TECHNICAL BULLETIN #1 **1980**

Item #1 Recent Failures:
R-3's: actual failures have been reported (Jan '80) from Z-hills and elsewhere. R-3 s have a functional life of 300 to 700 activations according to the manufacturer. Testing and field experience have confirmed these figures. In original manufacture, the lever mechanism was attached to the webbing with aluminum rivets. After extensive cycling, the rivets loosen. Under loaded conditions, they may pull out, causing the release to fail. Current distributor (The Jump Shack) is replacing the aluminum rivets with stainless steel rivets. Dealers have been supplied with appropriate quantities of replacement rivets. Visual inspection of the condition of the lever rivets is sufficient to detect wear and possible failure.

Item #2 Synthetic Ripcord Handles:
Actual failures have been reported. Non-metallic ripcord handles are a recent item of parachute equipment. Testing to date indicates a reliability factor of 99.998%. There are at least four different types in the field being used to-day. Problem relates to unknown and unpredictable deterioration of the handle material over time. Exposure to the elements (sunlight, water, heat, etc.) and a variety of chemicals can cause a weakening of the handle material. The exact effects are not quantified. Visual inspection and testing of structural soundness by flexing & twisting the handle are sufficient to detect a failure. Mike Johnston (of the Jump Shack) described a test procedure jumpers can do to test the integrity of their plastic ripcord handles. With the rig on, reach in and grasp the handle, but instead of pulling it normally, twist and flex it against the body and pocket. If the handle is substandard, it will break. Skydiving, Vol 1, #7

Item #3 Ram Air Riggers
Para-Flite has recently distributed to all those certified for the Ram-Air Reserve (for which they have a current address), an update bulletin on the brake attachment. Those who received ratings at the time of the Safety-Flyer's introduction will recall a notice which was circulated relating to slippage of the D-lines through the brake loop. This only affected the first few canopies produced. The latest material indicates a repositioning of the brake release lanyards from the link to the brake loop. The intent is that after opening and brake release, the Jumper can wrap these lanyards around his hands, using them as "toggles" rather than steering with the back risers. If you hold a Ram-Air Reserve certification, but have not received a package, please contact the office.
Also of interest to the Ram-Air Rigger, Para-Flite is completing final testing on a larger reserve, the Safety-Star. Designed on the Lissaman 7808 (Cruisair) airfoil, the canopy is Strato-Star sized. Packed size will be equal to or less than the Flyer.

Item #4 Safety & Equipment Seminar:
A number of industry representatives have already indicated an intention of attending the seminar to meet members of the Canadian parachuting community and to promote their products. The following plan to be in Calgary for March 28/80:

Allan Levinson, President GQ-Security Ltd, California
Mike Johnston, President, The Jump Shack, Michigan
Mike Truffer, Editor et al, Skydiving Magazine, Florida
Mike Zahar, Chief, Research and Development, Flying High, B.C.
Steve West, President, Westway Parachute Ent., Ontario
Frank Chevrier, President FXC Corporation, California
Ron Edwards, President, National Parachute Supply, New Jersey
Larry Krueger, Vice-President, National Parachute Supply, N.J.
Jake Brake, Research & Development, Para-Flite Inc., New Jersey

Several members of the TT&SC will also be in attendance, and will be presenting short papers on several topics.

Bob Wright, South Western Ontario Organization of Parachutists
Tom McCarthy, Gananoque Sport Parachute Centre
Norm Meyers, Author, Jump Pilot's Handbook
Howard Sommerfeld, Co-author, Instructor & Rigger Manuals
Duncan Grant, Technical Co-ordinator

Item #1 Kevlar Suspension Lines Technical Release.
(from GQ Security Inc.)
We have received numerous telephone calls and written inquiries concerning field refit programs of canopies with Kevlar suspension lines. Kevlar, which is an aramid fibre such as Nomex, was primarily used up to this point for reinforcing cords in automobile tires. Several things should be understood about Kevlar. Kevlar has zero (0) elongation characteristics. Kevlar should **NEVER** be used for a round canopy suspension line set. Kevlar is also very strong and has a much higher breaking strength than a similar denier nylon braided or twisted cord. Kevlar has very, very little resistance to abrasion. We feel that local experimentation should be discouraged.

Ram Air canopy owners interested in having Kevlar line conversion should be urged to contact the manufacturer of their canopy for specific information. Some of the information that they must know is:

1. Kevlar cannot be successfully finger trapped.
2. Zigzag stitching of Kevlar is particularly tricky.
3. Steering lines may be made of Kevlar down to the lower control line portion. Lower control lines should never be made of Kevlar because of the constant running through rings. Also, the constant daisy-chaining of brakes would cause Kevlar used at that point to wear out very rapidly and possibly break.
4. People owning canopies equipped with Kevlar lines must be constantly vigilant to inspect the entire metal surface of every grommet on their slider after every jump to insure that it is not nicked, pitted or roughed-up in any way. Grommets found to be damaged in any way should immediately be smoothed off with a very fine grained emery paper. The same procedure would apply to Rapide links.

Local riggers must be discouraged from purchasing bulk Kevlar lines and attempting to design and install line sets on Ram Air Canopies using the normal techniques applied to coreless, braided lines made of nylon or dacron. We are fully aware that every holder of a Master Rigger's rating feels that he is qualified to make this type of alteration and the technical judgements required. We are stating, categorically, that we feel that this is not the case and that if this practice is allowed that it may have serious or even fatal consequences in some cases. We are enlisting the aid of the C.S.P.A., U.S.P.A., the Safety and Training Committee, the P.E.I.A., and all Conference Directors in assisting us in this effort.
G.Q. Security Parachutes, Inc. will not sell Kevlar line sets or bulk Kevlar to be used on any canopy but a Unit and only in cases where we know the qualifications of the individuals making the request. We hope that other manufacturers of Ram Air canopies will take the same measures.
Cordially your's for blue skies. (signed) Alan Levinson.

Item #2 New Products:
Para-Flite, Inc. has introduced two new canopies, the XL-Cloud (7-cell, 265 sq.ft., $799) and the Safety-Star (5-cell, 185 sq.ft., $641). Both utilize the Lissaman 7808 airfoil section which was very successful for their Cruisair. To attain smaller packed volume, these canopies incorporate the F-111 fabric.
Pioneer has introduced the Merlin, A Small but high performance 7-cell ram-air. Following this sometime in the Spring or Summer are two others, the Titan (7-cell, 265 sq.ft.) and the Kestral (5-cell, 180 sq.ft.). Owners of early models of the Merlin are advised to add 5" to the brake setting if the openings are too firm. A Phoenix (5-cell, 180 sq.ft.) ram air reserve is in development with proposed release in the fall.
For those student operations looking for a reliable, but docile replacement for the rapidly aging military surplus canopies, GQ Security has a large version of their SAC available. It's an Aero Conical with a forward speed of 10-12 mph, 360° turns in 4.5 sec., and stand-up landings for a 180 lb. jumper. It's made of F-111 (small) and has a fence extending down about 11" below the skirt. Price will be about $450.

Item #3: Designing equipment?
Do you know all the guidelines? Write to

National Technical Information
U.S Dept. of Commerce,
5285 Port Royal Rd.,
Springfield, Virginia
U.S.A. 22161

For $3.50 in microfiche or $24.00 in paper, they will provide you a "Recovery Systems Design Guide" AD-A070251.

Item #4: Freefall Photographers
Andy Keech, just dropped me a note that he is undertaking Skies Call 3. He's looking for a total of 200 photos by the Spring '81. If you have interesting, artistic, lucky or special shots, send them to

Andy Keech,
6339 31st Place N.W.
Washington, D.C.
U.S.A. 20015,

He's promising remuneration, here's your big chance

Item #5: Reserve Incidents:
Several of the small volume Lopo Canopies have been suffering damage on reserve deployment. After consultation with the manufacturers, there are two Major Factors. One, Round Canopies invert about 3% of the time. Two, the deployment diaper installed by the manufacturer is not being used, has been removed or is not properly closed. Any of these will increase the probability of an inversion. Therefore, leave the diaper on and do it up properly. Experiment with your main if you must, but not with your reserve.

TECHNICAL BULLETIN #3 **1980**

Item #1 Notes from the PEIA Meeting:
Main Canopy suspension line entanglement with main container flaps was recently recognized as a potentially common malfunction. Several individuals were unaware of these occurrences while others had witnessed several mals of this type. Rande Del uca showed related film footage. Further research is to be conducted. (Eds: very recent accident involving a Canadian jumper has brought home the point that this is more than hypothetical.)
AS 8015 is nearing completion of the bureaucratic process. Watch for an announcement, soon?
On going testing by members of the PEIA included drag tests on pilot chutes and ripcord pull force capabilities. Copies of this material will be distributed as soon as it becomes available.

Item #2 USPA Board of Director's Meeting:
* Competition Rules and sport guidelines for CRW were presented to the appropriate Committees prior to acceptance by the Board. CRW Awards are now being administered by the USPA Office.
* Parachutist is looking for a new editor. CanPara still cannot afford one, we're relying on volunteer assistance as always.
* The Safety and Training Committee has prepared a set of recommendations for the Park Service as a guide when evaluating applications for permits to jump from El Capitan
* B.J. Worth, well known relative worker is to head the delegation for the U.S. Style and Accuracy Team.
* Ted Strong of Strong Enterprises and Mike Johnson of the Jump Shack are drafting some guidelines for student tandem systems for USPA
* A new parapad from Continental Air Sports is to be used at the U.S. Nationals.

Item #3 PARA-FLITE Incorporated Notices:
Safety Flyer Steering System Notices.
In order to improve the handling characteristics, provide softer landings, and make reserve riser lengths less critical, we will now use the red deployment brake locking lanyards as control lines as well as to secure the deployment brakes. This simple change is done by moving the red lanyards from the connector links to the deployment brake loops sewn to the rear lines of the canopy. By doing this, after the jumper has released the deployment brakes, he can use the locking lanyards as control lines since they are now attached to the rear lines of the canopy. Because the jumper is in direct control of the trailing edge only, the canopy will be more responsive to turns and handle more like a main canopy. Also your control stroke will be greatly increased since you are no longer limited by the length of the reserve risers.
To make this change to a "Safety Flyer Reserve", contact Para- Flite Inc. for a complete set of instructions.
Rubber Bands
We have run into rubber bands that fused themselves to the grommet of the deployment bag. It appeared that the rubber band was melted, but the canopy we found it on had not been exposed to heat. This is not a big problem on deployment bags, but could be disastrous on reserve diapers. After checking with a rubber band manufacturer we found that all rubber bands are subject to strange behaviour above 130°F. Since then we started using standard BUNA-N "O" rings number 01-128 on Safety-Flyer bags. This number identifies the compound (01) which in this case is BUNA-N, with a temperature range of -65°F to + 225°F, and the size. This particular "O" ring breaks at around __ lbs. The "O" ring, because it is a round cross section, allows for smoother release of the suspension lines.
signed Elek Puskas, President.

Item #4 State of the Art:
What do you expect to be the result of field experience with the new types of equipment being produced? You don't really know! You accept the manufacturer's claims without question, expecting each new product to be smaller and lighter, perform better, to be less work to care for, to be more idiot proof, and yet to have all the good qualities of your old equipment. Each new product is expected to do more, never less, than the item which it is to replace.
Here are some comments which you may find are thought provoking. Why even bother thinking? Primarily because as an Instructor and/or Rigger, you are in a position of respect to whom less knowledgeable folk will come for sound advice.
What is known about the current equipment as compared to that old military surplus stuff? Right, it is softer, lighter, more comfortable, comes in various colours, harness sizes, and container sizes. Each is designed to fit specific main and reserve canopies, and a limited size range of parachutists (wearer).
What happens to this rig during use? If it is cared for, it works very well. If a rig is packed with the wrong sized parachute, it will not work properly eventually, if the cut is too large, seams will split and grommets will pull out. As compared to the military rig, it lacks the durability. If you drag it across the packing area it will wear out very quickly simply because it doesn't have the reinforcing of a military rig. Military rigs have been around the sport for 30 years and more. Sport rigs are lucky if they last 5 years. But, we know all this, and are prepared to sacrifice the durability for lightweight and comfort. We ensure that canopies and rig are compatible.
How does this relate to canopies? Well, smaller pack volume canopies are made of lightweight fabric. Obviously they will not be as durable as the canopies made from heavier fabric. Remember the original Strato-Star of 1.5 oz. fabric? Many of them have lasted through 4 & 5000 jumps. How about the ParaCommander? Some of the originals are still being jumped today, with 5 and 6,000 jumps accumulated. To expect a new ultra-light canopy to last that long would be foolish. They should however, last a thousand jumps if properly cared for. This entails regular inspection of the canopy lines etc., and attention to the manufacturer's recommendations.

Lightweight reserve canopies have seen a similar decrease in durability with the introduction of light weight fabrics. Whereas, the F10 reserve could be clumsily deployed manually (or in some reported cases invert) with no visible damage. The lightweight canopies are far more likely to incur damage in these circumstances. Great care should be taken in an effort to minimize these possibilities. Use the diaper provided, follow all the packing instructions, select a compatible pilot chute which is in excellent condition.
Packing of reserves is another way the canopies and containers become damaged. Care in placement of the bulk of the fabric is essential. Otherwise grommets end up being pulled out, or dented by the ripcord pins, closing loops wear excessively and the canopy fabric sometimes becomes pinched or burned in the closing process. Some Riggers (and others) in the past used the packing paddle

as a ram to shift canopy fabric. This used to create stress marks on the heavy fabrics; with a lightweight fabric it is likely to create a hole.
In summary, the current products being offered by the equipment manufacturers are better. They are smaller, lighter, as strong and have more desirable performance characteristics. They are not more durable. They may be more idiot proof but they are less Rigger proof. The individual working with the gear must know what he is doing. The products require day to day care, inspection and maintenance. For the dollars invested don't treat It like your old third-hand P.C. or Star. When making equipment recommendations direct the newcomer towards tested, tried and proven equipment. Products which will carry him through the minor mistakes and abuses which are possible would be best.

Item #5 A.O.D. Servicing:
A.O.D. Servicing for FXC's is available in Canada. Frank Chevries and Rick Smith arranged to have Airborne Precision Instruments Ltd. of Calgary look after servicing for Canadian owners. Their address is:

Airborne Precision Instruments Ltd.
110 5621 11 Street N.E.,
Calgary, Alta.
T2E 6Z7
(403) 275-4211

The other item of interest is that parts are no longer available for the FXC 8000. It a unit is damaged, the existing parts will have to be repaired, or the unit will have to be scrapped.

Item #6 U.S. Goings On:
American jumpers to begin a Northward migration? After attending a meeting of U.S. parachuting leaders in Salt Lake City, Utah, this is beginning to look like a distinct possibility. In discussions with several Directors of USPA, their Executive Staff, Parachute manufacturers and distributors, and especially the DZ operators, one item, the price of fuel was prominent. The experts stated that across the U.S. jumpers are currently paying $12.00 and better for 10,000' jumps. Their predictions were that this could increase significantly during the year.
The problem being faced is that the cost of aviation fuel is rising rapidly. By way of illustration, Jack Bergman, USPA Treasurer, purchased about 75% of the fuel required for the U.S. Championships (15,000 gal.) The cost has risen $.10 per gallon in the few weeks since the transaction (thus realizing a notable saving) with predicted further increases prior to the Championships. In general what this means is, that each operator will have to increase his jump rates every time the price is increased.
In Canada the cost of gas is not rising as rapidly. Also in comparison the unit cost of a gallon of gas is about half what it is in the U.S.. This relates to the fact that the Imperial gallon is larger than the U.S. gallon, while the Canadian dollar is worth about 2% less than the U.S. dollar. Not to dazzle anyone with figures (I would only confuse myself), the most likely result is that many U.S. jumpers discover that jump rates in Canada are lower, while their dollar is buying more. With this as an incentive plus the fact that Canadians are known throughout the U.S. for being hard partiers and top skydivers, a northward migration may result.
At the least, many Canadians may think twice before making that southward trek when they realize they will be paying much more for each jump they make.

Item #7 Ring and Snap Relations by Don Beck:
The Ring and Snap combination will provide a safe satisfactory connection only if they properly function together. Some important points to consider in determining proper combinations are:

1. The ring must enter the snap throat opening without force and allow the snap guard (or gate) to firmly and completely close after entry.
2. The "proper ring retention area" of the ring must fill the "ring retention area" of the snap as completely as possible.
3. The dimensional relationship as measured on the snap between the inside of the "snap-ring retention area" to guard pivot point, and the distance as measured on the ring across the outside width dimension, must be such that the latter will be greater than the former. If the ring is too narrow across this dimension, there is the distinct possibility that the ring may lodge with one side in the ring retention area of the snap and the other side across the face of the guard, thus forcing the guard to open and inadvertently disengaging the ring from the snap. This disengagement is commonly called "THE ROLL-OUT PHENOMENON", and can only occur with loose harness straps, twisted harness straps, or an improper ring-snap relationship.

Proper Ring-Snap relationships and other hardware data can be obtained by purchasing my book entitled "LOAD BEARING PARACHUTE HARDWARE" from Para-Gear Equipment Company or other book sources. DGB

Item #8 New Products:
Para-Innovators Parachute Company now offers 3 new reserve canopies, and a new container system for sport use. The container system is called a "Stream-lite (P/N C3-1). The canopies are two versions of a 26' lo-po (P/N - R-4 & R-5), and the "Feather-Lite" (P/N R2-1). For information and packing instructions, contact Para-Innovators, 171 E 1st, Perris, CA. 92370. GQ-Security has introduced a larger version, of the Unit, called a Unit III. At 236 sq.ft., it is comparable to the Strato-Cloud, but is made of F-111.

Item #1 Suspension Line/Main Container Entanglement :

As a result of a second fatal accident within 10 days involving a Canadian jumper due to similar circumstances, the two recommendations discussed in this Bulletin are felt to be of extreme importance.

Based on several knowledgeable opinions, a primary contributing factor to these two accidents is free stowing of the suspension lines. This practice is no longer considered to be advisable or recommended, especially for long line canopies. An enclosure device for the main canopy, such as a bag or diaper, which incorporates line stowage for the majority of the suspension lines is recommended. Stowing of the lines on the deployment device should minimize the possibility of an entanglement, as well as to ensure that if one does actually occur, it will be far enough below the main canopy not to inhibit main deployment. As an optimum, all of the suspension lines should be stowed. However, if this is not possible, due to the construction of the deployment device, at least 50% of the lines should be stowed on the device.

The second point of concern is the actual procedure for dealing with a main Canopy malfunction. All jumpers utilizing the cutaway procedures must be encouraged to ensure that there is no connection between the main and the jumper other than the risers prior to cutting away. If some sort of entanglement exists it should be cleared with the use of a knife (or whatever) prior to the cutaway. As an essential part of this, jumpers must be encouraged to carry a knife in an accessible location.

If one of these entanglements occurs, there is a good possibility that the main canopy will be substantially open. At that point it would be counter productive to cutaway the main without clearing the entanglement. A far more serious situation could occur if the entanglement isn't cleared.

Once a complete study of this problem is finished, these recommendations will be reassessed. They are a summation of the best information available at this time, to a problem which demands immediate attention and action. This notice is being rushed, to communicate these two items of information to the active jumper in the minimum amount of time. Please discuss the recommendations contained in this Bulletin with as many jumpers as possible, hold seminars if feasible, post a copy of the notice at each D.Z. and loft.

TECHNICAL BULLETIN #5 **1980**

Item #1 Equipment Standards for National Championships:
CSPA, as the host of the 1980 National Parachuting Championships, will be assuming all responsibility for Drop Zone Safety, Equipment Inspection, gear checks when boarding the aircraft, and all of the other unpopular jobs that a Drop Zone Operator is normally stuck with. As officers of the Association (Rigger or Instructor), I would ask that you advise all prospective Nationals participants of this situation.
CSPA's Basic Safety Regulations and the equipment and training recommendations will apply for all jumps made at the Nationals site beginning July 7 and extending through until July 21, 1981. These encompass equipment reserve "rigger packed" and sealed, protective helmet, proper footwear, etc., conduct on the airport (DOT regulations, pets leashed), and performance during the jump (opening altitude, use of an instrument, adequate separation after RW). Equipment is expected to be of a proven and tested design from a reputable manufacturer. Prototype equipment (non-tested) is not considered acceptable at a National Competition. Relative workers planning to attempt CRW after the freefall portion of the jump will be required to carry a hook knife and to wear a hard shell helmet. All jumpers will require a gear check, whether competing, fun jumping, or filling a wind-dummy load (judges included).

Item #2 Accident Reporting:
Following the distribution of a report on recent serious accidents, a significant number of individuals indicated that they had previous experience with incidents related to the same cause (that being suspension line entanglement). In part this is gratifying because the problem is seen as survivable, but it is also very frustrating. If this information had been compiled earlier, 1979 might have been the year for a "Don't freestow recommendation. Everyone who writes the 'A', 'B', 'C' or 'D' licence exam correctly responds to the "why submit AIM's" question, then promptly ignores it.
In this period of rapid change and experimentation do yourself and your jump-buddies a favour. If something strange happens, write down all the facts on one of those pieces of yellow paper and send it in. Encourage others to do the same.

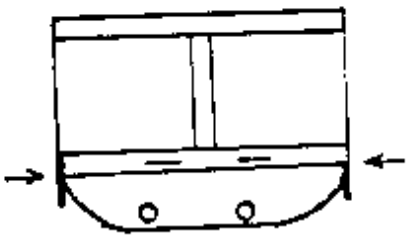
Item #3 Home Manufacture of Equipment:
Why is it that everyone who attends a Rigger course and owns a sewing machine which will handle E-thread begins to modify and manufacture equipment? I guess it is just the adventure seeking nature of the skydiver, never willing to admit that there's more to parachutes than what you can see. Because equipment usually works properly, one naturally assumes that it always will, never planning for the consequences if it doesn't.

Three recent incidents have prompted this righteous outburst. Two of these relate to harness damage during normal jumps. The third to a container where the seams didn't overlap, so that it had to be tacked in the middle to cover the reserve. All of them looked, good on the ground and should have stayed there! AIM's come into the office (the few that do) containing notes such as "plan to convert this to pull-out" or if it was a pull-out, "convert to throw away". Don't look now, but that is not as easy as it may seem. The USPA Safety and Training Committee is concerned about these currently, primarily due to the number of fatal accidents related to less than perfect copies of workable systems.
When a conversion is done, to what specifications is the work checked? Does the hand deploy pouch meet Relative Workshops spec's? Not likely. How about that pull-out, did the plans come from Flying High or the Jump Shack.
I'm jumping with a four-man team that looks the same as Rocky Mountain High, we're on the ground, but the in-air performance is quite different. This holds true with equipment as well. The big manufacturers have the experience gained over many years. Don't expect to do as well as them when you first try, and don't think for a minute that since they tested their rig, that you don't have to test your copy of it. Finally and most important, if you make equipment, jump it yourself, do not pass it on to some unsuspecting student as the real thing until it is fully tested, and you've developed the expertise as a manufacturer. If you don't believe me, talk to the people in the business who have been around for awhile.

Item #4 Riggers:
If the usual occurs, several riggers could be kept busy in the few days preceding the Nationals. Reserves must be rigger packed and sealed (BSR #7). There are always a number of individuals who arrive without this done. If you are available, interested, and are planning to be there, please notify the office. You will probably need an extensive collection of packing manuals since the folks who haven't had their reserve repacked won't remember their manual, or don't own one.

Item #5 Video Equipment:
This will be of interest to Instructors and Drop Zone operators. Rande Deluca is upgrading his equipment to colour and is therefore selling his Black and White system. It is valued at $4,000.00, but going for $2,950.00. It includes two cameras, recorder, case, freefall case, RF Converter, cables, battery and all (except a monitor). He is forwarding the details to me, if you are interested, or contact him directly.

Item #6 Attention Jumpers!:
Due to the feedback from the field, i.e. suspension lines entangling with the side flaps on containers, it is recommended that band stows be added to your Para-Flite Inc. deployment bag.
Attach two loops approximately 2" long to the binding tape that runs down each side of the deployment bag. The loop that is sewn on the open side of the bag should be placed on the binding tape that hold the 2" pile velcro to the bag.



TECHNICAL BULLETIN #6 1980

Item 1 "TUFFY":
"TUFFY" the Airborne Trooper, well known for his ability to survive every sort of landing is residing at the CSPA Offices. This 170 lbs., torso shaped drop test dummy is available on request for Senior or Master Riggers and Centre Operations to pursue testing programs. Cost is only the shipping from CSPA to the test site including return. Note "Tuffy" is not currently nor likely to be represented by legal counsel.

Item #2 Ripcord Handles:
An FAA Airworthiness Directive (80-13-01) has been issued at the request of Strong Enterprises. It requires that all angled plastic handles on Pop Top conventional reserve containers be replaced with metal ripcord handles. Effective date is June 16, 1980.
A Ripcord handle exchange is available through the Jump Shack. Send them your ripcord with synthetic handle, $4.00, and sufficient postage. They will replace the handle with a metal one and return it to you. Ensure that it is appropriately tagged with your name and address.
Owners of Wonderhogs from the Relative Workshop which were obtained between January 1979 and mid-summer '79 are being offered a free replacement if their synthetic (nylon) reserve ripcord handle has a round rather than oval cross-section. The owner must send the reserve ripcord along with a note listing the rig's serial number and date of manufacture with his/her name and address. Non-applicable ripcords will be returned, or the owner will be charged for the handle replacement.

Item #3 Emergency Rig Repacks:
A number of incidents have recently been reported involving parachutists repacking emergency rigs for aerobatic and glider pilots. These rigs fall into the same category as sport reserves. They must be packed by a current, rated Rigger. Riggers should be cautioned to ensure that they obtain the latest instructions for packing the reserve. Changes are made to these almost as often as to sport equipment. If the owner does not have the instructions, consult the manufacturer. Repacking an emergency rig without proper directions could expose the individual to substantial liability if the parachute failed to work when needed.

Item #4 Reserve Packing:
Several reports have been submitted concerning sport reserves which were found to be improperly assembled when inspected prior to being repacked. One particular front mount reserve had neither a cross connector, nor a pilot chute although it was modified. Several navy conicals manufactured prior to 1960 have failed tear testing. A number of four-line release systems have been incorrectly attached, two failed to release on one side in actual use. Numerous steerable canopies have not had the steering lines marked; a significant number of tandem mounted reserves lack any sort of control toggles or lines even though the riser length places the connector links at or beyond maximum arm extension. No one plans to use their reserve, but when one must, it had better function perfectly, as there is at that point no margin for error.

Item #5 Service Bulletins:
Both G.Q. Security and the Jump Shack have distributed service bulletins recommending the use of a deployment bag and the stowing of main suspension lines for the rigs which they manufacture. The bulletins include diagrams for the addition of line stow retainers to their existing deployment bags. Recommendations include stowing all the main suspension lines to leave no more than 12" free (an identical recommendation to that of Para Flite and Flying High).
N.B. More reports of malfunctions involving line entanglements due to free stowing have been received. Don't let it happen to you! Don't bet the odds are in your favour. The stakes are far too high!

Item #6 Rapide Links:
A few reports of the use of chain link connectors, rather than Rapide Links for line attachment have been received. The chain connectors are available from local hardware shops but are not usually manufactured to the same specifications as hardware used in parachuting. Several of these links have shattered after a few jumps. Some experienced jumpers are turning the Rapide Links sideways in the riser to spread the webbing fully. Unfortunately the lateral breaking strength of the link is only about 250 lb. (**see TB #7, Item 5**) not adequate for repeated openings. Replacing the Rapide Link with 2 conventional connector links can be done if spacers are used on the lines and the opening in the riser is stacked to prevent the link from turning on its end.

Item #7 SENTINEL Mounting:
In mounting the plate for a Sentinel 2000 A.O.D., if the container is closed with fabric loops, (ie. Pop Top or SST) the plate must be grommeted in place. For further information consult SSE or the Jump Shack.

Item #8 Reserve Diaper:
It seems that diapers on reserve parachutes have even more benefits than initially expected. While performing a TRCP, a student inadvertently pulled the reserve handle instead of the main. Because the main canopy (PC mkII) was by then fully inflated, very little drag was produced by the reserve pilot chute. As a result, the diaper did not release the reserve canopy thereby preventing a possible critical entanglement during simultaneous deployment.

Item #9 Compatibility Chart:
The following chart has been prepared by Strong Enterprises in cooperation with other equipment manufacturers, fellow members of the PEIA. Although it does not include recently introduced equipment, it is very helpful.

Item #10 Old Topics Revisited:
Reports of diapers hanging up (on the packing table) continue to come in. The cause is the use of long (large) rubber bands which entangle together as the lines are extended. More line entanglements have occurred because of free stowing. Malfunctions on home made gear continue. What is surprising is that people are paying nearly full retail price for shoddy copies of working rigs.

RESERVE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

RIG																	
A	3		4	0	4	X	X				X	X	X	0			
B						X	X	3	X							X	
C						X	X	3								X	
D	2			0	0	X	X		X			0	1	0		0	X
E			X									X					
F	3					X	X	3								X	
G								X								X	
H						X	X									X	
I	0		X	X	X	X	X		X			X	X	X			
J	0	X	X	0	0	X	X	X	X			X	0	X			
K		X										X					
L		X						X	X			X		X			
M	X					X	X		X			X	X	0			
N	2			X	X				X	1		X		X	X		
O	2				X				X	1		X	0	X			
P	2			X	X				X	1		X	0	X	X		
Q	X			0	0	1	1		1			0	X	0		0	1

HARNESS/CONTAINERS

A- Advanced Air Sports FFE 102
B- Altitude Shop Classiflyer
C - Altitude Shop Corsair
D - Centaurus Corp. Centaurus 5012
E- ParaInnovators Piglett II
F - G.Q. Security The System
G- G.Q.Security System II
H - G.Q Security System III
I- Jump Shack SST 050
J- Jump Shack Racer 050
K- Pioneer Parachute Shadow
L- Relative Workshop Wonderhog II
M - Stewart Systems Sweethog II
N - Strong Enterprises Combination
O- Strong Enterprises Eagle System II
P- Strong Enterprises Starlite
Q- Strong Enterprises Centaurus 5013

RESERVES/PILOT CHUTES

1- Paraflite Safety Flyer Square Reserve
2- Pioneer 22' Super LS % Std Round Reserve
3- ParaInnovators 23' Conical Piglett II R - 2 "
4- Various 24' Circular "
5- Various 26' Conical "
6- G.Q Security 26' Conical 64B1209 "
7- National /G/Q/Security 26' Conical 73E1581 "
8- G.Q.Security 26' Conical SAC 79A1684 "
9- Strong Enterprises 26' Conical S.E. Lopo "
10- Strong Enterprises 26' Conical Lopo Lite"
11- 24' Conical Preserve II, III "
12- Various MA-1 Military Pilot Chutes
13- ParaFlite HotDog "
14- Strong L'l Grabber"
15- Strong Grabber "
16- G.Q Security 63F1122 P/C "
17- Centaurus Corp. Pilot Chute "

TECHNICAL BULLETIN #7 1980

Item #1 AIM Reports:
Accompanying this bulletin are the accident/incident/malfunction report summaries for 1979 and for 1980, up to October. In 1979, 156 AIM's were submitted, including three fatal accidents. To date for 1980, 220 reports have been submitted including 6 fatal accidents. The reports submitted represent only a portion of the actual occurrences, many individuals deeming it unimportant to make the effort. Each and every Rigger and Instructor should take the time to study these figures carefully. They present a picture of the actual results of the combination of current equipment and training. The patterns shown should assist in assigning priorities for student training and when making equipment recommendations.
In view of the fact that countless AIM Reports are never completed, or if completed are not submitted to the National Office, we risk the danger of interpreting trends with insufficient data. We desperately need the essential data base provided by the AIM Reports, on each and every Accident, Incident and Malfunction, however trivial. Do yourself, the students, other jumpers, and the Sport a favour. Submit AIM Reports!

Item #2 Missing Gear:
The following equipment was borrowed at the U.S. Nationals. It was a demo rig provided by the Jump Shack and Pioneer Parachutes. Please contact Mike Johnston or Jim Mowrey if you locate any of these items:

CONTAINER: SST Racer Serial 05019, February 1980, all black with red lightning bolt on pilot chute cap.
MAIN: Pioneer Kestral, Serial #594970, March 1980, a 5-cell canopy with white roof and rainbow floor.
RESERVE: Para-Innovator Featherlite, Serial # 792172C, January 1980.

ALSO MISSING: A rainbow pattern Unit, Serial #O1290. It has kevlar lines, and a reward is offered. If located, contact:
Don Kerlin, Skies West, 2158 27th Ave., Greeley, CO 80631, (303) 330-8000

ITEM #3 CLASSIFIER Reserve Special Notice:
Two components are of critical importance to the proper functioning of the reserve system:

1) A reserve pilot chute with a compressed spring tension of no less than 22 pounds;
2) Correct reserve closing loop lengths measured before installation.

Pilot chutes. While there seem to be virtually no standards set forth for minimum pilot chute spring forces, our own testing indicates that an MA-1 pilot chute (or equivalent) with a minimum spring tension of 22 pounds is best suited to this reserve system. You can measure the spring tension on a scale by compressing the spring until the top of the pilot chute is within 2 inches of full compression.
Loop Length. If your Classifier was made for installation of a round reserve only (SP-6 series) the correct loop length is 3 inches before installation. The loop will stretch during installation. For this reason, we recommend the installation of new, 3 inch, ungutted 550 cord loops during each reserve repack.
If your Classifier was made to accept a Safety Flyer (SP-F series), the correct loop is 9 1/2 inches before installation. If you are using a round reserve in that container, the correct length before installation is 12 1/2 inches. As discussed above, replace loops at each repack for best results. Please note that the SP-F loops are continuous and that, in this instance, they are made of gutted 550 cord.
We also recommend your rigger cut back the hook velcro on the top closing flap of your Classifier reserve container to just inside of the grommets. This may give a more positive opening to this system.
Address any questions or requests for free reprints of this Special Notice to:
The Altitude Shop Inc., 9276 Tennessee St., Vallejo, Calif. 94590. Tel. 707-643-6510
(Note: My apologies for the delay in getting this information to you, but the Altitude Shop forgot to notify CSPA, hence we had to read this in Parachutist. D.G.)

ITEM #4 Self-Awareness:
In a review of the accident reports, including fatalities, looking for a key to the recent increase in accident rate, one item became obvious. There were no glaring violations of BSR's. Two accidents can be attributed to the dangerous practice of free stowing lines, a practice which is no longer considered reasonable. For the other serious and fatal accidents, no one single item can be identified, except that in each case the individual failed to deal with the circumstances. Briefly to illustrate, one jumper tried to do too much in freefall before checking where he was, another delayed after the cutaway attempting to gain stability, a third struggled with a twisted belly-band eventually inhibiting the reserves ability to deploy when finally activated, a fourth got caught in a squall and was blown off the drop zone to land in a lake. There are many more incidents: exiting the aircraft without a clear view of the ground, hang-ups on aircraft during RW exits, premature activations of main or reserve in freefall. These incidents confirm that equipment is not yet "idiot proof", nor have all the "idiots" stopped parachuting. The equipment is safe, but not perfect; jumpers are more experienced, but not infallible. A high degree of respect is necessary for the potential dangers of the sport. You may push the circumstances occasionally, taking a little extra risk where external pressures make it necessary, but making a habit of this could shorten a parachuting career considerably. The earth has no respect for the number of jumps in your logbook!
Take a few minutes to evaluate your gear, your skydiving practices and yourself. What are the things which could go wrong, and what would you do in each case? What are your bad habits, what errors do you make? How often do you make errors in judgement; can they be prevented or reduced? Use the time now, rather than between exit and landing.

ITEM #5 Correction:
In TB #6, Item 6, I advised that Rapide Links have a lower breaking strength if loaded sideways. Mike Johnston of the Jump Shack, has done some tests to determine that the #5 link will actually hold a 2500 lb load in a lateral application. Oops, I stand corrected. He also mentioned that if the link bears the Rapide name, it is satisfactory, regardless of the location of purchase.

ITEM #6 More Kevlar:
Although this material is somewhat suspect in its application as suspension line, more research is being conducted. A reserve canopy utilizing circumferential reinforcing bands of kevlar tape is currently being tested by Pioneer Parachute Company. If successful, this will offer a significant improvement in the safety of low profile, low volume, circular reserves. Even if an inversion occurred on deployment, the integrity of the canopy would remain, though some sections might suffer damage.

ITEM #7 Liability:

All rated individuals are cautioned to ensure that they are working within the limitations of responsibility as defined for their particular level of rating by CSPA. That is the limit of your insured liability by CSPA. Beyond those limits you and your club are responsible for your own defense. If the limitations are less than what are required, obtain supervision or upgrade.

ITEM #8 Notice RW:
A large number of the log books submitted for licensing indicated that individuals are participating in RW prior to obtaining any licence. This is a violation of CSPA recommendations. A "B" licence is necessary prior to participating in RW. An 'A' licence holder who is 'B' qualified may work one on one with a certified RW or Senior Instructor. Repeated violation of CSPA, recommendations may result in the withdrawal of rating privileges and liability insurance. (C.Y.A.)

ITEM #9 Steerable Reserves:
Eddie Grimm of Niagara Parachutes has tested and introduced a arrangement for the steerable 26' Lopo reserve. In an amalgamation of features from the vented and the 4 line release configurations, he claims to have achieved a best solution. The 24 gore, 26' diameter Baby Cobra is now supplied with 4 lines to be released (freeing 5 gores) with the next gore or either side having mesh lowest (A) sections. The rate of descent, stability, forward speed, and toggle pressure are all described as improved over previous steerable reserves.

ITEM #10 Line Entanglements:
The technique of stowing lines in the main container rather than on the deployment device has been cited in a few recent accidents and incidents in Canada and the U.S. The potential for container flap to line entanglements similar to that for free stowing. The practice of placing the line stows on the deployment device, to have the lines, canopy and risers clear the container early in the deployment sequence is regarded as the best method available.

1980 AIM SUMMARY (to October)													
No.Jumps	A	I	M	Total	BC	AB	SK	MB	ON	PQ	NB	NS	Other
5	25	13	17	55	3	10	0	2	32	4	1	1	2
5-25	6	7	21	34	2	7	0	2	16	3	2	0	0
26-99	7	9	38	54	0	11	2	4	30	2	6	1	0
100-499	14	13	33	60	7	8	0	0	28	10	4	4	1
500+	2	9	17	28	1	6	1	2	12	1	4	0	0
Total	54	51	126	231	13	41	3	10	118	20	17	6	3

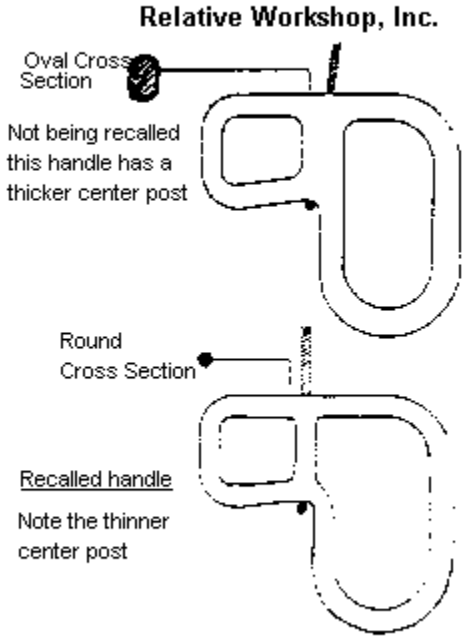
SUMMARY 3 YEAR OVERVIEW					
YEAR	ACCIDENT	INCIDENT	MALFUNCTION	FATAL	TOTAL
1977	44	29	87	4	164
1978	93	45	200	7	345
1979	41	23	89	3	156
1980 (to Oct)	54	51	126	6	237
TOTAL	232	148	502	20	922

# JUMPS	ACCIDENT			INCIDENT			MALFUNCTION		
	'78	'79	'80	'78	'79	'80	'78	'79	'80

<5	53	21	25	13	6	13	14	8	55
5-24	11	4	6	11	5	7	24	7	34
25-99	4	3	7	7	3	9	34	23	54
100-499	18	9	14	10	5	13	82	29	60
500+	7	3	2	4	4	9	46	22	28

TECHNICAL BULLETIN #8 1980

Item #1 Ripcord Recall:
Wonderhog owners that have the type of ripcord being recalled (see diagrams below) should send the entire ripcord to the Relative Workshop together with the following information: the name and mailing address of the owner; the serial number and date of manufacture of the rig (this information is on the TSO tag that is tucked behind the back pad at the top of the container); the name of the person or dealer from whom the rig was purchased, and whether the rig was purchased new or used.
For Wonderhog owners who are not able to supply the above information, or obtained plastic handles from another source, such as blast handle conversions, the Relative Workshop will provide replacement ripcords with a metal handle for $5 if they return the old ripcord.



ITEM #2 Ripcord Pull Force:
The Jump Shack/PEIA recently released a study concerning pull force capability. The study was conducted in response to inquiries from the FAA concerning contradictory results between a US Navy/Air Force report and a University of Queensland, Australia study. The results of the PEIA study are presented here as clarification of some misconceptions about male and female capabilities.
The pull force test was conducted using a standard tandem harness with left side ripcord placement, a Martin Baker type handle and the housing and attachments done in the common manner. A strain gauge with indicator needle was attached to the cable and the pack tray. The test included a single pull with right, left and then both hands. No instructions for pull technique were provided. Jumpers and non-jumpers were both tested to evaluate the influence of training/experience.
The results for a right hand pull were: male 34-106 lb (241 subjects); female 26-118 lb (105 subjects). The left hand pull was generally a higher value, and was never less than equal to the right hand value. Using both hands the male ranged from 100-291 lb, the female from 58-248 lb. The nonjumper's average pull capability was approximately 72-90% of that of a jumper indicating that technique and experience improve the pull force capability.
Other interesting observations from the study include a 15% reduction in pull force where the handle shape requires that the fingers wrap around rather than through (i.e. blast handle as opposed to Martin-Baker type).
The study recommendations emphasize the need for continued instruction of proper technique and for standardization of ripcord location and configuration. A location which allows two-handed pulls provides an increased safety factor. The existing FAA (and CSPA) specifications of pull force (min 6lb max 22lb) are compatible with the capabilities of the male and female skydivers when the ripcord handle is in the location common to modern sport parachute equipment.

Item #3 O-Rings:
Currently 'O' rings are supplied with Para-Flite's Safety-Star and Safety Flyer to be used, in place of elastic bands, to close the deployment bag. Some jumpers are now using these on the main deployment devices, as a method of evaluation of their reliability

and durability. Experience to date indicates that they last significantly longer than elastics (30-40 jumps rather than the 3 or 4 jumps as reported by one person). It is also reported that at least one or two reserve manufacturers are undertaking testing to determine the suitability of the 'O' ring in combination with a deployment diaper

Item #4 Student Tandems:
The PEIA has produced a list of recommendations concerning student tandem equipment. These were prepared by their Technical Committee which includes Elek Puskas, Ted Strong and Mike Johnston. Anyone interested in these recommendations may obtain a copy from the CSPA office.

Item #5 Landing Force:
The following excepts from the chart prepared by the Canadian Paediatric Society appeared in Vol. XI, Number 4 of their publication. They provide an appreciation of the force experienced in relation to the material composition of the landing site (target).

Relationship of Surfaces, Drop Height, and Gravity Forces				
Surface	Drop Height in Feet			
	3.5	4	8	10.5
Packed Earth		175-225		
Pea Gravel (8" deep)	10-20		15-40	20-50
Wood Chips (12" inches)	15-20		30-35	42-48

*Figures given indicate range of gravity force in repeated drop tests. Serious injury is likely to occur in impacts in excess of 50g. Source of data Franklin Institute Research Laboratory, Philadelphia

Item #6 Manual Corrections:
Recently CSPA distributed packing manuals for Rogersport's EZ Flyer tandem container system to current riggers. An error has been discovered in 3 of the diagrams in that manual. A corrected set of diagrams is enclosed with this bulletin for insertion in the manual. CSPA riggers possessing this manual should update it accordingly.

Item #7 Low Openings:
From a review of recent Accident and Incident reports as well as reports from fatal accidents in Canada and the USA, a tendency to "work with" a slow to deploy main parachute is becoming too common. A very large proportion of the fatal accidents victims were wearing unopened but fully serviceable reserve parachutes. Far more shocking is the realization that there were ten times that number of possible fatalities. These were individuals who were saved by their main canopy within two seconds of impact with the ground. Confidence in the reliability of the main parachute must not be allowed to replace a respect for the ground and the passage of time. Encourage your friends, students and yourself to try the main, but to use the reserve before time has run out.

TECHNICAL BULLETIN #9 MAY, 1981

Item #1 AOD's for Student Parachutists:
Although the use of AOD's for student jumpers is only a recommendation, and not a BSR, it is a very strong recommendation from the TT&SC which should be complied with to the maximum extent of every club's ability. Although fewer students have suffered serious injuries in recent years, this should not reduce your determination to see that every student is backed-up on every jump by an AOD. Now they are duty free, what's holding you back?

Item #2 Safety-Flyer Bridles:
Riggers are advised that all Safety-Flyer (or Safety-Star) reserves equipped with a cotton bridle are grounded. The pilot chute-bridle-bag assembly is to be returned immediately to Para-Flite Inc. for replacement. Contact Para-Flite for further information (609) 663-1275.

Item #3 Miniature 3-Ring:
In conjunction with the introduction of the new Swift rig from Para-Flite, a miniature version of the 3-Ring release has been produced. It utilizes the smaller two rings from the existing system with a smaller 3rd ring. It is reported that the mini rings have been tested to withstand the 3000 lb load requirement that was used with the initial 3-ring design.

Item #4 Altered Reserves:
Reports have come in from recent rigger courses concerning alterations to reserve parachutes. Closing of reserve modifications, installation of 4-line releases, removal of quick opening bands and removal of diapers seem to be recurrent items. None of these is recommended. Reserves should be left as manufactured, unless specific alteration direction is provided by the manufacturer. An altered reserve must be tested for reliability and durability prior to going into service. Remember, you count on having this parachute work perfectly every time

Item #5 Technical Library:
The CSPA office is assembling a collection of packing manuals for surplus and spot equipment. Several manufacturers have assisted by donating a copy of each of their current manuals. Donations of manuals for older equipment would be welcome. A list of material currently on hand follows:
Rumor Reserve; R + J Para Sales
Comet Main; Embury
Hang Glider 22, 24 + 26 Recovery; Embury
Bullet; Flying High
Unit System & SAC; GQ Security
Emergency 150, 250, 350, 500 & 550 Packs; GQ Security
Delta II; Irvin
Six-Pack; Niagara
Condor, 252 Para-Foil Mini System; North American
Nova Piglet Main, Piglet '2' Container, R-1, R-2, Steamlite, Wedge; Para-Innovator
Classiflier, Corsair, Top Secret; Altitude Shop
SST, Racer, "POP"; the Jump Shack
Para-Cushion, Eagle, Pop-Top, Stylemaster; Strong
Wonderhog; Relative Workshop
Paraplane, Cloud, StratoCloud, Strato-Star, Strato-Flyer, Cruisair, Americal Papillon, SafetyStar, Safety Flyer; Para-Flite
Fox; Guardian
Para-Sled; Aero Foil System
Para-Commander, Russian PC, Merlin, Super 22, Jerry Bird Reserve, 23' Reserve, Emergency (B-26, QAC-28, B-24, -5B-28, 9-B); Pioneer Flyer; Rogersport Rigs
Rapid Transit System; Sky Supplies
If you have been unable to obtain instructions for a particular product, a copy can be obtained at reasonable cost from the library material. Please keep any photocopy requests within reason, i.e for equipment which is in actual use, as the office staff has many other activities filling their time.

Item #6 Accident Highlights:
In an effort to keep you updated with current accident trends, some very brief excerpts are presented here. Through awareness of these perhaps the number of reoccurrences may be reduced.

a) Student with 24 jumps involved in 4way RW planned activities incomplete, student stable to 100'; activated reserve, insufficient altitude for deployment. (Fatal)
b) Intermediate licence holder, using unfamiliar equipment experienced streamer on main, delayed cutaway, attempted to regain stability, no reserve activation. (Fatal)
c) Intermediate jumper, twisted belly band, tried to pull it clear, caused main horseshoe, reserve entanglement (Fatal)
d) Intermediate jumper, experienced spin on opening (ram-air) due to release of surge brakes. Attempted to correct spin until impact. Did not attempt to cutaway or pull reserve. (Fatal)
e) Experienced jumper plagued by unattached suspension lines while packing. Found connector link was bent straight. (Red faced)
f) Intermediate jumper could not locate hand deploy pilot chute due to bulky winter clothing. Activated reserve. (Slight embarrassment)
g) Experienced jumper loaned gear to intermediate jumper from another DZ, for a "test flight". Intermediate jumper experienced severe opening shock after short delay (main was free packed). Equipment was promptly returned, no sale.

TECHNICAL BULLETIN #10 AUG, 1981

Item #1 Wonderhog Compatibility:
Each Wonderhog is built for a particular main and reserve canopy; the main and reserve containers are built in many different sizes. The size of the main and reserve containers are printed on the TSO label in code. The charts below define the codes used.

It is possible to fit canopies into containers that were actually built for smaller parachutes, and vice versa. This is of little consequence with the main parachute system, as safety usually isn't compromised and only appearance suffers.
But this is not the case with the reserve system. Packing a reserve parachute into a reserve container that was designed for a different canopy can result in hard ripcord pulls and decreased performance. This is especially true if a ram-air reserve is installed in a container designed for a round reserve.
The chart below should serve as a guide for matching the right canopies with the right container.
For parachutes not listed here, consult the Relative Workshop.
The information and specifications in this chart were in effect at the time of printing. The Relative Workshop. Inc. however, reserves the right to change specifications or design at any time without notice and without incurring any obligation.

WONDERHOG II COMPATIBILITY CHART

FPII	Strato-Flyer	
	Crusair	Piglets with 4 risers:
	5-Cell Mini-Foil	R-1 Piglet II, bias
	Unit I&II	R-2 block
	Cobra	R-21 Featherlite
	Dble. Keel Dactyl	R-4 25'
	Titan	
	Superlite II	Preserve I & III
	Superlite	Super 22
	XL Delta Cloud	Strong Lopo Lite
FFII	(same as FPII)	Ripstop Tri-conical
		Safety Flyer
		Safety Star
		Phoenix
FLII	(same as FPII)	Nimbus
		Taffeta Tri-conical
		Piglets with 4 risers as per FPII
FPII		Strong Lopo
		Security Lopo
		National Lopo
		Joe Smith Lopo
LPII	Lightweight Strato Cloud	(same as FPII)
	252 Lite Para-Foil	
	Viking	
	XL Strato Cloud	
	RW Paracommander (F-111)	
LLII	(same as LPII)	(same as FPII)
LFII	(same as LPII)	(same as FFII)
LSII	(same as LPII)	26' Navy Conical
		24' Surplus Ripstop
		Taffeta Tri-conical
		26' Super Steerable
SLII	Strato-Star	(same as FPII)
	5-Cell Para-Foil	
	RW Para-Commander	
	Piglet	
	Sparrow	
SFII	(same as SLII)	(same as FFII)
SSII	(same as SLII)	(same as LSII)
CLII	Strato-Cloud	(same as FPII)
	252 Foil	
	Thunderbow	
CFII	(same as CLII)	(same as FFII)
CSII	(same as CLII)	(same as LSII)
PLII	Paracommander	(same as SLII)
PFII	(same as PLII)	(same as FFII)
PSII	(same as PLII)	(same as LSII)
FPIISII	(same as FPII)	(same as FPII)
FLIISII	(same as FPII)	(same as FLII)
FFIISII	(same as FPII)	(same as FFII)
KPIISII	Kestrel	(same as FPII)
	5-Cell Para-Mount	
MPIISII	Merlin	(same as FPII)
	7-Cell Para-Mount	
	6-Cell Para-Mount	

	Pegasus Strato Cloud Delta	
MLIISII	Kestrel %-Cell Para-Mount Paradactyl Cruislite Merlin 7-Cell Para-Mount 6-Cell Para-Mount Pegasus Unit III Strato Cloud Delta	(same as FLII)
MFIISII	(same as LFII)	(same as LFII)
TPIISII	Firefly	(same as FPII)
TTIISII	(same as TPIISII	R-21 Featherlite K-XX Shoobie 24'
LPIISII	(same as LPII)	(same as LPII)

Item #2 PEIA Rigger Convention:

1. Main Canopies: Four manufacturers participated in this session, describing in general terms, their methods of construction, canopy characteristics and common problems (or misconceptions). Their principal concerns were the use of correct packing and maintenance techniques, proper initial assembly in a compatible container and a review of the instructional manual accompanying the canopy by the owner and rigger. Careful packing, regular inspection and stowing the lines were all mentioned. A slow inflating canopy (i.e. Unit) can be improved by opening a 4" -6" diameter hole in the slider, by crossporting the canopy and by moving the inner steering line a 1/2 cell further inboard.
2. Reserve Canopies: Five manufacturers discussed current developments for reserve parachutes. The two key points were adherence to manufacturer's specifications and the use of diapers. Virtually all of the manufacturers stated that their TSO's were invalid if the diaper were removed or altered. Several felt that their canopies faced a significantly higher probability of damage during a non-diapered deployment. Pioneer has authorized a retro-fit of diapers on early editions of the tri-conical, 26' lopo and super steerable. Consult them for details. Current and future editions of the various canopy owner's manuals will include information pertaining to repair (line replacements, patching, etc.) as well as the packing information. Splicing reserve suspension lines was not acceptable to any of the manufacturers. An overall summery of the session might be to say that "if something isn't going together (working) properly, check both the canopy and container manuals. If the problem still exists, consult the manufacturer or an accessible expert (i.e. CSPA). Do not innovate with a reserve unless it's on main risers and going into a main container for proper testing".

Several manufacturers used the occasion to announce new reserve developments. Comet and Pioneer are now introducing ram-air reserves; Pioneer and National have smaller lopo reserves (lightweight). The "free bag" concept is being used with the ram-air and may become available for some round canopies.

3. Rigger Liability: the USPA insurance program and the possibility of the FAA deregulating some aspects of parachuting were discussed in the next session. The responsibility of testing compatibility and function still remains with the rigger, although many of the manufacturers are or have recently published lists of compatible canopy-container configurations. Although this is of interest to the Canadian rigger, It is not a direct concern in a legal sense.
4. Harness and Container Systems: Eight manufacturers took considerable time and care to provide owner's manuals and then to describe the step by step packing of their rigs. Each pointed out unique features of their gear, answered questions and outlined solutions to common problems. The constantly repeated points included:

i) Canopy compatible with container (volume)
ii)Use the Manual
iii) Inspect thoroughly before repacking
iv) Check the length of the closing loop (see manual
v)Check velcro is in useable condition
vi) Check for any Bulletins (update user information)
vii) No T-Bars for closing, (if you can't pull it closed by hand, don't close it.)

Innovations in the newest rigs on the market to include the use of elasticised fabric for pilot chute pouches, bridle cord mountings which are even more difficult to twist, reserve ripcord handles for CRW (both a smaller trapezoidal shape and a triangle shape are being introduced as being "snag-proof"), smaller container flaps with less stiffening (ref. Line entanglement), smaller "all fabric" hand-deploy pilot chutes, and of course lighter weight. Most manufacturers had a 17-18 lb rig to show, containing a light reserve and small five-cell main.

5. The final session included equipment compatibility and sewing and sewing machines. An excellent handout was provided which I will distribute when my copy arrives. Major points included using good quality thread, keeping the machine lubricated and expending a good deal of attention and loving care towards the machines. No favour was shown to casual or part-time rigger/manufacturers.

Item #3 Reserve Procedures for Tandems:

It is evident from reviewing recent AIM's, along with licence and rating examinations, that many jumpers are not reading their equipment owners manuals. Worse yet, many are planning to do the wrong things in the event of a malfunction, because it seems like a better idea (based on limited knowledge). The following will not replace the need to <u>read</u> your owner's manual but it might get you motivated to do it.

I) Total on Tandem: Pull the reserve, don't fool around chasing the handle nor waste precious time cutting away (besides a loose riser could snag your reserve.)

II) Pilot Chute in Tow: Assume a horizontal attitude and pull your reserve. Do not pull the bridle and do not waste time cutting away. The likely cause is a twisted belly-band which could develop to a horseshoe if you help by pulling on the bridle.
III) Bag Lock/Raeper Lock/Streamer: Cutaway and pull your reserve. You haven't slowed down and it's not likely to get any better.
IV) Canopy Mal: With 1/2 or less canopy, you do not have a great deal of time, particularly if it is spinning. Check the situation and your altitude. If there is no immediate solution, Cutaway and Pull Your Reserve. Many single point release systems will be jammed by excessive twisting of the risers; don't get caught in an worsening situation by expending a lot of your time trying to fix the main.

Item #4 Reserve Ripcords:
In recent years several tandem rigs have been produced employing fabric materials (rather than metal) as the ripcord handle, ripcord housing and/or ripcord cable. Experience with these innovations has shown more problems than advantages. Where the opportunity presents itself, these items should be replaced with their metal counterparts. This replacement should be done in particular where a relatively inexperienced jumper is purchasing 2nd hand equipment fitted with a ripcord handle, housing and/or cable.

Item #5 Student Training:
Recent events have spotlighted two specific concerns in student training. The first is the requirement to provide the first jump student with the information he needs to know to complete his jump safely. The second concern is the training necessary for individuals in the 16 to 18 year age range.
a) KISS: Every student must learn enough in a FJC to complete his/her parachute jump safely. This includes how to perform each of the tasks he must do in the course of the jump (i.e. A/C exit, canopy check and control, landing) and how to deal with any unusual circumstances which might occur, particularly those after exit where the Instructor is no longer present to assist. Inclusion of items such as the history of parachuting, names of all the parts of a parachute, how it deploys, description of the different events in parachuting (S&A,RW) may be appropriate in a week long course, but certainly do not contribute to a student's successful jump on the "same day" training course. in dealing with emergency procedures the key points are recognition and action. The novice must be able to identify a good canopy, and if it isn't good, to deploy the reserve successfully. Names of all the possible malfunctions, of how they might occur, and of how severe they should be before using the reserve are inappropriate to effective training of the individual for his first few jumps. This along with the items mentioned earlier should be part of the follow-up training program. Remember: the longer the course, the more that will be forgotten.
b) Minors in Parachuting: Every Instructor is undoubtedly aware of the documents required by a minor to participate in parachuting (parental consent, etc.). What about his/her training course? At 16, one becomes eligible to drive a car, solo in an aircraft, scuba dive, and parachute. However, being eligible to participate and being capable of successful participation are distinctly different. The average 16 to 17 year old has not had the opportunity of facing and dealing with the stress situations which a 20 year old has experienced. There a possibility that on the first occasion when exposed to a high stress situation, no reaction or a substantially delayed reaction will result. This might be acceptable when driving a car (the other guy avoided the collision), but it is not acceptable in parachuting because the ground will not move aside.
Training of minors should be undertaken with adequate care. The Instructor should encourage parental involvement (auditing the training course, advising them of the potential dangers also). Parachuting is a safe sport for the active participant, but it is not for the individual just out for the thrill of an amusement ride.

Item #6 Accident Investigation:
In the event of a serious or fatal accident in your area, here are a few things to do and a few to avoid.
a) Sequence of events: Record the date, time, load number, name of participants and pilot, exit altitude planned activities.
b) Background: Record the individual's jump experience, experience with equipment, date of previous jump, time in the sport, level of formal training, licence held.
c) Equipment: Document the complete rig, serial number, dates of manufacture (container, main and reserve), repack dates, type of helmet, jumpsuit, footwear, goggles, gloves and instruments worn or not used). Assess the condition of the gear (new, good or worn-out).
d) Witnesses: Obtain statements of observation from witnesses of the accident. Don't ask them to provide conclusions. Prepare a list of individuals present, including the victims relatives and close friends, DZ staff, experienced jumpers, spectators and the investigating police officers (if present).
e) Avoid speculation as to the cause or consequences of the accident. Avoid issuance of groundings or demands for resignation.
f) Notify the CSPA Office as soon as possible. Telex with a return number if no answer is obtained. Be prepared to provide details over the phone. The press and the police are very likely to contact CSPA directly to confirm progress of any investigation.
Accident investigations must he conducted in the event of any fatal or serious injury. A serious injury would be described as requiring substantial medical attention and extended hospitalization.

Item #7 3-Ring Releases:
With a significant number of jumpers using the Relative Workshop designed release, a few critical inspection details are mentioned to assist you when inspecting them.
a) Metal to metal contact between the rings. With a load on the risers the three rings should be in contact and lying parallel to each other. If the large ring is not in contact with the second ring but touching the webbing of the riser only, a significantly larger load is transferred to the small ring and loop.
b) Loop length holding down the small ring should be short enough to hold that ring in parallel with the other two, but long enough to not apply tension to the cutaway cable.
c) Cutaway housings must be long enough to reach the grommets in the risers under loaded conditions, allowing some movement in order that no load is transferred to either the housing or the cable. The end fittings must be properly swaged in position. The housings at the cutaway handle end may or may not be tacked in place, depending on rig manufacturer.

TECHNICAL BULLETIN #11 OCTOBER, 1981

Item #1 Accident Reports:
Excerpts from recently reported accidents are presented here for their information value. Through awareness of these, perhaps the number of re-occurrences may be reduced.
a) Second jump student exited A/C, snagging main bridle with left arm. Spinning horseshoe malfunction resulted. Snag released 2 seconds prior to impact, insufficient time for main to clear. Reserve not activated (fatal). (A S/L system should ensure clearing main from student separation force recommended 100 lbs. A Reserve mounted AAD is strongly recommended for every student.)
b) Intermediate jumper experienced momentary pilot chute-in-tow immediate cutaway reserve activated approximately 1 second prior to impact (Fatal). (Identification and activation of fabric reserve ripcord required excessive amount of time. An AAD might have helped prevent this accident.)
c) Novice jumper improperly deployed the throw-away pilot chute (over shoulder) causing a pilot chute-in-tow. Reserve procedures were not initiated (Fatal). (Recognition and reaction to this situation would have prevented this accident. An AAD might have helped prevent this accident.)
d) First jump student experienced partial malfunction. Reserve procedures (manual) were not completed. The AAD fired with the non-pilot chute equipped reserve emerging at approximately 300'
subsequently entangling with the main (serious injuries were sustained). (Recognition and reaction to the malfunction should have resulted in prevention of this accident.)

Item #2 A.I.M. Reports:
Accident investigations of the above four situations brought to light previous similar incidents which had <u>not</u> been reported. Although not directly a consequence of the missing reports, this failure to submit reports negates any opportunity to learn from those prior incidents, making re-occurrences more likely.
If you experience an accident or malfunction, please pass on the information so that we may attempt to disseminate information with a view to improving our safety record. (Need forms? Just ask.)

Item #3 Non-Members: The number of non-CSPA students making parachute jumps is increasing. Although every effort is being made to enrol these individuals, until this is accomplished, CSPA rated Instructors and Riggers may wish to withhold their services from these people. CSPA's insurance provides third party liability, property damage and personal liability insurance to rated Instructors and Riggers performing activities within their privileges. Providing services to non-members is done without this protection. A review of our costs in an ongoing case are as follows:

Initial retainer and case research $9,000.00
Defense cost (2 weeks trial estimated) $25,000.00
A co-defendant's retainer alone was $3,000.00

Three Instructors involved in a different action are being covered by CSPA's insurance, where without the coverage the initial retainer for council would have been $2,000.00/each. Current information indicates that at least 5 cases are proceeding at the present time. Do you believe it won't happen to you?
Now is the time to lower the boom, not after the event, when it is too late and you are being sued out of your socks. Accordingly, by direction of the CSPA BOD, ratings of those CSPA Rated Individuals guilty of contravening BSR's, Policy and Procedures by their involvement with non-CSPA Members will be withdrawn from the protection of the Instructor, Rigger, Jumper, Drop Zone Operator and the Association. (D.E. Holmes)

Item #4 Currency:
Commenting on the high number of accidents in aviation sports, Paul Poberezny penned these words: "Self policing is a good start toward keeping air sports simple and enjoyable. Flying within one's capability is an asset that adds to the stability of all aviation. Training from qualified persons is so very desirable. Don't feel that just because you have your license that you have achieved your goal. You haven't. It is only after many wonderful hours and years of safely enjoying this vast ocean of air above us, when you hang up your goggles and helmet (and rig) to fly no more that you have achieved that goal .
"This is particularly applicable to those of you who don't "fly" enough to really feel that you are on top of things. The money you "lose" in hiring an Instructor for an hour or two is actually a bargain for the occasional sport participant. Knowledge and skill deficiencies are commonplace in our accident statistics"
(Reprinted from Aviation Safety Letter, 4/81 Department of Transport)

Item #5 Radios for Students Training:
In recent years, ground to air radios (one way)) have been incorporated into the student training programs at several drop zones and Centres. A review of their results indicates that the radio is providing a useful and valuable communication linkage with the student. Without a radio, the student is beyond the Instructor's influence from aircraft exit until reaching a relatively low altitude where a loud hailer might be effective, but where little time remains in the canopy descent. Several recent reports and comments have emphasized the radios assistance in encouraging a student with a minor malfunction to initiate reserve procedures while still at an altitude which provided an adequate safety margin.

TECHNICAL BULLETIN #12 1981

Item #1 Identification of Risks:
In recent weeks some concern has been expressed about the manner in which CSPA and groups providing parachute training have identified the levels of risk. In the normal course of events, Instructors are asked "How safe is the sport?".
The answer is related to the reliability of the equipment (one malfunction per 100 jumps or whatever) and to the ability of the individual making the jump to perform as trained while in the stress situation. Parachutes being quite reliable, and student equipment being carefully controlled (packing and maintenance), student malfunctions are infrequent. This is not a reason to say that parachuting is perfectly safe. Accidents do happen; a few students do experience malfunctions, but most remember what to do. Some students manage to land off the airport and on things which they shouldn't hit. Broken and sprained ankles are not uncommon. Serious injuries do occur, but infrequently.
Identifying the risks precisely is not possible due to the difficulty in collecting the statistical information. A reasonable estimate would place the possibility of a malfunction (for a student) as less than 1 chance per 100, but greater than 1 chance per 1000. The possibility of the student (who experiences the malfunction) reacting incorrectly would be in the area of 1 chance in 10. Numbers are interesting, but when the mal occurs, it might be the person's first jump. The recipient doesn't relate to the 1 in 100. Stress the idea of being prepared, because it may occur, and of taking an active role in the jump.

Item #2 Hand Injuries:
In the last 9 months about a dozen active jumpers have reported hand injuries. These ranged from finger dislocations to loss of a portion of one or two fingers. Most injuries were received during A/C exit, having a portion of the hand caught in a section of the door frame or the assist strap. In light of these occurrences, aircraft operators are encouraged to remove the assist strap found on the forward side of the right hand door on most Cessna aircraft. It should be replaced if necessary, with a short length of webbing, anchored at one end only. Similarly, the framing around the door should be padded and taped to cover sharp edges and fill any narrow channels. Jumpers should likewise be attentive to their hand placements during exit from any aircraft, ensuring clean release of any grip.

Item #3 Back Injuries:
Numerous intermediate and experienced jumpers have discovered the thrill of making fast hook turns on ram-air canopies at low altitude. Properly executed, it is an impressive manoeuvre equivalent to the stunt driver stopping inches from a concrete wall. A few jumpers have also discovered the consequences of a miscalculation in altitude for the flare. Injuries ranging from minor bruises to broken backs have resulted. Even a couple of the Knights have missed on their timing, earning a limp which lasted for a few days.

Item #4 Exam Corrections:
A few errors on the answer sheets for the C & D-licence exams have been reported to the Office. Please amend your answer sheets as follows:
C-licence, Q 1a) increase the figure by 50 metres
Q 19e) change to the other possible answer.
D-licence, Q 19h) change to the preceding letter in the alphabet.
If you find any other errors, please bring them to the attention of the Office so that they can be corrected.

Item #5 Case Results:
A decision has been reached in the litigation between C.Smith and CSPA (also included Horizon Aerosports and several individuals). CSPA has been cleared of any responsibility. Of the $600,000.00 claimed, a portion has been assessed to the plaintiff (C.Smith) and a portion to the parachute centre and Instructor.

Item #6 Course Conductor Training:
Course Conductor designation is separate from the Instructor ratings. A Course Conductor's only function is to administer Instructor A courses. The designation is renewable annually, requiring participation in CSPA courses.
Individuals interested in becoming Course Conductors should contact the Office. Selection of Course Conductor candidates will be done based on a review of their experience. A brief resume of time in the sport and time instructing should be included along with details of accumulated jump experience, jump activity in the past two years and accumulated students trained and dispatched. Thirty-eight individuals from across Canada have been approached directly towards becoming Course Conductors.

Item #7 Practical Experience:
In Technical Bulletin #9, Instructors and Riggers were asked to provide the office with documentary proof of practical experience accumulated following their rating courses. To date, about 10% of those holding ratings have done this. Those who have yet to forward this material are encouraged to do so as soon as possible. Individuals revalidating ratings in conjunction with a membership renewal should ensure that this material is included. This applies to recent and long-time rating holders alike.

TECHNICAL BULLETIN #13 1982

Item 1 Exhibition Jumps:
More "Demos" are being done than in previous years; our relationship (and credibility) with DOT is improving. An increase in the number of accidents, particularly serious accidents may jeopardize this relationship. One weekend in July '82 saw one jumper seriously injured, another killed, while performing exhibition jumps. Both accidents, one on either side of the country, found jumpers performing 10-way RW from large aircraft over urban areas. In both cases, the performance of normal RW jumps was complicated by props worn for the event (flag, camera, smoke). These props were involved in the malfunctioning of the equipment, which had drastic consequences for two individuals. In both cases, the availability of a large aircraft was an encouragement for the RW-attempts.
CSPA has published recommendations pertaining to Exhibition Jumps in PIM Two, section 12. One recommendation contained there is that jumps be made from no higher than 7,200' due to the poor spectator value. Even experienced jumpers often have difficulty locating aircraft at 10,000'. Freefall parachutists are virtually invisible without binoculars. Another recommendation suggests practising the intended jump at the local DZ; another suggests not using a prop (smoke, etc.) unless you have been carefully instructed in its operation and proper method for mounting. Having an unlit smoke trailing in freefall on a 8m lanyard did not result from proper mounting, nor did a 10-way which funnelled at about 5 or 6 identify an experienced group since some participants had not yet earned a 10-way patch.
DOT's concern in authorizing access to the airspace is for the safety of personal property and the general public who remain on the ground while we parachutists perform overhead. They are not particularly concerned that we put our own lives at some risk. However, they are concerned when parachutists land off target, miss the stadium or wind up in the stands, bounce off the roof of someone's home, and land amongst the spectators. When a skydiver is injured, it demonstrates that he was not in control, since no one would plan to be injured. The above events when repeated across Canada will give DOT just cause for limiting the number and location of our demos. Currently, In Vancouver and in Calgary, approval is not being given for jumps over the urban area. This situation may go either way at present, more restrictions may appear or these may be relaxed. Your actions and judgement will help to decide the outcome.
Insurance coverage for property damage and third party liability is provided by CSPA, but only for some members. To qualify when performing any exhibition jump, each participant must hold at least a C-licence, have made 50 jumps within the previous 12 months and be wearing a ram-air main and steerable reserve. If the target is less than 25m from any obstacle, (i.e. football field) a D-licence is required, if it is less than 15m, an E-licence or equivalent is required. A complete list of these criteria has been published and distributed with the BoD minutes of Dec. 5-6/81. Please re-read all of this material; be careful when you parachute for the public.

Item #2 Accelerated Freefall:
The United States Parachute Association recently introduced an addition to their Instructor and Jumpmaster Ratings where a current "I or JM" may qualify to teach or perform Accelerated Freefall jumps. In Canada there has not been a large demand for such a program; at present 2 or 3 centres are using this technique on a continuing basis. To receive approval for their programs, these centres have made individual requests to the TTSC, providing the Committee with details of the intended training, the qualifications of the instructors involved and the name of the individual in charge. If other individuals are considering introducing this sort of training they should seek a positive recommendation from the TTSC in the same manner.
In a policy statement, published with the BoD minutes of Dec. 5-6/81, the TTSC made some minimum recommendations. In order to conduct the training, the following conditions would have to be satisfied: The student is provided a tandem rig, a functional OAT is incorporated, an altimeter is worn, he is instructed In the technique for proper activation of the main and correct emergency procedures; the Instructors (JM's) have practised the technique, they are wearing altimeters (one with an audio-altimeter), procedures have been arranged and practised for unusual circumstances, all participants are wearing clear goggles, small RW jumpsuits and helmets which allow verbal communication. The training must include exit procedures, attitude and altitude awareness, use of Instruments, main activation and emergency procedures. Further, the training must place the student in the active role (i.e. observe your altitude, at 4,000 AGL wave-off, then pull); placing the student in a passive role (i.e. "I'll wave to you, you pull) is not beneficial, more over in unplanned circumstances it could be dangerous.
The Coaching Committee is planning to incorporate training for accelerated freefall (buddy-jumps) with the material for Relative Work Coaches. (Note: See item #4).

Item 3 Reserve Steering:
It has been found that 26 low porosity canopies with 4-line release installed on 2 risers MAY NOT BE STEERABLE. It is recommended that these canopies be modified to a tri-vent, or changed to a 4 riser configuration. There is no indication that deployment reliability Is affected. For further information, contact the manufacturer of your reserve.
((c) Educational Bulletin, PEIA, 1982)
Several malfunction reports have highlighted the lack of steering system for the reserve where vented reserves are installed in tandem containers. In a number of situations individuals have found the risers too long, the lines were not marked or they were too hard to pull down. Installation of toggles, and steering lines where necessary, should be considered. Consult the Owner's Manual or the canopy manufacturer. if you repack a reserve or if you are briefing someone for a tandem endorsement, be sure to cover this aspect. Landing a steerable lopo down-wind for a lack of toggles hardly seems to make the expense of obtaining a higher performance reserve a worthwhile investment. Manufacturers and dealers will undoubtedly make these items available if the customers request them.

Item #4 Relative Work Coaching:
Although it is not printed in the licence requirements in PIM One, it seems that a great many individuals (including a few Instructors) have decided that 4-way RW is a prerequisite for the A-licence. More than 1/2 the A-licence applicants in 1982 have had some RW experience, primarily 4-way, much of it done prior to completing the required figure 8. Perhaps because no-one has been repeatedly reminding jumpers about the benefits of a well designed progression program, many have forgotten that students should acquire skills in a logical sequence, working from basic skills to more complex ones. Falling base must be a very simple skill.
A few DZ's across the country are offering formal RW instruction. The programs usually begin after the individual has completed his turns, loops and rolls, including a style set. By that time, the individual has transitioned to a tandem rig and ram-air canopy. These programs include several jumps (about 10), beginning one on one with an expert relative worker, then progress to 4-way. The RW-student has an opportunity to learn techniques for exiting from a variety of positions, different types of docks or grips (.e.g. hook-up,

back-in, side body), changing and maintaining rate of fall, and of course altitude awareness and break-off procedures. A number of excellent 1:1 and 4-way exercises, designed by Rob Laidlaw of Auspex are now in use at the Claresholm and Gananoque DZ's. Claresholm is offering 3 programs: Basic RW, 4-way team and senior 4-way RW.
Note: CSPA will be introducing its RW Coaching program this fall (Sept. '82 at Gananoque). The clinic will discuss identification of RW skills, teaching techniques and exercises for skill learning for 1:1, and 4-way groups. Instruction concerning accelerated freefall will also be included. Written and practical evaluations will be conducted. Interested individuals should contact the Office.

Item #5 Mr. Bill Dives:
Skydiving(c), August 82 (volume 3, Number 7, Issue #31), featured a front page photo of a Mr. Bill dive. The objective it seems is for one jumper to hold onto another (or each other) while one of the two pulls, having his main canopy open. The photo proves it can be done. A couple of local jumpers tried and accomplished it. Not mentioned in the photo caption were the bruises and swollen fingers which resulted. In 1981, a number of jumpers received serious hand injuries during exit from the aircraft. In 82, some of these reports are likely to identify Mr. Bill dives as the cause with the urge to attempt this stunt moving from DZ to DZ. (Note: The locals who tried it, don't plan on doing it again.)

Item #6 P.C. Steering Lines: A majority of DZ s in Canada are changing to PC's (Lemoigne canopies) for their student jumpers. The canopies provide better performance and greater durability than military surplus canopies. Several clubs have experienced problems in this transition as a result of using risers made for either a cheapo or a ram-air canopy. Both have their steering lines and guide rings behind the rear risers while the PC's have an internal steering line with a guide ring on the front of the rear riser. Mis-match of the canopy and risers will cause abrasion of the steering lines, the riser and possibly some suspension lines.

Item # 7 Grommet Overlap:
Grommet overlap occurs when the washer on the main top flap grommet catches under the grommet of the bottom flap, locking the two together, even though the ripcord is clear of the loop. The result is a total pack closure. If the Combination Tandem has seen a lot of use, the grommets show signs of wear, it is susceptible to grommet overlap. A few simple safeguards will prevent it:

1. Be sure all grommets are set securely. A well set grommet tends to be flat and has few places to snag.
2. Try to avoid pulling the top flap down below the grommet on the bottom flap.
3. After closing the pack, slide your fingers under the flaps and feel to be sure all of the grommets are free and clear of each other.

These few preventative measures take very little time, and will help you to avoid any undue excitement and early repacks on your reserve.
Note: Combination Tandems manufactured after January of 1982 have 7/16 grommets in place of "0" spur on the top flap. ((c) Strong Enterprises, May '82)

Item #8 Ripcord Release (AOD) Improvement:
The backmounted reserve container has posed a problem for the Sentinel Mk 2000. We believe SSE has solved the problems.
A brief explanation: A metal plate is mounted on the reserve top flap. On this is mounted the power piston that extracts the reserve pins when the Mk 2000 is activated.
The problem which has been occurring, is the cartridge on the end of the piston has been breaking off even with a protective cover. This happens when jumpers do a PLF over the reserve container. The impact is just too much for the cartridge to take, and with the average replacement cost of $15.00 (US), it is too much for the average jumper to take.
Don't let this discourage you from adding a Ripcord Release to your equipment. The manufacturer of the Sentinel, SSE has come up with a solution to the problem. They have designed a new power piston that fits between the main and reserve container divider flaps, putting it out of harm's way. The actuator cable that extracts the pins, runs through a housing that goes from the power piston to a stiffener on the reserve side flap at the grommet. This new design does more than solve the problem. It also opens the door to the possibility of putting a Ripcord Release on the main container. For prices and more information contact: SSE, 5801 Magnolia Ave., Pennsauken, N.J., 08109, (609) 663-1275.
((c) SSE, May '82)

Item #9 3-Ring Releases: The hardware used in the 3-ring release is cadmium plating over carbon steel. Since the plating is softer than the actual rings, small dents will appear on the rings as a new rig or risers are "broken-in". On older rigs, each ring has a flat portion around its circumference which is a result of the contact between the rings.
Inspection of the release system should include checking the slack on the short housing. Under canopy the short housing (normally on the right side) should not be under any tension. An indicator of an improper component (housing too short, or riser made to incorrect dimension) is abrasions to the grommets in the riser and on the housing end. Inspection should also confirm that there is metal to metal contact between each of the 3-rings; that with light tension on the harness and riser the rings are aligned (approximately parallel).

Item #10 FXC Model 12000 Installation on Tandem Rig:
The model 12000, when originally mounted on chest-type reserves, did not experience any altitude or premature actuation. But when installed in a piggyback system harness flexing/elongation is being experienced which can cause the hose to stretch and to possibly cause a premature actuation when above the altitude setting.
To ensure that this problem does not occur, the hose must be allowed to move freely. The use of loops to secure the hose to the harness is recommended rather than excessive tacking.
If your harness/opener could possibly experience a stretch situation, a new hose assembly is strongly recommended, which is 2 inches longer. This must be accomplished at FXC Corporation for a cost of $35.00 which includes the normal calibration testing ($25.00) plus the new hose assembly, $10.00. Please mail prepaid and the opener will be returned freight collect.
For international customers, send air parcel post only and do not claim the value above $250.00 US, for custom duty purposes. Otherwise any additional costs for customers will be added to the repair charges.
FXC wishes to thank the jumpers around the world who were helpful in testing this situation and proving this potential problem.
Please direct any correspondence regarding this modification, if required, or any other features of the FXC Model 12000 to: FXC Corporation, 3410 S. Susan Street, Santa Ana, CA, 92704-6997, Attention: Product Support. ((c) FXC Corporation)

Item #11 Reserve Conversion to 4 Risers:
The following parachutes may be converted for use with four riser legs. The conversion must be performed by an FAA Certified Master Rigger.

MODEL	CANOPY PART NO.
"K-20"	5375-1
"K-22"	5418-1
"Super 22" (Low Speed)	5050-1
"Super 22" (Standard)	5050-501
"K-26 Konical"	5400-1

Slide lines one-by-one and in order from one existing separable link onto two No. 6 Maillon Rapide Links, with equal number of lines on both Rapides. Repeat with remaining link. Install riser. CHECK FOR PROPER CORDING AND DIRECTION OF FLIGHT. Consult manufacturer for Riser Modification, if not compatible with Rapide. (courtesy Pioneer Para Co.(c))

Item #12 Stunt Jumps:
CSPA and USPA have both made a determination that fixed object jumping is not considered within the bound of Sport Parachuting. As such neither organization is publishing any information concerning such stunts nor is any disciplinary action to be taken against Association members performing such stunts.

Item #13 Student Tandems:
A recent incident has identified a potential unusual situation for students using tandem rigs where a cross connector is in place between the main risers. For the situation to occur the reserve must be activated before or at the same time as the main. An example would be where a student experienced a pull problem with the main resulting in a delayed activation, while at the same time the OAT activated the reserve. After both canopies inflated normally, the expected instruction to the student would be to cutaway the main. However, because the reserve was extracted between the main risers, a cut-away will result in the reserve being choked as the main riser and cross connector slide up the reserve lines to the skirt. (Note: On a tandem harness the reserve risers are attached behind the main riser attachment point.) The appropriate instruction in this situation is to remain with both canopies.
For more information concerning any of these items contact the CSPA Office or the author where noted.

TECHNICAL BULLETIN #14 1982

Item #1 Insurance Coverage:
Financial protection for the individual in the event of a parachuting accident or property damage claim continues to be a concern for the active parachutist. Following a lengthy series of meetings with representatives from our insurance broker, Reed, Stenhouse Ltd., and our insurance underwriter, General Assurance Co., some clarification of your coverage as a CSPA member and as a rating holder is in order.
As a member, your coverage by the CSPA Insurance policy is subject to the following constraints:

a. you are participating in parachuting jumps or related activities within North America (Canada and USA).
b. the coverage applies to property damage or personal injury sustained by another (third) party, whether that party is a CSPA member or not. (This assumes that you, the member, caused the damage by making, or attempting to make a parachute jump.)
c. the coverage does <u>not</u> apply to personal property damage or personal injury sustained by a member from his own participation in a parachute jump.
d. the limit of coverage is currently $1 million; the deductible portion, to be paid by the member causing the damage, is $250.
e. the coverage is based on adherence to existing CSPA Policy and Recommendations. It assumes strict compliance with administrative and financial aspects (i.e. payment of membership fees, prompt reporting of AIM's), along with a common sense application of the recommendations concerning actual jump activities.

As a CSPA Instructor, Rigger or Coach, your coverage by the CSPA Insurance policy is extended to include the following:

a. any claim for damages or personal injury caused or incurred by another CSPA member from his/her participation in parachute jump activities, where you provided supervision or assistance to that individual.
b. It is assumed that you were acting within the limitations of your rating and in accordance with CSPA's policy and recommendations.

The Insurer, General Assurance Co., relies on CSPA to prepare and revise the Policy and Recommendations concerned with "sanctioned parachute jumps and related activities" as necessary. This would Include the change necessary as a result of the introduction of a new type of parachute or a new training technique; changes as a result of the gradual evolution of parachute activities and the continuous accumulation of experience in parachute jumping and training; changes resulting from an administrative concern such as CSPA services or staffing changes, legal advice or Board of Directors actions.
Should you have any questions with regard to your coverage under the CSPA policy, these should be discussed with CSPA. The Executive Director and Technical Director may be able to resolve basic administrative and technical concerns. Special cases and major issues will be dealt with by the BoD and TT&SC.

Item #2 Equipment Modification:
An incident which was the result of a minor alteration to a main parachute system nearly cost a CSPA member his life. Following some general directions which appeared in a provincial newsletter an individual made a modification to his throw-away pilot chute, adding a tab which was to secure the pilot chute to its pouch. Unfortunately the directions as they appeared, left several items to the imagination, including correct placement of the velcro. Our victim, after making the alteration according to the directions, made a jump to try out his hand-i-work. He discovered that the hook velcro tab on the top of the pilot chute could stick to the mesh on the bottom, resulting in;

1) almost no drag,
2) a pilot chute in tow,
3) a bag in tow with a lot of loose line nearby,
4) a much lower than normal deployment after an intentionally high activation.

There are two concerns as a result of this incident. The first is home modification of parachute equipment, whether main or reserve or container. There is a certain amount of knowledge gained from an active involvement in parachuting (i.e. 400 jumps/year); there is some knowledge to be gained from attending courses or seminars, and reading magazines, etc; there is also an amount of information to be gained in looking at the work others have done, including discussing their reasons for making things as they are. Most important is the awareness (or knowledge) that the job at hand requires more information than what you have been given. If the details aren't specified, consult the author or an expert source (i.e. the manufacturer or CSPA).
The second concern is for the preparation of technical articles and directions. If you find yourself with the responsibility for writing this sort of material, be thorough. Check your resource material for similar articles; follow the format used in military directions or as illustrated in Poynter's Manual. Don't give anyone the opportunity to misinterpret your directions. Identify the equipment required, materials to be used, process to be followed, etc. Assume the person reading the directions is an idiot, even if you're certain that he couldn't possibly be one.

Item #3 Instructor Assisted Deployment:
A considerable amount of experience has been accumulated on this system within the last couple of years. The precise techniques for handling the pilot chute initially varied across the country. However, in reviewing our experience with the various techniques, it appears that one method is noticeably more reliable. To begin, IAD's are performed for students wearing tandem rigs which have a throw-away pilot chute system for main deployment. The usual method of exit is the dynamic technique rather than either the poised or flying exit. The pilot chute size, bridle length and pin configuration are equivalent to that found on a Wonderhog. The main canopy should be packed using a bag or raeper.
The dispatching technique requires the Instructor (Jumpmaster) to remove the pilot chute from the student's rig on jumprun. (The pilot chute may be stowed behind the back pad or in an elastic keeper.) As the student moves into the "Ready" position, the JM ensures that the bridle is clear (free) from the pin to the pilot chute, which he is holding. On "Go" the student exits from the door; as this is happening the JM leans forward towards the rear doorframe, extends his arm down and outward, releasing the pilot chute into the airflow behind the student. The pilot chute will rapidly extend the bridle, extracting the pin and then the main canopy. The Instructor will observe a deployment identical to what he would see if an expert parachutist exited the aircraft to perform a clear and pull.

It may be of interest that the DZ's using this method for IAD's are reporting a decrease in canopy malfunctions as compared with the numbers which occurred when they were holding the pilot chute to extract the pin.
Maintaining a grip on the pilot chute to extract the pin and perhaps the main canopy will cause increased strain on the components. It may also place the bridle, bag, canopy, or lines in a position where these are more easily grasped by a student.

Item #4 Rigger's Library:
Dan Poynter has provided a list of equipment manufacturers, their addresses, products and available packing instructions. The cost of various booklets is also identified. The attached list appeared in a recent issue of Parachutist .
Dan's company, Para Publishing, has produced numerous books concerned with parachuting including Poynter's Manual, the Skydivers Handbook, and study guides for American Instructor and Rigger ratings.

Item #5 Automatic Activation Devices:
At the 1975 AGM, the Board of Directors almost approved a motion which would have made AAD's mandatory for all student training operations in Canada. However, several parachuting experts felt that if clubs and centres were provided with information about AAD's, they would voluntarily introduce these safety devices. As a result of initiatives taken at that meeting numerous seminars were held across Canada disseminating information concerning AAD's. At the same time, CSPA undertook the project of lobbying the Federal Government in order to have the customs duty removed from imported AAD's . This was finally realized in 1980. At this time a significant number of Canadian DZ's are using AAD's.
In the past 24 months there have been four student fatalities. In all four cases, an automatic activation device might have helped prevent the fatality. The accidents did not occur at major commercial centres where hundreds of students are trained each year. Can you do any less? Think about it! These organizations ensure that every student is wearing an AAD on each and every jump. These accidents occurred at small clubs where a limited number of students are trained each year. Centre operators count on their AAD's as a practical back-up for human error.
Note: It is interesting to see that once again, there is a proposal before the BoD which would make AAD's mandatory.
The Rigger's Library
by Dan Poynter
In the last few years there has been a virtual explosion in parachute equipment Accompanying this proliferation of parachutes is an avalanche of paper: the necessary packing instructions, change notices, owner's manuals and other support publications. These manuals are an absolute necessity to the parachute rigger and are very useful to anyone who has purchased, or who is contemplating the purchase of, used equipment
Here is a current rigging publication checklist You may wish to send for one or all. The prices noted include shipping charges and have been recently verified by the source

Advanced Air Sports Products, Inc	
990 East Lakeshore Drive	
Lake Elsinore, CA 92330	
Preserve I & III	$1.00
Tandem FFE-102	1.00
Enterprise, Emergency Back	1.00
Paradactyl	1.00
Double Keel Dactyl	1.00
Back Up System, Hang Glider	1.00
Alpha Para-Equipment	
Rt #2, Box 140	
Bardstown, KY 40004	
AL-2 "Telstar" reserve packing instructions	$1.00
Comet International Air Inc	
2233 Huron Drive, South	
Santa Ana, CA 92704	
CRW 228 Square	n/c
Deville & Company	
302 Connie Lynn Drive	
Monroe, LA 71203	
DevCo Container	n/c
Embury Sky Systems, Inc	
33330 Westlong Street	
Lake Elsinore, CA 92330	
24'& 26' Hang Glider Parachute	n/c
22' Hang Glider Parachute	n/c
FXC Corporation	
3135 West Warner Avenue	
Santa Ana CA 92704	
Model 8000 automatic opener's manual	n/c
Model 12000 automatic opener's manual	n/c
The Jump Shack. Inc	
29706 Grand River Avenue	
Farmington Hills, MI 48024	
SST Owner's Manual	n/c
Pull Out Pilot Chute	n/c
SST Racer-Trainer	n/c
The Altitude Shop	

917 Tennessee Street
Vallejo, CA 94590

Top Secret Piggyback Reserve Packing Instructions	$3.00
Classiflier Piggyback	3.50
Corsair Piggyback	3.50
Notice on Top Secret	n/c
Notice on Classiflier	n/c
Notice on Flap/Lines	n/c

Butler Parachute Systems, Inc.
401-A East Fawnridge
Austin, TX 78753

BETA Emergency System	$5.00
NAA Condor Piggyback assembly and packing instructions	.50
Jalbert Para-Foil(5- and 7-cell)	.50

Para-Flite Inc. and Steve Snyder Enterprises, Inc.
5801 Magnolia Ave
Pennsauken, NJ 08109

Strato-Star Flight Manual	n/c
Strato-Star and Strato-Cloud with the "slider' reefing method packing instructions	n/c
Sentinel MK 2000 Automatic Opener Owner's Manual	n/c
Para-Plane: Installation instructions for reefing line with swivel attachment bulletin	n/c
Para-Plane PCR swivel attachment diagram	n/c
Para-Plane Flight Check Trim Method 6 July, 1973	n/c
MK 2000 Sentinel mod for Strong POP TOP Reserve Sys.	n/c
Sentinel MK 2000 serials 4913-5700 recall notice	n/c
Sentinel 2000. Other Pin Spacings	n/c
Para-Flite Canopies. Instructions	n/c
Paralert	n/c
MT-1/MT-2	n/c
Strato-Flyer	n/c
Parts List	n/c
Safety-Flyer	n/c
XL-Cloud	n/c
Safety-Star	n/c
Cruisair	n/c

Para-Gear Equipment Co
3939 West Oakton
Skokie, IL 60076

Para-Commander Handbook, by Lewis	$3.00

Para-Innovators
171 E. First St.
Perris, CA 92370

Piglet "2" Main Canopy Packing Instructions	$1.00
Piglet "2" Reserve Canopy(60A114e3,26') Packing instructions	1.00

National Parachute Supply
P.O. Box 1000
Flemington, NJ 08822

NP-5 packing instructions	$0.50

North American Aerodynamics
Hwy. 202
Flemington , NJ 08822

NAA-1 Mini-System Reserve Assembly & packing instructions	$0.50
NAA-P-1 Mini Pig Reserve Assembly & packing instructions	0.50
NAA Flat Pack Reserve Assembly & packing instructions	0.50

Parachutes Australia Pty. Ltd.
68 Wentworth Ave
Sydney, NSW 2010
Australia

Pigmee Owners manual	$2.75
Pigmee Change Notice #3	n/c
Pigmee Change Notice #5	n/c
Pigmee Reserve Packing Instructions	n/c
Slimpack Packing Instructions	1.00
Slimpack Safety Notes	n/c
Pull Out Pilot Chutes	0.50

Pioneer Parachute Company Inc.

Pioneer Industrial Park
Manchester, CT 06040

Para Commander Owner's Manual	$1.50
Para-Sail owner's Manual	1.00
Operating Procedures for Ascending Parachutes & Self-inflating Wings by Neumark	3.00
Thinpack Parachute Assembly (PA-TP-26-(2) Packing Instructions	3.00
Jerry Bird Auxiliary Container (PIN 2612-1) Packing Instructions	n/c
26' Diameter Auxiliary Parachute (PIN 2324 & 2412) Chest type assembly packing instructions	n/c
Packing instructions, supplement for the Pioneer 23' and 27' Russian Para-Commander	n/c
Packing instructions, 23' diameter chest reserve	n/c
Packing instructions, PA-QAC-28	n/c
Packing instructions, PA-9-B	n/c
Packing instructions, 23' diameter Para Twin reserve	n/c
Paradactyl Canopy Flight Manual	1.50
Razzor-Back Owner's Manual	1.50
Volplane Owner's Manual	1.25
Volplane packing Instructions amendment	n/c
Russian Para-Commander Safety Bulletin 17 Oct 1973	n/c
23' & 26' Auxiliary Parachute Notice August 1975	n/c
23' Tri-Conical Notice, 16 August 1976	

Rogersport
467 Speers Road 33
Oakville Ontario L6K 3S4
Canada

E-Z Flyer Flight Manual	$2.00

Sky Sports Inc.
RR #2
Hutchinson, KS 67501

Micro-pig and Super-pig packing instructions	n/c

GQ Security Parachutes Inc
P.O. Box 3096
San Leandro, CA 94578

Crossbow Manual	$1.00
150/250 Safety-Chute Manual	3.00
500/550 Seat Safety-Chute Manual	1.00
Thunderbow Manual	.50
Sierra Reserve Packing Instructions	1.00
SAC Manual	.50
26 LoPo Reserve Manual	.50
350 Series Safety Chute Manual	3.00
Unit Manual	2.00
System Manual	2.00

Sky Supplies, Inc
Rt #1, Box 894-A
DeLand, FL 32720

Rapid Transit System	n/c

Strong Enterprises
11236 Satellite Blvd
Orlando FL 32809

Stylemaster and Starmaker Service Manual (SC 304)	$1.00
POP TOP Reserve Service Manual (SC 305)	1.00
Para-Cushion Seat Service Manual (SC 307)	1.00
Para-Cushion Back Service Manual (SA 111)	1.00
Starlite Service Manual (SC 309)	1.00
Supplemental Packing Instructions for Diaper Equipped 26' Canopy	.50
Eagle System Tandem	1.00
Sentinel Tandem Installation	n/c
Lite Canopy/SST Container	n/c
Lite Canopy/Diaper	n/c
Combination Tandem	1.00

NOTE: Many of the above listed manuals and more may be ordered from single sources. Write to the following for complete listings
Para-Gear Equipment Co., 3839 W. Oakton St., Skokie, IL 60076; or
Butler Parachute Systems, Inc., 401-A E. Fawnridge Dr., Austin, TX 78753
Manuals, information and kits for in-flight line release systems (reserve steerability modification) may be obtained from

Para Innovators, 171 East First St, Perris, CA 92370
Para-Gear Equipment Co, 3839 West Oakton St, Skokie, IL 60076
Charles K Waters, 3409 Canyon Drive, Waco, TX 76708

The Military Connection

There are some very good military manuals available to the general public. The problem is that they are little known outside the services and few of the people who know of them know how to obtain them

× To get the two-inch thick, loose-leaf assembly and packing treatise published by the U S Navy, specify "Manual, AirCrew Systems, Parachutes, NAVAIR 13-1-6.2" and send $10 to Director, Navy Publications and Printing Service Office, Building 157-2, Washington Navy Yard, Washington, DC 20390

× To get the technical manual published by the Air Force specify AD-A070 251 (paper), Recovery Systems Design Guide and send $24 to National Technical Information Service, Department of Commerce, Springfield, VA 22151

× The Navy School manuals have been changed and they contain little of value to the sport rigger/jumper now. They may still be obtained from some parachute dealers. Ask for "Navy Manual, Aircrew Survival Equipmentman 3&2" at about $5 and "Navy Manual, Aircrew Survival Equipment 1&C" at about $4 50

× Other manuals useful to the rigger and sport parachutist are "The Parachute Manual" at $30.95 and "Parachuting, The Skydivers Handbook" at $6.95, available from Para Publishing, P O Box 4232-204, Santa Barbara, CA 93103

× Information on the Stevens Cutaway System may be obtained from Stevens Para-Loft, Antioch Airport, Antioch, CA 94590

× Your rigging library will not be complete without some important USPA documents, available through USPA, 806 15th Street Washington, DC 20005 Include payment with your request

USPA Part 114 JIM Checks & Briefings	$0.50
USPA ParT 119 Auxiliary (Reserve) Parachute	0.50
USPA Part 120 Equipment	0.50
USPA SOP 21 Equipment Defects	n/c

Publications, like tools, are a prized possession of the parachute rigger, he wants a complete and up-to-date set. To the non-rigger, the information they contain is vital, interesting and educational Build your parachuting library by sending for the above listed publications today

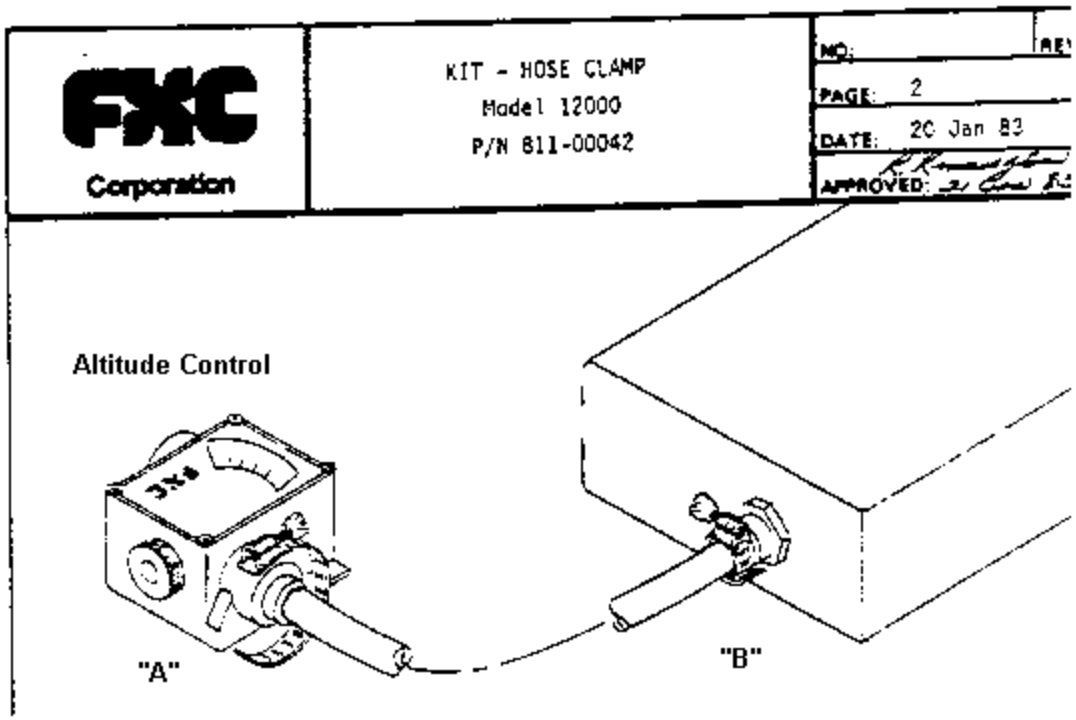
TECHNICAL BULLETIN #15 1983

Item #1 AAD Warning:
The FXC Corporation recently issued the following warning. It concerns FXC 12000 units, serial numbers 3370 through 4933. It concerns units which have a metal hose assembly.

Caution Due to certain types of FXC Model 12000 Automatic Parachute Release installations on sport parachuting harnesses and aerial manoeuvres, it has been brought to the attention of FXC Corporation that the Automatic Parachute Release (AAD) may experience severe strain and function prematurely.
While FXC takes no responsibility for the AAD installation, on previous occasions it has notified manufacturers of harness/containers and riggers of preferred considerations for mounting of the AAD.
These considerations include:

1) Do not disassemble the AAD.
2) Mount the Altitude Control on the front of the harness.
3) Mount the AAD In such a manner that the Hose/ Housing have smooth bends.
4) Make sure that the Altitude Control Hose has movement and is not tight to the harness.
5) Install the Mounting Plate in such a manner to assure in-line (direct) pull of the pins during activation.

To further reduce the risk of premature firing, FXC has available Kit/Installation Instruction. It is recommended if the user expects to experience harness deformation during opening or during free-fall manoeuvres, he should consider requesting this kit. It will be mailed to you free of charge or, if you prefer, clamps will be installed during your next scheduled servicing at FXC.
Please check your FXC units immediately. For further information contact: Howard M. Weiske, Director of Marketing, FXC Corporation, 3410 South Susan St., Santa Ana, California, 92704, USA, (714)556-7400.



Instructions:

1. Place clamp strap around hose assembly - Figure A, (Typical both ends)
2. Re-thread clamp strap back into clamp as shown - Figure B, (typical both ends)
3. Locate clamp as close as possible to each end of braided hose.
4. Tighten clamp, using screwdriver, until firmly secure.
5. Cover the hove clamps with vinyl-type tape to prevent any sharp edges or protrusions

Item #2 Reserve Guide Rings:
The following notice was recently distributed by the Jump Shack Inc. It is of interest to anyone using an SST Racer, and for all riggers.

All SST/Racers with Ram Air Reserves MUST be inspected immediately by an appropriately rated parachute rigger. All SST/Racers with Ram Air Reserves are hereby grounded until an inspection of the reserve steering guide rings has been noted on the reserve packing data card.
Three random failures of toggle rings on main ram air canopies have been reported by G.Q. Security Parachute Inc. Toggle rings from the same lot may have been used by Lite Flite Inc. or field riggers on SST/Racer main and reserve risers. The ring involved is a 3/4 inch inside diameter "O" ring. This ring must be replaced with a 1 1/4 inch outside diameter, 1 inch inside diameter, solid steel ring (Para-Gear part number H424, or equal) on all SST/Racer reserve risers with a ram air canopy installed.
No failures of the 3/4 inch I.D. ring have been reported on the SST/Racer but replacement is required on reserve risers if a ram air canopy is installed. For further information, contact The Jump Shack, 29706 Grand River Ave., Farmington Hills, Mich. 48024, USA.

Item #3 G.Q. Security Equipment Bulletin:
The following information was contained in a service bulletin released by G.Q. Security:
Upgrading the reserve riser steering guide ring to Alpha System (all) System, System II, and System III manufactured for X-2TEN(R) Reserve.
In the month of October, 1982, three Unit IV main canopies failed a single toggle guide ring each. Two of these were being used in high altitude, high speed opening conditions, one in normal skydiving activities. There have been hundreds of such high altitude jumps, and literally thousands of low altitude deployments, all without failure.
This bulletin is being issued as a precautionary measure to upgrade the reserve brake system and reduce the likelihood of failure.
There have been no known ring failures on any of the above mentioned systems.
If your Alpha System has a round reserve packed, not utilizing the toggle rings, the rings (if installed) may be replaced at the next scheduled reserve repack.
Specific installation details are available from G.Q. Security or CSPA. The manufacturer has specified that the work must be performed by a master rigger.

Item #4 Acrylic Jumpsuits:
Clubs and Centres who are actively involved in student training, as well as jumpsuit manufacturers will be interested in the following information which has recently been brought to CSPA's attention.
In Canada and the USA, there are federal regulations governing the manufacture of any garments worn as clothing. One of these regulations precludes the use of flammable materials for any item of clothing. These regulations were recently brought to the attention of several jumpsuit manufacturers and to the PEIA. Some fabrics, such as cottons are treated with a flame retardant, if they are to be used in clothing manufacture.
In the coming weeks, jumpsuit manufacturers will be providing warning-notices to their customers. Organizations who are training students may wish to ensure that their students are provided with non-flammable jumpsuits. Experienced jumpers should be advised of the dangers of wearing an acrylic suit should it come into contact with an open flame, power lines, or hot metal such as an A/C exhaust or a smoke canister. It is a known fact that acrylic fabrics are highly flammable. In previous years, several warnings have been extended to experienced jumpers. Student parachutists are seldom as well advised.

Item #5 Throwaway Pilot Chutes:
Recent incidents have brought attention to a malfunction possibility of a throw-away pilot chute where braided suspension line is being used as the bridle cord. During activation several expert jumpers have experienced a pilot chute-in-tow situation as a result of the bridle forming a half-hitch around the pilot chute fabric.
Some manufacturers of this type of pilot chute were contacted. Their experiences parallel those which had been reported to CSPA. Virtually all of the malfunctions reported to them involved small diameter (28"-30") pilot chutes. They indicated that these malfunctions were infrequent, however, they would not recommend this type of pilot chute for use by student parachutists.

Item #6 Smoke Generators:
Several individuals have contacted the Office looking for a Canadian source of smoke generators. Three types (SC43, SC811 and SC42) are available from H and C Chemical Industries, 221 Nipissing Rd., Milton, Ont., L9T 1R3.
As these items are controlled under the explosives act, specific federal requirements must be met in order for an individual to purchase smoke generators. For further information contact the company. Prices for the 2-3 minute generators range from $15 - $25 per unit.

KIT HOSE CLAMP DIAGRAM GOES HERE

Instructions:
1. Place clamp strap around hose assembly - Figure A, (typical both ends).
2. Re-thread clamp strap back into clamp as shown - Figure B, (typical both ends).
3. Locate clamp as close as possible to each end of braided hose.
4. Tighten clamp, using screwdriver, until firmly secure.
5. Cover the hose clamps with vinyl-type tape to prevent any sharp edges or protrusions.

Item #1 Mini 3-Ring:
In late 1981, Para-Flite introduced a miniature version of the 3-ring release combined with the introduction of the Swift System. The rings used on the harness were the size of the middle ring in the existing system, but were specially manufactured for increased strength.
Recently reported incidents of deformation of the largest ring in mini 3-Ring installations have brought a dangerous situation to our attention. Some mini 3-Ring installations have not utilized the strengthened mid-ring. Two rings which were forwarded to the office after being removed from tandem harnesses showed significant deformation into oval shapes. Both rings had been utilized as the largest ring within a mini 3-Ring installation on sport tandem rigs. Neither had been subject to excessively high loadings nor an extensive number of opening loads. Both rings had a noticeable surface texture consisting of numerous lines following the circumference of the ring in a manner similar to a bicycle or motorcycle tire. These lines were evident on all surfaces of the ring (i.e. front, back, inside, and outside edges), running parallel, 1 to 2 mm apart. These concentric lines are not evident on approved 3-Ring hardware. The 3-ring system would not release through either of the deformed rings.
Should you find mini 3-Ring installations where these lines are evident on the largest ring (harness attachment), ensure that the rig is not utilized until the manufacturer can be contacted, confirming the source and reliability of the rings, or until the rings are replaced with rings of adequate strength. Contact the CSPA office for further information if necessary. The source of this sub-standard hardware has not been identified at this time.

ITEM #2 FXC Corporation Service Information:
Automatic activation devices (AAD) are now required in all student training operations (CSPA Policy). To ensure that the FXC 12000 units in service achieve a high level of performance reliability, the FXC Corporation has provided the following service information.
The housing connecting the control unit to the power unit should not be placed under tension. Proper attention to mounting instructions from FXC and the rig manufacturer will ensure that this housing is not stressed. FXC recommends the replacement of the rubber housing with the metal shielded housing (see item 3). With the metal shielded housing, the installation of hose clamps (see Technical Bulletin #15) is necessary to ensure that no leakage occurs. Installation of the metal shielded housing is recommended by FXC, but is not mandatory. Use of the hose clamps with the metal shielded housing is required.
FXC no longer produces the tool box style test chamber. On inquiry, they advised that their stock of these test chambers has been exhausted. A larger version of the test chamber is available although it is significantly more expensive. This larger version test chamber allows easier testing of the FXC devices, including adjusting test rates of descent.
For test firing of the FXC devices, it is recommended that a shock absorbing material be placed around the cable at the mouth of the housing or that the cable be attached to some drag load. This will prevent the nylon plug and parts within the power unit from being damaged during test firings.

Item #3 User Results:
A number of user problems have been reported, related to the use of FXC devices by sport parachutists at clubs throughout Canada. Investigation and analysis of this information is underway at present. All clubs and centres are encouraged to maintain records for each of their AAD's (by serial #), recording every AAD activation, with details of the situation. All such information provided to the CSPA office is reported to the manufacturer.

a. Testing and Calibration: several organizations who have access to test chambers report that their units require frequent calibration adjustments. All of these centres emphasize the necessity for regular testing of their AAD's. CSPA is presently compiling a list of available testing facilities within Canada. At present, repairs are only available at FXC Corporation, California, USA.
b. Field Inspection: if a unit is suspected to be non-serviceable, several items may be verified by visual inspection prior to shipping the unit to a testing or service facility:
   - the hose connecting the control and power units, if metal shielded, must be fitted with hose clamps at either end. Field reports do not indicate significant problems with the rubber hose as long as it is not stretched during parachute deployment.
   - at the control unit, the calibration knob should not be separated from the housing. If it can be pressed inward, it requires adjustment. There should be no in/out movement.
   - removing the face plate of the control unit, a thin brass shim should be visible between the aneroid capsule and the housing. If this shim is bent, it must be replaced. When removing the indicator scales from the control units, be certain that they are not interchanged between units. These scales may be slightly different; each unit is calibrated to its own individual scale. Interchanging these scales may result in miscalibration of an AAD.

   Calibration: The FXC 12000 units should be calibrated prior to every jump. Proper procedure involves turning the safety knob to the "Jump" position, then using the adjustment knob to move the indicator needle to a point on the scale higher than the desired activation altitude and then back down to the desired setting. Care should be taken when making this adjustment as the knob is connected directly to the aneroid capsule. Use of excessive force could damage delicate parts within the control unit.

Item #4 Analysis of Reserve Deployment Systems:
Para-Flite Incorporated recently completed an analysis of reserve deployment systems. Their principal concern was an assessment of the reliability of their current deployment system. The study, conducted by an independent testing laboratory, was divided into two phases. The first phase was a series of bag extraction tests, conducted in a wind tunnel. The tests used wind speeds of 60 mph (3 tests), 100 mph (3 tests), 150 mph (1 test), and 180 mph (1 test); all extractions were documented using high speed 16 mm movie filming. Three rigs were tested at each airspeed increment. The film was studied using a motion analyzer. For the test, a free bag system was used. Reserve canopy weights were 5 lbs, 8 1/2 lbs, and 10 1/2 lbs. The results were as follows (total 25 test runs):

a. One pair of O-rings broke at 150 mph load; One O-ring broke at 120 mph load; One pair of O-rings broke at 180 mph load.
b. 1) The reserve canopy was removed from the pack tray even when both O-rings broke.

2) Maximum acceleration occurred about 4 feet from the pack tray.
3) With increased airspeed, the point of maximum acceleration was marginally closer to the pack tray.

c. Some increase in extraction speed was evident with increased airspeed, but not a direct (linear relationship):
airspeed 120, extraction 90 - 100 fps
airspeed 150, extraction 95 - 140 fps
airspeed 180, extraction 95 - 150 fps

d. The load exerted on the bag (and closing loops) by the canopy shows some increase with increased air speed:
airspeed 120 mph load 150 - 180 lb/sq. ft.
airspeed 150 mph load 110 - 170 lb/sq. ft.
airspeed 180 mph. load 180 - 270 lb/sq. ft.

The second phase of testing was a deployment bag/locking stow study and analysis. An evaluation of bags with 2, 3 and 4 stows was conducted. Both static and dynamic tests were conducted; in each case both O-rings and rubber bands were assessed for their relative strengths. The results of the tests follow:

a. The dynamic test placed a 140 - 150 lb load on the bag. During testing no O-rings broke, while rubber bands failed only infrequently. Hence, O-rings may be more consistent in strength than rubber bands.

b. The static test measured the force necessary to extract the canopy from the bag and the distance travelled in accomplishing this.
- 2 stows, retention force 170 - 180 lb (rubber) and 205 - 260 lb (O-ring),
- 3 stows*, retention force 280 - 330 lb (rubber) and 290 - 375 lb (O-ring),
- 4 stows, retention force 250 - 280 lb, with rubber band or O-ring.

*Note: the 3-stow configuration utilizes a standard 2-stow arrangement with the third stow centred between, not the more common arrangement of one stow in the centre with the two stows near the outer edges of the bag.

c. Attaching the stowing bands (rubber or O-ring) to the tongue of the bag with grommets on the bag resulted in frequent bag locks. Bag locks were also easily achieved with one suspension line out of place. However, as long as the stowing bands can break, the consequence is not catastrophic.

Test Conclusions: Stripping the canopy from the D-bag when using a 2-stow system (O-rings) is highly improbable. Utilizing a heavy reserve canopy and a high drag pilot chute, breakage of both stowing bands did not occur until speeds in excess of 150 mph were used. In these cases, the canopy was released from the bag approximately 4 feet from the pack tray. With smaller, lighter reserves, the extraction speed must approach 200 mph to break both stowing bands. For normal sport parachuting activities, a 2-stow system with O-rings (size 01-222) is more than adequate. Para-Flite is testing for TSO, a new method Safety Stow for use with heavy reserves at high speed and/or high altitude. For more information contact Para Flite Inc., Pennsauken, N.J. A copy of their Technical Report is on file at the CSPA office.

Item #1 3-Ring Release:
During the course of the season, several incidents of premature release of the main riser(s) occurred. After inspection of the equipment in question and consultation with the manufacturers concerned, these occurrences can be ascribed to misassembly of the release system. The misassembly may occur when an individual jumper is connecting the risers to the harness or where a rigger installs the cutaway housings, constructs the risers, etc. Note: although most 3-ring release components on the market to-day are supplied by or manufactured to the specifications of 3-Ring, Inc. the patent holder (Bill Booth), there are some non-approved parts and components available. Recently, the Relative Workshop and 3-Ring, Inc. introduced cables and housings marked by a yellow colour and "RW" initials to assist in the identification of standard components. Riggers and Instructors are encouraged to inspect their student equipment as well as their own gear to ensure that the 3-ring releases are comprised of standard parts, properly constructed and installed on the rig in addition to being correctly assembled.
To inspect the 3-ring Installation, there are several items to check. First, the cutaway housings should be properly finished at both ends. At the handle end, each housing should have a brass ferrule which will prevent the cable from being snagged or the housing from unravelling. At the riser end, each housing should have a metal terminal fitting outside another brass ferrule. The terminal fitting must show visible evidence of having been swaged (i.e. two distinct indentations); it should be covered with yellow heat shrink tubing bearing the initials RW. On older installations the heat shrink may be black in colour. The terminal fitting which is marked (AMP 4*, 40-50) has a "0" grommet fitted into it.
Second, the rings must be linked correctly: middle through large; small through mid (but not large); fabric loop through small (but not mid), continuing through the #2 riser grommet to the back of the riser. It is not possible to inspect the bar tack which holds the loop to the riser as it is covered by a confluence wrap of 1" type IV tape. The rings when folded into position, with light tension applied to the riser must be in metal to metal contact, lying roughly parallel to each other. The cable must be routed through the housing, through the fabric loop (white) which is captured in the grommet on the terminal fitting, then into a pocket of the back of the riser for a distance of six inches (measured from centre of the riser grommet). Pulling lightly on the terminal end of the cutaway housing should not cause the system to release. The cable must not be twisted to form a pigtail at any point.
Third, the housings, especially the short housing, must be installed in a manner such that tension can not be applied to the housing or the white fabric loop when the risers and harness are loaded. Remember that while the canopy is deploying (snatch force and opening shock), the harness is subjected to loads which are sufficient to cause the harness and riser webbing to elongate (stretch). When suspended under canopy (or connected in a hanging harness) the housing should not be under tension. It should be possible to move the terminal fitting to a position above the grommet in the riser without substantial effort. The recommended method of tacking the housing will allow upward movement of the housings, but will not allow them to move downward (direction of cutaway pull). If the housing are securely tacked in a manner which allows no upward or downward motion, proper positioning is critical. In this situation, on opening with above normal loads could exert tension on the housing causing damage which could result in a premature release.
Fourth, when inspecting an old (used) 3-ring look for signs of wear. Surface abrasions on either grommet (terminal fitting or in riser) indicate some tension on the housing. Wearing on the fabric loop or around the riser grommet indicate loading damage. The 3-rings should have marks on their surface indicating metal to metal contact. The stitching anchoring the large ring to the riser must be a 4-point WW stitch pattern with a row of stitches across the top 4 points (2 3/4" length).
The 3-ring release system has proven to be ,a very reliable system, with no known failure modes other than improper manufacture or misassembly. It takes very little effort to check that it is properly installed and assembled, but that time and effort must be taken. For clarification or further information, contact either the Relative Workshop or the CSPA Office.

Item #2 Reserve Parachute:
While every skydiver is required to wear a second parachute, very few individuals (Riggers and Instructors included) extend much concern towards this canopy until they or their student are suspended underneath one of them. Numerous recent incidents have recounted the various "surprises" which followed reserve activations. Slow deployment of the reserve has resulted from having the pilot-chute attached by a bridle which is shorter than recommended. Another cause is the hesitation of the pilot-chute because the spring was partially extended inside the container; the small canopy in a larger container with long closing loops allowed the spring to extend.
Steering a reserve is not always as easy as it seems. Vented reserves, particularly when attached to risers in a tandem rig, do not turn at a satisfactory rate if you pull on the suspension line; it is very difficult to pull in a significant amount of line. A sliding soft toggle provides much superior directional control. Some reserves are designed and tested on a 4-riser system. When placed on two risers the forward speed and rate of turn of the reserve may diminish considerably, but it will still open. From experience, the manufacturers generally agree that a LOPO 4-line release reserve is harder to turn, has less forward speed and is more likely to sustain damage during deployment. The 4-line release configuration performs very poorly when installed on a 2-riser rather than 4-riser system.
As well, some individuals continue to experiment with reserve canopies by removing the factory installed diapers, filling in or altering the canopy vents, and in one instance, change an apex vent cap. If you are not convinced that your reserve is what you want, sell it and buy one which is. Don't destroy the reserve by making major alternations (unless you are a Master Rigger).

Item #3 Standards for Manufacture:
In recent years, a wide variety of rigs and canopies have appeared on the market. In essence, a buyer can put together a functional system by purchasing a main canopy, a reserve canopy and a tandem rig. Of course the container must be sized to fit the canopies. Unfortunately, the whole thing, once assembled, doesn't always perform as advertised. The numerous reports of malfunctions, and close calls received at the office confirm this is the case. Not all the incidents are reported either, since some are rather embarrassing. To date, the equipment buyer (or his rigger) has been faced with the problem of how to fit the toggles which came with the canopy, to the matching risers which were supplied with the rig. What about the bag that was with the canopy which is narrower but longer than the pack tray of the main? More serious, but less evident is the vented reserve canopy which is packed without toggles because none were supplied with the rig. Then there was the reserve which had a 14" bridle of tubular nylon because nothing else was available when the rig was assembled. The 14" bridle is even too short for a chest mounted reserve but none the less it was installed with a tandem reserve.

In the USA, there are standards for testing equipment before it is put on the market. In Canada, there are no such standards. Senior jumpers and rating holders must take extra care to ensure that individuals are fully informed before they purchase equipment. In addition, regardless of his/her number of jumps or years in the sport, the individual's gear should be checked for proper assembly before it is used. It is better to be surprised at the packing table than at 1,000' AGL.
In the coming months, the PEIA, a group of American equipment manufacturers will be completing a set of standards for the delivery of parachute equipment. In essence, this document defines the accessories which will accompany each item (main, reserve, rig) as it is shipped to the customer. The main canopy is to include connector links, lines, canopy, steering lines and bridle attachment. The reserve canopy will include links, lines, canopy, deployment device (i.e. diaper or bag) and bridle attachment. The rig (harness and container) when shipped will include the main deployment device (bag or pod), the activation system, (hand deploy or ripcord), the main risers and toggles, and for the reserve the risers, toggles and bridle. At this point the only thing missing is the spring-type pilot-chute (e.g. MA-1). It is hoped that manufacturers throughout Canada adopt this set of standards also. Further, Riggers and Instructors (Coaches, too) must raise the level of awareness concerning equipment at their own DZ. No steerable reserve should be packed without adequate steering controls (i.e. toggles). Saving the individual from a high speed impact is a marginal success if he is seriously injured in a downwind, tree or power line landing shortly after.

Item #4 Para-Flite Ram-Air Reserve:
As a result of a square reserve deployment system analysis project conducted by Para-Flite, they have developed an improved deployment bag closing method. They have named it the Safety Stow. The Safety Stow has two advantages over conventional deployment bag retention methods:

1) It has at least twice the retentive strength of two, three or four conventional locking stows and
2) It is much less likely to possibly have bag locks caused by incorrect or sloppy packing.

Because of the Safety Stow's ability to retain the canopy in the deployment bag even under adverse conditions such as very high speeds, or very high snatch forces generated by the combination of high drag pilot-chutes, high speeds, and heavy weight reserve canopies. Para-Flite recommends that the Safety Stow be retrofitted to the following reserve canopies:

Safety Flyer,
Safety Star,
MT-1 and MT-2.

The retrofit should be accomplished during the next repack cycle. Retrofitting of the Safety Stow is optional on the following reserve canopies:

Swift Reserve,
Cirrus Reserve and
MT-15.

Retrofit instructions and kits are available from Para-Flite. If you have any questions, please call or write to Para-Flite.

Item #5 SKY SUPPLIES issues Bulletin on MIRAGE Container System:
Sky Supplies has made a minor change to the design of an internal flap of its Mirage reserve container. Mirages built before April 1, 1983, should be modified to the new configuration. The work may be done by an FAA Master Rigger or Sky Supplies.
The change involves shortening the #1 kicker flap. Sky Supplies will perform the work at no charge. Owners should contact Sky Supplies before sending their rigs in.
Separately, Sky Supplies has detailed instructions for packing ram-air reserves in either the Rapid Transit System or Mirage rigs. It also has prepared compatibility charts showing which canopies will fit in the various containers built by the company. (Both the Rapid Transit System and Mirage are custom built in a wide variety of container sizes, and it's important to match the container with its canopies.)
For more information, contact The Annex, Inc., DBA Sky Supplies, 1738 Patterson Ave., DeLand, FL, 32720, (904) 734-9641, Mon-Thurs.
AIM REPORT - SAMPLE SUMMARY
CASE #1 - INCIDENT
MID AIR CANOPY COLLISION
SETTING: Two experienced jumpers exit different aircraft on separate passes over the exit point from 7,000' and 9,000' altitudes. One aircraft is a style load while the other is a relative work load. Reasonable separation had been maintained between the two aircraft and the two groups of participants. During the canopy descent, jumper #1 is set on final for an accuracy approach when jumper #2 initiates a series of spiral turns, descending through the final approach path of jumper #1. Collision occurs at approximately 400' AGL with jumper #2 initially brushing the leading edge and immediately making full contact with the top skin of jumper #1's canopy.
OUTCOME: Extensive damage caused to jumper #1's canopy with momentary loss of control. No reported injuries to either parties following safe landings.
RECOMMENDATIONS: More awareness of traffic in confines of bowl area should have been demonstrated by top individual. VFR principles (see and be seen) along with preplanning intended manouvers (i.e. CRW, accuracy, etc...) should be observed more attentively. With more than one aircraft in the air, look to see if you are sharing the air space.
CASE #2 - ACCIDENT
MULTIPLE FRACTURES - TIBIA AND FIBIA LEFT LEG
SETTING: 31 jump novice who recently had been transitioned from a round to a square canopy was part of the first load after a windhold. Dropped WDI and novice self spotted under the supervision of Instructor A. Normal delay from 7,200' AGL. Spot was good according to WDI indicators. Winds were called 10-15 knots from ATC but ground observers noted significant gusting of surface winds at DZ. High winds resulted in significant overshoot of DZ with attempt to land on a narrow road close to DZ.
OUTCOME: Turbulence was encountered close to the ground with actions taken to avoid power lines resulting in a high speed tree landing.
RECOMMENDATIONS: If there exists any doubt as to conditions after WDI measurement is taken, air-to-ground communications should confirm actual conditions. Novices should be briefed as to abnormal wind conditions (i.e. gusts, turbulence) as well as to the selection of an off DZ landing site (air photo of DZ area is useful). For example, an open field upwind from a row of trees may provide a suitable alternate away from gusts and turbulence. Caution should be exercised if a road is chosen as landing site. Visual checks must be performed to confirm area as safe for yourself and other users (i.e. cars,

farmers, etc...). Telephone and hydro lines are obstacles which might not be apparent until very close to the ground and the possibility of oncoming vehicles could present some difficulties

CASE #3 - INCIDENT

PREMATURE ACTIVATION OF MAIN CANOPY FROM STRUT OF CESSNA-182

SETTING: Upon initiating climb-out for a poised type of exit, the jump door brace bar slipped and lodged itself under main ripcord housing. Once in place, individual performed exit motions which forcibly activated the main parachute container.

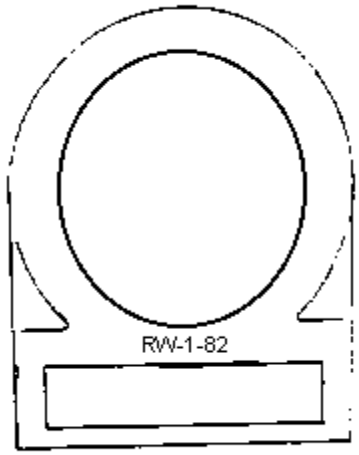
OUTCOME: Pilot-chute and remainder of main canopy assembly were extended into the slipstream and underneath horizontal stabilizer area at which point the jumper was pulled off aircraft. Normal opening developed as assembly became clear of aircraft.

RECOMMENDATIONS: As per section 5.7 1 in PIM One, an equipment inspection should be performed prior to every jump. Exposed ripcord cables, and ripcord housings should be protected from sharp and protruding objects found on the aircraft. Proper operation and use of the jump door is immeasurable to the safety of all concerned. If need be, removal of the door should be considered.

Item #1 Safety Warning, 3-Ring Release Grounding*:
All Wonderhog II's, Sprints, and Vectors with the large rings of the 3-ring release stamped RW-I 82 and the RW-I 83 are grounded as of February 3, 1984 until the large rings are either replaced or pull tested for strength.
Some of the large rings with the above markings were not heat treated at the suppliers and are soft. Two incidents have been reported where these rings elongated on opening shock. One of these incidents prevented the jumper from releasing a malfunctioned main canopy. The deployed reserve entangled with the main. Rings with markings of RW-1-81 and RW-1-84 are acceptable. Only the RW-I-82 and RW-I-83 are suspect.
If you own a Wonderhog with the suspect rings, you may obtain replacement rings at no charge from the Relative Workshop by sending a letter requesting replacement RW-I rings and including the serial number of your Wonderhog. The rings must be replaced by a senior or master rigger. These replacement rings are free. **(Suspect rings must be returned to the RWS.)
If you wish not to replace these rings, they must be pull tested to 2,500 pounds. A rigger must observe this test. You should measure the inside diameter of the large ring prior to testing with a micrometer. The ring should be loaded to 2,500 pounds, the load relaxed, and the ring remeasured. There should not be a difference of more than 0.005 inches. If there is, replace the ring. If both large rings pass the test, the rig should be tagged.
Proper tagging procedure is to place a small piece of wire through the webbing slot on the right side ring. A piece of picture hanging wire can be used. Place a lead seal on the wire and use the rigger's seal press to seal and tag the rig. A rigger must observe the pull test and his/her seal must be used to tag the rig. Proper notation should be made on the packing data card and in the rigger's log book.
Owners of rigs that are not Wonderhogs must contact the manufacturer for replacement rings.
**To make it easier to replace rings on rigs we have designed a separable RW-I similar to a normal separable D ring. All that is required is a bolt cutter and a screwdriver. No stitching is required.
3-Ring, Inc., 1725 North Lexington Avenue, DeLand, Florida, 32720, USA, (904)737-8721.
*Equipment manufacturers in addition to the Relative Workshop who have issued equipment grounding for harnesses fitted with 3-ring hardware of this type include:

Para-Flite,
The Jump Shack,
Sky Supplies,
Flying High,
Westway,
Niagara,
National, and
Strong.

Pull tests are available at the Jump Shack, South and at Flying High. The CSPA staff will endeavour to keep members advised of additional testing facilities as they are identified.
Approximately 20% of the rings in service are soft. Don't ignore this notice; the consequences are quite serious.



Item #2 Loaning of Parachute Equipment:
A review of reported accidents, incidents and malfunctions brings with it a rather startling realization. A rather large portion of these situations are experienced by individuals wearing equipment other than their own. Although it has not been possible to gather data which would allow us to accurately identify the proportion of all jumps (beyond the student level) made by individuals using borrowed equipment, it is estimated to be considerably lower than the accident/malfunction rate for equipment borrowers. Frequently, the individual (who is borrowing the equipment) has not accumulated a large number of jumps (less than 500) and may have been inactive for some period of time. In circumstances such as this it is recommended that the individual be provided with equipment fitted with an AAD; in addition, thorough briefing in correct operation and emergency procedures should be included. A series of indoctrination (familiarization) jumps should follow, these should be supervised by an Instructor or Coach. Do not approach a request to lend your gear casually. Be cautious; assure yourself that the other person is qualified and

knowledgeable about normal and emergency actions. Do not assume he/she knows what to do. If your gear has special or unique features, don't lend it. You will sleep more soundly at night if you are not haunted by the question of your responsibility towards someone's accident while wearing your gear.

Item #3 Alteration to Parachute Equipment:
In the course of investigating serious accidents which occurred during the past year, it was determined that some of the equipment had been altered (modified) from its original (manufactured) configuration. Since there are no equipment standards in Canada, any owner is free to alter his/her equipment as he/she sees fit. Further use of the altered equipment is at his/her own risk. The situation is complicated however, when the owner sells the equipment to another individual without returning the gear to its original configuration. The new owner (usually a novice or intermediate jumper) seldom is aware of or understands the alteration and its affect on the performance of the equipment. Subsequently the new owner becomes the victim of an accident. After the fact it is sometimes impossible to identify the exact influence of the "alteration" on the outcome of the events. In most circumstances however, the presence of the alteration causes doubt to be cast on the reliability or preparation of the equipment. In some situations, it places the former owner in a rather awkward position.
Recommendations related to this topic are as follows:
a: Equipment owners: If you possess gear (main, reserve, rig) which has been alter from original, endeavour to return it to original (if possible) prior to selling that equipment. Ensure that the new owner is aware of any alterations which have not been corrected; further, arrange to have the new owner inspect the equipment with a third party, assuring that he/she is provided with an unbiased evaluation of the changes and of how they will affect jump activities and durability.
b. Equipment buyers: Identify any and all changes from original. Don't buy gear without obtaining a second (impartial) opinion from the most experienced person available.

Item #4 Special Notice:
All MK 2000 Sentinel sensing units are required to be returned to SSE Inc., for service checks every six months for commercial or club use, and annually for individual use.
SSE considers units not serviced according to the above schedule to be unairworthy.
SSE have often received sensing units in for repairs that have not been serviced for three, four or more years at a time. This just doesn't, make good sense.
SSE have increased the size of their service department, and can turn around most repairs in a week.
Don't take a chance! Get your Sentinel checked out according to schedule.
SSE Incorporated, 5801 Magnolia Avenue, Pennsauken, NJ, 08109, USA, (609) 663-2234.

Item #5 Service Bullet in, Starlite Tandem PN 1050-1 and 1051-1: Rigger inspection and repack also includes full inspection of harness and containers.
Care should be taken to examine the reserve ripcord housing and pocket to assure that the pocket is threaded onto the chest strap properly and that the pocket is securely attached, both to the housing and harness.
Ripcord pins should be capable of free movement through the housing.
Strong Enterprises, A division of S.E. Inc., 11236 Satellite Blvd, Orlando, FL., 32809, USA, (305) 859-9317

Item #1 Airworthiness Directive, Transport Canada, US Department of Transportation, Federal Aviation Administration:

April 18, 1984: The following copy of FAA Airworthiness Directive 84-06-05 concerning a parachute harness has been provided to the Canadian Sport Parachute Association.

As you know, Transport Canada Airworthiness Branch does not control parachuting. However, as a service to the public we distribute short compliance Airworthiness Directives. The Airworthiness Branch considers compliance with this A.D. to be extremely important in the interest of safety.

84-06-05 PARACHUTE HARNESS MANUFACTURED UNDER TSO-C 23b:

Amendment 39-4839. Applies to all of the following manufacturer's parachute harnesses using the 3-Ring Inc. release system:

Adventure Loft, Inc.
Aerotech Inc.
Altitude Shop
The Annex
Bill Coe
Bureau of Land Management, Rec Whse
The Chute Shop
Embury Sky Systems
Flying High
G.Q. Security Parachutes, Inc.
LLB Enterprise
National Parachute Supply, Inc.
McLaughlin Para Center
North American Aerodynamics
Nytech Inc.
Parachute Associates, Inc.
Para Flite,Inc.
Para Gear Equipment Co.
Para Phernalia
Para Wing SA
Pioneer Parachute Co., Inc.
Ray Har a C/O Cazer Para Loft
Reltny Parachute Service
Relative Workshop, Inc.
Rogersport
Sky Supplies
SSK Industries Inc.
Strong Enterprise, Inc.
Thomas Sports Equipment LTD
Weckbecker
Westgaard Parachute Enterprise
Westway Parachuting Enterprise

Compliance: Required prior to next jump, unless already accomplished.

a. Visually inspect the harness to determine whether or not it incorporates a 3-Ring Inc. release system, and if incorporated, whether or not the large ring of this assembly is identified by either Part Number RW-1-82 or RW-1-83.

b. If either finding of the inspection in paragraph a. is negative, no further action is required.

c. If both findings of the inspection in paragraph a. are positive, replace or test the large rings in accordance with 3-Ring Safety Bulletin No. 3 dated February 15, 1984.

(1) Replace defective rings or identify acceptable rings in accordance with the instructions in this bulletin.

d. Replacement and testing of the large rings must be accomplished by an FAA certified Parachute Rigger, an FAA certified Parachute Loft or the manufacturer of the parachute harness involved.

e. An equivalent means of compliance with this AD may be used if approved by the Manager, Atlanta Aircraft Certification Office, 1075 Inner Loop Road, College Park, Georgia, 30337, USA.

This amendment becomes effective on April 9, 1984.

For further information, contact: Jerry Boutwell, Aerospace Engineer, Aircraft Certification Office, FAA, Central Region, 1075 Inner Loop Road, College Park, Georgia, 30337, USA; telephone (404) 763-7407.

3-Ring Release Safety Bulletin A detailed investigation into the reported failure of the large 3-ring has resulted in the following:

1. Rings stamped RW-1-81 or RW-1-84 are safe to use.

2. All rings stamped RW-1-82 or RW-1-83 may be defective; therefore, any harness equipped with these rings cannot be jumped unless one of the two following options are met:

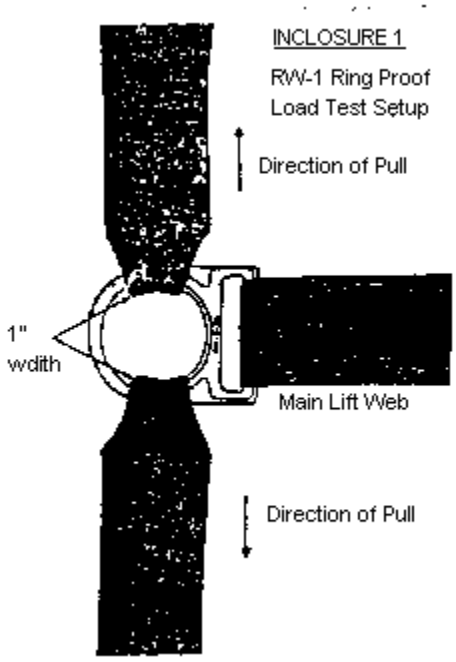
Option #1 - replace all suspect rings. A separable ring is currently available, (stamped RW-6-84), which will enable a quick and easy replacement of all suspect rings. Upon request, replacement ring kits and complete installation instructions will be provided from your harness container manufacturer. (Note: a heavy duty bolt cutter will be required to remove the suspect rings.)

Option #2 - test all suspect rings. An FAA Master Rigger is authorized to certify that suspect rings are not defective as follows:

1) Using a Tinius-Olsen or other suitable pull-testing device, pull in opposite directions against each side of the round portion of the ring using one inch tubular nylon webbing, or either Type VII or Type VIII nylon webbing folded under to a width of one inch (see diagram).

2) Subject each load to a 2,500 pound (1134 kg) proof load. Measure the internal diameter of the large ring prior to testing with a micrometer at eight points around the circumference; load the ring to 2,500 pounds, relax the load, and remeasure the ring at the same eight points. Rings which show no deformation more than 0.020 inches are acceptable. Any ring showing deformation more than 0.020 MUST BE REPLACED. (Note #1: defective rings will noticeably distort when loading reaches approximately

2,000 pounds (907 kg) and stay distorted when tension is relaxed. Note #2: If pull test is conducted using two metal bars in place of webbing loops and test is conducted at 90 degrees to normal hardware loading (as shown in drawing), then a 2,500 pound may stretch normal good hardware. Therefore a 2,000 pound load will be sufficient to certify a ring as good in this case.)
3) Harnesses using rings which have been tested and are found to be acceptable, must be designated by permanently affixing a rigger's seal (with symbol) using wire (not red rigger's thread) to the right ring's webbing slot. The seal must be attached to the square portion of the ring through which the main lift web passes, not the round portion.
4) Once sealed, a permanent entry must be entered in the parachute log book accompanying the harness which states that the rings were satisfactorily tested to a 2,500 pound proof load, and the date of the test.
5) The rigger or other individual performing the test and certifying that the rings have been tested should retain a permanent record of each test and the date of test.
6) In the event that a harness has only one acceptable ring, BOTH RINGS MUST BE REPLACED.
For further information, contact 3-Ring Inc., 1725 North Lexington Avenue, DeLand, Florida, 32720, USA, (904) 736-8721.



Item #2 FXC AAD Bulletin:
Owners of FXC Model 12000 automatic openers should allow at least 1,500 feet between the preset calibration activation altitude and the intended main deployment altitude. FXC published this new procedure on March 29.
For example, a jumper who plans to deploy his main at 2,500 feet above ground level (AGL) should set the activation altitude at 1,000 feet AGL or below.
FXC is applying a label with the instructions on all new or repaired Model 12000's. Questions should be directed to Rick Velazquez, FXC Corporation, 3410 S. Susan Street, Santa Ana, CA, 92704, USA; (714) 556-7400.
The Model 12000 is an all mechanical automatic opener that may be installed on the main or reserve container. The device has been troubled recently by a number of accidental firings; it went off at altitudes well above the preset activation altitude even when it was apparently calibrated correctly. The cause has been identified and corrected, but owners of the units should ensure theirs has been upgraded.

Item #3 Automatic Activation Devices:
AAD's get some rough treatment through normal use with students. Care should be taken to note any unusual performance of the unit. This may be a warning that something could be amiss with the mechanism. Have it checked out by the manufacturer if you have the slightest doubt. An AAD has an invaluable job to do when called upon. Be sure it is ready when the time comes.
SSE recommends that Sentinels be returned to them for inspection and service every six months when in use with students and every 12 months for units used on personal gear. Batteries should be replaced every four months or less as testing indicates. The explosive cartridge is due for replacement every one and one half to two years, or sooner if the plug pins become broken or damaged or if the plug end separates or cracks from the metal cartridge base.
For the FXC 12000, a functional test in an altitude chamber must be performed every repack (i.e. every 120 days) when used on a reserve. Although FXC altitude chambers are not at every DZ, a manufacturer's inspection and service schedule of six months for students and 12 months for personal units is probably a safe one to adopt.
Again, if the performance of any AAD has ever been atypical, do as every manufacturer indicates in their manuals (usually in bold print). Return it immediately for testing and inspection.

Item #1 Airworthiness Directive, Transport Canada, US Department of Transportation, Federal Aviation Administration:
June 1, 1984: The following copy of FAA Airworthiness Directive 84-10-03 concerning Herbie Hog Parachutes is provided to the Canadian Sport Parachute Association.
As you know, Transport Canada Airworthiness Branch does not control parachuting. However, as a service to the public we distribute short compliance Airworthiness Directives. The Airworthiness Branch considers compliance with this A.D. to be extremely important in the interest of safety.
84-10-03 HERB M. GRAVES, JR.:
Amendment 39-4861. Applies to all Herbie Hog parachutes equipped with plastic deployment handles.
To prevent possible nondeployment of the parachute canopy due to separation of the plastic handle when subjected to the deployment force, replace the plastic handle with a metal handle. Rework the parachute by removing the plastic handle and cable assembly and replacing it with a "Martin Baker" type metal handle and cable assembly. Care must be taken to assure that the pin spacing and cable length are compatible with the parachute rigging installation.
Compliance is required prior to making the parachute available for any parachute jump and before the next deployment after the effective date of this AD unless already accomplished).
This amendment becomes effective on May 21, 1984.
For further information contact: Joseph L. Condo, Special Programs Branch, ASW-190, Aircraft Certification Division, Federal Aviation Administration, P.O. Box 1689, Fort Worth, Texas 76101, telephone (817) 877-2567.

Item #2 Standardized Nomenclature for Ram-Air Inflated Gliding Parachute Wings, PEIA Technical Standard 100.0:
This document was written by Manley C. Butler, Jr. as part of his work on the Aircrew Gliding Escape System (AGES) Program at the Aerosystems Department, Naval Weapons Center, China Lake, CA. Inputs were solicited from manufacturers and users of ram-air gliding parachute wings, with the cooperation of the Parachute Equipment Industry Association (PEIA). The PEIA adopted this nomenclature on February 23, 1984, and member companies will incorporate this terminology into their publications as they are reprinted. It is anticipated that the transition will be completed by January 1, 1986. In view of the fact that the member companies of the PEIA are responsible for the great majority of the ram-air parachutes produced in the world, it is anticipated that this document will become the de facto standard for the rest of the parachute community as well.

Item #3: TSO-C 23c, Personal Parachute Assemblies:
a. Applicability:
Minimum Performance Standard - This Technical Standard Order (TSO) prescribes the minimum performance standard that personnel parachute assemblies must meet in order to be identified with the applicable TSO marking. This TSO has been prepared in accordance with the procedural rules set forth in Subpart O of the Federal Aviation Regulations, Part 21. Personnel parachute assemblies that are to be so identified and that are manufactured on or after the date of this TSO must meet the standard set forth in society of Automotive Engineers, Inc. (SAE) Aerospace Standard (AS) 8015A, "Minimum Performance Standard for Parachute Assemblies and Components, Personnel," dated September 30, 1982, as amended and supplemented by this TSO.
b. Markings:
None in addition to the marking specified in Federal Aviation Regulations (FAR) S 21.507(d).
c. Data Requirements:
In addition to FAR S 21.605, the manufacturer must furnish the Manager, Aircraft Certification Office (ACO), Federal Aviation Administration (FAA), having purview of the manufacturer's facilities, one copy each of the following technical data:
1) Operating instructions.
2) Equipment limitations.
3) Inspection and test procedures applicable to this product.
4) Specifications.
5) Maintenance procedures.
6) Manufacturer's TSO qualification test report.
d. Previously Approved Equipment:
Personnel parachute assemblies approved prior to the date of this TSO may continue to be manufactured under the provisions of the original approval.
e. Availability of Reference Documents:
1) Copies of SAE AS 8015A may be purchased from the Society of Automotive Engineers, Inc., Department 331, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15096, USA.
2) Federal Aviation Regulations, Part 21, Subpart O and Advisory Circular 20-110, "Index of Aviation Technical Standard orders," may be reviewed at the FAA Headquarters in the Office of Airworthiness, Aircraft Engineering Division (AWS-110) and at all ACO's.
Note: AS 8015A is reprinted in Poynter's Manual, third edition. These changes to standards should be reviewed by all parachute equipment manufacturers.
Provisions have been made for periodic revisions of this document, inputs concerning revisions and additions are welcome and should be submitted to: Parachute Equipment Industry Association Inc., Attention: Technical Committee Chairman, 1440 Duke Street, Alexandria, VA, 22314, USA.
Copies of the 14-page document may be obtained from the PEIA.

Item #4 Racer/Chaser/Free Bag Situation Clarified:
Volume VI, No. 1 Issue of the ParaNewsbrief reported a potential problem with the Racer and Square Reserve Free Bag System. It turned out that the report was erroneous and the system involved was in fact a Chaser made by Thomas Sports in England.

Item #5 Service Bullet in - Combination Tandem Reserve Ripcord Housing Clamp, May 15, 1984:
Affected assemblies: Combination Tandem with nylon stiffeners in the end flaps of the reserve containers - serial numbers 403009 to 405052 manufactured between March 19, 1984 and May 11, 1984, and Combination Tandems that had the AAD Installation upgraded during the same time period.
Primary Problem: Reserve ripcord housing is not adequately secured to the end flap of reserve container, because wrong housing clamp was used.
Potential Problem: Inadvertent reserve canopy activation - If housing snags anything, it will pull the reserve. Failure to upgrade the affected rigs according to the procedure below will create a serious compromise of safety.
Modification Kit: One each - clamp (with one dimple), two each 6-32 X 3/8" phillips flat head screws, two each - 6-32 Nylock nut, two each - flat washers.
Tools Needed: Phillips screwdriver, 11/32" (or 9mm) end wrench, drill and 9/64" bit.
Procedure:

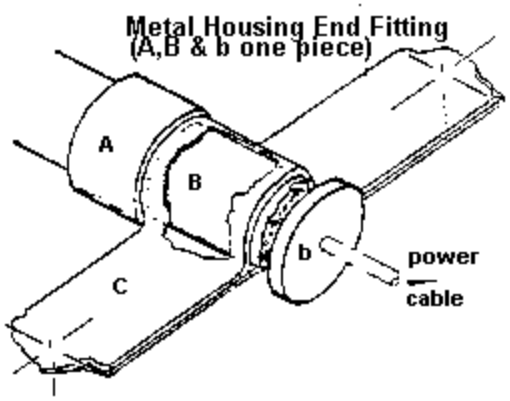
1) Remove existing reserve ripcord housing clamp (with two dimples) from end flap of reserve container. Discard used clamp, screws, washers, and Nylock nuts.
2) Using the existing hole which is closer to the edge of the flap, install the replacement clamp in the same manner as the original. Insert the screw through the washer, through the original drilled hole in the flap, from the inside of the container outward, through the clamp, and thread the Nylock nut loosely on top.
3) Align the clamp as the original was (the old hole should be right beside the new clamp), using a 9/64" bit, drill through the end flap (nylon plate and two layers of fabric) using the hole in the clamp as a guide.
4) Install the second screw in the same manner as the first, installing the housing under the clamp before tightening the nuts.

Item #6 Publication - How to Get an FAA TSO for Parachutes:
This is written by Manley C. Butler, Jr., President of Butler Parachute Systems, Inc.. Mr. Butler has over 10 years of widely varying experience in the parachute industry and is an accomplished technical writer as well. The book is 112 pages and includes sections covering:

- The FAA and TSO Process, including addresses for all of the relevant FAA offices, and reprints of the relevant FAR's
- Quality Control Systems and their importance to the manufacturer and includes a Sample QC Manual that is worth the price of the book itself.
- Performance Specifications and Testing for compliance with TSO C23, including a basic discussion on some of many things that can affect the test conditions for parachutes. It includes the latest TSO revision (TSO C 23c) as well as sample forms and documents to help you figure out how to meet the requirements of the performance specification (also included).

Certificated Parachute Lofts and a Sample Loft Operations Manual
The official publication date for this book is September 1, 1984 but copies should be available direct from the publisher in early July. The book will also be available from Butler Parachute Systems, Inc. and parachute dealers and distributors worldwide.
The retail price is $34.95 (postage paid) and quantity discounts will be available.
For further information and orders contact: Technical Information Publication Services (TIPS), P.O. Box 796, Georgetown, TX, 79626, USA, or Butler Parachute Systems, Inc., 107 Ellis St., Ridgecrest, CA, 93555, USA.
Note: This publication will be of great assistance to any aspiring rigger who plans to manufacture components for sport parachutes. Individuals presently involved in production of sport equipment may pick-up helpful hints from a review of the "Quality Control" section.

Item #7 Mounting of AAD Power Cables:
Reports received have identified a potential problem with mounting of the power cable for mechanical action AAD units. Movement of the housing towards the pins during firing of the unit is possible if the end of the power cable housing is not properly secured with a mounting plate (stiffener) and housing clamp. Both the FXC 12000 and SSE Pin Puller (for SSE 2000) use a metal housing end fitting which is shaped to mate precisely with a metal "U-shaped" mounting clamp. Slippage may occur if the mounting clamp is not fully tightened into position, if a soft material (e.g. rubber bushing) is inserted within (between B and C) the clamp or if a clamp other than that provided by the manufacturer is used. Slippage of the housing if the mounting screws are not tightened is obvious. Insertion of a soft material will appear to make a snug fit but under the shock of AAD firing may prevent the mounting clamp (C) from catching against the ridge (A) on the housing end fitting- slippage of the housing may result. Using a clamp other than that provided by the manufacturer may result in incorrect alignment of the housing end fitting, with a similar result. Any amount of movement of the housing end fitting towards the pins could result in incomplete extraction of the ripcord pins. Immediate inspection of all AAD installations is strongly recommended. Correction of any deficiencies should be performed before further use of the equipment.



Item #8 Ram-Air Reserves:
Reports from a couple of conscientious riggers have provided the following information for use when inspecting ram-air reserves. These points were discovered during repacks which means at least one person overlooked these details during initial rig assembly and inspection. Read on for details.

a) Slider grommets: Improper setting of grommets left sharp internal edges which could damage lines or cause a slider hang-up.

b) Fabric threads, created when the material is cut to shape for the canopy or slider, should be carefully trimmed away with a hot knife to prevent further ravelling of the fabric. Very fine, but strong nylon fibres could wind around the suspension lines creating deployment problems.

c) Deployment brakes should be set very carefully; a premature brake release or a brake lock would be no joke on a reserve. Follow the manufacturer's instructions; tack toggles and excess lines in position as directed.

d) Rapide links: although some opinions to the contrary have been expressed, it seems that the consensus within the industry suggests that these links should be positioned in a vertical orientation for reserve canopies.

e) Bridle locking loop vs. packing aid. Some rigs (e.g. Wonderhog) use a lightweight shock cord loop in a staging process, assuring pilot chute extraction before the reserve canopy is allowed to emerge. Other rigs (e.g. Bullet) use a lightweight shock cord loop as a packing aid only. The reserve bridle is not to be folded through this loop during packing. Check the instructions for every rig before you make a mistake. Replacement of a shock cord loop requires identical materials; use of a heavier shock cord may cause a hang-up of the material in a small diameter grommet.

Item #9 AAD Mounting/Student Tandems:
Testing of some student rigs recently identified a situation where the AAD power cable had been positioned too close to the first pin to allow full pin extraction. The particular equipment involved in the incident were the FXC-12000 AAD and the Racer SST Trainer.
This situation was identified during routine field testing for AAD calibration. It emphasizes the importance of testing AAD units in a mounted configuration and the practice of regular calibration tests. Check your student rigs. Remember that this problem could occur on any rig, with any AAD; it is in no way restricted to those products mentioned above.

Item #10 Skydiver/Aircraft Interactions:
An alarming number of incidents and accidents have been reported in the last few weeks. Additional emphasis on safety around the aircraft may be necessary to stop the rapid increase in personal injuries and the number of property damage claims for aircraft damage. Several of these incidents have had near fatal consequences for the jumper(s) involved.

a) Premature canopy deployment of main and reserve canopies have dragged jumpers from the strut, the step and out the door. The importance of the pre-jump equipment inspection, and pin check prior to exit cannot be over-emphasized. Recently an individual with over three thousand jumps experienced a premature reserve deployment, with resulting aircraft damage, but no serious physical injuries.

b) Tail strikes have occurred on occasions where jumpers exit the aircraft while
1) the aircraft is in a climb attitude,
2) the aircraft is level under full power and the jumper uses a full spread body position and
3) using a "zero G" exit technique.
Recognizing the potential for serious injury to the individual and also the high cost of repairs to the aircraft, these three exit situations should be avoided.

c) Canopy landings on or near the active runway have caused injury and aircraft damage. In one situation, the pilot ground looped his plane during landing roll-out as he swerved to avoid a canopy which was descending onto the runway. In another situation, a pilot accidently struck a student with the aircraft wing during the landing- the student had directed the canopy to descend over the active runway, landing just in front of the aircraft as it touched down. It is extremely fortunate that no one was killed.

d) Collision of freefalling skydivers with aircraft are extremely rare. Each year a number of "near-miss" reports are submitted. In most cases the problems occur during the operation of several jump aircraft at one site. Of particular interest are those situations where extra aircraft have been brought in for a boogie or competition. Proper pilot briefings, the use of radio communications between aircraft, co-ordination of manifest, pilots and skydivers are all important.

A timely reminder to the experienced as well as novice jumpers about the need for safety precautions around the aircraft may contribute to the prevention of accidents involving skydivers and jump aircraft. However, just because an accident/incident has not occurred to date is neither a valid or rational reason for continued disregard of safety precautions around aircraft.

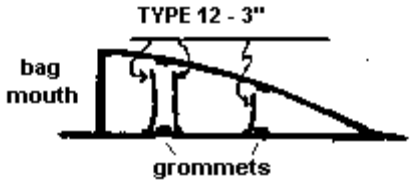
TECHNICAL BULLETIN #21 **OCTOBER, 1984**

Item #1 Sport Brace of In-Flight Door:
Cessna aircraft which are equipped with an in-flight door that incorporates a support brace have been involved in several recent accidents. The type of door under discussion is found on Cessna 172, 180, 182 and 185 aircraft used in jump operations. The particular part is a tubular metal support bar which locks into the door frame from the door when the door is in the open position. Problems which have been encountered include snagging of harnesses, ripcords and clothing. At least two premature activations have been attributed to the presence of the support brace; in both cases aircraft damage was significant. Other incidents involve jumpsuit or rig hang-ups on the support brace; in most instances the exit was disrupted and some equipment damage sustained. Solution to the problem involves removal of the brace. A number of alternatives to hold the door in position have been identified. Note that exposed door handles have caused similar problems.

Item #2 AAD Mounting Problem:
During an AAD test drop a unit failed to activate the reserve. The unit was an FXC 8000 mounted on a conventional reserve container (T7A military surplus). The AAD which had the power cable clamped to the ball swage of the reserve ripcord was unable to remove the pins far enough for them to clear the locking cones. The ripcord pocket which incorporates a metal spring and fabric cover was identified as a contributing factor.
The solution to this problem could include exchanging the ripcord pocket installation of an elastic-type pocket is recommended. In addition use of an attachment method where the AAD power cable is connected to the first pin at the pin is also recommended. Note that this AAD test uncovered a potential situation. Functional testing of AAD's on a regular basis is strongly recommended.

Item #3 AAD Grounding Recommendation:
SSE of Pennsauken NJ, manufacturers of the Sentinel 2000 AAD recently distributed this notice. Please pass this information along to concerned individuals in your area.
Sentinel Mk 2000 Safety Alert
Sept. 27/84: To all dropzones, clubs, USPA, CSPA
Units affected: all Sentinel Mk 2000 units. SSE Inc. has received several reports of unwanted and unexplained activation of some Sentinel Mk 2000 AAD's. It is believed that some of these unwanted activations may be the result of improper calibration or misuse of the AAD. Other inadvertent activation remains unexplained at this time. Until further details of these reports are obtained and are properly analyzed SSE recommends that all Sentinel Mk 2000's be removed from service immediately.
Please advise all parachute jumpers in your region of this recommendation.
SSE Inc.
The manufacturer SSE is currently conducting tests to isolate the cause of the unexplained firings of the Mark 2000 unit. Preliminary testing has indicated that the cause may be a static electric charge build-up. Further testing is needed to obtain conclusive results. It is anticipated that the required tests will be completed by the end of Oct 84. If test results support initial findings the necessary change could be completed within four weeks (by end of November). A company spokesman speculated that a modified cartridge could be made available within a short time.
Of the reported inadvertent firings most were related to long freefalls (AFF) and/or use of ram-air canopies. The instances were thought to occur in low humidity (dry) climate situations. Although no guarantee was offered it was felt that electrically grounding the unit prior to boarding the aircraft might be an interim solution*. Exposing the unit to a situation where static charges are generated greatly increased the chance of a firing. Examples of static sources are dry air, nylon carpet, nylon gear, indoor packing, etc.
Allowing the units to remain in service despite the manufacturer's recommendations is the decision of the DZ operator or club; such an action carries with it assumption to full responsibility for any incident. Extreme caution must be exercised if such action is undertaken particularly during situations such as opening an inflight door, student exit, or unit contact with the aircraft (e.g. metal door frame).
SSE Inc. has requested that a written report of any inadvertent firing of a Mk 2000 unit be forwarded to them as soon as possible. Details should include date, place, type of jump, equipment, temperature and humidity plus unit serial number. They have also asked that you refrain from telephoning as time spent on the phone will only delay completion of the testing.
* Caution: Electrically grounding the unit may cause the cartridge to fire.
Following are several items (#4-13) reprinted from Skydiving Issues 49 and 50 just in case you haven't heard about these changes and recommendations.

Item #4 Racer Updates:
The Jump Shack South sent notice about a modified ram-air deployment bag for the SST Racer shown below.



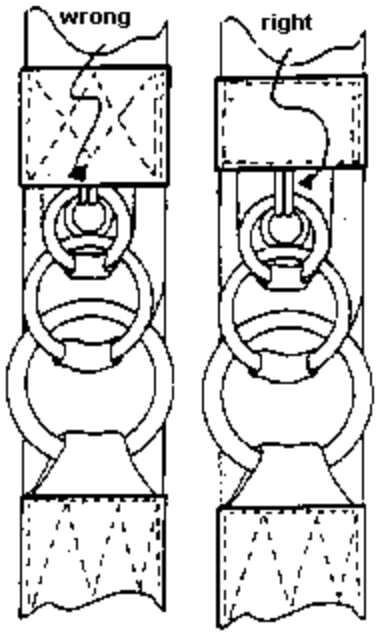
The Type 12 webbing acts to protect the closing loops from friction against the canopy fabric. One Racer without this modification hung-up after a breakaway; the jumper had to reach back, grab the reserve pilot chute and throw it. The rig contained a Para-Flite Safety-Flyer.
Jump Shack also recommends sewing the Kevlar locking loop installed on the Racer's Pop Top reserve. After determining the proper loop length and securing the finger trap, sew the assembly together along its entire length to within a half-inch of the pin

ends. The idea is to prevent any reserve canopy fabric from working its way into the loop and thus hindering pilot chute deployment.

Item #5 Mirage Update:
The Annex says it strongly recommends that owners of old Sky Supplies designed Mirage harness and container systems with large-volume ram-air reserves have them modified by their shop. Weak pilot chute launches from the system have been reported and the problem may be aggravated by the bulk of bigger canopies such as the GQ Security X-210R and Para-Flite Cirrus. The tightly packed canopy fabric might conform around the through-type loops to inhibit the pilot chute launch.
The modification involves moving the ripcord to a top flap that is similar to that on the Para-Flite Swift system. It costs about $125 US.
Owners of Mirages with behind-the-back pins should pull the reserve ripcord on the ground to check out the pilot chute launch. If it is satisfactory have the reserve repacked. If it isn't contact the Annex at (904) 734-9641 about the modification. A spokesman for the Annex said old-style Mirages with Django Firefly and Para-Flite Swift reserve will also benefit from the update.

Item #6 Rapide Links:
Skydiving pull-tested some half-threaded #5 Rapide links to destruction several weeks ago to determine exactly how strong these fittings are. The #5 link is used on most main and reserve canopies sold today. Many jumpers don't notice that their links are loose until the locking barrel has become half unthreaded.
Two half-threaded Mallion links failed at 1,700 and 1,800 pounds respectively. (Mallion manufacturers bonafide Rapide links although cheaper clones are commonly encountered.) A half-threaded no-brand link purchased at a local hardware store failed at 1,800 pounds while a properly threaded #5 link withstood a pull-test of 3,000 pounds. It was permanently elongated at the end of the test but it didn't fail.
One way to prevent links from unthreading is to force a piece of 3/4 inch I.D. clear plastic tubing (available at many hardware stores) over the link. The tube also protects the slider grommets from sustaining damage when striking the links. But some jumpers worry that control lines can jam between the slider and the bumper causing serious problems at low altitudes. The problem may be aggravated when #5 grommets are used in the slider instead of the larger #8 grommets.
When used on its reserves Para-Flite recommends loosening the links and retightening them finger-tight plus one-quarter turn at each repack. Doing this insures the links are properly tightened - overtightening them can result in the barrel unscrewing off the wrong end of the threads or cracking either way ruining the link.

Item #7 3-Ring Reminder:
Many construction features of 3-Ring risers are critical to the proper operation of a 3-Ring system. Riggers encountered a pair of risers that had a three-point WW stitch pattern instead of the recommended box pattern around the confluence wrap. (See sketch.) The incorrect pattern allowed the confluence wrap to capture the small ring; one riser wouldn't release when the rigger tried to disconnect the main canopy to repack the reserve. (Note how the edge of the small ring slid under the edge of the confluence wrap effectively preventing the 3-ring mechanism from releasing.)

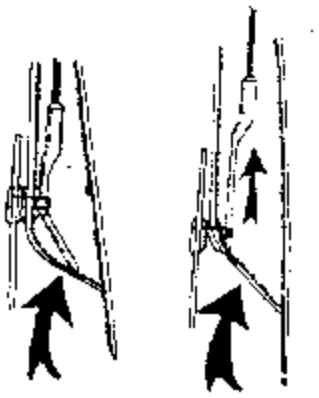


improperly made 3-ring riser (left)

Item #8: FAA OK's Inflight Door For Cessna 206:

The FAA recently issued a Supplemental Type Certificate (STC) for two jump-related modifications to Cessna 206's with cargo doors. John Attardo and Tim Monsees co-operators of Sky's West Parachute Center in Loveland Colo. received the STC last month and are making it available to other 206 owners.
The first modification is a roll-up in-flight door made from nylon Cordura fabric stiffened with horizontal battens. Attardo says a 206 with the door is quieter, warmer and faster climbing.
The second modification which can be used in conjunction with the door is a floater handle mounted along the fuselage of the aircraft above the right side door. Attardo says the handle makes group exits easier especially when the in-flight door is installed.
(Although the handle is approved under an FAA STC jump pilots at Spacel and Tex. refuse to allow jumpers to hang outside of its Cessna 206 because they claim it hampers the control of the airplane at jumprun speeds.)
Plans and complete STC paperwork for the door and handle are available from the designers for $150. Contact Sky's West at Ft. Collins-Loveland Airport Loveland Co 80537 USA. Telephone (303)669-9966.

Item #9 Vector Reserve Container Modified:
Several reports of bent reserve pins and accidentally opened reserve containers has prompted the Relative Workshop to consider slightly redesigning its Wonderhog Vector reserve container.
The company received the first reports of pin problems and open containers several months after the Vector was first introduced. It responded by stiffening the pin protector flap - the distinctive V-shaped flap in the center of the container - with Lexan. (It had been using ballistics cloth.) But occasional reports of bent and pushed-out pins continued.
The reserve pin will bend if something catches under the top flap of the reserve. Even if the pin doesn't bend the force against the tip of the pin could cause it to slide out of the locking loop. The company believes this can occur when a jumper leans against something in the aircraft or during canopy relative work when a canopy's nose catches under the flap.

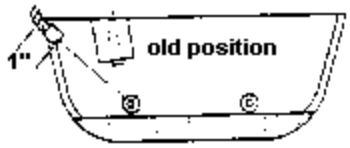


Side views of the Vector reserve ripcord, showing how bending the top flap can bend the pin (left) and push it out of the locking loop (right)

Bill Booth, designer of the rig, recently displayed one possible solution: revising the closing order of the top and bottom flaps and installing a small channel in the bottom flap to receive the end of the pin. The modification would require changing the top flap.
Reserve ripcord pins are required to withstand a bending force of only eight pounds. They must be that soft to be swaged - or squeezed - securely to the cable. Several jumpers have suggested changing to a pinless flexible cable to hold the reserve closed, such as that used on 3-Ring canopy releases. Booth, however, wants to avoid trying an unproven method to close the reserve container..
The Relative Workshop offers a CRW modification to help prevent the problem. The modification makes the pin protector flap bulge out slightly.

Item #10 Warp 3 Modification:
All Warp III harness and container systems manufactured before July, 1984, must be inspected before their next use to insure their reserve containers function correctly.
Specifically, the rigs must be checked to verify that both reserve ripcord pins will clear the closing loops before the shoulder of the first pin (closest to the ripcord handle) reaches the end of the housing. If they won't, the ripcord housing must be moved as outlined below.
Ron Edwards, president of National Parachute Industries, Inc., reports that three Warp III's have been found where the manufacturing tolerances combined to allow the first pin to jam in the housing before the end pin cleared the closing loop. Two of the faulty rigs discovered were of the narrow design for women. Edwards said that in the event of an emergency, the continuous locking loop would have probably allowed the container to release the pilot chute and open normally.
The bulletin issued by the Flemington, NJ, company stressed that if there is any doubt that both pins would clear before the shoulder of the first pin reaches the housing, the housing should be moved by an FAA Senior or Master Rigger according these instructions.

1. Remove the tacking securing the housing on the reserve closing flap.
2. Pull the housing back through the gap provided for the old housing placement.
3. Reroute the housing so it will go around the upper left hand corner of the top reserve closing flap.



Drawing of the top reserve flap of the Warp 3 showing where the ripcord housing is moved (see text)

4. The end of the housing should extend in one inch from the upper left-hand corner of the reserve closing flap.
5. Retack the housing with five turns of super tack or equivalent thread.
6. The shoulder of the first pin must be at least one-half inch from the end of the reserve ripcord housing when the end pin clears the closing loop.

Anyone having questions about the modification should contact National at (800) 526-5946 or (201) 782-1646

Item #11 Sentinel Batteries:
The use of Duracell brand alkaline batteries in the SSE Sentinel MK 2000 Automatic Activation Device may cause the unit to malfunction.
SSE issued a bulletin in mid-July, explaining that the Duracell battery has a plastic insert at its positive end which prevents it from making a secure electrical connection with the contact spring of the Sentinel.
The bulletin said the Sentinel's test lights should indicate a bad connection during calibration. If the Bat light fails to glow during calibration, the unit would likely not fire when needed. But apparently the poor connection can be intermittent; the unit could pass the calibration check but fail to work during a jump.
The bulletin recommends removing the plastic insert.

Item #12 Jump Shack South Free Bags:
Ram-air freebags from The Jump Shack South are now closed by a system that duplicates the Para-Flite Safety-Stow. The company also reports that riggers may use a hot knife to trim the 3-inch buffer strip inside its reserve freebags. The company previously required that the ends be cut with scissors.

Item #13 Old Velcro:
Westgaard Parachute Company Manager Sandy Reid suggested a clever use for worn-out pile Velcro that's been replaced. Sew a bright flag to the end of the each strip and save them to cover the pesky exposed areas of hook Velcro that seem to catch on everything during repairs and repacks. The flags will remind you to remove the strips when you're done.

Item #1 Cross-Connector:

The inclusion of a cross-connector between the left and right risers on the main canopy has been popular for a number of reasons. With Capewell-type canopy releases it is considered necessary when a reserve lanyard (S/L) is present. In many student tandem systems, the cross-connector itself performs the reserve lanyard function. Recently a cross-connector has been identified as desirable by some CRW participants. Persons involved in recommending use of a cross-connector, those installing cross-connectors, and those persons using equipment fitted with a cross-connector should know the various failures/problems associated with the presence of a cross-connector.

Two types of cross-connectors are in service at present; the first is fitted between the left and right risers at the connector links, (i.e. top of the risers), while the second type attaches to each riser at or near the canopy releases (bottom).

The first type is found on conventional gear where a Steven's lanyard is in use and also on tandem rigs where the gear is used for CRW. The problems associated with this cross-connector configuration relate to the connector snagging on another part of the rig or the jumper's body during deployment of the main. Reports of entanglements with the main top flap, the reserve container (tandem rig) and the jumper's helmet have been received. In many cases, equipment damage has been substantial; fortunately personal injury has been minimal. The most frequent incident involves the cross-connector snagging the reserve container when it is in a tandem configuration; damage to the container was sustained in all reported incidents while activation (release) of the reserve canopy resulted in approximately 50% of the reports. Several victims mentioned that the connector was made of suspension line-type material (e.g. 550) or climbing rope, recently installed for a few CRW jumps. Note: reports to date have not identified similar problems with a front to back connector (same riser) as opposed to the side to side (left to right) cross-connector.

Use of a cross-connector at the bottom end of the risers, between the canopy release attachments (harness connection) is common with student tandem rigs. In many situations, the cross-connector acts as the reserve lanyard, activating the reserve parachute through the action of cutting away from the main canopy. Several incidents have been reported where the cross-connector became snagged on some part of the jumper (e.g. arm) or part of their equipment (e.g. helmet) during activation of the reserve. No incidents were associated with normal main deployment. In cases of low main activation and simultaneous reserve activation (by an AAD), the action of cutting away the main resulted in the cross-connector causing the main to choke off the reserve canopy. The reserve is deploying between the main's risers with the cross-connector in front and the main behind it. Cutting away the main allows it to slide up towards the skirt of the reserve. Where the bottom-type cross-connector is present, individuals should be cautioned against cutting away the main in a simultaneous deployment two canopy inflated situation.

When contacted, several equipment manufacturers identified similar reported incidents with cross-connectors in these two locations. Several confirmed that they have explored and are using other solutions to satisfy the cross-connector functions. All said that their concerns were directed to general sport, student and military equipment requirements, primarily tandem gear; and not to specific CRW needs.

Prior to installing a cross-connector on any rig, consult the equipment manufacturer for specific recommendations. Prior to installing a side to side, top of risers cross-connector, take time to carefully assess the potential for entanglement of the connector with the main container flaps and the reserve container (if a tandem rig). [Note: some tandem rigs are prone to reserve damage where the reserve container is separate with exposed corners inside the main container, snags and damage to the reserve have occurred from risers in incidents where a cross-connector has not been present.

If you have any questions regarding the use of cross-connectors, please contact the manufacturer, a Master Rigger or Duncan Grant.

TECHNICAL BULLETIN #23 **FEBRUARY, 1985**

Item #1 SILICONE SPRAY:
The following comes from longtime jumper Dean Frazier of Honolulu:
Here's a little trick I've used for years with no problems - one which helps prevent slider hangups and wear on lines, bridles and risers caused by being chafed by Velcro hook; spray components with silicone lubricant where rubbing and abrasion is likely to occur.
I began using spray silicone lubricant when the Para-Commander came out (1964), and while many other jumpers were experiencing crown-line burns, I never had a burned or damaged line. I spray all the suspension lines of a square and have never experienced a slider hang-up or a burned line.
Silicone lubricant is also effective on retainer bands, helping them stretch and remain soft and flexible. They also don't crack, break, or show signs of age as soon. As far as I have been able to tell, neither nylon or rubber is particularly degraded by silicone. I use a brand sold for scuba gear, since I also spray silicone on my diving gear regularly. (Scuba silicone lubricant is a food-service grade, pure silicone that contains no petroleum distillates.)
Silicone lubricant is particularly effective on older rigs where risers brush past Velcro hook during deployment, and the use of silicone can retard the development of riser and steering-system fuzzies.
I regularly spray silicone on the components of my 3-Ring riser releases and pack closing loops. I get easy, wear-free pin pulls.
Someone will probably say that using silicone is not good for parachuting gear, but at least in the Hawaii climate and my jumping conditions, I have never experienced problems resulting from silicone, and I've been putting the stuff on my rigs since the early seventies.

Item #2 STRONG LOPOS:
This note from Herbert A. Farber, Senior Rigger #2158523:
There are still some Strong LoPos from #3000 to #4000, manufactured in 1979, that have not been treated. I recently ran across one that had been packed for about three years and the lines - still in the rubber bands - were stiff as a board. (Latex-treated lines left the Strong Enterprise shop before any trouble was suspected. The lines stiffened in the field and those canopies were recalled for factory laundering.)
In my judgement, if the rig had been jumped and the reserve needed, it would not have opened. In twelve years of rigging, this is the worst I've seen come out of a container.

Item #3 KEVLAR TIPS:
Here are some tips from John Sherman on working with Kevlar. Sherman, manager of the Jump Shack South, is designing a Kevlar harness and has found the synthetic fiber requires new rigging techniques.
A hot knife does nothing to Kevlar. The stuff's also very tough, so it doesn't cut easily, particularly with a dull blade, once the strands are severed, it frays quickly.
To make it easier to work with, keep a roll of masking tape handy. Wherever you need to cut, wrap that area with masking tape first. Then make your cut mark on the tape. The tape keeps the strands in their woven position.
Fingertrap Kevlar lines much the same way. After cutting, screw the finger trapping fid right over the taped end. Make the finger trap, remove the tape after unscrewing the fid, and draw the end back inside before stitching.
Although taping Kevlar adds an extra step, it saves time and improves the quality of the repair. Besides, unlike nylon and Dacron, you don't need to sear the ends, or clip off seared ends during finger trapping.
One thing to always keep in mind about Kevlar: it abrades. Some riggers even suggest you don't daisy chain Kevlar lines because they abrade so easily.

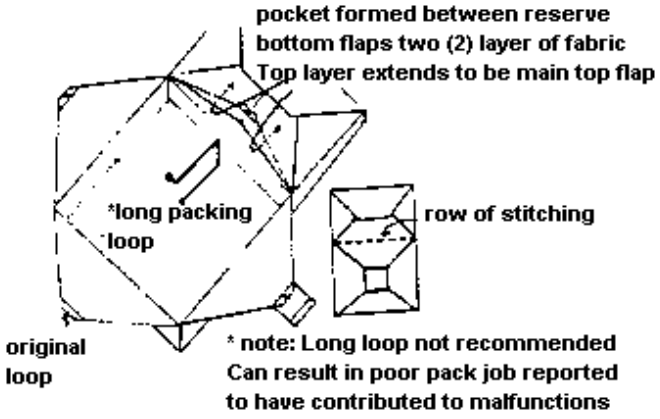
Item #4 CHLORINE AND NYLON:
FAA Master Rigger Dan Wilcox, a parachute technician at Kennedy Space Center in Florida, reminds riggers that chlorine damages nylon. He believes there is no published data telling how nylon is affected by various concentrations and exposure times. If a rig is brought in for repacking after a demonstration jump into a swimming pool, Wilcox urges that it be immediately and thoroughly rinsed and then closely inspected for fabric deterioration.
NASA has been wrestling the problem because space shuttle parachutes have been rinsed with a chlorine solution to stop algae growth after immersion in the Atlantic Ocean.

Item #5 SLIDER GROMMETS:
Sandy Reid, general manager of Westgaard Parachute says resewing the hole with a zig-zag before replacing a slider grommet helps improve the repair by making the fabric squeeze tighter around the reset grommet.
And Mike Furry from Glide Path International offered this tip: apply a light coat of sewing machine oil to grommet sets, and grommets won't tend to split when you set them. Mike says the trick works particularly well for the large #8 grommets found on most sliders.
Note: Items #1-5 are reprinted from Skydiving: Issue #53.

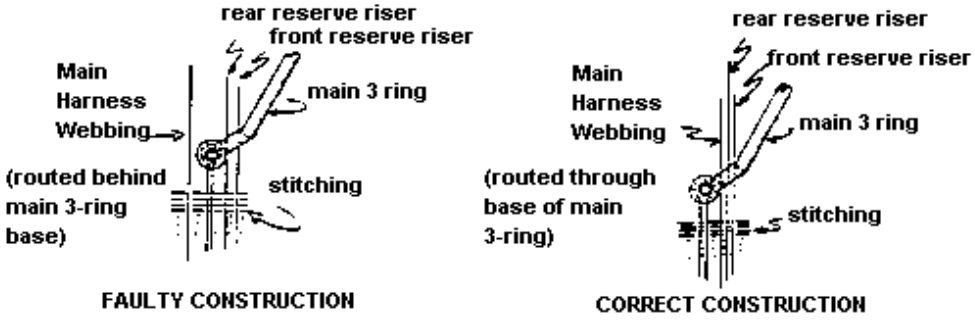
Item #6 BAD IDEAS DON'T DISAPPEAR:
During recent trips across Canada, several innovative, but deadly ideas were encountered. Do any of the following sound familiar:
- ripcord stops: (main or reserve) the rubber band and lead sinker have reappeared in a couple of places. Don't use one!
- reserve diaper removal: some folks think they are being helpful when they remove one of these devices. Leave it on the reserve!
- filling in reserve vents does not improve canopy performance or reliability. A 4-line release steering option doesn't work too well on most lopo reserves. If you don't like the reserve you've got, buy a new one, don't ruin your existing canopy by altering it!

Item #7 Main Inhibition of Reserve on WONDERHOG Type Containers:

An incident occurred where a copy of a Wonderhog was about to have the reserve repacked and when the reserve ripcord handle was activated the pilot chute did not deploy because the main was still in the deployment bag inside the container and had been pulled up so that the bag (even though inside the container) had pushed up over the reserve pilot chute preventing it from deploying. On some copies, and on some Wonderhogs, the top of the main container flap and the bottom of the reserve container flap are not stitched separating them (see drawing) thus allowing the main deployment bag to ride up. It is suggested that stitching is added (consult a Rigger) or a long packing loop is attached to the base of the main container, which when closed will pull the main deployment bag away from the reserve.
Reprinted from the British Parachute Association, Safety Information, Nov 30/84.



Item #8 McLachlan Parachute Equipment "RACER":
A serious design fault has been detected on a system manufactured by McLachlan Parachute Equipment (NZ) Ltd. The system involved carries the name "Racer" and is a copy of the SST Racer manufactured in the USA.
The problem involves the routing of webbing through the large 3-ring on the harness and the positioning of the main risers (see diagram). The system was test dropped by an independent testing authority under APF (Australian Parachute Federation) supervision. The test drops were carried out to the design standards approved by the Department of Aviation. The drops simulated the forces that would occur during a parachute opening sequence.



The second drop resulted in complete failure of all harness stitching on one side of the main lift web.
Further to this test the equipment did not carry details of date of manufacturer or serial number on the manufacturer's label as is required under the standard approved by the Department of Aviation.
All McLachlan Parachute Equipment Ltd. systems must therefore be withdrawn from service and considered unsafe for live drops until visually inspected by a senior (CSPA) parachute Rigger.
Visual Inspection Procedure:
Equipment must be checked to ensure that the rear diagonal strap, the main and reserve risers all pass through the 3-ring hardware bars.
The equipment must also carry a manufacturer's label showing; date of manufacturer, serial number, name of the manufacturer, model number or model name and approval identification.
Equipment that does not meet these requirements should be withdrawn from service and referred to the manufacturer.
Reprinted From: Australian Parachute Federation Limited, December/84.
For further details contact: Rick Collins, APF Director Safety, 14 Balcombe Road, Mentone, Victoria, Australia, 3194.

TECHNICAL BULLETIN #24 **JUNE, 1985**

Item #1 RESERVE RIPCORD HANDLES:
PEIA recommends that the following materials NOT be used in ripcord components* to be installed on reserve, auxiliary or emergency parachute assemblies
1. "Plastic" - to include ALL types of thermoplastic, thermosetting and filled varieties regardless of manufacturing methods.
2. Any other material likely to exhibit a catastrophic failure mode with no indication of impending failure.
(*handles, cables, pins, termination balls and/or equivalent components.)
Notes:
1. This recommendation in no way voids or alters the requirements of AS-8015A as referenced in TSO-C 23c or NAS-804 as referenced in TSO-C 23b.
2. This bulletin is a recommendation based on cumulative industry experience to date. It does not carry the force of law.
3. This bulletin does not concern main parachute assemblies.
4. PEIA recommends that the affected equipment be retrofitted with a steel (stainless or plated) component at the next repack or within 120 days.

Reprinted with permission from Para Newsbriefs Volume VII No 1; this information was prepared by the Technical Committee of the Parachute Equipment Industry Association (PEIA).

Item #2 Functional Test of AAD Mounting:
Riggers are reminded that the process of installing an AAD on a piece of parachute equipment must include a functional test. The purpose of the test is to confirm that when mounted on equipment which is in a jumpable configuration (packed), the AAD is able to clear the ripcord pins), from the closing loops or locking cones.
The rigger is not obligated to perform calibration-type tests of the AAD but should advise the owner of the manufacturer's service recommendations (e.g. annual calibration testing) as well as explaining how to care for the unit.
Mounting of the AAD should be done in consultation with an individual (rigger or Instructor) who has considerable experience with the unit and equipment. Manufacturers of AAD units provide mounting instruction for only a limited number of the tandem and conventional container systems which are on the market. The rigger cannot assume that the mounting illustrated in the Owner's Manual will work on another brand of container or with the illustrated type of container when assembled with a canopy of a different size (i.e. packed volume).
Parachutes Australia, the manufacturer of the Pigmee container systems and the FAA (US Department of Transport) have released bulletins which concern Pigmee II and III container systems. The four page document is on file at CSPA. Any CSPA rigger who performs services on this type of equipment can contact CSPA to obtain a copy.

Item #4 SENTINEL MK 2000:
As you are aware SSE issued a notice on September 27, 1984 recommending the removal from service of the Sentinel MK2000 Automatic Activating Device. After conducting special tests, investigation has shown that some cartridges in certain production lots could be susceptible to unwanted activation by unpredicted influence of a form of static electricity.
Because there is no way of detecting exactly which cartridges may be susceptible, in the interest of safety concerning this issue, we reluctantly must recommend that all MK2000 refill cartridges manufactured before January 1, 1985, be removed from service. As per the Sentinel MK2000 Owner's Manual the recommended service life of these cartridges is 1.5 to 2 years, therefore there should be no cartridges in use which are older than two years under any circumstances. A newly engineered upgraded cartridge which has a special new design to deal with this problem based on most current state of the art know how, is now available from SSE.
These new cartridges carry permanent identification markings, lot #, type, and date of manufacture to avoid confusion with older unserviceable units. All unmarked cartridges that are in service which are less than two years old may be returned to SEE for partial credit against the purchase of the upgraded version. No cartridge other than those manufactured and marked with the correct information are authorized for use with the MK2000. Any use of other than these new cartridges is unauthorized, absolutely not recommended under any circumstances, and could be extremely dangerous if used in any type of parachute jumping activities.
We are very sorry that this problem has occurred. While the indications of problems are few, the potential hazard is so great that we must take this action in the interest of the safety of everyone.
Reprinted with permission from April 29, 1985 SEE Incorporated Memorandum.

Item #1: DZ Operation Practices, Examples:
The following items were identified as potential good ideas for drop zones at the recent PEIA hosted DZ Operators Meeting, held at Muskogee, Oklahoma. They are presented for your information, to use as you see fit. These ideas are not given the status of Regulations or Recommendations at this time.
Labelling of Equipment and Training Aid: The mock-ups, landing platform, and such as well as the parachute gear should be marked "Caution, not for use without supervision". Non-participant in training classes including children should be discouraged from any type of use of this equipment.
Waivers or Releases: prior to training, the student should sign a release related to the training activities (e.g. PLF's, aircraft exit practice). After training, but prior to the jump, the student should sign a release pertaining to the aircraft ride and the parachute descent. Note: after training, he/she is prepared for the jump and hence is in a position of better understanding the jump related release which he/she is signing.
Financial Structure: the cost of the training should be separated from the cost of the aircraft ride, equipment rental and jump. It may be expedient to have the two payments directed to two different entities, (1. jump training, 2. aircraft flight). Note: retraining criteria or the validity period of the training should be identified. A period of 30 days might be allowed for the student to jump prior to requiring an extensive review session and appropriate training fee.
Logbook Entries: ensure that your staff make accurate, detailed entries in the student's logbook which are related to the actual performance: the entry should identify what was seen. A positive encouragement is OK, but keep the bulk of the comments to the actual facts. If a performance was bad, record it that way.
Be Prudent: don't take shortcuts when training small groups, everything should be done in the same careful manner, regardless of circumstances. Student jumping should stop at a specific time, such as one hour or one half hour before sunset. This becomes an operational rule for the DZ, all Jumpmasters, all pilots, and the owner himself.

Item #2 Promotion of Student Training Programs:
Several suggestions were made relating to promotion of DZ programs which included student training and tandem jumping. A number of examples follow:

- Yellow Pages is a resource which most individuals use to obtain goods or services. A listing of your DZ under Skydiving or Parachuting in the directory for one or more metropolitan centres within reasonable distance from your DZ is considered to be a key element in most promotional schemes. A Yellow Pages listing is generally used in conjunction with activities such as exhibition jumps and static displays (e.g. sports shows).
- Demonstration Jumps are not noted for recruiting new students. Individuals who are spectators at one type of event (e.g. football game) are likely to be spectators when it comes to parachuting as well. Successful use of a demo jump as a recruiting opportunity incorporates the use of both a knowledgeable commentator and brochures. The commentator should be able to provide information about how and why to get involved for the fans, during a lull in the aerial action. The brochures should be placed where fans can pick them up during intermission or after the game. The offer of a special rate or group discount may be used as a further enticement or as a means of measuring the return from the demo.
- Radio Advertising, scheduled for a non-prime time period may be affordable. Based on your knowledge of the age and activity group which you wish to reach, the radio people can recommend a campaign strategy to you. Note that different radio stations reach different markets; you first need to know who your potential clients are.
- Newspaper Advertising under the "Personals" column was identified as a successful venture by several operators. Again, selection of an appropriate paper is the first activity.
- College and University Clubs are a source for parachuting students which is used by several DZ operations. In most cases, a rebate of some amount from the training fees is returned to the club to be used to support of their social activities.
- Cable TV and Radio Stations often have personalities who get involved in adventure-type activities such as white-water rafting, boardsailing or in this case, skydiving. The offer of a free or low cost training course or tandem jump may be sufficient to provide several minutes of airtime during the prime listening or viewing hours. Selection of the appropriate personality and station should be based on their audience profile paralleling your student parachutists profile.
- Outdoor Sports Shows and Events have been identified as a worthwhile option in reaching potential skydiving students. The type of person who is interested in hunting, fishing, camping, canoeing, hiking and the like is certainly a better prospect for sport parachute training than the average person off the street or the spectator at a ball game.

Item #3 Owner's Manuals:
At the recent PEIA Rigger's Convention, several manufacturers showed new editions of their Owner's Manuals. Most of these revised manuals provided up to date user information, with expanded directions for packing, operation and maintenance. Most included additional illustrations or photos of the proper set-up for the equipment including AAD mountings. Warnings pertaining to the risk of serious injury or death as a result of using the equipment are included. Equipment Companies are not planning any type of manual distribution to owners or riggers, although most identified that their manuals are available on request from the individual. In some cases a cost may be involved. Of particular interest were new Owner's Manuals from National Parachute Industries (Warp III), the Jump Shack (Racer), Rigging Innovations (Talon) and Para-Flite (Ram-Air Flight Manual). If corresponding with any of these companies, remember to identify the product name and serial number of your equipment.

Item #4 FXC Automatic Activation Devices:
At the PEIA Rigger's Convention a representative from FXC, in discussion with many Master Riggers in attendance, highlighted a number of concerns. *NOTE: Many of these points have been explained in greater detail in previous bulletins.

1) An operational or functional test of the unit can be performed by inflating a plastic bag with the control unit inside it. The power cable must be loaded or restrained in order to avoid damaging the unit when performing this test firing;
2) In a reserve mounted configuration, it is required that the AAD be tested at every repack in an altitude chamber. At present, the FXC Corp. recognizes only their own facility in California as a certified test facility. Testing and calibration of a unit takes approximately six to eight weeks, at a cost of roughly $50.00 US;

3) All Model 12000 units may be refitted with a lightweight aneroid capsule and lever mechanism (fits in the control unit). This part exchange is said to reduce the possibility of AAD activation during main deployment. NOTE: it is strongly recommended that the AAD be calibrated to function at least 1,500' below the intended main activation altitude (e.g. main pull at 2,500'; set AAD for 1,000' AGL). Units, when fitted with the lightweight aneroid and lever have a label attached to confirm the servicing. Cost of the upgrading is roughly $50.00 US; it is done in conjunction with calibration and testing:
4) Accessory Parts: when connecting the AAD to a one pin Tandem Reserve (e.g. Vector, Centarus, Talon), a special terminal fitting (smaller hole) is required for the power cable; part number is 311-200164. Use of the ripcord housing mounting plate (#511-00116) is required for all current tandem reserve configurations. The ripcord housing mounting bracket (dual clamp) is sized to fit a standard diameter ripcord housing, not the small diameter ripcord housing commonly supplied on tandem rigs. Contact the rig manufacturer for detailed instructions.
5) Mounting of the control unit on any of the current tandem rigs must locate the control unit on the front (main lift web) in such a manner that the unit can move up or down slightly. This will ensure that no tension is placed on the connecting hose or fittings during deployment or actions such as climbing out of the aircraft. The usual method employs the attachment of a three to four inch length of type 17 webbing (one inch wide) on the left main lift web; the clamp on the back of the control units is then fitted around the type 17. NOTE: FXC Corp. and several rig manufacturers strongly discourage the practice of clamping the control unit directly to the main lift web. They caution that this practice can, over a period of time, result in damage to both the AAD and the structural integrity of the harness webbing.
6) Logbook records for each AAD unit, including all activity, normal and abnormal functioning, servicing, calibrating, testing and upgrading should be maintained by the owner. Further it is the owner's responsibility to be alert for Service Bulletins as published in "Canpara", Technical Bulletins, "Parachutist" and "Skydiving", then to have the unit serviced in accordance with information in the Bulletin within the recommended time period.
7) Model 8000 Units labelled either Hi-Tec or FXC are no longer considered serviceable at FXC corporation. Replacement parts and servicing have been discontinued.

Item #5 SSE SENTINEL 2000 AAD:
1) the Sentinel 2000 unit with Pin Puller can be fitted on most tandem container systems. Specific instructions should be obtained from the container manufacturer. In all known mounting configurations, a stiffener plate with long shank grommet must be installed. In some reserve configurations (e.g. Vector, Briefcase) a small conical sleeve must be fitted to the ripcord pin prior to connecting the power cable
2) the cartridge in the Sentinel Unit must be dated Jan '85 or more recent. Any other cartridge must be removed; at present SSE is offering a rebate on old cartridges returned for replacement.
3) Pin Puller systems of recent manufacture or those that have been upgraded are marked "SQ" indicating completion of recent modifications; the ferrule of the power cable is stamped with "S".

Item #6 Tandem VECTOR Modifications:
As a result of deployment damage to newer canopies, the Relative Workshop has published several modification notices; they have sent copies direct to all registered equipment owners. These notices concern:
1) steering line replacement (main and reserve),
2) exchange of slider stops,
3) venting of stabilizers and modified packing procedure,
4) equipment break-in period and exit procedures.

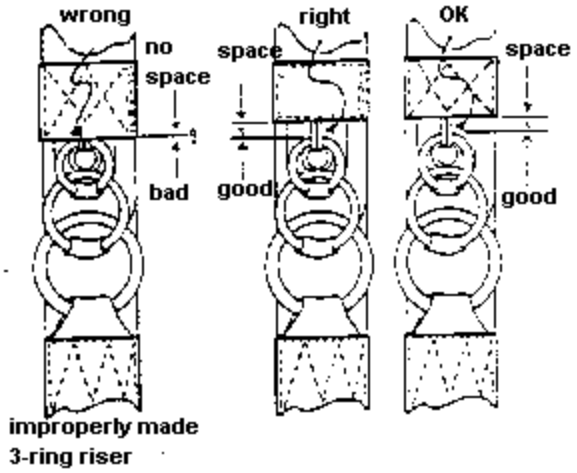
Completion of all modifications is necessary prior to the next jump on the equipment. Use of/attention to altered techniques is strongly recommended.
Some clarification of tandem jumping guidelines is provided with these notices. Read and adopt these practices. At present all tandem jumping in the US and Canada is under the auspices of the equipment manufacturer. Tandem ratings are issued and supervised by the manufacturer; failure to comply with his guidelines can result in removal of the rating. Note that in Canada, a Tandem master must hold at minimum, a valid instructor rating. The Coaching Committee of CSPA recognizes the manufacturer's supervision of the qualification process. WARNING: the manufacturers prohibit the use of this equipment with passengers who are minors. No one who has not reached the age of majority can be accepted as a tandem passenger. In addition, all tandem masters and passengers must sign an Experimental Test Parachute Jumper Assumption of Risk Agreement prior to making any jumps on the equipment.

Item #7: AIROTECH, Airworthiness Directive, Volume 1:
85-09-01. Airotech, Inc: Amendment 39-5048. Applies to Airotech, Inc., Force 1(A) harness/container assemblies. Compliance is required within thirty (30) days from the effective date of this AD, unless previously accomplished.
To prevent high ripcord pull forces due to jamming of the ripcord pin when it enters the cable housing, accomplish the following:
1) inspect the installation of the ripcord cable housing to determine if it is installed in accordance with Airotech, Inc., drawing number FC-2B, revised April 25, 1984. If it is not in conformance, install in accordance with this drawing. Ripcord pin must be started into the end of the ripcord housing as required by the note in current packing instructions.
2) alternate means of compliance which provide an acceptable level of safety may be used when approved by the Manager, Western Aircraft Certification Office, FAA, Northwest Mountain Region.
All persons affected by this directive who have not already received these documents from the manufacturer may obtain copies upon request to FAA, Northwest Mountain Region, 17900 Pacific Highway South, C-68966, Seattle, Washington 98168.
This amendment becomes effective May 13, 1985.
FOR FURTHER INFORMATION CONTACT: Mr. Walter Elerman, Aerospace Engineer, Systems & Equipment Section, ANM-173W; telephone (213)536-6388. Mailing address: FAA, Northwest Mountain Region, Western Aircraft Certification Office, ANM-173W, P.O. Box 92007, Worldway Postal Center, Los Angeles, California 90009.

Item #8 Canadian Accident Rate:

The following comment is presented in an effort to stimulate some thought about your accident rate and your reaction to accidents. Accidents are events which result in bodily injury to sport participants.
It appears that the rate (number) of serious accidents in Canada has increased recently. Several questions should be answered in response to this statement.
1. Is there a true increase in the accident rate? Compare total number of jumps at your club to number of injuries for 1984, then for 1985; are the number proportionate?
2. Are these accidents the results of bad equipment or a lack of training or from a personal error in judgement? Are some/all/any of those preventable? How?
3. Are the "human error" types of accidents preventable in any way? Do you present Canopy Control and Emergency Procedures in a manner which is as simple as is possible? Excessive detail and covering all the possibilities is not considered to be helpful in the training.
4. Are you taking time to consider and use the recommendations from other DZ's, CSPA and USPA as they come to your attention? Are you learning from the mistakes of others or re-inventing the wheel? The idea that "it has always worked for us" denies statistical probabilities; take time to identify the differences (if any) between your method and their's as a way of isolating the possible cause. Having a small club and only making a few jumps doesn't prevent accidents; it just means they are relatively infrequent on a time scale but could be just as frequent when scaled against the number of jumps made.
If your thoughts and answers to the questions (1-4) are available to share, the Technical and Coaching Committees are interested in them. If you have questions, both these groups are available and eager to help or at least try. Write soon.

Item #9 Clarification of Technical Bulletin 21, Item 7, OCTOBER '84:
The item refers to the incorrect manufacture of a 3-ring riser. A diagram with Technical Bulletin 21, Item #7 shows the small ring being overlapped by the confluence wrap. The text accompanying the diagram states, "The incorrect pattern (3 point cross stitch) allowed the confluence wrap to capture the small ring", preventing it from functioning during an inspection. It should be clarified that this type of stitch, a 3 point cross stitch, was not the primary cause. Rather, the confluence wrap was placed and stitched into such a position as to allow the small ring to tuck under it. Therefore, a poorly placed and poorly box or cross stitched confluence wrap could effect the same result.



Item #9: PEIA Canopy Study:
MAIN CANOPIES

	VOL	PEIA AREA	WT	VOL	OLD AREA	WT
Stingray	324	142	4.9	296	145	5.1
Firefly w/Kevlar	-	-	-	338	176	
Raven 1	361	-	-	338	181	5.8
Spitfire	402	176	5.9	349	180	6.0
Hobbit	-	-	-	364	162	-
X-210 w/Kevlar	-	-	-	364	210	-
Raven II	400	199	7.0	364	218	6.5
Scorpion	419	178	6.5	373	185	6.4
Avenger	457	214	7.1	411	220	7.1
Nimbus Beta	454	188	7.1	-	185	
Firelite	-	-	-	416	172	
Raven III	478	232	-	416	249	7.2
Firefly	-	-	-	416	176	
Swift Main	397	199	6.1	416	200	

Wildfire	-	-	-	420	168	
Maverick	425	194	7.0	430	200	
Unit w/Kevlar	-	-	-	442	200	
Merlin Lite	475	206	7.6	442	200	
X-210	424	196	-	442	210	
Renegade	-	-	-	454	232	7.7
Raven IV	506	-	-	468	282	7.9
Fury	454	213	7.5	468	220	
Pegasus	-	-	-	468	220	
Cirrus Cloud	-	-	-	468	230	
Dragonfly	-	-	-	468	220	
Unit (F-111)	546	198	7.75	468	200	
Marauder	547	253	8.2	476	265	8.2
Raider	535	226	8.2	480	220	
Vulcan	561	-	-	492	282	8.7
Cruislite	476	220	7.75	520	220	
Kestrel	-	-	-	520	190	
Strato Flyer	-	-	-	520	176	
Spirit	496	211	7.5	520	212	
Nimbus	537	-	-	530	225	
DC-5	-	-	-	570	270	
Wizard	496	-	-	572	271	
Viking Superlite	-	-	-	572	230	
Osprey	-	-	-	572	230	
Hercules	-	-	-	577	340	
200 Foil	-	-	-	607	200	
Merlin	-	-	-	614	200	
Unit III	-	-	-	624	236	
Titan	-	-	-	624	270	
30' XL Main	-	-	-	624	30'Dia -	
Cruisair	-	-	-	645	220	
LR-288	-	-	-	650	288	
Manta	621	278	10.0	650	288	
Unit IV	-	-	-	655	303	
Unit (old)	-	-	-	655	200	
Strato Cloud Delta	-	-	-	676	240	
Pursuit 230	-	-	-	676	230	
270 XL Cloud (F-111)-	-	-	676	270		
Comet 300	-	-	-	676	270	
RWPC (F-111)	-	-	-	676	24'Dia -	
Piglet II Main	-	-	-	676	23'Dia -	
Cloud Lite (1.25oz)	-	-	-	702	230	
Nimbus XL	623	273	-	720	270	
XL Cloud (old)	-	-	-	728	260	
252 Lite	677	236	-	740	252	
Mighty Mak	-	-	-	750	375	
Goliath	-	-	-	780	375	
272 Foil	-	-	-	820	272	
Strong 28' Set-10	-	-	-	840	28'Dia -	
Foil 5-Cell (old)	-	-	-	910	180	
Strato Star	-	-	-	910	180	
300 Foil	-	-	-	940	300	
252 Foil (1.25)	-	-	-	962	252	
Cloud (1.55)	-	-	-	1014	230	
PC MK-1	-	-	-	1144	24'Dia -	
T-10 w/net	-	-	-	1404	35'Dia -	
RESERVE CANOPIES						
Phantom 22	274	22'Dia	4.1	263	22'Dia	4.1
Hobbit w/Kevlar	314	162	5.5	312	162	
Phantom 24	332	24'Dia	5.1	315	24'Dia	5.1
Featherlite R-2-3	321	23'Dia	5.1	338	23'Dia	-
K-20	-	-	-	338	20'Dia	-
K-22	376	22'Dia	5.9	364	22'Dia	-
Swift	366	-	-	367	177	
Phantom 26	384	26'Dia	6.1	372	26'Dia	-
Piglett II (R-I)	-	-	-	390	20'Dia	-
Preserve III	-	-	-	390	24'Dia -	
SAC	395	22'Dia	-	390	22'Dia	-
NAA-22	-	-	-	395	22'Dia	
X-210R	-	-	-	412	210	
Firefly reserve	384	175	6.5	416	176	

Strong G2R w/Kevlar	421	-	-	416	228	
Phantom 28	472	28'Dia	7.0	421	28'Dia	-
Strong LopoLite	444	26'Dia	-	442	26'Dia	-
Super 22 (Low Speed)-	-	-	442	22'Dia	-	
Strong G-228	-	-	-	465	212	
Cirrus	443	230	7.0	468	230	
R4-3 (26' lopo)	394	26'Dia	6.2	468	26'Dia	-
Safety Flyer	468	152	7.0	468	160	
K-26	-	-	-	468	26'Dia	-
Super 22 (Std)	-	-	-	468	22'Dia	-
Strong G-300 w/Kevlar-	-	-	494	271		
Phoenix	-	-	-	510	190	
NAA-26	-	-	-	520	26'Dia	-
National Lopo	-	-	-	520	26'Dia	
Security Lopo	-	-	-	520	26'Dia -	
Strong Lopo	482	26'Dia	7.3	520	26'Dia	-
Reliant	-	-	-	572	265	
26' Super Steerable	-	-	-	572	26'Dia	
T-IOA (24' Surplus)	-	-	-	624	24'Dia	-
26'Navy Conical	573	26'Dia	8.5	624	26'Dia	-

TECHNICAL BULLETIN #26 **NOVEMBER, 1985**

Item #1 PHANTOM Reserve Service Bulletin:
PHANTOM DIAPER DESIGN CHANGE AND THE NEED FOR STAGED DEPLOYMENT
All Phantom Round Reserves manufactured after September 1, 1985, have an improved diaper deployment system. The new diaper holds the skirt tighter which takes up less space in the container and further reduces the possibility of an out of sequence deployment. The new diaper is a fully tapered design with rounded corners and No. 2 nickel/brass grommets.
If you have a Phantom 22, 24, 26 or 28, manufactured before September 1, 1985 the diaper should be changed at the next regular repack. Just call or mail the model, serial number and date of manufacture to:

National Parachute Industries Inc.,
P O. Box 1000,
47 East Main Street,
Flemington, NJ,
08822,
Phone (201)782-1646.

They will send a new diaper with instructions for installation. Installation must be accomplished by an FAA Master Rigger or Certificated Parachute Loft. There is no charge for the diaper and instructions.
If you prefer to return your Phantom to National for retrofit, the cost will be $20 US plus the repack and shipping.
Recent tests have shows that the highest degree of reliability is achieved when Phantom Reserves are packed in containers which provide a staged deployment. Effective staging or metering is usually accomplished by a hesitator loop or friction staging. Harness/Container systems which are known to provide adequate staging are the Warp III, Vector and Racer. If you have questions about the staging provided by your container, contact the manufacturer or your rigger.
FMI, Contact your Rigger or Ron Edwards, at National Parachute Industries Inc.

Item #2 SSE Service Bulletin:
SSE POWER PLATE ON TANDEM RESERVE CONTAINERS
Subject Models:

Starlite Tandem, PN 1050
Universal Starlite Tandem, PN 1050-2
Starlite Combination Tandem, PN 1050-3

POTENTIAL PROBLEMS: The position of the power plate of the SSE Sentinel MK 2000 (mounted inside the reserve pin flap), coupled with the shape of the end pin (caused by swaging the pin to the cable) created an occasional hard pull, and the potential for more serious problems if the end of the pin should hang up on the end of the power plate when pulled. There is no problem with the container or ripcord; it is the installation of the power plate that creates a hazard.
RECOMMENDED ACTION: Strong Enterprises suggests removal of the SSE power plate from the Starlite tandem series of containers . The remaining holes may be touched up with a hot knife if necessary to eliminate fraying. The FXC Model 12000 or the SSE Pin Puller may be used in place of the Sentinel power plate.
FMI: Strong Enterprises, 11236 Satellite Blvd., Orlando, FL, 32821, (305)859-9317.

Item #3 Aluminum Grommets:
In recent months, several equipment manufacturers have used the aluminum grommet in the construction of diapers and deployment bags. The aluminum grommet is readily identifiable; it is silver-white in colour; the surface is a flat or matte finish rather than the shiny polished chrome finish of a nickel grommet; the grommet is usually a "#2" size. It is favoured over brass because of its lighter weight and ease of installation. Due to the softness of the metal, there is a potential for bending as a result of high loadings. Riggers and Instructors are advised to check the aluminum grommet, initially for proper seating, then frequently during its use for signs of bending or separation. Two critical locations are:

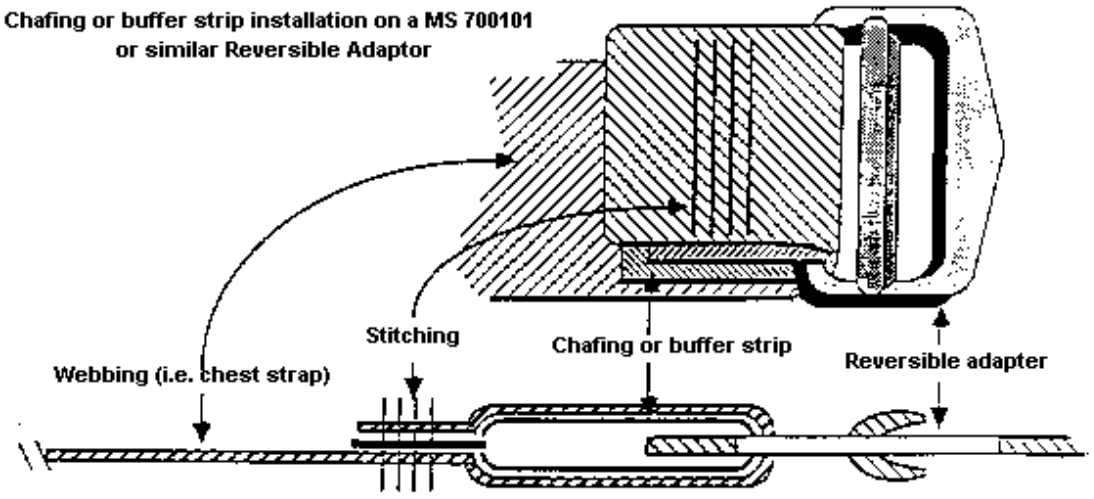
1) the bridle pick-up point on a deployment bag (main or reserve) and
2) the tongue of the reserve diaper.

Remember that saying about "an ounce of prevention".

TECHNICAL BULLETIN #27 **MAY, 1986**

Item #1 SWIFT RESERVE RECALL NOTICE:
ATTENTION: SWIFT RESERVE OWNERS
If you own a Swift reserve between and including Serial Nos. R3-2750 and R3-3471, your reserve must be returned to Para-Flite, Inc. immediately for inspection and/or modification. DO NOT use these reserves until after they have been modified and/or inspected and stamped by Para-Flite, Inc..
During a routine master pattern regeneration an error was introduced in the airfoil section resulting in the affected reserves having less forward speed, higher rate of descent, and most importantly, very poor or no flare. Deployment reliability and speed are not affected by this problem.
The modification will consist of a new top surface leading edge panel and correction of the shape of the ribs near the leading edge. The modification will be performed such that it will not require restitching previously stitched areas.
The structural integrity of the canopy will not be affected.
We will return these parachutes as soon as possible.
If you have any question, please fell free to call 609-663-1275.
ATTENTION: RIGGERS
Do not repack Swift Reserves in the Serial No. range of R3-2750 to R3-3471 inclusive unless the canopy bears the stamp "Modified in Accordance with Para-Flite Drawing No. 886028"

Item #2: D.J. Associates Inc., Warning Notice re: MS70101 light weight adaptors installed without a buffer:
Date: March 26, 1986
Release Date: IMMEDIATE
Issued By: D.J. Associates, Inc.
It has come to my attention that the MS70101, light weight reversible adapter, is being sewn onto webbing without the use of a "buffer" strip on the sewn side.
We have spent a lot of money on our tooling trying to keep the sharp edges in this part to a minimum. Since it is a stamping and is already very thin, by its very design it tends to be abusive to the webbing
All stamped parts should only be used with a "webbing buffer" on the sewn side to prevent abrasion and cutting. The buffer strip can be any kind of webbing which is thick enough to increase the radius of the edges and provide some protection to the sewn webbing
When installing buffer strips, either leave them long enough to have the "tails" caught in the regular stitch pattern or sew them on the webbing with a bar tack or a regular stitch pattern.
MS70101 WARNING NOTICE: We recommend that ALL hardware sewn onto webbing have buffer pads on the sewn end where the hardware tends to abrade the fabric
Note: Adapters of this type are very common to sport parachute harness and container systems. They are most often found on chest straps, belly bands and horizontal back bands.
Modification to include a chafing, (buffer) strip requires sewing machine stitching and, therefore, should be done by a FAA Senior rigger or CSPA rigger B.



Item #3 Pioneer Parachute Co., Inc., Safety Advisory H-6232, November 1985. Re: Excessive stiffness in resin coated Dacron lines:
To all owners and users of Pioneer sport and military parachutes with Dacron lines

Pioneer Parachute Company, Inc has recently been made aware of a problem with Pioneer K-series reserves that use resin treated Dacron suspension lines which become excessively stiff after a 120 day repack cycle
This condition could impede inflation and may also be apparent on other canopies with Dacron lines, including Pioneer main and reserve ram air parachutes.
The problem is attributable to excessive resin treatment by the cord manufacturer, resulting in the stiffness where the line appears to be "set" (hard to straighten after being packed), as well as a slight tackiness on new lines that may cause them to adhere to each other after being packed for a period of time.
Due to the potentially serious nature of this condition, all owners of affected Pioneer parachutes (and dealers with units in stock) are urged to follow the inspection and corrective action detailed in this advisory.
Main Parachutes
Prior to the next usage, inspect for stiffness or tackiness. If apparent, follow Remedial Instructions provided herein.
Reserve Parachutes
Prior to the next usage, have parachute inspected by a Senior or Master Rigger. If stiffness or tackiness is apparent, Senior or Master Rigger is to follow Remedial Instructions provided herein.
Remedial Instructions for Stiff Lines
Repairman - Senior or Master Rigger (Reserve
Chutes) (CSPA Rigger "A" or higher)
Materials Required - Clean cloth, warm water, and talcum powder.
Procedures

1) Place canopy on packing table with risers secured to table.
2) Soak a clean cloth in warm water and wipe each suspension line from riser to skirt three times. Wipe each line with a dry cloth.
3) Allow to dry thoroughly.
4) Apply talcum powder to a clean dry cloth and wipe each suspension line, from riser to skirt.
5) Once completed, shake excess talcum powder from suspension lines. Canopy may now be packed in accordance with manufacturer's instructions.
6) Corrective action in accordance with this advisory should be noted on the packing card.

Pioneer Personnel Parachutes which employ resin treated Dacron suspension lines are as follows:
Ram-Air Wing Main Parachutes

Name	Part Number
Merlin	5156-l,5156-501,5156-505,5481-l
Superlite II	5179-l,5179-501
Titan	5183-l,5183-501,5183-503,5475-l
Kestre	5184-l,5184-501,5184-503
Osprey	5492-1, 5492-501
Falcon	5792-1
Tactical Main Canopy - 1	5436-1,5436-501,5436-503,5436-505
Tactical Main Canopy - 2	5479-l,5479-501,5479-503
Tactical Canopy - 9	5660-1, 5(60-501
Hi Lifter (Tandem)	5842-1,5853-1,5853-501,5853-503, 5853-505

Ram-Air Wing Reserve Parachutes

Phoenix	5277-1,5457-1,5457-501
Reliant	5366-1,5366-501,5456-1,5456-501, 5520-1,5520-501
Tactical Canopy - 9	5660-1,5660-501
Hi Lifter (Tandem)	5542-1,5853-1,5853-501,5853-503, 5853-505

Round Main Parachutes

Relative work P C.	2759-505,2759-507,2759-509,2759-511, 2759-513

Round Reserve Parachutes

Super 22	5050-501,5050-505
K-20	5375-1
K-26	5400-1
K-22	5418-1

Item #4 SST/Racer Notice Re: Incorrect routing of left 3-Ring release housing:
08/20/1985
Notice to owners of all SST/Racers purchased in 1984 and 1985.
The left Three Ring release housing on some 1984-85 SST/Racers may be routed incorrectly. This deviation has no safety implications. Only appearance is affected as the incorrectly routed housing tends to push the left riser off the shoulder.
To identify whether your rig is affected, locate the left-over the shoulder comfort pad and trace the three ring housing to where it emerges from the pad on it's way to the riser. Now reverse your trace and feel with your fingers whether the routing is as in sketch "A" or "B" (TB27 page 5). If it is as in sketch "A" follow one of the corrective procedures as described below.
This procedure should only be performed by an appropriately rated rigger.
There are two ways to correct the problem:

1. Remove the tacking and reroute the housing in the correct manner. Retack the housing. This method takes longer but does not require the use of a sewing machine.
2. Remove the lower 308 stitch holding the comfort pad to the type 8 diagonal. Move the housing to the outside of the pad and restitch. The restitch may be a 304 stitch if a 308 machine is not available.

Note: The proper distance for the housing to stick out of the pad is 4.5" to the centre of the eye for standard rings and 3.75" for mini rings.

Left Side

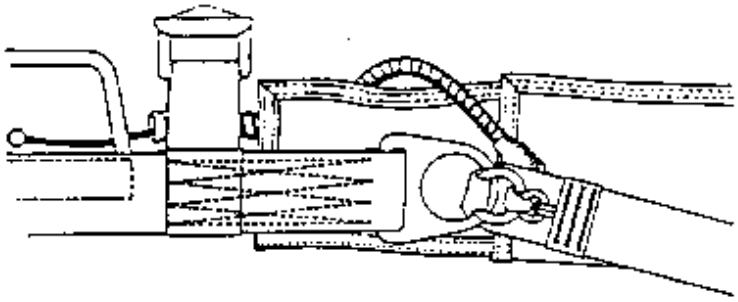


Diagram "A" WRONG

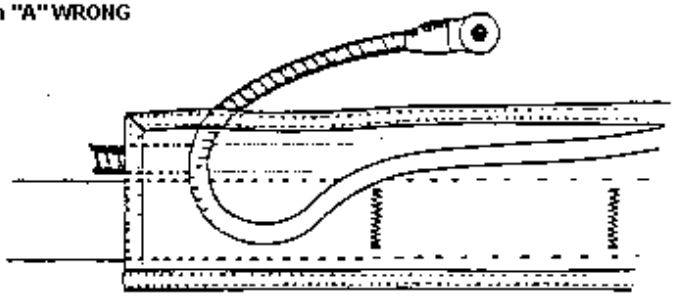
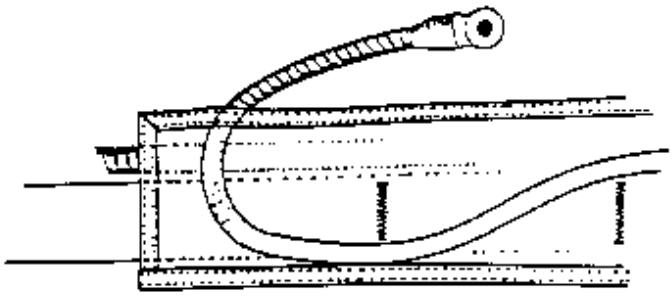


Diagram "B" RIGHT



Item #5 Error on "B" certificate exam answer sheet:
Question 1 b) 30 km/hr is the correct answer

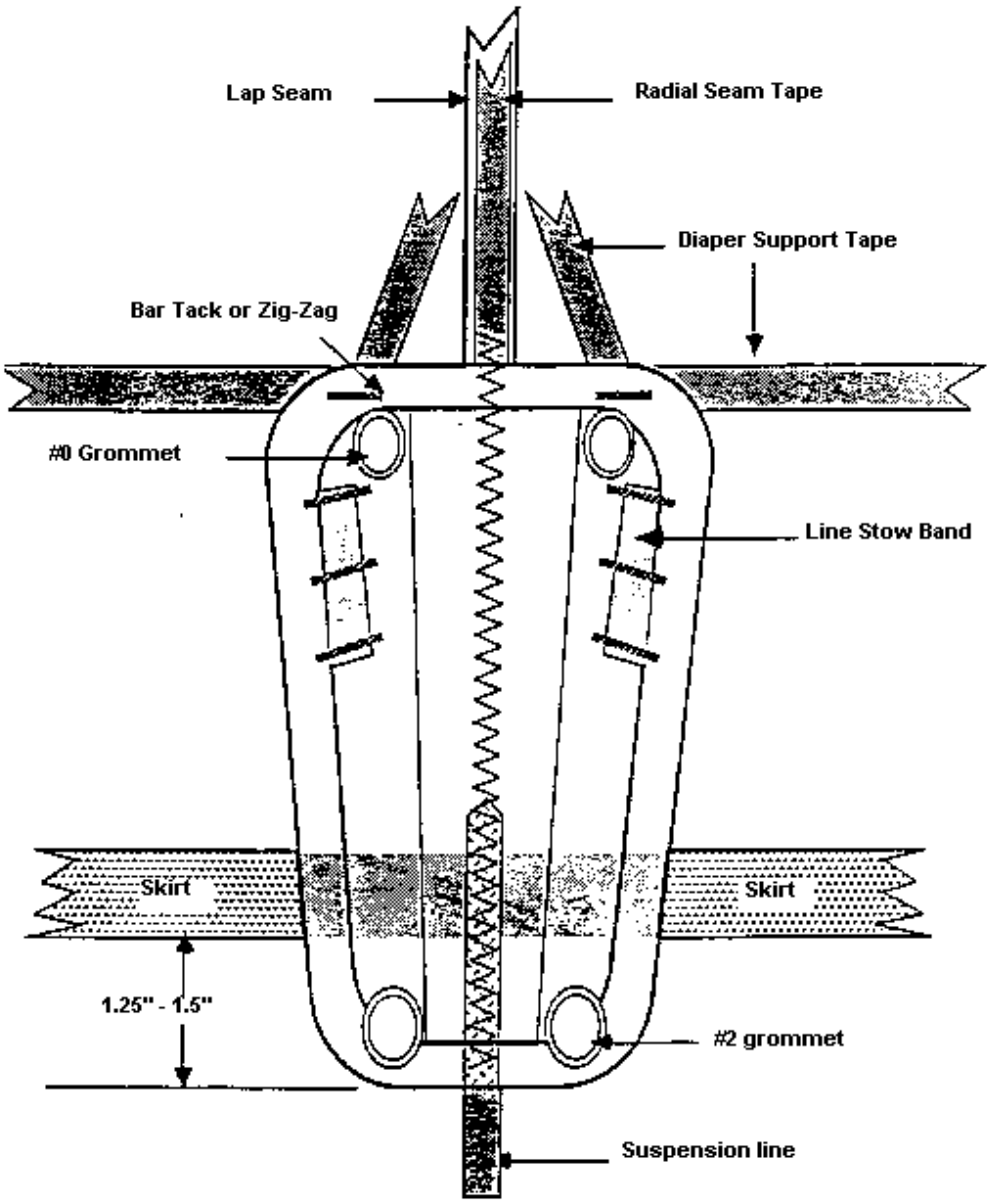
Item #6 Phantom Diaper Change:
(see National Service Bulletin dated 10/01/85 - CSPA Technical Bulletin 26 Item #1)
Equipment and materials needed:
1. Seam ripper.
2. Sewing machine - zig-zag and bar tack or equivalent
3. Nylon E thread (VT295, size 69)

Preparation:
1. Carefully pick all stitches holding the old diaper and remove from canopy.
2. Inspect canopy for damage.
3. Fold new diaper in half to find the vertical centre line and mark with chalk on the stow loop side of diaper.

Installation:
1. Position diaper vertical centre line on radial seam tape with stow loop side of diaper up (see illustration TB27 p 6).
2. Position wide end of diaper on top of support tape (see illustration TB27 page 6). The narrow end of the diaper should extend 1 1/4" to 1 1/2" below the skirt.
3. Keep the diaper centered and bartack or zig zag wide end of diaper onto the diaper support tape (see illustration TB27 pg 6).
4. Keep diaper centered and zig-zag diaper to lower lateral band, stitching just above grommets as shown. Keep the zig zag stitching between the two rows of stitching at the skirt. Backstitch both sides.

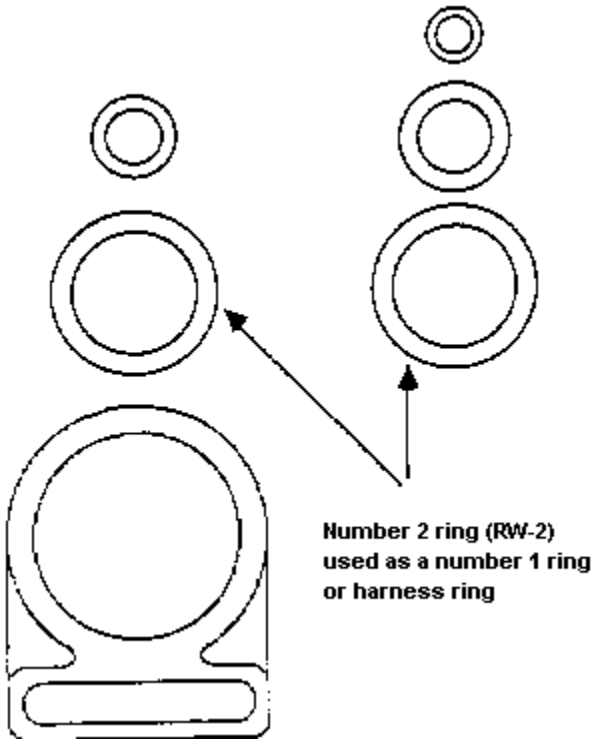
5. Now, zig-Zag from top to bottom on diaper centre line, through radial seam tape, making sure to work in any slack in fabric. Stitching should include area of diaper that extends below skirt.
6. Inspect finished installation and log.
7. Send model, date of manufacture and serial number to National.

REFERENCE ILLUSTRATION - NOT TO SCALE

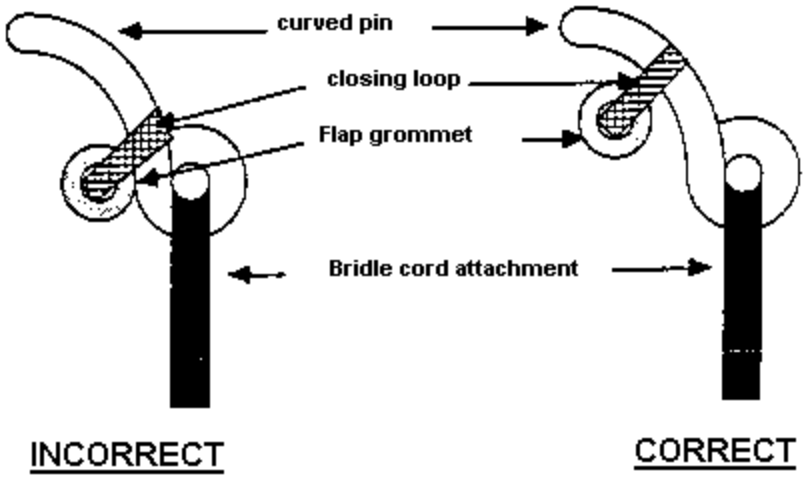


TECHNICAL BULLETIN #28 **JULY, 1986**

Item #1 RW-2 ring misuse:.
DJ Associates, Inc.
8411 South Zero St
Fort Smith, Arkansas
72903-7097
Safety Warning Notice
MISUSE OF RW-2 RING
It has come to our attention that some manufacturers are using the RW-2 ring as the number one ring in a "mini" ring system. This ring was not designed for this purpose and could deform and cause a malfunction.
If you are going to install a mini ring system on a rig, it should only be done using the "D" shaped ring number one ring such as the RW-7 from 3-Ring Inc. or the French mini "D" ring.
The RW-7 ring has a proof load of 2,000 lbs (900 kg) and the RW-2 has a proof load of 500 lbs (227 kg). The RW-1 ring carries a proof load of 2,500 lbs (1127 kg).
Since the first ring in the 3 Ring system gets most of the load, we consider the use of any ring not designed and intended for this use to be improper and unsafe.
DJ ASSOCIATES
Donald G. Beck
President
The RW-2 ring is softer than the RW-1 rings grounded in the 1984 FAA Airworthiness Directive. RW-2 ring factory proof load testing is only 500 lbs., however, opening shock loadings of 2,000 have been measured. Permanent deformation of the RW-2 ring can occur with a loading as little as 850 lbs. Deformed or elongated rings can cause a 3 Ring system to completely lock during operation on a cutaway.



Item #2 Northern Lite III main pilot chute in tow:
A series of pilot chute in tow malfunctions reported to Para-Phernalia, Northern Lite III manufacturers, has been attributed to the curved pin being buried in the main closing loop.
The manufacturer indicates that it is mandatory that the curved pin not be buried and that the pin position be adjusted so that the closing loop is midway on the curved pin (see diagram below).



TECHNICAL BULLETIN #29 FEBRUARY, 1987

Item #1 K-XX Canopies:
THIS SAFETY NOTICE SUPERSEDES THE PREVIOUSLY ISSUED SAFETY NOTICE OF NOVEMBER 17, 1986 WHICH RECALLS FORTY K-XX PARACHUTES.
An additional 101 parachutes are suspected of having understrength fabric. These parachutes will have 1981 or 1982 manufacturing dates.
THESE PARACHUTES ARE GROUNDED, ARE NOT TO BE USED AS RESERVE CHUTES, AND ARE NOT TO BE REPACKED.
This notice affects forty all white K-XX parachutes (recalled previously), eighty K-XX parachutes (colors), twenty K-XXII parachutes with alternating light Blue and Royal Blue gores, and one white 26 ft conical reserve chute.
PARACHUTES WITH THE FOLLOWING SERIAL NUMBERS ARE GROUNDED:
K-XXII, P/N 5418-1
Color Pattern Lt. Blue and Royal Blue Alternating Gores:

598557	598561	598565	598569	599076
598558	598562	598566	598650	599441
598559	598563	598567	598651	599638
598560	598564	598568	599044	599639

K-XX, P/N 5375-1
Color Pattern(s) Lt. Blue Upper Panels & Royal Blue Lower Panels
or Yellow Upper Panels & Tan Lower Panels

598162	598927	598966	599000	539043
598318	598928	598967	599001	539048
598865	598929	598968	599004	599049
598866	598930	598969	599005	599050
598923	598937	598970	599006	599051
598924	598960	598971	599008	599087
598925	598961	598972	599009	599165
598926	598965	598995	599042	599166

PARACHUTES WITH THE FOLLOWING SERIAL NUMBERS ARE GROUNDED:
K-XX, P/N 5375-1
Color Pattern(s) Lt. Blue Upper Panels & Tan Lower Panels
or Yellow Upper Panels & Tan Lower Panels

598307	598345	598364	598526	598535
598317	598346	598366	598527	598536
598320	598347	598367	598528	598537
598340	598348	598521	598529	598545
598341	598349	598522	598530	598571
598342	598350	598523	598531	598572
598343	598351	598524	598532	598592
598344	598363	598525	598533	598863

26 ft Conical, P/N 2412-501, All White, S/N 599093
A release, to be issued later, will provide further explanation to the disposition of these parachutes.
The following white K-XX parachutes were grounded on the Safety Notice of November 17, 1986 and are still grounded:

598539	558550	598843	598998	599563
598540	598552	598844	598999	599613
598541	598553	598845	599002	599614

598542	598554	598858	599003	599640
598546	598555	598864	599007	599701
598547	598556	598962	599164	599702
598548	598579	598996	599561	599703
598549	598842	598997	599562	599711

TECHNICAL BULLETIN #30 **NOVEMBER, 1987**

Item #1 FXC Factory Recall:
The following is a reprint of the latest FXC factory bulletin:
Reference: FXC Model 12000 AAD. P/N 811-00042
Subject: Inadvertent Firing
FXC has been made aware of inadvertent firing of Model 12000 AAD's in the field
An analysis of the problem by FXC Engineering has determined that this is caused by the rotation of the new Braided Power Housing relative to the main Body Housing causing the Retaining Ring to be released from its groove thus causing an inadvertent firing
The units affected are from Serial Number 9464 to 10422
FXC will replace the housing and do a complete functional/calibration check and return the unit at no cost.
Units affected are to be returned immediately for corrective action.
Should you require additional information, please feel free to contact Mr. Dan-San Abbott, Director of Operations or Mr. Rick Velazquez, Marketing Product Support.
All units are to be shipped pre-paid parcel post and they will be returned parcel post pre-paid.
Ship to FXC CORPORATION.
3410 South Susan St.
Santa Ana, California
92704-6997
(714) 556-7400
There have been at least 3 reported incidents in Canada of these affected units. At least 2 inadvertent firings were on the ground while waiting to board the aircraft.
In regard to FXC's minimum functional test requirements the following excerpt is reprinted from SKYDIVING magazine, Volume 7, Number 7, Issue #79: article by Skip King.
.....that failure to test an automatic activation device in an altitude chamber at every repack cycle, as instructed in the owner's manual, may also constitute gross negligence.....

Item #2 Reserve Ripcord Pull Forces:
To conform with industry standards the T&SC now recommends all C.S.P.A. Riggers adopt the new minimum/maximum pull force requirements.....
Chest Mount Reserves minimum 5 lbs - minimum 15 lbs
Piggyback Reserves minimum 5 lbs - maximum 22 lbs
Upcoming reprints of P.I.M. #1, Section 5.6.5, and P.I.M. #2, Section 14.8 reflect these changes.

Item #3 Ripcord Handles:
The T&SC recommends that CSPA Riggers do not pack any reserve container with an Anti-Wind Blast Handle or with synthetic (not metal) ripcord handles of any type.
These handles will not be permitted at the Canadian National Championships under any circumstances

Item #4 Main Parachute Snivel:
The following is reprinted from a British Parachute Association Safety Bulletin dated August 1987.
Because of two incidents involving Glidepath Fury canopies streaming it was discovered that these two canopies did not have slider stops attached to the outside A line flares which they should have had. Anyone jumping Glidepath canopies especially Fury's should check this and if they do not have the slider stops should contact their supplier immediately.

Item #5 IAD/Hanging Exits/Premature Deployments:
A number of AIM reports have been received by the C.S.P.A. office indicating inadvertent main parachute activations while using an IAD/Hanging Exit combination. This combination is specifically not recommended by the T&SC and CWC. Proper IAD dispatch techniques are explained in the Level 2 Coaching Certification Manual, Chapter 4.
There have also been AIM reports submitted with inadvertent main parachute activations resulting from contact with door frames, control knobs, door handles and other protrusions. Extra care must be exercised by all jumpers exiting the aircraft, and by jumpmasters dispatching students. Large equipment and large jumpers seem to be contributing factors. More exit practise on the ground, with full equipment on, may help to alleviate these problems.
Aircraft operators and pilots should ensure that any protrusions which could snag equipment should be adequately protected or removed.
Dave Martin
Chairman T&SC

TECHNICAL BULLETIN #31 **MARCH, 1988**

Item #1 S.A.C. RESERVES GROUNDED:
An air worthiness directive, issued by the FAA has grounded all Security Aero Conical (S.A.C) reserves effective immediately. Riggers shall not pack S.A.C reserves and owners shall not jump S.A.C reserves. At least 5 SAC reserves have been found with severely weakened fabric. This defect could possibly be caused by the same conditions that the Pioneer "K" series reserves were recalled for, during the last couple of years. The problem arose when a certain batch of marquisette used in the modifications, was discovered to contain a acidic substance that deteriorated nylon.
Because of the quality control used with the TSO system, Pioneer was able to trace and recall only affected reserves. GQ Security, on the other hand, went out of business several years ago, and records for the quality control/materials used are not available
According to information supplied by some alert FAA Riggers, fabric deterioration found on affected SAC reserves has apparently occurred from one repack to the next.

Item #2 INSTALLATION OF LAMINATED KEVLAR BANDS ON PHANTOM ROUND RESERVES:
All Phantom Round Reserves manufactured after January 1, 1988 have a unique laminated kevlar construction. The crown support band, which is interwoven with the radial seam tapes, has 2 layers of Kevlar and the upper lateral band (apex) has 3 layers of Kevlar. Phantom reserves have used 3 single layer Kevlar bands (skirt, crown and apex) for several years and TSO certification was accomplished in this configuration. The use of multi-layer, laminated Kevlar in the 2 upper bands provides a significant increase in lateral strength and reduces the possibility of structural damage in the event of an out-of sequence or irregular deployment.
All Phantom Round Reserves (22, 24, 26 and 28) manufactured before January 1, 1988 should have Laminated Kevlar bands installed in conjunction with the next scheduled repack. Installation is required prior to August l 1988.
Laminated Kevlar bands may be installed by any Master Parachute Rigger or Certificated Loft who has the required personnel, machinery, materials and instructions. Many National Parachute Dealers are equipped to provide this service. If you prefer to return your Phantom canopy to National for installation, the cost will be $35.00 plus shipping. National Parachute Dealers, Master Parachute Riggers and Certificated Lofts may charge more or less.
Instructions and specifications for installation of Laminated Kevlar bands have been provided to all National Parachute Dealers. Instructions and specifications will be provided to Master Parachute Riggers, Certificated Lofts or their foreign equivalent upon request.
CSPA Certified Riggers are reminded that this type of major modification may only be done by a Rigger "B"- or higher rating holder

Item 3 SAFETY NOTICE FROM PARA-PHERNALIA:
Several hundred owners of Para-Phernalia Northern Lite harness and container systems equipped with the 3-ring release must have their rigs inspected to ensure the release systems are not defective.
The company recently issued 3 safety bulletins explaining that the connectors on the ends of the release cable housings may not be adequately crimped in place. The connectors - technically called AMP connectors - prevent a riser from releasing accidentally. If a connector isn't securely affixed to the housing, a tug on the housing can extract the cable from the locking loop and release the riser.
The bulletin affects those Northern Lites with serial numbers 0573N through 0800N. It said a rigger must check the security of the AMP connectors during the next reserve repack.
(The inspection order applies to rigs with a 3-Ring release system and not to those equipped with the Chrysalis release system)
The rigger should use a spring scale, such as those used to weigh fish that has a 30 lb capacity. Disconnect the 3-Ring risers from the harness, pass a length of 550 cord through the grommet in the hole of the AMP connector and knot it into a loop. Use the scale to apply a straight pull of 25 to 30 pounds to the loop (and therefore the connector). The connector should not slip
If the connector pulls off, return the cable housing with the serial number of the Northern Lite to Para-Phernalia for a free replacement.
More information is available from the company at 1045 12th Ave
N.W #F-8. Issaquah, WA 98027. The phone numbers is (206)392-9534

Item #4 Don't wash F-111:
During recent studies on F-111, the fabric used on most of the recently manufactured canopies, it was discovered that the fabric suffers water damage more easily than previously thought.
During the filming of the new Norm Kent video, From Wings Came Flight, several jumpers landed in the ocean. Normal procedures were carried out i.e rinsed several times in fresh water and hung to dry but all of the canopies involved suffered structural damage during ensuing jumps.
It has been found that water not only washes off the fluorocarbon coating but if the immersion has been in salt water, even after several rinsing cycles, fine crystals of salt remain in the fabric and act as mini-knives on the fabric, thus contributing to the deterioration of the parachute canopy.

Item #5 ELASTICS:
Riggers are reminded that Phantom series reserves require special elastics on deployment diapers. They're available from National Parachutes and its dealers.

Item #6 CSPA EXHIBITION RATING (Revised Feb.10/88)
To qualify:

- current CSPA membership
- "C" Certificate of Proficiency
- Minimum 400 jumps, of which 250 must be with a Ram-Air Canopy
- 50 Ram-Air jumps in the previous 12 months
- 10 successive pre-planned stand-up accuracy jumps within 5 meters of the target center, with a Ram-Air canopy
- successful completion of the written exam

To annually re-qualify:
- current CSPA membership
- 2 successive pre-planned stand-up accuracy jumps within 5 meters of target center with a Ram-Air canopy
- 50 Ram-Air jumps in the previous 12 months

Administered by:
- course conductors
- logbook examiners
- instructor "B"'s
- judges (all items except the exam).

Item #7 CSPA on the move:
Effective April 1, 1988 the CSPA National Office will move to: 4195 Dunning Road, RR #3, Navan, Ont K4B 1J1 telephone: (613)) 835-3731.

Item #8 SWIFT Reserve Recall:
The following Swift Reserves have not been returned to Para-Flite for inspection and/or modification:

R3-2757	R3-2944	R3-3044	R3-3295
R3-2778	R3-2945	R3-3048	R3-3307
R3-2780	R3-2946	R3-3116	R3-3358
R3-2785	R3-2947	R3-3134	R3-3379
R3-2799	R3-2951	R3-3149	R3-3380
R3-2800	R3-2957	R3-3181	R3-3381
R3-2805	R3-2958	R3-3197	R3-3382
R3-2808	R3-2962	R3-3198	R3-3383
R3-2811	R3-2963	R3-3199	R3-3384
R3-2816	R3-2973	R3-3200	R3-3385
R3-2840	R3-2979	R3-3201	R3-3386
R3-2848	R3-3007	R3-3202	R3-3387
R3-2853	R3-3008	R3-3203	R3-3388
R3-2859	R3-3009	R3-3204	R3-3389
R3-2897	R3-3010	R3-3205	R3-3390
R3-2913	R3-3011	R3-3206	R3-3391
R3-2914	R3-3012	R3-3207	R3-3392
R3-2915	R3-3013	R3-3208	R3-3393
R3-2917	R3-3014	R3-3209	R3-3394
R3-2920	R3-3015	R3-3210	R3-3395
R3-2922	R3-3016	R3-3211	R3-3396
R3-2924	R3-3017	R3-3212	R3-3398
R3-2925	R3-3018	R3-3213	R3-3399
R3-2927	R3-3019	R3-3214	R3-3400
R3-2933	R3-3020	R3-3215	R3-3401
R3-2935	R3-3021	R3-3216	R3-3402
R3-2936	R3-3025	R3-3225	R3-3403
R3-2937	R3-2028	R3-3226	R3-3406
R3-2938	R3-3029	R3-3228	R3-3407
R3-2939	R3-3033	R3-3229	R3-3411
R3-2940	R3-3037	R3-3230	R3-3413
R3-2941	R3-3041	R3-3269	R3-3417
R3-2943	R3-3042	R3-3292	R3-3427
			R3-3451
			R3-3470

TOTAL 134(18.5%)

TECHNICAL BULLETIN #32 **FEBRUARY, 1989**

Item #1 Acid Treated Mesh Contamination:
The British Parachute Association has grounded all parachute equipment in which mesh (marquisette) is a component. This includes not only most manufacturers of round reserves, but also reserve and main pilot chutes. It should be noted that this particular grounding in not currently applicable in Canada or the United States.
The concern is ongoing since the identification of weak fabric found in some Pioneer and Security reserves several years ago. During the course of acidity testing by G.Q Parachutes (Great Britain) mesh used in other makes of reserves was identified as having a pH of 4.3 or less (neutral is 7.0, each 1.0 increment of the scale is a ten fold increase/decrease of basicity/acidity). MIL-C-3395 (specification for mesh) does not indicate a pH range, and to date no correlation has been determined for the level at which deterioration of nylon fabric occurs.
Washing the canopy is not recommended, as it may cause as many problems as we're trying to prevent. National Parachutes is developing a tensile test procedure for the Parachute Industry Association which will involve a tensile proof loading of the parachute fabric. Some 200 Phantom round reserves (of all vintages) have been tested in this manner, all have passed.
The prudent rigger will focus particular attention on the panels immediately adjacent to (and in contact with) the mesh on all reserves at each 120 day repack.

Item #2 Coroner's Inquest:
Last year (1988) there were six skydiving fatalities in Canada, four of which led to inquests being convened. The coroner/jury recommendations of three (the fourth is pending) are reproduced here after a synopsis of each accident.
SYNOPSIS - The student performing solo freefall, simultaneous activation of main canopy (by the student), and a reserve canopy (by the AAD) resulting in subsequent entanglement
RECOMMENDATIONS
1. Use of audible altimeter be recommended until the student is considered self-supervised.
2. A log should be kept on the AAD check-out date and attached to the unit to ensure operability.
3. Every parachuting Centre and Club should have mandatory membership with the Canadian Sport Parachuting Association (CSPA) and adhere to its minimum safety standards.
4. We recommend that CSPA be empowered and funded by the Federal Government that parachuting clubs adhere to its minimum safety standards.

SYNOPSIS - Experienced skydiver performing relative work, normal break off at altitude. No activation of main canopy (experienced with the equipment) attempting activation at impact.
RECOMMENDATIONS
1. It should be mandatory to have all skydiving clubs and skydivers be members of the Canadian Sport Parachuting Association.
2. Government funding be increased to Canadian Sport Parachuting Association so they can scrutinize all parachuting clubs and equipment for safety.
3. That all manufacturers of parachute equipment check designs and safety features of reserve chutes, especially ripcord length and tension.
4. When skydivers take their reserve parachutes in for the 120 days mandatory repacking, they should be present to deploy it while wearing. This will ensure the owner is comfortable with procedure and can operate their reserve chute properly.

SYNOPSIS - first jump student had a partial malfunction of main canopy, with no deployment of the reserve.
RECOMMENDATIONS
1. That Transport Canada become responsible for regulating parachuting clubs in Canada and develop a training program. This to be done in conjunction with the Canadian Sport parachuting Association.
2. That Transport Canada or the Canadian Sport Parachuting Association make it mandatory that reserve parachutes be repacked and inspected every 120 days or less and that the packing rigger place a card in the parachute pouch with his/her name, date and place of inspection, and that the above be logged in the club records.

Coroner's Recommendation
That the training developed by Transport Canada, in league with the Canadian Sport Parachuting Association, clearly indicate the required curriculum, the minimum instructional time to be spent on each segment of the training and of thee total course package and a requirement that written and oral confirmation be mandatory.

Item #3 Reserve Activation:
Every individual (particularly small people) should ensure that their reserve can be activated with one hand well before reaching full arm extension. Below 2,000 feet in free fall, at terminal velocity, is not the time to discover that other means are required (such as two hands, or rolling the shoulders).

Item #4 Substandard/Misidentified Thread:
Rigger "B"'s should pay particular attention to their thread inventory. Threads from several manufacturers (both Canadian and American) have not conformed to specifications. One instance involved cotton thread labelled as nylon, another pertained to a batch of 2 ply which should have been 3 ply, and a third company admitted to occasionally mislabelling spools of thread as to thread size.

Item #5 Hand Deploy Pilot Chutes:
A hand deploy pilot chute is a component which may be expected to wear out. It should be inspected periodically, and particularly if main canopy deployments have become a problem.

Item #6 Bag/Pod Locking Stow Elastics:

The elastics used to close a bag/pod should be of a consistent type (i.e. mil-spec) and in good condition. Weak broken or elastics too long could result in a canopy before lines deployment (malfunction).

Item #7 Galvanized Ripcord Cable:
Riggers are reminded that the reserve ripcord cable is specified to be stainless steel; the use of galvanized cable will result in a higher than normal reserve pull force.

Item #8 FXC Automatic Activation Devices:
FXC Corporation has issued a reminder to users that disassembly of the "black box" must only be done by FXC or an authorized repair facility. Several units have been returned to the factory with the seals broken.

TECHNICAL BULLETIN #33 **JUNE, 1989**

Item #1 Round Reserves/Pilot Chutes with mesh:

History: In 1988 the FAA and subsequently CSPA, grounded all Security SAC reserves due to fabric deterioration. Acid contamination was suspected in the mesh used for the modifications, but no proof was available to verify this. As well, Pioneer Parachutes recalled many of their 'K' series reserve parachutes, but no reason was given.

In March,1985 the FAA issued an alternate means of compliance to the AD which grounded the SAC reserves. (See the bulletin in the latest issue of Canpara). It consisted mainly of a pH test to determine if there was an inordinate level of acidity in the mesh, and canopies which "passed" the pH test were allowed to be returned to service.

At the beginning of this year, the BPA grounded all parachute equipment containing mesh until such time as it could be checked for the level of acidity. Canopies meeting the set standards were then released to service. Canopies which failed the "pH" test were treated in a neutralizing solution, a patch was cut out of the maker's panel, and a destructive test was performed on that patch. If the patch stood up to the strength requirement, the canopy was deemed to have passed and the maker's panel was repaired with a panel patch.

To Date: Once the proper pH indicator test solution became available, riggers started checking the mesh of all canopies and pilot chutes for acid contamination. In a short period of time it became very apparent that acid contamination was a problem in a wide range of different reserve canopies and pilot chutes.

Although testing in Canada has only just started in the last month, several parachutes have been found to be damaged in the order of a 60% reduction in canopy cloth strength. At least one of these canopies was a square reserve with no mesh contact.

G.Q. Parachutes Ltd.(of England) has developed a procedure for testing and treating any affected "British built" SAC's. National Parachute Industries has developed a procedure for testing and treating any affected Phantom round reserves, Magnum reserve pilot chutes, and their pilot emergency parachutes. The process, listed on the separate company bulletin, is a reasonably fast, non-destructive procedure. It is believed that the PIA will adopt this procedure to deal with other affected equipment.

Recognition: Riggers will be able to identify reserves which have been tested/treated by looking for the following information:

SAC Reserve - on the maker's panel in permanent waterproof ink -"AD 88-05-08 NO LONGER APPLIES
-TSO markings are to be intact or restored
-(in Canada) the rigger's name, number, date and place of test.

Phantom Reserve -on the maker's panel in permanent waterproof ink,
-ph test . . . . . PASSED
-40 lb tensile test PASSED
-the rigger's name, number, date and (in Canada) place of test.

As well, there may be a stain on the center of the mesh panel in a blue, blue-green, green, green-yellow, or yellow color. This is left from the pH indicator test solution and will not harm the fabric or mesh. The color of the dried stain has no bearing on the test results, as the indicator solution color is only valid for a period of about one minute.

Scope: All meshed reserve parachutes and pilot chutes must be checked for excessive levels of acid contamination at the next repack cycle or Dec 31,1989, whichever is sooner. Any affected equipment must have the acid neutralized, be tensile tested and marked at that time. Unaffected equipment must be tensile tested and marked. Canopies and pilot chutes which were not built by either National or Security should be tested and marked as per the National Parachute Inc. marking system listed above.

Criteria: pH testing, tensile testing, and neutralization may be accomplished by any FAA Master Rigger, FAA Certificated Loft or CSPA Rigger "A" (National Parachute Industries allows an FAA Senior Rigger to do this on their products).

Because of the chance of error in doing the pH testing and neutralizing the affected equipment, these two operations are looked upon as a modification and cannot be done or certified by a CSPA rigger "A". Although this means that, to some extent, owners must send their equipment to someone other than their local rigger, the TSC feels that this slight inconvenience is overshadowed by the need to rely on safe equipment. For this reason we have identified several competent key riggers across the country who will be able to perform this service.

Ron Dionne
803 Homewoood Rd.
Campbell River, B.C.
V9W 3N6 (604) 286-6095

Dave Martin, Sequential Flyer
Comp I,Site 1,RR #1
Fredericton, NB
E3B 3A8 (506) 459-7077

Robert Ledoux, Ctr Ecole de para de Valcourt
C.P. 636
Valcourt, Que
J0E 2L0 (514) 532-2024

John McCarthy, Gananoque SPC
Box 147
Gananoque, Ont.
K7G 2T7 (613) 382-5114

Guy Plamondon
157-10224 140 Ave
Edmonton, Alta

T5E 2E6 (403) 456-2192
Tom Pfeifer
914 Main St.
Saskatoon, Sask
S7H 0K5 (306) 665-2920
Steve West, Westway
PO Box 37
New Hamburg, Ont.
N0B 2G0 (519) 662-3278
John Addison, Skyscape
Box 2289
Morden, Man,
R0G 1J0 (204) 872-3170
Al MacDonald, Flying High
Box 626
Abbotsford, B.C.
V2S 6R7 (604) 852-9442

Some may or may not charge for the pH test and tensile test, but most will charge for the neutralization. We are confident that we can eliminate the acid/mesh problem through this testing program. Any other rigger "B"'s or FAA Master riggers not on the above list may contact Al MacDonald at the above address/telephone# to purchase a testing/info package. Rigger "A"'s with questions or anyone with any pertinent information can also contact same.

Addendum: It seems that the bottom line to the canopy/pilot chute is the strength of the cloth, especially on panels adjacent to and touching meshed mods. What passed as OK on the old "snap test" or "thumb test" (which seems to load the material to about a 10-20 inch/pound force) doesn't come anywhere near the requirement of the new 40 inch/pound force strength test. Many riggers are purchasing or making a fabric clamp to do a more qualitative strength test on canopy fabric, rather than relying on the old "seems strong enough to me" snap/thumb testing; especially now that a problem has been identified. Several U.S. parachute companies are now selling a set of clamps for this test. (National is selling Aerostar p/n 51406M clamps). They are basically a modified set of vice-grips. This qualitative test should also give riggers ease of mind when asked to pack that "1950/1960 pilot's pack" that has been lying in someone's basement for several years.

TECHNICAL BULLETIN #34 **AUGUST, 1991**

Item #1 TALON Skyhook Pilot Chutes - TALONETTE Harness/Containers:
On April 20, 1991, an incident occurred which resulted in a total pack closure of the main with a pull-out deployment system. Upon activating the reserve ripcord, the individual experienced a pack closure on the reserve. After reaching back and pulling on the container, the reserve deployed at approximately 400' AGL, resulting in a total inversion of the round reserve and extensive damage to the canopy. However the individual landed safely. The equipment was subsequently taken to the harness/container manufacturer for examination. Upon close examination, the manufacturer was able to duplicate the situation in the loft. Additional testing indicates the cause of the problem to be a sub-standard spring in the Skyhook pilot chute.
In repacking the Talon, further investigation revealed the situation to manifest itself only when the main container is full as in a total malfunction. This appears to be primarily as a result of the tension placed on the very small and tight containers. As of this date, the problem appears to be limited to the Talonette models B-/4 & B-/6.
Additional tests with the original pilot chute and the main container empty, showed the pilot chute to function with a slight hesitation before clearing the container.
Tests using a new Skyhook with good spring tension functioned properly with the main full or empty.
TALON B-/ SERIES AFFECTED CONTAINERS 1988-PRESENT
1399, 1457, 1554, 1584, 1585, 1587, 1632, 1640, 1653, 1667, 1681, 1682, 1690, 1699, 1700, 1717, 1724, 1725, 1727, 1750, 1780, 1785, 1787, 1788, 1789, 1750, 1791, 1753, 1754, 1814, 1818, 1827, 1832, 1833, 1855, 1858, 1868, 1913, 1955, 1988, 2008, 2012, 2039, 2052, 2057, 2213, 2218, 2228, 2238, 2276, 2287, 2298, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2327, 2329, 2340, 2352, 2359, 2366, 2409, 2413, 2415, 2431, 2471, 2478, 2483, 2493, 2495, 2496, 2497, 2589, 2590, 2599, 2600, 2611, 2652, 2671, 2697, 2714, 2725, 2803, 2833, 2855, 2856, 2860, 2867, 2894, 2895, 2908, 2942, 2951, 2954, 2956, 2957, 2970, 2977, 2982, 2983, 2984, 2989, 2995, 3004, 3010, 3013, 3016, 3017, 3031, 3040, 3043, 3044, 3046, 3048, 3051, 3058, 3068, 3071, 3074, 3083, 3099, 3106, 3114, 3118, 3143, 3147, 3169, 3178, 3216, 3217, 3218, 3219, 3226, 3228, 3229, 3233, 3239, 3285, 3290, 3300, 3310, 3320, 3375, 3392, 3422, 3433, 3465, 3466, 3467, 3469, 3555, 3560, 3568, 3584, 3613, 3624, 3649, 3650, 3693, 3699, 3703, 3745, 3746, 3784, 3835, 3836, 3841, 3851, 3855, 3862, 3884, 3927, 3947, 3960, 3964, 3975, 3977, 3978, 4034, 4040, 4041, 4044, 4064, 4065, 4067, 4080, 4093, 4102, 4104, 4126, 4129, 4132, 4133, 4140, 4143, 4146, 4154, 4156, 4160, 4161, 4164, 4174, 4184, 4186, 4296, 4312, 4330, 4351, 4359, 4415, 4426, 4445.

Item #2 - TANDEM VECTOR/Packing of drogue pilot chute:
The Relative Workshop recommends that when packing the drogue pilot chute on the Vector system that:
The drogue should be laid out and all but two or three feet of the Kevlar bridle should be stacked into the middle. Fold the drogue in half, then fold the bottom back up to the pocket length. Roll each side into the centre and slide the entire thing into the spandex pocket.
BE SURE THAT IT IS FREE TO SLIDE AND CAN BE EASILY REMOVED.
Packing the kevlar bridle outside the pilot chute may cause problems.

Item #3 Grounding of PINTAIL Canopies:
The following was received from Parachute Industries of South Africa (PISA) concerning Pintail canopies.
During April of this year, customer reports of Pintail malfunctions became a source of major concern to our Company. On 17 April 1991, Service Bulletin 01/01/5004 was issued, in which Pintail canopies were temporarily grounded. The reason was to thoroughly re-evaluate the opening characteristics of the Pintail, in light of these reports.
We conclude that, because of its unique shape, the Pintail was rather difficult to pack. Dealing with the tapered tail, as well as the slack in the D-lines, required a fair degree of care and attention, and that these were possible problem areas.
With this in mind, a series of Pintail's were modified, and have undergone an intensive evaluation programme. Essentially, these modifications comprised the removal of the two outboard D lines, altering the deployment brake setting, and some additional crossporting.
To date, some 300+ jumps have been performed with these modified canopies on a formalised testing programme with no malfunctions experienced.
We have received positive comments from the jumpers about the openings and the flight characteristics on the Pintail canopies. Overall performance remains unaltered, and no peculiar or unusual habits were noted.
Modifications to these canopies must be carried out by a FAA Master Rigger or equivalent recognised by the National Aero Club or Government Aviation Authority of the country concerned.
The cost of the modifications to be performed on the Pintail's will be borne by Parachute Industries of Southern Africa. We recommend that all Pintail customers return their canopy to the Dealer through whom the canopy was purchased. PISA will compensate each Dealer US$35 per canopy once the serial # is supplied.

Item #4 Modifications to EXCALIBER H/C System:
An incident recently occurred which resulted in a jumper being unable to withdraw the reserve ripcord pins far enough to allow the reserve pilot chute to deploy. Luckily, the jumper had presence of mind to relocate the main deployment handle and initiate the deployment sequence; landing the main parachute was uneventful.
The equipment was examined thoroughly and it was found that by pulling the yoke down sharply against the backpad, the ripcord housing would form a very tight radius, to the point where the top pin would bind until this radius was reduced.
Contributing factors on this problem included:
1. The ripcord housing tacking (at the pin end) was loose, which allowed the housing to pivot over the shoulder starting at a point closer to the pins.
2. The harness was loose enough to allow the container to slide up high enough on the individual's back (a small female) that the yoke could be pulled down tightly against the backpad. This possibly could have been caused by a somewhat headdown attitude while reaching for and pulling on the reserve ripcord.

The same problem was able to be reproduced on several other Excaliber's of different sized harnesses, containers and housings with the main container full or empty.
Although this is an isolated incident, and the only design or manufacturing problem reported in the seven years this system has been in use, Flying High has decided to modify the Excaliber. The ripcord housing stiffener will be replaced and the ripcord housing will be rerouted on all Excaliber's. This will guarantee a straight line pull of the ripcord pins into the housing, no matter what the angle or tension on the yoke.
At the time of the next reserve repack, the Excaliber harness/container system must be returned to Flying High for modification. **Riggers are not to repack the reserve in an unmodified Excaliber harness/container.** Owners are requested to send their rigs (with the reserve removed) prepaid, to Flying High or call (604) 852-9442 for further instructions. Flying High will do the modification without charge and return the equipment to the owner, freight collect. Riggers will be able to tell if this modification has been performed by noting that the stiffener extends up to or into the binding tape at the top of the reserve container, and that the ripcord housing angles to the top right corner of the stiffener plate. The placement of the top tacking from the end of the housing will be equal to or greater than the length of one ripcord pin. A notation on the packing card will be made by Flying High.
Questions concerning this bulletin or the modification may be addressed to Al MacDonald, Manager, Flying High Mfg. Inc., Box 626, Abbotsford, BC, Canada V2S 6R7.

Item #5 BULLET Harness/Container Systems with FXC 12000 installed:
In a recent incident, an experienced jumper snagged the power cable of the FXC 12000 on a protrusion from the locked open door of a Cessna. The power cable mounting plate was ripped off the reserve side flap and the reserve deployed successfully as the jumper cleared the aircraft.
Contributing factors on this incident were:
1. Although not large at all, the metal protruding from the in-flight door was enough to snag and securely hold the power cable. (The T&SC recommends that all doors and areas around doors where jumpers will exit, be carefully checked for anything that could snag on a jumper or his/her equipment).
2. Although the exposed power cable was less than 3" long and it fit tightly against the reserve container side flap, it was not covered, and therefore susceptible to being snagged.
3. The Bullet container was an older model with the reserve ripcord on the right side main lift web. The FXC was also mounted on the right side.

Although this is an isolated incident, and also a non-standard (right pull) configuration, Flying High has decided to eliminate the possibility of a similar occurrence by modifying all Bullet's set up for the FXC 12000 installation.
At the time of the next reserve repack, the harness/container system must have a protective channel installed on the side flap so as to prevent the power cable from being snagged. Riggers are not to repack the reserve in a Bullet with an FXC installed, until the protective channel is installed. This channel, along with the installation instructions, may be obtained in kit form from the manufacturer and installed in the field by a certified rigger. If you own one of these affected products, contact Flying High with your name, address and serial number of the container(s).

Item #6 SECURITY Aero-Conical testing:
An amendment to the original AD regarding putting SAC's back in service was issued on 91-02-05. This AD amendment requires all Security Aero Conicals be tested according to the PIA Technical Standard 108, Parachute Canopy Fabric Tensile Test, Non-Destructive Method, dated January 25, 1989.
The mesh (netting) must also be tested, using Bromocresol Green Solution, to determine if it is acidic. If it is acidic, the canopy cannot be returned to service unless the acidic condition in neutralized.

TECHNICAL BULLETIN #35 **FEBRUARY, 1992**

Item #1 NATIONAL PHANTOM Reserves:
All riggers should be aware of the National Parachute Industries, Inc. requirement that a pH/TS test be effectuated once a year on all National Phantom 22, 24, 26, & 28 reserve canopies, Pilot Emergency Parachute 360, 425 & 490, Magnum Reserve Pilot Chute 357, 357S and 44. This is in addition to the original testing that should have already been performed on these items. This effects all of the above mentioned manufactured before June 1, 1989 and remains in effect until further notice provided by the manufacturer.
Action: Test fabric for presence of acidic mesh and tensile strength.
If both tests pass - return to service.
If passes tensile test but fails pH test - neutralize before returning to service.
In case of tensile failure - return to manufacturer for further testing and rework before return to service.

Item #2 Failure of MAILLON RAPIDE links:
There has been some concern with the number of failures on Rapide or "Quick " links used on parachuting equipment. The majority of these documented failures have been on "Taiwan" links, copies of the French produced Maillon Rapide links. Although some failures have occurred when using the French links most of these have been attributed to incorrect rigging practices. Bona fide Rapide links can be easily identified by the manufacturers name and other identifiable markings stamped on each one.
It must be remembered that these links are not manufactured specifically for parachuting use and quite often may not come up to the rigid testing normally used for hardware parts used in parachuting applications. A #5 link has a Safe Working Load (SWL) of approximately 620 lbs. which translates to a Proof Loading (PL) of about 1550 lbs. - comparable to our MBS. A #6 has a SWL of approximately 880 lbs. or 2200 lbs. Proof Loading. Stainless steel links of these same numbers equate to higher loading ranges i.e. a #5 SS has a SWL of 990 lbs or approximately 2475 lbs PL. All of these links are designed for longitudinal stress.
Riggers should also be aware that some manufacturers state in their specifications that a #6 Rapide link is to be used on their reserve canopies. Some manufacturers of square reserve canopies now call for stainless steel #5 links as standard equipment with their parachutes.
To be on the safe side use only authentic Maillon Rapide links and make sure that proper procedures for installing and tightening are used. All riggers are required to thoroughly inspect all components during assembly and maintenance of parachuting equipment.

Item #3 Removal of data panel on certified equipment:
There have been some instances of parachuting equipment appearing with the maker's gore or data panel having been removed by unknown persons. This practice not only automatically removes the responsibility of the manufacturer to honour any warranties but also voids the TSO on that equipment. Although some may not think this is any big deal, especially on main canopies, by removing the data panel information from a harness/container or reserve canopy, and in the process voiding the TSO, when taken to a rigger he would naturally assume this equipment was no longer airworthy and could refuse to inspect and repack the reserve.

Item #4 A.A.D. Installations:
A recent article in Skydiving newsmagazine graphically illustrated the results of an improper installation of an Automatic Activation Device. Although the installation in question was a Warp 3/SSE Pin Puller combination, this type of incident can happen with any harness/container/AAD installation. Riggers are reminded that it is their responsibility to functionally test all AAD installations they may be making and also to test these installations at each repack cycle. If in question about specific installations contact the harness/container manufacturer for specifications and directions on correct assembly or contact the AAD manufacturer to determine compatibility.

Item #5 Bikini sliders on RAVEN Reserves:
There have been some instance of excessive deployment times on Raven Reserves manufactured prior to March 1988. It is recommended that if reserves of this vintage do not have a "bikini" slider as part of the assembly that one be installed as soon as possible. Although the "traditional" slider is certified for both main and reserve use Precision Aerodynamics, Inc. started shipping all Ravens with the "bikini" slider effective 1 December 1987. When changing the slider the data panel must be marked with the appropriate information.
It should be noted that "bikini" sliders are not to be used on the newer Super Raven which Precision began shipping 10 March 1988. Super Ravens have a specifically designed high aspect ratio slider which is one of the key elements in producing clean, crisp, consistent openings. Super Ravens are easily identified by their red end-cell logo panels.

TECHNICAL BULLETIN #36 **JUNE, 1992**

Item #1 RELATIVE WORKSHOP issues product recall:
The Relative Workshop, Deland, Florida, has issued Service Bulletin #010592 dated 21 May 1992 which affects all of their Type XVII (Mini 1") main risers with reserve static line (RSL) attachments.
Although these Mini l" risers are designed to withstand loads up to 2,500 pounds it is apparent that newly designed canopies with Microline, used by heavier jumpers, occasionally exceed this design limit. These risers, on average, appear to be stronger than the canopies they are attached to as scores of canopies have blown up without damage to Type 17 risers. Breaking lines on a main canopy is a problem for which corrective action can be taken, but if a riser with an RSL attached were to break, this could be fatal. It could deploy the reserve canopy into the now malfunctioning main canopy.
STATUS: MANDATORY
Compliance DATE: Immediately, prior to next jump.
REQUIRED ACTION: Immediately disconnect the reserve static line (RSL) from the Type 17 (Mini 1") main riser. Have a currently rated parachute rigger cut the reserve static line (RSL) attachment ring off the riser. Then attach the snap shackle end of the reserve static line (RSL) around either the adjacent short or long cutaway housing. The system may remain in service, set up this way, until replacement Type VIII (1 3/4") risers set-up for an RSL are installed.
Contact the Relative Workshop or one of their dealers with the serial numbers of affected systems and they will supply Type 8 (l 3/4") risers at no cost, if the RSL was installed by Relative Workshop. (If the RSL is an after-market installation, they can supply the recommended Type 8 risers at reasonable cost.)
REMEMBER: This bulletin only affects those Type 17 (Mini l") main risers with reserve static lines (RSL) attached which were manufactured by Relative Workshop. It does not affect Type 17 main risers which have been manufactured without reserve static line attachments.

Item #2 NATIONAL PHANTOM Reserves:
National Parachute Industries, Inc. has issued an amendment to the service bulletin issued June 1, 1989. This amendment deals with a revised method of monitoring Phantom reserves, Magnum pilot chutes and Pilot Emergency Parachutes that were listed on the June '89 directive.
Since the original bulletin was issued National, and riggers in the field, have tested and retested several thousand canopies for acid contamination and tensile strength. The resulting documentation indicated acidic pH conditions were absent after: 1. Having passed the initial test or, 2. Were retested following proper neutralization according to the manufacturer's instructions.
The service bulletin amendment states that any of the above mentioned products manufactured prior to 1-6-89 should undergo at least one test according to the original bulletin, using the test methods described, and,

- If PASSED, document results according to their guidelines. Product does not have to be retested except for normal periodic checking of the fabric's strength during repacks as prescribed by good rigging practices and procedures described in the 1989 bulletin.
- If FAILED, the product needs to be treated and monitored according to the bulletins directions for another year after the initial test date expires. A total of two years monitoring would apply to this product. After this time period apply the same procedures as outlined in the above paragraph.

What this amendment does essentially is to release riggers from the responsibility of performing a pH test on the above-mentioned products once a year. However, it does not release them from the responsibility of periodic tensile testing of the fabric. This periodic testing of material strength should not only apply to the above-mentioned canopies but to all parachutes intended for use in sport reserve or pilot emergency applications.

Item #3 Premature line wear:
There have been reports from the field that suspension line wear on some of the new, high performance canopies seems to be precipitated by not stowing the collapsible/stowable slider. The slider on some of the newer canopies are made to be stowed in a manner described by the manufacturer that helps in reducing drag and also prevents vibratory action at high speed that can cause premature wear of the lines just above the connector links. Although the Spectra lines commonly used on these canopies has a high tensile for it's size the constant flapping of an unstowed slider may cause wear which ultimately could result in suspension line breakage during canopy deployment.

TECHNICAL BULLETIN #37 **SEPTEMBER, 1992**

Item #1 SKYHOOK Reserve pilot chutes:
Service Bulletin #1513 Revision A refers to Skyhook Reserve Pilot chutes PIN 2233-() manufactured by Rigging Innovations Inc. between May 16, 1989 and July 29, 1991. Serial numbers include 2405-5551.
In April 1991, a Skyhook reserve pilot chute was identified as having non-spec spring tension. Subsequent investigations have identified additional Skyhook pilot chutes using nonspec. springs.
The Skyhook reserve pilot chutes must have their spring tension tested for acceptable limits according to Rigging Innovations testing procedure TP-19F001, Field Pilot chute Spring Test.
Those pilot chutes passing the test may be marked as specified in the test procedure and returned to service. Those failing the test must be returned to the manufacturer or their designated representative for repair or replacement.
COMPLIANCE DATE: At the next reserve repack.
For information on field testing and the tools required to accomplish this test contact:

×Sandy R. Reid, President
Rigging Innovations, Inc.
236 East 3rd St. Perris, CA 92570
phone: 714-657-1769 fax: 714-657-0547

Item #2 PARACHUTES DE FRANCE Bulletins:
On a JAGUAR harness/container system, during a main canopy cutaway, the left hand release cable could not be extracted from the housing, because the housing was sliding freely up and down. The routing of the housing changed due to the pull force applied to the cable. Method of inspection according to the bulletin is: Check if the 3-ring housings are firmly attached to the harness, inside the right hand chest strap:
step 1) Remove the 3-ring release handle and cables
step 2) Try if you can to slide up or down one housing relative to the other,
Short travel of some millimetres is normal.
If you can freely move one housing relative to the other, this can seriously effect a break away operation, or even make it impossible. In this case, the JAGUAR must be returned to Parachutes de France for repair. Repairs are free of charge, except for return shipping charges.
COMPLIANCE DATE: IMMEDIATE
Also from Parachutes de France a bulletin regarding modification of ATOM harness/container systems equipped with a LOR 2 system, carrying serial numbers lower than #920801. During a repack it was found that a higher pull force than 9 daN was required to extract the ripcord pin. Research revealed that this unusual high pull force is caused by the small velcro parts that hold the lanyards to the reserve container top flap.
Modifications may be performed by following these instructions:
step 1) Open the reserve pin cover flap
step 2) Remove the two lanyards from their respective velcro pieces.
step 3) Carefully unpick the hook velcro piece sewn to the reserve top flap. Make sure not to cut any fabric.
* This simple modification can be performed by any appropriately rated rigger. It is not necessary to repack the reserve.
* Removing the pile velcro pieces from the lanyards is not necessary. Due to the nature of the lanyard webbing this operation is very delicate and must only be performed with the greatest care and attention.

COMPLIANCE DATE: IMMEDIATE

Item #3 RACER ELITE Deployment bag length:
A service bulletin from the Jump Shack dated June 24, 1992 deals with the possibility of reserve deployment bags being of incorrect size. This notice only affects the Standard Elites (those measuring 14" wide at the shoulders and 17" wide at the hips) which were manufactured from November 20, 1991 through June 20, 1992. (Bags marked "W")
A pattern change in November, 1991 which makes the yoke and the top reserve flap more "scooped out" effectively made the existing Standard Square Reserve Bag too long for the newer model Standard Body rigs.
The "fix" is a easy one. On the Standard width bag there is a stitch line across the bag horizontally 4 inches up towards the bridle from the horizontal centerline of the top grommet. Simply add another stitch line (Fed. Std 301 single needle lockstitch, using "E" thread) two inches down from the existing stitch line or two inches up from the centre line of the grommet. This effectively shortens the bag in an area which should have little or no canopy occupying it anyway and prevents unsightly excess bag from sticking out the top of the reserve container.
This alteration is optional and can be performed at the next reserve inspection & repack.
Also from Jump Shack - apparently some riggers in the field have been installing the reserve pilot chute Quick Loops up-side-down. The Kevlar Quick Loops are to be installed on the pilot chute with loops facing up. Those riggers unsure of the correct method of installation should be consulting their SST, Racer Elite Owners Manuals for details.

Item #4 Rigger responsibilities:
A recent incident blatantly illustrates the need for all riggers to make sure all tools and packing aids are accounted for after performing any procedures on parachuting equipment.
Scenario: a prospective buyer for a used piece of equipment is encouraged by the owner to familiarize himself with the gear by practising reserve procedures at the same time affording himself an opportunity to inspect the reserve canopy he is contemplating purchasing. The reserve ripcord handle was pulled - but the pilot chute failed to clear the container of the SST Racer. The locking loop, mounted on the pilot chute, was firmly attached to the lower flaps of the reserve container. Closer inspection showed that an elastic band was wrapped around the locking loop, preventing it from pulling through the grommets.
It was surmised that the elastic band had been used as a bodkin lock (this procedure is mentioned in several manufacturer's packing instructions) but had not been removed from the bodkin prior to removing the bodkin from the container. Withdrawing the bodkin without removing the elastic resulted in it's becoming entangled with the locking loop. This could have resulted in a fatal accident. COUNT & DOUBLE CHECK YOUR TOOLS!

There seems to be a disturbing number of unqualified people masquerading as riggers and also a number of qualified riggers who are short-cutting their duties.
I have seen instances of riggers "pencil packing" reserves without even removing the seal from the previous repack; unqualified persons using the seal and certificate of someone who perhaps isn't even aware this is happening; and also, there are a number of riggers out there making repairs etc. who are neither qualified to attempt such tasks nor have they received the necessary training to perform these duties.
It is apparent that quite a number of riggers in the field are paying little attention to either TB's or AD's. There are still a lot of canopies out there with acid mesh contamination that still have not been through the initial testing, even though a number of repacks have been done since the publication of directives.
Riggers practising these 'indiscretions' should review their motivations and the commitment to safety they made when becoming a rigger. At very least let's "clean up our act" or "get out of the theatre". Remember, you are legally responsible for your actions!

Item #5 RAVEN sliders:
To check that a Precision Raven canopy is fitted with the correct slider, use the following chart:

CANOPY MODEL		PART NUMBER
Micro Raven 150	21004B	
Raven 1		21005B
Raven 2		21005B
Raven 3		21006B
Raven 4		21006B

TECHNICAL BULLETIN #38 **DECEMBER, 1992**

Item #1 "Mandatory" service upgrade from FXC:
Effective 1 December 1992. all Model 12000's returned to FXC Corporation, Santa Ana for servicing, will be automatically upgraded to the latest revision level (new production standard), Revision "J".
The "Mandatory" upgrade policy will address three (3) important factors:
#1. FXC will be able to ensure reliability of the Model 12000 by keeping all units to the latest revision standard.
#2. FXC will be able to reduce servicing "turn around time" as servicing will be automatically accomplished to the latest standard. A pre-established price for this service is published, eliminating time consuming telephone call coordination with individualized costing information.
#3. Once to standard, a Revision "J" Model 12000 needs only be factory serviced every two (2) years.
Questions regarding price schedule and what work needs to be accomplished for the various revision models should be directed to FXC Corp. at (714) 556-7400 or Fax.(714) 641-5093

Item #2 Tensile testing:
It is imperative that all active riggers include in their tool kit the implements with which to test the strength of canopy fabric. Periodic testing of all reserve parachutes has become a mandatory function for technicians in the field. This testing applies not only to round canopies effected by the "acid-mesh" problem but to all other models of round parachutes and square reserves as well. The problem of sub-standard fabric keeps appearing on a regular basis; all canopies are suspect and should be tested.
Recently, a square reserve manufactured in the early 1980's was routinely tested by a rigger and found to destruct with a pull force of around 20 pounds. This canopy had been stored in a basement, under normal circumstances, for several years while the owner took a hiatus from the sport. When returned to the manufacturer the canopy was deemed not airworthy. No repairs were performed as it was decided it would be uneconomical to attempt such a task. No compensation was offered.

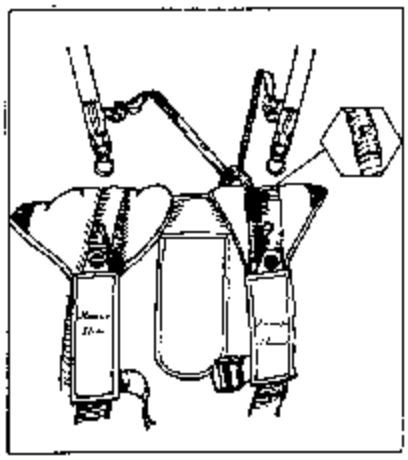
Item #3 Main closing loop tension:
In a recent study performed by a member of the T&SC it was discovered there is a wide variance of pressures exerted on the closing loop of main containers fitted with the over-the-bag method of loop attachment. Some manufacturer's have the loop attachment point at the bottom of the container (just below the bottom of the reserve container). When this method is used the main closing loop must travel around the bag on it's way to the bottom closing flap. Substantial pressure is exerted on the bag, which eventually means that the loop will form a depression in the bag and main parachute packed within. As the depression is formed the loop reduces tension on the closing pin. Reduction in loop tension can occur in only a few minutes. Factors which affect this
1.A long loop with low tension on the pin will very quickly loosen up even more
2.Length of time the packed canopy is stored, how often it is flexed or if weight is placed on the packed rig. All could affect the amount the main closing loop "bites" into the main deployment bag/packed canopy
3.A very clean main pack job can allow the loop to pull right into the "wind channel" in centre of the packed canopy
4. A very sloppy main pack job which leaves a large bulk of fabric in the centre of the bag (and soft corners) requires a longer loop. As a novice jumper's packing skills improve, the high bulk in the centre gradually diminishes as the corners are filled and the bulk equalizes in the bag. Many jumpers may not notice the slow "lengthening" of the main closing loop
5.A change in packing volumes can occur when travelling between areas that experience different levels of humidity, significantly affecting closing loop lengths
6.Because of the memory associated with "ZeroP" fabric it may be more prone to "compression factor" than other canopy fabrics
Riggers should advise parachutists with this closing configuration of the possibility of reduced tension on the closing device, making an inadvertent main container opening more likely when moving around in aircraft. Maintaining an adequate amount of tension on main container loops is a requirement that is quite often overlooked on all container types. A loop which has been left too loose, just because it's easier to pack, could develop into a life-threatening scenario for all persons in a skydiving aircraft. Pull force exerted on a closing pin should be between 4 and 12 pounds. This applies to straight or curved pins.
Regardless of loop length, a physical inspection of closing loops should be performed each time the main parachute is packed. Loops that have begun to fray should be replaced immediately. And, don't forget pin checks - prior to boarding and prior to exit

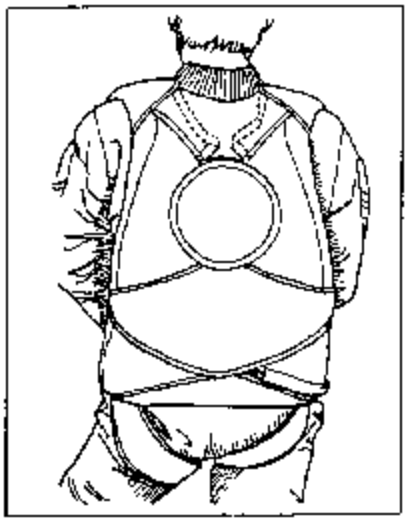
Item #4 PARACHUTES DE FRANCE service bulletins 92003, 92004 & 92005:
#92003 - modification to the cutaway system on Galaxy/tandem equipment.
STATUS Mandatory: for Galaxy tandem harness/container systems with Serial number lower than 910301.
This modification involves the fixation of cutaway housing to the harness, risers also involved.
#92004 - Inspection of proper functioning of mini-risers.
STATUS Mandatory: all PDF mini-risers (with "PF" mark on rings).
Inspection involves the use of a suspended harness, plus cleaning and lubrication of the cables and housings.
Possibility of riser modification could exist.
#92005 - inspection of cutaway housings.
STATUS Mandatory: Jaguar - Campus - Campus 2 - Atom
Inspection involves housing fixation - equipment to be grounded if one housing can move freely relative to the other.
Retacking of both housing required.
Date of above Bulletins: 17 November 1992
Further information can be acquired by contacting Parachutes de France or copies of the aforementioned bulletins can be obtained from the undersigned.

TECHNICAL BULLETIN #39 **1992**

Item #1 RACER ELITE RSL installation:
There have been several instances here in Canada of incorrect installation of the Reserve Static Line on Racer Elite, harness/container systems. Although it has not been determined if the incorrect routing of the RSL's were performed by a rigger or perhaps by the owner's themselves, more attention needs to be paid to routing of this device.
The correct method of installation for the RSL is included in the Racer Elite manual and close attention should be paid to that section. Stated in the pertinent section is:
Note: To preclude the possibility of inadvertently routing the static line under the top flap we recommend that the reserve be packed and sealed before taking the following steps.

A. Pass one end under the top half of the reserve ripcord housing, BUT NOT UNDER THE RESERVE RISERS OR THE TOP FLAP OF THE RESERVE CONTAINER.
B. Connect the shackle to the small ring located on the side of the riser.
C. Repeat for the other side.
D. Store the reserve static line in the channel over the wearer's shoulder and mate the velcro on the yoke or top flap.





Owners of the Racer Elite harness/container systems should also be made aware that in the event they have a reserve canopy deployed before the main, and wish to release the main canopy, the RSL must be disconnected before initiating the breakaway procedures. Failure to do so could result in the main canopy, still attached to the RSL, sliding up the reserve lines and collapsing the reserve canopy.
The RSL on this system can be optionally assembled to a single riser. Ensure that the lanyard is properly routed under the reserve ripcord housing and both snap shackles are attached to one riser ring. (As per manufacturer's specifications)

Item #2 CYPRES AAD closing loops:
The closing loop material used by Airtec seems to be quite susceptible to abrasion. Although the material used is quite strong (TS325#) there have been several inadvertent reserve openings attributed to the breakage of the reserve loops, possibly due to incorrect handling by riggers.
The least amount of fraying of the closing loop(s) indicates that a new one should be installed.
The rigger's package supplied by Airtec contains a spool of the loop material, a special coating for this loop material, specific temporary closing pin and a finger trapping needle. Riggers that are packing rigs with a Cypres installed should have access to these materials and tools. They are available by contacting:
AIRTEC GmbH
Mittelstraße 69
4798 Wünnenberg
Germany

Item #3 PARACHUTES DE FRANCE service bulletin #92006:
SUBJECT: Change of closing loop on the reserve containers on all JAGUAR, CAMPUS, CAMPUS 2, GALAXY tandem and ATOM, manufactured before 23 November 1992.
STATUS: Mandatory
At the next repack, replace the closing loop of the reserve container with the new type. Adjust it's length to obtain proper flap positioning (a drawing is provided with the new loops) and correct ripcord pull forces. This operation can be performed by any appropriately rating rigger.
New loops are available from PARACHUTES DE FRANCE SA. List price for single loops, PIN 20070515: FFR 12,50 per unit. List price for double loops (LOR 2 system), P/N 20070516: FFR 16,80 per unit. Contact:
PARACHUTES DE FRANCE SA

Olivier RHEIN
P.O. Box 247
95523 Cergy-Pontoise Cedex
FRANCE

Item #4 Ram Air reserve brake line retainer rings:
A number of inadequate ring installations have been brought to the attention of the T&SC. On some older piggyback systems, originally designed for round reserves, riggers have been installing brake line rings that do not meet a required standard for ram air deployment.
Riggers that plan on installing these rings should contact the manufacturer for specific instructions on parts and installation requirements. If this is not possible, contact a rigger with knowledge of correct installation procedures.
It must be remembered, the opening forces of a ram-air reserve are greater than a round parachute and materials that will withstand these forces must be used. Welded rings are not acceptable, as is Type III tape. Type IV 1" (1000#) tape is accepted by most manufacturer's and should be attached to the riser with 3 or 4 bartacks or zig-zag stitchings.
Forged or machined rings of an acceptable strength shall be used; design of steering toggles and brake loops affect the size of ring that can be used.

Item #5 Rigging practices:
The T&SC will be implementing a disciplinary program in an attempt to discourage unethical rigging practices. If riggers have had documented complaints filed against them the T&SC will investigate the complaint, send the individual notice of the complaint and will expect a response from the person involved. If no rebuttal is received possible disciplinary action will follow, such as, revocation of ratings and publication of this revocation in CanPara.

TECHNICAL BULLETIN #40 **JULY, 1993**

Item #1 CYPRES AAD'S:
With the increasing popularity of the Airtec Cypres among skydivers in Canada, Riggers in the field should be prepared to deal with the specific problems that will arise when dealing with these units.
As cited in Bulletin #39, the closing loop material used with the Cypres is not very resistant to abrasion. This condition is compounded if the same material used for the loop is not used for the pull-up cord as well. The manufacturer, Airtec, mandates the use of a special 1.7 mm polyethylene braid that is treated with a silicone lubricant when used on the majority of container systems. The pull-up cord is of the same material, sans lubricant.
Airtec has available to riggers, a Riggers Packing Kit, which contains all the required materials you would need to properly maintain the units to manufacturer's specifications. This kit costs 35 DM & contains the following:
- a 50 metre roll of braided loop material
- a small bottle of silicone lubricant
- a finger trapping needle
- a special Cypres temporary pin
- 5 special washers (used with loop)
- a User's Guide

Airtec does not want anyone who has not been authorized by them to install the Cypres units in container systems. Riggers interested gaining the necessary authorization to install these units should contact Airtec for information. This information and Rigger's Installation Kit will cost you 100 DM. Before you obtain the authorization you will be required to fill out a questionnaire about the product after which you will receive a package that contains a video tape and manual that details the installation procedures. This package, and the package described above are available from Airtec at the following address:

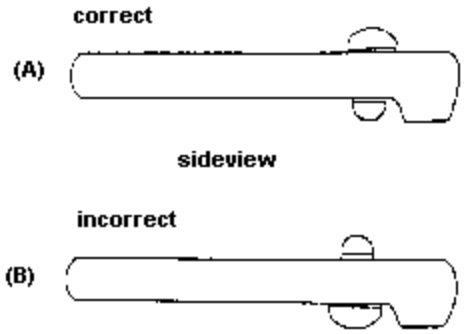
AIRTEC GmbH
Mittelstraße 69
4798 Wünnenberg
Germany
Tel: 02953/8010 Fax: 02953/1293

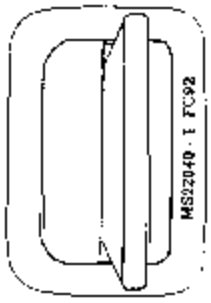
Item #2 Reserve sealing methods:
There has been some concerns voiced from riggers in the field about excessive pull forces on reserve ripcords when the pin sealing method deviates from the prescribed format. The method being used by some riggers that has been noticed to exceed the normal pull force is a method whereby the sealing thread is passed through the closing loop before being passed under the ripcord pin.
Although I have been unable to duplicate this phenomenon on demand riggers that use the thru-the-loop method should be aware that excessive pull forces could result from this unconventional sealing method. A review of Poynter's 7.94 may be in order.

TECHNICAL BULLETIN #41 **OCTOBER, 1993**

Item #1 RAPIDE link damage:
There had been several reports of unexplained main suspension line breakage. This breakage had been reoccurring on the same canopy type which indicated there may be reasons other than wing loading causing this damage. Upon closer inspection by a rigger it was found that whomever had installed the canopy to the main risers probably had used pliers or vice-grips to assist in holding the Rapide Links for tightening. This resulted in scoring of the links thereby creating a "cutting" action on the lines during opening.
Think of the possible consequences if this method were used while installing a reserve canopy to risers.

Item #2 Incorrectly manufactured hardware:
All Relative Workshop Vector container systems manufactured between April 22, 1993 and June 10, 1993 could have hardware installed on the leg straps (tandem & sport) and chest straps (tandem & tandem passenger harness) which has been incorrectly manufactured. This is not life threatening, but may allow webbing slippage; thus allowing an uncomfortable harness.
Mandatory at next repack. Compare MS-22040 hardware against drawing A & B. If hardware is correct (A), log compliance on reserve data card. If hardware is incorrect (B), notify the Relative Workshop. Following are serial numbers of rigs that could be effected.



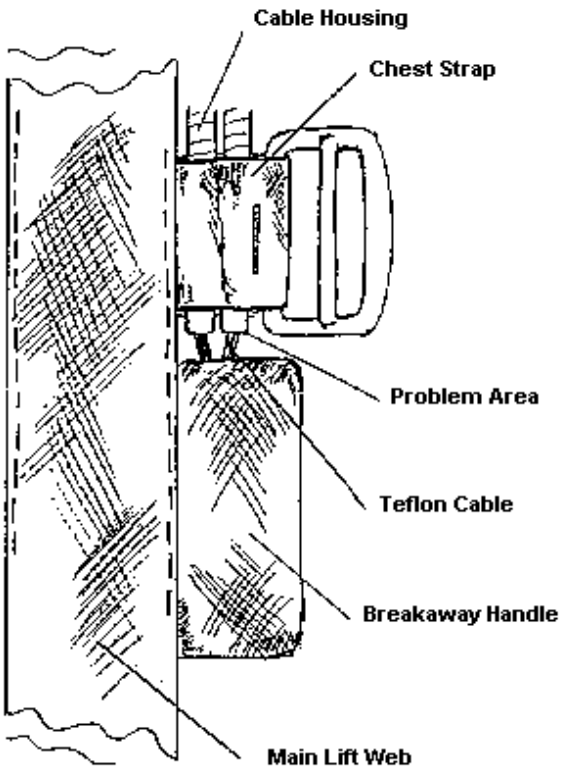


** not to scale

21732, 22860, 25063, 25692, 25898, 25905, 25906, 25909, 25911, 25912, 26202, 26204, 26220, 26253, 26642, 26647, 26653-26655, 27023, 27081, 27096, 27357, 27429, 27430, 27440-27444, 27448-27452, 27458, 27546, 27595, 27764, 27766-27770, 27780, 27788, 27821, 27843, 27844, 27848-27865, 27868, 27871-27875, 27879-27900, 27906-27909, 27912-27915, 27917-27920, 27922-27944, 27947-28029, 28038-28043, 28045-28049, 28051, 28053-28066, 28068, 28069, 28075, 28079, 28080, 28082-28103, 28108-28115. 28118-28124, 28127-28135, 28137-28139, 28141, 28142, 28144, 28145, 28149, 28156, 28158-28162, 28165, 28166 28168, 28184, 28185, 28190, 28197, 28200, 28204-28206, 28215, 28220, 28227, 28259-28263, 28276 28297-28302, 28407, 28674.

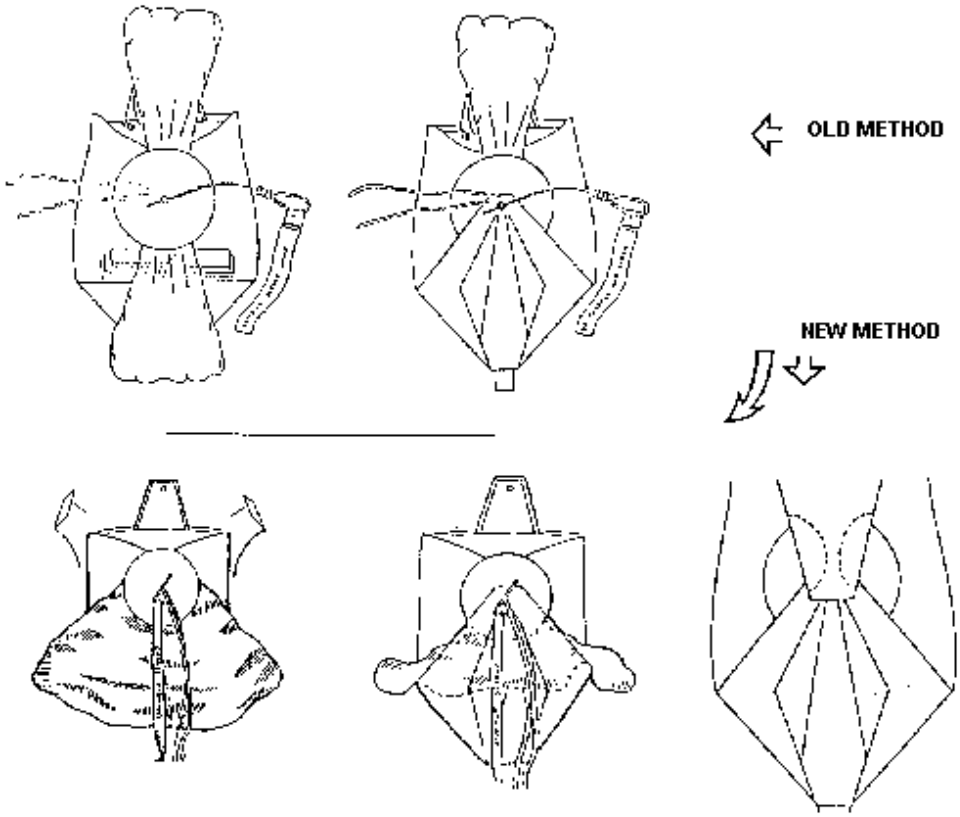
Item #3 Bullet inf rom THOMAS SPORTS EQUIPMENT (TSE):
Inspection of some older models of Tear Drop H/C has revealed excessive wear in the area of the small washer which retains the reserve loop. Also, wear has been noticed on the loop where it passes through the grommet of the metal "pop-top" plate. This damage may have occurred while packing the reserve.
There has been a number of premature reserve deployments on T.S.E. One Pin Tear Drop Reserve Containers. Containers with the small "old-type" washers and loops should be changed to the updated "Cypres" type of washer/loop combination. A qualified rigger can perform this loop change without repacking the reserve.
For further information call Thomas Sports Equipment at 0262 678299 or Fax 0262 602063 (UK). New loops will be sent the same day at no charge.

Item #4 Damage to break-away cables:
There have been several reports from the field of damage occurring to the Teflon covering used on break-away cables.
This damage is being caused by poor finishing on the inside of the cable housing where the end ferrules are attached. This damage to the cable covering could result in excessive pull forces on the break-away handle. Housing should be checked, inside and out, to ensure that the ends are smooth.


Cable Housing
Chest Strap
Problem Area
Teflon Cable
Breakaway Handle
Main Lift Web

TECHNICAL BULLETIN #42 **JANUARY, 1994**

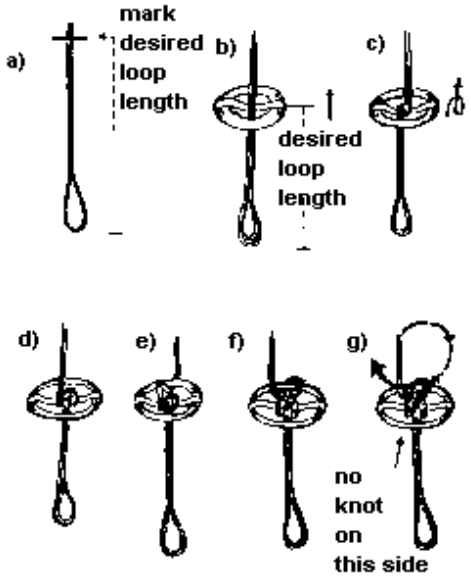
Item #1 Pilot chute stowage on SUNPATH JAVELIN:
An updated version of packing instructions, issued in early 1993, contains new procedures for pilot chute fabric stowage on Javelin reserve containers. The new method reflects experience gained by Sun Path in it's day-to-day operations plus feed back from riggers in the field.
It was found that some riggers, when using the old method of stowage, would sometimes not only tuck the pilot chute fabric under the top flap of the reserve container but also into the cavity between the freebag and the top flap. This could result in the pilot chute improperly launching or even failure to deploy.
The revised instructions tell the rigger to follow the same basic steps except the pilot chute fabric is rolled and positioned differently; most of the fabric ends up under the bottom flap.
Copies of the current manufacturer's instructions can be obtained by contacting Sunpath at (813) 782-9242 or fax (813) 788-3057



Item #2 CYPRES closing loops:
An alternate method of retaining the special Cypres reserve closing loops was introduced during 1993. The older, but still acceptable, method illustrated below left involved a greater degree of manual dexterity vis a vis the tying of knots than the method now being suggested, shown below on the right.
This newer method requires a special retaining washer available from Airtec, at the following address, on request.

AIRTEC GmbH
Mittelstraße 69
33181 Wünnenberg
Germany

Remember, when packing equipment that has a Cypres installed, you must use pull-up cords of the same material as that of the closing loops. The specific cord is also available from Airtec.


a)
mark
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loop
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desired
loop
length
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no
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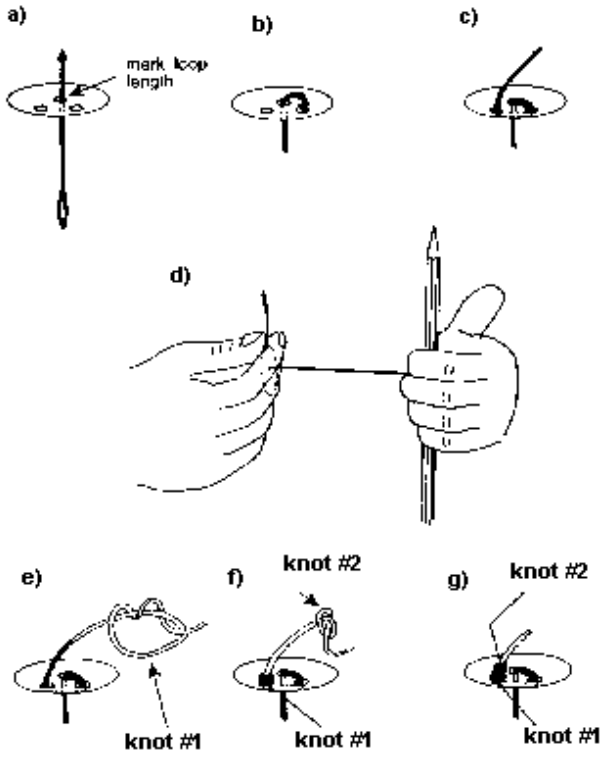
a)
mark loop
length
b)
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e)
knot #1
f)
knot #2
knot #1
g)
knot #2
knot #1

TECHNICAL BULLETIN #43 **MARCH, 1994**

Item #1 TSO waiver:
Recent Canadian vacationers to a prominent US DZ report that American Drop Zones which have a waiver for foreign jumpers to use non-TSO'd gear, also require an owner's manual for this equipment. Apparently manuals have been requested from Canadian manufacturers, but have not been forthcoming in all cases. So if you, or someone you know, owns non-TSO'd equipment, make sure you have your owner's manual with you when you head south. If you are a manufacturer - how about sending along those requested manuals!
The US drop zones that hold this waiver from the FAA will probably also require a statement from the CSPA that states that the equipment in question has been deemed as airworthy for use in Canada, when maintained and packed in accordance with the manufacturers specifications. Requests for this form should be made to the Chairman, T&SC. Include the manufacturer's name, model, serial number and date of manufacture.

Item #2 AAD installations:
There may be some confusion as to who is qualified to install AAD's in Canada. Discussion on this topic took place at the recent T&SC Meeting in Vancouver and the following applies:
Initial installations shall be performed by the manufacturer of the harness/container system or a C.S.P.A. rated Rigger "B", using information and specifications supplied by the manufacturer.
The only exception to this would be the installation of an Airtec Cypres AAD into a container that has the manufacturer's installation kit already installed. This installation could be performed by a current Rigger "A" provided there are no sewing operations involved. This Rigger "A" must also have received the necessary authorization from Airtec to perform this installation.
Removal/installation of all AAD's currently on the market can be performed by Rigger "A"s as long as no sewing is involved. Airtec installation authorization does not negate this requirement.

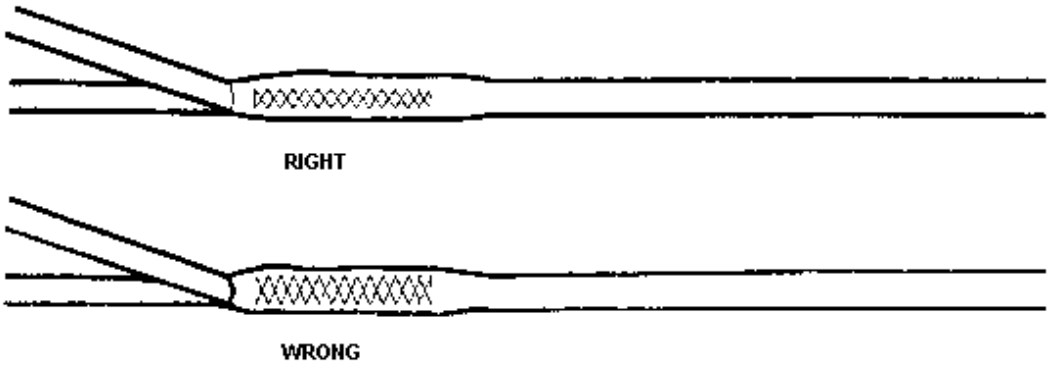
Item #3 FXC bulletin:
In a bulletin dated 12 January 1994, FXC Corporation refers to their "MANDATORY" upgrade Service Bulletin of 1 December 1992 regarding the FXC 12000 to Revision "J" level.
Some concern has been expressed at the substantial number of FXC 12000's that have not been returned to FXC to have this "MANDATORY" upgrade completed.
FXC now states that "to install a Model 12000 AAD on either a main or reserve (auxiliary) parachute system, the Model 12000 AAD must be a Revision "J" unit.
"J" units can be readily identified by noting if the unit has three (3) small "gold-coloured" air filters installed on three sides of the altitude controller. In addition, the label on the AAD will state: "J" Revision. If a Model 12000 AAD in question does not have three (3) filters installed, and/or the label does not say "J" Revision, it is not a "J" and is not to be installed on any parachute system.
FXC Corp. has also recalled 130 of the FXC 12000's because they may fire prematurely. Both new and older models are involved in the recall. The devices are being recalled because they were assembled with an undersized retaining ring. The incorrect rings were installed on Model 12000's built or serviced by FXC in September and October of 1993.
The retaining ring in question is a small circular shaped component that locks the power cable housing to the main power body. If the ring is not seated properly, when the power cable housing is strained, pulled or twisted, the retaining ring can work free. This would allow the power spring to push itself out of the power spring body, risking a premature activation of the parachute system.
FXC Corp. "strongly urges" that all FXC owners immediately inspect this junction point to confirm the locking ring is fully seated in its groove." If the ring is not properly seated, the AAD must be returned to the factory. This junction point should be inspected on each repack cycle or every 6 months.
Model 12000 AAD's with the following serial numbers should be returned to FXC immediately.
877, 1068, 1248, 1692, 1994, 1995, 1996, 1999, 2001, 2004, 2178, 2714, 2898, 2899, 2937, 3368, 3666, 3693, 3694, 4099, 4520, 4931, 5110, 5335, 5504, 5506, 5508, 5511, 5624, 6353, 7149, 7201, 7668, 7816, 7824, 7825, 7826, 8210, 8212, 8215, 8222, 8251, 8744, 9363, 9684, 10014, 10053, 10153, 10192, 10444, 10667, 10707, 10725, 10776, 10813, 10884, 10885, 10891, 10893, 10917, 10961, 10968, 10982, 10983, 10997, 11006, 11020, 11023, 11161, 11186, 11204, 11209, 11426, 11798, 12027, 12185, 12448, 12524, 13625, 13673, 13813, 13837, 14039, 14222, 14353, 14384, 15030, 15422, 15429, 15434, 16188, 16194, 16465, 16940, 17565, 17998, 17999, 18017, 18018, 18025, 18026, 18027, 18028, 18030, 18120, 18637, 18660, 19063, 19132, 19264, 19265, 19266, 19267, 19268, 19269, 19270, 19271, 19292, 19293, 19294, 19295, 19296, 19297, 19298, 19299, 19300, 19301, 19302, 10303 and 19304.

Item #4 CYPRES AAD recall:
Airtec is recalling about 1500 CYPRES AAD's because it is likely they don't meet the company's performance standards.
The recall affects 1527 units: 185 built in late August 1993 and all of those built in September and October of 1993.
Airtec president Helmut Cloth says the problem involves "a small modification to one integrated circuit" that "under extremely rare circumstances might exceed the precise tolerances that we demand."
Some CYPRES AAD's can be checked without opening the reserve container. All CYPRESes built after October 31, 1993, have some numbers stamped on the control unit, the little panel with the display and pushbutton. If the control unit has numbers stamped on it, then it is not affected by the service bulletin.
Airtec informs me only 13 of the affected units were sold in Canada and the owners of these should have been contacted by the dealer from whom it was purchased.
Airtec will reimburse jumpers $10 for shipping and $40 for a reserve repack if they have an affected unit. This offer is good until 30 April 1994.

Item #5 GLIDE PATH closes doors:
Just three weeks after grounding all Nova main canopies Glide Path International has lifted the grounding and sold all it's assets to a new group of investors calling themselves Flight Concepts International.
Glide Path grounded the Novas on January 13, 1994 "until we can discover what causes the problem (if a problem with the canopy exists)."

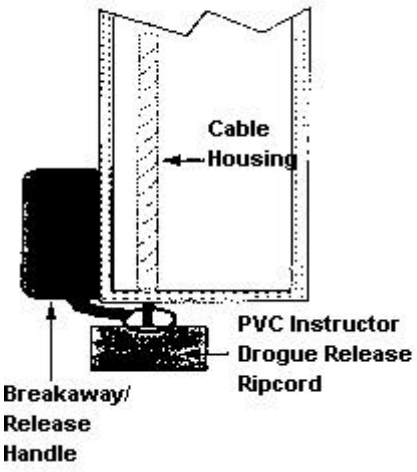
In its subsequent bulletin, Glide Path says, "Since then we have examined in detail all available evidence" regarding Nova accidents. "We are unable to determine a correlation between the accidents and the design of the Nova because, in every case, one or more of the following conditions were present:
"1) High winds, producing turbulent conditions.
"2) Vigorous thermal activity, producing turbulence.
"3) Operator error involving excessive control input close to the ground.
The bulletin, dated February 2nd, continues by saying Glide Path has received numerous attestations to the reliability of the Nova and also says "it is overwhelmingly evident that the Nova is no more and no less dangerous than any other high performance canopy, and Glide Path International feels compelled to withdraw its advisory not to jump the Nova." Two days later the company closed it's doors.
Owners of these ultra high performance canopies must be aware of the inherent dangers when using them in turbulent conditions, and that violent manoeuvres close to the ground should be avoided. Education of prospective buyers, as to the possible hazards of these canopies, should be foremost in the minds of anyone attempting to dispose of them on the unwary skydiving public.

Item #6 PARA-FLITE service bullet in No. 9401:
A bulletin which demands compliance at the next repack cycle, but not later than 150 days after the issue date of January 3, 1994, affects Swift Plus reserves with Spectra lines.
A Swift Plus reserve was found to have a faulty bartack at a D line cascade. The width of the bartack was too wide to catch the finger trapped insertion of the cascade, which allowed the cascade to be pulled free by hand.
All bartacks on Spectra equipped Swift Plus reserves must be subjected to visual inspection and compared to the following drawing. "Good" bartacks will have a centered appearance and ample material on both sides of the stitches.
In case a defective bartack is found notify Para-Flite immediately providing the serial number of the canopy and on which line(s) the defect appears.
Information regarding this problem is available from Para-Flite Customer Service Department via telephone (609) 663-1275, FAX 1-609-663-3028, or by CompuServe mail box No. 75470.4341.



TECHNICAL BULLETIN #44 **OCTOBER, 1994**

Item #1 Replacement breakaway/release handle for STRONG tandems:
Strong Enterprises has modified its Dual Hawk Tandem system so that pulling the breakaway handle will automatically first pull the drogue-release ripcord.
The new handle features a small metal ring that slips over the instructor's drogue-release ripcord when it is inserted into its housing. Pulling the breakaway handle simultaneously pulls the drogue-release handle. The cables attached to the two handles are of the correct length so the drogue, if deployed, will be released before the main risers are jettisoned.
Although Strong Enterprises does not require that the installation be made by a certified rigger, owners of the tandem system should be aware of a potential problem. When assembled correctly, the ring must be below the handle pocket and above the instructor's drogue-release handle (as shown in the diagram). It is possible to place the ring inside the breakaway handle pocket and still have it between the cable housing and the drogue-release handle. However, this configuration can produce a hard pull or make it physically impossible to remove the drogue-release cable from it's housing.



Item #2 PARACHUTES DE FRANCE service bullet in:
An AD issued by Parachutes de France May 3, 1994 applies to their model P512 emergency parachutes.
To state precisely the applicability of the periodicity of maintenance and packing, the following measures are rendered mandatory at the effective date of the present Airworthiness Directive:
Modify as following the page M4. paragraph "Periodicity of maintenance procedures and packing" of the "Manuel d'utilisaton et de maintenance" P/N 90091133 Issue 4. May 03, 1994 according to Parachutes de France Service Bulletin No. 001 may 03. 1994.

Periodicity of maintenance procedures and packing:
- One year in standard normal conditions and storage as described hereafter
- If normal storage conditions are not respected, the operator must adjust the periodicity.

Standard normal conditions and storage:
Textile and other materials used in the construction of the parachutes may be affected or damaged by different elements. During the periods when the equipment is not used, the parachutes must be stored in a room where the temperature is kept between 15°C (59°F) and 22°C (71°F), while the relative humidity must be kept between 15% and 72%.
Furthermore the parachute must be protected from:
- ultraviolet light beams
- excessive heat, 100°C (212°F) and more
- acid and corrosive agents (keep batteries away)
- smoke (chlorine and other aggressive materials)
- gnawing animals

During periods of regular use, it is acceptable to store the parachute in the carrying bag in a room free of humidity and gnawing animals.

Item #3 SSE stops Mk2000 AAD servicing:
SSE Inc. announced early this year that it will no longer service Sentinel Mark 2000 AAD's owned by civilians.
"The Sentinel Mark 2000 AAD has not been generally available for sale to the civilian skydiving market for a number of years and it has now become uneconomic for SSE to continue the repair and maintenance of the product." wrote the New Jersey company.
SSE sold the service and repair business for the Mk2000 to Paratronics Inc., 3301 Pleasant Valley Lane, Arlington, Texas 76015 Phone (817) 465-7051.

Item #4 Product service bullet in from PARACHUTES CANADA:
In a bulletin dated 29 July 1994 Parachutes Canada cites unauthorized modifications to some of their student canopies (SL-292). Modifications to steering systems should not be performed unless manufacturer permission has been granted.

Also in this bulletin....
No Orion or SL student canopies are to be used on a student system that is not equipped with:
a) a functioning AAD
b) an RSL
c) a single action left-hand handle (cut-away/reserve) even if equipped with a right hand cutaway handle
d) proper instruction in its use as outlined by the CSPA, USPA or CAPS.
For more information regarding this bulletin contact Parachutes Canada, 446 Harrison St., No. 2A, Sumas, WA 98295. Phone (604)853-8033.

Item #5 AIRTEC concerns:
The makers of the CYPRESS have voiced some concerns about positioning of some of the cutters being installed on various rigs. The installations have not been in accordance with their "Rigger's Guide for Installation" supplied to all qualified installers of these units.
For the majority of rigs on the market Airtec instructions say to install the release element under reserve flap #3. Very few rigs have been approved for cutter installation under reserve flap #1. An example of this would be the Relative Workshop Vector II. For rigs that are not mentioned in the Rigger's Guide a call to Airtec is in order.

Also, **do not** install the cutters under flap #1 if there is a **round reserve** installed in the rig.
Airtec also recommends additional silicone impregnation of completed loops, after installing the loop to the disk. Do not impregnate the knot, it will slip. Running loops should be completely impregnated.
Do not treat loops in a 2-pin pop-top, where a quick loop is installed (Racer), and loops in 1-pin pop tops (Tear Drop).
Rigger "A"s in Canada are reminded that they are not qualified to install CYPRESS AAD's unless they have obtained authorization from Airtec, and no machine sewing operations are involved. Authorization from Airtec is required for **all** riggers performing Cypress installations.

Item #6 RSL routing:
A number of incidents related to incorrect routing of Reserve Static Lines have been reported. Although the majority of these potentially life-threatening incidents have been traced to individual owners, not riggers, it does not relieve anyone of the responsibility to inform unwary skydivers of the perils involved.
Incorrect RSL routing could cause main/reserve entanglements.
The quarterly repack cycle is a convenient time to brief equipment owners on the correct method of routing and attaching their RSL. For those riggers who are unsure as to correct routing, consultation with the Owner's Manual is in order. Also refer to TB #39 re Racer Elite.

Item #7 Hazards of RACER copies:
A condition that could cause a total malfunction of the reserve exists on a number of rigs currently in the field. Manufactured by several different individuals since the early 80's these 'Racer' copies have a built in problem with ripcord housing routing which could produce a hard pull situation, especially for persons with a slight build.
Owners of these copies should be made aware of potential problems - at very least a number of practice reserve deployments is a must.
First recognized in 1991 on the 'Excalibur' system built by Flying High Manufacturing, the condition was corrected by installing a new stiffener plate and repositioning the ripcord housing. All units built by Flying High were recalled and should have been modified by this time. A notation on the packing card, placed there by Flying High, would have been made if the rig has been modified. If in doubt as to the status of an 'Excalibur', contact Flying High.
See TB 34(4) for information regarding "Excalibur" recall.

Item #8 PARACHUTES DE FRANCE technical information bulletin:
Identification
All BLUE TRACK, BLUE TRACK PRO SERIES and MERIT canopies manufactured before January 14, 1994, carrying serial numbers in the following series.

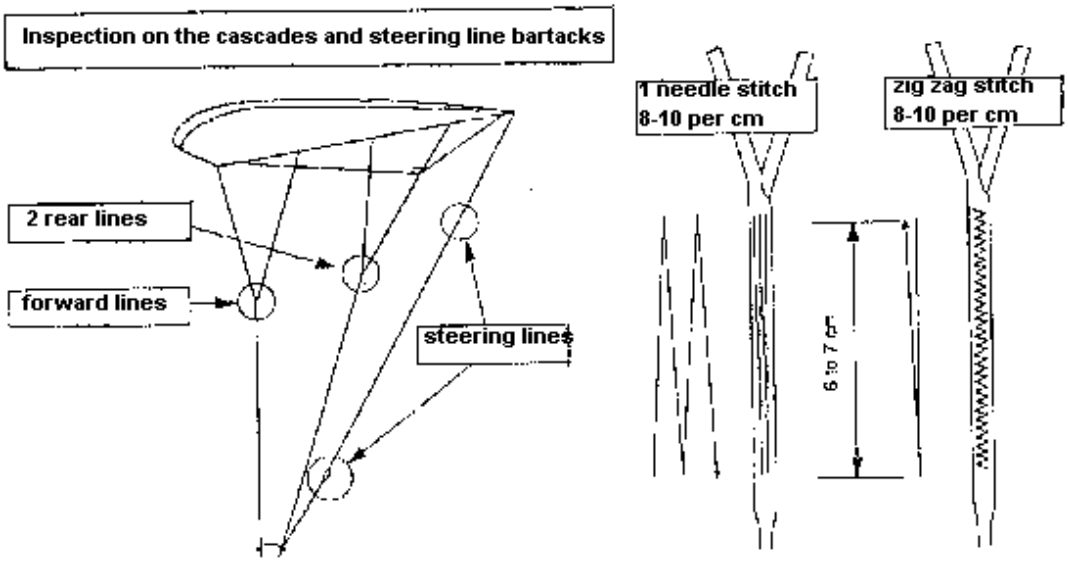
BLUE TRACK BT PRO 100	C series
BLUE TRACK BT PRO 120	C series and DB001B though DB020B
BLUE TRACK BT PRO 140	C series
BLUE TRACK BT-40	B and C series
BLUE TRACK BT-50	B and C series, DA series
BLUE TRACK BT-60	B and C series
BLUE TRACK BT-80	B and C series, DA series
MERIT 170, 190 and 210	B and C series

Finger trap junctions on the suspension lines of these canopies use only one bar tack per junction.
Background:
Canopies in the field have shown wear on the bar tacks of the suspension lines. Generally only the bar tacks of the cascades are affected. Repeated friction contact with the slider grommets causes the stitching to unravel.
A severely damaged bar tack may cause the finger trapped line to slip out of the other line, making it impossible for the canopy to fly properly.
Service Bulletin:
Affected canopies must be inspected for the condition of the bar tacks. In case of damaged bar tacks, all cascade and steering line bar tacks must be replaced by zigzag stitching according to the instructions of this bulletin.
At the discretion of the rigger, other bar tacks can be repaired as necessary.
Qualified Personnel:
All appropriately rated parachute riggers employed by authorized PARACHUTES DE FRANCE distributors. PARACHUTES DE FRANCE offers a financial arrangement to its distributors for repairs carried out before January 1, 1995.
Compliance Date:

Inspection must be carried out before the next jump. Alternatively inspection and repair can be carried out by our After Sales Department free of charge, except for the shipping costs.

Authority:
PARACHUTES DE FRANCE
B.P. 247,
95523 Cergy-Pontoise Cedex
FRANCE

Contact: Michel AUVHAY
Tel 33 1 34.33.35.10
Fax 33-1-30.32.43.11



TECHNICAL BULLETIN #45 **MAY, 1995**

Item #1 Acid Blue Update
A document received from Black Ram Parachute School on April 11, 1995 confirms that equipment contaminated at the Prince George Airport by a sprayed chemical dye is still grounded.
Dupont Chemicals has apparently refused to conduct tests to determine what, if any, damage is suffered by nylon coming in contact with the aqueous preparation of a triphenylmethane dye. The dye,[Formula: C.I.Acid Blue; C.I.42090 (disodium salt)] had been sprayed on the Prince George dropzone by a helicopter company testing the spray patterns of their equipment.
Several manufacturers of the equipment used at Prince George that may have been contaminated recommended grounding of equipment until such time test results could be published. These mandated groundings have not been lifted.

Item #2 Strong Dual Hawk Tandem Updates Now Mandated
Strong Enterprises of Orlando, Florida has mandated five updates that were previously recommendations.
The service bulletin states: Inspect all Dual Hawk Tandems for compliance and unless previously updated, make the following changes in accordance with the instructions available from Strong Enterprises:
(1) Replace yellow-cable cutaway handle with breakaway drogue release PN 862020 (Ref. 3/13/94 addendum to DHT Manual and Tandem Jumping #15, Feb, '94)
(2) Change type VIII main risers to type VII main risers. (Ref. Tandem News #14, March '93)
(3) Change reserve free bag from light blue bag with nitrile O-rings or rubber bands to orange bag PN 730324 with bungee stows and plastic chokers (Ref. Tandem News #7, Jan '91; NOTE: This bulletin cancels Service Bulletin #10.)
(4) Modify Master reserve canopies manufactured prior to 10 Sept 1990 by adding reinforcing tape across tail. Canopies not previously updated will have stabilizers that stop about 1 1/2" short of the tail, while updated units will have the stabilizers sewn directly to the tail.
(5) Install Cypres AAD (Ref. Tandem News #12, May/June '92 & TN #16, Aug. '94)
COMPLIANCE DATE: Cypres installation by 01 July 1995; other four items by 01 January 1995.

Item #3 Equipment Storage
From a submitted A.I.M. report comes a scenario that could be repeated at just about any dropzone across the country.
A jumper doing a cursory inspection on a borrowed piece of equipment, noticed fraying of the main pilot chute bridle. Further investigation showed that the bridle had been chewed in half by a small animal.
Complete inspection of equipment that has been stored for any extended period of time should be made prior to use. See Poynter Vol 1, 7.98 for suggested storage methods.

Item #4 Safety Notice from Jump Shack
In a notice dated 1 Sept. 1994 Jump Shack states:
All Racer/Elite 1" wide Main Risers manufactured between 9/15/92 and 12/30/92 which dates involve serial numbers 382xx to 522xx must have the 3 ring closing/retaining loop tested to a 30 pound load ASAP. This test can be conducted by inserting a fish scale into the loop and loading the loop to the required load. Any failures should be returned for replacement.

Item #5 Cypres Installation in Rigging Innovations Rigs
A number of Cypres AAD's installed in Flexon container systems became inoperative - prompting Service Bulletin #SB-155 from Rigging Innovations.
Upon examination by Airtec, the manufacturer of the Cypres, it has come to light that the control unit cable has failed adjacent to where it enters the control unit itself. It was RI's theory that this was a result of the installation peculiar to the Flexon. The Flexon and '94 Talon both route the control unit over the shoulder and mount it adjacent to the inside of the right 3 ring location. The control unit is held in place with a small band of elastic. It was originally though that because the elastic covers part of the display window, when turning on and calibrating the Cypres, the user was pushing the control upward to expose the display window. In doing so, the cable was being flexed just above the control unit. Enough of the flexing eventually resulted in the cable failing. Continuing investigations have revealed however that additional Cypres units have developed problems with the control unit cable in locations other than adjacent to the control unit. Because of these new developments, Rigging Innovations feels that the cable used on the Cypres will not withstand the normal flex and manipulation experienced by the Flexon style installation. Accordingly, the mounting of the control unit has been re-designed to preclude these problems.
Although RI can supply a modification kit that enables riggers to modify the affected systems in the field, it is recommended that Flexon and Talon rigs be returned to the manufacturer for the necessary modifications. The installation involves relocation of the control unit to the inside top of the backpad area below the neck.

Item #6 Brass Grommets
Of concern to all riggers - the use of brass grommets in parachute manufacture, especially on those parachutes used for emergency systems.
Brass grommets, when used with rubber bands, set up a chemical reaction which in time will cause the fusing of the two, especially when heat, humidity and extended time periods are factors. This problem is noticed more often on pilot rigs that are inspected less often than the manufacturer specified. This rubber band melt-down is especially critical when the grommets/bands on the deployment diaper become fused, possibly causing a total malfunction.

Item #6 (actually #7) Line Snags
A jumper reported a main canopy line snagging on the grommet located in the piece of webbing which holds the main container closing loop.
This caused a potentially dangerous situation as the jumper, after breaking away from the main, deployed his reserve parachute past the trailing mess.
The security of this particular grommet should be inspected regularly during the main packing process - a hook knife may also help in this type of situation.

Item #7 (actually #8) Cypres Batteries

From the Internet - a fatality occurred in the Netherlands recently on a rig with a functioning Cypres installed. The rig had been borrowed for testing prior to purchase. Neither parachute was activated.

Apparently the Cypres was switched on and active. Readouts indicate that the unit tried to fire at the right altitude, but the cutter did not perform its function. The summarization was insufficient battery power. Why didn't it indicate this when the unit was switched on? Reasoning is - only battery voltage is indicated, not power.

The fact remains - don't rely on mechanical devices and activate at least one of your parachutes before impact. It is imperative that the Cypres batteries be changed according to the manufacturers directives (every two years and/or five hundred jumps) remembering that "no jump" rides in the aircraft also count toward the cumulative total.

TECHNICAL BULLETIN #46 **AUGUST, 1995**

Item #1 Parachutes de France P512( ) 01
An Airworthiness Directive issued by PDF on June 21, 1995 applies to emergency parachutes delivered within the previous 12 month period. Serial numbers affected are:
DE039 to DE046 DF001 to DF024 DG001 to DG017 DH001 to DH006
DJ001 to DJ019 DM001 to DM025 EC001 to EC031 ED001 to ED025
EE001 to EE019
The following measures are rendered mandatory at the effective date of the directive.
> Before next use, verify tightening of the 4 "French" connector links between canopy and harness container. Write down the repacking into the parachute log-book with mention "French links tightened".<

Item #2 Middle Rings on Strong Dual Hawk Tandems
Main risers on Dual Hawk Tandems manufactured by Strong Enterprises in the period 01 January 1994 to 31 July 1995 were cited in a PRODUCTALERT issued 9 August 1995. (Part No. 834606 Master 425 Main and Part No. 834607 T-520 main).
Users reported three middle rings that literally broke (separated from the riser and lost on opening), and several that were deformed (either elongated or "potato chipped"). Investigation revealed that the supplying vendor provided middle rings which, although virtually identical dimensionally, were machined instead of forged and therefore not as strong. Visually, the two type may not be reliably distinguishable from each other. Tensile testing shows the forged rings to be more than twice as strong as the machined version. Tests conducted on RW-2 rings purchased recently from a different vendor for test purposes were also machined. There have been no reports of damage on solo (non-tandem) equipment. Some have suggested that hard openings caused by Spectra lines and/or Z-po canopies may be at fault, but data does not substantiate this. While it seems obvious that the machines rings have permeated the parachute industry over that past 1 1/2 years, the problem appears to be restricted to tandem jumping because of the greater forces involved. At this time Strong is actively seeking a satisfactory ring to replace the machined ring. Further testing and investigation is on-going; they seek information on broken or damaged rings. Strong will issue a service bulletin when more complete information is available.

RECOMMENDED ACTION: Until more information is available, users should inspect the middle ring of each tandem 3-ring assembly prior to every jump by viewing both from the front and especially from the side while turning each middle ring 360 degrees. Any sign of stretching "out of round" or bending "out of plane" is cause for immediate replacement prior to jumping.

Item #3 Cypres Batteries
Airtec has completed preliminary investigation of an incident in which a Cypres was discovered with a leaking battery. The battery had been installed in a two year old unit.
Although there was considerable damage to components within the container extensive drop testing with the original damaged items installed indicated that the reserve parachute would have functioned correctly if it had been needed.
This is the first and only case of a leaking battery; a matter which is being taken very seriously by Airtec and the manufacturer of the batteries. The investigation continues.
Also Airtec has recently discovered a set of non-original batteries in a Cypres unit. They are greatly concerned about this situation, and the risks that result from using unapproved batteries.
Airtec states:"To understand the reasons for our great concerns about the usage of non-original batteries in the Cypres, it is necessary to realise what is involved in the assembly, testing and quality control of the Cypres battery assembly. Although the Cypres with the non-Airtec battery (from a source in Australia) did activate when the skydiver opened too low, it is simply unacceptable to use."
"This particular battery assembly, even though it did utilise the proper cells, does not meet our specifications in five critical areas. The loss of quality caused by this is enormous, this type of substitution is very dangerous; Cypres units with this non-approved assembly will ultimately fail in use."
"Please realise that our motive in this matter is safety related and has nothing to do with the loss of revenue. The Cypres battery assembly is sold with minimal markup, the costs are much more that just that of the two battery cells. The fact is, that the only way to make a reasonable profit on the assembly is by careless assembly techniques, lack of testing and lack of quality control, the very problems found with this particular sub-standard battery assembly."
"Therefore, we have to again stress that only Airtec-supplied battery assemblies are approved for use with the Cypres. Please help in our efforts to keep the level of safety as high as possible."

Item #4 Stelar Reserve Recall
Strong Enterprises, manufacturer of the Sellar ram-air reserve, on May 4th issued an immediate and mandatory recall on all units manufactured prior to May 1,1995 including part numbers 430120, 430140, 430160, 430180, 430220 and 430240.
According to the Strong product service bulletin, "bonding on some suspension line (not control lines) may cause the lines to stick together." Strong reported that although the Stellar reserve passed TSO required "freeze and bake" environmental tests, input from the field prompted closer examination of the lines which were used.
Strong will replace all lines on those Stellar canopies affected at no charge. Owners will have two options: return the canopy to Strong for modification, or receive a replacement set of lines at no cost with $100 reimbursement for installation. Strong will also reimburse shipping expenses to those returning their canopy and will repack the reserve if the entire rig is shipped.
The compliance date for Stellar modification is June 10, 1995. Only an FAI Certificated Master Rigger or foreign equivalent (Rigger "B") may make the modification in the field. FFI (407) 859-9317.

Item #5 PDF Stitch Pattern
A Parachutes de France ATOM harness/container system manufactured in June 1994 was found with a missing "W" stitch pattern which secures the 3-ring harness ring.
This omission was attributed to human error (lack of attention) during the inspection procedure and it has been decided that statistically the chance of this type of incident happening again is extremely slim.
The person responsible for the inspection was immediately replaced.

PDF requests that all users of Atom harness/container systems visually inspect for the presence of the two stitch patterns securing the harness rings. This can be performed on a packed parachute, without opening the containers.

Item #6 Tensile Testing of Fabric

As mentioned in TB#38 the continuing vigilance of all riggers is required during inspection of reserve/emergency parachutes to ensure that any defects in canopy fabric are being detected.

A rigger in the field, upon inspection of a GQ Security 350 which had not been repacked since 1988, noticed some irregularity in the fabric pattern. As there was no evidence of the canopy, ASAC 22 manufactured in 1984 having had a pH test performed, the rigger proceeded with the test, as per PIA and CSPA directives.The canopy indicated pH levels as normal.

Fabric tensile strength was then tested using PIA TS-108 procedure. It was found that the fabric in the panel that had a noted irregularity in pattern destructed at 31 pounds, in the perpendicular direction. Straight line testing maintained a 40 pound loading for 3 seconds.

Non-destructive testing was performed on all remaining panels of the canopy, with no failure noted.

Riggers not familiar with the PIA TS-108, Parachute Canopy Fabric Tensile Test, Non-Destructive Method, dated January 25, 1989, can obtain a copy by contacting the Chair, Technical & Safety Committee.

TECHNICAL BULLETIN #47 **JANUARY, 1995**

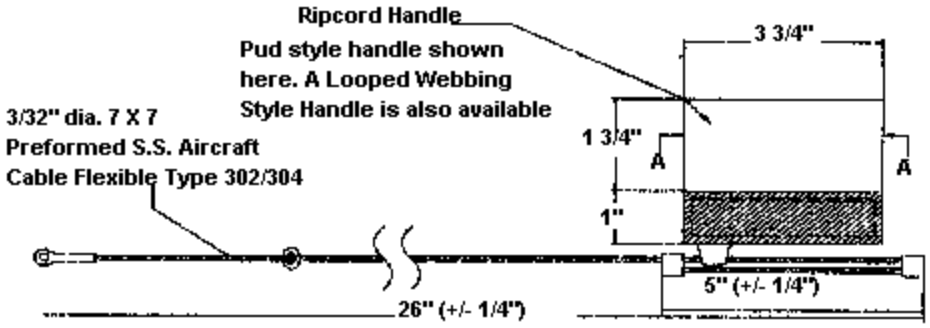
Item #1 Tandem Vector Reserve Ripcord Length

A report from the field alleges that a reserve ripcord on as Tandem Vector appeared to be a shorter length than required. During a gear check it was found that the pins had moved to within a quarter inch from releasing the reserve pilot chute.

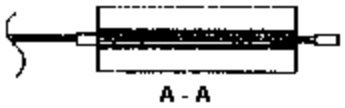
The Relative Workshop states that "as far as we know, there may have been two different lengths used over the years". It is suspected that an older version may have been two inches shorter than the one currently in production. Dimensions for the reserve ripcord that exists today, the only one that should be used, are 26 inches OL (+/- 1/4") measured from the eyelet to the end of the NicoPress sleeve at the handle end.

The Relative Workshop recommends using the newer loop-style handle as opposed to the older pillow type. The new handle is easier to see and pull in most situations.

Riggers are reminded that it is their responsibility to ensure that all components are compatible. The situation described above should have been caught by the rigger at repack time. Determining the correct ripcord length and compatibility on a Tandem system is no different than the method used on other systems. Remember, SCF!



The tolerance given (+/- 1/4") for the ripcord length are the same tolerances used by Capewell when manufacturing reserve ripcords.



Item #2 Parachutes Canada Defender Instructions

Parachutes Canada has authorized the use of Canadian Aerosports Inc. "Defender" reserve packing instructions for the packing of Parachutes Canada reserves. A copy of these instructions may be obtained directly from Canadian Aerosports Inc., 33456 Dewdney Trunk Rd., Mission, BC V2V 6Y3

Item #1 Emergency Rigs

Several reports citing inappropriate packing methods for pilot emergency systems have been received over the past year. This leads us to believe that riggers are not using the manufacturers instructions, which are required, when packing these rigs. Reports have been filed which show incorrect pilot chute placement, out of sequence container flap closures, incorrect closing loop length, size and material - plus various other conditions that could affect the reliability of these systems.

Manufacturers instructions, when translated and applied properly, can be a factor in determining whether a system will operate correctly, if and when needed.

Also, a very important item, tensile testing of canopies, is not being performed at regular intervals. Pilot rigs are notorious for being left in not-so-perfect environments and require very close scrutiny for materials degradation.

CSPA has had a "type rating" system in place for a number of years now which requires a rigger to have experience in three (back, seat & chest) types of pilot emergency systems before being signed off as qualified to maintain these systems.

A Rigger "A" certificate does not automatically infer that one is qualified to work, unassisted, on a system with which they have no experience - sport or emergency.

Item #2 Cypres Maintenance

Airtec, makers of the popular Cypres AAD, have come to realise that there is a lack of clarity about the 4 year maintenance of the Cypres. Possibly the expression "4 year check" introduced by them has also contributed to this. Therefore, they would like to give some explanations.

The maintenance of the Cypres cannot be compared to a usual regular cycle check, e.g. on a car.

Sometimes they receive Cypres units 5 to 6 months before their actual maintenance date. In these cases they unfortunately have to inform the customers that they cannot carry out the maintenance right at that time, but only when it is really due. This is not arbitrariness on their part but for technical reasons. The maintenance of a Cypres should generally be carried out at the fixed date i.e. the first time being 4 years after manufacture. As it is hard to meet this date precisely in practise, they have agreed on a flexible time span of plus/minus 3 months.

Why can't the maintenance be carried out more than 3 months before it is due?

For the maintenance, they do not only check the complete electronics of the device for correct function, but they also compare the measured data of the single unit with other units from the same manufacture period. The reason for this is that the data of a single unit could show no deviations but, compared with other units, it could show deviations which could lead to more comprehensive tests. This statistical procedure which should guarantee the high quality standard of the Cypres, requires that the date of the maintenance is met precisely.

If a unit is returned for maintenance after the due date, why is it then not valid for 4 full years, but only until date of manufacture plus 8 years?

Although they will still do maintenance on units they receive after their due date, the maintenance validity - because of the reason mentioned previously - is not 4 full years but only until the next regular maintenance date, i.e. date of manufacture plus 4 years, 8 years, etc. Because, in such cases as they do not have the according comparison data, they cannot judge the long term behaviour of the unit in question. So, they only can release it until the next maintenance due date.

As a Cypres is a life saving device, they do not want to accept any possible risk.

Therefore, please return units 4 years after date of manufacture (this information can be found on the silver processing unit label) plus/minus 3 months.

TECHNICAL BULLETIN #49 **APRIL 1996**

Item #1 Cypres Installation - Sidewinder Harness/Container Systems

Information received from Flying High Manufacturing Inc. indicates that there have been some problems with the installation method that has been used for the Cypres AAD. Erratic readings had shown up on several instances while the unit was in it power-on-self-test mode or when in the on position. The units were analyzed by Airtec and broken wires in the control head cable were found.

After consultation with Airtec, Flying High has decided to modify the installation procedure of the Cypres AAD in all Sidewinder harness/container systems.

Riggers and owners can recognize the new installation method by tracing the control head cable. From the control head, it runs under the top reserve flap and exits out the right side. The cable runs OVER the back diagonal (previous installations ran under the back diagonal) and down into the right side of the reserve container.

The manufacturer states that Cypres units with the control head mounted in a plastic pouch may be rerouted without repacking the reserve - using the following procedures:

> Remove the control head from the pouch and, while gently pulling the cable from the right side of the back diagonal, ease the control head out the right side of the top reserve flap and out from under the back diagonal. Slide the control head OVER the back diagonal, under the top reserve flap and back into the pocket.

For Sidewinders with the Cypres control head tacked onto the top inner reserve flap the rerouting cannot be performed without opening the container.

All Sidewinder harness/container systems with a Cypres installed must have the control head cable rerouted at the next reserve repack, or before if desired.

For owners wishing to convert from a tacked control head to the plastic pouch method, Flying High will supply a pouch and instructions free of charge to any Rigger "A" or "B" who has the "Cypres Packers Kit". Serial numbers must be quoted when requesting this field installation kit.

FMI: Flying High Manufacturing, Inc.,
P.O. Box 2320,
Claresholm, AB
T0L 0T0
Tel/Fax (403) 687-2225

Item #2 Dangerous and/or Unethical Rigging Practices

The Technical & Safety Committee has been receiving a disturbing number of reports which cite instances of rigging situations which are of an unacceptable nature. Some of these reported instances are flagrant violations of accepted rigging standards and can be considered quite dangerous. Questionable rigging methods will not be tolerated and disciplinary actions will be considered for those who persist in continuing such practices.

Attached to this bulletin is a two page document which can be used in situations where someone feels there is a need for investigation. This is a three stage process whereby only the third stage would be considered serious enough for T&SC investigation.

This process is not intended to be used for "witch" hunts or frivolous reporting. All those accused will be entitled to face their accusers - so read the document carefully.

CANADIAN SPORT PARACHUTING ASSOCIATION
RIGGING INCIDENT REPORT GUIDELINES

- The use of this report is to document rigging incidents and track trends concerning problem riggers. If the rigging community is to establish a self-policing program, it is necessary to fully document all rigging incidents so that the persons involved have the opportunity to explain their actions. This is not designed to be a witch hunt but an objective report that will be used to notify equipment owners and relevant organizations of problem riggers so that appropriate action may be taken.

- A three step program has been developed so that every effort is made to solve minor problems on an individual level with educational and remedial action provided for. If the problem is not resolved at this level or the problem is more serious, then a second level of action is provided for. If the attitude of the rigger is such that they are uncooperative or the nature of the problem is of such a serious nature, then the third level of notification is provided for. In this case proper documentation is provided for by this report.

- The following is a description of the three steps.

1. This concerns minor rigging incidents that may not be serious or life threatening. You should notify the rigger involved to explain what you've found and ask for their explanation of the situation. If a successful resolution of the problem requires action on your part that will cause an expense for the owner, then the owner should be notified. They may wish for the equipment to be returned to the original rigger for corrective action.

2. This level is for more serious offenses that include defective workmanship, disregard of the basic rules of rigging, and repeat incidents. Not only should the owner be notified, but the manufacturer of the equipment involved should be contacted for possible violations of the manufacturers instructions and/or authorizations.

3. This is the final step by which the BOD of the CSPA is notified for official action. It must be remembered that once an official report is filed through the Technical & Safety Committee, they are obliged to investigate and issue a report to the BOD, recommending possible disciplinary action. This level is for the most serious incidents that are of a life threatening nature, show persistent recurrence of problems, and/or an unrepentant attitude on the part of the rigger involved.

- The following are guidelines for the actual documentation of the report.

1. Check to see if the seal is intact or still attached to the ripcord cable. Do not throw it away as the data card signature may be illegible and the seal may be the only means of identifying the rigger who packed the parachute. Photograph seal and packing card.

2. As soon as a problem is identified, do the following: a) have an independent witness substantiate your finding, preferably another rigger. b) photograph the problem areas, preferably with a 35mm camera fitted with a macro lens. Make two copies of the photos; one to keep and one to submit with this report. The use of additional methods/materials, if required to complete this report, is recommended.

3. Notify the rigger involved for their response. If possible, allow them the opportunity to examine the equipment.

4. Notify the owner of the equipment involved. Let them know that the rigger involved was contacted and tell the owner their response.

CANADIAN SPORT PARACHUTING ASSOCIATION

RIGGING INCIDENT REPORT

The purpose of this form is to document and report incidents which may indicate uninformed, careless, negligent, or unethical rigging practices. It is of the utmost importance that all relevant facts and dates be reported. Persons filing reports can expect to be identified during investigations.

DATE OF INCIDENT:		
LOCATION OF INCIDENT:		
EQUIPMENT OWNER:		
ADDRESS:		
CITY:	PROVINCE:	POSTAL CODE:
TELEPHONE NO.:	FAX NO.:	
HARNESS/CONTAINER:	MANUFACTURER:	
SERIAL NUMBER:	DATE OF MANUFACTURE:	
RESERVE CANOPY:	MANUFACTURER:	
SERIAL NUMBER:	DATE OF MANUFACTURE:	
RESERVE CANOPY:	MANUFACTURER:	
SERIAL NUMBER:	DATE OF MANUFACTURE:	
AAD:	MANUFACTURER:	
SERIAL NUMBER:	DATE OF MANUFACTURE:	
DESCRIPTION OF PROBLEM:		
MANUFACTURER NOTIFIED?	[]YES []NO	
NAME OF RIGGER INVOLVED:		
CERTIFICATE NUMBER:	SEAL SYMBOL:	
ADDRESS:		
CITY:	PROVINCE:	POSTAL CODE:
REPORT FILED WITH T&SC:	[]YES []NO	
NAME OF CSPA OFFICIAL NOTIFIED:	DATE:	
NAME OF PERSON REPORTING:		
CERTIFICATE NUMBER:	SEAL SYMBOL:	
CSPA MEMBERSHIP NUMBER:	DATE OF EXPIRY:	
ADDRESS:		
CITY:	PROVINCE:	POSTAL CODE:
TELEPHONE NUMBER:	FAX NUMBER:	
DATE:	SIGNATURE:	