

telephone and their associated filters. We, also, have an additional advantage, because when our communication demands require additional carrier telephone circuits, we can use the CTC code line.

### Talk on Both

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In CTC territory on the Frisco, emergency telephones for use of trainmen are provided with a double-pole, double-throw switch by means of which the telephone can be connected to either the dispatcher's telephone line or to the CTC code line. This switch is left normally in the center or open position and when trainmen desire to contact the dispatcher the switch is thrown to the position marked "Dispatcher." In event the dispatcher's circuit is out of service, the switch may be thrown to the opposite position to connect to the CTC code line. When thrown to the "code line" position the trainman has to whistle or blow into

the transmitter to actuate a voice-calling device on the CTC machine. The actuating of the voice-calling device rings a bell and lights an indicator light over a switch, which the dispatcher moves to the "CTC code line" position in order to answer the call. We use No. 8 Copperweld weatherproof line wire for our CTC code line and our experience, since our first CTC installation in 1943, has shown that during ice storms the code line wires are very seldom broken, and in many cases have been our only means of communication.

Our practice is to drop the code line into important stations, especially freight division points, where it is available for emergency use. This circuit is terminated in a small metal box in the station and is provided with normally-open knife switches and blocking filters. When other circuits fail, the operator may break a seal on this box and close the knife switches. This connects the code line to a special telephone jack on his desk which is so wired that inserting the jack plug opens other telephone circuits to prevent possible interference with the code line due to ringing on such circuits.

A single-pole, single-throw toggle switch is used as an "Off-On" switch in the lamp battery circuit, and a single-pole, double-throw toggle switch is used in the coil energizing circuit. Both upper and lower coils of the relay under test are controlled by this switch. These parts are shown in the diagram.

The original calibration values of Style "KP" relays may be obtained by slight adjustment of the fixed contact elements of the relay under test. A special contact adjusting tool is used for this purpose. All bending of contact elements should be restricted to the heavier semi-rigid fixed members. The straight movable contact springs must not be bent.

Two armature positioning tools, one for each end of the armature, should be inserted through the magnetic gaps into the coil spools and pressed firmly in position until all armature motion is taken up. (See Service Spec. 3623, Rev. 7-2-53, US&S Co. for Style KP relays).

The armature positions at which the contacts should just make or break should be the basis for all contact adjustments. With the armature locked in position, contacts should be adjusted to the point of making; i.e., between a barely visible gap to the point of just making contact. This is easily accomplished with the aid of the lamps. A style KP relay rack, in which the combination pin plates have been removed, is used for inserting all types of Style KP relays for testing and calibration.

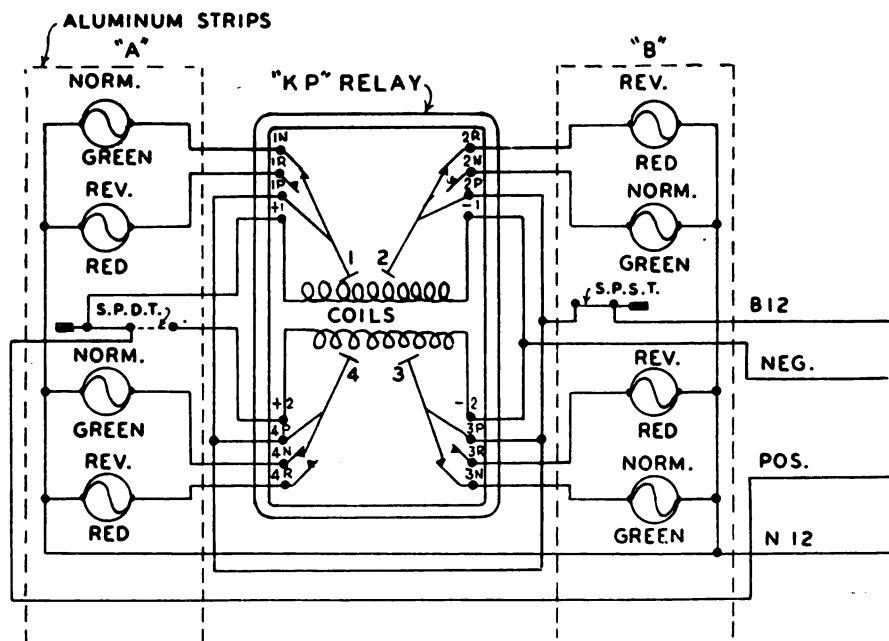
## KINKS

### Testing "KP" Relays

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An arrangement of eight lamps (CTC panel indication type) is made use of in the testing and calibration of Style "KP" relays. These lamps are mounted on two separate aluminum strips which were cut to measure 2 in. by 6 in. The thickness is about 1/16 in. Four lamps and one toggle switch are mounted on each strip, these being evenly spaced and mounted vertically. The aluminum strips are bent at an angle of 90 deg. ("L" shaped) 1 1/2 in. from one end. This leaves an upright portion of the strip of 4 1/2 in. on which the lamps and switches are mounted. The 1 1/2 in. angle portion of the strips are drilled and used for mounting purposes. These aluminum strips are fastened on each side of the Bakelite plug connectors of the style "KP" relay test rack. The relays to be tested and calibrated are plugged into these connectors. Two of the lamps on each strip are red and two are green. The red lamps are lighted

when the contacts of the relay under test are in the reverse position, whereas the two green lamps are lighted when the contacts are in the normal position.



Wires NEG and POS (at right of diagram) go to "load" side of potentiometer rheostat and volt-milliammeter for checking electrical calibration of relay