

Signal Training Bulletin

Committee G: Education & Training Communication & Signal Division, AAR

F-2 Absolute Permissive Block System

Definition: A block signal system under which the block is usually from siding to siding for opposing movements and the fixed signals governing entrance into the block display an aspect indicating Stop when the block is occupied by an opposing train. For following movements, the section between sidings is divided into two or more blocks and train movements into these blocks, except for the first one, are governed by intermediate fixed signals, cab signals or both. The intermediate fixed signals usually display an aspect indicating Stop, then Proceed at Restricted Speed, and the cab signal displays an aspect indicating Proceed at Restricted Speed as its most restrictive indication.

Symbol: None.

Description: Absolute Permissive Block (APB) is a signal system designed to provide a definite space interval between trains in respect to following movements by employing the use of permissive intermediate signals and also to provide protection for opposing movements by using absolute signals usually at sidings and referred to as head block or home signals. Refer to Figure 1.

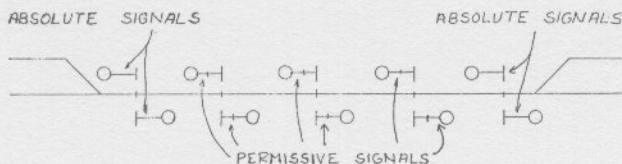


Figure 1

Purpose and Application: APB signal systems are employed on major routes to maintain a safe spacing between trains operating in the same direction and to prevent trains moving toward each other from entering a block such that their continued progress would be obstructed.

General Information: APB is a method of signaling whereby train movement between sidings is controlled by permissive signals and authority to move past absolute signals is issued via train orders.

Follow-up movements can be made by clearing up signals, i.e., signals automatically becoming less restrictive by trains traversing through blocks, at a specified distance from the rear of the train. Opposing movement protection can be accomplished by causing the opposing absolute signal to display an aspect indicating Stop whenever a train enters the block.

Detailed Operation: APB is a signal system which employs both absolute and permissive signals. Absolute signal displaying an aspect indicating Stop can only be passed on permission from the dispatcher or, in case of communications failure, by flagging ahead of the train. Absolute signals can normally be identified by the absence of a milepost number board. Permissive signals, sometimes referred to as Stop-and-Proceed signals, are usually intermediate signals which, if displaying an aspect indicating Stop, may be passed at restricted speed after a stop has been made. No permission or flagging is required. Permissive signals can normally be identified by a milepost number board mounted on the signal mast.

APB signal systems employ some method of allowing for follow-up movements and opposing movement protection. One such method is the use of directional stick relays. When a train passes a signal, it conditions the circuitry such that the signal control relay (HD) de-energizes and a stick relay energizes. This situation pole-changes (changes the polarity) of the energy being applied to the line circuits. This line

circuit conditioning causes the control relay for the signal in the rear to become energized with energy of reversed polarity thereby displaying an aspect indicating Approach. Refer to Figure 2.

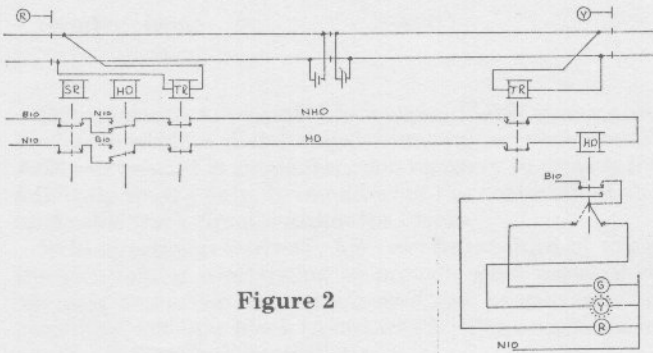


Figure 2

If, however, the train movement is in the opposite direction, the stick relay will not become energized. In this situation, the control (HD) relay will de-energize and the line circuits will in turn cause the control relay (HD) for the opposing signal in advance to be de-energized thereby displaying an aspect indicating Stop. Refer to Figure 3. The

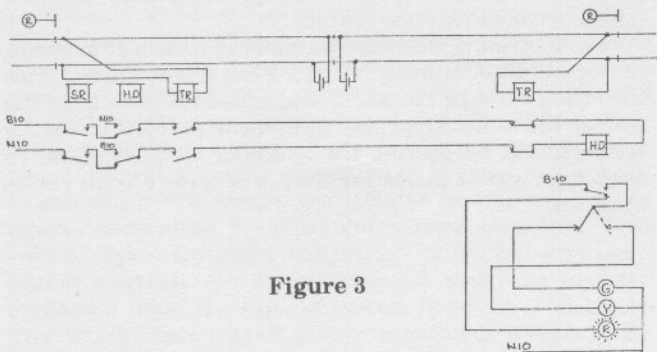


Figure 3

sequence is repeated at each intermediate signal until the opposing absolute (head block) signal displays an aspect indicating Stop. This sequence is commonly referred to as "tumble down."

APB is a very flexible system which can be modified to satisfy a variety of local conditions and situations. It also lays the premise for much of the vital circuitry used in other systems such as centralized traffic control (CTC) which will be discussed in another Signal Training Bulletin.

Note: This Bulletin is for general information only. For specific applications consult the rules, standards and instructions published by your railroad.

Notes:

