airplaneLatLin simulates the Linearized longitudinal dynamics of an aircraft

airplaneLatLin uses the linearized lateral equations (4.9, 19) from Etkin (1996) to simulate the longitudinal dynamics of an aircraft which, in the case of Homework 10, is a Boeing 747-100. The case that is simulated is in cruise, at an altitude of 20,000 feet and Mach number = 0.5 as given in Table E.1, case 2.

State is the current state vector consisting of Δv, Δp, Δr, $\Delta \phi$, $\Delta \psi$, and Δy_E.

```
function dState = airplaneLatLin(t, State, A)
    global E1
    dState(1:4,1)   = A * State(1:4);
    dState(5,1)     = State(3) * sec(E1.theta0);
    dState(6,1)     = E1.u0 * State(5) * cos(E1.theta0) + State(1);
end
```