3.2.6 Cooper-Harper Rating Scale

*General description* - The Cooper-Harper Rating Scale is a decision tree that uses adequacy for the task, aircraft characteristics, and demands on the pilot to rate handling qualities of an aircraft (see Figure 6).

*Strengths and limitations* - The Cooper-Harper Rating Scale is the current standard for evaluating aircraft handling qualities. It reflects differences in both performance and workload and is behavioral anchored. It requires minimum training and a briefing guide has been developed (see Cooper and Harper, 1969, pp. 34-39). Cooper-Harper ratings have been sensitive to variations in controls, displays, and aircraft stability (Crabtree, 1975; Krebs and Wingert, 1976; Labacqz and Aiken, 1975; Schultz, Newell, and Whitbeck, 1970; Wierwille and Connor, 1983). Harper and Cooper (1984) describe a series of evaluations of the rating scale.

Connor and Wierwille (1983) reported significant increases in Cooper-Harper ratings as the levels of wind gust increased and/or as the aircraft pitch stability decreased. Ntuen, Park, Strickland, and Watson (1996) reported increases in Cooper-Harper ratings as instability in a compensatory tracking task increased. The highest ratings were for acceleration control; the lowest for position control; rate control was in the middle.

*Data requirements* - The scale provides ordinal data that must be analyzed accordingly. The Cooper-Harper scale should be used for workload assessment only if handling difficulty is the major determinant of workload. The task must be fully defined for a common reference.
Thresholds - Ratings vary from 1 (excellent, highly desirable) to 10 (major deficiencies). Noninteger ratings are not allowed.

Sources -
Crabtree, M.S. Human factors evaluation of several control system configurations, including workload sharing with force wheel steering during approach and flare (AFFDL-TR-75-43). Wright-Patterson Air Force Base, OH: Flight Dynamics Laboratory; April 1975.


Lebacqz, J.V. and Aiken, E.W. A flight investigation of control, display, and guidance requirements for decelerating descending VTOL instrument transitions using the X-22A variable stability aircraft (AK-5336-F-1). Buffalo, NY: Calspan Corporation; September 1975.

