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Module

Chapter D: Data Files Source Language

For endorsement, authorisation and issue record of this document, please refer to the SSI Applications Manual Contents, NR/L2/SIG/17002.

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User information

This Network Rail standard may contain requirements that are colour-coded according to the following Red–Amber–Green classification.

Red – Mandatory requirements

- **Requirements** that **will** be complied with, and achieved under all circumstances.
- Accountability for the efficacy of these requirements lies with the Professional Head/Standard Owner.
- These requirements are monitored for compliance.
- Local non-compliances, discovered through engineering verification visits, will be reported and monitored through the quarterly Engineering Verification Report.
- Corrective actions will be enforced where local non-compliances remain open beyond the agreed mitigation plan dates.
- These are presented in a red box **and with the word “shall” or a direct instruction.**

Amber – Conditional requirements

- **Requirements** that **will** be complied with unless deviation has been approved.
- Accountability for the efficacy of these requirements lies with the Professional Head/ Standard Owner, or their nominated Delegated Authority.
- These requirements are monitored for compliance.
- Derogations **may** be permitted; which are to be approved by Standard Owner in advance.
- Derogations and Temporary Non-Compliances **may** be granted through the existing Delegated Authority arrangements.
- These are presented with an amber sidebar **and with the word “shall” or a direct instruction.**

Green – Guidance

- Guidance based on good practice; representing supporting information, based on good practice, to help achieve **RED** and **AMBER** requirements.
- This guidance is **not mandatory** and is not monitored for compliance.
- Alternative solutions may be used, which do not need to be formally approved.
- Decisions made by a competent person to use alternative solutions should be backed up by appropriate evidence/documentation.
- This is presented with a dotted green sidebar **and with the word “should” (usually in notes).**

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Issue record

Issue	Date	Comments
2	Feb 2002	2 nd Issue
3	03/03/2012	3 rd Issue

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 03/03/2012.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 3 (Option Selection) to continue to comply with the issue of any relevant Network Rail standards current when GRIP Stage 3 was completed and not to comply with requirements contained herein, unless stipulated otherwise in the scope of this standard.

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1 The Geographic Data Files Source Language

The functional data is built up from the data types which were described in Chapter B Section 4. Many of these data types can appear anywhere in the functional data and it is therefore appropriate to discuss their effect in this section. Other data types can occur only in certain parts of the functional data however, and it is more appropriate to discuss their effect in the section which deals with preparation of the relevant part of the functional data.

Most data types consist of an identity name followed by one or more qualifiers which define the nature of the test or command to be performed. These qualifiers are grouped into one or more qualifier words. Some general rules apply to all the data:

The order of the qualifiers within a qualifier word is immaterial.

Qualifier words shall be separated from names and from each other by at least one space.

All words of a data item (its name and all its qualifiers) shall appear on the same line.

Consecutive data items may be separated in several possible ways. One or more spaces may be used, or a carriage return, or a comma between spaces. The last way is desirable between consecutive data types with qualifiers to clearly identify the break between the end of the qualifier(s) of one data type and the start of the next data type.

Comments may be entered subject to the same constraints which apply to comments in the identity files.

In many cases, the format for tests and commands is the same. This causes no problem because the program decides which it is according to its context. If it follows an "if" or is in an area of data which is otherwise known to contain conditions, it is assumed to be a test, otherwise it is assumed to be a command.

The purpose of the following sections is to define the formats of all data types together with the effects of these data types.

1.1 Signal memory test

A signal memory test has the form of the signal name followed by a space, and then followed by one or more qualifier words which define the nature of the test to be carried out. A single signal memory test can only operate on one of the three bytes of signal memory (see Chapter B Section 3 and Figure B3 for the memory allocation) and it can only test for one state of the defined bits in that memory byte. The possible tests can be divided into three groups, which correspond to tests on each of the three bytes:

1.1.1 Group 1 (first byte)

A selection of bits from the first byte may be tested to determine whether they are set or clear. If the test is for bits set (at '1'), the first qualifier word should be "set". If it is for bits clear (at '0'), the first qualifier word should be "clear". The first and second qualifier words should be separated by a space. The second qualifier word defines which bits out of the first byte are to be tested. The following possibilities exist:

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Bits Contents

TORR test passed
not red retained
route/junction indicator proving
signal stick
aspect not disconnected
temporary approach control not applied
train in section proving code
(code values 0, 1, 2 or 3)
(choose only one code)

Source Language Abbreviation

torr
nrr
rip
stick
asdis
tac
tisp0, tisp1, tisp2,
or tisp3

Chapter G Section 1.2 contains further details of the meaning and use of the train in section proving codes.

If more than one qualifier is to be used, they should be joined by "+", for example:

S11 set nrr+asdis

This tests for the "not red retained" bit and the "aspect disconnection" bit in the '1' state. Note that both bits shall be in the required state for the test to be passed.

S12 set tisp0

This checks that the train in section proving code is '00'. Note that "set" and "clear" do not affect the test on the code, but one or other is required by the compiler if there is no other second qualifier word. In such cases the use of "set" is recommended.

S13 clear tac+tisp0

This checks that the temporary approach control bit is zero and that the train in section proving code is '00'. Note again that the test on the code is unaffected by the "set" or "clear" qualifier.

1.1.2 Group 2 (second byte)

This is somewhat similar to the first group. The various bits which may be tested are:

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Bit Contents

Source Language Abbreviation

lamp proving	lp
auto mode	auto
free of approach locking	foal
aspect control	ascon
button pulled	bpull
aspect code:	
green	g
flashing double yellow	fyy
double yellow	yy
flashing yellow	fy
yellow	y
shunt (red + associated position light, or position light shunting signal off)	s
red (includes position light shunting signal on)	r
most restrictive	mr
(only one aspect code may be selected)	

Note that the "mr" code is used by the Interlocking during calculations associated with red retaining. It is therefore usually "invisible" to the process of data preparation and is only included for the sake of completeness.

Once again, the code test is unaffected by the "set" or "clear" qualifier, which is required by the compiler. If an aspect code is included, it can be preceded additionally by "<" or ">" (meaning "less restrictive than" and "more restrictive than", respectively - note that unlike timer tests, ">" does not mean "equal to or more restrictive than"). The following examples may help to clarify this.

S20 set lp+foal+r

This tests that signal 20 is lamp proved, free of approach locking, and that the controls are at red.

S21 clear bpull+y

This checks for a '0' in the button pulled bit, and an aspect code of yellow.

S22 set lp+<s

This checks that the lamp proving bit is set and that the aspect code is less restrictive than shunt (i.e. any aspect code between yellow and green inclusive). The test "<s" will always equate to a test for a signal controlled to a main proceed aspect, irrespective of whether the signal has an associated position light aspect or has two, three or four aspects. This provides for a consistent data construct which does not require tailoring to a signal's aspects. Similarly "<r" can always be used to test for a main signal controlled to any proceed aspect (including associated position light), and "<y" can always be used to test for a distant signal (with single yellow) controlled off. Any of these can be linked with a test for lamp lit where required.

Note that when a signal is commanded to change to an aspect which has already failed, a test on "lp" may continue to report the lamp of the new aspect as proved for one major cycle before the lamp failure is reported.

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1.1.3 Group 3 (third byte)

The third byte of the signal memory contains the approach locking timer. Tests on this are therefore indicated by using "alt" as the first qualifier.

If the test is for the timer to be in the stopped state (i.e., not in use), the second qualifier is "stopped". If the contents of the approach locking timer are to be compared with a value, the second qualifier is that value and the first qualifier has a "<" or ">" appended to it. The "<" and ">" indicate that the timer should be "less than" or "greater than or equal to" the value given, respectively. Both these tests will fail if the timer is in the stopped state. The value represents time in seconds:

```
S30 alt< 60
S30 alt> 120
S30 alt stopped
```

All the timers in the Interlocking have an accuracy of ± 2 seconds over their entire working range, so care should be taken when specifying short delays. For instance, a test for ">2" only guarantees a delay of one Interlocking major cycle, i.e. a minimum time of just over half a second.

1.2 Signal memory command

Like the signal memory test above, this data type also operates on the three bytes of signal memory, but it sets and clears bits rather than testing them. In addition to the three groups of commands corresponding to those defined for the signal memory test, there is an additional category for aspect sequencing.

1.2.1 Group 1 (first byte)

The bits which may be set or cleared are the same as those in Group 1 of the signal memory test except the "asdis" and "tac" bits cannot be referred to by the command, as these may only be amended by messages from the Technician's Terminal. A command to the train in section proving code sets that code to the defined value. For example:

```
S11 set stick+tiisp0
```

Once again the code operation is independent of the "set" or "clear" qualifier, which is required by the compiler.

1.2.2 Group 2 (second byte)

The bits which may be set or cleared are the same as those in Group 2 of the signal memory test. A command to the aspect code sets that code to the defined value. "<" and ">" have no meaning in the command context, and therefore cannot be used. Examples follow:

```
S20 set bpull+r
S21 clear foal+g
```

The aspect code operation is independent of the "set" and "clear" qualifier which is required by the compiler. If it is required to operate on no bits other than the aspect code, "set" should be used as the first qualifier, rather than "clear", for example:

```
S20 set yy
```