First, I would like to explain that this remote control equipment is available in two different styles. Each has its own advantages, depending upon the type of operation for which it is intended.

One style provides for remote control of the locomotive from a control panel at a fixed location. All standard operations on the locomotive are controlled simply by pushing buttons on the panel. The usual method of control for the fixed control station is by inductive carrier transmitted to the locomotive receiver coil over a line wire which parellels the operating track. With this inductive system the operating area is limited to the length of the line wire.

This system lends itself for application to a repetitive operation such as pushing cars to a dumper.

The other type of remote control apparatus is provided by lightweight, solid state, portable radio transmitting equipment. This unit, which weighs less than five pounds, provides the operator with complete mobility. The operator can ride or walk with the locomotive anywhere there is track.

Control signals with this equipment are transmitted to the locomotive by conventional space radio transmission.

This style of control equipment is especially well suited for safe, gentle coupling of cars and for spotting cars precisely, because the operator can position himself at the point of coupling or at the spotting location. This eliminates unsafe conditions created by misinterpreted hand signals and blind movements of locomotives.

A very good example of one application of portable radio control of an unmanned switching locomotive is at an industrial plant in New Jersey where they operate three unmanned locomotives over 15 miles of in-plant tracks. The plant is heavily criss-crossed with roads, walkways, narrow gauge and standard gauge tracks. With portable equipment one man directs the operation of the switcher.

In addition to remotely controlling the movements of the locomotive, the operator throws switches as required, walks onto crossings to flag approaching traffic before moving the train safely over the crossing, spots cars with precision not usually obtained with manual control, and rides the locomotive into storage tracks.

We also have supplied remote control equipment for switcher locomotives at the Ford Motor Company's Rouge Plant, Dearborn, Mich., one of the largest integrated plants in the world. It is completely modern and equipped with electric and oxygen furnaces, and is capable of receiving ore and processing it to finished product. This plant makes parts for all Ford automobiles and is the main assembly center for the Fairlane and Mustang models.

Bulk material movement is handled by 18 dual-controlled locomotives. Each locomotive cab is equipped with two sets of controls, one on each side. Prior to installation of the remote control equipment each locomotive required a five-man crew, including two engineers.

Sixteen of these locomotives are equipped with remote control in the form of a cable and a small portable hand-controller. One engineer now moves from one side of the cab to the other—a reduction of one engineer. This one engineer controls all movements of his locomotive with the hand-controller—conventional controls are not used.

Six of the locomotives are equipped with a combination of space radio and direct wire. The remaining 10, equipped with direct wire only, are arranged for easy conversion to space radio.

Another very interesting application of remote control uses fixed station control with inductive type transmission for remotely controlling the movements of an unmanned diesel-electric locomotive as an integral part of a push-button coal handling facility.

At a rail-to-barge coal transfer installation operated by Transportation Services, Inc. on the Tennessee River at Florence, Ala., a remotely controlled locomotive picks up a string of loaded coal cars at a rail head and delivers them to a dumper.

The remotely controlled locomotive is an integral part of this installation where all major operations are remotely controlled by push buttons. In fact, push buttons for automatically uncoupling the locomotive; for raising, lowering, starting and stopping the car shaker; for controlling the slope of the conveyor belt and the length of the telescoping discharge tube and for operating the locomotive are all concentrated on the same control panel which is housed high up in a centrally-located control tower. Push