

The S600B StageMate™ portable PA system offers powerful state-of-the-art performance in a compact lightweight package with multiple options for connectivity and system expansion. The ability to run from internal battery power allows high-power operation where other systems simply cannot go and is rechargeable from either AC power or a 12V car socket.

Derived from large line array technology, the CDD™ (Constant Delivery Dispersion™) speaker array delivers clear, intelligible sound over extended distances. The coverage is up to twice that of conventional cabinets.

Designed for professional touring, the compact enclosure is made from multi-ply Baltic birch, CNC machined for precise construction and weight reduction, then covered in impact and weather resistant Duratec™ UV finish.

The system expands to stereo with the matching S648 extension speaker, and allows connecting up to three S648's resulting in a 400 watt system with increased CDD™ array coverage. For bass-heavy applications, a powered subwoofer can be linked to the MAIN volume control through the XLR Line Out.

The built-in 6 channel mixer is capable of receiving up to 11 different sources at the same time. A variety of inputs include *Bluetooth*® wireless technology for audio playback, 4 XLR mic inputs, 2 instrument inputs with Hi-Z switch, stereo dual 1/4" input, 1/8" stereo input for portable devices and an accessory bay which accepts an optional UHF wireless mic/instrument receiver. The active 3-band EQ controls are designed for natural sounding yet powerful tone shaping for vocals and instruments. DSP effects with variable settings for Echo, Reverb and Chorus add extra dimension to live performances.

Other features include Phantom mic power, a USB charge port, Headphone output and XLR Line Out.

Advanced speaker technology and flexible connectivity options in a light weight yet rugged package make the S600B an indispensable system.

- Lightweight, compact PA system with pristine sound and outstanding projection
- Can run for hours in battery mode on a single charge, rechargeable from wall AC or car 12V DC socket
- 400w Stereo amplification drives up to three S648 extension speakers
- Four 3.5" Mid-Hi drivers in CDD™ (Constant Delivery Dispersion™) array
- 8-inch, 250 watt Neodymium woofer with computer tuned porting
- Six channel mixer, stereo or mono operation, 11 simultaneous inputs
- *Bluetooth*® wireless technology for streaming audio
- Optional UHF wireless mic/instrument receiver plugs in without connectors
- 4 balanced XLR mic inputs with Lo, Mid and Hi EQ
- 2 mono Line/Instrument inputs
- Hi-Z switch for Magnetic or Piezo pickups
- Dual 1/4" Stereo L-R Input with Lo and Hi EQ
- 1/8" jack Stereo Input with Lo and Hi EQ
- USB charge port for smartphone/media player
- 48V Phantom Power switch for mics
- DSP effects with adjustable Delays, Reverb & Chorus
- Direct Out XLR with Level, DC isolated and ground lifted
- Link to MAIN switch for Direct Out XLR to house system or powered sub
- Headphone/Tuner output jack
- Cool running Class D operation
- Amp limiter built-in to increase headroom
- Dual pole mounts for speaker stands and stacking S648 extension speaker
- Exclusive "lock-in" AC cord prevents accidental disconnect
- Designed and manufactured by Carvin Audio in the USA

GETTING STARTED QUICKLY

1. With POWER off, set the channel LEVELS and the MAIN volume at "0". Set the channel EQ controls to their center "0" position. This is the normal setting for the amp.
2. Connect a mic or instrument to the Channel 1 XLR or 1/4" jack.
3. Turn the amp ON.
4. Turn up the channel LEVEL to about "5". Gradually increase the MAIN control to the desired level. If no sound is heard, turn down the MAIN and check the POWER (green) LED.
5. Adjust the EQ controls to your liking. Keep in mind that turning up a tone control isn't always the answer. Sometimes turning down the MID control will get you the sound you want.
6. Need more volume? Try the channel GAIN switch to compensate for low levels from mics or instruments. Even though the S600B is driven by a powerful amplifier, connecting additional speakers is the best way to get substantially more output. Doubling speakers increases acoustic output by four. Using the "R/Stereo" speaker jack will also make use of the second amplifier.



RECEIVING INSPECTION - read before getting started

INSPECT YOUR SYSTEM FOR DAMAGE which may have occurred during shipping. If damage is found, please notify the shipping company and Carvin Audio immediately. SAVE THE CARTON & ALL PACKING MATERIALS. In the event you have to re-ship your unit, always use the original carton and packing material. This will provide the best possible protection during shipment. Carvin Audio and the shipping company are not liable for any damage caused by improper packing. SAVE YOUR INVOICE. It will be required for warranty service if needed in the future. SHIPMENT SHORTAGE. If you find items missing, they may have been shipped separately. Please allow several days for the rest of your order to arrive before inquiring. RECORD THE SERIAL NUMBER on the enclosed warranty card and on this manual for your records. Keep your portion of the card and return the portion with your name and comments to us.

SPECIFICATIONS: S600B, S648 EXTENSION SPEAKER

Output Power, S600B:	2x 200W @ 4 Ohms total, Int. speaker power 150W @ 8 Ohms
Frequency Response:	60Hz-18kHz
Speaker Configuration:	four 3.5" MF/HF, 8" Neodymium LF, 8 Ohms/200W
Sensitivity:	93dB 1W/1M, 90dB 1W/2M, max SPL 118dB @ 300W pk. (int.)
Coverage:	Horizontal: 110 deg. Vertical: 40 deg.
Input Impedance:	1/4" (Ch.1&2): 100K Ohms or Hi-Z switch: 500K Ohms XLR: 2.2K Ohms, Stereo Inputs (Ch.5&6): 22K Ohms
Gain switch:	+20dB (Ch. 1-4)
Phantom Power:	+48V, switchable for Mics 3&4
Tone Controls:	HI: 8.5kHz, +/-12dB MID: 800Hz, +/-12dB LOW: 70Hz, +/-12dB
Direct Out:	Variable OFF to +4dBu, DC isolated, 100 Ohm gnd lift
DSP Effects:	Variable settings for Delay, Reverb, Chorus
Protection:	speaker, thermal, over current, under voltage
Power Amp topology:	Class D
Power Supply topology:	High frequency switch mode
AC Power Requirements:	90 to 250VAC 50/60 Hz, 100VA
DC Battery Charge Input:	12-15VDC, 2A (car battery voltage with C12VDC cord)
Dimensions: S600B, S648	9.7"W x 11.5"D x 17.25"H (246 x 292 x 438mm)
Mounting/Transport:	top and bottom pole cups, integrated handle
Weight :	(with battery): 25.5 lbs. (11.6 kgs)
Warranty:	One year parts and labor
Optional Accessories:	UX600: Wireless Mic/Instrument Receiver CB601: padded bag w/wheels, CV600: vinyl cover SS20, SS15: pole stands, SS3: stacking pole B600: replacement battery C12VDC: charging cable for 12V vehicle outlet S610B battery powered 400W 10" subwoofer
S648 Extension Speaker:	8 Ohms/200Wrms, 93dB 1W/1M, 90dB 1W/2M, max SPL 122dB
(same size and configuration)	weight: 18lbs (8.2 kgs)



1. XLR INPUTS

The XLR input can be used for microphones or as an input from direct boxes or active instruments.

2. 1/4" INPUT JACKS

The 1/4" input jacks are designed to work with nearly any source, including active or passive instruments with piezo or magnetic pickups.

3. HI-Z (IMPEDANCE) SWITCH

Pressing the **Hi-Z** switch IN raises the input impedance of the 1/4" INPUT to above 500K Ohms. This allows the full tonal range and dynamics of piezo or magnetic pickups to be heard and can also benefit active pickup systems. If the sound is too bright for your liking or if there is excess noise, set the Hi-Z switch to the OUT position.

4. GAIN SWITCH

The **GAIN** switch will increase the sensitivity of the 1/4" and XLR inputs by +20dB. Set the **GAIN** switch IN to compensate for instruments or microphones with low outputs. For low volume situations, or to get the best dynamics from high output instruments, set the **GAIN** switch to the OUT position.

5. L-R INPUT (DUAL 1/4")

The Channel 5 **L-R** INPUT consists of two 1/4" jacks for input from a variety of sources such as keyboards, rhythm machines, amp modelers or other mixers.

Stereo speaker operation requires an extension speaker plugged into the **(R)** SPEAKER OUTPUT. The **PHONES** jack retains the stereo signal path.

6. L-R INPUT (STEREO 1/8')

The Channel 6 **L-R** INPUT is an 1/8" jack for input from your MP3 player or other music source.

Stereo speaker operation requires an extension speaker connected to the **(R)** SPEAKER OUTPUT. The **PHONES** jack retains the stereo signal path.

7. CHANNEL LEVEL

Use the channel **LEVELS** to control the volume of each input source, sending the mix to the **MAIN** volume control. The **GAIN** switches on channels 1-4 will also affect the level. If your sound becomes distorted, reduce the **LEVEL** or set the **GAIN** switch **OUT** and increase the **MAIN** volume.

8. CHANNEL EQ CONTROLS

The **HI**, **MID** and **LOW** controls are custom shaped EQ controls designed to allow adjustment of tone for a variety of instruments and sources. Center "0" is the flat setting. When a control is turned to the right it boosts the signal content in the **LOW**, **MID** or **HI** frequency range and when turned to the left reduces the frequency range. If turning up an EQ control distorts the sound, reduce the channel **LEVEL** and increase the **MAIN** volume or set the channel **GAIN** switch to **OUT**.

9. EFFECTS CONTROL (CHANNEL)

The **EFFECTS** control adjusts the effects level going from the channel to the internal DSP effects processor. If unwanted distortion is heard from the effects, lower the channel **EFFECTS** control and increase the master **DSP EFFECTS LEVEL**.

10. BLUETOOTH® WIRELESS CONNECTION

The S600B features **Bluetooth®** wireless technology which allows audio playback from an enabled device. Pairing is available any time the S600B power is ON.

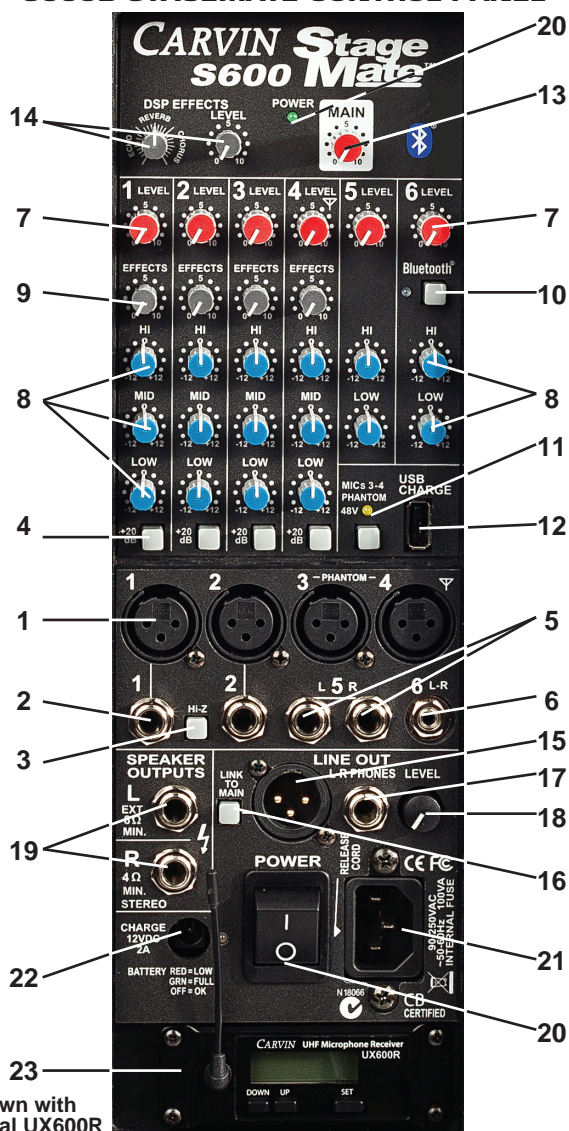
To hear the audio from a **Bluetooth®** enabled device:

1. Reduce the **LEVEL** for Channel 6 to avoid loud music after connection.
2. Press the **Bluetooth®** switch IN to enable the audio circuit and view LED status. The blue LED blinks on and off to indicate it is open to pairing.
3. Pair your device with the S600B, which will be seen as "Carvin S600B - ____". The blue LED will be ON continuously when the device is paired.
4. On your device, play the music and turn up the volume to full.
5. Raise the Ch. 6 **LEVEL** control and the **MAIN** volume to the desired level.

Helpful hints about using Bluetooth®

1. The range of the **Bluetooth®** connection is typically about 20-30 feet, and can be affected by people or objects between the S600B and the connected device.
2. Keep the connected device close to the S600B to avoid unexpected dropouts from increased distance.
3. The **Bluetooth®** switch does not enable/disable the paired connection to your device, it only affects the audio connection to the mixer.

S600B STAGEMATE CONTROL PANEL



shown with optional UX600R

11. MICS 3-4 PHANTOM POWER SWITCH

The **PHANTOM POWER** switch provides power to condenser microphones, active direct boxes or active instruments connected to the XLR input. The red LED will indicate the **PHANTOM POWER** is ON. Leave this switch **OUT** if phantom power is not required. Note that when running on battery power the phantom voltage may be reduced, but will be enough for most microphones.

12. USB CHARGE PORT

The **USB CHARGE** port provides USB power to keep your media player charged. One device can be powered at a time.

13. MAIN (VOLUME)

Use the **MAIN** to control the overall volume of the speakers. Reduce the **MAIN** if your sound becomes distorted. With the **LINK** to **MAIN** switch IN, the **MAIN** will also affect the XLR OUT.

14. DSP EFFECTS CONTROLS

The S600B features a DSP effects processor featuring lush effects of **ECHO**, **REVERB** and **CHORUS**.

Raise the channel **EFFECTS** control to send the signal from the chosen channel to the DSP processor. If distortion is heard, lower the channel **EFFECTS** control and increase the main **DSP EFFECTS LEVEL**.

The left **EFFECTS** control (**ECHO-REVERB-CHORUS**) selects the effect type and adjusts time, decay, regeneration and speed settings depending on the effect type. The **DSP EFFECTS LEVEL** adjusts the effects level heard at the outputs.

ECHO: When the **EFFECTS** control is in the lower 1/3 of rotation it selects the **ECHO** effect. The lowest setting is a short "Slapback" with a short, single repeat delay. Turning the control to the right will increase the length of delay and number of repeats.

REVERB: When the control is the middle 1/3 of rotation it selects the **REVERB**

effect. Turning the control to the right increases the reverb decay time.

CHORUS (with Reverb): When the control is in the last 1/3 of rotation it selects the CHORUS effect, with optional Reverb. The first setting will be a slow chorus swell without Reverb. Turning the control to the right will increase the Chorus speed. REVERB is added at the half-way mark and the Chorus speed settings are repeated from slow to fast.

15. LINE OUT XLR JACK

The LINE OUT XLR provides a balanced output for going direct to a house system, recording input or to other powered systems like a powered subwoofer. The LINE OUT signal is affected by the channel LEVEL, EQ controls and internal DSP effects.

With the LINK TO MAIN switch OUT, the XLR output is adjusted from the LINE OUT LEVEL control, and the signal is not affected by the MAIN level.

With the LINK TO MAIN switch IN the XLR output is adjusted by the MAIN control.

The XLR is protected against Phantom power (DC voltage) on cables coming from phantom powered mixer inputs. Ground pin 1 of the XLR is lifted to 100 Ohms above the chassis ground to prevent hum from grounding issues.

16. LINK TO MAIN SWITCH (LINE OUT XLR)

If the LINK TO MAIN switch is set to the OUT position, the LINE OUT XLR output level is adjusted from the LINE OUT LEVEL control and the signal is not affected by the MAIN level.

With the LINK TO MAIN switch IN, the LINE OUT XLR level is adjusted from the MAIN volume control along with the S600B speaker outputs. This provides better control when connecting a powered subwoofer to the S600B; once a good bass balance is achieved, the MAIN volume will also control the subwoofer level.

17. PHONES JACK

The PHONES jack is a stereo 1/4" jack designed for connecting headphones, tuner or stereo recording device. The volume is adjusted by the DIRECT OUT LEVEL control, containing the audio mix from the channel LEVEL settings. To listen to headphones without hearing the other speakers, turn down the MAIN control and adjust the headphone volume with the DIRECT OUT LEVEL control.

18. LINE OUT LEVEL (PHONES)

The DIRECT OUT LEVEL controls the output level to the 1/4" PHONES jack and with the LINK TO MAIN switch OUT, also controls the XLR output.

With the LINK TO MAIN switch IN, the XLR output is only adjusted by the MAIN control.

19. SPEAKER OUTPUTS

The S600B has two 1/4" SPEAKER OUTPUTS connectors, each connected to a different amplifier allowing stereo operation when the R (Right) jack is used.

For the best performance use the matching S648 extension speaker featuring identical drivers and cabinet design as the S600B.

The L (Left) speaker jack is connected in parallel with the internal S600B speaker system amplifier. You may connect one S648 extension speaker or a speaker with an impedance of 8 Ohms or higher.

The R (Right) speaker jack is connected to a second amplifier and activates stereo mode when plugged into. Stereo sources from CH.5 or CH.6, including the *Bluetooth*® audio connection, will then be heard in stereo.

You can connect up to two S648 extension speakers to the R (right) speaker jack, or speakers with a total impedance of 4 Ohms or higher.

If you go below the minimum speaker load rating, the S600B will protect and shut off.

20. POWER SWITCH / LED

The POWER switch turns the amp ON or OFF. The green POWER LED will light approximately 3 seconds after the POWER switch is turned on.

To charge the S600B from AC power, the POWER switch must be ON.

21. AC POWER JACK & FUSE

The AC POWER JACK will accept 90VAC to 250VAC, 50Hz or 60Hz. Plug the cord into a grounded 3 prong power source. No attempt should ever be made to use the AC cord without the ground connected.

A locking AC cord (Carvin part# 120V18L7) is supplied. However, a standard AC cord can be used. (for European 230V use a CEE-7 plug cord set).

To detach the cord from the amp, press the release lever on the underside of

the cord near the amp.

The FUSE for AC power is located internally near the AC input. To check or replace, first turn the POWER switch **OFF** and **remove the power cord**. Remove the 12 screws from the edge of the control panel. Carefully remove the control panel from the speaker enclosure.

BATTERY OPERATION AND CHARGING

The **S600B** features a rechargeable 12 volt battery system which is able to power the unit without connecting to a wall AC socket.

MAXIMIZING BATTERY LIFE: Run time will vary depending on speaker volume and the number of speakers connected. The S600B alone can run for over 2 hours at 100W peak power. At lesser volumes the S600B can run with all extension speakers for 4 hours or more. If the CHARGE LED near the power switch blinks RED or if the sound becomes distorted, lower the volume for better sound and longer play.

CHARGING: The battery will charge when the unit is powered ON from AC power, or it can be charged through the CHARGE 12VDC connector. Charge time for a nearly dead battery to full charge is approximately 6 hours.

BATTERY REPLACEMENT: If battery run time is greatly reduced after many charge cycles it may need replacement (Carvin part #B600). To replace the battery first turn the POWER switch **OFF**, and **remove the power cord**. Remove the 12 screws from the edge of the control panel. Remove the panel from the speaker enclosure. Disconnect the wires from the battery posts (leave these wires connected to the circuit board to prevent shorting the battery) and disconnect the 4-pin speaker connector from the circuit board. Remove the nut and wood block holding the battery. Secure the new battery with block and nut. Connect the wires with the correct +/- polarity. Replace the control panel screws by hand to avoid stripping (after repeated use).

The AC fuse type is a 5mm x 20mm 250V Slow Blow rated at 5A.

22. CHARGE 12VDC CONNECTOR, LED INDICATOR & FUSE

The CHARGE connector is for charging the S600B internal battery from a car or other vehicle using an adapter such as our C12VDC power cord to plug into a 12V car accessory socket (cigarette lighter). The S600B will charge through the CHARGE connector whether the POWER switch is OFF or ON. The S600B can be used while connected to the CHARGE 12VDC connector for continuous use. It is recommended to start with a full charge.

The LED will indicate GREEN when the battery is at full charge, OFF when it is slightly drained (OK), and RED when the battery is LOW.

NOTE: Charging a completely dead battery, running at high volume and multiple speakers each require more power and can drain your vehicle's battery faster.

The FUSE for the 12VDC power system is located internally near the 12VDC connector. To check or replace, first turn the POWER switch OFF, and remove the power cord. Remove the 12 screws from the edge of the control panel. Carefully remove the control panel from the speaker enclosure.

The battery fuse type is a 6.35mm x 32mm 250V Slow Blow rated at 15A.

23. ACCESSORY BAY (FOR OPTIONAL UHF WIRELESS RECEIVER)

The S600B is designed with an accessory bay which allows direct mounting of our UX600R UHF Wireless Mic/Instrument receiver, for use with the UX600M wireless handheld microphone or the UX600B beltpack transmitter. The UX600R plugs directly into the bay without any connectors to connect.

Audio from the UHF receiver will be heard through Channel 4 while allowing full use of the CH.4 XLR input.

To mount the receiver in the accessory bay, first remove the adhesive cavity cover. Remove the bag containing 4 mounting screws. Slide the unit into the bay until you feel some resistance, then press more firmly as the receiver is seated and the face panel meets the S600B. Screw in the 4 screws, being careful not to strip the plastic housing.

HELPFUL HINTS:

NO SOUND:

- The channel LEVEL or MAIN volume are set to "0".
- Speaker Output jack has been shorted or not fully plugged in, triggering protection circuits.

POOR HIGH FREQUENCIES:

- The HI frequency EQ control is set too low.
- Set the Hi-Z impedance switch IN for instruments on Ch.1 or Ch.2.

AMP SEEMS VERY SENSITIVE TO INPUT SIGNALS:

- Adjust the channel LEVEL or MAIN volume.
- Turn OFF the GAIN switch for Ch.1-4.

FEEDBACK FROM MIC OR INSTRUMENT:

- Keep the mic or the face of the instrument pointed away from the speakers.
- Use the EQ controls to reduce feedback or reduce the channel LEVEL.

DEVICE DOES NOT CHARGE WHEN CONNECTED TO USB CHARGE PORT:

- The phone or device battery is too low and is pulling too much power from the charge port, which will stop the charging.

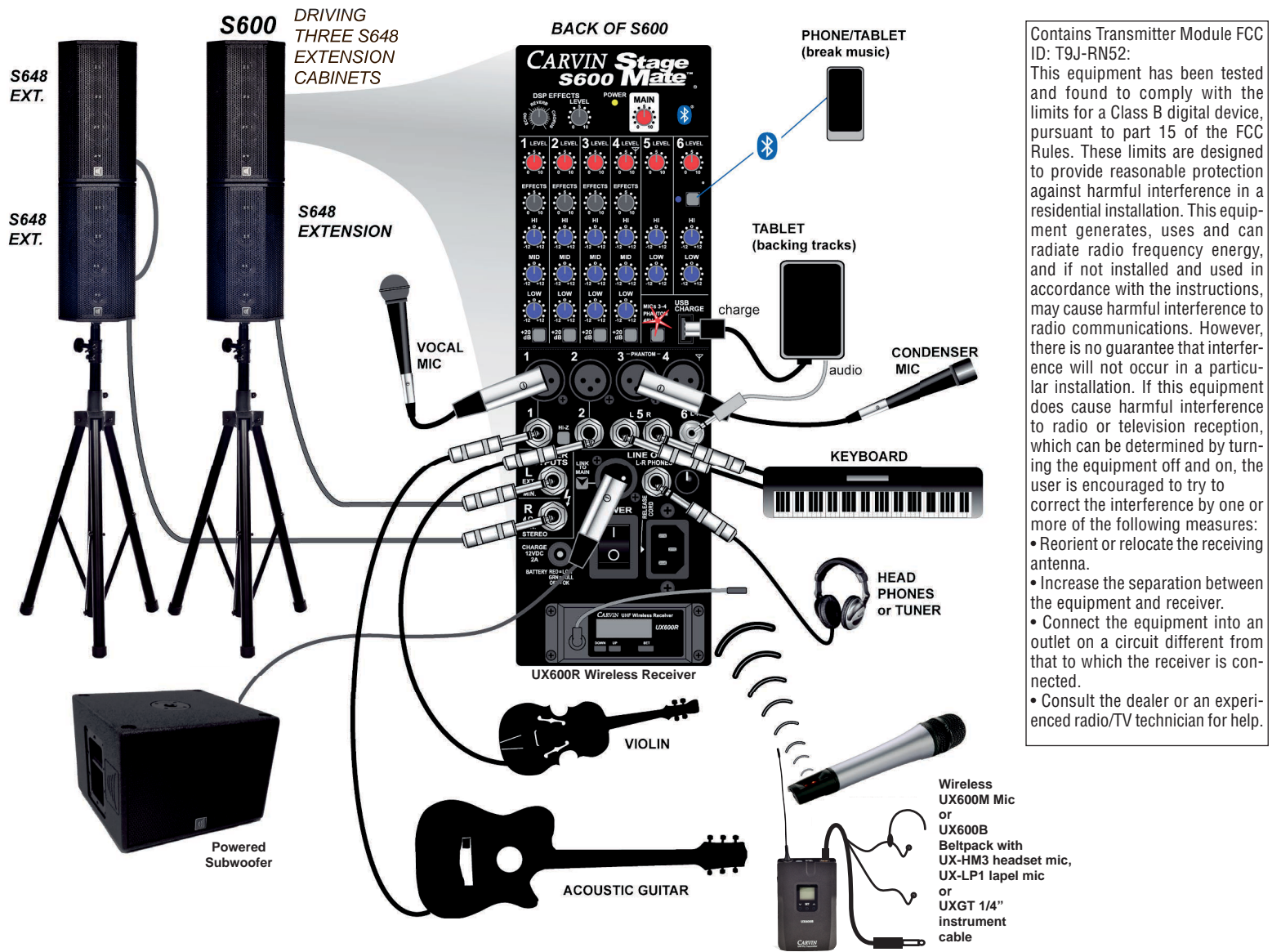
FOR MAXIMUM OUTPUT:

- Connecting an extension speaker to the "R" Speaker Out will make use of the second internal amplifier. The S600B will drive a total of 3 extension speakers. Every time you double your speakers your acoustic output goes up by a factor of four.

LOCKING AC CORD
120V16L7




S600B EXAMPLE SETUP:




Contains Transmitter Module FCC ID: T9J-RN52:
 This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

 This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

CAUTION
 RISK OF ELECTRIC SHOCK
 DO NOT OPEN


This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.


IMPORTANT! FOR YOUR PROTECTION, PLEASE READ THE FOLLOWING:

WATER AND MOISTURE: Appliance should not be used near water (near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

POWER SOURCES: The product should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

GROUNDING OR POLARIZATION: Precautions should be taken so that the grounding or polarization is not defeated.

POWER CORD PROTECTION: Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them. Prevent sharp bends of the cord, paying particular attention to the plug at each end of the cord.

SERVICING: The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

FUSING: If your unit is equipped with a fuse receptacle, replace only with the same type fuse. Refer to replacement text on the unit for correct fuse type.

SAFETY INSTRUCTIONS (EUROPEAN)

The conductors in the AC power cord are colored in accordance with the following code.
 GREEN & YELLOW—Earth BLUE—Neutral BROWN—Live
U.K. MAIN PLUG WARNING: A molded main plug that has been cut off from the cord is unsafe. NEVER UNDER ANY CIRCUMSTANCES SHOULD YOU INSERT A DAMAGED OR CUT MAIN PLUG INTO A POWER SOCKET.

LIMITED WARRANTY

Your Carvin Audio product is guaranteed against failure for 1 YEAR unless otherwise stated. Carvin will service and supply all parts at no charge to the customer providing the unit is under warranty. Shipping costs are the responsibility of the customer. CARVIN DOES NOT PAY FOR PARTS OR SERVICING OTHER THAN OUR OWN. A COPY OF THE ORIGINAL INVOICE IS REQUIRED TO VERIFY YOUR WARRANTY. Carvin Corp. assumes no responsibility for horn drivers or speakers damaged by this unit. This warranty does not cover, and no liability is assumed, for damage due to: natural disasters, accidents, abuse, loss of parts, lack of reasonable care, incorrect use, or failure to follow instructions. This warranty is in lieu of all other warranties, expressed or implied. No representative or person is authorized to represent or assume for Carvin Corp. any liability in connection with the sale or servicing of Carvin products. CARVIN CORP. SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

MAINTAINING YOUR EQUIPMENT

Avoid spilling liquids or allowing any other foreign matter inside the unit. The panel of your unit can be wiped with a dry or slightly damp cloth in order to remove dust and bring back the new look. As with all pro gear, avoid prolonged use in caustic environments (salt air). When used in such an environment, be sure the amplifier is adequately protected.

SERVICE

In the USA go to www.carvinaudio.com.

Outside the USA, contact your dealer or go to www.carvinaudio.com and click on "Dealers" for your nearest service center. Include a written description of the problem with serial number and date of purchase.



CAUTION
 RISK OF ELECTRIC SHOCK

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL! THIS UNIT CONTAINS HIGH VOLTAGE INSIDE!