TO: MSPM Distribution
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The coding scheme for relocation information has been changed from a one bit - four bit code to a one bit five bit code to allow for more relocation types. This revision of $B D .2 .01$ reflects this change.

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## Identification

Binding Information and Format
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## Introduction

It is desirable, at times, to bind a number of separate segments into a single segment. In order to accomplish this, certain information such as address relocation information, is needed. this information for a segment <a> is located in its companion segment <a.symbol>. The following paragraphs describe this information and its format.

Location of Address Relocation Information
When segment <a> and segment <b> are bound together, <a> and <b> must be combined, <a.link> and <b.link> must be combined, and <a.symbol> and <b.symbol> must be combined. This address relocation information for 〈a>, 〈a.link>, and <a.symbol> is located in three areas in <a.symbol>. It may be referred to by class 2 symbols (See BD.7.01). The address relocation information for <a> begins at $\langle a\rangle \mid$ [rel_text], for <a.link> begins at <a>|[rel_link], and for <a.symbol> begins at <a>|[rel_symbol].

## Format of Address Relocation Information

A variable length prefix coding scheme is used for the relocation information. For each half word in the text, link, or symbol segment there is one relocation bit which, if the half word is not relocatable, is equal to zero. If the half word is relocatable there are five bits of relocation information, the first of which is equal to 1.

The relocation bits for <a> are packed together and begin at $\langle a\rangle \mid\left[r e l \_t e x t\right]+1$. The correspondence of the groups of bits which are the units of relocation information to half words in the text segment is sequential from left to right and from word to word by increasing value of the address. That is, the first unit of relocation information relates to the left half of the first word in the text segment, the second unit to the right half of the first word, the third unit to the left half of the second word, etc. Note that a unit of relocation information may be broken across a word boundary due to the variable length coding and the bit packing.

In the word preceding the relocation bits, that is, at location <a>|[rel_text], is a count of the total number of bits of relocation information for the text segment <a>.

The format of the relocation information for <a.link> and <a.symbol> is exactly the same as that for <a>. For <a.link> a count of the relocation bits is located at $\langle a\rangle \mid[r e 1$ link] and the actual information itself begins at $\langle a\rangle \mid[\overline{r e l}$ _link]+1. The count of the relocation bits for <a.symbōl> is located at <a.symbol>|[rel_symbol] and the relocation bits start at <a.symbol>|[rel_symbol]+1.

There is no relocation information for the relocation bits themselves. The relocation bits that begin at <a.symbol>|[rel_symbol]+1 are the binding information for <a.symbol> up to [rel_text]-1. Nothing ever appears in <a.symbol> following the relocation bits.

The following pictorial diagram may help to illustrate:


| Code | Relocation Type | Remarks |
| :---: | :---: | :---: |
| 0 | Absolute | Non-relocatable references. |
| 10000 | Text | Relative to beginning of text segment. |
| 10001 | Negative Text | A text reference preceded by a minus. |
| 10010 | Link Pointer 18 | Relative to beginning of link section. |
| 10011 | Negative Link Pointer 18 | Reference to linkage section preceded by minus. |
| 10100 | Link Pointer 15 | All ip references, (i.e. the same as link pointer 18 except that only the low order 15 bits are relocated.) |
| 10101 | Definition Pointer | Relative to def ptr for external symbol definitions. |
| 10110 | Symbol | Relative to beginning of symbol segment. |
| 10111 | Negative Symbol | Reference to symbol segment preceded by a minus. |
| 11000 | Link Block | Relative to beginning of linkage block. |
| 11001 | Negative Link Block | Reference to linkage block preceded by a minus. |
| 11010 | Self Relative | Self relative references. |
| 11011 | Unused. |  |
| 11100 | Unused. |  |
| 11101 | Unused. |  |
| 11110 | Unused. |  |
| 11111 | Escape | Reserved for future use as an escape. |

MULTICS SYSTEM-PROGRAMMERS ${ }^{\prime}$ MANUAL SECTION BD.2.01 PAGE 4
The following diagram illustrates the assignment of relocation codes for the linkage section. See BD.7.01 for a description of the linkage section.

Relocation type left half word


Relocation type right half word
Absolute
"
"
"
"
"
Link Block
Link Pointer 18

Absolute
"

## Absolute

"

11
"

