

M E M O

To: CSL, SSL  
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Subject: BCPL .BR file format

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File: BRFORMAT  
Archive category: BCPL

word #	contents
0	version number (currently #1000)
1	length of file
2	0
3	word # of name table (= #17)
4	0
5	word # of label table
6	0
7	word # of code
10	0
11	word # of chain table
12	0
13	word # of zchain table
14	0
15	0
16	0

-----  
 (word 3 ->)  
 number of names  
 for [descriptor  
 each [initial value  
 name [name string  
 [...

-----  
 (word 5 ->)  
 number of labels  
 for [name number  
 each [PC  
 label

-----  
 (word 7 ->)  
 number of words of code  
 [code word 0  
 [code word 1  
 [...

-----  
 (word #11 ->)  
 number of names  
 for [PC of first link + #100000 if zchain  
 each  
 name

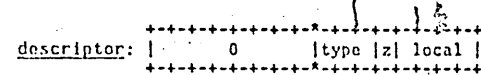
-----  
 (word #13 ->)  
 number of zchains  
 for [name number  
 each [PC of first zchain link  
 zchain

-----  
 (word 1 ->)

Word 0 is two bytes of version number, currently #1000 = 2.0. The first (left hand) byte of all .BR files loaded must agree with the version of BLDR.

Words 1 - #16 give the positions of the various tables in the file. Positions are word numbers, where the first word of the file is word 0. Currently these tables are sequential in the file, but the positions must still be given.

The name table must contain an entry for every static; that is, every name defined by 'static [name=value]', by 'let name(...) be', or by 'name:'. and every name which appears in an external declaration and is used somewhere in the code.



- local: 0 => name appears in an external declaration  
#0 => it does not
- z: 0 => name is a normal static  
1 => name is a page zero static
- type: 0 => undefined in this file (just external)  
1 => defined by 'static [name=value]'  
2 => defined by 'let name(...) be' (procedure)  
3 => defined by 'name:' (label)  
4-7 are unused

initial value: significant only for names of type 1; it contains the value assigned in 'static [name=value]'.

name string: the BCPL string for the name. First byte = number of characters; last byte is 0 only if the string has even length.

The order of appearance of names in the names table determines the 'number' of the name, used in the label table and the zchain table. The first name is number 1.

The label table contains a two-word entry for each static of type 2 or 3 (procedures and labels; these statics must be initialized to point at entry points in the loaded code). The first word of each entry is the name number, determined by the order of appearance of the names in the name table. The second word is the relative address (in the code) of the location to which the static cell must point (the first word of code is word 0).

The code is just that. It is loaded as-is, except that its chains and zchains are fixed up, as below.

The chain table contains a one-word entry for each static, ordered by name number. There are two flavors of entries in this table, distinguished by bit 0.

If bit 0 = 0, this is a normal chain. Bits 1-15 are the relative code address of the first link. Bits 1-15 of each line in the chain are set to the address at which the static is allocated; bit 0 of each link is left alone (for multiple indirection on the Nova). Bits 1-15 of each link give the relative code address of the next link; a 0 (or #100000) terminates the chain.

If bit 0 = 1, this is a zchain. The static must be a page zero static. Bits 1-15 of the entry are the relative code address of the first link of the chain. Bits 8-15 of each link are set to the address of the static; bits 0-7 are left alone. Bits 8-15 of each link are the backwards offset (1-377) of the next link relative to this one; that is, (addr of this link) - (addr of next link). An offset of 0 terminates the chain. If the distance between two references to a page zero static is greater than 377, an entry in the zchain table must be used.

A chain table entry of 0 is ignored.

The zchain table contains a two-word entry for each page zero static for which a simple chain is not sufficient, as above. The first word of each entry is the name number of the static. The second word is interpreted in the same way as a zchain entry in the chain table.