TRANSMITTER GROUP NEWS

WINTER 1983 ISSUE

CONTENTS

STAFF MOVEMENTS

Appointments and Attachments:

Robin Singleton	A/S.T.E. Start Point	11th July 1982
Peter Lee	A.R.E. F.E.R.S.	September 1982
Edgar Martin	P.A.O. A.R.S.	September 1982
Mike Barton	S.T.E. Kirk O'Shotts	27th September 1982
Jeff Cant	S.T.E. Woofferton	1st October 1982
John Aberdein	S.T.E. Daventry	11th October 1982
Peter Davies	Engineer, Daventry	11th October 1982
Graham Smith	A/Senior Engineer Tx Ops. I	11th October 1982
Spencer Cresswell	A/A.T.M. Oxford	11th October 1982
John Goule	A/S.T.E. Redruth	25th October 1982
John Macrae	Attachee, Tx Tech. Services	25th October 1982
Norman Marsden	A.T.M. Divis	1st November 1982
Bob Long	T.E. Meldrum	1st November 1982
Roy Sharp	A/A.T.M. Meldrum	1st November 1982
John Winrow	T.E. Woofferton	1st November 1982
Derek Thomas	S.T.E. Skelton	8th November 1982
Phil Jones	A/S.T.E. Wenvoe	15th November 1982
John Custance	Attachee, Tx Tech. Services	22nd November 1982
Peter Bird	S.T.E. Daventry	5th December 1982
David Porter	T.E. Woofferton	6th December 1982
Mike Whitley	Secondment to F.C.O. Masirah	6th December 1982
Roy Gee	Sen. Eng. Aerials I	6th December 1982
Cliff Bryant	Design Engineer, Designs Department	20th December 1982
David Cowie	T.E. Melvaig	20th December 1982
Harry Field	T.E. Woofferton	1st January 1983
Graham Avis	A/T.M. Woofferton (6 months)	4th January 1983
Paul Abernethy	Engineer, Tx Tech. Services	4th January 1983
Phil Riley	Secondment to F.C.O. Masirah	4th January 1983
Peter Hodgskin	A/A.T.M. Oxford	10th January 1983
Jim McKay	Company Manager, C.R.C.	18th January 1983
Paul Widger	S.T.E. Holme Moss	24th January 1983
Neil Wilkieson	A/S.T.M. Woofferton (2 years)	2nd March 1983
Alastair Malcolm	R.E. F.E.R.S.	29th March 1983
Neville Pickering	A/T.M. Woofferton (2 years)	May/June 1983

Retirements

We wish the following members of Transmitter Group staff every happiness in their retirement:

Dick Pritchard	Woofferton	30th October 1982
Bill Mackey	Woofferton	24th November 1982
Peter Pearson	Holme Moss	6th December 1982
Arthur Driscoll	Rowridge	11th December 1982
Ray Milligan	Rampisham	15th December 1982
Billy Abbott	Lisnagarvey	26th December 1982
Fred Allen	Holme Moss	28th December 1982
John Ainsworth	Skelton	31st December 1982
Charlie Johns	Washford	31st December 1982
Ray King	Daventry	28th February 1983

Death

We record, with sympathy, the death on 4.11.82 of Ron Salino, former S.T.M Meldrum.

GOOD HOMES WANTED

Valve Section have the following technical magazines dating from 1977 which they now wish to dispose of. If you are interested in any of them, please contact Mr G.E. Morgan stating your requirements.

Magazine title	No. of issues
Broadcast Engineering	24
BSI Annual Report	2
BSI News	7
Communications International	9
Computer Design	13
Computer Systems	9
Electrical Equipment	3
Electronics	68
Electronic Components and Applications	3
Electronic Engineering	2
Electronic Equipment News	6
Electronics Industry	20
Electronic Production	2
Engineering Production & Design	3
Electronic Product Design	11
Electronic Product News	25
Hewlett Packard Journal	8
Industrial Research	2
Industrial & Scientific Instruments	4
International Systems	21
Journal of A.T.E.	1
Marconi Instrumentation	3
Microforecast	11
M.S.N.	7
National Electronics Review	4
New Electronics	19
Semiconductor International	8
Weekly Electron	11

PROBLEM CORNER

Dear Auntie Wendy,

I'm worried about my Transmitter Manager. He seems friendly enough but every now and then he gets very mean. The other day he refused to buy a screwdriver to leave at a new Silver Streak station. Instead he left a penny on a piece of string. I've raised the matter at a union meeting but the penny is still there. What should I do?

'Grieved', Little Carping TMT

Dear 'Grieved'

You should try to understand your manager more - he's probably supplied hundreds of screwdrivers over the years so he has plenty of experience. Not many people know that Black Holes were discovered by trying to find out why the world demand for screwdrivers has never been satisfied. You should feel happy with your lot - if your manager was a true Scot he would have changed the penny to a halfpenny.

CHRISTMAS AT HQ

England was merry England, when
Old Christmas brought his sports again.
'Twas Christmas broached the mightiest ale;
'Twas Christmas told the merriest tale.
-Sir Walter Scott

Do you remember Christmas 1982? Has it disappeared in a haze of alcohol or food? It's interesting to think of the number of parties that must happen every year in Transmitter Department - after all we have staff in fifty different locations and most of them have at least one party and visit some others. There must be a hundred parties a year and yet we've never had a real insight into what goes on at the "standard transmitter party".

A casual observation shows an age range of seventeen to seventy and no-one is related to anyone else. Is this a recipe for disaster or success? So we're all in show business - what really happens at one of these wild parties? Let us do a travelogue and visit one at Grafton House.

It's lunchtime and unusual features have appeared. The snack-bar 'fridge has white wine inside rather than milk, a filing cabinet outside CET's office has two barrels of beer on top, a cupboard is full of crisps, twiglets, biscuits, peanuts whilst over a hundred sausage-rolls have mysteriously appeared. There's even a Stilton lurking enticingly and, just to add class, a BBC micro playing Snake. People start to appear and include valued guests like the smashing lady from EPD who organises our travel, and even our friendly neighbourhood copper. He turns out to be Welsh and is soon comparing pubs in the valleys with another Welshman. A lot of the men drink beer and too many talk work whilst the women gather together and drink lemonade. The odd engineer appears and pours himself a mug of white wine, ignoring the red. Then the hard bunch arrive, fresh from the French ferry on a stormy day, having collected their duty-free, ignoring what they've been eating and drinking for the last 36 hours, including the moules marinieres. Now everybody's there and determined to do their bit whether it is drink, eat or even talk more work. Those who are both young and sober, in other words the secretaries, dance in CET's office and are even joined by the odd man who isn't too old or sozzled to join in. Eventually the supplies are consumed and opening time has come round. The English give up and go home.

The Scots and the Welsh find some whisky that the Latin commissionaire had stacked away and then retire to the George and Dragon. They started off in France so they're getting international as well as drunk. The evening passes, accompanied by a steak, and at least one Scotsman misses the last train home (to St. Albans).

The next day it transpires that the Welsh, drinking beer, have challenged the Scots, drinking whisky, to a championship match. It seems to be about drinking, but the ferocity of the argument makes you think it could be about golf or rugby. The Engish keep quiet. Otherwise all is still apart from the odd twitch when the 'phone rings. The Celtic fringe return home for the weekend to recover whilst the Engish go to the TCPD party in the evening. So ends that part of the festive season until the SCPD party in four day's time.

Isn't it strange? All those parties in the depth of the British countryside on remote hill-tops and we never hear what really happens.

At Christmas play and make good cheer,
For Christmas comes but once a year.
- Thomas Tusser

AUTOMATIC VIDEO MEASUREMENTS

The new Video Waveform Analyser, coded ME3P/502, has just been produced as a small batch prior to a major production run. Details of what it can measure have been circulated in a memo from John Packman. One prototype will spend a couple of weeks at each of several team bases as part of a field trial. The basic specification does not reveal some of the subtle features of this new and 'smart' instrument.

It is our first major piece of measuring equipment to have built-in intelligence. Upon being given a video waveform the Analyser will measure everything it can, compare it with the station maintenance limits, and then print the results. If it has a two-wire access to the generator, it will even change the waveform to suit the measurement. Degrees of automation are variable from totally manual up to 'having tea while it's doing it'. It goes without saying that it can't make the tea - yet! The machine really comes into its own when a BBC microcomputer is connected to it. The print-out then contains station and Engineer names and moves into the realm of graphics. The results can be automatically compared with the previous set and changes highlighted.

It is intended to buy one for each TV maintenance base plus one for Maintenance Centres and training as necessary. The cost is five thousand pounds each (made by Avitel) so the investment will be quite large. It is also intended to produce a simplified version with a suitable interface to replace the MJVs in the fullness of time. In the current form, the machine will not measure all our parameters since it has been designed to suit the all-BBC basic requirement. Each department will then have customising options to suit by using spare slots in the mainframe. The processing is based on the standard Z80 range of units (ZEUS) also used on HF automation, MIC VDUs and firmware development systems. The same units appear in the television world as ANT, DOG, EAGLE and other such fauna - the first is Animated News Titles and we'll leave you to guess the others.

MURPHY'S LAW

1. All warranty and guarantee clauses become void upon payment of invoice.

2. Dimensions will always be expressed in the least usable terms. Velocity, for example, will be expressed in furlongs per fortnight.

3. A dropped tool will land where it can do the most damage. (Also known as the law of selective gravitation).

4. The probability of a dimension being omitted from a plan or drawing is directly proportional to its importance.

5. Interchangeable parts won't.

6. Probability of failure of a component, assembly subsystem or system is inversely proportional to ease of repair or replacement.

7. A fail-safe circuit will destroy others.

8. A failure will not appear until a unit has passed final inspection.

9. Manufacturers' spec sheets will be incorrect by a factor of 0.5 to 2.0 depending on which multiplier gives the most optimistic value. For salesmen's claims these factors will be 0.1 and 10.0.

10. The necessity of making a major design change increases as the fabrication of the system approaches completion.

11. Firmness of delivery dates is inversely proportional to the tightness of the schedule.

12. In any given calculation the figure that is most obviously correct will be the source of error.

13. A customer's acceptance of a scheme proposed by Projects Department is in inverse proportion to the amount of effort they have spent researching and evaluating.

HOLME MOSS WINTERS

As we look towards another winter my thoughts turn back to previous winters spent at Holme Moss remembering things that made us laugh which are perhaps only funny in retrospect. Like the time Mr Mitchell walked lightly over a snowpile saying 'Come on Kathleen, it's safe here' forgetting that when weight was being shared out I was in the front row. When I did finally step out of the bus I sank into a snowdrift over waist high. Mr Mitchell and Mrs Clarke tried to pull me out of that one with difficulty as we all three had hysterics trying to get me onto the duckboard that someone had brought.

We go shopping into Huddersfield and once had to go in January. The bus driver and I set off down the drive to where the bus had been left to find it encased in ice. Jim worked with the de-icer to clear the windscreen so we could see where we were going. All very well until the heat from the engine warmed the ice enough to melt it just as we were going round a roundabout in the busiest part of town. We can still smile at the memory of people staring in amazement as the ice slid gracefully to the road with an almightly clatter.

There was also the time we had to go out into a blizzard and Nelson Bull offered and tried to shield me from that awful biting wind. He really boosted my morale as people who know Nelson and myself will appreciate. So wherever you are Nelson, thanks for that.

I could go on forever about these things, like Derek Newell lending me his goggles - then having to lead me by the hand because I couldn't see, or Mike Greenwood bawling me out for setting off alone through snow up to six feet deep, and the time some of the engineers went looking for a man who turned out not to be lost at all, I can still see Mike Salmon bribing the man with the snowplough, using Frank Orme's whisky, so they could get me in to cook the meal. I hope it was worth it Mike!

I've left home intending to go to London and ended up snowed in here for four days, and seen engineers digging a path with shovels so I could go home. I've been brought in on a sledge and tried snow shoes that broke, but I know that when I have retired from my kitchen and am left with only yesterdays my abiding memory will be of the care and kindness always shown to me during my winters with the BBC, so thanks for the memories, lads.

Miss Kathleen Turner (Cook)
Holme Moss Transmitting Station

Matters of common interest to the Administrative Assistants were discussed when all those who could, attended a meeting at Sutton Coldfield at the end of October.

Gathered together in the sunshine at the end of the sessions are : front row - Marjorie Rothwell, Margot Robinson, Liz Wild, Betty Rae, Eileen Briggs, Hilary Hayes, Pat Rowland and Audrey Clarke. Bringing up the rear are Sean Newbery, George MacKenzie (C.E.T.), Mike Stratton and David Sandbrook.

Photo : Bob Robson.

'A happy time was had by all' seems to be the feeling in this photo at the end of a Safe Work at Heights course held in the first week of November at Sutton Coldfield. Climbing staff from A.C.E.D., T.C.P.D. and Transmitter Group were there including Clive Hosken who is one of the course instructors. Other transmitting station staff also visible in the picture are Miles Ashton and Ricky Janes from Wrotham, Derek Newell from Holme Moss, Neil Bayliss from Droitwich, Derek Ward from Woofferton, Willie Skinner from Rosemarkie and Brian Mitchell from Heathfield.

AUDIO MEASUREMENTS

A lot of confusion seems to exist over audio measuring techniques. Various changes have recently been made and units such as dB4, dBu and even dBqOps have appeared. All the details are in fact published in Test Procedure ATP-G but it could be useful to simplify this to current practice only and publish it as a Transmitter Technical Pamphlet - what do you think? Please tell John Packman.

The science of audio measurement has been manually intensive for many years although an early attempt was successfully based on electromechanical techniques. These devices are now worn out and new ideas are forming. In 1980, some sequence generators were made that send a full test but slowly so that an AC Test Set could be used at the receiving end. At the moment each MIC has one of these but it is not intended to get more. The AC Test Set has meanwhile mutated into the ME2/5 Test Set which is half-size, lost some minor facilities but gained some, including sweep.

Several broadcasters identified the need to speed audio measurements and early in 1981 the EBU produced an outline system for short duration tests. These were realised by engineers using bus-controlled equipment and desktop computers thus proving feasibility. The first applications were in Equipment Department test room. For those who wanted something more customised an Australian firm produced a dedicated Test Set to the EBU specification but it unfortunately cost more than a computer and an h-p audio analyser. The search for something cheaper goes on since at £8000 for both ends of the dedicated set life would be expensive. The HF stations need a very simple test to check distortion, level and noise at the start of transmission and this is being done by bussed devices such as Modulation Analysers, with fuller tests on demand, all under the direct command of the Control System. Checking of lines is another area with special requirements. It would be invidious to mention names, departments, or even countries since there are so many people involved but everyone hopes that a reasonably standard approach will be found.

RAMPISHAM RE-ENGINEERING

Nearly 9 months have passed since the beginning of Rampisham's rebuilding programme, and already all parts of the building and site have been affected. The first two of 34 self supporting towers have been erected - a 50m and a 60m - and Marconi's will start the building of new BBC designed 4 band arrays very soon.

A contractor's village has been developed. Four contractors are already on site each with their own enclosure, and a total of 10 cabins; other contractors are expected soon. Even at this early stage at least 20 contractors employees can be expected on site each day.

The installation of S41, the first AEG 500kW transmitter, has been completed and it is now being commissioned. The transmitter has already radiated 500 kW into the dummy load on some frequencies; tests are continuing on other wave bands. These will be followed by tests with the Transmitter in its automatic mode.

S41 is unlike Rampisham's existing equipment. It even looks different! Most of the transmitter's indicators, controls and meters are in a bay incorporated in the front of the RF cabinet. There are no tuning controls as such although manual control of certain tuning stages is possible - the transmitter being designed for automatic self tuning operation. Over 100 LEDs are used to give indication of status and O/L.

The AEG transmitters each use a single 11kV supply with their own HV and MV transformers. The EHT and valve O/L protection employs crowbar technique using an 'ignition' to take the fault current. The protection has to be such that if a s/c consisting of a 0.3 mm diameter wire is connected across the RF O/P valve, and EHT applied, the O/L circuitry has to suppress the EHT before the wire is ruptured, which with an EHT supply capacity approaching 1 MW is quite a feat!

S41 only uses 3 valves, RF drive, RF O/P and PDM switching valves. The transmitter employs 'Pantel' modulation - an AEG development which is based on a series PDM modulator. The PDM valve, together with a transformer and commutating diodes, switch the EHT to give a 0.30 kV square wave with a repetition frequency of 54 kHz. This is filtered to give a DC EHT supply to the RF O/P stage anode. Varying the Mark/Space ratio either side of its starting value in direct proportion to the either side of its starting value in direct proportion to the instataneous value of the modulating signal. The EHT, therefore, varies either side of its starting value in sympathy with the modulating signal, producing anode amplitude modulation.

Delays are creeping in to the project. AEG have just announced a 3 month delay and the building contractors are 3 weeks behind schedule, but then considering that it has rained nearly every day for the past 6 weeks and they are working in ankle deep mud, it's not surprising!

Roll on Spring!

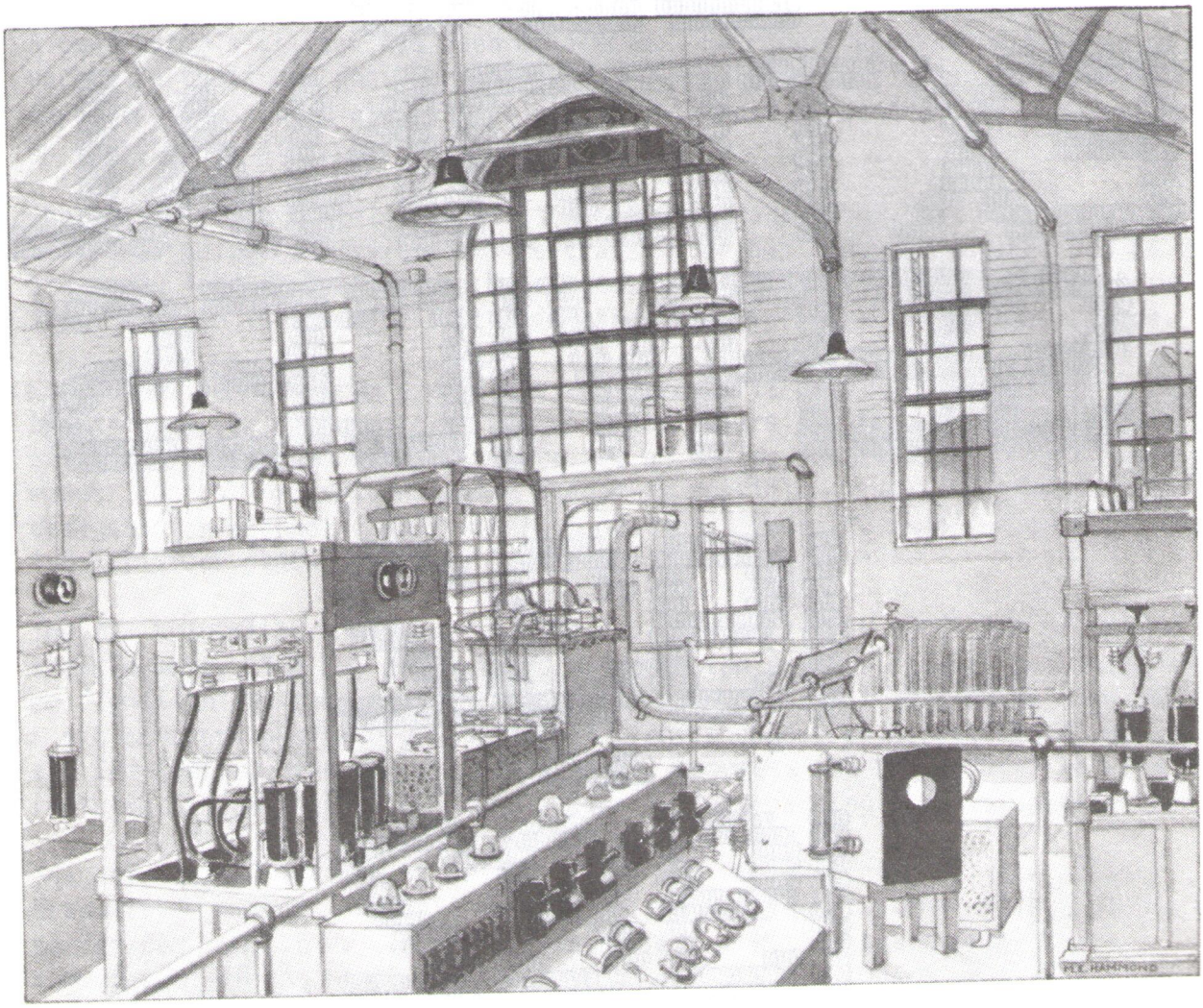
G. Avis

BBC EXTERNAL SERVICES

1932 1982

So much has been written regarding the 50 years of broadcasting that I was rather hesitant when asked to do a special section to commemorate the event. Not only does it seem to have all been said, but it has been said with such journalistic expertise. However, I have tried to bring together various items of 'never before published' which could be of interest.

DAVENTRY CHRISTMAS CARD 1949



'THE OLD GENTLEMAN' or to give its correct title, Daventry 5XX was built in 1925. It was opened in July of that year by the Post Master General and its opening was commemorated by a poem, part of which is reproduced below, written by Alfred Noyes. The drawing shows the transmitter in 1949 in a partially dismantled state after years of faithful and honourable service.

You shall hear their lightest tone
Stealing through your walls of stone

Till your loveliest valleys hear
The far cathedral's whispered prayer.

Daventry calling . . . Daventry calling . . .
Daventry calling . . . Dark and still.

MORE GOINGS ON AT DAVENTRY

In the autumn issue of Transmitter Group News under the heading 'Goings on at Daventry', Norman Rhodes reported on two events inspired by the 50th Anniversary of External Broadcasting. There were more to come.

Derek East, President of the Daventry Club, presented a commemmorative Rose Bowl to be competed for in an annual sporting event. Ken Bradford emerged as the first winner of the Trophy, but modesty prevents me from naming the runner-up.

Reflecting the hard times we live in, staff celebrations to mark our Anniversary were confined to a get together on station. An almost 100% turnout of staff and their wives, together with our retired staff and their wives, set against a background of three (in service) SWB18's, ensured a nostalgic occasion. George Mackenzie, Bill Mitchell, Derek East and their wives were very welcome visitors.

From the proverbial 'Five barley loaves and two small fishes', our proficient canteen staff produced a memorable buffet and the effect of quantity as well as quality was produced by mirrors. Lubrication was leftovers from our standby engines, but few recognised it after the first glass.

Every successful day has its one bad moment and, on behalf of one of my retired staff, I apologise to George for the unauthorised modification to the aerodynamic shape of his car whilst it was parked on the station. (S.I. 314 para 4 clears me, but Notes for Guidance P/2/1973/2 may be more sympathetic, George).

D.E. hosted our 50th Anniversary Guest Day. D.G., M.D.X.B., C.E.X.B. and A.C.E.T. were the principal BBC visitors, together with eighty invited local notabilities. The focal point of the afternoon was the unveiling of a commemorative plaque by D.G. The inscribed plaque, mounted on a black acrylic resin base, has a distinct resemblance to one of the old split stator tuning capacitors and very handsome it looks.

Station staff produced a number of effective displays, old and new test gear, components manufactured on station, valves, some dating back to the 5XX days and aerial parts, all of which appealed to visitors and guests alike. Peter Wagstaff's 'Black Museum' of failed aerial parts evoked particular interest.

D.G. appeared to enjoy his first visit to an HF transmitting station and commented on the impressive size. Modestly, we advised him that he was in the largest transmitter building in the world. I am relieved to say that, on this occasion, there were no bad moments, but the evening shift T.E. may not agree with me. To be caught by D.G. in the middle of eating a tomato with his fingers was embarrassing enough, but to have the remainder scrutinised by the aforesaid and jokingly pronounced as 'being of inferior quality' will take some living down!

Right, back to work lads.

Maurice Williamson

George Mackenzie, Alasdair Milne (D.G.), Maurice Williamson & Bill Dennay

CONTEMPORARY ACCOUNTS

Rampisham have provided us with extracts from the magazine Wireless World which claimed a part in furthering the development of Empire Broadcasting by statements contained in a leader in its issue of July 14th 1926.

'Broadcasting provides a means, such as has never existed before, for linking up large areas and even bringing different nations into mutual touch with some central point. We, in Britain, are often being accused of insularity in our outlook and despite the fact that the British Empire extends to every corner of the globe, our broadcasting organisation has been set up to serve this country alone, with no consideration for the possibilities of reception farther afield.' After publishing a further article on the possibilities of reception in the Colonies of transmissions from home, the response was such that Wireless World claimed that 'the possibilities of people in the Colonies being able one day to listen in with a wireless set to the transmissions of the Mother Country are looked forward to with an eagerness which should stir us to a sympathetic response'.

The Empire Service, once started, however, was not without its critics. We read in Wireless World dated June 22nd, 1932 from a Mr R.L. Mann in Kenya:

' . . . I have no wish to be rude, but it seems so strange to think that England, the pioneer of wireless, is now the nonentity, the banana skin. My 'listening-in post' is not set in a congested suburb of a big city where aerials jostle one another like spider webs in a wine cellar, where the shriek of reaction in agony kills all but the loudest signals. No! I am not there. I am on top of the world. I am 5,000 feet above sea-level, and the nearest house is several miles away. I have an ideal listening post such as all may envy. When I tune in I hear the uttermost parts of the world, not because I am clever; not that, but by reason of my position. I hear Moscow, built last year, I think, with her two- to three-hundred kW output. Willy nilly, one must hear that. I hear Milan, Rome. I hear France, with her splendid new S.W. station built especially for the benefit of her colonies. Not one station, but two. One directional N. and S., the other E. and W., with a total of four wavelengths, so that every colony might have every chance of good reception. Stations with a punch in them, and one so close to G5SW that one must have a good set to tune it out. Then I hear an automatic Morse which seems to work night and day like a hive of mammoth bees; and then comes a harmonic of Moscow, the giant Bolshie, louder and clearer that G5SW on its own wave. Then, whilst I split the divisions of the dial into decimal points, I steal through, whilst holding my breath, to get my lover, G5SW; but should I over-shoot by the fraction of a hair's breadth I run into another Morse automatic. In any case, almost without exception, I have that constant back-ground of Morse, which saps one's concentration.

Is this our much-vaunted link with the Empire? Is this the best that Britain can offer her sons across the sea? Is this the outcome of the Colonial Conference?

I saw in the Press that those in authority were huffed or annoyed because they did not get any telegrams of congratulation on the new service. The apathy is more eloquent than the praise.

Speaking personally, I tune in to G5SW out of sheer sentiment; the programme value is not worth a dime, I get better programme value from Manitoba, and Oaklands, California. It sounds like swank to talk about these far-distant stations, but I do not imagine for one instant that I am anything more than a mere novice; but what I do say is: If I get these stations - I think I have logged sixty - why on earth should G5SW be so consistently bad?'

President Devan Nair on his visit to the Jubilee Exhibition at F.E.R.S.

Three of the Big Guns on Ascension Island - pretty old - only one still working!

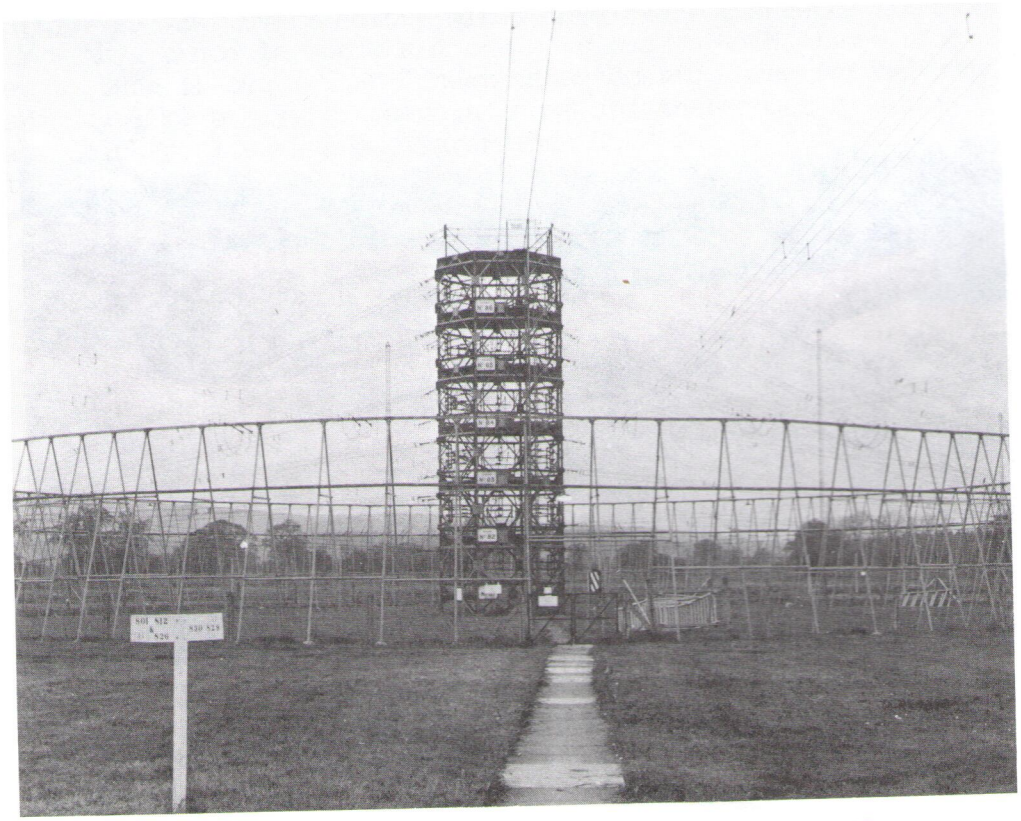
WOOFFERTON : A BRIEF HISTORICAL PERSPECTIVE

Of the High Power HF Transmitting Stations built during World War II, Woofferton (O.S.E. 10) was the last to be completed. Equipped initially with six RCA Type MI 7300 50kW transmitters (Senders 81-86), these having to be shipped across the Atlantic as they were the only suitable units available at the time, the station opened on 17th October 1943. Problems were immediately encountered because the transmitters were not designed for rapid wave-changing, but substantial modifications to overcome these difficulties were carried out by station staff under the directions of L.F. Ivin, Engineer-in-Charge.

The early years of Woofferton were characterised by a certain lack of continuity in operations. The station closed down in August 1944 when the transmitters were removed for use by the Armed Forces, but re-opened again three months later when four of the transmitters were returned (a considerable time was to elapse before the remaining two were re-installed). Again in June 1948, the station was closed down, this time for economic reasons; it re-opened three weeks later, financed by the Voice of America, to relay two VOA networks. In 1949, the BBC Russian Service was added to the Woofferton schedule, and shared use continues to the present day with BBC programmes being radiated when the facilities are not required by VOA.

In 1963/64 Woofferton was completely re-equipped - six Marconi BD252 250kW transmitters replaced four of the RCA 50kW transmitters (the remaining two being retained as spares). The aerial site was extended from the original 180 acres to 320 acres; the aerial switching was demolished and a trunk and feeder system was installed; the complement of twenty seven aerials was increased to thirty five.

A further improvement in the facilities at Woofferton was completed in 1981 with the installation of four Marconi B6124 300kW transmitters, replacing the last two RCA 50kW transmitters; the B6124 is designed for remotely controlled operation on any one of thirty two pre-tuned channels. At the same time, four new wide band arrays were erected on the site, these being of computer-assisted design by a U.S. Company, T.C.I. And finally, in perhaps the most significant recent development, Woofferton became the first HF station to be equipped with a microprocessor based automatic control system, developed by Designs Department in conjunction with T.C.P.D.



The old aerial switching tower, Woofferton 1961.

NUMERATOR

```
          x7xxx
      ----------
xxx   xxxxxxxx
      xxxx
       xxx
       xxx
       xxxx
        xxx
        xxxx
        xxxx
```

This skeletal division sum works out exactly, with no remainder. Given that the second figure in the five-digit quotient is a 7, you are asked to deduce the remaining figures.

See next issue for solution.

THAT WILL DO NICELY . . .'

A letter was recently received from American Express Company, addressed to 'Mr T.M. Oxford, Bbc Transmitting Station.' They probably ran out of genuine names to circularise ages ago!

SAFE CRACKING ANSWER:

2s - second row from top.

BIG BROTHER

A man called at our house the other day to see our television licence, as he was checking all the licences in the street. I was about to dash out to meet my boyfriend, so I asked him if he would mind coming back the next day when Mum would be in. I told him where we kept the licence, so it would save Mum a search. When he returned the following day, Mum answered the door. 'Excuse me Madam' he said, 'I'm checking the television licences in the area and I believe yours is in the top left hand drawer of your husband's desk.'
'Good heavens' said my Mum in total surprise 'I had no idea those detector vans of yours were so accurate!'

(Letter seen in a magazine)

MINOR CAPITAL EXPENDITURE PROPOSALS ISSUED

TG No.	TITLE	DATE ISSUED	AMOUNT £
41/82	HF Stations : High Voltage Test Equipment *	20.09.82	6,400
42/82	Battery Chargers and Switch Tripping Units *	21.09.82	1,700
43/82	Heathfield : Building Improvements *	28.09.82	18,500
44/82	Skelton : New PABX *	15.10.82	9,783
45/82	Rosemarkie : Rewiring *	14.10.82	1,800
46/82	Woofferton : Electricity Metering *	20.10.82	8,780
47/82	Surescue Safety Devices *	09.11.82	2,600
48/82	Spare UHF Feeder Connectors *	04.11.82	9,000
49/82	Rigger Radio Telephones *	09.11.82	9,000
50/82	Skelton : Provision of Power Winch *	10.11.82	1,000
51/82	HF Transmitters : Synthesisers *	15.11.82	1,000
52/82	Thrumster : Range Rover	23.11.82	4,500
53/82	Daventry : Replacement Milling Machine	18.11.82	6,372
54/82	Reserve Drive Monitoring Pye UHF 77	18.11.82	9,880

*** Denotes schemes approved**

T.G.O.R.s ISSUED

No.	TITLE	DATE ISSUED
24/82	Bartley : Removal of Mast and Buildings	16.09.82
25/82	Girvan : Access Track Improvements *	25.10.82
26/82	Brougher Mountain : TV Feed	29.10.82
27/82	Replacement of MEL Amps	02.11.82
28/82	Larne : New Building	30.11.82

*** Denotes schemes approved**

NEW AND DISCONTINUED SERVICES

NEW RADIO SERVICES

NORTH HESSARY TOR	Exeter, St Thomas (VHF Stereo)	29.10.82

NEW UHF STATIONS

ANGUS

Tillicoultry	5.11.82

CRYSTAL PALACE

Alexandra Palace	19.11.82

DIVIS

Cushendall	15.11.82
Cushendun	15.11.82
Glenariff	15.11.82

HANNINGTON

Chiseldon	5.10.82

HOLME MOSS

Holmfield	3.09.82

KIRK O'SHOTTS

Cathcart	19.11.82
Dunure	22.10.82
Holmhead	2.12.82
Largs	15.10.82
Strathblane	17.09.82
Twechar	19.11.82

MELVAIG

Tarbert	22.10.82

MENDIP

Portishead	10.12.82
Redcliff Bay	10.12.82
Wootton Courtenay	8.10.82

REDRUTH

Bossiney	24.08.82

TACOLNESTON

Ipswich (Stoke)	19.11.82

WENVOE

Abercynon	5.11.82

WINTER HILL

Melling	26.11.82
Orton	15.10.82

CLOSURE OF 405 LINE SERVICES

FORT WILLIAM

Campbeltown	5.10.82
Port Ellen	5.10.82

HANNINGTON

Hungerford	5.10.82
Marlborough	5.10.82
Swindon	5.10.82

KIRK O'SHOTTS

Ayr	4.10.82
Girvan	4.10.82

OXFORD

Oxford	4.10.82

PETERBOROUGH

Bedford	8.10.82
Cambridge	8.10.82
Northampton	4.10.82

SUTTON COLDFIELD

Hereford	4.10.82

TACOLNESTON

Aldeburgh	4.10.82

NOTE FROM THE EDITOR

Please can I have your ideas and contributions for the Spring issue by Friday 18th March.

Colin Inglis
Room G2, Grafton House