

Mobile Television Vans for the U.S. Marine Corps

By C. D. PHILLIPS

On the basis of information supplied to the press last July, and in relation to descriptions of other vans being published, we have been asked to describe briefly the numerous vans made and outfitted by RCA Corp., with emphasis on designs, and equipment different from the other vans described in this issue of the Journal.

FOR MANY YEARS RCA has been designing and assembling outside broadcasting vans planned to carry facilities equal to a studio of comparable size. Live and telecine cameras, VTRs, sound and vision mixers, microwave link terminals and ancillary power, lighting and climate control systems are integrated into the wheeled production centers.

In designing a mobile television unit, three factors are considered: motive power, chassis/body and operating equipment.

Motive power is chosen after studies of the total complement of equipment and personnel required, the terrain that must be negotiated and the environmental conditions that will be found. The standard commercial vehicle most responsive to these guidelines is selected, and if necessary, modified or equipped

to increase its reliability, performance and durability.

RCA uses four different basic chassis/body types: for spot news coverage and other events that call for smaller TV production capability, either (1) a "box body" or (2) an integrated cab and body may be used; (3) for medium or large show requirements, a bus may be used; and (4) for extensive and flexible operations, a trailer class of semi-articulated van may be used.

Inside these vehicles, compact equipment is laid out so that an aisle runs through the entire body for personnel traffic. Single- or multiple-camera chains, for both live and film presentations, can be complemented or replaced by a variety of other items, including videotape recorders, production equipment, microwave terminals and sound or vision transmitters. Such an OB system can be linked to the station's master control for program integration or be interconnected to a network for direct feed.

Figure 1 shows the layout of a typical RCA OB unit.

This contribution has been prepared in October, 1972, with the cooperation of Edward J. Dudley, RCA Government and Commercial Systems, Moorestown, NJ 08057, by C. D. Phillips, RCA Corp., Bldg. 3-2, Camden, NJ 08102.

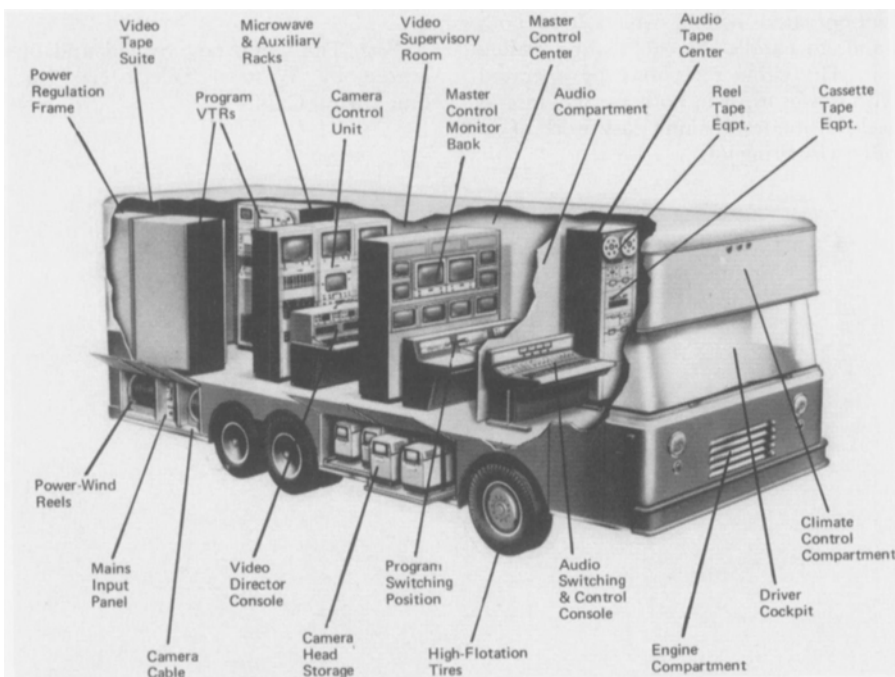


Fig. 1. A typical layout of an RCA outside broadcast unit.

Training Programs Production Units

A complete color TV studio on wheels that can move into virtually any location in the country to produce training and instructional programs on videotape was designed for the U.S. Marine Corps. The studio system, built compactly inside a 35-ft (10.67-m) mobile van, includes broadcast-quality color TV cameras, videotape recorders, a TV film system, video control and switching console, a full audio system, and supporting apparatus. This is the same type of equipment as used by TV networks and stations.

Two identical vans were delivered to the U.S. Marine Corps in July by RCA Broadcast Systems, Camden, N.J.; one will operate from the Marine station at Quantico, Va., and the second from the Marine station at Camp Pendleton, Calif.

The custom-built chassis employs air-ride suspension and is powered by a Ford engine with five-speed transmission. Front wheel drive eliminates the need for differential connections to rear wheels. This allows as much as 70% additional storage space under the van body for carrying cameras and other equipment while under way. A six-ton air-conditioning unit, mounted over the cab, provides complete conditioning, i.e., cooling, heating and dehumidifying.

The major items of equipments are briefly described below.

Color TV Cameras

The two "live" color TV cameras aboard each van are RCA's type TK-44B, a current three-tube design that is used in the commercial and educational television fields. The camera is highly sensitive and capable of producing broadcastable color pictures from light levels as low as 5 fc. This is roughly the illumination given off by an ordinary household flashlight.

The TK-44B incorporates many automatic features for the purpose of minimizing the number of operator manipulations while maintaining sharpness and detail in color pictures. Among these features is "bias light," a system for minimizing scene "lag" when the camera is operating in very low conditions. Another feature, known as RGB coring, reduces the picture "noise" that often accompanies low light level operation. An additional feature is scene contrast compression, which enables the camera to produce picture detail usually lost in shadows without over-brightening the rest of the TV picture.

Color TV Film System

This system is used to display motion pictures and slides in the TV system and is the intermediate equipment between the optical medium of film and the electronic medium of television. Each van has a color-film system consisting of one TK-27B color-film camera, a TP-55 multiplexer, a TP-66 film projector and a TP-7 slide projector.

Recent refinements in the design of the TK-27B have included built-in contour enhancing circuits which permit high-frequency details in the picture to be

amplified without an annoying increase in "noise." Contouring, which enhances picture definition as well as detail, is produced from the TK-27B's luminance signal. The camera employs a four-tube design; three pickup tubes handle chroma signals and the fourth produces luminance, or brightness.

Videotape Recorders

The two TR-60 compact television tape recorders aboard each van are broadcast-quality, quadruplex machines capable of recording color picture and

audio signals and playing them back instantly. One machine in each van is equipped with an electronic editing system that permits rapid editing of taped programs without physical cutting of the tape. The TR-60 possesses many of the features used in larger, more expensive tape recorders, including a rear side erase head, complete monitoring of all critical machine waveforms and video signals, high gain servo and head resonance compensation. The machine measures only 33 in (84 cm) wide, 66 in (168 cm) high and 24 in (61 cm) deep.

What Sort of Mobile Television Unit Do We Want?

By K. K. ACKERMAN

Because the high cost, large size and complexity of general purpose mobile TV units may not be justified, it may be more economic to design specialized units for three different applications identified as Live coverage, Drama inserts, and News coverage. The effect on the design of mobile units of lightweight cameras, camera cable and monitors is discussed.

Introduction

Most broadcasting organizations have equipped themselves with general purpose mobile units. A typical specification would include:

- (a) four cameras plus one spare and facilities for controlling and accommodating six cameras;
- (b) a 24-channel sound desk;
- (c) a 10-source vision mixer with full effects and chroma key facilities, etc.;
- (d) a monochrome caption scanner for opacities and transparencies with color synthesizer;
- (e) five 10:1 and three 18:1 fully servo-controlled zoom lenses;
- (f) comprehensive talkback, communication radio talkback and telephone systems;
- (g) sophisticated vision synchronizing, auto phasing and locking arrangements; and
- (h) a 30-channel lighting control and dimmer system.

An example of such a vehicle is illustrated in Fig. 1. It is 34 ft 10 in (10.62 m) long, 8 ft 2½ in (2.50 m) wide and 10 ft 11 in (3.33 m) high, weighs 13 tons (11.79 metric tons) and costs nearly \$900,000.

The high cost and complexity of this

type of vehicle are direct results of the wide variety of types of program which it is required to cover. The large sound desk is necessary for light entertainment shows from theaters, and for covering "pop" music groups. The comprehensive talkback and telephone arrangements are essential for sport and other complex live broadcasts particularly when the vehicle may serve as the production linking point for a multiple event covering a number of sites. The large complement of lenses is included to cover both indoor and outdoor telecasts.

The only way to reduce the size, cost and complexity of these mobile units is to identify particular areas of programming and to design vehicles which are suited to that application. In a large organization like the BBC with a sizeable fleet of vehicles, this should be possible and result in worthwhile economics.

Three Types of Mobile Units

Three program categories call for distinctly different technical facilities:

Live Coverage

This includes major sports events, political conventions and the like. The emphasis here is on a large number of cameras; vision synchronizing is essential, as are complex telephone and communications systems. Much less important are a large sound desk, lighting control systems and sophisticated effects facilities on the vision mixer. As the events are predictable, parking arrangements can be planned and therefore a large cumbersome vehicle is not a serious embarrassment.

Drama Inserts and Magazine Programs

Here it should be explained that in the United Kingdom a high percentage of drama is produced in a TV studio on videotape and matching of 16mm film quality to that of the electronic camera is not always adequate despite the very significant improvements that have been effected in 16mm techniques. Experiments have shown that a small mobile

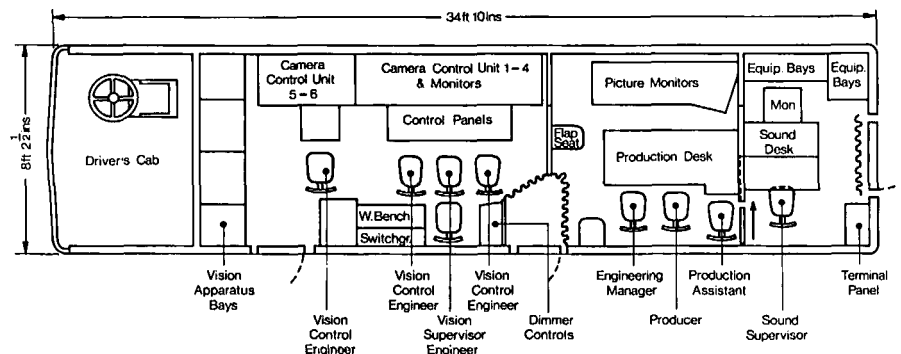


Fig. 1. General-purpose, four- to six-camera color mobile unit.

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