TEXT & PHOTOS BY PAUL TRADELIUS

Chopper Talk

A big-block engine kit, swashplate setup & your holiday wish list

JOHN BEECH OF AUDACITY MODELS (audacity models.com) has recently released a "big block" engine kit for his very popular Pantera 50 helicopter. John knows that a lot of us have a used .60 or larger engine on the shelf just looking for a good project, and a Pantera on steroids is just what is needed to bring a little excitement back into our flying. And, since I used to drive F-4s and F-16s in the Air Force, I agree completely that it's impossible to have too much power available when you need it. And that's the key: when you need it. Just having a larger engine doesn't mean it has to be used at full power all the time. But, when you're doing high-performance maneuvers, it's nice to know that the power is there to keep up your rotor speed.

I installed the big-block kit with a well-used YS .60 engine running on Byron Originals 30% Rotor Rage Helicopter fuel (byronfuels.com) with Mavrikk 620 rotor blades (heliproz.com). This combination is like having an afterburner when you need it! The new Spektrum AR7100R receiver with RevLimit (horizonhobby.com) also matches up nicely with this new flight performance package because it has a sensor that mounts to the back of the engine and prevents the rpm from over speeding. Now I can set my throttle curve to full power at all pitch settings and never have to worry about over speeding the engine or head, and yet have all the power needed for any maneuver. If you haven't yet tried this combination, it brings a whole new meaning to the term "3D maneuver."

Fellow club member James Lerch with two Pantera 50s on steroids. His YS 80-powered machine was clocked at 89mph, while mine has a YS 60 with Mavrikk 620 rotor blades to handle the extra power. We both use JR7100R receivers with RevLimit to keep the engines within operational limits. This excessive performance isn't required for normal flying, but it's great to have when needed.

MORE SWASHPLATE SETUP

In my September '08 column I discussed the myth of adjusting the swashplate to a level position during setup. I recommend that you set the swashplate to a slight right tilt as this is what will be needed during a normal hover. It seems my article struck quite a nerve, because I received several e-mails about how wrong I was: that it would work okay while flying upright, but the helicopter would be out of trim when inverted. The argument presented was that the helicopter needs a slight right trim to the swashplate for a hover, but when it's inverted, the rotor blades are turning in the opposite direction and therefore the swashplate would need a slight left trim. Although this would seem to be correct on the surface, not all the forces on the helicopter while inverted were taken into consideration by those in disagreement.

Although the dynamics of a helicopter are certainly complicated, I believe the answer lies in the center of gravity (CG) being well below the rotor disk when the helicopter is upright; this has a stabilizing effect. That same CG is well above the rotor disk when the helicopter is inverted, and this has a destabilizing effect. Now imagine a helicopter in an inverted hover. Because the helicopter tilts left, the CG is also offset to the left of vertical, and this causes the helicopter to roll to the left. If the helicopter had any left trim to the swashplate, the

helicopter would roll rapidly to the left. If the swashplate were trimmed to a level position, which I did not recommend, it could not provide an opposing force to keep the helicopter from rolling to the left. Therefore, with the helicopter in an inverted hover, tilted slightly to the left and with the CG to the left of vertical as well, a slight amount of right swashplate trim is again needed to keep the helicopter from rolling to the left. As it turns out, this right swashplate trim needed while inverted is almost identical to the amount of right swashplate trim that's also needed when upright. By having the swashplate trimmed slightly to the right during setup as I suggest, the helicopter is therefore in trim both upright and inverted. I continue to have an open mind, however, and I'm happy to hear opposing views. I believe such discussions help all of us better understand our equipment as well as the aerodynamics involved.

My Vibe 50 Pro with ThunderTiger Redline 53 engine, powered by Byron's 30% Rotor Rage Heli fuel and guided by a JR 9303 radio, has proven to be a consistent performer for 3D aerobatics.

GOODIES TO GIVE (OR GET!)

When you read this, the holidays will be just a few weeks away, and those of us who fly helicopters must be the easiest people in the world to get presents for. Here are a few of the products I'm using that I really like; you may want to consider adding them to your holiday list.

MILD TO WILD

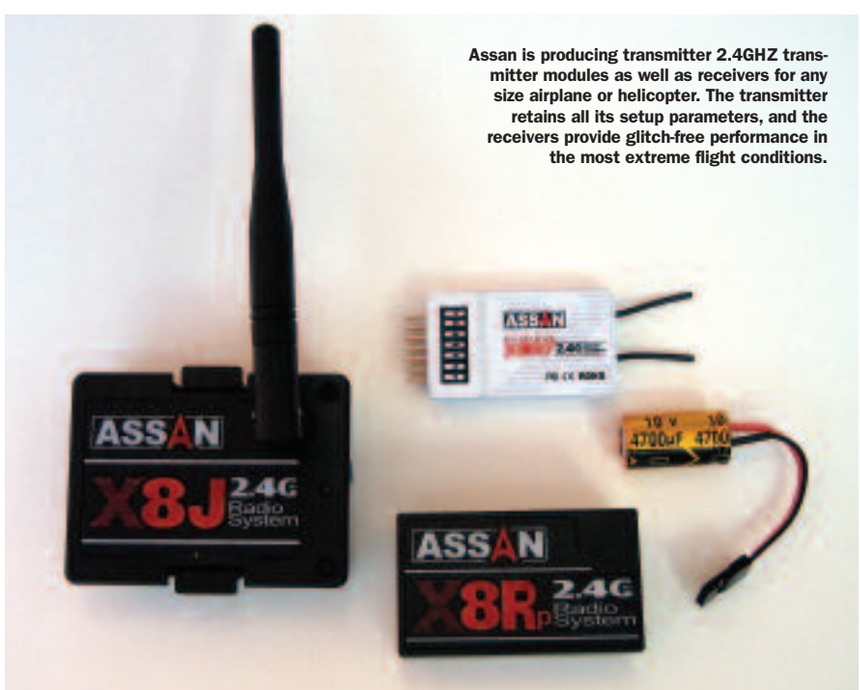
Another of the helicopters I'm flying is the JR Vibe 50 Pro (horizonhobby.com) with Thunder Tiger 53 Redline engine (acehobby.com), Mavrikk 600 rotor blades and the new Hitec HS-7966HB coreless digital servos with Karbonite gears (hitecrcd.com). And, when setup with the Hitec HFP-20 Digital Servo Programmer, I can adjust each servo's overload protection rate, resolution, speed, endpoints, center point and several other parameters to fine tune its performance. Although I like to toss my helicopters around, I like to do it smoothly, and the 50 Pro with this setup lets me fly as mild or wild as the mood suits me.

GREAT VALUE

In a previous column I mentioned the Gohbee Stinger 50 (gohbee.com) with the Evolution 52 helicopter engine (horizonhobby.com) as a good value combination, and to make things even better I added the Mavrikk all-metal rotor head. This head was designed for the Raptor 50 (acehobby.com), but fits equally well on the Stinger, or most 50/600 size helicopters. It not only looks like a million bucks, but improves the overall handling and performance.

2.4GHZ UPGRADE

We're seeing an ever increasing number of 2.4GHz radios at the flying field, and Assan (hobbycity.com) is a leading company in the manufacture of aftermarket 2.4GHz transmitter modules and receivers. To convert my standard JR 9303 transmitter, I just removed the module and replaced it with the Assan



Assan is producing transmitter 2.4GHZ transmitter modules as well as receivers for any size airplane or helicopter. The transmitter retains all its setup parameters, and the receivers provide glitch-free performance in the most extreme flight conditions.

The Duralite A123 batteries feature a Stay Balance Charge Safe circuit with a non-combustible chemistry to eliminating external balancing. With discharge rates of 30C continuous and 60C burst, these batteries combine high performance with extremely safe operation.

module. All setup functions within the transmitter remain the same. Assan's receivers are also extremely small and lightweight, and they've never missed a beat.

LIPO RECOMMENDATION

It looks like LiPo batteries are here to stay, not only to power our electric helicopters, but also for our transmitters and receivers. I have been using several of the Duralite (duralite.com) LiPo, Li-manganese and A123 cells with great success. I also feel a lot better about using the Li-manganese and A123 cells because they are completely safe from catching on fire while charging or discharging and offer improved performance.

TOOLS OF THE TRADE

CSM is well known for their gyros, and has recently introduced several innovative and very useful products. The CSM Carb Smart (heliproz.com) monitors your engine temperature and adjusts the mixture to keep it within set limits. This allows a high degree of engine performance without the fear of burning it up with a lean run. The CSM RevLock 30 is not only an engine governor to keep the engine and rotor speed within useable limits, but now also modulates the maximum collective pitch to keep from overloading the engine. The CSM CycLock is a CCPM manager to optimize performance and can also be used with their SL720 gyros to convert your rotor head to flybarless operation. I will be doing an article on this handling breakthrough in the near future.

ThunderPower chargers/cyclers/dischargers are designed to safely handle any of our battery needs, from 2 to 10 cells at charge rates of up to 10 amps. A large digital display makes them easy to monitor and adjust.

CHARGE IT UP

Proper charging and maintenance is essential for the safe operation and long life of our batteries, and Thunder Power has both the LiPo batteries and chargers for almost any hobby application. One of their systems I'm using is the combination of their Super Charger (TP-1010C) together with their balancer (TP-210V); used together, these provide a closed-loop system to constantly monitor and balance LiPo batteries while they're being charged. This heavy-duty system is for larger packs, up to 10-cell A123 and LiPo packs or 30-cell NiMH/NiCd packs at charge rates of up to 10 amps. Thunder Power's TP-610C charger is for slightly smaller battery packs, but it incorporates a digital balancer, charger and discharger/cycler, all in one small unit. The 610C is designed to handle up to 6-cell A123 and Lipo packs or 14-cell NiMh/NiCd packs at up to 10 amps. Both systems are easy to use with clear digital multi-function displays.

XFC ACTION

Although I was able to attend the Extreme Flight Championships (XFC) several months ago, it's hard to see everything and remember all of the exciting maneuvers. SKS Video Productions (sksvideo.com) has a great video of this and many other events to bring all the flying up close and personal, whether you had a chance to attend or not.

Our website, modelairplanenews.com,, has even more ideas and information on our hobby, including the Radio Control Zone, where you can join in on our many forums. I wish you all happy holidays and, till next time keep up your rotor speed.