Blue Sky | SUB 15 *Universal*
1000-Watt subwoofer with adaptive x-over

Owner's Manual

Contents

Safety Instructions

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

AVIS: RISQUE DE CHOC ELECTRIQUE
NE PAS OUVIR

WARNING: To reduce the risk of fire or electrical shock, do not expose this equipment to rain or moisture. Do not remove cover. No user serviceable parts inside. Refer servicing to qualified personnel.

1. **READ INSTRUCTIONS** - Read all safety and operating instructions before operating this product.

2. **RETAIN INSTRUCTIONS** - Retain these safety and operating instructions for future reference.

3. **HEED WARNINGS** - Follow all warnings on this product and in the operating instructions.

4. **FOLLOW INSTRUCTIONS** - Follow all operating and use instructions.

5. **ATTACHMENTS** - Do not use attachments not recommended by the product manufacturer as they may cause hazards.

6. **WATER AND MOISTURE** - Do not use this product near water - for example, near a bathtub, washbowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.

7. **ACCESSORIES** - Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with accessories recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions and should use a mounting accessory recommended by the manufacturer.

8. **POWER SOURCE** - This product should be operated only from the type of power source indicated on the marking label on the back of the product. It is **IMPORTANT** to confirm that the voltage selector switch on the back of the subwoofer is set to the proper voltage setting. If you are unsure of the type of power that is supplied to your home, consult your product dealer or local power company.

9. **LIGHTNING**- For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power-line surges.

10. **OVERLOADING** - Do not overload wall outlets or extension cords as this can result in a risk of fire or electric shock.

11. **LIQUID ENTRY** - Never spill any liquid of any kind on the product.

12. **SERVICING** - Do not attempt to service this product yourself. Opening or removing covers, including any over bottom or side speaker drivers, may expose you to dangerous voltage or other hazards. Refer all service to qualified service personnel.

13. **DAMAGE REQUIRING SERVICE** - Unplug this product from the wall outlet and refer servicing to qualified personnel under the following conditions:

    a. When the power-supply cord or plug is damaged.
    b. If liquid has been spilled, or objects have fallen into this product.
    c. If the product does not operate normally by following the operating instructions. Adjust only controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
    d. If the product has been dropped or damaged in any way.
    e. When the product exhibits a distinct change in performance - this indicates a need for service.

14. **REPLACEMENT PARTS** - When replacement parts are required be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in risk of fire, electric shock, or other hazard.

15. **SAFETY CHECK** - Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

16. **HEAT** - This product should be situated away from heat sources such as radiators, heat registers, stoves, or other products that produce heat.

1. SUB 15 Universal Introduction

Blue Sky is a philosophy. We design each product to represent the highest ratio possible of performance to cost, providing the highest value added to our customers.

We will continually seek out opportunities to utilize the talent of the Blue Sky team to realize this philosophy. Our customer's value requirements will always be our prime focus, and only those products that achieve our performance value ratio will earn the right to carry the Blue Sky logo.

To that end we are proud to introduce the Blue Sky SUB 15 Universal 1000-Watt subwoofer. The SUB 15 Universal is a sealed box subwoofer, designed around a 15" forward-firing driver with a massive cast aluminum frame, dual 2.5" voice coils - which has almost 2.36" of excursion (peak to peak) and features an enormous 20+ Lbs. motor structure - total driver weight 36 Lbs. (**see figure 1** for a detailed driver cutaway drawing). One of the SUB 15 Universal's unique features is a switchable low frequency response characteristic, of either 30Hz to 200Hz +/-3dB or, in "extended LF mode", 20Hz to 200Hz +/-3dB (anechoic). The extended mode is ideal for large rooms that don't exhibit the room gain phenomenon of smaller sealed spaces. In addition, the SUB 15 Universal also has built-in 2.1 bass management electronics with both a 4th order 80Hz Linkwitz-Riley low-pass filter and a 2nd order 80Hz high-pass filter that is compatible with the SAT 12's bass-managed input and is also compatible with the SAT 6.5 and SAT 5.

The SUB 15 Universal is also the second subwoofer from Blue Sky which allows you to add true low frequency extension to your existing nearfield and mid-field monitors. To accomplish this, the SUB 15 Universal includes dual independently tunable, state variable, high pass and low pass filters (50hz to 160Hz) with 4th order slopes.

We hope that this subwoofer brings you years of accurate and problem free operation. We ask that you take the time to read this manual, register the product and visit our website for any updated information regarding this product. If you have any questions please don't hesitate to contact us. www.abluesky.com

Thank you for choosing Blue Sky!

Figure 1
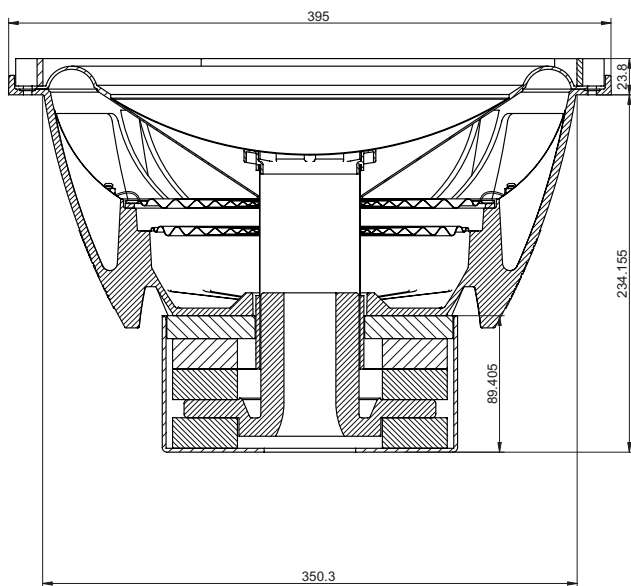
2. Important notes about the SUB 15 Universal and this Owner's Manual

Voltage Selector Switch:
Prior to powering this unit, please confirm that the voltage selector switch, located on the back of the subwoofer, has been set to the correct voltage setting and that the proper fuse is installed. If you are unsure of the type of power that is supplied to your home / studio, consult your product dealer or local power company. Additionally, the SUB 15 Universal draws a maximum of 1600 Watts and this needs be considered when selecting a proper power source.
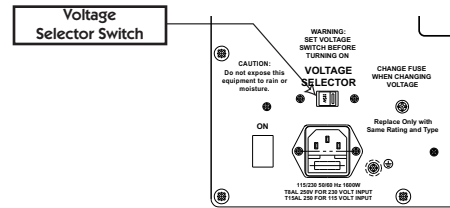
The Owner's Manual:
This manual primarily addresses the general features of the SUB 15 Universal, along with SUB 15 Universal applications relating to setup and operation with **non** Blue Sky nearfield monitors. For setup information relating to the use of this product with Blue Sky's SAT 12, SAT 6.5 & SAT 5, please read the manual that is included with the those specific products.

IMPORTANT, PLEASE NOTE: If you are planning to use the SUB 15 Universal with Blue Sky's SAT 12, SAT 6.5 or SAT 5, please set the selector switch on the back of the SUB 15 Universal to the "BLUE SKY" setting. If you are you using the SUB 15 Universal with the SAT 5, you will also need to set the 80Hz High Pass Filter on the SAT 5 so that it is "OUT" of circuit.
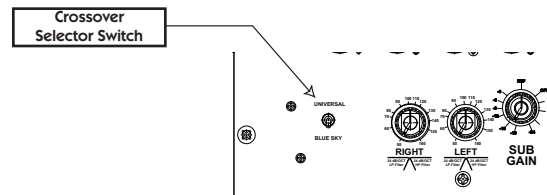
3. SUB 15 Universal, what is included?

The SUB 15 Universal includes the items listed below. Please carefully unpack each item and inspect the components for damage. If any part of the system has been damaged, please contact the dealer that supplied the product or Blue Sky directly.

SUB 15 Universal Inventory:

1	SUB 15 Universal
1	Power Cable
1	Owner's Manual
1	Warranty Card

4. Quick Setup

1. If you haven't already done so, carefully remove all items from the packaging and confirm that everything that is listed on page 4 is included. [SUB 15 Universal - What is included?].

2. The SUB 15 Universal is compatible with XLR input / output connections. For more information on connecting your system, please see page 6 [System Signal Connection].

4. The first step in the installation process is to position the subwoofer. Although you have great flexibility with regard to where the active subwoofer can be placed, a good starting point is centered between the left and right satellite speakers. This could be under a console / desk, behind the console / desk, etc. For an expanded subwoofer placement guide, please see page 9 [Subwoofer Placement Guide].

5. Once the subwoofer is in position, connect the two input cables from the left and right <u>analog</u> outputs from the mixing console, digital workstation or other source, to the left and right inputs on the subwoofer. For more information on connecting your system, please see page 6 [System Signal Connection].

6. Our recommended position for the nearfield monitors is based on an ITU standard and sets the speakers at 60 degrees from the listener, forming an equilateral triangle (a triangle with equal sides) - **<u>See Figure 2</u>**. Fortunately, this setup eliminates most of the math and is easily simplified to the following guidelines: If you want to sit 1 meter (39.37 inches) from the monitors, place the speakers 1 meter apart. If you want to sit 6 ft. from the monitors, place the speakers 6 ft. apart. Etc. Ideally your monitors should be at seated ear height. If this is not possible, tilting the cabinet at the listening area can improve high-frequency coverage.

7. Once all the monitors are properly placed, connect your left nearfield monitors to the left output on the back of the sub, via XLR cable. Now do the same for the right channel, connecting the right nearfield to the right output. Lastly, please plug in the power cord to the IEC connector on the subwoofer. Prior to proceeding confirm that the system is wired correctly, as shown on page 6 [System Signal Connection].

8. At this point the monitoring system is correctly configured, and ready for the final step in the installation. Prior to plugging the system into the wall outlet, and powering up the system, do a final quick check of all connections and level settings.

9. If everything is correct, plug the power cord into the wall outlet. **Do not turn on the power switches, yet!** Some mixers and out-board equipment such as D-to-A converters and equalizers generate loud rail-to-rail pops when they initially turn-on. Depending on the level and the gain setting of the monitoring system, these pops could damage your monitors. To avoid this, always turn on equipment in the following sequence: All sources and mixer first, then the SUB 15 Universal and then rest of your monitoring system.

10. It is now time to set the Variable Cutoff Frequency on the back of the SUB 15 Universal to best match your monitoring system (if you are using the SUB 15 Universal with Blue Sky monitors, set the Filter Selector Switch to "BLUE SKY" and skip to item 11). To determine the proper filter setting on the SUB 15 Universal, you first need to know the cutoff frequency of your monitors. This can typically be
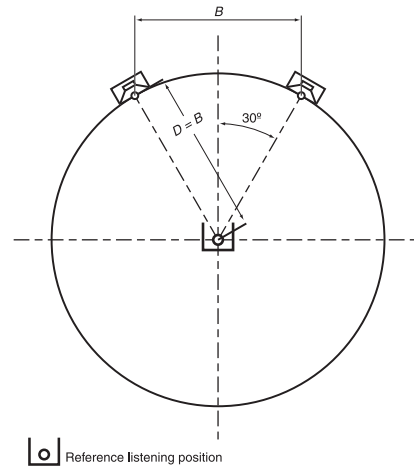

Figure 2

found in the manual, under specifications and may look like this: **40Hz to 20kHz +/-3dB**. The low frequency cutoff off for the monitor in this example would be around 40Hz. We recommend you set the SUB 15 Universal one octave above this cutoff frequency. To go up one octave, multiply the LF cutoff frequency times two. In our example this would be 80Hz, because 2 x 40Hz = 80Hz. **<u>Make sure to set both the left and right channel to the same setting.</u>**

11. At this point the Blue Sky monitoring system is fully operational, and ready for use. Begin by playing familiar pieces of music, which can assist you in the fine-tuning first the level and then the placement of the subwoofer. It is important to remember that the positioning of the subwoofer in the room will impact the subwoofer level. You may find it necessary to increase or decrease the level of the subwoofer to best match your monitors. Again use a familiar piece of music which includes plenty of LF material to help you set the proper level.

12. If a more exacting setup is required, using test signals and a SPL meter, please see Page 9 [Expanded Calibration Guide].

13. Just remember - Use your ears, they are the best audio tool you have and you will be amazed how accurate the setup can be if you use familiar audio material during the setup of the system.

14. Congratulations! You have now completed the "quick setup" of the SUB 15 Universal. If you have any questions, please do not hesitate to contact us directly with your questions. (516) 249-1399 (9:00am to 5:30pm EST) or visit our web forum www.abluesky.com/forum

A note about the LF EXTENSION and PHASE switches:
One of the SUB 15 Universal's unique features is a switchable low frequency response characteristic, of either 30Hz to 200Hz +/-3dB or, in "extended LF mode", 20Hz to 200Hz +/-3dB (anechoic), marked 30Hz and 20Hz respectively. The extended mode is ideal for large rooms that don't exhibit the room gain phenomenon of smaller sealed spaces. The only way to be absolutely sure of which setting is appropriate for your studio is to use an acoustic analyzer. Using the 20Hz in a sealed space, such as a small to medium size studio, can result in a rising LF response characteristic below 30Hz.

The PHASE setting on the SUB 15 Universal should typically be set to 0, especially when the SUB 15 Universal is used with Blue Sky SATs. However, there may be times, depending on the speakers used with the SUB 15 Universal or because of certain acoustic conditions, that the phase setting needs to be set to 180, so as to get proper summation between SAT and SUB. The only way to be absolutely sure which setting is appropriate for your studio is to use an acoustic analyzer.

5. System Signal Connections

CABLE WIRING SPECIFICATIONS

Most users of the SUB 15 Universal will be using ready made cables, however if you need to wire your own cables, follow the wiring specifications below.

	XLR	TRS	RCA
HOT (+)	Pin 2	Tip	Tip
COLD (−)	Pin 3	Ring	
SHIELD (GROUND)	Pin 1	Shield	Shield

IN   OUT

XLR INPUTS (ELECTRONICALLY BALANCED)

Figure 2: The SUB 15 Universal's XLR inputs can handle up to +24dBu of signal level at the input and are compatible with most, if not all professional gear. Additional adaptor cables can be purchased from most professional audio dealers, so that the SUB 15 Universal can be used with other output types (TRS, RCA etc.)

Figure 3

Left SAT 12

Right SAT 12

LEFT Channel
80Hz bass-managed output
(going to the 80Hz input on the right SAT 12,
SAT 6.5, SAT 5 or other non Blue Sky Monitor)

Right Channel
80Hz bass-managed output
(going to the 80Hz input on the right SAT 12,
SAT 6.5, SAT 5 or other non Blue Sky Monitor)

Source / Stereo Outputs
(going to the LEFT & RIGHT
bass-management inputs on the SUB 15)

SUB 15

SUB OUT to SUB IN
(optional)

Optional
additional
subwoofers

Optional additional subwoofers
(for best results, use identical subs)

6. Expanded Calibration Guide

Instructions for electroacoustic calibration of a 2.1 audio system using a SPL meter and Blue Sky's test files.

Before starting this procedure you will need to download BlueSkyTestFiles.zip (an 18 MB zip file) by going to www.abluesky.com/calibration. To download the test file, "Right Click" and select "Save Target As". The file will begin downloading once a location has been selected.

Once downloaded, either burn the test files to a CD or import them into your DAW and follow the instructions below.

ADDITIONAL REQUIRED ITEMS

1.   2.1 Monitoring System
2.   SPL Meter - such as the SPL meter sold by RadioShack in the U.S.

BlueSkyTestFiles.zip Includes 4 files:
- 1000Hz SINEWAVE -20dBFS.wav – a 1kHz file recorded at -20dBFS for electrical calibration
- 40-80Hz PINK NOISE -20dBFS.wav – a 40Hz to 80Hz bandwidth limited pink-noise file recorded at -20dBFS
- 500-2.5kHz PINK NOISE -20dBFS.wav – a 500Hz to 2.5Hz bandwidth limited pink-noise file recorded at 20dBFS
- Pink Noise full bw -20dBFS.wav – a full-bandwidth pink-noise file recorded at - 20dBFS

These test files are all mono files. Please make sure you hard assign them to the left and then the right, not both channels at the same time. If you are using a CD player use only one channel of the CD player.

THEORY
The purpose of calibration is to adjust the overall electroacoustics system gain so that 0dBVU of electrical signal level equals a certain acoustic level at the listening position. Since most recording media is now digital, the reference electrical signal level is usually –20dBFS with 20dB of headroom. The reference SPL level however can vary based on the delivery media and speaker type.

Please note that the bandwidth limited signals that have been provided, limit many of the room interaction affects often associated with measuring SPL and broadband pink noise.

All test signals are recorded at –20dBFS including the 1 kHz sine wave tone. The sine wave tone is used to set the electrical output level throughout the signal path, right up to the point you get to the speakers, while the various pink noise signals are used for acoustic measurements and calibration.

The following procedure assumes you are calibrating the system to 85dBC SPL.

Step 1   TURN OFF THE MONITORING SYSTEM (until step 4)

Step 2   Remove all eq and dynamics from the signal path and set all controls to zero / unity gain. Play the 1kHz Sine Wave, hard assign it to the left channel only, and adjust the output fader so the output meter reads -20dBFS. If you are using an analog console, set the output level to 0 VU. Then hard pan the signal to the right channel output and repeat for the right channel. **Once calibrated do not move the output faders.**

Step 3   Mute everything and make sure the 1kHz tone is OFF .

Step 4   Now that the system has been electrically calibrated turn ON your 2.1 System (SUB 15 Universal + monitors).

Step 5   Assign the 500-2.5kHz pink noise signal to the left channel only. Make sure there is nothing coming from the right channel (or any other channels). Because this signal is bandwidth limited, you don't have to worry about turning the sub off. There are two methods of setting the levels.

A. If you have a master monitor level control, you can set the sat gain control at reference and then adjust the monitor gain control for 85 dBC. Then mark the monitor level as your reference position. B. The other method is to set master monitor level to the position you want as a reference level and then use the volume controls to set 85 dBC. If you use this method you should mark the knob position with a grease pencil so you can always go back to reference level if the knob gets moved.

For either method:
SPL should be measured at the mix position, with the SPL meter at arms length, with the microphone at seated ear height, angled at approximately 45 degrees, and pointed at the center point between the left and right speakers.

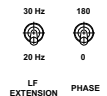Once the left channel is set to 85dBC, repeat this step for the right channel

Step 6   Feed 40-80Hz pink noise signal to the left channel only. Adjust the subwoofer level control until the subwoofer reads 85dBC (slow) at the mix position. The meter will bounce around a little, so you will need to do a mental average (I tend to filter out the peaks in my mind, so I don't set the sub too hot). The right channel should measure about the same and no additional adjustments need to be made.

Step 7   You can play the full-bandwidth pink noise, assigning it to the left and then the right channel (not at the same time). You should measure about 85dBc. It may be a little higher, because below 30Hz the room may have a little extra gain. No adjustments should be made with Full Bandwidth pink noise, unless you have an RTA (real time analyzer).

Step 8   You are finished and the calibration process has been completed – enjoy!
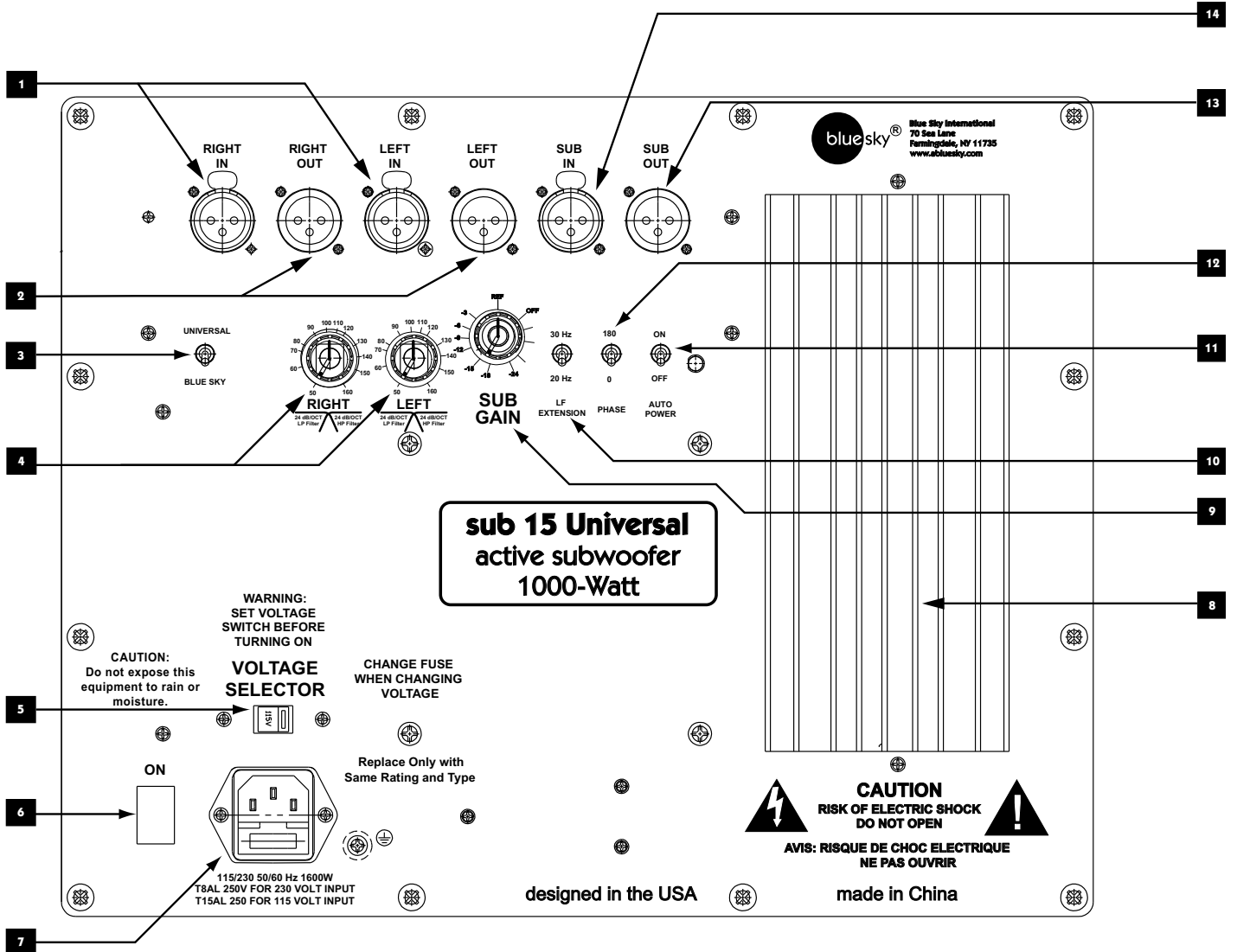
A note about the LF EXTENSION and PHASE switches:
One of the SUB 15 Universal's unique features is a switchable low frequency response characteristic, of either 30Hz to 200Hz +/-3dB or, in "extended LF mode", 20Hz to 200Hz +/-3dB (anechoic), marked 30Hz and 20Hz respectively. The extended mode is ideal for large rooms that don't exhibit the room gain phenomenon of smaller sealed spaces. The only way to be absolutely sure of which setting is appropriate for your studio is to use an acoustic analyzer. Using the 20Hz in a sealed space, such as a small to medium size studio, can result in a rising LF response characteristic below 30Hz.

The PHASE setting on the SUB 15 Universal should typically be set to 0, especially when the SUB 15 Universal is used with Blue Sky SATs. However, there may be times, depending on the speakers used with the SUB 15 Universal or because of certain acoustic conditions, that the phase setting needs to be set to 180, so as to get proper summation between SAT and SUB. The only way to be absolutely sure which setting is appropriate for your studio is to use an acoustic analyzer.

7. A Tour of the SUB 15 Universal Amplifier and I/O

RIGHT IN
RIGHT OUT
LEFT IN
LEFT OUT
SUB IN
SUB OUT

bluesky®
Blue Sky International
70 Sea Lane
Farmingdale, NY 11735
www.abluesky.com

UNIVERSAL

BLUE SKY

REF
OFF

90 100 110 120
80 130
70 140
60 150
50 160

90 100 110 120
80 130
70 140
60 150
50 160

30 Hz

180

ON

20 Hz

0

OFF

RIGHT
24 dB/OCT LP Filter
24 dB/OCT HP Filter

LEFT
24 dB/OCT LP Filter
24 dB/OCT HP Filter

SUB GAIN

LF EXTENSION

PHASE

AUTO POWER

sub 15 Universal active subwoofer 1000-Watt

WARNING:
SET VOLTAGE
SWITCH BEFORE
TURNING ON

CAUTION:
Do not expose this
equipment to rain or
moisture.

CHANGE FUSE
WHEN CHANGING
VOLTAGE

VOLTAGE SELECTOR

115V

ON

Replace Only with
Same Rating and Type

115/230 50/60 Hz 1600W
T8AL 250V FOR 230 VOLT INPUT
T15AL 250 FOR 115 VOLT INPUT

designed in the USA

made in China

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

AVIS: RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR

1
2
3
4
5
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13
14

7. A Tour of the SUB 15 Universal Amplifier and I/O

1. **LEFT / RIGHT XLR IN** - These XLR inputs should be connected to the left / right output of your console or digital workstation. The inputs are electronically balanced. Do not connect more than one source to these inputs. Refer to page 6 for more information [System Signal Connection].

2. **LEFT / RIGHT XLR OUT**- These XLR outputs should be connected to the inputs of your left / right nearfield or mid-field monitors. The outputs are electronically balanced. [System Signal Connection].

3. **UNIVERSAL / BLUE SKY FILTER SWITCH** - This switch is used to either activate the variable state filters, or activate the fixed 80Hz low pass and high pass filters that are required for use with Blue Sky monitors. If you are using the SUB 15 Universal with the SAT 5, you will also need to set the 80Hz High Pass Filter on the SAT 5 so that it is "OUT" of circuit.

4. **VARIABLE CUTOFF FREQUENCY CONTROL KNOBS -** These controls are for adjusting the dual 24dB per octave low and high-pass filters. The cutoff frequency can be adjusted from 50Hz to 160Hz. It is recommended that the SUB 15 Universal's filters be set one octave above the natural roll off of the nearfield monitors that are being used with the SUB 15 Universal. To activate these variable filters, the UNIVERSAL / BLUE SKY SWITCH - must be in the up position (VARIABLE). For more information see item 10 on page 5 [Quick Setup].

5. **VOLTAGE SELECTOR SWITCH-** This switch can be set to either 115 Volts or 230 volts. Prior to powering this unit, please confirm that the Voltage selector switch, located on the back of the subwoofer, has been set to the correct voltage setting. If you are unsure of the type of power that is supplied to your home / studio, consult your product dealer or local power company. If your changing the Voltage, please also confirm the proper fuse is installed [see number 6].

6. **POWER SWITCH -** Controls the power to the amplifier and all internal electronics.

7. **FUSE HOLDER / IEC RECEPTACLE -** Replace with same rating and type for your local voltage rating. For 115V applications use a 15 Amp T 250V and for 230 Volt applications use a 8 Amp T 250V fuse. Check voltage selector switch before connecting power (T stands for time delay or SloBlo). Connect to 115 Volt AC / 60Hz power source, rated for 1600 WATTS or 230 Volt / 50Hz rated for 1600 WATTS. Only use the supplied power cord or an IEC approved power cord with a safety ground pin.

8. **AMPLIFIER HEATSINK-** The heatsink provides essential cooling to the amplifier inside the SUB 15 Universal. Please ensure that proper air circulation is available for proper cooling.

9. **SUB GAIN -** This knob controls the input sensitivity of the subwoofer amplifier only. When set to the reference position a 100mV signal at the input equals 90dB output at a meter.

10. **LF Extension -** One of the SUB 15 Universal's unique features is a switchable low frequency response characteristic, of either 30Hz to 200Hz +/-3dB or, in "extended LF mode", 20Hz to 200Hz +/-3dB (anechoic), marked 30Hz and 20Hz respectively. The extended mode is ideal for large rooms that don't exhibit the room gain phenomenon of smaller sealed spaces. The only way to be absolutely sure of which setting is appropriate for your studio is to use an acoustic analyzer. Using the 20Hz in a sealed space, such as a small to medium size studio, can result in a rising LF response characteristic below 30Hz.

13. **PHASE -** This switch is used to change the phase response of the subwoofer only. When this switch is in the 0 position, it is in-phase with the signal going to the nearfield or mid-field monitors. When this switch is in the position marked 180, it is 180 degrees out-of-phase with the signal going to the nearfield or mid-field monitors. The PHASE setting on the SUB 15 Universal should typically be set to 0, especially when the SUB 15 Universal is used with Blue Sky SATs. However, there may be times, depending on the speakers used with the SUB 15 Universal or because of certain acoustic conditions, that the phase setting needs to be set to 180, so as to get proper summation between SAT and SUB. The only way to be absolutely sure which setting is appropriate for your studio is to use an acoustic analyzer.

13. **AUTO POWER -** This switch is used to activate the automatic mute circuit built into the subwoofer. When the automatic mute circuit is activated, the system will automatically mute both the subwoofer and satellite outputs when no signal is present for 15 minutes. This mode also reduces power consumption at idle. Once a signal is present again, the system will automatically turn on.

13. **SUB OUT-** This balanced XLR output can feed additional subwoofers for increased bass performance and should be connected to the SUB IN of an additional Blue Sky 15. The output contains the summed low passed subwoofer output and the SUB IN audio.

14. **SUB IN -** This XLR input can be connected to either the subwoofer output of an external bass-management controller, or the "daisy-chain" output of a SUB 15 Universal. This input is full-bandwidth (up to approximately 200Hz) and does not use a low pass filter.

8. Subwoofer Placement Guide

So now that my system uses an integral subwoofer, how do I place it in my studio for the best possible low frequency performance?

The low frequency response and efficiency of a subwoofer are heavily influenced by the acoustics of the playback environment. More specifically, the response is influenced by the room's dimensional ratios, types of construction and location of the subwoofer within that environment. You can significantly improve the subwoofer's in-room response and efficiency by experimenting with various room placements until you find an optimum location.

When placing the subwoofer there are several general guidelines that should be kept in mind. These include:
- Every acoustic space is unique and experimentation is an important key in finding the best possible location in your particular environment.
- A subwoofer becomes more acoustically efficient (has greater output) as you move it closer to a room surface (e.g. wall or floor).
- A subwoofer will give maximum output and maximum acoustic excitement when it is located in a corner.
- Under certain acoustic conditions corner locations are optimum; in others they can excite multiple "room modes", producing "muddy" or "boomy" sound.

The following methods have been found to work successfully under most conditions:

The first method described below doesn't require any special test equipment. It does require a pair of good ears and familiar broad-spectrum music material – recordings with lots of energy across a wide frequency range (from low to high). The recordings should be highly dynamic and be of relatively high quality.

The second subwoofer placement method requires using a real time analyzer – such as those made by Gold Line™ or The Audio Toolbox(TM) by TerraSonde(TM). Although many home audio enthusiasts may not have access to this equipment, if you are having a sound system or home theatre system professionally installed, this information may be useful to the installer.

Method 1

Place the subwoofer at the main listening position and connect and make sure it is properly connected to your receiver. Turn on the CD or music source and make sure that the level of the subwoofer has been raised high enough so that low frequencies are not masked by the background noise in the room. Once you have roughly balanced the level, between the sub and main speakers, move around the room and pay careful attention to where the spectral response is smoothest and has the greatest low frequency extension, pay special attention to the corners and along the walls. Also, make sure to pay attention to where the system has its' greatest impact and definition. You are not just listening for the most boom, but rather where the bass is most accurate and natural sounding. Remember, because the subwoofer is basically omni-directional, the best spot for the subwoofer can be next to, or even behind, the main monitoring area.

After finding the spot where the subwoofer has the best response in the room, place the subwoofer in that location. Now, listen from the main position and confirm that the subwoofers response is

similar to when the positions were reversed. If it is, then leave the subwoofer in that location. If not, continue to experiment with the subwoofer location until the most accurate and best response has been achieved.

Method 2

Subwoofer placement using a real time analyzer – Such as those made by Gold Line™ or The Audio Toolbox™ by TerraSonde™.

Place the subwoofer at the main listening position and connect the subwoofer to your pink noise generator. Turn on your pink noise generator and make sure that the level of the subwoofer has been raised high enough so that low frequencies are not masked by the background noise in the room. Now set the analyzer to 1/12 octave resolution (or whichever setting provides the highest resolution on your particular analyzer), real time mode and begin to take measurements around the room. If the analyzer you are using has the ability to do real time averaging, then use this function to better analyze the spectral response.

As you walk around the room, be sure to pay careful attention to where the spectral response is smoothest and has the greatest low frequency extension, pay special attention to the corners and along the walls. Remember, because the subwoofer is basically omni-directional, the best spot for the subwoofer can be next to, or even behind, the main monitoring area.

After analyzing the data and finding the spot where the subwoofer has the best response in the room, place the subwoofer in that location. Now, take some additional measurements from the listening position and confirm that the subwoofers response is similar to when the positions were reversed. If it is, then leave the subwoofer in that location. If not, continue to experiment with the subwoofer location until the smoothest and best response has been achieved.

Additional Notes

It has been found that a subwoofers' in-room response can sometimes be improved by facing the drivers toward a wall. Again, experimentation is the key to finding the best possible location.

Properly designed subwoofers generate tremendous energy, so they may vibrate objects close to them. If you hear buzzing or vibrating objects, make sure to try and dampen those objects. Rattling, buzzing and other sympathetic resonances can make the subwoofer localizable and therefore should be avoided. Using a sine wave generator can be helpful in locating these acoustic anomalies.

9. Technical Information

This next section outlines the components, specifications and performance data that make this product such a uniquely high value.

In order to continually improve all of its products Blue Sky reserves the right to change these specifications without notice.

SUB 15 Universal Active Subwoofer

Enclosure
* .75" MDF with 1" front and rear baffle and internal bracing
* Isolation feet included
* Dimensions: 20.75" H x 18" W x 20.63" D (inc / heatsink and grill)
* Weight 125 lbs. / 56.69 kg

15" Hemispherical Woofer
* 15-inch high excursion (2.36" peak to peak) woofer with a vented 20+ Lbs. motor (total driver weight = 36 Lbs.)
* Cast aluminum frame
* Dual 2.5" high temperature voice coils
* Dual progressive spiders
* Mica filled polypropylene cone w/ Santropene surround
* Fully video shielded

Electrical Specification
* Input Voltage   115/230 VAC 50/60Hz switchable
* Wattage   1600 Watts
* Fuse   115VAC 8A - 250 V 5x20mm (Time Delay or Slo-Blo)
                      230VAC 15A - 250 V 5x20mm (Time Delay or Slo-Blo)

Amplifier
* Class D design
* 1000 Watts RMS into 4-Ohm
* .1% THD + noise at rated power @ 1kHz
* XLR balanced input
* Adjustable gain control
* Voltage Sensitivity 100mv=90dB SPL@1m

Switchable low frequency response characteristic:
* Frequency Resp. 30Hz mode +/-3dB 30Hz to 200Hz
* Frequency Resp. 20Hz mode +/-3dB 20Hz to 200Hz
* Low Frequency Cutoff (20Hz mode)   -3dB @ 20Hz
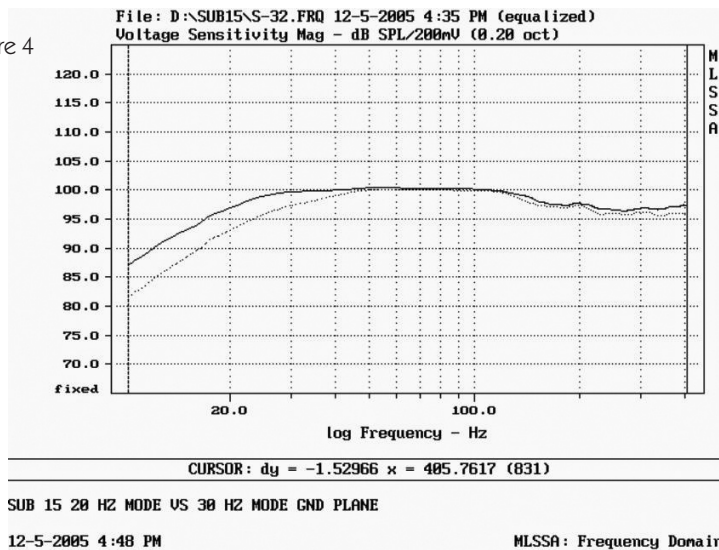   (see figure 4 for specific measurement data)

Bass-Management Section
* Input impedance   20K balanced
* Common mode rejection   40dB typical @ 60Hz
* Maximum Input Level   +24dBu balanced
* Output Impedance   200 Ohms balanced
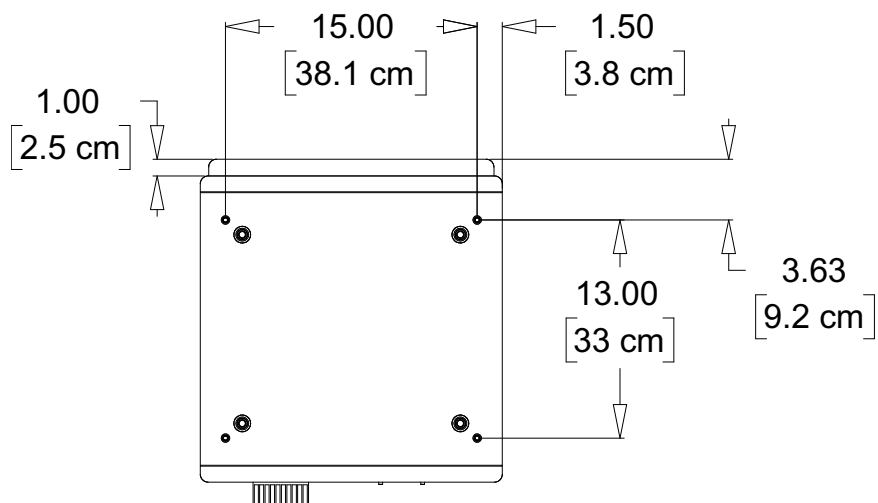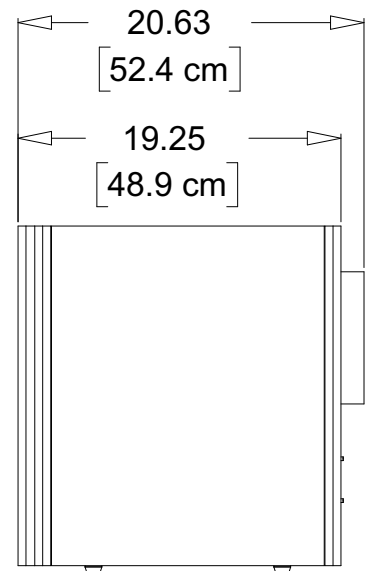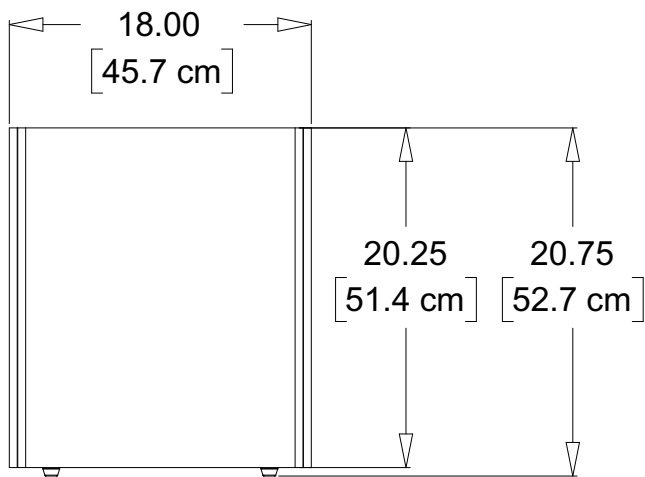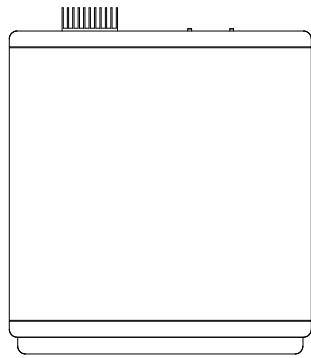* Nominal gain   0dB
* SUB IN low pass filter   None

Switchable Filter Settings
        * BLUE SKY Mode
                High Pass Filter   80Hz 2nd Order
                Low Pass Filter   80Hz 4th Order
        * Universal Mode
                Dual independently tunable state variable high pass
                and low pass filters
                Frequency Range   50Hz to 160Hz
                Filter Slope   4th Order

Figure 4

```
File: D:\SUB15\S-32.FRQ 12-5-2005 4:35 PM (equalized)
Voltage Sensitivity Mag - dB SPL/200mV (0.20 oct)
```
CURSOR: dy = -1.52966 x = 405.7617 (831)

SUB 15 20 HZ MODE VS 30 HZ MODE GND PLANE

12-5-2005 4:48 PM   MLSSA: Frequency Domain

10. SUB 15 Universal Cabinet Dimensions

18.00
[45.7 cm]

20.25
[51.4 cm]

20.75
[52.7 cm]

20.63
[52.4 cm]

19.25
[48.9 cm]

15.00
[38.1 cm]

1.50
[3.8 cm]

1.00
[2.5 cm]

13.00
[33 cm]

3.63
[9.2 cm]

11. Factory Service Instructions

Service for the U.S. versions of Blue Sky products is available only from our authorized distributor, Group One Ltd., located in Farmingdale, New York. (Service for Blue Sky products outside the United States can be obtained through local dealers or distributors.) If your monitor needs service, follow these instructions:

1. Review the manual and ensure that you have followed all setup and operating instructions.

2. Call (516) 249-1399 9:00am to 5:30pm EST and ask for Customer Service. Explain the problem and request an RA (Return Authorization) number. It is important to have your product serial number available when you call. You must have an RA number before you can obtain service.

3. Pack the product in its original packing material and box (do not return the power cord or the manual). If you don't have the original packing material and/or box, please let Customer Service know when you call for the RA number. Blue Sky is not responsible for any damage that occurs due to non-factory packaging.

4. Include a legible note stating your name, shipping address (no P.O. boxes), daytime phone number, RA number, and a detailed description of the problem, including how it can be duplicated

5. Write the RA number on the top of the carton.

6. Ship the product to the address below. We recommend United Parcel Service (UPS). Please insure the product regardless of shipping method.

> **Blue Sky International**
> **ATTN: SERVICE DEPT / RA#**
> **70 Sea Lane**
> **Farmingdale, NY 11735**
> **USA**

7. Turnaround time is three to five business days depending on the problem. When calling for RA numbers, please ask Customer Service what the turnaround time is. The serviced product will be sent back to you via the same shipping method as received (i.e. if you ship your monitor UPS Ground it will be returned UPS Ground, UPS Red will be returned UPS Red etc...). This only applies to products serviced under the warranty.

12. General Contact Details

For sales and other enquiries, please contact Blue Sky at:

Blue Sky International
70 Sea Lane
Farmingdale, NY 11735
USA

tel:	516 249 1399
fax:	516 249 8870
email	info@abluesky.com

To discover the very latest information check out our website at:

www.abluesky.com

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