

## Feedback Linkage

This appendix contains a simplified model of what we have referred to as the feedback linkage throughout the text along with notes explaining the details of the linkage. Please note that the line numbers have been inserted for easy reference only and are not part of the linkage. This linkage is not intended to be definitive or complete. There may be other and better ways of modeling this scenario.

1. [AB][sound system]<on-off><volume><duration><pitch>
2. [A]<hear B><talk to B><comment on feedback>
3. [B]<hear A><talk to A><comment on feedback>
4. [C]<adjust sound system>
5. <converse> : [A]<talk to B> v [B]<talk to A>
6. -<converse> : [A]<comment on feedback> v [B]<comment on feedback>
7. [sound system]<on-off\off> v [sound system]<on-off\on> x [sound system]<volume\low> :: [A]<hear B\yes> x [B]<hear A\yes> x [feedback\no]
8. [feedback\yes] :: [A]<hear B\no> x [B]<hear A\no>
9. [A]<hear B\yes> x [B]<hear A\yes> -> <converse>
10. [A]<hear B\no> v [B]<hear A\no> -> -<converse>
11. [C]<adjust sound system> : [sound system]<on-off\on> x [sound system]<volume\high> x [feedback\yes]

### Notes

1. [AB] is the linkage which has a prop part ([sound systems]) which has several properties mentioned in angle brackets(<>).
2. The role part [A] has three tasks (in angle brackets)which are not described in detail.
3. The role part [B] is similarly described.
4. The role part [C] has only one task.
5. The top level task <converse> is defined as a task in which either [A] executes the <talk to B> task or (v) [B] executes the <talk to A> task.
6. -<converse> means, in effect, that the <converse> task is "turned off" or interrupted. When this happens either [A] performs the <comment on feedback> task or [B] performs a similarly named task. Note that both [A] and [B] have tasks with this name which are NOT the same. The results of the two tasks may be different.
7. When [sound system]'s <on-off> property is set to off or <on-off> is on and [sound system]'s <volume> property is set to low, [A]'s <hear B> property is set to yes and [B]'s <hear A> property is set to yes (they can both hear each other). There is no feedback. This is an example of a setting procedure.
8. When feedback occurs, [A] and [B] cannot hear each other.
9. If [A] can hear [B] and vice versa, they converse (execute the <converse> task).
10. If [A] cannot hear [B] or vice versa, <converse> is interrupted.
11. This is a description of what happens when [C] executes the <adjust sound system> task. Here we model how feedback occurs ([feedback\yes]).