

INSTALLATION GUIDE

SYSTEM OVERVIEW:

***** PLEASE READ STEP 4 BEFORE BEGINNING, regarding circuit board orientation. Failure to do this causes more problems than everything else combined. *****

Each Sustainiac® *Stealth PRO™* sustainer is pretested in an appropriate electric guitar before shipping.

The Sustainiac® *Stealth PRO™ Sustainer* is an electromagnetic sustain system. It produces infinite sustain of the string vibrations of electric guitars. The driver functions as an active neck pickup when the sustainer is off. The neck pickup output level is adjustable by a trimpot on the circuit board (near 10-pin connector) so you can match the output to your other pickups. The combined HARMONIC/GAIN switch/pot control provides three operating modes: NORMAL, HARMONIC, and MIX modes. With this feature, sustained string vibration can be controlled to make cool-sounding harmonics.

HOW IT WORKS: First, the *Stealth PRO™ Sustainer* electronically amplifies and processes the pickup signal of your instrument. Then this amplified, processed pickup signal is sent to a patented *magnetic string driver transducer (driver)*, which replaces your existing neck pickup. The driver is available in either single-coil size or full humbucker size. The driver sends out a focused magnetic field that pulsates in synchronization with the musical string vibrations. This pulsating magnetic field adds vibrational energy back into the strings during each vibration. Vibration energy is normally lost as friction, causing the notes to die out. By adding energy during each string vibration, the vibrations are sustained indefinitely. A single, 9-volt alkaline battery powers the system for about 20 hours of combination sustaining/normal playing. More or less time, depending on how much you use the sustainer. When the battery dies, your instrument will not continue to function normally. **The neck pickup function will cease before the sustain function.**

MAGNETIC STRING DRIVER TRANSDUCER: The *driver* is the size of a single-coil pickup or a full-size humbucker pickup, depending on the model you select. Color choice is black or white. It replaces your neck pickup. When the sustainer is OFF, the driver functions as a humbucking active neck pickup. It is equalized for either humbucker or single-coil sound. The magnetic field that the driver produces can cause interference with nearby pickups. Therefore, the sustainer automatically selects the bridge pickup when the sustainer is on. Our unique (patented) *Bilateral Driver* design almost totally eliminates this undesired characteristic that is typical of all other sustainer drivers.

SPACING: The driver should be located at least 3.5 in. (90 mm) from the bridge pickup (center-to-center). The closer this spacing, the lower you must set the sustainer *gain trimpot* before oscillation (squeal) occurs. This decreases performance. Therefore, 22 fret guitars usually work better than 24 fret guitars. We don't recommend any guitar having more than 24 frets for any electromagnetic sustainer. No slanted driver!

ELECTRONICS: The sustainer electronics consist of a single small, prewired circuit board. This measures 1.1 in. x 3.75 in. The board fits on edge into most electronics cavities. In Strats and many Ibanez guitars, it fits between the pickup selector switch and the pots. (See installation drawing.) Your existing electronics cavity must be rewired to accept the supplied circuit board and switches in order to install the Sustainiac® *Stealth PRO*.

BATTERY: A single 9-volt **alkaline** battery powers the Stealth PRO. If you don't want to route a cavity into your guitar to mount a quick-change battery holder (optional), you can consider putting it in the tremolo cavity. Move the 3 tremolo springs over to one side. The battery will fit into this space on many guitars. Minor routing will probably be necessary. You can order a quick-open trem cavity cover from us for a fast battery change. (**Low battery indicator:** Neck pickup function will cease to function at about 7-7.5 volts.)

Sustainer “squeals”, pulsates or makes guitar signal “grungy” (“static” or “dirty” sound mixed with signal)

- Pickup switch not wired properly. *Only the bridge pickup must function when sustainer is ON.* Check this by tapping on other pickup polepieces. If any other pickup functions when the sustainer is ON, check wiring of 8-pin connector. Make sure that one pole (section) of the guitar pickup selector switch is dedicated only to the bridge PU (and also white wire, 8-pin connector). This is to insure that no other PU signal can be mixed with the bridge pu signal when the sustainer is ON.
- Magnetic field cancellation tab not properly positioned for magnetic “null” if Stratocaster
- Metal foil or conductive coating located near driver and/or bridge pickup. This must be removed from the pickup area, or the sustainer will not function properly. Magnetic “null” adjustment of tab will not be possible on Stratocasters. **FOIL-COVERED PICKGUARDS MUST BE SCRAPED CLEAR.** “Mirror” or metallic pickguards also cause this problem.
- Gray/violet wires from 8-pin connector too close to any pickup signal wire or to the white input wire. Same for the brown/gray wires on the 10-pin connector. If moving these wires to a particular location eliminates the grunge/squeal or makes it go away, you should fix them in that place. You might have to shield them if the electronics cavity is packed full of wires and circuitry.
- Driver (transducer) shield not grounded. See hookup diagram.
- Driver shield must be maintained until last 1 in. (25mm).
- Make sure all grounds are properly connected.
- GAIN is set too high. Set GAIN trimpot to lower level by turning counterclockwise.
- White/orange wires of 8-pin connector not cut short. They must be short to prevent crosstalk.

Sustainer makes mostly harmonics when control is set for FUNDAMENTAL mode

- Make sure HARMONIC/DRIVE pot (or toggle switch) is wired correctly. If YES, then.....
- Reverse driver polarity by swapping red and black wires. (Control *must* be rotated clockwise for FUNDAMENTAL mode, counterclockwise for HARMONIC mode, even if you prefer the other way around. Otherwise, neither mode will function properly.)
NOTE: EMG and some other pickup types are reverse polarity from normal. These pickups will require that you reverse the driver polarity from that shown in your hookup diagram.

Sustain is weak

- Raise **both driver and bridge pickup** closer to strings. Especially close to smaller strings. Both have a *profound and equal* effect on the sustainer gain.
- Reverse driver polarity, especially if Normal Mode produces mostly all weak harmonics
- Guitar cord has partial short, which reduces the signal level but still allows some to pass
- Tone control turned to “bass” setting. Tone control might be wired wrong.
- HARMONIC/DRIVE pot on front of guitar turned to midpoint setting
- Gain trimpot on circuit board set too low. Increase its setting. If too high a setting is entered, then uncontrolled squeal or pulsation might occur. In this case, review adjustment procedure for magnetic field cancellation tab and other squeal preventive suggestions.

No neck pickup function

- Neck pickup stops working when battery voltage goes down to about 7 volts. Replace battery.
- Trimpot (near 10-pin connector) turned down. Adjust this to proper pickup volume level.
- Neck pickup preamp input (orange on 10-pin connector) must connect to driver black wire by ON/OFF switch when sustainer turned OFF.

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BATTERY DISCONNECT: A stereo output jack is supplied which disconnects the battery if your normal guitar cord is not plugged in. This stereo jack replaces your existing instrument jack. *The green wire on the 10-pin connector connects to the jack ring terminal.* When a mono guitar cord is plugged in, the green wire is connected to ground. If the sustainer POWER SWITCH is turned OFF, the sustainer is now in *Standby mode*, and the driver preamp is ON so it can function as a pickup. The unit draws about 3-5 milliamperes (ma) in *standby* mode to run the driver preamp. You *must* have both the instrument cord plugged in, and the sustainer power switch turned on in order to activate the sustainer. You must remember to unplug the guitar when not using it, or the battery will slowly drain in about 100-200 hours in standby. For those guitars that have active pickups (such as EMG's) or piezo preamps that run on their own 9-volt battery, an optional 9-pin jack must be ordered to insure that both batteries are completely disconnected when no plug is inserted into the jack.

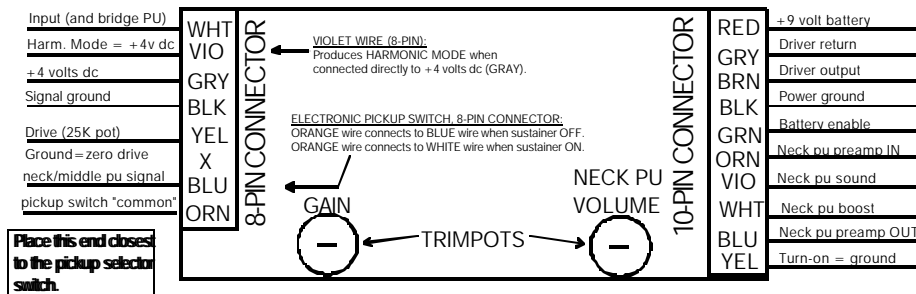
POWER AND HARMONIC CONTROLS: The **Stealth PRO** has two main controls: The *ON/OFF* switch and the *HARMONIC/GAIN* control. Both of these are special push-pull switches that are attached to control potentiometers. These "switch/pot" controls then replace two of your normal guitar potentiometers. These controls make the sustainer practically invisible on the instrument, without having to drill new holes for the switches. Alternatively, if you are willing to drill holes in your guitar body, one or both of these controls can be replaced by *mini toggle switches* if you desire. No extra charge for this option. **An optional 25K DRIVE control is available for the toggle-switch option. Yellow wire grounded = zero drive, yellow through 25K to ground = maximum drive. Drive wire not connected = max. drive.**

ON/OFF CONTROL: The *POWER* switch, a potentiometer/switch combination part, turns the sustainer ON by pulling out on the knob (or can be optional toggle switch). The bridge pickup is automatically selected when sustainer is ON. A 250K pot is included in kits for guitars with single-coil bridge pickups, 500K for bridge humbucker guitars. The pot portion of the control can then be used for the original volume or tone function, since the control uses only the switch portion of the control (becomes master tone on a Strat or Ibanez). Optionally, you can use a mini toggle switch for ON/OFF control.

HARMONIC/GAIN CONTROL: The *HARMONIC/GAIN* control is a 250K ohm pot/switch combination. When pushed in, it produces either *FUNDAMENTAL* or *HARMONIC* string vibration, depending on how it is rotated. Rotate it full right (clockwise), and you get mostly fundamental string vibration. Rotate it full left (counterclockwise), and you get intense *HARMONIC* string vibration. Rotate it toward center from either full setting, and the sustainer gain decreases toward zero. As the sustainer gain is decreased, slower fade-in of the sustain function will be realized. (Optionally, use a 3-position toggle switch, no extra cost.)

Pull the knob out, and you get two more modes: Full right (clockwise) = *MIX* mode is actually a more subtle harmonic mode. *MIX* produces mostly fundamentals on high notes, and mostly harmonics on low notes. Full left (counterclockwise) will produce yet another harmonic mode on some notes. This control uses both the pot and switch portions of the control. Or, you can use the optional 3-pos. toggle switch control. *MIX* mode is in the middle position with the toggle control option.

NECK PICKUP BOOST: The new white/violet wires (10-pin) will boost the neck pickup sound if they are both connected to ground with a DPDT switch (toggle or push-pull). This gives a humbucker sound to the pickup. If these wires are not connected to ground, then the sound is more like a Strat single-coil.



CONNECTOR COLOR CODE AND WIRE FUNCTION DIAGRAM

SUSTAINER CHECKOUT AND ADJUSTMENT

- Turn the sustainer ON by actuating the power switch. Listen for squeal or "grunge" coming from the amplifier. (See step #11 below.) Make sure that *only the bridge pickup* (PU) functions when the sustainer is on by gently tapping the polepieces all of the pickups with a steel object like a screwdriver blade.
- If you have a current meter to measure battery current, idle current should be about 3 or 4 ma. Full power sustain of most notes should be about 20 to 60 ma. after first shooting above 100 ma for a short time. Actual current depends on notes played. Higher notes and harmonics draw less current. Check troubleshooting guide if battery gets warm or if current remains above 60 ma.
- Most notes should sustain in *FUNDAMENTAL* mode. (Some won't, particularly very high or very low notes.) If you don't get mostly strong fundamentals, make sure the violet/gray wires are connected as shown in the hookup drawing. If this is OK, than the driver leads (red, black) should be reversed. (For EMG pickups, leads *MUST* be reversed.) Harmonic mode occurs when the violet/gray wires are shorted together by the *HARMONIC MODE* control pot (or switch, if using a toggle control).
- GRUNGE/SQUEAL TEST AND ADJUSTMENT OF MAGNETIC FIELD CANCELLATION TAB:** *This is mainly for Strats only.* If you have squeal and/or grunge in your guitar signal, you might need to add a tab. More likely, the problem will be due to poor wire placement. For Strats, place the tab in the best position to remove distortion, hiss, and squeal, with your instrument amplifier set to a *clean* setting. Check in both *FUNDAMENTAL* mode (clockwise), then in *HARMONIC* mode (counterclockwise). Start with the tab in the center position. The tab can be placed on either the neck or bridge side of the driver. Carefully and slowly slide the moveable magnetic field cancellation tab to the best position to minimize squeal and distortion. If you have a tap switch on a bridge humbucker, select the tap so you can hear the distortion better. Use trial and error to determine this. **Use only a plastic or wooden stick (or fingers) to move the tab. Do not use metal, because it will affect the setting of the tab.**

If you cannot make squeal go away then go to the *TROUBLESHOOTING* section, which follows. More troubleshooting details are on the Sustainiac website, *Stealth PRO* page or *INSTALLATION* page.

TROUBLESHOOTING GUIDE

CAUTION: Remove battery before soldering any connections to the circuit.

Your *SUSTAINIAC® STEALTH PRO™* sustainer has been completely tested for proper operation. Since installation in your instrument requires that you solder numerous connections, it is possible that one or more tiny solder "bridges" can occur which short adjacent connections. Check your work under a strong light, using a magnifier. Double check each wire with the color-coded drawing.

SYMPTOM Sustainer dead

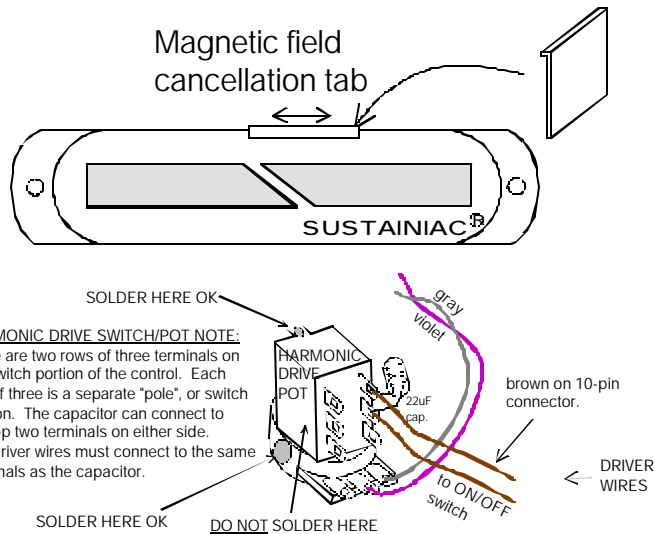
- Make sure **both** sustainer ground (black) wires are connected to pot bodies. (Many people connect battery (-) to black (10-pin), *then don't connect to a pot body.*)
- Make sure output jack terminals not shorted to jack housing or to each other.
- Check to make sure battery is good (+8 volts or greater) and is wired in properly.
- Check driver shielded wires for solder short.
- Check circuit board connectors for pulled-out or improperly connected wire. Also, check for correct insertion of the connectors.
- Mono guitar cord must be plugged into guitar jack (not stereo). (3-5 ma Standby)
- Green wire must be connected to stereo output jack "ring" terminal
- Yellow wire is connected to ground when sustainer switch set to ON position.
- If the circuit board is physically pressed tightly against the pickup selector when you install a pickguard (Strat, Ibanez), the insulation on the board can be punctured, causing internal connections to be shorted to guitar ground or other electrical contacts.

PRELIMINARY INSTRUMENT CHECKOUT

NOTE: Don't install a battery yet.

1. Set HARMONIC/DRIVE pot on the guitar body to maximum right (clockwise) for maximum gain in FUNDAMENTAL mode. Make sure this switch is PUSHED IN. (OPTIONALLY, set toggle MODE switch to FUNDAMENTAL position.) Set neck pickup trimpot (near 10-pin connector) to a 12-1 o'clock setting.
2. Set your guitar amplifier on CLEAN setting, with the treble control advanced and midrange control reduced. This will allow you to better hear grunge and distortion that might be picked up from the sustainer.
3. **Before installing a battery**, make sure that the battery wires are not reversed. Make sure the power switch is pushed IN (off). Make sure the connectors are plugged in correctly. If you have a meter to measure current, set it to 1-ampere full scale and put it in series with the battery (+) terminal.
4. Now, install a 9-volt ALKALINE battery. Don't use Nicad, which only has 7.2 volts. Feel the battery. **If it gets warm or current meter "pegs", remove it immediately, and recheck wiring.**
5. Plug in a mono guitar plug. With the ON/OFF switch pushed in (**sustainer OFF position**), make sure that the instrument functions normally. Exercise the pickup selector switch to make sure the pickups work OK. The driver should function as a pickup when the sustainer is off. It needs to be set for proper level by adjusting **NECK PICKUP TRIMPOT** if necessary. Also, test the instrument volume and tone controls for proper operation. Standby current should be 3-5 ma (milliamperes).
6. If you have a Strat (with slanted bridge pickup), insert the MAGNETIC ADJUSTMENT TAB between the driver and cavity to a position at the center as shown in the diagram below. We don't supply one for other guitar types unless you specifically request one.

DETAIL OF MAGNETIC TAB INSTALLATION: We only supply this for Strats and knockoffs having a slanted bridge pickup. It can face the neck or face the bridge (see drawing). Set the instrument amplifier to a clean setting, and turn up the treble so you can easily hear distortion. **Move the tab is to the position where noise and squeal is minimum.** Don't use a metal object to move the tab because it interferes magnetically. A good way to do it is to move the tab with the fingers while sustaining the big E-string. The tab can be secured in place with small dab of silicone adhesive or double-stick tape after positioning. On some installations, there is sufficient friction to hold it in place.



RETROFIT INSTRUCTIONS

CAUTION #1: Make sure that your body is discharged of static electricity before handling or working on the sustainer circuit board. A static spark can damage semiconductor components.

1. () Check to make sure you have received all of the parts necessary to install the sustainer.
 - (1) CIRCUIT BOARD (1.1 in. x 3.75 in.)
 - (2) DRIVER TRANSDUCER (black or white, SC or HB size, appropriate mounting screws, 2 springs, magnetic field cancellation tab, 0.5 x 0.85 in. Strats only (*not needed on other guitars*))
 - (3) MISCELLANEOUS PARTS BOX
 - WIRE HARNESS 10 pin connector, 8 pin connector.
 - TWO SWITCH/POTENTIOMETERS, one for **POWER** and one for **GAIN/HARMONICS**
 - OPTIONAL: Toggle switches can replace either pot/switch control at your option
 - STEREO OUTPUT JACK type dependent on original guitar jack, 9-pin for active pickups
 - SHIELDED WIRE for tone control hookup or output wire
 - EXTRA HOOKUP WIRES: When you trim the harness wires short, (as you should) you will have lots of extra wire.
 - WIRING ACCESSORIES: heatshrink tubing for wire splices, nylon wire ties
 - 9V BATTERY SNAP; or, optional quick-change battery case. Two batteries needed if your guitar has active pickups such as EMG's, also 9-pin output jack to disconnect both batteries.

SUSTAINIAC CIRCUIT INSTALLATION

CAUTION #2: Do not install a battery until the entire installation and steps 1-3 of PRELIMINARY INSTRUMENT CHECKOUT procedure are finished.

CAUTION #3: Never solder any wires of the sustainer with a battery installed!

SOLDERING: Use a good quality pencil-type soldering iron, preferably of 25 to 50 watts capacity. The best is to use a controlled temperature iron, set at about 650°F (340°C). Do not use a clumsy "gun" type iron. NEVER use acid-core solder. Use only rosin-core solder, intended for electronic use.

2. () Remove strings and pickguard (if any) from the instrument. Or, simply remove bolt-on neck after loosening strings. First, capo or tape strings to the neck near the nut to prevent a tangled mess.
3. () Some pickguards are covered with conductive foil to shield from hum pickup. **This must be removed from the whole area around the neck pickup (driver) and also bridge PU.** This shielding causes magnetic interference with the driver that causes squeal and grunge in the output signal. "Mirror" pickguards and trim-rings will cause problems, *and should be replaced with non-metallic ones.*
4. () **PLAN YOUR INSTALLATION BEFORE BEGINNING.** On Strats, Ibanez and Les Paul-type guitars, the circuit board placement should be exactly as shown on the hookup diagram. On Strats, be sure to wrap the wires coming from the 10-pin connector around the ON/OFF switch to keep the wiring short and neat. *Otherwise, it won't fit into the cavity.* For other guitar types, plan the installation carefully. ****ULTRA IMPORTANT**:** the 8-pin connector should be oriented close to the pickup selector switch.

Some sustainer signal wires can radiate electronically into your guitar pickup signal wires. This is known as "crosstalk". The result is that a "grunge" (distortion) is heard in your guitar output signal. It can even cause oscillation, which is normally heard as a high-pitched squeal. In order to minimize crosstalk, remember the following: CROSSTALK PREVENTION MUST DOMINATE YOUR ENTIRE INSTALLATION. So, please read the following notes carefully:

Keep the driver wires *short* (brown/gray wires on 10-pin connector). Keep the white/orange wires on the 8-pin connector (bridge pickup signal) *short*. ****** Keep all pickup signal wires away from the circuit board by at least 1/4 inch. Especially, white and orange 8-pin.**** Shield your output jack tip wire, or keep it physically away from the circuit board.**

The violet/gray wires on the 8-pin connector should be twisted together, and kept away from the guitar pickup signal wires.

The circuit board itself should be placed on its edge. This keeps it from lying on top of the guitar signal wires and controls, radiating distortion/grunge into the guitar signal. If the board *must* lie flat on top of guitar signal wires or the controls, consider shielding the board. To do this, you must first cover it with copper tape. Then, connect the copper tape to ground with a wire. Finally, cover the copper with insulating tape. But test it first before going to all this trouble.

Some wires don't cause grunge or oscillation: Both BLUE wires and the ORANGE wire on the 10-pin connector only carry middle and neck pickup signals. These signals are not heard when the sustainer is running. The black (ground), red, yellow, green wires generally don't cause grunge problems, either.

5. () STEALTH PRO CONTROLS: Remove the controls from your guitar that will be replaced with Sustainiac switch/pot controls. On Strats, a single MASTER TONE control (attached to ON/OFF switch) will replace the original NECK TONE. This will control the tone of all the pickups on the instrument. **TOGGLE SWITCH OPTION:** On Strats, you won't have much room to use two toggle switch controls without removing at least one of the tone controls, unless you are willing to do some body routing.

6. () For Strats and Ibanez with pickguard, mount the **Stealth Pro** push-pull switch/pot controls to the pickguard exactly as shown in the diagram. The solder lugs on the two controls should face each other to minimize wire lengths. *Arrange signal wires to provide maximum distance from the circuit board.* For Ibanez, consider adding a 3rd hole between volume and tone for Harmonic Mode control, so you don't have to lose your tone control. (In other words, make it like a Strat.)

7. () If a tone control is replaced by the ON/OFF switch (as with Strats and 4-pot Les Paul types), transfer the tone capacitor from the original pot, and attach to the new one as shown. Guitars that only have two pots must give up either the VOLUME or TONE function, unless another control is added.

8. () NECK PICKUP: Remove neck pickup, and replace with Sustainiac driver.

9. () DRIVER: Route driver wires to the ON/OFF switch and 10-pin connector. Solder driver shield wire to ON/OFF pot body or tab. *Do not try to solder to the switch body (upper square portion), because internal plastic parts will melt..* **If you have EMG pickups (and some other types), you will have to reverse the red/black driver leads from the drawing, because these pickups have reverse polarity from normal.**

10. () Attach the two wiring harnesses to the respective connectors. Keep the wires as short as possible to avoid electrical crosstalk which results in grunge in the pickup signal. *In Strats and Ibanez, the installation won't fit in the electronics cavity unless the wires are kept short.*

11. () BEGIN WIRING THE SUSTAINER AS SHOWN IN THE HOOKUP DIAGRAM. SUSTAINER WIRING CAUTIONS (grunge/oscillation prevention) : READ STEP 4 AGAIN.

- Keep the Sustainiac signal wires as short as possible (brown, gray on 10-pin connector, Har./Gain, violet/gray on 8-pin connector)
- Keep guitar pickup signal wires away from sustainer signal wires and also away from the circuit board itself. Keep the bridge pickup signal input wire (white/8-pin con.) as short as possible, and away from the STEALTH PRO circuit board and the violet/gray wires. Same for orange wire, 8-pin connector.
- Guitar pickup signal wires include any that are attached to the tone or volume controls, or the output jack. Shield the guitar output wire, or keep it away from white/blue/orange 8-pin.
- Where the driver red/black wires protrude from the shield, they must be kept away from the guitar signal. Driver red/black unshielded length should not exceed 1 inch (25 mm).

12. () HARMONIC/GAIN CONTROL WIRES (violet/gray): **(See drawing, page 6)** Twist these together before connecting to the HARMONIC/GAIN control. *These wires must not run near any guitar signal wire.* In some installations where the violet/gray wires must run a long distance, they themselves can be shielded. This requires replacing the gray/violet wires with a shielded pair. *It usually isn't necessary, except for extreme cases.*

First, pull the violet/gray wires “up” (not out) from the connector prongs. They are held by V-shaped prongs, which pierce the wire insulation, making contact with the inner conductor (“insulation displacement”). Then, carefully press the red/black wires from the shielded cable into the V-shaped prongs of the insulation-displacement connector using a thin screwdriver. The two prongs will cut into the insulation, making contact with the wire strands without soldering. *Be very careful not to damage the connector (or your fingers).*

13. () MASTER TONE POT: On Strats and Ibanez pickguards, the connection from the output on the volume pot to the tone pot runs parallel to the sustainer circuit board. Therefore, the tone connection must be shielded. If you don't do this, you will get grunge in the output signal. Use the extra shielded wire provided as shown in the diagram.

14. () OUTPUT JACK: Remove existing guitar jack, and replace with supplied stereo jack. For Strats, make sure that none of the jack terminals touch the conductive jack housing. You will have to bend them in to prevent touching. Connect a black wire (8-in. for Strats) to the jack ground terminal. The green STANDBY wire from the 10-pin connector connects to the ring terminal. The best way is to use part of the 2-conductor shielded cable supplied (shield to ground terminal, red to tip), and use the black wire to connect the ring terminal to a shortened green STANDBY wire.

15. () GROUND CONNECTIONS: The ground wires are best attached to the pot bodies or the small tab on the switch housing. ***(Don't try to solder to the square switch bodies, because internal plastic parts will melt. This will destroy the switches).*** All pot bodies must be grounded. Solder black ground wires to all pot bodies, and also to other guitar parts that need grounding. Make sure that both black wires from the 8-pin and 10-pin connectors are grounded. The black wire from the 10-pin connector **must** be soldered to the **same exact ground point** as the battery (-) wire. *If they are attached to different locations, grunge will appear in the guitar output signal due to pulsating ground currents.*

16. () PICKUP SELECT OR SWITCH: For Strats and Les Paul type guitars, rewire pickup selector switch as shown, keeping all pickup signal wires short and away from Sustainiac wires and circuit board. **IMPORTANT:** On Strats and other guitars having a lever-type pickup selector switch, note that the switch section (pole) having the **bridge pickup** connection *has no other pickups attached to it.* You can use any type of pickup selector switch you choose, **but no other pickup must be allowed to connect to the bridge pickup when the sustainer is on.** Since 3-position Gibson-type selector switches have only one pole, this is accomplished differently as shown on the appropriate hookup diagram. On guitars having individual pickup selector toggle switches, the bridge switch is separated from the neck and middle pickup switches. In operation the internal electronic switch on the sustainer circuit board connects the orange OUTPUT wire (8-pin connector) to the white wire (bridge pickup) when the sustainer is ON, and to the blue wire (neck/middle pickups) when the sustainer is OFF.

17. () **INITIAL TRIMPOT SETTINGS:** Set the neck pickup trimpot (near 10-pin connector) to a rotation of about 12 o'clock. This will set the sustainer neck pickup volume to the correct levels for most normal output pickups. Set higher to match *hot* pickups. Set the SUSTAINER GAIN trimpot (near 8-pin connector) to about a 11 to 1 o'clock rotation. Too high a GAIN setting can cause squealing in Harmonic Mode.

18. () **Do not install a battery until steps 1-3 of the PRELIMINARY INSTRUMENT CHECKOUT procedure is finished.**

19. () **Check to make sure that you do not have any wiring mistakes.**

20. () **The installation is now complete. Go to CHECKOUT section.**

After everything is checked out and working, you can use some of the supplied wire ties to make the installation neat, and also to keep guitar signal wires away from sustainer signal wires.