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Do we need to initialize the pins, I heard someone say that with the new Pin(functions) the pins are automatically set to outputs?

It may have been me during one of my prosthelyzing posts. The pinX() functions in Spin2 actually do three things:

- 1) Select the correct IO registers (A or B)
- 2) Make pin(s) inputs or outputs as required
- 3) Write to or read from the desired pin(s).

To make a pin high in the P1, we would do this:

```
dira[pin] := 1
outa[pin] := 1
```

In the P2, this handles it:

```
pinhigh(pin)
```

We only have 32 pins on the P1, but 64 on the P2. While we *can* directly access the IO registers, I don't recommend it because programs change. When I used to design products for EFX-TEK, I would never connect external circuitry to the Propeller in my schematic. When the PCB layout guy was finished, he had decided the best pins to use for the layout -- all I had to do was update my pin constants in the listing to move test code to the final product. This happens all the time (pins moving), which is one (of many) reasons why embedding pin #s into our code is a bad idea.

In the P1, we could do this:

```
outa[MSB..LSB] := value
dira[MSB..LSB] := %1111
```

In the P2, we do it like this:

```
pinwrite(LSB addpins (MSB-LSB), value)
```

There is a caveat, however. In the P1, we can also do this:

```
outa[LSB..MSB] := value
```

...which will reverse the output order of the lower four bits in value. How can we do this in the P2?

```
pinwrite(LSB addpins (MSB-LSB), value rev (MSB-LSB))
```

Okay, this is not quite as friendly as the P1 version, but -- thankfully -- is an infrequent requirement. It might be tempting to do this:

```
outa.[LSB..MSB] := value
```

...but this doesn't work. The rightmost value in the .[] syntax is used as the LSB.

Are the old pin registers (dira, outa, ina) necessary?

In Spin2, I don't see any need for direct IO register access.

Is everything I did wrong, or are there compiler issues? Mainly I am curious why many pin initialization worked (or at least compiled) like outa[7] and outa.[7], and others did not.

Things have changed from the P1 to the P2. This syntax:

```
outa[7]
```

...is actually referring to register \$003 in the cog. Why? In P2 syntax, **outa** is just another register and anything in [] is an offset. The address of **outa** is \$1FC. Add 7 and you get \$203 which is an illegal address because the max is \$1FF, hence it wraps around to \$003.

I think you see now why I have become a bit adamant about NOT using IO registers in Spin2 code -- let the Spin2 instructions do the work for you.

Important notes:

-- It is best NOT to use IO registers directly in Spin2; the underlying code for the high-level instructions is very efficient and fast.

Side note. This blinker code works, but is tedious to write versus using the new Spin2 functions for IO.

```
dirb.[56 & $1F] := 1
repeat
  outb.[56 & $1F] ^= 1
  waitms(100)
```

It's worse if you want to do multiple pins manually. Note the use of **addbits** versus **addpins** due to the nature of the syntax.

```
dirb.[(56 & $1F) addbits 3] := %1111
repeat
  outb.[(56 & $1F) addbits 3] := getrnd()
  waitms(100)
```

To access bits within a register we have to use the **.[]** notation. Registers are only 32 bits, so we have to use **& \$1F** with the **B** IO registers. Again tedious. Don't do it.

Final comment about pin groups. They only work within one register. What happens if you do this

BUS = 30 addpins 7

The Propeller will create a group that will impact pins 30, 31, 0, 1, 2, 3, 4, 5 -- which is probably not what we want. I was just writing multi-channel LED driver for the P2 that looks for these boundary issues.

It's something to be careful with.