

Piper Comanche Modern Digital (& Legacy) Autopilot Overview

as of 2/2023 by CJ Stumpf

There are THREE modern digital autopilot models available covering ALL Comanche models. They are, in order of approval, Genesys' STEC 3100, Garmin's GFC500, and Trio's ProPilot.



Genesys STEC 3100



Garmin GFC 500



Trio ProPilot (Choice: Round or Rectangular Head
note: Comanche servos have capstans, not the arms shown)



Owners report happiness flying with all three digital models, as well as the legacy analog Piper Altimatic/Century models.

Many early Comanches left the factory without autopilots, others with very limited AutoControl units, and later models with capable Altimatics which nonetheless are aging. While we recommend shoulder harnesses as your first upgrade, Autopilots are so high on the list of safety equipment, that FAA initially included them in the FAA "Non-Required Safety Enhancing Equipment" (NORSEE) expedited approval program. (FAA then offered experimental autopilots their own path: Autopilots by necessity interface with the control systems, and redefined NORSEE to require no interface to primary systems).

First, a note on the Legacy: Remarkably, at 50 years old, the legacy models still perform beautifully, and many include electric trim. Some definitely need a tuneup, as the "griplets" connectors loosen over decades, A famous sign of this? Loss of reliable altitude hold. Many recommend Autopilots Central in Tulsa, OK - however if you have one and haven't had a tune-up yet, act soon.

Common Features of the newly approved Garmin, STEC, Trio digital autopilots:

All three can track the magenta line, intercept and hold altitude, have Heading (follow Pilot provided Course) and Track (follow / return to a GPS flight plan) modes, have max/min airspeed "envelope protection", have O Sh*t! "level" and "get me out of here!" options, and can fly an approach, including glide slope/glide path. Trio certificated flies the GPS overlay of ILS and VOR, the other two fly either mode.

Differentiators:

STEC is an acknowledged master of Autopilots with over 1000 AML projects to date. It is the only one to include integrated electric trim in all models (trim is an optional servo in Garmin, Trio does not offer a trim servo but works with separate electric trim.). Yaw is optional. The STEC 3100 added a smart new 5 second cleaning cycle at startup. The fact that its servos apply to all its models is a testament to solid design.

Garmin is the option king, as long as it's Garmin. With 2, 3, and 4 servo options (the latter 2 being optional Electric Trim and Yaw) and nifty optional TOGA and SmartGlide if you add some additional Garmin equipment, Garmin's upsell feature array is impressive. While Dynon comes close, Garmin is the sole company that can currently provide an entire STC'd panel for a Comanche. Be aware that the GFC 500 requires at minimum a GI 275 (singles can get away with a G5) and the STC specifies Garmin GPS so use of Avidyne is by Avidyne STC and as with Garmin 430/530, will therefore likely not include VNAV. A status symbol to some, a sign of conformance to others, all one vendor has advantages, and Garmin's network of approved installers is impressive.

Many Comanche owners opt for the optional trim and the optional trim switch. The optional yaw servo, while almost considered a requirement for a Bonanza, is generally considered less interesting for the stable Comanche singles which do not have the same tendency to wag. (The twins are a different discussion and not covered here.)

Trio is remarkably standalone out of the box. It integrates beautifully with GPS and EFIS, yet out of the box it does not even require a GPS to fly Heading mode, and is happy to fly with guidance from even a handheld GPS. Despite being capable, it's main cited differentiator is its remarkably low cost. Its low installed price is less than half it's competitors, and unlike Garmin, it requires no additional equipment.

Launch issues (all now fixed), Models covered, Limitations as of 2023:

1. STEC 3100 had teething problems with settings, now fixed.

Approved for all PA-24 including -400! (note: PA-30/39 approval expected 2023Q1 (yay!)). Only one with integrated auto-trim.

2. Garmin GFC500 had a runaway trim issue, resulting in Garmin's request to turn off the electric trim servo (or the entire system) while new software approved, now fixed.

Approved for PA-24 & PA-30/39 except -400 & some 260C turbos.

(note: Singles require G5 (+GAD 29) or GI 275. note: Twins require a GI 275 ADAHRS source and a GTN are required, and note: for "smart glide" you must have a GTN Xi)

3. Trio ProPilot had some delays & problems with infant mortality, now fixed.

Approved for all PA-24 (including -400!). Note: Engineering and documentation for PA-30/39 complete and awaiting test flight & submission. As ACO requested 1 project at a time, awaiting completion of the current submission of an EFIS etc. software update.

(EASA note: STEC 3100 EASA approval pending, anyone have EASA status for other 2?)

Prices:

STC Group's Trio ProPilot, due to a design team of DER/A&P/ME Comanche Owners, is less than half the (installed) cost of the others.

Genesys' STEC 3100 has upgrade pricing of approx +\$10,000 from a 2-servo w/ electric trim, approx +\$13,000 from a 1-servo.

Garmin's GFC 500 requires G5 + GAD 29B, or GI 275, + Garmin GPS (must be a GTN version for some features)

ComancheZOOM (CZ) resources & Demos from Providers, Owners, Installers, FAA:

Sonny Mounicou's GFC 500 CZ, of his install and post-install flight of his 4-servo GFC 500, is amazing and inspiring.

Rob Lenert's Altimatic & Brittain & Century CZ, New Life for Old Autopilots, includes two sections: Operations & Capabilities, and a detailed Maintenance & Configuration section, likewise an amazing & inspiring resource for legacy autopilots.

CZ by STC Group on Trio ProPilot, Garmin on GFC 500, Genesys on STEC 3100 each are direct from the Corporate STC Holder - and is an example of how the Comanche Community organised to separately convince each of Garmin, Genesys, and STC Group, to do the STC for our AML addition. To be clear, None of these \$100,000+ STC investments would have happened in this timeframe, if ever, without the organization and determination shown by the Comanche Community.

Trio ProPilot live install will again happen at ComancheTown SNF, likely 8:30-noon, date TBD. The demo Comanche already has Wiring (1+ hour to run w/floor already open, thanks to Greg Piehl), Tray (for square unit head), Drilled bracket holes, Breaker & On/Off switch, Labels (note that on/off switch is required for square head, already integrated with round head). The expected install time to fit the bracket-mounted capstan servos, attach bridle cables to control cables, and electrically connect to breaker, switch, and GPS is a mere 3 to 3.5 hours. Post maintenance test flight is separate 😊

Hope you find this information of use.

CJ Stumpf for ComancheZOOM '23