

APPENDIX G

Leaflet Production and Dissemination

The ability to influence a target audience with appropriate themes and messages will be determined, at times, by the capacity of the PSYOP unit to produce and disseminate leaflets. This appendix includes production and dissemination considerations for leaflet operations.

Production

As soon as possible in the PSYOP planning process, PSYOP personnel should decide on the best means of dissemination. When deciding on leaflets as the primary means of PSYOP dissemination, the PSYOP planner must ensure enough quantities can be produced to accomplish the mission. Inherent in this planning process is an examination of available HN printing support. Should the need arise to produce leaflets at CONUS locations and forward them to the mission area, planning time must include production and shipment time delays. Figure G-1, pages G-2 and G-3, illustrates leaflet mission planning factors.

Leaflet Printing Capabilities

Presses used in the medium and modular printing system (print company) can only print a printed image maximum size of 13 3/8 by 19 3/4 inches. The paper size is 14 by 20 inches. Table G- 1, page G-3, list leaflet sizes and the number of leaflets that may be obtained based on paper sizes.

NOTE: All estimates are based on present support provided by the print company. Times can be shortened with additional personnel assisting with packing. In this case, all estimates use 6- by 3-inch, 20-pound paper.

Production Time Requirements

Table G-2, page G-4, depicts the amount of time required for production of camera-ready art work. Additional time is required for illustrators to prepare camera-ready copy and color separations.

- POTF Commander's Intent.
 - Target coverage.
 - Priority of targets (if more than one).
 - Density desired (6-30 leaflets per 10,000 square meters).
 - Other instructions.
- Size (dimensions)/weight (type of paper) of leaflet.
- Aerodynamics of leaflet:
 - Ground rate of descent (V_o).
 - Variation coefficient (cloud spread factor) (R_p/T_o).
 - Autorotating/Nonautorotating.
- Total number of leaflets per target/number of leaflets per box/bomb.
- Wind speed (knots) and direction (degrees).
- Function altitude (in thousands of feet).
- Type of aircraft and aircraft certification.
- METT-T to include target location relative to tactical situation.
- Inadvertent leaflet fallout. Avoid —
 - National boundaries.
 - No-fly/buffer zones.
 - Water.
 - Friendly areas unless loss of leaflets, risk to aircraft, or possible harm to political situation is acceptable (probably not your decision).
- Leaflet Plotting Tasks.
 - Maintain a leaflet plotting kit.
 - Kit should have as a minimum:
 - Protractor in degrees.
 - Straight edge with nautical mile scale.
 - Calculator.
 - Leaflet guide (or extract).
 - Plotting work sheet with formulas.
 - Map sheet of target area (same scale as straight edge).
 - Pencil/graph paper or transparency.
 - Determine plotting factors.
 - Perform the following steps in order:
 - Gather from USAF extract weather data (wind speed in knots and direction in degrees).
 - Acquire target area/release altitude.
 - Acquire the leaflet size and paper weight.
 - Determine Ground Rate of Descent (V_o), variation coefficient (cloud spread factor) (R_p/T_o), and time down data from leaflet guide or extract (enter on work sheet).
 - Calculate and vector wind drift.
 - Perform the following calculations, record on work sheet, and draw vectors on overlay:
 - Determine the drift distance through each 5,000-foot interval (time down factor x wind speed).
 - Plot these vectors on map overlay (chart course of travel from target backwards to function point).
 - Determine the resultant net vector (line from release to impact, distance in nautical miles and direction).
 - Determine maximum deviation normal to net vector (line perpendicular to net vector at widest point).

Figure G-1. Leaflet mission planning factors.

- Determine ground pattern and density.
- Perform the following calculations using the formulas provided and plot on overlay:
 - Calculate using formulas the major axis (or length) of the ground pattern and plot on overlay.
 - Calculate using formulas the minor axis (or width) of the ground pattern and plot on overlay.
 - Calculate the area of the ground pattern and draw the ellipse of ground pattern on overlay.
 - Calculate leaflet dispersal per 10,000 square meters.
- Conduct a leaflet drop.
- Perform the following steps:
 - Understand the commander's intent and METT-T.
 - Calculate the ground dispersion pattern (avoid inadvertent leaflet fallout).
 - Conduct USAF coordination:
 - Relay important information to planners (function alt, drift direction in degrees and drift distance in nautical miles).
 - Determine target approach.
 - Determine method of release/distribution.
 - Coordinate for Army to Air Force exchange of leaflets for loading.
 - Monitor mission and record results on mission report and relay results to POTF.

Figure G-1. Leaflet mission planning factors (continued).**Table G-1. Leaflet sizes and numbers.**

Paper Size	Leaflet Size	Total Leaflets/Sheet
8.5 X 11 inches	4 X 3 inches	4
	4 X 4 inches	4
	6 X 3 inches	3
	6 X 6 inches	1
8.5 X 14 inches	4 X 3 inches	8
	4 X 4 inches	6
	6 X 3 inches	4
	6 X 6 inches	2
11 X 15.75 inches	4 X 3 inches	10
	4 X 4 inches	6
	6 X 3 inches	6
	6 X 6 inches	2
13.75 X 20.5 inches	4 X 3 inches	20
	4 X 4 inches	15
	6 X 3 inches	12
	6 X 6 inches	6
17 X 22 inches	4 X 3 inches	28
	4 X 4 inches	20
	6 X 3 inches	15
	6 X 6 inches	6

These estimates are based on the assumption that the printing press is set and ready, a camera-ready copy is available, and 100 copies of a single page are being produced. To obtain a rough estimate of time required to produce a printed product, you must also determine the following:

- Number of colors in the product.
- Number of sides.

- Quantity requested.
- Size and weight of paper.
- Type of bindery work needed, if any.
- Type of package needed for dissemination.

The time listed in Table G-2, page G-4, is for the first 100 copies. The press can produce 5,000 two-color copies per hour after the initial run is completed. Bindery operations and drying time depend on product requested.

Product Production Cost Analysis

Cost estimates for production are based on man-hours, print supplies, and equipment time. Table G-3, page G-5, illustrates the estimates of cost of leaflet production.

Dissemination

Effective dissemination of leaflets is critical to the success of the PSYOP mission. The following paragraphs describe points to consider when planning for PSYOP leaflet dissemination operations.

Table G-2. Estimated production time for camera-ready art work.

Task	Time
Black and White	
Camera-plating	30 minutes
Printing (100 copies of 1 page)	30 minutes
Sizing and cutting (100 sheets, standard size)	30 minutes
Color	
Camera-plating	
Two colors total	45 minutes per page
Three colors total	1 1/4 hours per page
Printing (100 copies per page)	
Two colors	1 1/2 hours
Three colors	2 1/2 hours
Sizing and cutting (100 copies)	30 minutes per page
Binding (100 copies)	
Stitching, folding, and stapling	45 minutes

Table G-3. Leaflet production cost estimates.

Number of Colors/Size (per 100,000 copies)	Cost (per copy)
1 color/1 sided	
8.5 X 11 inches	\$1,700/.017
6 X 3 inches	\$ 500/.005
1 color/2 sided	
8.5 X 11 inches	\$2,000/.020
6 X 3 inches	\$ 585/.006
2 color/1 sided	
8.5 X 11 inches	\$2,346/.023
6 X 3 inches	\$ 690/.007
2 color/2 sided	
8.5 X 11 inches	\$2,642/.026
6 X 3 inches	\$ 790/.008
NOTE: Add 25 percent to the base cost for each additional color beyond two colors.	

Leaflet Dispersal

If a leaflet or piece of paper is dropped from a balloon or aircraft, the leaflet will be blown or moved along at about the same speed and in the same direction of the wind. The leaflet offers little or no wind resistance. If there are updrafts or downdrafts, the leaflet still follows the general direction of the wind. The pull of gravity acting upon the leaflet causes it to fall at a fairly stable, constant rate as illustrated in Table G-4, page G-7.

Wind Effects

If the falling rate of the leaflet is known and the wind's speed and direction are known, then the distance the leaflet travels before coming to the ground can be computed with reasonable accuracy. For example, if a leaflet is dropped from 10,000 feet and falls at a rate that takes it 1 hour to strike the ground in a 10-knot wind, the leaflet will travel in the direction of the wind for 10 nautical miles. If the wind is blowing twice as fast, or 20-knots, the leaflet will travel twice as far or 20 nautical miles. Figure G-2, page G-8, illustrates an example of how prevailing winds affect flight paths for leaflet dissemination.

Dimensions

The rule of thumb for leaflet dispersal is that actual impact may vary from the predicted impact by as much as 10 percent of the distance the leaflets travel. For

example, for specific targets 100 miles away, the center of impact could be as much as 10 miles away from the predicted center of impact. However, this attempt is not necessarily a failure because the dimensions of the leaflet pattern itself will be large enough to assure substantial coverage of the chosen target, provided proper leaflet selection has been made. Figure G-3, page G-9, illustrates typical leaflet dispersal patterns. Doubling the number of leaflets released at one time does not increase the area covered by these leaflets. It doubles only the density of the leaflets on the ground. To increase the area covered on the ground, increase the size of the major and minor axis as in square D of Figure G-3. Table G-5, page G-9, is a guide for leaflet drops that cover certain dimensions. Figure G-4, page G-10, is a leaflet work sheet that allows PSYOP personnel to compute leaflet mission data in the field.

Other Variables

Dispersal area can be changed by variations in leaflet size and paper weight used. Table G-6, page G-11, illustrates how these variables affect dispersal.

Leaflet Artillery Rounds

PSYOP units may use either of two types of leaflet artillery rounds (LARs)—the 155-mm LAR (XM951) or the 105-mm LAR (M84). The 155-mm LAR is preferred for use in PSYOP because it was specifically designed to deliver leaflets. Figure G-5, page G-12, provides a detailed view of the 155-mm LAR (XM951). The 105-mm LAR, actually a modified M84 smoke round, is not preferred for PSYOP use because it must be modified and is not as safe as the 155-mm LAR. However, it may be used if the 155-mm LAR is unavailable. The 105-mm LAR is 6 to 8 pounds lighter than a standard smoke shell. Maximum range is 11,500 meters, and the desired burst height is 27 to 46 meters. Its Department of Defense Ammunition Code is C450. LARs may have extremely limited availability. Their use is further restricted by their long lead time to fill and deliver to the firing unit versus timeliness of the message. The LARs may produce casualties and are limited to war scenarios.

Capacity

The number of leaflets inserted in either round depends on the weight of the paper and the size of the leaflet. The following dimensions are based on leaflet rolls prepared with a leaflet rolling machine.

Standard dimensions for the 155-mm LAR leaflet roll are 4 to 5 inches in height, with a 1-inch inner and a 4-inch outer diameter.

Standard dimensions for the 105-mm LAR leaflet roll are 10 1/2 inches in height, with an outer diameter of 3 inches.

Table G-4. Standard leaflet information table.

Leaflet area: 18 square inches

Paper: 20 pounds, autorotating

Leaflets per pound: 519

Ground rate of descent (V_0): 2.5 feet per second

Variation coefficient (cloud spread factor) (R_v/T_0) = 1.11

Time down factors or ground rate of descent through layers of atmosphere (expressed in fractions of an hour):

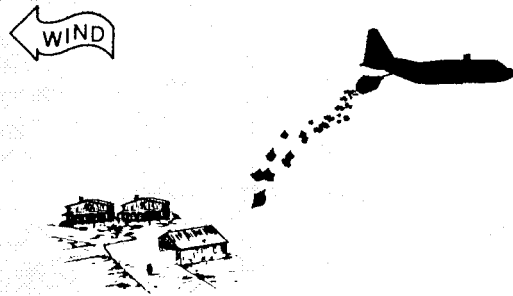
Altitude	1,000-Foot Increments	5,000-Foot Increments	Total Descent
40,000	.25	.27	3.24
35,000	.28	.30	2.97
30,000	.32	.34	2.67
25,000	.25	.38	2.33
23,000	.19		
20,000	.20	.43	1.95
18,000	.17		
16,000	.18		
15,000		.47	1.52
14,000	.18		
12,000	.19		
10,000	.15	.51	1.05
9,000	.10		
8,000	.10		
7,000	.10		
6,000	.10		
5,000	.11	.54	.54
4,000	.11		
3,000	.11		
2,000	.11		
1,000	.11		
Surface	.06		

Target Approach.

Track of aircraft during approach and release:

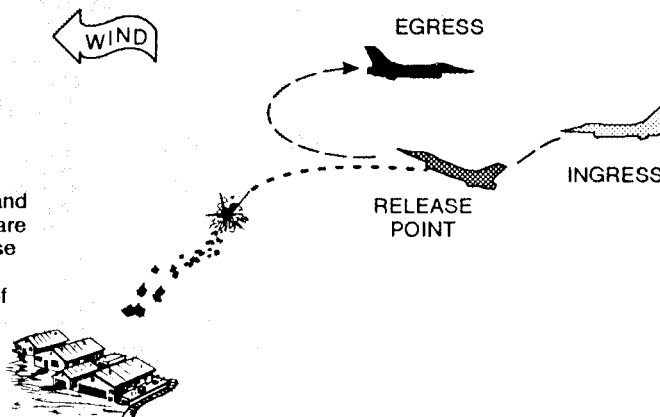
DIRECT TRACK.

- Flight path directly over the target and into the wind.
- More accurate.
- Miss possible when release is short or long of target.



PARALLEL TRACK.

- Flight path parallel to and upwind of the target.
- Less accurate.
- Miss possible when aircraft flies too close or too far from target or aircraft releases too short or too long of target.
- Both wind and leaflet drift are expressed in degrees and in the direction from which the winds and/or leaflets are blowing on a 360-degree scale moving in a clockwise direction from due north. For example, a 90-degree wind is blowing from east to west. A net leaflet drift of 180 degrees means the leaflet cloud is drifting from south to north.



Distributed Cluster Release.

- Release of several boxes/bombs at calculated intervals.
- Can be used with either direct track approach or parallel track approach.
- Works best with parallel track.
- Greatly increases the chance of placing leaflets on target.
- Can be used to overcome limitations or to avoid inadvertent leaflet fallout.
- Reduces leaflet densities where ground patterns do not overlap.
- Minor axis is such that footprints overlap, widening the axis when aircraft uses parallel track approach.
- Requires prior coordination with USAF air crew.

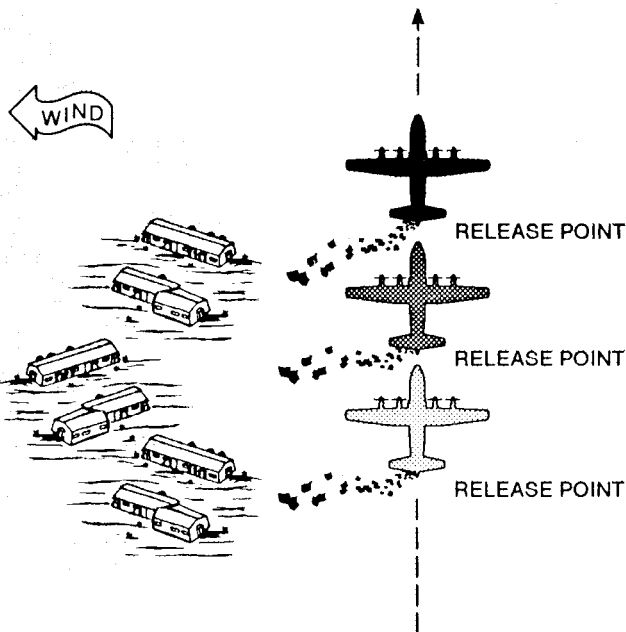


Figure G-2. Flight path guide.

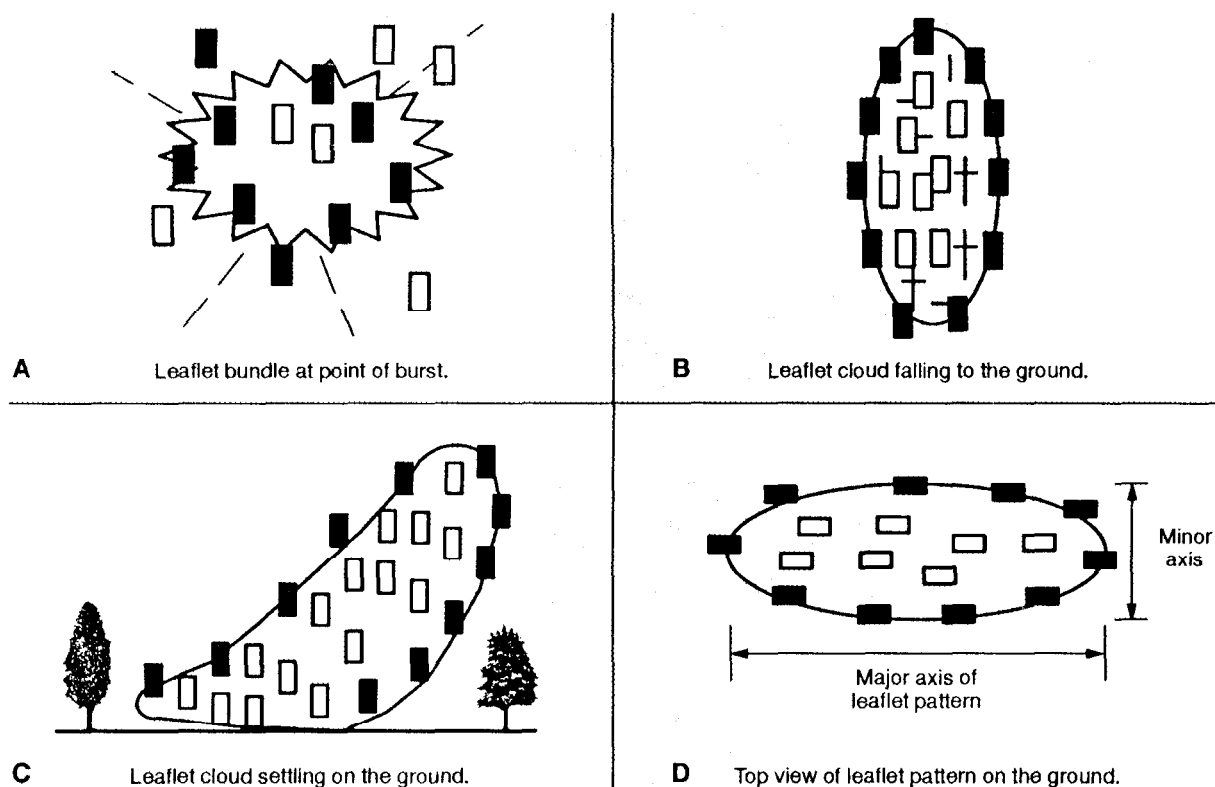


Figure G-3. Leaflet dispersal patterns.

When a leaflet rolling machine is not available leaflets may need to be rolled by hand for use in 155-mm rounds. Table G-7, page G-11, provides formulas for hand rolling leaflets for these rounds.

Restrictions

The use of LARs is restricted to hostile audiences. This use is limited because of the risk of casualties associated with downrange debris.

Table G-5. Leaflet drop statistics guide.

	Division	Regiment	Battalion
Frontage (in kilometers)	20 to 30	10 to 15	5
Depth (in kilometers)	16 to 20	7 to 10	3
Number of leaflets required	850,000	180,000	33,000

Size: _____ Weight of paper: _____ Autorotator: Y or N _____ Leaflets per lb: _____

Ground Rate of Descent (V_0): _____

Cloud Spread Factor (R_f/T_0): _____

WIND DRIFT

ALTITUDE (Ks)	V_0 (Time Down) x		WIND SPEED (knots)=		DRIFT (NM @ Az (degrees))
_____	_____	x	_____	=	_____ @ _____
_____	_____	x	_____	=	_____ @ _____
_____	_____	x	_____	=	_____ @ _____
_____	_____	x	_____	=	_____ @ _____
_____	_____	x	_____	=	_____ @ _____
_____	_____	x	_____	=	_____ @ _____
_____	_____	x	_____	=	_____ @ _____
_____	_____	x	_____	=	_____ @ _____
_____	_____	x	_____	=	_____ @ _____

NET DRIFT is line drawn from Function Point to Impact: Distance in Nautical Miles: _____ Az: _____

MAXIMUM DEVIATION Normal to Net Vector: Distance in Nautical Miles: _____

GROUND PATTERN

MAJOR AXIS: $(1/2 \text{ Release Altitude}/6060) + (\text{Net Drift} \times R_f/T_0) =$ _____ nautical miles

MINOR AXIS: $(1/2 \text{ Release Altitude}/6060) + (\text{Maximum Deviation} \times R_f/T_0) =$ _____ nautical miles

DISPERSAL

AREA: $(.785 \times \text{MAJOR AXIS} \times \text{MINOR AXIS}) =$ _____ nautical miles

MEAN DENSITY per square nautical miles: $(\text{number of leaflets} / \text{AREA}) =$ _____ leaflets

DENSITY per 10,000 square meters: $(\text{MEAN DENSITY} / 343) =$ _____ leaflets per 100-meter square

Figure G-4. Leaflet work sheet.

Table G-6. Leaflet dispersal variations.

Leaflet Size	Paper Weight	Dispersal Characteristics/Uses
4 by 1 inch	16 pounds	Slow rate of descent, high spread factor. Good for harassment messages. Good for area targets.
8.5 by 2.83 inches	16 pounds	Very favorable dissemination characteristics for area targets. Dispersal is wider in strong winds.
6 by 2.4 inches	16 pounds	Smaller dissemination area. Better for point target.
6 by 3 inches	20 pounds	Used in Vietnam for safe conduct passes. Substantial spread pattern.

Table G-7. Rolling formulas for 155-mm artillery rounds.

Number of Artillery Rounds	Number of Rolls and Leaflets	Time	Number of Personnel
1 155-mm	4 rolls of 4-inch diameter	24 minutes	2
476 155-mm	1 million leaflets	190 hours	2
476 155-mm	1 million leaflets	85 hours	4
<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">Mission</p> <p>1 million leaflets for 476 155-mm artillery rounds. 85 hours to roll. 1 day to pack/set detonator. 0 hours for loading.</p> </div>			

Coordination

Coordination with a field artillery unit for support is the responsibility of the PSYOP officer in charge of the plans of execution.

Logistics

PSYOP units using LARs must address the following logistic concerns:

- Requirement for pre-positioning.
- Need for trained personnel to load leaflets by hand.
- Specific requirements for storage of LARs.

Preparation Procedures

Both types of artillery rounds used for leaflet dissemination require specialized preparation. PSYOP planners must ensure sufficient time during the planning cycle to prepare these rounds for use.

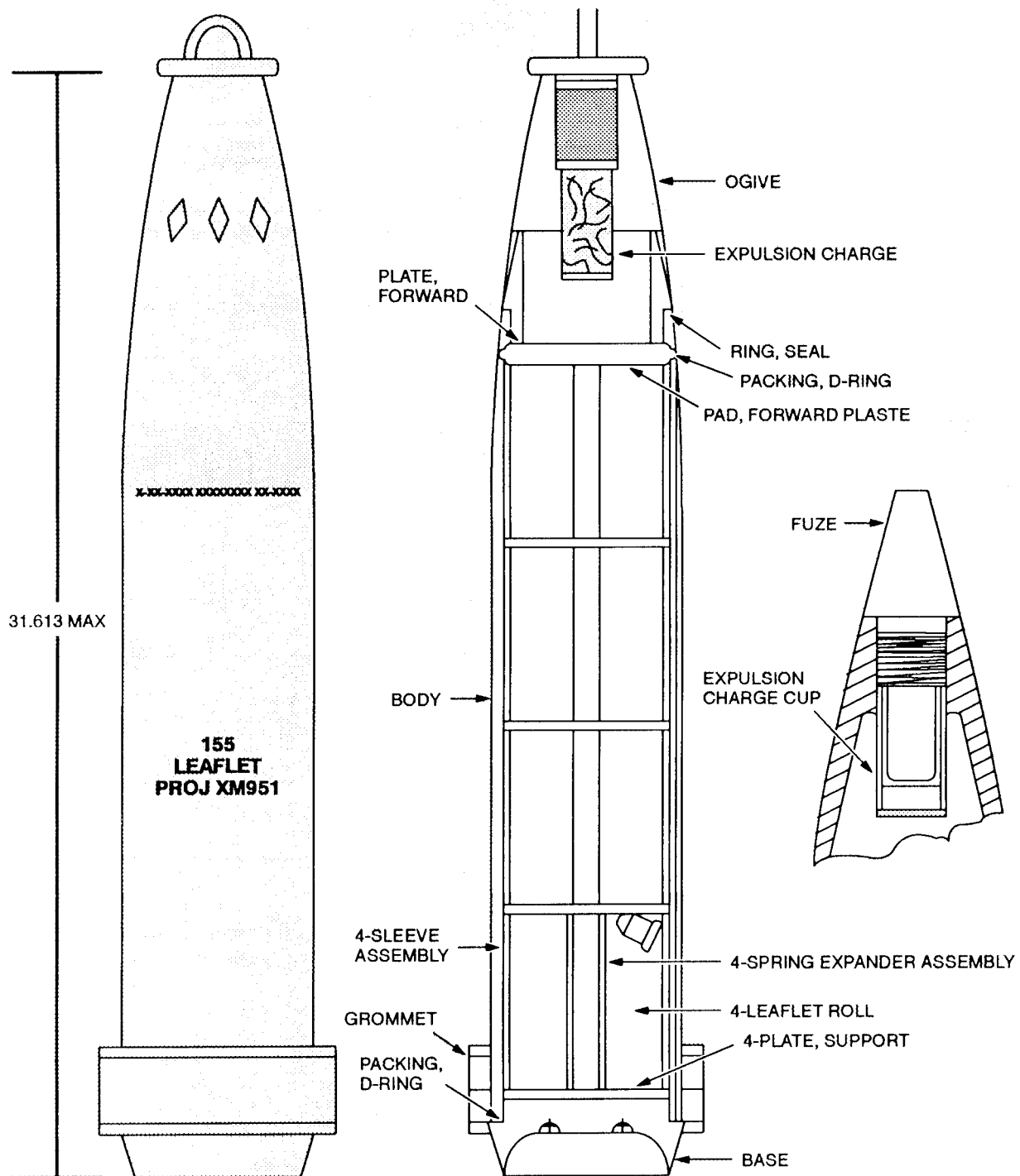


Figure G-5. 155-mm LAR (XM951).

155-mm LAR. Once the target audience has been selected and the leaflets designed and printed to standards, the leaflets are machine-rolled to the standard dimensions for the 155-mm LAR by trained PSYOP personnel. All leaflet rolls must be of uniform weight and diameter to ensure against adverse effects on ballistics. Figure G-6, page G-14, illustrates a leaflet roll properly encased in the leaflet sleeve assembly. Pallets of LARs are then requisitioned from the storage site for the loading of the leaflets. Figure G-7, page G-14, illustrates the rearview of a pallet loaded with LARs. The same trained personnel load the leaflet rolls in the rounds to preclude such dangers as early base separation or a “short round.” Each leaflet loading team should follow the current accepted procedures for computing ranges, proper propulsion charge for the LAR, and fuze timing for proper area coverage of the target audience.

105-mm LAR. The preparation procedures for the 105-mm LAR are very similar to the ones for 155-mm LAR, with one important difference. The 105-mm LAR is a smoke round that must be modified for PSYOP use. To avoid confusion with normal smoke shells, PSYOP personnel remove all old markings from the shell cases and projectiles. A large “P” for PSYOP is stenciled on the shell. If a number of different leaflets are used or if the loaded shells are stored for future use, PSYOP personnel stencil the serial number of the leaflet on the shell and attach one copy of the leaflet and its English translation to the LAR.

Leaflet Artillery Round Planning

Table G-8, page G-15, is designed to aid planners in planning LAR dissemination missions. The chart provides information on dispersion patterns of LARs. The chart is based on three altitudes, five wind speeds, and an average of 2,200 leaflets per round. To determine the dispersion patterns of other altitudes and wind speeds, the user will have to extrapolate from the chart.

To use the chart, PSYOP personnel select a release or detonation altitude for the round. Based on current wind data for the targeted area, they read across the chart to the appropriate wind speed. They then read down for the resulting data on leaflet dispersion. Wind speed, length, and release data are expressed in nautical miles.

The release figure indicates how far from the target area the round should be detonated in relation to wind speed and altitude. The LARs should always be delivered to detonate upwind of the target area.

Density indicates leaflets per 100 square meters. The length and width are the area on the ground of the leaflet dispersion pattern.

Leaflet Bomb (M129E1/M129E2)

The M129E1/M129E2 leaflet bomb is the approved method of disseminating leaflets from high-speed aircraft. To ensure correct, on-target dissemination of products, special planning factors must be taken into effect. Figure G-8, page G-15, and the following paragraphs provide the characteristics and considerations for the use of this bomb.

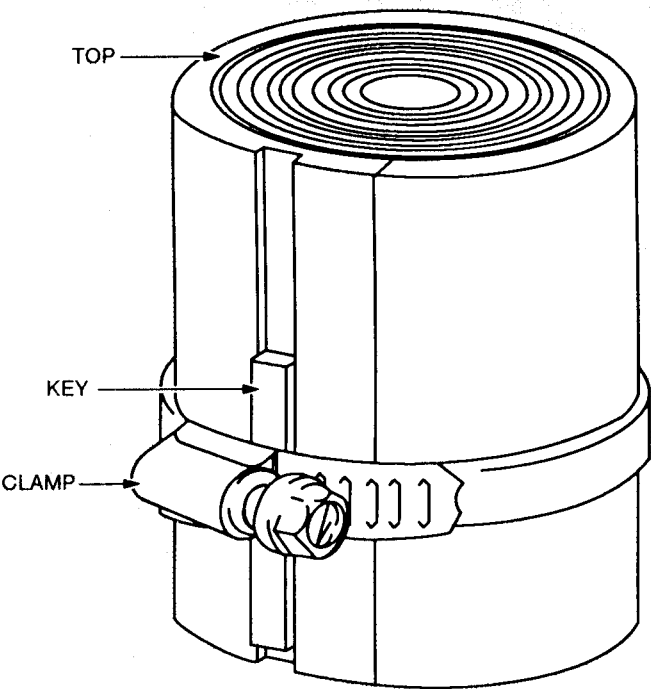


Figure G-6. Leaflet sleeve assembly for 155-mm LAR.

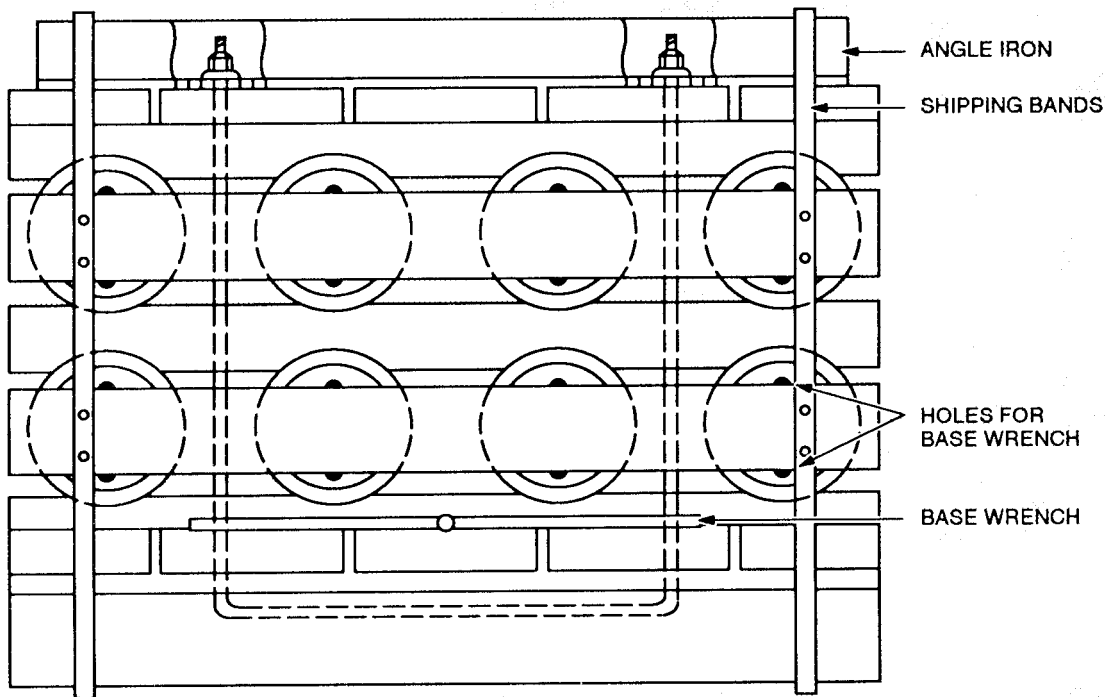


Figure G-7. Rear view of pallet loaded with LARs.

Table G-8. Leaflet dispersion patterns.

Altitude	Wind Speed (in knots)				
	05	10	15	20	25
500 feet	Release = .6	1.2	1.8	2.4	3
	Density = 214	128	80	58	49
	Length = .64	1.3	2	2.7	3.3
	Width = .05	.05	.05	.05	.05
1,000 feet	Release = .9	1.8	2.7	3.6	4.5
	Density = 80	46	31	23	18
	Length = .94	2	3	4	5
	Width = .09	.09	.09	.09	.09
1,500 feet	Release = 1.1	2.4	3.6	4.8	6
	Density = 49	23	16	12	9
	Length = 1.3	2.7	4	5.3	6.7
	Width = .13	.13	.13	.13	.13

Loading Method

To load 13.3- by 20.3-centimeter (5 1/4- by 8-inch) leaflets, use six 36.1-centimeter (14 1/2-inch) diameter rolls and one 31.7-centimeter (12 1/2-inch) diameter roll. Formulas for rolling leaflets by hand are found in Table G-9, page G-16. Place the detonating cord in the seam between the two halves of the bomb before placing the leaflets inside. (See Figure G-9, page G-16.)

Stock Number: DODAC E907 132500-542-0289-E907-G-58.

Tail Assembly: DODAC M148.

Weights: Empty: 52.57 kilograms (115 pounds).
Loaded: Approximately 101.37 kilograms (223 pounds).

Inside Diameter: Minimum: 34.3 centimeters (13 1/2 inches).
Maximum: 39.3 centimeters (15 1/2 inches).

Capacity: Approximately 30,000 leaflets, 13.3 by 20.3 centimeters (1 1/4 by 8 inches, 16 pounds, machine rolled).

**Recommended
Fuze Type:** M147.

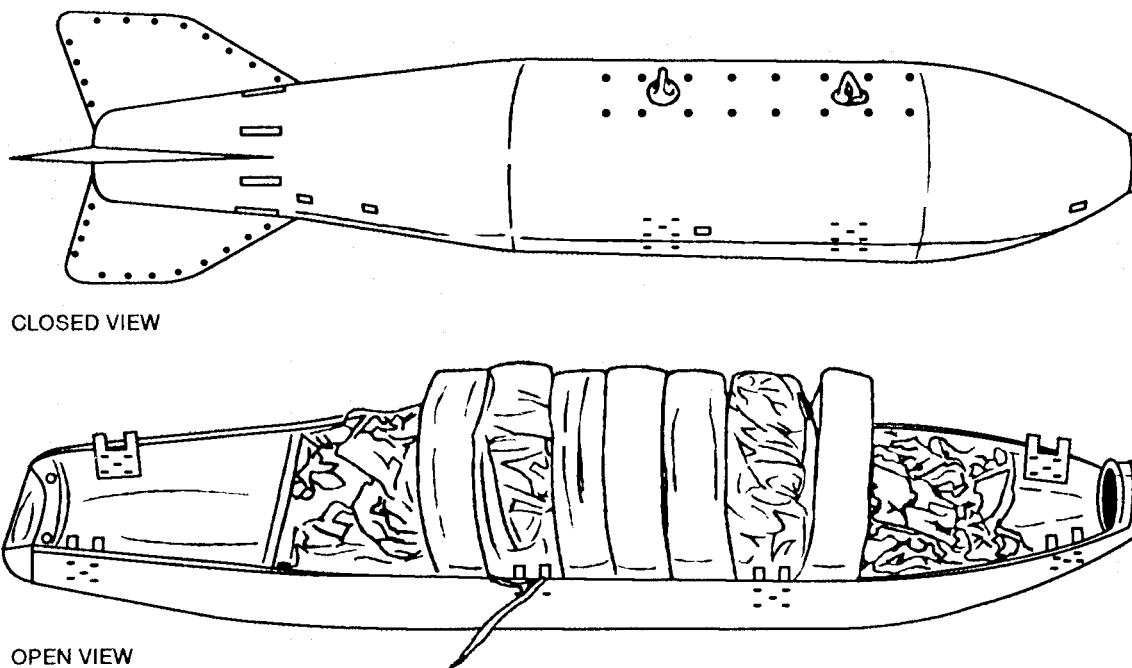
Figure G-8. Leaflet bomb (M129E1/M129E2) characteristics.

Table G-9. Leaflet rolling formula (M129 leaflet bomb).

Number of M129 Leaflet Bombs	Number of Rolls and Leaflets	Time	Number of Personnel
1	8 to 12 rolls of 14-inch diameter	1.5 hours	6
16	1 million leaflets	24 hours	6

Mission

1 million leaflets for 16 M129 leaflet bombs.
24 hours to roll.
6 hours to pack/set detonator.
2 hours to load.

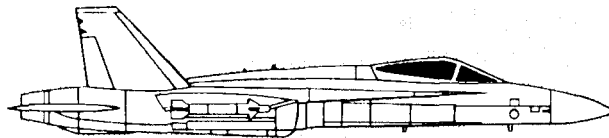
**Figure G-9. M129E1/M129E2 leaflet bomb, open and closed views.**

Dissemination

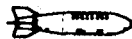
The M129E1/M129E2 can be used only on aircraft not requiring forced ejection for release from a bomb shackle. Figure G-10, page G-17, illustrates leaflet dissemination aircraft and the number of M129E1s/M29E2s bombs they can carry.

Type Aircraft	Type Dispenser	Maximum Dispensers Per Aircraft
F4G	M129E1	18
F16A,B,C,D	M129E2	4*
B52	M129E1	47
FA-18	M129E1	3

*Flight characteristics are greatly diminished when carrying this round.



Release Altitude: Point at which aircraft releases bomb.



Descent: 1- to 99-second fuse (set by USAF).



Function Altitude: Point at which bomb detonates and releases cloud.

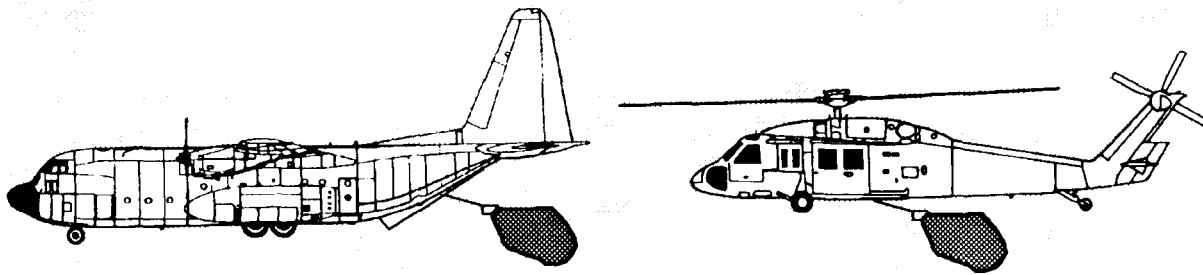
Figure G-10. Leaflet dissemination aircraft and number of dispensers they can carry.

Static-Line Box

At high altitudes, the use of leaflet bundles or boxes opened by a static line has proved effective. Through use of rollers on the deck of the aircraft, boxes weighing up to 49.90 kilograms can be ejected with minimum exertion. The box is rolled out of the aircraft, and as the container comes to the end of the static line, the sides of the box split (Figure G-11, page G-18). In effect, the box is turned inside out, and the leaflets fall away from the empty box.

The steps required to prepare boxes for high-altitude, static-line dissemination are shown in Figure G-12, page G-19.

TRANSPORT OR ROTARY-WINGED AIRCRAFT



Function Altitude: Point at which box opens (end of static line) and releases leaflet cloud.

Figure G-11. Static-line box employment.

Balloon Delivery Systems

Balloons can be used for communication, intelligence collection, and equipment drops for support missions. However, their primary purposes in PSYOP are to deliver leaflets or novelties and gifts and to support deception operations.

PSYOP Product Delivery

In addition to leaflets, balloons can drop food, toys, household goods, and daily commodities to the selected target audience. Drops for harassment can include national flags and passport-like safe conduct passes that permit would-be defectors to cross over to opposing forces. This type of pass was sent by balloon from the Republic of China to the People's Republic of China and aided in the defection of former Communist airmen, journalists, and Red Guards.

Deception Support

PSYOP units supporting deception operations can use balloons to drop equipment such as parachutes or other evidence, such as food or ammunition, behind opponent lines to indicate the presence of strike or reconnaissance forces. Balloons may be made of paper, rubber, or polyethylene. The chart in Table G-10, page G-20, lists the balloon specifications, nomenclatures, and capabilities.

Planning Considerations

Just as special planning considerations are required for bomb or artillery leaflet dissemination, the dissemination of leaflets by balloon requires special planning. Since special considerations may add time to the planning process, the PSYOP staff planner must ensure that sufficient time is available for this type of operation.

Climatological Information. Before beginning any balloon operation, the PSYOP unit should get a climatology summary from division, corps, a military satellite forecasting system, or the International Civil Aviation Organization.

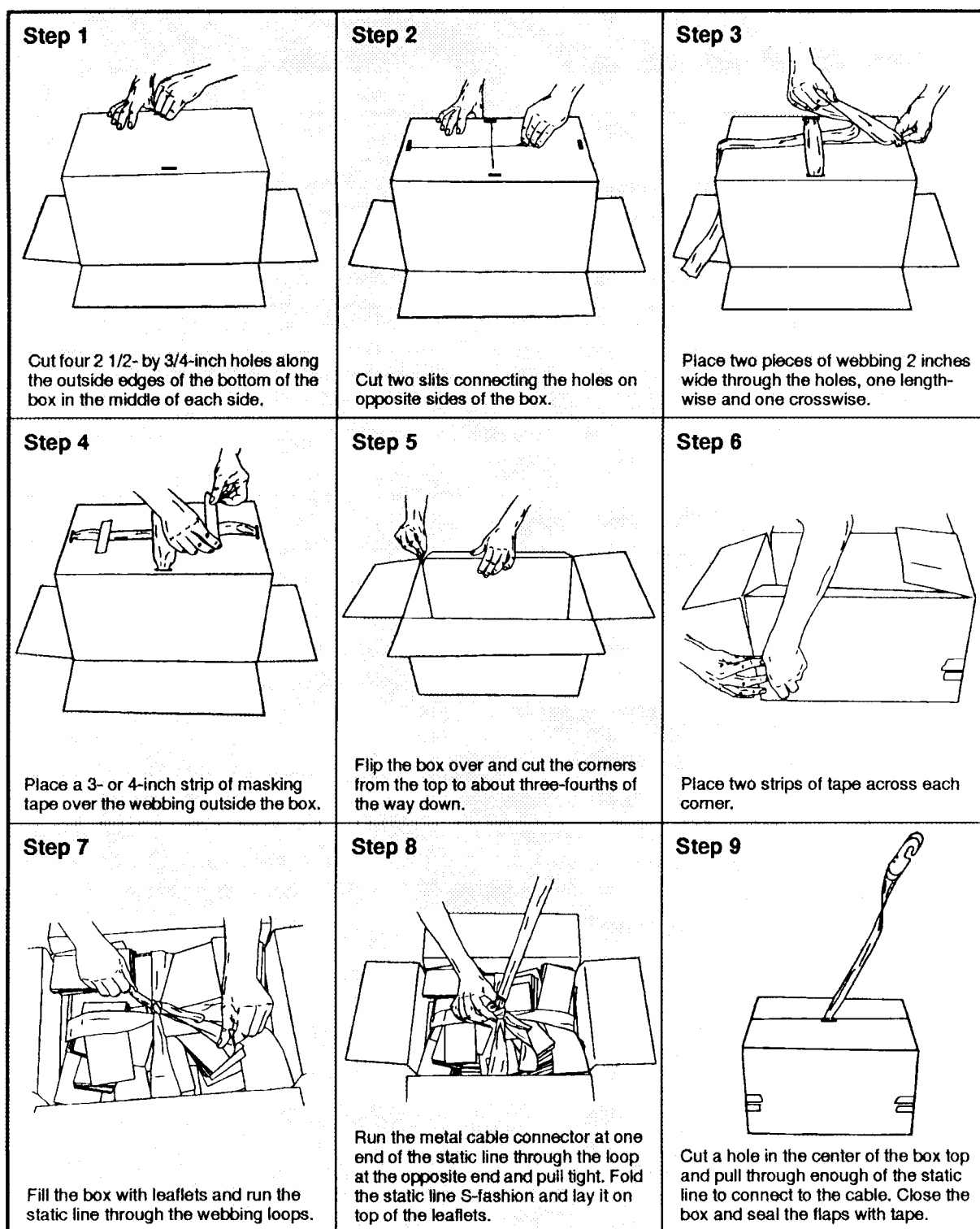


Figure G-12. Steps in the assembly of the static-line box.

Table G-10. Balloon characteristics, capabilities, and payloads.

Grams	Color	Nomenclature	National Stock Number
30	Black	ML-51A	6660-00-526-6041
00	Black	ML-160A	6660-00-663-8151
150	Clear	ML-835/AM	6660-00-936-8927
1,000	Clear	ML-537/UM	6660-00-809-5114
Ranges			
Short Range		Under 400 kilometers (250 miles)	
Medium Range		400 to 960 kilometers (250 to 600 miles)	
Long Range		Up to 2,400 kilometers (1,500 miles)	
Payload			
Balloons have a relatively small payload of about 20 pounds.			

The climatology summary includes mean winds and any special or unusual weather conditions. The unit can then make map overlays indicating net drift vector and major drop axes for the area under study to assist in planning routes, altitudes, and the scope of the proposed operation.

Flight Patterns. Flight patterns are determined by the weather, winds, air currents, and gas pressure. The slightest leak in the balloon will alter the flight pattern. Balloons can be tracked by radar for about 40 kilometers by adding a conventional reflector or a radio wind sonde. This distance is sufficient to establish wind patterns and trajectory. Flight patterns are easily constructed showing altitude, time, distance, and payload.

Other Data and Equipment Temperature changes effect equipment capabilities, including ballast systems used to counteract the effects of altitude and temperature on fluids and gases used. Considerations concerning the following data and equipment are essential for balloon operations:

- One-degree grid overlay for AO planning.
- Release points.
- Mechanical and electrical timers.
- Standard tables of inflation.
- Key factors of air density and viscosity.
- Ascension rates.

Inflation Procedures

Balloons should be inflated in a protected area or inside a shelter. Windspeeds no greater than 5 to 7 knots during inflation and launching are desirable. Balloons are easily inflated. For safety, helium is preferred, although hydrogen, a highly inflammable gas, or coal gas may also be used. Extreme care is required when hydrogen is used. The crew must wear protective cotton clothing and goggles. No silk, fur, nylon, or ether potentially spark-producing clothing may be worn. All inflation equipment must be electrically grounded. Smoking in the area is prohibited.