final

This instruction is designed to expose NVIDIA's final register combiner to assembly. Final combiner is always enabled. When it is not specified in shader explicitly, it defaults to *final 1-zero,r0,zero,zero,zero,zero,r0*, which is setting shader's output color to the content of *r0* register. Final combiner is free on NVIDIA's hardware. Final combiner (other than the default one) may be quite expensive on ATI's hardware (up to four instruction slots).

```
final src0,src1,src2,src3,src4,src5,src6
```

Registers

Argument	Description	v_n	c_n	t_n	r_n	zero, fog	addr0v1	mulef
src0, src1, src2, src3	source register	x	x	x	x	x	x	x
src4, src5, src6	source register	x	x	x	x	x		

addr0v1 is a special token, which can be used only as an argument in *final* instruction. It is equivalent to setting input to the clumped sum of *r0* and *v1*, i.e. `addr0v1.rgb = clamp(r0 + v1)` . Alpha component of *addr0v1* is zero.

mulef is a special token, which can be used only as an argument in *final* instruction. It is equivalent to setting input to the multiplication of arguments *src4* and *src5*, i.e. `mulef.rgb = src4 * src5`. Alpha component of *mulef* is zero.

Remarks

All arguments modifiers except **invert** are prohibited. All arguments are clamped to the unit range. *.a* selector is allowed on *src0-src5* arguments. *.a* and *.b* selectors are allowed on *src6* .

This instruction sets shader's output color according to the following formula

```
output.rgb = src0 * src1 + (1-src0) * src2 + src3
output.a = src6
```

On NVIDIA's hardware fog blending has to be done in pixel shader. This is what final combiner is supposed to do, e.g. *glEnable(GL_FOG)* will not affect anything. Fog factor (which is in *.a* portion of *fog* register) is only available in *final* instruction.

ATI's hardware has fog blending, which occurs after pixel shader. It is controlled in normal way via *glEnable(GL_FOG)*.

Example

```
ps.1.2
def c0,1,1,0,0 // fog color
tex t0 // Load texture
tex t1 // Load texture
final v1.a,t0,c0,1-t1,zero,zero,c0
```