

```

1  |----- MODULE AJupiterExtended -----|
   | AJupiter extended with JupiterCtx. This is used to show that AJupiter implements XJupiter. |
5  | EXTENDS JupiterCtx, BufferStateSpace  TODO: To extend AJupiter |
6  |-----|
7  | VARIABLES cbuf, crc, sbuf, srec, cincomingXJ, sincomingXJ
8  | varsEx  $\triangleq$   $\langle \text{intVars}, \text{ctxVars}, \text{cbuf}, \text{crc}, \text{sbuf}, \text{srec}, \text{cincomingXJ}, \text{sincomingXJ} \rangle$ 
10 | AJMsgEx  $\triangleq$  [ack : Nat, cop : Cop, oid : Oid]
11 | commXJ  $\triangleq$  INSTANCE CSComm WITH Msg  $\leftarrow$  Seq(Cop),
12 |                               cincoming  $\leftarrow$  cincomingXJ, sincoming  $\leftarrow$  sincomingXJ
13 |-----|
14 | TypeOKEx  $\triangleq$ 
15 |    $\wedge$  TypeOKInt
16 |    $\wedge$  TypeOKCtx
17 |    $\wedge$  commXJ! TypeOK
18 |    $\wedge$  crc  $\in$  [Client  $\rightarrow$  Nat]
19 |    $\wedge$  srec  $\in$  [Client  $\rightarrow$  Nat]
20 |    $\wedge$  cbuf  $\in$  [Client  $\rightarrow$  Seq(Cop)]
21 |    $\wedge$  sbuf  $\in$  [Client  $\rightarrow$  Seq(Cop)]
22 |-----|
23 | InitEx  $\triangleq$ 
24 |    $\wedge$  InitInt
25 |    $\wedge$  InitCtx
26 |    $\wedge$  commXJ! Init
27 |    $\wedge$  crc = [c  $\in$  Client  $\mapsto$  0]
28 |    $\wedge$  srec = [c  $\in$  Client  $\mapsto$  0]
29 |    $\wedge$  cbuf = [c  $\in$  Client  $\mapsto$   $\langle \rangle$ ]
30 |    $\wedge$  sbuf = [c  $\in$  Client  $\mapsto$   $\langle \rangle$ ]
31 |-----|
32 | DoOpEx(c, op)  $\triangleq$ 
33 |   LET cop  $\triangleq$  [op  $\mapsto$  op, oid  $\mapsto$  [c  $\mapsto$  c, seq  $\mapsto$  cseq[c], ctx  $\mapsto$  ds[c]]
34 |   IN    $\wedge$  crc' = [crc EXCEPT ![c] = 0]
35 |        $\wedge$  cbuf' = [cbuf EXCEPT ![c] = Append(@, cop)]
36 |        $\wedge$  SetNewAop(c, op)
37 |        $\wedge$  Comm! CSend([ack  $\mapsto$  crc[c], cop  $\mapsto$  cop, oid  $\mapsto$  cop.oid])
38 |        $\wedge$  commXJ! CSend(cop)
40 | ClientPerformEx(c, m)  $\triangleq$ 
41 |   LET xform  $\triangleq$  xFormShift(COT, m.cop, cbuf[c], m.ack)
42 |   IN    $\wedge$  cbuf' = [cbuf EXCEPT ![c] = xform.xops]
43 |        $\wedge$  crc' = [crc EXCEPT ![c] = @ + 1]
44 |        $\wedge$  SetNewAop(c, xform.xop.op)
46 | ServerPerformEx(m)  $\triangleq$ 
47 |   LET   c  $\triangleq$  ClientOf(m.cop)

```

