

# BLM Smokejumper Equipment List



## **Mission Statement**

This collection of information is to make known the equipment which can be used by the BLM Smokejumpers. This is not policy manual. It is a list of equipment, required and optional, for the purpose of answering any questions and clear up any misconceptions of the appropriate equipment to be used for a given situation.

This is not to say this assemblage is the only equipment list to ever be used by the BLM Smokejumpers. Change and improvement with regards to equipment is continual, we must seek developmental advancement in all aspects of our profession. This is to be done in conjunction with the Modification Documentation (MODOC).

The use of the MODOC is the document for any changes to the current procedures and/or equipment. The MODOC remedies the issues of duplication of tests, allows systematic plan for a test plan, a historical records of ideas regarding smokejumping and keeps all parties educated in the research being done.

## Required and Optional Equipment:

Equipment which is listed below may have multiple options for the particular equipment. But one of the options must be used in the capacity for which it was intended and at the appropriate time.

### Required:

- Parachute
- Reserve
- Harness
- Let down system
- Helmet w/ face guard and chin strap
- Jumpsuit w/ these components:
  - Collar
  - Chest Protection
  - Back Protection
  - Hip Protection
  - Thigh Protection
  - Knee Protection
  - Leg Pockets
  - Knee/Shin Guards
- Boots
- Flight Gloves

### Optional Equipment:

- Personal Gear Bag
- Field Rigging Kits
- Pack-out Bags
- Mouth Guard
- CYPRES Reserve Units
- Protective eyewear

If a BLM Smokejumper decides to disregard the list of required or optional equipment for different equipment or choose not to use said article, the smokejumper MUST get approval the Loft Manager of their respective base.

The equipment list does not cover every piece of equipment which a smokejumper may use in the line of duty. Examples of equipment not in this document are:

- Headlamps
- GPS
- Water containers
- Etc.

## Parachute:

Current BLM canopy: DC-7 Main Canopy  
 \*MT-1S Reserve Canopy  
 \*With or without a Smokejumper CYPRES unit.

Current BLM canopies in the evaluation phases :

EIFF Classic  
 EIFF Classic Pro  
 Atair-320  
 Atair-290

## Main Canopies

Determination of who is permitted to jump canopies other than the DC-7 depends on the specific phase each canopy is in. The Canopy Evaluation document determines criteria of each phase. The Canopy Evaluation is located at the end of this document.

All canopies will be distinguished by a colored numbered tag with black printed letters and numbers on the left risers. Different colored tags on the left riser are as follows:

White	DC-7 (fig. 1)
Yellow	EIFF Classic and EIFF Classic Pro (fig. 2)
Red	Atair 290 and 320

## MODOCs which pertain to Parachutes.

- 002 Main rigging procedure
- 029 EIFF Field Test
- 040 Canopy Evaluations
- 063 EIFF Reliability Evaluation
- 070 Atair 290, 265 and Performance Design's ACE
- 074 Eiff Classic Pro Phase I Jumps
- 076 Eiff Classic Pro Phase I Jumps.doc
- 079 Eiff Rigging
- 080 BLM Smokejumpers Canopy Evaluation Plan



Fig. 1



Fig. 2

### Reserve Canopies

#### Cypres vs. non. Cypres

All reserve canopies will have an A or B followed by a three digits. The A or B will determine whether the Alaska or Boise owns the canopy.

For the year 2007, two reserves systems will be use. The difference is whether or not the reserve has the CYPRES unit. If the Reserve canopy has the letter C following the three digits, it has a CYPRES AAD unit on the particular system. These systems will also had an ON/OFF switch on the smokejumper right side (designated by the orange arrow) (fig. 4). In addition, it will have an LED display on the top of the reserve container (designated by the white arrow), between the carabineers. The original reserve container does not have the C in the chute number or the switch and LED screen(fig.3).

Starting the season of 2007, all BLM smokejumpers will have the ability to use live CYPRES AAD reserves on any and all jumps.

### MODOCs which pertain to CYPRES and other AADs.

- 021 Cypres AAD
- 022 AAD Design
- 039 Irvin AAD Class/R&D
- 053 A Cable Puller AAD
- 056 CYPRES Jump Plane Evaluation
- 061 Smokejumper CYPRES AAD

Fig 3



Fig. 4

## Drogue

Currently there is only one type of drogue the BLM smokejumpers use (fig. 5 and 6)

### MODOCs which pertain to Drogues.

- 001 Video of Dummy Drops
- 007 Reserve/Drogue-in-Tow Validation
- 008 Reserve/Drogue-in-Tow Validation with PG Bag
- 013 Drogue-Ride Stability
- 014 New Drogues Built Old Design Specs
- 015 New Drogues Built to Old Design Specs-Dummy Drop
- 016 Drogue Reinforcement
- 017 Drogue Z-P Cap
- 018 ZP and Relative Workshop Drogue Drop Tests
- 023 Drogue Bridle Reinforcement
- 050 Improved exit and Drogue Modifications
- 068 Russian vane drogue



Fig. 5



Fig. 6

## Main Deployment Bags:

Main Deployment Bags (D-bags) to be used at this time are the ones with the blue type IV binding on the bag and blue type III tape near the bridle/ big ring tether joint. This shows the older Drogue have had their last modification and the D-bag is the updated (larger size). The new Drogues do not have the type III binding tape at this joint.

### MODOCs which pertain to Main Deployment Bags.

- 026 Main Parachute Deployment Bag. Doc
- 034 Field Test of Resized Main Container and Deployment Bag
- 046 Main D-bag



Fig.



Fig.

## Main Containers:

Main Containers will be designated by the blue type III binding tape. The containers made in AK will have this binding tape on the pin cover only (fig. ), those made in Boise will have all binding done in the blue (fig. ).

Just as a reminder. On the tape on the pin flap, there must be certain information about the rigger of the parachute and the parachute itself.

These items are:

Parachute number

Riggers name

Date

Drogue number of the one used

AK or Boi, whether it was rigged w/ the nose exposed or not, respectively

## MODOCs which pertain to Main Containers.

034 Field Test of Resized Main Container and Deployment Bag



## **Evaluation Main Canopy Deployment Bags:**

Evaluation Main Canopy D-bags will be designated for each specific evaluation parachute. Size is determined by parachute being jumped in the evaluation process. Or if specific R&D is being done on the D-bag itself.

Main D-bags which are themselves in a test phase will be marked with red binding tape or otherwise marked red in an obvious manner.

## **Evaluation Main Canopy Containers:**

Evaluation main canopy containers will be designated for each specific evaluation parachute. Size is determined by parachute being jumped in the evaluation process. Or if specific R&D is being done on the container itself.

Main canopy containers which are themselves in a test phase will be marked with red binding tape or otherwise marked red in an obvious manner.

**Harness:** Model 8801 or newer model of the 8801

Harnesses are to be in superior condition in respects to the Harness Inspection Sheet. Only harnesses assigned from one of the BLM Smokejumpers bases will be used by the Boise or Alaska Smokejumpers.

The BLM smokejumpers currently have two slightly different harnesses in use. The original models are shown in figure 7 and 9. The newer models have a Velcro-less chest strap (fig. 8) and Oetiker clamped cable housing (fig.10).

Only deviation will be to specified by BLM smokejumpers when using R&D harnesses or prototypes. This will be documented by the MODOC system. MODOCs which are pertinent are as follows:

**MODOCs which pertain to Harnesses.**

- 003 Personal Gear Bag Attachment
- 004 Reserve Container Attachment Hardware Retrofit
- 005 Large Rig Stabilization
- 006 Main Container Stabilization
- 010 Equipment Check
- 011 3 Ring Assembly Maintenance
- 019 Harness Upgrade
- 025 Drogue Release Handle
- 030 Pull-the-dot Snap Check
- 037 Container Attachment Points
- 048 Velcro-less Chest Strap
- 049 Cable Housing Modification
- 062 Harness R&D
- 066 Harness Cable Housing Cover Modification 2005



Fig.7

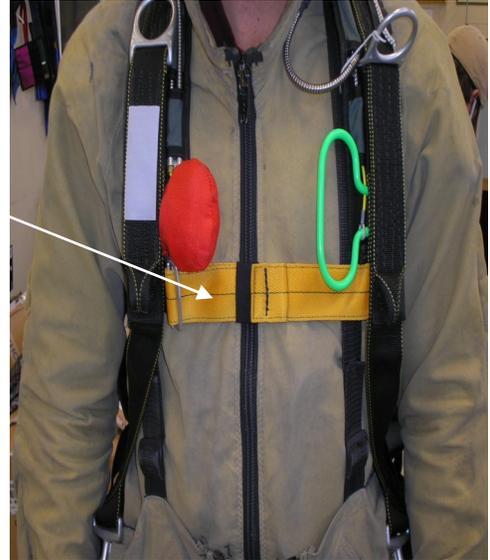


Fig.8

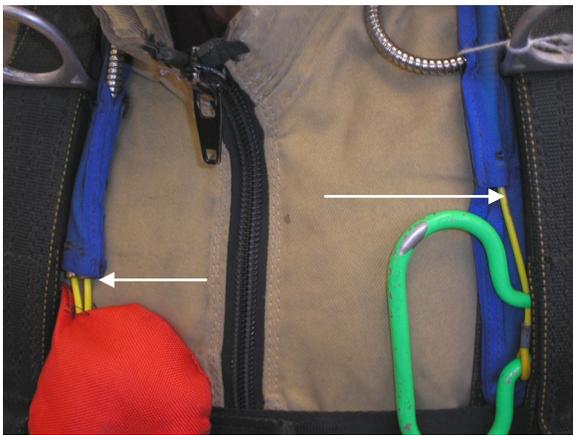


Fig.9

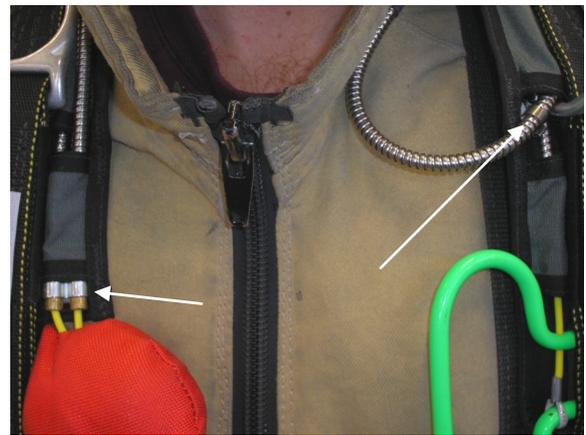


Fig. 10

## **Helmet:**

Jump helmets will meet the required standard.

The only standards the BLM smokejumpers use at this time is the ANZI Z90.1.

The helmet must also have a metal framed mesh mask which will be secured down with a bungee type device and tabs from the mask to adhere to the helmet to further secure the mask (fig.11). All helmets are to be secured to the smokejumper by way of chinstrap, we use a couple of different models (fig.13). The facemask of the jump helmet does have another option of a rectangular opening which is covered by plexi-glass affixed to the mask.

The jump helmets will be replaced at any time if the jumper has sustained a significantly hard impact or the helmet shell is damaged in any way.

From the Boise Loft, the sizes are color synchronized (fig.12).

### **SIZE OF HELMET**

### **COLOR**

6 5/8

**ORGANGE**

6 3/4

**CHARTRUESE GREEN**

6 7/8

**LIGHT BLUE**

7

**RED**

7 1/8

**YELLOW**

7 1/4

**FOREST GREEN**

7 3/8

**PURPLE**

7 1/2

**BLUE**

7 5/8

**GOLD**

7 3/4

**SILVER**

7 7/8

**BURGANDY**

8

**BLACK**





Fig. 11



Fig.12



Fig.13

## Let-Down Systems:

The BLM Smokejumpers will be use one of two types of let-down descending methods.

1. .75 or 1.00 inch Tubular webbing (fig. 14 and 16)
2. PMI Friction Device, The Sterling Kevlar Rope, and The Omega Carabineer are the other combination of parts to make up the other descending device (fig.15 and 17)

For Updated procedures refer to the RATUM, chapter 6.

### **MODOCs which pertain to Let-Down Systems.**

029 EIFF Field Test

031 Let Down Tape Bag 2002

032 Improved Interagency Letdown Project



Fig.14



Fig. 15



Fig. 16



Fig. 17

## **Jumpsuits:**

Jumpsuits are to be made of Kevlar or Millenia. Not other material will be acceptable at this time. Future material will only be made for construction if specified by the lofts and has gone through the MODOC process.

### **MODOCs which pertain to Jumpsuits.**

072 Hard Pad Jumpsuit

073 Millenia Jumpsuit Material

### **Jumpsuit Protection:**

These are the areas of specific which need protection. All pads in the BLM Smokejumper jumpsuit will be of the hard pad type, the exception will be the collar of the suit.



**Collar:**

Collars are a foam or mesh form which is covered with either Kevlar or Millenia fabric. Collars are to be in superior condition and will stand up when the jacket is zipped up to the neck of the smokejumper.

When jacket is zipped to the top, should stand and cover the back of the head above the head and top vertebra joint (fig.18). Also, when the jacket is zipped up, the area open to the throat will be kept to a minimum



Fig. 18

### Shoulder protection:

The protection must cover from the top of the shoulder at the trapezius, out to the shoulders outer edge (fig.19).

The BLM Smokejumpers have number of different choices of shoulder pads. Examples are:

Moto-cross (fig.19)

Motorcycled padded jacket (fig.20)

Smokejumper construction (fig.21)



Fig. 19



Fig. 20



Fig. 21

### Elbow Protection:

Elbow pads will be worn on all jumps. Elbow pads protection should begin on the mid to lower humerus (highlighted w/ white arrows) and down past the elbow, to the mid forearm (highlighted w/ orange arrows). A must for these pads is free range of motion for the smoke-jumper, while maintaining all the protection possible. Some of the examples use by the smoke-jumpers are as follows:

Moto-cross (fig. 22,23,and 24)

Motorcycle, these are in a slip in to the outer shell

Smokejumper construction, which is attached to the jacket by the way of a pocket (fig. 25)



Fig. 22



Fig. 23



Fig. 24



Fig. 25

### Chest protection:

Padding will be to the discretion to the jumper. Some of the examples use by the smokejumpers are as follows:

Moto-cross (fig.26 and 27)

Motorcycle (fig.28)

Smokejumper constructed (fig. 29)



Fig. 26



Fig. 27



Fig. 28

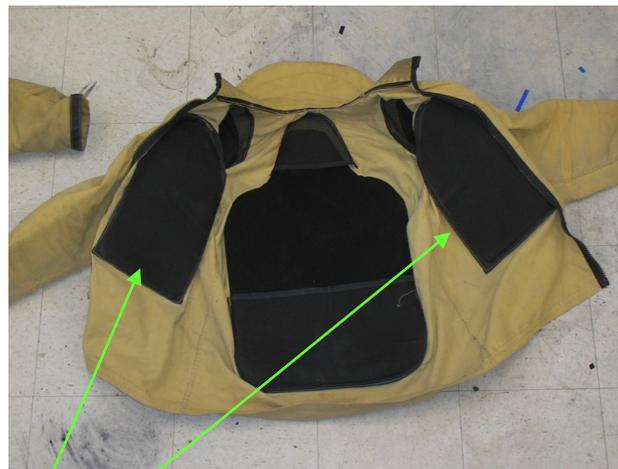


Fig. 29

## Back protection:

Minimum protection will consist of a hard plastic layer and a softer cushion layer. The protection area of the back pad should cover from the lower neck (C-5 vertebra) down to the lower back (lumbar vertebrae) and almost as wide as the rib cage of the jumper wearing the pad. Some of the examples use by the smokejumpers are as follows:

Moto-cross (fig.30)

Motorcycle (fig.31 and 32)

Smokejumper constructed (fig. 33)



Fig. 30



Fig. 31



Fig. 32



Fig. 33

## Hip Protection:

Minimum protection will consist of a hard plastic layer and a softer cushion layer. The layers will cover the area of the hip starting at the front-center of one leg and continuing around the back to the same point on the opposite leg. The height will begin at waist level and continue down to the bottom of the gluteus maximus. Coverage will also cover the joint consisting of the top of the femur and hip. Some of the examples use by the smokejumpers are as follows:

Hockey (fig.34 and 36)

Smokejumper constructed (fig.35 and 37)



Fig. 34



Fig.35



Fig. 36



Fig. 37

### Thigh Protection:

Minimum protection will consist of a hard plastic layer and a softer cushion layer. The protection should cover from the front-center of the thigh around to the back of the thigh. Thigh protection should cover mid-shaft of femur, without interfering with other protection on the suit and without restricting movement. Examples are as follows:

Football style thigh pads would be tacked into place  
Smokejumpers constructed (fig.38 and 39)  
Hockey (fig. 40 and 41)  
Look at the new style of pads and knee guards



Fig.38



Fig. 39



Fig. 40



Fig. 41

### Knee/shin protection:

Minimum protection will consist of a hard plastic layer and a softer cushion layer. Most protection will be provided in the forms of motocross, hockey, or baseball shin guards. While wearing the shin guards the protection must cover the knee cap to the bottom of the quadriceps muscle, no matter what position the lower leg is in. The lower portion of the shin guard should not be so long as to interfere with any type of locomotion of the foot. Yet cover enough as to give adequate protection to the shin (tibia and fibula). Some of the examples use by the smokejumpers are as follows:

Baseball (fig.42)

Moto-cross (fig.43, 44, and 45)



Fig. 42



Fig. 43



Fig. 44



Fig. 45

### Leg Pockets:

Leg pockets are to be made of Kevlar or Millenia material. Current pockets are approximately 850 cubic inches in total. This is achieved by making the pocket in the dimensions of 4x12x17.5.

Proper leg pocket use maintains no equipment will be hanging out of the pocket once the draw string has been tightened and there will be not holes in the pocket itself (fig.46). Draw strings not tightened and tucked away or equipment hanging out poses a hazard to the smokejumper in potentially all aspects of parachuting (fig.47).



Fig. 46



Fig. 47

## **Personal Gear Bag:**

All Personal Gear Bags (PG bags) will be manufactured in the Smokejumper loft and designed for the specific reason of a PG bag. Another design or a commercially produced bag will be considered, but only after it has been thoroughly inspected by either the loft manager, the asst. loft manager, or one of the loft technicians. All requirements regarding size and weight must be met regarding the PG bag and the attachment points must work with the connection of the harness without modifying the jump harness.

Size requirements are not to exceed 22" width, 17" height, and 14" depth. The weight will not exceed 30 pounds.

All PG bags will have a minimum of three points of connection, two of which will be to the harness and one to the crotch strap. All connections will be made with loft approved hardware. As of 12/06, the connective hardware is the Austrialpin Click loc.

### **MODOCs which pertain to P-G Bag.**

- 003 Personal Gear Bag Attachment
- 012 Personal Gear Bag specifications
- 059 PG bag weight increase



**BOOTS:**

All BLM smokejumpers must wear all leather, lace-type work boots with non-slip, melt-resistant soles and heels. The leather top must be at least 8 inches in height, measured from the top of the heel. If a low heeled boot is worn, leg strap keepers must be worn.



## Field Rigging

### Field Rigging Supervisor (RS)

Only people with a Senior or Master Riggers Certificate and approved by the loft will be Field Rigging Supervisors.

A current RS must be on site for all field rigging.

RS will directly supervise all rigging operations, including inspection, drogue rigging, and main rigging.

All field rigging sites must be approved by the RS.

RS will have the final say on airworthiness of all parachuting equipment including canopies, drogues, component parts, and harnesses.

RS will be responsible for maintaining Master Log records for field rigging stations. The RS will sign the Master Log for each parachute packed under his supervision.

RS is not authorized to make technical decisions regarding changes to system components. RS will refer to loft overhead if any unusual situation arises.

Rigging supervisors will have the authority to dismiss an individual from rigging duties if an individual fails to follow rigging procedures and policy .

### Field Rigging and Inspection

Field rigging will only occur under the direct supervision of a rigging supervisor.

Rigging will be done only in an area subject to the rigging supervisor's approval. It must be large enough for complete inspection and rigging, free from all obstacles and debris, clean, smooth and dry. No rigging or inspection will be done on asphalt, concrete or open ground due to tar and abrasion factors. Smooth finished, stain free concrete floors are acceptable.

Canopies will be bagged or otherwise protected when not being inspected or rigged to minimize UV deterioration of fabric.

All canopies and drogues will be completely inspected prior to rigging in the field. **Flying the canopy does not constitute inspection.**

Forest Service bases will be considered field rigging stations, but repairs may be done in established Forest Service lofts by appropriately skilled riggers.

## **Field Rigging Equipment**

1. When rigging on a lawn or hard surface only the appropriate riser tension devices may be used.
2. When rigging on a lawn two stakes must be used to keep the tension device in place. When rigging on a hard surface the hard surface tension device must be tied securely.

### List of tools and items which should be in your field rigging kit:

Spikes (2)  
Lawn rigging hooks (soft)  
Eight Cord (6 ft.)  
Drogue Deployment Bag  
Rubber Bands (Main D-Bag and Cargo chute sizes)  
Pull-up cord

### Optional:

Needle  
Red E thread for the RSL  
Super tack

## **Field Repairs**

Only minor repairs are permitted at field rigging stations.

Repair standards at field rigging stations will be identical to those in the parachute lofts.

Harness repairs can only be done by a Senior Rigger. This includes tacking droop risers and RSLs.

Any harness field repairs must be recorded on the harness data card. This includes tacking droop risers and RSLs.

