

Human Links in Camera Chains

SINCE THE EARLIEST issues of this magazine there have been news items and photographs of Marconi Image Orthicon Television cameras at work in the most peculiar places and in the most difficult circumstances, in South Africa, in hospitals, at the first overseas broadcast from Calais, at U.N.O., in the air, at a snooker match and even down in the London Tubes.

The story of how cameras and their associated equipment are made is quite an adventure in itself. To be fully in the picture one must appreciate that the art of TV is advancing rapidly and to meet the demand resulting from our early efforts in the field and the orders secured by H. A. Lewis, Manager of Broadcasting Division, and his staff, very special steps have had to be taken to produce the gear in the shortest possible time.

Early efforts will always be linked with

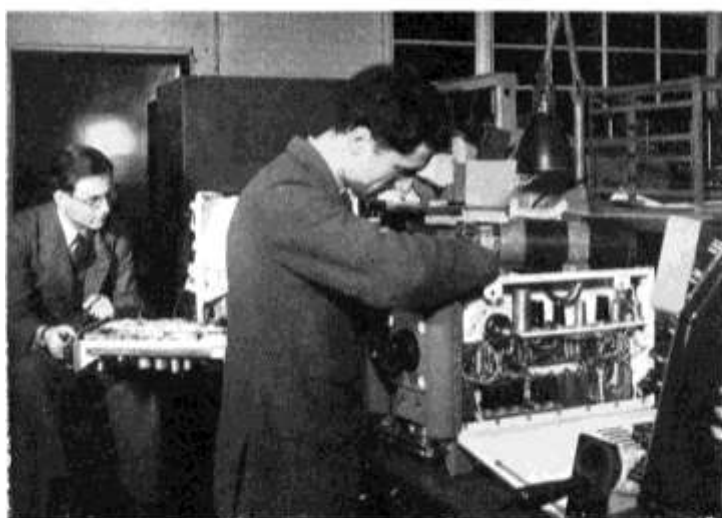
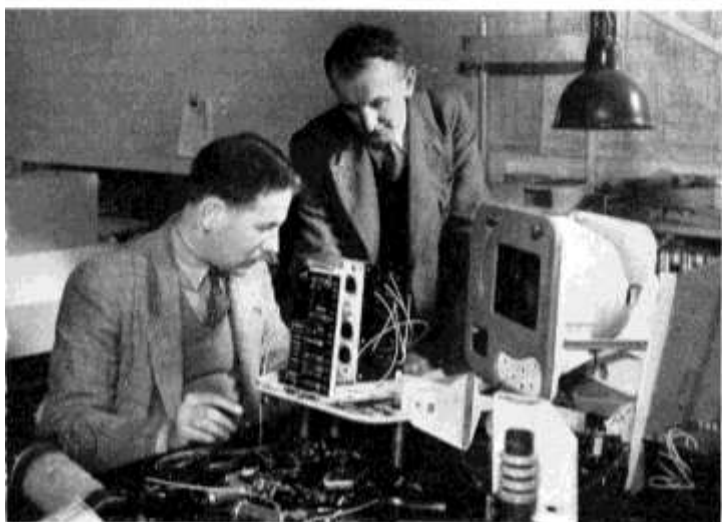
the names of L. H. Bedford, George Partington and Frank Baum, who worked near-miracles in their endeavour to produce the first six cameras.

Based on this original equipment, new and advanced designs have been produced by the development team and these have formed the basis of large contracts for the B.B.C. and the Canadian Broadcasting Corporation. This equipment includes over 100 different designs ranging from a fully equipped mobile control room down to a small box which lights up showing "Sound on", "Vision On".

Equipment for two complete studio centres will be among the first deliveries. Each centre has two studios, a teleciné room and a master control room, four mobile control rooms each equipped with three cameras and several sets of test and monitoring equipment for television transmitters. The mobile control

George Partington, Chief of Television Studio Development, with (left) John James and Ken Harrod





rooms in themselves represent quite a formidable design project. Starting with a small bus chassis whose steering and many other parts were modified, a thermally insulated body was added, with operating positions, racking for equipment, heaters, a cooler, cable connector panels, mains and battery lighting, stowage for cameras, tripods, and lenses.

Operational experience with earlier equipment showed that many new facilities were required to meet more ambitious programmes, and the rapid development of television technique showed that higher specifications had to be met. These two main points added up to a new design for most units and the decision was made less than eighteen months ago to supply this new equipment against the contracts mentioned, giving the users the benefit of the most up-to-date equipment. This has meant a tremendous effort by the Television Studio and O.B. Development Group at Baddow, the Works at New Street and the Television Test Section also at the Works.

The development of this programme has broadly followed the usual course. From the basic ideas followed the preliminary circuit investigations, bread-board layouts—known as birds' nests at Baddow—the laboratory prototypes and the issue of drawings to the Works. But because of the wide range of equipment involved and the peculiarly un-

Ron Oddy, Chief of Television Draughting Section, discusses a camera viewing hood with its designer, R. D. Revill. Behind them is B. L. Crick

Bill Bush, Chief of Baddow Workshop, talks over the assembly of a Monitor with J. Reeves

Peter Helsden (left) makes adjustments to a prototype Camera Control Unit. D. Haley is working on a camera

L. J. Van Rooyen (centre) aligns a prototype Teleciné equipment, assisted by N. A. B. King and D. Morgan



H. Kingdon, Superintendent of Prototype and Instrument Shops, checks details with his shop floor planning team, while R. M. Carroll clears up a query with D. Haldane; (left to right) D. Haldane, R. M. Carroll, T. Stubbings, F. Leach, H. Kingdon, L. Staines, W. Cooper

stable state of television technique, this process of orderly development has often had to be short-circuited. Laboratory prototypes have arrived after production models with the inevitable consequence of "Mods" on the Works which have been taken with surprising equanimity and the final units have satisfied all. With the Works anxious for information so that production could start, the lights at Baddow have burned till midnight. Ken Harrod, assisted by Hazel Woodrow and Iris Miller, made his waveforms look like those in the book; John James battled with half a dozen different units at once; John Poole with his intercom was the only man with an excuse for talking to himself; Eric Davies gyrated affably between cameras, line strobos, and the most compact vision mixer ever—definitely no room for that extra knob, but it goes in; L. J. Van Rooyen marrying film with television in a machine on which one presses a button marked "start" and up comes Bing Crosby in sound and vision. Eric Mitchell and Derek Law combining

the arts of the telephone and television engineers to produce "master switching", and Phil Berkeley, who lives in a world of forward drives, air coolers, mains voltage control units and, we believe, the best in contemporary coach body design.

The ideas from this team and their assistants flowed into Ron Oddy, who, assisted by Joe Beavis and the draughting section, produced the drawings. As soon as they were ready, and sometimes sooner, Bill Bush and the Baddow workshop were on the job making experimental prototypes, which meant work for Danny Parish and his "tin bashers". During assembly and wiring there was the inevitable shortage of components, but what Yorkey Smith couldn't produce over his stores counter, "Stapes", A. B. Stapleton, could usually find underneath someone else's! Then more midnight oil by Development to find any faults.

The drawings were passed to New Street for issue to the Works and the start of production. Because the contracts were urgent the organisation of



F. Harbridge, Section 21, assembling an Image Orthicon deflection yoke for the Mark II camera

G. Barrett, Production Foreman, Section 16, examines camera controls while A. Chapman (right), G. Roote, and apprentice A. J. Webster prepare sub-assemblies.

production was handled in an unorthodox manner, and information, including drawings and schedules, instead of passing through the Planning Department, went straight to the shop floor where it was handled by Dick Carroll, Progress Engineer. To him fell the unenviable task of co-ordinating the efforts of Designs, Test, Contracts, and Works, of settling all the queries and holding the strings.

Harry Kingdon, Superintendent of the Model Shop, was assisted in the planning of manufacture by the shop floor methods men Dave Haldane and Wally Cooper, backed up by such as Les Staines, Tom Stubbings, and Frank Leach.

With such a large job assistance had to be obtained from various sections. The Sheet Metal Section at Waterhouse Lane under Dave Reid did a lion's share of the sheet metal work and welding. Some of the styled casings they pro-





Completing a batch of Studio Consoles at Waterhouse Lane are H. Dale, A. Shaw, E. Oliver, A. Wiggan, D. Stiles, T. Thorpe, and C. Oehlrich.

duced mainly by hand were an object lesson in how to turn out a first class job with the minimum of tools, while back at New Street Gus Owers, foreman of the turners, with the help of his lads on the lathes and autos, managed to keep the shops going with lens holders, turrets, and other necessary parts, not forgetting the American screws, nuts, and hank bushes he was called on to produce out of the hat. George Snow, of the Mills, who has that faraway look, always managed to work this one in when asked.

Job tickets having been rate-fixed by Alan Beale, they were then printed and issued to Jack Stock, foreman of Section 21, and his assistant Cecil Harris, who in turn instructed their chargehands and operators. Cases, chassis, and mountings were made by Bert Owers, the man with the cheerful smile, Wilky and Lucky (G. Wilkinson and G. Lucking), George Blackwood, and Bob Hines, to mention a few. Clutches, handles, and yoke details were machined by Jack Rolfe, Nobby Richmond, and others.

The detailed parts were brought together, checked, and sub-assembled.

These and other complementary parts were then laid out, checked by Des Chilvers, and issued to those wizards of the soldering irons and interpreters of schematic diagrams headed by Freddie Fowler, Vic Saffen, Lionel Heard, Reg Gray, and that master of the trumpet, Lloyd Harvey.

Many of the large assembly jobs were passed over to the Mounting Shop under George Stock and George Barrett. Their responsibilities included the Camera Control Units, on which Arthur Chapman and his group kept pace with the production schedule as well as modifications, the Picture and Waveform Monitors on which Reg Anstey and Frank Canham and their groups worked wonders, and other units including electronic viewfinders, and many types of power units.

The operation of a camera depends on a long complicated channel or chain of control and monitoring equipment. There is the electronic viewfinder, on which the camera operator sees a controlled reproduction of the picture from his own camera; the Camera Control Unit, and the Picture and Waveform Monitor which are used to control and

Mrs. Brenda Harrington winding a section of a deflection coil assembly





E. H. Pursey and D. Pay check a complete camera channel



J. Bausor and a camera in Test

monitor the picture quality; after these the synchronising generator which ensures that the picture being taken by the camera is faithfully transmitted. The vision mixer is the means by which the producer selects the picture from any one of the cameras which he is using and switches it for transmission.

Then there are the power units and communication equipment for speech between producer and camera crews.

All these units quickly took shape along the assembly benches of Sections 16 and 21. On the gleaming white chassis were assembled all the various parts which Bill Wheeler and "The Major", Dave Davidson, of the Progress Department shepherded to the right place at the right time, hundreds of separate items—tag boards, video units, chokes, transformers, relays, indicator lamps, yokes for the Image Orthicon tubes, lens holders, panels, control handles and, finally, cases.

The completed units passed under the keen eyes of Vic Andrews and his

inspectors and on to the Test Division.

In TV Test, Joe Swain, ably assisted by Don Pay and "Perce" Pursey and many others worked for months to clear up the teething troubles in this new equipment. In all a great effort was made by the Works Development and TV Test. Team spirit and goodwill carried them on till late at night on weekdays, on Sundays, at Easter and Whitsun.

The very closest co-operation has been maintained between Designs, Works, Test, and Contracts, with the result that despite all the difficulties arising from present-day conditions, deliveries of the equipment are now being made and new orders are in hand. Even newer designs are under way, for TV cannot stand still, and even bigger problems face us. With the same wonderful co-operation shown so far, there is no doubt that all the problems will be met, the designs will be equally successful and the world will see that Marconi still leads the way in TV as in all other fields of electronics.