

**1. Copyright.**

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**2. *O<sub>2</sub>*'s frontend command line parser.** The `argv[]` data passed by `"int main(int argc, char* argv[])"` is mapped into raw char tokens and placed into a container for lexical assessment.

Command Format:

file name followed by (options)\*

Note:

File name can be quoted or unquoted. Safest is quoted "...". Just watch out for unquoted: a space(s) must separate a filename from an option's phrase. Eg. `ws.lex-g` thinks the `-g` is part of the file name. It should be: `ws.lex_g`. Note the space between the extension ".lex" and the "-g" option which separates these two phrases.

Comments can be sprinkled throughout the command line. This was added to document the test driver's regressive test files. There is no difference in input coming from the program's command line environment or a test harness's data file. The extensions: comments, and separate lines of command data would normally be absent when coming from the program's command line environment.

Command Line Parameters:

- p — generate pdf / ps documents
- err — generate error symbols
- t — generate terminal symbols
- all others are relics of the past — so out damn spot

Errors:

"comment-overflow", "bad-eos", "bad-esc", "bad-cmd-opt"

### 3. Fsm *Co2\_lcl\_opts* class.

#### 4. *Co2\_lcl\_opts* constructor directive.

```
<Co2_lcl_opts constructor directive 4> ≡
  err_sw_ = 'n';
  t_sw_ = 'n';
  prt_sw_ = 'n';
  parm_cnt_ = 1;
```

#### 5. *Co2\_lcl\_opts* op directive.

```
<Co2_lcl_opts op directive 5> ≡
  parser_ → set_use_all_shift_on();
```

#### 6. *Co2\_lcl\_opts* user-declaration directive.

```
<Co2_lcl_opts user-declaration directive 6> ≡
public: yacco2 :: CHAR err_sw_;
  yacco2 :: CHAR t_sw_;
  yacco2 :: CHAR prt_sw_;
  std :: string file_to_compile_;
  yacco2 :: UINT parm_cnt_;
```

**7. Co2\_lcl\_opts user-prefix-declaration directive.**

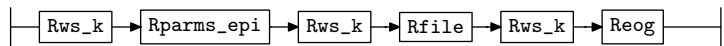
```

⟨ Co2_lcl_opts user-prefix-declaration directive 7 ⟩ ≡
#include "o2_lcl_opt.h"
#include "ws.h"
#include "eol.h"
#include "c_comments.h"
#include "xc_str.h"
#include "unq_str.h"

```

**8. Ryacco2\_options rule.**

Ryacco2\_options

**9. Ryacco2\_options op directive.**

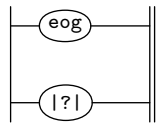
```

⟨ Ryacco2_options op directive 9 ⟩ ≡
TOKEN_GAGGLE * err_queue = ( TOKEN_GAGGLE * ) rule_info_.parser_--error_queue();
if ( err_queue-empty() ) return;

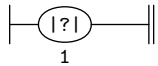
```

**10. Reog rule.**

Reog

**11. Reog's subrule 2.**

Bad data or missing option indicator: "-" so report it.



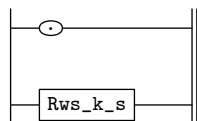
```

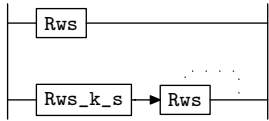
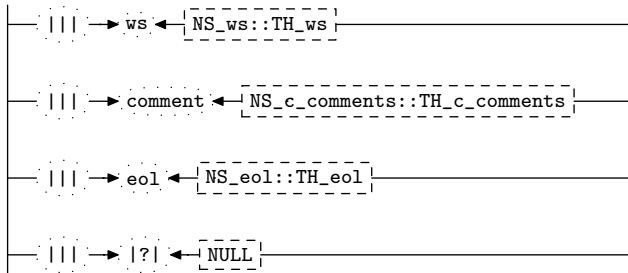
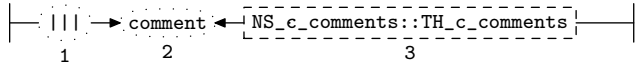
⟨ Reog subrule 2 op directive 11 ⟩ ≡
rule_info_.parser_--set_use_all_shift_off();
CAbs_lr1_sym * sym = new Err_bad_cmd_line_opt;
sym->set_rc(*sf-p1--, __FILE__, __LINE__);
ADD_TOKEN_TO_ERROR_QUEUE(*sym);
rule_info_.parser_--set_stop_parse(true);

```

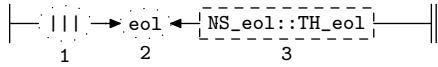
**12. Rws\_k rule.**

Rws\_k

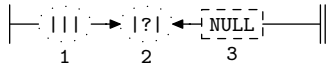


**13. *Rws\_k\_s* rule.***Rws\_k\_s***14. *Rws* rule.***Rws***15. *Rws*'s subrule 2.**

⟨*Rws* subrule 2 op directive 15⟩ ≡  
*sf*→*p2*→*set\_auto\_delete(true)*;

**16. *Rws*'s subrule 3.**

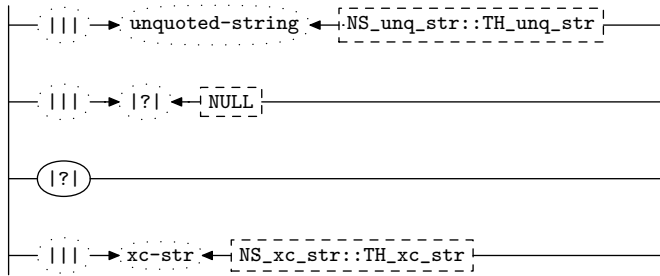
⟨*Rws* subrule 3 op directive 16⟩ ≡  
*sf*→*p2*→*set\_auto\_delete(true)*;

**17. *Rws*'s subrule 4.**

⟨*Rws* subrule 4 op directive 17⟩ ≡  
*rule\_info*→*parser*→*set\_use\_all\_shift\_off()*;  
 ADD\_TOKEN\_TO\_ERROR\_QUEUE(\**sf*→*p2*→);  
*rule\_info*→*parser*→*set\_stop\_parse(true)*;

18. *Rfile* rule.

Rfile



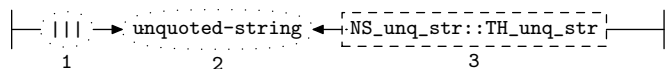
19. Rfile user-declaration directive.

⟨Rfile user-declaration directive 19⟩ ≡  
**public: void** *edit\_file*(*CAbs\_lr1\_sym* \* *Sym*);

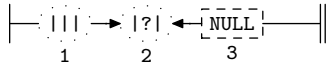
20. Rfile user-implementation directive.

⟨Rfile user-implementation directive 20⟩ ≡  
**void** *Rfile::edit\_file*(*CAbs\_lr1\_sym* \* *Sym*){ *Co2\_lcl\_opts* \* *fsm* = ( *Co2\_lcl\_opts* \* )  
     *rule\_info\_\_parser\_\_fsm\_tbl\_\_*;  
     **using namespace** **NS\_yacco2\_err\_symbols**;  
     **using namespace** **NS\_yacco2\_k\_symbols**;  
     *std::ifstream* *ifile*;  
     *ifile.open*(*fsm->file\_to\_compile\_c\_str*());  
     **if** (*ifile.good*()) {  
         *ifile.close*();  
         **return**;  
     }  
     *CAbs\_lr1\_sym* \* *sym* = **new** *Err\_bad\_filename*(*fsm->file\_to\_compile\_*);  
     *sym->set\_rc*(\**Sym*, **\_\_FILE\_\_**, **\_\_LINE\_\_**);  
     *rule\_info\_\_parser\_\_add\_token\_to\_error\_queue*(\**sym*);  
     *rule\_info\_\_parser\_\_set\_stop\_parse*(**true**); }

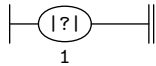
21. *Rfile*'s subrule 1.



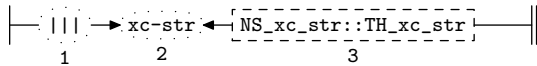
⟨Rfile subrule 1 op directive 21⟩ ≡  
     *T\_unquoted\_string* \* *uqstr* = *sf-p2\_\_*; *Co2\_lcl\_opts* \* *fsm* = ( *Co2\_lcl\_opts* \* ) *rule\_info\_\_parser\_\_fsm\_tbl\_\_*;  
     *fsm->file\_to\_compile\_* += *uqstr->unquoted\_string*()-*c\_str*();  
     ++*fsm->parm\_cnt*;  
     *edit\_file*(*uqstr*);  
     *sf-p2\_\_->set\_auto\_delete*(**true**);

**22. *Rfile's subrule 2.***

⟨ Rfile subrule 2 op directive 22 ⟩ ≡  
*rule\_info\_\_parser\_\_set\_use\_all\_shift\_off* ();  
 ADD\_TOKEN\_TO\_ERROR\_QUEUE(\**sf*-*p2*);  
*rule\_info\_\_parser\_\_set\_stop\_parse*(*true*);

**23. *Rfile's subrule 3.***

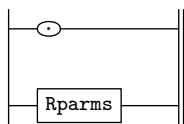
⟨ Rfile subrule 3 op directive 23 ⟩ ≡  
*rule\_info\_\_parser\_\_set\_use\_all\_shift\_off* ();  
*CAbs\_lr1\_sym \* sym = new Err\_no\_filename* ();  
*sym*-*set\_rc*(\**rule\_info\_\_parser\_\_current\_token*(), *\_\_FILE\_\_*, *\_\_LINE\_\_*);  
 ADD\_TOKEN\_TO\_ERROR\_QUEUE(\**sym*);  
*rule\_info\_\_parser\_\_set\_stop\_parse*(*true*);

**24. *Rfile's subrule 4.***

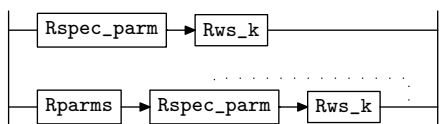
⟨ Rfile subrule 4 op directive 24 ⟩ ≡  
*T\_xc\_str \* xcstr = sf*-*p2*; *Co2\_lcl\_opts \* fsm = ( Co2\_lcl\_opts \* ) rule\_info\_\_parser\_\_fsm\_tbl*;;  
*fsm*-*file\_to\_compile\_ += xcstr*-*c\_string*()-*c\_str*();  
 ++*fsm*-*parm\_cnt*;;  
*edit\_file*(*xcstr*);

**25. *Rparms\_epl* rule.**

*Rparms\_epl*

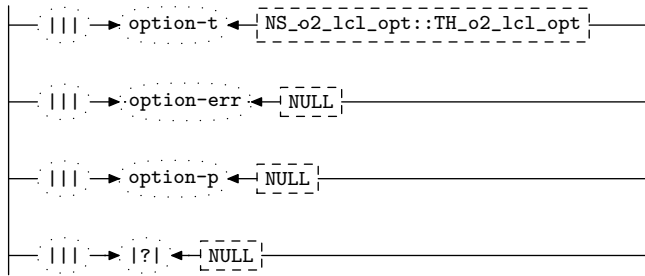
**26. *Rparms* rule.**

*Rparms*

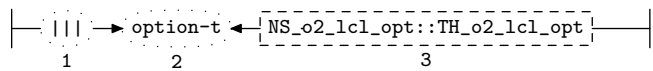


**27. Rspec\_parm rule.**

Rspec\_parm

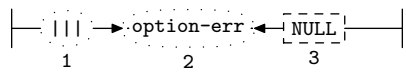


**28. Rspec\_parm's subrule 1.**



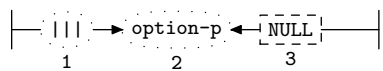
⟨Rspec\_parm subrule 1 op directive 28⟩ ≡  
 Co2\_lcl\_opts \* fsm = ( Co2\_lcl\_opts \* ) rule\_info...parser--fsm\_tbl...;  
 ++fsm\_parm\_cnt...;  
 fsm\_t\_sw\_ = 'y';  
 sf\_p2--set\_auto\_delete(true);

**29. Rspec\_parm's subrule 2.**



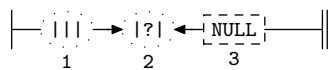
⟨Rspec\_parm subrule 2 op directive 29⟩ ≡  
 Co2\_lcl\_opts \* fsm = ( Co2\_lcl\_opts \* ) rule\_info...parser--fsm\_tbl...;  
 ++fsm\_parm\_cnt...;  
 fsm\_err\_sw\_ = 'y';  
 sf\_p2--set\_auto\_delete(true);

**30. Rspec\_parm's subrule 3.**



⟨Rspec\_parm subrule 3 op directive 30⟩ ≡  
 Co2\_lcl\_opts \* fsm = ( Co2\_lcl\_opts \* ) rule\_info...parser--fsm\_tbl...;  
 ++fsm\_parm\_cnt...;  
 fsm\_prt\_sw\_ = 'y';  
 sf\_p2--set\_auto\_delete(true);

**31. Rspec\_parm's subrule 4.**



A false option so report it.

⟨Rspec\_parm subrule 4 op directive 31⟩ ≡  
 rule\_info...parser--set\_use\_all\_shift\_off();  
 ADD\_TOKEN\_TO\_ERROR\_QUEUE(\*sf\_p2...);  
 rule\_info...parser--set\_stop\_parse(true);

**32. First Set Language for  $O_2^{linker}$ .**

```

/*
  File: o2_lcl_opts.fsc
  Date and Time: Fri Jan  2 15:33:45 2015
*/
transitive      y
grammar-name    "o2_lcl_opts"
name-space     "NS_o2_lcl_opts"
thread-name    "Co2_lcl_opts"
monolithic     y
file-name      "o2_lcl_opts.fsc"
no-of-T        569
list-of-native-first-set-terminals 1
  LR1_questionable_shift_operator
end-list-of-native-first-set-terminals
list-of-transitive-threads 6
  NS_unq_str::TH_unq_str
  NS_o2_lcl_opt::TH_o2_lcl_opt
  NS_c_comments::TH_c_comments
  NS_ws::TH_ws
  NS_eol::TH_eol
  NS_xc_str::TH_xc_str
end-list-of-transitive-threads
list-of-used-threads 6
  NS_c_comments::TH_c_comments
  NS_eol::TH_eol
  NS_o2_lcl_opt::TH_o2_lcl_opt
  NS_unq_str::TH_unq_str
  NS_ws::TH_ws
  NS_xc_str::TH_xc_str
end-list-of-used-threads
fsm-comments
"\02's command line options dispatcher."

```



**33. Lr1 State Network.**

$\Rightarrow$					State: 1 state type: $s/r$				
$\leftarrow$	rule	$\rightarrow$	R#	sr#	Po	$\leftarrow$	subrule element	$\rightarrow$	Brn Gto Red LA
c	Rws.k		3	1	1	$\epsilon$			1 0 1 1
c	Rws		5	1	1	ws NS_ws::TH_ws			1 2 6
c	Rws		5	2	1	comment NS_c.comments::TH_c.comments			1 2 5
c	Rws		5	4	1	?  NULL			1 2 3
c	Rws		5	3	1	eol NS_eol::TH_eol			1 2 4
c	Ryacco2_options		1	1	1	Rws.k <u>Rparms_epi</u> $\epsilon$ <u>Rws.k</u> $\epsilon$ ...			1 7 14
c	Rws.k_s		4	2	1	Rws.k_s <u>Rws</u>			1 15 16
c	Rws.k		3	2	1	Rws.k_s			1 15 15
c	Rws.k_s		4	1	1	Rws			1 17 17
$\Rightarrow$	arbitration-code: $\epsilon$						State: 2 state type: $s$		
$\leftarrow$	rule	$\rightarrow$	R#	sr#	Po	$\leftarrow$	subrule element	$\rightarrow$	Brn Gto Red LA
t	Rws		5	4	2	?			1 3 3
t	Rws		5	3	2	eol			1 4 4
t	Rws		5	2	2	comment			1 5 5
t	Rws		5	1	2	ws			1 6 6
$\Rightarrow$	?						State: 3 state type: $r$		
$\leftarrow$	rule	$\rightarrow$	R#	sr#	Po	$\leftarrow$	subrule element	$\rightarrow$	Brn Gto Red LA
t	Rws		5	4	3				1 0 3 1
$\Rightarrow$	eol						State: 4 state type: $r$		
$\leftarrow$	rule	$\rightarrow$	R#	sr#	Po	$\leftarrow$	subrule element	$\rightarrow$	Brn Gto Red LA
t	Rws		5	3	3				1 0 4 1
$\Rightarrow$	comment						State: 5 state type: $r$		
$\leftarrow$	rule	$\rightarrow$	R#	sr#	Po	$\leftarrow$	subrule element	$\rightarrow$	Brn Gto Red LA
t	Rws		5	2	3				1 0 5 1
$\Rightarrow$	ws						State: 6 state type: $r$		
$\leftarrow$	rule	$\rightarrow$	R#	sr#	Po	$\leftarrow$	subrule element	$\rightarrow$	Brn Gto Red LA
t	Rws		5	1	3				1 0 6 1
$\Rightarrow$	Rws.k						State: 7 state type: $s/r$		
$\leftarrow$	rule	$\rightarrow$	R#	sr#	Po	$\leftarrow$	subrule element	$\rightarrow$	Brn Gto Red LA
c	Rparms_epi		7	1	1	$\epsilon$			7 0 7 2
c	Rspec_parm		9	1	1	option-t NS_o2.lcl.opt::TH_o2.lcl.opt			7 18 20
c	Rspec_parm		9	2	1	option-err NULL			7 18 22
c	Rspec_parm		9	3	1	option-p NULL			7 18 21
c	Rspec_parm		9	4	1	?  NULL			7 18 19
t	Ryacco2_options		1	1	2	Rparms_epi <u>Rws.k</u> $\epsilon$ <u>Rfile</u>			1 8 14
c	Rparms		8	2	1	Rparms <u>Rspec_parm</u>			7 23 25
c	Rparms_epi		7	2	1	Rparms			7 23 23
c	Rparms		8	1	1	Rspec_parm <u>Rws.k</u> $\epsilon$			7 26 27
$\Rightarrow$	Rparms_epi						State: 8 state type: $s/r$		
$\leftarrow$	rule	$\rightarrow$	R#	sr#	Po	$\leftarrow$	subrule element	$\rightarrow$	Brn Gto Red LA
c	Rws.k		3	1	1	$\epsilon$			8 0 8 2

c	Rws	5	1	1		ws NS_ws::TH_ws	8	2	6
c	Rws	5	2	1		comment NS_c.comments::TH_c.comments	8	2	5
c	Rws	5	4	1		?  NULL	8	2	3
c	Rws	5	3	1		eol NS_eol::TH_eol	8	2	4
t	Ryacco2_options	1	1	3	Rws_k	<u>Rfile</u>	1	9	14
c	Rws_k_s	4	2	1	Rws_k_s	<u>Rws</u>	8	15	16
c	Rws_k	3	2	1	Rws_k_s		8	15	15
c	Rws_k_s	4	1	1	Rws		8	17	17
$\Rightarrow$ <i>Rws_k</i>									
State: 9 state type: <i>s</i>									
←	rule	→	R#	sr#	Po	←	subrule element	→	Brn Gto Red LA
c	Rfile		6	3	1	?			9 28 28
c	Rfile		6	1	1		unquoted-string NS_unq_str::TH_unq_str		9 29 32
c	Rfile		6	2	1		?  NULL		9 29 30
c	Rfile		6	4	1		xc-str NS_xc_str::TH_xc_str		9 29 31
t	Ryacco2_options		1	1	4	Rfile	<u>Rws_k<sup>ε</sup> Reog</u>		1 10 14
$\Rightarrow$ <i>Rfile</i>									
State: 10 state type: <i>s/r</i>									
←	rule	→	R#	sr#	Po	←	subrule element	→	Brn Gto Red LA
c	Rws_k		3	1	1	ε			10 0 10 3
c	Rws		5	1	1		ws NS_ws::TH_ws		10 2 6
c	Rws		5	2	1		comment NS_c.comments::TH_c.comments		10 2 5
c	Rws		5	4	1		?  NULL		10 2 3
c	Rws		5	3	1		eol NS_eol::TH_eol		10 2 4
t	Ryacco2_options		1	1	5	Rws_k	<u>Reog</u>		1 11 14
c	Rws_k_s		4	2	1	Rws_k_s	<u>Rws</u>		10 15 16
c	Rws_k		3	2	1	Rws_k_s			10 15 15
c	Rws_k_s		4	1	1	Rws			10 17 17
$\Rightarrow$ <i>Rws_k</i>									
State: 11 state type: <i>s</i>									
←	rule	→	R#	sr#	Po	←	subrule element	→	Brn Gto Red LA
c	Reog		2	2	1	?			11 12 12
c	Reog		2	1	1	eog			11 13 13
t	Ryacco2_options		1	1	6	Reog			1 14 14
$\Rightarrow$ <i> ? </i>									
State: 12 state type: <i>r</i>									
←	rule	→	R#	sr#	Po	←	subrule element	→	Brn Gto Red LA
t	Reog		2	2	2				11 0 12 4
$\Rightarrow$ <i>eog</i>									
State: 13 state type: <i>r</i>									
←	rule	→	R#	sr#	Po	←	subrule element	→	Brn Gto Red LA
t	Reog		2	1	2				11 0 13 4
$\Rightarrow$ <i>Reog</i>									
State: 14 state type: <i>r</i>									
←	rule	→	R#	sr#	Po	←	subrule element	→	Brn Gto Red LA
t	Ryacco2_options		1	1	7				1 0 14 4
$\Rightarrow$ <i>Rws_k_s</i>									
State: 15 state type: <i>s/r</i>									
←	rule	→	R#	sr#	Po	←	subrule element	→	Brn Gto Red LA
t	Rws_k		3	2	2				1 0 15 1
c	Rws		5	1	1		ws NS_ws::TH_ws		15 2 6
c	Rws		5	2	1		comment NS_c.comments::TH_c.comments		15 2 5

c Rws		5	4	1	?  NULL		15	2	3
c Rws		5	3	1	eol NS_eol::TH_eol		15	2	4
t Rws_k_s		4	2	2	Rws		1	16	16
$\Rightarrow$ <i>Rws</i>									
← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red	LA
t Rws_k_s		4	2	3			1	0	16 1
$\Rightarrow$ <i>Rws</i>									
← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red	LA
t Rws_k_s		4	1	2			1	0	17 1
$\Rightarrow$     <i>arbitration-code: ε</i>									
← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red	LA
t Rspec_parm		9	4	2	?		7	19	19
t Rspec_parm		9	1	2	option-t		7	20	20
t Rspec_parm		9	3	2	option-p		7	21	21
t Rspec_parm		9	2	2	option-err		7	22	22
$\Rightarrow$  ?									
← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red	LA
t Rspec_parm		9	4	3			7	0	19 2
$\Rightarrow$ <i>option-t</i>									
← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red	LA
t Rspec_parm		9	1	3			7	0	20 2
$\Rightarrow$ <i>option-p</i>									
← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red	LA
t Rspec_parm		9	3	3			7	0	21 2
$\Rightarrow$ <i>option-err</i>									
← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red	LA
t Rspec_parm		9	2	3			7	0	22 2
$\Rightarrow$ <i>Rparms</i>									
← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red	LA
t Rparms_epi		7	2	2			7	0	23 2
c Rspec_parm		9	1	1	option-t NS_o2.lcl.opt::TH_o2.lcl.opt		23	18	20
c Rspec_parm		9	2	1	option-err NULL		23	18	22
c Rspec_parm		9	3	1	option-p NULL		23	18	21
c Rspec_parm		9	4	1	?  NULL		23	18	19
t Rparms		8	2	2	Rspec_parm <u>Rws_k<sup>ε</sup></u>		7	24	25
$\Rightarrow$ <i>Rspec_parm</i>									
← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red	LA
c Rws_k		3	1	1	ε		24	0	24 2
c Rws		5	1	1	ws NS_ws::TH_ws		24	2	6
c Rws		5	2	1	comment NS_c.comments::TH_c.comments		24	2	5
c Rws		5	4	1	?  NULL		24	2	3
c Rws		5	3	1	eol NS_eol::TH_eol		24	2	4
t Rparms		8	2	3	Rws_k		7	25	25

c	Rws_k_s	4	2	1	Rws_k_s	<u>Rws</u>	24	15	16
c	Rws_k	3	2	1	Rws_k_s		24	15	15
c	Rws_k_s	4	1	1	Rws		24	17	17
$\Rightarrow$ <i>Rws_k</i>									
	← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red LA
t	Rparms	8	2	4			7	0	25 2
$\Rightarrow$ <i>Rspec_parm</i>									
	← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red LA
c	Rws_k	3	1	1	ε		26	0	26 2
c	Rws	5	1	1	ws NS_ws::TH_ws		26	2	6
c	Rws	5	2	1	comment NS_c.comments::TH_c.comments		26	2	5
c	Rws	5	4	1	?  NULL		26	2	3
c	Rws	5	3	1	eol NS_eol::TH_eol		26	2	4
t	Rparms	8	1	2	Rws_k		7	27	27
c	Rws_k_s	4	2	1	Rws_k_s	<u>Rws</u>	26	15	16
c	Rws_k	3	2	1	Rws_k_s		26	15	15
c	Rws_k_s	4	1	1	Rws		26	17	17
$\Rightarrow$ <i>Rws_k</i>									
	← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red LA
t	Rparms	8	1	3			7	0	27 2
$\Rightarrow$ <i> ? </i>									
	← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red LA
t	Rfile	6	3	2			9	0	28 1
$\Rightarrow$ <i>    arbitration-code: ε</i>									
	← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red LA
t	Rfile	6	2	2	?		9	30	30
t	Rfile	6	4	2	xc-str		9	31	31
t	Rfile	6	1	2	unquoted-string		9	32	32
$\Rightarrow$ <i> ? </i>									
	← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red LA
t	Rfile	6	2	3			9	0	30 1
$\Rightarrow$ <i>xc-str</i>									
	← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red LA
t	Rfile	6	4	3			9	0	31 1
$\Rightarrow$ <i>unquoted-string</i>									
	← rule	→ R#	sr#	Po	←	subrule element	→ Brn	Gto	Red LA
t	Rfile	6	1	3			9	0	32 1

**34. Index.**

€ : 12, 25.  
 ||| : 14, 18, 27.  
 |?| : 10, 14, 18, 27.  
 \_\_FILE\_\_ : 11, 20, 23.  
 \_\_LINE\_\_ : 11, 20, 23.  
 add\_token\_to\_error\_queue : 20.  
 ADD\_TOKEN\_TO\_ERROR\_QUEUE : 11, 17, 22, 23, 31.  
 c\_str : 20, 21, 24.  
 c\_string : 24.  
 CAbs\_lr1\_sym : 11, 19, 20, 23.  
 CHAR : 6.  
 close : 20.  
 comment : 14.  
 Co2\_lcl\_opts : 20, 21, 24, 28, 29, 30.  
 current\_token : 23.  
 edit\_file : 19, 20, 21, 24.  
 empty : 9.  
 eog : 10.  
 eol : 14.  
 Err\_bad\_cmd\_line\_opt : 11.  
 Err\_bad\_filename : 20.  
 Err\_no\_filename : 23.  
 err\_queue : 9.  
 err\_sw\_ : 4, 6, 29.  
 error\_queue : 9.  
 file\_to\_compile\_ : 6, 20, 21, 24.  
 fsm : 20, 21, 24, 28, 29, 30.  
 fsm\_tbl\_ : 20, 21, 24, 28, 29, 30.  
 good : 20.  
 ifile : 20.  
 ifstream : 20.  
 NS\_c\_comments::TH\_c\_comments : 14.  
 NS\_eol::TH\_eol : 14.  
 NS\_o2\_lcl\_opt::TH\_o2\_lcl\_opt : 27.  
 NS\_unq\_str::TH\_unq\_str : 18.  
 NS\_ws::TH\_ws : 14.  
 NS\_xc\_str::TH\_xc\_str : 18.  
 NS\_yacco2\_err\_symbols : 20.  
 NS\_yacco2\_k\_symbols : 20.  
 NULL : 14, 18, 27.  
 open : 20.  
 option-err : 27.  
 option-p : 27.  
 option-t : 27.  
 parm\_cnt\_ : 4, 6, 21, 24, 28, 29, 30.  
 parser\_ : 5, 9, 11, 17, 20, 21, 22, 23, 24, 28, 29, 30, 31.  
 prt\_sw\_ : 4, 6, 30.  
 p1\_ : 11.  
 p2\_ : 15, 16, 17, 21, 22, 24, 28, 29, 30, 31.  
 Reog : 8.  
 Reog : 10, 11.  
 Rfile : 18, 20, 21, 22, 23, 24.  
 Rfile : 8.  
 Rparms : 25, 26.  
 Rparms : 26.  
 Rparms\_epi : 8.  
 Rparms\_epi : 25.  
 Rspec\_parm : 26.  
 Rspec\_parm : 27, 28, 29, 30, 31.  
 rule\_info\_ : 9, 11, 17, 20, 21, 22, 23, 24, 28, 29, 30, 31.  
 Rws : 14, 15, 16, 17.  
 Rws : 13.  
 Rws\_k : 8, 26.  
 Rws\_k\_s : 12, 13.  
 Rws.k : 12.  
 Rws.k\_s : 13.  
 Ryacco2\_options : 8.  
 set\_auto\_delete : 15, 16, 21, 28, 29, 30.  
 set\_rc : 11, 20, 23.  
 set\_stop\_parse : 11, 17, 20, 22, 23, 31.  
 set\_use\_all\_shift\_off : 11, 17, 22, 23, 31.  
 set\_use\_all\_shift\_on : 5.  
 sf : 11, 15, 16, 17, 21, 22, 24, 28, 29, 30, 31.  
 std : 6, 20.  
 string : 6.  
 Sym : 19, 20.  
 sym : 11, 20, 23.  
 t\_sw\_ : 4, 6, 28.  
 T\_unquoted\_string : 21.  
 T\_xc\_str : 24.  
 TOKEN\_GAGGLE : 9.  
 true : 11, 15, 16, 17, 20, 21, 22, 23, 28, 29, 30, 31.  
 UINT : 6.  
 unquoted-string : 18.  
 unquoted\_string : 21.  
 uqstr : 21.  
 ws : 14.  
 xc-str : 18.  
 xcstr : 24.  
 yacco2 : 6.

[〈 Co2\\_lcl\\_opts constructor directive 4 〉](#)  
[〈 Co2\\_lcl\\_opts op directive 5 〉](#)  
[〈 Co2\\_lcl\\_opts user-declaration directive 6 〉](#)  
[〈 Co2\\_lcl\\_opts user-prefix-declaration directive 7 〉](#)  
[〈 Reog subrule 2 op directive 11 〉](#)  
[〈 Rfile subrule 1 op directive 21 〉](#)  
[〈 Rfile subrule 2 op directive 22 〉](#)  
[〈 Rfile subrule 3 op directive 23 〉](#)  
[〈 Rfile subrule 4 op directive 24 〉](#)  
[〈 Rfile user-declaration directive 19 〉](#)  
[〈 Rfile user-implementation directive 20 〉](#)  
[〈 Rspec\\_parm subrule 1 op directive 28 〉](#)  
[〈 Rspec\\_parm subrule 2 op directive 29 〉](#)  
[〈 Rspec\\_parm subrule 3 op directive 30 〉](#)  
[〈 Rspec\\_parm subrule 4 op directive 31 〉](#)  
[〈 Rws subrule 2 op directive 15 〉](#)  
[〈 Rws subrule 3 op directive 16 〉](#)  
[〈 Rws subrule 4 op directive 17 〉](#)  
[〈 Ryacco2\\_options op directive 9 〉](#)

# o2\_lcl\_opts Grammar

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$O_2$ 's command line options dispatcher.

	Section	Page
<b>Copyright</b> .....	<a href="#">1</a>	1
<b><math>O_2</math>'s frontend command line parser</b> .....	<a href="#">2</a>	2
Fsm Co2_lcl_opts class .....	<a href="#">3</a>	2
Co2_lcl_opts constructor directive .....	<a href="#">4</a>	2
Co2_lcl_opts op directive .....	<a href="#">5</a>	2
Co2_lcl_opts user-declaration directive .....	<a href="#">6</a>	2
Co2_lcl_opts user-prefix-declaration directive .....	<a href="#">7</a>	3
Ryacco2_options rule .....	<a href="#">8</a>	3
Ryacco2_options op directive .....	<a href="#">9</a>	3
Reog rule .....	<a href="#">10</a>	3
Reog's subrule 2 .....	<a href="#">11</a>	3
Rws_k rule .....	<a href="#">12</a>	3
Rws_k_s rule .....	<a href="#">13</a>	4
Rws rule .....	<a href="#">14</a>	4
Rws's subrule 2 .....	<a href="#">15</a>	4
Rws's subrule 3 .....	<a href="#">16</a>	4
Rws's subrule 4 .....	<a href="#">17</a>	4
Rfile rule .....	<a href="#">18</a>	5
Rfile user-declaration directive .....	<a href="#">19</a>	5
Rfile user-implementation directive .....	<a href="#">20</a>	5
Rfile's subrule 1 .....	<a href="#">21</a>	5
Rfile's subrule 2 .....	<a href="#">22</a>	6
Rfile's subrule 3 .....	<a href="#">23</a>	6
Rfile's subrule 4 .....	<a href="#">24</a>	6
Rparams_epi rule .....	<a href="#">25</a>	6
Rparams rule .....	<a href="#">26</a>	6
Rspec_parm rule .....	<a href="#">27</a>	7
Rspec_parm's subrule 1 .....	<a href="#">28</a>	7
Rspec_parm's subrule 2 .....	<a href="#">29</a>	7
Rspec_parm's subrule 3 .....	<a href="#">30</a>	7
Rspec_parm's subrule 4 .....	<a href="#">31</a>	7
<b>First Set Language for <math>O_2^{linker}</math></b> .....	<a href="#">32</a>	8
<b>Lr1 State Network</b> .....	<a href="#">33</a>	9

o2\_lcl\_opts Grammar

TABLE OF CONTENTS 1

**Index** ..... 34 13