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# AIRPORT SHARED RESOURCE

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**CADT** ControlTower

## OPERATIONS

**ACTION** BeforeLanding:  $\mathbb{N}[o]$

**ACTION** AfterLanding:  $\mathbb{N}[i]$

**ACTION** BeforeTakeOff:  $\mathbb{N}[o]$

**ACTION** AfterTakeOff:  $\mathbb{N}[i]$

**PROTOCOLS:** *Landing* : *BeforeLanding*; *AfterLanding*

*TakeOff* : *BeforeTakeOff*; *AfterTakeOff*

**CONCURRENCY:** (*Landing* | *TakeOff*)\*

## SEMANTICS

**DOMAIN:**

**STATE:** *ControlTower* = *Sequence*(*boolean*)

**INVARIANT:**

**INITIAL:**  $\text{Length}(\text{ControlTower}) > 0 \wedge \forall i \in 0..\text{Length}(\text{ControlTower}) \bullet \neg \text{ControlTower}[i]$

**PRE:** true

**CPRE:**  $\exists i \in \mathbb{N} \bullet \neg \text{self}[i]$

**BeforeLanding**(*ra*)

**POST:**  $\text{self}[ra] \wedge (\forall i \in 0..\text{Length}(\text{ControlTower}) \bullet \text{self}[i] = \text{self}^{\text{in}}[i] \vee i == ra)$

**PRE:**  $\neg \text{self}[ra]$

**CPRE:** true

**AfterLanding**(*ra*)

**POST:**  $\neg \text{self}[ra] \wedge (\forall i \in 0..\text{Length}(\text{ControlTower}) \bullet \text{self}[i] = \text{self}^{\text{in}}[i] \vee i == ra)$

**PRE:** true

**CPRE:**  $\exists i \in \mathbb{N} \bullet \neg \text{self}[i]$

**BeforeTakeOff**(*ra*)

**POST:**  $\text{self}[ra] \wedge (\forall i \in 0..\text{Length}(\text{ControlTower}) \bullet \text{self}[i] = \text{self}^{\text{in}}[i] \vee i == ra)$

**PRE:**  $\neg \text{self}[ra]$

**CPRE:** true

**AfterTakeOff**(*ra*)

**POST:**  $\neg \text{self}[ra] \wedge (\forall i \in 0..\text{Length}(\text{ControlTower}) \bullet \text{self}[i] = \text{self}^{\text{in}}[i] \vee i == ra)$