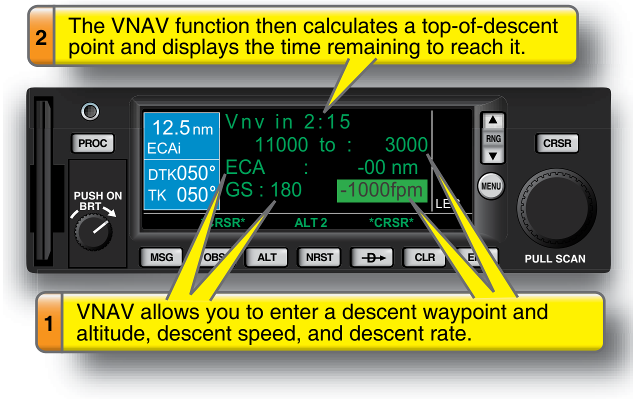

Figure 3-31. *Planning a descent with an advanced avionics unit.*

It is a good idea to cross-check the results of your manual descent calculations with the results produced by the computer. Many RNAV units do not display a waypoint for the planned top-of-descent point. However, there may be an "approaching VNAV profile" message that anticipates the descent point and cues the pilot to begin descending. Caution is advised that some systems calculate the vertical flight path dependent on the current airspeed/groundspeed values. Lowering the nose and gaining airspeed in the descent may confuse you into perceiving a false vertical goal or vertical rate, resulting in failure to meet the crossing restriction with some systems. Determine if the system recomputes the airspeed/groundspeed, or if you must enter the descent airspeed during the VNAV programming.

Managing Speed

Up to this point the focus has been on the task of losing excess altitude. For example, in the situation shown in *Figure 3-27,* you are faced with the requirement to reduce altitude from 11,000 feet to 3,000 feet. Most descent scenarios also present the challenge of losing excess speed. In piston aircraft of modest performance, losing excess speed seldom requires much forethought. Slowing from a cruising speed of 120 knots to an approach speed of 100 knots requires little planning and can be accomplished quickly at almost any point during a descent. Flying higher performance aircraft requires a closer look at concepts of excess altitude and excess speed. Higher performance piston engines usually require descent scheduling to prevent engine shock cooling. Either the engines must be cooled gradually before descent, or power must be constant and considerable in the descent to prevent excessive cooling. In such instances, a much longer deceleration and gradual engine cooling must be planned to prevent powerplant damage. Additionally, the turbulence penetration or V_A speeds should be considered with respect to weather conditions to avoid high speeds in turbulent conditions, which could result in overstressing the airframe. Drag devices such as spoilers can be of great advantage for such maneuvers. In the scenario in *Figure 3-27,* a cruising speed of 270 knots is inappropriate as the aircraft descends below 10,000 feet, and even more so as it enters Class C airspace. Therefore, descent planning must include provisions for losing excess airspeed to meet these speed restrictions.

Some sophisticated FMSs are able to build in a deceleration segment that can allow the aircraft to slow from the cruise speed to the desired end-of-descent speed during the descent. This type of navigation system allows you to maintain the cruise speed up until the top-of-descent point and calculates the deceleration simultaneously with the descent. A deceleration segment is illustrated in *Figure 3-32.*

Simple FMS units such as GPS RNAV receivers assume that you will slow the aircraft to the planned descent speed before reaching the top-of-descent point. ATC timing may preclude this plan.

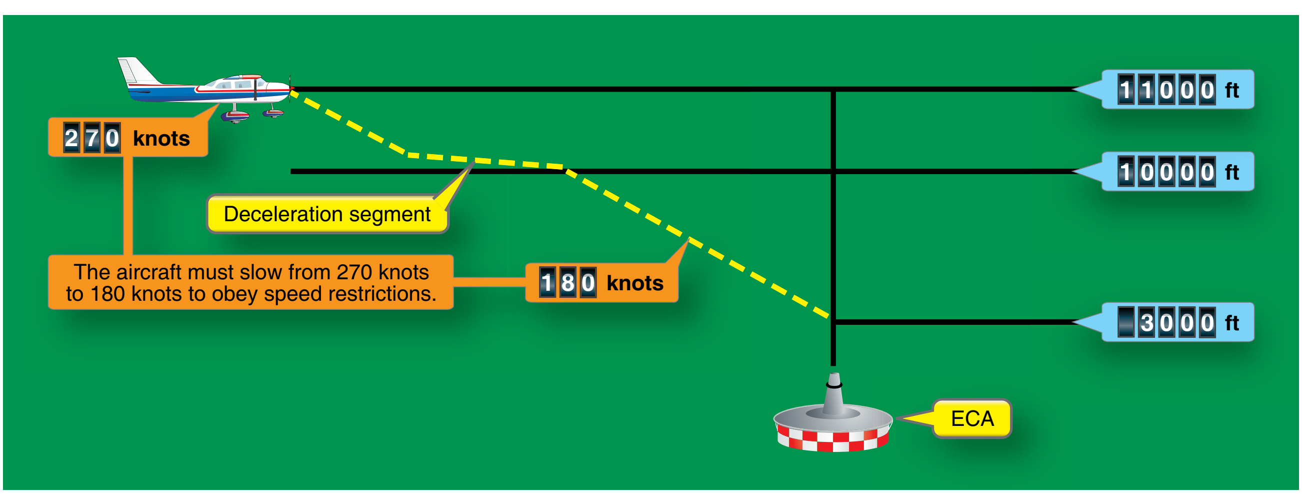

Figure 3-32. *A deceleration segment planned by a more sophisticated FMS.*