──────────────────── MODULE $P2PBroadcastSpec$ ────────────────────

EXTENDS $Naturals$, $Sequences$

CONSTANT
  $Proc$,    Set of processes
  $Data$
VARIABLES
  $sent$,    All messages sent
  $received$    All messges received

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$vars \triangleq \langle sent, received \rangle$

$Message \triangleq [from : Proc, data : Data]$

$Init \triangleq \wedge sent = \langle \rangle$
$\qquad \wedge received \quad = [m \in Message \mapsto \{\}]$

$TypeOK \triangleq \quad \wedge sent \in Seq(Message)$
$\qquad\qquad\quad \wedge received \in [Message \rightarrow \text{SUBSET } Proc]$

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$Send \triangleq \wedge \exists m \in Message : sent' = Append(sent, m)$   Always enabled
$\qquad\quad \wedge \text{UNCHANGED } \langle received \rangle$

$Recv(m) \triangleq \quad \wedge sent \neq \langle \rangle$
$\qquad\qquad\quad \wedge m = Head(sent)$
$\qquad\qquad\quad \wedge sent' = Tail(sent)$
$\qquad\qquad\quad \wedge \exists p \in Proc : received' = [received \text{ EXCEPT } ![m] = @ \cup \{p\}]$

$Next \triangleq \exists m \in Message : Send \vee Recv(m)$

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$Spec \triangleq Init \wedge \square[Next]_{vars}$

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