



EAA Chapter 166

Hartford, Connecticut

May 2021



NEXT MEETING

May 22, 2021,
10:00am at
Steve's
Hangar

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A REMINDER TO PAY DUES:
\$21 dues can be paid online [here](#).

OUR CHAPTER IS ACCEPTING DONATIONS FOR OUR RV-12:
Donations of any amount can be made [here](#). Thank you!

PRESIDENT'S MESSAGE

by Steve Socolosky

Greetings fellow EAA 166 Members!

After 30 aviation enthusiasts (EAA 166 Members and a few guests) turned out last month for our first outdoor meeting of 2021 at my hangar, 230 Lindbergh Dive, at Brainard Airport, we're going to do it all over again, only one week earlier, on Sat., May 22, due to Memorial Day weekend. We'll have coffee and a few treats and please feel free to bring your own. Please wear your mask!

Our Ray Scholar, Cheyenne Fuoco, is continuing her journey towards her Private Pilot Certificate and hopes to solo by the end of this month! Last Sunday, Kathy and I were flying back from 44N and we heard Cheyenne in the pattern! Here's a screenshot from FlightAware: looks like 11 landings and 1 go-around on Rwy 20! Way to go, Cheyenne!!!!

At our last RV-12 build, Hartford Jet Center owner and EAA 166 Member, Lindsey Rutka, stopped and would like us to organize a fly-in/youth aviation/cookout/etc., for maybe July or the fall. We will brainstorm at our meeting!



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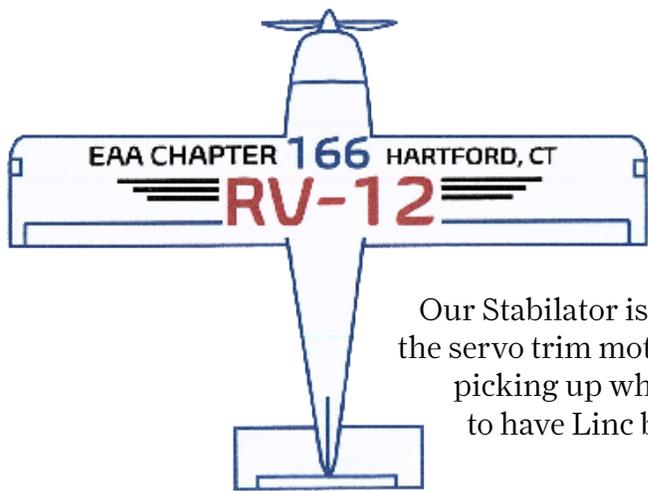
PRESIDENT'S MESSAGE

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Finally, our guest speaker this month will be Mr. Ken Katz on the history of the B-52! This should be very interesting, since many of our members have had some involvement with this great aircraft, like our Ken Benson flying the Pratt B-52 testbed for the JT9D and I made parts for the B-52'S engines when I worked for a Pratt supply chain manufacturer.

I hope to see you all on Saturday, May 22, at 10:00 AM at my hangar!

Blue Skies!
Steve Socolosky



EAA 166 RV-12 BUILD UPDATE

Our Stabilator is attached and torqued! We are assembling hardware to install the servo trim motor and all its linkage. Then we will be on to the Fuselage, picking up where we left off when the plane was at the school. It was great to have Linc back, along with his grandson, Robbie! —*Steve Socolosky*



For more EAA 166 RV-12 build updates and photos, view the builders log [here](#).

LAST MONTH'S MEETING

Last month, the chapter met at Steve's hangar, and Cheyenne Fuoco gave an update on her flight training. Larry Anglisano gave a talk about avionics options for kit builders, and other new and old business was discussed. Read the full meeting minutes [here](#).

Antenna Tech 101: Wire it right the first time

by *Larry Anglisano*

In talking with a number of builders at our last meeting, and others over the years, it seems that antenna system wiring remains one of the more challenging portions of a kit project. Don't shortchange performance—get it right the first time. I'm currently helping a friend troubleshoot a GPS reception problem on his RV-3, and it's proof that even the best-installed antenna installations can require extensive troubleshooting. After 10 years of flawless performance, this particular RV installation is suddenly plagued by a noise interference issue that's causing the Avidyne GPS receiver to shut down during certain engine power settings. It's one reason why you should follow the avionics installations manuals to the letter. And when it comes to the right signal cable and RF connectors, most are pretty specific.

In the bad old days, it was acceptable to wire an entire antenna farm with 50-ohm RG-58 coax, and for some non-critical systems where signal loss isn't an issue that still might be the case. But most good avionics techs will recognize that the old black RG-58 cable can have significant signal loss and RF leakage that can degrade or even kill the performance of co-existing systems, including audio panels and even more critical components like magnetometers and GPS receivers. Unwanted noise is often the result of poor shielding at the cable. Also, the jacket material on old RG-58 might be a fire hazard in a crash, which should be a major consideration. That's why the majority of installation manuals call for (and suppliers primarily sell) RG-142 or better (RG-400), which is low-loss, twin-shielded and if sourced from an aircraft supply house, will likely have a protective jacket that's fire resistant.

A boring, but worthwhile read is the FAA's advisory circular AC 43.13-1B (specifically,



chapter 11) which offers practical guidance and the best practices for selecting the proper cable and connectors, in addition to properly routing them throughout the airframe. And laying in the coax is something you want to do early in the build process because it may not be easy to do well as the project advances. When possible, make the connectors easy to access if you should move or replace antennas later on. Eyeballing the installation manual for Garmin's GTR-series comm radio reveals some specifics on antenna cabling. Garmin prescribes that the coax should be RG142, RG400, or comparable quality, which is pretty much the standard across the board for Garmin and most other brands of equipment.

Almost universally, the antenna connectors that join the cable on both ends will be quick-disconnect BNC and thread-on TNC types. Some are available in right-angle form, which could be extremely useful in tight areas. And speaking of tight areas, don't forget that the body of the connector will need to fit through any bulkhead hole you drill. A typical outside

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Antenna Installs

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diameter of a TNC body is .65 inches, while a bayonet-style BNC might be a touch smaller. Don't skimp on quality, and this hardware isn't cheap, or at least the high-quality stuff isn't.

A dual-crimp AMP male TNC (a common connector for attaching to the female connector on many WAAS GPS antennas, to name one application) sold through Aircraft Spruce (and plenty of other suppliers) is \$20 per connector. You'll pay dearly for good cable, too. RG142 typically sells for \$5.50 per foot, and many builders find it more efficient to source a roll of say, 100 feet or even more. Measure out what you'll need for cable and connectors for all the systems in your kit and take it from there. You could source the cable from an avionics shop, but many won't be willing to cut 100 feet or more from the install supply. Best to have your own raw supply of cable on a spool.

Use caution when routing the cable in close proximity to the cabling for other systems, especially GPS. Stay away from strobe light power supplies and even servo, gear and flap motors. In keeping with the guidance in AC 43,13-1B, ensure that coaxial (and triaxial) cable is bent at a radius of no less than 6 times the outside diameter of the cable. For fabric and composite installations, it may not matter how well you routed the cable or crimped the connectors. If there isn't a sufficient ground plane, performance will likely suffer, even for non-transmitting antennas like the ones used for GPS navigators and ADS-B position sources. Hitting the Garmin manual again, the one for the G3X Touch GPS engine suggests the conductive ground plane be a minimum diameter of 8 inches. While that sounds like plenty, you might not have the area where you want to mount the antenna. Like many antennas, the WAAS antenna is grounded through the mounting hardware and the coaxial antenna connection. The Garmin manual suggests that the mounting hardware (washers and nuts) and doubler plate should make contact with an unpainted grounded surface to ensure proper antenna



grounding.

Since routing cable with a BNC or TNC connector on it isn't always practical, you should learn how to crimp your own connectors so you can do it on the aircraft. For simpler systems, you might have a shop crimp for you. In any case, poor connector crimps will come back to haunt you, or anyone else trying to troubleshoot the system they're connected with. Like the many techs, I prefer crimping over solder connections. It's just easier and done right, lasts forever.

For starters, invest in a decent crimping tool that's made for RG142 cable (most will also crimp RG58). Crimping the connector on the cable isn't difficult, but it is something you get better at the more you do it. If you haven't worked with coax and connectors, buy spare connectors in case you botch one—or two. There are plenty of tutorials on YouTube. You can also use the install manual as a general reference.

Last, start planning the antennas and cabling early in the project. As the fuselage begins to take shape, think about how you'll route the coax, how you'll provide strain relief, and also consider things you can do to easily inspect the cable and connectors as the aircraft ages. The continued airworthiness of antenna systems is important, but it's often overlooked.



FLY BOY'S FOOD FLIGHTS



Mansfield, MA - 1B9 Hanger 12 Rest. ***Excellent
Best Avocado toast, enormous French toast, and the bacon! thick & local

Plum Island, MA - 2B2 (2 miles to town) taxi 978-465-5107, -2333
Tuscan seaside grill *** Lobster ravioli is great, colossal shrimp cocktail. Vera Italian ** very good. White table service

Southbridge, MA - 3B0 Red Baron Rest - ** Much improved breakfast

Plymouth, MA - kPYM Plane Jane's Rest - **
Good burgers, Fries. A lot of spectators

Hops on the Hill (Helo's only) So. Glastonbury **
Good selection of beers for passengers. Great food truck selection - Lobster rolls to BBQ

Newport - kUUU Brick alley pub ** - good everything

Jonny's Rest **5 - very good place (Middletown close to 1st. beach past Flo's)

Minute Man - 6B6 - Nancy's ** Good but limited menu - full bar

Hampton Field -7B3 Café ** well rounded menu. Very cool décor

