

## Dynamic System Property: *atis* **Feedthroughness**

(Dynamic system properties are those properties that are part of the theory and describe patterns in time as change occurs within a system or between a system and its negasystem.)

**Feedthroughness**,  $f_T(\mathfrak{S}_x)$ , =<sub>df</sub> transmission of negasystem *toput* through a system to negasystem *output*.

$$f_T(\mathfrak{S}_x) =_{df} \sigma(\mathfrak{S}_x) \mid \sigma(x) = (f_O \circ f_N \circ f_I)(x); \text{ that is, } \sigma(x_{T_p}) = x_{O_p}$$

**Feedthroughness** is defined as a *system state-transition function*; such that it is a composition of *feedin*, *feedintra* and *feedout*.

**Positive** and **negative feedthroughness** definitions are as follows:

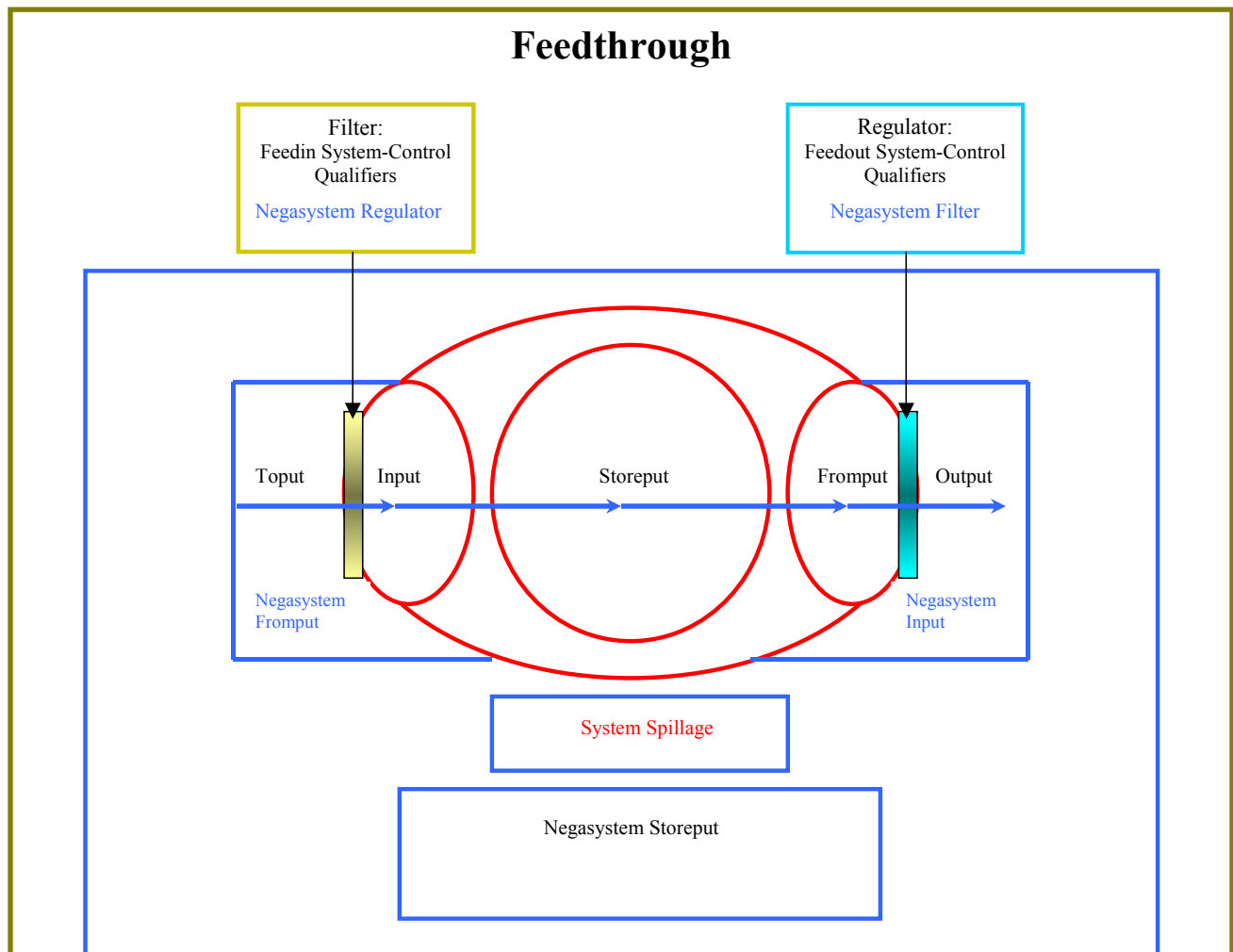
$$f_T^+ =_{df} \mathcal{A}(f_I)_{t(1)} < \mathcal{A}(f_O)_{t(2)} \qquad \bar{f}_T =_{df} \mathcal{A}(f_I)_{t(1)} > \mathcal{A}(f_O)_{t(2)}$$

APT&C (Analysis of Patterns in Time and Configuration),  $\mathcal{A}$ , analyses measure *positive* and *negative feedthrough*. These analyses determine measures of *system state* and a comparison of these measures before and after feedthrough determines positive or negative feedthrough.

**Feedthrough** is *feedback* with respect to the *negasystem*. As such, the report provided for *feedback* also applies for *feedthrough*. For *feedthrough*, however, there are products on the market that are called ‘feedthroughs’. One such *feedthrough* is shown below. As the name indicates, the object is to “feedthrough” something from one side to the other, through the connecting “system.” As with *feedback*, if there is no change as a result of the *feedthrough*, then it is a *Feedthrough Identity System*. If, there were substantial modification of the *input* so that the *feedthrough* is not recognizable, then we have a *Feedthrough Zero-Neutralized System*. Any modification of the initial *feedin* is the result of the system’s *derived production output*. For most, if not all, social systems, any initial *feedthrough* will be modified in some way, resulting in a *derived production output* that is distinctly different from the *toput*. As a result, *feedthrough* will be modified so that there is a reduced commonality of *toput* and *output*.



The FC-VFT vacuum feedthroughs are designed for use of fiber optics in vacuum chambers, such as for plasma monitoring. The vacuum feedthrough consists of an M12 housing with Viton® O-ring and 2 SMA fiber optic interconnects to allow easily coupling to fiber optic cables and probes. The vacuum feedthrough can be delivered for all fiber diameters, such as 50 μm up to 1000 μm for UV/VIS as well as for VIS/NIR. (This is a product of Avantes, Inc., Boulder, Colorado.)



*Feedthrough* is shown as it is initiated in *toput*, transmitted to *input*, then to *storeput*, then to *fromput*, and then transmitted to *output*. As seen here, both the *filter* and *regulator* may influence *feedthrough*, as well as the *production process* of *storeput* (see *filtration*, *regulation*, and *derived production output*).