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June 2022

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ALTERNATIVE CONNECTIONS



Approach Fast Stack and Its Harnesses

When anticipating an avionics upgrade, especially a whole-panel upgrade, we tend to put a lot of thought into the equipment, with consideration for how we plan to fly, our budget, and what equipment is best for our mission. A big part of this process is compatibility. “I like this box, this ADS-B solution, this autopilot but — do they all work together?”

My role as a consultant is to help aircraft owners lay out a plan that meets these goals, with no equipment conflicts. We tend to give little thought to the part of the installation that ties all this equipment together and makes it a system. We think about the avionics panel and the tools we use to communicate and navigate our way through the ATC system, whether it be VFR, Light IFR or True IFR. But the forgotten pieces I’m talking about are the avionics harnesses, or what the Brits like to call the “loom.”

If you have ever peeked under your panel, especially a legacy panel that has gone through numerous avionics upgrades through the years, you often find a “rat’s nest” of wires and cables, some that are no longer connected to anything. We hear stories of owners doing major panel work who, in the process, end up removing a significant amount of harness, much of which was no longer doing anything. Frankly, to me, that speaks to the quality of the avionics shops that have had their hands under there. A quality shop is not going to leave old wires behind that go to nowhere.

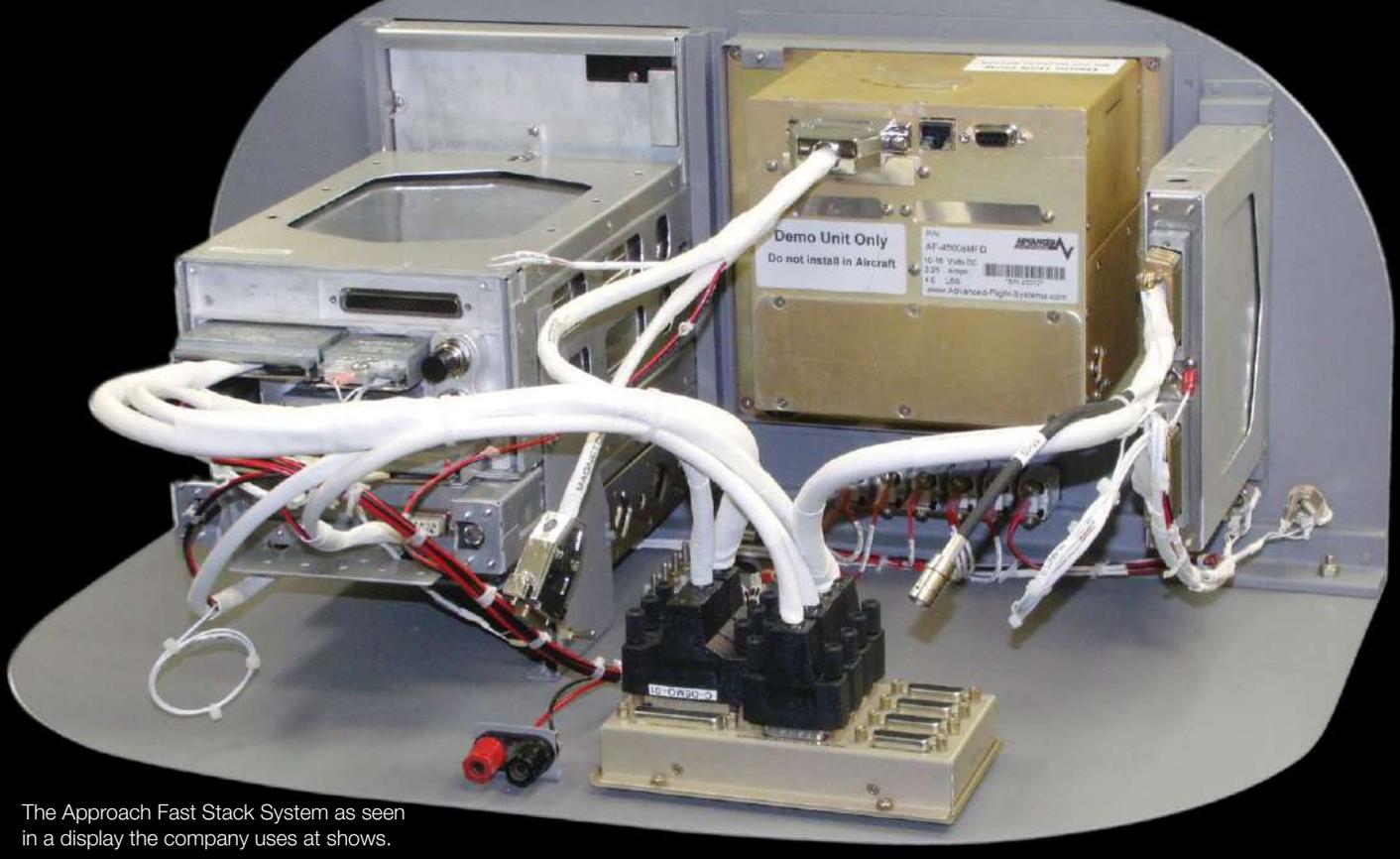
Harnessing up your new avionics panel has changed over the years. If you look back to the legacy avionics you saw in the ’60s and ’70s, and specifically the connectors and the wires/cables used, and compare that to today, you’ll see a lot of changes. First, all the connectors were solder-type. At some point, avionics manufacturers moved away from solder- to crimp-type connectors. I’m not sure if OSHA put pressure on the industry to get away from the use of solder, which had lead and frankly

was unhealthy to breathe, or that installers just wanted to get away from the cold solder joint, the nemesis of the harness man.

Bottom line: Today almost all the connections we use in aviation harnesses are crimp-style and require an avionics shop to maintain the tools necessary to do crimp style wiring harnesses. We also see the choice of wire, or more accurately cables, most often used for antenna connections have changed. RG-58, the black stuff you can still find in legacy installations, was single-shielded and broke down over time. It is no longer used and was replaced with better quality, double-shielded cable.

I think we knew about this problem for a long time, but the advent of Wide Area Augmentation System (WAAS) GPS systems brought it all to a head. WAAS systems are much more sensitive to interference and would not perform with RG-58 or any single-shielded antenna cable, or next to another unit that transmitted over RG-58. I remember the first time we learned this lesson at Eastern Avionics, shortly after Garmin started doing WAAS upgrades to their non-WAAS GNS-430s and 530s. The first aircraft we upgraded was a regular customer’s Baron with dual 430s.

With the upgraded WAAS units back in the Baron, any attempt to transmit on either radio resulted in the loss of the GPS signal. Not only were the antenna cables an issue, but we also discovered that the Emergency Locator Transmitter (ELT) in the off position was creating a harmonic that also caused the GPS signal to drop. My understanding is today, replacing single-shielded antenna cable is *required* for the GNS and GTN or Avidyne navigators, or any new WAAS GPS installation.



The Approach Fast Stack System as seen in a display the company uses at shows.

The process of upgrading an avionics panel starts with removing all the units and the mounting trays. In many cases, the mounting trays for a typical new or legacy center stack are attached to each other, making a mounting system. The trays for units being discarded are removed from the system and the new configuration with the new trays is created. Busy avionics shops like Eastern Avionics (now APG), Gulf Coast Avionics, Pacific Coast Avionics, and Sarasota Avionics likely have a full-time wiring guy whose only job is to wire up one panel after another. The new avionics are wired and those units remaining from the old stack get modified to accept their new partners. The system is tested on the bench before being installed in the aircraft, and the installer has only to mount the new system and attach power and ground and antenna connections. This is the way it has been done for years. Then, along comes the hub wiring system, an alternative to the traditional art of harnessing.

The Road to Approach Fast Stack

This is a story of two companies that came together. An entrepreneur from Provo, Utah, essentially invented what is now called the “hub” system. We will talk about that concept in some detail. That company was known as Approach Systems and their primary market was experimental builders.

Meanwhile, Tom Hass, with lots of avionics experience, opened his new avionics shop, Park Rapids Avionics, in 2001 in Minnesota. Tim Hass joined the company in 2003. In 2006, a Piper Malibu owner came to Park Rapids Avionics with an avionics upgrade in mind, and that pilot was aware of Approach Systems and liked it and wanted it for his Malibu upgrade. He introduced the Hass’s to the owner of Approach, who just happened to be thinking beyond Approach, and Park Rapids decided to purchase the company. Approach Fast Stack was born. It was decided that Tim would grab the reins and run the new division.

The Approach Fast Stack System

The heart of the Fast Stack System is the hub. The principle of the system is that all individual harnesses (provided by Approach Fast Stack) for each piece of avionics plugs into the hub, which is mounted to the firewall or some other location under the panel. Approach offers two different hub options:

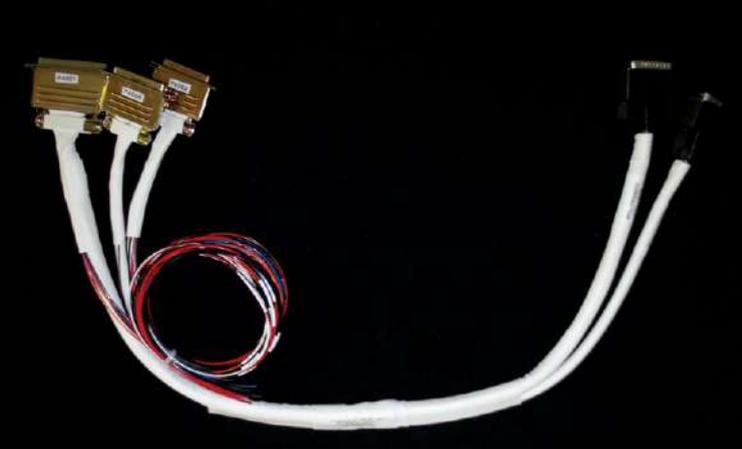
PRO HUB (IFR CENTRIC)

The Approach Fast Stack Pro Hub is ideally suited for IFR-configured instrument panels and can be retrofitted to any older or newer aircraft, certified, or home-built. The Pro Wiring System is compatible with most nav/GPS/comm, modern audio panels, intercoms, moving map displays, VHF omni-directional range (VOR) indicators, Horizontal Situation Indicators (HSIs), Radio Magnetic Indicators (RMIs), Automatic Direction Finders (ADFs), annunciators, mode control, and just about any “send and receive” RS-232 formatted electronic device. The Pro Wiring System is designed for a full Garmin, Apollo, or Bendix/King stack and other legacy avionics and includes an autopilot interface.

PRO-X HUB (IFR EFIS CENTRIC)

The Fast Stack Pro-X Hub is designed for an IFR, Electronic Flight Information System (EFIS) centric, configured instrument panel and can be retrofitted to any older or newer aircraft, certified, or home-built. The Pro-X Hub is compatible with (but not limited to) Garmin nav/GPS/comm, audio panels, intercoms, moving map displays, VOR indicators, HSIs, and just about any “send and receive” EFIS.

All Fast Stack Hubs are compact and lightweight, permitting installation anywhere behind the instrument panel. Simply select the appropriate Approach cables for your avionics, plug it in, and you are done. All Approach cables are Mil-Spec Tefzel with proper gauge and shielding. Cable ends are terminated with the connector that connects the hub to the avionics.



Cabling to Avionics

Approach Fast Stack now provides you with the individual pre-made cables that simply plug into your avionics and into the hub. All cables are double-shielded and grounded at the hub (eliminating the possibility of ground loops) and available for the majority of avionics in the marketplace. Simply select the Approach Fast Stack hub for your mission (basic, VFR, IFR, and IFR with EFIS), choose the ready-built cables for your avionics, install the hub, plug in the cables (between the hub and avionics), and you're done.

Why Approach Fast Stack?

Tim Haas does not pretend that the Fast Stack system is a cheaper solution. He suggests that the typical package for a well-equipped IFR panel is about \$3,000. Where it saves is on the labor side. Tim suggests that since the harnesses are already complete and plug-and-play, it significantly saves on installation man-hours.

It's an obvious solution for experimental builders who likely don't have the tools or expertise, much less the desire, to build harnesses. And since the hub system became PMAed for certified aircraft, it has gained popularity in the certified market. In fact, Tim reports that certified aircraft owners, avionics shops, and A&P/IAs represent about 60% of his market.

You know how hard it is to get into an avionics shop these days. Many pilots have discovered that their A&P/IA is more available than an avionics shop but is often concerned about creating harnesses. Your A&P/IA, in partnership with Approach Fast Stack, may be the solution.

Need a harness for a single piece, or a few pieces of avionics, but don't need the whole hub system? Approach Fast Stack can also supply you or your A&P/IA with direct harnesses for conventional wiring installations.

While Tim reports that A&P/IAs are now the largest growing segment of their customer base, they often lack access to the avionics themselves, and that's where the relationship with Park Rapids Avionics comes in. Park Rapids can often provide the avionics, combined with the Fast Stack system, and meet your needs in that area as well.

Also consider that if you have a long-term plan for your aircraft and the possibility that the avionics you install today may not be viable down the road, you can see how easy and affordable it would be to upgrade in the future with the Fast Stack System.

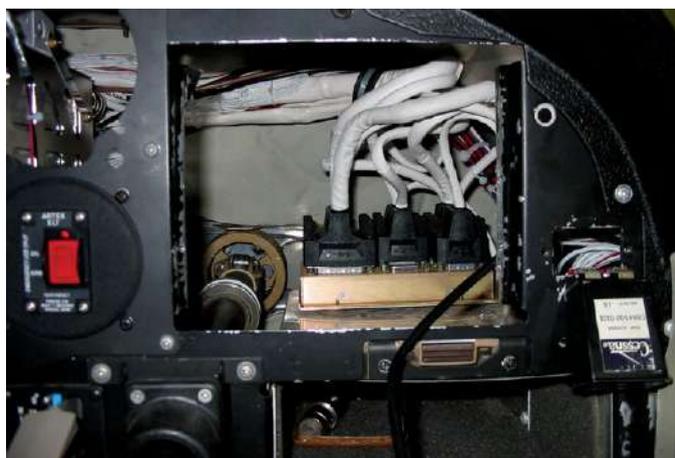
Conclusion

It's obvious that I did not get very technical here. I don't have to because Tim will walk you through the Fast Stack process from start to finish. You can get started by visiting their website at www.approachfaststack.com.

Years ago, avionics shops would quote list price/installed. Most shops today embed the cost of harnesses into the quote with install hours (including harness creation) and with miscellaneous parts. Tim noted that some shops are now adding harnesses as a line item in their quotes so, frankly, it's hard to actually determine just what you are paying for the harness portion of your install. What is obvious is that the Fast Stack system eliminates the chance that years later you will look under your panel and find a "rat's nest."

Thanks for Reading!

Until Next Time ... Happy and Safe Flying! ✈️



**Approach**
Fast Stack
www.approachfaststack.com



Bob Hart purchased his first airplane in 1971 at age 21. He's owned five others since. As a Senior Avionics Consultant at Eastern Avionics, Bob has personally sold over \$20 million in Avionics. Bob now offers avionics advice through many online forums and through his website: www.AvionixHelp.com and is semi-retired. After living in Colombia, South America, for a few years, he is now back in sunny Florida.

Editor's Note: Bob Hart is a regular participant on the Piper Owner Society's forums and is available to answer your avionics-related questions. To contact him, visit www.PiperOwner.org, click the Forums tab, and scroll down to the "Avionics" forum. Piper Owner Society membership is required.