1. Global definitions and files.
Basic preamble include files used by all others.

```
⟨ globals.h 1 ⟩ ≡      /* file: globals.h */      /* prelude files using yacco2: for o2, o2linker utilities */
#ifndef globals_h__
#define globals_h__ 1
#include <stdarg.h>
#include <stdlib.h>
#include <string.h>
#include <limits.h>
#include "yacco2.h"
#include "yacco2_T_enumeration.h"
#include "yacco2_err_symbols.h"
#include "yacco2_characters.h"
#include "yacco2_k_symbols.h"
#include "yacco2_terminals.h"
  using namespace std;
  using namespace NS_yacco2_T_enum;
  using namespace NS_yacco2_k_symbols;
  using namespace NS_yacco2_terminals;
  using namespace yacco2;
#endif
```

2. "o2linker_types" header file of common set of definitions and structures.
"o2linker_types.h" file is a common set of definitions and structures used by "o2linker_externs.w" external routines. Contains definitions and type-defs.

```
⟨ o2linker_types.h 2 ⟩ ≡
#ifndef o2linker_types_
#define o2linker_types_ 1
  ⟨ defines 3 ⟩;
  ⟨ Type defs 4 ⟩;
  ⟨ Structure defs 26 ⟩;
#endif
```

3. Definitions for O2 and my external routines — "yacco2_extn.w".
As i'm writing directly out to a file, the use of the ctangle macro directive displays its displeasure so i'm using the direct c code route.

```
⟨ defines 3 ⟩ ≡
#define CWEAVE_TITLE_LIMIT 75
#define RESERVE_FIXED_NO_THREADS 1024
#define NO_BITS_PER_SET_PARTITION 8
#define ACCEPT_FILTER true
#define BYPASS_FILTER false
#define Success true
#define Failure false
#define Nested_file_cnt_limit 15
#define O2_library_file "yacco2.h"
#define Yacco2_holding_file "yacco2cmd.tmp"
#define Linker_holding_file "linkercmd.tmp"
#define Max_buf_size 2 * 1024
#define Max_cweb_item_size 10 * 1024
```

This code is used in section 2.

4. Typedef definitions.

⟨ Type defs 4 ⟩ ≡
```
typedef int Voc_ENO;
typedef int RULE_ENO;
```
See also sections 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, and 25.
This code is used in section 2.

5. ⟨ Type defs 4 ⟩ +≡
```
typedef std::set < int > INT_SET_type;
```

6. ⟨ Type defs 4 ⟩ +≡
```
typedef INT_SET_type ::iterator INT_SET_ITER_type;
```

7. ⟨ Type defs 4 ⟩ +≡
```
typedef std::vector < INT_SET_type > INT_SET_LIST_type;
```

8. ⟨ Type defs 4 ⟩ +≡
```
typedef INT_SET_LIST_type ::iterator INT_SET_LIST_ITER_type;
```

9. ⟨ Type defs 4 ⟩ +≡
```
typedef std::map < int , std::string > INT_STR_MAP_type;
```

10. ⟨ Type defs 4 ⟩ +≡
```
typedef INT_STR_MAP_type ::iterator INT_STR_MAP_ITER_type;
```

11. ⟨ Type defs 4 ⟩ +≡
```
typedef std::set < std::string *> STR_SET_type;
```

12. ⟨ Type defs 4 ⟩ +≡
```
typedef STR_SET_type ::iterator STR_SET_ITER_type;
```

13. ⟨ Type defs 4 ⟩ +≡
```
typedef std::map < NS_yacco2_terminals::T_in_stbl * , STR_SET_type >
    T_IN_STBL_SET_STR_MAP_type;
```

14. ⟨ Type defs 4 ⟩ +≡
```
typedef T_IN_STBL_SET_STR_MAP_type ::iterator
    T_IN_STBL_SET_STR_MAP_ITER_type;
```

15. ⟨ Type defs 4 ⟩ +≡
```
typedef int Voc_ENO;
```

16. ⟨ Type defs 4 ⟩ +≡
```
typedef int RULE_ENO;
```

17. ⟨ Type defs 4 ⟩ +≡
```
typedef int T_ENO;
```

18.

⟨ Type defs 4 ⟩ +≡
```
typedef std::set < T_in_stbl *> T_IN_STBL_SET_type;
```

19.

```
⟨ Type defs 4 ⟩ +≡
  typedef T_IN_STBL_SET_type ::iterator T_IN_STBL_SET_ITER_type;
```

20. ⟨ Type defs 4 ⟩ +≡

```
  typedef vector⟨T_ENO⟩ T_COUNT_type;
```

21. ⟨ Type defs 4 ⟩ +≡

```
  typedef T_COUNT_type::iterator T_COUNT_ITER_type;
```

22. ⟨ Type defs 4 ⟩ +≡

```
  typedef vector ⟨ T_in_stbl *> STBL_T_ITEMS_type;
```

23. ⟨ Type defs 4 ⟩ +≡

```
  typedef STBL_T_ITEMS_type ::iterator STBL_T_ITEMS_ITER_type;
```

24. ⟨ Type defs 4 ⟩ +≡

```
  typedef std::map⟨int,int⟩ BIT_MAP_type;
```

25. ⟨ Type defs 4 ⟩ +≡

```
  typedef BIT_MAP_type::iterator BIT_MAP_ITER_type;
```

26. *prt_called_thread_list_ast_functor*.

```
⟨ Structure defs 26 ⟩ ≡
  struct prt_called_thread_list_ast_functor : public Type_AST_functor{
          functor_result_type operator()(yacco2::ast_base_stack * Stk_env); typedef
          void(*PFF) ( AST * , std::ofstream * , int ) ;
      prt_called_thread_list_ast_functor(PFF Func);
      void o_file(std::ofstream * Ow_linker_file);
      void reset_cnt();
    private:
      yacco2::ast_base_stack * stk_env_;
      yacco2::INT idx_;
      yacco2::AST * cnode_;
      yacco2::ast_base_stack::s_rec * srec_;
      PFF prt_funct_;
      yacco2::INT cnt_;
      std::ofstream * ow_linker_file_; } ;
```

This code is used in section 2.

⟨ Structure defs 26 ⟩ Used in section 2.
⟨ Type defs 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25 ⟩ Used in section 2.
⟨ defines 3 ⟩ Used in section 2.
⟨ `globals.h` 1 ⟩
⟨ `o2linker_types.h` 2 ⟩

O2LINKER˙TYPES