

PARTS & INVENTORY APPRAISALS

PART I

by

Edwin Lindquist, Director- Asset Assurance

MORTEN BEYER & AGNEW, INC.

The following article is the first in a three part series discussing in detail appraisals of parts and inventories. MORTEN BEYER & AGNEW'S Director of Asset Assurance, Mr. Edwin Lindquist, will outline and discuss the ingredients pertinent to an aircraft parts and inventory appraisal. Aircraft parts and inventory appraisal methodology and industry accepted techniques will be reviewed in the second part of the series to demonstrate how these types of appraisals are assembled. The conclusion will offer an outlook on aircraft parts and inventory values and examine industry trends and conditions that have an impact on these values.

Part I – Introduction: Basics, Objective, & Purpose

The primary objective of an inventory value appraisal is the determination of a numerical result, either as a range or most probable dollar amount of a value, now or at some specified point in the past or future.

The numerical result is objective and unrelated to the desires, wishes or needs of the client who engages the appraiser to perform the work. The amount of this figure is totally independent of what someone desires it to be. All of the principles of the ethics of the appraisal stem from this central fact.

The appraiser's primary obligation to the client is to reach complete, accurate and pertinent conclusions and numerical results, regardless of the client's wishes or instructions in this regard. The fact that an appraiser has been employed to make an appraisal is a confidential matter. In some instances, the very fact of employment may be information that a client, whether private or public, prefers for valid reasons to keep confidential. Knowledge by outsiders of the fact of engagement of an appraiser may jeopardize a client's proposed transaction. Consequently, it is improper for the appraiser to disclose the fact of his or her engagement, unless the client approves of the disclosure or clearly has no interest in keeping the fact of the engagement confidential; or unless the appraiser is required by the due process of law to disclose the fact of his or her engagement.



It is not proper for an appraiser to reveal to any third party the amount of his or her evaluation without permission of the client unless required to do so by due process of law.

The purpose of performing an appraisal is to determine:

Fair Market Value

The Fair Market Value is the Appraiser's opinion of the most likely trading price that may be generated under the market circumstances that are perceived to exist at the time in question. Market value assumes the part, or parts are valued for its highest, best use, that the parties to the hypothetical sale transaction are willing, able, prudent and knowledgeable, and under no unusual pressure for a prompt sale, and that the transaction would be negotiated in an open and unrestricted market on an arm's-length basis, for cash or equivalent consideration, and given an adequate amount of time for effective exposure to prospective buyers.

Distress Value

The Distress Value is the Appraiser's opinion of the price at which the part, or parts could be sold under abnormal conditions, such as an artificially limited marketing time period, the perception of the seller being under duress to sell, an auction, a liquidation, commercial restrictions, legal complications, or other such factors that significantly reduce the bargaining leverage of the seller and give the buyer a significant advantage that can translate into heavily discounted actual trading prices. Apart from the fact that the seller is uncommonly motivated, the parties to the transaction are otherwise assumed to be willing, able, prudent and knowledgeable, negotiating at arm's-length, normally under the market conditions that are perceived to exist at the time, not an idealized balanced market.

Securitized Value or Lease-Encumbered Value

Securitized Value or Lease-Encumbered Value is the Appraisers opinion of the value of an inventory under lease, given a specified lease payment stream (rents and term), and estimated future residual value at lease termination, and an appropriate discount rate. The Securitized Value or Lease-Encumbered Value may be more or less than the Appraiser's opinion of Current Market Value. Moreover, the Appraiser may not be fully aware of the credit risks associated with the parties involved, nor all related factors such as the time-value of money to those parties, provisions of the lease that may pertain to items such as condition of parts, security deposits, purchase options at various dates, term extensions, sub-lease rights, repossession rights, reserve payments and return conditions.



Three Types of Appraisals Apply to Aircraft Parts Inventories:

Extended Desk Top Appraisal

An extended desktop appraisal is one that does not include an on-site inspection of the inventory and the related documentation but, does include consideration of condition status information that is provided to the appraiser from the client, aircraft operator, or in the case of a second opinion, possibly from another appraisers report. An extended desktop appraisal relies on the accuracy and details provided by the client. An extended desk top appraisal includes a disclaimer stating: "the Appraiser relied solely on the data and information provided by the client and did not independently inspect the inventory or verify the accuracy of the details and information provided."

Full Appraisal

A full appraisal is one that includes an inspection of the inventory and the associated records and documentation. This inspection is aimed solely at determining the overall condition of the inventory, records, and documentation to support the value opinions of the Appraiser. A full appraisal includes a full inspection, or random sampling of inventory line items to verify accuracy and completeness of the client's records representations compared to the actual findings of the line item details as found "on the shelf."

Comprehensive Appraisal

A comprehensive appraisal is one that includes a detailed inspection of the inventory records to ensure that the records are in sufficiently good order that each part has all the required certification documentation necessary for the part to be used by any certified operator in accordance with the requirements of their regulatory authorities. A comprehensive appraisal includes a 100% inspection for quality and quantity count verification of the entire inventory.

Reasons to determine Value

1. Collateral
2. Insurance
3. Taxes



Basic Ingredients of an inventory appraisal

1. Description
2. Quantity
3. Condition
4. Acquisition or List Price
5. Sell Price

If the basic information is available the evaluation process is relatively simple.

Simple example:

| | |
|--------------------|--|
| Description: | Washer (<i>with manufacturers documentation & package</i>) |
| Quantity: | One |
| Condition: | New |
| Acquisition Price: | As per purchase order |
| Sell Price: | Recent transaction |

The objective of the exercise is to sell something for more than you paid for it. The necessity for profit engages complications:

The acquisition price has to be less than the sell price; therefore in only remote circumstances will the acquisition price be the same as list price, except for new purchases from the OEM.

To buy at a lower price than list price a form of justification is required:

- ✦ Volume purchase discount
- ✦ Dealer purchase discount
- ✦ Distress sale purchase discount

The necessity to purchase below list price adds complications to the process:

Buying at volume to get a discount requires stocking an inventory (overhead).

Being a dealer will require services costs such as franchise fees, business structure, or other forms of overhead.

Purchasing from a distress sale often requires accepting items in addition to the “washer” or whatever the item of description you specialize in selling. Now things become more complicated due to diversification. Inventory increases and overhead increases.



Most people will agree that in the re-sale business the success secret is in the purchase. There is a good measure of truth to this statement and the lower the purchase price and the higher the selling price – the greater the profit; providing both the purchase and selling transactions take place. Even if an item is obtained *free* there is still a cost involved if and when the item sells. Purchasing at a distress sale generally adds to the complication sequence by virtue of adding other than “new condition” items to the inventory. If items do not fit the description of new they probably cannot be offered for sale as “new” therefore a less than new price will have to be considered and things become more complicated due to administration and control of the varying conditions of the inventory, except in case of OAG sales when price is of no object.

The five steps are no longer simple. Complications arise when basic information is not provided. A process has to be incorporated to use an alternate means to arrive at providing “substituted” information when basic information is not available or not provided.



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PART II METHODOLOGY OF APPRAISING AIRCRAFT PARTS AND INVENTORIES

by

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Item 1 - Analysis

Parts are grouped into 4 general classes; each class has its own sub-category of condition.

Rotable (component such as a pump)

New
Overhauled
Repaired
Serviceable
Unserviceable

Expendable (component such as a washer)

New
Serviceable



Item 2 – Quantity

As materials are purchased (acquired) and sold the quantity keeps changing.

What quantity does the appraiser use?:

1. The quantity provided by the owner of the inventory at the date the quantity is identified.
2. The actual count if a detailed inventory is taken & the date of the date of taking the detailed inventory.

Item 3 – Acquisition Price:

Purchase price (acquisition cost) will vary due to the circumstance of purchase. Depending on the nature of the company acquiring the inventory, the purchase price will either be a matter of record with each item purchased, or averaged, or assigned a “Book Value”.

What price does the appraiser use?:

1. The actual purchase price is most relevant.
2. The average purchase price is a good reference.
3. The “Book Value” is of little significance to the appraiser.

Item 4 – Sell Price

In the aircraft parts re-sale business the “sell price” is usually “as much as you can get”. As much as you can get is often determined by the motivation of the seller and the motivation of the buyer.

What is the significance of the sell price to the appraiser? This price is of high significance because it relates actual transactions. Actual transactions (providing they are current) are acceptable references in determining Fair Market Value in the appraisal forum.

The Appraisal: Putting it all together:

Establish the Context of the Inventory

Active Inventory: A dedicated inventory acquired to support a specific operation ie. An airline’s inventory acquired to support it’s own fleet.

Speculative Inventory: An inventory acquired for the purpose of re-sale to any willing buyer.



The objective of the appraisal is to determine Fair Market Value based on the subject of the appraisal (the inventory) to be valued at its “highest and best use”. In this context the “Active Inventory” has a value based on the airline’s own consumption and the airline’s own overhaul, repair, and replacement cost. The cost associated with an airline inventory is valued in the context of the on-going operation of the airline, therefore the relationship of the value lies in the replacement cost of each line item and in consideration of usage of each line item. The airline’s objective is to acquire items that comprise the inventory and use the items in support of day-to-day operations. When an airline determines it no longer has a need of an item(s), it will seek ways to dispose of it. At this point the items the airline disposes of usually become part of a speculative inventory.

The value of a Speculative Inventory lies in the relationship between the acquisition cost and the price it sells for. List prices are references to discounts negotiated in the acquisition as well as motivating the buyer to take part in a transaction. List prices are used as reference information. The actual value of a part in a Speculative Inventory will depend on sales history, availability, and usage. These factors form a basis of a discount scale or percentages that may be applied to a referenced list price.

The Active Inventory and Speculative Inventory share an important economic issue: **usage** or the **rate of turn over** of each line item in the inventory. For a transaction to happen there must be two parts. In the case of the Active Inventory there must be a “failure” of a part or component on the aircraft and a like replacement part on the inventory shelf. In the case of the Speculative Inventory there must be a “willing seller” and a “willing buyer”.

Establishing a Value

If there is a history of transactions detailing the selling prices of various items and there are transactions pertaining to most of the inventory line items, the inventory may be appraised on the basis of each line item unit having a cost attached to it and each line item having a transaction sale price attached to it. In the aircraft parts inventory sales business many of the unit line items will not have sales transactions and many of the line item units may not have acquisition and / or list prices. To arrive at a value of the line items without sale transaction history and line items that do not have acquisition and / or list price, a weighted averaging methodology can be used.

Weighted Average allows for the provision of a different importance or “weight” to each data item. The weighted average gives the flexibility to define or customize a system of importance when it is not appropriate to treat each item equally.

Example: Suppose one unit of a line item sells for \$182.00; one unit of another line item sells for \$386.00; and one unit of another line item sells for \$697.00. To obtain a weighted



average add \$182.00 + \$386.00 + \$697.00 = \$1,265.00. Then divide each of the line item units by \$1,265.00 to obtain the respective weight of that unit:

The weighted average may best be interpreted as an average to be used when some items have more importance than others; the items with the greater importance have more of a say in the value of the weighted average.

In this case the “weight” or most importance is based on the value of the item and in consideration of a quantity of one of each.

A typical parts inventory may consist of a large number of hardware items such as nuts, bolts, washers, etc., with a very low cost per unit item relative to few line items of high dollar value and small quantities. Following is an example showing value spread using weighted average and the effect of including quantity.

Calculation of Weighted Average

| Unit Price | Unit Weight | Unit Weighted Price | Quantity | Extended Weighted Price |
|-------------------|--------------------|----------------------------|-----------------|--------------------------------|
| \$1.25 | 0.000987167 | \$0.001234 | 2500 | \$3.08 |
| \$182.00 | 0.143731491 | \$26.16 | 70 | \$1,831.14 |
| \$386.00 | 0.304837117 | \$117.67 | 45 | \$5,295.02 |
| \$697.00 | 0.550444225 | \$383.66 | 8 | \$3,069.28 |
| \$1,266.25 | 1.000000000 | \$527.49 | | \$10,198.52 |

Weighted Average: Sum of unit prices (\$1,266.25) divided into each unit price equals Unit Weight. Sum of Unit Weighted Prices equals Weighted Average Price.

Random Sampling: Sampling is used to learn about a system that is too large and costly to study in its entirety. In the case of an aircraft parts inventory the objective of random sampling is to learn the accuracy of the stated quantities, conditions, etc. as per the inventory record list v/s the actual quantities, conditions, etc. (a method of verifying the accuracy and completeness of the inventory).

The **population** is the total inventory the appraiser is interested in knowing about. A **sample** is a smaller collection of units selected from the population. A sample is **representative** if each characteristic (and combination of characteristics – tag, trace, certification, teardown report, etc) arises the same percent of the time in the sample as in the population. A sample that is not representative in an important way is said to show **bias**. A **random sample** or **simple random sample** is selected such that (1) each population unit has an equal probability of being chosen, and (2) units are chosen independently, without regard to one another. By deliberately



not sampling based on any measurable characteristic, a randomly selected statistical sample will be free (on average) from bias and therefore representative (on average). Furthermore, the randomness introduced in a controlled way into a statistical sample will let you make probability statements about the results. Thus a careful statistical sample will be nearly representative, and the appraiser will be able to compute just how representative it is.

The theory and practice of random sampling can become very complex and detailed. A more complex form of random sampling utilized by appraisers is known as **stratified random sampling**. Stratified random sampling applies to an inventory that contains clear, known, easily identified groups (rotable, consumable, serviceable, overhauled, new, etc). If the appraiser chooses a random sample from such an inventory as a whole, each segment or **stratum** may be under or over-represented in the sample as compared to the population (total inventory). This may contribute some extra randomness to the results since the appraiser would not be using the known information about these groups.

A **stratified random sample** is obtained by choosing a random sample separately for each of the strata (segments or groups) of the population. If the population is similar within each stratum but differs markedly from one segment to another, stratification can increase the precision of the appraisers statistical analysis. Stratification can also make administration easier since the appraiser may be able to delegate the selection process by using on-site personnel to aid with the process.

In conducting a stratified random sampling, the appraiser is free to choose any sample size for each individual stratum. There is no requirement that the appraiser sample the same number from each stratum or that the samples be allocated according to population percentages. This allows the appraiser to determine sample sizes according to costs and benefits. Some strata may be more costly to sample than others, and therefore the appraiser will tend to use smaller sample sized for them. Some strata will be known to have more variability than others, and for these you will therefore tend to use larger samples.

Analysis of the Inventory

Identify the Classifications: New, Overhauled, Repaired, Serviceable, Unserviceable

Group the Classifications: If the acquisition prices and/or list prices (per unit) do not have large spreads between each of the line items, then it is not necessary to group them. With most inventories this is not the case. Usually there are large quantities of low cost items and fewer items with higher list prices. Also there are often gaps in the cost of certain items (items may range in a cost of \$1.00 to \$150.00 without large gaps between each line item cost – then there may be a gap from the \$150.00 item and the next higher cost item is \$675.00). If there are



large gaps in the profile of each class of items consideration should be given to dividing the classification into groups ie.

Group 1: New items in a group price range of \$1.00 to \$150.00;

Group 2: New items in a group price range of \$675.00 to \$2,250.00

Establish as many groups as may be necessary. Apply the same process to each classification. In many cases there is not sufficient transaction data to support values of individual line item units. If list prices are available list prices may be used as a base-line starting point and discounted. The rate of discount will depend on the classification of the parts as well as the rate of sales that can realistically be estimated.

Discounts

Discount rates are proportional to supply & demand. As the supply increases and the demand decreases – the rate of discount increases.

The rate of turn over (demand).

Demand is a factor of usage.

Appraisal Consideration Step 1

- A. Category, quantity, condition
- B. Acquisition cost & sell price
- C. Activity - rate of turn-over

Appraisal Consideration Step 2

- A. Sort by category & condition
- B. Analyze "Sales Reports" and establish percent margins between acquisition and sales
- C. No sales history items - solicit quotes from other sources



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PART III SPARE PARTS, MARKET TRENDS OBSERVATIONS, COMMENTS & CONCLUSIONS

by

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30 Years Ago (The 1970's):

1. Arrival of widebody aircraft:

✦ DC8 and 707 aircraft were the primary aircraft types that served the inter- and transcontinental markets. With the arrival of the widebody aircraft, air carriers saw opportunities to take advantage of the efficiency of widebody aircraft on the long haul.

✦ Major airlines started selling DC8 and 707 aircraft, thus replacing them with B747, DC10 and L1011s.

✦ A shorter haul market existed for the traditional DC8 & 707 aircraft and the capacity and range combination they provided. Continental markets were also expanding for the same capacity aircraft.

✦ Charter operators and new start-up airlines absorbed the shedding of well-maintained aircraft from the major carriers as they replaced DC8 and 707 aircraft with new widebodies.

2. Start-up and smaller carriers obtained DC8 and 707 aircraft – usually without spares support.

✦ Large carriers such as Pan Am, British Airways and TWA had surplus and redundant DC8 and 707 inventories. These inventories were on the books for little or no value.



✦ Individual start-up and charter operators did not have the financial ability to purchase bulk inventories and relied on their ability to purchase parts as the need arose.

3. A need quickly developed to address the requirements of airlines to dispose of surplus and redundant inventories, as well as requirements of start-up and charter operators to obtain individual parts without having to buy bulk and/or new from the manufacturer. These needs were satisfied in the then lucrative parts inventory business.
4. Spares companies seemingly grew out of nowhere and became high profile players in the surplus aircraft parts business.
5. Stage II noise requirements were on the horizon, fuel prices rose, inflation and deregulation combined to destabilize the industry.
6. The first Airbus aircraft entered the marketplace.

20 Years Ago (The 1980's):

1. DC8 and 707 aircraft were becoming obsolete. Cargo conversions and developing countries became the mainstay of DC8 and 707 aircraft.
2. Realities of deregulation emerged with new start-up carriers, mergers, bankruptcies and general instability.
3. Companies that became well established in the 1970s were in a position to take advantage of obtaining low cost inventories from bankruptcies and mergers.
4. Inventories with the aircraft parts surplus and supply companies became more diversified. The diversification trend of aircraft parts inventories was generated by the dwindling DC8 and 707 markets, as well as the need of the parts supply companies to maintain their presence in the marketplace.
5. Aircraft surplus and parts supply companies were now supporting most aircraft models.
6. The trend for out-of-production aircraft placements was in developing countries.
7. Consignment inventories became a partial trend. Consignment inventories reduce risk as well as reduce profit.
8. Quality of parts from aircraft surplus and supply companies became scrutinized by the Federal Aviation Administration (FAA).
9. Stage III was on the horizon.



10 Years Ago (The 1990's):

1. Consolidation of airlines and code sharing emerged. Strategic alliances included the concept and practice of air carriers with common equipment to share inventories and combine marketing of surplus inventory. These functions became established trends.
2. Aircraft leasing resulting in the sale and leaseback of aircraft carried over into aircraft engines, ground support equipment and aircraft parts inventories.
3. Recession in the early 1990s caused many aircraft to be parked for a long period of time – many of which never returned to service.
4. McDonnell Douglas became part of Boeing.
5. The trend of the previous decades, which witnessed the financial success of aircraft parts surplus and supply companies, stimulated growth of new companies venturing into the marketplace.
6. The reality of Stage III placed many aircraft out of service and large inventories of spare parts became available with no viable future. Inventories applicable to Stage II aircraft were purchased by aircraft surplus parts and supply companies because they were cheap.
7. New aircraft placement began to outpace used aircraft placements. Likewise, current production aircraft outpaced placements of out-of-production aircraft)
8. The rate at which out-of-production aircraft dropped out of service permanently was similar in scope as when jet aircraft replaced reciprocating powered aircraft.
9. Values of inventories for out-of-production aircraft declined sharply as availability mounted and demands dwindled.
10. Aircraft parts sales from one surplus parts supply company to another surplus parts supply company becomes a larger part of the total sales of these companies as brokering become an essential part of survival.

Present (The New Century):

1. Lots of obsolete parts with few obsolete buyers.
2. Technology and design has directed the aftermarket parts business away from the surplus parts suppliers and back to the Original Equipment Manufacturer (OEM).



Examples:

- ✦ Avionics & instruments are digital. Hence, support from OEMs is ongoing with continuous upgrades in software.
- ✦ Reduced commonality of parts and components on various aircraft. (i.e. JT8 engines were used to provide power a variety of aircraft, now each aircraft model has a specific engine application.)

3. Surplus inventories with applications to current production aircraft are generally not available due to “Just In Time” provisioning programs adopted by airlines. (OEMs are more aggressive in the aftermarket at the expense of the surplus parts dealers.)

MBA’s View of the Future:

1. Airline parts inventories that have a present and future application are “active inventories,” therefore; they are not surplus with little or no book value.
2. Inventories that are available as surpluses are obsolete and/or have little or no current future application.
3. Item numbers 1 and 2 above are the reasons the recent past and current situation exists: “There are no viable parts inventories available at bargain prices”.
4. Survival in the aircraft part sales business depends on:
 - ✦ Manufacturer distributor agreements
 - ✦ Primary Maintenance Authorization (PMA) sales and distribution
 - ✦ Component exchange programs
 - ✦ Repair Station capability
 - ✦ Specializing in specific products or services, such as component exchanges.
 - ✦ Rigorous compliance with FAA records requirements.

