

# Commander

## Owners Group



## Commander FAQ

### *History*

Rockwell began designing the Commander in the late 60's. Originally they developed both a fixed gear model called the 111 and a retractable version called the 112. Both were originally powered by a Lycoming 180HP O360 engine. The prototype 112 first flew on December 4, 1970 while a prototype 111 flew for the first time late in 1971. The loss of a 112 prototype during flight testing due to the structural failure of the tail unit delayed certification and production of both models until a fix was found. Deliveries of production aircraft took place from late 1972. Very few 111's were ever built before Rockwell decided to concentrate on the 112 which in the production models received the more power IO360 engine rated at 200HP.

Refinements continued each year and in 1974 Rockwell changed the marketing designation to 112A which had a higher max takeoff weight, improved cabin ventilation and detail refinements. The turbocharged 112TC was introduced in 1976.

Also introduced in 1976 was the 114, which is basically a 112 with a more powerful six cylinder IO540. The 114 remained in production basically unchanged until production ceased in 1979, by which point it had been named the Gran Turismo Commander.

Meanwhile a new variant of the 112 called the 112B had appeared in 1977. It featured an increased max takeoff weight and the extended wingtips introduced on the 112TC. At that time the 112TC was designated the 112TCA, later it became known as the Alpine Commander.

Around 1980, Rockwell sold the Commander division to Gulfstream. Gulfstream serviced and supported the fleet during the 80's but never built any aircraft. In 1990 a new corporation was formed called *Commander Aircraft Corporation*. CAC bought all the rights to the Commander aircraft from Gulfstream and resumed production in 1991.

CAC continued to produce aircraft until 2002 when it sought bankruptcy protection. In 2005 a group of over 50 owners purchase the assets of CAC in bankruptcy court and formed a new corporation, Commander Premier Aircraft Corporation, to resume manufacture of the aircraft and to provide service to the existing fleet. *Commander Premier Aircraft Corporation* (CPAC) was located in Cape Girardeau Missouri and while they did provide service and limited parts support, they were never able to secure production funding and entered Chapter 7 bankruptcy in 2012.

In 2014 Ms. Borui Mao purchased the assets of CPAC at auction and moved operations to Norman Oklahoma. Ms. Mao has indicated she intends to restart production for both the U.S. and Chinese markets.

## ***Models***

All models share approximately 95% of the airframe with later models incorporating some changes to handle higher loads and weight increases.

### Commander 112

- Introduced 1971. Powered by Lycoming IO-360@ 200HP

### Commander 112A

- Gross weight increase to 2,650 lbs.

### Commander 112TC

- Switched the engine to the carbureted Lycoming 360 and added a turbocharger. Book HP up to 210HP. Gross weight 2,850 lbs.

### Commander 112TCA

- 112TC with extra features and options. Gross weight increase of 100lbs to 2,950lbs.

### Commander 112B

- Basically a straight 112 but fitted with the longer wing of the 112TC. Performance penalty in cruise because of the added drag of the longer wing, but a good candidate for the Hot Shot STC where the extra wing could actually be used. The rumor is that Rockwell produced these simply because they had leftover TC wings. Gross weight 2,800 lbs.

### Commander 114

- Introduced in 1976 by Rockwell.
- 260HP Lycoming IO-540 engine
- 2 bladed prop
- 14 volt electrical system

### Commander 114A

- Introduced by Rockwell in 1979
- 3-bladed prop
- Leather interior
- Double-paned glass in doors
- Gross weight increase to 3,250lbs

### Commander 114B

- Introduced by CAC in 1992
- 28 volt electrical system
- Redesigned cowl
- New instrumentation
- New airframe fairings
- Air conditioning now available as an option
- 8kt performance increase in cruise

#### Commander 114TC

- Turbocharged version of the 114B

#### Commander 115

- Introduced by CAC in 2000
- Basically a marketing change to reflect new features added
- Redesigned panel and electrical busses
- 90 gallon wing
- TKS FIKI now available

#### Commander 115TC

- Basically this was a marketing change only to the 114TC. All the options of the straight 115 were included.

## Specifications

| Model                      | Engine   | Prop                          | Weights (lbs)                             | Fuel (gal)      | Wing/area              |
|----------------------------|--|-------------------------------|---|-----------------|------------------------|
| 112 / A                    | 4 cyl. Lycoming IO-360-C1D6 @ 200HP                  | Hartzell HC-E2YR-1BF/F7666A   | Empty – 1688lbs<br>Gross – 2650lbs        | 50 std / 70 opt | 393.10" / 152 sq/ft    |
| 112TC / TCA                | 4 cyl. Lycoming TO-360-C1A6D @ 210HP                 | Hartzell HC-E2YR-1BF/F8467-7R | Empty – 1750lbs<br>Gross                  | 72              | 427.20" / 163.81 sq/ft |
| 112B                       | 4 cyl. Lycoming IO-360-C1D6 @ 200HP                  |                               | 2800lbs 112B<br>2850lbs TC<br>2950lbs TCA | 70              |                        |
| 112 Hot Shot (STC)         | Turbo-normalized 112 (w/IO360)                       | Hartzell HC-E3YR-1RF/F7392    | +26lbs                                    | unchanged       | unchanged              |
| 114 (division at sn 14150) | 6 cyl. Lycoming IO-540-T4A5D or IO-540-T4B5D @ 260HP | Hartzell HC-C2YR-1BF/F8467-7R | Empty – 1,905<br>Gross – 3,140            | 70              | 393.10" / 152 sq/ft    |
| 114A                       |  | McCauley B3D34C-405/90DFA-13  | Empty – 2,074<br>Gross – 3,250            | 70              |                        |
| 114 Hot Shot (STC)         | Turbo-normalized 114                                 | unchanged                     | unchanged                                 | unchanged       |                        |
| 114B                       | 6-cyl. Lycoming IO-540-T4B5 @ 260HP                  | McCauley B3D32C419/82 NHA-5   | Empty – 2,182<br>Gross – 3,305            | 70              |                        |
| 114TC / 115TC              | 6 cyl. Lycoming TIO-540-AG1A @ 270HP                 |                               | Empty – 2,152<br>Gross – 3,305            | 90              |                        |
| 115                        | 6 cyl. Lycoming IO-540-T4B5 @ 260HP                  |                               | Empty – 2,102<br>Gross – 3,260            | 90              |                        |

## Book Performance

| Model         | Speed, kts   | Takeoff ground roll | Climb (ISA. Gross, sea level) | Range (nm)                            | Ceiling (feet) | Landing ground roll |
|---------------|--|---------------------|-------------------------------|---------------------------------------|----------------|---------------------|
| 112 / A       | Max - 153<br>75% - 135<br>65% - 130<br>55% - 119                   | 1,190 ft            | 1,020 ft/min                  | 75% - 780<br>65% - 846                | 13,900         | 680 ft              |
| 112TC / TCA   | Max - 170<br>75% - 163<br>65% - 154<br>55% - 137                   | 1,190 ft            | 914 ft/min                    | 75% - 665<br>65% - 835                | 20,000         | 680 ft              |
| 112B          | Max - 150<br>75% - 142<br>65% - 132<br>55% - 128                   | 1,190 ft            | 880 ft/min                    | 75% - 780<br>65% - 846                | 15,200         | 680 ft              |
| 112 Hot Shot  |  |                     | 1,100 ft/min                  |                                       |                |                     |
| 114           | Max - 187<br>75% - 150<br>65% - 141<br>55% - 135                   | 1,390 ft            | 1,088 ft/min                  | 75% - 619<br>65% - 650<br>55% - 675   | 17,400         | 680 ft              |
| 114A          | Max - 187<br>75% - 152<br>65% - 143<br>55% - 131                   | 1,170 ft            | 1,020 ft/min                  | 75% - 616<br>65% - 647<br>55% - 672   | 16,800         | 680 ft              |
| 114 Hot Shot  |  |                     | 1,100 ft/min                  |                                       |                |                     |
| 114B          | Max - 164<br>75% - 160<br>65% - 155<br>55% - 149                   | 1,040 ft            | 1,070 ft/min                  | 75% - 640<br>65% - 680<br>55% - 760   |                | 680 ft              |
| 114TC / 115TC | Max - 197<br>75%/25K - 187<br>75%/17,500 - 177<br>75%/12,500 - 170 | 1,408 ft            | 1,050 ft/min                  | 75% - 670<br>65% - 780<br>55% - 870   | 25,000         | 734 ft              |
| 115           | Max - 164<br>75% - 160<br>65% - 155<br>55% - 149                   | 1,145 ft            | 1,070 ft/min                  | 75% - 855<br>65% - 940<br>55% - 1,005 |                | 720 ft              |
|               |  |                     |                               |                                       |                |                     |
|               |  |                     |                               |                                       |                |                     |

## Owner Reported Performance, Cruise

- 112/A
  - 4500ft, 24MP, 2500rpm. TAS 140 knots at 11.8gph, 11C. 2550lbs.
  - 4500ft, 24MP, 2400rpm, TAS 140 knots at 11.5gph, 5C, 2340lbs
  - 5000ft, 24MP, 2430rpm, TAS 136 knots at 10.3gph, -4C, 2550lbs
  - 5500ft, 23MP, 2500rpm, TAS 143 knots at 12gph, +5C, 2400lbs

- 112TC/TCA
  - 8000ft, 31MP, 2400 rpm. TAS 145 knots at 12.5 gph, 4 deg., 2500lbs
  - 7000ft, 31MP, 2450 rpm. TAS 147 knots at 13 gph, 51F, 2700lbs
  - 8000ft, 31MP, 2350rpm. TAS 141 knots at 11.5 gph, -4 deg C., 2750 lbs.
  - 12,500ft, 31MP, 2350rpm. TAS 146 knots at 11.5 gph, -4 deg C., 2750 lbs.
  - 8,000ft, 30MP, 2400. TAS 138kts at 12.6gph, -4 deg C, 2500lbs
- 112 Hot Shot
  - 12,000ft, 25.5MP, 2400rpm. TAS 149kts at 12 gph, -15C, 2500lbs.
  - 16,000ft, 25MP, 2400rpm. TAS 162kts at 12.5 gph, ISA, 2500lbs.
- 112B
  - 5500ft, 24MP, 2500rpm, TAS 139 knots at 12.4gph, +4C, 2450lbs
- 114
  - 6500ft, 23MP, 2510rpm. TAS 146.4 at 13.9gph, 7C, 2550lbs.
  - 5500ft, 23.5MP, 2450rpm. TAS 143 at 12.7, 15C, 2700lbs.
  - 6000ft, 24MP, 2300rpm. TAS 146 at 11.4, 51F, 2700lbs
  - 11,000, 20MP, 2400rpm, TAS 150kts at 12.5 gph, -12C, 2700lbs
- 114 Hot Shot
  - 8,500ft, 21.7MP, 2320rpm. TAS 139 at 12.2gph, 16C, 2,700lbs
  - 12,000ft, 24.1MP, 2500rpm. TAS 157 at 16.1gph, 20C, 2700lbs
  - 12,000ft, 24.1MP, 2500rpm. TAS 148 at 11.9 (LOP), 20C, 2700lbs
- 114B
  - 7,500ft, 21MP, 2500rpm. TAS was 150 knots at 14.8 GPH, 4 deg. C, 2950lbs
  - 7500 MSL, 21", 2300 RPM, 150 KTAS, 14 GPH, 12 C, 2950 lbs.
- 114TC/115TC
  - 11,000, 29MP, 2200rpm, TAS 160kts @ 15.4gph, -12C, 2975
- 115 (see 114B)
- Super Commander
  - 7500 MSL, 22.5", 2500 RPM, 170 KTAS, 18 GPH, 12C, 2950 lbs.

## Buying a Commander

This article is written with the intent of helping you buy a Commander single engine piston airplane. There are many good books on the generalities of buying and owning an airplane, so these paragraphs will focus on the specifics of buying a Commander.

One of the first things to consider is the characteristics of your typical flight. This will help determine which Commander model is right for you. If you always fly solo, or with two adults and some baggage, the 112 series might be perfect. If you need to carry four adults, you will probably require the additional load carrying ability of the 114 or 115. If you are based in mountainous terrain, or you need to cross it frequently, consider a factory turbocharged (112TC, 114TC or 115TC), turbo-normalized Commander Hot

Shot 112 or 114. There are also Super Commander's. An IO-390 112 and an IO-580 Super 114, 114B or 115.

Generally if you rent for at least 50-100 hours per year, then owning your own aircraft, or a share in an airplane will probably make sense for you. However, ownership can be expensive, and there are several factors to consider. Aside from the initial purchase cost, you will need to take into account additional one-time costs (sales or "use" tax, avionics upgrades, new engine/propeller, paint, upholstery, AD compliance), and then on-going fixed costs such as maintenance, insurance, hangar fees and property tax depending on where you are based. Parts availability is generally not a problem, thanks to information and assistance available from members of the Commander Owners Group (COG). Commander ownership is generally no more expensive than any other complex piston single, and is probably cheaper than many.

Having decided that you want a Commander, and you can afford to own an airplane, you need to think about where you buy from. If you haven't done so already, join COG and post a message to the forum. Members are very knowledgeable about what is available. Websites such as [www.aso.com](http://www.aso.com), [www.trade-a-plane.com](http://www.trade-a-plane.com) and [www.controller.com](http://www.controller.com) are the most respected places to look. Beware of auction sites, as the planes offered there generally are projects or problems. There are brokers who specialize in Commanders, such as [www.SuncoastAviation.com](http://www.SuncoastAviation.com) to help educate you on the product and/or to just give you helpful tips on things to look for or stay away from. Online valuation tools such as VRef are just a "guideline" and should not be taken as absolute, as there are so many variables in determining fair market value that aren't listed in their brief chart.

Once you find your dream Commander, be patient and do your homework thoroughly. When you have made a decision to purchase there are 3 rules: Satisfactory flight test with all installed equipment in proper working order (or as specified); a satisfactory prepurchase inspection done by a shop of your choosing; and last but not least a clear title. There are title and escrow Co's. in OKC to handle that for you. Make sure the logbooks are complete and original, as it is a deterrent on value when there are missing logs or lapses in the books. Find an A&P, preferably with Commander experience, and get a really good pre-buy inspection done before you commit to the purchase. The Owners Group and Suncoast Aviation have detailed factory annual guidelines and prepurchase checklists. Prepurchase inspections are always the Buyer's responsibility, but depending on the offer, some Seller's may agree to split the cost of annual when the sale is within 90 days of next annual due. Airworthiness issues are the Seller's responsibility.

Finally, make sure that you get good transition training in your Commander. COG and Suncoast Aviation have recommendations for experienced AC11 instructors. If you have low hours or no make and model time, most insurance companies require 5-10 hours of dual before you can solo or carry passengers, depending on your previous experience.

## ***Annuals***

Annuals are straightforward affairs for the Commander. As would be expected, having a shop familiar with the Commander makes the process that much easier.

The COG has an 'official' factory annual checklist available at <http://www.commander.org/Bergcom/Tech/Books.htm>

## ***General Maintenance***

Maintenance for the Commander would be considered 'normal' in the GA industry, but knowledge of certain systems and techniques is essential to achieving good results in a cost effective manner. As a prerequisite, owners should have the latest Parts and Service manuals. Official versions of these manuals should be secured from the factory, but to assist in casual review, the COG has non-official versions published on its website at [www.commander.org](http://www.commander.org)

When performing maintenance, the following areas in particular require some Commander specific knowledge:

- Rigging
- Hydraulic systems

Proper rigging is essential to achieving best performance. In walking ramps around the country, the COG has found many mis-rigged Commanders. While re-rigging is not an annually required task, if any flight surface has been removed, any operating cable replaced, or if it's been a considerable period of time since last checked, it is suggest that the entire system be checked.

This is one of the reasons why periodically taking your Commander to the factory for an annual is a good idea. The factory performs this type of maintenance daily and can quickly and correctly rig your aircraft. A local shop not familiar with the Commander can expend a significant amount of time learning how to perform this operation.

The hydraulic system in the Commander has gone through several iterations over its life with the most significant change occurring in the 70's when the system changed from mechanical limit switches to pressure switches. The most common service need for the hydraulic system is troubleshooting slow leaks that cause the pump to continuously cycle (and burn out if one isn't careful). In addition to the Maintenance Manual already mentioned, the COG has published a specific troubleshooting guide to assist the owner and their shop with serving the hydraulic system. This troubleshooting guide may be downloaded from the COG website at [www.commander.org](http://www.commander.org)

Parts availability is generally straightforward for most systems in a Commander. Rockwell used off-the-shelf parts whenever possible, so most components are available from the original manufacturers. These readily available components would include starters, pitot system components, electrical components, etc. Many small parts are also common between other aircraft including Piper and Cessna.

In addition, items such as fairings and interior plastics are readily available from 3<sup>rd</sup> party suppliers. See the listing on the COG website at [www.commander.org](http://www.commander.org)

Major airframe parts can be a challenge to replace. The most problematic for owners is replacing items like gear doors, ailerons, flaps, etc. While salvage yards do have some of these components, the COG has identified many of the sub-contractors that produced assemblies for CAC and they can repair almost any damage. Note that even if the repair facility has a replacement skin or entire control, they cannot make an outright sale. This restraint is imposed by FAA regulations making a distinction between work performed as a repair versus sales of over-the-counter parts which requires PMA approval. So while sometimes a bit awkward, there should not be any problem with replacement of any Commander specific part.

## ***Special Airframe Maintenance***

While extremely well built, many of these airframes are now over 40 years old. Consequently, the COG has some special service recommendations.

The COG recommends that every 5 years or 500 hours the entire tail structure receive a thorough external and internal camera inspection. Then every 20 years or 2,000 hours we recommend the vertical stabilizer and rudder/elevator system be disassembled, inspected, and renewed as required.

For the gear, the COG recommends every 5 years or 500 hours that the gear springs be removed to permit a complete inspection of the unloaded system and at that time, renew all components as required. This includes the gear doors and associated mechanisms.

Jim Richards of Aerodyme in Burlington Vermont is not only the STC holder for the Super Commander conversion, but has a wide range of expertise in maintenance of these critical areas. Aerodyme also has parts and repair services for many of the components in these assemblies. Visit [www.aerodyme.com](http://www.aerodyme.com) for more information.



## What are the current AD's applicable to the Commander?

There are no airframe AD's applicable to any Commander built after 1992 and only three major AD's applicable to all other Commanders. At this point in time any Commander that is legally flying should have had these taken care of already. The three major AD's are Wings Spars, Vertical Fin, and Seat belts.

- **Wing Spars** – there were reports of cracking of the wing spar at the gear attachment point on some Commanders. There were early Service Bulletins related to taking care of this issue in various ways, but a single fix was developed by Rockwell and Gulfstream and released in the late 80's. One of the first tasks of the then-new Commander Aircraft Corporation was to provide an installation service for this final AD (and typically the two below at the same time) as part of a settlement between an earlier owners group and Rockwell/Gulfstream. The relevant AD is:
  - 90-04-07
    - The service bulletins describing this fix are:
      - SB-112-71C
      - SB-114-22C
    - Note that not all countries required this AD. In particular watch for aircraft coming back into the US from Canada. Canada elected to only require the spar mod kit if there was actual evident of cracking. No crack, no mod. However as soon as one of these aircraft is registered in the US, the AD will apply and you'll have a significant job on your hands (approx 40 hours per wing + parts).
- **Vertical Fin** – This AD actually calls for inspections of the vertical fin attachment point for cracks at 100 hour intervals. The plane can fly as-is indefinitely as long as no cracks are found. In the event of cracking a repair with a reinforcing part must be installed as per a service bulletin. Most owners would have installed the fix simply to eliminate the repetitive inspections. The Relevant AD is:
  - 88-05-06
    - The service bulletins describing the fix are:
      - 112-72A
      - 114-23A
- **Seat Belts** – This AD was to address the seat belt attachment points to provide better crash impact performance. To accomplish compliance the attachment point for the front seat belts was moved to the ceiling of the aircraft. The relevant AD is:
  - 85-03-04 R2
    - The service bulletins describing the fix are:
      - SB-112-45A or SB112-70A Revision 1
      - SB-114-5A or SB-114-21A Revision 1
- **Elevator AD** – this AD was issued in 2011 due to some cracking found in elevator spars at the outboard attachment brackets. The COG developed an AMOC for routine inspection which as of 1/2013, is required every 250 hours or annually. A link to the AMOC is on the home page of the COG website. Replacement PMA'd spars are available from Aerodyme in Burlington VT.

**Minor AD's** – we'd describe these as minor as most were simple to address or are so old that any Commander flying has probably long-since taken care of these

- AD 77-01-08 – oil pressure tube assembly, 112's through sn 470. This AD addresses a potential problem with the oil pressure tube assembly and requires inspections every 10 hours unless the fix from the below SB is applied.
  - The service bulletins/letters addressing this fix are:
    - SL-112-26
    - SB-112-46
- AD 75-22-09 – Aileron doublers for 112's up to sn 380. This AD required replacement of all outboard aileron doublers within 10 hours.
  - The service bulletins describing the fix are:
    - SB-112-35
- AD 73-24-01 – Aileron hinges for 112's up to sn 120. This was an inspection to determine if an incorrect type hinge had been fitted to the aileron. If measurement of the hinge material indicated the incorrect hinge type, it was to be replaced.
  - The service bulletins describing the fix are
    - SB-112-6
- AD 73-14-06 – prop bulkhead inspection for 112's all models. Checking for cracks. Most Commanders took care of this by implementing the below SB.
  - The service bulletins describing the fix are
    - SB-112-7
- AD 73-14-04 – engine and prop controls for 112's up to sn 90. Deals with some grommets that were installed in the quadrant and needed replacement.
  - The service bulletin describing the fix is:
    - SB-112-5
- AD 76-23-02 – cabin air vents for 114's sn's 14089 through 14113, 14115 through 14122, 14125 through 14131, 14134 through 14149, 14152 through 14154, and 14156 through 14158. This was to address of problem of excessive carbon monoxide entering the cabin during flight and taxi. It was address with some slight modifications to the cabin vent controls and system.
  - The service bulletin describing this fix is:
    - SB-114-6
- AD 2000-11-04 – Aeroquip exhaust band clamp for 114TC's. This issues addresses reported failure of the exhaust band clamp that attaches the exhaust to the turbocharger. Complaine consisted of replacing the clamp with an improved design from Aeroquip.
  - The service bulletin describing this fix is:
    - SB-114-33A

## Wing life limits

Certified under FAR23, life limits are required for the wings. These limits represent a calculation only – no static testing was performed to derive these numbers.

Paul Sterling of Sterling Aviation Technologies is currently developing an STC to extend the life limits of the wings and he expects to have that STC ready in the next few years. However, Commanders have rarely been used as trainers and it's not uncommon to find early 112's with 2000-3000 hours of total time. With most owners flying 150 hours per year or less, the life limits are not a concern for most owners.

| <u>Model</u> | <u>Wing Life-Limit (Hours)</u> |
|--------------|--------------------------------|
| 112          | 6,945                          |
| 112B         | 8,878                          |
| 112TC        | 10,908                         |
| 112TCA       | 7,947                          |
| 114          | 19,284                         |
| 114A         | 14,812                         |
| 114B         | 14,812                         |
| 114TC        | 10,349                         |

## History of Structural Differences and the Wing Life Limits, by Don McCosh, Commander DER

In general, the original Model 114 was changed from the basic Model 112 as related to the engine change (weight and power), by a new engine mount, firewall channel and angle stiffeners, and side skin reduced rivet spacing.

There were a number of changes made for the Gross Weight increase of the 114. Some of the major changes to the wing are, addition of doublers to the Main Spar upper and lower caps, inboard skin changes, inboard aft rib changes, forward auxiliary spar increased spar caps (and others), outboard forward intercostals and others. Changes to the fuselage include the centerline truss, rear spar fitting rivets, extended Tee Fitting at Main Spar, other local doublers, aft fuselage stringer, stringer attachments and intercostal. Changes to the vertical stabilizer front spar area and to the rudder stiffener.

As to the wing service life of the Model 114 vs the Model 112, the fatigue critical areas of the wing are at the inboard end of the Wing Main Spar. As noted in the previous email, the Model 114 has Upper and Lower Main Spar Doubler straps added. These straps reduce the tension stresses in the spar lower cap, the Service Life as calculated per AFS-120-73-2, Fatigue Evaluation of Wing and Associated Structure on Small Airplanes is 19284 Hours. The Service Life of the Model 112 has been established as 6945 Hours. The Model 112 was Certificated without the additional doublers, which presumably resulted in higher tension stresses in the lower cap, even at the lower Gross Weight. The other differences in the wings, as described above, do not have an effect on the wing service life.

## ***The Commander Owners Group***

If you've found this information helpful and are a Commander owner, pilot, or enthusiast, we invite you to join the Commander Owners Group. The COG is a not-for-profit 501c6 corporation dedicated to preserving and enjoying the line of Commander aircraft. We accept no advertising and are not affiliated with any entity (including the factory), so dues from our members supports the group and its activities including publications like this, the COG website and conferencing system, and the annual COG fly-in.

Membership is only \$75 per year. To join, visit [www.commander.org](http://www.commander.org)