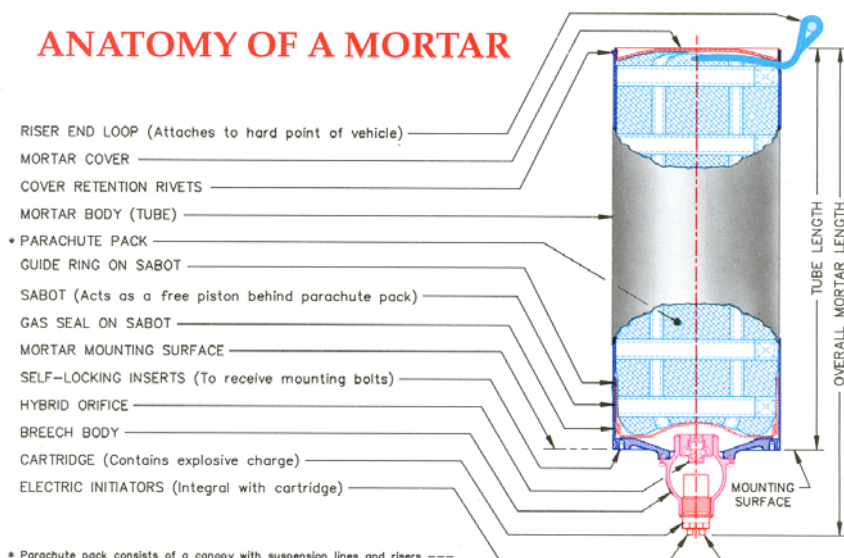


MORTAR-DEPLOYED PARACHUTES FOR SPIN RECOVERY AND VEHICLE STABILIZATION

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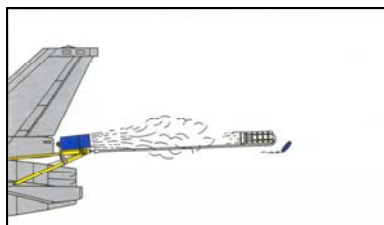


ANATOMY OF A MORTAR

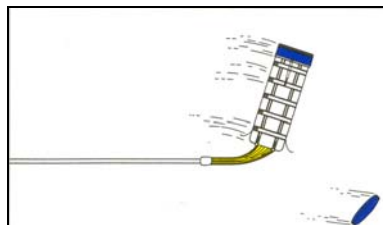


AN ESTABLISHED TECHNOLOGY FOR PARACHUTE DEPLOYMENT

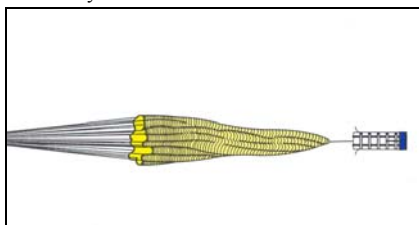
A Typical Sequence of Events during Mortar-Deployment of a Spin Recovery parachute



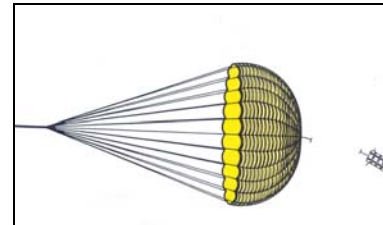
1. Mortar fires...forcefully expelling the parachute. Pack cover separates and falls away.



2. Riser deployed...suspension lines being extracted as the pack rotates 180°.



3. Deployment bag, with sabot attached, strips off. Canopy and lines are at "Line Stretch" condition.



4. Fully effective chute working in approximately 1 second !

IRVIN products have been developed and tested for over 75 years to demanding specifications. They are in use worldwide and are endorsed by many nations as products of reliability and quality.

IRVIN AEROSPACE INC.

3701 West Warner Avenue, Santa Ana, CA 92704, U.S.A.

Tel: (1) (714) 662-1400

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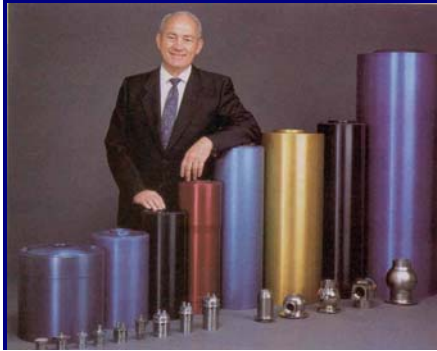
E-Mail: Marketing@Irvin aerospace.com

Website: www.airbornesystems-na.com

Mortars-0803



PYROTECHNIC MORTARS



A representative sampling of parachute mortars which have been designed, developed and qualified by Irvin. Applications are:

From left:

- MDAC AV-88 Harrier (Spin)
- Mitsubishi XT-4 (Spin)
- Air Vehicle (Stabilization)
- Shuttle Orbiter (Landing)
- MDAC C-17 (Deep Stall)
- Taiwan IDF (Spin)
- Booster Recovery (Drogue)
- Gen. Dyn. A-12 (Spin)

Lower left front: Mortar pyrotechnic cartridges

Lower right front: Mortar breeches in which high pressure is generated upon ignition of the pyrotechnic cartridge

Mortar Information									Parachute System Information		System Top Assembly Number	Application
Tube O.D. (in)	Mortar Length (1) (in)	Mortar Assy Weight (lbs) (2)	Average Muzzle Velocity (fps)	Peak Reaction (lbs)	Mortar Assembly Part Number	Mortar Cartridge Part Number	Breech Body Part Number	Breech Volume (cu in) (3)	Available Pack Volume (cu in)	Pack Assembly Weight (4) (lbs)		
2.126	5.35	0.50	72	(5)	784015-1	750075-1	(6)	(7)	14.42	0.45	742301-1	X-34 Orbital Sciences
3.46	5.75	2.06 (8)	150	1,700	753336-503	750063	756779-501	1.32	45	1.0	738012-1	ARD
5.5	12.19	7.65	(5)	(5)	747090-1	750043	747092	7.51	235	4.3	742293-1	Premier I (Raytheon)
7.4	11.86	(5)	(5)	(5)	7R277-503	750043	747092	7.51	311	9.3	742311-1	Hawker Hi-speed
7.4	17.64	12.35	(5)	(5)	7R277	7R300	7R256	9.0	649	12	742293-1	Premier I (Raytheon)
7.4	17.64	12.35	170	7,000	7R114	7R300	7R256	9.0	649	12	7R111	P3 (stabilization)
7.4	22.13 (9)	21.62	160	6,000	813007-1	814000	813009-1	24.43	650	12	813000-1	Shuttle (pilot)
9.0	14.22	13.06	120	10,000	756310-1	750043	756305-1	9.0	785	16	742277-1 / 742290-1	XT-4 (Mitsubishi) / MSU (Honda)
9.0	28.18	25 (10)	180	14,000	756542-1	750052	813009-1	24.43	1588	29.7	782018-1	C-17 (pilot chute)
9.0	32.25	21.46	180	18,000	756897-1	750066	756888-1	15.0	1707 (11)	49.5	742291-1 / 742291-501	GEX (Bombardier) / CRJ700 (Bombardier)
12.44	34.65	24.94	115	17,000	716785-1	GICD 54-111-507 (12)	753278-1	17.97	3280 (11)	85	742264-1	F-16 (original)
12.44	30.13	34.18	135	13,000	756523-1	750057	756511	33.51	3355	67	742280-1	IDF (Taiwan)
12.44	32.69	35.62	(5)	(5)	756599-501	750057	756675	33.51	3636	85	742286-501	FS-X (F2) (M.H.I.)
12.44	34.88	36.22	135	19,000	747047-1	750057	753360	33.51	3695 (11)	85	742295-1	F-16 (1998 update)
15.88	26.35	40.92	117	16,000	756800-1	750072	753343-1	42.50	4767	114	742288-1	F-22 Raptor
15.88	27.1	45.20	(5)	(5)	753344-1	750071	753343-1	42.50	4863	100	783018-1	Kistler (stabilization)
15.88	31.35	47.20	140	24,000	753355-1	750072-1	753343-1	42.50	5680	112	783017-1	Kistler (drogue)
15.88	31.84	47.80	125	22,000	756428-1	750050	753286	43.88	5778	135	742281-1	ATF (YF-22A)
15.88	45.35	61.09	140	30,000	756493-1	750055	756483	65.45	8378	186	742283-1	ATA (A-12)

- (1) Mortar length includes cover (but does not include length of power unit)
- (2) Mortar assembly weight includes the weight of the cartridge(s)
- (3) Calculated volume
- (4) Weight of pack contained within the mortar tube
- (5) Data not available or subject to interpretation
- (6) Breech is integrated with mortar body

- (7) Must be used with 753365-1 Sabot (hemispherical protrusion)
- (8) Stated weight is for flange (muzzle) mount configuration. Base mounted configuration weight = 1.59 lbs.
- (9) Special application – design not typical
- (10) Weight includes 5 lbs of added ballast in the sabot
- (11) Indicated systems have domed covers
- (12) 2 required