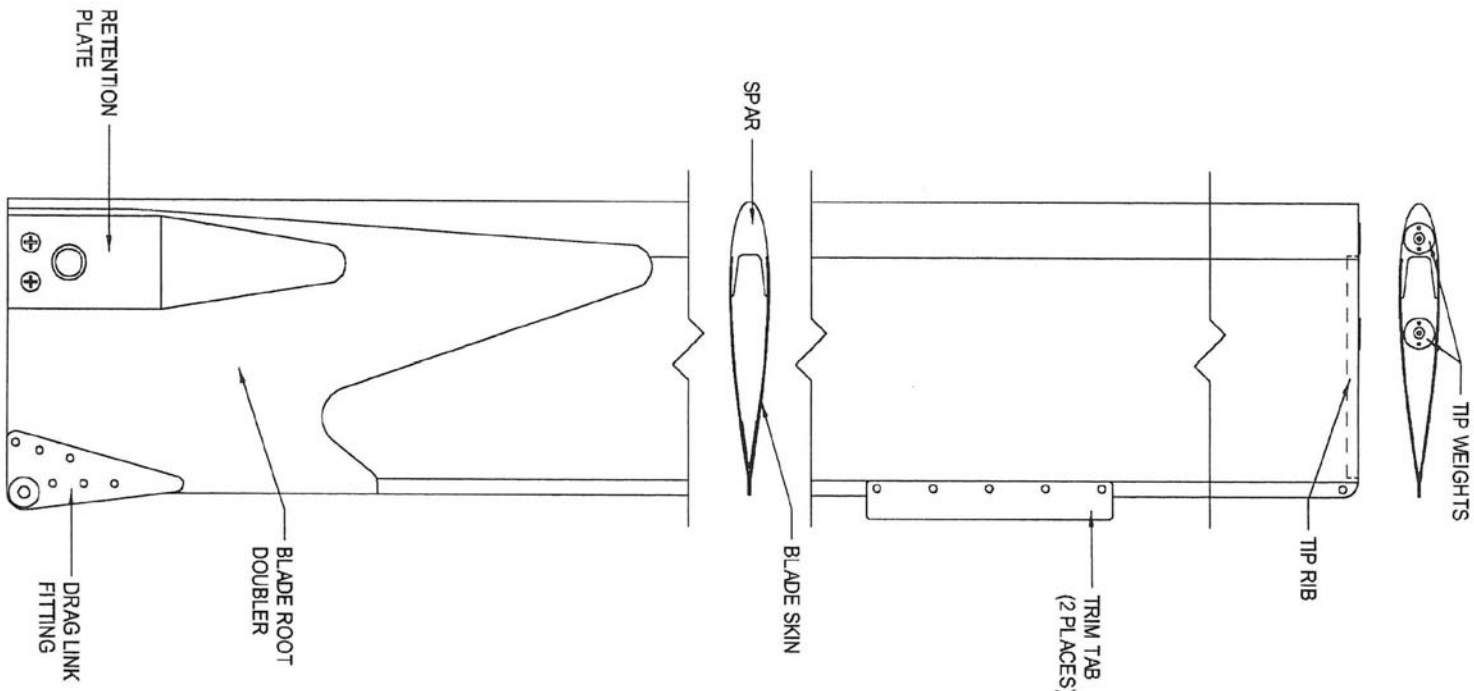
TRACKING BLADES WITH THE ENSTROM ROTOR SYSTEM

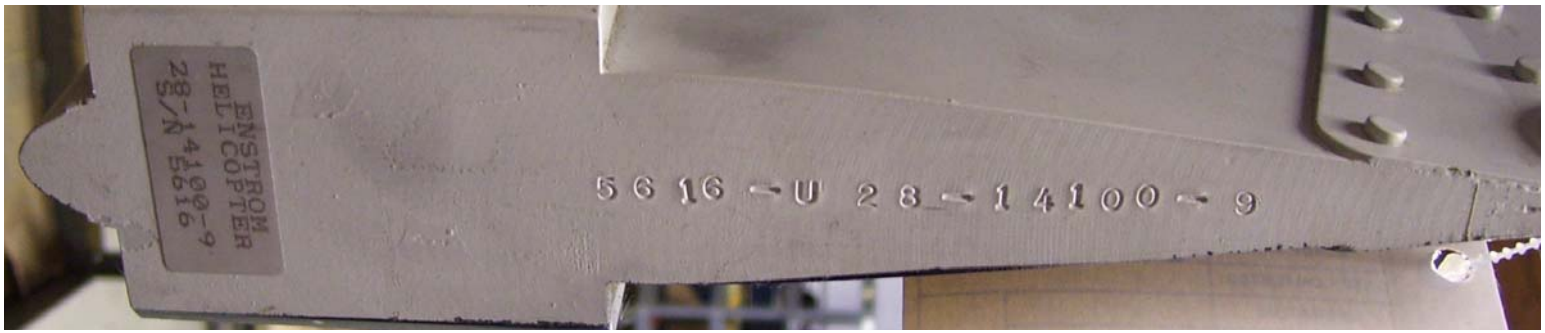
Experience tells us that some of the earlier published information on how to track the Rotor system isn't really optimum. This procedure should be used anytime the rotor system needs to be tracked.

Blade History

- **Enstrom has manufactured blades using spars from 4 different suppliers.**
  - **Alcoa (A)**
  - **Reynolds (R)**
  - **Martin (M)**
  - **Universal (Current supplier) (U)**



Identification Markings on Blades

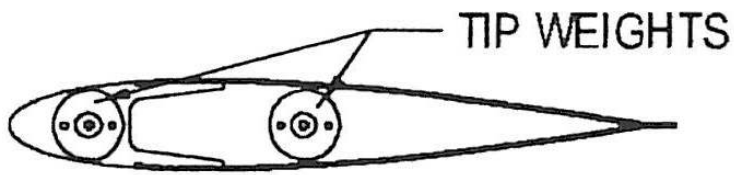


Stamped in the root end of the blade:

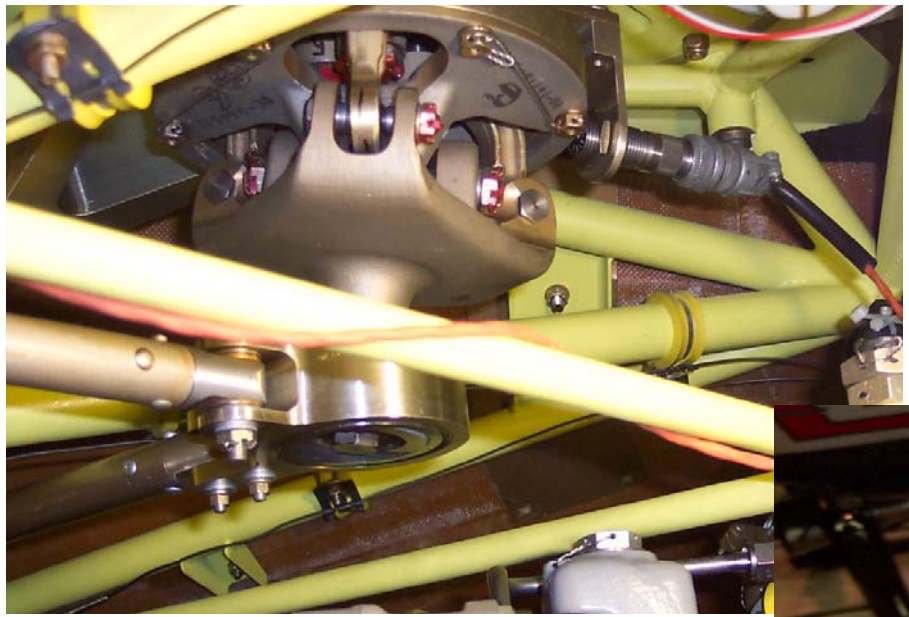
- **5056-U is the serial number of the blade and the spar manufacturer**
- **28-14100-9 is the part number of the blade**

Blade weight and tip weight distribution information.

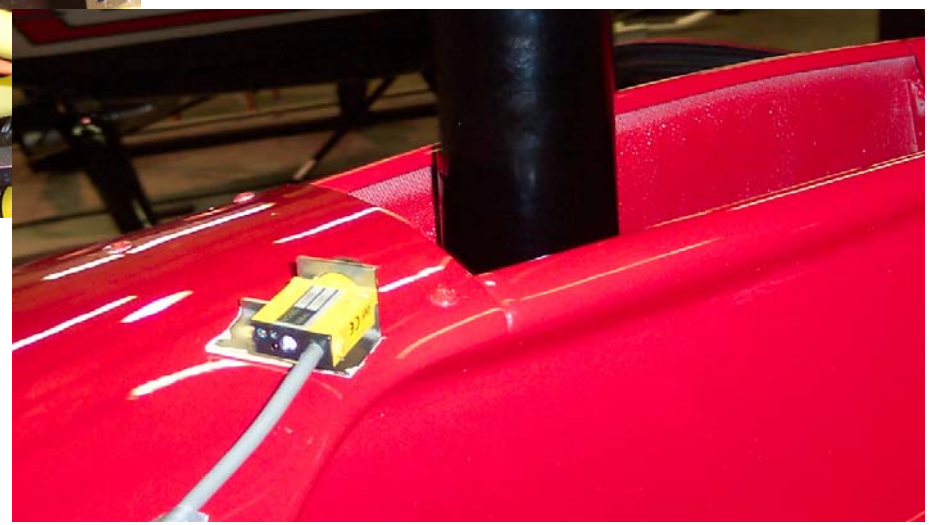
- **51.12 is the blade weight before it is balanced**
- **B.6.1.0:**
  - **B is the weight classification of the blade**
  - **6.1.0 is the distribution of the tip weights (75% in the front pocket**



INSTALL THE MAGNETIC PICKUP ON THE 480 OR THE OPTICAL SENSOR ON THE PISTONS



480 INSTALLATION

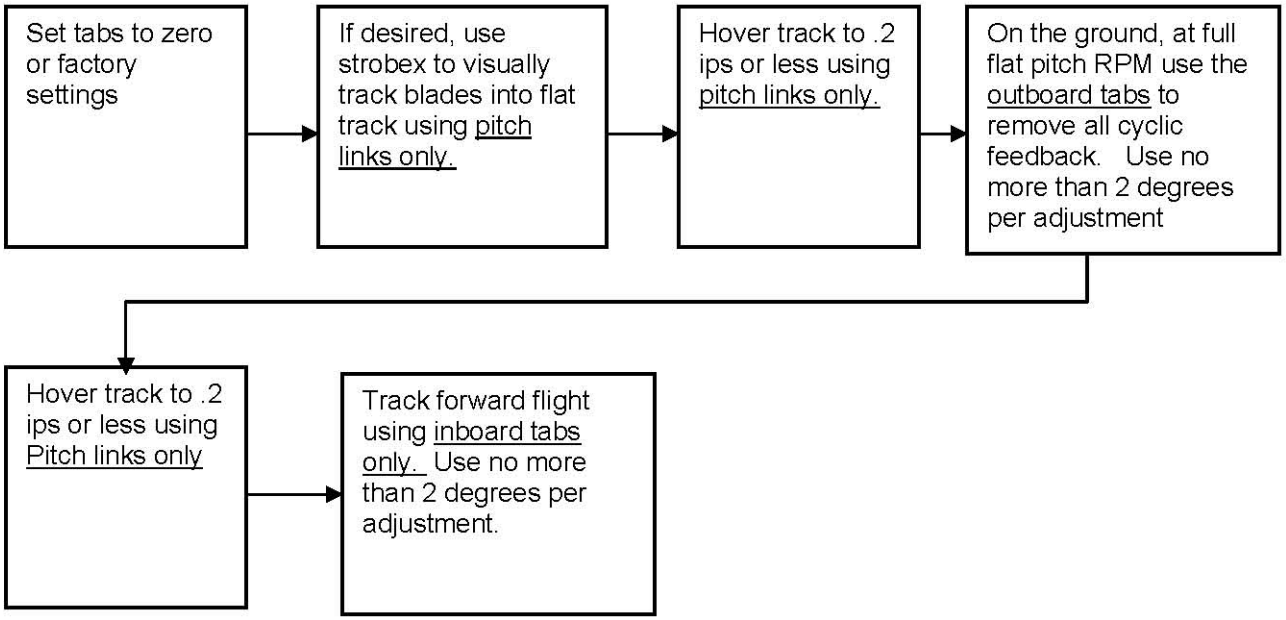


280FX INSTALLATION

VERTICAL VELOCIMETER INSTALLATION

480 INSTALLATION

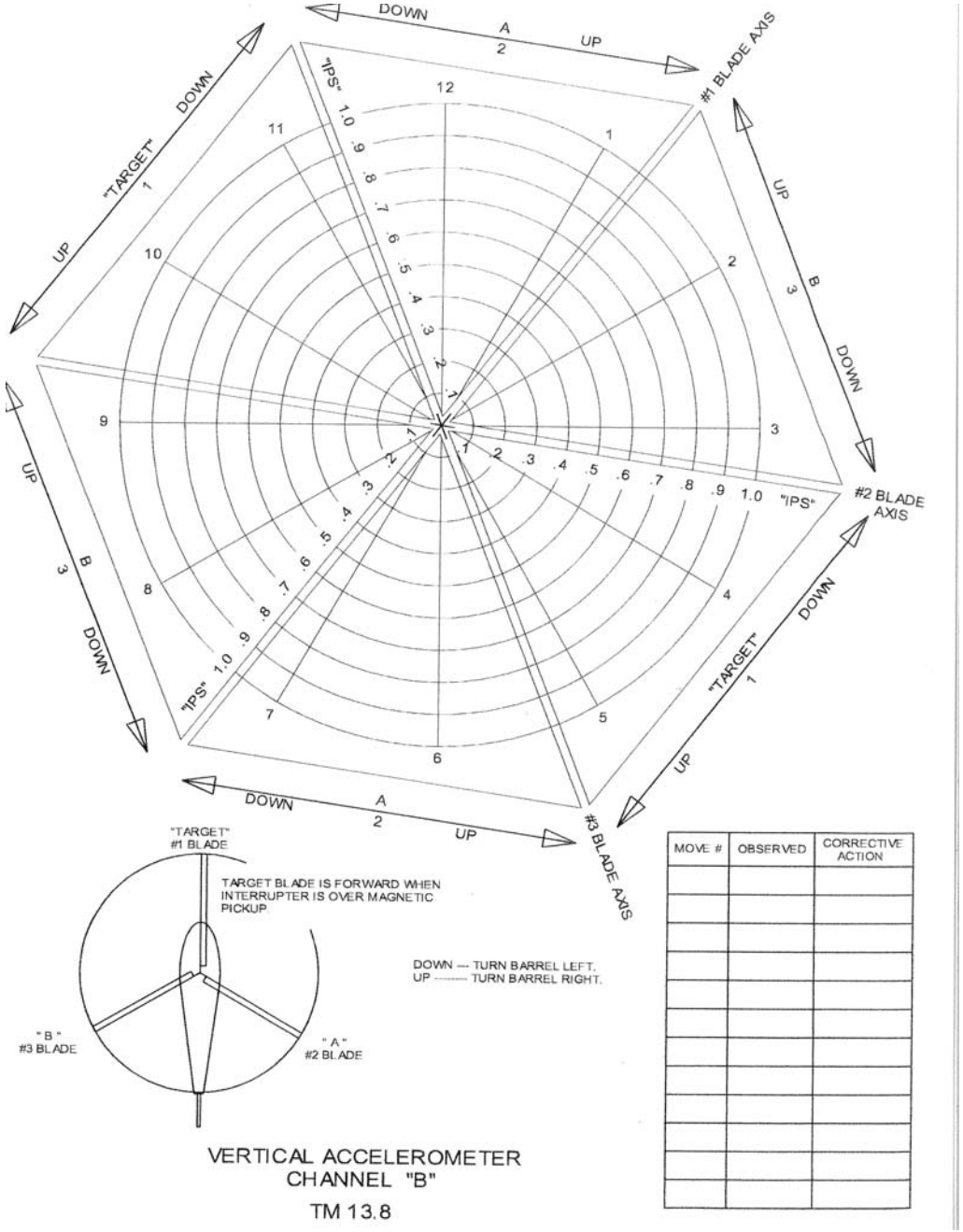
PISTON HELICOPTER INSTALLATION

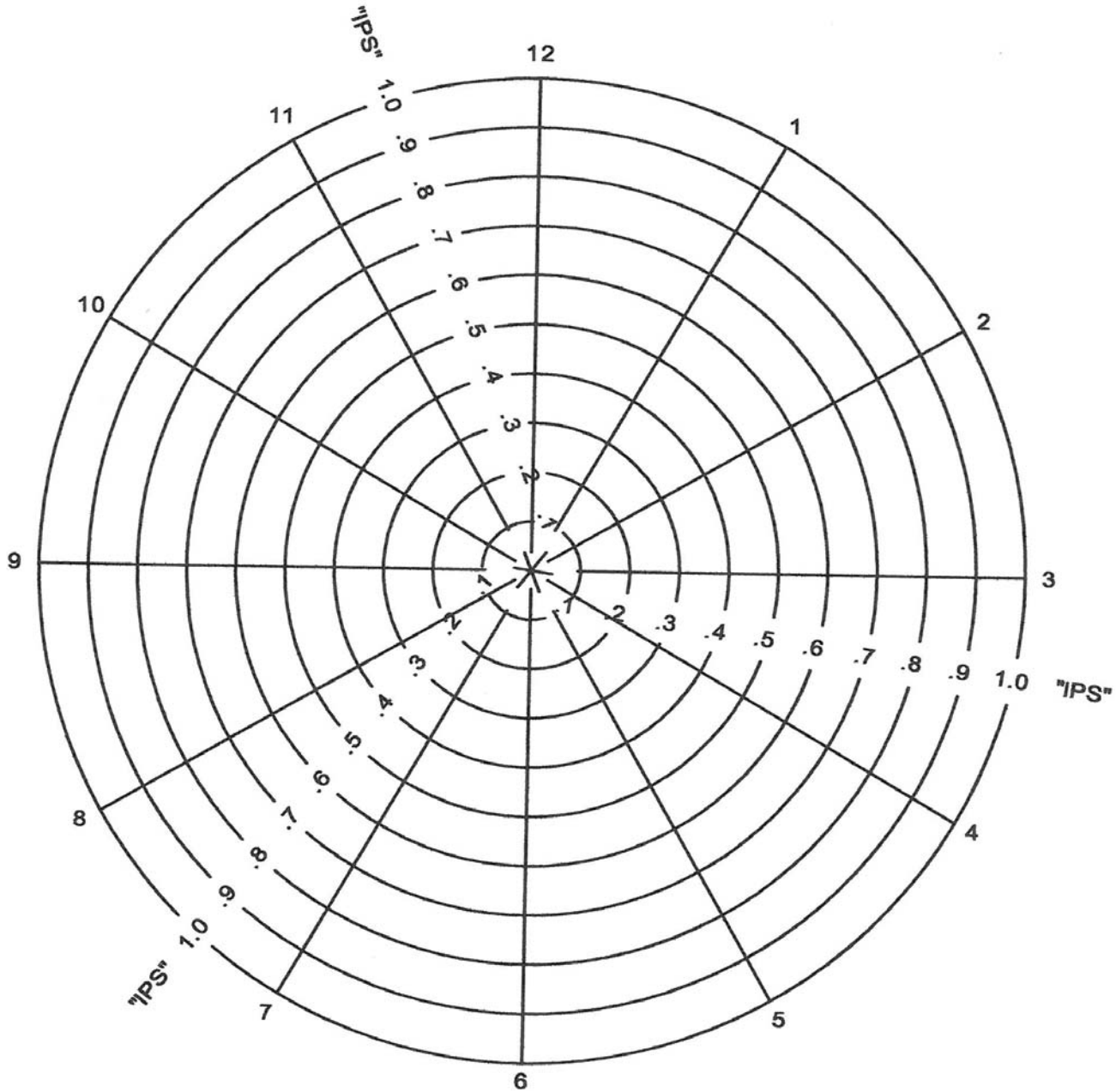


ENSTROM BLADE TRACKING PROCEDURE

1. **Grease main rotor hub.**
2. **Bleed dampers.**
3. **Set the blade tabs to the blade info sheet or to zero.**
4. **Visually verify that the track is reasonably close.**
5. **Track the hover to .2 ips using pitch links.**
6. **Eliminate cyclic feed back using outboard tabs.**
7. **Re-track hover using pitch links.**
8. **Track forward flight using inboard tabs**

Enstrom Vertical Accelerometer Polar Chart




12
1
2
3
4
5
6
7
8
9
10
11
.1
.2
.3
.4
.5
.6
.7
.8
.9
1.0
"IPS"

TRACKING PROCEDURES

- Ground run the helicopter with the blades at full RPM, flat pitch.
- Verify that the blades are in a reasonable track
- Hover the helicopter and record the ips readings.
- Track the helicopter to .2 ips or less using pitch links.

- Enstrom recommends tracking with a polar chart and not with a strobe light. The purpose of blade tracking is to reduce vibration and the lowest vibrations are not necessarily the result of the blades being perfectly in track.

.Do not make changes to the tip weights!

1 up	
1 dn	
2 up	
2 dn	
3 up	
3 dn	

ISOLATING CYCLIC FEED BACK

- Run the helicopter on the ground at 100% N2, collective full down.
  - On the 480's pulling a bit of collective to get the helicopter light on the skids will make feeling the feedback more accurate. Most 480s have some feedback with the collective all the way down that is actually mechanical, and not caused by the blades.
- Move the cyclic forward and aft over about a 6 inch arc at about one cycle per second and observe its feel. It should feel smooth with no notch or hesitation.
  - NOTE: Severe Feed back will cause stick shake but feed back can still be present when there is no stick shake.

If the cyclic is smooth, the tracking can move into the forward flight phase, if there is feedback present, shut down.

- Add 2° up tab to #1 blade and run the helicopter again.
- Note on the chart the results of the tab angle.
- If the cyclic is smooth the procedure has been completed. If it feels the same or worse, try 2° down on the same tab.
- Continue trying each tab, up and down until the cyclic feedback is eliminated.
  - Generally, if the feedback gets worse on a tab adjustment, the opposite tab adjustment should make it better.
  - One tab adjustment on one blade should remove any cyclic feed back.
  - If adjustment to a tab does not make the feed back better, then take it out again. don't leave tab that is not effective.

•If tabs have been adjusted to correct cyclic feed back, the hover will have to be re-tracked.

•Once the helicopter hover track is .2 ips or better, the forward flight can be tracked.

•Forward flight is tracked using the same polar chart and adjustments are made using inboard blade tabs.

Clock Angle Corrections

If the blades are not responding to the pitchlink or tab moves, and the plots move around in a circle, a clock angle correction is indicated.