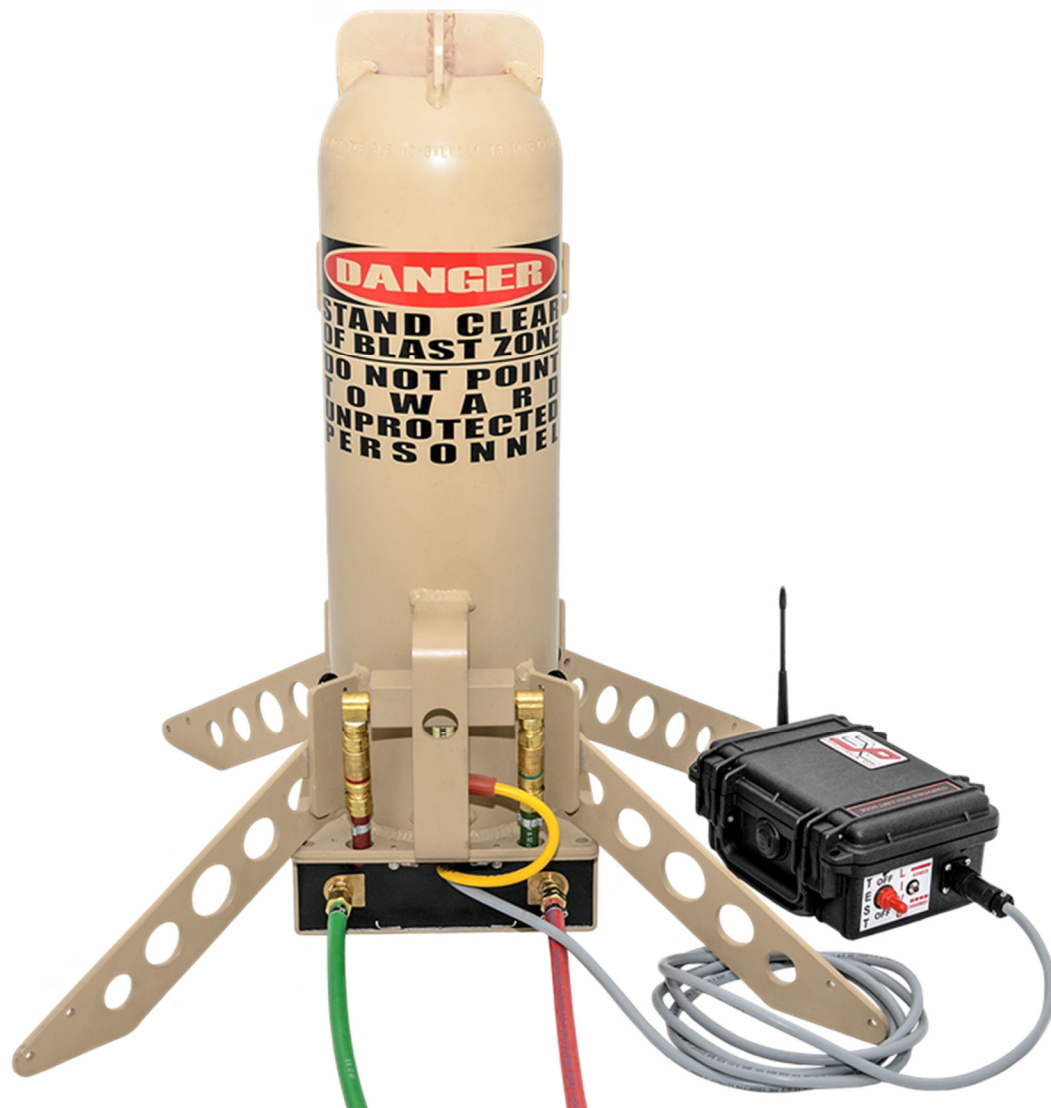




X-05 Operator's Manual

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COMPANY PROPRIETARY



WARNING: Never place objects, especially body parts, over the cannon. When firing, any object in the blast cone is subject to blast effects including very brief moments of intense heat. This flash effect can cause serious flash burns to exposed skin or ignite readily flammable liquids or material; i.e. gasoline, black powder, etc.



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WARNING: This symbol indicates that violating this item could cause serious personal injury.



CAUTION: This symbol indicates that violating this item could cause minor or medium personal injuries or material losses

Packing List for the Model X-05

When your Model X-05 Explosive Blast Simulator arrives, the shipping container will contain the following:

1. Model X-05 Explosive Blast Simulator Cannon Assembly
2. Propane Regulator and Propane Regulator Adaptor
3. Oxygen Cylinder and Oxygen Regulator
4. Oxygen and Propane Hoses
5. Gas Cylinder Bracket with clamps
6. Control Box
7. X-MIT or X-LRT Transmitter (Optional)
8. Hardwired Trigger Cable (Optional)
9. Operations Manual and Troubleshooting Guide in document holder

The components of the X-05 are illustrated on the following two pages.

X-05 Cannon and Control Box

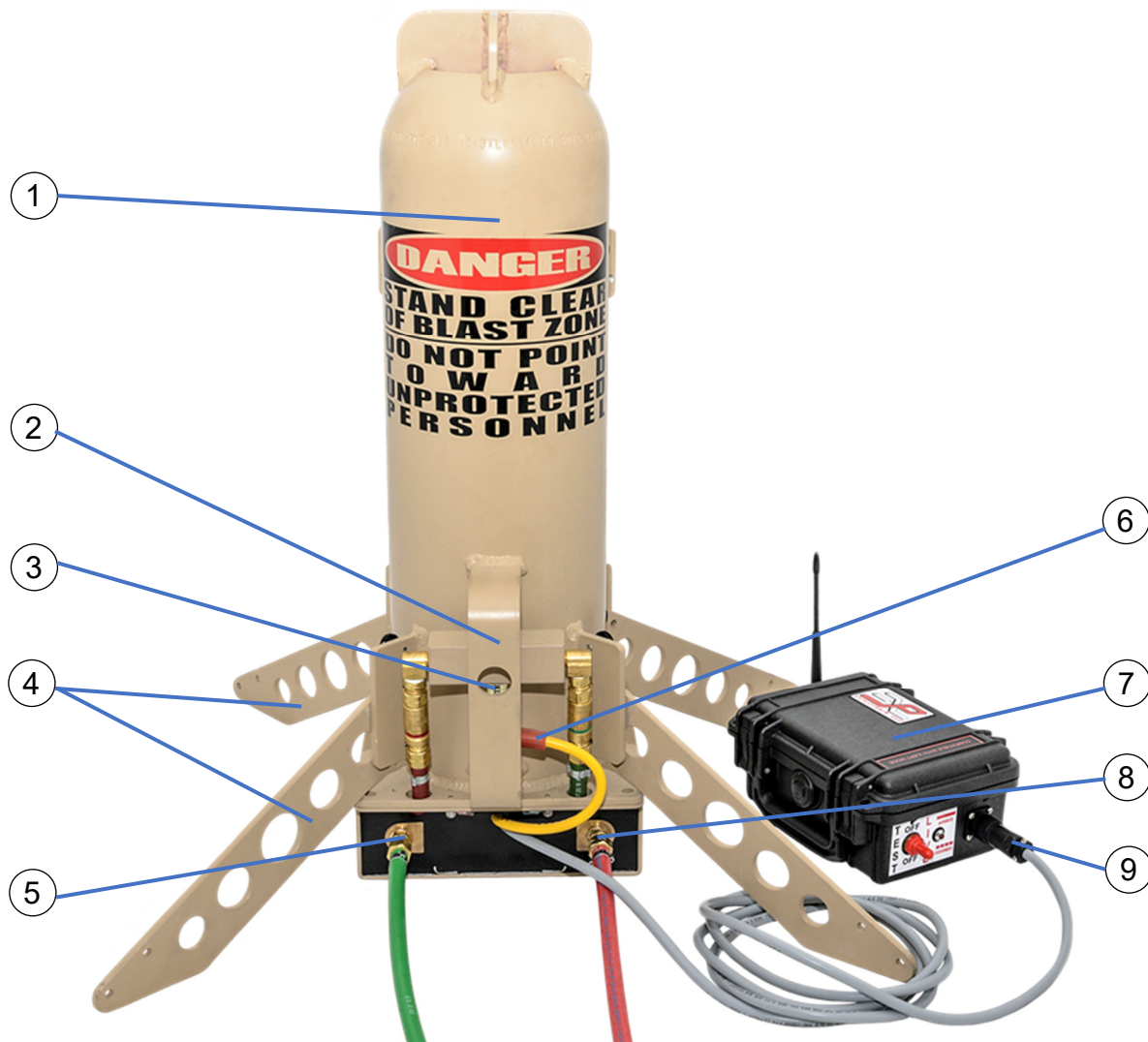


FIGURE 1

- | | |
|-----------------|------------------|
| 1. Cannon | 6. Ignition Wire |
| 2. Handle | 7. Control Box |
| 3. Spark Plug | 8. Propane Valve |
| 4. Support Leg | 9. Cannon Cable |
| 5. Oxygen Valve | |

Gas Cylinder Assembly Components

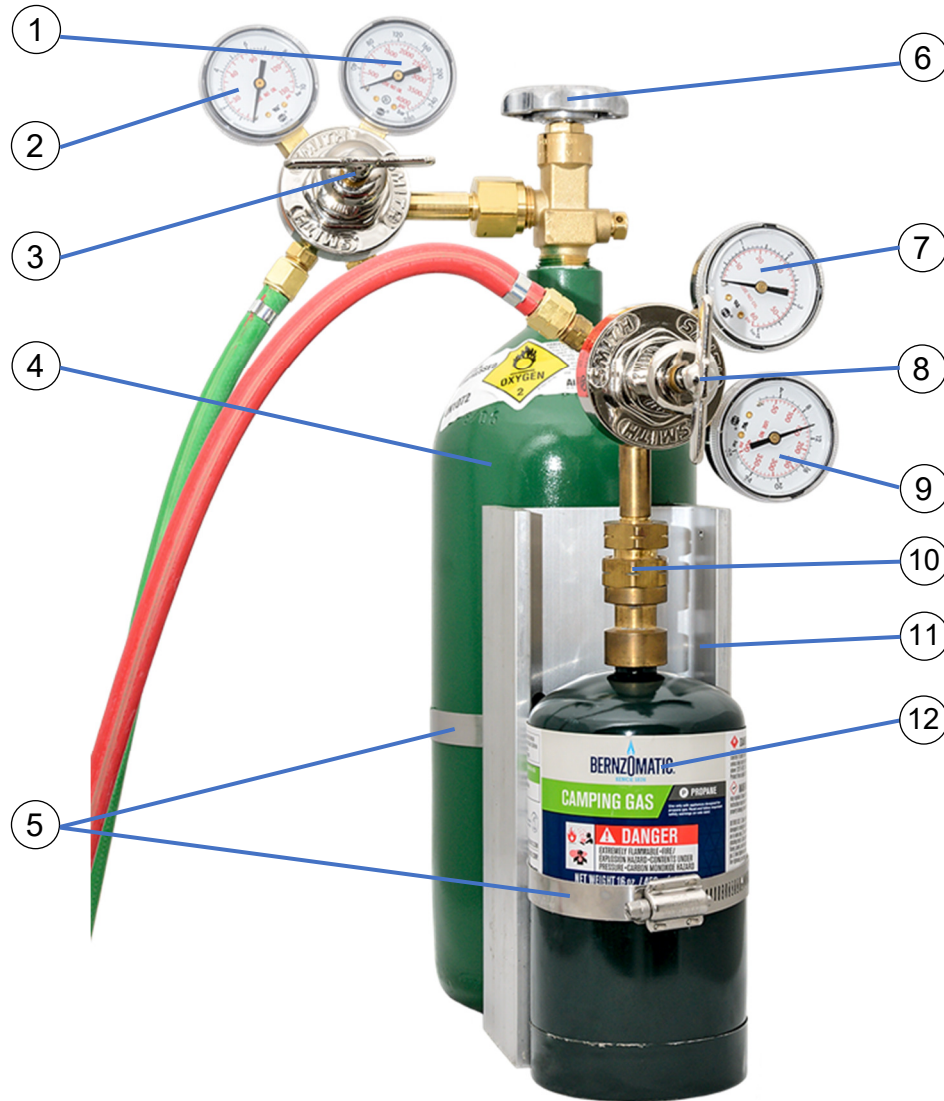


FIGURE 2

- | | |
|--------------------------------------|---------------------------------------|
| 1. Oxygen Primary Gauge | 7. Propane Secondary Gauge |
| 2. Oxygen Secondary Gauge | 8. Propane Regulator Adjustment Screw |
| 3. Oxygen Regulator Adjustment Screw | 9. Propane Primary Gauge |
| 4. Oxygen Cylinder | 10. Propane Adapter |
| 5. Gas Cylinder Clamps | 11. Gas Cylinder Bracket |
| 6. Oxygen Tank Main Valve | 12. Disposable Propane (not included) |



NOTE: The Oxygen Cylinder is shipped EMPTY and must be filled. The Propane Cylinder(s) must be purchased separately. If a Material Safety Data Sheet (MSDS) is needed, please visit our website to request a copy.



CAUTION: The introduction of foreign debris, e.g., sand or dirt, into the gas system of the blast simulator may cause the valve to malfunction by sticking in the open position, thereby allowing gas to flow freely causing a potentially unsafe condition. It is imperative to keep the ends of the hoses and valve fittings covered while they are not connected to each other. If you suspect dirt may have been accidentally introduced into a hose, before connecting it to the valve you may connect one end to its gas source and open the valve momentarily to blow the dirt from inside the hose. Be sure to wear eye protection and do not point the open hose toward any personnel or open flame.

Assembly of the Oxygen Cylinder

1. Exchange the supplied EMPTY Oxygen Cylinder for a full one or have the supplied tank filled (typically at a local welding facility). The Oxygen Cylinder is equipped with a CGA 540 fitting. Note: Medical Grade oxygen is not recommended for use.
2. Note the difference between the Oxygen Regulator and the Propane Regulator in Figure 2 . The Propane Regulator has the Propane Adapter fitting already installed.
3. Install the Oxygen Regulator onto the full Oxygen Cylinder and install the assembly into the larger clamp on the proper side of the Gas Cylinder Bracket (see Figure 2). Rotate the Oxygen Cylinder/Regulator assembly to the proper orientation as shown in Figure 2 and securely tighten the clamp that holds the Oxygen Cylinder to the Gas Cylinder Bracket.
4. Securely tighten the Oxygen Regulator Mounting Nut with a 1-1/8" wrench to 40-60 ft/lbs. Note: Do not use pliers or any other size tools.
5. Attach the free end of the **green** Oxygen Hose to the Oxygen Regulator. Securely tighten the Oxygen Hose Coupler Nut with an 11/16" wrench (see Figure 2) while holding the regulator nut with an opposing 9/16" wrench.

Procurement and Installation of the Disposable Propane Cylinder

1. A disposable Propane Cylinder must be purchased and installed for proper operation.
2. Recommended commercially available types of disposable Propane Cylinders are those used typically for recreational camping, such as:



Bernzomatic 16.4 oz.



Coleman 16.4 oz.



1. The Propane Cylinder should be secured in an upright position ($>45^{\circ}$) during use.
2. **Caution:** Before installing the new Propane Cylinder, turn the Propane Regulator Adjustment Handle (#4, Figure 2) counterclockwise until minimal resistance is felt. **DO NOT COMPLETELY REMOVE THE ADJUSTMENT SCREW FROM THE REGULATOR!**
3. Insert the new disposable Propane Cylinder into the Propane Adapter on the Propane Regulator and carefully screw it clockwise into the adapter until it is hand tight. Do this quickly to prevent as little gas as possible from escaping.
4. Install the complete Propane Cylinder/Regulator assembly into the smaller clamp on the proper side of the Gas Cylinder Bracket (see Figure 2). Rotate the Propane Cylinder/Regulator assembly to the proper orientation as shown in Figure 2 and securely tighten the clamp that holds the Propane Cylinder to the Gas Cylinder Bracket.
5. Attach the free end of the **red** Propane Hose to the Propane Regulator. **Note: All Propane hose fittings are left-handed threads.** Securely tighten the Propane Hose Coupler Nut with an 11/16" wrench (see Figure 2) while holding the regulator nut with an opposing 9/16" wrench.



WARNING: Do not use Oxygen or disposable Propane Cylinders that have passed their date of certified use.



WARNING: Do not use Oxygen or disposable Propane Cylinders that show evidence of physical damage or corrosion; i.e. pitting,



CAUTION: The Propane Regulator Adapter is connected to the Propane Regulator with **left-handed threads** and is tightened with two opposing 1-1/8" wrenches. The Propane Hose fitting is connected to the Propane Regulator with **left-handed threads** and an 11/16" wrench and an opposing 9/16" wrench.

NOTE: Larger refillable propane cylinders may be used. If needed, the Propane Regulator Adapter may be removed from the Propane Regulator to allow attachment to a standard propane cylinder.



CAUTION: When removing or attaching hoses to the X-05, **DO NOT** remove hose fitting from the X-05 cannon. This may create a hazardous condition, i.e. leaking gas.

Use the Gas Cylinder Clamp to firmly attach both the Oxygen and Propane Cylinders to the Gas Cylinder Bracket.

Gas Cylinder Clamps



FIGURE 3

X-05 Control Box

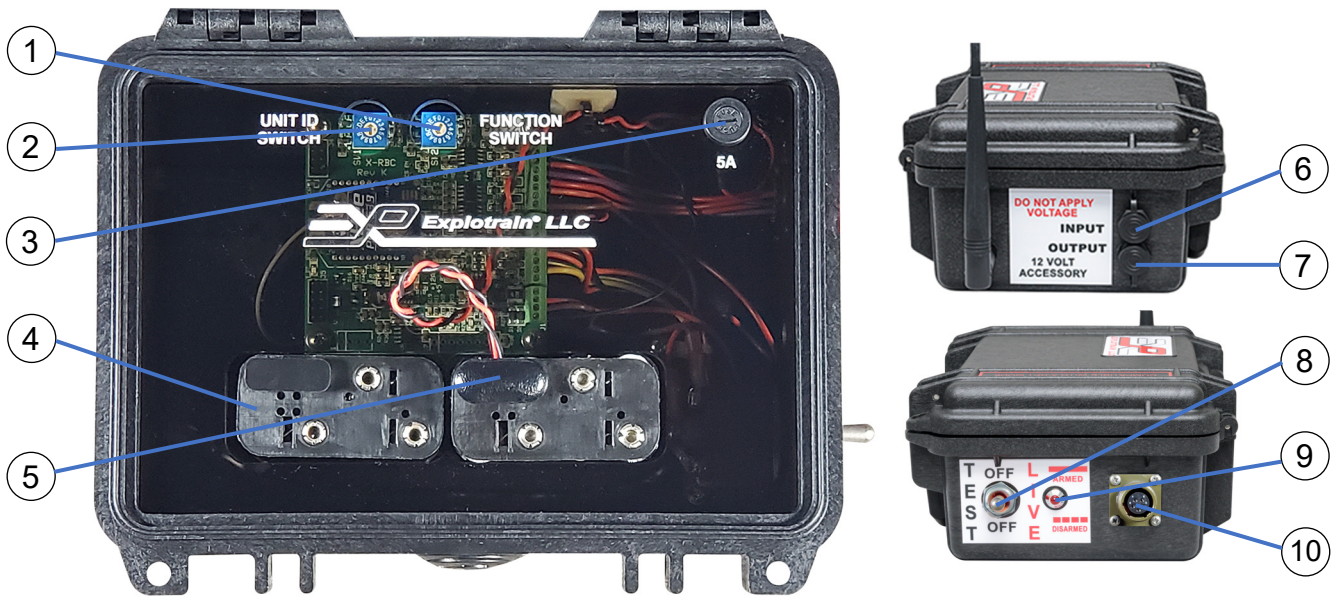


FIGURE 4

- | | |
|----------------------|-----------------------|
| 1. Function Switch | 6. Input Plug |
| 2. X-0 ID Switch | 7. Output Plug |
| 3. 5 Amp Fuse | 8. Mode Switch |
| 4. Battery Pack | 9. Armed LED |
| 5. Battery Connector | 10. Cannon Cable Plug |

Installation of AA Batteries

The Model X-05 uses eight AA Batteries for its 12V DC power supply.

1. Place the Batteries in the Pack and insert into Control Box as shown.
2. Ensure the Mode Switch (#8, Figure 4) is in the OFF position and connect the Battery Connector to the Battery Pack as shown.
3. The second Battery Pack is available to use as a spare power supply.
4. To change to the second Battery Pack, ensure the Mode Switch is in the OFF position and simply attach the Battery Connector to the second Battery Pack.



DO NOT POINT CANNON TOWARDS **UNPROTECTED PERSONNEL**

Preparation for Firing

1. Mount or place the Cannon Assembly in the desired location.
2. Deploy the legs to support the Cannon in a vertical or angled position as desired.
3. Ensure all thumb screws are securely tightened.
4. The Cannon Assembly may also be attached to irregular surfaces if it is SECURELY clamped or otherwise held in position.
5. Connect the Cannon Cable to the Control Box as shown in Figure 1.
6. Connect the Oxygen and Propane Hoses as shown in Figure 1.
7. If concealing the Cannon Assembly, do not put fragile or loose objects in the blast cone.

Your Model X-05 is now ready for use.
FOLLOW SAFETY INSTRUCTIONS BELOW!

Safety Instructions to follow prior to Firing

-  **CAUTION:** Make sure Model X-05 is located on a firm level surface or securely attached to a surface or object prior to firing.
-  **CAUTION:** Do not place hard objects such as gravel, rocks, nails etc. in Blast Cone as they will create a fragmentation hazard during firing.
-  **CAUTION:** For additional visual effects, you may place various powders on top of the Cannon. **NOTE:** Do Not use flammable materials such as coffee creamer or flour. Recommended powders are Fuller's earth, Bentonite clay, talcum powder or chalk. Place powders in a frangible container such as a small paper bag.
-  **CAUTION:** Hearing and eye protection are strongly recommended for the operator or any person within 15 feet of the unit or exposed to repeated blasts.
-  **CAUTION:** While weatherproof, the Model X-05 cannot be completely submerged.



WARNING: Never place objects, especially body parts, in front of the Cannon. When firing, any object in the blast cone is subject to blast effects including very brief moments of intense heat. This flash effect can cause serious flash burns to exposed skin or ignite readily flammable liquids or material; i.e.: gasoline, black powder, etc.



FIGURE 5

Setting the Unit ID

1. Open the Control Box and locate the UNIT ID rotary switch.
2. Rotate the switch until the arrow points to the desired Unit ID (0 through 9). Note: The Unit ID of the X-MIT must also be appropriately set (see X-MIT Operation, below).
3. Unit IDs A through F may only be used with the X-MIT and X-ACT software enabled Transmitters, not the X-LRT.

Setting the Function Switch

1. Open the Control Box and locate the FUNCTION rotary switch.
2. Rotate the switch until the arrow points to the desired Gas Fill Time position. Fill times are listed in the Control Box with Function Switch settings of 2 to C for the X-05 - 0.2 second (minimum time for dependable blast) to 2 second (maximum amount of usable gas fill). **9 is DEFAULT as shipped from the factory.**

Note: Gas Fill Time Setting 0 opens valves for 1.0 sec but no spark is fired. Use this position to clear lines upon set up or before storing if desired.

Note: Gas Fill Time for the propane valve will be automatically extended slightly in colder temperatures to compensate for lower delivery pressures.



Perform Maintenance / Inspection prior to each use of Model X-05

Operating the Model X-05

The Model X-05 is designed to operate in two modes: **TEST** and **LIVE**. If your unit has been custom programmed, please see the attachment for a description of operating the Model X-05 with your customized programs.

The operational mode of the X-05 is determined by the Mode Switch and actual firing of the X-05 is controlled by the X-MIT or X-LRT Transmitters, X-ACT Tablet, or Hardwired Trigger Cable (optional).

TEST Mode

TEST Mode is an easy and safe way to determine that your Model X-05 is functioning properly in the scenario in which it will be used. **TEST** Mode is only used to provide an audible signal from the Buzzer whenever the Model X-05 receives a Fire Signal from the X-MIT transmitter or Hardwired Trigger Cable. No gas or spark is used, and the entire firing system is disabled in this mode.

1. Flip the Mode Switch from **OFF** to **TEST**. The buzzer will beep once and the Armed LED will start flashing.
2. Briefly press the appropriate X-0 UNIT button on the X-MIT Transmitter. The Armed LED on the side of the Control Box changes from flashing to solid once the X-05 is Armed.
3. Press and hold the appropriate X-0 UNIT button of the Transmitter to produce a brief audible signal from the Buzzer. The three beeps indicate the three functions of the Firing Cycle: Gas Fill, Spark, and Accessory Output.
4. When finished, simply flip the Mode Switch to the middle **OFF** position.



LIVE Mode

LIVE Mode is used to provide a loud report when the Model X-05 receives a Fire Signal. This report can be Extremely Loud and may cause hearing loss if protective equipment is not used.



WARNING: Personnel should stand back at least 15 feet when firing and stay clear of the Blast Cone.

1. Make sure the Cannon Assembly is securely attached or deployed.
2. Flip the Mode Switch from **OFF** to **LIVE**.
3. Open the Main Valve on the Oxygen Cylinder slowly by turning counterclockwise until FULLY open.
4. The Primary Pressure Gauge will indicate the amount of pressure in the cylinder. A full cylinder is 2015 PSI.
5. The disposable Propane Cylinder does not have a main valve, so the Primary Pressure Gauge will always register pressure once the cylinder is screwed into the Propane Regulator.
6. Turn the handle on the Regulator Adjustment Screw of both the Oxygen and Propane Regulators clockwise until the proper operating pressures are reached on the Secondary Pressure Gauges.



CAUTION: Operating pressures of 70 PSI for oxygen and 30 PSI for propane are the maximum recommended pressures for achieving the maximum sound level. 30 PSI for oxygen and 15 PSI for propane are the minimum pressures to reliably simulate an explosive blast.

Safety Features and Procedures for Firing

ARMING

To operate and fire the Model X-05 in **LIVE** Mode, the unit must be Armed. The Model X-05 will not fire when Disarmed.

1. Flip the Mode Switch from **OFF** to **LIVE**. The buzzer will beep once and the Armed LED will start flashing.
2. Briefly press the appropriate X-0 UNIT button of the X-MIT Transmitter. The Armed LED on the side of the Control Box changes from flashing to solid once the X-05 is Armed.
3. The Model X-05 may be Armed or Disarmed remotely at any time in **LIVE** Mode by briefly pressing the appropriate X-0 UNIT button of the X-MIT Transmitter.



FIRING

The Model X-05 can be Fired only when Armed.

1. Once armed, the Model X-05 can be Fired by pressing and holding the appropriate X-0 Unit button of the X-MIT Transmitter for at least one second to initiate a Firing sequence (see **X-MIT Operation** below).
2. A brief (1 second) flow of gas into the Cannon is immediately followed by an extremely loud (100-125+dB; 160dB Peak) report, as the gas mixture is ignited by the Spark Plug.
3. The Model X-05 can be Fired again by repeating the above Firing Sequence.

If a continuous Fire Signal is received, the unit will still only allow a single fuel gas fill to prevent over filling before ignition.

LIVE Mode Summary

1. Open Main Valve on Oxygen Cylinder
2. Set Secondary Pressures on Regulators (70psi Oxygen; 30psi Propane max)
3. Flip Mode Switch to **LIVE**
4. Arm the Model X-05 with a brief button press
5. Fire the Model X-05 with a one second button press
6. Unit can be fired again immediately
7. Disarm the Model X-05 with a brief button press
8. Flip Mode Switch to **OFF** (center position)



CAUTION: The only time you should hear gas flow is at the beginning of each Firing Sequence. If you should hear gas flowing at any other time, immediately turn the unit to OFF, close main valves, and check all hose and regulator fittings.



Turn Off Instructions

Disarm the Model X-05 by briefly pressing the appropriate X-0 UNIT button of the X-MIT Transmitter. This action toggles the unit between Armed and Disarmed status. Once the Armed Indicator LED changes from solid to flashing, the unit is Disarmed and will not fire.

Once the unit is Disarmed, flip the Mode Switch on the Control Box to the middle position: **OFF**. Also, switch-off the X-MIT.

Storage Requirements

When storing the Model X-05, the fuel lines should be depressurized.

1. Once the unit is Disarmed, close the Main Valve on the Oxygen Cylinder.
2. Turn Propane regulator adjustment screw counterclockwise until minimal resistance is felt. **DO NOT REMOVE THE ADJUSTMENT SCREW FROM THE REGULATOR!**
3. Arm and Fire the unit several times to release any residual fuel gasses in the lines.
4. The secondary gauge (left-hand gauge) on both regulators should read Zero.



WARNING: While the quantities of fuel gasses released may not be sufficient for the unit to actually Fire, this bleeding operation should be treated as an actual Firing sequence for safety reasons.

Replacing Cylinders

To replace an Oxygen Cylinder:

1. Turn off the Model X-05.
2. Depressurize the fuel lines (see **Storage Requirements**, above).
3. Using a 1-1/8" wrench, loosen the brass nut where the Oxygen Regulator attaches to the Oxygen Cylinder. Remove regulator and carefully set aside, being mindful not to introduce dirt or other debris into the exposed end of the regulator.
4. Loosen the clamp that holds the Oxygen Cylinder to the Gas Cylinder Bracket.
5. Remove the empty Oxygen Cylinder.
6. Install the replacement Oxygen Cylinder to the Gas Cylinder Bracket.
7. Re-attach the Oxygen Regulator to Oxygen Cylinder and rotate cylinder to the proper orientation (see Figure 2). Securely tighten regulator nut with a 1-1/8" wrench. Do not use pliers or any other size tools.
8. Securely tighten the clamp that holds the Oxygen Cylinder to the Gas Cylinder Bracket.



9. Inspect the gas hose fittings-to-regulator attachments for leaks by checking for bubbles when sprayed with soapy water.

To replace a disposable Propane Cylinder:

1. Turn off the Model X-05.
2. Depressurize the fuel lines (see **Storage Requirements**, above).
3. Loosen the clamp that holds the Propane Cylinder to the Gas Cylinder Bracket.
4. Remove the entire disposable Propane Cylinder/Regulator assembly.
5. Being careful to point the Propane Cylinder opening away from the body, rotate the empty Propane Cylinder counterclockwise to unscrew it from the Propane Adapter/Regulator assembly.
6. Insert the new disposable Propane Cylinder into the Propane adapter and screw it clockwise into the adapter until it is hand tight. Do this quickly to prevent as little gas as possible from escaping.
7. Install the entire Propane Cylinder/Regulator assembly in the proper orientation back into the clamp that holds it to the Gas Cylinder Bracket (see Figure 2) and tighten clamp securely.
8. Inspect the gas hose fittings-to-regulator attachments for leaks by checking for bubbles when sprayed with soapy water.



CAUTION: The Propane Regulator Adapter is connected to the Propane Regulator with left-handed threads and are tightened with a 1-1/8" wrench.

Hardwire Input

Your Model X-05 has an Input Port on the Control Box to allow for hardwired operation with the use of a Hardwired Trigger Cable (Optional).

1. Momentarily grounding Conductor **2** of the hardwired input (connect Black Conductor **2** to the Green/Yellow Ground Conductor) will toggle the X-05 between Armed and Disarmed status.
2. Momentarily grounding Conductor **1** to the Green/Yellow Ground Conductor will send a Fire signal to the X-05.
3. Hardwire inputs and Transmitter inputs can be used at the same time (i.e. a pressure plate switch connected to the Hardwired Trigger Cable and a Transmitter can both be used to Fire the X-05).



Accessory Output

Your X-05 is equipped with an Accessory Output. It provides a 12 volt DC output as well as a discrete grounded output that can be used to operate a wide range of standard or custom made accessories.

Changing Channels

All X-0 Units and corresponding X-MIT, X-LRT, and X-ACT Transmitters must operate on the same channel. Multiple Transmitters in close proximity, however, can interfere with one another. To avoid this, set the Transmitters and X-0 Units to a different channel. Transmitters and X-0 units purchased prior to October 2020 were capable of 3 separate channels - **A, B, or C**. Transmitters and X-0 units purchased after October 2020 are capable of 12 channels - **1 thru C**. All Transmitters and X-0 units are shipped from the factory on Channel **A**. Channels on the X-0 units may be changed as follows:

1. Ensure Power Switch is in the **OFF** position.
2. Set Function Switch to **F**.
3. Set Unit ID Switch to selected channel: **1 thru C** (for newer X-0's) or **A, B, or C** (for older X-0's). Factory default is channel **A**.
4. Turn Unit **ON** and wait until LED D7 on X-0 control board stops blinking. On the newer units, the LED will blink the number of times as the channel it is set for as a visual confirmation of the channel. On the older units the LED will blink rapidly for about 5 seconds and stop.
5. Turn Unit **OFF** and return Function Switch back to 9 (factory default gas fill setting for an X-05) and the Unit ID Switch back to your current Unit ID requirements.
6. Resume normal operation.

Both the X-MIT and X-0 use the same procedure. Please note that an X-MIT on one channel will not communicate with an X-0 on a different channel.



Maintenance and Inspection Procedures

Before Each Use:

- Ensure Batteries are fully charged.
- Ensure Control Box latches are fully secured.
- Inspect Regulators and Gauges for cracks or obstruction of indicator pointers. If cracks or obstructions are visible see troubleshooting guide.
- Make sure no water, dirt, or other foreign materials remain in the Cannon.
- Make sure the Oxygen Cylinder has sufficient charge by checking primary pressure gauge. A fully charged Cylinder (2015 psi) should provide approximately 150 shots.
- One Disposable Propane Cylinder should provide approximately 50 shots (the Primary Pressure Gauge is not an accurate indicator of remaining liquid propane).

Periodic Checkpoints

- Inspect the welds of the Cannon for visible cracks or other indications of fatigue. If any anomalies are visible, see troubleshooting guide.
- Inspect the Spark Plug body for cracks or other indications of fatigue. Make sure the Spark Plug is tightly seated – if not, use a 13/16" wrench and tighten to 40 ft-lbs.
- Ensure Spark Plug ignition wire is fully seated and firmly attached to Spark Plug.
- Ensure the Oxygen and Disposable Propane Cylinders are firmly secured before use.



Operation Summary Checklist

- ☐ **Power:** ensure batteries are new or fully charged
- ☐ **Communication:** ensure transmitter has fresh batteries and ensure simulator and transmitter are on same Channel and Unit ID
- ☐ **Gas pressures:** oxygen @ 70 psi; propane @ 30 psi
- ☐ **Hose connections:** ensure gas hoses are properly connected between regulators and simulator
- ☐ **Cable connections:** ensure cannon cable is securely connected to Control Box
- ☐ **Spark plug:** ensure spark plug is tight and spark plug cable is securely connected



**Thank you for purchasing your
Model X-05 Explosive Blast
Simulator.**

**We at Explotrain, LLC truly appreciate your
business.**

**If you have any questions or comments on this,
or any of our products, please let us know.**

**Phone: (850) 862-5344
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