# ALU INPUT #2

These X, Y values only go to ADDER 2.

# ADDER 2

This adder is primarily used for advancing the PC but also helps out in some of the complex operations when it is used concurrently with ADDER 1.

Combine the result of the two 8 bit adders to give the 16 bit result.

# BIT TEST

This tests for a bit being set/cleared, used by the BCLR/BSET/BCHG/BTEST instructions.

We decode the selected bit. From this we also generate two masks, one with the bit set, and its inverse.

We need bit 14 to check for overflow during arithmetic shift left.

# SHIFTERS

We have both a left and a right shifter. Shift is by one place only. The input bit is calculated in the control module. As well as the shift we also extract the LS & MS bits and also determine if the input is zero.

# OUTPUT MUX

As well as the result of ADD2 the ALU outputs one result from either ADDER 1, or the logic unit, or one of the shifters.

# ALU INPUT #1

These X, Y values drive all the ALU components other than ADDER 2.

Split the X2 & Y2 inputs into MSB & LSB to drive the 8 bit adder units.

Split the X1 & Y1 inputs into MSB & LSB to drive the 8 bit adder and logic units.

Generate X

# LOGIC

This implements the logical (OR, XOR, AND, INV) and also helps in the BIT instructions.

Combine the 8 bit logic units to give the 16 bit result.

# FLAGS

Here we generate result status information (carry, overflow, zero, negative).

# ADDER 1

This is used in the arithmetical operations.

Combine the 8 bit adders to give the 16 bit result.