

We are happy now to introduce what is probably the first serious appreciation of Baird's studios at Crystal Palace, certainly the most detailed yet. Ray Herbert has written it for us, so there is no need to say any more.

THE CRYSTAL PALACE TELEVISION STUDIOS

by Ray Herbert

"The existence of a fully-equipped television broadcasting station in the Crystal Palace, which could act at any moment, was the great surprise which Mr J.L. Baird sprang on the radio world yesterday. It was known, of course, that the Baird Company used the South Tower for experimental transmission but no one suspected that 40,000 sq. ft. of the building had been converted into a complete Television Broadcasting Station..."

--- News Chronicle, Saturday, February 2, 1935.

So little is known regarding the existence of television studios at the Crystal Palace that photographs taken there are sometimes attributed to Alexandra Palace. This is surprising as the Baird Company could claim with justification that their laboratory and studio complex beneath the main concourse of Sir Joseph Paxton's massive glass edifice in south London was the most extensive in Europe.

In July, 1933, the company moved to the Crystal Palace, occupying 40,000 sq ft of space under the south transept and adjoining the tunnel which connected the two distinctive towers designed, incidentally, by Isambard Kingdom Brunel.

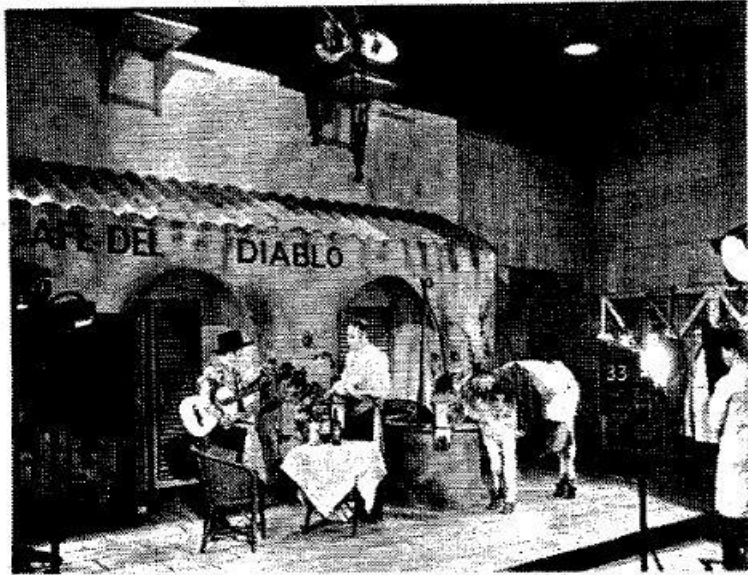
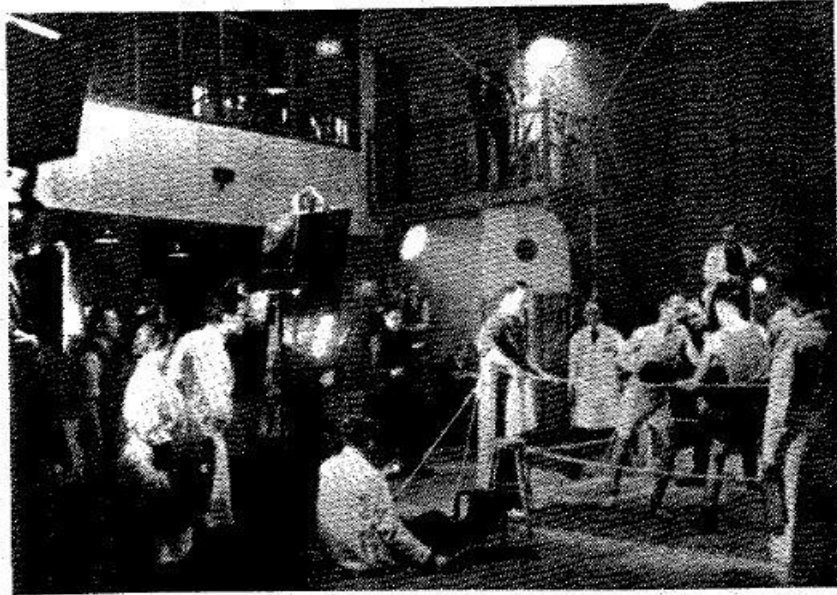
There were three sizable studios, comprehensively equipped and acoustically isolated. The largest measured 60ft by 40 ft and could accommodate full scale productions involving up to 40 actors. A smaller studio employing a flying-spot disc scanner dealt with close-ups of single performers or announcers. Other facilities included telecine equipment, dressing rooms, generating plant, workshops, offices, sound and vision radio transmitters and laboratories.

From the beginning of 1934 until mid-1935 the system operated at 180 lines, considered at the time to be high definition (pre-war British Standard BS205 stated that this description applied to definition in excess of 100 lines).

The Baird Company lost no time in getting the message across that they would soon be in a position to provide a public service. Demonstrations were given to the Prime Minister, BBC officials, the Post Office and press at Film House, Wardour Street, in March, 1934. Every opportunity was taken of capturing the interest of the public. One ingenious example occurred at the fifth Annual General Meeting the same month when the shareholders were surprised at the absence of the chairman, Sir Harry Greer. He eventually appeared not in person but on a television screen and the Baird company report was delivered from a studio in the Crystal Palace. While he made his way back to the Wardour Street meeting place, the shareholders and the press enjoyed a variety show and excerpts from films.

The Baird Intermediate Film Process

In order to meet the expectations of the viewing public, not to mention the



BAIRD'S SURPRISE STUDIOS

1. Baird's spacious No. 1 Studio at Crystal Palace in December 1934. The control room is seen top left, with the camera booth below. From left: A. Sandford, P. Tempero, J. Percy, A. Banfield (sitting), Capt. West, R. Rees, N. Cave, S. Birchenough, J. Grimstone, T. Bray, J. Reed (spotlight).
2. No. 1 Studio at Crystal Palace in January 1935. The guitar player and Spanish waiter were taken from the transmitter laboratory staff.
3. Baird television studios at the Crystal Palace in 1935. Originally published in the *Illustrated London News*.
4. Baird 120-line colour camera using mirror drum, as employed at the Crystal Palace in February 1938 for the Dominion Theatre demonstration. It used the floodlight system, not a flying spot.
This photograph was taken at the works of B. J. Lines.

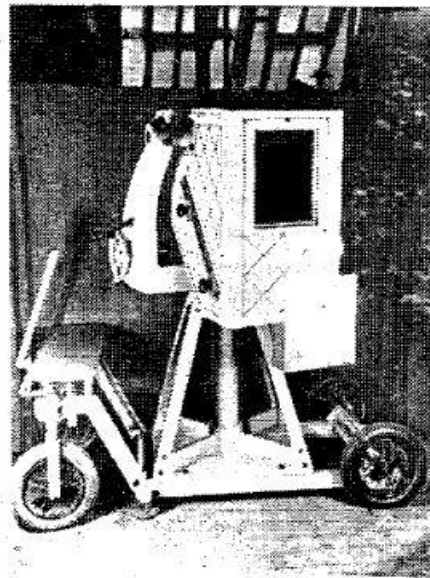
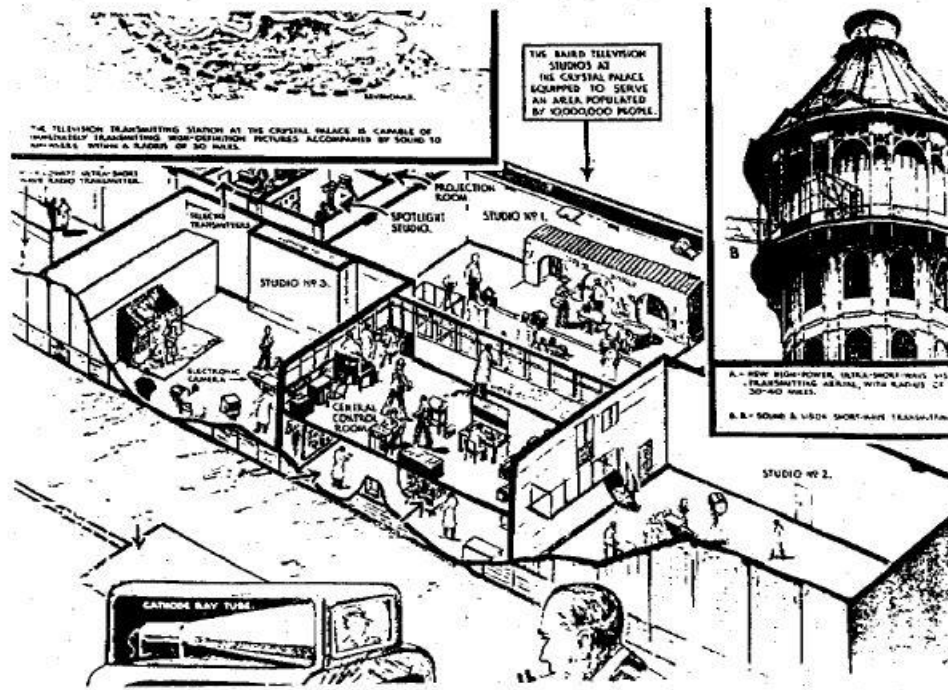
Between 1933 and 1936 the most extensive television complex in Europe was located beneath the main concourse at the Crystal Palace, a fact even now unknown to most people. The Baird Company could claim with justification that no other organisation had the capability of providing from a single site live, high definition television broadcasts, transmitters, receivers, cathode ray tubes, microwave relay systems, photocells, magnetrons and telecine equipment.

There were four studios each comprehensively equipped and acoustically isolated. The largest, measuring 70ft. x 40ft., could accommodate full scale productions involving up to 40 performers.

From February until June, 1935, over 42 programmes were transmitted from the studios to various demonstration locations in London. Well known theatrical personalities took part - Alma Taylor made frequent appearances, others included Vivian Foster, Leonard Henry and Claude Lampier with Billie Carlyle. True to the tradition established at Long Acre, the Baird staff had a supporting role providing boxing matches, sketches from the Cafe del Diablo set and carrying out announcing duties. Transmission from the Crystal Palace continued until the disastrous fire in November, 1936.

One of the outbuildings to survive was the Rotunda, the subject of an interesting article by Ken Kiss in the magazine of the Crystal Palace Foundation. His research reveals that it opened on 3rd June, 1881. Extensive alterations in 1911 included a gallery and when the Baird Company leased the premises in 1936 this area accommodated several research units. In the main body of the building the biggest television picture tubes available anywhere were manufactured.

Photographs and notes kindly supplied by Ray Herbert



Television Advisory Committee set up in April 1934, means had to be found of providing programmes having good entertainment value, which meant dealing with groups of performers on a large stage. The flying-spot scanner (camera) could only cope with a small area of about 4ft square when operating at a definition of 180 lines. At that time (early in 1934) electronic cameras were still in the development stage and EMI had not yet produced any pictures of live objects using their Emitron tube. The only practical solution appeared to be the intermediate film process. This employed a cine camera using 17.5mm film (split 35mm stock for reasons of economy), developing and fixing the pictures immediately, typically within 30-50 seconds, and then passing them still wet through a telecine scanner. Interchangeable lenses enabled close-up shots to be obtained, fast film kept the lighting requirements to a reasonable level and the exposed material could be washed and dried for future use. There were some inherent disadvantages. Due to the processing time the sound had to be recorded on the film, resulting in a significant deterioration in the quality. The equipment could only be used from a fixed position, the programme length depended upon the size of the film magazine and a sound-proof booth proved necessary to contain the noise generated by the drive motors. For all that, it was a sophisticated piece of equipment and enabled ambitious productions to be presented at a time when no alternatives were available.

Between February and June, 1935, over 40 transmissions were made to various demonstration locations in London. In November the first of the dual standard sets, the T5, made its appearance at the Press Club for a special 240-line transmission which featured Leonard Henry. As the BBC had closed down the 30-line service in September and the opening of Alexandra Palace was still twelve months away, these were the only examples of live television to be seen in the country.

Telecine and Tele-recording

On 19th August 1929, at the Baird Long Acre laboratories, the press witnessed for the first time talking films displayed on a television screen. Known then as Tele-Talkies, they were produced by a continuous motion projector (Mechau) and scanned by a 30 hole disc. At the Crystal Palace telecine equipment figured prominently in the development programme. The early 180-line equipment used a scanning disc spinning at 3,000 rpm in a vacuum to avoid dust and air turbulence. A photocell was situated behind it. At a later stage tests were carried out using an electronic camera tube, the Farnsworth image dissector, for use in the telecine machines. Its considerable insensitivity did not matter for this type of application as any amount of light could be obtained from an arc lamp. Although free from shading (tilt and bend) and providing good detail in the shadows, it suffered from noise and geometric distortion. Mechanical scanning arrangements were resumed for the 240-line telecine machines used initially at Alexandra Palace. The possibility of recording television programmes on film received considerable attention and by the end of 1934 this had been achieved using a high-intensity cathode-ray tube and a 17.5mm cine camera. Projection receivers had not yet arrived and by using the fast processing techniques already mentioned, the recorded television images could be developed, fixed, washed, dried and then projected on to a large screen all within about two minutes.

Vision and Sound Transmitters

The vision transmitter operated at the high power of 10kW on 42.8MHz, quite a feat late in 1934. Designed and built at the Crystal Palace, unusual steps had to be taken to avoid infringement of a Marconi patent on neutralising, a technique

necessary with triode power amplifiers to prevent self oscillation. By using tetrode valves the need for this arrangement could be eliminated. It was decided to employ Metropolitan-Vickers constantly-pumped demountable tetrodes type 43, an entirely new departure for ultra short wave transmitters. MetroVick took a particular interest in this work and had one of their engineers on site for long periods during the trials. Two years later they obtained a contract from the Air Ministry for the supply of 19 radar transmitters to be used on the coastal chain and these bore a remarkable similarity to the Baird design.

The sound occupied a separate channel on 35.3MHz using a 500 watt, amplitude-modulated transmitter. Both sound and vision aerials were attached to the top of the 275ft South Tower.

The Fire and After

A most spectacular conflagration lit up the London skyline on the night of 30th November 1936, when the Crystal Palace, together with the Baird complex, was burnt to the ground. Only the South Tower, the School of Arts and the Rotunda in the Palace grounds survived. It represented a catastrophe for the company, only slightly eased by the insurance pay-out of £80,000, about £1.8M in today's money. Fortunately all the equipment purchased by the BBC for Alexandra Palace had been delivered six months earlier. The School of Arts had been producing the T5 mirror lid receiver during the past year and work on these continued. In the Rotunda 12, 15 and 22-inch diameter picture tubes were manufactured under the Cathovisor trade mark. In the gallery of this old building the vacuum physics department designed and produced split-anode magnetrons for the microwave-relay system, projection tubes capable of throwing a 13ft x 10ft television picture on a cinema screen and monoscopes (still picture tubes).

There were two transmitters still in use at the South Tower. One on the fourth floor operated with a power of 300 watts on 150MHz, the other radiated John Baird's colour television pictures between 1937 and 1939. He had a small studio at the bottom of the spiral staircase and occasionally the 120-line mirror drum colour camera would be trundled through a convenient gate nearby for televising the red trolleybuses on Anerley Hill.

On 4th February, 1938, a demonstration of colour television was introduced as a surprise item at the Dominion Theatre, Tottenham Court Road, London. At the evening performance 3,000 people watched pictures from the Crystal Palace on a 12ft x 9ft screen. Although fully reported in the national and technical press at the time, few people seem to be aware of this achievement which represented a triple first for John Logie Baird. It was the first time that colour television had been transmitted by radio link or demonstrated to the public in a theatre and never before had any outside scenes been televised in colour.

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*If you are interested in reading more about the Baird installation at Crystal Palace you will find several articles on the transmitter and the studios in the Newnes book **Television Today** and also on pp 399/400 of **Newnes Practical Mechanics**, June 1935 (studios only).*

The following two articles continue our Crystal Palace theme and were discovered by Pat Hildred in a souvenir edition of the *Croydon Advertiser* issued in 1986 to commemorate the 50th anniversary of the destruction of the Crystal Palace. The building burned down on 30th November, 1936.

Both stories are delightful, first-hand accounts and are most valuable as such, although some of the factual details concerning the subsequent history of the Baird company and Cintel are not guaranteed.

MY DAYS WITH THE PIONEER OF TELEVISION

Frank Rose recalls the Palace

He hadn't been home from work long when his neighbour asked: "Do you know the Palace is on fire?"

"Don't be silly," he replied. "I've only just come from it. Everything was fine."

But the neighbour insisted, so he went to an upstairs window and looked out. Sure enough, there was the bright glow. For Frank Rose it was a sight that chilled. He had only been married a year, he had taken out a 22-year mortgage on a house, and he was looking at his place of work going up in flames.

"It was unbelievable. I had only been in the building about an hour or so before, and there I was watching the Palace on fire. My home is only about three-quarters of a mile from the building as the crow flies, so I had a good view of the disaster. I didn't go up there, but I watched all night from here. The next day, I went up there, to see what the damage was, and to find out if I still had a job."

Frank Rose worked for the television pioneer John Logie Baird, who had some years before established large new studios, laboratories and offices at the Palace.

On that day after the fire, he was told to go home and wait for news. He waited, anxiously, for a week. Then he was told he still had a job. In fact the entire staff was kept on.

The fire destroyed the studios, and the operation was crammed into the School of Arts at the Palace.

With the outbreak of war television transmissions ceased. The technical expertise was diverted into Government projects. The company Baird set up was taken over by J. Arthur Rank, who changed the name to Cinema Television Ltd (Cintel) and they moved into a new factory in Worsley Bridge Road, Sydenham. During the 1940s the company was renamed Rank Cintel, and the factory finally closed in 1964.

But for Frank Rose, the memory of Baird stays fresh and alive.

"He was the quietest, most gentle man I ever worked for. A gentle genius, a man who was always interested in you as a person. A very considerate man, and undeniably an eccentric, too. He would scribble notes, often very important notes, on the walls of the corridor outside the

laboratory - so many that the walls had to be regularly redecorated!"

The Baird Company moved to Crystal Palace in 1933-34, and soon after the move they transmitted a television broadcast from the South Tower to Wardour Street in Soho, London. The demonstration was put on for Members of Parliament, in preparation for broadcasts from Alexandra Palace, and it used 240 lines. They showed a Spanish cafe scene complete with the Television Toppers, two donkeys and 24 pigeons.

Unfortunately, Baird lost the competition for television transmitting rights to EMI, whose system made use of electronics, while the Baird system was mechanical and too cumbersome. Baird and EMI had taken it in turns to transmit from Alexandra Palace over a period of six months, and it was a great blow to Baird when he lost the contract. Years of work, and a lot of money, had been spent on developing his system.

Gaumont British wanted to show TV pictures in cinemas, which would have been technically impossible with Baird's system. So, in 1933, they had appointed Captain West of EMI to develop an electrical system, as Baird's technical director.

Baird and one engineer continued mechanical experiments from a house in Sydenham, while Captain West and 25 staff conducted electronic developments at Long Acre, before moving to the ground floor of Crystal Palace. Baird had little or no say in the working of the Palace staff.

Frank Rose looks back on those days as some of the happiest of his life. He joined Baird, the eccentric Scot touched with genius, in the early 1930s, and shared with wonderment the early development of television.

As well as the excitement of working for such a new development, there were other perks at the Palace... like seeing the spectacular firework shows for nothing.

"If we worked overtime on a Thursday we would only have to wait a little longer before the fireworks started, so we got a free show!" he said with a broad smile.

Often they would spend their lunch break on the boating lake, or strolling round the grounds.

Baird himself died in Bexhill in 1946 of, it is frequently said, a broken heart. For all his inventive genius, he had not been able to adapt to make his television system a success.

But Mr Rose, who said he also found Captain West an excellent man to work for, continued at the factory until it closed in 1964. Now he hopes, perhaps, that there might be a reunion of all the people who used to work with John Logie Baird, perhaps even involving his widow Mrs Baird, who now lives in Canada.

* Frank Rose has presented one of the first "Televisors" to the Crystal Palace Foundation, to be put on show when the museum is established. The metal set, base and mirror drum holder has a plaque bearing Baird's signature and the motto "the eyes of the world".

The screen is 2 in. by 4 in.; programmes were limited to showing only five people in a confined space. It was sold in 1930 for 25 guineas.

We do not have any information on the Crystal Palace Foundation's museum but perhaps someone with more knowledge can inform us.

In 1986 the Foundation was located at 84 Anerley Road, London,

ANOTHER STORY

This is part of a letter written to Elsie Nuttall, who now lives in Chelmsford, on 1st December, 1936, by her husband, then her fiance.

"We had been engaged to be married just a few weeks," she writes, "and it seemed to me that as a result of the fire, and loss of work, we would never be able to be married. I was working in Salford, Lancashire, and he had joined Baird Television a few months earlier - hence this letter..."

c/o Miss M. Payne,
67a Westow Street,
London, SE19
1/12/36

Elsie Dear,

We had all finished work at about 6.30 and I had my tea as usual. At about 8 o'clock someone shouted down the stairs to say there was a big fire on. I looked out and saw the sky lit up, so I went out to investigate. It gave me a horrible feeling to realise that the Palace was burning.

At that time the fire was localised on the far side of the Centre Transept, so our part of the building was quite clear. The door was locked and the doorkeeper was somewhere in the building, so somebody climbed over the gate to open the door.

When we got in everything looked quite normal and we could walk the full length of our corridor. Towards the end of the corridor it was beginning to get hot from the fire above.

We opened the emergency doors in case we had to make a sudden departure and then proceeded to remove some of the more

dangerous things such as gas cylinders and flasks of liquid air. But soon the firemen ordered everyone to leave.

Although the fire started in quite a small area, the firemen were unable to prevent it spreading and it was quickly realised that the whole of the building would have to burn itself out.

It was terrible to feel so helpless. We knew that these premises, still looking spick and span and containing so much of our work, would soon be nothing but a pile of rubbish and there was nothing at all we could do to prevent it. I could not bear to watch it burning, so I left. By this time the streets were packed with sightseers and I had to use brute force to get through the crowds. All traffic was stopped, except for police cars and fire engines, and the police had brought a loudspeaker car to direct the crowds.

I thought you might hear about the fire and become anxious so I wanted to telephone to reassure you. When I got in sight of the telephone box I found it was besieged and I could not get near. Eventually I was able to make my way to the cafe where I have lunch. The proprietress recognised me and took me through to their house to use their telephone. Before leaving I had a coffee with one of our fellows who stays there.

The glare from the fire was terrific. Several airplanes were circling round taking photos and newsreels.

When I got back, Westow Street had been turned into a car park for sightseers. Visitors parked their cars here and walked the rest of the way.

This morning I went to find out what the position was. The firemen were still in possession and we were not allowed to enter. We were told to

report for duty tomorrow. I met some of the other fellows and we looked round the outside of the building and then had coffee. I was able to obtain details from a man who had been in attendance till 2 o'clock.

The whole of the main building, containing most of our labs, has been destroyed. It was feared at one time that the fire might reach the south tower, and all the houses in Anerley Hill were evacuated in case the tower (300 feet of it) should collapse. Parts of the main building were dynamited to cut off the advance of the fire and the tower was saved. A small building, near the foot of the tower, which also contained apparatus was likewise saved.

Our receiving set production is carried on in a separate building only by a long passageway. It was found possible to cut off the advance of the fire in this direction so that the building was saved and production is going on normally today.

This is very fortunate financially as we derive a considerable profit from the sale of receiving sets. The only snag here is that the cathode ray tubes used in the receivers were made in the main building where all the plant has been destroyed. We have, however, a considerable stock of these tubes, and we hope to be able to start production again before the stock is exhausted.

The traffic is very dense today and it is moving slowly. There are still crowds of people on the pavements. At the roundabout there is a policeman on each of the four roads and the loudspeaker is giving instructions to the traffic and stopping it occasionally to let pedestrians cross.

The airplanes have been swarming round all day like vultures round a corpse. Several RAF machines have chased them away

from time to time but they keep returning.

I am terribly sorry that our future happiness should have been threatened by this fire, but there is no cause for despair. Baird Television is not finished yet. With sufficient determination we should still win through.

Don't forget to see Sylvia Sidney in "Fury."

Love, Tom.