

# TELEVISION COVERAGE OF THE PRESIDENTIAL INAUGURATION\*

By

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*Summary—Extensive television and radio coverage of the inauguration of President Eisenhower in January was provided by the National Broadcasting Company. Because of the physical magnitude of the task and the fact that considerable mobile coverage was required, it is felt that a description of the operational procedures is of interest. A rather detailed description of a new small mobile unit is also included.*

THE NBC television and radio coverage of the inauguration of President Eisenhower in January 1953 was one of the most ambitious projects of its type which has thus far been attempted. The inauguration-day coverage was continuous from 7 A.M. to 7 P.M., at which time equipment was moved out to Georgetown University Gymnasium where the Inaugural Ball was televised from 11:15 P.M. until after midnight.

The groundwork for the project began in November 1952. Since this was to be an integrated operation for both radio and television, there was joint planning for the two services. Information and suggestions were gathered from all available sources, and a survey made of the route to be followed by the parade. It was finally decided that four fixed locations along the route plus a mobile unit would give the desired television coverage. The locations were the Capitol, the Federal Trade Building, the Treasury Building, and Lafayette Park. In addition, the film studio at television station WNBW in Washington was used, and commercials for the sponsor (General Motors) originated at the Waldorf-Astoria Hotel in New York. For radio, there were, in addition, two mobile units and a fixed location at the Esso Building. The remote locations and the route of the parade are shown in Figure 1. After the locations had been selected, arrangements were made for equipment, power, telephone lines and similar details necessary for smooth operation.

A novel feature of the inaugural coverage was the first use of the new Cadillac Telemobile Unit which has been dubbed the "Traveling Eye." This is a self-contained unit with its own power supply, capable of transmitting complete audio and video signals of broadcast quality

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\* Decimal Classification: R550.

to a nearby relay receiver. Because of the uniqueness of the unit, and because its construction involved solution of many problems which may arise in future developments of this type, it is felt that a fairly detailed description of the construction would be of interest. The unit is described in the last section of this paper.

### *Switching Center*

Over-all control of the entire television operation was exercised through the switching center which, together with a commentator's booth, was constructed on the stage of WNBW Studio "A" in the Wardman Park Hotel. The switching center for radio was located in Room 305D of the Wardman Park Hotel; cross feeds being provided.

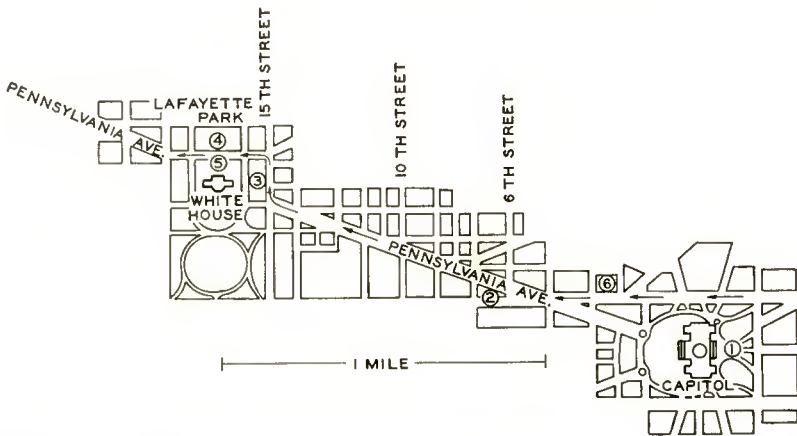


Fig. 1—Route at the inaugural parade up Pennsylvania Avenue from the Capitol to the White House. The remote pickup locations shown are: 1, The Capitol; 2, The Federal Trade Building; 3, The Treasury Building; 4, Lafayette Park; 5, Presidential reviewing stand; 6, The Esso Building.

Between each television fixed remote location and the switching center the following circuits were installed: a regular video line, an emergency video line, a regular audio line, an emergency audio line, a feedback line, a "program" phone line, an "engineering" phone line, and a business phone. Some of the feedback circuits were radio-frequency links. All of these circuits except the radio-frequency links and the microwave link between the Capitol dome and the Wardman Park Hotel were supplied by the telephone company. Diplexed video and audio signals from the mobile unit were beamed to the Capitol dome on microwave.

The system was designed to be as flexible as possible. All incoming video circuits had monitors which provided preview for the program

department as well as a constant check on operational condition of both circuits and equipment. Each video circuit fed into a variable 75-ohm pad, and then into a stabilizing amplifier. Both the switching system and the monitors were fed from this amplifier. The output of the switching system fed the outgoing circuits through additional stabilizing amplifiers, equalizers, and distribution amplifiers. A pulse cross monitor enabled the sync generators on field locations to be phased to WNBW in order to prevent picture rolling when switching the picture from one location to another. The system produced very stable pictures.

Parallel circuits were provided between remote locations and the output terminal feeding the NBC network and the WNBW transmitter.



Fig. 2—View of the Capitol from the photographer's stand at the moment the Chief Justice was administering the oath of office.

This minimized the possibility of loss of program due to equipment or circuit failure.

#### *Capitol Building*

This was considered the most important of the remote locations, since the swearing-in ceremony and the acceptance speeches were made here. Accordingly, five camera chains were used—one on the second balcony, two on the photographers' platform, and two on the steps in front of the building. In addition to the camera chains, the Capitol setup included a 10-kilowatt gasoline engine-generator set for emergency power, and control rooms which were installed in the crypt. NBC radio provided a "pool" sound pickup for use by all networks and newsreels.

### *Treasury Building*

Three camera chains were used here — two in the stands and one on the “Industrial Monkey” which is a boom-type lift mounted on a truck. The emergency New York telemobile unit, which includes a 10-kilowatt generator, was parked nearby and used as a control room.

### *Lafayette Park*

Pennsylvania Avenue separates Lafayette Park from the White

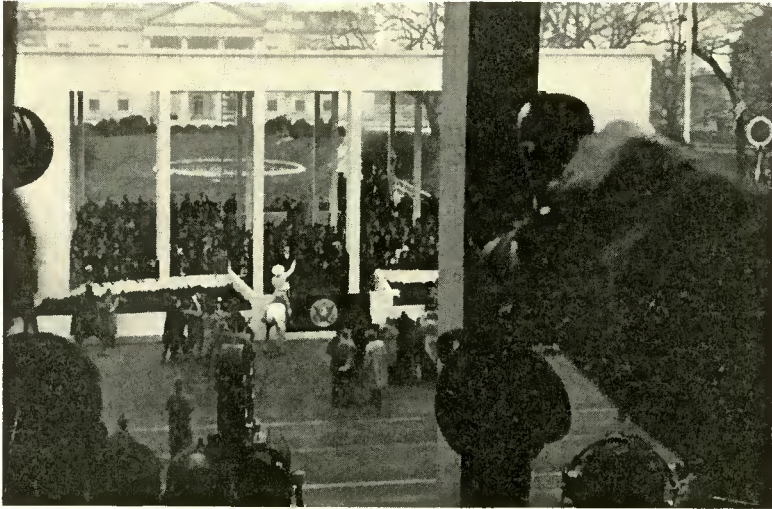


Fig. 3—The presidential reviewing stands on the White House grounds as seen from the Lafayette Park camera location.

House grounds. The presidential reviewing stands were erected on the White House side, and public stands on the Lafayette Park side. Three camera chains were set up here — two on the Park side and one on the White House side. It was originally planned to use the regular New York telemobile unit for the control room, but the soft ground in the Park would not support the weight of the truck. The control equipment therefore had to be transferred to a lighter truck and a separate 10-kilowatt generator was employed. The signal from the camera on the White House side was distributed to the other networks on a “pool” basis. It was the only camera operated in this manner.

### *Federal Trade Building*

Three camera chains were set up on the balcony of the east end



of the Federal Trade Building. A roped-off section of the cafeteria was used as the control room.

### *Operation*

The "program" phone lines were used by the producer for two-way



Fig. 4—The switching center in the Wardman Park Hotel. The producer's position is at the right.

communications with the various remote points. The feedback line fed the "on the air" audio to the monitors at each of the remote locations for the information of the commentators. In addition, an "off the air" video monitor was installed at each location, so that commentators could observe the picture being transmitted. A switching system was

installed which permitted the producer to utilize one or more feedback lines for giving instructions to various points. Since the feedback system used several radio-frequency links, and since other networks were using channels in the same portion of the spectrum, "beeper" signals were mixed into the feedback system for easy, positive identification of NBC.

That the program was carried out on radio and television without interruption of any kind is a tribute to the planners, the engineers, and the equipment. The magnitude of the operation can best be understood from the following list of some of the material requirements:

- 5000 feet of camera cable,
- 7000 feet of microphone cable,
- 2000 feet of coaxial cable,
- 2000 feet of power cable,
- 16 remote camera chains,
  - 4 remote control rooms (one for each location),
  - 3 10-kilowatt generator sets,
  - 8 radio relay transmitters,
  - 9 microwave transmitters.

A total of 57 engineers for television and 24 for radio participated in the program. The cooperation of personnel of the American Telephone and Telegraph Company, the Chesapeake and Potomac Telephone Company, and the Potomac Power Company was an important contribution to the success of the operation.

#### *Cadillac Mobile Unit*

In planning the inauguration coverage, the desirability of having a mobile television pickup unit, which could itself be a part of the parade, became evident. NBC has mobile units which carry the necessary technical equipment. Such a unit is pictured in Figure 5. It was felt, however, that, due to its size, the use of such a unit in the parade would not be in keeping with the dignity of the occasion. For this reason, the decision was made to convert a passenger car to a small mobile unit. A Cadillac limousine was chosen for the purpose.

The complete unit is shown in operation in Figures 6 and 7. As seen in Figure 6, two operators are stationed on the roof of the car. One operates an image orthicon camera, and the other "aims" the dish of the microwave transmitter used to beam the video and audio to the Capitol dome. The operators reach their stations by hydraulic lift seats which raise them into position.

In addition to the driver, there are a control engineer and an announcer in the car. Since the announcer's field of vision is some-

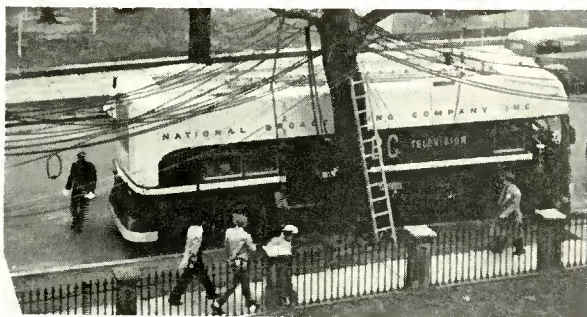


Fig. 5—The emergency New York Telemobile Unit in use as a control room for the Treasury Building cameras.

what restricted, he sometimes must depend on the monitor kinescope to observe the scene being picked up. When the vehicle is stationary, the driver doubles as a cameraman, using a developmental hand-held Vidicon camera as shown in Figure 7.

The electronic equipment carried in the unit includes:

- a field sync generator,
- an image orthicon camera chain,
- a Vidicon camera chain,
- a field relay transmitter,
- a diplexer,
- a field audio amplifier,



Fig. 6—The Cadillac Telemobile Unit moving down Pennsylvania Avenue toward the White House. The microwave relay dish is aimed at the Capitol.



a transmitter control unit,  
 a two-way, 450-megacycle FM radio,  
 a 26-megacycle FM receiver.

All the equipment operates on 110-volt 60-cycle current with the exception of the 450-megacycle radio which is powered by the 6-volt battery system of the car.

The 60-cycle power is supplied by a 3½-kilowatt gasoline-driven engine-generator set which, together with an 800 cubic foot per minute exhaust fan, is installed in the trunk as shown in Figure 8. The generator has 3 per cent voltage regulation and 3 cycles frequency regulation from no load to full load. With a constant 2.5-kilowatt load,



Fig. 7—Cadillac Telemobile Unit parked on Pennsylvania Avenue. The driver is operating the hand-held Vidicon camera.

a frequency deviation of  $\pm 2$  cycle about 60 cycles was measured. The drift is such that with the sync generator running on crystal, the picture stability is quite acceptable.

To accommodate all the equipment and personnel in a standard "75" Cadillac limousine, very extensive body modifications were made, and extensive acoustic damping installed. The interior was stripped down to the base metal and two hatches were cut into the roof. These were then fitted with water-tight sliding covers similar to sliding hatch covers used on a small boat. These hatches were surrounded by the stainless steel rings bearing specially designed carriages as shown in Figure 8. One of the carriages is used for the image orthicon camera



and the other for the microwave transmitter. The two positions are interchangeable.

To support the weight of the camera, carriage, and steel ring, the roof had to be completely rebraced with steel bows running athwartships and a structural member running the length of the car roof. Furthermore, the entire roof structure had to be supported by three steel stanchions running from floor to ceiling along the center line of the car. The stainless steel panning rings are supported on steel piping welded to the roof and to the supporting bows. The weight of all added bracing members and the panning rings is about 1500 pounds.

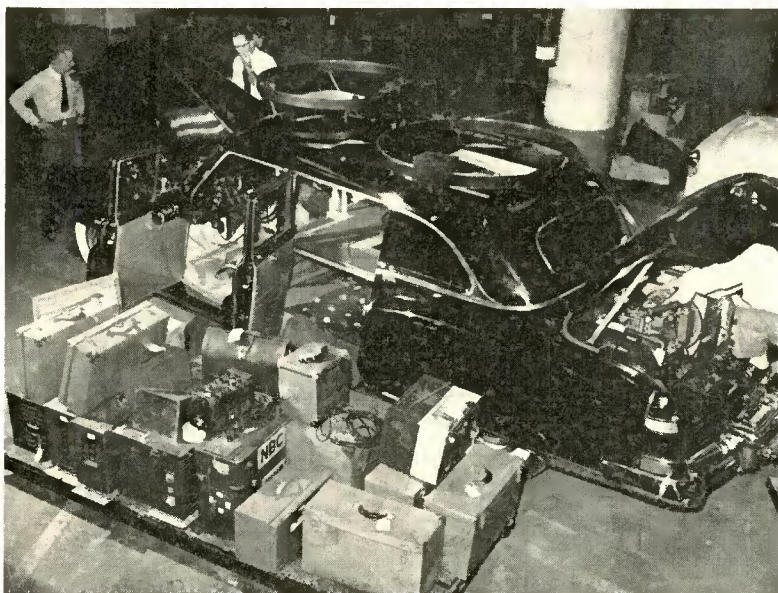


Fig. 8—The Cadillac "75" limousine in the process of conversion. The  $3\frac{1}{2}$ -kilowatt engine-generator can be seen in the trunk. All the equipment on the dolly was fitted into the car.

The telescoping lift seats, which hold the cameraman and transmitterman, are supported on  $\frac{1}{4}$ -inch steel plates on the car floor. The original hydraulic system in the car, used to move the driver's seat laterally, was converted to power the two lift seats.

The rear windows were replaced with very heavily tinted green glass to facilitate observation of the cathode-ray tubes by the engineer and the announcer. As further light control, the two side windows were equipped with black shades.

Since the car was expected to operate at low speeds for sustained periods, it was necessary to install a 5-bladed radiator fan, new drive

pulleys for higher fan speed, a shroud on the motor side of the radiator to allow for adequate engine cooling, and a slow commercial-type differential with a 4.27 to 1 ratio. Several exhaust fans had to be installed to provide cooling for the electronic equipment. A 90-ampere 6-volt alternator, rectifier, and regulator is driven from the fan to carry the load of the 450-megacycle 2-way radio equipment. To add further capacity to the 6-volt system, an auxiliary battery was installed. The left front grill air intake duct was replaced by an external air scoop on the left front fender to eliminate exhaust fumes being picked up from preceding units in the parade.

The car weighed 8000 pounds fully loaded, and required specially constructed rear springs, a reinforced front end suspension, and heavier commercial tires.

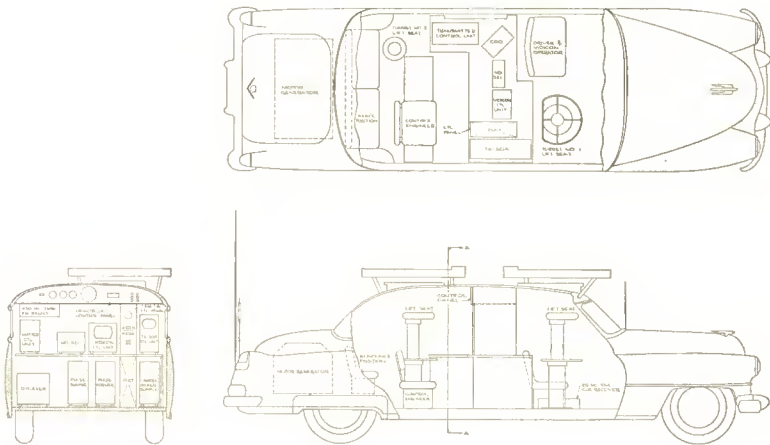


Fig. 9—Physical location of equipment in the Cadillac.

The completion of this conversion job in the short time allotted would have been impossible without the excellent coöperation of C. H. Schamel of Fisher Body Division, and C. A. Rasmussen of Cadillac Motor Car Division of General Motors Corporation together with that of the NBC Engineering Department.