

## The utterly outrageous inventions of Geoffrey Walter Henry Larkby 1910-1999 by his daughter Pauline Dearing

### Introduction

Quite some time ago I was invited to write about my father, Geoff Larkby, who was an engineer with the BBC from 1936 until his retirement aged 60 in 1970. It is with some trepidation that I embark on this task. I have much information and will try to convey his warm personality, his enthusiasm for projects and his original approach to problems which he solved by, to quote Douglas Birkinshaw on father's retirement, "clever, cunning, and if I may say so, utterly outrageous inventions which work so well".



Although eventually rising in the BBC and attaining a personal grade he was definitely a 'doer'. He had not followed the usual more academic entrance to work at the BBC but had had a variety of jobs prior to working for the BBC all of which gave him experience which was to stand him in good stead for the engineering challenges ahead.

In the 1980s GWHL recorded an audio cassette tape account of his early life which runs up to the time he was seconded to the RAF to work on RADAR. He also preserved a great number of photographs (not necessarily labelled) and other papers.

### Early life and early employment

Geoffrey Walter Henry Larkby was born in 1910, the son of a bank manager and a former nurse. His father died when he was five years old and he was sent to boarding school in Harlow, St Mary's College known as Harlow College, a school founded in 1862 and specialising in the Classics.

When he left school his mother apprenticed him to Gordon England, an engineering firm which made specialist bodywork for Austin Sevens. Gordon England had been a test pilot, designer and factory manager and he applied the lightweight principles from aircraft to car bodywork. He started by racing, and then selling to the public. The firm expanded with its patented body system but the depression in America forced it to bankruptcy in 1930.

GWHL was offered the chance of transferring his indentures to another motor car company but by that time he thought that motor car engineering was really not for him.

It was about this time that he began to take an interest in radio and he thought that the radio world or electrical world could offer something a bit more than that of the motor car world so he found a job with a small radio company, name forgotten, but from there he went to Messrs Ultra. He had also been employed by S.T.C., Philco and H G Russell. Ultra Electric Ltd was a well known manufacturer of radios, amongst other items, and there he learnt a lot about repairing radio receivers.

From that firm he moved to the service department of the A C Cossor Company. Here he met two men who became leaders in their fields, Leslie Herbert Bedford in radar development and Owen Standige Puckle in early television.

Geoff Larkby (GWHL) also worked for Standard Telephones gaining experience with automatic telephone equipment and many other electrical devices. Armed with this experience, he joined the Post Office as a labourer, an unskilled workman. Instead of digging holes in the road he was sent to help with the building of the new automatic City and Central Telephone Exchange at Faraday House, in Queen Victoria Street. Whilst here doing a very repetitive job he made an automatic testing device which came to the attention of the District Engineer. He won a Post Office Engineering Award and was promoted from being a labourer. When filling out the form for promotion he wrote that he spoke small amount of German and a small amount of French and with those capabilities he was sent to the International Repeater Station. So with his knowledge of valves he was given French lessons every morning and he dealt with equalising long distance lines to Paris, Moscow and Madrid where using his languages he was learning a new technique.

After about a year he realised that he was not going to get on in the Post Office unless he obtained an Honours Degree and became an Engineer, so his thoughts turned to the BBC where he thought his lines experience might help.

## Interview experience at BBC

The job at the BBC paid twice his previous salary and he was very impressed with the courtesy of the staff and the carpets in the offices! His Post Office boss warned him about throwing in his lot with the BBC which, the boss pointed out, was only a small concern compared with the government controlled Post Office.

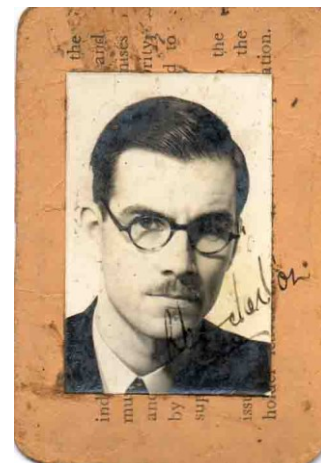
## Start at BBC – 1935

His first job was as a Relief Engineer, filling in slots where somebody was required. He had to carry a record, which was Henry Hall's *Teddy Bear's picnic*, the standard BBC test record

at the time, and with another engineer test the studios. This was done very thoroughly before every transmission from the studio, every mike was tested, every plug and socket in the studio was tested, the gramophone pickups were tested and there was a system of signals from the control room. Each mike was talked into in turn and if the test were successful the studio red light would be flashed once and if there were some trouble then there would be two flashes. This one flash for yes and two for no was a kind of standard code and covered most contingencies.

## Description of times in the BBC about 1935

Radio had three channels, the national, the regional and the Empire. The Empire was on at strange time due to the overseas broadcasting network times of transmission. This was also the time when the thirty-line Baird television system, which was done from two studios in BH basement, had just finished. The competition was on for the two systems, the Baird 405 sequential system and the EMI 405 line interlaced system. Some engineers left the London Control Room to go to Alexandra Palace to build the Alexandra Palace studio.



Always wanting to know how things worked, what exactly was inside a grey box, GWHL was always taking things to pieces, so the BBC decided that he would be better employed in the Maintenance Division. This was on a shift system of three shifts a day, shift one 0900 till 1645, shift two 1645 till 2300, and shift three or the Empire shift 2300 till 0900 next morning. The Empire shift was generally not busy and as long as the telephone was manned an engineer could snatch some sleep. GWHL's favourite place was on top of the tick tock box which was nice and warm in an alcove in the roof of the control room on the eighth floor. The interval signal before WW2 was just a tick tock produced from a microphone listening to a slave clock off the master.



Broadcasting House (BH) Control Room on the eighth floor showing the National, Regional and Empire Control Positions, GWHL nearest the camera.



GWHL as Transmission Supervisor,  
BH Control Room



## Run up to WW2

As it became obvious there was going to be a war there were secret papers produced which contained the orders to be opened by the Senior Control Room Engineer in that event. These were ex Navy men and could be counted on to carry out their orders to the letter.

## WW2 start 1939

The political situation was worsening and the question was what to do about the Control Room which was on the eighth floor and incredibly vulnerable to bombing.



It was decided to make a temporary control room in a linen cupboard in the basement which measured approximately twelve feet by six feet where three sets of Outside Broadcast portable gear to keep the service going, and a change over mechanism switch which changed the main lines from the top control room to the bottom control room so in an emergency, switch these switches over, go down the battery driven Outside Broadcast gear and work from there. This was duly done but there was no ventilation and was so hot one could only work in there for a short time.

There is a photograph (Plate V) of the 1939 temporary wartime control room in Edward Pawley's book *BBC Engineering 1922-1972*.

The maintenance division was told that they could no longer go home every day but would do a fortnight on duty at a time and be available 24 hours a day (as far as GWHL remembered). They were permitted to bring in tools or a lathe or other items to pass the time more pleasantly. Meanwhile the variety studio, Studio BA, next door to the linen cupboard control room had a sort of stage and it was decided to build a new Control room on this with adequate facilities and mains driven equipment.

One of the incidents that GWHL remembered was when they were checking a broadcast to ensure it was going out to the transmitter. Normally this would be done by plugging in headphones but in this instance the Senior Control Room Engineer could not find headphones and used a field telephone where the microphone was switched on by picking it up. He located the fault but unfortunately forgot to unplug the telephone leading to a transmission of lots of people saying 'Bobby Howe has found it', meaning found the fault. Eventually the transmitter rang up to say there was 'interference on the line'. Next day there was a visit by Queen Elizabeth and King George VI and when they got to the Control Room the Queen asked who was Bobby Howes they had heard so much about the previous night.

The new Control Room built on the stage of Studio BA was finished with the racks of equipment supported off the rear wall by a series of stays about two foot six to three foot long. Now in order to be near the job all the time, because by now the air raids had started a little, GWHL decided to make a hammock and sling it behind the racks to be instantly available to start up auxiliary generators or do anything else required. The Senior Control Room Engineer, Mr Radford, who was ex-Navy, insisted that he make the hammock to naval standards and apart from being woken occasionally by stuff tossed over the racks it was a relatively comfortable place to sleep.

Air raids were going on fiercely and the building shook and the department wanted to hear what was going on outside. GWHL got two Chinese hat enamelled metal lampshades and mounted them face to face with a mike in between to create an omni-directional microphone

and he hung this on the top of the middle mast of Broadcasting House and brought the leads down through the Control Room. It was joked that if the gain of the amplifiers was turned up you could hear the enemy saying 'Let go' as the noise of a bomb was truly frightening. This really served its purpose when a firewatcher on the roof was calling for help and his telephone lines had been cut by shrapnel but he was heard and help was sent. After that the powers that be had two or three mikes installed to make an alternative communications arrangement for the firewatchers.

Broadcasting House was hit by bombs. This is a transcript of GWHL's recorded account of two bombs.

But of course, then we had a tragedy hit the building. We had this man on the roof and about seven o'clock one evening he called down to us that a stick of bombs had been dropped, one north of us, further up Portland Place, and one south of us, somewhere near Regent Street but he thought there was a third one and he thought that it had hit us.

Well, there was no explosion in the building but at any rate the fireman started on a search and they got to the seventh floor and found a hole in the side of the building. In point of fact, I can't - the exact time of this bomb hitting the building was known because as it came through the room it cut the clock leads and stopped the slave clock, so the bomb actually clocked in. At any rate they found the hole in the seventh floor, the hole in the - the hole was in the - really the outside wall of the seventh floor and there was a hole in the floor so the fireman then went down one stairs to the sixth floor and he found a hole in the roof and a hole in the floor so down he went to the fifth floor and all he could find on the fifth floor was a dent and he could see no bomb at all. Everybody went back and looked everywhere and couldn't find the bomb.

Now well the construction of Broadcasting House is rather peculiar. There is a central tower which is built of blue engineering brick which is very hard and this tower contains all the steelwork for the studio and outside this tower on every floor is a corridor running right round the tower, and then outside the corridor are the offices which have outside windows. So the steelwork of the outside portion of the building is not connected to the steelwork of the inside of the building. This gives good sound insulation and makes a very strong structure because this blue engineering brick is very thick, about three foot, something of that nature at the bottom, I suppose, going down to about eighteen inches further up the building. There are very few doors through this tower structure but there is one on the fifth floor and what had happened was that the bomb had got down as far as the fifth floor which was the newsroom, taken one bounce and bounced straight through the office door which was open and clean

through the one door in the tower which was open into the music library. It had gone over a rack of music and hit the next rack and the rack landed on top of it and buried it.

Now we had a message from the fireman by telephone saying that he had found the bomb by this time some forty minutes had elapsed and the police had been in the building and said you must evacuate the building and the man in charge who was an army man who we won't mention his name said, 'I'm in charge of the building and only when I decide will it be evacuated. I refuse to do anything about it.' Then we got this message from the fireman saying he had found the bomb. What he tried to do, he said something but we never understood quite what he did say but the bomb went off and of course he was instantly killed and, because it exploded in this very strong tower, it couldn't blow out sideways it blew top and bottom and it blew out every floor from the eighth floor down to the second and it killed, unfortunately, fourteen people who were down on the floor below, and injured, I can't remember how many more, and set fire to the building and that was that. It was a frightful business, all the air plant went backwards, luckily the arrangements were such that it didn't interfere with broadcasting, in fact it went off during the news and Bruce Belfrage was reading the news at that particular time.

Well that meant to say that we had got nothing in the way of studios from top to bottom of the place and the eighth floor, which was the old control room was only held up by the apparatus racks which were bolted side by side in standard rack fashion and they worked as a great six foot girder across the floor. I went up there and it was most frightening because you looked through a crack in the floor and there was nothing till you got down to the second.

Actually, all that was the first one. Then the raids continued and then one night the same man on the roof of the building said that there's a parachute mine coming down and they've got the searchlights on it, he gave us a running commentary about how things were going on, and he said, well it's getting so low that they can't get the searchlights on it and it looks as though it's going to come right over our building, and then he went on to say that it is coming over our building and not only that it's gone over and the parachute has caught on the mast. And he said now the parachute is tearing and the bomb, the mine, the pressure mine, was leaning against the side of the building and the parachute tearing and he said well all I can do is to lay down flat and God help us. At any rate, it went down the side of the building and blew up. It killed a policeman who unfortunately was underneath. It set fire to the building and it really did do a frantic amount of damage.

One of the terrible things was that the firemen, of course, were pouring water into the building as fast as they could to get the fire out and all this water was dropping down into the



standby batteries gradually reducing their SG and the volts were dropping down and our problem was to get the third emergency Control Room at Maida Vale, in our studios as Maida Vale, going before we lost volts all together because there was no incoming power and the diesel drove a charging system which charged the batteries but with the batteries being filled up with water we were in a bad way.

But all went well, we managed to get the other Control Room going and I and my partner, we stuck over at Broadcasting House and tried to sort of clear up what we could and get things going with another set of batteries from a lighting set but the water continued to come down and everybody aid well it's no good clearing up really until all this water stops draining down. But after about a day and a half somebody went up the top and of course what had happened was that the blast had broken through a water main half way up the building and this was actually cascading down and we could have stayed there until Kingdom come but in the wreckage that existed it was very difficult to see things like this to begin with. But things were cleared up.

By now it was 1940, GWHL and a Control Room Engineer called R E Young received letters from the Air Ministry asking them to go for an interview. They were asked their salaries and on that salary level were given the rank of Flying Officers. They had been seconded from the BBC to the RAF for technical duties.

## GWHL and RADAR in WW2

He and R E Young built many RADAR stations around the coast – possibly about 30. GWHL followed the invasion fleet to France in 1944 where he was servicing the RADAR ships. His papers are with the RAF Air Defence Radar Museum at Neatishead, Norfolk, England.

This point is the end of the GWHL audio cassette tapes recorded in the 1980s. He was still much too interested in his current new retirement projects, boats etc.

THE BRITISH BROADCASTING CORPORATION

Broadcasting House, London, W. 1

TELEPHONE: WELBECK 4468 TELEGRAMS: BROADCASTS, LONDON

BROADCASTS, TELEX, LONDON

Reference: O2/EST/DAC/NEH

17th November, 1945.

Dear Larkby,

I am writing to let you know that we have applied for the release under the Class 'B' scheme, of all our Engineers serving with H.M. Forces, to return to the service of the Engineering Division of the Corporation. Such release is, of course, subject to your own concurrence, and I should like to hear from you on this point as soon as possible.

Our men will be released to enable us to reinstitute the Television Service, and I should like those of you who are ex-Television men to let me know whether you wish to be considered for any other department of the Division. I must make it clear that ex-Television Junior Maintenance Engineers promoted to be Maintenance Engineers in their absence may not all be able to return to Television work and may therefore be appointed to other duties.

I am unable to say at this date precisely what post you will occupy on return to our service, but your resettlement will be carried out in accordance with Resettlement Officer's letter of the 12th December, 1944.

I trust that you are enjoying good health and that we shall soon have you back with us.

Yours sincerely



P. A. Florence

Flight Lieutenant G.W.H. Larkby,  
H.Q. 60 Group,  
Leighton Buzzard,  
Beds.

## Post war

I have very little in the form of Geoff Larkby's own accounts of his work at the BBC. I do remember him telling me about projects that he worked on and for most of them I have some accompanying information such as photographs, so I will do my best to assemble them in some sensible order although there are some items when I just cannot be sure of the date.

## The IEE (Institution of Electrical Engineers) Faraday Lecture 1948-1949 in conjunction with Television exhibition tour 1948-1949

The IEE Faraday Lecture scheme was introduced in 1924 and was established for the purpose of describing to the informed and interested layman the most recent developments in electrical engineering practice and particularly those having an immediate bearing on the life of the community; at the same time the lectures pay tribute to the memory of Michael Faraday. In 1949 this was to be given by Sir Noel Ashbridge MICE MIEE, Director of Technical Services of the BBC or, if required, by Mr H Bishop, Chief Engineer BBC.

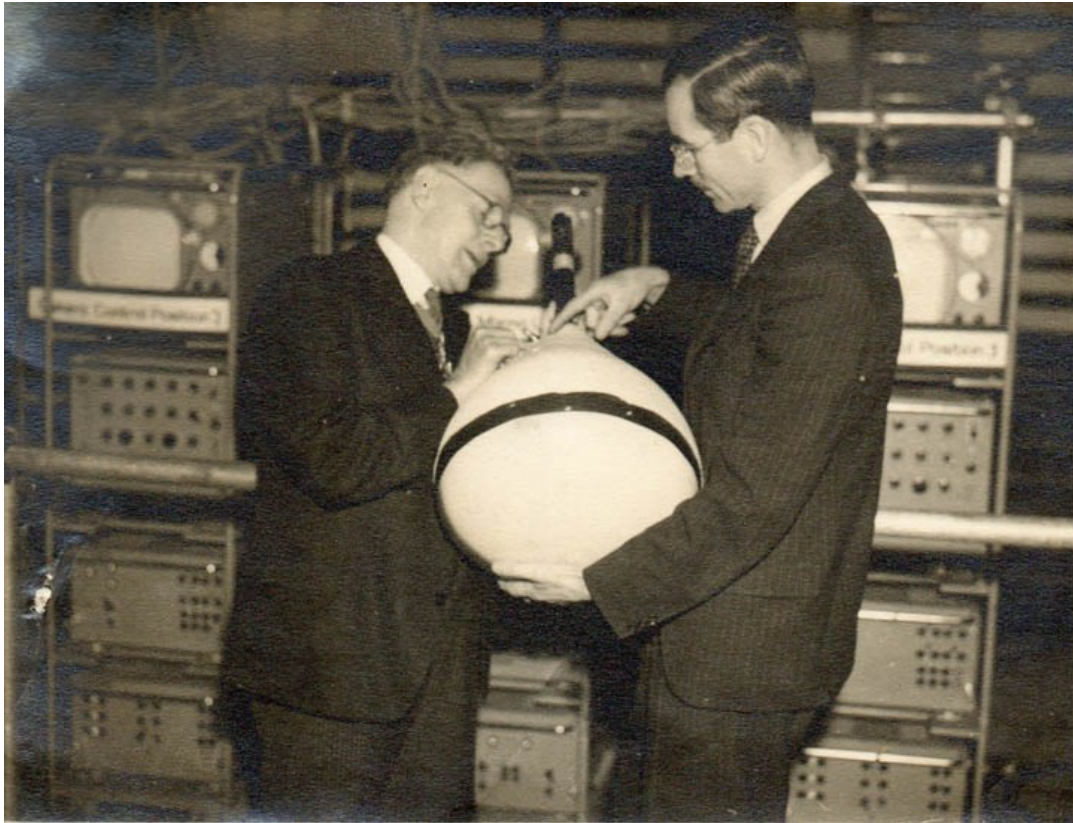
Transmitters did not cover the whole country and the next transmitter, at Sutton Coldfield near Birmingham, was due to open in late 1949, so this exhibition and lecture tour to publicise television went to Bristol, Birmingham, Liverpool, Manchester, London, Leicester, Sheffield, Newcastle and Edinburgh. Geoff Larkby was in charge of this operation.

The exhibitions served a dual purpose: not only did they serve as good publicity for the television service, as a place where you could see television actually working and possibly see yourself on screen, but they provided a warm and secure storage for the large amount of complex and expensive equipment to be used for the lectures.



This photo of the team and one of their BBC vehicles has the names as left to right Mark Levy, Tiger Webb, Jack Belasco, O'Gorman(?), EMI, Proctor, Geoff Larkby, (?), F W Nicolls, Driver Hall, Driver Willis, Driver Steve, Frank Smith.





GWHL demonstrating at the Television Exhibition in Sheffield,  
racks of equipment labelled in the background.



appeared on Saturday. It was found by  
Chadwick, who took it to her home  
Pickston-street, Harpurhey, where it was  
looked after by the family and renamed  
"Tarzan."

4/2/49

## November television for S. Manchester

"Evening Chronicle" Reporter  
**T**ELEVISION programmes  
will be seen in Man-  
chester when Sutton Cold-  
field, Birmingham, station  
opens in November.

Mr. G. W. H. Larkby, a B.B.C.  
television engineer, said to-day:  
"A clear image should be  
received in Manchester, parti-  
cularly on the south and south-  
east sides of the city."  
Mr. Larkby was at the open-

ing of a television exhibition  
at Manchester gas showrooms  
to-day.

Mr. John Coatman, B.B.C.  
Northern Director, said of  
prospects of a television station  
in the North: "There will be no  
avoidable delay."

The Lord Mayor (Miss Mary  
L. Kingsmill Jones) was the  
first Manchester person to be  
televised.

She sat in a chair and was  
televised across the basement  
floor to sets displayed in the  
room. It was also, for the first  
time, television by gaslight.

Television, when it comes to  
Manchester, in about three  
years, will be within reach of  
workers. Sets now are £48 and  
they carry one-third purchase  
tax, which will probably have  
been withdrawn by then.

The mobile engineering unit  
televised me—and will televise  
anyone while the exhibition is  
in Manchester. The screen  
image is a true one, not inverted  
as in a mirror, so that for the  
first time I was seeing myself as  
I "really am." I could see my  
profile in comfort.

The Lord Mayor of Manchester  
(Ald. Miss Mary Kingsmill  
Jones) as she appeared on the  
television screens and (below)  
being televised.

This is at Manchester with the Lord Mayor being televised.





This photo shows the broadcast equipment labelled for public view at the Television Exhibition in Liverpool.



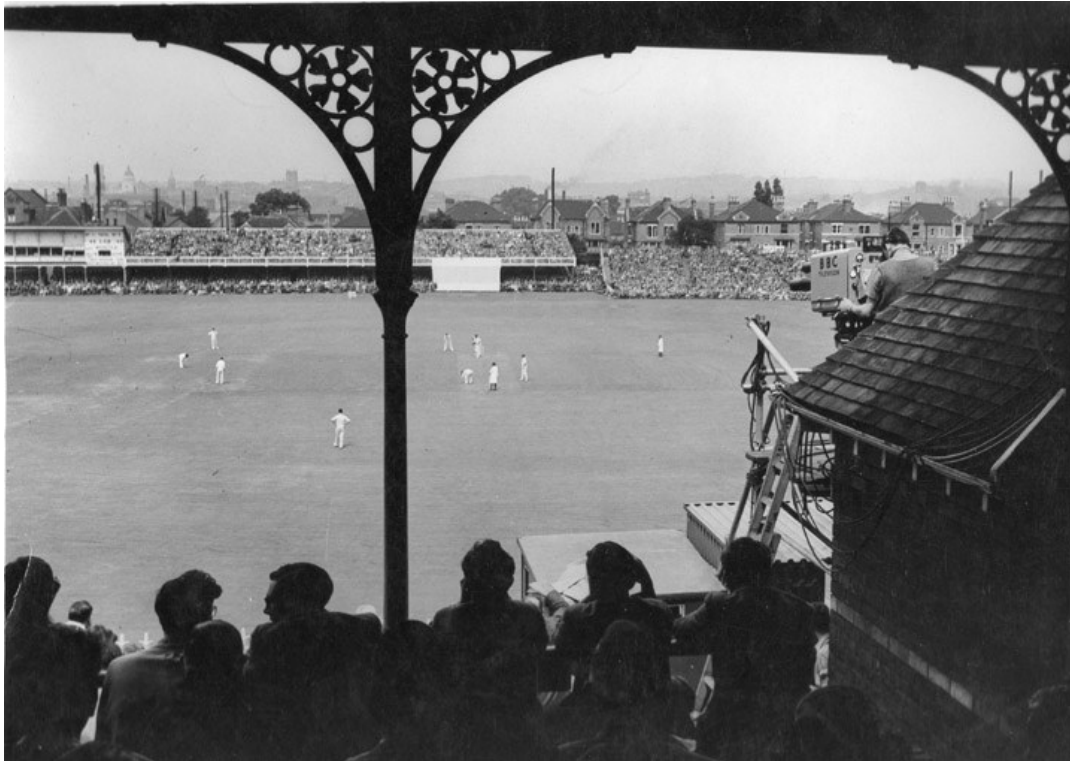
These two photographs show the Television Exhibition in Sheffield where there were 5000 applications for the 2500 Faraday Lecture tickets, demonstrating the great interest shown by the public.

## University Boat Race 1949

First TV OB of the Boat Race as mentioned in Tom Worswick's interview transcript, and also in the Radio Frequency Section of this website's section on Designs.



## OB of Third Test Match England v West Indies at Trent Bridge Nottingham 20 July 1950



This BBC photograph has this information on the reverse.

During the period July 20<sup>th</sup> – 25<sup>th</sup>, viewers were able to follow the Third Test Match at Trent Bridge.

The picture signals were transmitted by two microwave radio links in tandem from Trent Bridge to the Sutton Coldfield transmitting station, where they were broadcast for viewers in the Midlands. They were also broadcast from Alexandra Palace, being sent on there from Sutton Coldfield over the G.P.O. link.

This camera gave viewers close-up shots of the West Indian spin bowlers Ramadhin and Valentine, whose bowling did so much to gain the victory for the West Indies.

## Designs Department in 1950

On [www.bbceng.info](http://www.bbceng.info) there is a photo of Designs Department staff in 1950.



## TV Inlay Process 24 October 1950

This is mentioned in [Tom Worswick's reminiscences](#) and in [Studio Apparatus \(Television\) Section](#)



These BBC photographs taken off the tube demonstrate the “inlay process”. First shot is exterior of building (on a photograph) then the interior of building (studio set).



Composite scene.



“Diagonal wipe” inlay process.



# IEE Children's Christmas Lecture given by H L Kirke Head of BBC research Department 1950



GWHL constructed the mechanical demonstration model of a TV picture being broken down into lines and portions of lines and showed how these were transmitted and reassembled into an image for the viewer to see. This was done using black and white table tennis balls. The image of the dog was physically moved across the stage and reassembled the other side.



**TELEVISION EXPLAINED TO CHILDREN**

**INGENIOUS DEMONSTRATIONS**

It was no surprise to find the lecture theatre of the Institution of Electrical Engineers packed with young people yesterday; television, after all, is the newest toy in many homes, and there is a very natural curiosity to know just how it works. Thus, when Mr. H. L. Kirke, head of the B.B.C.'s research department, described the basic principles of television in a Christmas lecture for older schoolchildren he was assured of an attentive audience, and prepared for a difficult one.

Television, he explained, was essentially a method of signalling, and the message was the picture definition. Just as the pictures in newspapers are composed of a great number of dots, so the televised scene can be broken down and analysed. With an ingenious device, resembling in appearance a giant camera tube—the heart of the television camera—Mr. Kirke showed how the cathode-ray scanned line by line the structure of a picture. The information obtained was translated into varying potentials of electricity which were used to instruct a somewhat similar cathode-ray tube in the receiver to paint a picture in accordance with the signals.

The importance of having the lines properly synchronized was illustrated by a still more ambitious demonstration. On the one hand was a rough picture of a dog, comprising a number of black and white balls arranged in lines; these lines, representing the picture detail, were "transmitted" to the other side of the hall. In this way the lecturer was able very effectively to show how a simple picture could be broken down and its elements used to reform the picture.

# Non-BBC project - The Flying Saucer and the Festival of Britain 1950

This is not a project for the BBC although the BBC did have a something to say on the matter.

In October 1950 the Festival of Britain organisers formally invited GWHL to quote for the following.

Work out precise calculations and execute prototype for Flying Saucer.

Execute and supply four off Flying Units complete with Control Gear in duplicate, and supervise installation of the work at City Hall, Manchester.

I don't believe this was ever actually flown at one of the designated regional Festival venues. I seem to remember GWHL telling me that it was thought people would panic but I notice the image still appeared on the postage stamps. The secret fuel was compressed air!

**Daily Mirror**  
SAT OCT. 21 1950  
ONE PENNY  
FORWARD WITH THE PEOPLE  
No. 14,602  
Registered at G.P.O. as a Newspaper.

**Festival crowds will see this tame 'flying saucer'**

"Daily Mirror" Reporter  
**T**HE first "flying saucer" ever to be seen in captivity will puzzle thousands of visitors to the travelling section of the Festival of Britain next year.  
It is a milky-coloured plastic disc, measuring six feet across. It has no engine, no working parts and makes no noise.  
At the Festival exhibition its inventors claim it will fly round in circles at a height of about sixteen feet and will stay in the air as long as the operators wish.  
The "saucer" has been designed and built by Mr. Richard Levin, chief designer of the travelling section of the Festival in association with Mr. Geoffrey Larkby.  
Mr. Levin said last night: "I don't regard this as a contribution to the science of aviation. It is rather a scientific curiosity."  
Mr. Levin would not reveal how the "saucer" was controlled. Asked why he had made it, he said:  
"There have been so many stories of the mysterious flying saucers that we decided to make one of our own. We call it the 'Ectoplax'.  
"We have already successfully flown a half-size model. The full-size one will have its maiden flight soon.  
An Air Ministry spokesman said last night: "We shall watch its development with interest."  
The Ectoplax will be seen only at Manchester, Nottingham, Birmingham and Leeds. It will not appear in London.



The "flying saucer" that will tour Britain during the Festival year—an artist gives his impression

Nothing to be written or typed in this margin

From: Engineering Establishment Officer. REF: WWH/JL  
Subject: ENGINEERING ACTIVITIES OUTSIDE CORPORATION.  
To: Mr. G.W.H. Larkby, Designs Department.

24th October, 1950.

In reply to your memo of 19th October, this is to confirm that the Corporation has no objection to your designing a "Flying Saucer" for the Land, Air and Sea Travel Section of the Festival of Britain. This approval is given provided that your Corporation duties are in no way affected and that your connection with the E.E.C. is in no way publicised.

*Whiting*  
(W.H. Whiting.)  
for E.E.C.

AS/20/P Please turn over

## Television Camera Zoom Lens 1949, 1951

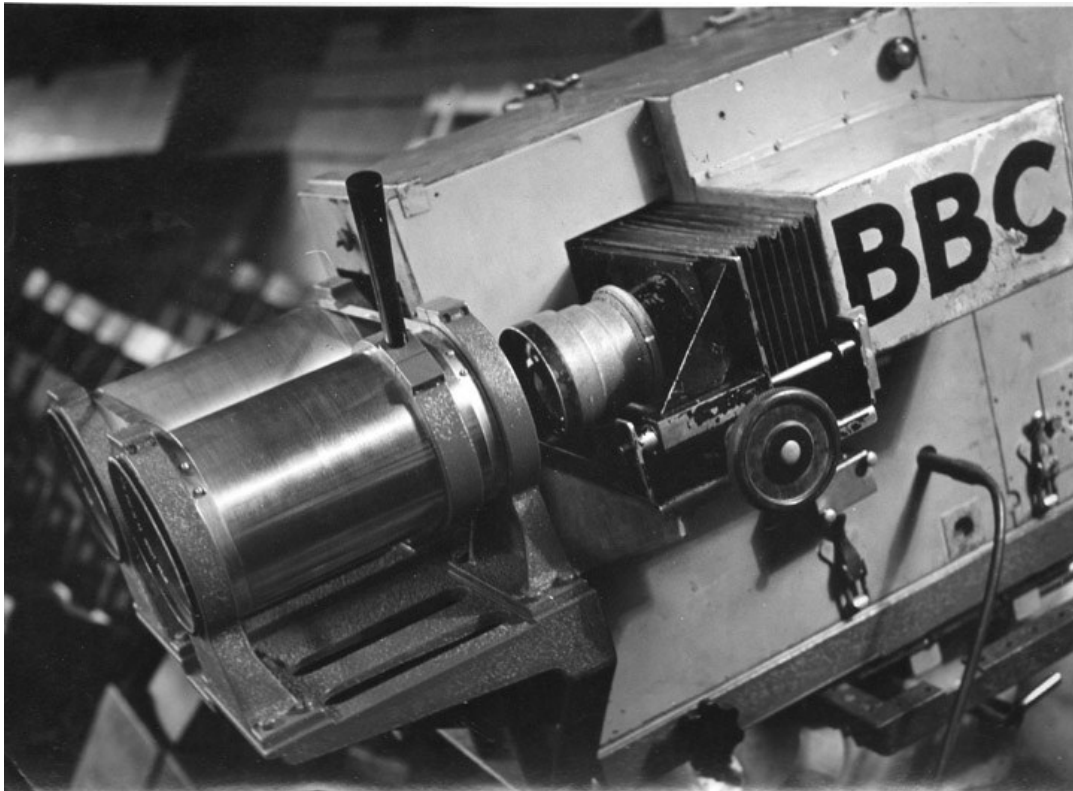
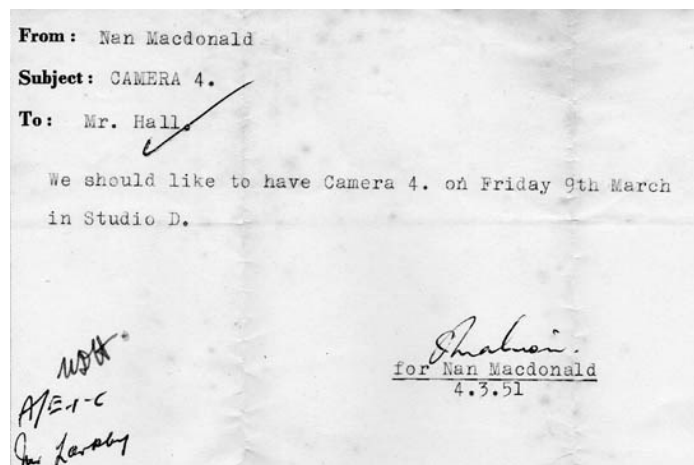


Photo of zoom lens mounted on a super Emitron camera 1949  
(First used for televising the Cup Final 1949) - BBC photo

GWHL definitely worked on the newer zoom lens as I can remember him talking about it and he named the first boat he built at home *Zoom* in the early 1950s. I think now, looking back, that he was concerned with designing the electronic controls necessary to perform the smooth and accurate movement of the various components of the zoom lens in conjunction with the firm of Evershed and Vignoles. It seems that the prototype was tested in the studio on Children's Hour programmes in the Lime Grove Studios.



Memo requesting camera for Children's Hour programme

11th March, 1951.

Dear Mr. Madden,

Now that the experimental transmissions have finished, we would like to thank you and all your staff for the wonderful help and encouragement that you have given us.

It is with a real feeling of regret that we leave the Children's Hour at Lime Grove, and we shall both miss the programmes in which we like to think we have played a small part, sometimes with a little more enthusiasm than success.

Our visit has been of great use to us and we are now in a much better position to assess the merits of a particular design as applied to studio cameras and at the same time has given us great personal pleasure.

Yours very sincerely,

(Philip Houchin)  
Research Department, Messrs. E.M.I.  
(Geoffrey Larkby)  
Designs Department, BBC.

Cecil Madden, Esq.,  
A/H.Tel.C.P.  
Lime Grove.

Copy of letter of thanks for Children's Hour test transmissions



Following studio tests the lens was tried out on OB.



Photo of prototype Zoom lens fitted to one of the cameras used to televise the racing at Royal Ascot 12 June 1951 (BBC Photo)



Photo of a later zoom lens on a Marconi Emitron Mk III from about 1953  
(no date on photo but the Evershed name is visible).

I found an article in *Philips Forum* Vol. 5. No. 3, 1953 about Zoom lenses which has photos supplied by the BBC.

Paris to London transmission 21 April 1952



PARIS — LONDON MONDAY 21/4/52

PARIS — LILLE 819 LINES 50F  
 CONVERTED AT LILLE TO 405 LINES 50F

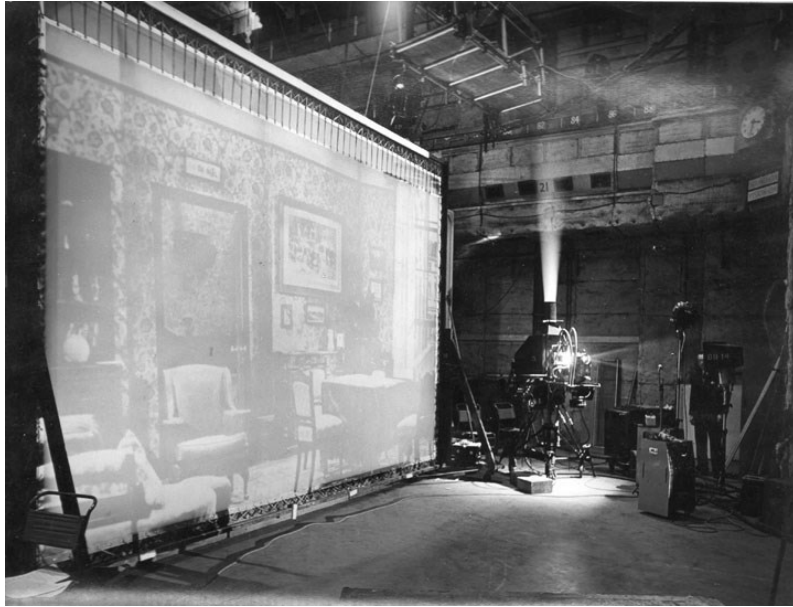
LINK	PARIS	LILLE	MILES	FREQ MCS
			128	
	LILLE	CASSEL	32	9000
	CASSEL	ARENBOU	33	7000
	ARENBOU	- SWINGATE	25	4800
	SWINGATE	- WROTHAM	36	4800
	WROTHAM	- LONDON UNIV.	26	7000
	LONDON U	- B.H. VIDEO	<u>280</u>	
	B.H.	- BROCK VIDEO	MILES	

This is written on the reverse of the photo showing the transmission links.

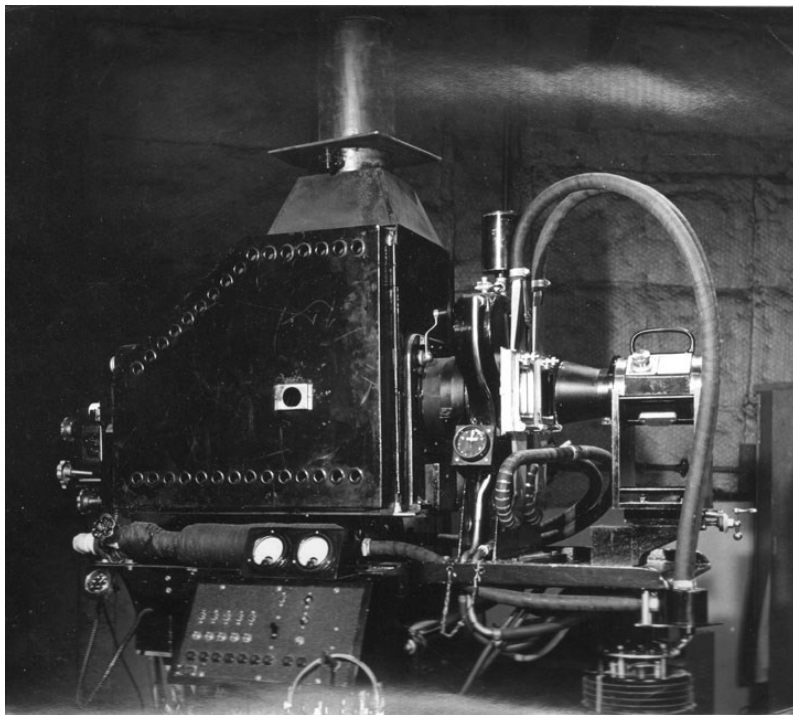
S. N. Watson mentions this event in his reminiscences. I assume this must have been engineering tests as according to information from the *Radio Times* programmes were broadcast in the UK from France during July 1952.

## Still Back Projection 14 March 1952

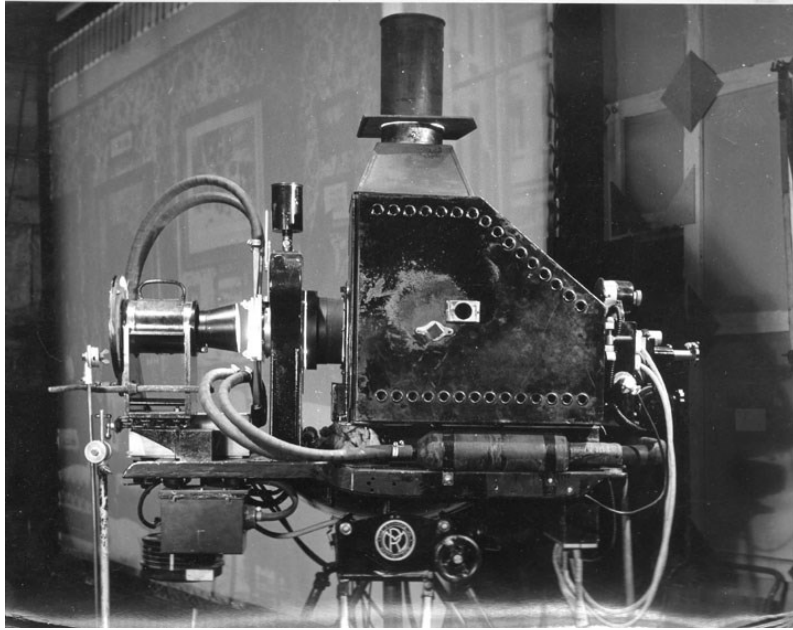
GWHL labelled this 'Nellie' and is using a Mole-Richardson light or projector. The image was projected onto the screen by means of mirrors not shown in the photographs and I am sure this was one of his projects.



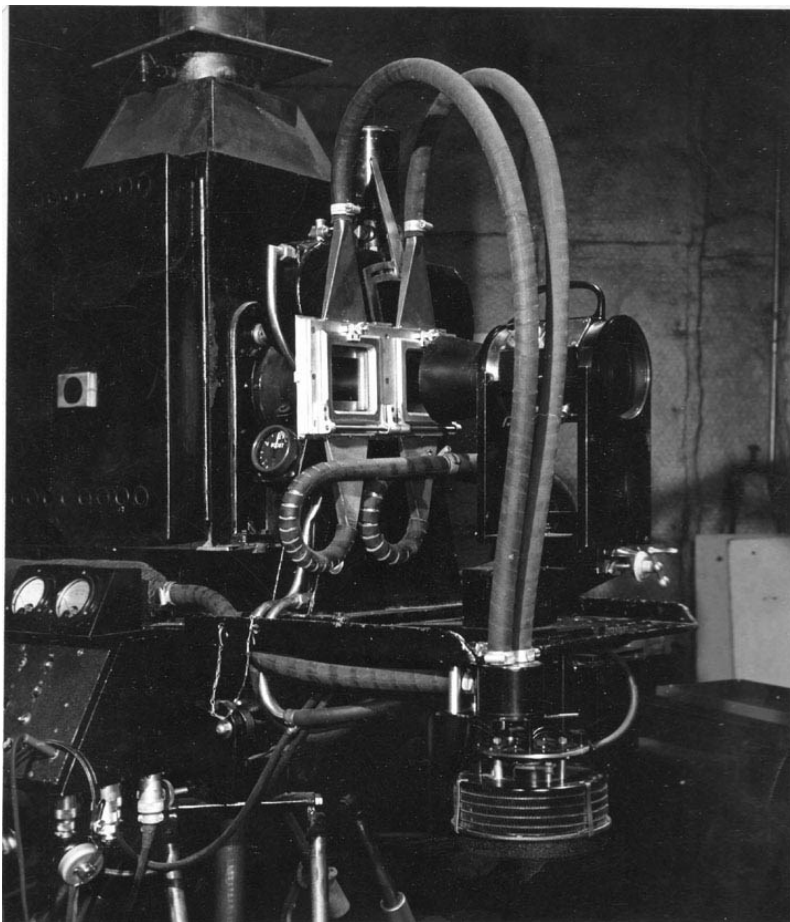
This BBC photograph of Still Back Projector at Lime Grove shows a general view of projector in use, throwing image onto a screen via a mirror not shown in the picture.



Right-hand side view of Projector showing control panel, input silencer, radiator, gate changeover valve, lens focusing mechanism. BBC Photograph.



Left-hand view showing water pump, radiator, exhaust silencer, picture on screen in background. BBC photograph.



Front right view of Projector showing double slide gate, lens focusing mechanism and radiator. BBC photograph

## Roving Eye Mark I 1953-1954 and Roving Eye Mark II 1957

### Roving Eye Mark I

The following text is taken from a BBC photograph dated 8 January 1954.

The BBC's 'Travelling Eye' is a vehicle equipped with a Television Camera, VHF sound and vision transmitters, power unit and gyro-compass controlled aerial. This unit, which is in the experimental stage, is intended for use in bringing topical outside events to viewers. Under favourable conditions it can work within a radius of some two miles of a fixed receiving point and the camera can operate when the vehicle is in motion or stationary. If the vehicle is moving the gyro-compass control ensures that the bearing of the transmitting aerial on the van is maintained correct with respect to the fixed base irrespective of vehicle movement.

The following 1954 BBC photographs were taken in Broadcasting House car park, where the original BH extension was built.



Side view and view showing camera mounting and aerial array.





Interior view showing camera control position and camera lift in down position.  
Aerial turning mechanism is also visible.



View from the front showing vision transmitter, sound control  
and communication equipment and camera on lift in down position.



From left to right, not all names known: Wireman, Fred Willis (driver), wireman, Jimmy Moon, Tom Greenwell, Bill Meads, Geoff Larkby, Tony Stanley, Frank Hughes



Geoffrey Larkby on left talking to Bill Meads Laboratory Mechanic (29 April 1954)

18 Feb  
Main

# TELEVIEW

1954  
*'Travelling eye' gives viewers an exciting glimpse of London after dark*

**T**HE rain was dripping down the umbrellas of passers-by. Cars and taxicabs, black and shining, slid down the gleaming roadway. Eros swung past against a blaze of night signs. And television's millions saw it all without getting their feet wet.

It was the first demonstration of the B.B.C.'s new "travelling-eye" equipment, a demonstration slipped into "Panorama" to add to television history. Engineers devised a single camera unit and sound transmitter, mounted in a van and powered by a petrol engine. Sound and vision sig-

nals were sent to a receiving point on top of a building in Coventry-street, where last night's 10-minute journey ended.

The camera, mounted in a swivelling open turret, began its half-mile run outside Green Park Underground station, where a damp but devoted Peter Dimmock explained the route.

Then, with Dimmock on board, the van moved off, past brightly-lit shop windows and the dim-facade of Burlington House, down Piccadilly towards the Circus. The camera swung upon crowds of innocent bystanders, showed close-ups of passengers on a Holloway-bound bus and peered in at the driver, who grinned hugely.

Pictures were so clear that numbers on buses were easily identified. The amount of free advertising was lavish despite Mr. Dimmock's cautions: "Now we're passing a well-known

by **PETER BLACK**

hotel." This was the only discernible embarrassing moment. It was the most vivid and exciting ten minutes of television since the summer, and roused all one's flagging sense of wonder.

1954  
7. Feb 18

NEWS CHRONICLE, THURSDAY, FEBRUARY 18, 1954

## LOOKING AT TV UNDER A ROVING EYE

By **JAMES THOMAS**

**T**ELEVISION'S new candid camera, the "travelling eye," made its debut last night, projecting the rain-soaked pavements of Piccadilly, the flaming adverts, the girls, the spivs and the barrow-boys, to all Britain.

The eye was mounted on top of a B.B.C. van which contained a miniature TV station capable of feeding driver's-eye pictures into the national network as the van rumbled through the West End of London.

The experiment was almost flawless. Bobbies in gleaming wet capes looked up as the eye travelled eastwards. Crowds outside the Corner House waved, taxi-drivers winked, busmen scratched their beads in perplexity.

### Searchlights

The camera had twin searchlights fitted to light up the passing throng. In Coventry Street, astonished pedestrians twisted into the beam of light. It made one wonder about the future of the travelling eye—and whether it might not get the B.B.C. into trouble.

The experiment proved it is no longer necessary to still the roar of London's traffic to meet the people who are in Town tonight. And as "In Town Tonight" is going on TV soon, the travelling eye is obviously going to earn its keep.

As written in these two newspaper cuttings from 18 February 1954 *Panorama* viewers on the 17 February were treated to shots from the 'Travelling eye' as it drove round the West End of London.

There is a Radio Times entry for Children's Television on July 19 1954 where the Roving Eye was explained by GWHL. Unfortunately I cannot locate my copy of the broadcast. There is a Technical Memorandum 8.10.(54) The Roving Eye

## Roving Eye Mark II

The summary from the Engineering Division Monograph No. 12 *An Improved Roving Eye* reads:

The Roving Eye is the popular name for a television camera vehicle built by the BBC in 1954 in an attempt to introduce a new technique for television outside broadcasts.

The name was an apt one, describing the original intention behind its construction, which was to produce a vehicle capable of carrying a television camera and the associated equipment to permit pictures and their sound accompaniment to be broadcast whilst it was moving unimpeded by connecting cables.

Since Roving Eye I was built in the winter of 1953-4, a great deal of experience has been accumulated and this has been embodied in a new design – Roving Eye II – which is described and illustrated in this Monograph. Several novel features are incorporated, including a 45-ft telescopic mast which, when the vehicle is stationary, gives it a working radio range of about 10 miles from a good receiving site.



Construction



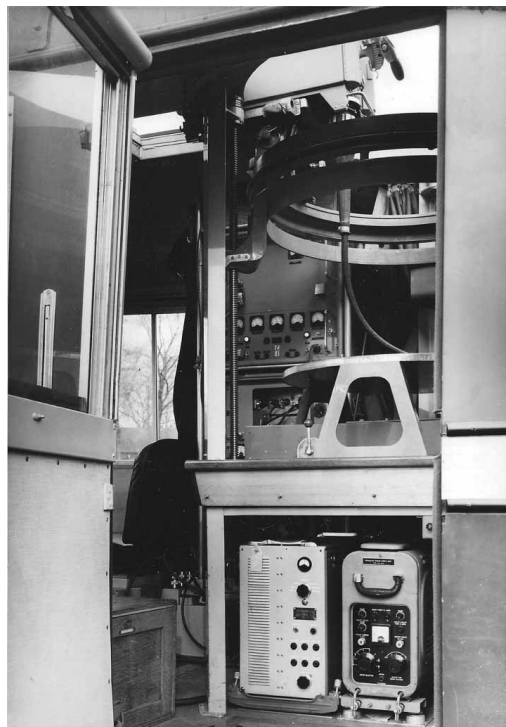
Compressed air mast when down January 1956







Internal arrangement of equipment. Camera control monitors and radio check monitors on the left; sound communication equipment on the right.  
Left foreground: camera lift,; centre top: aerial bearing dial



Door of vehicle open to show camera lift, vision transmitter in the background, test waveform generator and camera power supply in bottom foreground.



Roving Eye II ready to rove. Camera operator in place and steerable aerial to the rear.



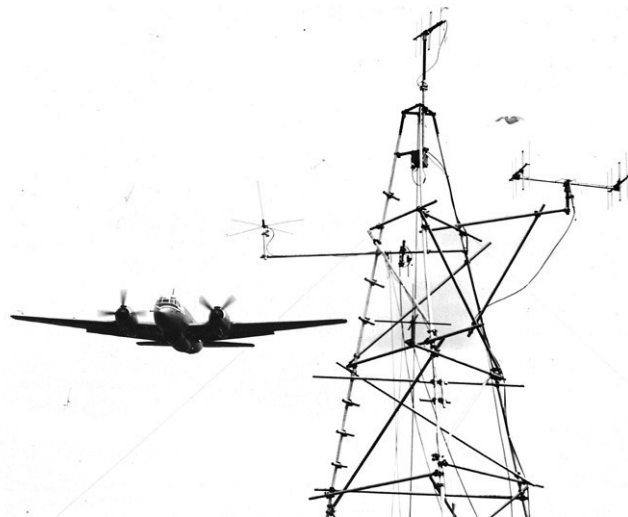
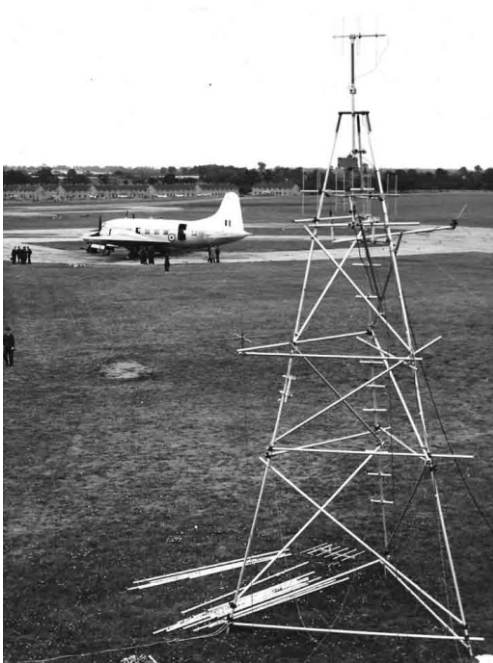
Operators in position. L to R: vision operator, sound operator and producer.

Actually from Designs Department – R Robertson (?), ?, G W H Larkby

February 1957

## Live TV from aircraft 1955

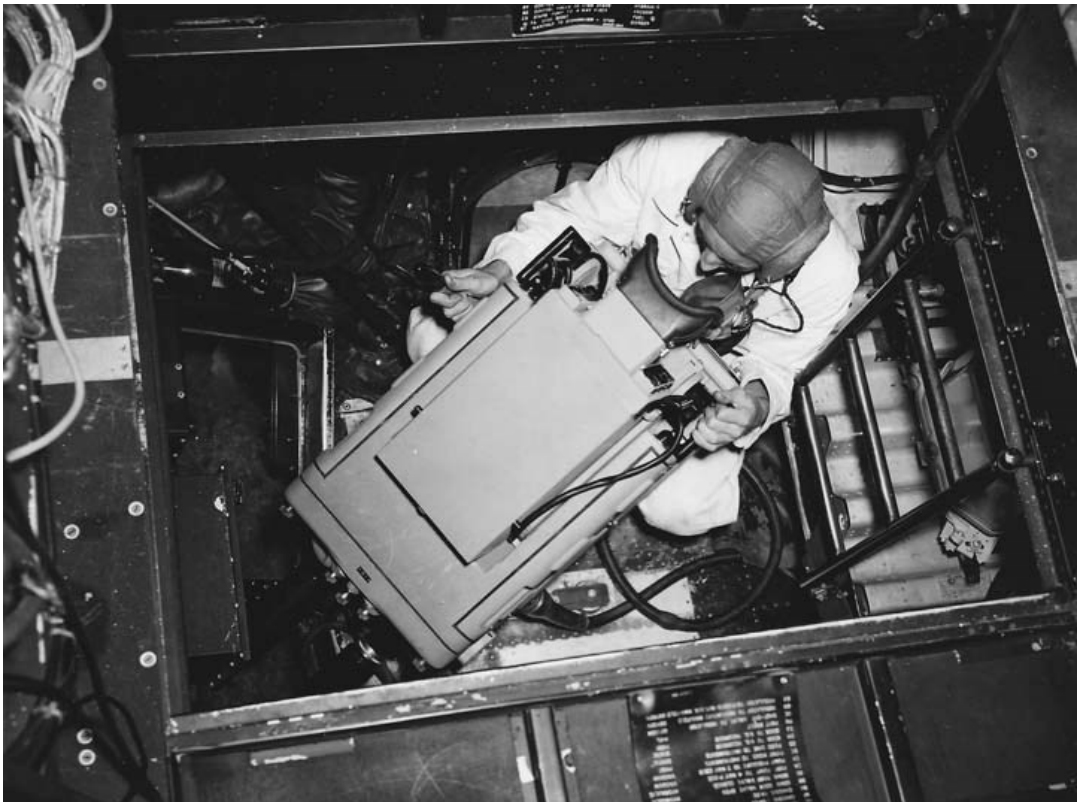
These were to be the first live television pictures transmitted from an aircraft in flight. GWHL was working on this in conjunction with G J Moon. The RAF at Watton provided a Vickers Varsity aircraft which was capable of taking all the heavy equipment including two cameras, and cameramen. One camera was in the cockpit and the other in the bay underneath. A tower with multiple aerials received the pictures and sound and forwarded them on. The RAF had made exact plans (Operation CHANGEOVER) how to move all the equipment to an alternative aircraft should the designated one, WJ947, become unavailable.



GWHL on the right

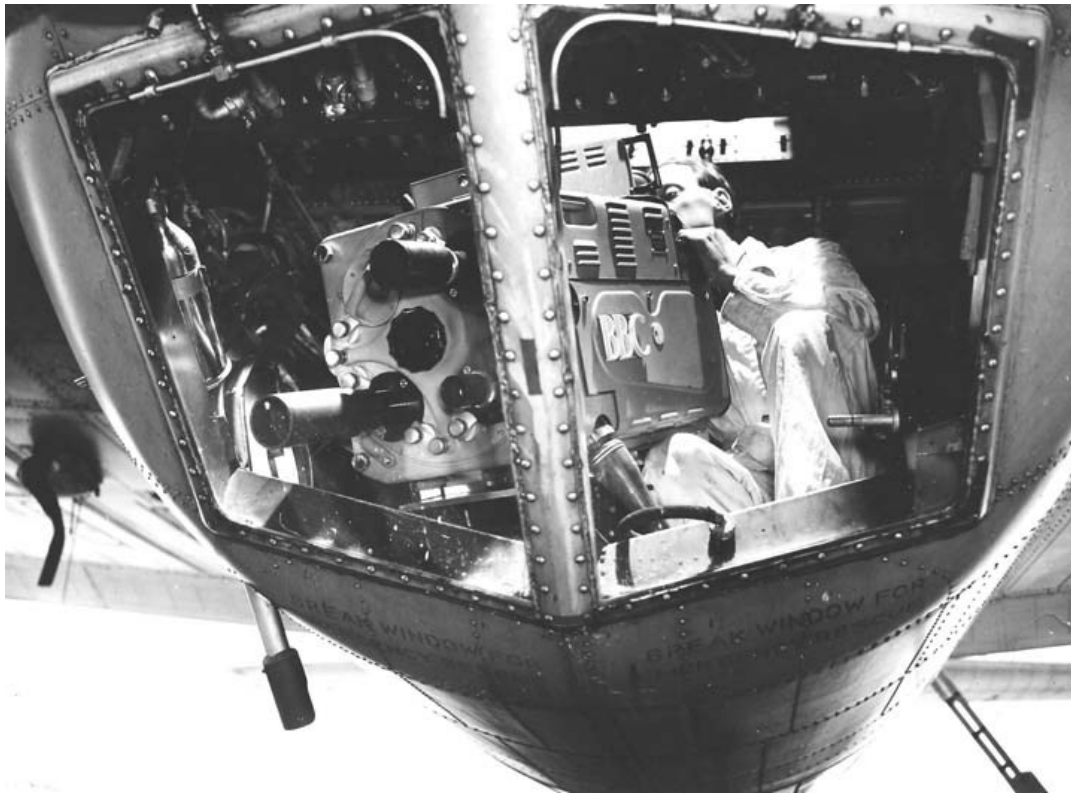


Cockpit camera and cameraman



Bay camera and cameraman





GWHL on the ground at Watton

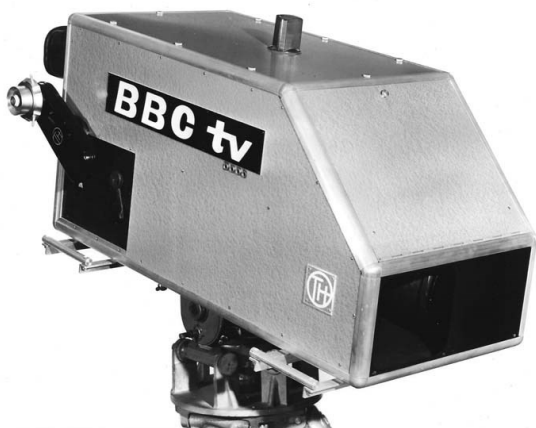
EBU visit to Kingswood Warren BBC Research Department 25  
September 1959



GWHL on right talking about the Remote Camera

Universal Zoom Camera 22 August 1960

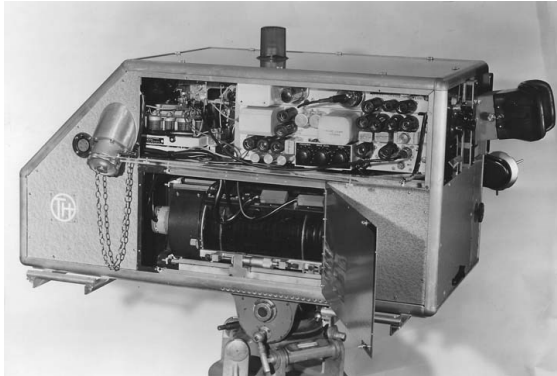
These are BBC photos with a description on some of them.



Wide angle adaptor lens inoperative



Showing optical folding and filter wheel  
assembly

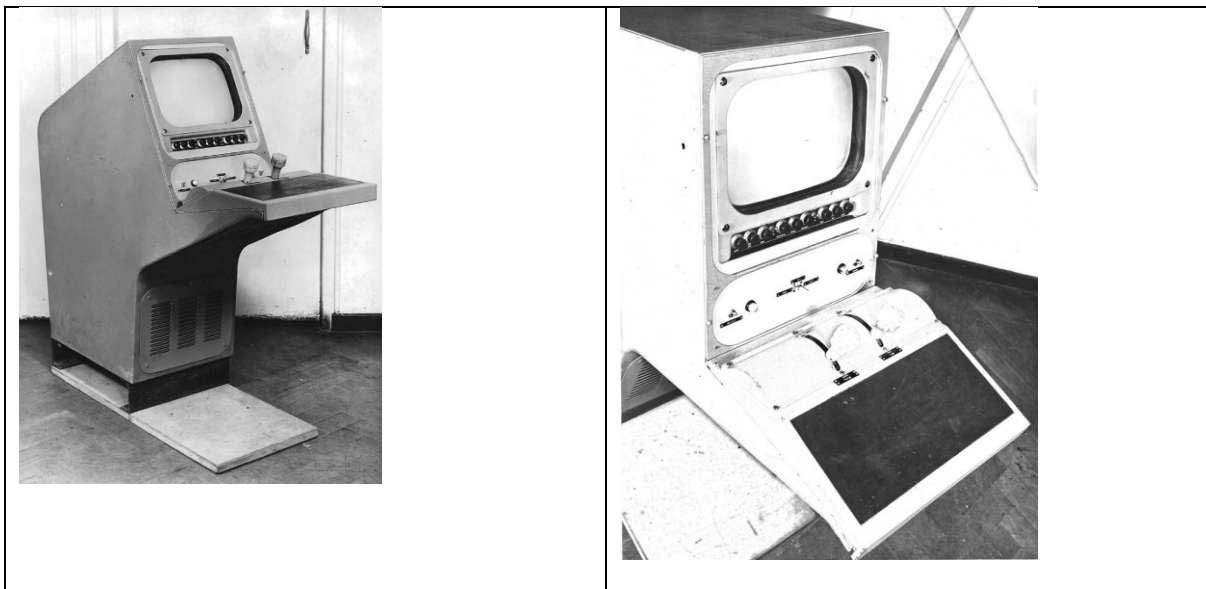


Showing camera tube yoke assembly and  
circuitry



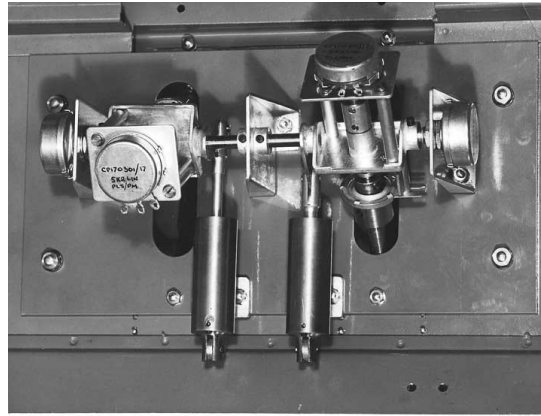
Front cover open to show equipment layout

Remote Controlled TV Cameras 1959 onwards:



Two views of the Control Consoles for the BBC Designs Department Remote Control  
Camera – BBC Photos taken 13.5.1959.

The left hand knob operates Focus and Zoom. The right hand knob operates Pan and Tilt.  
The centre switch controls Iris diaphragm.



Underneath view of Control Panel showing error generation potentiometers and air damping mechanism fitted to Zoom and Tilt controls. BBC Photo 13.5.1959

In the field trials carried out from All Souls Hall a vidicon camera had the four lens turret removed and a zoom lens mounted together with the motor mechanisms for the zoom, focus and iris movements.



Camera with cover removed showing mechanisms.



A facility was provided whereby there could be four preselected shots set up which could be chosen by the interviewer with the aid of the four button control.

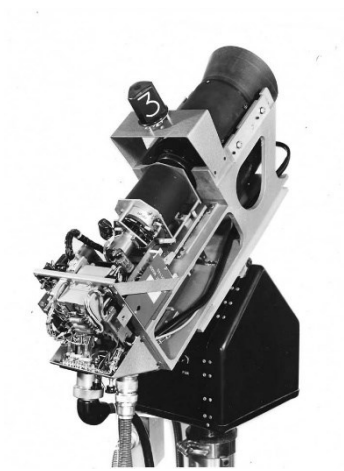


Shot Box – Selects any one of four pre-arranged camera shots. The camera automatically adjusts pan, tilt, zoom and focus for each shot. BBC photo 17.8.1959



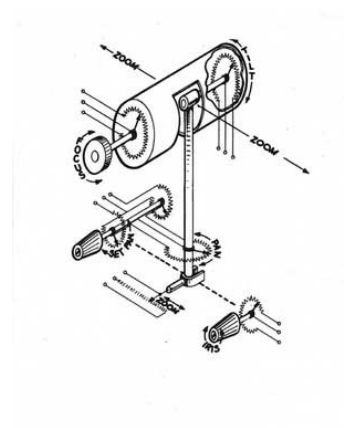
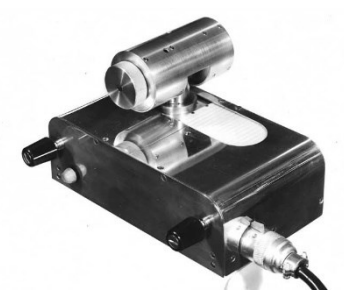
GWHL on the left holding the Shot Box in the All Souls television interview studio  
– BBC photo 17.8.59

1961



Remotely controlled camera.

This shows the maximum elevation. BBC photo 15.3.1961



“JOYSTICK” FOR REMOTE CONTROL GIVING FOUR SEPARATE MOVEMENTS.

REMOTELY CONTROLLED CAMERA

CAMERA SHOWING MAXIMUM ELEVATION.

“Joystick” Type of control for remotely controlled camera. BBC photo 15.3.61



GWHL wrote an article on remote control cameras for *Wireless World* which was published in the [December 1960](#) edition.

## Remote Controlled cameras used to televise the Control Room at Goonhilly 1962



GWHL at controls

An experiment in colour television transmission to the USA by Telstar satellite. These transmissions, which were of limited duration owing to the orbiting of the satellite, were originated at Goonhilly and transmitted to Andover in Maine, USA and took place over several days. There was a piece included in the BBC Television news of 1030 pm during this period showing viewers, in black and white, the colour monitor displaying the picture as it was being returned from Telstar. Further tests were done sending pictures from the USA to the UK.

## IEE Faraday Lectures on Colour Television 1964-1965

The lecture was mostly delivered by Mr (later Sir) Francis McLean, Director of Engineering or by M J L Pulling, Deputy Director of Engineering.

This lecture tour started in Swansea and was for GWHL the second IEE Faraday Lecture on which he had worked.

### Members of the Demonstration Team for the whole or part of the time:

G.W.H. Larkby : Head of the team

J. Banks  
J. Bradley  
J. Cox  
M. Fairhurst  
J. Harris  
J. Hewitson  
J.P. Meadows  
R. Robertson  
F. Robinson  
D. Simmons  
M. Skeggs  
K.A. Stephens  
J.E. Tanner  
I.H. Teear  
R. Terry  
P. White

### Others who gave assistance:

K. Hayward  
K. Howe  
Miss D. Munday  
F.G. Parker  
Miss M.K.P. Robinson  
A.R. Stanley  
I. Vickers  
S.N. Watson  
Miss A. Westaby  
T. Worawick

Not counting lectures given on BBC premises the Lecture was given 29 times to a total audience of over 50,000.



Dates and places for lectures –

24 Nov 1964 1830 Brangwyn Hall, Swansea

25 Nov 1964 0930 Brangwyn Hall, Swansea

17 Feb 1965 1800 Central Hall, Westminster, London

18 Feb 1965 1800 Central Hall, Westminster, London

26 Nov 1964 Colston Hall, Bristol

19 Jan 1965 1030 1430 1900 Town Hall, Birmingham (three lectures given)

Leicester

26 Jan 1965 1430 1930 Free Trade Hall, Manchester

Stoke on Trent

9 Feb 1965 1430 1930 Guildhall, Portsmouth (50% oversubscribed)

24 Feb 1965 1430 1930 Bradford

Sheffield

16 Mar 1965 1600 2000 Mansion House, Dublin

18 Mar 1965 Ulster Hall, Belfast

1 Apr 1965 Edinburgh

6 April 1965 Newcastle

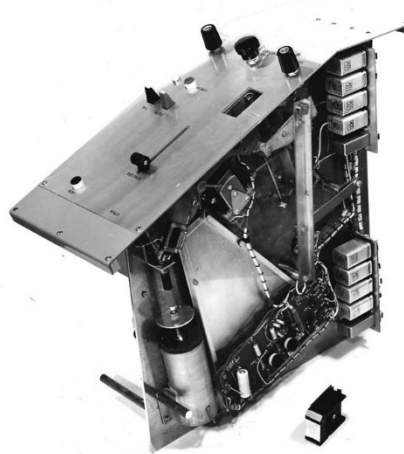
Brussels, Belgium



Director of Engineering, Mr (later Sir) Francis McClean, in front of the demonstration model.

## The Programme Effects Generator 1965

This was developed to facilitate the use of programme effects in radio programmes. These had previously been laboriously produced from 78 rpm disk records or 33 1/3 and 45 rpm fine groove records. There were many drawbacks to these systems but the cassette recorders in the new effects generator were quick to rewind and be available to run again and also convenient to operate whilst needing less work beforehand to have the correct effect available. The BBC patent application for these 'Improvements in and relating to tape recording replaying devices' credits not only Geoff Larkby but also H Davies, H J Houlgate and D Peat.



BBC photo showing the BBC Programme Effects Generator consisting of four-channel main unit and two channel auxiliary unit. The second BBC photo shows a reproducing module removed from cabinet; tape cassette in lower foreground. Photos dated 8.3.1967

## The Royal Air Force Coastal Command Display Anti-Submarine Operations

I can't find a date for this event. The Queen Mother and Prince Charles were attending. There are photos of HM The Queen Mother and Prince Charles displayed on a monitor

## Royal Air Force Coastal Command – The Helix Experiment

GWHL carried out an investigation for Coastal Command into possible systems of data transmission. I do not have a date for this report.

## The Boat Race on the Thames March 1968

This race was televised using a colour camera on a boat on the water. GWHL was obviously on board for this race.



This was the rope that had got wrapped around the boat propeller necessitating getting a diver into the water to free it.

## BBC Tour promoting colour television about February/March 1968



## Pictures from submarines submerged March/April 1968

Only practical way to obtain live pictures from a submarine was from periscope depth.

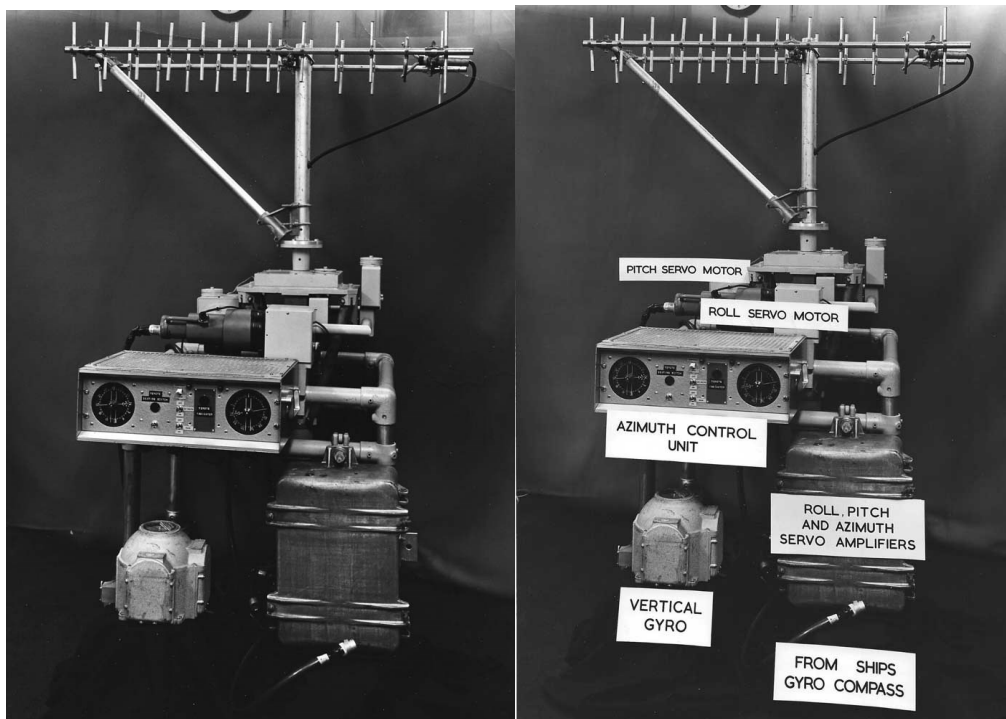
## Stabilized platform for Cowes Power Boat Race 31 August 1968

This was to be an outside broadcast of the Daily Express Power Boat race held on 31 August 1968. The course was from Cowes to Torquay and back, a distance of 199 nautical miles. The speed of the winner was expected to be between 25 and 60 knots, depending on prevailing weather conditions. To cover the event TV cameras were at Cowes, Hurst Castle, Durlston Head and Portland Bill as well as one airborne in a helicopter, and two waterborne. To keep up with the race participants a fast boat was required so GWHL borrowed a high speed gunboat, R.L.N. Susa, from Metro Vickers boatbuilding yard. GWHL also had some assistance from the Royal Navy.



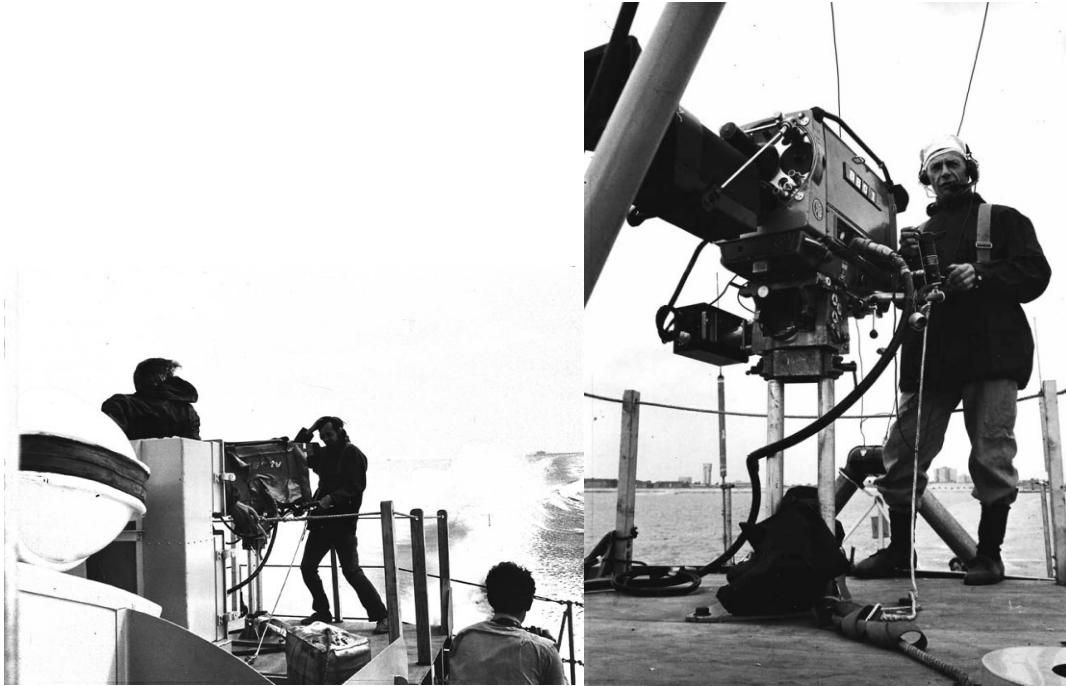
For this broadcast Designs Department supplied a stabilised aerial platform servo-controlled using a vertical gyro as a reference for pitch and roll correction, which could correct for

errors up to plus or minus twenty-five degrees. Continuous rotation was provided in azimuth. The azimuth signal was obtained from the ship's gyro compass to which could be added an overriding correction depending on the bearing of the receiving station. This bearing was obtained by means of the ship's radar. This unit was originally designed for the arrival of Sir Alec Rose where it would have been installed on a coasting vessel of perhaps 500 to 1,000 tons which would have been a completely different carrier from a gunboat. Alterations to the Yagi aerial were found to be necessary, in turn requiring modifications because of the extra weight of the aerial.



The rehearsal on 30/8/1968 went well except that vertical movement of the ship caused the picture monitors in the chart room to fail through mechanical and then electrical failure. For the actual race, things did not go well as the now rough weather produced vertical forces of more than 4G causing one television camera's mounting to become detached followed by failure of the other camera.





However, during all this time pulse and bar were radiated to the appropriate stations. Later, when in harbour it was found that seawater had been forced through the waterproofing of a plug and while at anchor this percolated into the plug itself causing the h.t. fuses to blow.



GWHL's conclusions after this experience included that more rugged, small and remote controlled cameras with adequate communications were necessary for this type of work.

## Review of the Western Fleet 28-29 July 1969

This was a major colour television Outside Broadcast with transmission on BBC1 and BBC2.

GWHL was on board HMS Duncan where Designs Department was given great assistance by Lt J Cardale.

## TELETEXT – LATE 1960s

I have no written information on this but I do remember GWHL telling me of a new system of transmitting information in the vertical interval of a transmission. This was later developed into the BBC's CEEFAX service.

## End note

I am sure that I have omitted projects, for example, I believe there was a joystick arrangement for allowing a moveable selection from a wide screen film on telecine to avoid just transmitting the central empty part, and I expect there would have been others. He was always interested in navigation and made a device which revealed an inaccuracy in the old Consol system. In his consulting roles he worked for military establishments and indirectly to do with a nuclear power station. He always said that he had had a most interesting life, and I have to agree.

Pauline Dearing (nee Larkby)

2024