

# Flight Command

MSD'S PROGRAMMABLE 6AL-2 BRINGS CONSISTENT LAUNCHES AND TUNABLE TIMING TO STREET/STRIP 5.0 'STANGS

**W**e've said it before and we'll continue to say it: We always enjoy seeing and hearing about new concepts and technology that aftermarket manufacturers apply to many of the tried-and-true performance products available for Fox-body ('79-'93) Mustangs. As our hobby's illustrious run continues (can you believe it's been 30 years?), it's crazy to think that despite all of the major advancements being made in the world of bolt-on gear for 'Stangs of the post-Fox era, we still honestly dig putting our hands on cool stuff for pushrod-powered Mustangs from time to time, simply because we feel it's the best way for us to pay homage to the Pony that got us here.

While it's oftentimes overshadowed by air and fuel when discussing the way an engine runs, spark actually is the most important element of the trio. Spark helps transfer heat to an engine's air/fuel mixture and initiates the combustion process. Having strong, solid spark is paramount for a Mustang's engine, especially whenever modifications are intended to increase horsepower.

Thanks to the emergence of yet-to-be-modified Mustangs we've recently encountered (stone-stock 'Stangs such

► With its all-new 6AL-2 (PN 6530; \$410), MSD brings hard-core race features (two-step rev limiting, programmable timing curves, and a lot more power) together into one affordable, *digital*, plug-and-play ignition unit for street/strip, 5.0-powered 'Stangs.

Text and Photos by KJ Jones

as the cherry piece our freelance newbie Sharad Ridalis scored), improving a 5.0's spark supply—better known as *making spark hotter*—is one of those DIY-friendly Mustang-tech projects that seems to never go out of style. The procedure usually is highlighted by adding an ignition amplifier of some sort, and complementing the spark box with a stronger coil, billet distributor, and wires that have higher conductivity than the 7mm found on stock engines. Increased voltage from an upgraded ignition creates a broader flame in each cylinder, which results in more efficient fuel burn and improved engine performance.

For a long time, MSD's 6AL ignition box (PN 6420; \$226.60) reigned as king of the ignition upgrades for 5.0-powered Mustangs. With nearly 115 millijoules (mj) of spark energy and 480 volts (V), 'Stangbangers were quick to add 6ALs to their street/strip Ponies to meet the increased spark demand brought about by nitrous systems, turbos, and blowers. (Later versions of the 6AL included such features as a single rev limiter and provisions for plugging in a timing accessory.) Well, the second generation of MSD's 6-Series ignition box is now upon us, and 5.0 Mustang & Super Fords is lucky enough



**Horse Sense:** Unfortunately, we were not able to get to the track to test Sal's Mustang before our deadline for this report. We plan on following up to see how his high-miles engine runs with its new ignition pieces, and if having the ability to dial-in launch consistency and a top-end timing curve has improved his coupe's dragstrip performance. Look for a follow-up to this report on our website, [www.50mustangandsuperfords.com](http://www.50mustangandsuperfords.com).

## 5.0 IGNITION UPGRADE



▲ Sal Ybarra provided his '93 LX for our test. Sal still uses quite a bit of antiquated equipment in his coupe (we found an old-school Ford Motorsport SVO Extender unit in the front-passenger footwell, and the MSD 6AL unit shown in this photo is more than 10 years old), but the 130,000-mile, naturally aspirated Pony still covers the distance in 11 seconds.

► Disconnecting the negative battery cable is pretty much an industry standard when it comes to projects that involve a Mustang's engine or electrical system. Sal's coupe has a trunk-mounted battery and thus uses a cutoff switch, but it's always best to play things safe and pull the cable.



► MSD gave its factory-style Blaster TFI coil a bit of a new look (left) by doing away with the black isolator ring that surrounds the unit (right).



However, despite the facelift, the coil is internally unchanged and still features the same 85:1 core-turn ratio and 48,000v maximum output of the original Blaster (and lower primary resistance than a stock coil).

► Using hardware that is included, Sal installs the new coil in the same spot as the old Blaster. One of the bolt holes for the coil's bracket is difficult to access, so Sal uses a telescoping magnet to hold the bolt in position and secure the coil to the strut tower. Since we're using all new pieces with this project, a fresh MSD wiring harness for the coil (PN 8874; \$24.40) is also added during this step. The harness simplifies the process because it plugs directly into the OEM wiring for the coil; then its four color-coded wires are plugged into the corresponding connectors of the 6AL-2.



to be chosen as the first 'Stang mag to use it. That's right—the company recently rolled out its all-new Programmable 6AL-2, and we're taking it out on its inaugural test drive by installing it in our buddy Sal Ybarra's (of Sal's Speed Shop) 11-second '93 LX coupe.

The new digital ignition box was developed with a lot more voltage and spark



▲ The 6AL-2 is mounted in the same location along the driverside inner fender where the original 6AL box was attached.

► Hooking up our project's new ignition is plug-and-play. Harnesses are provided for power and ground (left; heavy red/heavy black), the coil (center; orange/black) and all of the box's features that are triggered by rpm (launch limiter, dark blue; burnout limiter, light blue; retard, pink; tach, gray; PCM, white).

energy than its predecessor (535 V/135 mJ). However, improved spark isn't the unit's only—or greatest, for that matter—quality. The new box includes three rpm-based rev limiters; a burnout limit, a variable, clutch/transbrake-triggered limiter for consistent launch rpm; and a provision to set a high-end rev limit that will protect an engine against damage caused by missing

► Sal routes the dark blue launch-limiter wire through the firewall and into the coupe's cockpit. The wire will be tied into a toggle switch to arm the limiter; then to a momentary switch installed on the shifter handle. With a Two-Step, Sal will be able to stage with his foot mashed on the floor while rpm holds steady at whatever rpm he programs into the 6AL-2.



## COMPUTER PROGRAMMING

After installing the 6AL-2, we spent the remainder of our time experimenting with launch-rpm settings and possible timing maps for Sal's coupe. Programming logic for the new box is simple. Although we didn't get an opportunity to test our limiter and retard tune-ups at the track before this story deadline, we're confident this upgrade will bring noticeable improvement to Sal's reaction-time and 60-foot consistency, and quite possibly add one or two more mph at top end once we learn what the sweet spots are for timing retard in the back half of the dragstrip.

► Loading the included Pro-Data graphics viewer is simple. Simply pop the disc into your laptop's CD drive and follow the software's installation steps. The 6AL-2 kit also includes a nine-pin cable that handles the box-to-laptop link. In the event you don't have a laptop with a serial-port that will accept the nine-pin line, MSD recommends using IOGEAR's USB-to-Serial/RS-232 adapter (PN GUC232A; \$29.95) or an MSD handheld programmer (PN 7550; \$228.60), as either will get you into the ignition once the software's up and running.



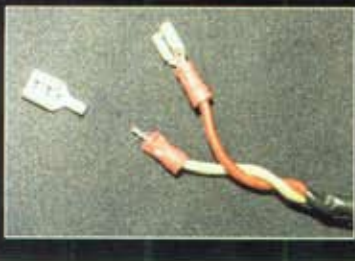
► We're sure many of you are familiar with MSD's little rpm chips, the small, white plug-in modules that contain the electronics logic for the 6AL's rev-limiter function. The 6AL-2 box does not require those chips, nor does it have just a single rev limiter. Burnout, launch, and maximum rpm can instead be programmed in 100-rpm increments. As Sal's 'Stang has a five-speed transmission, we also used 6AL-2 to set up a drop-rpm value, which is a separate rpm window (lower than the launch limit) that prevents the launch limiter from activating when Sal kicks the clutch between shifts.



▲ In most drag-racing applications, engines don't require as much timing at high rpm as they do when your Pony is leaving the line. We think the 6AL-2's timing control is its coolest programmable function. With this feature, we can change the timing map for Sal's engine by retarding timing at any rpm we choose. In this example, timing retard starts with 1 degree at 5,000 rpm and is gradually ramped to a full 2 degrees by 5,500 rpm and fixed at that point through the 302's 6,500-rpm limit.

## SOLID CONNECTIONS

**W**e uncovered a few issues with some of the ignition-related wiring on Sal's coupe that could have made our efforts completely for naught if we hadn't made the necessary repairs. As a rule of thumb, whenever you're working with engine-related electronics in older 'Stangs (like the '93 Fox we're using, or other pre-'99 Ponies), a thorough inspection of all the wiring (wires, connectors, harnesses, and so on) is always a good idea.



a shift, spinning tires, or drivetrain failure. But the bigger news is that the 6AL-2 also includes features (advanced timing retards for launch consistency, top-end performance, and boost) that once were only available in MSD's race-specific boxes, such as the Programmable Digital-7 unit in our '86 T-top coupe project Mustang.

We selected Sal's 'Stang as our tester because it truly fits the description of a street/strip Fox that will benefit from receiving an ignition makeover. Sal's LX is long in mileage (130,000 miles on the stock short-block), and although it's naturally aspirated, the engine has many of the typical bolt-ons (Trick Flow Twisted Wedge heads, a custom camshaft, BBK cold-air induction and Pro-M Bullet mass air, FRPP Cobra intake manifold, and more) that give 5.0s plenty of need for hotter spark. Sal uses the aforementioned MSD 6AL to provide his Pony's bullet with the spark it needs, but the box is more than 10 years old. As the 'Stang has slowly but surely become more stripcentric—driven wide-open when Sal competes in Pacific Street Car Association events on the West Coast—we think it's time to set up Sal's ride with the full collection of CARB-approved ignition pieces

▶ Removing the OEM distributor is easy. Simply remove the hold-down apparatus, disconnect the ignition wires from the spark plugs, and pull straight up.



▶ The stock distributor is replaced with this CNC, ready-to-install Pro-Billet unit (PN 8456; \$290.10). When installing the distributor, Sal cranks the engine until the No. 1 piston is at top dead center on the compression stroke (Important note: The crank will line up on TDC two times as the distributor turns—once on exhaust-stroke TDC and a second time on compression. After installing the distributor's O-ring and lubing the steel distributor gear, Sal drops the unit into the block with the rotor pointing at the number one position (where the No. 1 spark plug wire will be when the cap is reinstalled). Once the distributor housing and gear are seated, Sal sets the TFI module on the new piece in the 5 o'clock position, which allows him to easily connect the harness.



▶ Sal recommends using a dab of dielectric grease on each tip of the distributor cap to help ward off moisture.



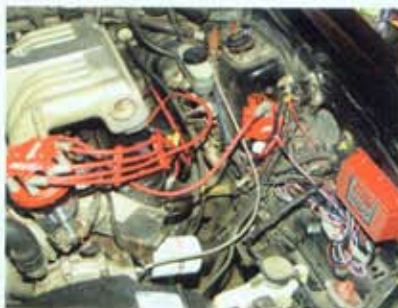
(Programmable 6AL-2/PN 6530, \$410; TFI High-Performance Coil/PN 8227, \$49.70; '86-'93 Pro-Billet Distributor/PN 8456, \$290.10; and Super Conductor 8.5mm spark plug wires/PN 35399, \$91.40) that it really should have to be more consistent in Mustang Madness, the Open-Compstyle, 'Stangs-only PSCA class he competes in.

"With a stick car and racing on a pro (0.400) light, it's really hard to try and launch at the exact same rpm every time unless you have a rev limiter," says Sal. "Even though I could have installed a Two-Step (MSD launch-rev limiter) on my 6AL, I wanted to use an all-inclusive unit and really needed to get with the newer technology. With the enhancements and features that are built into the 6AL-2, especially the spark increase over a 6AL's output and the boost-retard, I'm confident that adding it will make a noticeable difference in the way my Mustang performs. It definitely will have the right ignition if I ever decide to install a power-adder."

We spent a morning with Sal as he performed the ignition transition on his coupe. On the hard-parts side of the project, all of the MSD pieces are bolt-in ready and can be installed in about two hours.



▶ Installing MSD's Super Conductor 8.5mm spark plug wires (PN 35399; \$91.40) closes out the ignition makeover. After plugging in the wires, Sal sets timing at 21 degrees (initial timing advance) as that gives his 'Stang's 302 the best throttle response from idle.



▶ Fresh, new, and ready for action! Upon firing the coupe's engine, we immediately noticed that the bullet sounds crisper (at idle), and its hotter ignition has improved throttle response.

On the computer side, the ignition system's Pro-Data software (PN 9608, included) is easy to manipulate, and allowed us to create and store all types of potential killer-launch (rev limit) and top-end (timing retard) tune files that will hopefully help Sal reach the winner's circle the next time he goes racing.

Read on for photos and additional details on this project, and consider making this upgrade on your stock (or non-digitally ignited) Mustang, especially if it sees a fair amount of action on the dragstrip. **5.0**

## SOURCE 5.0

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