# OptiList Format

H(X)=5   V(Y)=4  C=HV-1

| Word: | 1 | 2 | 3 | 4 | 5 | 5+1 | 5+2 | 5+3 | 5+4 |
|---|---|---|---|---|---|---|---|---|---|
| Index | ID | X | Y | Len | #IDs | ID1 | ID2 | ID3 | ID4 |
| 0 | B1 | x | y | len | 1 | R5 | | | |
| 1 | C1 | x | y | len | 3 | R1 | R2 | ~T | |
| 2 | Q1 | x | y | len | 4 | C5 | Q2 | R3 | R4 |
| … | | | | | | | | | |
| C-3 | R3 | x | y | len | 2 | Q3 | ~R | | |
| C-2 | ~ | x | y | 0 | 0 | - | - | - | - |
| C-1 | ~ | x | y | 0 | 0 | - | - | - | - |
| C | ~ | x | y | 0 | 0 | - | - | - | - |
| C+1 | ~B | -1 | V | len | 2 | C2 | C4 | | |
| C+2 | ~L | 0 | -1 | len | 1 | R3 | | | |
| C+3 | ~R | H | -1 | len | 2 | C1 | C3 | | |
| C+4 | ~T | -1 | 0 | | | | | | |

Notes:

- H and V are selected to be one larger than the minimum necessary to contain the grid schematic.
- The list needs one line for each xy position in the grid schematic plus up to 4 additional lines for the four edges.
- The list is created once and contains all information needed both to display the grid schematic and to optimize it.
- Perturbation is done by randomly selecting two lines from the list and swapping their xy coordinates (to the extent that they are swappable).
- If the list is sorted by ID and the connection end list is also sorted by ID, then the length calculation for each ID can be done in one pass through the list.
- If the trial length sum for both items is less than the existing length sum, then the xy positions are swapped and the lengths of the end list IDs are adjusted.

```
┌──────────────┐                                    ┌──────────┐        ┌──────────┐
│ Raw Netlist  │──────SplitNetList──────────────┐   │   Sym    │───────▶│  H & V   │
│  (NetMemo)   │──┐                              │   │  Count   │        └──────────┘
└──────────────┘  │    Leading spaces and        │   └──────────┘
                  │    empty lines trimmed        │
                  ▼                               ▼
         ┌──────────────┐              ┌──────────────┐
         │ Text Netlist │              │Symbol Netlist│
         │ (TxtNetList) │              │ (SymNetList) │
         └──────────────┘              └──────────────┘
                                              │
                                              ▼
                              ┌──────────────┐   ParseLinkedNets
         ConfigMemo ─────────▶│ Sym Link List│
                              │  (LinksList) │   ID  NumLinks  LinkedNets
                              └──────────────┘
                                      │
                                      ▼
                              ┌──────────────┐   BreakOutLinks (long list of pairs)
              Links           │  Stats List  │
                              │ (NetStatList)│   NetName ID  (sorted by NetName)
                              └──────────────┘
                                      │
                                      ▼
         ┌──────────┐         ┌──────────────┐   BuildNetStatsList
         │  Links   │◀────────│Net Stats List│
         └──────────┘         │   (SrtTSL)   │   ID  NumLinks  LinkedNets
                              └──────────────┘
```