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Subject: New Version of MAD

Effective January 6, 1965, a new version of MAD will replace the current version. This new version will have the following added features:

1. A new statement
INSERT FILE ALPHA
will cause file ALPHA MAD to be inserted in the compilation after the INSERT FILE statement. Only one level of nesting depth of inserted files is allowed, although any number of INSERT statements may appear in the higher level program.
2. An addition has been made to the '...' block notation in MAD.
Formerly only the form
A...B or A... B
was allowed, where A and B are variables. Now the second expression may be a constant, e.g.,
A ... 7.
See MAD Manual, November, 1963, page 16.
3. A change has been made in MAD for defined operators. (See MAD Manual, November 1963, pages 100-112.) This was needed due to the added feature of saving and restoring index registers 1, 2 and 4 in functions. The change was made to the ...RTN... operator. This is now a unary operator, i.e. only a B operand. The function of the B operand remains the same, that is, the address of the value to be returned to the calling program. The A operand is internally set to the address of the index restoring code. This address is designated "FF". Note the example on pages 110-111 of the manual. This should be changed to the following:

...RTN... This symbol, which is obviously invalid in a statement, stands for the operation of placing the appropriate value(s) in the arithmetic

register(s) and then returning from a function to its calling program. It is analogous to the right hand side of a substitution statement (the b operand) and then a transfer to a given address (there is no designation for this address within the triple). As such, there is no result. As an example, if the result of a function were a double precision number, say mode 5, the following would be a reasonable definition.

```
MODE STRUCTURE 4, RTN.5
JMP **3, BT, **1
CLA B
LDQ B+1
TRA FF
OUT ACQ
END
```

The address FF is the address of the index restoring code.