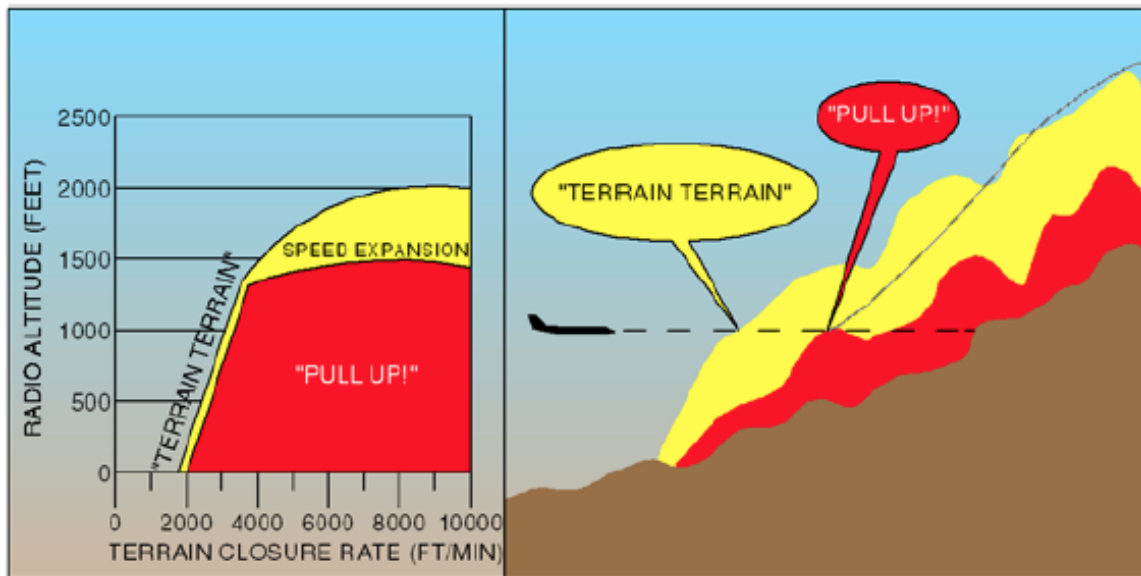


TAWS Overview

What Is TAWS?

Terrain Awareness Warning System (TAWS) is an aircraft system intended to prevent inadvertent controlled flight into terrain (CFIT). When a TAWS equipped aircraft has inadequate terrain and/or obstacle clearance ahead, based on the system's projected flight path, audio and visual warning alerts are issued. These systems utilize GPS position along with a world terrain database to provide Forward Looking Terrain Avoidance (FLTA).



TAWS Regulations in Canada

Canada's TAWS regulations were initially proposed more than a decade ago with implementation intended to harmonize with the FAA requirements. Finally after much delay, Canada's TAWS regulations came into force on July 4, 2012. All affected aeroplanes were required to be in compliance by July 4, 2014.

Transport Canada's Advisory Circular # [AC 600-002](#) provides an excellent summary of the current Terrain Awareness Warning System (TAWS) regulations.

TAWS Class B

Class B TAWS provides a very good level of protection at a reasonable cost. In addition to Forward Looking Terrain Avoidance (FLTA) these systems also alert flight crews to:

- Excessive Rate of Descent with respect to terrain
- Premature Descent Algorithm (PDA);
- Negative climb rate or Altitude Loss before acquiring 213 meters (700 feet) terrain clearance after takeoff or missed approach
- Descent to 500 feet above terrain or nearest runway elevation during a non-precision approach.

Class B TAWS is the minimum standard required for private turbine-powered aeroplanes configured with 6 or more seats, excluding pilot seats, commercial subpart 703 air taxi aeroplanes configured with 6 or more seats excluding pilot seats and Commuter subpart 704 Aeroplanes configured with 6 to nine passenger seats excluding pilot seats.

TAWS Class A

Class A TAWS are significantly more costly than Class B systems but they provide a much higher level of protection. Class A systems have all the features of Class B systems plus they include the alerting features of legacy Ground Proximity Warning System (GPWS) including:

- Excessive Closure Rate to Terrain
- Flights above terrain with less than 152 meters (500 feet) terrain clearance while the aeroplane is not in landing configuration
- Excessive Deviation Below Glideslope

Class A systems are required in Commuter subpart 704 Aeroplanes configured with 10 or more passenger seats, excluding pilot seats and in aeroplanes operating under subpart 705 airline operations.

HTAWS

HTAWS refers to "Helicopter Terrain Awareness and Warning System". HTAWS is similar to the fixed wing systems except that it utilizes different algorithms to suit the unique capabilities of helicopters.

Canada and most other countries do not have a regulatory requirement for installation of HTAWS however many operators have installed systems to meet the needs of their safety

conscious clients. The FAA published a new regulation in 2014 which requires HTAWS to be installed on Helicopter Air Ambulances.

Available Systems

Honeywell, Universal, Sandel and Garmin each manufacture TAWS and/or HTAWS systems. The choice of which specific system to install requires careful consideration. The final decision is can be made after reviewing variables including, compatibility of existing installed equipment, display requirements, available panel space, existing STC approvals, equipment cost and any other planned system upgrades.

Maxcraft has installed systems from each of these manufacturers in a variety of aircraft types and notes that each product has niches where they are the obvious choice.

Maxcraft holds several TAWS STC approvals including the Sandel ST3400 Class A TAWS in the Beech 1900C/1900D aircraft and the Garmin GTN750 GPS/NAV/COM with Class A TAWS in the Beech 1900C. Maxcraft expects to receive a new Transport Canada STC in early 2015 which will approve HTAWS enablement in the Garmin GTN750 for the EC135 helicopter.



Garmin - GTN750 TAWS



Sandel - ST3500H HeliTAWS