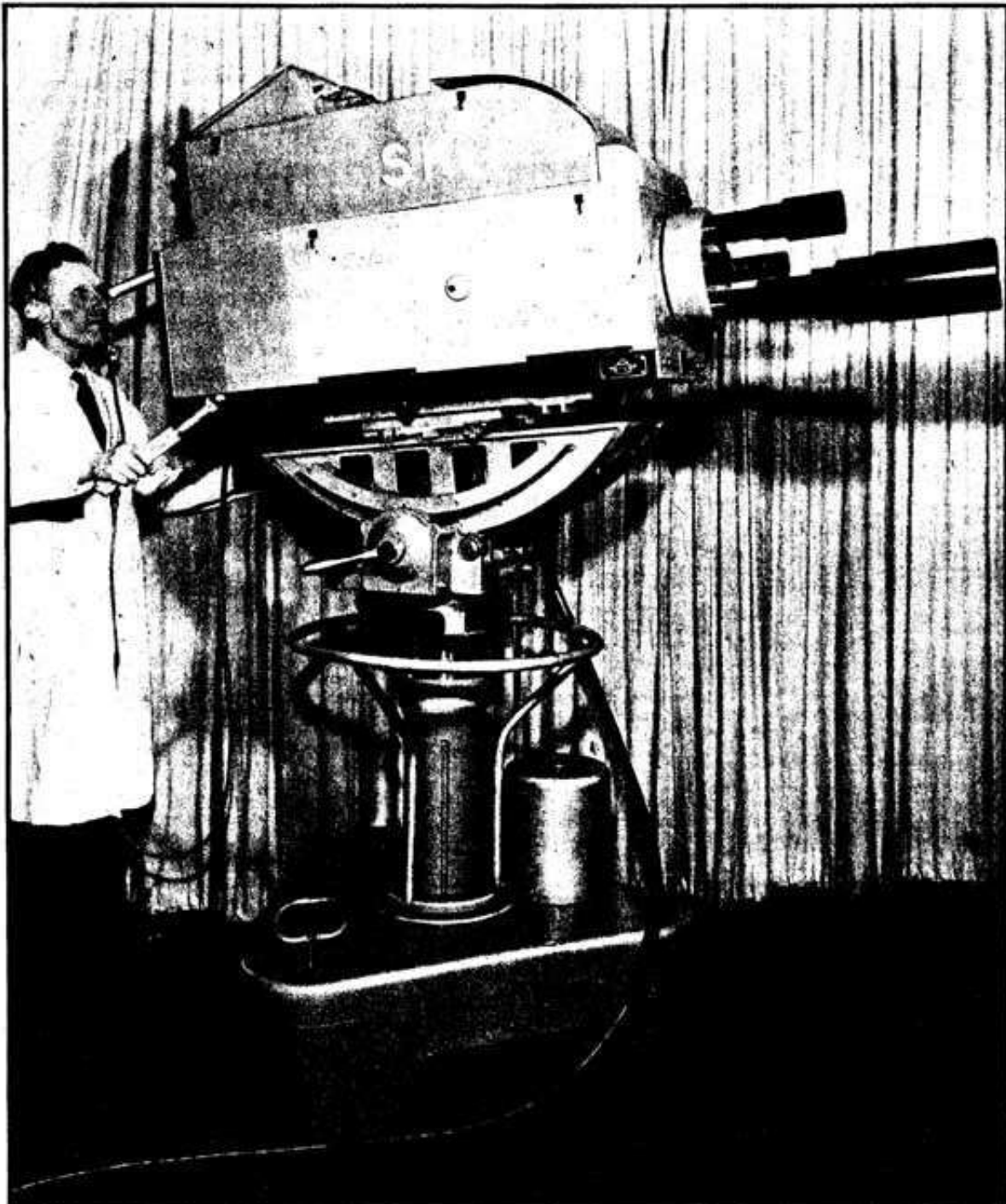


ELABORATE MEDICAL TV CAMERA



In striking contrast to the tiny one-man TV camera we described in the August issue, this monster must be among the world's largest. But there's a good reason for its size: It is one of the latest Marconi 3-Tube Image Orthicon Colour Cameras, and which the designers claim has many advantages over previous colour cameras. As well as studio use, it is finding extensive application in closed circuit systems, especially for medicine and surgery. This particular camera is part of a complete medical demonstration unit ordered by Smith Kline & French Laboratories Ltd., and at present on a tour of major Australian hospitals. See story page 9.

COLOUR TV FOR AUST. HOSPITALS

Of all the jobs undertaken by TV, and colour TV in particular, that of medical instruction is one in which its unique qualities have been most dramatically demonstrated. A medical colour TV unit at present touring Australia has been enthusiastically praised by doctors who have seen it in operation. Here is a description of the equipment and its method of use.

HOW to pass on the skill of an experienced surgeon to the students who must some day take his place has always presented a difficult problem. For obvious reasons the number who can be physically present alongside the operating table must be limited.

Even then there is a risk of their hampering the surgeon if all are to get a good view and, since this must not happen, a restricted view usually has to be accepted.

KEEPING PACE

Nor is the problem confined to students. Fully qualified doctors and surgeons are in continual need of instruction in order to keep pace with the rapid progress in modern medical science. And, where radically new techniques have to be demonstrated, the number who may wish to see a particular operation may run into hundreds.

There have been many attempts to solve this problem. Motion pictures, first in black and white and later in colour, have played a significant part in the past and, regardless of what transpires in the future, will undoubtedly



The complete colour TV system is housed in this van, the interior of which is divided into two compartments and driver's cabin. The van weighs 8 tons fully loaded, 2 tons being accounted for by the TV equipment.

assume an important role for a long time to come.

But films have their limitations and it is seldom practical to record and replay an entire operation, meaning that the student is usually presented with an edited version which, while extremely useful, may give a false impression of time and other factors. On the other hand, a record which can be replayed over and over again will always have its place in the scheme of things.

The advent of TV was hailed as the best answer to the problem so far, and many experiments were made with early black and white systems. These un-

doubtedly offered a great deal, but the lack of colour was a serious limitation. A black and white image can show the mechanics of an operation but it cannot portray the all important colours which signify the difference between healthy and diseased tissue etc. In short, colour is vital.

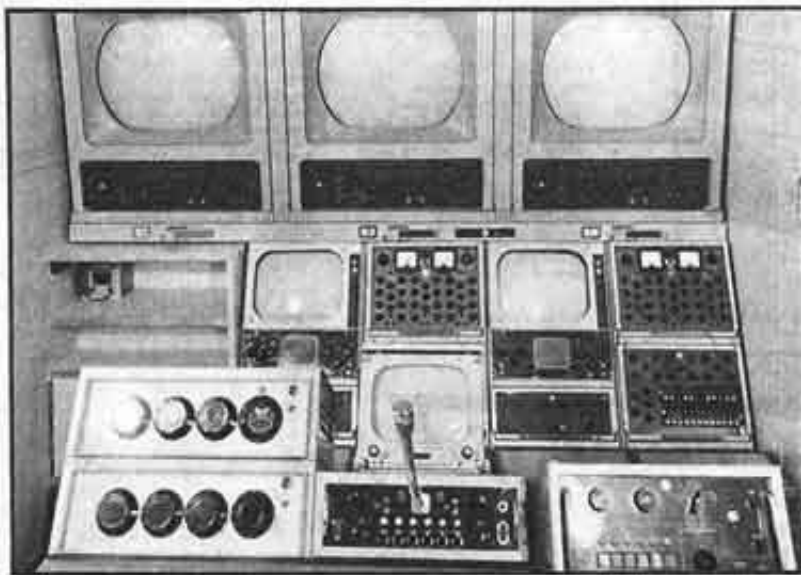
So far, only a few hospitals in the U.S.A. have been able to afford permanent colour TV installations, and it may be some time before such installations become a regular feature of most hospitals. Realising this, the firm of Smith Kline and French Laboratories Ltd., London, pharmaceutical suppliers, decided to acquire a complete colour TV system which could be made available to medical conventions as a gesture of goodwill to the medical profession.

CONTINUOUS USE

An order was placed with the Marconi Company and the unit was delivered in June 1958. It was an immediate success and has been in almost continuous use ever since throughout the United Kingdom. Recently it was shipped to this country and has so far given demonstrations in Adelaide, Melbourne, and Brisbane. It is due in Sydney in early October, at the Royal Prince Alfred Hospital.

The entire system is housed in a large van, similar to a medium size bus. It weighs 8 tons fully loaded, two tons being the TV equipment. There are two colour cameras, one black and white camera, a complete control panel with colour monitors for each camera, plus a "line" monitor, full mixing facilities, provision for wipes, laps, dissolves, and similar effects, audio control facilities, and communication between producer and the "studio" staff.

The completeness of the equipment is illustrated by the fact that, at a recent demonstration for the staff of Smith



The centre compartment of the van is the Control Room, shown here. In the top rack are three 21in colour monitors, one line and two camera monitors. Below them are picture and waveform monitors and camera control equipment.

Kline and French Laboratories (Aust.) Ltd., it was able to present a two hour variety show with all the technical smoothness we are accustomed to see on regular programs. This was, incidentally, the first time this equipment had been used for such a purpose, in either England or Australia.

The colour system used is similar to the U.S. N.T.S.C. compatible colour TV system, but modified to the British 405 line standard. Briefly, this provides for a high definition monochrome picture on which is superimposed a low definition colour pattern, it having been demonstrated that the eye cannot distinguish fine detail in colour.

COLOUR CAMERAS

The colour cameras are designed around a system of three-image orthicon tubes. From the lens light passes to a system of dichroic mirrors which splits the image into its red, green, and blue components and directs each to the appropriate image orthicon. Neutral density filters in the blue and red channels enable these to be matched with the green channel and ensure that each tube is being operated on the same part of its curve.

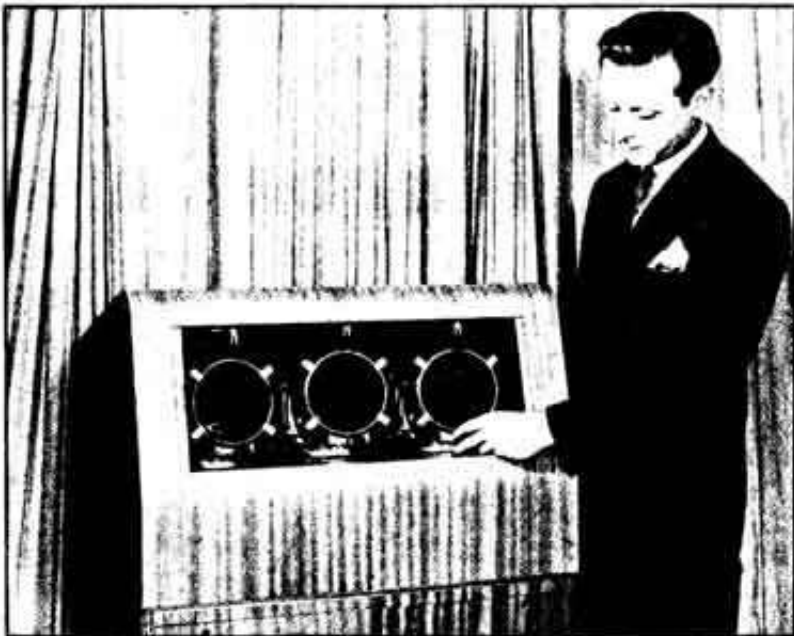
Signals from the cameras are fed to the control panel and displayed on the appropriate camera monitors. The producer selects the most suitable picture at any time, and this is displayed on the "line" monitor.

The monitors are standard 21in colour TV receivers, and similar sets could be used for audience display where relatively few people were involved. For large audiences, however, a projection system is used, capable of covering a 6ft by 8ft screen and coping with an audience of 300.

The projector uses three small screen, high intensity, picture tubes, each in a conventional projection optical system. These sit side by side and the images from all three are superimposed on the screen. One tube produces a blue image, one a green, and one a red. The blue and the green tubes achieve their colours directly from the phosphor, but the red is produced by an amber phosphor and a suitable optical filter.

When used for medical demonstrations, it is usual to place one camera in the operating theatre, and the other in a small "studio" in some other part

PROJECTOR FOR LARGE SCREEN



For large audiences the picture is presented on a 6ft x 8ft screen by means of this three element projection unit. The picture can be viewed comfortably by up to 300 people.

of the building. The theatre camera is aimed at a mirror suspended at a suitable angle above the operating table, giving a "bird's eye view" of the operation.

The second camera covers a panel of medical men who explain to the audience the nature of the operation, detail the case history, discuss similar cases in the past, and generally fill in the background. They may also comment during the operation and after it is concluded. The black and white camera mentioned earlier may be used during these discussions to present charts, X-rays, etc., relevant to the case.

At the staff demonstration which Radio Television and Hobbies was privileged to attend the quality of the

colour was extremely good. Moreover, the quality was consistently even and there were no problems such as gross change in colour values due to lighting variations, which are often reported from overseas.

According to a spokesman for Smith Kline and French (Aust.) Ltd., the demonstrations given so far in Australia have been enthusiastically received by the medical profession and, having seen what the system will do, this is easy to believe. While it may be some time before our hospitals can afford this very valuable aid—a simpler, one camera, system is estimated to cost between £25,000 and £30,000—it would appear to be something which should be made available with the least possible delay.



☆
At left is shown a typical operating theatre scene. The colour camera is aimed at a mirror angled above the table and a battery of lenses enables the best possible image to be obtained. At right is the actual image in the mirror as seen by the camera. Portion of the TV camera lens can be seen in the top right hand corner of the picture.
☆

