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SSI Applications Manual

SSI Data Preparation Interfacing with IECC/ARS

Endorsement, Authorisation and Issue Record

For endorsement, authorisation and issue record of this document, please refer to the SSI Applications Manual Contents, RT/E/S/I 7002.

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I Introduction

SSI equipment may be used in association with other computer-based systems to make up an "Integrated Electronic Control Centre" (IECC). This will typically include a VDU-based "Signalling Display System" (SDS) in place of a conventional control/indication Panel, and an "Automatic Route Setting Computer" (ARS) which reduces the Signaller's workload by automating the task of route-setting in all but the most unusual circumstances. These and other systems in the IECC are connected to the SSI Panel Processors via a duplicated signalling communications network within the Control Centre, which allows any device to interrogate any Panel Processor to ascertain the current "State of the Railway" for its Central Interlocking, and to send panel requests which are passed on to the Interlocking MPMs to be processed.

In an IECC installation the SDS handles the tasks of interpreting button sequences (or the VDU-based equivalent) to generate panel requests, and of updating indications in line with the latest "state of the railway". This eliminates all the Panel Processor data with the exception of the Central Interlocking's identity number, and so no data need be entered in the IND & BUT identity files before running the Panel Processor data compiler. The data files can also be left blank, except the PBK file which requires at least a dummy entrance button list to satisfy the compiler's syntax checking (i.e. a "list header" specifying zero sets of data, followed by an "end of special"). In some circumstances it may be desirable to produce some conventional Panel Processor data to allow testing of Interlocking data on a Design Workstation independently of the SDS. There is no need to delete this data before programming EPROMs for use in the final system, as the extra information is simply ignored by the IECC version of the Panel Processor program. There are differences between this Panel Processor data and that prepared for a Panel controlled Central Interlocking, and this is covered by Section 7.

Most of the Interlocking data in the SSI Central Interlockings in an IECC scheme is identical to that provided for use with a conventional Panel, but there are some additional latches required to provide locking associated with "reminder devices" which are the VDU equivalent of a collar placed on a button on a conventional Panel, and "ARS sub-areas" which allow the Signaller to specify the parts of the controlled area over which automatic route-setting is to operate. The data associated with these latches is described in Sections 2 and 3 respectively.

Like SSI, both the SDS and ARS systems make use of geographic data, which are described in separate documents. To allow communication between the systems to be established, the ARS & SDS data preparation systems access the SSI data identity files to allow them to interpret the SSI "state of the railway" memory, and this requires that a standard nomenclature must be followed for the naming of certain identities. These conventions are described in Section 4.

Other systems in the IECC system also interpret the SSI "state of the railway" memory, and thus any changes made to identity files that are not implemented in all IECC systems simultaneously can lead to mismatches between SSI and IECC. Additionally SSI PFM and

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PRR files are used in ARS data preparation, and thus any changes to these files may also affect ARS data. Guidance on making these changes is given in Section 5.

Where an SSI scheme makes use of a conventional Control Panel, a crude level of ARS capability can be provided by data within the Interlocking. This is limited by the information available within the "state of the railway memory", and cannot take account of train descriptions and timetable information, but is adequate for simple functions such as automatic terminal platform working. An example of this is described in Section 6.

2 Interface With Signalling Display System (SDS)

2.1 Reminder Devices

When it is necessary to prevent the passage of trains over a section of track, the established practice to prevent the setting of routes on an entrance/exit Panel is for a collar to be applied to one or more buttons. The collar then physically prevents the Signaller from pressing this button unless he first removes the collar. The provision of a similar facility with a VDU-based system requires the addition of some extra Interlocking logic to provide an equivalent to the collar. The equivalent of each collar is a "reminder device" which is represented in the Interlocking by a latch, and by the display of a shaded area on the Signaller's VDU.

One latch is provided for each switch and button represented on the VDU as required by the operations department. In an electrified area, there will be an additional latch for each "button", to indicate when the restriction applies to electric traction only; this is displayed in an alternative colour on the VDU but is treated identically to the first latch by the SSI. Where routes cross an Interlocking boundary, all the necessary latches are tested in the SSI Central Interlocking controlling the route entrance.

2.2 Control of Reminder Devices

Two panel request identities are allocated to allow the Signaller to apply and remove each reminder device. The convention adopted is that a latch bit set indicates an applied reminder device, a latch unset indicates a removed reminder device. The points reminder device latch may only be set if the points have previously been keyed normal or reverse. All other reminder device latches are unconditionally set when the device is applied and the data for setting these latches should not include any other commands, i.e. it is the Signaller's responsibility to ensure that the associated function is in the required state before the device is applied. Generally, any button or switch on an equivalent Panel that the Signaller may operationally apply a reminder device to, should have this facility on an IECC scheme.

/ Reminder device application requests

```
*QRD34   LRD34 s .
           / button 34 reminder (all trains)
*QRDE34   LRDE34 s .
           / button 34 reminder (electric traction)
*QRDA36   LRDA36 s .
           / auto button 36 reminder
*QRD32E   LRD32E s .
           / emer. repl. button 32 reminder (all trains)
*QRDE32E   LRDE32E s .
           / emer. repl. button 32 reminder (electric traction)
*QRDP103   if ( P103 kn or P103 kr ) then LRDP103 s \ .
           / points 103 reminder
*QRDARSD2K LRDA32K s .
           / ARS sub-area D2 reminder
```

/ Reminder device removal requests

```
*QXRD34   LRD34 xs .
           / button 34 reminder (all trains)
*QXRDE34   LRDE34 xs .
           / button 34 reminder (electric traction)
*QXRDA36   LRDA36 xs .
           / auto-button 36 reminder
*QXRD32E   LRD32E xs .
           / emer. repl. button 32 reminder (all trains)
*QXRDE32E   LRDE32E xs .
           / emer. repl. button 32 reminder (electric trctn)
*QXRDP103   LRDP103 xs .
           / points 103 reminder
*QXRDARSD2K LRDA32K xs .
           / ARS sub-area D2 reminder
```

Where a single VDU 'button' serves as an exit button in one Interlocking area (the 'exit' Interlocking) and an entrance button in another (the 'entrance' Interlocking), it will be necessary to duplicate the latch in both of the Interlockings, each having its own set of panel requests to apply and remove the reminder device. When the Signaller initiates the application or removal of a reminder device, the appropriate panel request is first sent to the exit Interlocking. When the SDS observes that the latch concerned is set or unset to the required state in that Interlocking, a panel request is then sent to the entrance Interlocking. The indication on the Signaller's VDU is driven from the state of the latch in the entrance Interlocking.

The one disadvantage of this method is that, due to the inability of the SDS system to drive an indication from a combination of latch states from both of the Interlockings concerned, the indication is not monitoring the state of the latch in the exit Interlocking. Thus if the latches become out of correspondence with each other due to a Mode 1 or 2 start after a power interruption, the indication shows only the state of the latch in the entrance Interlocking. However, this method should be used until further notice. Special naming conventions apply to the panel requests sent to the entrance Interlocking to apply or remove the reminder devices and to the associated latches. This is covered in the last paragraph of Section 4.1.