{ict\_advance, no input, no eof -- suspend&wait}

{} 0

0 1 {{0 0} x {}}

{}

{ict\_advance, no input, at eof -- fail}

{} 1

0 1 {{0 0} x {}}

{pc 2 at 0 er {0 x}}

{ict\_advance, has input, no eof -- consume}

{{NUM 1 0 0}} 1

0 1 {{0 0} x {}}

{pc 2 at 0 cc NUM ok 1}

{ict\_advance, has input, at eof -- consume}

{{NUM 1 0 0}} 1

0 1 {{0 0} x {}}

{pc 2 at 0 cc NUM ok 1}

{icf\_halt -- stop engine}

{} 0

0 2 {{14 14 14} {} {}}

{pc 1 ht 1}

{icf\_halt -- stopped engine, no instruction advance}

{} 0

1 2 {{14 14 14} {} {}}

{}

{iok\_ok -- always match}

{} 0

0 1 {8 {} {}}

{pc 1 ok 1}

{iok\_fail -- never match}

{} 0

1 1 {{8 9} {} {}}

{pc 2 ok 0}

{iok\_negate -- match negation}

{} 0

1 1 {{8 10} {} {}}

{pc 2 ok 0}

{iok\_negate -- match negation}

{} 0

1 1 {{9 10} {} {}}

{pc 2 ok 1}

{icf\_jalways -- jump always}

{} 0

0 1 {{11 5 8 8 8 8} {} {}}

{pc 5}

{icf\_jok -- jump on ok, !ok -- no jump}

{} 0

0 1 {{12 5 8 8 8 8} {} {}}

{pc 2}

{icf\_jok -- jump on ok, ok -- jump}

{} 0

1 1 {{8 12 5 8 8 8 8} {} {}}

{pc 5}

{icf\_jfail -- jump on !ok, !ok -- jump}

{} 0

0 1 {{13 5 8 8 8 8} {} {}}

{pc 5}

{icf\_jfail -- jump on !ok, ok -- no jump}

{} 0

1 1 {{8 13 5 8 8 8 8} {} {}}

{pc 3}

{icl\_push, save current location}

{{ID lalal 0 0} {NUM 1 0 5}} 0

2 2 {{0 0 0 0 15 15} x {}}

{pc 6 ls {1 1}}

{icl\_rewind, reset to last saved location}

{{ID lalal 0 0} {NUM 1 0 5}} 0

3 1 {{0 0 15 0 0 16} x {}}

{pc 6 at 0 ls {}}

{icl\_pop, discard last saved location}

{{ID lalal 0 0} {NUM 1 0 5}} 0

4 1 {{0 0 15 0 0 15 17} x {}}

{pc 7 ls 0}

{isv\_terminal -- semantic value, set for terminal}

{{ID lalal 0 0} {NUM 1 0 5}} 0

2 1 {{0 0 0 0 23} x {}}

{pc 5 sv {{} 1 1} as {{{} 1 1}}}

{isv\_clear -- semantic value, clear}

{{ID lalal 0 0} {NUM 1 0 5}} 0

3 1 {{0 0 0 0 23 22} x {}}

{pc 6 sv {}}

{isv\_nonterminal\_leaf -- semantic value, set for leaf nonterminal}

{{ID lalal 0 0} {NUM 1 0 5} {NUM 1 0 5}} 0

4 1 {{0 0 0 0 15 0 0 24 0} x {}}

{pc 9 sv {0 1 2}}

{isv\_nonterminal\_range -- semantic value, set for range nonterminal}

{{ID lalal 0 0} {NUM 1 0 5} {NUM 1 0 5}} 0

4 1 {{0 0 0 0 15 0 0 25 0} x {}}

{pc 9 sv {0 1 2 {{} 1 2}}}

{ias\_push -- save semantic value on ast stack}

{{ID lalal 0 0} {NUM 1 0 5} {NUM 1 0 5}} 0

5 1 {{0 0 0 0 15 0 0 24 0 27} x {}}

{pc 10 as {{0 1 2}}}

{ias\_mark -- remember location on ast stack}

{{ID lalal 0 0} {NUM 1 0 5} {NUM 1 0 5}} 0

6 1 {{0 0 0 0 15 0 0 24 0 27 28} x {}}

{pc 11 ms 0}

{ias\_mark -- remember location on ast stack, empty ast stack}

{{ID lalal 0 0} {NUM 1 0 5} {NUM 1 0 5}} 0

0 1 {28 {} {}}

{pc 1 ms -1}

{ias\_mrewind -- discard ast stack to last saved location}

{{ID lalal 0 0} {NUM 1 0 5} {NUM 1 0 5}} 0

10 1 {{0 0 0 0 15 0 0 24 0 27 28 27 27 27 29} x {}}

{pc 15 as {{0 1 2}} ms {}}

{ias\_mpop -- discard last saved ast location}

{{ID lalal 0 0} {NUM 1 0 5} {NUM 1 0 5}} 0

10 1 {{0 0 0 0 15 0 0 24 0 27 28 27 27 27 30} x {}}

{pc 15 ms {}}

{ict\_match\_token, no match}

{{NUM 1 0 0}} 1

1 1 {{0 0 1 0 1} {x bad} {}}

{pc 5 ok 0 er {0 bad}}

{ict\_match\_token, match}

{{NUM 1 0 0}} 1

1 1 {{0 0 1 0 1} {NUM bad} {}}

{pc 5}

{ict\_match\_token, no match, token map}

{{NUM 1 0 0}} 1

1 1 {{0 0 1 5 1} {x bad} {x 5 NUM 7}}

{pc 5 ok 0 er {0 bad}}

{ict\_match\_token, match, token map}

{{NUM 1 0 0}} 1

1 1 {{0 0 1 7 1} {NUM bad} {NUM 7}}

{pc 5}

{ict\_match\_tokrange, no match}

{{NUM 1 0 0}} 1

1 1 {{0 0 2 0 1 2} {a z bad} {}}

{pc 6 ok 0 er {0 bad}}

{ict\_match\_tokrange, match}

{{f 1 0 0}} 1

1 1 {{0 0 2 0 1 2} {a z bad} {}}

{pc 6}

{ict\_match\_tokrange, no match, token map}

{{k 1 0 0}} 1

1 1 {{0 0 2 5 7 0} {bad} {a 5 x 6 z 7 k 0}}

{pc 6 ok 0 er {0 bad}}

{ict\_match\_tokrange, match, token map}

{{x 1 0 0}} 1

1 1 {{0 0 2 5 7 0} {bad} {a 5 x 6 z 7 k 0}}

{pc 6}

{ict\_match\_tokclass, no match}

{{NUM 1 0 0}} 1

1 1 {{0 0 3 2 0} bad {}}

{pc 5 ok 0 er {0 bad}}

{ict\_match\_tokclass, match}

{{8 1 0 0}} 1

1 1 {{0 0 3 2 0} bad {}}

{pc 5}

{icf\_ntcall -- subroutine invokation}

{} 0

0 1 {{6 5 8 8 8 8} {} {}}

{pc 5 rs 2}

{icf\_ntcall -- nested subroutine invokation}

{} 0

0 2 {{6 3 8 6 8 8 8 8 8} {} {}}

{pc 8 rs {2 5}}

{icf\_ntreturn -- subroutine return}

{} 0

1 1 {{6 5 8 8 8 7} {} {}}

{pc 2 rs {}}

{icf\_ntreturn -- nested subroutine return}

{} 0

2 2 {{6 3 7 6 6 7 7} {} {}}

{pc 2 rs {}}

{inc\_save - save match status for nonterminal}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 0

6 1 {{0 0 0 0 15 15 0 0 23 5 0} {NT} {}}

{pc 11 ls 1 nc {1,NT {2 1 {} {{} 2 2}}}}

{inc\_restore - restore match status for nonterminal - wrong location for restore}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 1

10 1 {{0 0 0 0 15 15 0 0 23 5 0 0 0 9 22 4 0 0} {NT} {}}

{pc 18}

{inc\_restore - restore match status for nonterminal}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 1

10 2 {{0 0 0 0 15 15 0 0 23 5 0 0 0 9 22 16 4 0 0} {NT} {}}

{pc 0 at 2 ok 1 sv {{} 2 2} ls {}}

{ier\_push -- save error information}

{} 0

0 1 {18 {} {}}

{pc 1 es {{}}}

{ier\_clear -- clear error information, nothing to clear}

{} 0

0 1 {19 {} {}}

{pc 1}

{ier\_merge - merge current and pushed error - keep current, pushed is empty}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 0

3 1 {{18 0 0 1 0 0 21} {XX} {}}

{pc 7 es {}}

{ier\_merge - merge current and pushed error - current is empty, keep pushed}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 0

5 1 {{18 0 0 1 0 0 18 19 21} {XX} {}}

{pc 9 er {0 XX} es {{}}}

{ier\_merge - merge current and pushed error - old/new identical}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 0

4 1 {{18 0 0 1 0 0 18 21} {XX} {}}

{pc 8 es {{}}}

{ier\_merge - merge current and pushed error - old/new sam location, merge messages}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 0

5 1 {{18 0 0 1 0 0 18 1 0 1 21} {XX YY} {}}

{pc 11 er {0 {XX YY}} es {{}}}

{ier\_merge - merge current and pushed error - current further than pushed}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 0

5 1 {{0 0 1 0 0 18 0 0 1 0 0 21} {XX} {}}

{pc 12 es {}}

{ier\_merge - merge current and pushed error - pushed further than current}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 0

7 1 {{0 0 15 0 0 1 0 0 18 16 1 0 0 21} {XX} {}}

{pc 14 er {1 XX} es {}}

{ier\_nonterminal - replace token error against nt error}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 0

4 1 {{0 0 15 0 0 1 0 0 20 1} {X NT} {}}

{pc 10 er {1 NT}}

{isv\_nonterminal\_reduce - reduce to bottom}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 0

6 1 {{0 0 15 0 0 23 23 23 26 2} {NT XX YY} {}}

{pc 10 sv {2 0 1 {{} 1 1} {{} 1 1} {{} 1 1}}}

{isv\_nonterminal\_reduce - reduce to mark}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 0

7 1 {{0 0 15 0 0 23 28 23 23 26 2} {NT XX YY} {}}

{pc 11 sv {2 0 1 {{} 1 1} {{} 1 1}}}

{isv\_nonterminal\_reduce - reduce to mark and rewind}

{{NUM 1 0 0} {SPACE { } 0 1} {ID ident 0 2}} 0

7 2 {{0 0 15 0 0 23 28 23 23 26 2 29} {NT XX YY} {}}

{pc 12 sv {2 0 1 {{} 1 1} {{} 1 1}} as {{{} 1 1}} ms {}}