

The City of Durant encourages participation from all its citizens. If participation at any public meeting is not possible due to a disability, notification to the City Clerk at least 48 hours prior to the scheduled meeting is encouraged in order to make the necessary accommodations. The City of Durant may waive the 48-hour rule if interpreters for the deaf (signing) or translation services for limited English proficient (LEP) individuals are not the necessary accommodation.

DURANT AIRPORT AUTHORITY/ DAA

5:00 PM

**Roscoe J. Hatfield
Council Chambers, 300
West Evergreen,
Durant, Oklahoma**

April 4, 2018

**SPECIAL CALLED
AGENDA**

**DURANT CITY HALL
300 W. EVERGREEN, DURANT, OK
ROSCOE J. HATFIELD COUNCIL CHAMBERS**

CALL TO ORDER

ROLL CALL

ORDER OF BUSINESS

1. Administration

- a. Consider Approval of a Lease Agreement of the Large Hangar at Durant Airport with Hangar 10 Aviation, LLC for the Regional Airport - Eaker Field

ADJOURNMENT

CERTIFICATE

This is to certify that in conformity with the Oklahoma Open Meeting Act, public notice of the date, time and place of this meeting was filed with the City Clerk of Durant on the 29th day of March, 2018 and that an agenda of said meeting was posted at the place of such meeting at 4:55 p.m. on the 2nd day of April, 2018.

Cynthia J. Price, City of Durant



The City of Durant

Public Works Director

Memorandum

Date: 3/29/2018
To: Airport Authority Special Called Meeting
From: Marty Cook - Public Works Director
Re: Consider Approval of a Lease Agreement of the Large Hangar at Durant Airport with Hangar 10 Aviation, LLC for the Regional Airport - Eaker Field

Council Information / Action Requested

Approve / Deny

City Staff Information / Action Follow-up, if Council authorizes this action:

ATTACHMENTS:

Description	Type	Upload Date
Attachment "A"	Cover Memo	4/2/2018
Appraisal	Cover Memo	3/29/2018
Lease Agreement	Cover Memo	4/2/2018

"A"



Approximate AREA WITHIN RED BOX.

Airport & Aviation Appraisals, Inc.

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Bastrop, Texas 78602

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March 29, 2018

Durant Regional - Eaker Field

City of Durant

1201 NE 2nd

Durant, OK 74701

Attn:

Mr. Marty Cook

Public Works Director

Ladies and Gentlemen:

In accordance with your request, we submit herewith our Appraisal Report concerning the Market Rental Value for an existing hangar structure at Durant Regional Airport, Durant, OK. The subject is a large, open bay aircraft hangar which totals approximately 25,000 square feet, located on a portion of the airside property inventory, in the vicinity of the airport's terminal. The subject is currently owned and utilized by the City of Durant, in connection with their operation of the airport's fixed base operation. The salient facts and conclusions that relate to the subject property are summarized as follows:

Location:

Durant Municipal Airport

City of Durant

Bryan County, Oklahoma

Owner(s) of Record:

Land: City of Durant

Improvements: City of Durant

R.E. Tax Assessment:

N/A

Land Area:

2.34 Acres (102,000 Square Feet)

Zoning:

Airport Industrial



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Estimated Marketing
Period: 8 to 12 months by qualified personnel and organizations

Estimated Exposure
Time: 6 to 7 months by qualified personnel and organizations

Three Year Sales
History: The subject has not sold to any third parties over the last three years

Improvements (Square Feet):	
Hangar Bay:	25,000
Office/Shop Area:	<u>0</u>
Total	25,000

Highest
and Best Use: Aircraft Storage/Maintenance -Aviation Related

Market Rental Value:

Market Data Approach

	<u>Size (SF)</u>	<u>Site Size (SF)</u>	<u>Rent PSF (Net)</u>	<u>Rental</u>
Hangar with Supporting Site (Hangar/Office/Shop Area)	25,000	102,000	\$0.50	\$12,500

<u>Concluded Market Value</u>	<u>Annual Rent PSF</u>	<u>Annual Rental</u>
Hangar with Supporting Site (Hangar/Office/Shop Area)	\$0.50	\$12,500

Date of Value: March 27, 2018

Date of Inspection: Not Inspected

This report contains information considered relevant to both the value of the property and the method by which we have analyzed collected data to arrive at the value conclusion. Additionally, this Appraisal Report for the client, the City of Durant, Oklahoma is for the sole use of the client, and is governed by the Uniform Standards of Appraisal Practice regulations that apply to Appraisal Reports under Standards Rule 2, Subparagraph A. Supporting data which may help the reader more fully understand the conclusions which are presented in this Appraisal Report is present in the appraiser's files. This report cannot be fully understood without reference to this material.

The purpose of the appraisal is to assist the City of Durant, Oklahoma in determining a Market Rental Rate that is appropriate for the subject property, and takes into account the



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land and the improvements built on the site of approximately 2.34 acres. It is our understanding that city of Durant would like to lease the hangar to the tenant in its entirety. Additionally, the lessee would upgrade the facility with many modern features. The intended user of the report is the City of Durant, Oklahoma. The information and opinions contained in this appraisal set forth the appraiser's best judgment in light of the information available at the time of the preparation of this report. Any use of this appraisal by any other person or entity, or any reliance or decisions based on this appraisal are the sole responsibility, and at the sole risk of the third party. The appraiser accepts no responsibility for damages suffered by any third party as a result of reliance on or decisions made or actions taken based on this report.

The property rights which this appraisal seeks to value are those held by the City of Durant in fee simple interest, potentially that could be conveyed to a tenant in leasehold estate. The Dictionary of Real Estate Appraisal published by the Appraisal Institute defines Fee Simple as follows: *absolute ownership unencumbered by any other interest or estate; subject to the limitations of eminent domain, escheat, police power, and taxation.*

The purpose of this appraisal contained herein is to estimate the Market Rental Value of the property as of March 27, 2018. Although the values which we will determine for the subject will relate to a Market Rental Rate which pertains to the consideration paid by the lessee to the lessor, the principal of Market Value which is generally provided and referred to with regard to Market Value is for the most part, similar to that which is applicable to a fee simple sales transaction. For purposes of this appraisal, Market Value can be stated as follows:

The most probable price which a property brings in a competitive and open market under all conditions requisite to a fair sale; the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

- buyer and seller are typically motivated;
- both parties are well informed or well advised, and each acting in what he considers his own best interest;
- a reasonable time is allowed for exposure in open market;
- Payment is made in terms of cash in U.S. dollars for in terms of financial arrangements comparable thereto; and
- the price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.

Source: *Uniform Standards of Professional Appraisal Practice* as promulgated by the Appraisal Standards Board of the Appraisal Foundation, published by the Appraisal Foundation, 2018.

In undertaking and developing this appraisal report we have engaged in the following activities which are by no means all inclusive.



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- * We reviewed various technical data, site plans and any other pertinent information available at this time with regard to land and improvements on the subject properties.
- * We examined various documents pertaining to the subject properties and reviewed general data relating to the airport and the general aviation environment which surrounds the subject properties' immediate area.
- * Researched and analyzed the market for airport real estate comparable to the subject property and interviewed various airport and aviation personnel regarding current market conditions, current pricing practices relating to the subject properties and its position within the market place. In addition, we have evaluated the competitive position of the subject within the specific market for related properties.
- * We have uncovered pertinent market data with relation to the lease of relevant comparable properties which we believe are similar to and are useful in estimating a rental value for the subjects.
- * Engaged in a methodical and systematic analysis of all the data collected and placed it within proper context for related properties in order to develop an estimate of market rental value for the subject property.

The Market Data Approach is an appraisal procedure whereby comparisons between prices paid for, or rentals rates for comparable facilities are made with the subject. Due to the fact that the subject property is assumed to be primarily appropriate for lease, the primary appraisal technique utilized was the Market Data Approach. We considered utilizing the Cost Approach, however due to the age of the structure, we chose to use only the Market Data Approach.



Aerial View of Durant Municipal Airport



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Aerial View of The Subject Property

AIRPORT AND FACILITY DESCRIPTION

Facility Name: Durant Regional - Eaker Field
City Name: Durant
County: Bryan
State Name: Oklahoma

Ownership: Publicly Owned
Use: Open to The Public
Owner's Name: City of Durant

Geographic Data

Latitude N3356.5
Longitude W09623.7 (Estimated)
Arpt Elevation 699 ft (Surveyed)
Magnetic Variation 05E
3 Miles SW Of Durant

Aircraft Data

Operations (reported)	Yearly Avg.	Daily
General Aviation Transient	6,500	18



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General Aviation Local	48,500	133
Air Taxi	0	0
Commercial	0	0
Commuter	0	0
Military	30	0

Aircraft based on Field

General Aviation Singles	63
General Aviation Multi	10
Jet Aircraft	2
General Aviation Helicopters	2
Military Aircraft	0
Gliders	0
Ultralights	0

Runway & Approach Info for KDUA

Rwy	Length	Land Dist**	Approach*	Rwy	Length	Land Dist	Approach
17	5,001x100	5001'		35	5,001x100	5001'	

Airport Facilities

Airport Attendance Schedule	Mon-Fri 0800-1700, Sat-Sun 0900-1700
Airport Status	Operational (
Airport Lighting Schedule	Actvt MIRL Ry 17/35 - CTAF.
Airport Storage Available	Tie Downs, Hangar
Extra Services Available	Flight Instruction, Aircraft Rental, Aircraft Sales
Wind Indicator	Yes - (Lighted)
Control Tower	No

Federal Status

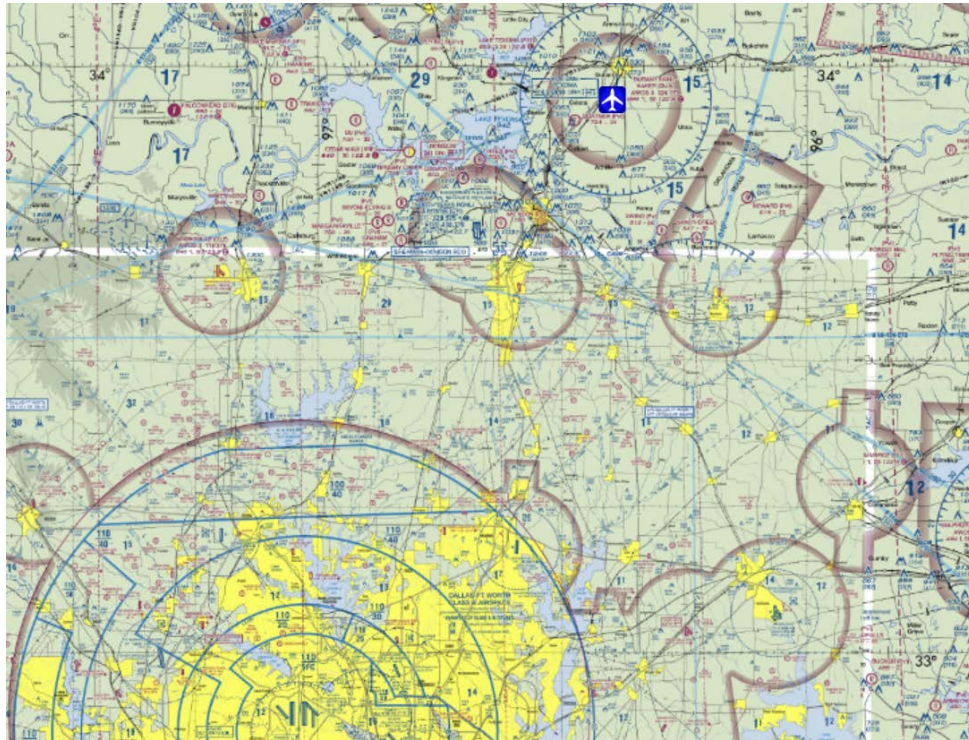
Airport Certification:	
Aircraft Rescue & Firefighting Index:	None
Airport of Entry:	No
Custom Landing Rights:	No
Joint Civil/Military:	No
Military Landing rights:	Yes

Federal Agreements

National Plan of Integrated Airport Systems (NPIAS)
 Grant Agreements under FAAP/ADAP/AIP
 Assurances Pursuant To Title VI, Civil Rights Act Of 1964
 Surplus Property Agreement Under Regulation 16-WAA
 Agreement Under DLAND Or DCLA Has Expired



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Sectional Chart Showing Dallas Class B Airspace And Durant Regional Airport



General Location Of The Subject Property On The Northwest Portion of the Airport



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Site Component:

102,000 Sq. Ft.

2.34 Acres

After discussions with airport management, we have allocated a supporting site to the subject property. The site recognizes the intended use of the property as a storage facility for a variety of aircraft, including turbine airplanes of intercontinental size and range. Accordingly, we have allocated site of just over 100,000 square feet, which includes a ramp of approximately 100 feet in depth on either end of the building. Although the doors which serve the hangar are generally utilized on the southeast side of the building (the doors on the northwest side are welded in the closed position), we understand that the plan for the property is to construct a separation wall in the middle of the hangar and conduct operational arrivals and departures on both sides of the building. The site will include some area on the southwest side of the hangar that can be eventually utilized by the tenant for parking. The area on the northeast side of the hangar that is paved will not be considered to be part of the supporting site.

In the context of the appraisal, the designation of the supporting site will assume that it will be an integral part of the leasehold that includes the hangar. The site will be for the exclusive use of the lessee, and the lessee will be responsible for any upkeep and maintenance that pertains to it. This determination is also predicated on the general suitability of the site for the operation of high-performance aircraft. Since the property was not inspected, we did not ascertain the overall suitability of the apron area was for the envisioned activities. Since we understand that some interior concrete work will be done on the hangar to address existing floor conditions, we assume that these activities could also be performed on the exterior site in order to mediate any problems with the paved surface.



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Aerial Photograph Of The Subject Property



View Of The Northwest Hangar Door From The Ramp



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View of the Site from Approximately the South



View of the Site from the General Area of the Terminal Building



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View of the Apron Portion of the Site on the Southeast Side of the Hangar



Paved Area Adjacent to the Northeast Hangar Wall



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Exterior Area of the Site Abutting Southeast Door System



View of the Southwestern Portion of the Site



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Photograph Showing Apron Area on the Northwest Portion of the Site



Area of the Site Adjacent to the Southeast Door System



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Improvement Components:

Hangar Bay:	25,000
Office/Shop Area:	<u>0</u>
Total	25,000

It is our understanding that the subject property was possibly constructed when the airport was utilized as a Naval Auxiliary Field in the Second World War. In any event, the design and the construction of the hangar indicates that it is of a style that dates from the war, to the middle of the 1950s. The structure shows the predictable wear and tear of a long life in service. However, we have been informed by airport management that the basic condition of the walls roof and doors is serviceable. As previously mentioned, the current plan is to upgrade the hangar with appropriate interior lighting in a concomitant electrical system, plumbing, a spray on insulation treatment, a power system to drive the doors on both ends of the structure and any other necessary additions to the basic shell which exists in its present form as of the date of the appraisal. We also understand that some interior office area will be constructed. The hangar will be divided into two sections by a demising wall, and the proposed improvements will all be at the expense of the lessee.

The hangar has been utilized continuously as basic open bay storage space by the airport. The City of Durant owns the FBO and has a contract with an operator to provide manpower and services relating to fueling and other activities relating to the FBO. The subject property represents an unusual candidate for the type of rehabilitation that is envisioned for it. Unlike many hangars that date from the general time when the subject was constructed, this particular unit has excellent vertical horizontal and operational capacity. While the steel frame of the building shows some oxidation and rust, it has been shown that this condition can be arrested and treated and when the structure is appropriately coated, the integrity of the structural system should continue to support the kind of general aviation activity that occurs at Durant Regional Airport. The door system offers a clear opening of approximately 100-105 feet in width and offers a clear height of approximately 28 feet. This entrance can accommodate virtually all of the business aircraft commonly in use as of the date of the appraisal. It is our understanding that the intent is to utilize the structure for mostly storage applications, and we believe that this is the most appropriate use for the building. As of the date of the appraisal we have not seen any specific technical data regarding any planned modifications and upgrades, however this has been described to us by airport management and represents our understanding of the proposals applicable to the subject, and the conclusions that are reached in the appraisal document are based on these descriptions.



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We also have been informed that airport management has considered performing this type of upgrade on the hangar, and that it is recognized that the position of the building relative to the terminal building, and the desirable size and shape of the facility make the subject and integral element of the overall airport property owned and controlled by the City.



Interior View Of The Hangar Looking Toward The Northwest Door System Area



View of the Underside of the Hangar Roof System



Interior View Of Hangar Roof Truss System



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View of Piping Which Was Previously Installed to Support a Sprinkler System



Interior View Of The Hangar Floor System



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Interior View Of The Southeast Door



Interior View Showing Vertical Support Members



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Close-Up of Hangar Door Frame



View of Interior Floor System Showing Deterioration and Spalling



Existing Roller System on Hangar Door



Interior View of Hangar Personnel Door



External View Of Galvanized Paneling With Baked -On Enamel Finish On Wall



View Of Block And Brick Door Pocket



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External View of Northeast Wall System



View Of External Wall System Showing Electrical Connection



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Gutter And Downspout System Adjacent To Hangar External Wall



Glass Augmented External Door Paneling



View Of Exterior Door Pocket Showing Brick and Block Condition



Upper-Level Door Tracks From The Outside



View Of Hangar Door And Door Pocket Interface



Exterior View of Upper-Level of Door Pocket



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Minor Damage To External Paneling Above Hangar Door



Fuel Truck Adjacent To Southeast Hangar Door System



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Highest and Best Use

As the photographs taken by airport management earlier in the report indicate, the subject is basically a shell that exhibits acceptable parameters with regard to the condition of the main components. The size and shape of the hangar are mirrored in many modern structures which had been recently built for storage applications. The hangar consists of approximately 25,000 square feet in aggregate space, and if this were equally divided with the planned demising wall, it would produce two hangar bays of 12,500 square feet each. This is a very desirable configuration for fixed base operator. It allows that one bay could be leased in its entirety to a corporate flight department or an aircraft management firm, and the other bay could be utilized for open bay storage of individual aircraft. Because the hangar is a shell, it does not have many amenities, however it represents a clean piece of paper on which a modern plan can be carried out and implemented for aircraft storage that will prove practical for many years to come. The general dimensions of the hangar are 200 feet in length, and 125 feet in width.

Given the size and configuration along with the location in a strategic point on the airport with relationship to the terminal, we believe that the Highest and Best Use for the structure is for rehabilitation and redeployment for modern aircraft. Based on discussions with airport management, it is our opinion that as described, the hangar represents a viable platform for investment and utilization. In the portion of the appraisal that develops a Market Rental Rate for the improvements and supporting site, we will discuss the overall utility and impact of recycling an existing structure compared to building something new from scratch. There are a number of considerations that are applicable to this process that not only provide economies for those who undertake it, but also can be positively affected with regard to planning approval and regulatory processes that govern modern, on-airport construction.

MARKET DATA APPROACH

The Market Data Approach is based on the premise that the market value of a property is directly related to the prices or rental rates of comparable, competitive properties. This analysis focuses on differences in the legal, physical, locational, and economic characteristics of similar properties and the subject property. It also focuses on these differences in the real property rights conveyed, the dates of leases, the motivations of lessors and lessees, and the financing arrangements for each lease transaction, which can account for variations in rental rates. Four major principles of real estate are inherent in the Market Data Approach.

The principle of supply and demand and its relationship affects prices as buyers constitute market demand and the properties offered for sale make up the supply. Shifts in either one of these elements may cause prices to vary.

The principle of substitution as applied in the Market Data Approach holds that, "The value of a property tends to be set by the price that would be paid to acquire a substitute



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property of similar utility and desirability" Appraisal Institute, Dictionary of Real Estate Appraisers. Or, should substitute properties not be available in the marketplace, less reliability can be placed on this approach to valuation.

The principle of balance is implied in the Market Data Approach in the relationship between land and improvements, between a property and its environment, and between the forces of supply and demand.

Finally, the principle of the externalities, such as the neighborhood and the economy, can affect the property value positively or negatively.

These four principles are considered in arriving at the Highest and Best Use as improved for the subject property. Through the Market Data Approach, an indication of a market for similar type properties lends support for the Highest and Best Use as improved and for the existing improvements to be maintained for the same use.

The Market Data Approach is applicable to all types of real property interests and depends upon the availability of sufficient data, the recent reliable transactions indicating value patterns, and the nature and stability of economic conditions affecting the marketplace. When valuing an income producing property, such as the subject property, it can be used in conjunction with the Cost and Income Approaches to value, and to test the reasonableness of the values derived from each of these approaches.

A systematic procedure for applying the Market Data Approach involves:

- 1) Researching the market for data on the prices or rents of comparable properties.
- 2) Verifying the data is accurate and representative of arm's-length transactions.
- 3) Determining relevant units of comparison.
- 4) Comparing the subject with the comparables and adjusting the comparables for differences.
- 5) Reconciling the multiple value indications into a single value or a range of values.

The examination of relevant market rental data will attempt to reconcile the existing conditions in the marketplace for similar facilities, the physical nature of the subject property and the overall demand for facilities given the size and the scope of Durant Regional Airport. Our examination of data will allow that the overriding operational requirement for this market, is the operational availability of an adequate array of taxiway and runway surfaces on which to operate general aviation airplanes. This will effectively define the overall market universe for comparable facilities.



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As previously mentioned, the subject property is sizable. We have therefore attempted to find large type hangar comparables in the state of Oklahoma and Texas within a reasonable distance of Durant. It should be recognized that because of the specific nature for airport properties, the size of the marketplace that tenants typically examine is much larger than for commercial and industrial property of a non-aeronautical nature. We have also partially focused on properties that are in a less than good condition and are older in order to reflect the marketplace. Some of the comparables would be described as “projects” and this recognizes that because of the age and condition, there is a concomitant reflection in the rental rate that is payable. As previously mentioned, the subject property is functional, but can only fulfill a limited role given its condition and age.

We will also present some smaller comparables, with an appropriate adjustment for the volume of leasable area contained in the subject property. Our comparable hangar rentals are presented on the following pages:



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Hangar Lease No.1

Airport:	North Texas Regional Airport Dennison, Texas
ATC NAVAIDS:	GPS, RNAV, ILS, NDB, VOR, VOR/NDB CT,
Longest Runway:	9,000 Feet
Annual Operations:	51,000
Air-Carrier Operations:	N/A
Pass. Enplanements:	N/A
General Aviation Operations:	51,000
Based Aircraft:	170
Size of Leased Area:	8.6 acres (374,616 Square Feet)
Lease Terms:	2003 – 2028 - Three 5 Year Options
Escalations:	CPI every 5 years
Lessor:	Grayson County
Lessee:	Lake Texoma Jet
Improvement Description:	37,708 sf Hangar/Office/Terminal
Annual Rent:	\$77,277 net
Annual Improvement Rental Rate:	\$2.05 Per Square Foot

Comments: This lease should be adjusted slightly upward for the larger size of the comparable and adjusted downward the 9,000-foot runway system at this airport. The lessee is a fixed base operator on the airport, and also had an overhaul facility for jet engines on the other side of the airport property. The hangar is in good condition and has been recently updated in the terminal portion of the structure. The airport is a superior operational facility to Durant, and the condition of the basic hangar property is also superior to the subject. This hangar is the front door to an FBO and is in very good condition although the property probably dates back to the Second World War. In terms of the locational adjustment, a good barometer would be to compare the ground rent at Durant with prevailing rates at North Texas Regional. We are informed that land rent is approximately \$0.10 per square foot at Durant. Rental rates at North Texas Regional for land range from \$0.21 per square foot to \$0.27 per square foot for leases unpaved areas.



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Hangar Lease No. 2

Airport:	North Texas Regional Airport Dennison, Texas
ATC NAVAIDS:	GPS, RNAV, ILS, NDB, VOR, VOR/NDB CT,
Longest Runway:	9,000 Feet
Annual Operations:	51,000
Air-Carrier Operations:	N/A
Pass. Enplanements:	N/A
General Aviation Operations:	51,000
Based Aircraft:	170
Size of Leased Area:	10.4 acres (453,024 Square Feet)
Lease Terms:	2012 – 2022 - One 10 Year Option
Escalations:	CPI every 2 years
Lessor:	Grayson County
Lessee:	Airborne Resources
Improvement Description:	28,770 sf Hangar/Office/Shop
Annual Rent:	\$80,023 net
Annual Improvement Rental Rate:	\$2.78 Per Square Foot
Comments:	This hangar is a maintenance facility in very good condition, but also has large door height and the other features which enable it to fulfill its role as a Part 145 maintenance facility. Grayson County Airport's general proximity to Dallas allows it to draw from a pool of qualified technical personnel. The subject's location with regard to Oklahoma City and its pool of trained aeronautical workers is relatively equal. The subject is in inferior condition, and the rent for the comparable should be adjusted downward considerably. The comparable is a fully functional Part 145 maintenance facility and therefore is certified by the FAA to be appropriate for the technical level of work that is performed in the facility. The subject property does not have an area where complementary office and shop space could be constructed without impinging on the hangar floor area. A similar operational and locational adjustment for the superiority of the airport is appropriate.



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Hangar Lease No. 3

Airport:	Sundance Airport Oklahoma City, Oklahoma
ATC NAVAIDS:	GPS, RNAV, NDB, VOR, VOR/NDB
Longest Runway:	5,000 Feet
Annual Operations:	40,000
Air-Carrier Operations:	N/A
Pass. Enplanements:	N/A
General Aviation Operations:	40,000
Based Aircraft:	210
Size of Leased Area:	Not Specified
Lease Terms:	Month to Month
Escalations:	CPI every 2 years
Lessor:	Sundance Airport, LLC
Lessee:	David Huffman
Improvement Description:	4,800 sf Hangar/Office/Shop
Annual Rent:	\$9,600 net
Annual Improvement Rental Rate:	\$2.00 Per Square Foot
Comments:	This hangar is a maintenance facility in fair to poor cosmetic shape. However the building is in basically sound condition and still offers utility. The tenant is a maintenance organization that specializes in warbird restoration. The lease is month-to-month, and the condition of the property is somewhat comparable to the subject. The location of the comparable is superior to Durant, and the airport operational parameters are relatively similar, and the comparable does not have the flexibility that is inherent in the basic structure represented by the subject. The comparable is also constructed of tilt up concrete and is slightly more robust construction. The comparables rent should be adjusted downward for the size of the subject, and also be adjusted downward for some of the creature comforts that are present in the comparable such as heat and a fairly capable electrical system.



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Hangar Lease No. 4

Airport:	North Texas Regional Airport Dennison, Texas
ATC NAVAIDS:	GPS, RNAV, ILS, NDB, VOR, VOR/NDB CT,
Longest Runway:	9,000 Feet
Annual Operations:	51,000
Air-Carrier Operations:	N/A
Pass. Enplanements:	N/A
General Aviation Operations:	51,000
Based Aircraft:	170
Size of Leased Area:	2.39 acres (103,937 Square Feet)
Lease Terms:	2012 – 2017 - Two 5 Year Options
Escalations:	CPI every 2 years
Lessor:	Grayson County
Lessee:	U.S. Aviation Group
Improvement Description:	25,112 sf Hangar/Office
Annual Rent:	\$72,000 net
Annual Improvement Rental Rate:	\$2.87 Per Square Foot

Comments: This structure supports a large flight school that specializes in training airline pilots from overseas. A sizable investment was made by US Aviation Group in order to make this older hangar property viable given the standard of training that is offered to what are basically state-owned foreign air carriers. We understand that the basic hangar was also added to in order to accommodate some of the operational requirements of the large student population which is invariably being trained at this facility on a consistent basis. This comparable has slightly smaller door height clearance but is in general, superior to the subject. As has been mentioned, this airport is a significant facility and also has a control tower and an instrument landing system. The comparable should be adjusted downward for all of these considerations.



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Hangar No. 5

Airport:	Dallas Executive Airport (RBD) Dallas, TX
ATC & NAVAIDS:	ILS, NDB, VOR, VOR/DME, GPS RNAV, CT
Longest Runway:	6,451 feet
Annual Operations:	+/- 65,000
Commercial Operations:	NA
General Aviation Operations:	+/- 65,000
Based Aircraft:	190
Lessor:	City of Dallas
Lessee:	Jet Center Dallas
Land Area:	2.1 Acres
Improvement Description:	Very large barrel roof style design with a large complement of office and shop area built on either side. The composition is as follows:

Office/Shop:22,225

Hangar Bay:

Total45,325

23,100

The structure is uninsulated, and has large manually operated sliding doors at either end of the hangar portion. The door height is approximately 25 feet high , and most of the office space is in very good condition.

Annual Rent:	\$79,847.04 net (capped CPI 3 year period)
Annual Improvement Rental Rate:	\$1.76 per SF
Original Lease Term:	30-years 2000-2030 w/ two five-year options.
Comments:	Hangar 7. Located on the North end of the airport and is one of the oldest hangars on the airport. it has however, functioned consistently over its lifespan and has been upgraded, particularly in the office section. Until 2015, it was leased to a heavy maintenance operator for approximately \$4.53 per square foot net. The property was recently returned to the city of Dallas by the lessee. Although the office section is in good condition, and quite large, the hangar bay is similar to the subject. It is uninsulated, and the door



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system on both ends of the hangar needs work. The main downward adjustments pertain to the large amount of office and shop area which is obviously not present in the subject, and the very much superior location of the airport in the Dallas Metroplex.



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Hangar Lease No. 6

Airport:	Dallas Executive Airport (RBD) Dallas, TX
ATC & NAVAIDS:	ILS, NDB, VOR, VOR/DME, GPS RNAV, CT
Longest Runway:	6,451 feet
Annual Operations:	+/- 65,000
Commercial Operations:	NA
General Aviation Operations:	+/- 65,000
Based Aircraft:	190
Lessor:	City of Dallas
Lessee:	Jet Center Dallas
Land Area:	.58 Acres
Improvement Description:	20,160 SF open bay type hangar/office shop facility with roll up fabric doors.
Annual Rent:	\$21,952 net (capped CPI 3-year period)
Annual Improvement Rental Rate:	\$1.09 per SF net
Original Lease Term:	20-years 2001-2021 w/ options.
Comments:	Small paved site on the north side of the airport. The current condition of the property is not appropriate for a functioning paint facility. A fairly significant amount of rehabilitation may be necessary in order to make the property leasable for a compliant paint facility. This property is a true "project" and has a smaller hangar bay and a huge number of infrastructural elements that need to be addressed in order to make it a viable facility. If an investment were made, the upside would be a modest-sized paint facility in a very lucrative marketplace. Relatively speaking, the subject is in better condition and has more utility than the comparable. The main adjustment is the superiority of the Dallas Executive location, and also because the City of Dallas is now making a concerted effort to upgrade the airport infrastructure and better serve the general aviation aircraft population than the airport has done in the past.



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As has been made clear, the subject is a large assemblage of hangar area in both the vertical and horizontal context. Large hangars, when leased by the typical tenants for an airport of Durant's characteristics typically represent a lease rate which reflects both of the smaller market for the aggregate space, and also the large amount of area that a tenant must commit to leasing.

In the Highest and Best Use section of the report, we addressed the array of potential viable users for the subject because of its size and configuration. Both aircraft management entities and air charter facilities place a high degree of importance on some level of self fueling privileges when evaluating potential leasehold positions. These entities use large amounts of jet fuel, and the attractive nature of their fuel purchase arrangement at a given airport is a factor in attracting and holding a customer base. Durant as a Sponsor, has control of both wholesale and retail fueling, the capacity to convey self fueling privileges to a qualified user is within their purview. Other possible users for the subject such as maintenance operators do not have the same reliance on access to wholesale fuel.

The range of adjusted rental rates indicated by our comparables is below \$1.00 per square foot. Another major factor regarding the subject property is the operational limitations that apply to the 5,000-foot runway system at Durant, and the impact that it would have on turbine-dependent users for the subject property that would need to attract larger business jet aircraft to enhance and expand their business.

There is a specific plan to rehabilitate the subject property and modernize the facility. We believe that this will significantly extend the operational viability of the hangar, and as we have mentioned, this particular type of structure tends to be inherently sound. Our conclusions are however, based on the assumption that there are no structural flaws that would require extraordinary remediation. Generally, when a project of this magnitude is undertaken, there is a significant investment in determining the condition of the basic building, and the cost and extent of any modifications that are required, or desired by the tenant.

The age and the Spartan condition of the hangar notwithstanding, we believe that in order to replace the equivalent structure in an insurance replacement scenario, it would be necessary to invest a minimum of \$20 per square foot in order to develop a building with the horizontal and vertical capability utilizing modern structural materials that create the same envelope for aircraft storage. This would assume that the footings and foundations could be utilized as is normally the practice when developing an insurable value for a hangar. A replacement value of just under \$500,000 is yet another compelling reason why the property's potential in a rehabilitated condition is formidable. However, this is somewhat offset by the limitations of the operational environment at Durant, and also the general location and demographic that surrounds the airport. The limited market for a hangar with this kind of capability is an important consideration, especially when the capabilities of alternative facilities like North Texas Regional are considered in the



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context of the upper portion of the turbine business aircraft spectrum and the performance that is represented by the aircraft in this realm.

The process of narrowing the range of value also has to consider the risk that is inherent in any rehabilitation project. Even the most prudent estimations of the cost and difficulties associated with making a 1940s vintage structure competitive with modern facilities, are subject to significant risk and uncertainty should some condition be uncovered during the rehabilitation process that seriously exceeds the budgeted funds allocated to the process. Based on the foregoing analysis, our conclusion of value is that the subject property in its present condition as of the date of the appraisal under the conditions of the assignment is \$0.50 per square foot when considered on a unit basis. The overall value for the subject property based on our estimations of the rentable size is as follows:

Market Data Approach

	<u>Size (SF)</u>	<u>Site Size (SF)</u>	<u>Rent PSF (Net)</u>	<u>Rental</u>
Hangar with Supporting Site (Hangar/Office/Shop Area)	25,000	102,000	\$0.50	\$12,500

This report contains information considered relevant to both the market rent of the property and the method by which we have analyzed collected data to arrive at the value conclusion. We hereby certify to no present or contemplated financial interest in the property and that our employment and compensation are in no way contingent upon the value estimate.

Respectfully submitted,

Winthrop D. Perkins

Winthrop D. Perkins, CRE
President



Airport & Aviation Appraisals, Inc.
CERTIFICATION OF THE APPRAISER

The undersigned does hereby certify that, to the best of my knowledge and belief:

1. The statements of fact contained in this report are true and correct.
2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, unbiased professional analyses, opinions, and conclusions.
3. I have no present or prospective interest in the properties that are the subject of this report, and I have no personal interest or bias with respect to the parties involved. I have not provided any real estate appraisal services with regard to the subject property within the preceding three years.
4. My compensation is not contingent upon the reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value estimate, the attainment of a stipulated result, or the occurrence of a subsequent event.
5. My analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice.
6. The undersigned individual has not made a personal inspection of the property that is the subject of this report.
7. No one other than the undersigned prepared the analyses, conclusions, and opinions concerning real estate that are set forth in this appraisal report.
8. The undertaking of this appraisal assignment was not based on a requested minimum valuation or specific valuation or approval of a loan.
9. Based upon the descriptions, definitions, assumptions, data, and conclusions presented herein, it is our opinion that the market rental value was as delineated in the foregoing report.

Winthrop D. Perkins

Winthrop D. Perkins, CRE



Airport & Aviation Appraisals, Inc.
ASSUMPTIONS AND LIMITING CONDITIONS

This appraisal is subject to the following assumptions and limiting conditions.

1. No responsibility is assumed for matters of a legal nature affecting title to the properties nor is an opinion of title rendered. The title is assumed to be good and merchantable.
2. No survey of the properties has been made by the appraiser and no responsibility is assumed in connection with such matters. Sketches in this report are included only to assist the reader in visualizing the properties.
3. Public information and industry and statistical information are from sources we deem to be reliable; however, we make no representation as to the accuracy or completeness of such information, and have accepted the information without further verification.
4. All mortgages, liens, encumbrances, leases, and servitudes have been disregarded unless so specified within the report. The properties are appraised as though under responsible ownership and competent management.
5. The forecasts, projections, and operating estimates contained in this report are based upon current market conditions, anticipated short term supply and demand factors, and a continued stable economy. These forecasts are, therefore, subject to changes in future conditions.
6. It is assumed that there are no hidden or unapparent conditions of the properties, subsoil, or structures which would render them more or less valuable. No responsibility is assumed for such conditions or for engineering which may be required to discover such factors.
7. It is assumed that there is full compliance with all applicable federal, state, and local environmental regulations and laws unless non-compliance is stated, defined, and considered in the appraisal report.

It is further assumed that any mechanical and electrical equipment, which is considered part of the real estate, is in proper operating condition except when noted herein. These include, but are not limited to, such items as the heating, air conditioning, plumbing, sprinkler (if any), and electrical systems.

8. While it is believed the information, estimates, and analyses given and the opinions and conclusions drawn from them are correct, Airport & Aviation Appraisals, Inc. does not guarantee them. We believe the information which was furnished to us by others is reliable, but we assume no responsibility for its accuracy.



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9. In the event this appraisal is used for a sale price, financing, or tax purposes, no responsibility is assumed for the inability to negotiate favorably on the basis of the values expressed herein.

10. It is assumed that all applicable zoning and use regulations and restrictions have been complied with, unless a non-conformity has been stated, defined, and considered in the appraisal report.

11. It is assumed that the utilization of the land and improvements is within the boundaries or property lines of the properties described and that there is no encroachment or trespass unless noted within the report.

12. The distribution of the total valuation in this report between land and improvements applies only under the reported Highest and Best Use of the properties. The allocation of value for land and improvements must not be used in conjunction with any other appraisal and is invalid if so used.

13. Neither all nor any part of the contents of this report should be conveyed to the public through advertising, public relations, news, sales, mail, direct transmittal, or other media without the prior written consent and approval of Airport & Aviation Appraisals, Inc.

14. In accordance with recognized professional ethics, the professional fee for this service is not contingent upon our conclusion of value, and neither Airport & Aviation Appraisals, Inc. nor any of its employees has a present or intended financial interest in the properties.

15. The opinion of value expressed herein is valid only for the stated purpose and date of the appraisal.

16. Financial statements and other information provided by the Client or its representatives in the course of this investigation have been accepted, without further verification, as correctly reflecting the properties' business conditions and operating results for the respective periods, except as specifically noted herein.

17. The conclusions are based upon the assumption that present management would continue to maintain the character and integrity of the enterprise through any sale, reorganization, or diminution of the owners' participation.

18. Future services regarding the subject matter of this report, including, but not limited to, testimony or attendance in court, shall not be required of Airport & Aviation Appraisals, Inc., unless previous arrangements have been made therefore in writing.



Airport & Aviation Appraisals, Inc.

19. This report and the conclusions arrived at herein are for the exclusive use of our client. Furthermore, the report and conclusions are not intended by the author, and should not be construed by the reader, to be investment advice in any manner whatsoever. The conclusions reached herein represent the considered opinion of Airport & Aviation Appraisals, Inc., based upon information furnished to them by the Client and other sources. The extent to which the conclusions and valuations arrived at herein are relied upon should be governed and weighed accordingly.

20. The Americans with Disabilities Act (ADA) became effective January 26, 1992. We have not made a specific compliance survey and analysis of these properties to determine whether or not it is in conformity with the various detailed requirements of the ADA. It is possible that a compliance survey of the properties, together with a detailed analysis of the requirements of the ADA, could reveal that the properties are not in compliance with one or more of the requirements of the Act. If so, this fact could have a negative effect upon the value of the properties. Since we have no direct evidence relating to this issue, we did not consider possible noncompliance with the requirements of ADA in estimating the value of the properties.

21. This appraisal is predicated on the assumption that hazardous substances do not exist at the subject properties. Hazardous substances cover any material within, around, or near a property that may have a negative effect on its value, including, without limitation, hazards that may be contained within the properties, such as friable asbestos, and external hazards, such as toxic waste or contaminated ground water. No apparent evidence of contamination or potentially hazardous materials was observed on the date of inspection. Members of this appraisal office are not qualified to determine the existence of, nor is any certification made as to the presence or absence of, any hazardous substances. No responsibility is assumed for any such conditions, nor for any expertise or engineering knowledge required to discover them.

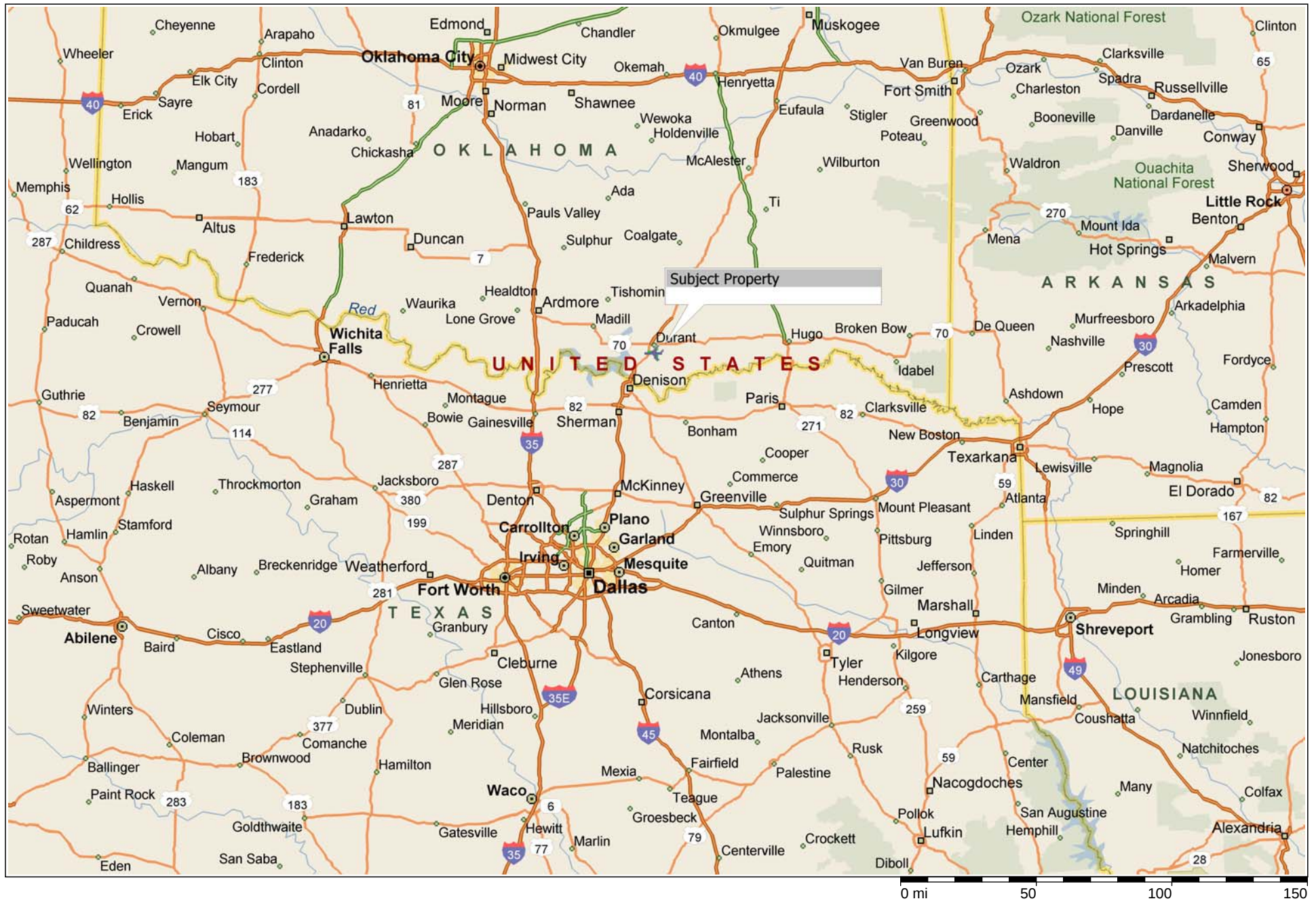
22. This Appraisal Report is governed by the Uniform Standards of Appraisal Practice regulations that apply to Appraisal Reports under Standards Rule 2, Subparagraph A. Supporting data which may help the reader more fully understand the conclusions which are presented in this summary report is present in the appraiser's files. This report cannot be fully understood without reference to this material.



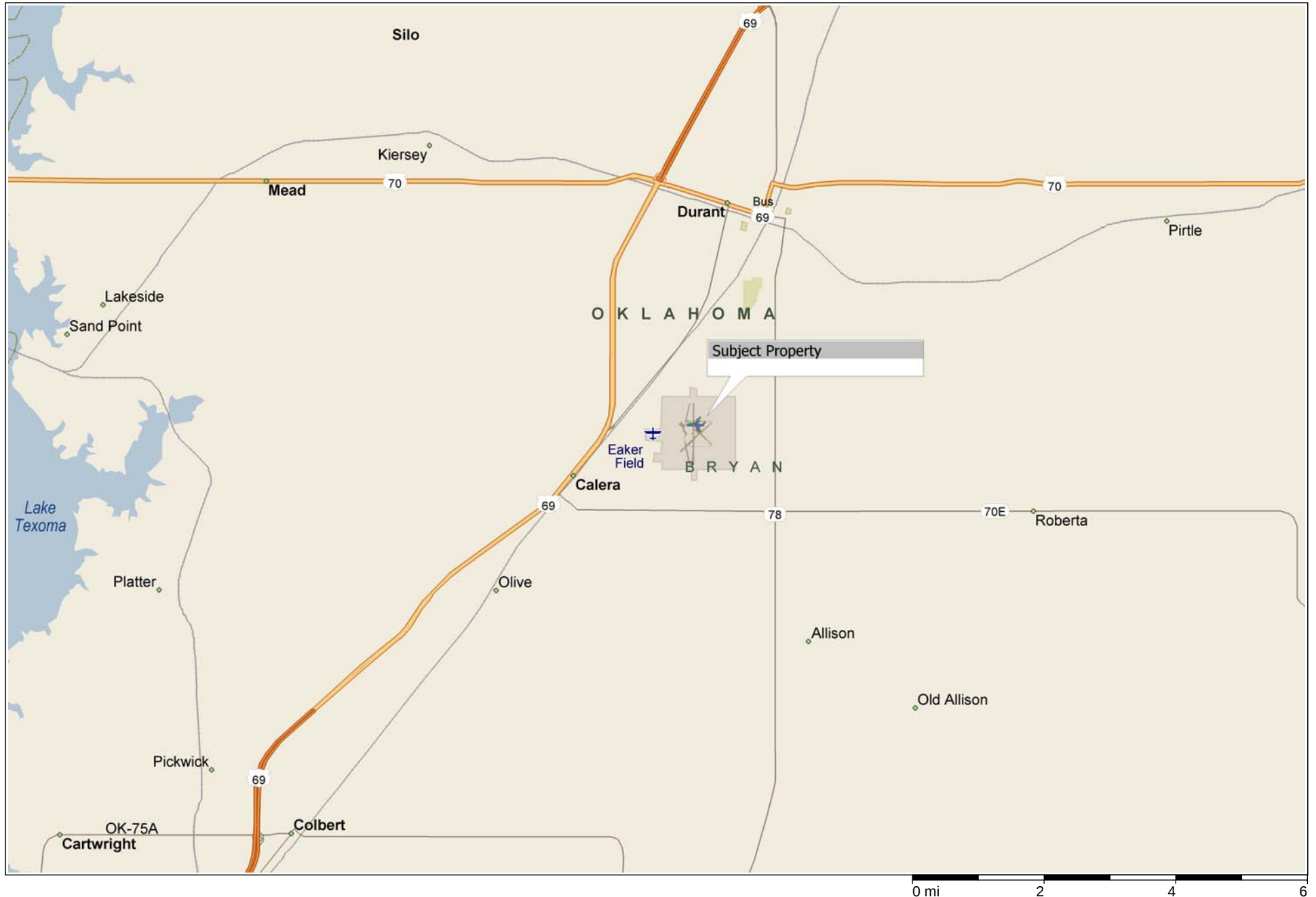
Airport & Aviation Appraisals, Inc.

ADDENDA

Texas, United States, North America



Oklahoma, United States, North America



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QUALIFICATIONS OF

WINTHROP D. PERKINS, CRE

PROFESSIONAL POSITION

Founder and Principal of:

a.) Airport & Aviation Appraisals, Inc, (1984-Present). Specialists in the appraisal of aviation-related real estate and businesses.

b.) MMU-FTC, LLC (1984-Present). Developers and owners of 75,000 sq. ft. of hangar space for corporate jets and a 23,000 sq. ft. flight training center at Morristown Airport, Morristown, NJ. Developers and owners of 40 T-hangars at Morristown Airport, Morristown, NJ. Suppliers of Phillips 66 aviation fuels at Morristown Airport, Morristown, NJ

AFFILIATIONS AND SPECIAL CERTIFICATION

Member, The Counselors Real Estate

Certified General Appraiser State of New Jersey and Texas

Member, New Jersey Aviation Association

Member, Morristown Aviation Association

Member, Morris County Aviation Advisory Board

EDUCATION

Noble & Greenough School, Dedham, Massachusetts 1971

B.A., Harvard University, Cambridge, Massachusetts 1975

Courses conducted by the Appraisal Institute: Real Estate Appraisal Principles, Basic Valuation Procedures, Standards of Professional Practice Parts A & B, Capitalization Theory and Techniques Parts A & B, Advanced Applications, Report Writing & Valuation Analysis.

EXPERT TESTIMONY

Mr. Perkins has appeared as an expert witness in the valuation of aviation properties in courts in Ohio, Kentucky, New Hampshire and North Carolina, and the US Court of Federal Claims.

EXPERIENCE – CLIENTS SERVED

Mr. Perkins has completed nearly 350 aviation and aerospace real estate appraisal assignments.

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Previous Experience on Similar Projects

List of Previous Experience

Airport & Aviation Appraisals, Inc. has performed over +350 aviation real estate appraisal assignments. The following is a partial listing of recent engagements which all involved the value of aviation property.

Philadelphia International Airport, Philadelphia, Pennsylvania- Appraisal of corporate aircraft hangar of approximately 26,095 square feet located on 1.254 acres on the southwest side of Philadelphia International Airport .

St. Louis Regional Airport Authority, East Alton, Illinois- Appraisal of various Supplemental Type Certificates (STC'S) held by Premier Aircraft, LLC, for the Falcon 50-4 Performance Upgrade, and to update the primary flight displays on Falcon 20/200 aircraft.

T.F. Green Airport, Providence, Rhode Island- Appraisal of a complex consisting of two older open bay hangars with integrated office space and supporting airside land .

T.F. Green Airport, Providence, Rhode Island- Appraisal of a complex of hangars, terminal and airside land located on T.F. Green Airport, occupied by an FBO, Northstar Aviation.

Trenton-Robbinsville Airport, Washington Township, New Jersey- Appraisal of entire facility that consists of +/- 41.83 Acres for tax appeal.

Orange County Airport (MGJ), Montgomery, New York- Appraisal of unimproved land on the north side of Runway 26, and unimproved airside land on the northwest side of Route 211, and two medium sized open bay hangars.

New Braunfels Municipal Airport, New Braunfels, Texas. -Appraisal of of all T hangars, various parcels of vacant and unimproved land, a parcel of improved land supporting an FBO, and four open bay hangar structures.

Myrtle Beach International Airport, Horry County, South Carolina- Appraisal of "Myrtle Beach International Commerce Park Planned Unit Development", a tract of land owned by Horry County, containing 467 acres.

Antilles Seaplanes, LLC Gibsonville, North Carolina- Appraisal of Type Certificate No.4A24 (ATC) and various Supplemental Type Certificates (STC'S) SA59WE, SA4-1467, SA4-1055, SA4-1109, SA4-683, SA-682, SA4-680, SA4-678, SA4-677, SA4-1551, SA4-681, SA2317WE, SA1969WE, SA1589WE, SA1751WE, SA4-1550, SA355WE, SA108WE and SA101WE, held by Atlantic Coast Seaplanes, LLC pertaining to Manufacture of airplane models G-21C, G-21D, G-21E, and G-21G.

Sussex County Airport, Georgetown, Delaware- Appraisal of six separate parcels of vacant and improved land located that have airside access. The parcels contain a total of

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approximately 4.2 acres of airside land and some were vacant and immediately available for aviation development, while others are improved with hangar structures.

Ellington Airport, Ellington, CT.- Appraisal of a facility that consists of +/- 125 Acres, located in the jurisdictional border of the Town of Ellington, which is a general aviation airport, improved with one paved runway system, and airside improvements such as a terminal structure, and several open bay hangars.

Valuation report concerning unimproved land on the Myrtle Beach International Commerce Park Planned Unit Development at Myrtle Beach International Airport, Myrtle Beach, South Carolina.

Appraisal report concerning the hangar facility located an assemblage of hangar, shop and office space, 11.2 acres of land and 55,293 square feet of improvements, and is currently occupied at 18500 Edison Avenue, Spirit of St. Louis Airport, Chesterfield, Missouri. The structure contains an assemblage of hangar, shop and office space,

Spirit of St. Louis Airport in Chesterfield, Missouri. The aggregate property of approximately 3 acres of land and 21,880 square feet of improvements, occupied by Monsanto Company, a large multi aircraft corporate flight department.

67 acres of land and other improvements comprising a portion of Rancho Estrella Airport in Salome, Arizona.

Appraisal Report concerning market value of approximately 29.48 acres of land and other improvements comprising a portion of Brookline Airport in Brookline, New Hampshire.

Proposed aviation easement over the property at 2406 South Section Line Road, Delaware, Ohio

Valuation Report concerning Cargo Building C-4 at Perimeter Service Road, Philadelphia International Airport, Philadelphia, Pennsylvania, partially leased by American Airlines, Inc.

Real Estate and Business Enterprise Value of Lake Texoma Jet Center, including aircraft engines, inventory of parts and various machinery and equipment at North Texas Regional Airport, Dennison, Texas.

Valuation Report concerning Upshur County Regional Airport (W22), City of Buckhannon, Upshur County, West Virginia.

Summary Appraisal Report concerning the hangar facility located at 18200 Edison Avenue, Spirit of St. Louis Airport, Chesterfield, Missouri

Capitalization Rate Study For Airside Property At Various General Aviation Reliever Airports

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Valuation Report concerning Hangar 14 and Hangar 15, located at Roanoke Regional Airport at Roanoke, Virginia.

Appraisal of the market value of the 11 hangars owned by Profile Aviation Center, Inc., located on Hickory Regional Airport, in Hickory, North Carolina.

Restricted Use Appraisal Report concerning the hangar facility located at 169 Route 17K, Stewart International Airport, Newburgh, New York.

Valuation Report appraisal report concerning the hangar facility located at 23825 Wind Sock Drive, Dulles International Airport, Dulles, Virginia.

Summary Appraisal Report concerning the hangar facility located at Rogers Municipal Airport, Rogers, Arkansas.

Valuation report concerning Ridgely Airpark, located in the Ridgely, Maryland.

Valuation report concerning Hangar 85-176, office and hangar complex at Bradley International Airport Windsor Locks, Connecticut.

Appraisal Report of the FBO facility operated by McKinney Airport Partners, Inc. at Collin County Regional Airport, McKinney, Texas.

Summary Appraisal Report concerning the hangar facility located 49 Clarks Barn Road, Castanea, PA.

Summary Appraisal Report pertaining to the market value of 17 Airpark Road, office and hangar complex at Lebanon Municipal Airport Lebanon, New Hampshire

Market rent analysis report pertaining to the New York Army Air Guard Aviation facility at Long Island Mac Arthur Airport.

Summary Appraisal Report of Sundance Airpark, Oklahoma City, Oklahoma.

Summary Appraisal Reports concerning the hangar facility and land located at 18064 Edison Avenue and 18086 Edison Avenue, and the hangar facility located at 18004 Edison Avenue Spirit of St. Louis Airport, Chesterfield, Missouri.

Valuation report concerning four hangars and leasehold comprising a portion of Westfield Barnes Airport.

Market rent analysis report pertaining to the Signature Flight Support leasehold area located on an airside location at the Lambert-St. Louis International Airport in St. Louis, Missouri at 5995 James S. McDonnell Boulevard.

Assistance to your organization with an appraisal relating to the aviation and aeronautically related property, and Business Enterprise Value at Ohio State University Airport in Columbus, Ohio.

Airport & Aviation Appraisals, Inc.

Valuation report concerning both improved and unimproved condition at Danielson, Hartford Brainard, Waterbury Oxford, Groton and Waterbury- Oxford Airports.

Three parcels of vacant land adjacent to both the east and west side of Louisiana Regional Airport consisting of approximately 202 Acres located in the unincorporated portion of Ascension Parish, Louisiana.

Summary Appraisal report concerning the value of the Leasehold interest of Virginia Aerospace, LLC/Love Terminal Partners, L.P. at 7701 Lemmon Avenue and 7777 Lemmon Avenue, Dallas Love Field, Dallas, Texas.

Columbia Air Services, Lakeland Linder Regional Airport, Lakeland, Florida - Appraisal of a fixed base operation consisting of approximately 65,504 square feet of existing hangar, office and terminal area and several large ramp and tie down areas. The FBO was created from merging the existing assets of two existing fixed base operations on the facility.

Bult Field, Will Township, Illinois- Appraisal of a facility which consists of +/- 285.31 Acres, located in the jurisdictional border of Will Township. This is a new general aviation airport improved with a paved runway system, airside improvements such as a terminal structure, 132 T hangars and a variety of other operationally necessary aeronautically related improvements.

Central Texas Airport, Bastrop County Texas- Proposed 1800 acre general aviation airport.

Spirit of St. Louis Airport, Chesterfield, Missouri- Appraisal of a hangar, office and shop facility located on the midfield area of the airside. The aggregate property consists of approximately 9 acres of fee simple land and 100,170 square feet of improvements.

Lakeland-Lindner Regional Airport, Lakeland, Florida- Appraisal of hangar and office facility located on the west side of the airside property inventory. The property consisted of approximately 33,142 square feet (0.76 acres) of land and 8,830 square feet of improvements.

Driggs- Reed Memorial Airport, Driggs, Idaho - Appraisal of hangar and office facility located on the southwest side of the airside property inventory. The property consisted of approximately +/- 1.043 Acres (45,440 Square Feet) of land and 11,020 square feet of improvements.

Orlando International Airport (Aeroterm.) – Appraisal of 9.1 acres of airside land for air cargo operation.

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Toledo Express International Airport, Toledo, OH– Appraisal a structure of approximately 34,021 square feet located on 2.51 acres on the north side of Toledo Express International Airport.

Woodbine Airport, Woodbine, NJ – Appraisal of a number parcels of airside land for future development by the airport sponsor.

Cape Girardeau Regional Airport, Cape Girardeau, Missouri - Valuation of a 52,000 square foot hangar and supporting site.

Atlantic City International Airport, Egg Harbor, New Jersey - Valuation of one parcel of land, consisting of 123,750 square feet (2.84 acres) improved with a 50,000 square foot hangar.

Lane Aviation, Columbus, OH - Appraisal of Lane Aviation Facility to determine market rental rate upon reversion of the structure to the Columbus Airport Authority.

Bismarck Airport, Bismarck, North Dakota - Appraisal of a complex of hangars, terminal and airside land, pieces of equipment and a fuel farm.

Reese Airpark, Lubbock, Texas - Appraised entire 1,766 acre /military/industrial airport in aggregate, for potential privatization. Airport property included vacant airside and industrial/commercial land, hangars, auto parking facility, garages, office buildings, vehicle maintenance structures, farm, control tower, aircraft parking ramps and industrial park.

Teterboro Airport, Teterboro, NJ (Port Authority NY & NJ) Appraisal of all airside land and improvements totaling over ½ million sq. ft of buildings on a 800 acre general aviation airport (largest and busiest in the world) to determine new lease rates.

Solberg Airport, Reddington, NJ – Appraisal of an entire 597 acre privately owned public airport, for possible sale.

David Wayne Hooks Memorial Airport, Spring, Texas – Appraisal of an entire 718 acre privately owned public airport, with 430,00 square feet of improvements for possible sale.

Princeton Airport - Valuation of entire airport.

Randall Airport, Middletown, New York - Valued entire 229 acre airport in aggregate and evaluated the development potential of the facility.

Spirit of St. Louis Airport, Chesterfield, Missouri – Appraisal of a complex of hangars, offices and shop facility consisting of approximately 5.19 Acres of land and 32,800 square feet of improvements.

North Las Vegas, Nevada (Nevada State Bank)– Appraisal of approximately 3.4 acres improved as a heliport with three structures totaling approximately 22,460 square feet.

Airport & Aviation Appraisals, Inc.

Du Page Airport, Chicago, Ill. – Appraisal of vacant airside parcels for future development.

Salem Air Park, Salem, OH – Appraisal of Salem Air Park consisting of +/- 35 Acres airside improvements such as a terminal structure, T hangars and a variety of other operationally necessary aeronautically related improvements.

Bismarck Airport, Bismarck, North Dakota - Appraisal of Corporate Hangar (Building 45) at 2301 University Drive. Analyzed the value in the context of the existing supporting ground lease, and also with a new 20-year ground lease at the current market ground rental.

Hobby Airport, Houston, TX (HCC Service Company)– Market Value of corporate hangar of approximately 38,588 square feet located on 2.34 acres on the south side of William P. Hobby Airport.

Norwood Airport, Norwood, Massachusetts– Appraisal, for financing purposes, of a large FBO facility consisting of contiguous parcels of underlying land with aeronautically related improvements constructed upon them.

Driggs- Reed Memorial Airport, Driggs, Idaho (Anheuser-Busch Companies) – Appraisal of /corporate hangar facility.

Oakland International Airport, Oakland, California. (Bank of Texas) – Appraisal, for financing purposes, of an existing and proposed new FBO facility.

North Central Airport, Smithfield, Rhode Island (CommerceBank) – Appraisal of charter/corporate hangar facility.

Allaire Airport, Belmar, NJ - Retained by owner to appraise entire airport, in aggregate for potential sale. This 670 acre general aviation airport is one of the largest privately owned, public use airports in the United States.

Morristown Municipal Airport, Morristown, NJ (D.M. Airport Developers) – Appraisal of an entire 637 acre privately leased public airport, for financing purposes.

Youngstown Municipal Airport, Youngstown, OH (City of Youngstown). Valued entire 1,400 acre airport in aggregate and evaluated potential "privatization" and sale of facility. Additionally, was also retained by Western Reserve Port Authority to negotiate leases and airport use agreements with fixed base operator, all airlines and United States Air Force Reserve.

South Jersey Regional Airport, Lumberton, NJ (Fleet Bank) Appraisal of an entire 689 acre privately-owned public airport facility in aggregate. Included land improvements and going concern value of fixed base operation for financing purposes, and sale to public sponsor .

Bismarck Airport, Bismarck, North Dakota - review appraisal report concerning the Building 2 at Bismarck Airport and the appraisal performed in connection with it.

Airport & Aviation Appraisals, Inc.

Eagles Nest Airport, Eagleswood, New Jersey. Appraisal of entire airport in aggregate, for potential sale.

Bult Field, Monee, Ill. (Illinois Department of Transportation) Appraisal of entire general aviation airport for potential acquisition by public sponsor.

Hilton Head Airport, Hilton Head, South Carolina Valuation of business, airside land and improvements occupied by a fixed base operation.

Bayport Aerodrome, Bayport, New York.– Appraisal of concerning an office structure and supporting airside property along with a T hangar complex.

Sussex County Airport, Georgetown, Delaware - Valuation of six separate parcels of vacant and improved land.

George Bush Intercontinental Airport, Houston TX/(BankOne)-- Valuation of an air cargo facility of 169,010 sq. ft. on 8.398 acres of land.

Northampton Airport, Northampton, Mass - Appraisal of entire airport for purchase by third party.

Fort Lauderdale-Hollywood International Airport, Fort Lauderdale, Florida (BankOne)- Appraisal of complex of buildings located on the northern airside land inventory at Fort Lauderdale-Hollywood International Airport. The complex is an amalgam of pre-existing aviation related structures such as an open bay hangar, and a now abandoned motel, and more modern, dedicated airside cargo buildings used for cargo sortation. The complex is located on 22.55 acres of airside property, and also includes a large ramp area on which large air carrier type aircraft can be parked while cargo is enplaned and deplaned.

Groton-New London Airport, Groton, Connecticut (Salem Five Bank) -Appraisal of fixed base operation's real estate assets.

Flying M Aerodrome, Germansville, Pennsylvania. – Appraisal of a facility, which consists of +/- 62.5 acres and a variety of other operationally necessary aeronautically, related improvements.

Spitfire Aerodrome, Pedrickstown, NJ – Appraisal of privately owned public airport consisting of +/- 41 Acres and airside improvements such as a terminal structure, T hangars and a variety of other operationally necessary aeronautically related improvements.

Summit Airpark, Middletown, DE- Appraisal of entire 520 acre airport and fixed base operation/maintenance business under the ownership of Summit Aviation, located at Summit Airport in Middletown Delaware.

North Central Airport, Smithfield, Rhode Island– Appraisal of vacant airside parcels for future development and airside improvements on the airport for leasing.

Airport & Aviation Appraisals, Inc.

Harrisburg International Airport, Harrisburg, PA -Appraisal of a corporate hangar of approximately 12,000 square feet located on 1.3 acres on the north side of Harrisburg International Airport.

Stewart Int'l Airport, Newburgh, NY (DM Airports Int'l) - Appraised entire 2,000 acre air carrier/air cargo/military/industrial airport in aggregate, for potential privatization. Airport property included vacant airside and industrial/commercial land, a new 100,000 sq. ft. airline terminal, cargo buildings, corporate hangars, FBO hangars, auto parking facility, garages, FBO hangars, office buildings, vehicle maintenance structures, airport rolling stock, Crash-Fire-Rescue equipment, 260 acre C-5A/C-130 military leasehold, fuel farm, control tower, aircraft parking ramps and 700,000 square foot industrial park. Assignment also included extensive analysis of lessees' property tax burden after consummation of lease with State of New York.

Stennis International Airport, Bay Saint Louis, Mississippi -Market rental relating to real estate comprising two open bay hangars, and a T hangar complex to be constructed at Stennis International Airport. Developed recommendations regarding contractual stipulations pertaining to land lease extensions for lessee constructed improvements. Analyzed though-the-fence possibilities at this facility, and provide a variety of approved documentation relating to similar agreements at other airports subject to Sponsor's Assurances.

St. Louis Regional Airport, Alton, Illinois- Appraisal of entire real estate assets including through the fence land of a heavy maintenance/ fixed base operations in order to determine market rental rates.

Camden County Airport, Berlin NJ – Appraisal of entire airport (in aggregate) for potential sale and financing .

New Castle County Airport, Wilmington, DE (Delaware Skyways.) – Appraisal of leasehold interests, fixed assets, inventory, and intangibles; also including all equipment, machinery, and aircraft located at New Castle County Airport, Wilmington, Delaware.

Chester County Airport, Coatesville, Pennsylvania- Market Rental Value for various T-hangars.

Rutland State Airport, Clarendon, Vermont - Valuation of leasehold interests in hangar.

Boulder City Airport, Boulder City, Nevada - Market rent analysis report concerning two vacant airside land areas.

Bar Harbor Airport, Trenton, Maine - Valuation of fixed base operation consisting of approximately 24,130 square feet of existing hangar, office and terminal area and a large ramp and tie down area.

Airport & Aviation Appraisals, Inc.

Lakeland Linder Regional Airport, Lakeland, Florida - Valued fixed base operation consisting of approximately 7,178 square feet of existing hangar, office and terminal area and a large ramp and tie down area.

JFK Int'l Airport, New York, NY (Japan Airlines). Age life study of Hangar 14. Appraisal conducted for rehabilitation and reconstruction of 700,000 square foot maintenance hangar to state of the art cargo facility/office building.

Various airports (Federal Express) Appraisal of air cargo facilities at, Hartsfield-Atlanta Int'l Airport, Anchorage Int'l Airport and Chicago O'Hare Airport totaling 250,000 square feet. Provided valuation and consulting services with regard to disposition of airport cargo properties in three key metropolitan locations.

Various airports (Trans-World Airlines) - Appraisal of TWA hangars, terminals, flight kitchens, cargo buildings and maintenance structures totaling 1.5 million square feet at JFK Int'l Airport, Chicago O'Hare Airport, Philadelphia International Airport and Boston Logan Airport.

Rickenbacker Int'l Airport, Columbus, OH - Provided valuation and consulting services to Turner Construction Company with regard to Flying Tigers' 275,000 sq. ft. air cargo hub and valuation of entire 5,000 acre all cargo/military use airport in aggregate.

T.F. Green State Airport, Providence, RI (Rhode Island Airport Corp). Valued leasehold interest of air-carrier's position in Old Terminal Building as a part of a buyout leading to the construction of a New Terminal of 200,000 sq. ft. on the same site.

San Jose International Airport, San Jose, CA - Market Value appraisal of underlying site of Hewlett Packard Corporate Hangar to update and escalate lessee's ground rent payments.

New Castle County Airport, Wilmington, DE – Appraisal of all vacant parcels of airside land for future development by the airport sponsor.

Trenton-Mercer County Airport, Trenton, NJ – Appraisal of all vacant parcels of airside land for future development by the airport sponsor.

Millville Municipal Airport, Millville, NJ – Appraisal of all vacant parcels of airside land for future development by the airport sponsor.

Lambert-St. Louis Int'l Airport, St. Louis MO (St. Louis Air Cargo Services, Inc.) – Appraisal of 31 acres of airside land for air cargo operation.

Francis S. Gabreski Airport, Westhampton Beach, NY (Suffolk County) Valuation of all airside land and improvements plus landside industrial land and improvements on 1,500 acre general aviation/military airport. Valuation used to determine market rental rate. Valuation included feasibility study and analysis of absorption and Highest and Best Use analysis for all airside real estate.

Airport & Aviation Appraisals, Inc.

Roanoke Regional Airport, Roanoke, VA – Appraisal of a heavy maintenance operation, an FBO, a Charter Operation, and a corporate aviation hangar.

Queen City Municipal Airport, Allentown, PA – Appraisal of a large maintenance hangar.

Missoula International Airport, Missoula, MT - Valuation of on airport parcel to determine market value as a part of a transaction involving a land swap between the airport and another governmental agency.

Cape May Airport, Cape May, NJ – Appraisal of all vacant parcels of airside land for future development by the airport sponsor.

Midway Airport, Chicago, IL - Valuation of a large stand alone corporate aviation facility and a small maintenance hangar to determine market rental rate for land and improvements.

Colorado Springs Airport, Colorado Springs, CO - Market Value of corporate hangar to assist airport during negotiations after the reversion of the facility upon expiration of the underlying ground lease.

Davenport Municipal Airport, Davenport, IA - Valuation of three separate vacant parcels of general aviation land to determine market rental rates.

Reading Regional Airport, Reading PA - Valuation of three older open bay hangar facilities to determine Fair Market Rental Rates by fixed base operators.

Lancaster Airport, Lancaster, PA - Appraisal of Armstrong World Industries hangar to determine market rental rate upon reversion of the structure to the Lancaster Airport Authority.

Lakefront Airport, New Orleans, LA (Orleans Levee Board/MillionAir) - Appraisal of leasehold to determine fair market rental rate.

Tinticum Fuel Farm, Philadelphia International Airport, Philadelphia, PA - Valuation of airline consortium's leasehold interest of a 1,000,000 gallon fuel farm to determine market rental rates.

Cape May Airport, Cape May, NJ – Appraisal of FBO's leasehold.

Westfield-Barnes Airport, Westfield MA – Appraisal of fueling rights and unexpired leasehold interest advantage of multi-hangar FBO facility.

Trenton Mercer Airport, West Trenton, NJ – Appraisal of vacant airside parcel for development with a corporate flight department.

Wilkes County Airport, North Wilkesboro, NC (Tyson Foods) – Appraisal of corporate flight department hangar.

Airport & Aviation Appraisals, Inc.

New Castle County Airport, Wilmington, DE (Hercules)– Market Value of corporate hangar.

Manchester Airport, Manchester, NH (BankBoston/Wiggins Airways) – Appraisal, for financing purposes, of a large proposed new FBO facility

Palm Beach Int'l. Airport, Palm Beach, FL (BankBoston) – Appraisal, for financing purposes, of an existing and proposed new FBO facility.

Sikorsky Airport, Bridgeport, CT (BankBoston) – Appraisal of charter/corporate hangar facility.

Rentschler Airport, East Hartford, CT (United Technologies). Appraisal of entire 800 acre airport in aggregate, for potential sale. This was a major airport facility that was owned and operated by United Technologies.

Braden Airport, Easton, PA (Leigh-Northampton Airport Authority) Appraisal of entire general aviation airport for potential acquisition by public sponsor.

Luton Int'l Airport, Luton, England (Garrett Turbine Engines/Allied-Signal) Valuation of market rental rate for airside land and improvements occupied by a fixed base operation.

Cape May Airport, Cape May, NJ – Appraisal of an FBO for buyout by the airport sponsor.

Lakefront Airport, New Orleans, LA (Orleans Levee Board) - Valuation of all airside improvements on the airport.

Rickenbacker Int'l Airport, Columbus, OH - Provided valuation and consulting services to Turner Construction Company with regard to Flying Tigers' 275,000 sq. ft. air cargo hub and valuation of entire 5,000 acre all cargo/military use airport in aggregate.

New Castle County Airport, Wilmington, DE (MBNA)– Market Value of corporate hangar.

Delaware Airpark, Dover, DE - Appraisal of entire airport for purchase by the State of Delaware.

Colorado Springs Airport, Colorado Springs, Colorado - Appraisal of land and buildings to determine market rental rate for a fixed base operation.

Business Jet Center, Love Field, Dallas, Texas (Wells Fargo Bank) -Appraisal of fixed base operation's real estate assets (150,000 sq. ft. – 17 Acres) and business enterprise value for Wells Fargo Bank.

Summit Airpark, Middletown, DE- Appraisal of entire 520 acre airport for Commerce Bank.

Airport & Aviation Appraisals, Inc.

Lancaster Airport, Lancaster, PA -Appraisal of 7,000 square foot corporate hangar to determine market rental rate.

St. Louis Regional Airport, Alton, Illinois- Appraisal of entire real estate assets of a heavy maintenance/ fixed base operations in order to determine market rental rates.

Sikorsky Airport, Bridgeport, CT - Appraisal of entire airport, in aggregate, for possible privatization.

New Castle County Airport, Wilmington, DE (Krapf, Inc.) – Appraisal of unexpired leasehold estate and leasehold interest advantage of three hangar complex (corporate and FBO) for potential purchase.

Monroe Municipal Airport, Monroe, NC (W.F. Harris Development LLC) – Appraisal of a 13 acre airside adjacent parcel for a potential “thru-the-fence” operation.

Austin-Bergstrom Intl'l Airport, Austin, TX – Appraisal and market rental rate study of unexpired leasehold estate of a heavy maintenance operation.

Long Island Mac Arthur Airport, Islip, NY (Chase Manhattan Bank) – Appraisal of a charter operation hangar (1998) and an FBO facility (1999) for financing purposes.

Allentown Airport, Allentown, PA - Valued fixed base operation for airport authority. Ascertained impact of fuel flowage, tie-down rentals, hangar rentals, concessions and other income-producing components to develop a value for the facility.

Port Columbus Int'l Airport, Columbus, OH – Valuation consulting services of vacant airport-related land.

New Castle County Airport , Wilmington, DE (Atlantic Aviation/DuPont) - Valuation of leasehold interests in hangar.

Lancaster Airport, Lancaster, PA - Valuation of corporate hangar facility for purchase by fixed base operator. (1991)

Lakefront Airport, New Orleans, LA (Orleans Levee Board) - Evaluation of all airside improvements on the airport.

GLOSSARY OF AIRPORT AND AVIATION TERMINOLOGY

A - in the phonetic alphabet is Alfa (al-fah)

AAWS - automatic aviation weather service.

Abort - To terminate a preplanned aircraft maneuver; e.g., an aborted takeoff.

ADF - automatic direction finder.

ADIZ - air defense identification zone.

Advisory service - advice and information provided by a facility to assist pilots in the safe conduct of flight and aircraft movement.

Aerodrome - A defined area on land or water (including any buildings, installations, and equipment) intended to be used either wholly or in part for the arrival, departure, and movement of aircraft.

(FAA) Aeronautical Activity - any activity which involves, makes possible, or is required for the operation of aircraft, or which contributes to or is required for the safety of such operations, For example:

(1) The following are aeronautical activities:

- (a) Air taxi and charter operations.
- (b) Scheduled or nonscheduled air carrier services.
- (c) Pilot training.
- (d) Aircraft rental and sightseeing.
- (e) Aerial photography.
- (f) Crop dusting.
- (g) Aerial advertising and surveying.
- (h) Aircraft sales and service.
- (i) Aircraft storage.
- (j) Sale of aviation petroleum products.
- (k) Repair and maintenance of aircraft.
- (l) Sale of aircraft parts.
- (m) Parachute activities.
- (n) Ultralight activities.

(2) The following are not aeronautical activities: ground transportation (taxis, car rentals, limousines); restaurants; in flight food catering; barber shops; and auto parking lots.

Aeronautical beacons - rotating lights which indicate a landing place, landmark, or hazard. The usual color and color combinations of the rotating lights are:

white and green - lighted land airport (double white and green - military airport)

white and yellow - lighted water airport

white and red - landmark of navigational point

red alone - hazard.

Aeronautical Chart - A map used in air navigation containing all or part of the following: topographic features, hazards and obstructions, navigation aids, navigation routes, designated airspace, and airports. Commonly used aeronautical charts are:

1. Sectional Charts, 1:500,000 - Designed for visual navigation of slow or medium-speed aircraft. Topographic information on these charts features the portrayal of relief and a judicious selection of visual checkpoints for VFR flight. Aeronautical information includes visual and radio aids to navigation, airports, controlled airspace, restricted areas, obstructions, and related data.
2. VFR Terminal Area Charts, 1:250,000 - Depict terminal control area (TCA) airspace which provides for the control or segregation of all the aircraft within the TCA. The chart depicts topographic information and aeronautical information which includes visual and radio aids to navigation, airports, controlled airspace, restricted areas, obstructions, and related data.
3. World Aeronautical Charts (WAC), 1:1,000,000 - Provide a standard series of aeronautical charts covering land areas of the world, at a size and scale convenient for navigation by moderate-speed aircraft. Topographic information includes cities and towns, principal roads, railroads, distinctive landmarks, drainage, and relief. Aeronautical information includes visual and radio aids to navigation, airports, airways, restricted areas, obstructions, and other pertinent data.
4. Enroute Low-altitude Charts - Provide aeronautical information for enroute instrument navigation (IFR) in the low altitude stratum. Information includes the portrayal of airways, limits of controlled airspace, position identification and frequencies of radio aids, selected airports, minimum enroute and minimum obstruction clearance altitudes, airway distances, reporting points, restricted areas, and related data. Area charts, which are a part of this series, furnish terminal data at a larger scale in congested areas.
5. Enroute High-altitude Charts - Provide aeronautical information for enroute instrument navigation (IFR) in the high-altitude stratum. Information includes the portrayal of jet routes, identification and frequencies of radio aids, selected airports, distances, time zones, special-use airspace, and related information.
6. Instrument Approach Procedures (IAP) Charts - Portray the aeronautical data which is required to execute an instrument approach to an airport. These charts depict the procedures, including all related data, and the airport diagram. Each procedure is designated for use with a specific type of electronic navigation system including NDB, tacan, VOR, ILS/MLS, and RNAV. These charts are identified by the type of navigational aid(s) which provide final approach guidance.
7. Standard Instrument Departure (SID) Charts - Designed to expedite clearance delivery and to facilitate transition between takeoff and enroute operations. Each SID procedure is presented as a separate chart and may serve a single airport or more than one airport in a given geographical location.
8. Standard Terminal Arrival (STAR) Charts - Designed to expedite air traffic control arrival procedures and to facilitate transition between enroute and instrument approach operations. Each STAR procedure is presented as a separate chart and may serve a single airport or more than one airport in a given geographical location.
9. Airport Taxi Charts - Designed to expedite the efficient and safe flow of ground traffic at an airport. These charts are identified by the official airport name, e.g., Washington National Airport.

Affirmative - yes.

AID - airport information desk.

Aileron - a hinged control surface on the wing which aids in producing a bank or rolling about the longitudinal axis.

AIM - Airman's Information Manual.

AIP - The Airport Improvement Program of the Airport and Airways Improvement Act of 1982. Under this program, the FAA provides funding assistance for the design and development of airports and airport facilities.

Air Carrier - A commercial operator engaging in the carriage of persons or property in air commerce for compensation or hire. Air carriers are certificated in accordance with FAR Parts 121 and 127, and generally operate aircraft having a seating capacity of more than 30 passengers or a maximum payload capacity of more than 7,500 pounds.

Air Carrier District Office (ACDO) - An FAA field office serving an assigned geographical area, staffed with Flight Standards personnel serving the aviation industry and general public on matters related to the certification and operation of scheduled air carriers and other large aircraft operations.

Air Defense Identification Zone (ADIZ) - The area of airspace over land or water, extending upward from the surface, within which the ready identification, the location, and the control of aircraft are required in the interest of national security.

1. Domestic Air Defense Identification Zone - An ADIZ within the United States along an international boundary of the United States.
2. Coastal Air Defense Identification Zone - An ADIZ over the coastal waters of the United States.
3. Distant Early Warning Identification Zone (DEWIZ) - An ADIZ over the coastal waters of the State of Alaska.

Air Taxi - Scheduled and/or nonscheduled aircraft operations carrying passengers and/or cargo for compensation. The capacity of air taxi aircraft is limited by Part 135 of the Federal Aviation Regulations.

Aircraft Approach Category - A grouping of aircraft based on a speed of 1.3 times the stall speed in the landing configuration at maximum gross landing weight. An aircraft shall fit in only one category. If it is necessary to maneuver at speeds in excess of the upper limit of a speed range for a category, the minimums for the next higher category should be used. For example, an aircraft which falls in Category A, but is circling to land at a speed in excess of 91 knots, should use the approach Category B minimums when circling to land. The categories are as follows:

1. Category A - Speed less than 91 knots.
2. Category B - Speed 91 knots or more but less than 121 knots..
3. Category C - Speed 121 knots or more but less than 141 knots.
4. Category D - Speed 141 knots or more but less than 166 knots.
5. Category E - Speed 166 knots or more.

Aircraft Classes - For the purposes of wake turbulence separation minima, ATC classifies aircraft as heavy, large, and small as follows:

1. Heavy - Aircraft capable of takeoff weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight.
2. Large - Aircraft of more than 12,500 pounds, maximum certificated takeoff weight, up to 300,000 pounds.
3. Small - Aircraft of 12,500 pounds or less, maximum certificated takeoff weight.

Aircraft radio receiving frequencies - en route communications from 112.0 through 117.9 MHz received on the VOR receiver or the localizer receiver; air traffic control communications from 118.0 through 121.3 MHz; emergency frequency, 121.5 MHz; ground control uses 121.6 to 121.9 MHz; aeronautical advisory stations (UNICOM) use 122.8 and 123.0 MHz.

Aircraft radio transmitting frequencies - private aircraft to airport towers, 118.0 through 121.3 MHz (where the pilot can receive and transmit both); plus 122.5, 122.7, and 122.9 MHz where the pilot transmits on this frequency but receives on the published frequency for the tower; private or commercial aircraft to Federal Aviation Administration communications stations, 122.1, 123.6, and 126.7.

Airman's Information Manual (AIM) - A primary FAA publication whose purpose is to instruct airmen about operating in the National Airspace System of the United States. It provides basic flight information, ATC procedures and general instructional information concerning health, medical facts, factors affecting flight safety, accident and hazard reporting, and types of aeronautical charts and their use.

Airplane Design Group (Physical Characteristics) - The airplane design group subdivides airplanes by wingspan. The airplane design group concept links an airport's dimensional standards to aircraft approach categories or to airplane design groups or to runway instrumentation configurations.

(FAA) Airport - an area of land or water which is used, or intended for use, for the landing and takeoff of aircraft, and any appurtenant areas which are used, or intended of use, for airport buildings or other airport facilities or right-of-way, together with all airport buildings and facilities located thereon; and includes any heliport.

Airport advisory area - the area within 5 statute miles of an uncontrolled airport on which is located a flight service station so depicted on the appropriate sectional aeronautical chart.

Airport Approach Safety Zone - An element of either an Airport Impact Zone or an Airport Overlay Zone which consists of a portion of the Airport Approach Surface as defined in FAR Part 77. The actual boundaries and land-use provisions are determined by the local jurisdiction.

Airport Development Zone - A zone which replaces the existing zoning for the airport property encompassing the land presently owned by the airport and, if feasible, areas identified for future purchase, clear zones, and areas with noise levels greater than Ldn 70.

Airport Elevation/Field Elevation - The highest point of an airport's usable runways measured in feet from mean sea level.

Airport Hazard - Any structure or natural object located on or in the vicinity of a public airport, or any use of land near such airport, that obstructs the airspace required for the flight of aircraft in landing or taking off at the airport or is otherwise hazardous to aircraft landing, taking off, or taxiing at the airport.

Airport Impact Zone - A zone used to place land-use conditions on land impacted by airport operations. It establishes a new zone and provisions which replace an existing zone and standards.

(FAA) Airport Layout Plan (ALP) - shows the orientation and location of key facilities, such as runways and navigational aids, must be planned with consideration for approach zones, prevailing winds, airspace utilization, land contours and many other special factors. The dimensional relationships, even within the airport boundaries, between operational and support facilities and allocation of reasonable space to allow for orderly expansion of individual functions must be clearly established in advance. This is essential if such facilities are to be subsequently positioned where they can best serve their intended purposes while conforming to applicable safety and construction criteria.

Airport Lighting - Various lighting aids that may be installed on an airport. Types of airport lighting include:

1. Runway Lights/Runway Edge Lights - Lights having a prescribed angle of emission used to define the lateral limits of a runway. Runway lights are uniformly spaced at intervals of approximately 200 feet, and the intensity may be controlled or preset.
2. Touchdown Zone Lighting - Two rows of transverse light bars located symmetrically about the runway centerline normally at 100-foot intervals. The basic system extends 3,000 feet along the runway.

Airport Marking Aids - Markings used on runway and taxiway surfaces to identify a specific runway, a runway threshold, a centerline, a hold line, etc. A runway should be marked in accordance with its present usage, such as:

1. Visual.
2. Nonprecision instrument.
3. Precision instrument.

Airport Master Plan - An assembly of appropriate documents and drawings covering the development of a specific airport from a physical, economical, social, and political jurisdictional perspective. The airport layout plan is a part of this plan.

Airport surface detection equipment (ASDE) - radar equipment specifically designed to detect all principal features on the surface of an airport, including vehicular traffic, and to present the entire picture on a radar indicator console in the control tower. ASDE has a maximum range of 4 miles, through its 16-inch-diameter scope usually displays an area within only a 1-mile radius about the control tower.

Airport traffic area - unless otherwise specifically designated (Federal Aviation Regulations, Part 93), this refers to the airspace within a horizontal radius of 5 statute miles from the geographical center of any airport at which a control tower is operating, extending from the surface up to, but not including, an altitude of 3,000 feet above the elevation of the airport.

Airport traffic control service - air traffic control service provided by an airport traffic control tower for aircraft operating on the movement area and in the vicinity of an airport.

Airport traffic control tower (TOWER) - a facility providing airport traffic control service.

Airports of entry - specific airports where a Customs office is nearby and no special permission is needed to land on arriving from outside the United States. However, one-hour advance notice must be furnished to United States Customs. (This can be included in your flight plan filed in Canada or Mexico, for example.) For a list of the airports of entry, see Part 1 of the Airman's Information Manual.

Air route surveillance radar (ARSR) - long-range radar which increases the capability of air traffic control for handling heavy en route traffic. An ARSR site is usually located at some distance from the air route traffic control center it serves. Range, approximately 200 nautical miles.

Air route traffic control center (ARTCC) - a facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight.

Airside - Portion of the airport directly related to the arrival and departure of aircraft, including such airfield facilities as runway, taxiways, navigational aids, marking, and lighting.

Air traffic clearance (CLEARANCE) - an authorization by air traffic control for an aircraft to proceed under specified traffic conditions within controlled airspace for the purpose of preventing collision between known aircraft.

Air traffic control radar beacon system (ATCRBS) - this system, sometimes referred to as secondary surveillance radar, consists of three main components:

1. Interrogator. Primary radar relies on a signal being transmitted from the radar antenna site and being reflected, or "bounced back," from an object (such as an aircraft). This reflected signal is then displayed as a "target" on the controller's radarscope. In the ATCRBS the interrogator, a ground-based radar beacon transmitter-receiver, scans in synchronism with the primary radar and transmits discrete radio signals which repetitiously request all transponders on the mode being used to reply. The replies received are then mixed with the primary returns and both are displayed on the same radarscope.
2. Transponder. This airborne radar beacon transmitter-receiver automatically receives the signals from the interrogator and selectively replies with a specific pulse group (code) only to those interrogations being received on the mode to which it is set. These replies are independent of, and much stronger than, a primary radar return.
3. Radarscope. The radarscope used by the controller displays returns from both the primary radar system and the ATCRBS. These returns, called target, are what the controller refers to in the control and separation of traffic.

Air traffic controller - the Federal Aviation Administration employee responsible for directing movement of planes either on the ground or in the air at or near an airport which has a control tower.

Airway beacons - used before today's electronic airway system. Rotating beacons spaced 10 to 15 miles apart along the airways between airports formed a "lighted" pathway with Morse-coded flashes corresponding to sites marked on the sectional map. A few still remain in remote Western locations.

Airway/Federal Airway - A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

Airways, Victor - preestablished flight routes between VOR omni-stations as shown on sectional charts.

Alert area - any area indicated on aeronautical charts to inform the private pilot that a high volume of pilot training or other unusual aerial activity takes place there, so that he should be especially alert.

Amber light - an amber light flashing at an airport indicates that a Right traffic pattern is in effect at the time. The light is usually on top of the control tower or on an adjoining building or may be installed near the center of the segmented circle on the airport.

Approach and Clear Zones Plan - The Approach and Clear Zones Plan is compiled from the criteria in FAR Part 77, Objects Affecting Navigable Airspace. It shows the area affected by the Airport Obstructions Zoning Ordinance and includes layout of runways, airport boundary, elevations, and area topography. Applicable height limitation areas are shown in detail.

Approach Clearance - Authorization by ATC for a pilot to conduct an instrument approach. The type of instrument approach for which a clearance and other pertinent information is provided in the approach clearance and other pertinent information is provided in the approach clearance when required.

Approach control service - air traffic control service, provided by a terminal area traffic control facility, for arriving and departing IFR aircraft and on

occasion VFR aircraft.

Approach Gate - An imaginary point used within ATC as a basis for vectoring aircraft to the final approach course one mile from the outer marker (or the fix used in lieu of the outer marker) on the side away from the airport for precision approaches and one mile from the final approach fix on the side away from the airport for nonprecision approaches. In either case, when measured along the final approach course, the gate will be no closer than five miles from the landing threshold.

Approach procedures - all airports (unless specifically noted otherwise because of nearby obstructions, multiple use of airspace, etc.) use a left-hand (counterclockwise) pattern approach to the landing runway. On an airport with dual runways of the same heading, the left runway uses a left pattern, the right runway a right pattern.

Approach Slopes - The ratios of horizontal to vertical distance indicating the degree of inclination of the Approach Surface. The various ratios include:

20:1 For all utility and visual runways extended from the primary surface a distance of 5,000 feet.

34:1 For all nonprecision instrument runways other than utility extended from the primary surface for a distance of 10,000 feet.

50:1/40:1 For all precision instrument runways extending from the primary surface for a distance of 10,000 feet at an approach slope of 50:1 and an additional 40,000 feet beyond this at a 40:1 Approach Slope.

Apron/Ramp - A defined area on an airport or heliport intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, or maintenance. With regard to seaplanes, a ramp is used for access to the apron from the water.

Area navigation (RNAV) - a system utilizing a small on-board electronic computer to help the pilot of an equipped aircraft fly the shortest distance between two points rather than from VOR (very high frequency omnirange) station to VOR station.

ARSR - air route surveillance radar.

ARTCC - air route traffic control center.

ATC - air traffic control.

ATC clearances - when air traffic clearance has been obtained under either the visual or instrument flight rules, the pilot in command of the aircraft must not deviate from the provisions thereof unless an amended clearance is obtained.

ATIS - automatic terminal information service.

Autoland Approach - An autoland approach is a precision instrument approach to touchdown and, in some cases, through the landing rollout. An autoland approach is performed by the aircraft autopilot which is receiving position information and/or steering commands from on-board navigation equipment.

Automatic direction finder (ADF) - sometimes called the radio compass, this instrument has an azimuth dial with the 0 or 360 degree representing the nose of the aircraft. When the pilot tunes the receiver to the frequency of the nearest low or medium frequency radio transmitter, a pointer automatically shows him its position relative to his aircraft. For example, if he tuned into a commercial broadcast station at 700 kc and the pointer settles at 60 degrees, he knows the station is 60 degrees off to the right of his aircraft.

Automatic terminal information service (ATIS) - to reduce radio frequency congestion caused by many pilots requesting the same information, the Federal Aviation Administration established a system of broadcasting the following information for incoming aircraft: (a) traffic pattern information; (b) type of instrument approach to be expected; (c) runway in use; (d) surface wind; and (e) ceiling and visibility. The pilot is expected to have listened to such broadcasts before approaching a terminal which has ATIS. An alphabetical code word, such as information Alfa, info Bravo, or info Charlie is appended to the end of the broadcast.

(FAA) Aviation Use of Real Property (Aeronautical Property) - all property comprising the land, airspace, improvements and facilities used or intended to be used for any operational purpose related to, in support of, or complementary to the flight of aircraft to or from the landing area. It is not confined to land areas or improvements eligible for development with Federal-aid (FAA/ADAP/AIP) or to property acquired from Federal sources. In addition to the areas occupied by the runways, taxiways, and parking aprons, aeronautical property includes any other areas used or intended to be used for supporting services and facilities related to the operation of aircraft. It also includes property normally required by those activities which are complementary to flight activity such as convenience concessions serving the public including, but not limited to shelter, ground transportation, food and personal services.

Avigation and Hazard Easement - An easement which provides right of flight at any altitude above the approach surface, prevents any obstruction above the approach surface, provides a right to cause noise vibrations, prohibits the creation of electrical interferences, and grants right-of-way entry to remove trees or structures above the approach surface.

B - in the phonetic alphabet is Bravo (pronounced bra-voh).

Based Aircraft - An aircraft permanently stationed at an airport.

Below Minimums - Weather conditions below the minimums prescribed by regulation for the particular action involved; e.g., landing minimums, takeoff minimums.

Blast Fence - A barrier that is used to divert or dissipate jet or propeller blast.

Braking Action-Good, Fair, Poor, or Nil - A report of conditions on the airport movement area providing a pilot with a degree/quality of braking that he might expect, Braking action is reported in terms of good, fair, poor, or nil.

Building Restriction Line (BRL) - a line shown on the Airport Layout Plan beyond which airport buildings must not be positioned in order to limit their proximity to aircraft movement areas.

C - in the phonetic alphabet is Charlie (pronounced char-lee)

Capacity - Capacity (throughput capacity) is a measure of the maximum number of aircraft operations which can be accommodated on the airport or airport component in an hour. Since the capacity of an airport component is independent of the capacity of other airport components, it can be calculated separately.

Category II Operation - With respect to the operation of aircraft, means a straight-in ILS approach to the runway of an airport under a Category II ILS

instrument approach procedure issued by the Administrator or other appropriate authority.

Category III Operation - With respect to the operation of aircraft, means an ILS approach to, and landing on, the runway of an airport using a Category III ILS instrument approach procedure issued by the Administrator or other appropriate authority.

Category A - With respect to Transport category rotorcraft, means multiengine rotorcraft designed with engine and system isolation features specified in FAR Part 29 and utilizing scheduled takeoff and landing operations under a critical engine failure concept that assures adequate designated surface area and adequate performance capability for continued safe flight in the event of engine failure.

Category B - With respect to Transport category rotorcraft, means single-engine or multiengine rotorcraft that do not fully meet all Category A standards. Category B rotorcraft have no guaranteed stay-up ability in the event of engine failure, and unscheduled landing is assumed.

Caution area - airspace within which military activities are conducted that are not hazardous but are of interest to nonparticipating pilots.

Ceiling - (in meteorology) the height above the earth's surface of the lowest layer of clouds or obscuring phenomena that is reported as "broken," "overcast," or "obscuration" and not classified as "thin" or "partial." The ceiling is classified in several ways and shown by a letter in weather reports preceding the ceiling height. Some of the more important of these letters are M (measured), E (estimated), A (aircraft-obtained), W (indefinite), B (balloon). If one of these letters does not precede the cloud symbol or if thin, broken, or overcast clouds exist, there is no official ceiling.

Central altitude reservation facility (CARF) - an air traffic service facility established to conduct the volume of coordination, planning, and approval of special user requirements under the altitude reservation concept.

Charted VFR Flyways - Charted VFR Flyways are flight paths recommended for use to by-pass areas heavily traversed by large turbine-powered aircraft. Pilot compliance with recommended flyways and associated altitudes is strictly voluntary. VFR Flyway Planning charts are published on the back of existing VFR Terminal Area charts.

Circle-to Land Maneuver/Circling Maneuver - A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or is not desirable. This maneuver is made only after ATC authorization has been obtained and the pilot has established required visual reference to the airport.

Civil use of military fields - United States Army, Air Force, Navy, and Coast Guard fields are open to civil fliers only in emergency or with prior permission.

Clearway - An area beyond the takeoff runway under the control of airport authorities within which terrain or fixed obstacles may not extend above specified limits. These areas may be required for certain turbine-powered operations, and the size and upward slope of the clearway will differ depending on when the aircraft was certificated.

Closed Traffic - Successive operations involving takeoffs and landings or low approaches where the aircraft does not exit the traffic pattern.

Commercial Operator - A person who, for compensation or hire, engages in the carriage by aircraft in air commerce of persons or property, other than as an air carrier or foreign air carrier or under the authority of FAR Part 375. Where it is doubtful that an operation is for compensation or hire, the test applied is whether the carriage by air is merely incidental to the person's other business or is, in itself, a major enterprise for profit.

Compass Locator - A low-power, low or medium frequency (L/MF) radio beacon installed at the site of the outer or middle marker of an instrument landing system (ILS). It can be used for navigation at distances of approximately 15 miles or as authorized in the approach procedure.

1. Outer Compass Locator (LOM) - A compass locator installed at the site of the outer marker of an instrument landing system.
2. Middle Compass Locator (LMM) - A compass locator installed at the site of the middle marker of an instrument landing system.

Compass Rose - A circle, graduated in degrees, printed on some charts or marked on the ground at an airport. It is used as a reference to either true or magnetic direction.

(FAA) Compatible Land Use - compatibility of land use is attained when the use of adjacent property neither adversely affects flight operations from the airport nor is itself adversely affected by such flight operations. For all practical purposes the adverse effect of flight operations on adjacent land is attributable to noise and vibration (residential, schools, etc.). Land usage which adversely affects flight operations is that which creates or contributes to a flight hazard. For example, any land use which might block the line of sight from the control tower to all parts of the landing area, inhibits pilot visibility (such as glaring lights, smoke, etc. produces electronic aberrations of navigational guidance systems, or which tends to attract birds must be considered an incompatible land usage. Similarly under certain circumstances an exposed garbage dump may not only attract birds but, if open incineration is regularly permitted, can create a smoke hazard.

Compulsory Reporting Points - Reporting points which must be reported to ATC. They are designated on aeronautical charts by solid triangles or filed in a flight plan as fixes selected to define direct routes. These points are geographical locations which are defined by navigation aids/fixed. Pilots should discontinue position reporting over compulsory reporting points when informed by ATC that their aircraft is in "radar contact".

CONSOLAN - a low frequency, long-distance NAVAID used principally for transoceanic navigation. Two stations are now operating within the United States - Nantucket (TUK) 194 kHz and San Francisco (SFI) 192 kHz.

Continental control area - the airspace of the United States and Alaska (excluding the Alaska peninsula west of longitude 160 degrees W) at and above 14,500 feet MSL.

Continental United States - the forty-nine states located on the continent of North America, and the District of Columbia.

Control area - the airspace designated as colored federal airways. VOR federal airways, additional control areas, and control area extensions.

Control tower - Towers have been established to provide for a safe, orderly, and expeditious flow of traffic on, and in the vicinity of, an airport. When the responsibility has been so delegated, towers also provide for the separation of IFR aircraft in the terminal areas. (See also APPROACH CONTROL SERVICE.)

Control zone - controlled airspace which extends upward from the surface to the base of the continental control area (14,500 feet) in a radius 5 miles from the airport, and approach corridors for ILS systems.

Controlled airspace - airspace designated as continental control area, control area, control zone, or transition area, within which some or all aircraft may be

subject to air traffic control. Controlled airspace is shown on aeronautical charts through color-coded blue and magenta tinted bands. It may be made up of an airport traffic area, continental control area, control area, control zone, or federal airway. (See the individual listings for the first four terms.)

Conventional Hangar - A large building used to store more than one aircraft and/or to conduct aircraft maintenance.

Coupled Approach - A coupled approach is an instrument approach performed by the aircraft autopilot which is receiving position information and/or steering commands from on-board navigation equipment. In general, coupled nonprecision approaches must be discontinued and flown manually at altitudes lower than 50 feet below the minimum descent altitude, and coupled precision approaches must be flown manually below 50 feet agl.

Crash locator beacon - an electronic device attached to the aircraft structure as far aft as practicable in the fuselage, or in the tail surface, in such a manner that damage to the beacon will be minimized in the event of crash impact. It may be automatically ejectable or permanently mounted. If it is automatically ejectable, it will also have provision for manual removal and operation. The beacon operates from its own power source on 121.5 MHz and/or 243 MHz, preferably on both emergency frequencies, transmitting a distinctive downward swept audio tone for homing purposes, and is designed to function without human action after an accident.

Critical Aircraft - In airport design, the aircraft which controls one or more design items such as runway length, pavement strength, lateral separation, etc., for a particular airport. The same aircraft may not be critical to all design items.

D - in the phonetic alphabet is Delta (dell-tah).

Departure control - a function of approach control providing service for departing IFR aircraft and, on occasion, VFR aircraft.

DEP CON - departure control.

DEWIZ - distant early warning identification zone.

Displaced Threshold - A threshold that is located at a point on the runway other than the designated beginning of the runway.

Distance measuring equipment (DME) - airborne or ground equipment - UHF standard (TACAN compatible) - used to measure, in nautical miles, the distance of an aircraft from a navigational aid (NAVAID).

Distant early warning identification zone (DEWIZ) - an identification zone of defined dimensions extending upwards from the surface, in the DEW Line in Canada and around the entire coastal area of Alaska.

E - in the phonetic alphabet is Echo (eck-oh).

Easement - The legal right held by one party to make use of the land of another for a limited purpose.

Elevation - is given in feet above mean sea level and is based on highest usable portion of the landing area. When sea level, elevation will be indicated as "00"; when below, a minus sign (-) will precede the figure.

Emergency locator transmitter (ELT) - a radio transmitter attached to the aircraft structure, operating from its own power source on 121.5 MHz and 243 MHz, transmitting a distinctively downward-swept audio tone for homing purposes, and designed to function without human action after an accident.

En route air traffic control service - air traffic control service provided aircraft on an IFR flight plan between departure and destination terminal areas.

En route weather advisory service (EWAS) - provided from selected flight service stations controlling one or more remote communications outlets covering a large geographical area. All communications will be conducted on the EWAS frequency, 122.0 MHz, and will serve aircraft 5,000 feet and up along heavily traveled flyways.

Environmental Assessment (EA) - A concise public document, prepared under the guidelines of the National Environmental Policy Act of 1969, and for which a federal agency is responsible that serves to:

1. Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.
2. Aid an agency's compliance with the Act when no environmental impact statement is necessary.
3. Facilitate preparation of a statement when one is necessary.

It includes brief discussions of the need for the proposal, of alternatives as required, of the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted.

(FAA) Exclusive Right - a power, privilege, or other right excluding or debarring another from enjoying or exercising a like power, privilege, or right. An exclusive right may be conferred either by express agreement, by the imposition of unreasonable standards or requirements, or by any other means. Such a right conferred on one or more parties but excluding others from enjoying or exercising a similar right or rights would be an exclusive right.

Execute Missed Approach - Instructions issued to a pilot making an instrument approach which means to continue inbound to the missed approach point and execute the missed approach procedure as described on the Instrument Approach Procedure Chart or as previously assigned by ATC. The pilot may climb immediately to the altitude specified in the missed approach procedure upon making a missed approach. No turns should be initiated prior to reaching the missed approach point. When conducting an ASR or PAR approach, execute the assigned missed approach procedure immediately upon receiving instructions to "execute missed approach".

F - in the phonetic alphabet is Foxtrot (foks-trot).

Federal Aviation Administration - establishes regulations for the safe operation of private, business, commercial, and military aircraft in the United States. Washington address is Federal Aviation Administration, Department of Transportation, Washington, D.C. 20590.

Federal Aviation Regulations (FAR), Part 36 - FAR Part 36 contains noise certification standards for most airplane types, generally requiring newly designed and manufactured aircraft to be significantly quieter than older aircraft.

(FAA) Federal Funds - any airport which consists in whole or in part of property, improvements, or other assets conveyed by the United States Government without monetary consideration for airport purposes, or which was acquired, developed or improved with Federal assistance must be considered as an airport upon which Federal funds have been expended.

Fix - a geographical position determined by visual reference to the surface by reference to one or more radio navigational aids, by celestial plotting, or by another navigational device.

(FAA) Fixed-Base Operator (FBO) - an individual or firm operating at an airport and providing general aircraft services such as maintenance, storage, ground and flight instructions, etc.

FL - flight level.

Flameout - Unintended loss of combustion in turbine engines resulting in the loss of engine power.

Flight altitudes - (phraseology in communications) 1. Up to but not including 18,000' MSL - the separate digits of the thousands, plus the hundreds, if appropriate. Examples: 12,000 - ONE TWO THOUSAND; 12,500 - ONE TWO THOUSAND FIVE HUNDRED. 2. At and above 18,000' MSL (FL 180) the words "flight level" followed by the separate digits of the flight level. Examples: FL 190 - FLIGHT LEVEL ONE NINER ZERO; FL 275 - FLIGHT LEVEL TWO SEVEN FIVE.

Flight level (FL) - a level of constant atmospheric pressure related to a reference datum of 29.92 inches of mercury. Each is stated in three digits representing hundreds of feet; for example, FL 250 represents a barometric altimeter indication of 25,000 feet, FL 255 indicates 25,500 feet.

Flight plan (VFR) - to obtain maximum benefits of the flight plan program, flight plans should be filed directly with the nearest flight service station. Although position reports are not required for VFR flight plans, periodic reports to Federal Aviation Administration flight service stations along the route are good practice.

Flight service stations (FSS) - facilities operated by the Federal Aviation Administration to provide flight assistance service. They are within the National Airspace System and have the prime responsibility for preflight pilot briefing, en route communications with VFR flights, assisting lost VFR aircraft, originating NOTAMs, broadcasting aviation weather information, accepting and closing flight plans, monitoring radio NAVAIDS, participating with search and rescue units in locating missing VFR aircraft, and operating the national weather teletypewriter systems. In addition, at selected locations, FSS take weather observations, issue airport advisories, administer airmen written examinations, and advise Customs and Immigration of transborder flight.

FSS - flight service station.

Flight Standards District Office (FSDO) - An FAA field office serving an assigned geographical area and staffed with Flight Standards personnel who serve the aviation industry and the general public on matters relating to the certification and operation of air carrier and general aviation aircraft. Activities include general surveillance of operational safety, certification of airmen and aircraft, accident prevention, investigation, enforcement, etc.

G - in the phonetic alphabet is Golf, pronounced like the sport.

Gate Hold Procedures - Procedures at selected airports to hold aircraft at the gate or other ground location whenever departure delays exceed or are anticipated to exceed 15 minutes. The sequence for departure will be maintained in accordance with initial call-up unless modified by flow control restrictions. Pilots should monitor the ground control/clearance delivery frequency for engine startup advisories or new proposed start time if the delay changes.

General Aviation (GA) - That portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of public convenience and necessary from the Civil Aeronautics Board and large aircraft commercial operators.

(ICAO) General Aviation - All civil aviation operations other than scheduled air services and nonscheduled air transport operations for remuneration or hire.

General Aviation Airport - General Aviation airports are either publicly or privately owned airports which serve general aviation aircraft users.

General Aviation District Office (GADO) - An FAA field office serving a designated geographical area and staffed with Flight Standards personnel who have the responsibility for serving the aviation industry and the general public on all matters relating to the certification and operation of general aviation aircraft.

Go Around - Instructions for a pilot to abandon his approach to landing. Additional instructions may follow. Unless otherwise advised by ATC, a VFR aircraft or an aircraft conducting visual approach should overfly the runway while climbing to traffic pattern altitude and enter the traffic pattern via the crosswind leg. A pilot on an IFR flight plan making an instrument approach should execute the published missed approach procedure or proceed as instructed by ATC; e.g. "Go Around" (additional instructions if required).

Green, flashing - light signal from the tower meaning (on ground) cleared to taxi or (in flight) return for landing (to be followed by steady green at proper time).

Green light - alternating with red, general warning signal from tower; exercise extreme caution.

Gross Weight - Empty weight plus useful load is the gross weight of the airplane at takeoff. When an airplane is carrying the maximum load for which it is certificated, the takeoff weight is called the maximum allowable gross weight.

Ground Controlled Approach (GCA) - A radar approach system operated from the ground by air traffic control personnel transmitting instructions to the pilot by radio. The approach may be conducted with surveillance radar (ASR) only or with both surveillance and precision approach radar (PAR). Usage of the term "GCA" by pilots is discouraged except when referring to a GCA facility. Pilots should specifically request a "PAR" approach when a precision radar approach is desired or request an "ASR" or "surveillance" approach when a nonprecision radar approach is desired.

Ground control radio communications - pilots of departing aircraft should communicate with the control tower, on the appropriate ground control frequency, for taxi and clearance information and, unless otherwise advised, should remain on that frequency until they are ready to request take-off clearance. A pilot who has just landed should not change from the tower frequency to the ground control frequency until he is directed to do so by the controller. Ground control frequencies are provided in the 121.6-121.9 MHz band. The controller may omit the frequency, or the numbers preceding the decimal point in the frequency, when directing the pilot to change to a VHF ground control frequency if, in the controller's opinion, this usage will be clearly understood by the pilot; e.g., 121.7 - "Contact ground" or "Contact ground point seven."

Ground station call signs - shall comprise the name of the location or airport, followed by the appropriate indication of the type of station: OAKLAND TOWER (airport traffic control tower); MIAMI GROUND (ground control position in tower); DALLAS CLEARANCE DELIVERY (IFR clearance delivery position); KENNEDY APPROACH (tower radar or nonradar approach control position); ST. LOUIS DEPARTURE (tower radar departure control position); WASHINGTON RADIO (Federal Aviation Administration flight service station); NEW YORK CENTER (Federal Aviation Administration air route traffic control center).

H - in the phonetic alphabet is Hotel, pronounced (hoh-tel).

Handoff - An action taken to transfer the radar identification of an aircraft from one controller to another if the aircraft will enter the receiving controller's airspace and radio communications with the aircraft will be transferred.

(FAA) Height above airport (HAA) - indicates the height of the decision height or minimum descent altitude above the highest elevation in the touchdown zone. This is published in conjunction with IFR straight-in minimums.

Height Above Landing (HAL) - The height above a designated helicopter landing area used for helicopter instrument approach procedures.

Height above touchdown (HAT) - indicates the height of the minimum descent altitude (MDA) above the published airport elevation. This is published in conjunction with IFR circling minimums.

Helicopter/Copter - Rotorcraft that, for its horizontal motion, depends principally on its engine-driven rotors.

(ICAO) Helicopter - A heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes.

Helipad - A small designated area, usually with a prepared surface, on a heliport, airport, landing/takeoff area, apron/ramp, or movement area used for takeoff, landing, or parking of helicopters.

Heliport - An area of land, water, or structure used or intended to be used for the landing and takeoff of helicopters and includes its buildings and facilities, if any.

High-Speed Taxiway/Exit/Turnoff - A long-radius taxiway designed and provided with lighting or marking to define the path of aircraft traveling at high speed (up to 60 Nkts) from the runway center to a point on the center of a taxiway. Also referred to as long-radius exit or turnoff taxiway. The high-speed taxiway is designed to expedite aircraft turning off the runway after landing, thus reducing runway occupancy time.

HIRL - high intensity runway lights.

Holding - a predetermined maneuver which keeps an aircraft within a specified airspace while awaiting further clearance.

Holding fix - a specified fix used as a reference point in establishing and maintaining the position of an aircraft while holding.

I - in the phonetic alphabet is India (in-dee-ah).

ICAO - international civil aviation organization.

IFR -instrument flight rules.

IFR Aircraft/IFR Flight - An aircraft conducting flight in accordance with instrument flight rules.

IFR conditions - are those weather conditions below the minimum for flight under visual flight rules (in a control zone, less than 3 miles visibility and 1,000-foot ceiling).

IFR Takeoff Minimums and departure procedures - FAR Part 91 prescribes standard takeoff rules for certain civil users. At some airports, obstructions or other factors require the establishment of nonstandard takeoff minimums, departure procedures, or both to assist pilots in avoiding obstacles during climb to the minimum enroute altitude. Those airports are listed in NOS/DOD Instrument Approach Charts (IAPs) under a section entitled "IFR Takeoff Minimums and Departure Procedures". The NOS/DODIAP chart legend illustrates the symbol used to alert the pilot to nonstandard takeoff minimums and departure procedures. When departing IFR from such airports, or from any airports where there are no departure procedures, SIDs, or ATC facilities available, pilots should advise ATC of any departure limitations. controllers may query a pilot to determine acceptable departure directions, turns, or headings after takeoff. Pilots should be familiar with the departure procedures and must assure that their aircraft can meet or exceed any specified climb gradients.

ILS - Instrument Landing System - A precision instrument approach system which normally consists of the following electronic components and visual aids:

1. Localizer
2. Glideslope
3. Outer Marker
4. Middle Marker
5. Approach lights

ILS Categories -

1. ILS Category I - An ILS approach procedure which provides for approach to a height above touchdown of not less than 200 feet and with runway visual range of not less than 1,800 feet.
2. ILS Category II - An ILS approach procedure which provides for approach to a height above touchdown of not less than 100 feet and with runway visual range of not less than 1,200 feet.
3. ILS Category III
 - a. IIIA - An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 700 feet.
 - b. IIIB - An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 150 feet.
 - c. IIIC - An ILS approach procedure which provides for approach without a decision height minimum and without runway visual range minimum.

Imaginary surfaces - Those areas established in relation to the airport and to each runway consistent with FAR Part 77 in which any object extending above these imaginary surfaces is, by definition, an obstruction.

Inner Marker (IM) Inner Marker Beacon - A marker beacon used with an ILS (CAT II) precision approach located between the middle marker and the end of the ILS runway, transmitting a radiation pattern keyed at six dots per second and indicating to the pilot, both aurally and visually, that he is at the designated decision height (DH), normally 100 feet above the touchdown zone elevation, on the ILS CAT II approach. It also marks progress during a CAT III approach.

In-runway lighting - touchdown zone lighting and runway centerline lighting are installed on some precision approach runways to facilitate landing under adverse visibility conditions. Taxiway turnoff lights may be added to expedite movement of aircraft from the runway.

1. Touchdown Zone Lighting - two rows of transverse light bars disposed symmetrically about the runway centerline in the runway touchdown zone. The system generally extends from 75 to 125 feet of the landing threshold to 3,000 feet down the runway.
2. Runway Centerline Lighting - flush centerline lights spaced at 50-foot intervals beginning 75 feet from the landing threshold and extending to within 75 feet of the opposite end of the runway.
3. Runway Remaining Lighting - is applied to centerline lighting systems in the final 3,000 feet, as viewed from the take-off or approach position. Alternate red and white lights are seen from the 3,000-foot points to the 1,000-foot points, and all red lights are seen for the last 1,000 feet of the runway. From the opposite direction, these lights are seen as white lights.
4. Taxiway turnoff lights - flush lights spaced at 50-foot intervals, defining the curved path of aircraft travel from the runway centerline to a point on the taxiway.

Instrument approach light systems - 1. Instrument approach light systems provide the basic means for transition from instrument flight using electronic approach aids to visual flight and landing. Operational requirements dictate the sophistication and configuration of the approach light system for a particular airport. 2. Condenser-discharge sequenced flashing light systems are installed in conjunction with the instrument approach light system at some airports which have United States standard "A" approach lights as a further aid to pilots making instrument approaches. The system consists of a series of brilliant blue-white bursts of light flashing in sequence along the approach lights. It gives the effect of a ball of light traveling toward the runway. An impression of the system as a pilot first observes the flashing lights when making an approach is that of large tracer shells rapidly fired from a point in space toward the runway.

Instrument flight experience - see PREREQUISITES FOR PRIVATE PILOT CERTIFICATE.

Instrument Flight Rules (IFR) - Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

Instrument Meteorological Conditions (IMC) - Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling less than the minima specified for visual meteorological conditions.

Instrument Runway - A runway equipped with electronic and visual navigation aids for which a precision or nonprecision approach procedure having straight-in landing minimums has been approved.

(ICAO) Instrument Runway - One of the following types of runways intended for the operation of aircraft using instrument approach procedures:

- a. Non-precision Approach Runway - An instrument runway served by visual aids and a nonvisual aid providing at least directional guidance adequate for a straight-in approach.
- b. Precision Approach Runway, Category I - An instrument runway served by ILS and visual aids intended for operations down to 60 m (200 feet) decision height and down to an RVR of the order of 800 m.
- c. Precision Approach Runway, Category II - An instrument runway served by ILS and visual aids intended for operations down to 30 m (100 feet) decision height and down to an RVR of the order of 400 m.
- d. Precision Approach Runway, Category III - An instrument runway served by ILS to and along the surface of the runway and:
 - A. Intended for operations down to an RVR of the order of 200 m (no decision height being applicable using visual aids during the final phase of landing;
 - B. Intended for operations down to an RVR of the order of 50 m (no decision height being applicable) using visual aids for taxiing;
 - C. Intended for operations without reliance on visual reference for landing or taxiing.

Intermediate Fix (IF) - The fix that identifies the beginning of the intermediate approach segment of an instrument approach procedure. The fix is not normally identified on the instrument approach chart as an intermediate fix (IF).

International Airport - Relating to international flights, it means:

1. An airport of entry which has been designated by the Secretary of Treasury or Commissioner of Customs as an international airport for Customs service.
2. A landing rights airport at which specific permission to land must be obtained from Customs authorities in advance of contemplated use.
3. Airports designated under the Convention on International Civil Aviation as an airport for use by international commercial air transport and/or international general aviation.

International Civil Aviation Organization (ICAO) - A specialized agency of the United Nations whose objective is to develop the principles and techniques of international air navigation and to foster planning and development of international civil air transport.

Intersecting Runways - Two or more runways which cross or meet within their lengths.

1. A point defined by any combination of courses, radials, or bearings of two or more navigational aids.
2. Used to describe the point where two runways, a runway and a taxiway, or two taxiways cross or meet.

Intersection Departure/Intersection Takeoff - A takeoff or proposed takeoff on a runway from an intersection.

Intersection take-offs - 1. In order to enhance airport capacities, reduce taxiing distances, minimize departure delays, and provide for more efficient movement of air traffic, controllers may initiate intersection take-offs as well as approve them when the pilot requests. If for ANY reason a pilot prefers to use a different intersection or the full length of the runway, or desires to obtain the distance between the intersection and the runway end, HE IS EXPECTED TO INFORM ATC ACCORDINGLY. 2. Controllers are required to separate small propeller driven aircraft (less than 12,500 pounds) taking off from an intersection on the same runway following a large turbojet aircraft by ensuring that at least a 3-minute interval exists between the time that the preceding turbojet has taken off and the succeeding aircraft begins take-off roll.

J - in the phonetic alphabet is Juliett (jew-lee-ett).

Jet advisory areas - VFR Operation, jet advisory areas have not been designated positive control airspace, and VFR flight is permitted within these areas under the following conditions: (a) radar jet advisory area. Prior approval from ATC is required unless the aircraft has a functioning transponder and is operated on the appropriate code; (b) nonradar jet advisory areas. Prior approval from ATC is required in all cases. NOTE: Jet advisory areas and the flight levels comprising these areas are depicted on en route-high altitude charts.

Jet routes - a high altitude route system at 18,000 feet MSL to flight level 450 inclusive. Jet routes are predicated on high altitude navigational aids.

K - in the phonetic alphabet is Kilo (kee-lo).

L - in the phonetic alphabet is Lima (lee-mah).

Land plane - an airplane designed to rise from and alight on the ground.

Land Use - The present or planned utilization of a given parcel of land. Such land uses are normally indicated or delineated on a land-use map. Land-use maps may indicate usages for any given time period past, present, or future, and such period should always be indicated.

Landing - the act of terminating flight and bringing the airplane to rest; used both for land and seaplanes.

Landing direction indicator - a tetrahedron or a tee installed when conditions at the airport warrant its use, located at the center of the segmented circle, and used to indicate the direction in which landings and take-offs should be made. The large end (cross bar) of a tee is in the direction of landing. The small end of a tetrahedron points in the direction of landing.

Landing Minimums/IFR Landing Minimums - The minimum visibility prescribed for landing a civil aircraft while using an instrument approach procedure. The minimum applies with other limitations set forth in FAR Part 91, with respect to the minimum descent altitude (MDA) or decision height (DH) prescribed in the instrument approach procedures as follows:

1. straight-in landing minimums - A statement of MDA and visibility, or DH and visibility, required for a straight-in landing on a specified runway, or
2. Circling minimums - A statement of MDA and visibility required for the circle-to-land maneuver. Descent below the established MDA or DH is not authorized during an approach to the runway of intended landing can be made and adequate visual reference to required visual cues is maintained.

Landside - Portions of the airport interfacing with or supporting the airfield functions, including such facilities as terminal area buildings, aircraft parking apron, automobile parking area, fuel storage, air cargo, and ground access.

Large Aircraft - Aircraft of more than 12,500 pounds, maximum certificated takeoff weight.

LDA - localizer-type directional aid.

Light gun - an intense, narrowly focused spotlight used to direct a green, red, or white signal at any selected airplane in traffic on or about an airport. Usually used in control towers.

Light systems, runway edge - runway edge lights are used to outline the edges of runways during periods of darkness and restricted visibility conditions. These light systems are classified according to the intensity or brightness they are capable of producing: High Intensity Runway Lights (HIRL), Medium Intensity Runway Lights (MIRL), and Low Intensity Runway Lights (LIRL). The HIRL and MIRL systems have variable intensity controls, whereas the LIRLs normally have one intensity setting.

Limited aviation easement - An easement which provides right of flight above approach slope surfaces, prohibits any obstruction penetrating the approach slope surface, and provides right of entry to remove any structure or growth penetrating the approach slope surface.

LIRL - low intensity runway lights.

LMM - compass locator at middle marker ILS.

Loc - localizer.

Localizer - The component of an ILS which provides course guidance to the runway.

Loran (Long-Range Navigation) - An electronic navigational system by which hyperbolic lines of position are determined by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran A operates in the 1750- to 1950-kHz frequency band.

Low approach - 1. A low approach (sometimes referred to as a low pass) is the go-around maneuver following an approach. Instead of landing or making a touch-and-go, a pilot may wish to go around (low approach) in order to expedite a particular operation; a series of practice instrument approaches is an example of such an operation. Unless otherwise authorized by ATC, the low approach should be made straight ahead, with no turns, or climb made until the pilot has made a thorough visual check for other aircraft in the area.

Low/medium frequency (L/MF) radio range - these ranges are classified by their type of antennae. Two types of low-frequency ranges are in use: loop range (L) and adcock range (A). Low-frequency radio range courses are subject to disturbances resulting in multiple courses, signal fades, and surges over rough country. Pilots flying over unfamiliar routes are cautioned to be on the alert to detect these vagaries, particularly over mountainous terrain.

M - in the phonetic alphabet is Mike (mike).

Marker beacons - serve to identify a particular location in space along an airway or on the approach to an instrument runway. This is done by means of a 75-MHz transmitter which transmits a directional signal to be received by aircraft flying overhead. These markers are generally used in conjunction with low frequency radio ranges and the instrument landing system as point designators. Four classes of markers are now in general use: FM, LFM, station location or Z-Markers, and the ILS marker beacons.

(FAA) Maximum authorized altitude - the highest altitude on a federal airway, jet route, or other direct route for which an MEA is designated in Federal Aviation Regulations, Part 95, at which adequate reception of navigation aid signals is assured.

MHz - megahertz.

Microwave Landing System (MLS) - A precision instrument approach system operating in the microwave spectrum which normally consists of the following components: (1) Azimuth Station, (2) Elevation Station, and (3) Precision distance Measuring Equipment.

Middle Marker (MM) - A marker beacon that defines a point along the glideslope of an ILS normally located at or near the point of decision height (ILS Category I). It is keyed to transmit alternate dots and dashes, with the alternate dots and dashes keyed at the rate of 95dot/dash combinations per minute on a 1300 Hz tone, which is received aurally and visually by compatible airborne equipment.

Military climb corridors - are restricted areas shown on aeronautical charts. Civil aircraft may not fly through these areas without prior approval from the controlling agency.

Military fields, heavy traffic around - pilots are advised to exercise vigilance when in close proximity to most military airports, as these may have jet aircraft traffic patterns extending up to 2,500 feet above the surface. In addition, they may have an unusually heavy concentration of jet aircraft operating within a 25 nautical mile radius and from the surface to all altitudes. This precautionary note also applies to the larger civil airports.

(FAA) Minimum Standards - as used herein, this refers to the qualifications which may be established by an airport owner as the minimum requirements to be met as a condition for the right to conduct a commercial aeronautical activity on the airport.

MIRL - medium intensity runway lights.

MM - middle marker ILS.

MSL - mean sea level.

Muni - municipal.

Multicom service 122.9 MHz - a mobile service used to provide communications essential to conduct of activities being performed by or directed from private aircraft. Example: ground-air communications pertaining to agriculture, ranching, conservation activities, forest fire fighting, aerial advertising, and parachute jumping.

N - in the phonetic alphabet is November (no-vem-ber).

N - preceding numbers on an aircraft represents an aircraft of United States registry.

National airspace system (NAS) - the common system of air navigation and air traffic control, encompassing communications facilities, air navigation facilities, airways, controlled airspace, special use airspace, and flight procedures, and authorized by Federal Aviation Regulations for domestic and international aviation.

Nautical mile - 1,852 meters or 1.15 statute miles.

NAVAID - air navigation facility.

NAVAID, classes - VOR, VORTAC, and TACAN aids are classed according to their operational use. There are three classes: T (terminal), L (low altitude), and H (high altitude). Certain operational requirements make it necessary to use some of these aids at greater service ranges than are listed in the table. Extended range is made possible through flight inspection determinations. Some aids also have lesser service range due to location, terrain, frequency protection, etc.

Navigable airspace - airspace at and above minimum flight altitudes, including airspace needed for safe take-offs and landings.

NDB - nondirectional radio beacon.

Negative- No

Noise contours - A noise impact boundary line connecting places on a map where the level of sound is the same. Some of the terminology and methods used in developing noise contours include:

1. A-Weighted Sound Level (dBA): Commonly used sound measurement which approximates the manner in which the human ear responds to sounds.
2. Composite Noise Rating (CNR): A measure, taken over a 24-hour period, of the noise environment produced by aircraft operations. The CNR is calculated from aircraft noise and is expressed in terms of the maximum perceived noise level (PNL) and the number of operations in daytime and nighttime periods.
3. Day-Night Average Sound Level (Ldn): Equivalent noise level produced by airport/aircraft operations during a 24-hour time period, with a 10-decibel penalty applied to the level measured during the nighttime hours of 10 pm to 7 am.
4. Equivalent Sound Level (Leq): the constant sound level which, in a given situation and time period, conveys the same sound energy as does the actual time-varying sound in the same period. the equivalent sound level is the same as the average sound level.
5. Noise Exposure Forecast (NEF): A measure of the noise environment over a 24-hour period. It is based upon summation of individual noise events over the 24-hour period, with adjustments applied for nighttime noises.

Noise Exposure Map - A scaled, geographic depiction of an airport, its noise contours, and its surrounding area developed in accordance with FAR Part 150, including the accompanying documentation setting forth the required descriptions of projected aircraft operations at that airport in the current year and during the fifth calendar year beginning after submission of the map, together with the ways, if any, those operations for each of those years will affect the map (including noise contours and the forecast land uses).

Nondirectional radio beacon (NDB) –

1. A low- or medium-frequency radio beacon transmits nondirectional signals whereby the pilot of an aircraft equipped with a loop antenna can determine his bearing and "home" on the station. These facilities normally operate in the frequency band of 200 to 415 kHz and transmit a continuous carrier with 1,020-cycle modulation keyed to provide identification except during voice transmission.
2. When a radio beacon is used in conjunction with the instrument landing system markers, it is called a compass locator.
3. All radio beacons except the compass locators transmit a continuous three-letter identification in code except during voice transmissions. Compass locators transmit a continuous two-letter identification in code. The first and second letters of the three-letter location identifier are assigned to the front course outer marker compass locator (LOM), and the second and third letters are assigned to the front course middle marker compass locator (LMM), Example: ATLANTA, ATL, LOM-AT, LMM-TL.
4. Voice transmissions are made on radio beacons unless the letter "W" (without voice) is included in the class designator (HW).
5. Radio beacons are subject to disturbances resulting in ADF needle deviations, signal fades, and interference from distant stations during night operations. Pilots are cautioned to be on the alert for these vagaries.

Nonprecision approach procedure - standard instrument approach procedure in which no electronic glide slope is provided.

Nonprecision instrument runway - A runway having an existing or planned instrument approach procedure from which a straight-in landing is approved but

no electronic glide slope information is available and for which no precision approach facilities are planned.

Nontower airports –

1. Preparatory to landing at an airport without an operating control tower, but at which either an FSS or a UNICOM is located, pilots should contact the FSS or UNICOM for traffic advisories, wind, runway in use, and traffic flow information. CAUTION: all aircraft may not be communications with the FSS or UNICOM. They can only issue traffic advisories on those they are aware of.
2. At those airports not having a tower, FSS or UNICOM visual indicators, if installed, provide the pilot with landing information.

O - in the phonetic alphabet is Oscar (oss-cah).

Obstacle - An existing object, object of natural growth, or terrain at a fixed geographical location, or which may be expected at a fixed location within a prescribed area, with reference to which vertical clearance is or must be provided during flight operation.

Oct - octane.

Offset Parallel Runways - Staggered runways having centerlines which are parallel.

OM - outer marker ILS.

Operations – Basically defined as a single take off or landing event.

Outer fix - a fix in the destination terminal area, other than the approach fix, to which aircraft are normally cleared by an air route traffic control center or a terminal area traffic control facility, and from which aircraft are cleared to the approach fix or final approach course.

Overseas SAR region - overseas unified command areas, including the inland area of Alaska, which are not included within the inland region or maritime region as defined by the national SAR plan.

P - in the phonetic alphabet is Papa (pah-pah).

PAR - precision approach radar.

Parallel Runways - Two or more runways at the same airport whose centerlines are parallel. In addition to runway number, parallel runways are designated as L (left) and R (right) or, if three parallel runways exist, L (left), C (center), and R (right).

PATWAS - pilots automatic weather answering service.

PCA - positive control area.

Pilots automatic telephone weather answering service (PATWAS) - at some locations the numbers of pilots requiring flight weather briefings are too numerous for person-to-person briefings. PATWAS assists in this important service with telephone recorded weather briefings available at several locations. The recorded briefing includes a weather forecast which emphasizes expected weather up to about 12 hours in advance. Forecasts given around for the next morning.

Positive control area - is airspace so designated in Part 71.193 of the Federal Aviation Regulations, wherein aircraft are required to be operated under instrument flight rules.

Precision approach - a descent in an approved procedure where the navigation facility alignment is normally on the runway centerline, and glide slope information is provided such as ILS or PAR.

Precision approach radar - 1. Precision approach radar is designed to be used as a landing aid, rather than an aid for sequencing and spacing aircraft. PAR equipment may be used as a primary landing aid, or it may be used to monitor other types of approaches. It is designed to display range, azimuth, and elevation information.

Primary service - Primary service airports are public-use airports which receive scheduled passenger service aircraft and which annually enplane one one-hundredth percent (0.01%) or more of the combined total domestic passenger enplanements for all United States air carriers.

Primary surface - A primary surface is longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway. When the runway has no specially prepared hard surface, or planned hard surface, the primary surface terminates at each end of the runway. The width of a primary surface ranges from 250 feet to 1,000 feet, depending on the existing or planned approach system. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline.

(FAA) Public Airport - means any airport which is used or to be used for public purposes under control of a public agency, the Landing area of which is publicly-owned.

(FAA) Public-use Airport - means (a) any public airport; (b) any privately-owned reliever airport; or (c) any privately-owned airport which is determined by the Secretary to enplane annually 2,500 or more passengers and receive scheduled passenger service of aircraft, which is used or to be used for public purposes.

Q - in the phonetic alphabet is Quebec (keh-beck).

R - in the phonetic alphabet is Romeo (row-me-oh).

RADAR - radio detection and ranging.

Radar assistance to VFR aircraft - radar equipped Federal Aviation Administration air traffic control facilities provide radar assistance and navigation service (vectors) to VFR aircraft provided the aircraft can communicate with the facility, is within radar coverage, and can be radar identified.

Radar contact - used by air traffic controllers, indicates that an aircraft is identified on the radar display and that radar service can be provided until radar identification is lost or radar service is terminated. When the aircraft is informed of "radar contact" it automatically discontinues reporting over compulsory reporting points.

Radar handoff - that action whereby radar identification of, radio communications with, and, unless otherwise specified, control responsibility for an aircraft is transferred from one controller to another without interruption of radar flight following.

Radar identification - the process of ascertaining that a radar target is the radar return from a particular aircraft.

Radar service - a term which encompasses one or more of the following services, based on the use of radar which can be provided by a controller to a pilot of a radar-identified aircraft: (a) radar separation-radar spacing of aircraft in accordance with established minima; (b) radar navigation guidance-vectoring aircraft to provide course guidance; and (c) radar monitoring-the radar flight following of aircraft, whose primary navigation is being performed by the pilot, to observe and note deviations from its authorized flight path airway, or route. As applied to the monitoring of instrument approaches from the final approach fix to the runway, it also includes the provision of advice on position relative to approach fixes and whenever the aircraft proceeds outside the prescribed safety zones.

Radar traffic information service - a service provided by radar air traffic control facilities. Pilots receiving this service are advised of any radar target observed on the radar display which may be in such proximity to the position of their aircraft or its intended route of flight that it warrants their attention. This service is not intended to relieve the pilot of his responsibility for continual vigilance to see and avoid other aircraft.

Radial - a magnetic bearing extending from an ADF, a VOR, VORTAC, or TACAN.

RAPCON - radar approach control (United States Air Force).

RBN - radio beacon.

RCO - remote communications outlet.

Regional airline - An airline providing regularly scheduled passenger or cargo service with aircraft usually seating less than 60 passengers or cargo aircraft with 18,000 -pound payload or less. Special provisions, however, enable regional airlines to operate any size aircraft under certain conditions.

REIL - runway end identifier lights.

Restricted area - airspace of defined dimensions identified by an area on the surface of the earth within which the flight of aircraft, while not wholly prohibited, is subject to restrictions.

Right traffic indicator - at some airports, a flashing amber light is installed near the center of the segmented circle (but usually on top of the control tower or adjoining building) which indicates that a right traffic pattern is in effect at the time.

Rotating beacons - the rotating (surface) beacon has a vertical light distribution such as to make it most effective at angles of 1 degree to 3 degrees above the horizontal from its site; however, it can be seen well above and below this peak spread. Rotation is in clockwise direction when viewed from above. It is always rotated at a constant speed, producing the visual effect of flashes at regular intervals. Flashes may be one or two colors alternately. The total number of flashes are: 12 to 15 per minute for beacons marking airports, landmarks, and points on federal airways; 12 to 40 per minute for hazard beacons. The colors and color combinations of rotating beacons and auxiliary lights are basically:

White and Green.....lighted land airport
* Green alone.....lighted land airport
White and Yellow.....lighted water airport
* Yellow alone.....lighted water airport
White and Red.....landmark or navigational point
White alone.....unlighted land airport (rare
installation)
Red alone.....hazard

* Green alone or yellow alone is used only in connection with a not-far-distant white-and-green or white-and-yellow beacon display, respectively..

There are also rotating beacons and high intensity lights on aircraft for better visibility of their movements at night.

Runway - a strip, either paved or improved, on which take-offs and landings are effected. Runways are numbered to correspond to their magnetic bearing. Runway 27, for example, has a bearing of 270 degrees. Surface wind direction issued by the tower is also magnetic. (Winds aloft are given in true degrees.)

Runway edge light systems - used to outline the edges of runways during periods of darkness and restricted visibility conditions; classified according to the intensity or brightness they are capable of producing. They are high intensity runway lights (HIRL), medium intensity runway lights (MIRL), and low intensity runway lights (LIRL). The HIRL and MIRL systems have variable intensity controls, whereas the LIRLs normally have one intensity setting.

Runway end identifier lights (REIL) - are installed at many airfields to provide rapid and positive identification of the approach end of a particular runway. The system consists of a pair of synchronized flashing lights, one of which is located laterally on each side of the runway threshold facing the approach area. They are effective for: (a) identification of a runway surrounded by a preponderance of other lighting; (b) identification of a runway which lacks contrast with surrounding terrain; and (c) identification of a runway during reduced visibility.

Runway Gradient - The average slope, measured in percent between two ends or points on a runway. Runway gradient is depicted on government aerodrome sketches when total runway gradient exceeds 0.3%.

Runway Heading - The magnetic direction indicated by the runway number. When cleared to "fly/maintain runway heading," pilots are expected to comply with the ATC clearance by flying the heading indicated by the runway number without applying any drift correction.; e.g., Runway 4,040 degrees magnetic heading; Runway 20,200 degrees magnetic heading.

Runway length - landing - The measured length from the threshold to the end of the runway.

Runway length - physical -the actual measured length of the runway.

Runway length - takeoff - The measured length from where the takeoff is designed to begin to the end of the runway.

Runway marking - in the interest of safety, regularity, or efficiency of aircraft operations, the Federal Aviation Administration has recommended for the guidance of the public the following airport marking (runway numbers and letters are determined from the approach direction. The number is the whole

number nearest one-tenth the magnetic azimuth of the centerline of the runway, measured clockwise from the magnetic north. For example, runway 34 is equivalent to 340 degrees. The letter or letters differentiate between parallel runways: For two parallel runways "L" "R"; for three parallel runways "L" "C" "R".):

- (a) basic runway marking - used for operations under VFR: centerline marking and runway direction numbers;
- (b) nonprecision instrument runway marking - served by a nonvisual navigation aid and intended for landings under instrument weather conditions: basic runway markings plus threshold marking;
- (c) precision instrument runway marking - served by nonvisual precision approach aids and on runways having special operational requirements, nonprecision instrument runway marking, touchdown zone marking, fixed distance marking, plus side stripes;
- (d) threshold - a line perpendicular to the runway centerline designating the beginning of that portion of a runway usable for landing;
- (e) displaced threshold - a threshold that is not at the beginning of the full strength runway pavement;
- (f) closed or overrun/stopway areas - any surface or area which appears usable but which, due to the nature of its structure, is unusable;
- (g) fixed distance marker - to provide a fixed distance marker for landing of turbojet aircraft on other than a precision instrument runway. This marking is similar to the fixed distance marking on a precision instrument runway and located 1,000 feet from the threshold;
- (h) short take-off and landing runway (STOL) - in addition to the normal runway number marking, the letters STOL are painted on the approach end of the runway and a touchdown aim point;
- (i) taxiway marking - the taxiway centerline is marked with a continuous yellow line. The edges are marked with 2 continuous lines 6 inches apart. Taxiway HOLDING LINES consists of 2 continuous lines and 2 dashed lines perpendicular to the centerline. Pilots should stop short of the holding line for runway or when instructed by ATC to "HOLD SHORT OF (runway, ILS critical area, etc.)."

Runway separation - tower controllers establish the sequence of arriving and departing aircraft by requiring them to adjust flight or ground operation as necessary to achieve proper spacing.. They may "HOLD" an aircraft short of the runway to achieve spacing between it and another arriving aircraft; the controller may instruct a pilot to "EXTEND DOWNWIND" in order to establish spacing from another arriving or departing aircraft. At times a clearance may include the word "IMMEDIATE TAKE-OFF." In such cases "IMMEDIATE" is used for purposes of air traffic separation. It is up to the pilot to refuse the clearance if, in his opinion, compliance would adversely affect his operation.

Runway Use Program - A noise abatement runway selection plan designed to enhance noise abatement efforts with regard to airport communities for arriving and departing aircraft. These plans are developed into runway use programs and apply to all turbojet aircraft 12,500 pounds or heavier; turbojet aircraft less than 12,500 pounds are included only if the airport proprietor determines that the aircraft creates a noise problem. Runway use programs are coordinated with FAA offices, and safety criteria used in these programs are developed by the Office of Flight Operations. Runway use programs are administered by the air traffic service as "formal" or "informal" programs.

RVR - runway visual range.

S - in the phonetic alphabet is Sierra (see-air-ah).

Segmented circle - a system designed to provide traffic pattern information at airports without operating control towers.

Sequence report - the weather report transmitted hourly to all teletype stations, and available at all FSS communication stations.

Short take-off and landing (STOL) runway - a runway specifically designated and marked for STOL operations. (See RUNWAY MARKING.)

SID - standard instrument departure.

SIGMET - (issued only if the hazardous weather was not accurately predicted in the area/terminal forecasts) include weather phenomena potentially hazardous to all aircraft, specifically: (a) tornadoes; (b) line of thunderstorms (squall lines); (c) embedded thunderstorms; (d) hail 3/4" or more; (e) severe and extreme turbulence; (f) severe icing; and (g) widespread duststorms/sandstorms, lowering visibilities to less than 2 miles.

Simultaneous landings on intersecting runways - the safety and operation of an aircraft are the responsibility of the pilot. If for ANY reason (difficulty in discerning location of intersection at night, wind factors, etc.) a pilot prefers to use the full length of the runway, a different runway, or desires to obtain the distance from the runway threshold to the intersection. HE IS EXPECTED TO PROMPTLY INFORM ATC ACCORDINGLY.

SM - statute mile(s).

Small aircraft - usually aircraft of 12,500 pounds or less, maximum certified take-off weight.

Special use airspace - consists of that airspace wherein activities must be confined because of their nature, or wherein limitations are imposed upon aircraft operations that are not a part of those activities, or both. These areas are depicted on aeronautical charts.

Special VFR clearances –

1. An ATC clearance must be obtained prior to operating within a control zone when the weather is less than that required for VFR flight. Within most control zones, a VFR pilot may request and be given a clearance to conduct special VFR flight to, from, or within the control zone providing such flight will not delay IFR operations. The weather and clearance from cloud requirements for special VFR flight are: 1 mile ground visibility if landing or departing (1/2 mile for air carriers), 1 mile flight visibility if transiting the control zone, and flight to be conducted clear of clouds. When a control tower is located within the control zone, requests for clearances should be to the tower. If no tower is located within the control zone, a clearance may be obtained from the nearest tower, flight service station, or center.
2. It is not necessary to file a complete flight plan with the request for clearance, but the pilot should state his intentions in sufficient detail to permit air traffic control to fit his flight into the traffic flow. The clearance will not contain a specific altitude, as the pilot must remain clear of clouds. The controller may require the pilot to fly at or below a certain altitude due to other traffic, but the altitude specified will permit flight at or above the minimum safe altitude. In addition, at radar locations flights may be vectored if necessary for control purposes or on pilot request.
3. ATC provides separation between special VFR flights and between them and other IFR flights.
4. Within some control zones, the volume of IFR traffic is such that special VFR flight cannot be permitted.

Special VFR operations - aircraft operating in accordance with clearances within control zones in weather conditions less than the basic VFR weather minima.

Standard instrument departure (SID) - a preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual or textual form only.

Standard terminal arrival route (STAR) - a preplanned coded air traffic control IFR arrival routing, established for application to arriving IFR aircraft destined for certain airports, and preprinted for pilot use in graphic and textual or textual form only. Its purpose is to simplify clearance delivery procedures.

Statute mile - 5,280 feet. See also NAUTICAL MILE.

STOL - short take-off and landing.

Stopway - area beyond take-off runway used in decelerating airplane during an aborted take-off.

Surveillance radar –

1. Surveillance radars are divided into two general categories: airport surveillance radar (ASR) and air route surveillance radar (ARSR). ASR is designed to provide relatively short-range coverage in the general vicinity of an airport and to serve as an expeditious means of handling terminal area traffic through observation of precise aircraft locations on a radarscope. The ASR can also be used as an instrument approach aid. ARSR is a long-range radar system designed primarily to provide a display of aircraft locations over large areas.
2. Surveillance radars scan through 360 degrees of azimuth and present target information on a radar display located in a tower or center. This information is used independently or in conjunction with other navigational aids in the control of air traffic.

T - in the phonetic alphabet is Tango (tan-go).

T-hangar - A T-shaped aircraft hangar that provides shelter for a single plane.

Tactical air navigation (TACAN) - UHF navigational facility, omni-directional course and distance information. For reasons peculiar to military or naval operations (unusual siting conditions, the pitching and rolling of a naval vessel, etc.) the civil VOR-DME system of air navigation was considered unsuitable for military or naval use. A new navigational system, TACAN, was therefore developed by the military and naval forces to more readily lend itself to military and naval requirements. As a result, the Federal Aviation Administration has been in the process of integrating TACAN facilities with the civil VOR-DME program. Although the theoretical, or technical principles of operation of TACAN equipment are quite different from those of VOR-DME facilities, the end result, as far as the navigating pilot is concerned, is the same. These integrated facilities are called VORTACs.

Take-off clearance - tower controllers establish the sequence of arriving and departing aircraft by requiring them to adjust flight or ground operation as necessary to achieve proper spacing. They may "HOLD" an aircraft short of the runway to achieve spacing between it and another arriving aircraft. At times a clearance may include the word "IMMEDIATE." For example: "CLEARED FOR IMMEDIATE TAKE-OFF." In such cases "IMMEDIATE" is used for purposes of air traffic separation. It is up to the pilot to refuse the clearance if, in his opinion, compliance would adversely affect his operation.

Taxi - The movement of an airplane under its own power on the surface of an airport. Also, it describes the surface movement of helicopters equipped with wheels.

Terminal Area - The area used or intended to be used for such facilities as terminal and cargo buildings, gates, hangars, shops, other service buildings, automobile parking, airport motels, restaurants, garages, and automobile service.

Terminal control area (TCA) - consists of controlled airspace extending upward from the surface or higher to specified altitudes, within which all aircraft are subject to operating rules and pilot and equipment requirements specified in Part 91 of the Federal Aviation Regulations. TCAs are described in Part 71 of the Federal Aviation Regulations. Each such location is designated as a Group I or Group II terminal control area, and includes at least one primary airport around which the TCA is located.

1. Group I terminal control areas represent some of the busiest locations in terms of aircraft operations and passengers carried, and it is necessary for safety reasons to have stricter requirements for operation within Group I TCAs. Student pilots are forbidden..
2. Group II terminal control areas represent less busy locations, and though safety dictates some pilot and equipment requirements, they are not as stringent as those for Group I locations. Student pilots are permitted.
3. As terminal control areas come into being, they will be described and shown in graphic form, normally in Part 3 of the Airman's Information Manual, and then transferred to Part 4. In addition, for operational use, TCAs will be shown on a new series of VFR TERMINAL AREA CHARTS, available from the coast and geodetic survey.

Terminal control area operation - the operating rules and pilot and equipment requirements for operating within a terminal control area (TCA) are found in Federal Aviation Regulations, 91.90. Pilots should not request a clearance to operate within a TCA unless these requirements are met. (See TERMINAL CONTROL AREA.)

1. Operating rules and pilot/equipment requirements - Regardless of weather conditions, or whether the pilot is on an IFR flight plan or VFR, an ATC authorization is required prior to operating within a TCA. Additional requirements include: (a) a two-way radio capable of communicating with ATC on appropriate frequencies; (b) a VOR or TACAN receiver; (c) an appropriate radar beacon transponder (this is not required for VFR flights at Group II TCAs); and (d) private pilot certificate or better in order to land or take off from an airport within a Group I TCA.
2. Flight procedures - VFR Flights: (a) arriving VFR flights should contact ATC on the appropriate frequency and in relation to geographical fixes shown on local charts. Although a pilot may be operating beneath the floor of the TCA on initial contact, communications with ATC should be established in relation to the points indicated for spacing and sequencing purposes; (b) departing VFR aircraft should advise the ground controller of the intended altitude and route of flight to depart the TCA; (c) aircraft not landing/departing the primary airport may obtain ATC clearance to transit the TCA when traffic conditions permit and provided the requirements of Federal Aviation Regulation 91.90 are met. Such VFR transiting aircraft are encouraged, to the extent possible, to transit through VFR corridors or above or below the TCA.

Tetrahedron - a construction used in place of a T-bar in the segmented circle at some airports to indicate wind direction.

Threshold crossing height (TCH) - the height of the straight line extension of the visual or electronic glide slope above the runway threshold.

Tie-down area - A parking area for securing aircraft; can be for overnight (transient operator) or permanent use (in lieu of a hangar).

Tower-controlled airports –

1. When operating to an airport where traffic control is being exercised by a control tower, pilots are required to maintain two-way radio contact with the tower while operating within the airport traffic area unless the tower authorizes otherwise. Initial callup should be made about 15 miles from the airport.
2. When necessary, the tower controller will issue clearances or other information for aircraft to generally follow the desired flight path (traffic patterns) when flying in the airport traffic area/control zone, and the proper taxi routes when operating on the ground. If not otherwise authorized or directed by the tower, pilots approaching to land in an airplane must circle the airport to the left, and pilots approaching to land in a helicopter must avoid the flow of fixed wing traffic. However, an appropriate clearance must be received from the tower before landing.

TRACON - terminal radar approach control.

Traffic pattern - the traffic flow that is prescribed for aircraft landing at, taxiing on, and taking off from an airport. The usual components of a traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach. The following terminology for the various components of a traffic pattern has been adopted as standard for use by control towers and pilots:

upwind leg - a flight path parallel to the landing runway in the direction of landing

crosswind leg - a flight path at right angles to the landing runway off its take-off end

downwind leg - a flight path parallel to the landing runway in the direction opposite to landing

base leg - a flight path at right angles to the landing runway off its approach end and extending from the downwind leg to the intersection of the extended runway centerline

final approach - a flight path in the direction of landing along the extended runway centerline from the base leg to the runway.

Traffic pattern altitudes - at most airports and military air bases, generally extend from 600 feet to as high as 1,500 feet above the ground for propeller driven aircraft; up to 2,500 feet above the ground for military turbojet aircraft. Therefore, pilots of en route aircraft should be constantly on the alert for other aircraft in traffic patterns and avoid these areas whenever possible. Traffic pattern altitudes should be maintained unless otherwise required by the applicable distance from cloud criteria (Federal Aviation Regulation 91.105).

Traffic pattern direction - all airport traffic patterns circle to the left unless approved light signals or visual markings in the segmented circle, or dual runways, indicate a right hand pattern.

Transient - Operations or other activity performed by aircraft not based at the airport.

Transition areas -

1. Controlled airspace extending upward from 700 feet or more above the surface when designated in conjunction with an airport for which an instrument approach procedure has been prescribed, or from 1,200 feet or more above the surface when designated in conjunction with airway route structures or segments. Unless specifically specified otherwise, transition areas terminate at the base of overlying controlled airspace.

2. Transition areas are designated to contain IFR operations in controlled airspace during portions of the terminal and en route environment.

Transponder - the airborne radar beacon receiver-transmitter which automatically receives radio signals from all interrogators on the ground, and which selectively replies with a specific reply pulse or pulse group only to those interrogations being received on the mode to which it is set to respond.

TRSA - Terminal radar service area.

Turbojet Aircraft - An aircraft having a jet engine in which the energy of the jet operates a turbine which in turn operates the air compressor.

Turboprop Aircraft - An aircraft having a jet engine in which the energy of the jet operates a turbine which drives the propeller.

TWEB - transcribed weather broadcast.

Twr - tower.

Twy - taxiway.

U - in the phonetic alphabet is Uniform (you-nee-form).

UHF - ultra high frequency.

Ultralight Vehicle - An aeronautical vehicle operated for sport or recreational purposes which does not require FAA registration, an airworthiness certificate, nor pilot certification. They are primarily single-occupant vehicles, although some two-place vehicles are authorized for training purposes. Operation of an ultralight vehicle in certain airspace requires authorization from ATC.

Uncontrolled airports - use left-turn pattern approach unless airport displays approved light signals or visual markings in the segmented circle to indicate right-hand pattern.

Uncontrolled airspace - is that portion of the airspace that has not been designated as continental control area, control area, control zone, terminal control area, or transition area and within which ATC has neither the authority nor the responsibility for exercising control over air traffic.

UNICOM - a private aeronautical advisory communications facility operated for purposes other than air traffic control, transmits and receives on one of the following frequencies:

U1 - 122.8 MHz for landing areas (except heliports) without an ATC tower or FSS;

U2 - 123.0 MHz for landing areas (except heliports) with an ATC tower or FSS;

U3 - 123.05 MHz for heliports.

V - in the phonetic alphabet is Victor (vik-tah).

VASI - visual approach slope indicator.

Vector - the resultant of two quantities (forces, speeds, or deflections); used in aviation to compute load factors, headings, or drift.

Vertical take-off and landing (VTOL) aircraft - an aircraft which has the capability of vertical take-off and landing. These aircraft include, but are not limited to, helicopters.

VFR - visual flight rules.

VFR conditions - basic weather conditions prescribed for flight under visual flight rules.

VHF Omnidirectional range (VOR) -

1. VORs operate within the 108.0 - 117.95 MHz frequency band and have a power output necessary to provide coverage within their assigned operational service volume. The equipment is VHF; thus, it is subject to line-of-sight restriction, and its range varies proportionally to the altitude of the receiving equipment. There is some "spillover," however, and reception at an altitude of 1,000 feet is about 40 to 45 miles. This distance increases with altitude.

2. There is voice transmission on the VOR frequency and all information broadcast over L/MF ranges is also available over the VORs.

3. The effectiveness of the VOR depends upon proper use and adjustment of both ground and airborne equipment: (a) accuracy - the accuracy of course alignment of the VOR is excellent, being generally plus or minus 1 degree; (b) roughness - on some VORs, minor course roughness may be observed, evidenced by course needle or brief flag alarm activity (some receivers are more subject to these irregularities than others). At a few stations, usually in mountainous terrain, the pilot may occasionally observe a brief course needle oscillation, similar to the indication of "approaching station." Pilots flying over unfamiliar routes are cautioned to be on the alert for these vagaries and, in particular, to use the "to-from" indicator to determine positive station passage; (c) certain propeller RPM settings can cause the VOR course deviation indicator to fluctuate as much as plus or minus 6 degrees. Slight changes to the RPM setting will normally smooth out this roughness. Helicopter rotor speeds may also cause VOR course disturbances. Pilots are urged to check for this propeller modulation phenomenon prior to reporting a VOR station or aircraft equipment for unsatisfactory operation.
4. The only positive method of identifying a VOR is by its Morse code identification or by the recorded automatic voice identification, which is always indicated by use of the word "VOR" following the name of the range. Reliance on determining the identification of an omnirange should never be placed on listening to voice transmissions by the flight service station (or approach control facility) involved. Many FSSs remotely operate several omniranges which have different names from each other and in some cases none has the name of the parent FSS. (During periods of maintenance the coded identification is removed.)
5. Voice identification has been added to numerous VHF "AIRVILLE VOR" (VORTAC) alternating with the usual Morse code identification. If no air-ground communications facility is associated with the omnirange, "AIRVILLE UNATTENDED VOR" (VORTAC) will be heard.

VHF omnidirectional range/tactical air navigation (VORTAC)-

1. VORTAC is a facility consisting of two components, VOR and TACAN, which provides three individual services: VOR azimuth, TACAN azimuth, and TACAN distance (DME) at one site. Although consisting of more than one component, incorporating more than one operating frequency, and using more than one antenna system, a VORTAC is considered to be a unified navigational aid. Both components of a VORTAC are envisioned as operating simultaneously and providing the three services at all times.
2. Transmitted signals of VOR and TACAN are each identified by three-letter code transmission and are interlocked so that pilots using VOR azimuth with TACAN distance can be assured that both signals being received are definitely from the same ground station. A supplementary automatic voice identification is being added to the VOR. The frequency channels of the VOR and the TACAN at each VORTAC facility are "paired" in accordance with a national plan to simplify airborne operation.

Victor airways - low altitude federal airways indicated by V and a number on aeronautical charts. East-west airways are even-numbered; north-south, odd-numbered.

Visibility - The ability, as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night. Visibility is reported as statute miles, hundreds of feet or meters.

Visibility, Flight Visibility - The average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night

Visibility, Ground Visibility - Prevailing horizontal visibility near the earth's surface as reported by the United States National Weather Service or an accredited observer.

Visibility, Prevailing Visibility - The greatest horizontal visibility equaled or exceeded throughout at least half the horizon circle which need not necessarily be continuous.

Visibility, runway visibility value (RVV) - the visibility determined for a particular runway by a transmissometer, a photoelectric device calibrated in terms of a human observer. A meter in the control tower provides a continuous indication of the visibility (reported in miles or fractions of miles) for the runway. RVV is used in lieu of prevailing visibility in determining minimums for a particular runway. This program is gradually being replaced by RVR at transmissometer locations.

Visibility, runway visual range (RVR) - an instrumentally derived value, based on standard calibrations, that represents the horizontal distance a pilot will see down the runway from the approach end; it is based on the sighting of either high intensity runway lights or on the visual contrast of other targets, whichever yields the greater visual range. RVR, in contrast to prevailing or runway visibility, is based on what a pilot in a moving aircraft should see looking down the runway. RVR is horizontal, and not slant, visual range. It is based on the measurement of a transmissometer made near the touchdown point of the instrument runway and is reported in hundreds of feet. RVR provides an additional operating minimum at fields equipped with specified navigational aids. For example, at the present time the RVR minimum at Newark is 2,000 feet (in combination with a decision height [DH] of 218' MSL) for both take-offs and landings, regardless of the reported ceiling and visibility.

Visual approach - an approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of a radar facility and having an air traffic control authorization, may deviate from the prescribed instrument approach procedure and proceed to the airport of destination by visual reference to the surface.

Visual approach slope indicator (VASI) -

1. The VASI gives visual descent guidance information during the approach to a runway. The standard VASI consists of downwind and upwind light bars that provide a visual glide path which provides safe obstruction clearance within the approach zone. Some airports serving long-bodied aircraft have 3-bar VASIs which provide two visual glide paths to the same runway. The first glide path encountered is the same as provided by the standard Federal Aviation Administration VASI. The second glide is about 1/2 degrees higher than the first and is designed for the use of pilots of long-bodied aircraft. Lateral Descent, using the VASI, should not be initiated until the aircraft is visually aligned with the runway.
2. Standard VASI installation consists of either 2, 4, or 12 light units arranged in downwind and upwind light bars. The 3-bar installation consists of the standard VASI with an additional light bar installed equidistant upwind. A minimum of 6 light units are required for this installation.
3. The following information is provided for pilots as yet unfamiliar with the principles and operation of this system and pilot technique required. The basic principle of the VASI is that of color differentiation between red and white. Each light unit projects a beam of light having a white segment in the upper part of the beam and red segment in the lower part of the beam. The light units are arranged so that the pilot using the VASIs during an approach will see the following combination of lights:

Standard FAA 2-bar VASI

Below glide path	Red	Runway	Red
	Red		Red

On glide path	Red	Runway	Red
	White		White
Above glide path	White	Runway	White
3-Bar VASI			
Below both glide paths	Red	Runway	Red
	Red		Red
	Red		Red
On downwind glide path	Red	Runway	Red
	Red		Red
	White		White
On upwind glide path	Red	Runway	Red
	White		White
	White		White
Above both glide paths	White	Runway	White
	White		White
	White		White

4. When on the proper glide path, the pilot will overshoot the downwind bars and undershoot the upwind bars. Thus he will see the downwind bars as white and the upwind bars as red. From a position below the glide path the pilot will see the light bars as red and from above the glide path the light bars will appear white. Passing through the path from a low position is indicated to the pilot by a transition in color from red through pink to white. From a high position, passing through the path is indicated to the pilot by a transition in color from white through pink to red. When the pilot is below the glide path the red bars tend to merge into one distinct red signal. A safe obstruction clearance may not exist when this distinct red signal is visible. The visual glide path will separate into individual lights as the pilot approaches the runway threshold. At this point, the approach should be continued by reference to the runway touchdown zone.

5. In haze or dust conditions, or when the approach is made into the sun, the white lights may appear yellowish. This is also true at night when the VASI is operated at a low intensity. Certain atmospheric debris may give the white lights an orange or brownish tint; however, the red lights are not affected and the principle of color differentiation is still applicable.

Visual separation –

1. Visual separation is a means employed by ATC to separate IFR aircraft in terminal areas. There are two methods employed to effect this separation: (a) the tower controller sees the aircraft involved and issues instructions, as necessary, to ensure that the aircraft avoid each other; (b) a pilot sees the other aircraft involved and upon instructions from the controller provides his own separation by maneuvering his aircraft as necessary to avoid it. This may involve following in-trail behind another aircraft or keeping it in sight until it is no longer a factor.

2. When pilots have been told to follow another aircraft or to provide visual separation from it, they should promptly notify the controller if they do not sight the other aircraft involved.

VOR - VHF omnidirectional range.

W - in the phonetic alphabet is Whiskey (wiss-key).

Way point, RNAV - a predetermined geographical position, used for route or instrument approach definition or progress reporting purposed, that is defined relative to a VORTAC station position. Two subsequently related way points define a route segment.

Weather radar - the national weather service operates a 90-station network of weather radars. These stations are generally spaced in such a manner as to enable them to detect and identify the type and characteristics of most of the precipitation east of the continental divide.

Wind coverage - The percent of time for which aeronautical operations are considered safe due to acceptable crosswind components.

Wind direction indicator - a wind cone installed at the center of the segmented circle on an airport and used to indicate wind direction and velocity. The large end of the wind cone points into the wind.

Wind rose - A graphic depiction of historical prevailing wind patterns by speed and direction at a given location. A series of concentric circles cut by radial lines indicates the average percentage of time during the observation period that winds were occurring at successive wind speed groupings and by true direction. Wind rose data are used primarily for determining optimal runway alignment for wind coverage.

Wind shear - A change in wind speed and/or wind direction in a short distance, resulting in a tearing or shearing effect. It can exist in a horizontal or vertical direction and occasionally in both.

Wind sock - a cloth sleeve, mounted aloft at an airport to use for estimating wind direction and velocity

Wind tee - an indicator for wind or traffic direction at an airport.

X - in the phonetic alphabet is Xray (ecks-ray).

Y - in the phonetic alphabet is Yankee (yang-key).

Z - in the phonetic alphabet is Zulu (zoo-loo).

Z - Greenwich mean time.

**Lease Agreement for Large Community Hangar
of the Durant Airport Authority**

STATE OF OKLAHOMA)
) SS:
COUNTY OF BRYAN)

This Agreement, entered into this _____ day of _____, 2018, by and between the Durant Airport Authority (hereinafter called "Lessor"), being a public trust, and _____ (hereinafter called "Lessee"), with a mailing address being _____.

The Lessor, being the owner of certain hangars at Eaker Field Airport, Durant, Oklahoma, hereby agrees to lease the Large Hangar and a tract of land as identified in attachment "A" for the sum of \$2,400.00 annually for years 1-5, \$2,640.00 annually for years 6-10, for years 11 -20 on the contract anniversary date the annual rental fee shall increase by the previous calendar year's Consumer Price Index (CPI) as published by the U.S. Department of Labor, Bureau of Labor Statistics. (previous year's annual fee x (1 + CPI) = new monthly fee). Each annual payment thereafter, except the last annual payment shall be due and payable on the 1st day of March, for a term of 20 years at which time Lessee has exclusive right for 4 additional 5-year terms with a continuing escalation rate as previously set forth herein.

1. Lessee hereby agrees to make payment as above described during the term of the lease.
2. Lessee hereby agrees that Lessor shall incur no liability for loss or damage to aircraft or other equipment housed in said hangar other than as a result of gross negligence.
3. Lessee hereby agrees to keep the leased space sufficiently presentable. This includes mowing and maintaining all landscaped areas associated with the property shown in attachment "A".
4. Lessee hereby understands and agrees that said hangar shall not be used for the parking or storage of a crop dusting airplane or crop dusting equipment and chemicals.
5. The aircraft hangar and included ground area are to be used primarily for aviation-related purposes. Any other use must be authorized in advance by Lessor.
6. All interior improvements and/or additions of each of the hangars must comply with the City of Durant's Fire Codes, Building Codes, Electrical Codes and Plumbing Codes.
7. No alteration or addition to the Large Hangar shall be authorized without the written approval of the City Manager of Durant. Lessee shall hold harmless Lessor for any and all debts, liens, or other obligation incurred as a result of Lessee's improvements to or activities associated with the Large Hangar and other leased property.

8. No activity will be permitted unless in compliance with the Durant City Codes and Federal Aviation Administration regulations. No activity of any unlawful nature shall be performed or allowed on the leased premises.
9. Lessee shall be responsible for all utility bills including water, sanitary sewer, solid waste, electricity and any other utility service provided to the hangar.
10. Lessee shall be permitted to recondition this hangar along with addition of office, restroom facilities, and demising wall upon proper plan review and permitting by the City Building Official and Fire Marshal.
11. INSURANCE: The City can maintain insurance on the original exterior structure of the hangar which has an appraised value of \$500,000.00 as of the date of the execution of this Agreement. Lessee shall maintain liability insurance sufficient to recover any acts or omissions of negligence of Lessee and hold Lessor harmless from the same. Lessee shall provide property damage insurance in an amount sufficient to cover the amount of Lessee's investment and what other losses Lessee chooses to provide coverage. Lessee shall provide Lessor with certificate of insurance for all periods of this lease agreement.
12. Lessee may terminate contract at any time after the first one-year period upon 90-day written notice to Lessor.
13. Lessee agrees to invest an amount of more than \$300,000.00 within the first year toward improvements of the Large Hanger Improvements shall include window repairs; roof repair; paint, seal, and dustproof hangar floor; clean and paint exterior; spray insulation entire interior; update electrical and lighting entire interior.
14. Lessee is allowed to sublet areas of the Large Hanger insofar as the sublessee follows the same usage guidelines as set forth herein.
15. Lessor shall ensure Lessee as access from hangar to runway at all times.
16. Lessor will maintain all concrete and other common-area surfaces to aviation-suitable quality.

Dated this ____ day of _____, ____.

Durant Municipal Airport Trust Authority

Chairman

ATTEST:

Secretary

Lessee

Lessee

Mail all payments to: Durant Airport Authority
City Clerk's Office
P.O. Box 578
Durant, OK 74702-0578