q) <u>Outdoor Apparatus:</u>

The Outdoor apparatus is installed as under –

i) First Vehicle Track Circuit:

This is fixed slightly in advance of the Last Stop Signal. As soon as the engine or the first vehicle of a train going from 'X' to 'Y' passes over the First Vehicle Track Circuit, the Last Stop Signal is automatically replaced to 'ON' and the indication 'Train On Line' is displayed automatically on the instruments at stations 'X' and 'Y'. The buzzer at both stations 'X' and 'Y' gives an alarm and continues until the 'Train Entering Block Section' signal is acknowledged by the station 'Y'.

ii) Electrical signal reverser:

This is actuated by the FVT and replaces the Last Stop Signal at 'X' to 'ON' immediately as the engine
or the first vehicle of the train going to 'Y' passes over the First Vehicle Track Circuit.

iii) a Last Vehicle Track Circuit:

This is fixed at an adequate distance inside the First Stop Signal. When the last vehicle of a train passes over the LVT, the buzzer gives alarm at 'Y' and continues to do so until 'Y' replaces the SM's control slide/lever/knob for the Home signal to normal.

1.3. Parts and Description of Kyosan / Podanur make Push button tokenless block instruments:

(See Figure No. 4 for Kyosan make and Figure No. 5 for Podanur make at the end of this Chapter)

These instruments are provided at two consecutive block

stations 'X' and 'Y' on the single line to control trains passing over both the Up and Down block sections between these stations. These instruments are electrically connected with each other. Each block instrument contains the following parts as shown in figure Nos.4 and 5

a) Station Master's key.

b) e Bell Code Push Button.

c) 'Train Going To' Push Button.

d) 'Line closed' Push Button.

e) 'Cancel' Push Button and its counter.

f) ' 'Panel lamp' Push Button.

g) 'Train Going To' indicator.

h) 'Line closed' indicator.

i) 'SHK' push button.

j) 'SCK' push button.

k) 'Train On Line' indicator.

l) 'Train Coming From' indicator.

m) 'Free' indicator.

n) 'Signal Repeater Lamps' for Last Stop Signal

o) 'SNR' indicator (Podanur make only).

p) Telephone.

q) Single stroke bell.

r) Alarm bell.

s) Shunt key 'SHK'.

t) Slip siding key.

u) Catch siding key.

The above parts are described in detail in the following paragraphs.

a) Station Master's key:

This is used by the Station Master to lock the block instrument to prevent its unauthorised operation. When the instrument is locked by the Station Master, it is not possible to set the instrument to 'Train Going To' or initiate 'Line closed' or send bell code, while it is still possible for the instrument to transmit and receive 'Train On Line' code, transmit 'Train Going To' code, receive 'Train Coming From' code or receive bell code, answer back with 'Line closed' code and receive only bell code.

When the SM's key is taken out, shunt key, slip siding key and catch siding key, where provided, cannot be taken out.

b) Bell code push button:

This is used for transmitting bell code signals. In case of bell signal, only 'Bell code' button is pressed. When a code signal is required to be transmitted, in addition to the 'Bell code' button, 'Train Going To, or 'Line closed' button is pressed concurrently. This push button is also used (i) to acknowledge 'Train On Line' code and to stop the 'Train On Line' bell, (ii) along with cancel button to initiate cancellation of the 'Line clear', before the train enters the block section and (iii) also for push back cancellation.

c) 'Train Going To' push button:

This is a push button to be pressed to set the instrument in providing 'Train Going To' condition while despatching a train. It is necessary to keep this push button pressed continuously until the instrument gets 'Train Going To' condition from 'Line closed' condition.

d) 'Line closed' push button:

This is a push button to be pressed to set the instrument in providing 'Line closed' condition after the train has arrived at the receiving station. However, this button is also pressed in case of cancellation.

e) 'Cancel' push button and its Counter:

When 'Train Going To' condition is to be reset to 'Line closed' condition before the train has not entered the block section or when the train is to be pushed back to the sending station instead of proceeding to the next station, this push button switch is pressed.

f) 'Panel lamp' push button:

This push button is provided to turn the panel lights on.
When this is pressed, the indicators , except 'Train On Line' and 'Free' , are lit. This has to be pressed only when the condition of the block instrument is to be verified.

For verifying the condition of the block instrument, only the 'Panel lamp' push button has to be pressed, as pressing the bell code button would unnecessarily attract the attention of the Station Master at the other end.

g) 'Train Going To' indicator:

This shows 'Train Going To' indication on a green-lighted back ground. It is lit when BCB or Panel lamp push button is pressed.

h) 'Line closed' indicator:

This shows 'Line closed' indication on a white-lighted background.

i) 'SHK 'push button:

This push button is pressed along with BCB when shunt key is to be taken out.

j) 'SCK' push button:

Where slip siding or catch siding is provided, this button is pressed to extract the slip siding key or catch siding key.

k) 'Train On Line' indicator:

This shows' Train On Line' indication on a red-lighted background and remains lit till the block instrument is brought to 'Line closed' condition by the Station Master at the receiving end.

l) 'Train Coming From' indicator:

This shows 'Train Coming From' indication on a green-lighted background. It is lit when BCB or panel lamp push button is pressed.

m) 'Free' indicator:

This is a green-coloured lamp to indicate the function of time - release and turns on after 120 seconds upon cancelling operation, before a train has not entered the block section.

n) 'Signal Repeater Lamps' for Last Stop Signal:.

These are provided to indicate the condition of the Last Stop Signal. Green or red lamps repeat 'Proceed' or 'Stop' aspects respectively.

o) 'SNR' indicator:

This is an aid to the Station Master to verify if all relevant controls, levers/ knobs, signals etc., are normal.

p) Telephone:

It is provided in conjunction with the block instrument for communication with the station at the other end of the block section.

q) Single stroke bell:

This bell operates as bell signal is received.

r)Alarm bell:

This alarm bell rings continuously when a train has arrived at the station and intermittently when 'Train On Line' code is received.

s) Shunt key:

This key is provided by the side of the block instrument locked in EKT and is used for shunting operations between the Last Stop Signal and the opposing First Stop Signal. It can be extracted either with the block instrument in 'Line closed' position or the 'Train Going To' position after the train has been despatched. Taking out this key prevents the Station Master at the other end from obtaining 'Line Clear'. Whenever shunting is required to be performed up to the Last Stop Signal, the Station Master shall verify whether the block instrument is in the line closed position and then only extract the shunt key and keep it in his personal custody before authorising the shunt move. The code initials of the block stations at either end are engraved on the shunt key.

t) Slip siding key:

Wherever the Slip siding key is provided at stations equipped with these block instruments, an EKT with a key is provided by the side of the block instrument. The key in the EKT can be released only when the SM's key is turned on the panel with the block instrument set to the 'Train Going To' position. The extraction of the key locks the block instrument, which can be normalized to the 'Line closed' position only when the key is restored to the EKT.

u) Catch siding key:

Wherever the Catch siding key is provided at stations equipped with these block instruments, an EKT with a key is provided by the side of the block instrument. The key in the EKT can be released only when the SM's key is turned on the panel with the block instrument set to the 'Train Coming From' position. The extraction of the key locks the block instrument, which can be normalized to the 'Line closed' position only when the key is restored to the EKT.

Note: In case of block instrument failure, emergency button is to be pressed for extracting 'slip / catch siding key'.

w) Indoor Apparatus:

Electric Lock on Last Stop Signal:

An electric lock is provided on the Last Stop Signal lever which is released only when 'Train Going To' indication is displayed on the block instrument of the concerned block section.

Replacement page No. 11 to BWMS (TL) upto and including AS-4

Note: The above lever lock is dispensed with in case of single line token less block instrument with colour light signal.

x) <u>Outdoor Apparatus:</u>

The Outdoor apparatus is installed as under –

i) First Vehicle Track Circuit:

This is fixed slightly in advance of the Last Stop Signal. As soon as the engine or first vehicle of a train going from 'X' To 'Y' passes over the First Vehicle Track Circuit, the indication 'Train On Line' is displayed automatically on the block instrument at stations 'X' and 'Y'. In addition an audible warning sounds at the receiving station, which is intermittent, until acknowledged by the receiving station.

ii) Electrical signal reverser:

This equipment is provided where semaphore signalling is adopted and is actuated by the First Vehicle Track Circuit and it replaces the Last Stop Signal at 'X' to 'ON' immediately as the engine or the first vehicle of the train going to 'Y' , passes over the First Vehicle Track Circuit.

iii) Last Vehicle Track Circuit:

This is fixed at an adequate distance inside the First Stop Signal. When the last vehicle of the train passes over the Last Vehicle Track Circuit, the buzzer gives alarm at 'Y' and continue to do so until 'Y' replaces the SM's Control slide/lever/knob for the Home signal to normal.

1.4. Parts and Description of Axle Counter proven Block Panel (UFSBI & SSBPAC (D) Single Line):

(See Figure Nos. 6 & 7 at the end of this Chapter)

A set of two block panels and their associated equipment as shown in the diagrams will be used as a pair, one at station 'X' and the other at station 'Y'. Telephone communications is provided in conjunction with block panels.

a) <u>DESCRIPTION OF BLOCK PANEL FOR SINGLE LINE (UFSBI & SSBPAC (D) Single Line</u>:

(I) Keys		
Key	Function	
SM's Key	The key, when out, prevents the following operations.	
	a)	Transmission of BELL code.
	b)	Transmission of LINE CLEAR enquiry request.
	c)	Resetting of Axle Counter.
	d)	Cancellation of Line Clear.
	e)	Release of Shunt Key.