

| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | |
|----|--------|----|------|----|-----------|----|--------|--------------|---------|---------|---------|-----|-------|--------------------|-----------------|------------|-------------------------|--|
| 1 | OP | | SIZE | | OPERAND | | | | | | OPERAND | | | | | | MOVE | |
| 2 | OPCODE | | | | REG | | MOD | | OPERAND | | | | | | | | ADD, AND, CHP, SUB | |
| 3 | OPCODE | | | | REG | | OP | | OPERAND | | | | | | | | CHK, DIVS, LEA, MULS | |
| 4 | OPCODE | | | | REG | | MOD | | OP | | REG | | MOVEP | | | | | |
| 5 | OPCODE | | | | REG | | OP | SIZE | | OP | | REG | | ASL, ASR, ROL, ROR | | | | |
| 6 | OPCODE | | | | REG | | OPCODE | | | | | | REG | | ABCD, EXG, SBCD | | | |
| 7 | OPCODE | | | | REG | | OP | DATA | | | | | | | | | MOVEQ | |
| 8 | OPCODE | | | | COUNT | | OP | SIZE | | OP | | REG | | ASL, ASR, ROL, ROR | | | | |
| 9 | OPCODE | | | | DATA | | OP | SIZE | | OPERAND | | | | | | ADDQ, SUBQ | | |
| 10 | OPCODE | | | | CONDITION | | | OP | OPERAND | | | | | | Scc | | | |
| 11 | OPCODE | | | | CONDITION | | | DISPLACEMENT | | | | | | | | | Bcc | |
| 12 | OPCODE | | | | CONDITION | | | OPCODE | | | | REG | | | | DBcc | | |
| 13 | OPCODE | | | | | | SIZE | | OPERAND | | | | | | | | ADDI, CHPI, NEG, TST | |
| 14 | OPCODE | | | | | | SIZE | OPERAND | | | | | | | | MOVEM | | |
| 15 | OPCODE | | | | | | | | OPERAND | | | | | | | | JMP, JSR, NBCD, PEA | |
| 16 | OPCODE | | | | | | | | | | VECTOR | | | | | | TRAP | |
| 17 | OPCODE | | | | | | | | | | REG | | | | | | EXT, LINK, SWAP, UNLINK | |
| 18 | OPCODE | | | | | | | | | | | | | | | | NOP, RESET, RTS, TRAPV | |

OPCODE, OP determine instruction
 OPERAND determines data operated on
 REG selects a register
 SIZE chooses byte, word, long
 MOD determines if operand is source or destination, and length
 COUNT, DATA are constants in the range 1-8
 CONDITION specifies one of 16 possible conditions to test
 DISPLACEMENT is signed offset for branches
 VECTOR specifies where to trap

Fig. 5-23. Instruction formats used on the 68000 (first word only).

| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
|------------------|----|----|----|----|-----------|----|---|---|------|------|------|---|-----|-----|---|---|--|
| ADDQ | 0 | 1 | 0 | 1 | Data | | | 0 | Size | | Mode | | | Reg | | | |
| SUBQ | 0 | 1 | 0 | 1 | Data | | | 1 | Size | | Mode | | | Reg | | | |
| S _{cc} | 0 | 1 | 0 | 1 | Condition | | | 1 | 1 | Mode | | | Reg | | | | |
| DB _{cc} | 0 | 1 | 0 | 1 | Condition | | | 1 | 1 | 0 | 0 | 1 | Reg | | | | |

Fig. 5-24. Four 68000 instructions.