



TELEVISION OUTSIDE BROADCAST VEHICLES

The Marconi Company is probably more experienced than any in the world in designing and manufacturing outside broadcast units, and equipments have been despatched to very many different climates and operating companies. It was first to introduce air-conditioning into vehicles of this type and pioneered the use of all-metal light-alloy bodies, which have considerably reduced the dead weight and improved the stability of the vehicles under varying climatic conditions.

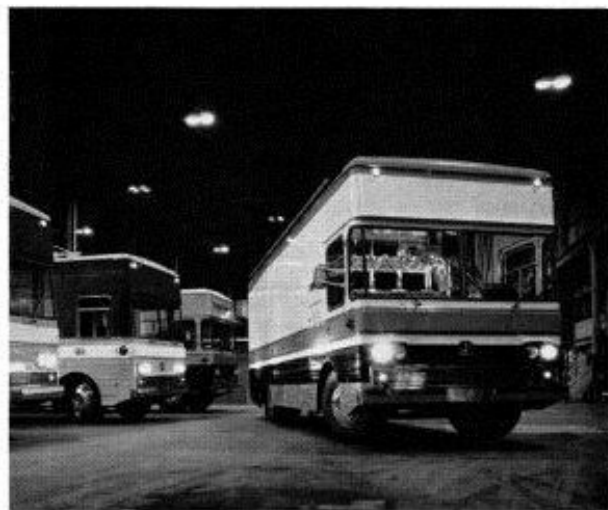
The following pages described the present range of standard vehicles-covering the small 2-Camera, the larger multicamera monochrome units and colour units. However, it is realized that these very flexible designs do not necessarily meet some of the more sophisticated and specialized requirements of certain operations.

Some of these alternative designs are briefly listed below.

1. A variation of the B4401 vehicle, incorporating VTR facilities. This is achieved by slightly lengthening the rear end, providing larger doors at the rear and replacing the maintenance bench by a VTR.
2. A variation of the 2-Camera B4400 vehicle, incorporating recording facilities
3. Dual-vehicle units (Production and Technical vehicles).
4. A 2-Colour Camera Unit Type B4402 which although smaller than the 4-Camera Vehicle described on the next page, still retains the same operational flexibility and environmental features.
5. Vehicles to special design.



One of two Colour Units supplied to Yorkshire Television



Outside Broadcast vehicles nearing completion



Colour Television Outside Broadcast Unit Type B4402

The introduction of a colour service in several countries plus the rapid expansion elsewhere resulted in our Colour Television Outside Broadcast Unit.

All the well tried and proven features of our black and white units have been incorporated into this unit; in addition, an extensive assessment of market requirements was conducted. Both factors have resulted in a vehicle design which meets virtually all known multiple colour camera Outside Broadcast Unit requirements.

Description

The interior of the vehicle is divided into Cab, Production Control, Sound Control and Vision Control—the three latter areas being interconnected. The cab will accommodate two passengers plus driver; full heating/demisting facilities are also available in this area.

The Production Area contains both black and white and colour monitoring facilities suitably placed relative to the production desk, and is accessible from the Sound Control area or from outside by a separate door. This desk can accommodate up to four persons and the careful design still provides an air of spaciousness. Maximum space is available for control panels such as Vision Mixer and talkback panels. The Sound Control Area is situated to the rear of Production Control Area and its floor level is raised above Production to provide the best line of sight. The Sound Control Desk can accommodate a 24-channel Sound Mixer plus echo control. The sound Jack-

field, and Sound Tape Recorder/Reproducer (optional) are in close proximity to the Sound Engineer. Personnel access to the Sound Control area is from Production or Technical Areas, or directly from outside by means of a separate exterior door.

The rear of the vehicle contains the majority of the equipment, housed in a total of eight special 48cm (19in.) racks—six are situated along one side of the van. Access to the rear is affected by withdrawing the six-rack assembly; the operation is by means of a special gear mechanism fitted below the floor. The remaining two racks are situated at the rear of the van (adjacent to the rear access door). These racks are directly above the vehicle termination panel. The remainder of this area accommodates a Vision Control Desk (camera operational controls, optional colour balance controls, engineering remote controls etc.).

The racks in the Technical Area accommodate up to six Camera Control Units, Power Supplies, Coding equipment, Communication equipment, up to six monochrome monitors (one per camera); plus additional picture and waveform monitoring. The Vision Mixer and other equipments are fitted to the two-rack assembly. Personnel access to this area is either through the rear access door or from Sound Control Area.

The basic complement of equipment comprises four Mark VII Colour Camera Channels. However the vehicle has been designed to accommodate up to six. The key to the design is one of equipment

expansion with a minimum of work being involved.

The complete vehicle is fully air conditioned.

Typical Schedule of Equipment

- 4 Mk. VII Colour Camera Channels Type B 3205 with zoom lenses.
- 4 PAL Colour Coders Type B 3370.
- 1 set PAL Synchronizing and Test Equipment.
- 1 Vision Mixer Type B 3724 with Line Clamp Amplifier.
- 1 set Sound Mixing Equipment, comprising 12-channel Sound Mixer Type B 1103, Programme Loudspeaker and Amplifier, Microphones with Stands.
- 1 set Communication Unit Type B 3654 with Headphones, Loudspeakers, etc.
- 3 Automatic Voltage Regulators.
- 1 Set Vision Monitoring Equipment for Black and White 36cm (14in.) and Colour 43cm (17in.) monitoring.
- 1 set Vision Distribution Equipment.

Optional Additional Equipment

- 1 Colour Picture Monitor, 52cm (21in.) Type CYB21C.
- 1 Black and White Picture Monitor, 43cm (14in.) CKD/14.
- 4 Colour Balance Control Unit.
- 1 Vision Mixer Type B 3724 with Special Effects (Optional to Vision Mixer under Equipment list).

2-Camera Television Outside Broadcast Unit Type B4400

The 2-camera television outside broadcast unit, Type B 4400, is designed to fit on a standard commercial 2-ton vehicle chassis, and the vehicle can be supplied with either a petrol or a diesel engine together with left- or right-hand drive.

Provision is made to house two complete Mark V camera channels Type B 3100 together with associated equipment including Picture and Waveform Monitor Type B 3901. Full synchronizing facilities are available, supplied by a Synchronizing Generator Type B 3605. Monitoring is on

36cm (14in.) picture monitors for the preview output of the vision mixer and also the transmission.

The roof of the vehicle is reinforced to take the weight of equipment and operator. Hardboard treads on a roof rack provide



a walkway to the area occupied by the camera or microwave link. A small rail is provided to enable cables to be attached to the roof easily.

Typical Schedule of Equipment

- 2 Mk. V 4½in. image orthicon camera channels. Type B 3100.
- 2 Zoom lenses.
- 2 Picture and waveform monitors, Type B 3901.
- 2 sets camera mountings.
- 2 sets camera cables.
- 1 Mobile vision mixer, Type B 3714 complete with line clamp amplifier.
- 2 36cm (14in.) general purpose monitors.
- 1 Synchronizing generator, Type B 3605.
- 1 Sound mixer, Type B 1102.
- 1 Loudspeaker and amplifier.
- 1 Sound distribution amplifier, Type B 1334.
- 1 set communications equipment B 3650 series.
- 1 Test meter, Type B 4105.
- 1 set microphones, cables and stands.
- 1 Production Talkback and Communications panel, Type B 16-3653.
- 1 set mains distribution equipment.
- 1 set air conditioning equipment.

Optional Items

- 1 Commentator's unit, Type B 3655.
- 1 Portable microwave link transmitter.
- 1 Vision and sound link receiver.
- 2 4½in. image orthicon tubes, Type P 811.
- 1 Petrol or diesel electric generator mounted on two-wheel trailer.
- 2 Camera carrying cases.

Mark V/Mark VII Camera O.B Unit Type B 4403/4404

The success of the four Mark V camera unit Type B 4401 together with the ever increasing demand for 'colour convertible' systems has spurred the design of this new outside broadcast unit.

The unit is offered as

- (a) The B 4403 Four-camera Black and White O.B Unit.
- (b) The B 4404 Two-camera Colour O.B Unit.

The B 4403 may be re-equipped as the B 4404 at any time when the change to colour is desired.

Features and Facilities B 4403 and B 4404

- 4 Mark V 4½in. image orthicon camera channels (B 4403).
- 2 Mark VII four tube colour camera channels (B 4404).
- 12 or 24 channel sound mixer.
- 48cm (19in.) colour picture monitors (B 4404).
- Dual synchronizing equipments.
- Solid-state vision mixer Type B 3724.

- Movable equipment racks save space.
- Full air conditioning of operational areas.
- Space for VTR in some versions.
- Separate sound control area.
- Reinforced roof will take camera or link.

The Vehicle

This is externally identical to that shown in the illustration, and the short wheelbase and good handling are major features for a full facilities mobile unit. The Bedford forward control chassis enables very full use to be made of available space and as before, comprehensive storage facilities are provided. The cab seats the driver and two passengers in considerable comfort and such details as heavy duty screen wipers are standard fittings.

Options

Keystone of this latest design is flexibility. The colour version may be equipped with a third Mark VII Camera channel, or a video tape recorder can be installed. The Mark VII channels themselves may



Production area of B 4401 vehicle



be fitted with Aperture Correctors (B3371) and/or Colour Balance Controls, and of course with the black and white or colour cameras a wide range of zoom lenses is available.

Space is allocated for a comprehensive range of test equipment and the termination panel has capacity for connection to other vehicles during complex outside broadcasts. The Vision Mixer has eight inputs, so that remote sources can be used, and Special Effects equipment can be fitted.



Type B 4401 television outside broadcast unit for 'Canal 13' Mexico City

S.H.F Vision and Sound Link Type TM112 and TM113

These transistorized radio-link equipments are suitable for use over distances up to 95 kilometres (60 miles) given favourable propagation conditions. They may be used for temporary installation or for permanent links. The equipments are suitable for use with colour television and the quality is such that several equipments may be used in cascade.

Features

Unattended operation once the link is set up, adequate a.g.c and a.f.c being provided to obviate any resetting.

Talk back circuits can be coupled into a telephone system.

Alignment simplified by built-in features and sound test signals.

Switched metering includes monitoring and power output.

The standard one-metre reflectors with tripod can be replaced by two-metre reflectors on a special base for long-range links.

Data summary

<i>General</i>	TM112	TM113
Frequency range:	6.2 to 7.6GHz	10.5 to 12.2GHz
Transmitter power:	1W nominal	250mW nominal
Aerial gain at mid-band:		
1m dia.	34.6dB	37dB
2m dia.	40.5dB	42dB

Receiver noise figure: 14dB 15dB
I.F.: 115 or 70MHz
I.F. bandwidth (3dB) 32MHz.
Power supply: 110, 115, 121, 127, 134 or 220V ($\pm 10\%$), 50 or 60Hz, single-phase a.c.

Power consumption: Transmitter, 240W. Receiver, 250W.

Dimensions:

Head units
 Height 35cm (14in.)
 Width 30cm (12in.)
 Depth 60cm (24in.)
 Weight 24kg (55lb)

Supply units
 Height 25cm (10in.)
 Width 15cm (6in.)
 Depth 60cm (24in.)
 Weight 16kg (35lb)

Aerials
 112.5cm (44in.) dia.
 Weight 13.5kg (30lb)
 220cm (87in.) dia.
 Weight 100kg (220lb).

Vision Channel

Video bandwidth: 30Hz to 12MHz.
Deviation: ± 1.2 MHz at 10kHz.
 ± 4 MHz at 1.5MHz.
 ± 5.7 MHz at 10MHz.
Pre-emphasis: To CCIR 625-lines, switch-controlled.
Input and output impedance: 75 Ω .

Input voltage: 0.5V min. p-p.

Output voltage (p-p max.): 0.5V remodulation output. 1.2V direct output 2V distributor output.

Crosstalk: Luminance/sound ratio 65dB. Luminance/sub carrier ratio 55dB.

Sound Channel

Sound bandwidth: ± 1 dB, 40 to 12000Hz (625 lines).

Sub-carrier frequency: 11.15MHz (819 lines) or 7.5MHz (625 lines).

Sub-carrier s.h.f deviation: ± 0.425 MHz nominal (0.65MHz max.).

Sub-carrier a.f deviation (at 1000Hz): ± 200 kHz.

Input and output impedance: 200 or 600 Ω balanced.

Output level: ± 12 dBm max.

Picture intermodulation: 65dB.

Total harmonic distortion: From 40Hz to 10kHz r.m.s signal/r.m.s spurious modulation ratio, 75dB.

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