plentiful supply of ferrite rings for mains leads. Most local people were grateful for these efforts but a few people became very abusive when they phoned the STE to complain of foreign languages and “Yankee



Doodle” spoiling their TV programmes. *(Sometimes arcing due to broken dipoles could cause TVI problems if not found. However this storm damage to A953 just before the March schedule change in 1987 was very obvious)*

Some of the faults were pretty amazing. People would spend £400 on a new colour TV and use an old aerial which had become badly corroded, twisted out of alignment and, in one case when the plug was taken off, the air-spaced coaxial downlead was found to be full of water. In January 1988 an old lady was found to have a mast-head amp which had a gain dropping by 35 dB across the four channels. It was suggested she offered the rental firm three quarters rental until they restored all four channels. People would buy cheap telephones from a discount shop and then find that, unlike the British Telecom sets, VOA interference would sometimes blot out all calls. In later years public liability for health and safety made these TVI visits a worrying problem. The team were loath to do more than remove and replace the mains plug after fitting ferrite rings in case of any future accident and possible blame being placed on station staff. This, together with lack of staff, meant that the service was finally discontinued.

The transformer enclosures of the senders and the old HV switch room were all protected by a Carbon Dioxide (CO<sub>2</sub>) system which automatically operated to extinguish any fire should the oil-filled components leak and ignite. When the CO<sub>2</sub> system operated, the enclosure immediately filled with a thick fog of gas accompanied by a very loud noise, warning bells operated and the sender was shut down automatically. There was a procedure to de-activate the system while staff were working in the protected area. De-activation in the older BD272 senders was to operate chains on the unit which prevented the CO<sub>2</sub> bottles being fired. In the B6124 the bottles were locked off automatically when the transformer enclosure was opened. There was however, a pull switch by the entrance door to fire the bottles manually. It was inevitable that sometime, someone would mix up his procedures. On 12th February 1988 the inevitable happened and the manual chain was operated on S83 and the transformer enclosure filled with fog. A spare set of CO<sub>2</sub> bottles had to be manoeuvred into position and fitted while the old ones were sent away for refilling.

Chains were again the problem later that year, programme chains this time. At 0730 on Monday 25th April, Brian Thomas (*right*) noticed that senders which had just powered on a Crash Start were radiating pulsed tone. After two minutes he managed to get Bush to switch to the correct programme. The TOM subsequently rang up to say that in fact Chain 32 had not been operating from midnight and so this made the total breakdown at Woofferton as 6 hours and 6 minutes. Bush had programme failure alarms fitted across their outgoing chains but to avoid alarms, pulsed tone was switched to the line when programme was not scheduled. Woofferton programme fail monitors were set for 40 seconds delay and they could not discriminate between programme or pulsed tone. A schedule amendment had been incorrectly programmed at Bush and all programmes on Chain 32 were replaced by pulsed tone. Woofferton's defence was that programme monitoring had ceased when the duty position and control desk were abandoned. They were told by local management to keep the monitoring speaker volume turned up so that in future someone would notice the long periods of pulsed tone.



During March and April 1988 water problems came to the forefront of Woofferton worries. Not the continual battle to overcome the frequent blockages in the tortuous water system of the B6124 senders but excessive water in the wrong place. In order to electrically isolate the BD272 valves, sitting at 11,000 volts, the inlet cooling water was fed via a small diameter PTFE pipe. The outlet of combined steam and water, ran away through large diameter Pyrex glass tubes. Sometimes these glass tubes cracked, which led to water pouring over the sender floor and steam filling the cabinets. On 10th March S91 was affected when one of the modulator tubes shattered. This is the easiest tube to replace, only shards of broken glass to remove, a new unit to refit to the hot metal flanges and mopping up to do. The worst pipe is the left hand final RF tube which entails removing the coil blower motor in addition to the problems of very restricted access. Curiously enough, the manufacturers referred to these tubes as Quikfit, surely a grave misnomer. However the staff turned to and soon replaced the tube, the packing washers and gaskets and the sender was back on power.

The BD272 senders have only a small water flow but not so the B6124. On Tuesday 12th April with the alarm bells ringing, the STE found the transformer enclosure of S84 full of steam, likewise the RF unit. All became clear when the door to the cooler room was opened and a fountain of water was seen to be spraying the ceiling and a pool two inches deep lying on the floor. This had happened when the pipe between the pump outlet and the pressure gauge had come adrift. However with the enormous pressure involved the effects were very dramatic. Eventually the sender was dried out and transmission resumed.

Privatisation had produced worries about the future for Transmission staff and so did a letter dated 18th April from Bert Gallon Chief Engineer, Transmission. The message was that VOA were planning to reduce their operating costs at Woofferton. Bert stated that the impact would probably be restricted to the early closure of the 100 kW transmitters at Daventry. Rumours and speculation abounded. Older staff remembered that Bert had been a Technical Assistant under L. F. Ivin and had married Joyce, a local girl. They hoped that loyalty to his old station would help to keep Woofferton running.

The TV team kept working away, making routine visits to transposer sites, attending faults and trying to keep up with all the broken modules which had been removed to base for repair. Ridge Hill took many hours of effort and on 25th March a night shift took place to do a formal acceptance of the new VHF filler transmitters. These were installed to replace the old valve equipment at Hereford which was due to close down and provide a service stretching from Ledbury to Leominster. The acceptance went okay and the next day the TV team did some field strength measurements to



verify the predicted service area. *(Above Alun Maddocks is checking the antenna on the borrowed Range Rover)* Unfortunately the new transmitters caused interference to listeners of the Pontypool VHF relay station and so the service was temporarily closed down after a week. The problem was eventually cured by changing the frequency of the smaller Pontypool relay.

Back at Woofferton the STEs finally moved into their new office on Sunday 10th April. The weekend was chosen because the PA system, R/T equipment, phones and clears boards, as well as the office furniture and lockers, all had to be moved at a time of minimum use. The staff worked hard to ensure that by Monday the STEs were able to operate at normal high pitch. Another movement was the installation of new standard frequency drive unit into the Apparatus Room. The HCD equipment was eventually connected up and switched on with Crowsley Park checking the frequency of Woofferton transmissions during the day to ensure that all units had settled down satisfactorily.

A tense time on the station is when a large number of senders are due to start, usually after the morning maintenance period. To suddenly find that three senders are not working is the moment that the STE's pulse rate rises and the adrenaline begins to flow. However to lose so many senders is unusual and if the fault appears to be common to all, the cure is sometimes relatively easy. When the pneumatically operated matrix switches in the Switch Stations are removed from service the air supply and electrical connections are removed and the switches are physically locked in a straight through condition using a wire strop and a padlock. The final operation is to remove the connecting lead between the rear of the sender panel and the array unit in the

Apparatus Room. Unfortunately this confuses the sender which finds that there is an array missing and the interlock is incomplete. Senders refuse to power and the WATCH alarm begins to howl. The correct final action for this job is to put dummy plugs with shorting links in the sender panel. With the short break in transmission for this work it is usually pretty close to transmission time when the clears are returned and this last action has a habit of being forgotten in the rush.



New technology came thick and fast to the Woofferton team patch. One of the most mind-boggling occurrences in 1988 was the acceptance of the RDS equipment on 7th October at the VHF site on Churchdown Hill at Gloucester. This Radio Data Service was offered as a boon to car drivers providing automatic receiver tuning and digital readouts for programme identification and eventually would be fitted to all VHF sites. The equipment looked bland in its usual silver racks but the heavy handbooks were pretty mind mangling. However the team was assured by John Rees (*seen left*) that everything was okay. As John had previously worked at Woofferton he was believed even though he had left the fold to work for Transmitter Engineering Department (TED). However the team were unable to test the installation because there were very few receivers in the country, only three in the Corporation for vehicles (the DG had one!) and just six special receivers in TED and additionally nothing could be checked with the spectrum

analyser. The team had to accept the “Emperor’s new clothes” and return to base via the Gloucester MF site where at least the equipment had valves. A sad foot-note to this meeting was that John Rees, a promising young engineer, lost his life in a road accident in August 1989.

Much publicity attended the Day of TV on 1st November. At the instigation of the British Film Institute the whole television output of Britain was recorded for posterity and 18,000 viewers were invited to tell their stories and record their thoughts about this all pervasive medium. The Woofferton team, at the sharp end in Transmission Group, knew that however good the programmes were, they only reached the viewers if the system was kept running. Thus it was that the team on that historic day was due to pay visits to the far-flung edge of their patch, in Wales.

The Ford Sierra was loaded up with the test equipment and the team set off for Forden, a MF station broadcasting Radio Wales on 882 kHz (*right, Andy Booth and Dick Lett at Forden*). The team checked the transmitter selection and changeover relays and glanced at the standby emergency diesel generator fuel level. That was okay at 500 gallons but preparing to leave proved more difficult. To inform the Monitoring and Information Centre (MIC) at Sutton Coldfield an automatic fault reporter is fitted to most small stations above the 10 watt size. This machine managed to dial a



lady in Montgomery who was surprised to be asked for a go home signal from Forden. Eventually the machine, called a Mini-FRED, talked to Sutton and the team were released to drive through the muddy lanes to Welshpool.



After a decent lunch at The Pheasant pub it was time for Dick Lett and Andy Booth to visit Long Mountain (*seen above examining a part of the transmitter*) where reports had been received that the BBC2 transmitter was starting in reduced power every morning. Two and a half hours were spent checking, even changing the output valve, but the fault resolutely remained hidden. So, after another battle with the fault reporter, the team finally set off for base as the sun began to set. Eventually a 400 page book "One day in the life of Television" appeared. It was no surprise

that the efforts of the Woofferton and other teams in the UK were not noticed or commented upon. (*Below, the end of play at Long Mountain*)



## CHAPTER 8 - A STRIKING YEAR - 1989

An interesting fault occurred on S81 in January 1989 when a tiny hole appeared in one of the smaller gauge pipes and a fine mist sprayed all over the interior pipework unit, known as the "submarine" section. When the water cooled capacitors had been fitted originally the water flow proved to be too high and washers were blown in causing blockages. Brian Slater from TED, as part of his job to clear up the outstanding faults, fitted coils of narrow bore copper tubing to reduce the flow. However these increased the pressure at that area and erosion produced tiny pin holes. This was the fifth similar puncture of these pipes. Sometimes the spray was so fine as to be almost invisible but enough to operate the leak detectors on the compartment floor. In this case the investigating TE found his face wet when he opened the unit door.

It was an interesting exercise to change these pipes and was usually left to the Workshop men in a period when the sender could be taken out of service. As a get-you-away dodge for pipes with holes, one of the more practical old-timers came up with a neat solution. Split a piece of rubber tubing then bind it tightly over the leak with the fishing line. This worked so well that sometimes the repair was forgotten and one was even found six months after its creation still water-tight.

At last the old Marconi synthesisers for the BD272 transmitters were replaced by new Hewlett Packard units similar to the ones which drove the B6124. The electrical connections were pretty simple but the metalwork, to enable them to be fitted into the sender H1100, took much workshop effort to complete. S96 became a test bed for a new tuneable TVI filter which was designed to provide more attenuation of the unwanted harmonics.

Despite all the advertising and publicity from the start of the VHF network the listening public in Britain had never taken to the service. The keenest audience was a small group of hi-fi buffs who enjoyed the much improved sound that the FM service provided. MF is the obvious medium for Local Radio, receivers will work almost anywhere, the signal is usually strong, night-time listening is small and people can move the radio about without having to turn the aerial around. However one thing which has always puzzled BBC staff, with their dedication to providing the best signal possible, is why the general public seem incapable of tuning a receiver to the MF carrier. In shops, garages etc. the radio is always tuned to one sideband. Very odd. This is a digression to explain that BBC Local Radio were desperate to get some MF outlets. It also explains why in January several engineers from Woofferton were seen climbing into a rather damp concrete bunker in the Hereford Water Works. Hereford and Worcester Local Radio were being given a medium wave service but the transmitter was placed in an underground room together with a large buffer water tank. One problem was that the power supply occasionally tripped if the Water Board Engineers put too many pumps on to draw water from the Severn into the system.

More problems for the Woofferton team. At the end of March Reg Gay left the station to take up the post of Resident Engineer at Masirah, in the Persian Gulf. Some time previously he and Dave Green had exchanged jobs and so Jeff Cant became TM(M). A planned UHF television transmitter replacement programme was starting in the UK. Many stations were built and commissioned some 20 years previously and they now needed re-engineering. In order to maintain a service, some emergency transmitters had been purchased which were shortly to go into service at Mendip. For some reason it was decided that Woofferton would maintain these transmitters and look after them as they were moved about the country. It subsequently emerged that these German transmitters had been at Brookmans Park with TCPD and even they had been unable to get them to work. It was an ominous thought for the fledgling TV team at Woofferton.

April arrived and a Transmission Group Management Conference at Wood Norton heard about the first large scale outside contract which the organisation had signed. This was for the maintenance of several base stations for a new mobile radio system called GEC National One. For the Woofferton Management the conference ended with a quick return to base on Monday 24th April for the start of a series of BETA strikes. The old ABS union had expanded and had been renamed the Broadcasting & Entertainment Trades Alliance. These lightning strikes eventually continued over the summer and were called at short notice thus causing maximum disruption to the system. At Woofferton this meant that the local management had to stay at work for the period of the strike in order to attempt to maintain scheduled operations. Local temperatures were sensibly kept low by both sides. However, in other parts of the Corporation, striking members were suspended by a management taking an unusually hard line and this led to increased tension. The one day strike in April caused extra work for the remaining management team as they wavechanged and tuned senders. The "Safety at Heights" course which commenced that day was not affected as the local BETA branch considered the needs of safety to come before the strike.

During the year several items of safety and security had been improved at Woofferton. X-rays are produced by the stopping of accelerating electrons but it had been thought that more than 11 kilovolts was needed for any problems to be found. However tests had shown that there were some areas on the exterior of the senders where the level of X-rays from the big valves were too high. This called for the installation of extra screening panels which was a job for the workshop staff led by Colin Hermes. In August the last small remaining asbestos type resistance mats were finally removed and taken for safe disposal by Sandy Ross, the BETA secretary.

In late February, there was a security alert for the whole of the BBC and a bomb warning was received at Skelton with a subsequent evacuation of the transmitter buildings. To increase security at Woofferton was found to be quite difficult even for the small area of the main building and was very labour-intensive. In August, staff were much relieved when a new automatic remote controlled security gate was fitted. A closed circuit TV camera and lights made it possible to check entry in the safety of the Duty Room.

The next upset was a two day strike called for 9th and 10th May which certainly caused Dave Green and Neil Wilkieson some loss of sleep as they tried to keep the station running. Only the technical staff actually came out on strike and they fully understood the feelings of the other lower paid employees who could not afford to lose another two day's pay. Staffing again proved a problem due to the mobile aspects of the rigging team. They had all gone to Droitwich leaving the rigger handyman Richard Davies on his own at Woofferton. On Tuesday 16th May, a matrix switch had



burnt up and needed replacement in the 45 minute morning break. Tony Nicholas, the Supervisor on site together with Richard changed this and no scheduled transmissions were lost. Next day saw the arrival of a party of Chinese who had been brought round by Dave Betts (*see above*). They seemed to be impressed by the station and presented silk handkerchiefs and badges before they left. The following day Array 903 suffered some burning of its groundwork and eventually rigger Peter James was brought back to the station from Droitwich to help in repair work.

Strike Day No. 4 on Friday 26th May was an unusual one because it was organised by the TM(M) who had received the news from BETA Head Office the previous evening, just before he was about to go home. The BETA secretary was on leave, the Chairman was at home and the other committee member was on a team visit to Llandinam. The strike was due to start at midnight and so the TM(M) informed the local BETA committee, all the HF sites and made sure that the management team of Neil and Dave at Woofferton turned out when the shift left site. By this time some members of staff were losing their initial enthusiasm for the strikes. The TM(M) was in an unenviable position as he was only acting and had been a union member for some 30 years. It was a case of split loyalties and if he had been an STE he would have joined the strike with the other members of staff. Thankfully both the local BETA branch and management tried to see his problem. More problems with BETA followed 7th June when the union blacked both work on the container transmitters and call-out for the GEC National One system.

During June there were another two short notice strikes and two more in July before an agreement was reached. Another strike, this time by the weather, caused extra work for staff. Thursday 6th July was a very hot and sticky day and during the evening there were thunderstorms over the whole team area. Most services were off for some time due to the loss of the public electricity supply. The MIC was jammed with fault reports from the various stations, all telling of problems. Even Forden was affected when the stand-by diesel refused to run up due to a fault on the starter panel.

The base town of Ludlow has both a UHF and VHF site in Mortimer Forest just above Whitcliffe (*see picture below*). This has both advantages and drawbacks. Station staff in Ludlow have a decent television picture and can also monitor from home. However local critics have always been annoyed with occasional “burbles and birdies” on Radio 3 but this problem had been present since the station was opened and was a function of the input and output frequencies selected for the station.



There was a period in the autumn of 1989 that Radio 3 output would disappear during the evening and then as mysteriously reappear whenever staff tried to trace the fault. One warm Thursday evening in August the fault re-occurred, the TM(M) was listening and so was the other member of the team, R. Glyn Jones. After some discussion it was decided to get the forest gate keys, some kit, spare units and a vehicle from Woofferton to finally track down this fault. As luck would have it the fault remained when the team arrived. Each of the little VHF modules was producing the correct 16 watts but the total output from the first combiner was only 3 watts. Every connector was checked and with trepidation the 3 dB coupler was dismantled where a dry joint was found. This was repaired and everything seemed normal. After packing all the kit up and writing the visit sheet, it was nearly midnight and time to go home. To compensate for the evening’s work, the team saw a badger in the headlights of the Range Rover as

they drove along the dark forest track.

The GEC National One system was the next piece of new technology to come along. This radio telephone system used receivers and transmitters controlled by a microprocessor with lines to Coventry where the main control was situated. Several GEC teams had been very busy installing

the base stations in locations throughout the UK. The London area was done first and by now a base station had been declared operational in a small building at Ridge Hill. In order to teach the Woofferton staff the fundamentals of the system, a course was run on Wednesday 16th August by Bob Robson, from Sutton Coldfield. There were 4 chaps from Wenvoe and four from Woofferton who spent two days trying to assimilate the peculiarities of this new system.

Despite the small amount of traffic on this new communications net the only time hands-on experience was allowed was at 8 -10 p.m. Only two channels were in use and there was no phone to the control point or TAC at Coventry. The first problem was to connect a portable computer to the local system controller in order to see what was happening. This had a strange propensity to go into a foreign mode and fill the screen with Greek characters. It certainly did not bode well for the people who were going to be called out for fault finding. These would be the STM, and the two TMs because the union had banned BETA members from attending following a dispute over on-call and stand-by payments.

Management was called out several times for National 1 duty during the next few months but it cannot be said that much progress was made. The hardware seemed to be okay but the software in the Local System Controller seemed to be rather poor. Usually the cure was to reboot the whole system locally with the computer and run off quickly, with one's fingers crossed. *(Right, Dave Green at Ridge Hill fighting the GEC National 1 system)*



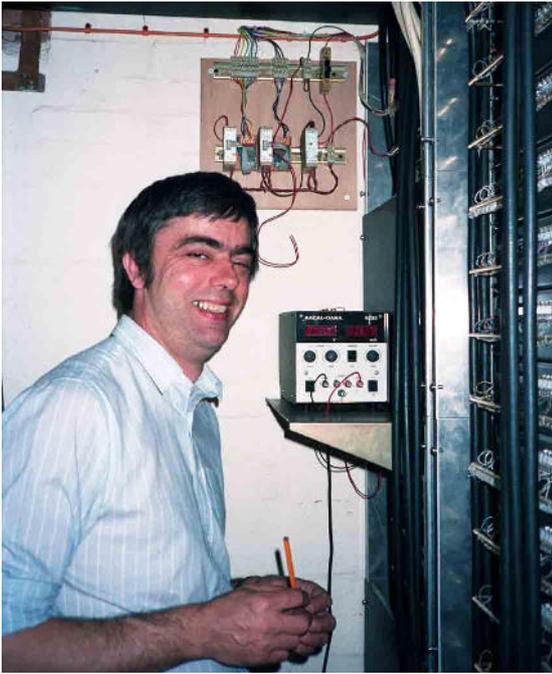
The Woofferton team area was not as large as some but it did entail a large amount of driving which reduced the time actually working at the site. The most distant was the UHF site at Cirencester which was 2 hours driving time. A slight inconvenience which could have been frustrating was that only half the spare units for the Plisch transposers were on site. The other half were kept at a similar site at Stroud, some miles away. Luckily the transposers were very reliable and this problem of having the correct spares in the wrong place did not often arise.

Stroud was the place where the TM(M) should have received a knighthood for services to Royalty. The site included a Local Radio Car Base station which fed reports from the roving microphone to the studio centre. A planned mains outage was agreed for 31st August and, as usual for small stations, no back mains supply was provided. The station was not regarded as important enough. By a coincidence, the news of a marital separation between Princess Anne and Mark Philips was announced to the press that morning. The TM(M) arrived at work to find that the phones were red hot because the Local Radio people were very keen to feed public opinion into both their broadcasts and the National Networks. With some alacrity John Harris and Sandy Ross set off for Stroud with a small generator from the Aerial Department to provide power for the Local Radio Car base. IBA were due to turn up later with a much bigger generator to power up the whole station. As usual there were no thanks from the Local Radio staff but some of the overheard vox pop reports from local gossips, contained innuendoes which were not deemed suitable for national taste. For his attempts to prevent these reports being broadcast, the TM(M) felt he should have been honoured.

The problems were not yet over for the day. David Attenborough, appeared in the TM(M)'s office just before 5 p.m. with a piece of coaxial feeder in his hand. An inspection had been made of the

Hereford and Worcester Local Radio Car Base station at Ronkswood Hospital by Bill Barrow, the Aerial STE, who had found the aerial and feeder full of water. Bill had severed the feeder and David wanted to know what should be done. The next day the Local Radio people had planned a big Outside Broadcast from the Severn Valley Railway and would be extremely annoyed to find no communications. So David was sent off to make a temporary repair to keep them happy. This was the new BBC system where the Woofferton Riggers were suddenly responsible for masts and aerials installed by Local Radio people as well as the normal Transmission Department structures. These erections were not always done in the best Woofferton manner and sometimes did not comply with all the proper technical and safety regulations.

Back on site at Woofferton there were two visits which were to have interesting consequences.



The first was by Tuke and Bell, the firm who had originally constructed the sewage works. They were back after some 45 years to modernise the system. Funds were also sought to automate the switching of the old BBC arrays. There were plans to do the job using local effort and so a request had been made for the provision of funds. In September this had suddenly been agreed, with the proviso that the money be spent by the end of March. Phil Sandell, (seen left with a prototype control unit on the wall) who had become the man in charge of this project, was faced with a problem. Should he continue to use the traditional hard wired system for controlling the groundwork rotary switches, using long lengths of 26 core cable. Or should he go for a more advanced method of control using one pair of twin twisted cable and several microprocessors. The firm of Klippon had some very glossy brochures on this new method and gave a presentation on site during 21st

November. They could see a good market at Woofferton with a large number of arrays to automate.

In order to permit safe work in the Aerial Field each sender has an electrical interlock key in the HT control circuit mounted in a panel in the Apparatus Room. This is in addition to the individual Array Isolator keys fitted in the selection circuit for each of the 36 arrays. If work is to be done on a particular array, just the Array key is removed, placed on the Aerial Clears Board with a cover over it and the STE signs to say the array is safe to work on. The rigger counter signs to acknowledge the fact and the time the array will be needed again. This particular array cannot then be used by any of the 10 senders. However if work is to be done in the Switch Stations or on the trunk feeder system all clears must be withdrawn and all 10 HT Isolator keys would be removed and placed on the aerial clears board. This system is checked frequently during the comprehensive interlock tests done by the STE.

At 1155 on Tuesday 17th October, at the correct scheduled time, the WATCH system automatically powered S81 while the interlock key was still on the clears board. Investigation revealed that the Whipp and Bourne VCB had jammed in and in this event the closing circuits controlled by the key were not executive. Luckily no one was hurt, although the riggers were in Switch Station 3. Immediately the Aerial Clears procedure was amended so that a sender door key was additionally hung up on the Clears Board with the HT interlock key.

Christmas 1989 was interesting at Woofferton. The new General Office had been very warm during the summer and at great expense an air conditioning unit had been ordered to cool things down. Logically it arrived for installation on 21st December, the day of the staff Christmas dinner at work. The two installation men worked hard but it was a noisy job so Eileen Briggs and Penny Smith evacuated next door for the traditional drink in the STM's Office. Stella Whiston sipped her sherry and told the men to give a shout if the phone rang, as she was going to eat. The dinner was a great success. After the recent rebuilding the Mess Room had been doubled in size and the tables were laid out in one long line. For once, the senders were forgotten and the dinner became a family meal for all the staff. On a station like Woofferton the staff very rarely gather in one place and it was pleasant to relax and enjoy the atmosphere. The meal, prepared by Margorie Bowen, Gale Tipton and Sarah Lovelock was excellent and Mark Edwards played a few carols on his trumpet just to celebrate the event. *(Woofferton staff are seen in the Christmas spirit in the Mess room)*



The next day, Friday, was the last day before the Christmas break. Dick Lett and Phil Sandell went to Long Mountain to look into a patterning problem on UT2. Iain Baillie and Mike Magrath took Glyn Jones from the workshop to Forden. The horn gaps on the MF aerial system tended to fill up with snow and Glyn was going to fit a shroud to hopefully stop this problem, *(Left, Glyn is doing maintenance on an OCB back at Woofferton)*. All spare hands disappeared into the aerial field back at base to help get Array 954 back into the air. Once an array is on the ground it seems to have a habit of coiling around every part of the groundwork to prevent itself being hauled aloft. It needed two men on the winch and as many as eight hands to untangle the wires as the array was hoisted back into place for service. By 4.30 p.m. most people were clearing up ready for the Christmas break when the team at Long Mountain rang to say they had broken the ignition key in the Range Rover and could they please be rescued.

The TM(M) set off with a spare key and after looking at the fault, which had reappeared, tried to contact the Monitoring and Information Centre at Sutton Coldfield for permission to leave site. This took some time as Sutton MIC had closed down two hours earlier than usual at 1800 for a Christmas party. Luckily Crystal Palace, manned 24 hours a day, was able to confirm that the station was on remote and so everyone eventually got back home to Ludlow at about 8 p.m.

## CHAPTER 9 - THE NINETIES BEGIN – 1990 to 1991

Looking back at the STE's log book for the year 1990 discloses that the majority of man-hours at Woofferton were spent on the water system and automatic FRF unit switching of the B6124 senders. Almost every day one of the four senders was being drained either to remove dirt from the water works or to remove and replace burnt RF contacts. The reliability of the senders was dependant on maintaining a continual flow of water. It became obvious that leaving the filaments on continually was extending valve lives and also prevented blocking of the pipes. When the water was turned off for maintenance, any dirt in the system had a tendency to coagulate and form a blockage. Once the water was switched on again, much time had to be spent checking for leaks and trying to balance up the water to give sufficient flow in each circuit.

Again, the weather produced some of the more lengthy shut-downs. On 25th January Rampisham, the modernised station near Bridport in Dorset, was badly affected by gales with no mains supply and some 15 arrays damaged. Cover was as usual provided by other stations including Woofferton. Satirical references to this station appeared in the STE's log, following a publicity article which referred to the now automated Rampisham as the "jewel in the BBC's crown". Bush House TOMs also tended to call it the "bucket and spade brigade", despite the fact that the station was some miles inland on a very exposed open site which seemed to attract bad weather. Woofferton had its share of gale damage on 21st February when Array 921 collapsed leaving the



triatric ropes supporting the battered remains of two bent spreaders some 300 feet in the air. (Left, Penny Smith from the office finds the broken spreader from Array 921) Five days later, another bad gale with winds gusting up to 60 mph. provided further work for the hard pressed riggers under Derek Ward. The metal screened trunking of S91 appeared likely to collapse where it crossed the road around the main building. Scaffold supports were quickly erected to prevent total failure until a more permanent job could be completed.

Not even the incoming programme feeds were immune. Following a mains fault in the Brimfield area during the evening of 10th April Dick Lett lost all incoming lines which came through the BT Exchange in the village. There was no programme to the station for over an hour and to make matters worse, the only working telephone line to the outside world was one to Birmingham. Dick thought that he might need semaphore or a runner with a message in a forked stick but eventually BT sorted things out. The standby supplies in the Brimfield Exchange, which should have taken over when the incoming supply went faulty, had themselves failed.

The Array Automation project led by Phil Sandell gathered momentum and soon Tony Nicholas and Pryce Edwards were making trenches all over the aerial field. The rigging staff were replacing manual switches in the groundwork with pneumatically operated ones and Phil, with assistance from any one available, was doing the wiring and testing. A portable building was moved from Wrotham to the site and became the centre for work on this project. By 11th August the Klippon system, using microprocessors and a twisted pair, rather than the multiway cables, was installed for test on Array 924. Four days later there was a fairly spectacular storm and accompanying lightning strike on the aerial field. This destroyed the Klippon modules and proved that perhaps the older method was more robust and better suited for the Woofferton installation.

This was a lucky break as each module cost £100 and the weakness of the system was proved before the expenditure of too much money and effort.

The Whipp and Bourne VCBs proved to be less reliable than had been hoped. They had a tendency to either refuse to close which was inconvenient or refuse to open which was potentially dangerous. Unlike the old English Electric OCBs they were not easily interchangeable, being firmly bolted in situ. The operating mechanism was also mechanically flimsy, and continual operation had disclosed several weak areas. A spare was on site and it was needed in anger on 8th February when the VCB feeding S82 refused to close. The workshop



staff were called out and vain attempts were made to fit the spare unit. After some 6 hours it became obvious that the spare was not a direct replacement and needed more adjustments. As it was now after midnight the volunteers went home to bed. It was 24 hours before the spare was finally fitted, by this time the broken unit had also been repaired. *(Above, the VCB will not fit, and staff are getting rather tired.)*

Mike Dilley was by this time firmly in the chair as TM(M) but his vast experience in Power Section was a great asset in these problems. Several VCB units at Skelton would shortly be available and matters were put in hand to ensure that they were given to Woofferton. These units had the advantage that they were equipped with a proper shunt trip coil to provide more reliable opening action. Later the units from Skelton were fitted by the excellent team of Mike, R. Glyn Jones (STE) and the workshop team of Colin Hermes, Colin Hillman, Glyn Jones and new man Russ Moore.

The UHF main station at Ridge Hill provided most of work for the Woofferton TV team. As well as the routine work there were two interesting incidents. The Marconi UHF 77 transmitters were designed before the days of 24 hour television. They worked on a Multiplex system where one half transmitted the sound signal and the other half the vision signal. Failure of one half of the pair caused the other to radiate a combined sound and vision signal at reduced power. For some time in April the BBC2 transmitters were occasionally starting in the morning on reduced power but visits had not disclosed any obvious fault. Early on Easter Sunday at 0740 Crystal Palace MIC had telephoned the TM(O) to say that the fault had occurred once more. The STM, Dave Green, ever eager to sort the problem out, joined Jeff Cant at Ridge Hill. Sliding back the drawer containing the Marconi Logic Control Unit caused the transmitter to run itself up. Further investigation revealed that the close down timer had not reset and was preventing the transmitter starting. For the past twenty years this little relay had conscientiously counted the time after the close down of transmission and then a spring should have returned the timer ready for the reception of the morning's start up sequence. The poor thing was now very tired and the spring was reluctant to reset the relay. Replacement of this relay cleared this elusive fault.

At Ridge Hill the IBA was the landlord and the BBC transmitters used their building and aerial system. This was to cause a shutdown on Tuesday 22nd May 1990 which even made the local papers under the heading "Blackout leaves TV viewers at a loose end". It also made an interesting day for Mike Dilley and Jeff Cant who were attending an Transmission Area Meeting at Church Stretton. They were called away from the meeting during the afternoon to attend a GEC National 1 call out at Ridge Hill when a GEC man wanted a spare transmitter. By 7 p.m. they were ready

for their dinner at the Long Mynd Hotel but were passing the Trumpet Inn when the team Range Rover appeared from Woofferton and informed them that all services were off at Ridge Hill. Returning to the station it was found that this had been caused by a feeder protection trip on the lower half of the IBA aerial. The procedure was then to wait for the duty IBA engineer from Abergavenny to attend and reset the trip. What had caused the fault was uncertain and all transmitters were back on power after a break of well over an hour. Mike and Jeff retraced their steps to Church Stretton to finally have sandwiches at just before 10 p.m., having driven past Ludlow for the third time that day.

Back at Woofferton things were just as exciting on the aerial Field. On 6th July the riggers arrived to find that thieves had struck. Arrays 901, 902 and 903 had been dismantled for rebuilding and the scrap copper gradually loaded onto a trailer. The thieves must have watched the pile growing and had struck, removing the copper and the trailer which was subsequently found abandoned. Security was heightened and later in August the new copper airwork was guarded in the field by Tony Nicholas and Alan Fletcher for four nights until it was hoisted into place. Woofferton Aerial department had an attraction for thieves and a later attempt was made to break into the outbuildings where copper was stored. A window was forced in the old rifle range but the thieves were disturbed by the security alarm operating. Steps were taken to fit all windows with security grilles to thwart further attempts at copper larceny.



In the autumn, agreement was reached by the BBC and BETA that the shift complement would be reduced to three, the advancing array automation project making the job of the Aerial Switching Engineer redundant. *(To protect the cables and air pipes numerous trenches were dug in the field)* The changeover took place after much work on the rotas on 4th November. In December there was a party for the retiring staff in the club when Peter Corston, Brian Thomas and Bernie Vaughan were presented with copies of photo albums depicting staff and work at Woofferton. Again the station was losing

valuable experience, Peter Corston having served for 33 years, most of the time at Woofferton. He was a keen tennis player and had been part of the team that had achieved a fifth consecutive victory in the Florence Cup, ensuring that the cup was retained on the station. Brian Thomas had joined the BBC at Woofferton and apart from 6 years at Rampisham had spent all his career at the station. Brian had also travelled extensively and had been interviewed on VOA during one of his trips to America. His comments were later broadcast world wide on the VOA English language programme. Bernie Vaughan had served the Corporation for 28 years after service with the Post Office at Criggion. Bernie had been involved in most of the work to turn L. F. Ivin's bungalow into the BBC Club.

Phil Dickenson also retired together with Dave Truscott and they attended a more private dinner at Overton Grange. Phil was really a North Country man and had served at Skelton and Burghead before coming to Woofferton. His calm and steady influence and experience together with that of the other retirees would be missed in the coming years. Dave Truscott had joined the BBC at OSE10 in 1959 but had served at Daventry and Rampisham before returning to spend his last eight years back at Woofferton. Dave had suffered ill health for a couple of years and his retirement solved a sticky problem. As part of his treatment he had been fitted with a heart

pacemaker but none of the experts could agree whether it would be safe to work at the station with all the RF about. They had to worry about their scientific standing but it was Dave's heart which stopped if they were wrong.

Just to finish off the year with a whimper and not a bang, there was a tremendous blizzard on 8th December which caused real problems for the MEB electricity supply people as well as the STE, Phil Sandell, who reported that very little programme was radiated between 4 and 6 o'clock in the morning. Even after some mains was restored it proved to be useless to power the senders due to the many interruptions. MEB Control at Tipton were so busy that they just ignored phone calls from the BBC and Powergen. At daylight the riggers arrived on site to discover a shambles on the aerial field. Six arrays were damaged, most of the open wire feeders were full of frozen snow and the senders were very reluctant to power into such a nasty load. This seems to have been the only time that the STE's log for 24 hours became a five page saga with all the faults. The misery was not yet over. Two days later the MEB removed the mains supply for two hours in the afternoon to carry out repairs to one of their transformers at Ludlow. With that, the worst was over for 1990.

This year of 1991 was a period of great change at Woofferton in personalities and working conditions. In January the BBC had proposed a completely new system of pay, grading and conditions of service. Every ten years or so there is a vast upheaval in the Corporation and all existing structures are changed. It takes roughly three years for the work force to even learn their new grades and titles and for all the anomalies to be recognised. This time it would be an even greater change which would "enable a more focused and market responsive approach to pay". In addition there were to be sweeping changes to the Conditions of Service. These were twenty years old and the idea was to remove a large number of special payments and incorporate them into the new salary. There were also to be new ideas on patterns of work, off duty days and the whole proposals were packed in a glossy brochure, "Pay in the 90s", a copy of which was given to every member of staff. After much discussion the union was unhappy to find that the whole package was to be implemented without their approval. Transmission Management at Warwick were not wholly in favour of the new conditions but they had to go along with them. Unfortunately the uncertainty of new grades and new conditions had an undesirable effect of depressing staff and causing morale to fall.

At Woofferton the year of 1991 started with some planned work on the B6124 VCB replacement programme. The experienced team of R. Glyn Jones and Mike Dilley, with the able assistance of Colin Hermes and Russ Moore from the workshops had now the experience needed to carry out the replacement without too many problems. In fact the worst part of the job was to get the sender actually working after all the other maintenance which had been done while the sender was off the schedule. S83 was completed on 4th January, S82 was back in service on 27th February, and S81 on 30th April.



Before the final replacement a couple of disastrous events struck the new senders in the HT area, unconnected with VCB replacement. On 14th January, R. Glyn Jones (*left*) was STE on nights when S84 shut down with a serious problem at 0040. When the Incoming supply OCB indicates *BBC System Fault* and the fault is accompanied by a severe mains dip and the lights dim, it is time to look for some major damage. None was obvious at first but Glyn

eventually found one set of seven HT rectifier diodes short circuit. The B6124 senders had been in service about ten years and only four spare diodes were in the stores. Glyn declined to use these and constructed a replacement diode arm from some spares for the BD272 senders. This unit was not rated for the same current and so the sender continued on reduced power.

A fundamental difficulty exists for stores holdings. Consumables can be calculated after a year or so in service but it would be difficult and expensive to stock every item that could fail. Hence there was some panic when AEI, makers of the rectifier diodes, were contacted and quoted 8 weeks delivery because they had none in stock. So Cyprus, who had some spares, were contacted and kindly offered to despatch a few diodes to Woofferton to get the sender back on full power.



With 42 diodes in each sender, four spares were obviously not enough and 8 weeks was a long time for reduced power operation. Karen Ede at Valve Section was made aware of the problem and started a search for equivalent diodes which were available ex-stock. The diodes from Cyprus appeared but were slightly bent, Workshops forced them into a useable state and the sender was back on full power by 22nd January. This was not the end of the story because a diode arm on S82 failed on 7th April and on 18th October another set

failed on S84 again. *(The damaged rectifier can be seen on the right above)*

Friday 8th February was to be the last working day for Dick Lett, who had served the BBC faithfully for many years. It started ominously enough after a blizzard at night which left the site covered with a foot of snow. Ironically, as he staggered in to work, the TM(O) received an urgent message from Mike Higgins at Warwick who wanted to know if we had any brambles in our perimeter fence. As the snow lay thick and fast and the perimeter fence was some 4 miles in length it seemed rather a irrelevant question at the time. However it could not have been very important as Warwick later rang to say they were all going home at noon because of the snow.



Meanwhile at Woofferton the staff were organising a little meeting at the club at lunch time to present Dick with a farewell gift when S83 dropped off. *(Dick Lett with his presentation RCA glass 'porthole', seen left)* As staff struggled with the sender, things went from bad to worse and it became clear that the fault was pretty unusual. In fact while Dick was in the club, Alun Maddocks and company discovered that the HT Rectifier transformer had failed. There were no Buchholz trips but continuity measurements were made of the resistance of the various connections. Comparing them with the spare transformer, outside the building under its blanket of snow, it was clear that something nasty had happened to the insides of the transformer. The TM(O) phoned Brentford, the manufacturers, and caught the manager just as he was going home early. He volunteered the information that two similar

transformers had failed at Rampisham with internal faults on the tap-changer mechanism!

The tap-changer mechanism is a switch fitted inside the transformer to permit small voltage changes by connecting the output to the various tapping points on the windings. These tappings were never used operationally and the switch had not been operated since installation but the contacts had presumably become overheated and damaged.



This proved to be the case but there was more than a week of hard work before the sender came into life again. The spare was removed from outside the building, where it had stood for ten years, transported to Brentford's (see photograph left) and had its tap-changer mechanism welded up, tested and returned. A week after the failure, the broken transformer which was furthest from the door, was removed (photograph below shows the lack of space for manoeuvre) and the good unit was moved into place. As the transformer weighed 6½ tons it was a slow job but everyone worked well, despite the cold weather and the complexity of having to remove or shift most other items in the transformer enclosure. The sender was finally ready for service after work on Saturday 16th but the TOM at Bush was loath to put it back onto the schedule and wanted Schedule Unit to do it. By the Monday morning things were back to normal, for a while anyway. There were feelings of relief that the repaired transformer, which was returned on 8th March, had in fact suffered from arcing on the tap-changer and the fault diagnosed by a very cold Alun Maddocks, a month previous, was confirmed. Dick Lett had served for 36 years and neither he nor anyone else had ever seen a transformer fail in their Corporation career. It was a shame that it had to happen on Dick's last shift at work.

The station was fed by two incoming 11 kV underground cables from the Midlands Electricity sub-station just beyond the perimeter fence. For many years this supply had been very reliable but recently problems seemed to occur when any maintenance was done on the sub-station involving the use of one transformer. Each of the two 33/11 kV transformers had temperature sensors which protected the system against overloading by tripping the incoming BBC supply when the insulating oil reached a certain temperature. When only one transformer was in use, Woofferton agreed to reduce the station maximum demand to 4.85 MW by reducing power on the senders. However it became apparent that there was a much increased domestic load on the substation which had not existed previously. Many houses had been built and this extra load, even with the reduced Woofferton load, made the use of one transformer sometimes perilously close to tripping. It was probably the hot day which finally caused the Metering OCB to trip at 1827 on Wednesday 18th September. The MEB Control at Tipton would not allow Woofferton to close the Bus Section OCB and so had to wait for the arrival of an MEB engineer to reset the temperature trips manually in the sub-station before the Metering OCB could be made and the BD272 senders resumed transmission.



Mains dips are normally confirmed by the MEB Control at Tipton but sometimes they are too localised to be visible to them. There were a couple of dips in May and one in June which started the standby diesel generator. It was not apparent that there was an actual fault until more occurred in October, when John Harris had successive trips during several evening shifts. It was then that the suspicion fell on the standby generator control unit. Watches were kept and measurements taken and Andy Matheson noticed that the incoming mains voltage was dropping just enough to cause the standby control unit to think that the mains had gone. The control unit would then run up the diesel and changeover the supply. The MEB maintained that their HV supply was within specification but it appeared at Woofferton that incoming supply voltage variations were occurring during a period of heavy station load. In order to prevent annoying operation of the diesel the operating voltage of the mains failure unit was lowered.

The site and its security seemed to need a great deal of attention; the Warwick query concerning the brambles originated after a small child had received RF burns whilst trespassing for blackberries at Brookmans Park. In order to appease Warwick and provide them with some idea of the scale of the problem, the state of the perimeter fence and hedges were mapped out for them by one of the female engineers, Gillian Moore. The security fence took a knock on Thursday 14th



March when a tipper lorry from Hereford and Worcestershire Contracting went off the main road, onto the soft grass verge and slowly tipped over, spreading 9 tons of tarmac over the fence and hedge areas (*see left*). The fence was repaired but the hedge has not grown again. On 5th April, it was discovered that some 13 reels of copper wire had been stolen from the car park area where the security fence had been cut. A police patrol car passing the station during the night of 8th April disturbed an intruder trying to climb over the fence near the main

gate. The patrol was answering another call and so this sighting was not pursued.

A visit by the Shropshire Council Footpaths representative had disclosed that, during the extension of the aerial field 10 years ago, a public footpath had been accidentally incorporated into the extreme east of the site. In order to maintain security and protect the public from contact with any dangerous wires or pick-up it was essential that the path be moved. A diversion order had to be obtained to the satisfaction of the walking public and the local council. At last the order had gone through and the path could be re-routed. Tony Nicholas and Pryce Edwards fitted several stiles and a footbridge and the diversion was constructed. Whether any ramblers will ever use the path is unknown. However, a party of 35 villagers walked the Richards Castle parish boundary on 6th September 1992, escorted by Richard Davies and Tony Nicholas.

During the year of 1991 the Voice of America proposed to equip Woofferton with its own 4.5 metre satellite dish and receiving terminal, with a standby diesel, in two containers on the old tennis court area. In order for Transmission Engineering Department to comply, maps and layouts were produced and planning permission was sought but the scheme came to nothing. More concrete results came from a much smaller in-house satellite receiver installation which was fitted on the roof of the main building. Despite having the wrong handbook, lossy coaxial feeder, a noisy Low Noise Amplifier Block plus a bent dish, Lee Davidson managed to provide a system which actually worked on 11th January. World Service programme was available from one of the audio channels and could be used if all incoming lines failed. This was thought to be a very remote possibility but it actually happened on 9th July when a BT power supply overheated

causing two programme lines and all outside phones to go dead. On 28th August all incoming



programme lines went down and the satellite feed was again used. The fault this time was due to one NICAM path failing at Brimfield Exchange and the change-over unit refusing to operate.

Back on the senders, the B6124 had their usual daily RF contact inspection and work was done to combat the frequent water leaks and blockages. It was always a case of too much water in the wrong place or too little water in the right place. The shift staff were becoming very good at temporary

plumbing and the workshops adept at removing permanent pipes in order to remove supposedly removable contacts which had welded themselves in situ.

John Harris in his role as Valve King, (*seen below meggering a TH537 valve*) was responsible for ordering new valves and semiconductors and vacuum capacitors with an annual budget over £100,000. He made sure that newly received valves were tested and that hours were used up before the two year guaranteed period expired. This year he found a new problem when it was decided by the manufacturers that the BD272 Cathode Follower valve, romantically called a 3Z222EW, was to become extinct. English Electric thought they could manufacture a replacement which would work but to do that it was necessary to have specimens and measurements, both physical and electrical of the existing valve. Eventually the replacement arrived, and the first of these new valves, named BY1654, was fitted into S94 for long term testing on 29th October.

John Harris had also been voted the man most likely to succeed as COSHH engineer. The new regulations concerning Control of Substances Hazardous to Health had demanded that someone be taken off shift and apply himself totally to sort out this mammoth task. Every substance and its use on the station had to be examined and instructions written to ensure that safety was maintained. Substances ranged from Brasso and Snowpake to Solder Flux and Washing Powder, PCB manufacturing chemicals to Photocopier Powder. Rather ominous substances discovered on outstations were also brought in for John's examination. This was another job where John's thorough and painstaking attention to detail were used to the full.



One peculiar occurrence on 17th October which presented an unusual series of log entries was started by the STE at Skelton who rang up at 1815 to enquire whether Woofferton had noticed any lack of programme feeds from Bush House. All VOA feeds were okay but the fill-in Green programme was noted to be missing. Skelton understood that Bush House had been evacuated due to worries about gas entering the building from a leak in India House next door. All apparently came normal after about 3 hours when Bush was re-occupied. All VOA programmes were carried normally as presumably the equipment had been left on. As there was no one at Bush to answer

the telephone or warn stations, the arrangements for the evacuation seemed to lack much forward planning.

By the end of 1991 the STM and his two TMs had changed and several staff had left the station for good. The first to go was Mike Dilley who finished his attachment as TM(M) at Woofferton and returned to his post in Power Section at Warwick on 10th May. Chris Abbott arrived in June to fill the post after some acting work by Phil Sandell. Dave Green finally retired in July when Peter Loveday took up the post of STM. Jeff Cant, had been displaced by Eric Hamblin from Skelton, as TM(O) in August, and left for a two year tour as Assistant Resident Engineer at Ascension in September. Dick Lett, as noted earlier, retired in a grand explosive style and the station lost two cleaners, George Teale and Malcolm Beagley. Stella Whiston moved north, to Scotland with her husband, leaving the General Office somewhat quieter than before. *(The photograph below shows the sender hall in all its pristine glory in 1991)*



## CHAPTER 10 - DOWNHILL TO THE GOLDEN JUBILEE – 1992 to 1993

January 1992 began with a scare over security when an increased threat was perceived to BBC installations. On 10th January the level of security was raised for four days with Jack Andow and Tony Nicholas on duty during the evening and night time making random patrols around the site. Call-outs for the GEC National 1 system became history when the maintenance contract was ended and the bulky handset was removed from the Duty Room on 15th January.

As well as the usual sender battles to keep the water flowing and repair the ravages of heat, several incidents occurred in the HT circuits of the transmitters. On 8th February the five 15 ohm resistance mats in the Penultimate HT on S95 failed. Much testing was done, with the prime suspect being the Pen HT cable. In the distant past soon after installation this cable had suffered from dramatic punctures due to RF affecting the insulation. After a suppression circuit had been added and the power rating of the resistance mats increased this area had apparently ceased to be problem. Despite all efforts, no definite fault could be found to account for the sudden demise of the mats.

Later in the year, on 4th December Harry Field was isolating the HT Enclosure of S95 and earthing the smoothing capacitors when his earthing wand produced a bright flash and a loud bang. Harry, being meticulous, always followed the set procedure and this saved what could have been a nasty accident. Inspection revealed that the modulator transformer resistance mats were open-circuit and so the capacitors could not discharge to earth when the enclosure was opened. Steps were taken to check all the other senders to see if the corresponding mats were intact.

In July, a request was made for Woofferton to check the condition of the HV cables in the BD272 HV AC Isolator boxes. Staff at the BBC Far Eastern Station at Kranji had found the insulation on their cables to be deteriorating. Where the cables rested on each other, a form of disintegration was taking place and the insulation was being converted into white powder. Presumably the higher temperature at Kranji had led to the deterioration being further advanced in their isolator boxes. The boxes were inspected in all BD272s throughout the Corporation, and a programme of replacement planned. With the removal of the suspect cables in S93 on 12th January 1993, all six senders had been tackled and the job was complete.

The station is surrounded by wildlife, and it is a great compensation for staff to see nature at all times of the year at their place of work. Hares, owls, stoats and woodpeckers have all been observed close to the building. However it is necessary for safety that the wildlife stays outside the technical areas. When a snake appeared in the sender hall in June it was observed not to be wearing an identity badge and was therefore ejected. A volunteer party captured it and it was released in the orchard, outside the security fence.

Several problems were also experienced with non-operation of the remotely controlled array switches due to rodents, most probably rabbits. Normally the cable and compressed air feeds were well protected underground in plastic piping fitted to brick manholes with metal lids for access. However, the main trunk runs up the field were in a concrete duct which sometimes suffered breaks in the concrete cover. *(Right, rigging staff drawing cables for array automation in 1990) For*



some reason the rodents found the pipes and cable covering edible and they chewed contentedly, eventually causing shut-downs. These manifested themselves when array switches refused to operate, the revertives disappeared or the air compressors supplying the field overheated.

The BT programme lines saw an expansion early in 1992 when two extra chains, 36 and 37 were installed together with better DEL and Control Line facilities. Later that year the Civil Defence Carrier receiver was removed. This had been fitted in the Sixties to allow a nation-wide warning



of incoming nuclear attacks and subsequent drifting of radio-active fall-out. There was a time during that era, when alarmists (or realists) filled the minds of the common man with the finality of an atomic attack. The true details, that have emerged since the fall of Communism, concerning the less than superhuman Soviet war machine, make it difficult for people in the Nineties to realise how ominous was the phrase “Four-Minute Warning” in those days. *(Apparatus Room shown at left, gradually filling up as automation was added)*

In June 1992 the Workshop Supervisor, Colin Hermes, retired after some 13 years of sterling service at Woofferton. Colin had arrived in November 1979 following the death of the late-lamented ‘Lofty’ Lewis. Unless one has worked at a transmitting station it is difficult to realise the importance of an efficient workshop staff. Transmitters are installed by the manufacturer’s engineers and are eventually persuaded to comply with the specifications issued by the BBC. The real work starts subsequently when the senders are operated day and night on the schedule. Then it becomes apparent that the transmitter spares provided on installation are inadequate or inappropriate. It also becomes obvious that certain mechanical areas of the senders need what is known in the trade as a DFA, “a different flaming arrangement”.



This is where the talents of the workshop come into play. Colin had worked in the design engineering workshops of Philips and he was able to use his skills to design a more robust arrangement, make working drawings and quickly produce a prototype model. Under his leadership more spares were constructed and many improvements made to increase the reliability of the senders. Life at a short wave station was all about constant development and the workshop played a major part in this development. Complying with the increasing number of Safety Directives, drawing up maintenance schedules and planning outstation visits were just some of

Colin’s workload. Apart from a rare heated technical argument, these jobs were accomplished with a light touch and sense of humour. *(Above, Colin Hermes preparing to remove a part of S81’s FRF coil in September 1988)*

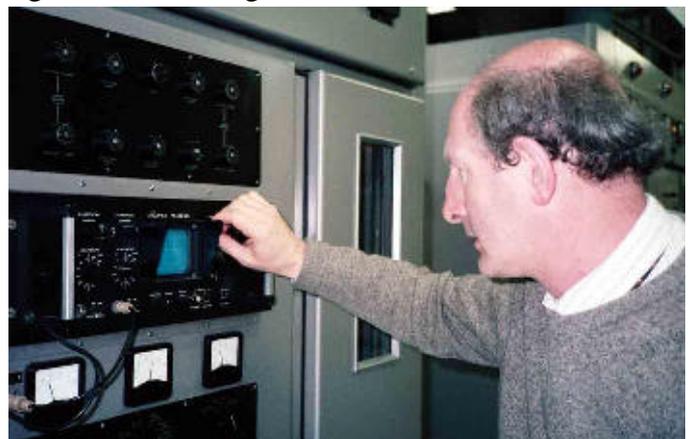
Shortly afterwards R. Glyn Jones got involved in a fault finding session which was produced by an extremely active storm passing close to the station. Thunderstorms are one natural phenomena which have the power to frighten and often kill in random fashion. The large number of tall metal masts sticking up at Woofferton are a temptation for Thor to give a demonstration of the power of nature. So it was 1635 hours, at the start of evening shift, on Saturday 11th July 1992 that Glyn noted a storm rolling closer and closer for a few minutes until there was a very loud bang and flash from the Apparatus Room which was followed by a smell of burning. There were lots of bells and alarms going off but Glyn sensibly waited until the storm had retreated before starting his inspection. Three senders were shut down due to the loss of revertives from the arrays. The Back-up Supervisor failed which meant that there was no frequency monitoring and no audio sequential monitoring. The Status and Alarms video display disappeared and the internal telephone exchange was injured. Eight array groundwork terminal boxes were affected, some fuses had gone and various printed circuit boards had suffered damage. It was some 24 hours before all equipment was back in working condition.

It had always seemed strange to BBC staff that some British high power overseas stations were staffed by the Diplomatic Wireless Service with only occasional assistance from seconded BBC engineers. Whilst also providing radio operators for British Embassies, the DWS, later to become the Foreign and Commonwealth Office Broadcast Group, also operated transmitting stations at Cyprus and Masirah. These senders appeared on the BBC External Services schedule and broadcast BBC programmes similar to BBC overseas relay stations.

Although never admitted publicly, it was supposed that in the event of a political crisis the FCO would use their transmitters to broadcast the Government line (or propaganda) without any need to consult the BBC. For the BBC, the division would at least go some way to prevent any blackening of the BBC's reputation for objective reporting. This did not apply in 1982 when one of the BBC senders on Ascension Island was taken over by the Government to broadcast propaganda to the Argentine troops on the Falklands Islands. Any objectors were told to examine the BBC's Licence dated 2nd April 1981 paragraph 19 Section 1 which gives the government the powers to do just that.

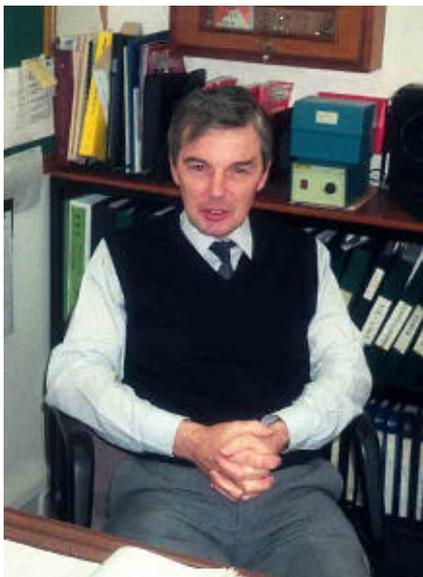
Eventually the BBC took over the operation and staffing of these overseas stations, as well as the MF site at Orfordness in Suffolk, and some of the staff were transferred to the BBC payroll. Andy Matheson was one of these ex-DWS men. Bringing a wealth of experience to Woofferton, he fitted in well and as an STE had the necessary placid temperament, refusing to panic when all around seemed chaotic. One such event occurred on the last day of August at 6 a.m. when S95 stopped suddenly with a loud bang from the Auxiliary Supplies unit as the interlock switch SWAH was closed. After following the proper procedure and getting a spare key from the TM's safe, Andy managed to get into the unit to find the contactors of relay RLN welded together. Several Auxiliary Circuit Breakers were damaged, the incoming 415 volt fuses had blown and the contacts on SWAH were welded. After much searching R. Glyn Jones on day shift found a loose burnt nut which seemingly had caused a phase-to-phase short circuit across the relay.

The B6124's had their moments of nightmare when sometimes everything goes wrong even during a spot of innocent maintenance. (Right, Alan Bayly avoiding waterworks) The day before Andy's explosion in S95, staff were carrying out a



routine acceptance test for a newly received Final RF valve when a hose blew off the valve coupling on S83. This had two direct effects, water spurted everywhere and saturated both the Final and Penultimate valve bases and also provided Alan Bayly with an unplanned shower. Both valve base dielectric capacitors became waterlogged and had to be replaced. Alan Bayly learned to stand by the STE when the pumps were started. On 20th October, a team under Richard Crowley were replacing a resistor when a pipe popped off one of the water-cooled cross-head switches again soaking the FRF valve base. After some 10 hours shut-down Andy Matheson and his evening shift completed the repair job.

The B6124 senders had the provision of working on frequencies below 6 MHz but there was never any provision at Woofferton of aerials to suit. R. Glyn Jones had the idea of replacing the cross-head switches used in this configuration with permanent short circuits. This would make available some spare cross-heads and hopefully reduce the number of burning contacts and water leaks. The first sender, S81 was modified on 22nd October and seemed to work as Glyn and the workshops had imagined. The solid copper shorting strap did not overheat and the sender seemed unaffected. Eventually the senders were modified over a period of six months and by April 1993 all B6124s had been done. It seemed a drastic alteration to the specification of the transmitters but as Glyn pointed out, the modification could be removed in less time than it would take to build a new array for service.



John Harris completed his last shift as STE on 18th September and left Woofferton for a well-earned retirement. John had joined the BBC at the beginning of 1962 after working at Thorn Electrical and had spent all his career at Woofferton. He had served as Liaison Engineer with Marconi at the installation of the BD272 senders (getting his youthful photograph in the sender manuals) and had nursed them along for 30 years. John would be remembered for his logical approach to fault finding, and his determined attitude of calmness.

With John Harris gone, that left Harry Field (*left*) as the “old man” of Woofferton’s shift staff as it rolled into the year of 1993. Only Eileen Briggs (*below*) in the General Office and the ubiquitous Tony Nicholas remained of the dwindling band who had actually worked or covered under L. F. Ivin. Tony Nicholas, ex-rigger, ex-handyman, had now become the

Supervisor, organising the cleaning staff and handyman, who not only maintained the site at Woofferton but also the numerous BBC-owned TV outstations. In addition, Tony kept an eye on the team vehicles as well as driving the fork-lift truck, tractor and mower when necessary.

Gilbert and Sullivan provided the most bizarre experience for Eileen Briggs. The comic operas were one of L. F. Ivin’s interests which, like most of his interests, became obsessions. Before the attendance of a performance by the Tenbury Operatic Society, Eileen was forcibly coached through the musical score by the Engineer in Charge in his office. Even after almost twenty years, Eileen alleged that she was word perfect on the score of *Iolanthe*. A true case of singing for one’s supper, or in Eileen’s case, her annual increment.



The arrival of Optimod audio signal processing equipment in February 1993 meant the end of separate VOA and BBC programme paths in the Apparatus Room. Within a short while all transmissions were enhanced by this modern system of HF processing. As usual, the initial setting-up of the necessary audio levels took some time to perfect. The equipment had a large number of adjustments and to gain the required improvement in audibility without causing the senders to overload took a couple of months. It was very easy to cause crowbar trips on the B6124s if the level was too high but a higher average level of modulation was required to give the transmissions a chance in the crowded HF spectrum.

Some alarms become like old and familiar friends, others strike a chill of fear by their rarity and ominous import. The sender oil-filled rectifier transformers are protected against internal short circuits, and any other catastrophic failure by a Buchholz Unit. This device fits on top of the transformer and operates by sensing the generation of gases in the tank. A slight gas pressure will give a warning alarm. If the fault is not investigated and cleared, a greater amount of gas will be formed and cause the unit to trip the circuit breaker feeding the transformer. These trips are very rare but the instructions are implicit. Isolate the unit and make a very thorough inspection because there is something seriously wrong with the windings or connections under the oil.

On 4th March 1993 S84 had a Buchholz Alarm and later a trip. Investigation revealed that the HT transformer tap changer mechanism was again the culprit and so the 6<sup>1</sup>/<sub>2</sub> ton unit had to be replaced. The spare transformer, which had been modified after Dick Lett's shut down, was outside ready to use. By 10th March it was all over and the sender was declared ready for service, after a lot of very hard work by all the staff concerned. Later during 1993 there were some equally long outages which were of a more planned variety. Most of these were to effect repairs to the water cooled FRF coils of the B6124 senders.

One happy event and a fairly unusual one for Woofferton was the wedding of Alun Maddocks and Wendy Wilson on 5th June. Wendy had arrived in 1988 as one of the increasing numbers of female engineers working in Transmission Department. Alun, a quietly spoken Welshman, had worked previously for British Steel and was by now regarded as one of the lynch-pins of the Woofferton STE rota. A throng of Woofferton staff attended the ceremony to support this BBC marriage and to wish the couple well. *(Wendy is showing Simon Houston how to change a BY1144 valve)*



And then it was 17th October 1993, a celebration of 50 years broadcasting at Woofferton. Some 270 retired staff from all over the country attended a party to celebrate this golden jubilee. The oldest was SME Frank 'Beetle' Thompson now 91 years young. There were displays of old photographs, the latest equipment and the chance to meet friends and colleagues from way-back to swap reminiscences of the old days. When L. F. Ivin ruled and television was thought to be a passing fad. When programmes were switched by a real flesh and blood person, not a Z80. Those were the days when the only fault finding accessory was a highly prized Avo. The evening saw the celebration continuing in the club over pints of beer. Despite all odds, including several attempts at closure, part time working and the odd strike, Woofferton had managed to reach its Golden Jubilee with Fifty Years of HF Broadcasting. Despite threats of future privatisation it is to be hoped that it will continue to carry on transmitting.

After working for over 34 years for the BBC External Services, the author retired in 1994, missing the Golden Jubilee celebrations due to a final posting to Ascension Island. Over ten years have passed since that memorable evening and many hopes and dreams have flickered around Woofferton. I took no part in the seismic changes which hit the station but can only record the following to bring readers up to date.

Following Government policy, however belatedly, the BBC in their wisdom, made the decision that, after some 75 years, the transmission of programmes was no longer to be a part of the corporate organisation. Thus on 27th February 1997, BBC Transmission ceased to exist. Castle Communications purchased the assets of the domestic services, radio and television for £244m. The BBC World services transmitting organisation was similarly purchased by Merlin Communications for £30m. Merlin, which was set up as a management buy-out, has diversified and now visitors to the Woofferton station will notice the proliferation of satellite dishes, a sign of the changing face of international broadcasting. Woofferton is determined to be part of that future and the hopes of all past staff members go with the station. May Woofferton carry on broadcasting to the world. *(Photograph below shows the array of satellite dishes in August 2006)*



### **Engineer in Charge / Senior Transmitter Manager**

L. F. Ivin : April 1943 - 10th May 1963 (retired).

R. A. Herbert : 1950 (acting for a year while Ivin was on loan to Research Dept.)

F. J. Balston (acting) : 10th May 1963 - 15th July 1963

G. E. Turner : 15th July 1963 - 25th Feb. 1972 (left to be EiC Daventry)

W. J. Gilmour (acting) : 25th Feb. 1972 - 10th May 1972

J. P. Atkins : 10th May 1972 - May 1975 (retired)

A. Malcolm : May 1975 - 25th June 1979 (to do relief duty at Kranji)  
F. Allsopp (acting) : 25th June 1979 - 24th August 1979  
A. Malcolm : 24th August 1979 - March 1983 (to be RE at Kranji)  
W. N. Wilkieson (acting) : 1st April 1983 - 1st April 1985  
W. N. Wilkieson : 1st April 1985 (First STM) - 16th March 1987 (to be RE BERS on Masirah Island)  
R. M. F. Mathewson (acting) : 16th March 1987 - Oct. 1987  
G. Burhop (acting) : Oct. 1987 - 25th July 1988  
W. N. Wilkieson : 25th July 1988 - 26th Oct. 1989 (to Warwick HQ)  
D. H. Green (acting) : 26th Oct. 1989 - 27th August 1991 (retired)  
P. Loveday : 28th July 1991 (Last STM, a post later redesignated to Engineer in Charge)

### **Assistant Engineer in Charge / Transmitter Manager**

A. G. Collins : 1943 - May 1944  
M. H. Hall: 8th May 1944 - 11th March 1946  
R. A. Herbert : 1946 - 1950  
R. G. Newman : 1950 (acting)  
I. S. Dinnis : 1951 - 1957  
A. P. Harrison : 1957 - 1959 (died in service)  
F. J. Balston : 1960 - 1966 (to RE Ascension)  
W. J. Gilmour : 1966 - 22nd January 1978 (died in service)  
P. E. Winsor (acting) : 15th March 1978 - 19th November 1979  
W. N. Wilkieson : 20th November 1979 - September 1980  
J. W. McKay (acting) : September 1980 - September 1982  
G. Avis (acting) : 4th January 1983 - May 1983  
N. A. Pickering : May 1983 - March 1985 (retired as last AEiC)  
R. Gay TM(O) : March 1985 - April 1989  
D. H. Green TM(M) : February 1985 - Oct. 1989  
J. A. Cant (acting) : April 1989 - 31st July 1991  
M. Dilley (acting) : January 1990 - 10th May 1991  
C. Abbott : 29th May 1991 -  
E. R. C. Hamblin : 1st August 1991 - November 1992  
R. Patterson : November 1992 (Senior Engineer) –