# Conversation Pieces

***Technically intriguing items from TRW, guaranteed to add luster to your conversation and amaze your friends.***

***Automatic Zero-visibility Landings*** If you travel by air frequently, you've probably had the experience of flying *almost* to the airport of your destination and then being diverted to a nearby city. The usual reason—fog. The radio beacons which guide your plane through its instrumented landing system (ILS) don't function accurately enough at altitudes under a few hundred feet. And that's where the fog is. Their accuracy is degraded because close to the ground the long wave-length radio signals on which conventional ILS operate are scattered by heavy rain or fog, and they reflect off buildings, trees, and other ground-based objects.

Suppose that instead of a low frequency radio beacon, however, you had very high frequency (i.e., gamma radiation range) signal with which to work. Properly collimated, such a signal could penetrate the fog and rain while remaining immune to the problems of ground scattering. This is the approach TRW Systems has taken in its Nuclear Instrumentation Landing System (NILS). NILS shows promise of guaranteeing safe, automatic, zero-visibility landings. It can be used as a primary guidance device or as an independent monitor for the next generation of microwave guidance systems now being developed by the Federal Aviation Agency.

NILS is a short-range guidance system which provides highly accurate aircraft position information during the last phases of descent, touchdown and rollout (see Fig. 1). Two NILS beacons give the aircraft position information while it is on the final portion of the approach, and two others as it lands and rolls down the runway. Each beacon contains a collimated radioactive source which emits high frequency radiation. Mechanical shutters within each beacon modulate this signal into two overlapping beams of radiation (see Fig. 2). On board the descending plane is a radiation detector. The radiation pattern of the pairs of beacons is such that when the plane is exactly on-course, it receives equal amplitudes of all four frequencies.

Under joint Atomic Energy Commission and Federal Aviation Agency sponsorship, we have developed and are testing full scale versions of it. Now we are getting it ready for extensive testing by the FAA. If NILS helps to land your plane in a fog some night, you'll know that it has been checked out by some of the best pilots and engineers in the U.S.

*Fig. 1 NILS System*

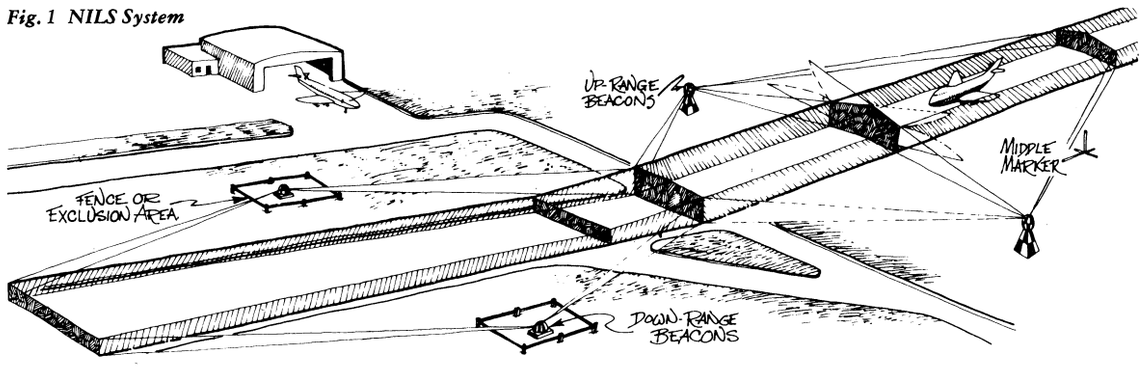
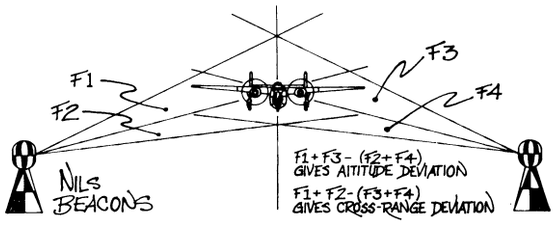



*Fig. 2 NILS Beam Formation*




For further information, write on your company letterhead to:

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