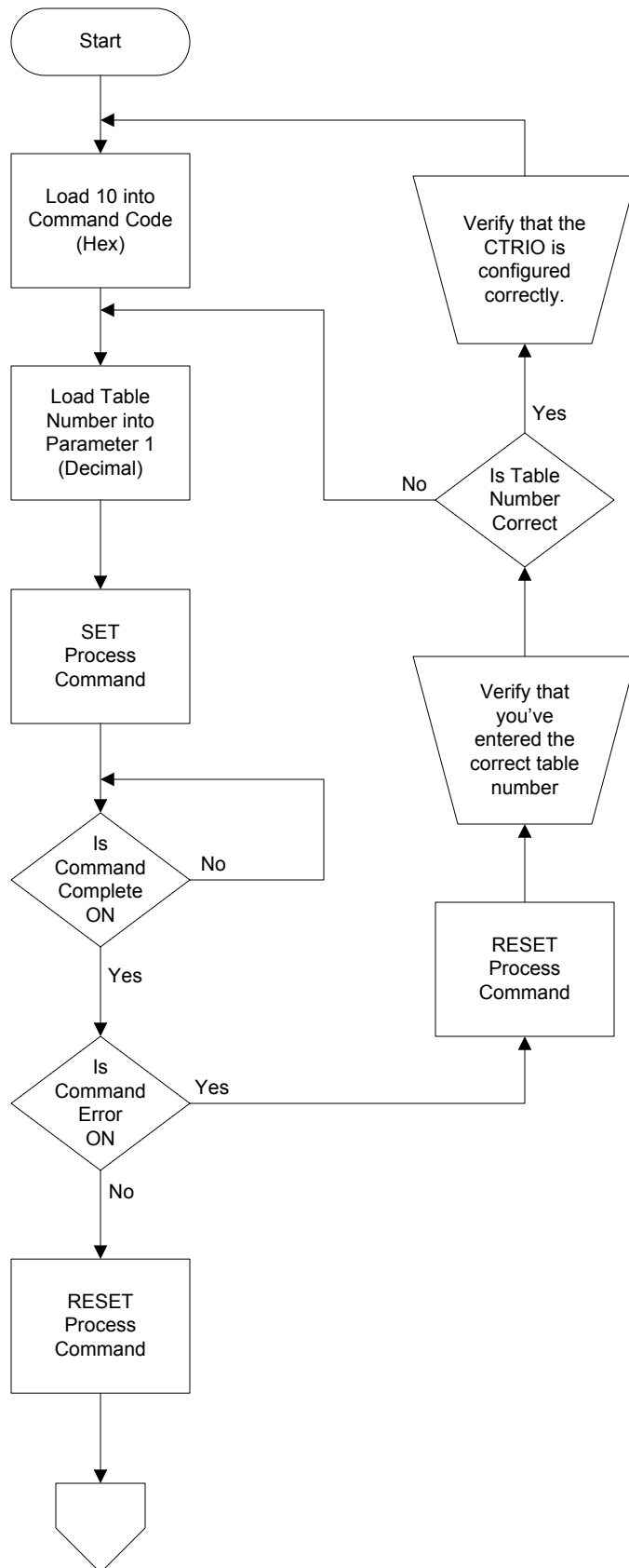


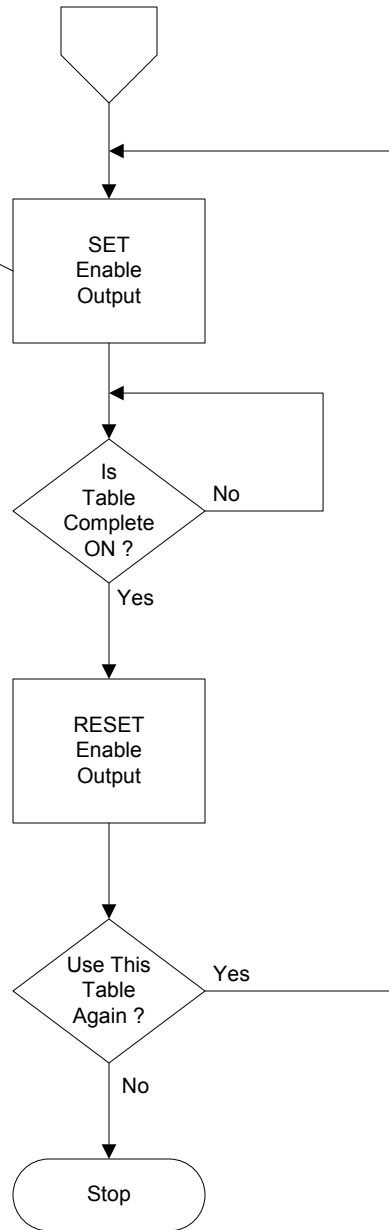


FLOW CHARTS

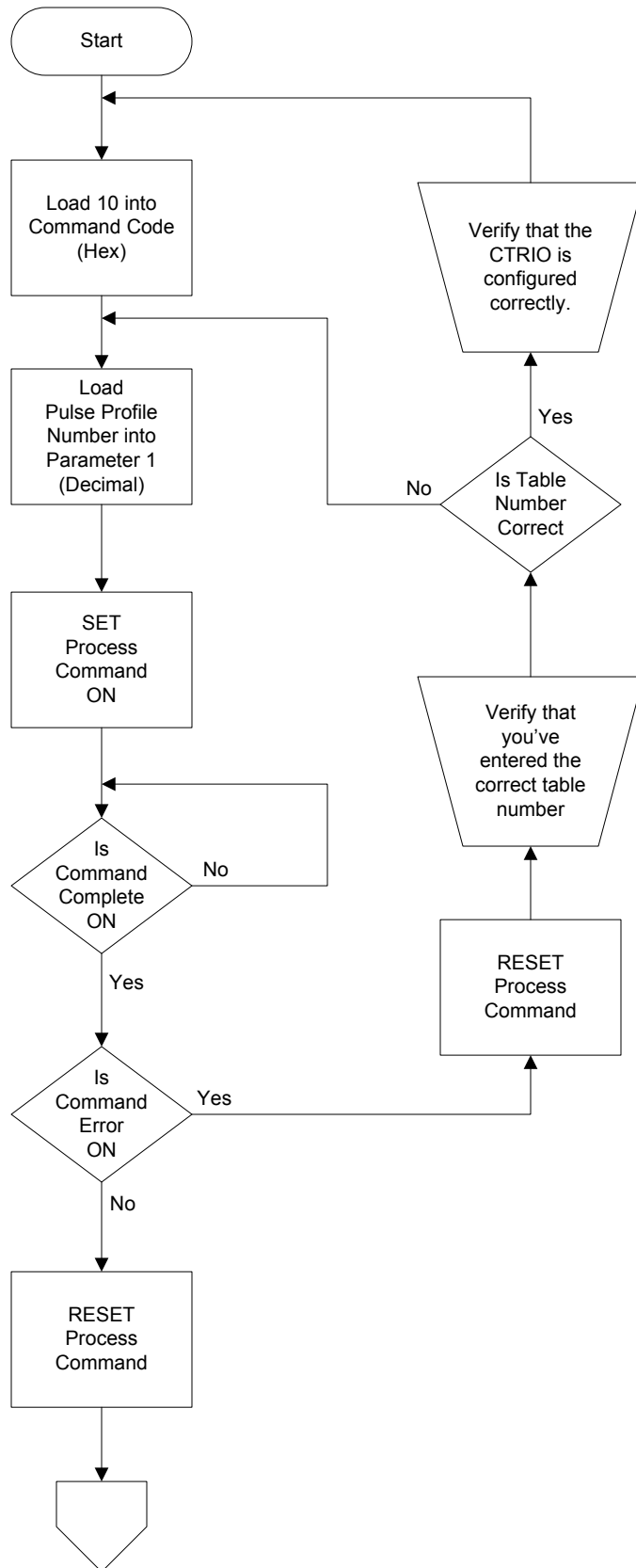
Load Preset Table



At this point, your table is active

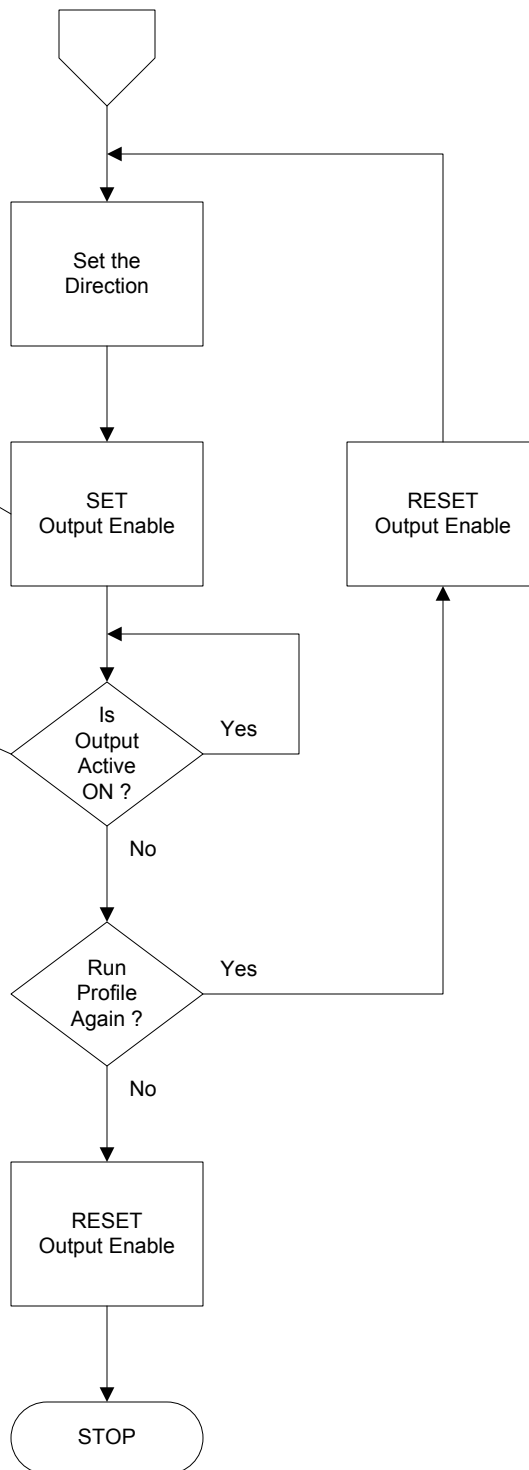


Run a Trapezoid, S-Curve, Symmetrical S-Curve, or Home Search Profile



At this point the profile will begin to run.

The Output Active bit will be ON while the profile is running.
Wait here until Output Active goes OFF, indicating the profile has completed.



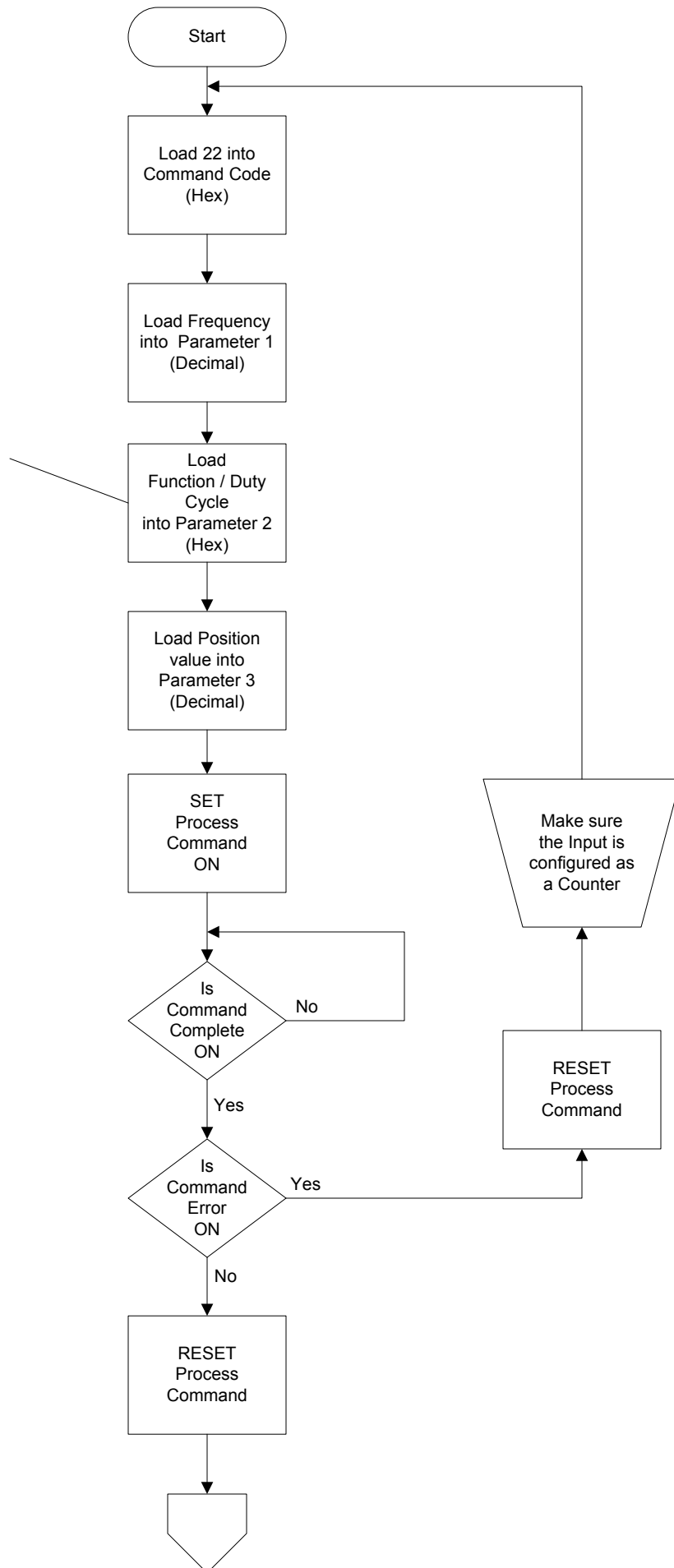
Run To Position

Upper Byte

00 - < Ch1/Fn1
10 - > Ch1/Fn1
01 - < Ch1/Fn2
11 - > Ch1/Fn2
02 - < Ch2/Fn1
12 - > Ch2/Fn1
03 - < Ch2/Fn2
13 - > Ch2/Fn2

Lower Byte

00 = 50% duty cycle
xx = xx% duty cycle

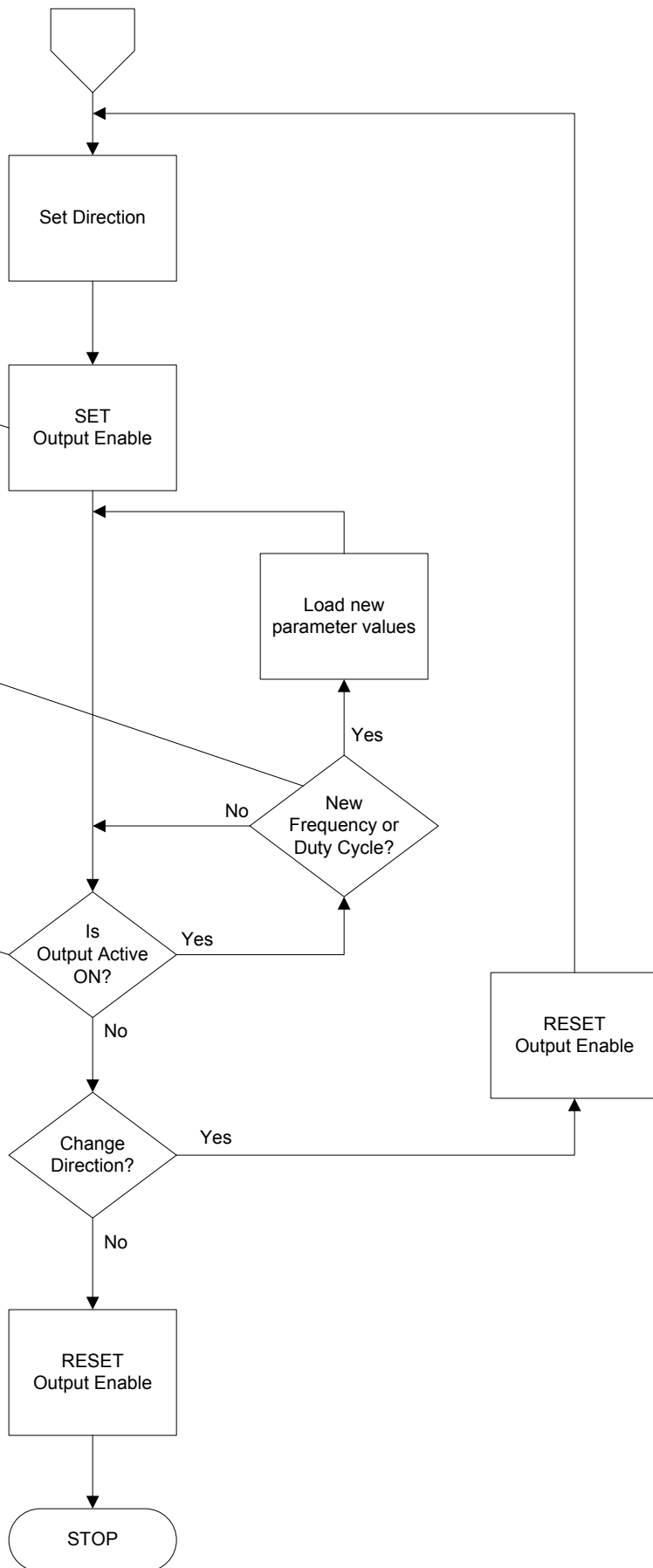


At this point the CTRIO will begin outputting pulses.

You can change the Frequency and/or the Duty Cycle as often as you need, you can even change them while the output is active..

The Output Active bit will be ON until the CTRIO sends out all of the pulses you configured.

You can also suspend the pulse output at any time with the Suspend Output bit.



Run To Limit

Upper Byte

00 – Ch1 Input C High
10 – Ch1 Input C Low

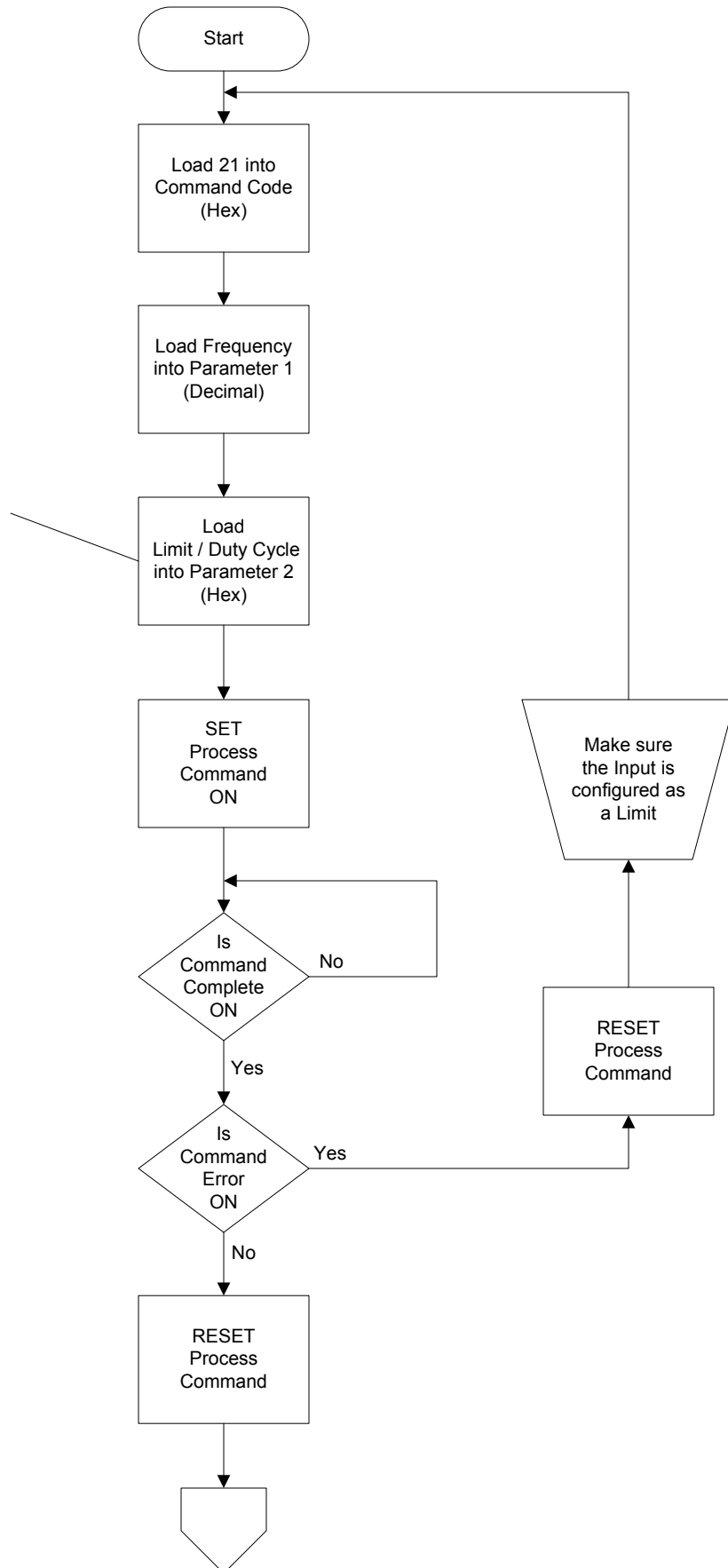
01 – Ch1 Input D High
11 – Ch1 Input D Low

02 – Ch2 Input C High
12 – Ch2 Input C Low

03 – Ch2 Input D High
13 – Ch2 Input D Low

Lower Byte

00 = 50% duty cycle
xx = xx% duty cycle

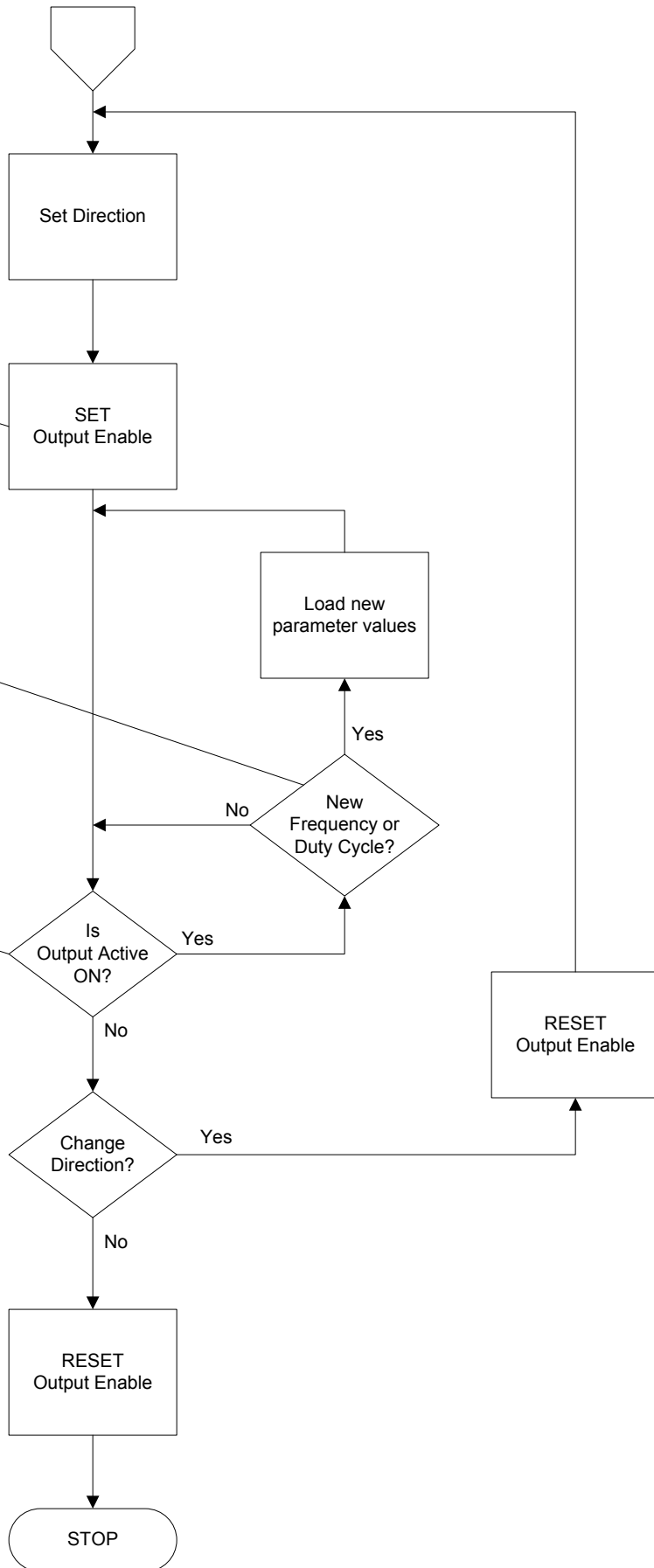


At this point the CTRIO will begin outputting pulses.

You can change the Frequency and/or the Duty Cycle as often as you need, you can even change them while the output is active..

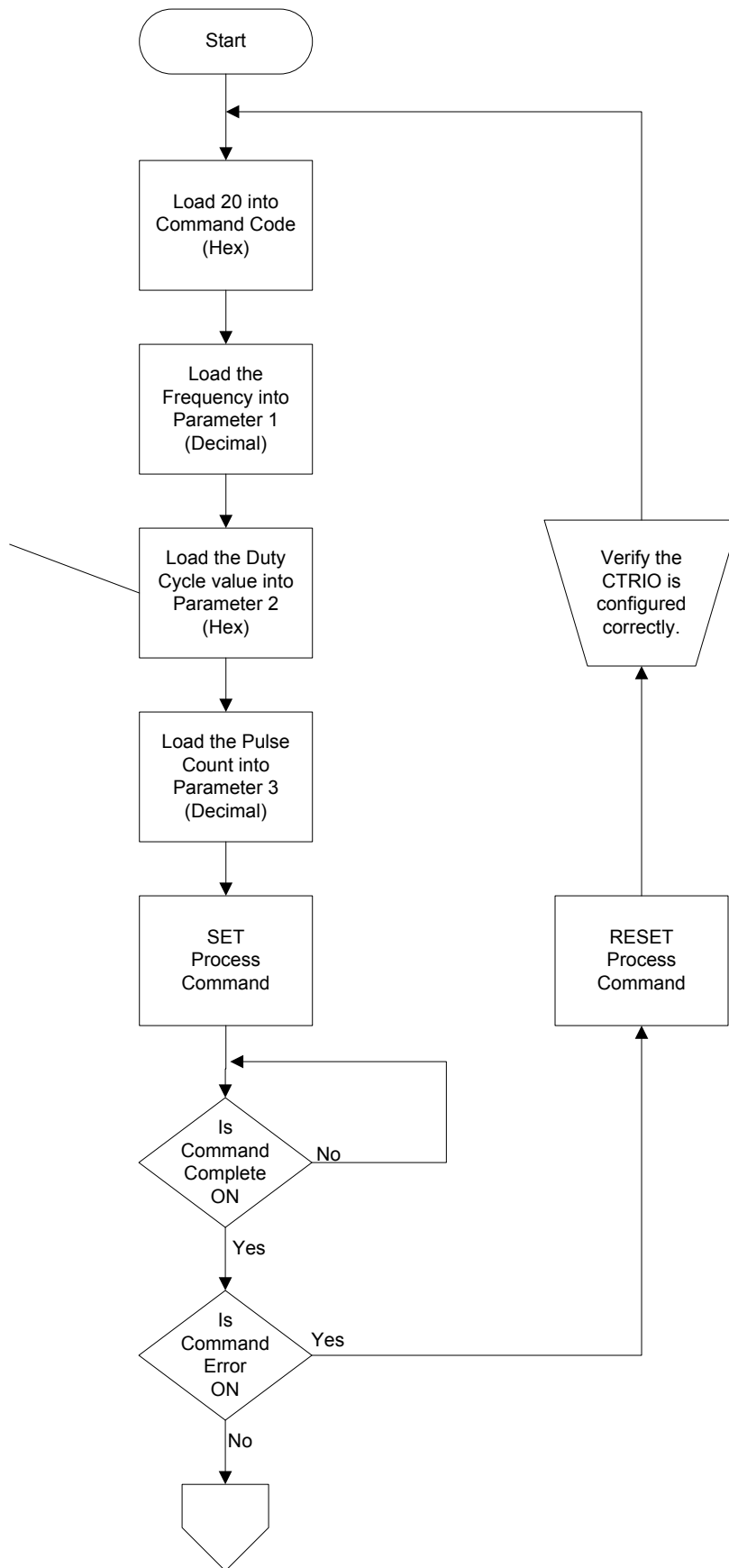
The Output Active bit will be ON until the CTRIO sends out all of the pulses you configured.

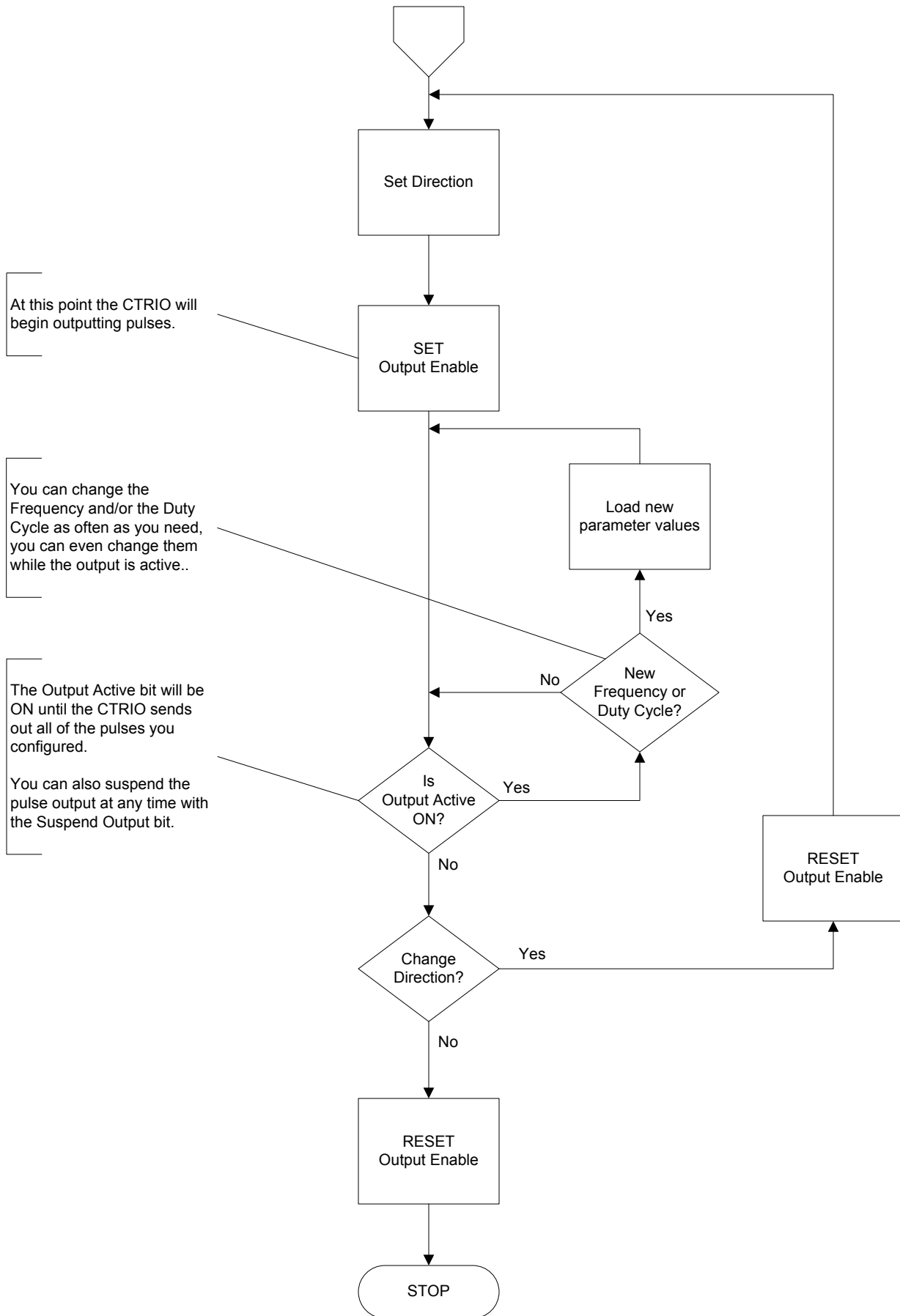
You can also suspend the pulse output at any time with the Suspend Output bit.



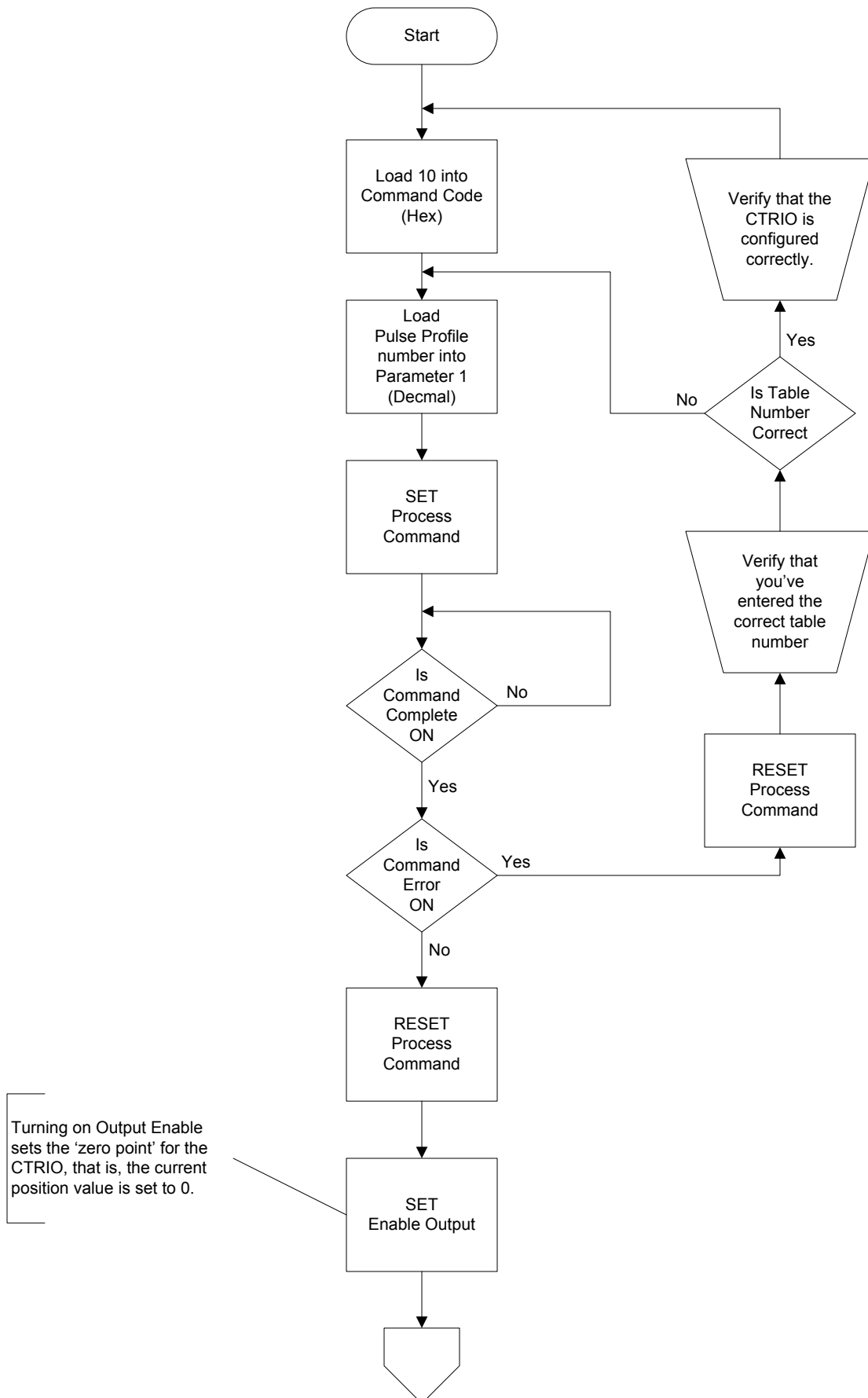
Velocity Mode

Lower Byte
00 = 50% duty cycle
xx = xx% duty cycle





Dynamic Positioning

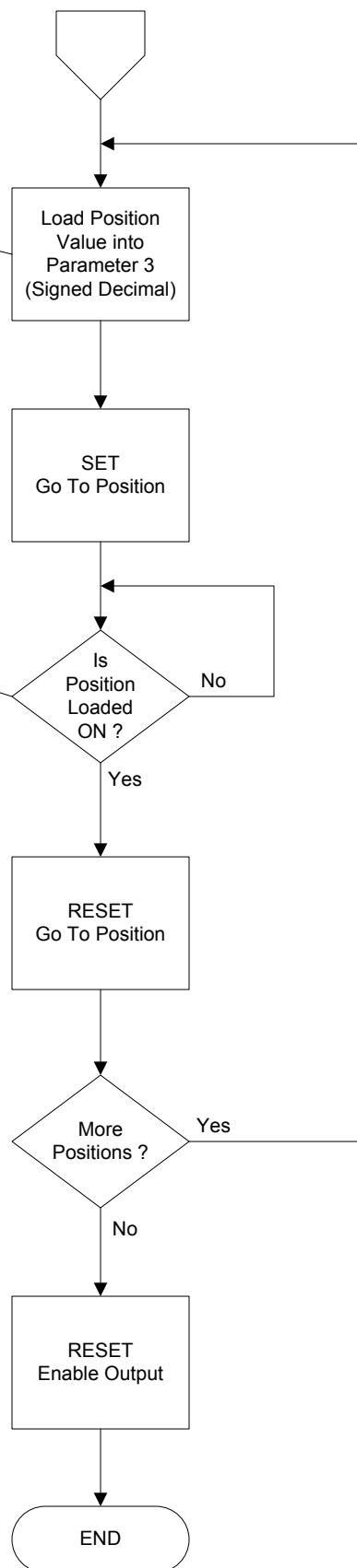


The direction will be determined automatically by the CTRIO.

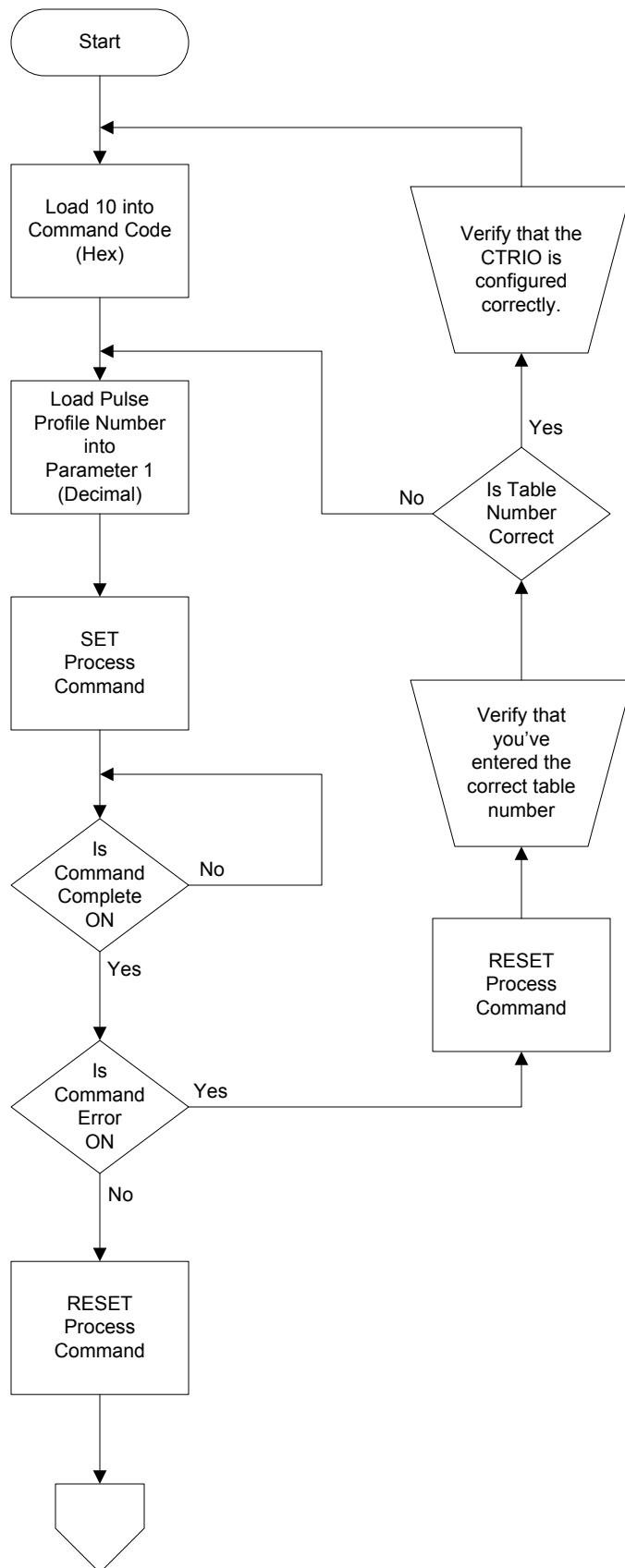
Once the current position is loaded, The CTRIO will begin to send output pulses.

You can suspend the pulse output at any time by using the Suspend Output bit.

Using Suspend Output will NOT reset the 'zero-point'.



Dynamic Velocity



The CTRIO is continually reading the Velocity register in the CPU. When a new value appears in this register the CTRIO will use the profile settings to move to the new velocity.

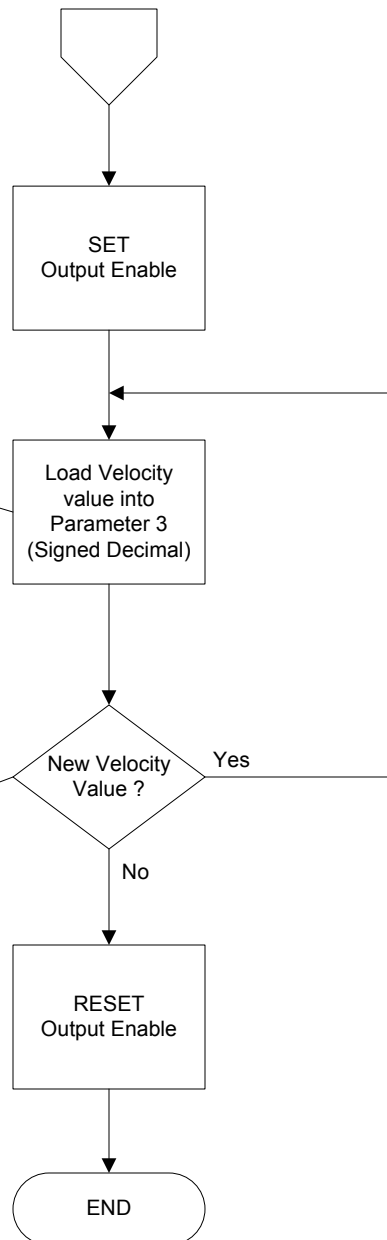
The direction is determined automatically from the sign of the velocity value.

Positive values will produce CW pulses.

Negative values will produce CCW pulses.

You can change the velocity value as often as you need.

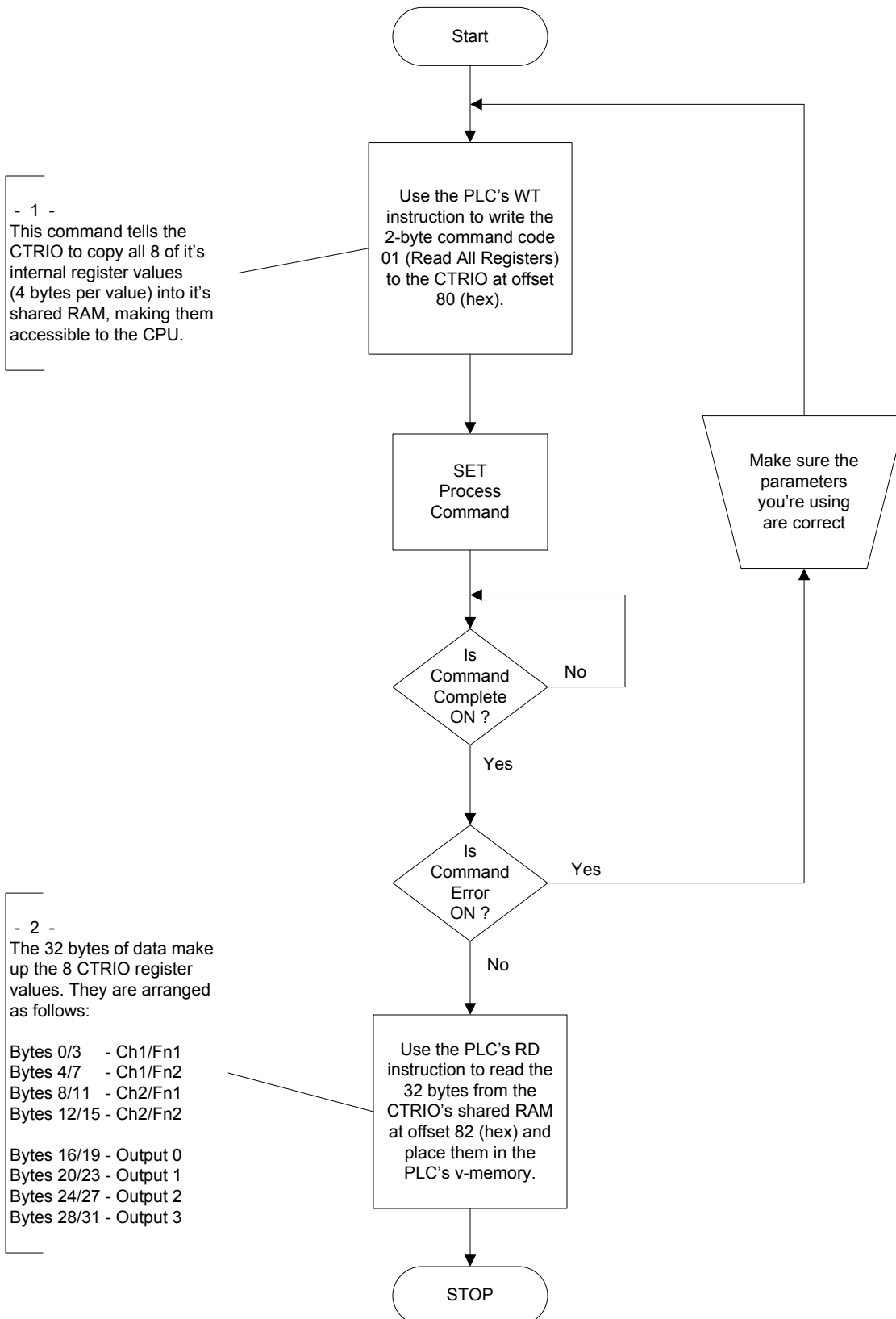
You can also suspend the pulse output at any time with the Suspend Output bit.



System Command - PLC Read from CTRIO

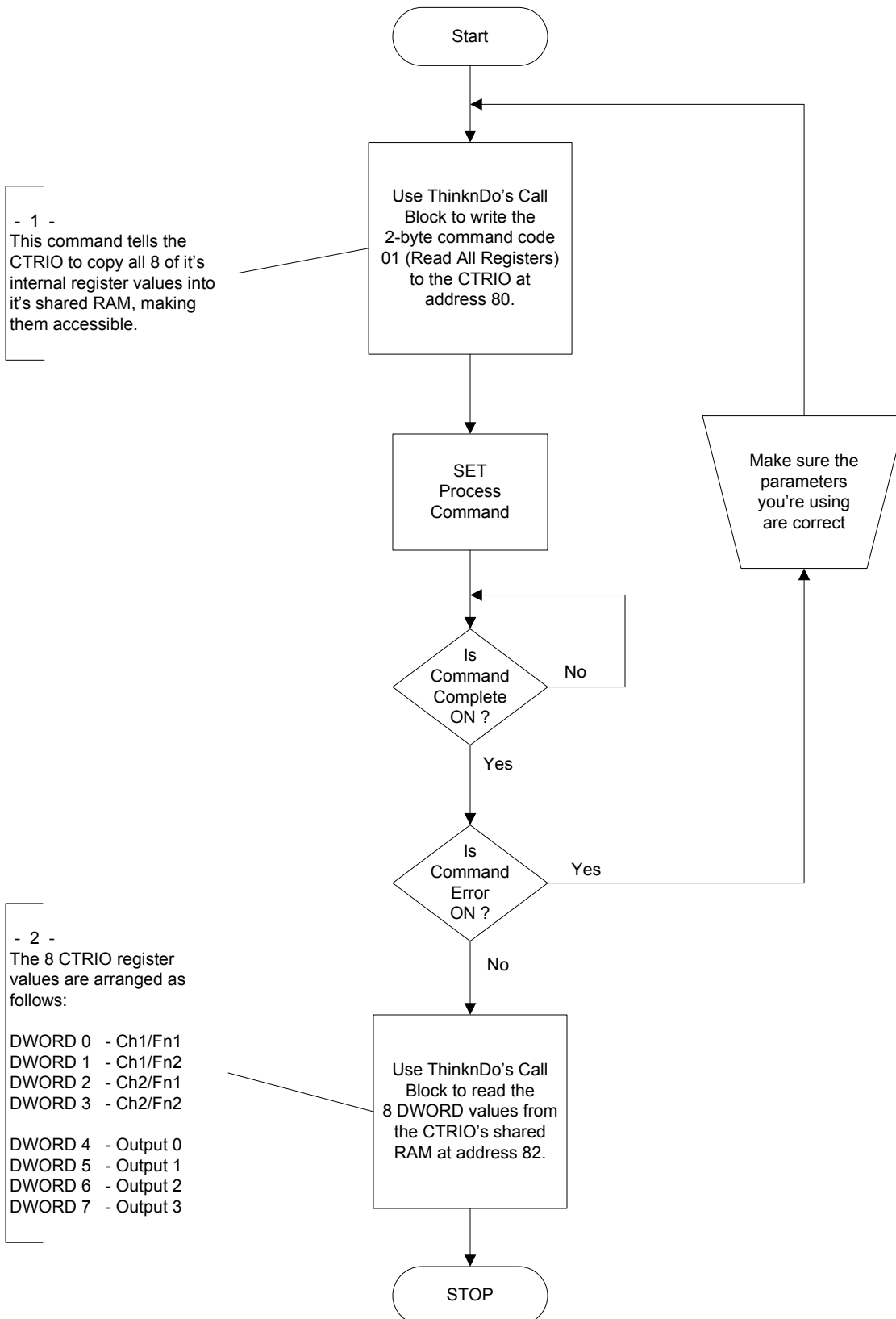
Reading the CTRIO's internal data registers is a two-step process:

1. Ask the CTRIO to transfer the internal register values to it's shared RAM.
2. Transfer the values from the CTRIO's shared RAM to the PLC's V-memory.



System Command - ThinknDo Read from CTRIO

Reading the CTRIO's internal data registers is a two-step process:
1. Ask the CTRIO to transfer the internal register values to it's shared RAM.
2. Transfer the values from the CTRIO's shared RAM to ThinknDo's memory.



System Command (PLC Write One Register to CTRIO)

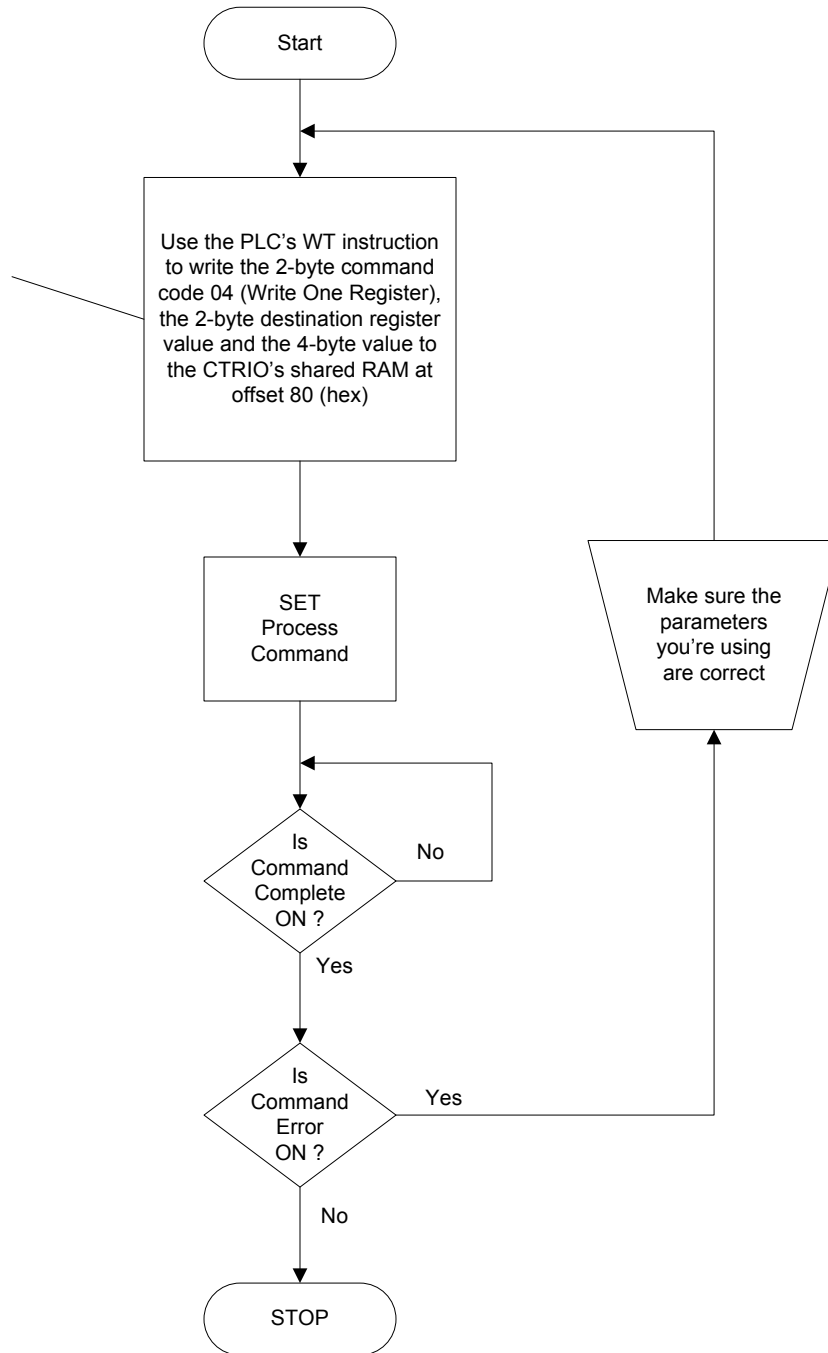
Writing to the CTRIOs internal data registers is a two-step process:

1. Transfer the data values from the PLCs V-memory to the CTRIO's shared RAM
2. ask the CTRIO to transfer these values from its shared RAM to it's internal registers.

The Destination Register values are as follows:

0 - Ch1/Fn1
1 - Ch1/Fn2
2 - Ch2/Fn1
3 - Ch2/Fn2

4 - Output 0
5 - Output 1
6 - Output 2
7 - Output 3



System Command (TnD Write One Register to CTRIO)

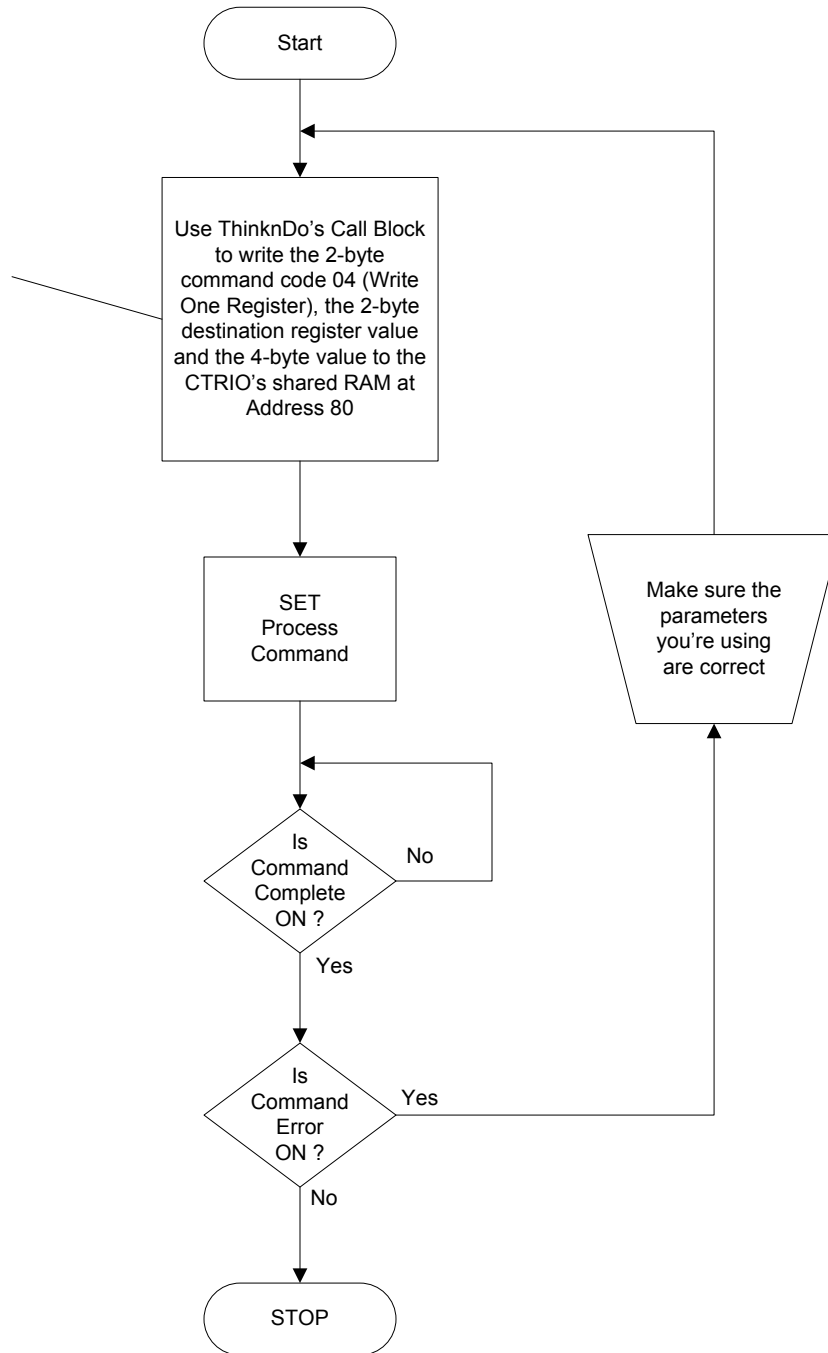
Writing to the CTRIOs internal data registers is a two-step process:

1. Transfer the data values from ThinknDo to the CTRIO's shared RAM
2. ask the CTRIO to transfer these values from its shared RAM to it's internal registers.

The Destination Register values are as follows:

0 - Ch1/Fn1
1 - Ch1/Fn2
2 - Ch2/Fn1
3 - Ch2/Fn2

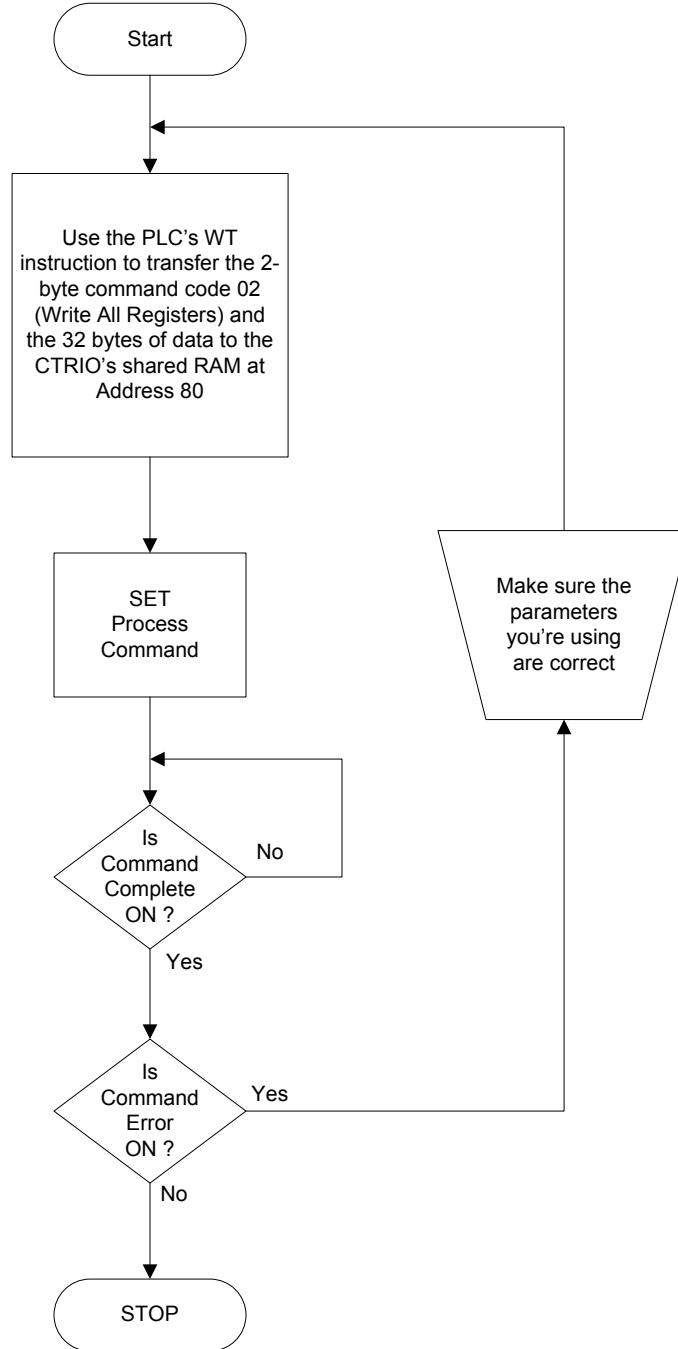
4 - Ouput 0
5 - Ouput 1
6 - Ouput 2
7 - Ouput 3



System Command (PLC Write All Registers to CTRIO)

Writing to the CTRIOs internal data registers is a two-step process:

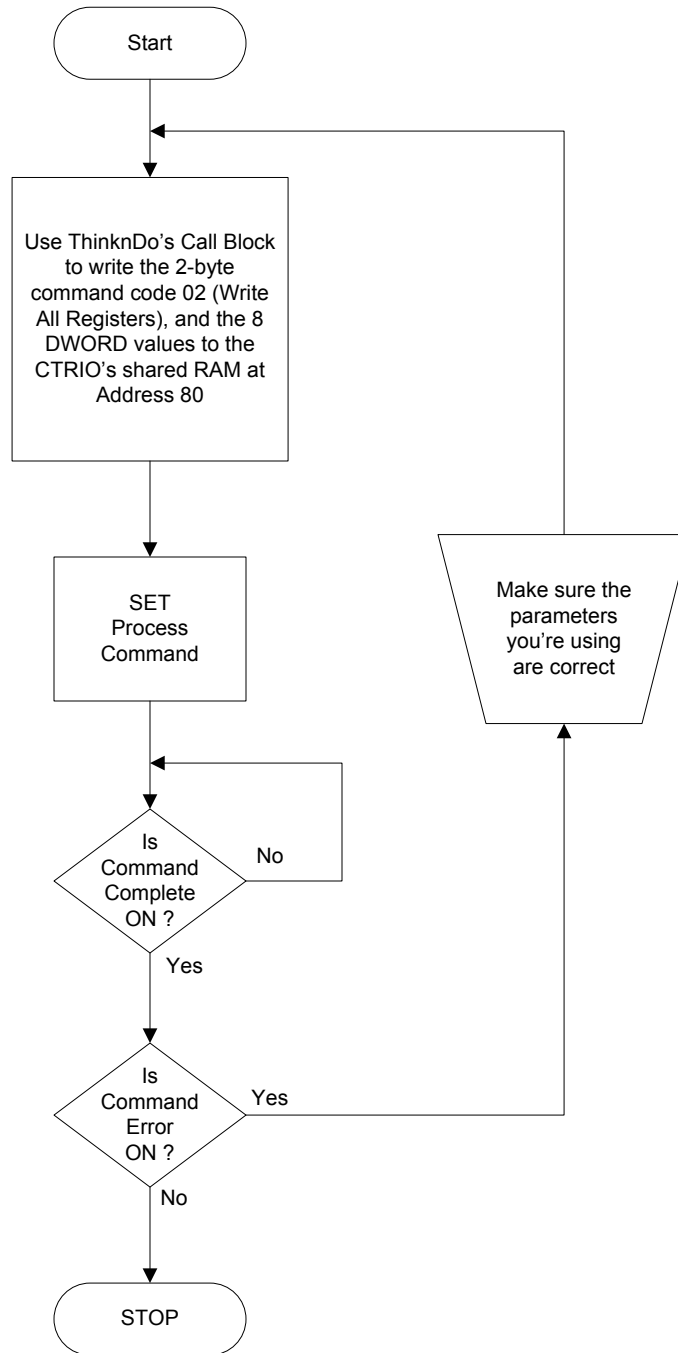
1. Transfer the data values from ThinknDo to the CTRIO's shared RAM
2. ask the CTRIO to transfer these values from its shared RAM to it's internal registers.



System Command (TnD Write All Registers to CTRIO)

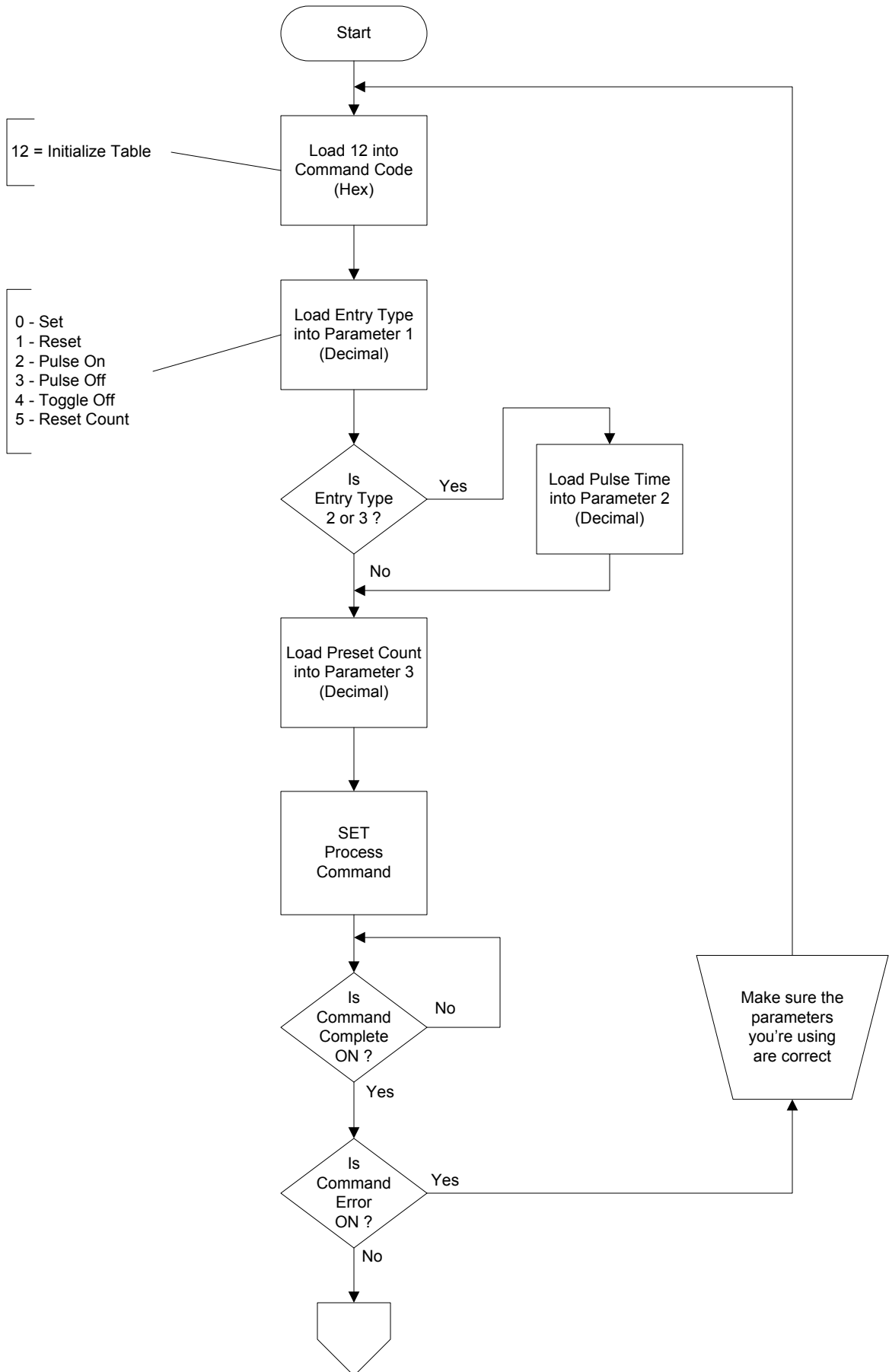
Writing to the CTRIO's internal data registers is a two-step process:

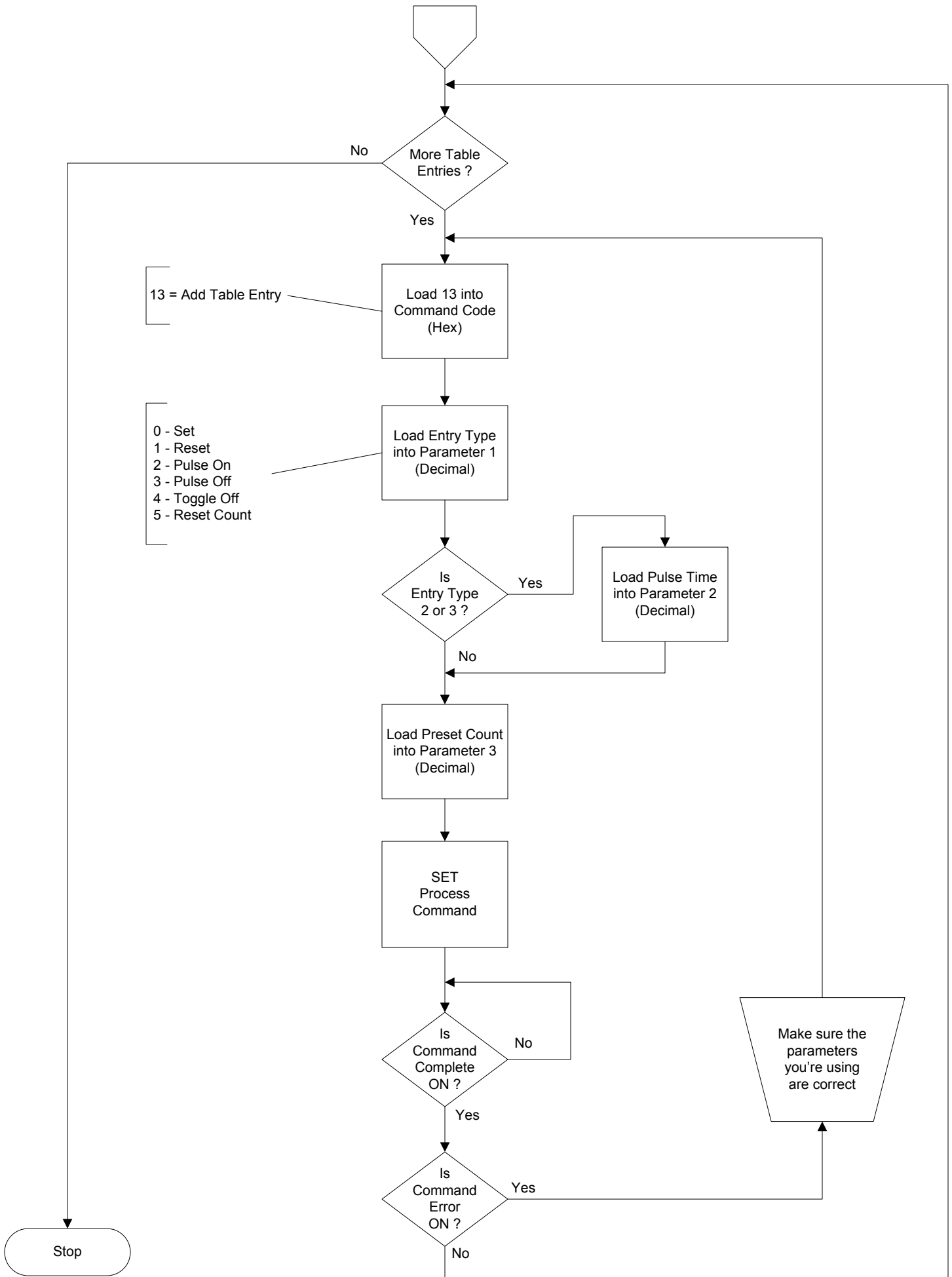
1. Transfer the data values from ThinknDo to the CTRIO's shared RAM
2. ask the CTRIO to transfer these values from its shared RAM to it's internal registers.



Build Preset Table

Using Initialize Table and Add Table Entry Commands





Edit Preset Table Entry

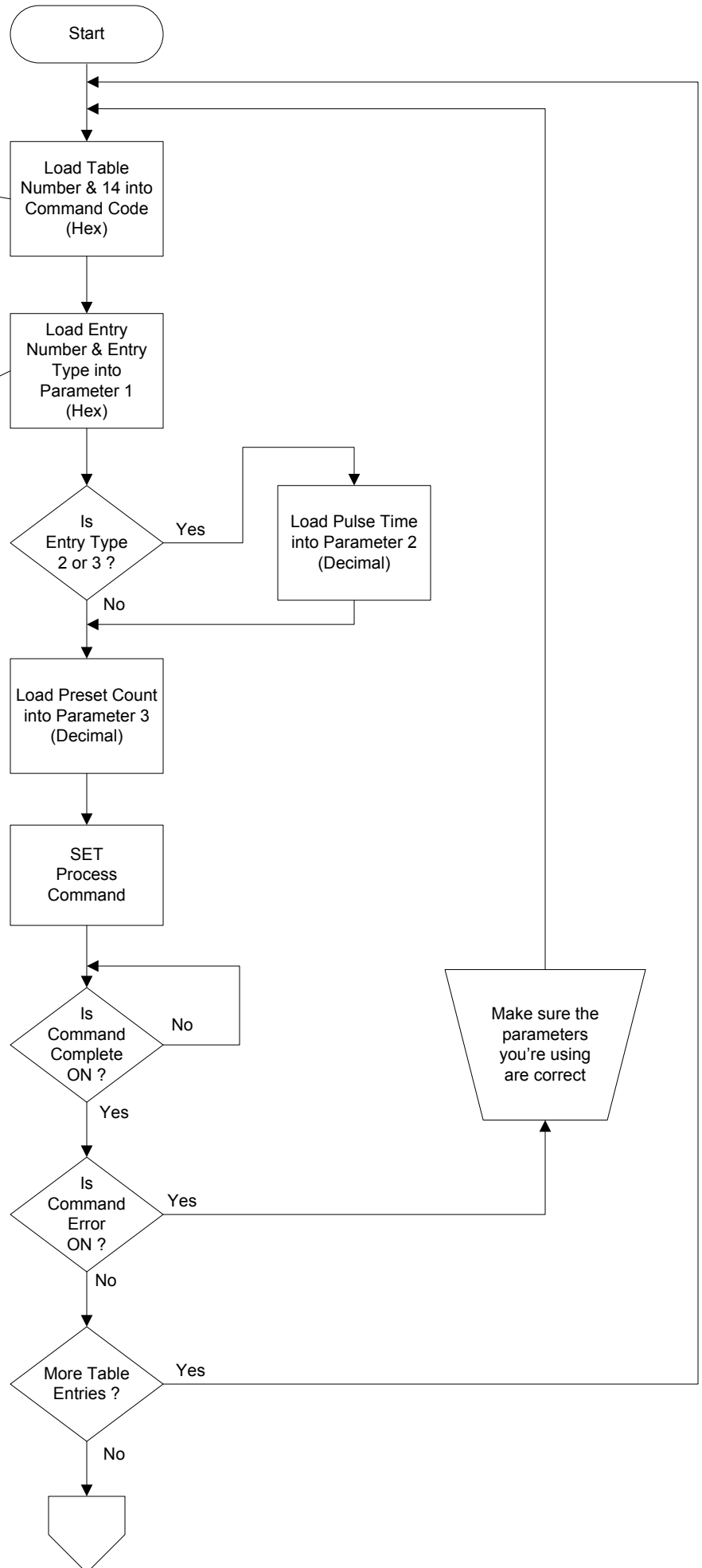
The Table number is loaded into the high byte and the value 14 is loaded into the low byte, for example:

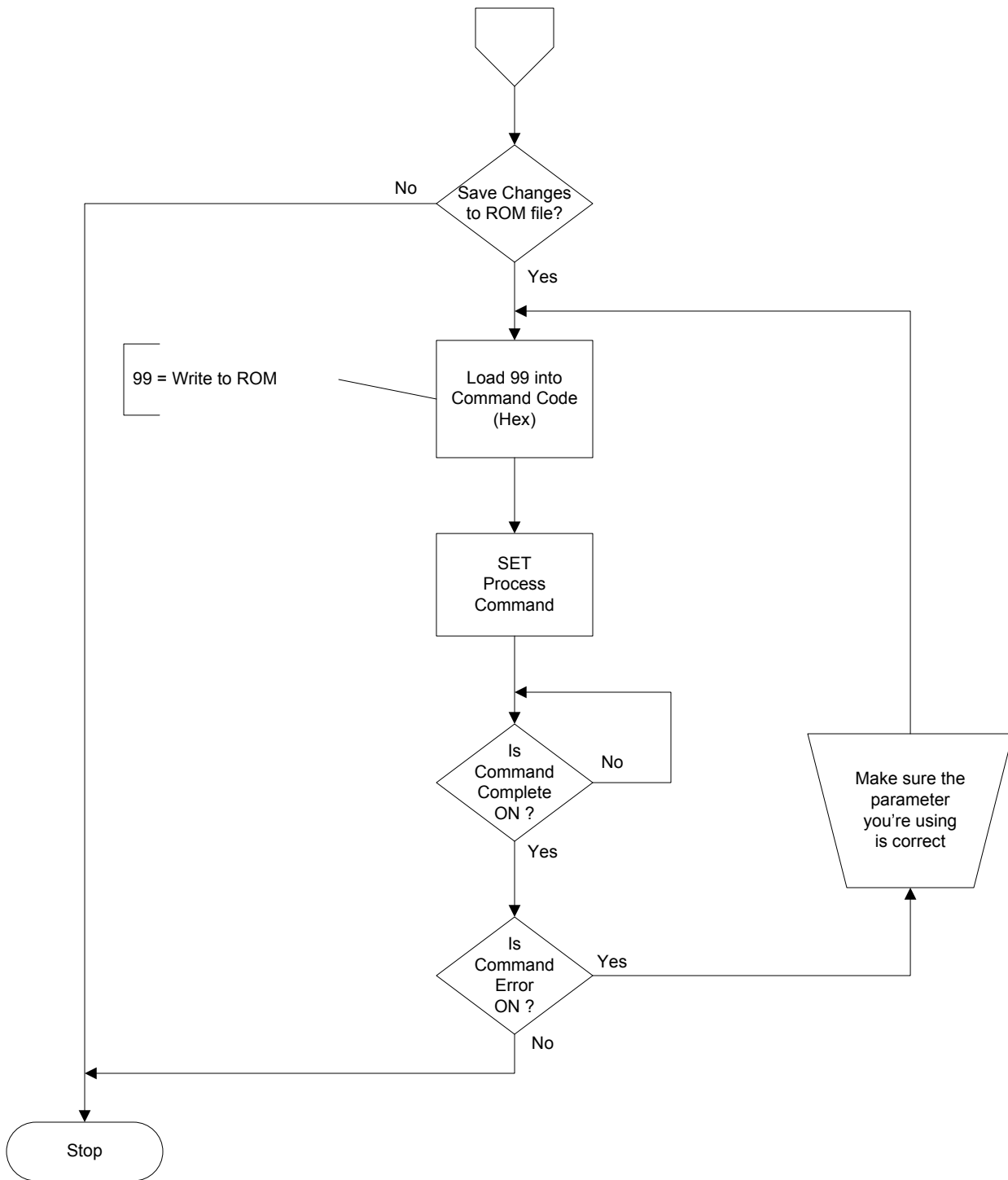
0214 = Edit Table #2

The Entry Number is loaded into the high byte and the Entry Type is loaded into the low byte, for example:

0202 = 3rd Entry is a Pulse ON

- 0 - Set
- 1 - Reset
- 2 - Pulse On
- 3 - Pulse Off
- 4 - Toggle Off
- 5 - Reset Count





Edit and Reload Preset Table Entry

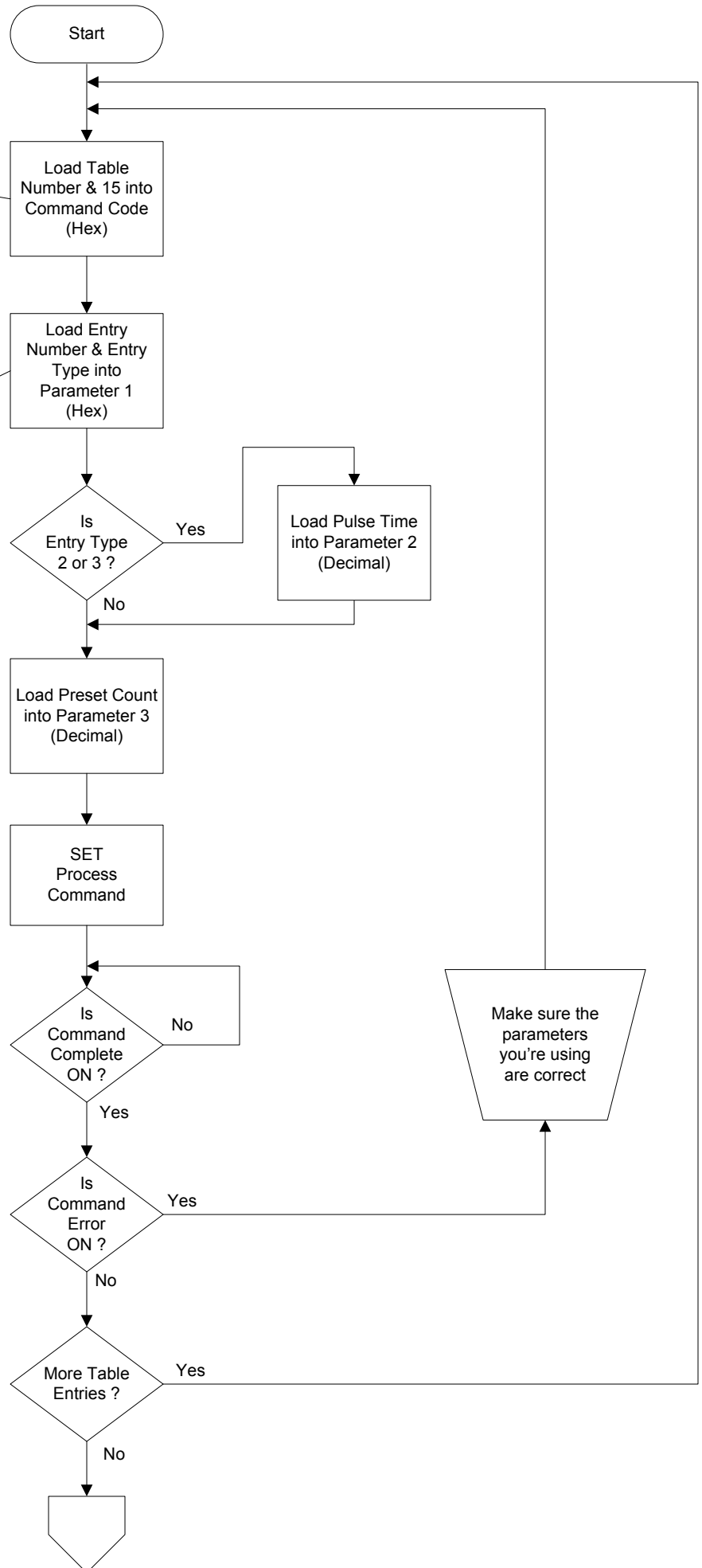
The Table number is loaded into the high byte and the value 15 is loaded into the low byte, for example:

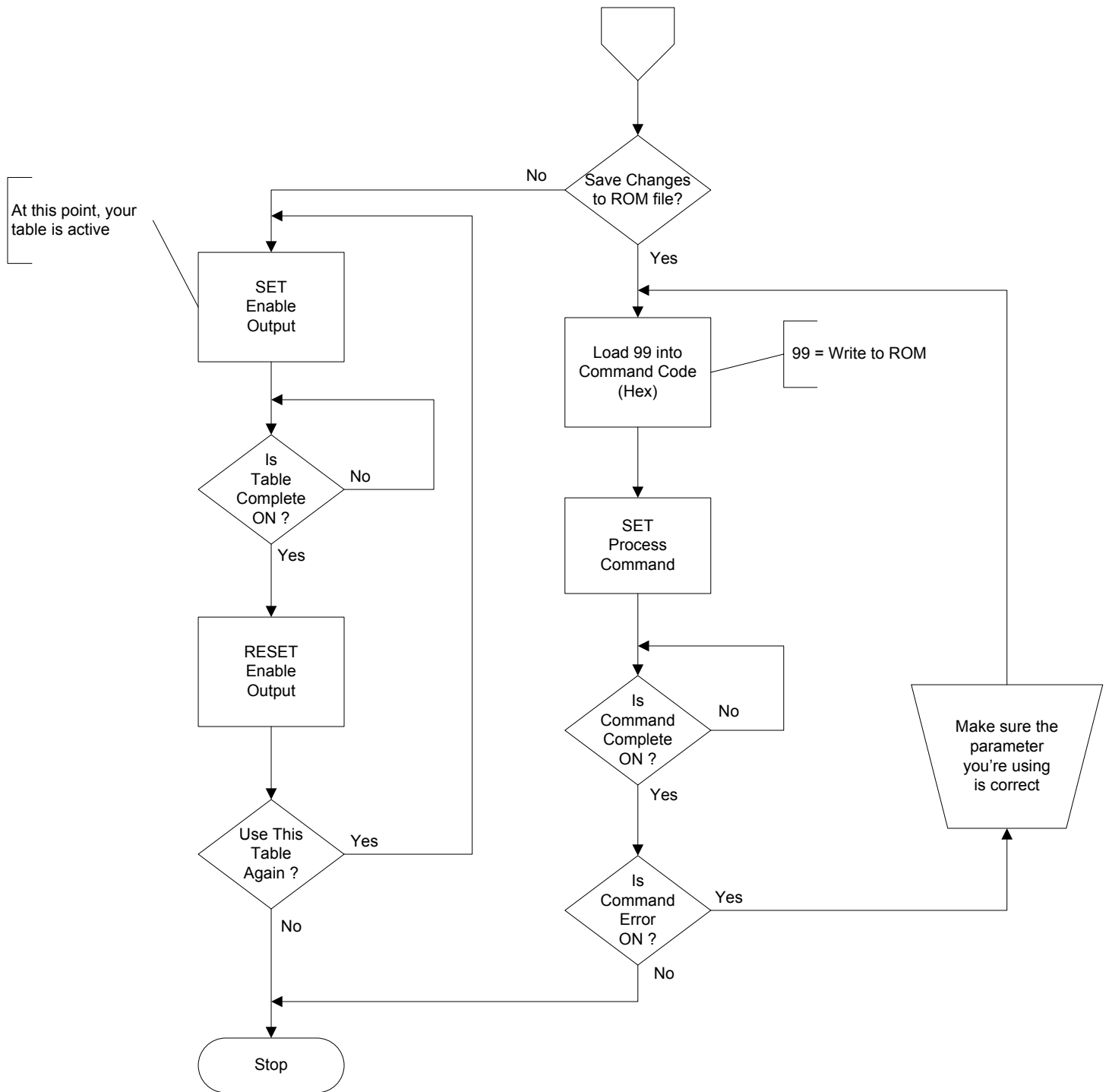
0215 = Edit then reload Table #2

The Entry Number is loaded into the high byte and the Entry Type is loaded into the low byte, for example:

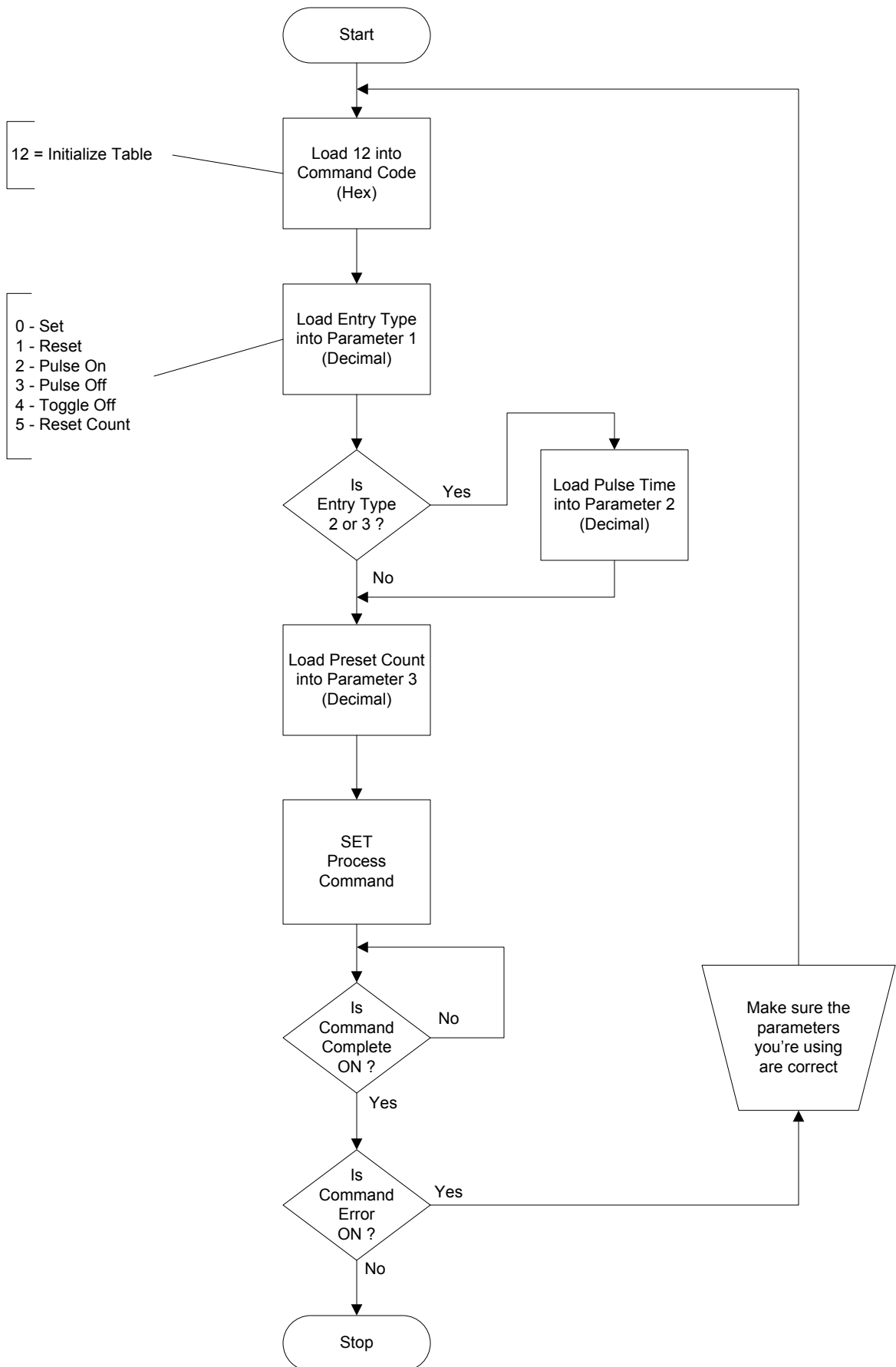
0202 = 3rd Entry is a Pulse ON

- 0 - Set
- 1 - Reset
- 2 - Pulse On
- 3 - Pulse Off
- 4 - Toggle Off
- 5 - Reset Count

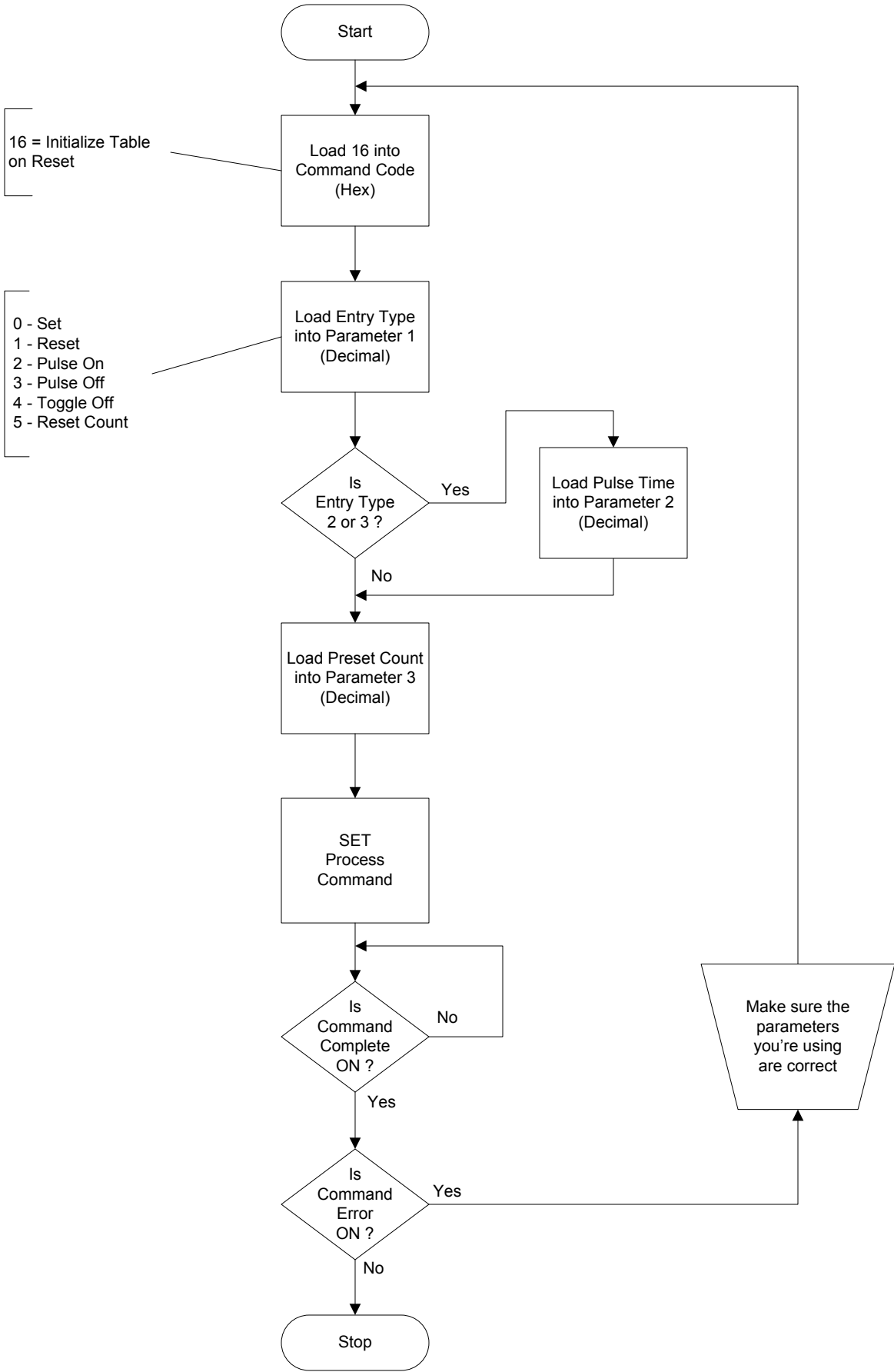




Initialize Table



Initialize Table on Reset



CTRIO File System Overview

At power up, the CTRIO:

1. clears the RAM file system
2. ensures the ROM file system is intact
3. copies the entire ROM file system to the RAM file system.

From this point on, all File and Table operations operate from the RAM copy.

CTRIO ROM File System



CTRIO RAM File System



When you Load a Profile or Preset Table, that file or table is copied from the RAM file system into the output's table buffer.

All operations performed by the output get the data from the table buffer.

Outputs configured as pulse outputs will use a pair of table buffers.

Table Buffer for Output 0

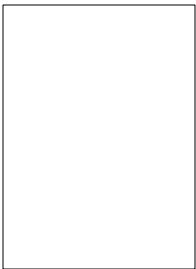


Table Buffer for Output 1

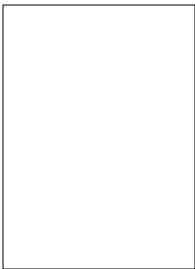
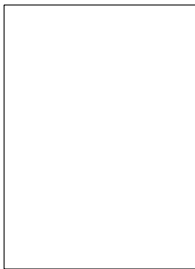


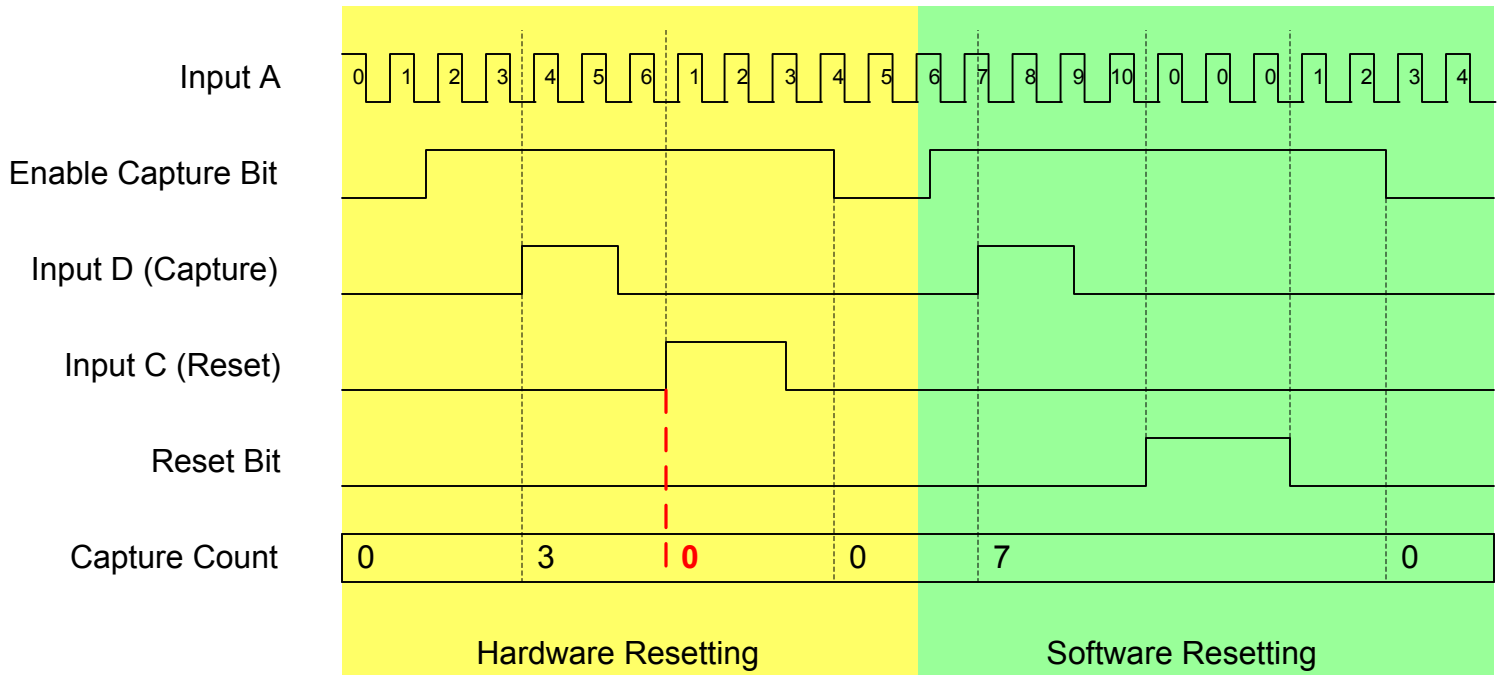
Table Buffer for Output 2



Table Buffer for Output 3



Behavior Previous to CTRIO Firmware v2.1.7



Behavior in CTRIO Firmware v2.1.7 and Later

