

# Chapter D: Alternative Methods, Preferred & Non-Permitted Overlaps, and Alternative Execution Clauses

## 1 Alternative Methods

There now follows a number of alternative methods which may be used to vary the methods shown above and elsewhere such as for cross boundaries and panel request splitting.

### 1.1 Reduced Catering for Mode 1 & 2 Start-up

The data in previous sections allows overlaps to be established immediately after a Mode 1 or 2 start-up when neither control bit in the points memory for facing points in the overlap are set. Thus for example this applies to the data in Chapter B, Section 4.2 for facing points 225, and in Chapter C, Sections 1.2 & 1.3 for facing points 225 & 227. An alternative but more restrictive data method may be adopted that simplifies the data and reduces data processing time. The draw-back of this method is that an overlap cannot be set through facing points if these points have not been keyed or route set through since the start-up. Thus if this method is used both Testers and Signalmen will need to be advised of this restriction and of the need to first key the points to the opposite direction or successfully route set through them after a mode 1 or 2 (or a SSI Design Workstation Simulation system) start-up. The Signaller on IECC schemes will also need to be told not initiate ARS until this is done.

It is a requirement that if the lack of set point control bits prevents an overlap being set or swung then the function (viz. point keying or route setting) requiring the overlap set or swung must be inhibited, thus the function must still include at least tests for one of the control bits set.

This method can only be applied to facing points with no connections beyond them in the overlap. A restricted application applies when there are no such connections in one position of the points or where there are further track sections.

#### 1.1.1 Adapted Example 2

Using Example 2 in Chapter B, Section 4, the data for 225 points can be simplified as follows. There are no connections or track sections in the overlap beyond these points.

In the PRR file:

```
*OL225A  if ( P225 cnf or P225 crf ) \
```

becomes:

```
*OL225A  if ( P225 cn or P225 cr ) \
```

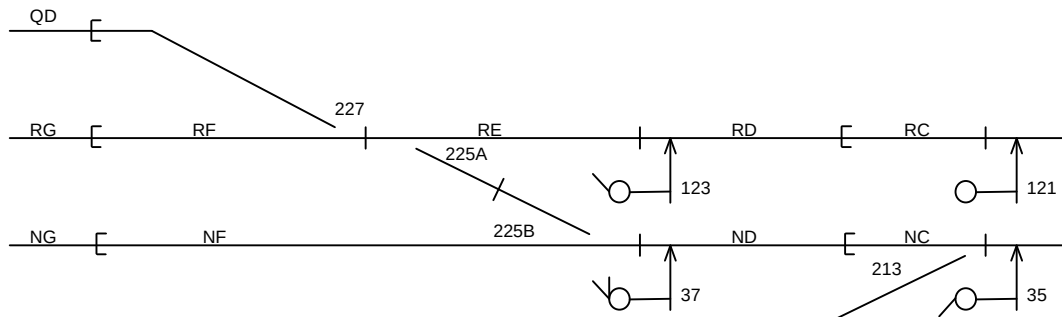
```
*OL225Q
  ( if P225 cr                               / via 225 already R
    then ONF-AC l
    \
  or if P225 cnf                             / via 225 already or called N
    then P225 cn , ONF-AB l
    \
  or P225 cr , ONF-AC l                     / via 225 called R
  )
\
```

becomes:

```
*OL225Q
  if P225 cn                               / via 225 already N
  then ONF-AB l
  else ONF-AC l                             / via 225 already R
\
```

### 1.1.2 Adapted Example 3

Using Example 3 in Chapter C, Section 1, the data for 225 and 227 points can be simplified as follows.



Note that in the following data, as emphasised throughout SSI8003-65, it is essential that the alternative tests in lists OL225A, OL227A and OL227AC match the alternative actual and implied tests in the alternative execution clauses in lists OL225Q, OL227Q and OL227QS respectively (see SSI8003-65D, Section 4 for further details of this matching).

Firstly, the \*OLxxxA and \*OLxxxQ type lists in the PRR file for facing points 227 are examined, these being used to set a new overlap through these points, whether from signal 123 or signal 37.

This simplification can only be used where an overlap can always be set via the way that the points are currently controlled. Thus for points 227, there being no further points beyond or other complications such as opposing overlaps within the overlap, this simplification can be applied to both legs of the overlap.

Thus:

\*OL227A if ( P227 cnf or P227 crf ) \

becomes:

\*OL227A if ( P227 **cn** or P227 **cr** ) \

and

```
*OL227Q
  ( if P227 cr                               / via 227 already R
    then ORF-AC l
    \
  or if P227 cnf                             / via 227 already or called N
    then P227 cn , ORF-AB l
    \
  or P227 cr , ORF-AC l                       / via 227 called R
  )
\
```

becomes:

```
*OL227Q
  ( if P227 cn then ORF-AB l \               / via 227 already N
    or ORF-AC l               / via 227 already R
  )
\
```

Secondly, there is also scope for the \*OLxxxA and \*OLxxxQ type lists in the PRR file for 225 points to be simplified, these being used to set a new overlap through these points.

There appears to be less scope for data simplification for these points, because there is a further set of points (227) and a track section (RF) in the overlap (beyond 37 signal) with 225 points reverse. Again, this simplification can only be used where an overlap can always be set via the way that the points are currently controlled. Thus for points 225, there being no further points beyond or other complications such as opposing overlaps within the overlap via points 225 normal, partial simplification can be applied which still permits points 225 to be swung normal if test " @OL227A " fails.

Thus:

\*OL225A if ( P225 cnf or P225 crf , @OL227A ) \

becomes:

\*OL225A if ( P225 cnf or P225 **cr** , @OL227A ) \

and

```
*OL225Q
( if P225 cr , @OL227A / via 225 already R
  then @OL227Q , ONF-AC l , ORE-BC l
  \
or if P225 cnf / via 225 already or called N
  then P225 cn , ONF-AB l
  \
or P225 cr , @OL227Q , ONF-AC l , ORE-BC l
  ) / via 225 called R
\
```

becomes:

```
*OL225Q
( if P225 cr , @OL227A / via 225 already R
  then @OL227Q , ONF-AC l , ORE-BC l
  \
or P225 cn , ONF-AB l / via 225 already or called N
  )
\
```

However, in this example that part of the overlap beyond points 225 reverse can be expected to be available (the simplified test " @OL227A " will pass once points 227 control bits have been set for the first time). Thus further simplification is possible (this would not be the case if for example points 227 were trailing instead of facing):

\*OL225A if ( P225 cnf or P225 crf , @OL227A ) \

instead becomes:

\*OL225A if ( P225 **cn** or P225 **cr** , @OL227A ) \

and

```
*OL225Q
( if P225 cr , @OL227A / via 225 already R
  then @OL227Q , ONF-AC l , ORE-BC l
  \
or if P225 cnf / via 225 already or called N
  then P225 cn , ONF-AB l
  \
or P225 cr , @OL227Q , ONF-AC l , ORE-BC l
  ) / via 225 called R
\
```

instead becomes:

```
*OL225Q
( if P225 cn then ONF-AB l \ / via 225 already N
  or @OL227Q , ONF-AC l , ORE-BC l / via 225 already R
  )
\
```

Thirdly, the OLxxxAC type list in the PFM file and the OLxxxQS list in the PRR file for points 227 are examined, these being used when an existing overlap is swung onto a further set of facing points. In this example an existing overlap beyond signal 37 is swung onto points 227 by keying points 225 reverse or by route setting from signal 37 via points 225 reverse.

This simplification can only be used where an overlap can always be set via the way that this further set of facing points are currently controlled. Thus for points 227, there being no further points or track sections beyond or other complications such as opposing overlaps within the overlap, this simplification can be applied to both legs of the overlap.

Thus, in the PFM file:

```
*OL227AC
if TRF c
( ~QR37C , P227 cnf
  or ~QR37B , P227 crf
  )
\
```

becomes:

```
*OL227AC
if TRF c
( ~QR37C , P227 cn
  or ~QR37B , P227 cr
  )
\
```

and, in the PRR file:

```
*OL227QS
( if ~QR37B , P227 cr / via 227 already R
  then ORF-AC l
  \
or if ~QR37C , P227 cnf / via 227 already or called N
  then P227 cn , ORF-AB l
  \
or P227 cr , ORF-AC l / via 227 called R
)
\
```

becomes:

```
*OL227QS
( if ~QR37C , P227 cn then ORF-AB l \ / via 227 already N
or ORF-AC l / via 227 already R
)
\
```

Where, as in this example, route setting from a forward signal is swinging an existing overlap onto a further set of facing points, this route setting must set the further set of points first in order to avoid route setting failure. This is in accordance with SSI8003-65C Section 1.2, and in this case of a panel request for a forward route over two sets of facing points in the overlap, the tests and commands for the points in the overlap are listed in reverse order. Thus points 227 are called before points 225 - this puts the former to the correct position thus leading the overlap set by the call to \*P225QR to be set the same way also. (In more complex cases, the second set of facing points may need to be both tested and called before the first set of facing points is tested and called.)

Forward route setting request 37C is typically:

```
*QR37C
if R37C a
  P227 crf , P225 crf
then R37C s
  @P227QR , @P225QR
  UNF-AC l , URF-BC l , URF-AC l , UQD-AB l
  S37 clear bpull
\ .
```

The forward route setting request for 37B is similar.

## 1.2 Alternative Method for Complicated Overlap Setting

This section shows a method of reducing the number of points free to move tests in setting complicated overlaps, which in turn allows the splitting up of overlap setting data into separate panel requests, thus avoiding problems of excessive data processing times.

The standard method for setting an overlap, using lists OLxxxA & OLxxxQ as shown in Examples 1 to 4 should be used where possible as it is easier to build

upon where there is more than one facing connection in an overlap. However it can lead to excessive data processing times. The main cause of this problem is data heavy points free to move tests combined with the double processing of these tests, once during the overlap availability check in list OLxxxA, and again during overlap setting in list OLxxxQ.

The preferred way of solving this problem is to split up the request as detailed in SSI8003-52. This will result in the overlap availability, calling and locking being done in the final part request, with the other points in the route being tested for availability and called in the earlier part request(s). If this does not solve the problem then an adaptation of the above standard method will have to be used, and this is detailed below.

The standard method is illustrated by the data in the PRR file for setting route 35B, as used in Example 4 in Chapter C, Section 2, and this is replicated below:

```
*QR35B
  if R35B a
    P213 cnf , P224 cnf
    @OL225A
  then R35B s
    P213 cn , P224 cn
    UNC-AC l , UND-AB l , ONE-AC l
    @OL225Q
    S35 clear bpull
  \ .

*OL225A  if ( P225 cnf , P226 cnf or P225 crf , @OL227A ) \

*OL225Q
  ( if P225 cr , @OL227A / via 225 already R
    then @OL227Q , ONF-AC l , ORE-BD l
    \
  or if P225 cnf , P226 cnf / via 225 already or called N
    then P225 cn , P226 cn , ONF-AB l , ONG-AC l
    \
  or P225 cr , @OL227Q , ONF-AC l , ORE-BD l
  ) / via 225 called R
\
```

It can be seen that that the point free to move tests in the first and third lines of list OL225Q (including any called by @OL227A) have already been processed in list OL225A. The tests in list OL225A just prove that at least one overlap is available, whereas the tests in OL225Q are used to decide which overlap is to be set.

As a first stage, the panel request can be restructured such that these tests are combined by bringing together the availability and setting of each overlap and the setting of the route, for each alternative overlap in turn. First expand the default commands in list OL225Q into a conditional statement, as explained in Chapter C, Section 2.2.:

```
*OL225Q
( if P225 cr , @OL227A / via 225 already R
  then @OL227Q , ONF-AC l , ORE-BD l
  \
or if P225 cnf , P226 cnf / via 225 already or called N
  then P225 cn , P226 cn , ONF-AB l , ONG-AC l
  \
or if P225 fr , @OL227A / via 225 called R
  then P225 cr , @OL227Q , ONF-AC l , ORE-BD l
  \
)
\
```

This results in all tests in list OL225A being present in expanded list OL225Q. The contents of this expanded list are incorporated into the panel request and lists OL225A & OL225Q abandoned. The commands for setting the rest of the route are combined with setting of each overlap, the former by means of new list RCOMM35B. The panel request QR35B becomes:

```
*QR35B
if R35B a
  P213 cnf
  P224 cnf
then ( if P225 cr , @OL227A / via 225 already R
       then @RCOMM35B
           @OL227Q , ONF-AC l , ORE-BD l
       \
or if P225 cnf , P226 cnf / via 225 already or called N
  then @RCOMM35B
       P225 cn , P226 cn , ONF-AB l , ONG-AC l
  \
or if P225 fr , @OL227A / via 225 called R
  then @RCOMM35B
       P225 cr
       @OL227Q , ONF-AC l , ORE-BD l
  \
)
\ .
```

```
*RCOMM35B
R35B s
P213 cn , P224 cn
UNC-AC l , UND-AB l , ONE-AC l
S35 clear bpull
\
```

As a second stage, if excessive data processing times (see SSI8003-52) require the panel request to be split then one possible overlap is evaluated in each request:

|        |             |
|--------|-------------|
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```

*QR35B
  if R35B a
    P213 cnf , P224 cnf
  then if P225 cr , @0L227A          / via 225 already R
    then @RCOMM35B
      @0L227Q , ONF-AC l , ORE-BD l
    else =QR35Bpt2
  \
\ .

*QR35Bpt2
  if R35B a
    P213 cnf , P224 cnf
  then if P225 cnf , P226 cnf          / via 225 already or called N
    then @RCOMM35B
      P225 cn , P226 cn
      ONF-AB l , ONG-AC l
    else =QR35Bpt3
  \
\ .

*QR35Bpt3
  if R35B a
    P213 cnf , P224 cnf
    P225 fr , @0L227A          / via 225 called R
  then @RCOMM35B
    P225 cr
    @0L227Q , ONF-AC l , ORE-BD l
  \
\ .

*RCOMM35B
  R35B s
  P213 cn , P224 cn
  UNC-AC l , UND-AB l , ONE-AC l
  S35 clear bpull
\
\ .

```

As a third stage, using further techniques in SSI8003-52, the data processing time for requests can be further reduced by moving the repeated points free to move tests and points commands for the other points in route to an extra initial request. Thus the point commands are removed from list RCOMM35B, and in the remaining requests these points are merely tested that they are still controlled to the required position:

```

*QR35B
  if R35B a
    P213 cnf , P224 cnf
  then P213 cn , P224 cn
    =QR35Bpt2
  \
\ .

```

```

*QR35Bpt2
  if R35B a
    P213 cn , P224 cn
  then if P225 cr , @0L227A          / via 225 already R
    then @RCOMM35B
      @0L227Q , ONF-AC l , ORE-BD l
    else =QR35Bpt3
    \
  \ .

*QR35Bpt3
  if R35B a , P213 cn , P224 cn
  then if P225 cnf , P226 cnf          / via 225 already or called N
    then @RCOMM35B
      P225 cn , P226 cn
      ONF-AB l , ONG-AC l
    else =QR35Bpt4
    \
  \ .

*QR35Bpt4
  if R35B a
    P213 cn , P224 cn
    P225 fr , @0L227A          / via 225 called R
  then @RCOMM35B
    P225 cr
    @0L227Q , ONF-AC l , ORE-BD l
  \
  \ .

*RCOMM35B
  R35B s
  UNC-AC l , UND-AB l , ONE-AC l
  S35 clear bpull
  \

```

As required in SSI8003-52 any tests for opposing route locking (on opposing sub-route and sub-overlaps free) would be repeated in each request. One or more stages of this method can also be applied to a second set of facing points (227 in this example).

The techniques in this and the following Section may be combined and applied in a similar manner to point key requests that swing facing points in overlaps that include further facing points. This is covered in Chapter E Section 2.

### 1.3 Swinging the Overlap First

In areas of complex or multiple overlaps where the setting of a route requires one or more overlaps to be swung there may be advantages in swinging the overlap(s) first before route availability is tested and the route set. The disadvantage is that the overlap may swing without the route setting, but possible advantages are:

- (i) Removal of points-free-to-move test from within points-free-to-move data in the PFM file thus generally reducing data processing times of route requests using the latter.