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. # file-name:.
Rfilename 1.2

3. # lrk-sufx:.
Rsym_def 3.2 Rsym_def1 2.2

4. # name-space:.
Rnamespace 1.2

5. # terminals-refs:.
Rsym_def 4.2 Rsym_def1 3.2

6. # terminals-sufx:.
Rsym_def 5.2 Rsym_def1 4.2

7. (:.
Ropen_par 2.1

8.):.
Rclose_par 2.1

9. ,:.
Rnamespace_phrase 1.1

10. NS_identifier::TH_identifier:.
Rfilename 1.3 Rfilename_id 1.3 Rnamespace 1.3 Rnamespace_id 1.3

11. NS_lint_balls::TH_lint_balls:.
Rlint 1.3

12. NS_term_def_ph::TH_term_def_ph:.
Rsym_def 1.3 Rsym_def1 1.3

13. NULL thread:.
Rfilename 2.3 Rfilename_id 2.3 Rnamespace 2.3 Rnamespace_id 2.3 Rsym_def 2.3 Rsym_def 3.3 Rsym_def 4.3 Rsym_def 5.3 Rsym_def1 2.3 Rsym_def1 3.3 Rsym_def1 4.3 Rsym_def1 5.3

14. Rclose_brace:.
Rsym_defs_phrase 1.4

15. Rclose_par:.
Rerror_symbols_phrase 1.4

16. Rfilename:.
Rfilename_phrase 1.1

17. Rfilename_id:.
Rfilename_phrase 1.3

18. Rfilename_phrase:.
Rparameters 1.2

19. Rlint:.
Rerror_symbols_phrase 1.1 Rerror_symbols_phrase 1.5 Rerror_symbols_phrase 1.7 Rparameters 1.1 Rparameters 1.3 Rparameters 1.5 Rfilename_phrase 1.2 Rnamespace_phrase 1.2 Rnamespace_phrase 1.4 Rsym_defs_phrase 1.2 Rsym_defs 1.2 Rsym_defs 2.3

20. Rnamespace:.
Rnamespace_phrase 1.3

21. Rnamespace_id:.
Rnamespace_phrase 1.5

22. Rnamespace_phrase:.
Rparameters 1.4

23. Ropen_brace:.
Rsym_defs_phrase 1.1

24. Ropen_par:.
Rerror_symbols_phrase 1.2

25. Rparameters:.
Rerror_symbols_phrase 1.3

26. Rsym_def:.
Rsym_defs 1.1

27. Rsym_def1:.
Rsym_defs 2.2

28. Rsym_defs:.
Rsym_defs_phrase 1.3 Rsym_defs 2.1

29. Rsym_defs_phrase:.
Rerror_symbols_phrase 1.6

30. ϵ **:.**
Rlint 2.1

31. identifier:.
Rfilename_id 1.2 Rnamespace_id 1.2

32. lint:.
Rlint 1.2

33. terminal-def:.
Rsym_def 1.2 Rsym_def1 1.2

34. `{:.`
Ropen_brace 2.1

35. `|+|:.`
Rfilename 2.2 Rfilename_id 2.2 Rnamespace 2.2 Rnamespace_id 2.2 Rsym_def 2.2 Rsym_def1 5.2

36. `|?|:.`
Ropen_par 1.1 Rclose_par 1.1 Rfilename 3.1 Rfilename_id 3.1 Rnamespace_phrase 2.1 Rnamespace 3.1 Rnamespace_id 3.1 Rsym_def 6.1 Ropen_brace 1.1 Rclose_brace 1.1

37. `|||:.`
Rfilename 1.1 Rfilename 2.1 Rfilename_id 1.1 Rfilename_id 2.1 Rnamespace 1.1 Rnamespace 2.1 Rnamespace_id 1.1 Rnamespace_id 2.1 Rsym_def 1.1 Rsym_def 2.1 Rsym_def 3.1 Rsym_def 4.1 Rsym_def 5.1 Rsym_def1 1.1 Rsym_def1 2.1 Rsym_def1 3.1 Rsym_def1 4.1 Rsym_def1 5.1 Rlint 1.1

38. `}:.`
Rclose_brace 2.1

39. Grammar Rules's First Sets.

40. *Rerror_symbols_phrase* **# in set: 3.**
(|?| |||

41. *Ropen_par* **# in set: 2.**
(|?|

42. *Rclose_par* **# in set: 2.**
) |?|

43. *Rparameters* **# in set: 2.**
|?| |||

44. *Rfilename_phrase* **# in set: 2.**
|?| |||

45. *Rfilename* **# in set: 2.**
|?| |||

46. *Rfilename_id* **# in set: 2.**
|?| |||

47. *Rnamespace_phrase* **# in set: 2.**
, |?|

48. *Rnamespace* **# in set: 2.**
|?| |||

49. *Rnamespace_id* **# in set: 2.**
|?| |||

50. *Rsym_defs_phrase* **# in set: 2.**
{ |?|

51. *Rsym_defs* **# in set: 2.**
|?| |||

52. *Rsym_def* **# in set: 2.**
|?| |||

53. *Rsym_def1* **# in set: 1.**
|||

54. *Ropen_brace* **# in set: 2.**
{ |?|

55. *Rclose_brace* **# in set: 2.**
|?| }

56. *Rlint*$^{\epsilon}$ **# in set: 1.**
|||

57. 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 closured 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 ↗used as a superscript along with the merged into state number.

58. Rerror_symbols_phrase.

```
1 Rlint  Ropen_par  Rparameters  Rclose_par  Rlint  Rsym_defs_phrase  Rlint
  ▷ 1  4  5  6  7  8  11  12
```

59. Ropen_par.

```
1 |?|
  ▷ 4  25
2 (
  ▷ 4  26
```

60. Rclose_par.

```
1 |?|
  ▷ 6  42
2 )
  ▷ 6  43
```

61. Rparameters.

```
1 Rlint  Rfilename_phrase  Rlint  Rnamespace_phrase  Rlint
  ▷ 5  27  28  29  40  41
```

62. Rfilename_phrase.

```
1 Rfilename  Rlint  Rfilename_id
  ▷ 27  59  60  65
```

63. Rfilename.

```
1 |||   # file-name  NS_identifier::TH_identifier
  ▷ 27  56  58
2 |||  |+|  NULL
  ▷ 27  56  57
3 |?|
  ▷ 27  55
```

64. Rfilename_id.

```
1 |||  identifier  NS_identifier::TH_identifier
  ▷ 60  62  64
2 |||  |+|  NULL
  ▷ 60  62  63
3 |?|
  ▷ 60  61
```

65. Rnamespace_phrase.

```
1 ,  Rlint  Rnamespace  Rlint  Rnamespace_id
  ▷ 29  31  32  33  34  39
2 |?|
  ▷ 29  30
```

66. Rnamespace.

```
1 |||   # name-space  NS_identifier::TH_identifier
  ▷ 32  67  69
2 |||  |+|  NULL
  ▷ 32  67  68
3 |?|
  ▷ 32  66
```

67. Rnamespace_id.

```
1 |||  identifier  NS_identifier::TH_identifier
  ▷ 34  36  38
2 |||  |+|  NULL
  ▷ 34  36  37
3 |?|
  ▷ 34  35
```

68. Rsym_defs_phrase.

```
1 Ropen_brace  Rlint  Rsym_defs  Rclose_brace
  ▷ 8  13  14  15  24
```

69. Rsym_defs.

```
1 Rsym_def  Rlint
  ▷ 14  53  54
2 Rsym_defs  Rsym_def1  Rlint
  ▷ 14  15  51  52
```

70. Rsym_def.

```
1 |||  terminal-def  NS_term_def_ph::TH_term_def_ph
  ▷ 14  45  50
2 |||  |+|  NULL
  ▷ 14  45  46
3 |||   # lrk-sufx  NULL
  ▷ 14  45  49
4 |||   # terminals-refs  NULL
  ▷ 14  45  47
5 |||   # terminals-sufx  NULL
  ▷ 14  45  48
6 |?|
  ▷ 14  44
```

71. Rsym_def1.

```
1 |||  terminal-def  NS_term_def_ph::TH_term_def_ph
  ▷ 15  17  22
2 |||   # lrk-sufx  NULL
  ▷ 15  17  21
3 |||   # terminals-refs  NULL
  ▷ 15  17  19
4 |||   # terminals-sufx  NULL
  ▷ 15  17  20
5 |||  |+|  NULL
  ▷ 15  17  18
```

72. Ropen_brace.

```
1 |?|
  ▷ 8  9
2 {
  ▷ 8  10
```

73. Rclose_brace.

```
1 |?|
  ▷ 15  16
2 }
  ▷ 15  23
```

74. Rlint.

1 ||| lint NS_lint_balls::TH_lint_balls
  ▷ 1 2 3
  ▷ $5^{\nearrow 2}$
  ▷ $7^{\nearrow 2}$
  ▷ $11^{\nearrow 2}$
  ▷ $13^{\nearrow 2}$
  ▷ $28^{\nearrow 2}$
  ▷ $31^{\nearrow 2}$
  ▷ $33^{\nearrow 2}$
  ▷ $40^{\nearrow 2}$
  ▷ $51^{\nearrow 2}$
  ▷ $53^{\nearrow 2}$
  ▷ $59^{\nearrow 2}$
2 ϵ
  ▷ 1
  ▷ 5
  ▷ 7
  ▷ 11
  ▷ 13
  ▷ 28
  ▷ 31
  ▷ 33
  ▷ 40
  ▷ 51
  ▷ 53
  ▷ 59

75. 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^2 --- 2 or more reducing productions
3) s/r --- shift and 1 reducing production
4) s/r^2 --- shift and multiple reducing productions

$\subset$ $1^{s/r}$ 3^{r} $5^{s/r}$ $7^{s/r}$ 9^{r} 10^{r} $11^{s/r}$ 12^{r} $13^{s/r}$ 16^{r} 18^{r} 19^{r} 20^{r} 21^{r}
22^{r} 23^{r} 24^{r} 25^{r} 26^{r} $28^{s/r}$ 30^{r} $31^{s/r}$ $33^{s/r}$ 35^{r} 37^{r} 38^{r} 39^{r} $40^{s/r}$
41^{r} 42^{r} 43^{r} 44^{r} 46^{r} 47^{r} 48^{r} 49^{r} 50^{r} $51^{s/r}$ 52^{r} $53^{s/r}$ 54^{r} 55^{r}
57^{r} 58^{r} $59^{s/r}$ 61^{r} 63^{r} 64^{r} 65^{r} 66^{r} 68^{r} 69^{r}

76. 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 $<$ rule name, rule rank number $>$ tupple allows you the reader to decifer the expressions. Transitions are represented by S_xR_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
← Follow set Rule → ← follow set symbols contributors →
Rerror_symbols_phrase[1]
Local follow set yield:
eolr.
← Follow set Rule → ← follow set symbols contributors →
Rlint[17] $R_{1\cdot1\cdot1}$ $\nearrow^{59}$ $\nearrow^{33}$ $\nearrow^{31}$ $\nearrow^{28}$ $\nearrow^{53}$ $\nearrow^{51}$ $\nearrow^{13}$ $\nearrow^{7}$ $\nearrow^{40}$ $\nearrow^{5}$ $\nearrow^{11}$
Local follow set yield:
|?|, (.

State: 4 Follow Set contributors, merges, and transitions
← Follow set Rule → ← follow set symbols contributors →
Ropen_par[2] $R_{1\cdot1\cdot2}$
Local follow set yield:
|?|, |||.

State: 5 Follow Set contributors, merges, and transitions
← Follow set Rule → ← follow set symbols contributors →
Rparameters[4] $R_{1\cdot1\cdot3}$
Local follow set yield:
|?|,).
← Follow set Rule → ← follow set symbols contributors →
Rlint[17] $R_{4\cdot1\cdot1}$
Local follow set yield:
|?|, |||.

State: 6 Follow Set contributors, merges, and transitions
← Follow set Rule → ← follow set symbols contributors →
Rclose_par[3] $R_{1\cdot1\cdot4}$ $R_{1\cdot1\cdot5}$
Local follow set yield:
|?|, |||, {.

State: 7 Follow Set contributors, merges, and transitions
← Follow set Rule → ← follow set symbols contributors →
Rlint[17] $R_{1\cdot1\cdot5}$
Local follow set yield:
|?|, {.

State: 8 Follow Set contributors, merges, and transitions
← Follow set Rule → ← follow set symbols contributors →
Rsym_defs_phrase[11] $R_{1\cdot1\cdot6}$ $R_{1\cdot1\cdot7}$ S_1R_1
Local follow set yield:
|||.
← Follow set Rule → ← follow set symbols contributors →
Ropen_brace[15] $R_{11\cdot1\cdot1}$ $R_{11\cdot1\cdot2}$
Local follow set yield:
|?|, |||.

State: 11 Follow Set contributors, merges, and transitions
← Follow set Rule → ← follow set symbols contributors →
Rlint[17] $R_{1\cdot1\cdot7}$ S_1R_1
Local follow set yield:

State: 13 Follow Set contributors, merges, and transitions
← Follow set Rule → ← follow set symbols contributors →
Rlint[17] $R_{11\cdot1\cdot2}$
Local follow set yield:
|?|, |||.

State: 14 Follow Set contributors, merges, and transitions
← Follow set Rule → ← follow set symbols contributors →
Rsym_defs[12] $R_{11\cdot1\cdot3}$ $R_{12\cdot2\cdot1}$
Local follow set yield:
|?|, |||, }.
← Follow set Rule → ← follow set symbols contributors →
Rsym_def[13] $R_{12\cdot1\cdot1}$ $R_{12\cdot1\cdot2}$ $S_{14}R_{12}$
Local follow set yield:
|||.

State: 15 Follow Set contributors, merges, and transitions
← Follow set Rule → ← follow set symbols contributors →
Rsym_def1[14] $R_{12\cdot2\cdot2}$ $R_{12\cdot2\cdot3}$ $S_{14}R_{12}$
Local follow set yield:
|||.
← Follow set Rule → ← follow set symbols contributors →
Rclose_brace[16] $R_{11\cdot1\cdot4}$ S_8R_{11}
Local follow set yield:

State: 27 Follow Set contributors, merges, and transitions
← Follow set Rule → ← follow set symbols contributors →
Rfilename_phrase[5] $R_{4\cdot1\cdot2}$ $R_{4\cdot1\cdot3}$

```
Local follow set yield:
  |?|, |||, ,.
← Follow set Rule  → ←            follow set symbols contributors            →
Rfilename[6]            R5·1·1 R5·1·2
Local follow set yield:
  |?|, |||.

State: 28  Follow Set contributors, merges, and transitions
← Follow set Rule  → ←            follow set symbols contributors            →
Rlint[17]               R4·1·3
Local follow set yield:
  |?|, ,.

State: 29  Follow Set contributors, merges, and transitions
← Follow set Rule  → ←            follow set symbols contributors            →
Rnamespace_phrase[8]    R4·1·4 R4·1·5 S5R4
Local follow set yield:
  |||.

State: 31  Follow Set contributors, merges, and transitions
← Follow set Rule  → ←            follow set symbols contributors            →
Rlint[17]               R8·1·2
Local follow set yield:
  |?|, |||.

State: 32  Follow Set contributors, merges, and transitions
← Follow set Rule  → ←            follow set symbols contributors            →
Rnamespace[9]           R8·1·3 R8·1·4
Local follow set yield:
  |?|, |||.

State: 33  Follow Set contributors, merges, and transitions
← Follow set Rule  → ←            follow set symbols contributors            →
Rlint[17]               R8·1·4
Local follow set yield:
  |?|, |||.

State: 34  Follow Set contributors, merges, and transitions
← Follow set Rule  → ←            follow set symbols contributors            →
Rnamespace_id[10]       R8·1·5 S29R8
Local follow set yield:


State: 40  Follow Set contributors, merges, and transitions
← Follow set Rule  → ←            follow set symbols contributors            →
Rlint[17]               R4·1·5 S5R4
Local follow set yield:


State: 51  Follow Set contributors, merges, and transitions
← Follow set Rule  → ←            follow set symbols contributors            →
Rlint[17]               R12·2·3 S14R12
```

```
Local follow set yield:


State: 53  Follow Set contributors, merges, and transitions
← Follow set Rule  → ←              follow set symbols contributors              →
Rlint[17]                  R12·1·2 S14R12
Local follow set yield:


State: 59  Follow Set contributors, merges, and transitions
← Follow set Rule  → ←              follow set symbols contributors              →
Rlint[17]                  R5·1·2
Local follow set yield:
  |?|, |||.

State: 60  Follow Set contributors, merges, and transitions
← Follow set Rule  → ←              follow set symbols contributors              →
Rfilename_id[7]            R5·1·3 S27R5
Local follow set yield:
```

77. Common Follow sets.

78. LA set: 1.

```
eolr.
```

79. LA set: 2.

```
|?|, |r|.
```

80. LA set: 3.

```
|?|, {.
```

81. LA set: 4.

```
|?|, |r|, }.
```

82. LA set: 5.

```
|?|, ,.
```

83. LA set: 6.

```
|?|, |r|, ).
```

84. LA set: 7.

```
|?|, ).
```

85. LA set: 8.

```
|?|, |r|, {.
```

86. LA set: 9.

```
|?|, |r|, ,.
```

87. Index.

err_symbols_ph_th_idx.w

Date: January 14, 2015 at 15:38

File: err_symbols_ph_th_idx.w