



Fig. 9-1. *Cross-section of a propeller blade.*

Pitch distribution makes talking about a specific blade angle difficult because the angle gradually changes through the entire length of the prop. So what we need is a kind of “street address” to help us identify specific blade angle locations. Blade station is a specified distance, measured from the center of the hub outward. For instance, in one model of the Beech B-55 Baron, the Pilot’s Operating Handbook (POH) describes a feathered condition as one where there is an 80.0-degree blade angle at the 30-inch station.

CONTROLLING PROPELLER PITCH

Over the years, several different types of propellers have been developed. The ground-adjustable type, found on older aircraft, permitted the pilot to set prop pitch on the ground. Normally set to provide maximum efficiency during straight-and-level flight, it could be reset to an angle more conducive to short-field takeoffs; the penalty would be slower cruise performance. The problem was that most fields were short in those days, so cruise efficiency suffered; a two-position prop was developed. Now, from within the cockpit, the pilot could switch from low pitch for takeoff to high pitch for cruise. The next logical step was a controllable pitch propeller, which allowed the pilot to select any blade angle within the prop’s range, but it was a matter of guesswork to decide which was the best. The short-lived automatic pitch prop had the capability of setting its own pitch as a result of aerodynamic forces; the pilot had no control at all!

FIXED-PITCH PROPELLERS

The fixed-pitch propeller is as common today in light, single-engine trainer aircraft as it was during the heyday of the Wright Brothers. The wooden version of this reliable one-piece