What's the Answer?

Contributions Paid for in Cash or by a Subscription to Railway Signaling

If You Have a Question That You Would Like to Have Someone Answer, Or If You Can Answer Any of the Questions Shown Below, Please Write to the Editor.

To Be Answered in a Later Issue

(1) How do you determine the resistance of relay or circuit-controller contacts? Are such tests included in a schedule for testing as a matter of routine? Please explain in detail the equipment used and the test procedure.

(2) Where a 220 to 550-volt single-phase charging line and communication circuits are supported on the same crossarm, do you transpose the a-c. line to avoid inductive interference? As a practical matter, how can such transpositions be located so as to obtain the desired effect?

(3) What special equipment have you devised for testing C.T.C. coding apparatus and how often is a complete test necessary?

(4) What is your practice as to the clearance allowed between the notch and the lock rod for facing-point locks on power switch machines? Do you allow more clearance in the machines at switches on remote-control or C.T.C. outlying locations than at power interlockings?

(5) What practice do you follow in pot-heading or otherwise sealing the outer protective covering of parkway cable where it is brought into an instrument housing?

Alining Signals on Curves

"How should an automatic signal be focused or alined, when it is located on a long curve, so as to give a satisfactory indication at a distance as well as at close range?"

How to Focus Signals

O. S. Field

Engineering Dept., General Railway Signal Co., Rochester, N. Y.

In our opinion, a blanket answer cannot be given to this question, as the factors involved must be considered separately. As a general rule the focusing of the lamp filament should be considered only in relation to the other optical components of the device and not in relation to the particular location of the individual signal. In other words, the filament should be located at the focus of the optical system so as to project the maximum amount of light flux, resulting in the greatest optical efficiency of the device. With this condition of correct focusing, problems of placing the beam where desired are solved by proper alinement of the complete signal unit and the selection of suitable spreading or deflecting glasses when curves are involved.

First, the problem of vertical alinement should be considered. The vertical axis of the main beam should be aimed so that it is 12 ft. above the rail at the point at which the indication of the signal is to be picked up.

Second, means should be provided for a "close-up" indication, preferably independently adjustable in alinement from the alinement of the main beam. We use lenses with "hot-spot" bulls-eyes, or small hot-spot roundels for this purpose. In either case the hot-spot can be rotated in its mounting to control the direction of the close-up beam without affecting the direction of the main beam.

Third, from the point where the main beam is picked up to the point where the close-up beam can be seen, the track must be horizontally covered by light from the main beam which has been diverted to either one or both sides of the axis. In the case of "S" curves a "spread-light" glass will usually give the best results. For such a location the horizontal axis of the beam should be aimed halfway between the extreme right- and left-hand trackage it is desired to cover, and a spread-light glass chosen which will spread the light to each side through a sufficient angle to cover all the track. For signals located on curves of one direction only, a glass deflecting part of the main beam to one side should be used. At this type of location, the axis of the main beam should be aimed at the pick up point, letting the diverted light cover the trackage as the signal is approached.

It is, of course, not practicable to supply nor carry in stock a great number of spreading and deflecting glasses to take care of the many degrees of angular deflection required. It is possible, however, to cover the vast majority of curved track locations with only two or three such glasses, selecting in each case the smallest available angular deflection which will cover the trackage.

The results of preliminary work in alining each signal unit may be observed by walking along the track from the pick up point to within 50 ft. or so from the signal. Final adjustments should be made based on observations from the cab of a locomotive.

Practice on the Southern

W. J. Eck

Assistant to Vice-President, Southern, Washington, D. C.

It is our practice to use "spread light" lenses and to focus the light so that the engineman will get the best possible indication of the signal when he first comes within sighting distance of the signal. We have not used any special method of giving a close-up indication.

Indication Should be Visible Throughout Entire Approach

L. F. Howard

Chief Engineer, Union Switch & Signal Co., Swissvale, Pa.

The primary requisite for proper light indication on a curve has always been, in our minds, one requiring visibility of the light throughout the entire approach to the signal. With modern light signals the spread of the standard lens equipment is not sufficient to fill the whole curve and if the signal is lined up to the point where it can be first picked up by the engineman, there will be a dark portion on the curve unless some special means, such as the use of deflecting cover glasses, are used to carry the light around the curve on the approach to the signal.

The deflecting cover glasses referred to in the data on pages 10 and 11 of the Union Switch & Signal Company instruction pamphlet U-5034 are so designed that a certain portion of the light goes straight through for long-range indication and permits the signal to be focused to the most distant point. The prism design is such that the remainder of the light is deflected over to the track in diminishing degrees of intensity corresponding with the shortening of the distance as the engine approaches the signal. In all light-signal work, consideration must be given to this problem and we have furnished a large number of deflecting cover glasses in both the 10-degree and 20-degree sizes for just this purpose.

The question is not very clearly defined as applying to a color-light signal, but we have assumed that is what is intended. The need for the deflecting prisms on curves applies equally well to interlocking signals as it does to automatic signals.

If the question is meant to include semaphore signals also, with the usual semaphore lamp, we know of nothing that has been done except in a few special cases where deflecting lenses or spreadlight lenses have been applied to the semaphore lamps. The night indication of a semaphore lamp, however, is picked up at a much wider angle than is possible in daylight and the necessity for special means for signaling on curves, with such equipment, is not often encountered.

Annunciator Circuits

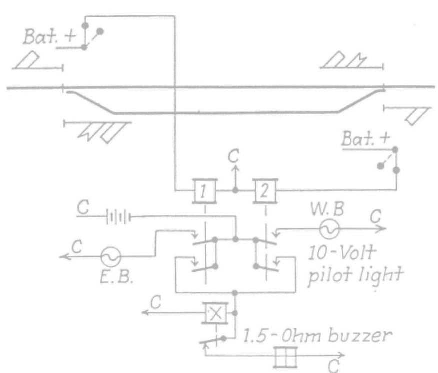
"What self-restoring annunciator circuits are available, that is, arrangements which do not require acknowledgment or push-button manipulation by the operator?

Automatic Station Annunciator

H. B. Garrett

Assistant Signal Supervisor, Southern Pacific, Phoenix, Ariz.

Several years ago, new station buildings were erected at two towns on the Tucson division of the Southern Pacific and it was desired that all the latest equipment be installed. For station annunciators we used the scheme shown, with three 500-ohm two-point d-c. relays. With all signals clear, the relays are de-energized. When either relay 1 or 2 is picked up, relay X is also picked up. This cuts out the local battery from the buzzer which will give a short alarm while relay X is being picked up. This relay may have a slow pickup characteristic if a longer signal is desired.



Annunciator applicable to single-track automatics

In addition to the alarm given by the buzzer, we used two pilot lights which light up while a train is within holding distance of the outbound signals. These lights were made of automobile tail lights, using the red lens and socket for a standard 10-volt signal lamp.

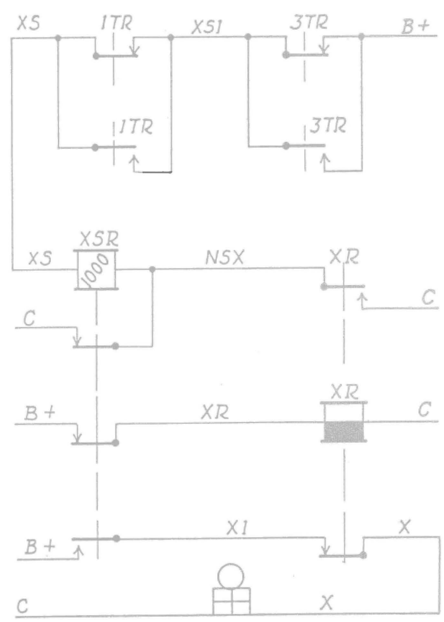
The voltage of the local battery is only 0.8 volt above the direct pick-up of relay X, thus retarding the pick-up of this relay and giving a longer alarm from the buzzer.

Circuit for Interlocking

R. H. Smedley

Circuit Draftsman, Reading, Philadelphia, Pa.

The accompanying circuit diagram shows a self-acknowledging annunciator circuit which replaces single stroke bells at interlockings. This circuit uses a neutral relay XSR with a stick feature in conjunction with a slow-release relay XR. The vibrating bell is energized by circuit X through a back contact on the XSR relay and a front contact on the XR relay.



This scheme can be applied at yard or at interlocking layouts

The stick feature of XSR relay checks that the XR relay has operated, as XSR cannot pick up until the NXS circuit has been completed through the normally open back contact of the XR relay.

The ringing period is regulated by the time for which the slow-re-