AUTOMATIC ACTIVATION DEVICE

OWNERS MANUAL

FXC CORPORATION
3410 SOUTH SUSAN STREET
SANTA ANA, CALIFORNIA 92704
(714) 556-7400
FAX (714) 641-5093

Revised April 1997 (Mod 3)

-DANGER-

AUTOMATIC ACTIVATION DEVICES SOMETIMES FAIL TO OPERATE PROPERLY OR ACTIVATE WHEN THEY SHOULD NOT DO SO EVEN WHEN PROPERLY POSITIONED AND OPERATED SO THAT YOU RISK SERIOUS INJURY OR DEATH EACH TIME YOU USE THIS DEVICE.

TABLE OF CONTENTS

1.0 DESIGN CONCEPTS

1.1 The ASTRA Automatic Activation Device is a computer controlled electronic altimiter that determines the rate of decent and the altitude above ground level (AGL) and fires a locking loop cutter if an unsafe condition is detected.

1.2 The program stored in the microcontroller reads the digital value from the analog-to-digital converter and determines the rate of descent and the altitude above ground level (AGL).

2.0 FUNCTION

2.1 The ASTRA (P/N 811-00356-1) is designed to automatically cut the parachute container locking loop if the unit's preset activation altitude is reached, and for whatever reason the rate of descent exceeds 130 ± 15 feet per second (ASTRA Expert settings). Under normal conditions, the ASTRA will not operate because the parachutist will have deployed his main chute, thus slowing his rate of descent to less than 115 feet per second before reaching the preset activation altitude.

2.2 The ASTRA is small in size, extremely rugged, and simple to operate. The ON/OFF switch, when turned to "ON," automatically calibrates the unit, checks continuity of the entire system, and continuously confirms the status of the batteries (see Figure 1).

Designed to fire at- Altitude Setting: 1000 ± 200 feet AGL
Rate of Decent 130 ± 15 feet per second

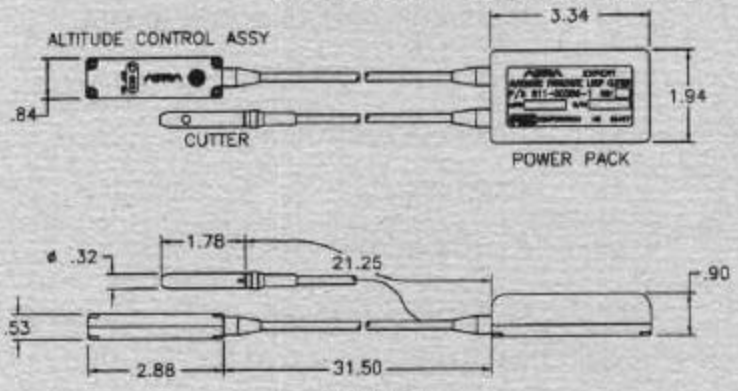

FIGURE 1

DISCLAIMER

THE ASTRA IS A BACK-UP SAFETY DEVICE. IT IS NOT DESIGNED TO BE THE PRIMARY MEANS TO DEPLOY THE PARACHUTE SYSTEM.

FAILURE TO MAINTAIN AND OPERATE YOUR ASTRA IN ACCORDANCE WITH THE OWNER'S MANUAL, MAY CAUSE IMPROPER OPERATION.

HOWEVER THE OCCURRENCE OF A MALFUNCTION CANNOT BE EXCLUDED. WE ACCEPT NO RESPONSIBILITY FOR DAMAGES AND CONSEQUENCES RESULTING FROM A MALFUNCTION..

3.0 COMPONENTS

3.1 The ASTRA consists of three (3) major components: The Altitude Control Assembly, the Power Pack, and the Cutter Assembly.

3.2 Altitude Control Assembly:

3.2.1 The Altitude Control Assembly contains a microcontroller circuit which has an EEPROM programmed with FXC's custom software. The unit also contains a high resolution pressure transducer and circuits which convert ambient air pressure into an electronic signal. This signal is amplified, and then converted to a digital value by an analog-to-digital converter.

3.2.2 The microcontroller reads the digital value from the analog-to-digital converter and determines the rate of descent and the altitude above ground level(AGL).

NOTE
THE ASTRA IS NOT MOISTURE-PROOF

4.0 OPERATION:

4.1. GENERAL OPERATION PROCEDURES

4.1.1 The ASTRA is very simple to operate. Turn it on at the drop zone. The green light will flash rapidly 5 times, flash slowly at least 10 times, then flash once momentarily each second. The momentary flashing confirms that the unit is calibrated to fire the cutter at 1000 feet above the ground level of that drop zone (SEE OPERATION STEPS TABLE).

4.1.2 If the green light stays "OFF" or "ON" continuously, either the battery voltage is too low or the cutter connection is faulty. The unit must be removed from service until the problem is corrected.

4.1.3 Once the unit is calibrated, it will "ARM" itself automatically during climbing but "ONLY" after reaching 1700 feet above that ground level (AGL).

4.1.4 If a jump is aborted after climbing above 1700 ft, turn the unit "OFF" before descending so that it will not inadvertently fire.

4.1.5 The ASTRA is designed to fire the cutter 1000 feet above ground level and at a rate of descent of 130± 15 feet per second for the ASTRA Expert.

4.1.6 The ASTRA "WILL NOT FIRE" above 1700 feet (AGL) regardless of the parachutist's rate of descent.

4.1.7 The ASTRA "WILL NOT FIRE" at any altitude if the rate of descent is less than 115 feet per second for the ASTRA Expert.

4.1.8 The ASTRA "WILL FIRE" when the parachutist reaches the unit's altitude setting and the rate of descent is greater than 145 feet per second for ASTRA Expert.

4.1.9 The ASTRA "WILL FIRE" when the parachutist is at or below the altitude setting and the rate of descent increases from less to moew than 130± 15 feet per second for ASTRA Expert.

4.1.10 When the unit "FIRES", the green light will "STAY ON" continuously until the unit is turned "OFF". If the unit is turned "ON" before replacing the cutter, the green light will "STAY ON". The green light "STAYS ON" continuously because of a faulty cutter circuit.

OPERATION STEPS TABLE

STEPS TO OPERATE YOUR ASTRA:

STEP 1.
Slide the ON/OFF switch to "ON" only at the ground level of the drop zone.

STEP 2.
Observe that the indicator green light blinks quickly five (5) times.

STEP 3.
Observe that the green light stays "ON" for one (1) second then turns "OFF" for one (1) second, until the unit calibrates itself to 1000 feet above the ground level (AGL) at that drop zone.

STEP 4.
Observe that once calibrated, the indicator green light "SHORT FLASHES" periodically the entire time the ASTRA is used.

STEP 5.
After each jump, slide the "ON/OFF" switch to "OFF".

4.2 MANDATORY OPERATION PROCEDURES:

4.2.1 The barometric pressure changes daily, therefore, for safety, the unit must be recalibrated before each jump at the ground level of the drop zone by performing all the steps in the operation steps table (knowledge of field elevation and barometric pressure is not required).

CAUTION

NEVER turn "ON" the ASTRA in an aircraft in flight. Serious injury can result from calibration at locations other than on the ground at the drop zone.

5.0 TYPICAL INSTALLATION:

5.1 Installation of the ASTRA has been specifically designed to be container fit friendly, rigger in the field friendly, and jumper friendly to the extreme. The unit fits into most of the existing mounting configurations and locations of the Cypres.*

Figure 4
POWER PACK INSTALLATION

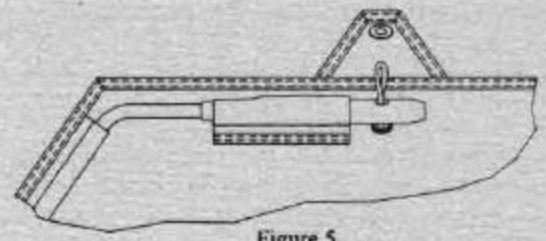

Figure 5
CUTTER INSTALLATION

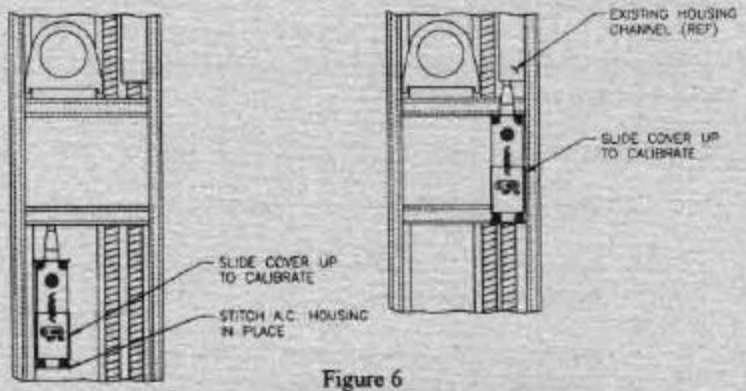

Figure 6
TYPICAL ALTITUDE CONTROL ASSEMBLY INSTALLATIONS

*ALL TRADE MARKS WHETHER STATED OR NOT ARE OF THEIR RESPECTIVE HOLDERS

6.0 THEORY OF OPERATION:

6.1 The unit is battery operated and contains an absolute air pressure sensor, miniature computer, and electrically actuated pyrotechnic cutter. The computer averages 16 pressure readings each second and stores the initial average value (approximately 20 seconds after turn on), the last average value, and the current average value. The difference between the initial value and the current value indicates altitude, and the difference between the current value and the last value indicates rate of change in altitude. The altitude and rate limits are calculated by the computer, and are verified by tests in an altitude chamber during manufacturing. The computer will fire the cutter only when the current altitude value is less than the calculated altitude limit and the current rate of descent value is greater than the calculated velocity limit. Other restraints imposed by the computer program are:

6.1.1 At some point in the flight the altitude must exceed 1700 feet above the drop zone before the ASTRA will "ARM" itself. If this altitude is never reached the ASTRA "WILL NOT FIRE" the cutter under any condition. The purpose of this safety feature is to minimize the risk of an inadvertent firing during ascent.

> **NOTE**
> Once the unit is calibrated, it will "ARM" itself automatically during climbing but "ONLY" after reaching 1700 feet above the ground level (AGL) at that drop zone.

7.0 MAINTENANCE:

7.1 The only maintenance required is to replace a weak Battery Pack or a fired Cutter Assembly.

7.1.1 BATTERY REPLACEMENT (see Figure 7):

a. Slide the "ON / OFF" switch to "OFF".

b. Remove the four (4) screws on the Power Pack cover, and remove the cover.

c. Remove the Battery Pack (P/N 811-00374) by pulling up on its lifting tab, and install a new one.

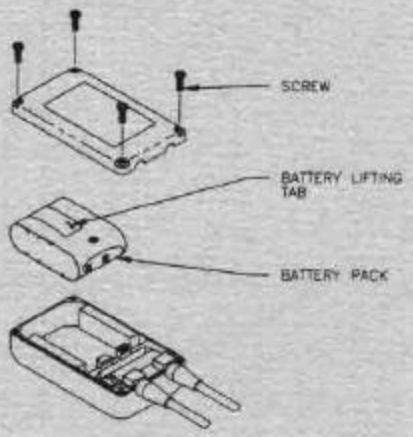

Figure 7
BATTERY REPLACEMENT

7.1.2 Cutter Replacement:

a. Unplug the cutter cable connector in the Power Pack by holding the flex circuit down with one hand while grasping the connector body with the other hand and pulling it straight up (see Figure 8).

> WARNING
> Before installing a Cutter Cable Assembly, short the outside pin of the 3 pin circuit to the center pin (see Figure 9).This "WILL" discharge any residual voltage on the capacitor thus preventing the possibility of the cutter firing as it is plugged in.

b. Plug the cutter cable onto the 3 pins on the flex circuit in the Power Pack. Take care to align the sockets with the pins before pushing down hard on the connector.

7.1.3 Cover Installation:

a. Slide the "ON/OFF" switch to "ON", the green light should be flashing.

b. Reinstall the cover to the housing.

c. Confirm that the green light is still flashing momentarily, and then slide the, "ON/OFF" switch to "OFF".

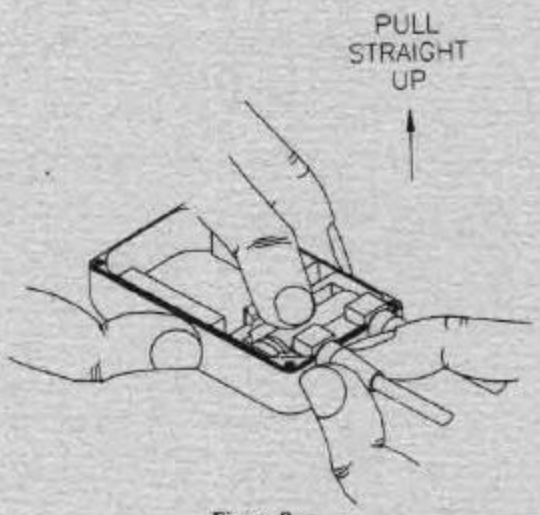

Figure 8
CUTTER REPLACEMENT

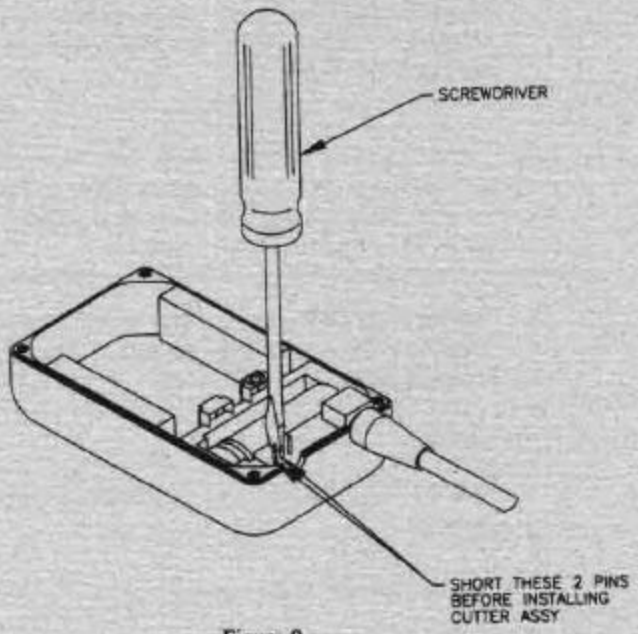

Figure 9
CUTTER REPLACEMENT

8.0 ILLUSTRATED PARTS BREAKDOWN:

8.1 This section shows the illustrated parts breakdown (see Figure 10).

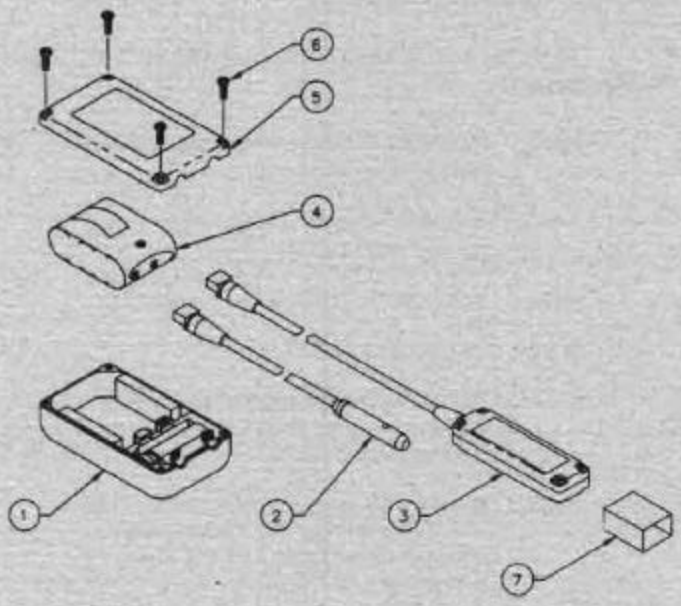

Figure 10
ASTRA ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTIONS	QTY
1	511-00543	POWER PACK ASSY	1
2	811-00375	CUTTER ASSY	1
3	511-00550	A.C.HOUSING ASSY	1
4	811-00374	BATTERY PACK	1
5	511-00549	POWER PACK ASSY. COVER	1
6	311-80266-15	SCREWS	4
7	511-00555	SAFETY COVER	1

9.0 FUNCTIONAL TEST

9.1 During every repack of the parachute , a functional test is recommended on the ASTRA, using the Cutter Test Probe and the Portable Altitude Test Chamber (see Figure 11).

9.2 To test the ASTRA using the Portable Altitude Test Chamber follow the following steps:

Step 1 Remove the four screws holding the cover on, then remove the cover.

Step 2 Carefully remove the cutter (see Figure 8), and then carefully install the Cutter Test Probe.

Step 3 Turn the Portable Altitude Test Chamber "ON".

Step 4 Turn the ASTRA "ON".

Step 5 Place the ASTRA inside the Portable Altitude Test Chamber, so that the Green Light on the Altitude Control Housing shows.

Step 6 Make sure that the control valve on the test chamber is closed and that the ASTRA has completed its calibration (green light is "SHORT" flashing periodically).

Step 7 Place the cover of the Portable Altitude Test Chamber onto the Chamber, holding it in place. Now using the hand pump, start pumping to the desired altitude.

Step 8 When at the desired altitude, turn the valve to start your descent. Record the readings of altitude and rate when the green light turns on steady.

Step 9 Now remove the Cutter Test probe, (see Figure 8) and discharge the capacitor (see Figure 9).

Step 10 Replace the Cutter Assembly and the cover.

Step 11 Test is completed.

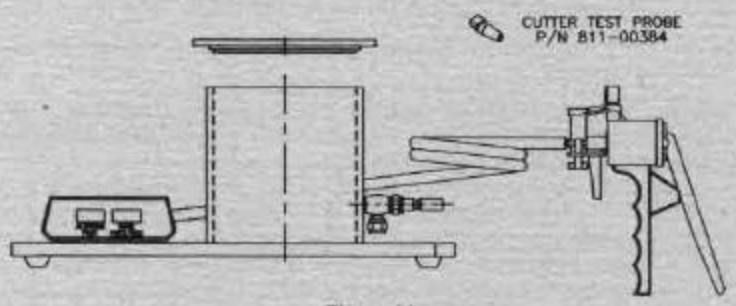

Figure 11
PORTABLE ALTITUDE TEST CHAMBER

10.0 WARRANTY :

10.1 The liability of the seller is limited to replacement of defective parts found upon examination by FXC Corporation to be defective in material or workmanship within one (1) year after purchase, and which has not been caused by an accident, striking, improper use, alteration, tampering, excessive use, misuse or abuse.

WARNING
THE DISCLAIMER MUST BE SIGNED AND RETURNED
TO FXC CORPORATION FOR THE WARRANTY TO BE IN EFFECT

11.0 DISCLAIMER:

11.1 The DISCLAIMER is an important legal document. One is printed herein for your reference and the one attached must be completed and sent to FXC Corporation.

DISCLAIMER

This is an important legal document. Allow yourself sufficient time to carefully read and understand the entire document, because by signing it, you are agreeing to give up certain legal rights.

In consideration of FXC Corporation, doing business as FXC, allowing me to purchase and the privilege of utilizing an Automatic Activation Device (ASTRA), designed, manufactured and/or assembled by FXC Corporation, for the purpose of performing an intentional parachute jump, I agree:

☐ * Initial

1.0 Representations, Warranties and Assumptions of Risk: I

(FULL NAME)

understand that parachute jumping will expose me to the risk of personal injury, property damage and/or death. I understand that the success of my jump is dependent upon the perfect functioning of the jump aircraft, the parachute system and the Automatic Activation Device (AAD), none of which can be guaranteed to function perfectly. I understand that the aircraft, parachute system and the Automatic Activation Device are all subject to malfunction either mechanical and/or electrical as well as operator error. I freely, voluntarily and expressly choose to assume all risks inherent in parachute jumping, including, but not limited to, risks of equipment malfunction, including those which may result from some defect in design, assembly, and/or manufacture, as well as those risks arising from improper and/or negligent operation and/or use of the equipment, for the thrill of participating in this activity, understanding full well that those risks may include personal injury, property damage, and/or death.

☐ * Initial

2.0 Exemption and release from liability:

a. FXC Corporation and their officers, directors, agents, servants, employees, shareholders, and all other representatives;

☐ * Initial

b. Manufacturers, designers, and FXC's suppliers of components incorporated into the ASTRA.

☐ * Initial

3.0 Covenant Not to Sue: I agree never to institute any suit or action at law or otherwise against FXC Corporation and/or persons described in paragraph 2 above, or to initiate or assist in the prosecution of any claim for damages of cause of action which I may have by reason of injury to my person or property, or my death, arising from the activities associated with or covered by this Agreement, whether caused by the negligence and/or fault, either active or passive, of FXC Corporation and/or persons described in paragraph 2 above, or from any other cause. I further expressly agree that I will never raise any claim against FXC Corporation and/or persons described in paragraph 2 above for product liability, failure to warn, negligence, breach or warranty, breach of contract, or strict liability, regardless of weather my claims for damages or injuries are alleged to result from the fault or negligence of the parties released. I further agree that my heirs, executors, administrators, personal representatives, and/or anyone else claiming on my behalf, shall not institute any suit or action at law or otherwise against FXC Corporation and/or persons described in paragraph 2 above, nor shall they initiate or assist the prosecution of any claim for damages of cause of action which I, my heirs, executors, administrators, personal representatives, any/or anyone else claiming on my behalf may have reason of injury to my person or property, or my death arises from activities covered by this Agreement, whether caused by negligence and/or fault, either active or passive, of any of FXC Corporations and/or persons described in paragraph 2

above, or from any other cause, I hereby so instruct my heirs, executors, administrators, personal representatives, and/or anyone else claiming on my behalf. Should any suit or action at law or otherwise be instituted in violation of this Agreement against FXC Corporation and/or persons described in paragraph 2 above, I agree that FXC Corporation and/or persons shall be entitled to recover, in addition to any other damages which may be incurred, reasonable attorney's fees and cost incurred in defense of such suit or action, including any appeals therefrom.

☐ * Initial

4.0 Indemnity Against Claims: I will indemnify, save and hold harmless FXC Corporation and/or persons described in paragraph 2 above from any and all losses, claims, actions or proceedings of every kind and character, including attorney's fees and expenses, which may be presented or initiated by any persons and/or organizations and which arise directly or indirectly from participation in the activities covered by the Agreement, whether resulting from the negligence and/or other fault, either active or passive, FXC Corporation and/or persons described in paragraph 2 above, or from any other cause.

☐ * Initial

5.0 Validity of Waiver: I understand that if I institute or anyone on my behalf institutes, any suit or action at law or any claim for damages cause of action against FXC Corporation and/or persons described in paragraph 2 above because of injury to my person or property, or my death, due to the activities covered by this Agreement can and will be used in a court.

☐ * Initial

6.0 I freely and voluntarily agree to all of the above by signing this contract on the _____ day of _____
(day) (month and year)
at _____
(location)

Medical coverage and public liability Insurance (TMMI) is available through United States Parachute Group Membership program.

PLEASE PRINT NEATLY

NAME: _____

SIGNATURE: _____

DRIVER'S LICENSE NUMBER: _____ STATE: _____

AGE: _____ BIRTHDATE: _____

ADDRESS _____

_____

TELEPHONE: _____

WITNESS NAME: _____

WITNESS SIGNATURE: _____

WITNESS DRIVER'S LICENSE NUMBER: _____ STATE: _____

ASTRA SERIAL NUMBER: _____

* Please read each paragraph carefully, Your initial indicates you understand and agree to all of the information and terms contained therein.

TRANSFER OF OWNERSHIP:

If the original owner transfers the ownership of the ASTRA to another party, a new disclaimer "MUST BE FILLED OUT" and sent to FXC Corporation this will allow the new owner to use the Warranty (if any) and get the ASTRA serviced.

WARNING
NO SERVICE OF THE ASTRA IS ALLOWED WITHOUT A DISCLAIMER ON FILE AT FXC CORPORATION

NOTE

IF YOU SUSPECT THE UNIT HAS BEEN FIRED IMPROPERLY AS DESIGNED,
"DO NOT TURN THE UNIT OFF:
RETURN THE UNIT TO FXC CORPORATION IMMEDIATLY
FOR EVALUATION.