Description Grammar Rules

$$\phi_{TA} ::= \phi_{init}\ \phi_{sys}$$

$$\phi_{init} ::= \textbf{A}\ \textit{can only be}\ \textbf{L}$$
$$\mid \textbf{A}\ \textit{can be}\ \phi_{locs}\ \textit{and it is initially}\ \textbf{L}$$

$$\phi_{sys} ::= \phi_{invrt}\ \phi_{sys}\ \mid\ \phi_{tran}\ \phi_{sys}\ \mid \epsilon$$

$$\phi_{invrt} ::= \textit{for}\ \textbf{A}\ \phi_{ic}\ \textit{in}\ \textbf{L}\ \mid\ \textit{for}\ \textbf{A}\ \textit{the time spent in}\ \textbf{L}\ \textit{cannot be}\ \phi_{icons}$$

$$\phi_{tran} ::= \textbf{A}\ \textit{can}\ \phi_{go}$$
$$\mid \textbf{A}\ \textit{can send}\ \textbf{S}\ \textit{and}\ \phi_{go}$$
$$\mid \textit{if}\ \phi_{sc}\ \textit{then}\ \textbf{A}\ \textit{can}\ \phi_{go}$$
$$\mid \textit{if}\ \phi_{tc}\ \textit{then}\ \textbf{A}\ \textit{can}\ \phi_{go}$$
$$\mid \textit{if}\ \phi_{tc}\ \textit{then}\ \textbf{A}\ \textit{can send}\ \textbf{S}\ \textit{and}\ \phi_{go}$$
$$\mid \textit{if}\ \phi_{sc}\ \textit{and}\ \phi_{tc}\ \textit{then}\ \textbf{A}\ \textit{can}\ \phi_{go}$$

Helper Grammar Rules

ϕ_{locs} ::= **L** | **L** ϕ_{locs}

ϕ_{sc} ::= **S** *is received*

ϕ_{tc} ::= *the time spent after* ϕ_{el} **L** *is* ϕ_{tcons} | ϕ_{tc} *and* ϕ_{tc}

ϕ_{ic} ::= *the time spent after* ϕ_{el} **L** *cannot be* ϕ_{icons} | ϕ_{ic} *and* ϕ_{ic}

ϕ_{tcons} ::= *more than* ϕ_{eq} **N** | *less than* ϕ_{eq} **N** | *equal to* **N** | ϕ_{tcons} *and* ϕ_{tcons}

ϕ_{icons} ::= *more than* ϕ_{eq} **N** | ϕ_{icons} *and* ϕ_{icons}

ϕ_{eq} ::= *or equal to* | ϵ

ϕ_{el} ::= *entering* | *leaving*

ϕ_{go} ::= *go from* ϕ_{locs} *to* ϕ_{locs}

Specification Grammar Rules

$$\phi_{spec} ::= \textit{it } \phi_{pf} \textit{ be the case that } \phi_{sf}$$
$$| \textit{ deadlock never occurs}$$
$$| \textit{ } \phi_{sf} \textit{ leads to } \phi_{sf}$$
$$| \textit{ for } \mathbf{A} \textit{ } \mathbf{L} \textit{ shall hold within every } \mathbf{N}$$

$$\phi_{pf} ::= \textit{shall always } | \textit{ shall eventually } | \textit{ might always } | \textit{ might eventually}$$

$$\phi_{sf} ::= \phi_{atom} \textit{ } | \textit{ } \phi_{atom} \textit{ } \phi_{op} \textit{ } \phi_{sf}$$

$$\phi_{atom} ::= \textit{for } \mathbf{A} \textit{ the time spent after } \phi_{el} \textit{ } \mathbf{L} \textit{ is } \phi_{tcons}$$
$$| \textit{ for } \mathbf{A} \textit{ } \phi_{locs} \textit{ holds } | \textit{ for } \mathbf{A} \textit{ } \phi_{locs} \textit{ does not hold}$$

$$\phi_{op} ::= \textit{and } | \textit{ or } | \textit{ implies}$$