



**PIA Technical Bulletin TB-260**  
**Parachute Industry Association Publications**  
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AAD / RSL Survey Report

*BACKGROUND: This Technical Bulletin contains portions of the information contained in the PIA Technical Committee ADD/RSL Survey Report that was initially undertaken in December 1991, to determine the status quo concerning AAD and RSL retrofit installations on TSO'ed harness / container systems. The data from those who responded was presented at the February 1992 PIA meeting. It is meant to be informational in nature, and to be used as a guideline to determine compatibility between the various AADs and Harness / Container systems on the market, and to allow riggers to determine RSL compatibility. It also provides guidelines for riggers to use on equipment where specific AAD or RSL systems are not provided by the harness / container manufacturer, in an attempt to eliminate some of the confusion and inaccurate information circulating in the field concerning such installations.*

*DISCLAIMER: This Technical Bulletin is based on the responses to an initial questionnaire, of December 19, 1991, and follow-ups and clarification questionnaires, submitted to PIA-member Harness / Container manufacturers. The PIA Technical Committee has made every effort to provide reliable and comprehensive information, however, this report is based solely on the information supplied by the respondents. This Technical Bulletin will be periodically updated, as additions and corrections are received from the respective manufacturers. It is also our desire to include compatibility information from other member harness / container manufacturers, as it becomes available. The Parachute Industry Association makes no endorsement of, nor makes any judgment as to the accuracy or validity of, any of the claims or data presented herein.*

**PIA Member Harness I Container Manufacturers who have responded to the Technical Committee Survey and its' subsequent revisions:**

1. The Adventure Loft, Inc.
2. Jump Shack - Parachute I-Abs, Inc.
3. Para-Flite Incorporated
4. Para-Phernalia, Inc.
5. The Uninsured Relative Workshop, Inc., d.b.a. Relative Workshop
6. Rigging Innovations, Inc.
7. SSK Industries, Inc.
8. Strong Enterprises
9. Butler Parachute Systems
10. Northern Lite Enterprises, Inc.
11. Parachutes de Prance S.A.
12. Sunpath Products
13. Parachute Industries of Southern Africa (PTY) LTD
14. Guardian Parachute
15. FliteLine Systems, Inc.
16. Stunts Adventure Equipment
17. Sky Supplies, Inc.
18. Altico, Inc.

**Q-1) Is your TSO'ed equipment available with an approved factory set up, (when originally manufactured) for the following items?**

**A. FXC Model 12000 AAD?**

**B. SSE MK-2000 / Pinpuller (Pinpusher) AAD?**

**C. Airtec Cypres AAD?**

**D. Reserve Static Line systems?**

**E. SSE MK 2000 / Micro Puller AAD?**

**F. FXC Astra?**

1. Brief Case	A) yes	B) yes	C) yes	D) yes	E) yes	F) yes	
Brief Case Student	A) yes	B) yes	C) yes	D) yes	E) yes	F) yes	
Prestige	A) yes	B) yes	C) yes	D) yes	E) yes	F) yes	
2. Racer	A) yes	B) yes	C) yes	D) yes	E) no	F) yes	
Racer/Elite	A) yes	B) yes	C) yes	D) yes	E) no	F) yes	
Racer Trainer	A) yes	B) yes	C) yes	D) yes	E) no	F) yes	
Elite/ Trainer	A) yes	B) yes	C) yes	D) yes	E) no	F) yes	
Elite/Tandem	A) yes	B) yes	C) yes	D) yes	E) no	F) yes	(Note 7)
3. EOS*	A) no	B) no	C) no	D) yes	E) no	F) no	
Swift II	A) no	B) yes	C) no	D) yes	E) no	F) no	
5. Vector-11	A) yes	B) yes	C) yes	D) yes	E) yes	F) pnd	(Note 5)
Student Vector-11	A) yes	B) yes	C) yes	D) yes	E) yes	F) pnd	(Note 5)
Tandem Vector-11	A) yes	B) yes	C) yes	D) yes	E) yes	F) pnd	(Note 5, 7)
6. Talon	A) yes	B) yes	C) yes	D) yes	E) pnd	F) yes	(Note 5)
Telesis	A) yes	B) yes	C) yes	D) yes	E) pnd	F) yes	(Note 5)
Flexon	A) no	B) no	C) yes	D) yes	E) no	F) yes	
Talon 2	A) no	B) no	C) yes	D) yes	E) no	F) yes	
Telesis 2	A) no	B) no	C) yes	D) yes	E) no	F) yes	
Genera	A) no	B) no	C) yes	D) yes	E) no	F) yes	
7. Sweethog(1-pin res.)	A) yes	B) yes	C) yes	D) yes	E) yes	F) pnd	(Note 5)
XN Sweethog	A) no	B) yes	C) yes	D) yes	E) yes	F) pnd	(Note 5)
X-XN Sweethog	A) no	B) no	C) yes	D) yes	E) yes	F) pnd	(Note 5)
Student Sweethog	A) yes	B) yes	C) yes	D) yes	E) no	F) pnd	(Note 5)
8. Dual Hawk Tandem	A) no	B) no	C) yes	D) yes	E) no	F) pnd	(Note 7)
Student Mini Hawk	A) yes	B) yes	C) yes	D) yes	E) no	F) pnd	
Mini Hawk	A) yes	B) yes	C) yes	D) yes	E) no	F) pnd	
Combination Tandem	A) yes	B) no	C) no	D) yes	E) no	F) pnd	
9. (Emergency Parachute Systems)	Yes (non-specific)						
10. Northern Lite III*	A) yes	B) yes	C) yes	D) yes	E) yes	F) yes	
NL III Infinity	A) yes	B) yes	C) yes	D) yes	E) yes	F) N/A	
11. Atom	A) yes	B) no	C) yes	D) yes	E) no	F) pnd	
12. Javelin	A) yes	B) yes	C) yes	D) yes	E) yes	F) no	
13. Naro	A) yes	B) no	C) yes	D) yes	E) no	F) no	
Student Naro	A) yes	B) no	C) yes	D) yes	E) no	F) no	
14. Mach III - Alpha	A) yes	B) no	C) no	D) yes	E) no	F) yes	
15. Reflex	A) no	B) no	C) yes	D) yes	E) no	F) no	
16. Eclipse	A) yes	B) no	C) yes	D) yes	E) no	F) yes	
Eclipse Student							
System	A) yes	B) no	C) yes	D) yes	E) no	F) yes	
17. Mirage - 1996 +	A) no	B) no	C) yes	D) yes	E) no	F) yes	
18. Dolphin	A) yes	B) yes	C) N/A	D) N/A	E) yes	F) N/A	

**Notes:** A "\*" following the container model name signifies that this system is no longer produced by the particular manufacturer. "N/A" In the above table means that the specific harness / container system always comes with the provisions for the particular item. "pnd" indicates pending further testing.

**Note 5:** The Micro Puller is currently not compatible with our RSL system.

**Note 7:** Only the Tandem models of these AADs are approved for use.

**Q-2) Can you (as the manufacturer) perform an *approved* retrofit installation (at your factory) for the following Items on your TSO'ed equipment? (Equipment was not originally built with the set-up for the particular item).**

**A. FXC Model 12000 AAD?**

**B. SSE MK-2000 / Pinpuller (Pinpusher) AAD?**

**C. Airtec Cypres AAD?**

**D. Reserve Static Line systems?**

**E. SSE MK-2000 / Micro Puller AAD?**

**F. ASTRA**

1. Brief Case	A) yes	B) yes	C) yes	D) yes	E) yes	F) yes	
Brief Case Student	A) yes	B) yes	C) yes	D) N/A	E) yes	F) yes	
Prestige	A) yes	B) yes	C) yes	D) yes	E) yes	F) yes	
2. Racer	A) yes	B) yes	C) yes	D) yes	E) no	F) yes	
Racer/Elite	A) yes	B) yes	C) yes	D) yes	E) no	F) yes	
Racer Trainer	A) yes	B) yes	C) yes	D) N/A	E) no	F) yes	
Elite/Trainer	A) yes	B) yes	C) yes	D) N/A	E) no	F) yes	
Elite/Tandem	A) yes	B) yes	C) yes	D) N/A	E) no	F) yes	Note 7
3. EOS*	A) no	B) no	C) no	D) N/A	E) no	F) no	
Swift II	A) no	B) yes	C) no	D) yes	E) no	F) no	
4. Northern Lite *	A) yes	B) yes	C) no	D) yes	E) no	F) no	
5. WonderHog II *	A) yes	B) yes	C) no	D) no	E) no	F) pnd	
Vector *	A) yes	B) yes	C) yes	D) yes	E) yes	F) pnd	Note 5
Vector-11	A) yes	B) yes	C) yes	D) yes	E) yes	F) pnd	Note 5
Student Vector *	A) yes	B) yes	C) yes	D) N/A	E) pnd	F) pnd	Note 5
Student Vector-11	A) yes	B) yes	C) yes	D) N/A	E) pnd	F) pnd	Note 5
Tandem Vector *	A) yes	B) yes	C) yes	D) N/A	E) pnd	F) pnd	Note 5, 7
Tandem Vector-11	A) yes	B) yes	C) yes	D) N/A	E) pnd	F) pnd	Note 5, 7
6. Talon	A) no	B) yes	C) yes	D) yes	E) pnd	F) yes	Note 5
Telesis	A) N/A	B) yes	C) yes	D) N/A	E) pnd	F) yes	Note 5
Flexon	A) no	B) no	C) N/A	D) N/A	E) no	F) yes	
Talon 2	A) no	B) no	C) N/A	D) N/A	E) no	F) yes	
Telesis 2	A) no	B) no	C) N/A	D) N/A	E) no	F) yes	
Genera	A) no	B) no	C) N/A	D) N/A	E) no	F) yes	
7. Sweethog (1-pin res.)	A) yes	B) yes	C) yes	D) yes	E) yes	F) pnd	Note 5
XN Sweethog	A) no	B) yes	C) yes	D) yes	E) yes	F) pnd	Note 5
X-XN Sweethog	A) no	B) no	C) yes	D) yes	E) yes	F) pnd	Note 5
Student Sweethog	A) yes	B) yes	C) yes	D) N/A	E) no	F) pnd	Note 5
Duece, Runt, and							
Sweethog-II (2-pin res)*	A) no	B) no	C) yes	D) no	E) no	F) pnd	
8. Dual Hawk Tandem	A) no	B) no	C) yes	D) N/A	E) no	F) pnd	Note 7
Student Mini Hawk	A) N/A	B) N/A	C) yes	D) N/A	E) no	F) pnd	
Mini Hawk	A) N/A	B) N/A	C) yes	D) N/A	E) no	F) pnd	
Combination Tandem	A) N/A	B) N/A	C) yes	D) N/A	E) no	F) pnd	
9. (Emergency Parachute Systems) Yes (non-specific)							
10. Northern Lite III	A) yes	B) yes	C) yes	D) yes	E) yes	F) yes	
NL Infinity	A) yes	B) yes	C) N/A	D) N/A	E) yes	F) N/A	
11. Atom	A) yes	B) no	C) yes	D) yes	E) no	F) pnd	
Jaguar, Requin*	A) yes	B) no	C) no	D) no	E) no	F) pnd	
12. Javelin	A) yes	B) yes	C) yes	D) yes	E) yes	F) yes	
13. Naro	A) yes	B) no	C) yes	D) yes	E) no	F) pnd	
Student Naro	A) yes	B) no	C) yes	D) yes	E) no	F) pnd	
14. Mach III - Alpha	A) yes	B) no	C) no	D) yes	E) no	F) pnd	
15. Reflex	A) no	B) no	C) N/A	D) N/A	E) no	F) yes	
16. Eclipse	A) yes	B) no	C) yes	D) yes	E) no	F) yes	
Eclipse Student							

System	A) yes	B) no	C) yes	D) yes	E) no	F) yes
17. Mirage 1996 +	A) no	B) no	C) yes	D) yes	E) no	F) yes
18. Dolphin	A) yes	B) yes	C) N/A	D) N/A	E) yes	F) N/A

**Notes:** A "\*" following the container model name signifies that this system is no longer produced by the particular manufacturer. "N/A" in the above table means that the specific harness / container system always comes with the provisions for the particular item. "pnd" indicates pending further testing.

**Note 5:** The Micro Puller is currently not compatible with our RSL system.

**Note 7:** Only the Tandem models of these MDs are approved for use.

**Q-3) Do you provide approved Instructions to allow riggers to perform a retrofit installing of the following items on your TSO'ed equipment? (Equipment was not originally built with the set-up for the particular item).**

**A. FXC Model 12000 AAD?**

**C. Airtec Cypres AAD?**

**E. SSE MK-2000 / Micro Puller AAD?**

**B. SSE MK-2000 / Pinpuller (Pinpusher) AAD?**

**D. Reserve Static Line systems?**

**F. ASTRA**

1. Brief Case	A) yes	B) yes	C) no	D) no	E) no	F) no	
Brief Case Student	A) yes	B) yes	C) no	D) N/A	E) no	F) no	
Prestige	A) no	B) no	C) no	D) no	E) no	F) no	
2. Racer	A) no	B) yes	C) yes	D) no	E) no	F) no	Note 4
Racer/Elite	A) no	B) yes	C) yes	D) N/A	E) no	F) no	Note 1, 4
Racer Trainer	A) no	B) yes	C) yes	D) N/A	E) no	F) no	Note 4
Elite/Trainer	A) no	B) yes	C) yes	D) N/A	E) no	F) no	Note 4
Elite/Tandem	A) no	B) yes	C) yes	D) N/A	E) no	F) no	Note 4, 7
3. EOS	A) no	B) no	C) no	D) N/A	E) no	F) no	
Swift 11	A) no	B) yes	C) no	D) no	E) no	F) no	
4. Northern Lite *	A) yes	B) yes	C) no	D) no	E) no	F) no	
5. WonderHog II *	A) no	B) no	C) no	D) no	E) no	F) pnd	
Vector *	A) no	B) no	C) yes	D) no	E) pnd	F) pnd	Note 5
Vector-11	A) no	B) no	C) yes	D) no	E) pnd	F) pnd	Note 5
Student Vector *	A) no	B) no	C) yes	D) N/A	E) pnd	F) pnd	Note 5
Student Vector-II	A) no	B) no	C) yes	D) N/A	E) pnd	F) pnd	Note 5
Tandem Vector *	A) yes	B) yes	C) yes	D) N/A	E) pnd	F) pnd	Note 5, 7
Tandem Vector-II	A) yes	B) yes	C) yes	D) N/A	E) pnd	F) pnd	Note 5, 7
6. Talon	A) no	B) yes	C) yes	D) yes	E) pnd	F) yes	Note 5
Telesis	A) N/A	B) yes	C) yes	D) N/A	E) pnd	F) yes	Note 5
Flexon	A) no	B) no	C) N/A	D) N/A	E) no	F) yes	
Talon 2	A) no	B) no	C) N/A	D) N/A	E) no	F) yes	
Telesis 2	A) no	B) no	C) N/A	D) N/A	E) no	F) yes	
Genera	A) no	B) no	C) N/A	D) N/A	E) no	F) yes	
7. Sweethog(1-pin res.)	A) no	B) no	C) yes	D) no	E) pnd	F) pnd	Note 5
XN Sweethog	A) no	B) no	C) yes	D) no	E) pnd	F) pnd	Note 5
X-XN Sweethog	A) no	B) no	C) N/A	D) no	E) pnd	F) pnd	Note 5
Student Sweethog	A) no	B) no	C) yes	D) N/A	E) no	F) pnd	
Duece, Runt, Sweethog-II*	A) no	B) no	C) no	D) no	E) no	F) pnd	
8. Dual Hawk Tandem	A) no	B) no	C) no	D) N/A	E) no	F) no	Note 7
Student Mini Hawk	A) N/A	B) N/A	C) no	D) N/A	E) no	F) no	
Mini Hawk	A) N/A	B) N/A	C) no	D) N/A	E) no	F) no	

Combination Tandem	A) N/A	B) N/A	C) no	D) N/A	E) no	F) no	
9. Emergency Parachute Systems	A) no	B) no	C) no	D) no	E) no	F) no	Note 3
10. Northern Lite III	A) yes	B) yes	C) yes	D) no	E) yes	F) yes	Note 6
NL III Infinity	A) no	B) no	C) N/A	D) N/A	E) yes	F) N/A	
11. Atom	A) yes	B) no	C) yes	D) no	E) no	F) pnd	
Jaguar, Requin *	A) yes	B) no	C) no	D) no	E) no	F) pnd	
12. Javelin	A) no	B) no	C) no	D) yes	E) no	F) no	Note 6
13. Naro	A) no	B) no	C) no	D) no	E) no	F) pnd	Note 6
Student Naro	A) no	B) no	C) no	D) no	E) no	F) no	Note 6
14. Mach III - Alpha	A) yes	B) no	C) no	D) yes	E) no	F) no	
15. Reflex	A) no	B) no	C) N/A	D) N/A	E) no	F) yes	
16. Eclipse	A) no	B) no	C) N/A	D) N/A	E) no	F) yes	
Eclipse Student System	A) no	B) no	C) no	D) no	E) no	F) no	
17. Mirage 1996 +	A) no	B) no	C) no	D) no	E) no	F) no	
18. Dolphin	A) no	B) no	C) N/A	D) N/A	E) no	F) no	

**Notes:** A "\*" following the container model name signifies that this system is no longer produced. "N/A" means that the specific harness / container system always comes with the provisions for the particular item. "pnd" indicates pending further testing.

**Note 1:** "Pin-pusher kit only, approved for field installation when instructions in kit provided by SSE are followed. Racer/Elite units built after June 91 (S/N 261xx and higher) will NOT accept the FXC-12000 or MK2000 and can NOT be modified to accept them, unless they were originally built with special provisions. Specifically, we have cut the yoke back on standard Elites to provide hard-arch neck clearance, eliminating necessary clearance for retrofit of existing hardware."

**Note 3:** "On our emergency parachute systems, we do not utilize RSLs; however, we do occasionally install a static line system."

**Note 4:** "The current Instructions furnished with the CYPRES are correct, except the 'Floating Loop' is not approved. In place of the 'Floating Loop' a 'Quick Loop' should be constructed using the line supplied with the CYPRES kit, exactly like the kevlar 'Quick Loop' supplied with the rig, and installed to the pilot chute as detailed in the Racer/Elite owners manual."

**Note 5:** The Micro Puller is currently not compatible with our RSL system.

**Note 6:** "We agree with the Cypres manual."

**Note 7:** Only the Tandem models of these AADs are approved for use.

**Q-4) In cases where there are no approved instructions for "retrofit Installations" on TSO'ed equipment (current or no longer manufactured), what suggestions would you make to the rigger in the field for:**

**A. Installing an AAD?**

**B. Installing a RSL?**

1. "Test **numerous** times on ground and in air. A freefall drop test should be done allowing the AAD to demonstrate proper functioning."
2. "Follow the FAR's."
3. "AAD and RSL Installations are not trivial: there are many potential problems which are not readily apparent to someone without considerable experience with some installations. The recent reports of failures of RSL's in Europe further illustrate the difficulties of RSL design. We do not recommend that the rigger develop his own installation. If a rigger persists in such a development, we suggest he comply with AC 105-2C Paragraph 4.e.(2) and Paragraph 8 when installing an AAD (see also FAR 21.611(c); FAR 43; FAR 65.111, 65.125, 65.129(d) and (e); and FAR 149.9)."
4. "Wait until we can provide written instructions or a drawing."
5. "Send the equipment back for proper installation. Only the factory can guarantee that a specific installation is performed correctly."
6. "We do not authorize field retrofit of AADs other than MK-2000. RSLs: we have granted limited authority for retrofit to certain military and foreign lofts. In these cases we have granted them specific

**WRITTEN** authority and provided them with the necessary technical data and parts kits. We authorize **ONLY** our **RSL** design configuration."

7. "Don't do it, send it to us. Otherwise, contact your FSDO and follow AC 105-2C paragraph 4.e.(2) and paragraph 8, and send us a copy of the approval for our records."

8. "For the Cypres, either do the field mod or send it to the factory for full installation. All of our systems were originally designed with Sentinel and FXC in mind. All systems are originally manufactured with RSL. (As of February 1992, all new systems will be made for the Cypres also.)"

9. "Several modifications are made to the rig during the manufacture of a rig (those destined for an AAD) that can significantly ease the installation process and make it a cleaner product in the end. Therefore, we do not authorize field installations of AADs. We feel that this is beyond the capabilities of most Master Riggers. All such installations must be done by us."

10. "1.- Carefully read the AAD manufacturer's instructions. 2.- Inspect other installations on the same type of container. 3.- Contact the manufacturer of the harness / container."

11. "A) and B), return equipment to factory for modification."

12. "A) return equipment to us for factory fitting, B) instructions are available."

13. "A) and B), return equipment to us for factory fitting."

14. "A) and B), return equipment to factory for modification."

15. "A) For the Astra we will send instructions for Rigger Retrofit. B) N/A."

16. "A) and B) return equipment to factory for modifications."

"A) and B) return equipment to factory for modifications."

17. "Send the equipment back for proper installation. Only the factory can guarantee that a specific installation is performed correctly."

18. A) "For installation of the CYPRESS, follow instructions in Airtec's manual. All of our harness/container systems are manufactured with a CYPRESS installation kit (unless the customer has specified otherwise). For the ASTRA, most of the CYPRESS kit may be used; however, a phone call to Altico will be helpful in answering questions concerning a couple of minor differences in procedure between the installation of the CYPRESS. For any other AAD, it is suggested that the equipment be returned to Altico for factory modification."

B) "N/A (All our harness/container systems come with an RSL.)"

**Q-5) What qualifications, if any, are required of riggers for assembling an AAD with your TSO'ed equipment originally manufactured *with* the provisions for the specific AAD?**

1. "Master rigger."

2. "Not delineated, however, any Rigger may perform a simple removal and replacement for testing or repair after reading the warnings in the owner's manual."

3. "May be done by an appropriately-rated senior rigger or master rigger, in accordance with our instructions (this is on a par with the installation of an approved reserve parachute in the harness/container)."

4. "Senior rigger."

5. "Only a FAA master rigger may install an AAD in our rig that has been previously set-up to accept that model of AAD."

6. "Senior rigger or foreign equivalent."

7. "We prefer to do the first-time AAD assembly, even into a rig built with the appropriate factory set-up. However, we do authorize specific riggers familiar with our equipment, the particular ADD, and the installation procedure to perform this work."

8. "None. Be a good rigger?"

9. No Response.
10. "None other than appropriately rated or experienced in this type of installation."
11. "Our manuals state it must be done by a qualified parachute rigger. Whether somebody is qualified is determined by local regulation."
12. "There are no written qualifications but would suggest master rigger."
13. "In most cases we would prefer to do a factory installation of the AAD but, there is no set rule and a master rigger or equivalent would be recommended."
14. "Must be appropriately rated or experienced in this type of installation."
15. "Our manuals state it must be done by a *qualified parachute rigger*. Whether somebody is qualified is determined by the local region."
16. "Senior rigger or foreign equivalent."  
"Senior rigger or foreign equivalent."
17. "Senior rigger or foreign equivalent."
18. "None."

**Q-6) What are your procedures, in cases where TSO'ed equipment is returned for a routine repair or repack, and it is discovered that an *unauthorized or unapproved alteration* has been performed?**

1. "Contact the owner and the rigger that did the installation, if possible. Do not pack until the alteration is approved."
2. "If the modification affects the function of the emergency or reserve system then we simply won't certify it as airworthy. We follow the FAR's."
3. "We advise the customer of the unauthorized or unapproved alteration, and obtain their permission to restore the article to its original configuration; we reserve the right to charge the customer for this restoration. Failing this approval, we tag the article as unairworthy and return it without doing any work on it."
4. "Ask Rigger to contact manufacturer."
5. "In the event we discover unauthorized or unapproved alterations have been performed, the customer and the rigger is informed by phone/letter or both. If such installation proves to be dangerous, the FAA is informed by letter about the situation."
6. "We inform them that we cannot work on the equipment unless the discrepancy is corrected also."
7. "We contact the owner, inform them of the situation, and explain our desire to correct the unapproved or unauthorized alteration. In the event they do not want us to correct it, we make a note of the situation in our file, tag the equipment, and return the equipment as is."
8. "Bad rigging we notify the rigger if possible and customer to try to correct it. If good rigging, it will depend on the alteration and reason."
9. "It will be evaluated for fit and function and a report made to the owner. The rigger who made the installation will be contacted and the situation discussed. If it is an unsafe installation, the FAA and the manufacturer of the AAD will be contacted as well."
10. "Contact the rigger who performed the alteration, if possible. If alteration is unsafe, inform the owner and either rectify the problem or return it to the owner unpacked."
11. "We will contact the customer and propose that we perform the usual factory retrofit. If this is not acceptable to the customer we will not perform other work on it."
12. "Depending on the situation if everything is good, OK. If not, consult with and inform customer to arrange changes."

13. "If alteration doesn't alter the fit, form or function of the equipment OK. If not contact owner and rigger and inform them of the situation, arrange for correction of the discrepancy. Note the discrepancy for future reference - only repair or repack when discrepancy has been corrected."
14. "Rework all changes to return to original configuration and condition."
15. "In the event we discover unauthorized or un-approved alterations have been performed, the customer and the rigger is informed by phone/letter or both. If such installation proves to be dangerous, the FAA is informed by letter about the situation."
17. "Determined on a case by case."
18. Altico neither authorizes nor prohibits modifications to its products. It is the responsibility of the equipment owner to assure that any modifications or repairs are airworthy and have been performed by an appropriately rated and qualified technician. "Unauthorized" or "un-approved" repairs are not necessarily *unsafe* repairs, and each situation is unique and must be dealt with individually. If any equipment returned to Altico were found to contain modifications or repairs which we deem *unsafe*, the owner and the rigger would be contacted to discuss a resolution of the problem.

**Q-7) What procedures including any testing, minor change submissions, etc. do you follow when approving the following for use on your equipment:**

- A) A particular model of AAD**
- B) A specific Installation method**
- C) A specific RSL configuration?**

1. "Numerous on ground and in air tests (dummy drop and live), written data.
2. "Each situation is different and there are no guidelines set forth, the procedure may vary from situation to situation. Generally, we will design the provision for, perform the installation of, then test for non-interference of the normal function of the reserve or assembly. If approval is warranted, we will then include the drawings in our engineering file and submit as a minor change.  
"A) Testing B) and C) Testing and minor change submission for installation method of AAD or RSL configuration."
3. "RSL: include static pull tests of *all* the systems' components to a minimum of 600 pounds for a minimum of 3 seconds; suspend harness activations of the system; dynamic activations of the system following acceleration of the main to typical baglock separation velocities; and intentional cutaways using the system. AAD; include as a minimum sufficient bench deployments to assure use of the proper functioning of the system, and possibly heat/cold soak tests to check the interaction of any internally-mounted components with the reserve and container. A minor-change submission must be made for AAD and RSL installations. This is true if the AAD model changes, if the AAD installation changes and if the RSL configuration changes."
4. "Minimum of table tests, depending on the modification we will drop the test."
5. "Each AAD installation is tested to insure that it will reliably open the container as it was designed to do by the manufacturer. For any given container size, there is only one approved installation method. There is only one approved RSL installation."
6. "We have our own in-house procedures for design qualifications of AAD installations. We start with any procedures mandated by the manufacturer of the AAD and then see how they interface with our designs. In the event of a conflict of installation or function parameters, we contact the manufacturer in an attempt to resolve any differences."
7. "A) On new designs, review of test reports, perform chamber testing, etc., to evaluate the AAD unit, regardless of installation, since it is not TSO-ed itself. B) Evaluated for system compatibility, possible interference with system, perform bench/chamber testing, and perform in air testing as a minimum. C)



Make sure it does not interfere in any manner with non-RSL operation of the system. Perform suspended harness and in air test to evaluate design.”

8. “A) Compatibility with rig, reliability, take it out and jump. B) Special installation, this depends what we are talking about. One of a kind, we usually don’t field test, (jump), but bench test, chamber test, etc. C) Never been asked. Always factory built as an original equipment.”

9. “Almost all of our products can safely utilize and AAD if the installation is properly engineered and executed.”

10. “Install the device (AAD or RSL) and then activate it in a simulated or live drop as required to assure proper operation.”

11. “A,B,C, In all cases we have to submit the design to the government test center for complete testing and official approval by the authorities in France.

12. “Our production manual has information for most currently used AADs and RSL configurations. Testing new AAD installations would require obtaining the new AAD, conferring with the manufacturer its use criteria, followed by a test program to meet that criteria.

13. N/A

14. N/A

15. “A) On new designs, review of test reports, perform chamber testing, etc., to evaluate the AAD unit, regardless of installation, since it is not TSO-ed itself. B) Evaluate for system compatibility, possible interference with the system, perform bench/chamber testing, perform in air testing as a minimum. C) Make sure it does not interfere in any manner with non-RSL operation of the system. Perform suspended harness and in air tests to evaluate design.”

16. “Any new AAD for possible installation needs to get to our factory for extensive testing for possible approval.”

17. N/A

18. “A) and B) Design the installation method, install the AAD and table-test it if possible, then determine whether further testing is appropriate. (Live tests are much preferred over dummy drops for testing in the air.) C) RSL is furnished on every harness/container we manufacture. It is located on the right main riser and the only change we have ever contemplated is the possibility of moving it to the left side. So far we have not made any change in its design, nor have we considered any other type of RSL configuration.”

*The PIA Technical Committee acknowledges the concern shown by the Harness / Container manufacturers who took the time to respond to this questionnaire. Their efforts have made it possible to compile this Technical Bulletin, which should help in clarifying these confusing issues. As one respondent stated: "We do not have any problem with disclosing the information in our response. The dissemination of this kind of Information can only be good for the riggers and users in the field."*