

The four-station-wagon and five truck convoy made the 78-mile trip in 2 hr 20 min.

## T&P Moves CTC Machine 78 Miles

CTC machine controlling 117 miles of single-track mainline was moved from Santo, Tex., to Baird, 78 miles. It was back in service controlling a 42-mile physical section after 4 hours, 55 minutes. The remaining 75-mile carrier section was in operation 5 hours, 20 minutes later. No trains were delayed.

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● On December 7, 1959, the dispatchers, CTC control machine and other CTC equipment were moved from their old location in Santo, Tex., to the new CTC building at Baird, a distance of 78 miles.

At the old location the control machine proper and the dispatchers, controlling 117 miles of busy track from Lancaster Yard (Fort Worth) to Dothan, were located in the old depot, while the relay application units, master coding unit, etc., all connected together and forming one large relay cabinet, were located in a separate building which had been constructed near the depot for that purpose. The tower case housing the line arresters, alternator, filters, impulse transformer, etc., was also located in this building.

The wiring between the control machine and the relay cabinet consisted of 375 working wires run in four 3-in. conduits.

At the new location in Baird a new

**Editor's Note:** Mr. Yarrell planned the CTC machine move and it was carried out under his direction.

building, complete with central heating and air conditioning, suitable wire races in the floor, etc., was constructed. Sliding glass windows were installed in the partition separating the control room from the equipment room so that indication lights, etc., on the control panel could be observed without having to enter the control room.

This moving problem was carefully studied, a method of approach decided upon, and preparations begun several months prior to the completion of the new building. These preparations were carried on in conjunction with the CTC construction program extending our controlled territory from Dothan to Clyde, a distance of 26 miles, which was then nearing completion insofar as the work in the field was concerned.

At the old location, temporary plastic-covered cables were installed to replace the old wiring and conduits between the two buildings. These cables consisted of 26 pairs of No. 22 gage, plastic-covered conductors each, and were cut in 90-ft. lengths with suitable plug couplers inserted 20 ft. from the control machine end. Because the depot was high above the ground, we were able to lay these

cables underneath the floor so they would not be disturbed. Sufficient slack was provided in each cable so that the equipment could be moved out and loaded without being disconnected. The plug couplers were properly painted and coded so that the two sections could be quickly matched and connected after being separated. More than 50 couplers of various sizes, ranging from 7 contacts to 27 contacts each, were used in the entire operation. Smaller cables of the same type were used for temporary connections between the tower case and relay cabinet end section, power supply, etc.

After the temporary wiring was completed and conduits were removed, the large relay cabinet, weighing approximately 1½ tons, was placed in a cradle to prevent it from buckling in any way while being lifted. This cradle was designed for this purpose, and was made in our signal shop. After being placed in the cradle, the cabinet was placed on a low shop-made dolly so that it could be rolled out of the building onto a temporary platform for loading.

### New Equipment Added

As soon as the new building at Baird was completed, all of the new equipment which was to be added after the move was made, was moved in. This included the new carrier master coding unit end section, carrier tower case, additional relay application units, additional new sections for the control machine, etc. Necessary temporary cable and plug couplers were provided where needed, so that

this equipment could be quickly connected when the old equipment was moved in. The necessary power supply was provided for. With the exception of the ringing circuit equipment, transmitters and speakers, which were already mounted on the control machine, complete new communication equipment was installed in the control room. Arrangements were made for the dispatcher and signal supervisor to be temporarily located in the telegraph office at Baird while the move was being made. The signal supervisor was assigned to assist the dispatcher in directing the men in the field in case it became necessary to make line-ups by hand.

Since the control machine was being moved from the center to one end of the present controlled territory, it became necessary to make a number of changes in the indication code jumpers at each control point. These and other minor changes had to be made during the time the move was being made. Necessary prints for making these changes were prepared and placed at each control point.

All preparations covering this phase of the operation having been completed, the time and date for making the move was decided upon and tentative general orders, etc., were drafted. In planning the operation, we estimated that if all went well and we were able to make an eastward line-up from Dothan through to Lancaster Yard at 1:30 a.m., after the last westward passenger train had cleared the territory, we could make the move and have the physical-controlled section from Dothan to Strawn (42 miles), back in operation by 6:30 a.m., and the carrier-controlled section of the territory between Strawn and Lancaster Yard (75 miles), back in operation by 12 noon. The additional time allowed for this section was due to the fact that we were unable to thoroughly check the new carrier equipment at Baird and Strawn until after the move was made and the carrier master coding unit, etc., were connected up. Prior to the move we could only check to determine that the transmitters and receivers were functioning properly and that our line transposition pattern was correct. Our plans called for two gangs to participate in the operation: Gang No. 1 under Foreman R. J. Thomson, with headquarters at Cisco, and Gang No. 3 under Foreman Clifton Conine, with headquarters at Fort Worth.

Ten days prior to the move a complete program of instructions was prepared, designating the time and date the men were to report to their respective gang headquarters, stations to which they were assigned and duties to perform. Each man was given a copy of these instructions. All gang men were directed to report to their respective headquarters at 12:01 a.m., December 7, there to be given a final briefing, and then to proceed to their assigned stations, reporting by signal phone to the signal supervisor at Baird on arrival.

### Men at Lancaster Yard

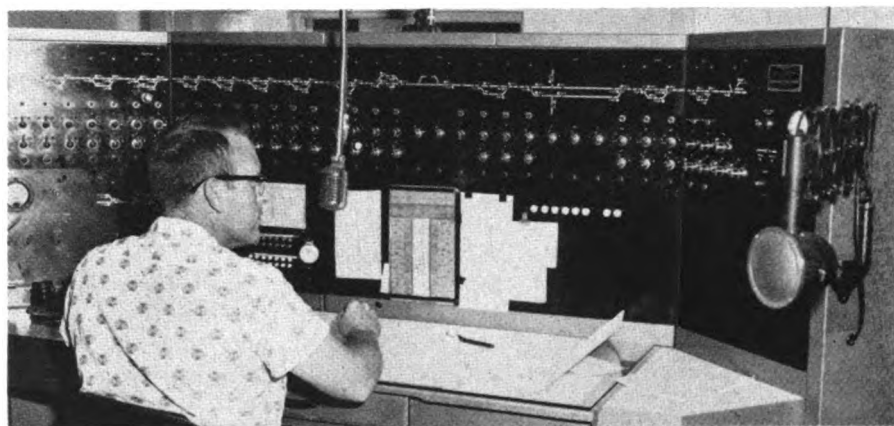
One inspector and two signalmen were assigned to the two-station control point at the west end of Lancaster Yard to make line-ups by hand during the move. Herders and switch engines are constantly making movements in and out of the yard at this point. These men also handled train movements at a siding 9 miles west of this point.

Since all of our CTC function control relays are stick relays, it was not

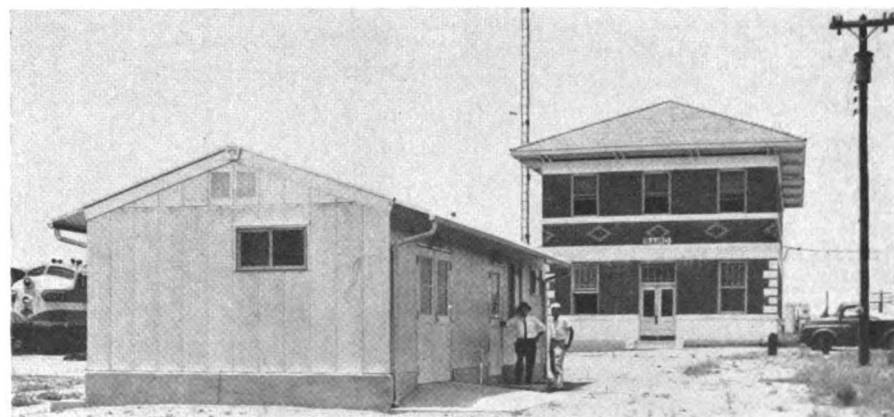
necessary to have special control panels at the control points for changing line-ups by hand. The application cabinets were opened and the relays were operated by hand. One leading signalman and two signalmen, with necessary testing equipment, were assigned to the control point at the east end of Strawn, where the new carrier converter station was located. At all other sidings two men were assigned so that hand line-ups could be made quickly at each end of the siding in case of a meet. Necessary track and highway transportation was provided.

Three days prior to the move the large relay cabinet at Santo was rolled out onto a temporary platform and loaded on a flat-bed truck. A separate winch truck was used to lift and load the cabinet.

At 12:01 a.m. on December 7, all men reported to their respective headquarters, as directed. They were given a final briefing and were on their way by 12:15 a.m. Gang No. 1 moved eastward out of Cisco toward Santo, and Gang No. 3 moved westward out of Fort Worth toward Santo. Two signalmen and a number of helpers had



Control machine and relay cabinet were hauled on flat bed trucks.



New steel house for CTC machine at Baird has separate equipment room.

been assigned to assist each foreman in handling the highway equipment, loading, unloading, etc. At 1:15 a.m. each foreman, with his crew and the two men assigned to handle the disconnecting, arrived at Santo. By 1:30 a.m. all men who had been assigned to the various control points had arrived and reported to the signal supervisor at Baird by phone.

At 1:35 a.m., after the last westward passenger train had cleared the territory controlled by the dispatchers, an eastward line-up was made all the way through from Dothan to Lancaster Yard for the next train, which was eastward passenger train No. 8. The dispatcher, with his train sheets, etc., got into a car driven by the trainmaster and rushed from Santo to Baird.

The control line was quickly disconnected and cut through. Plugs were pulled, cables rolled and placed in their prearranged position, and loading begun. The control machine was placed on a small dolly, rolled out on the depot platform and loaded on a flat-bed truck. The relay cabinet, having been loaded several days before, was ready to roll as soon as the plugs were pulled and cable rolled.

The plans called for all vehicles to move as a convoy, with proper spacing, etc. It consisted of four station wagons, one pick-up truck, two flat-bed winch trucks and two flat-bed winch trucks with "A" frames. The two trucks with "A" frames were for emergency use in case of a breakdown. At 2:10 a.m. the last car in the convoy cleared Santo. Only one stop was made by the convoy, and that was at a service station in Ranger for re-

fueling the trucks. The vehicles were so spaced that little delay occurred.

One unusual incident occurred during the trip. About 3:00 in the morning, just as the general signal inspector in charge and his driver, who were bringing up the rear, cleared the city limits of Cisco, a police patrol car was sighted approaching from the rear with red lights flashing and sirens wide open. We made a quick stop, expecting the worst. However, it developed that all the excitement was caused by a deadheading fireman who had slept through his terminal at Baird and had gotten off at Cisco and persuaded the police to catch the convoy so he could hitch a ride back to Baird in time to catch his run out.

At 4:30 a.m. the convoy arrived at Baird, right on schedule and properly closed up so that unloading could begin promptly. The loaded trucks were quickly backed into position. The winch truck with "A" frame for lifting the relay cabinet was placed in position, and the cabinet was raised high enough to let the truck on which it was loaded move out. It was then lowered to a temporary platform where it was again placed on the dolly and rolled into position in the equipment room. In the meantime the control machine and other equipment had been unloaded and placed in position. The coupling-up crew, consisting of three signalmen and one inspector, then moved in.

At 6:30 a.m. the physical controlled territory between Dothan and Strawn was placed in operation, and the dispatcher and supervisor were moved into the new control room, exactly as we had planned. As had been ex-

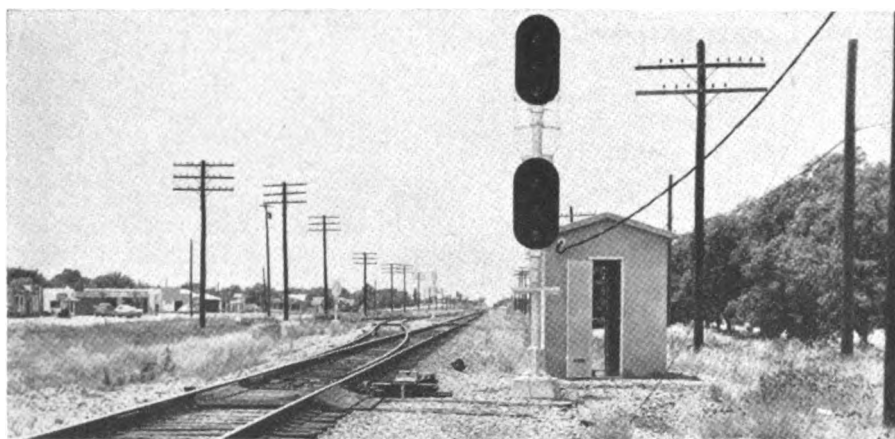
pected, we ran into some difficulty when we started checking out the new carrier equipment. However, all "bugs" had been eliminated, the equipment thoroughly checked, and the carrier controlled section from Strawn to Lancaster Yard was in operation at 11:50 a.m., 10 minutes ahead of schedule.

We have made a number of similar moves on our road since we first began installing CTC in 1937; however, due to careful planning, the use of experienced and well-trained personnel, and 100% cooperation on the part of every one involved, this move was the best. Thirty-six men, including two division inspectors and one supervisor, were involved in this operation, and not one mistake was made during the entire procedure. A number of train movements were made, including two passenger trains, during the time the move was being made, and no trains were delayed.

Our superintendent of rules, superintendent of communications, division superintendent, and assistant engineer of signals were all on hand and quietly lending a hand wherever needed. This in itself was most unusual and highly commendable.

When the move was completed, all equipment was placed in its permanent position, the permanent wiring installed, and the temporary cable and couplers released.

On January 14, 1960, the east and west ends of Jayell siding were converted from the type F coded CTC system to the type K2 system, and controls transferred from the type F machine in the telegraph office at Baird to the type K2 machine in the new building. On January 19, 1960, the unit wire control system controlling two power switches at the east end of Baird yard, with levers located on the control panel of the type F machine in the telegraph office at Baird, was transferred to the type K2 machine. On the same date a new control point at the west end of Baird yard, with unit wire control on the type K2 machine, was placed in service and the type F machine in the telegraph office removed. On January 21, 1960, the east and west ends of Clyde, controlled by the dispatchers at Baird, were placed in service, completing the CTC extension from Dothan to Clyde.



Concrete house parallel with track enables maintainer to see trains as he works.