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OPERATOR'S MANUAL **SIPS™ -BDA-700/800 *Li-ion* Portable In-Building** **Communications System**

**TO REDUCE THE RISK OF INJURY, YOU MUST
READ THIS OPERATOR'S MANUAL AND COMPLY
WITH ALL INSTRUCTIONS AND PROCEDURES
DESCRIBED HEREIN.**

**FAILURE TO DO SO MAY RESULT IN FIRE,
PERSONAL INJURY, AND/OR OTHER DAMAGE.**

Refer to EM-100 Operator's Manual for important information concerning *Li-ion* battery packs. Observe all guidelines below to assure safe operation of this product.

PATENTS AND PATENTS PENDING

7,838,142 • 7,990,102 • 8,025,118 • 8,026,698
8,084,154 • D601,088 • D632,649 • 20100197222
20100248616 and others

GENERAL SAFETY RULES

! WARNING

READ AND UNDERSTAND ALL INSTRUCTIONS

Failure to follow all instructions may result in electrical shock, fire, equipment damage, and/or serious personal injury.

SAVE THESE INSTRUCTIONS

This manual contains important safety and operating information for the Modtech Corp. SIPS-BDA-700/800 *Lithium-Ion* powered Portable In-Building Communications (IBC) System. Before using the IBC system, read this operator's manual. Also, read and observe all information on the labels attached to the system and battery packs.

- 1. CAUTION! EXPLOSIVE ATMOSPHERE.** This product includes an integral circuit breaker, which may cause an electrical flash if the breaker should reset. To avoid explosion or fire, do not operate this product in the presence of flammable gases or fumes.
- 2. CAUTION! INDOOR ANTENNA SAFE DISTANCE.** Use a maximum 3 dBi omni-directional antenna. Observe a minimum separation of 20 cm (~ 8 in.) from all users and bystanders so none receive RF exposure beyond the maximum permissible according to section 1.1310. See item 8 below for additional minimum spacing requirements.
- 3. CAUTION! OUTDOOR ANTENNA SAFE DISTANCE.** Use a maximum 11 dBd directional antenna. Observe a minimum separation of 120 cm (~ 4 ft.) from all users and bystanders so none receive RF exposure beyond the maximum permissible according to section 1.1310. See item 8 below for additional minimum spacing requirements.
- 4. LIGHTNING DISCHARGE.** Do not deploy system antennas or other components outdoors during electrical storms.
- 5. AVOID EXPOSING INTERNAL COMPONENTS TO DANGEROUS CONDITIONS AND ENVIRONMENTS.** This product houses components including battery packs in a water-resistant polymer case. Avoid opening the case door if doing so will expose internal components to dangerous conditions and environments including water and gases.
- 6. NO USER SERVICEABLE PARTS INSIDE.** Hazardous voltages are present when the covers of internal components are removed. Removing such covers will void your warranty. If you suspect a malfunction with this product, call your dealer or the Modtech Corp. support line at (440) 942-2133.

7. ASSURE PROPER ISOLATION BETWEEN OUTDOOR AND INDOOR ANTENNAS. Failure to do so may lead to amplifier oscillations which may be detrimental to the radio system and cause the amplifier to automatically disable itself. A minimum separation of ~100 ft. in the back field of the outdoor antenna is recommended.

8. AVOID OPERATING POWERFUL RADIO TRANSMITTERS TOO CLOSE TO THE SYSTEM ANTENNAS. Doing so may overload the system amplifier and cause it to automatically disable itself. Transmitters operating in the 851 MHz to 861 MHz band should be kept a minimum of 100 ft. from the outdoor antenna. Transmitters operating in the 806 MHz to 816 MHz band should be kept a minimum of 30 ft. from the indoor antenna(s).

9. REFER TO EM-100 BATTERY PACK MANUAL FOR IMPORTANT ADDITIONAL SAFETY GUIDELINES.

10. DO NOT BURN OR INCINERATE BATTERY PACKS. Battery packs may explode causing personal injury, fire, and/or damage. Fumes resulting from burning of battery packs may be toxic.

11. DO NOT DROP, CRUSH, IMPACT, OR MECHANICALLY ABUSE BATTERY PACKS. Cease use of packs that have suffered a sharp impact, been dropped, run over, or damaged in any other way. Such impacts may cause internal damage that is not externally visible and that, over time, may cause short circuits, battery cell leakage, or other events that may lead to fire, personal injury, and or equipment damage.

12. AVOID BATTERY SHORT CIRCUITS. A short circuit will result if conductive materials such as wires, metal tools, coins, keys, salt water, or other conductive objects contact the positive and negative terminals at the same time. A short circuit may cause sparks, excessive heat, fire, personal injury, or other equipment damage.

13. REPLACE FUSES ONLY WITH 10A 32V MINI BLADE FUSE. No exceptions.

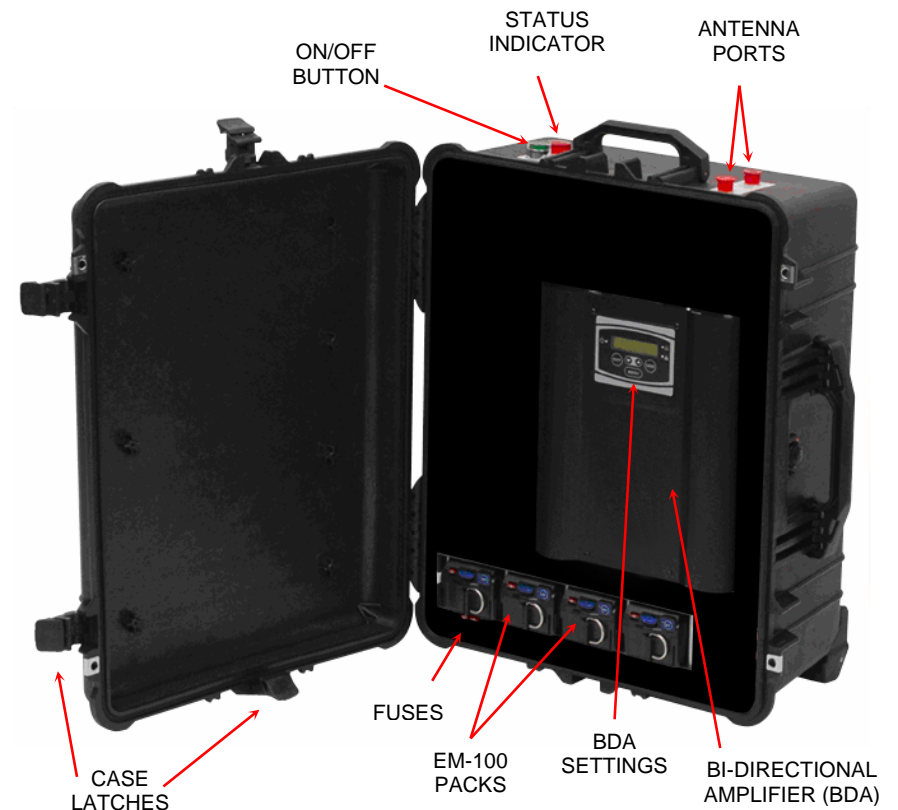
14. STORE BATTERY PACKS IN A COOL, DRY PLACE. Avoid leaving the battery pack in direct sunlight, vehicle cabs, compartments, or unventilated storage buildings during hot summer conditions. Under extreme temperature conditions damage may occur. Elevated temperatures in general shorten the life of your battery pack.

! WARNING

READ AND SAVE THESE INSTRUCTIONS FOR FUTURE USE.

Failure to follow all instructions may result in electrical shock, fire, equipment damage, and/or serious personal injury.

FUNCTIONAL DESCRIPTION

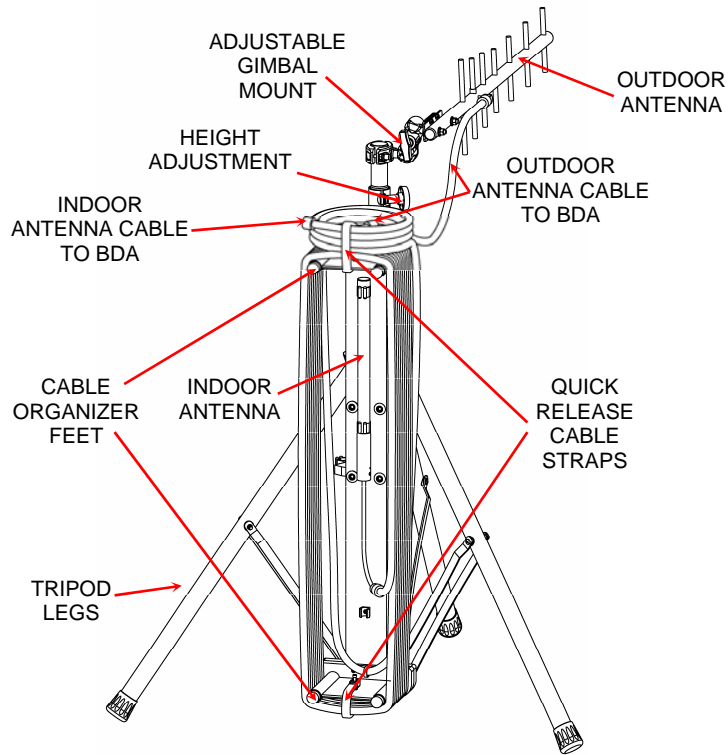


**SIPS-BDA-800 In-Building Communications System
Tactical Amplifier Kit (see Antenna Kit next page)**

! WARNING

UNDER NORMAL CIRCUMSTANCES THE TACTICAL AMPLIFIER CASE SHOULD NOT BE OPENED DURING USE. THE BDA AND EM-100 BATTERY PACKS RELY ON IT FOR PROTECTION FROM THE ELEMENTS.

FUNCTIONAL DESCRIPTION – cont'd

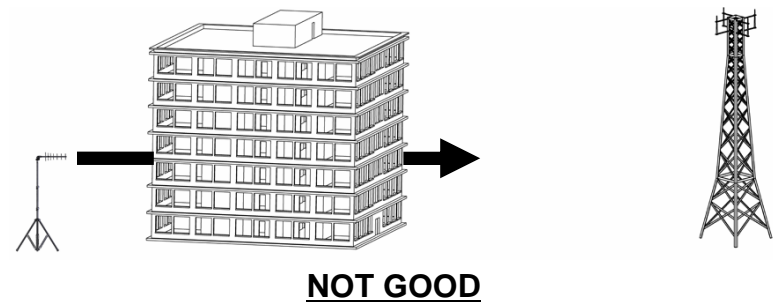
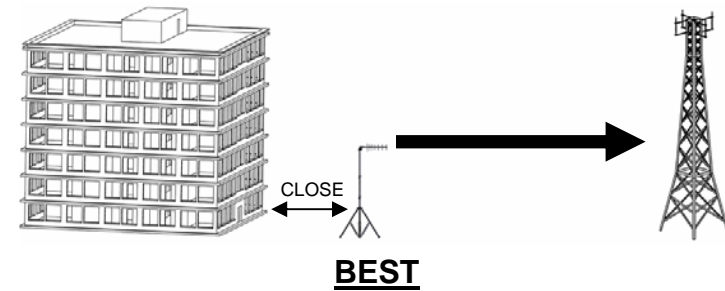


SIPS-BDA-700/800 In-Building Communications System
Portable Antenna Kit (see Amplifier Kit previous page)

Basic Operation:

- **Purpose** - the tactical BDA system is used to enhance radio coverage inside structures such as buildings and tunnels.
- **Requirements** - radio system coverage outside of the structure where the antenna stand will be placed must be adequate. If the portable radio is not operative outside, the tactical BDA will likely not provide coverage inside.
- **Antenna Location** - pick a location **outside** the building where
 - Radio system coverage is adequate
 - There is a clear path (insofar as possible) to a nearby tower / system repeater (within 5-6 miles is best)
 - A point of entry to the area requiring coverage enhancement is within reach (less than 100' if possible)

! WARNING
PLACEMENT SHOULD BE SUCH THAT THE OUTDOOR ANTENNA, WHEN AIMED AT THE TOWER / REPEATER, IS ALSO AIMED AWAY FROM THE INDOOR LOCATION.

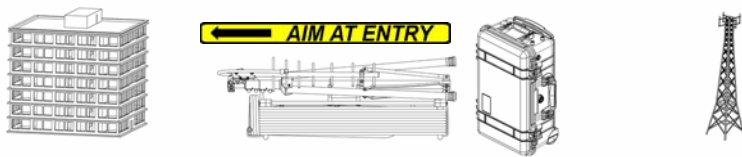


NOTE:
THE TRIPOD LEGS ARE MOST EASILY EXTENDED AND COLLAPSED WITH THE ANTENNA STAND LYING DOWN ON ITS CABLE ORGANIZER FEET.
 See DEPLOYMENT procedure below.

! IMPORTANT

**SIMPLE BUT CRITICAL PROCEDURES FOLLOW.
PAY ATTENTION AND SUCCEED.**

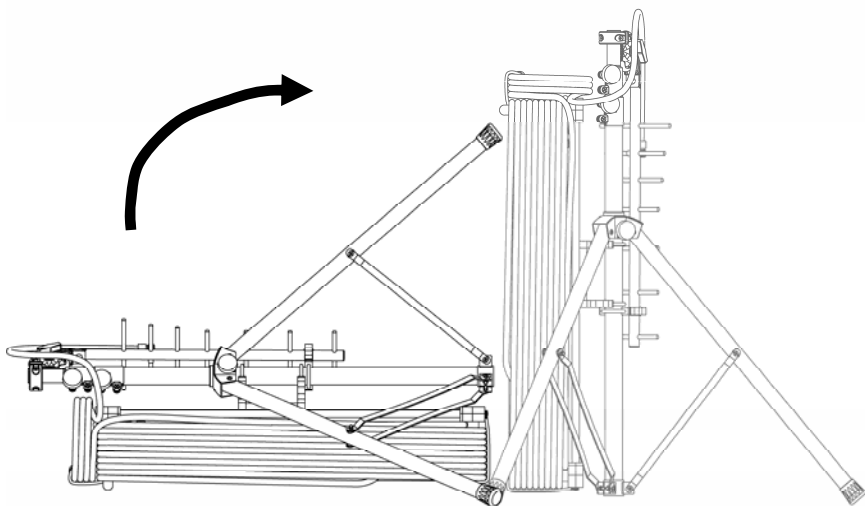
Deployment - at **outside** location, starting with antenna stand horizontal, **aim at stand entry** oriented as indicated, have tactical amplifier kit at hand.



Starting with step 1 and following along as indicated by yellow sequence indicators 1 to 9:

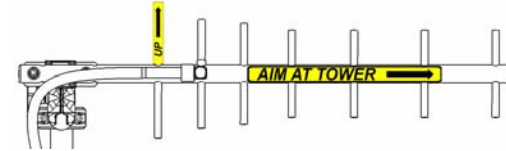
**FOLLOW
1 THESE
STEPS**

- 1 Loosen knob 1 to free tripod legs. Lift uppermost tripod leg to extend legs. Tighten knob 1 to secure extended legs. Rotate tripod to upright, vertical position.

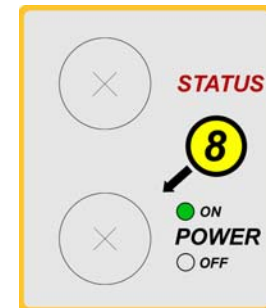


Deployment continued:

- 2 With tripod now standing, release both upper and lower cable bungee straps. Let coiled cable segments drop to the side.
- 3 Using gimbals adjustment, aim outdoor antenna (Yagi) main shaft at tower (system repeater). Small fingers should be oriented straight up and down.



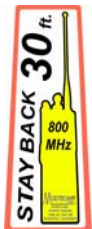
- 4 Extend tripod column upward using first extension section.
- 5 Extend tripod column further upward using second extension section.
- 6 Connect indoor antenna cable 6 to amplifier indoor antenna port 6.
- 7 Connect outdoor antenna cable 7 to amplifier outdoor antenna port 7.



- 8 Push and release green on/off button to start 30-second turn-on countdown.
- 9 Grasp lower portion of red, indoor omni antenna. Pull briskly from retaining clips and proceed without delay into structure. Once inside, orient the indoor antenna vertically by placing in orange cone or by hanging from eye hook.

! WARNING
**MAINTAIN A DISTANCE OF 25-30 FEET
FROM RED INDOOR ANTENNA WHEN
OPERATING YOUR PORTABLE RADIO.**

This is to avoid overloading the bi-directional amplifier.



USER INTERFACE OPERATION

The SIPS-BDA-700/800 user interface includes:

1. **On/Off Push Button Switch**
2. **Green Indicator Light** (integral to Pushbutton Switch)
3. **Red Status Indicator Light**

1. **On/Off Push Button Operation:**

- **Delayed On:** Press the push button momentarily and release. Green light flashes rapidly for 30 seconds. Unit then starts.
- **Immediate On:** Press and hold the push button for 2 to 3 seconds (until green turns on solidly) and release for immediate start. Turn off as usual.
- **Off:** Press the push button momentarily and release.

Delayed On:

2. **Green Indicator Operation:**

Amplifier	Shore Power	Charging	Green Light
Off	No	Don't Care	Off
On	No	Don't Care	Light blinks with on-time proportional to battery charge
On	Yes	Don't Care	Light is mostly on , quick blink off
Off	Yes	Done	One quick flash
Off	Yes	Charging	Two quick flashes

3. **Red Indicator Operation:**

- Normal Turn On: **several flashes** to prove indicator light is functional.
- Fault Condition: **repeating sequences of 3 or 4 flashes.**
- Fuse or Shutdown Battery Fault: **repeating on/off flash.**

MAINTENANCE AND STORAGE

Moisture and heat are deleterious to battery pack operation and life. Refrain from exposing packs or other components internal to the amplifier case to rain, snow, or moisture of any kind. When storing the amplifier with battery packs installed, a cool, dry location is best for good preservation of capacity and life. It is also advantageous to store packs for extended periods at somewhat less than full charge - 40% to 50% charge level is best. This will optimize shelf life and service life. 50% state of charge with a standard compliment of battery packs will provide for 5 to 6 hours operation. If full runtime on demand is required, batteries may be kept at 100% by leaving unit attached to shore power.

If the amplifier is disconnected from shore power, it should be re-attached to shore power overnight (~ 8 hours) at least weekly.

Battery packs placed in prolonged storage should be checked once or twice a year. When a pack is seen to decline to 10% charge level, it may be charged for approximately 1 hour to return it to 50% charge level. If the pack is allowed to discharge fully, it will become disabled but not otherwise damaged. In this case, a very short flash of the LED will occur when the test push button is pressed (see Table 1 EM-100 Manual). A disabled pack should be charged at the user's earliest convenience, preferably for approximately one hour if it is to be returned to storage.

If the pack is to be transported for recycling or other purposes, or at time of disposal or recycling, **remove the external fuse.** This will electrically disconnect the pack contacts from the batteries inside and provide a safer state for avoiding short circuit conditions. The fuse may be simply re-installed when the pack is to be returned to service.

DISPOSING OF BATTERY PACKS

Lithium ion battery packs are more environmentally friendly than many other types of batteries (e.g. lead acid or nickel cadmium types). Always dispose of battery packs according to federal, state, and local regulations. Contact a recycling agency in your area for recycling instructions and locations.

Always treat battery packs with care, do not incinerate or burn, and avoid crushing or compacting. Remove the external fuse when the pack is to be discarded or recycled. Do not allow the pack to become submerged in water.

