ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

7110.118

7/14/00

SUBJ: **LAND AND HOLD SHORT OPERATIONS**

1. PURPOSE. This order prescribes the standards for use by Air Traffic (AAT), Flight Standards (AFS), and Airports (AAS) in approving and conducting land and hold short operations (LAHSO). It also establishes the terms of reference, conditions, and limitations for the application of LAHSO. This order provides procedures to be applied when LAHSO clearances are being issued to Federal Aviation Regulations (FAR) Parts 91, 121, 125, 129, and 135 aircraft operators.

2. DISTRIBUTION. This order is distributed to branch level in Washington headquarters and regional Air Traffic, Flight Standards, and Airport Safety and Standards offices, the Office of System Safety, all air traffic field offices and facilities, Flight Standards District Offices, and Airport District Offices.

3. CANCELLATION. This order cancels Notice 7110.199, Land and Hold Short Operations.

4. ACTION. Facility managers shall ensure all air traffic control (ATC) personnel are briefed on the content of this order prior to conducting LAHSO. In order to conduct LAHSO, facility managers shall implement procedures that are in accordance with this order. At airports that are currently conducting LAHSO, facility managers shall ensure that these new procedures are implemented within 180 days. However, during this interim 180-day period, all airports and runway configurations may conduct LAHSO in accordance with the provisions of Notice 7110.199. The exception to this is the runway configurations requiring rejected landing procedures (RLP). Configurations requiring RLP's will be discontinued until such time as the procedures are validated in accordance with paragraph 10 of this order.

5. EFFECTIVE DATE. August 14, 2000.

6. BACKGROUND. LAHSO is an acronym for "land and hold short operations." These operations include landing and holding short of an intersecting runway, an intersecting taxiway, or some other predetermined point on the runway other than on a runway or taxiway. Previously, SOIR, the acronym for "simultaneous operations on intersecting runways," was used exclusively to describe simultaneous operations on two intersecting runways – either two aircraft landing simultaneously or one aircraft landing and another one departing. The term LAHSO incorporates SOIR and is expanded to include holding short of a taxiway and holding short of predetermined points on the runway. The additional operations outlined under this order are for those airports that need additional tools to decrease delays. This order sets the standards for conducting the following LAHSO combinations.

a. Landing and holding short of an intersecting runway.

b. Landing and holding short of an intersecting taxiway.

c. Landing and holding short of an approach/departure flight path.

d. Landing and holding short of a predetermined point.

7. EXPLANATION OF CHANGES.

The following changes apply to all LAHSO.

a. Mixed LAHSO operations shall be permitted at such time that adequate pilot training, on these procedures, is accomplished. Notification of completed training will be made by an Air Traffic GENOT.

Note– Adherence to the current policy of sequencing traffic on a first-come-first-served basis shall prevail.

b. Solo student pilots will not conduct LAHSO.

c. When air carrier LAHSO is conducted, vertical guidance is required on the hold short runway.

d. No waivers will be issued to the procedures contained in this order.

8. DEFINITIONS. For the purpose of this order, the following definitions are provided.

a. Available Landing Distance (ALD) - That portion of a runway available for landing and rollout for aircraft cleared for LAHSO. This distance is measured from the landing threshold to the hold short point.

b. Air Carrier Operation - Air carrier and commuter aircraft operating under FAR Parts 121 and 129.

c. Contaminated Runway - For the purpose of this order, a runway is considered contaminated whenever standing water, ice, snow, slush, frost in any form, heavy rubber deposits, or other substances are present. A runway is contaminated with respect to rubber deposits or other friction degrading substances when the average friction value for any 500-foot segment of the runway within the ALD falls below the recommended minimum friction level, and the average friction value in the adjacent 500-foot segment falls below the maintenance planning friction level.

d. Hold Short Point - A point on the runway beyond which a landing aircraft with a LAHSO clearance is not authorized to proceed.

e. Hold Short Position Marking - The painted runway holding position marking located at the hold short point on all LAHSO runways.

f. Hold Short Position Signs - Red and white holding position signs located alongside the hold short point.

g. Land and Hold Short Lights. Six or seven in-pavement, pulsing white lights at the LAHSO hold short point.

h. Vertical Guidance - Visual or electronic glide slope (e.g., precision approach path indicator (PAPI), visual approach slope indicator (VASI)).

Note– The pulsed light approach slope indicator (PLASI) may not be used to provide visual glide slope information during LAHSO.

i. Rejected Landing - For the purpose of LAHSO, a rejected landing is when the pilot in command elects to go around. In the event of a rejected landing on a configuration not requiring a RLP, normal pilot/controller responsibilities remain unchanged.

j. LAHSO - An acronym for "land and hold short operations." These operations include landing and holding short of an intersecting runway, taxiway, predetermined point, or approach/departure flight path.

k. Dry Runway - Defined as no visible moisture.

l. Mixed Operations - LAHSO conducted between an air carrier and any other type of aircraft operation.

m. Rejected Landing Procedure (RLP) - A published, predetermined heading to be used in the event of a rejected landing. Unless alternate instructions are given by ATC, pilots are expected to execute the procedure as published and remain clear of clouds.

9. WAIVERS.

No waivers will be issued.

10. CRITERIA FOR CONDUCTING LAHSO.

General - Local LAHSO development teams shall be established, in accordance with subparagraph 13b1 of this order, to develop procedures utilizing the following criteria.

a. The minimum distance required to conduct LAHSO will be 2,500 feet of the ALD on the hold short runway. This distance will be measured from the landing threshold to the hold short point.

b. For air carrier operations only:

(1) Arrival/arrival. Approved if the distance on the full-length runway from the threshold to the intersection where the hold short clearance is effective is greater than 3,000 feet.

(2) Arrival/departure. Approved if the distance from the departure runway threshold to the intersection where the hold short clearance is effective is less than 2,000 feet.

(3) If the runway distance and configuration do not meet the requirements of subparagraphs 10b1 and 2 of this order and air carrier operations are being conducted, RLP's must be developed and validated through modeling in accordance with Federal Aviation Administration (FAA) requirements using the following guidelines.

(a) The local LAHSO development team (see subparagraph 13b1 of this order) is responsible for developing the procedure collaboratively, considering the following:

1 A heading to fly with instructions to remain clear of clouds .

2 The point from which the rejected landing is initiated (the first one-third of the runway, or 3,000 feet, whichever is less).

3 Potential conflict with terrain or obstacles along the rejected landing flight path.

4 Potential conflicts with other procedural requirements; e.g., is there a possible conflict between an RLP and a one-engine-out procedure for a full-length aircraft?

5 Performance of the LAHSO aircraft and the full-length aircraft.

6 Different full-length traffic scenarios (e.g., arrival, departure, go-around).

7 Any other locally specific issues.

(b) Only one RLP can be developed for each runway configuration. Therefore, this single RLP must then be designed to accommodate all differing types of aircraft that could possibly be required to use it.

(c) Through modeling, RLP's shall demonstrate an acceptable level of safety.

(d) Local facilities must submit the procedure(s) to headquarters for approval. A copy shall be forwarded to the region.

(e) Headquarters is responsible for validating the procedure through modeling before approval to the facility for use.

11. LAHSO PROCEDURES.

a. General. The following conditions shall exist at the airport.

(1) Ceiling and visibility requirements.

(a) Non-air carrier aircraft: ceiling 1,000 feet and visibility 3 miles.

(b) Air carrier aircraft: ceiling 1,500 feet and visibility 5 miles, unless the landing runway is equipped with PAPI or VASI, in which case 1,000 feet ceiling and 3 miles visibility shall be applicable. For configurations requiring a RLP, the ceiling and visibility may differ.

(2) The LAHSO runway ALD must be dry.

(3) The tailwind on the hold short runway shall be calm (less than 3 knots).

(4) LAHSO shall not be utilized if wind shear has been reported.

(5) LAHSO will only be conducted at those airports that maintain a letter of agreement (LOA) signed by all the required parties, as defined in subparagraph 13b1 of this order. A copy of the LOA shall be forwarded to the Program Director for Air Traffic Planning and Procedures, ATP-1; Director, Flight Standards Service, AFS-1; and Director, Airport Safety and Standards, AAS-1.

b. Runway Equipment and Facilities. Markings and signs shall be installed in accordance with Advisory Circular (AC) 150/5340-1, Standards for Airport Markings, and AC 150/5340-18, Standards for Airport Sign Systems.

(1) Runway hold short position markings shall be installed and clearly visible at all hold short points.

(2) There shall be only one designated hold short point per operational direction on a runway.

(3) Runway hold short position signs shall be installed at each hold short point and shall be located on both sides of the runway. If one of the two signs is not functional or is destroyed, LAHSO may continue until the sign is repaired or replaced, if land and hold short lights are installed and operating.

c. Lighting.

(1) Land and Hold Short Lights - Land and hold short lights shall be installed as required below, in accordance with AC 150/5340-29, Installation Details for Land and Hold Short Lighting Systems.

(a) LAHSO may be conducted with the land and hold short lights that pulse at the rate specified in AC 150/5345-54, Specification for L-884 Power and Control Unit for Land and Hold Short Lighting Systems, until December 31, 2000.

(b) Effective January 1, 2001, any LAHSO that requires lights shall be conducted with land and hold short lights that pulse at the rate specified in AC 150/5345-54A.

(c) Land and hold short lights are required for all LAHSO except non-air carrier to non-air carrier runway/runway daytime LAHSO.

Note– Air carrier LAHSO conducted to runway/runway intersections can continue without land and hold short lights until January 1, 2001.

(2) Existing light bars containing five lights are acceptable until December 31, 2000, after which they shall be upgraded to meet the standards in AC 150/5340-29.

(3) When two or more land and hold short lights in a bar are not functional, the entire bar is considered out of service and operations requiring those lights shall be terminated.

(4) If the ATIS broadcast contains a generic LAHSO announcement (e.g., "LAHSO in effect"), then all sets of land and hold short lights shall be on. If the ATIS broadcast contains specific hold short points (e.g., "Expect landing on Runway 22 to hold short of Runway 27"), then only those sets of land and hold short lights shall be on.

d. Vertical Guidance.

(1) Air carrier and/or mixed LAHSO are only authorized on a runway that has electronic or visual glide slope indicator (PAPI or existing VASI is acceptable; PLASI is not acceptable for vertical guidance).

(2) Air carrier and/or mixed nighttime LAHSO may only be conducted with visual glide slope indicator (PAPI or existing VASI).

e. A LAHSO clearance shall only be issued to any aircraft listed in appendix 1 of this order. In addition, a LAHSO clearance shall only be issued to an aircraft and/or operator listed in accordance with subparagraphs 13b3 and 4 of this order. LAHSO operations involving helicopters may be authorized upon operator request. An eligible aircraft stopping distance list for each LAHSO configuration shall be placed at all affected positions.

Note– Controllers should be aware that pilots may not be able to accept a LAHSO clearance below 1,000 feet above ground level.

f. When an arriving pilot identifies their self to the local controller as a solo student pilot, that pilot shall not be issued a LAHSO clearance.

g. When LAHSO operations are expected to be utilized, an announcement shall be made on the ATIS; e.g., "LAHSO in effect" or "Expect landing on Runway 22 to hold short of Runway 27." Local LAHSO development teams will determine whether to broadcast ALD's on the ATIS.

h. When LAHSO is conducted at locations not served by an ATIS, or the ATIS is out of service, pilots shall be advised on initial contact, or as soon as practicable thereafter, to expect a LAHSO clearance.

i. Aircraft conducting closed traffic operations need only be advised once that "LAHSO is in effect." Acknowledgment of the current ATIS meets this requirement.

j. Traffic information shall be exchanged and a readback shall be obtained from the landing aircraft with a LAHSO clearance.

k. Aircraft/vehicles may be allowed to cross the portion of the runway surface beyond the hold short point. All other operations beyond the hold short point are prohibited. An acknowledgment shall be received from the crossing aircraft/vehicle.

l. LAHSO shall be terminated for any situation or weather condition which, in the judgment of the airport traffic control tower supervisor/controller in charge, would adversely affect LAHSO.

12. LETTERS OF AGREEMENT. The conduct of LAHSO, in accordance with the provisions of this order, requires that airport operators agree to undertake specific actions, including the installation and maintenance of required markings, signs, and in-pavement lighting. This not only involves a considerable capital investment, but imposes specific responsibilities and obligations on the airport operator. In order to ensure that LAHSO is conducted safely and in strict accordance with the provisions of this order, and to ensure that airport operators agree and are fully aware of their responsibilities, formal, signed LOA's between the airport operator and the ATC facility manager are required for the approval and implementation of LAHSO. A sample LOA is attached as appendix 2 of this order. LOA's shall address, as a minimum, the following:

a. Procedures for use of LAHSO at their specific localities.

b. Installation and maintenance of required markings, signs, and lighting.

c. Determination of the measured length of the ALD.

d. Coordination procedures for prompt exchange of required information (e.g., periodic friction measurements, inoperative lights, pilot reports, braking action reports, etc.)

13. RESPONSIBILITIES.

a. AAT is responsible for:

(1) Incorporating the applicable standards, procedures, criteria, and requirements contained in this order into appropriate AAT documents.

(2) Publishing appropriate pilot information for LAHSO in the Aeronautical Information Manual (AIM).

(3) Publishing ALD data in both the Airport Facility Directory and appropriate flight information publications.

(4) Annually convening a group to assess the conduct of LAHSO in the National Airspace System.

b. Air traffic managers are responsible for:

(1) Organizing a LAHSO development team consisting of representatives from AFS, AAT, the Airport District Office, airport manager, local National Air Traffic Controllers Association, and airport user representative(s). This team shall operate under the guidelines of this order.

(2) Determining that a valid operational need exists before developing procedures applicable to LAHSO. Such factors as, capacity, efficiency, user input, etc. should be considered in making this determination.

(3) Preparing a list of aircraft types authorized to participate for each configuration utilized at the facility. The list shall be readily available for controller use prior to operational use of LAHSO.

(4) Preparing a list of FAR Parts 121, 125, 129, and 135 operators authorized to participate in LAHSO at the airport. The list shall be readily available for controller use prior to operational use of LAHSO.

(5) Providing a listing of runways authorized for LAHSO, along with the appropriate ALD, for publication in the procedures publications. On a temporary basis, a notice to airmen maybe issued in lieu of the above.

(6) Maintaining a copy of an LOA signed by all parties that participated in the development of the LAHSO procedures.

(7) Coordinating with appropriate AFS field office, airport management, fixed based operators, and representatives of the aviation community while developing a LAHSO program.

(8) Providing a list of appropriate landing distances for all aircraft participating in LAHSO. This list shall be readily available for controller use prior to operational use of LAHSO.

(9) Conducting an annual review of the LAHSO program to validate its continued need and convening a local development team to review all LAHSO events and forward a report through the region to headquarters.

c. AFS is responsible for:

(1) Incorporating applicable standards, procedures, criteria, and requirements into appropriate AFS documents.

(2) Initiating international coordination efforts to update International Civil Aviation Organization (ICAO) Annex 6, Operation of Aircraft, to include LAHSO procedures.

(3) Developing appropriate information on flight procedures for incorporation into the AIM.

(4) Providing guidance materials needed to reach and educate both the pilot community and FAA inspectors concerning proper LAHSO procedures.

(5) Approving all air carrier LAHSO training procedures, including any special or unique go-around procedures resulting from a rejected landing.

(6) Requiring the Aviation Safety Program to develop educational programs and other initiatives to reach the general aviation pilot population concerning proper procedures and safety concerns when conducting LAHSO.

(7) Recommending what LAHSO subject matter should be included in appropriate flight training curriculums under FAR part 141, and in the curriculums for certificated flight instructor revalidation clinics.

(8) Providing ATS information relative to aircraft performance required for conducting LAHSO. AFS will provide support, as outlined in Order 7210.3, Facility Operation and Administration, Paragraph 10-3-7, Land and Hold Short Operations. AFS will support identification of eligible aircraft for operating within assigned ATS groups for use by controllers as a planning tool.

(9) Participating in local LAHSO development teams.

d. AAS is responsible for:

(1) Incorporating applicable standards, procedures, criteria, and requirements contained in this order into the appropriate documents.

(2) Initiating international coordination efforts to update ICAO Annex 14, Visual Aids.

(3) Publishing technical standards, siting specifications, and guidance for the design and installation of all hold short position markings, signs, and in-pavement lighting, as required by this order.

(4) Publishing standards and guidance for maintaining skid-resistant pavements and for publishing standards and guidance for evaluating these pavements with friction measuring equipment.

(5) Developing appropriate information on visual aids for incorporation into the AIM.

(6) Providing instructions to airport certification inspectors for reviewing and inspecting hold short position markings, signs, and lights required for LAHSO at certificated airports.

e. The Office of System Safety is responsible for:

(1) Maintaining/updating development of a risk assessment for LAHSO which considers safety of operations.

(2) Providing analytical support essential to continuing trend analysis of site-specific incidents/accidents involving LAHSO.

(3) Coordinating with AAT the publication of supplemental guidance and criteria to define and systematically collect LAHSO operational error reports.

(4) Coordinating with AFS the publication of supplemental guidance and criteria to define and systematically collect LAHSO pilot deviation reports.

(5) Developing a LAHSO data collection, data analysis, and data protection program.

(6) Participating in LAHSO program testing.

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Appendix 1
Aircraft Group/Distance Minima

	Sea Level -999	1,000- 1,999	2000- 2,999	3000- 3,999	4000- 4,999	5000- 5,999	6000- 6,999	7000- 7,000
GROUP 1	2500	2550	2600	2650	2700	2750	2800	2850
GROUP 2 & BELOW	3000	3050	3100	3150	3200	3250	3300	3500
GROUP 3 & BELOW	3500	3550	3600	3650	3700	3750	3800	3850
GROUP 4 & BELOW	4000	4050	4100	4150	4200	4250	4300	4350
GROUP 5 & BELOW	4500	4550	4600	4650	4700	4750	4800	4850
GROUP 6 & BELOW	5000	5100	5200	5300	5400	5500	5600	5700
GROUP 7 & BELOW	6000	6100	6200	6300	6400	6500	6600	6700
GROUP 8 & BELOW	7000	7100	7200	7300	7400	7500	7600	7700
GROUP 9	8000	8100	8200	8300	8400	8500	8600	8700

This table is an air traffic control tool for identifying aircraft, by groups, that are able to land and hold short based on the available landing distance. Air traffic managers shall utilize the above table for identifying aircraft by groups that are able to land and hold short at their facility, according to paragraph 13b3 of this order.

At locations requesting to utilize land and hold short operations (LAHSO) with aircraft requiring greater than 8,000 feet of available landing distance, air traffic managers shall coordinate with the appropriate Flight Standards office and Air Traffic Planning and Procedures to obtain a letter of authorization approving LAHSO.

LAHSO AIRCRAFT LANDING DISTANCES

GROUP 1 - 2500'

AA1	AA1 Trainer, Yankee, TR/TS-2, Cat, Lynx	1
AA5	Cheetah AA-5, Traveller, Tiger	1
AC52	Commander 520	1
AR11	Aeronca Chief/Super Chief, Pushpak	1
AT3P	Model 301	1
B14A	Cruisair, Cruismaster 14-19	1
B18T	Westwind 2/3, Turbo 18, Turboliner	1
BE19	Sport 19, Musketeer Sport	1
BE77	Skipper 77	1
BL17	Super Viking, Turbo Viking	1
BN2P	BN-2A/B Islander, Defender	1
BN2T	BN-2T Turbine Islander, Turbine Defender+C128	1
C120	Cessna 120	1
C150	Cessna 150	1
C152	Cessna 152	1
C172	Skyhawk 172/Cutless/Mescalero	1
C188	AG Wagon/AGTruck/AGHusky 188	1
C72R	Cutless RG, 172RG	1
CH7A	CHAMPION CITABRIA	1
CH7B	CHALLENGER, 7ECA, 7-DC	1
COUR	Courier, Strato-Courier, 250/295/391/392/395/700/800	1
D28D	Do 28D/D - 1/D-2, 128-2 Skyservant	1
D28T	Do-28D-6, 128-6 Turbo Skyservant	1

LAHSO AIRCRAFT LANDING DISTANCES

DHC1	Chipmunk DCH-1	1
DHC3	Otter DHC-3	1
DHC5	Buffalo DHC-5D/E	1
DO27	DO 27	1
G164	Model G-164 Ag-cat, Super Ag-Cat, King Cat	1
G64T	Model G164 Turbo Ag-cat	1
GA7	Cougar GA-7	1
J2	J-2 Cub	1
J3	J-3 Cub	1
J4	J-4 Super Cub	1
J5	J-5 Cub Crusier	1
LARK	Lark 100 Commander	1
M10	Mark 10 Cadet	1
M200	Commander 200	1
M4	M-4 Strata-Rocket, Astro Rocket, Bee-Dee,	1
M4	Jetasen, Super Rocket	1
M5	M-5 180c/200/235C Lunar-Rocket, 210TC	1
M5	Strata-Rocket, Patroller	1
M6	M-6 Super-Rocket	1
M7	M-7-235, MT-7, MX-7-160/180/235,	1
M7	MXT-7-160/180 Super Rocket, Star Rocket	1
M7T	M-7-420, MX-7-420, MXT-7-420 Star Craft	1
ME08	ME 108 Taifun	1
MITE	M-18 Mooney Mite, Wee Scotsman	1
P180	P-180	1

LAHSO AIRCRAFT LANDING DISTANCES

P28A	Cherokee, Archer, Warrior, Cadet,	1
P28A	Cruiser (PA-28-140/150/151/160/161/180/181)	1
PA11	Cub Special	1
PA12	Super Cruiser	1
PA14	Family Crusier	1
PA15	Vagabond Trainer	1
PA16	Clipper	1
PA17	Vagabond	1
PA18	Super Cub	1
PA20	Pacer	1
PA25	Pawnee	1
PA30	Twin Comanche, Turbo Twin Comanche	1
PC7	Turbo Trainer	1
RANG	Rangemaster	1
STLN	H-550/A Stallion	1
T34P	Mentor T34 A/B, E-17	1
TCOU	Twin Courier	1
TCOU	H-580 Twin Courier	1
TF19	F-19 Sportsman	1
VO10	100/150	1

GROUP 2 – 3000'

AC11	Commander 112A/C/114	2
AR15	Aeronca Sedan	2
BE17	Stagger Wing 17 (UC-43 Traveler)	2

LAHSO AIRCRAFT LANDING DISTANCES

BE23	Sundowner 23, Musketeer 23	2
BE36	Bonanza 36	2
BL8	Decathlon, Super Decathlon, Scout 8, MODEL 8	2
BU20	Bushmaster 2000	2
C175	Skylark	2
C177	Cardinal 177	2
C180	Skywagon 180 (U-17C)	2
C182	Skylane	2
C185	Skywagon 185 (U-17A/B)	2
C190	Cessna 190	2
C206	Stationair 6, Turbo Stationair 6	2
C207	Stationair/Turbo Stationair 7/8	2
C210	Centurion 210, Turbo Centurion	2
C303	Crusader 303	2
C336	Skymaster 336	2
C77R	Cardinal RG, 177RG	2
C82R	Skylane RG, Turbo Skylane RG, R182, TR182	2
D228	DO 228- 100/200 Series	2
DH2T	Turbo Beaver DHC-2T	2
DHC2	Beaver DHC-2	2
DHC7	Dash 7 DHC	2
ERCO	Aircoupe A2/F-1	2
G109	G-109 Ranger (Vigilant)	2
GC1	Swift	2
LA25	LA-250/270 Turbo Renegade/ Turbo Seafury, Seawolf	2

LAHSO AIRCRAFT LANDING DISTANCES

LA4	LA-4A,B, 4/200 Buccaneer	2
NAVI	Navion NA 145/154	2
NOMA	N-22-B, N-24-A	2
NORS	Norseman 4/5/6	2
OSCR	P66/64 Charlie, Oscar	2
PA22	Tri-Pacer, Colt, Caribbean	2
PA23	Apache 150/160	2
P28T	Cherokee Arrow 4, Turbo Arrow 4	2
PA31	PA-31P-350	2
PA31	Chieftan, Mohave, Navajo, T-1020	2
PA36	Brave, Pawnee Brave, Super Brave	2
PA44	Seminole, Turbo Seminole	2
PAY2	PA-41 Cheyenne II	2
PUP	B.121 Pup Series	2
S108	Voyager, Station Wagon 108	2
SC7	Shorts SC7 Skyvan, Skyliner	2
T6	Texan, Harvard	2
TAMP	Tampico TB-9	2
TOBA	Tabago TB-10C/200	2
TRIS	BN-2A Mark III Trislander	2

GROUP 3 - 3500'

AC50	Commander 500	3
BE24	Sierra 24, Musketeer Super	3

LAHSO AIRCRAFT LANDING DISTANCES

BE35	Bonanza 35	3
C140	Cessna 140	3
C205	Super Skywagon/Super Skylane	3
C208	Caravan 1-208, (Super Cargomaster,	3
C208	Grand Caravan (U27)	3
C337	Super Skymaster 337	3
C402	Cessna 401, 402, Utiline, Businessliner	3
F26T	SF206TP	3
F50	Fokker 50, Maritime Enforcer	3
L8	Luscombe Silvaire	3
M22	Mark 22, Mustang	3
M404	Martin 404	3
P28B	Dakota, Turbo Dakota, Charger,	3
P28B	Pathfinder (PA-28-201T/235/236)	3
P28R	Cherokee Arrow 2/3, Turbo Arrow 3	3
P32R	Cherokee Lance PA-32R, Saratoga SP,	3
P32R	Turbo Saratoga SP	3
P337	Pressurized Skymaster T337G, P337	3
P66P	P166 Portofino, Albatross	3
P68	P68/B/C/-TC, Victor, Observer/P68R	3
P68T	AP68TP-300 Spartacus	3
PA27	Aztec. Turbo Aztec	3
PA32	Cherokee Six, Lance, (Turbo) Saratoga	3
PA38	Tomahawk	3
RALL	Super Rallye MS 885/886, Commordore MS 150T/150ST/150SV/150SVS/892, Minerva MS 894, Rallye Club MS 100S/100ST880/881	3

LAHSO AIRCRAFT LANDING DISTANCES

TRIN	Trinidad TB 20/21	3
RELI	Reliant (Vultee) V-77	3

GROUP 4 – 4000'

AC56	560-F	4
AC72	Alti-Cruiser	4
AC80	Turbo Commander 680/681 Hawk Commander	4
B209	BO 209 Monsum	4
BE18	Twin Beech 18/Super H18	4
BE33	Bonanza 33, Debonair (E-24)	4
BE50	Twin Bonanza 50	4
BE76	Duchess 76	4
C170	Cessna 170	4
C310	Cessna 310 / Riley 65, Rocket	4
C335	Cessna 335	4
C340	Cessna 340	4
C411	Cessna 411	4
CP10	CAP 10	4
CP20	CAP20	4
DHC6	Twin Otter DHC-6 (all series)	4
DH8A	DHC-8/102/103	4
DH8B	Dash 8, DHC8-100/200	4
DOVE	Dove DH – 104	4
F600	F600, SF-600TP Canguero	4
M20P	M20/A/B/C/D/E/F/G/J/L/R, Mark 21,	4

LAHSO AIRCRAFT LANDING DISTANCES

M20P	Ranger, Maste, Super 21, Chaparral, Executive	4
M20P	Statesman, Ovation, 201, 205, ATS, MSE, PFM	4
M20P	201 / M-20J	4
P136	P136 Gull	4
P32T	Lance 2, Turbo Lance 2	4
P46T	Malibu Meridian	4
PA24	Comanche	4
PA46	Malibu, Malibu Mirage	4
PAY4	Cheyenne 400	4
PC12	PC-12	4
TA20	F-20A Topper, Ranchwagon, Seabird, Zephyr	4
TF21	F-21, T-Kraft	4
U16	Albatross	4

GROUP 5 - 4500'

A748	Bae HS 748 (Andover, C-91)	5
AC68	Super Commander 680S/E/F/FP	5
AEST	Aero Star 600/700	5
ARVA	101 Avara, 102, 201, 202	5
AT43	ATR-42-200/300/320	5
AT44	ATR-42-400	5
AT45	ATR-42-500	5
BE65	Queen Air 65 (U-8F Seminole)	5
BE95	Travelair 95	5
BE99	Airliner 99	5

LAHSO AIRCRAFT LANDING DISTANCES

BE9L	King Air 90, A90 to E90 (T-44, VC6)	5
C119	Flying Box Car	5
C212	C-212 Aviocar	5
C320	Skynight 320	5
C404	Titan 404	5
C425	Corsair/Conquest I-425	5
C551	Citation 2-SP	5
DC3	Skytrain (C-47, C-53, C-117 A/B/C, R4D 1 to 7)	5
DH8C	Dash 8, 300/311	5
DHC4	Caribou DHC-4	5
F27	Friendship F27, Troopship, Maritime, Firefighter	5
G44	Widgeon/Super Widgon	5
JS31	BAe-3100 Jetstream 31	5
JS32	Bae-3200, Jetstream Super 31	5
PAY1	Cheyenne 1	5
S601	Corvette SN 601	5
SF34	SF-340, 340-A	5
SW3	Merlin 3	5
SW4	Metro, Merlin 4	5
TBM7	TBM TB700	5

GROUP 6 - 5000'

AC6L	Grand Commander 685/680FL	6
AC90	Turbo Commander 690,	6

LAHSO AIRCRAFT LANDING DISTANCES

AC95	Commander Jetprop 980/1000	6
AC95	Turbo Commander 695,	6
AT72	ATR-72-101/102/201/202	6
ATP	Jetstream 61, Advance Turboprop	6
BE30	Super King 300/300LW	6
BE55	Baron 55/Chochise	6
BE58	Baron 58, Foxstar	6
C414	Chancellor 414, Rocket Power	6
C421	Golden Egale 421	6
C441	Conquest/Conquest 2 - 441	6
C500	Citation 1	6
C501	Citation 1-SP	6
F406	Caravan 2 - F406	6
G73	Mallard	6
H25A	BAe HS 125 Series 1/2/3/400/600	6
M20T	Turbo Mooney M20K/M20M, Encore, 231, 252	6
M20T	TLS, TSE	6
MU2	Mitsubishi MU-2, Marquise, Solitaire	6
SH33	Shorts 330, Sherpa	6
SH36	SD3-60-100, 300	6
SW2	Merlin 2	6
YS11	YS-11	6

GROUP 7 - 6000'

A306	A300B4 - 600	7

LAHSO AIRCRAFT LANDING DISTANCES

A310	A-310	7
A319	A319	7
A320	A-320	7
ASTR	Astra 1125, 1125-IW	7
B190	1900/C-12J, 1900-D	7
B350	Super King Air 350	7
B721	727-100	7
B722	727-200	7
B731	B737-100	7
B732	B737-200	7
B732	737-200 (Surveiller, CT-43, VC-96)	7
B733	B737-300	7
B735	B737-500	7
B736	B737-600	7
B738	B737-800	7
B73Q	B737 Stage 3	7
B752	B757-200	7
BA11	BAC One-Eleven	7
BA46	Bae 146, RJ, Quiet Trader, Avroliner	7
BE10	King Air 100A/B (U-21F Ute)	7
BE20	Super King Air 200	7
BE9T	Beech F90 King Air	7
C525	Citationjet C525	7
C550	Citation 2/-S2	7

LAHSO AIRCRAFT LANDING DISTANCES

CRJ1	Canadair Regional Jet, RJ-100	7
CRJ2	Canadair Regional Jet, RJ-200	7
CRJ7	Canadair Regional Jet, RJ-700	7
CAT	Canso/Catalina	7
CVLP	Convair 240/340/440, Liner, Samaritan	7
CVLT	Convair 540/580/600/640	7
DC4	Skymaster	7
DC6	DC-6/B Liftmaster	7
D328	Do 328	7
E110	Bandeirante EMB-110/111	7
E120	Brasilia EMB-120	7
E145	Embraer Regional Jet EMB-145	7
F100	FOKKER 100	7
F28	Fellowship F28, MK 4000	7
FA20	Falcon 20, Mystere 20 (T-11)	7
G159	GAC 159-C, Gulfstream 1	7
GLF5	Gulfstream 5	7
H25B	Bae HS 125 Series 700/800	7
H25C	Bae HS 125 Series 1000	7
HF20	HFB 320 Hansa jet	7
JS41	Bae-4100 Jetstream 41	7
L188	Electra 188, 188-C	7
LJ24	Learjet 24	7
LJ28	Learjet 28, 29	7
LJ31	Learjet 31	7
M202	M-202	7

LAHSO AIRCRAFT LANDING DISTANCES

MU30	Mitsubishi Diamond I/MU-300	7
PA34	Seneca 2/3	7
STAR	Starship 2000	7
WW23	1123 Westwind	7
WW24	1124 Westwind	7

GROUP 8 - 7000'

A330	A-330	8
A30B	A-300	8
B72Q	727 Stage 3 (-100 or -200)	8
B734	B737-400	8
B753	B757-300	8
BASS	B.206 Basset Series	8
BE40	Beechjet 400/T-1 Jayhawk	8
BE60	Duke 60	8
C560	Citation 5	8
C650	Citation 3/6/7	8
CL60	CL600/610 Challenger	8
DC3S	Super DC-3 (C-117D, R4D 8)	8
DC7	DC-7/B/C Seven Seas	8
DC9	All Series	8
DC9Q	DC-9 Stage 3	8
F2TH	Falcon 2000	8
F900	Falcon 900, Mystere 900 (T-18)	8
FA10	Falcon 10, Mystere 10	8

LAHSO AIRCRAFT LANDING DISTANCES

FA50	Falcon 50, Mystere 50 (T-16)	8
GLF2	Gulfstream 2	8
GLF3	Gulfstream 3	8
GLF4	Gulfstream 4	8
HERN	Heron DH - 114	8
L18	Lodestar	8
L29A	1329 Jetstar 6/8	8
LJ23	Learjet 23	8
LJ55	Learjet 55	8
MD80	DC-9-MD-87	8
MD80	MD-80 Series	8
MD80	DC-9-MD-80	8
MD90	MD-90	8
PAY3	Cheyenne 3	8
S210	STADE III, X B3, X R, XI R, XII	8
VF14	VFW 614	8
VTOR	AP68TP-600, Viator	8
YK40	YAK-40	8

GROUP 9 - 8000'

A340	A340	9
AP3M	Model 101, Mini Guppy	9
AP52	Model 101, Guppy	9
APIP	Model 201, Pregnant Guppy	9

LAHSO AIRCRAFT LANDING DISTANCES

B07H	707-400	9
B701	707-100, VC-137707, VC-137	9
B703	707-300, E-8 J-Stars,EC-137	9
B720	720	9
B734	B737-400	9
B74S	747SP/SUD	9
B762	767-200	9
B763	767-300	9
B772	B777-200	9
B773	B777-300	9
C750	Citation 10	9
COMT	Comet DH-106, Comet 4-C	9
CONI	MODEL 1649, Starliner (L049, 749, 1049, 1649)	9
DC10	DC-10 (all series)	9
DC85	DC-8-50, Jet Trader	9
DC87	DC-8-70	9
DC8Q	DC-8 Stage 3	9
JCOM	Jet Commander 1121	9
L101	L-1011 Tri-Star (all series)	9
L29B	1329-5 Jetstar 2/731	9
LJ25	Learjet 25	9
LJ35	Learjet 35, 36	9
MD11	MD-11	9
P808	Vespa Jet PD808	9

LAHSO AIRCRAFT LANDING DISTANCES

AIRCRAFT REQUIRING GREATER THAN 8000'

B741	747-100
B742	747-200
B743	747-300
B744	747-400
B74R	B747-SR
CONC	CONCORDE
CV99	Convair 990
LJ60	Learjet 60
SGUP	Super Turbine Guppy, Super Guppy
VISC	BAC-843

APPENDIX 2. Sample Letter of Agreement

Letter of Agreement (LOA)
Between Federal Aviation Administration (FAA)
and Metropolitan Airport Authority (MAA)

PURPOSE. This agreement delineates the responsibilities of the FAA and MAA that are necessary for initiating and carrying out land and hold short operations (LAHSO) on specified runways at the Metropolitan Airport.

BACKGROUND. LAHSO is an air traffic control procedure which permits the issuance of landing clearances to aircraft to land and hold short of an intersecting runway, taxiway, or other designated point on the runway. It is a procedure designed to increase airport capacity and to more efficiently move aircraft within the terminal airspace and on the airport surface.

APPROVED LAHSO RUNWAYS/LOCATIONS. The following runway hold short locations are approved for conducting LAHSO at Metropolitan Airport:

Runway	Location	Designation
10L	Prior to Runway 15/33 intersection	Day
10R	Prior to Runway 15/33 intersection	Day, night
11R	Prior to Taxiway B1 intersection	Day, night
15R	Prior to Runway 10R/28L intersection	Day
15L	Designated Point "HS-1" depicted on attachment "A"	Day

RESPONSIBILITIES OF MAA. In order to conduct LAHSO at the Metropolitan Airport, the MAA agrees to be responsible for the following actions:

1. Installing LAHSO runway markings and signs at all of the above specified locations in accordance with FAA Advisory Circular (AC) 150/5340-1, Standards for Airport Markings, and AC 150/5340-18, Standards for Airport Sign Systems.

2. Providing FAA with distance measurements from the landing runway threshold to the LAHSO runway position marking at each specified LAHSO location .

3. Installing a LAHSO in-pavement lighting system at all LAHSO locations. The lighting system shall be designed and installed in accordance AC 150/5340-29, Installation Details for Land and Hold Short Lighting Systems.

4. Notifying the FAA airport traffic control tower whenever runway markings, signs, and/or lighting systems are inoperative.

RESPONSIBILITIES OF FAA AIR TRAFFIC CONTROL. In conducting LAHSO at Metropolitan Airport, the FAA shall be responsible for the following:

1. Publishing a list of runways at the Metropolitan Airport that are approved for LAHSO, together with the available landing distance for each hold short location.

2. Terminating LAHSO on any approved runway location whenever MAA reports that signs and markings are not installed or are not in accordance with this order.

3. Terminating LAHSO at any location when, in the judgment of the air traffic manager, conditions are such that an unsafe operation may result.

4. Issuing appropriate notices to airmen relating to LAHSO.

5. Meet annually or as necessary to review events.

_____
John M. Doe Manager,
Manager, Metropolitan Airport Tower
Federal Aviation Administration

Date: _____

_____
Mary K. Smith
Metropolitan Airport Manager

Date: _____