

**1. Grammar symbols: Used cross reference.**

Reference of each grammar's symbol used within each rule's productions. The index uses the tripple: rule name, its subrule no, and the symbol's position within the symbol string.

**2. Rerror:.**

Rerrors 1.1 Rerrors 2.2

**3. Rerrors:.**

Ro2\_err\_hdlr 1.1 Rerrors 2.1

**4. bad char:.**

Error 12.1

**5. bad cmd-opt:.**

Error 5.1

**6. bad eos:.**

Error 9.1 Error 16.2

**7. bad esc:.**

Error 10.1 Error 15.2

**8. bad filename:.**

Error 4.1 Error 14.2

**9. bad int-no:.**

Error 6.1

**10. bad int-no range:.**

Error 7.1

**11. bad univ-seq:.**

Error 13.1

**12. comment-overrun:.**

Error 11.1

**13. eog:.**

Ro2\_err\_hdlr 1.2 Ro2\_err\_hdlr 2.1

**14. file-inclusion:.**

Error 14.1 Error 15.1 Error 16.1 Error 17.1

**15. nested files exceeded:.**

Error 1.1

**16. no end-of-code:.**

Error 2.1

**17. no filename:.**

Error 3.1 Error 17.2

**18. no int present:.**

Error 8.1

**19. |+|:.**

Error 18.1

**20. Grammar Rules's First Sets.****21. *Ro2\_err\_hdlr* # in set: 16.**

bad char bad cmd-opt bad eos bad esc bad filename bad int-no bad int-no range bad univ-seq  
comment-overrun eog file-inclusion nested files exceeded no end-of-code no filename no int present |+

**22. *Errors* # in set: 15.**

bad char bad cmd-opt bad eos bad esc bad filename bad int-no bad int-no range bad univ-seq  
comment-overrun file-inclusion nested files exceeded no end-of-code no filename no int present |+

**23. *Error* # in set: 15.**

bad char bad cmd-opt bad eos bad esc bad filename bad int-no bad int-no range bad univ-seq  
comment-overrun file-inclusion nested files exceeded no end-of-code no filename no int present |+

**24. LR State Network.**

List of productions with their derived LR state lists. Their subrule number and symbol string indicates the specific production being derived. The “▷” symbol indicates the production’s list of derived states from its closed state. Multiple lists within a production indicate 1 of 2 things:

- 1) derived string that could not be merged due to a lr(1) conflict
- 2) partially derived string merged into another derived lr states

A partially derived string is indicated by the “merged into” symbol  $\nearrow$  used as a superscript along with the merged into state number.

**25. *Ro2\_err\_hdlr*.**

1 Errors eog  
▷ 1 22 23  
2 eog  
▷ 1 2

**26. *Errors*.**

1 Rerror  
▷ 1 25  
2 Rerrors Rerror  
▷ 1 22 24

**27. Rerror.**

- 1 nested files exceeded
  - ▷ 1 9
  - ▷ 22↗<sup>9</sup>
- 2 no end-of-code
  - ▷ 1 10
  - ▷ 22↗<sup>10</sup>
- 3 no filename
  - ▷ 1 11
  - ▷ 22↗<sup>11</sup>
- 4 bad filename
  - ▷ 1 12
  - ▷ 22↗<sup>12</sup>
- 5 bad cmd-opt
  - ▷ 1 13
  - ▷ 22↗<sup>13</sup>
- 6 bad int-no
  - ▷ 1 14
  - ▷ 22↗<sup>14</sup>
- 7 bad int-no range
  - ▷ 1 15
  - ▷ 22↗<sup>15</sup>
- 8 no int present
  - ▷ 1 16
  - ▷ 22↗<sup>16</sup>
- 9 bad eos
  - ▷ 1 17
  - ▷ 22↗<sup>17</sup>
- 10 bad esc
  - ▷ 1 18
  - ▷ 22↗<sup>18</sup>
- 11 comment-overflow
  - ▷ 1 19
  - ▷ 22↗<sup>19</sup>
- 12 bad char
  - ▷ 1 20
  - ▷ 22↗<sup>20</sup>
- 13 bad univ-seq
  - ▷ 1 21
  - ▷ 22↗<sup>21</sup>
- 14 file-inclusion bad filename
  - ▷ 1 4 6
  - ▷ 22↗<sup>4</sup>
- 15 file-inclusion bad esc
  - ▷ 1 4 8
  - ▷ 22↗<sup>4</sup>
- 16 file-inclusion bad eos
  - ▷ 1 4 7
  - ▷ 22↗<sup>4</sup>
- 17 file-inclusion no filename
  - ▷ 1 4 5

▷ 22<sup>↗4</sup>  
 18 |+|  
 ▷ 1 3  
 ▷ 22<sup>↗3</sup>

**28. List of reducing states.**

The following legend indicates the type of reducing state.

Points 2–4 are states that must meet the lr(1) condition:

- 1) r — only 1 production reducing
- 2) r<sup>2</sup> — 2 or more reducing productions
- 3) s/r — shift and 1 reducing production
- 4) s/r<sup>2</sup> — shift and multiple reducing productions

⊂ 2<sup>r</sup> 3<sup>r</sup> 5<sup>r</sup> 6<sup>r</sup> 7<sup>r</sup> 8<sup>r</sup> 9<sup>r</sup> 10<sup>r</sup> 11<sup>r</sup> 12<sup>r</sup> 13<sup>r</sup> 14<sup>r</sup> 15<sup>r</sup> 16<sup>r</sup> 17<sup>r</sup> 18<sup>r</sup> 19<sup>r</sup> 20<sup>r</sup> 21<sup>r</sup> 23<sup>r</sup>  
 24<sup>r</sup> 25<sup>r</sup>

**29. Lr1 State's Follow sets and reducing lookahead sets.**

Notes on Follow set expressions:

1) The “follow set” for rule uses its literal name and tags its grammar rule rank number as a superscript. Due to space limitations, part of the follow set information uses the rule's literal name while the follow set expressions refers to the rule's rank number. This  $\langle \text{rule name, rule rank number} \rangle$  tuple allows you the reader to decipher the expressions. Transitions are represented by  $S_x R_z$  whereby S is the LR1 state identified by its “x” subscript where other transient calculations occur within the LR1 state network. R indicates the follow set rule with the subscript “z” as its grammar rank number that contributes to the follow set.

The  $\nearrow^x$  symbol indicates that a merge into state “x” has taken place. That is, the reduced subrule that depends on this follow set finds its follow set in 2 places: its birthing state that generated the sequence up to the merged into state, and the birthing state that generated the “merged into” state. So the rule's “follow set” calculation must also continue its calculation within the birth state generating the “x merged into” state.

State: 1 Follow Set contributors, merges, and transitions

$\leftarrow$  Follow set Rule  $\rightarrow \leftarrow$  follow set symbols contributors  $\rightarrow$   
Ro2\_err\_hdlr<sup>1</sup>

Local follow set yield:

eolr.

$\leftarrow$  Follow set Rule  $\rightarrow \leftarrow$  follow set symbols contributors  $\rightarrow$   
Errors<sup>2</sup>  $R_{1.1.1} R_{2.2.1}$

Local follow set yield:

file-inclusion, eog, |+|, nested files exceeded, no end-of-code, no filename, bad filename, bad cmd-opt,  
bad int-no, bad int-no range, no int present, bad eos, bad esc, comment-overrun, bad char, bad univ-seq.

$\leftarrow$  Follow set Rule  $\rightarrow \leftarrow$  follow set symbols contributors  $\rightarrow$   
Error<sup>3</sup>  $R_{2.1.1} \nearrow^{22} S_1 R_2$

Local follow set yield:

State: 22 Follow Set contributors, merges, and transitions

$\leftarrow$  Follow set Rule  $\rightarrow \leftarrow$  follow set symbols contributors  $\rightarrow$   
Error<sup>3</sup>  $R_{2.2.2} S_1 R_2$

Local follow set yield:

**30. Common Follow sets.**

**31. LA set: 1.**

eolr.

**32. LA set: 2.**

file-inclusion, eog, |+|, nested files exceeded, no end-of-code, no filename, bad filename, bad cmd-opt, bad int-no, bad int-no range, no int present, bad eos, bad esc, comment-overrun, bad char, bad univ-seq.

**33. Index.**

R<sub>1</sub> --- Ro2\_err\_hdlr: 25.

R<sub>2</sub> --- Rerrors: 26.

R<sub>3</sub> --- Rerror: 27.

*Rerror*: 23.

*Rerrors*: 22.

*Ro2\_err\_hdlr*: 21.



## o2\_err\_hdlr\_idx.w

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