$$\mathbf{F}\,\varphi \stackrel{\mathbf{n}}{=} true\,\mathbf{U}\,\varphi$$

$$\stackrel{\mathbf{dsc}}{=} true\,\mathbf{U}\,(\varphi \,\wedge\, (true \,\vee\, sing))$$

$$= true\,\mathbf{U}\,\varphi$$

$$\stackrel{\mathbf{t}}{=} true\,\mathbf{U}\,(\boxed{\varphi} \,\wedge\, alive)$$