BACKGROUND: The mechanical correlator on the Enstrom helicopters controls the engine throttle automatically in accordance with the collective position but it is important to understand the operating principals to get optimum performance from the correlator.

Take off Operational Procedure:

In preparation for lifting the helicopter into a hover, the pilot should increase the throttle friction so that it takes noticeable pressure to move the twist grip throttle. The pilot increases throttle to 3050 RPM and starts to pull pitch (collective). The correlator will automatically increase throttle as the collective is raised so the pilot must “roll off” (reduce) throttle as the collective is raised to keep the engine RPM from over speeding. Once the helicopter is in the hover, the collective is then correlated to the engine for that particular density altitude, gross weight, and wind configuration.

Theory of operation:

The correlator simulates a turbine governor in that the twist grip throttle doesn’t move as the collective is moved up and down. In the case of the Enstrom correlator, the throttle friction has to be tightened enough that the throttle does not turn as the collective is moved. If the twist grip throttle is allowed to move as the collective is moved, the correlating function between the collective and the engine is lost.

Because the correlator is mechanically operated and does not receive RPM sensor information, the pilot has to monitor RPM and may have to make small throttle inputs to prevent under speed or over speed of the engine RPM in certain flight regimes.

During hover and forward flight, if the throttle friction is sufficient and the correlator is properly maintained, moving the collective up and down will not require the pilot to change the throttle position to keep RPM steady. Due to fluctuation of required engine power from changes in translational lift, wind, or tail rotor position and effectiveness, the pilot will normally have to make small corrections at the throttle to offset differences in RPM. Turbine governors control the fuel control operation by referencing rotor speed and making fuel control corrections to maintain RPM, but the correlator relies on the pilot to perform this function.
Customer Support Training Information

Operational Check
The correlator is designed to hold RPM within certain limits. Verify correct Correlator operation as follows:

NOTE: The throttle correlator does not correlate tail rotor input.

1) Hover:
   (a) Set RPM to 3000, apply throttle friction, and perform normal hover maneuvers (left and right 360° spot turns). The RPM should remain in the green with minimal pilot throttle input.

2) Forward Flight:
   (a) Set 2900 RPM 25 in HG MAP at 55 MPH.
   (b) Hold airspeed constant and increase collective to 39 in HG MAP without adjusting throttle. Note the RPM change. **DO NOT EXCEED 3050 RPM.**
   (c) While maintaining the original airspeed decrease collective back to 25 in Hg MAP. Note RPM change.

NOTE: RPM must remain between 2900 and 3050 during the power changes without any throttle adjustments.

The throttle friction must be set high enough to prevent throttle movement during collective changes.

Correlator Adjustment:

(1) Remove the cover from base of the pilot’s collective to gain access to the correlator.
(2) Loosen the check nut at the base of the adjustment screw and back it off a few turns.
Customer Support Training Information

(3) Fly the helicopter and perform the test outlined at the top of page 2.
(4) Adjust the adjustment screw ¼ turn in either direction.
(5) Fly the test again to determine if the screw was turned in the correct direction.
(6) If the RPM tolerance got worse, try adjusting the screw in the opposite direction.
(7) Continue checking operation and adjusting the screw until the best operation of the correlator is obtained.
(8) Land the helicopter, tighten the check nut, and replace the cover over the base of the pilot’s collective.