Cooptair 8000

Operating Manual and Guide

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Overview

1. Specifications

The Cooptair 8000 utilizes up-to 256 16-bit commands, and can store, save, branch, utilize conditional branching, and do simple mathematics. It has a total of 16 registers, each storing 8 bits of data, and 256 memory addresses, also storing 8 bits of data each. It utilizes 8-bit complement numerical values, and thus can store integer values ranging from 128 to -127, inclusive.

2. How to Encode

To encode, you may enter the circuit entitled “CPU - CommandController”. In this file, you will find Pre-Programmable ROM, with 256 16 Bit Commands. The first command to run will be 00, and the last command will be FF. Every Command consists of 4 hexadecimal digits, or 16 bits of data. The list of commands, and their respective encoding, can be found later in this guide.

Command Prefixes List

Bits	**Command Use**
0000	Data->Register (MOV)
0001	Index->Register (STR)
0010	Register->Index (LDA)
0011	Register->Out (RET)
0100	Add (ADD)
0101	Subtract (SUB)
0110	Not Implemented
0111	Not Implemented
1000	Branch (B)
1001	Branch Positive (BPOS)

1010	Branch Zero (BZERO)
1011	Branch Negative (BNEG)
1100	Not Implemented
1101	Not Implemented
1110	Save Register to Output (SAV)
1111	Exit (EXIT)

Command Use and Formulation Guide

MNemonic	**Action**	**Guide**
MOV	Puts Static Input Value into Register R_1	0000 + R_1 Address (4 Bits) + Input (8 Bits)
STR	Stores Value of Register R_1 into Memory Address M_1	0001 + R_1 Address (4 Bits) + M_1 Address (8 Bits)
LDA	Loads Value of Memory M_1 into Register R_1	0010 + R_1 Address (4 Bits) + M_1 Address (8 Bits)
RET	Returns Value of Register R_1 into CPU Handling Unit	0011 + R_1 Address (4 Bits) + 1111 1111
ADD	Adds the Value of Registers R_1 and R_2, then returns the value into Register R_3	0100 + R_1 Address (4 Bits) + R_2 Address (4 Bits) + R_3 Address (4 Bits)
SUB	Subtracts the Value of Register R_2 from R_1, then returns the value into Register R_3	0101 + R_1 Address (4 Bits) + R_2 Address (4 Bits) + R_3 Address (4 Bits)
B	Branches to Inputted OpCode Address O_1 Unconditionally	1000 0000 + O_1 Address (8 Bits)
BPOS	Branches to Inputted OpCode Address O_1 if the Value of Register R_1 is Positive	1001 + R_1 Address (4 Bits) + O_1 Address (8 Bits)

BZER	Branches to Inputted OpCode Address O_1 if the Value of Register R_1 is Zero	1010 + R_1 Address (4 Bits) + O_1 Address (8 Bits)
BNEG	Branches to Inputted OpCode Address O_1 if the Value of Register R_1 is Negative	1011 + R_1 Address (4 Bits) + O_1 Address (8 Bits)
SAV	Returns Value of Register R_1 to the Main GUI	1101 + R_1 Address (4 Bits) + 0000 0000
EXIT	Quits the Program, and halts running. Will reset upon “Clearing”	1111 1111 1111 111