AC No. 65-19B

INSPECTION AUTHORIZATION STUDY GUIDE

Revised June 1978

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

PREFACE

INSPECTION AUTHORIZATION STUDY GUIDE

1. PURPOSE. This study guide provides guidance for persons who conduct annual and progressive inspections and approve major repairs and/or major alterations of aircraft. The guide is primarily intended for mechanics who hold or who are preparing to take the test for an inspection authorization. The guide stresses the important role that certificated mechanics who hold an inspection authorization have in air safety.

2. CANCELLATION. Advisory Circular 65–19A, Inspection Authorization Study Guide, dated November 17, 1976, is cancelled.

3. REFERENCES. Federal Aviation Regulations (FAR) Part 65 sets forth the privileges of mechanics holding an Inspection Authorization. Part 43 of the FAR sets forth maintenance rules and standards of performance.

4. HOW TO GET THIS HANDBOOK. Order Advisory Circular 65–19B from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

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CONTENTS

	Page
Chapter 1. ELIGIBILITY, ISSUANCE, RENEWAL, AND CHANGE OF FIXED BASE	1
1. Eligibility	1
2. Issuance	1
3. Duration	3
4. Renewal	3
5. Change of Fixed Base	4
Chapter 2. SUGGESTIONS FOR DEVELOPING GOOD OWNER/IA RELATIONS	5
6. Get it Straight	5
Chapter 3. BASIC FUNCTIONS OF THE IA	9
7. General	9
8. Approving Major Repairs and Major Alterations	9
9. Annual and Progressive Inspections	13
10. Maintenance Records	19
Appendix 1. FIGURES	
1. Typical entry for a one-time compliance with an Airworthiness Directive	23
2. Typical entry for a recurring inspection with an Airworthiness Directive	23
3. Typical entry for a one-time compliance on a suggested Airworthiness Directive Compliance Record	24
4. Reverse side of FAA Form 337	25
5. FAA Form 8010-4, Malfunction or Defect Report	26
6. Sample operation, limitations placard	27
7. FAA Form 8600-1, Inspection Reminder	27
8. Sample discrepancy list	28

Page

9. Sample maintenance record entry for an annual inspection ---- 29
10. Sample annual inspection entry when aircraft is found to be unairworthy ---- 29
11. Typical completion of the face of FAA Form 337 ---- 30
12. Sample weight and balance revision for a typical light, twin-engine aircraft ---- 30

Appendix 2. PUBLICATIONS

1. Regulations ---- 33
2. Technical Data ---- 34
3. Advisory Circulars ---- 36
4. Ordering Information ---- 36

Chapter 1.—ELIGIBILITY, ISSUANCE, RENEWAL, AND CHANGE OF FIXED BASE

1. ELIGIBILITY. Applicants are eligible for the FAA inspection authorization if they:

a. hold a currently effective mechanic certificate with both airframe and powerplant ratings, each of which is currently effective and has been continuously in effect for not less than the three-year period immediately before the date of application;

b. have been actively engaged in maintaining civil aircraft for at least the two years prior to applying;

c. have a fixed base of operations where they can be located during the normal working week;

d. have the necessary equipment, facilities, and inspection data available to properly inspect aircraft and parts. Modern, complex aircraft require maintenance to be performed in accordance with manufacturers' instructions and the use of special tools or equipment to do the work accurately and efficiently; and

e. have passed a written test.

2. ISSUANCE. Section 65.91 of FAR Part 65 sets forth the issuance rules for an Inspection Authorization (IA). (Through the remainder of this text the inspection authorization will be referred to as IA.)

a. *Apply for the Inspection Authorization (IA)* at the nearest FAA General Aviation District Office or at a Flight Standards District Office. Applicants outside the United States should apply to the nearest International Field Office.

b. *An applicant is required to have available all the reference material* needed for the test. A list of those materials and where to obtain them is presented in Appendix 2 of this study guide.

c. *Applicants who are employed full time in the maintenance* of civil aircraft and exercise the privileges of their mechanic certificate during that period, are considered to be actively engaged. Part-time employment will be evaluated and given consideration by an FAA airworthiness inspector.

d. *Written tests* are given by appointment and usually take a minimum of five hours. The tests are designed to test ability to use the proper technical data accurately while approving major repairs and alterations, and inspecting aircraft. Applicants should know how to use reference indexes to be able to locate specific information quickly.

(1) Part 1 of the test consists of multiple choice questions to be answered in a specified time. The questions are based on the issuance, privileges, and limitations of the Inspection Authorization. Use of reference material is not permitted during this part of the test.

(2) Parts 2 and 3 also have a time limit for each part. They cover situations applicants are likely to encounter while doing annual and progressive inspections and while approving major repairs and major alterations. Some questions will relate to a specific aircraft assigned by the FAA inspector. Applicants are expected to use or be familiar with the following:

(a) FARs pertaining to maintenance and airworthiness certification.

(b) Specifications: aircraft, engine, and propeller.

(c) Type certificate data sheets: aircraft, engine, and propeller.

(d) Procedures for conducting annual and progressive inspections.

(e) Rules pertaining to the IA.

(f) Airworthiness Directives (ADs).

3. DURATION. All IAs expire on March 31 of each year. An IA ceases to be effective whenever any of the following occur:

a. The authorization is surrendered, suspended, or revoked.

b. The holder no longer has a fixed base of operation.

c. The holder no longer has the equipment facilities and inspection data required to be eligible for renewal.

4. RENEWAL. To be eligible, applicants must present evidence at an FAA General Aviation, Flight Standards, or Air Carrier District Office or an International Field Office during the month of March that they still meet the requirements of Section 65.93 of FAR Part 65.

a. *Renewals* will normally be done in conjunction with a safety meeting designed to help IAs with their work. These meetings usually include:

(1) Discussions of maintenance problems of a general nature.

(2) Discussions of recent regulation changes and how they affect the IA.

(3) When available, manufacturers of aviation products may participate to acquaint IAs with current or new equipment and service problems.

b. *If IAs are unable to attend* the scheduled meeting, they should contact the local FAA office during the month of March to determine what renewal procedures are to be followed.

5. CHANGE OF FIXED BASE. Change of address of a fixed base of operations by an IA requires that the FAA be given written notice prior to exercising the authorizations' privileges at the new address. See Section 65.95(c) of FAR Part 65.

Chapter 2.—SUGGESTIONS FOR DEVELOPING GOOD OWNER/IA RELATIONS

6. GET IT STRAIGHT. Be sure to come to a mutual agreement with an owner as to exactly what work is to be performed. Misunderstandings usually result from a lack of clear communications. Attention to the following details will usually avoid the ill will a later disagreement may generate.

a. *Itemize the work* to be done so the owner will have a clear understanding of the work order.

b. *Establish a firm understanding about the cost,* or range of cost, anticipated for the job.

c. *If an annual inspection is involved,* indicate that certain maintenance is required to perform the inspection, such as:

(1) Removal of cowling, fairing, opening of inspection plates, etc.

(2) Cleaning the aircraft and engine.

(3) Disassembly of wheels and other components to determine their condition.

d. *Advise the owner that an annual inspection involves determination of compliance* with aircraft specifications and airworthiness directives.

e. *Agree as to whether routine servicing is to be included* as part of the inspection or is to be performed separately. Such servicing is not a part of the inspection, but may be conveniently done while conducting the inspection. Such items might be:

(1) Cleaning spark plugs.

(2) Servicing landing gear oleos.

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(3) Changing oil.
(4) Making minor adjustments.
(5) Servicing the brakes.
(6) Dressing nicked propeller blades.
(7) Lubricating where necessary.
(8) Stop drilling small cracks and minor patching of cowling and baffles.

f. *Make a written list* of all discrepancies found on the aircraft indicating if and how corrected. The owner may want a copy of this list.

g. *Discrepancies not corrected,* and which affect airworthiness, must be listed in duplicate. Give the original to the owner and the duplicate copy to FAA. The owner should be informed that the aircraft should not be operated without a special authorization until the discrepancies are corrected.

h. *Establish a reasonable time* period to accomplish the inspection.

i. *Request the owner to supply the complete aircraft records* (airframe, engine, and propeller) for study, review, and entries. Point out that this is necessary to properly conduct an annual inspection.

j. *Complete the inspection as soon as practicable.* Often an aircraft will sit around the shops waiting for parts, etc., even though the inspection was actually finished. In these cases it is advisable to officially report the aircraft unairworthy. (Ref: FAR 43.11(a)(5).) When the parts arrive, the repairs can be completed and the aircraft approved for return to service in the usual manner. Very often this time lapse represents several weeks, or even months, and things can deteriorate on the aircraft. Also, there is always the chance that an AD involving some part of the aircraft may have been issued in the interim. In these cases, it might be unwise to complete the

repairs originally intended and sign off the aircraft as "airworthy" without doing another complete inspection.

k. *Complete the aircraft record entries* as required by sections 43.9 and 43.11 of the FARs. Make adequate descriptions of repairs or alterations if accomplished along with the inspection.

l. *Record compliance with all Airworthiness Directives* actually accomplished. Provide sufficient information for the owner to comply with FAR 91.173(a)(2)(v). A general statement such as "All ADs complied with" is NOT an adequate entry and should be avoided. Many owners keep a separate record of AD compliance in the back of the logbook or a specially provided section. This is a good place to identify those ADs of a recurring nature and when the next compliance is required. See figures 1, 2, and 3 for typical entries.

m. *When approving repairs and alterations,* !As should be available as work progresses on major jobs. This way affected areas and structures can be seen more readily than after completion of the entire job. In many cases the workmanship during the progress of the job can be improved much more easily than having to redo it later.

Chapter 3.—BASIC FUNCTIONS OF THE IA

7. GENERAL. The basic functions of IAs are set forth in section 65.95 of FAR Part 65. That section provides that an IA may approve major repairs and major alterations, conduct annual inspections, and perform or supervise progressive inspections in accordance with the standards and procedures set forth in FAR 43.

IAs may not approve major repairs or major alterations on any aircraft maintained in accordance with a continuous airworthiness program under Part 121 or 127 of the FARs.

8. APPROVING MAJOR REPAIRS AND MAJOR ALTERATIONS. The IA's primary responsibility is to determine airworthiness by inspecting repairs or alterations for conformity to approved data, and assuring that the aircraft is in a condition for safe operation. During inspection of major repairs or major alterations, IAs should determine that they are compatible with previous repairs and alterations that have been made to the aircraft.

a. IAs should personally conduct this inspection since the regulations do not provide for delegation of this responsibility.

b. The responsibility for approving major repairs and major alterations should be taken seriously. It should consist of a detailed investigation to determine the material used, quality of workmanship, compliance with approved data, completeness, and possible effect on other structures or systems that make the aircraft at least equal to its original or properly altered condition. Approval should not deteriorate into a paper signoff. A record entry is the assumption of responsibility.

c. *The approval of alterations by IAs is often a misunderstood term.* IAs cannot approve the DATA for major alterations. They may, however, inspect to see that alterations conform to data PREVIOUSLY APPROVED BY THE ADMINISTRATOR (FAR 65.95). This means the IA must assure that data is available as a basis for approval. Preferably, this availability determination should be made prior to beginning the repair or alteration. If data is unavailable, or if an IA is unsure of the acceptability of the available data, the local FAA inspector should be consulted. The inspector may be able to:

(1) Establish an acceptable basis for approval;

(2) Approve the data himself; or

(3) Recommend application for a Supplemental Type Certificate (STC) as the circumstances warrant.

d. Quite often major repairs are performed that are eventually covered by fabric, metal skin, or another structure. When this situation exists, the IA should have a clear understanding with the mechanic performing the repair that a precover inspection is necessary. This inspection should assure that the repair was made in accordance with acceptable methods, techniques, and practices of Part 43 of the Federal Aviation Regulations and the structure to be covered is free from defects, corrosion, wood dry rot, and protected from the elements. All of which will help assure aircraft airworthiness. In addition, IAs should inspect other affected areas for hidden damage, if the aircraft has been involved in an accident or incident. An entry is required to be made in the maintenance record and a completed FAA Form 337, Major Repair and Alteration Form. See Figure 4, reverse side FAA Form 337 showing typical entries.

e. *Minor deviation from approved data is* permissible IF the change is one that could be approved as a minor alteration when considered by itself. Be sure to list the deviations when completing the aircraft records. When in doubt, contact the local FAA inspector who may decide the change is not minor and would need specific approval or amendment of the original approval.

f. *Approved data to be used as a basis for approval* of repairs and alterations may be one or more of the following:

(1) *FAA Publications.* FARs, Aircraft Specifications, Type Certificate Data Sheets, Advisory Circulars, etc.

(2) *Supplemental Type Certificates.* A summary is available that lists those STCs which the holders have said will be made available to the public. See Appendix 2.

(3) *Parts Manufacturing Approval.* Identifies FAA-approved replacement parts.

(4) *Technical Standards Orders.* Conformity to TSOs indicates FAA approval of materials and appliances.

(5) *Airworthiness Directives, (ADs).* FAA-approved data for mandatory action concerning deficiencies found in service.

(6) *Manufacturer's Instructions, Kits, and Service Handbooks.* Such instructions must bear indication of being FAA-approved when pertaining to major alterations or major repairs.

(7) *Major Repair and Alterations, FAA Form 337,* dated prior to August 25, 1955, indicating that some person has obtained previous FAA engineering approval for the alteration. All FAA Forms 337 being utilized as the approval basis must contain sufficient information to provide for

exact duplication of the alteration. After August 25, 1955, the FAA instituted the issuance of STCs for major type design changes.

(8) *FAA field approval.* This is usually an alteration that is to be performed on one airplane only or for limited duplication by the original modifier. Such approval carries limitations for its use as an approval basis for the same alteration to other aircraft. See your local FAA inspector for these approvals.

g. *Inspecting repairs or alterations* consists of these basic operations:

(1) *Determine* that the repair or alteration data has FAA approval.

(2) *Inspect* to determine that the repair or alteration conforms to the approved data in configuration and the performance standards of FAR Part 43. At the same time the aircraft should still comply with applicable airworthiness requirements and the repair or alteration should be compatible with all other installations.

(3) *All operating limitations affected* by an alteration should be appropriately revised. Sometimes these are in the form of flight manual supplements, instrument range markings, placards, or combinations of these. See the local FAA airworthiness inspector for limitations on changes which can be made.

(4) *Aircraft record entries* should be completed and the weight and balance data revised when appropriate. There should be a statement on the FAA Form 337 to the effect that weight and balance data has been revised. When an alteration results in a change in the center of gravity (c.g.) position, the affected c.g. limit should be investigated under adverse loading conditions unless it falls within an approved

empty c.g. range. For instance, if the c.g. has shifted aft, the aft loading conditions should be computed to see that the aircraft does not exceed the aft c.g. limit. While the pilot is legally responsible for having the aircraft correctly loaded, it is the IA's responsibility when approving an alteration to see that weight and balance data has been revised. The aircraft record entries may refer to the FAA Form 337 for details such as: "Installed exhaust augmentor kit in accordance with STC SA 453 CE, drawing number 5084 dated 5/19/65. See FAA Form 337 this date for details."

(5) *Indicate approval* on this form, and dispose of both copies in accordance with Appendix B of FAR 43.

9. ANNUAL AND PROGRESSIVE INSPECTIONS. The procedures and scope of these inspections are set forth in Appendix D of FAR Part 43 and should be followed in detail. There are additional requirements listed in FAR 43.15. The regulations speak of 100-hour and annual inspections as being of identical scope; the only difference between the two is the persons authorized to perform them. Record entries you make are very important as they are the only evidence an aircraft owner has to show compliance with the inspection requirements of FAR 91.169 or 91.171. The following reminders of IA responsibilities should help in determining that the aircraft complies with all airworthiness requirements (ref: FAR 43.15(a)):

a. *Configuration.* The aircraft should conform to the aircraft specification or type certificate data sheet. When the aircraft does not conform, use the "unairworthy" procedures of FAR 43.11(a)(5).

(1) Alterations to the product may have changed some of the operating limitations.

(2) Unrecorded alterations or repairs may have been made and warrant one of the following:

(a) Contact owner for pertinent information.

(b) If approved data is available, conduct inspection and personally approve.

(c) Contact local FAA inspector for assistance.

(3) The aircraft specification or data sheet indicates when a flight manual is required. It also identifies limitations which must be displayed in the form of markings and placards.

(4) The type certificate data sheets on later models of aircraft do not contain the lists of equipment approved for a particular aircraft as did the older specifications. This list of required and optional manufacturer's approved equipment can now be found in the original equipment list furnished by the manufacturer with the aircraft. Sometimes a later issue of the lists is needed to cover recently approved items. Serial number eligibility should always be considered when doing this.

b. *Condition.* An IA may use the checklist in FAR 43, Appendix D, or the manufacturer's inspection sheets, or a checklist designed by the IA that includes the items listed in Appendix D, to check the condition of the entire aircraft. This includes checks of the various systems as called for in FAR 43.15.

(1) Routine servicing is NOT a part of the annual inspection. The inspection itself is essentially a visual evaluation of the condition of the aircraft and its components and certain operational checks. The manufacturer may recommend certain services to be performed at various operating

(2) When the records DO NOT contain indications of previous compliance, the IA should:

(a) make the AD note an item on a discrepancy list provided to the owner and FAA; or

(b) with the owner's concurrence, do whatever disassembly is required to determine the status of compliance; or

(c) obtain concurrence of the owner to comply with the AD.

(3) Often an AD calls for an inspection at one time with a modification required at a later date. On these it is very important to identify the portion of the AD complied with and the exact method of compliance.

(4) Section 91.173(a)(2)(v) of the FAR requires each registered owner or operator to keep the current status of applicable airworthiness directives (AD). This status includes the method of compliance, AD number, and revision date. If the AD involves recurring action, the time and date should be recorded when the next action is required. As a vital part of the services they perform, IA's can provide the information an owner is expected to keep.

(5) The owner should also be informed if there are subsequent requirements of an AD or that some may require reinspection at certain operating intervals other than at annual inspections. Often these are at 100-hour intervals and will be due whether or not the aircraft is legally required to have 100-hour inspections.

(6) To assist an IA in keeping AD reference material current, we recommend adding the titles of new ADs to the space provided in the index of the AD summary.

d. *All malfunctions or defects* that come to the IA's attention should be reported on Malfunction or Defect Report, FAA

intervals. These can often conveniently be done at this time, and in fact should be, but should not be considered a part of the inspection itself.

(2) It is very important that the IA be familiar with the manufacturer's service manuals, bulletins, letters, etc., for the product being inspected. It makes no sense to utilize the experience other people have had on similar products, so use these publications to avoid overlooking problem areas.

(3) The FAA General Aviation Airworthiness Alerts, AC 43–16 (formerly FAA General Aviation Inspection Aids, AC 20–7), are also an important source of service experience. These alerts are selected service difficulties reported to the FAA on Malfunction or Defect Reports, FAA Form 8010–4 (formerly FAA Form 8330–2). Monthly copies of these alerts are provided free of charge to all IA's, repair stations, air taxis and FAA certificated aviation maintenance technician schools.

(4) When an IA approves an aircraft for return to service, the IA will be held responsible for condition of the aircraft AS OF THE TIME OF THAT APPROVAL.

c. *Airworthiness Directives.* The IA should determine whether all applicable airworthiness directives on the aircraft, powerplant, propeller, instruments, and appliances have actually been accomplished.

(1) If the maintenance records indicate compliance with an AD, the IA should make a reasonable attempt to verify this. The reason for this is that it is not uncommon for a component to have an AD complied with and properly recorded and then later be replaced by another on which the AD had not yet been accomplished. IAs are not expected to disassemble major components such as cylinders or crankcase, etc.

Form 8010–4. (See figure 5.) Copies are available at all FAA district offices, are easy to fill out, and need no addressing or postage. Prompt reporting will contribute much toward improving air safety by helping correct unsafe conditions.

e. Paperwork Review. The owner/operator is responsible for maintaining the equipment list, center of gravity, weight distribution, and loading schedules if necessary.

(1) IAs should determine that required placards and documents set forth in the aircraft specification or data sheet are available and current. The aircraft should be reported as "unairworthy" if these placards and documents are not available. Missing, incorrect, or improperly located placards should be regarded as a discrepancy and the owner/operator should be informed that under FAR 91.31 the aircraft should not be operated until they are available.

(2) The IA should refer to the registration and airworthness certificates for the owner's name and address and for the aircraft make, model, registration, and serial numbers needed for recording purposes. Be sure not to use the manufacturer's trade names as they do not always coincide with the actual model designation (Cessna Skylane is 182, Piper Comanche is PA–24–250, etc.). If these certificates are not available, the aircraft is not to be reported as unairworthy. The owner/operator should be informed that the documents must be in the aircraft with the airworthiness certificate displayed as required in FAR 91.27 WHEN THE AIRCRAFT IS OPERATED.

(3) Other documents often needed but not a part of the airworthiness requirements might be State registration, FCC radio station licenses, etc. The owner/operator is responsible for the proper display of these documents. However, the

IA will be performing an appreciated service by informing the operator of any deficiencies in the display and carriage of these documents.

(4) On aircraft for which there is no approved flight manual required, the operating limitations prescribed during original certification and as required by FAR 91.31 must be carried in the aircraft. These may be range markings on the instruments, placards and listings worded and located as required by the type certificate data. See figure 6.

f. *Aircraft Markings.* Required aircraft identification markings are discussed in FAR Part 45. It is the owner/operator's responsibility to have the nationality and registration marks properly displayed on the aircraft (FAR 91.31(c)). IAs can, and should, offer advisory service to owners and operators in regard to any deficiencies in marking; however, such deficiencies are not cause to report an aircraft "unairworthy."

g. *Inspection Reminder.* IAs should consult with aircraft owners to determine where they wish to have the FAA Inspection Reminder, FAA Form 8600–1, installed. The FAA Inspection Reminder should be placed conspicuously in the cockpit or where it will be seen during a preflight inspection. IAs should enter on the FAA Form 8600–1, the due date of the next inspection or inspection segment. The line titled "Section" on the form should contain the FAR section under which the aircraft is being inspected; i.e., FAR 91.169 (see figure 7).

h. *Unairworthy Aircraft.* If the aircraft is not approved for return to service, use the procedures specified in FAR 43.11. This will permit an owner to assume responsibility for having the discrepancies corrected prior to operating the aircraft.

(1) The discrepancies can be cleared by an A&P mechanic unless they consist of major repairs or major alterations. If

preventive maintenance, they could be cleared by the owner/pilot.

(2) The owner may want the aircraft flown to another location to have repairs completed, in which case the owner should be advised that a Special Airworthiness Certificate, FAA Form 8130-7 (formerly referred to as a ferry permit), is necessary. A Special Airworthiness Certificate may be obtained at an FAA GADO, ACDO, FSDO, EMDO, or IFO.

(3) There is no stigma attached to the aircraft because it was reported "unairworthy." In effect, the report says the aircraft is airworthy with the exception of the items on the discrepancy list. When those listed items are corrected, the aircraft is eligible to be operated. (See figure 8.)

i. *Incomplete Inspection.* In the event the annual inspection is not entirely completed, an IA should:

(1) Indicate in the aircraft records any discrepancies found.

(2) NOT indicate that an annual inspection was conducted.

(3) Indicate in the aircraft records the extent of the inspection and all work accomplished.

10. MAINTENANCE RECORDS. IAs and other maintenance personnel or agencies are required to record maintenance, inspections, or alterations that they perform or approve in accordance with the requirements of FAR 43.9 and 43.11. FAR 91.173 requires the owner/operator to keep maintenance records and should make them available to an IA. IAs are also required to indicate the time in service when work is done. See figures 9 and 10 for samples of typical IA entries.

a. *Significance of Maintenance Record Entries.* Responsibility for maintenance performed rests with the person whose

name is entered on the appropriate maintenance record and/or forms. The responsibility for annual and progressive inspections and for approval for return to service of major repairs or major alterations is assumed by the IA whose signature appears on the appropriate maintenance records.

b. *Completion of FAA Form 337 by IAs.* FAA Form 337 serves two purposes; one is to provide owners/operators with a record of major repairs and major alterations indicating details and approval, and the other is to provide the FAA with a copy for the records. A sample of a typical completed FAA Form 337 is provided in figure 11.

(1) The person who performed or supervised the major repair or major alteration prepares the original FAA Form 337 (two copies). The IA then further processes the forms when they are presented for approval.

(2) The official instructions for the completion of the form appear in AC 43.9–1C, or subsequent revisions.

c. *Disposition of FAA Form 337.*

(1) After the IA has found a major alteration or a major repair in conformity with FAA approved data, reviewed the FAA Form 337 for completeness and accuracy, and completed item 7, the IA should:

(a) Send the original copy of FAA Form 337 to the owner/operator.

(b) Forward the duplicate copy to the local FAA office within 48 hours.

(2) IAs should ensure that the duplicate copy is an exact and legible reproduction of the original. The signatures should not be carbon copies but original signatures in ink.

(3) In the event the FAA Form 337 has been completed for spare parts or components, both copies of the form with

the approval portion (item 7) completed should be attached to the part or component until it is installed on the aircraft.

(a) Those items identifying the component with a particular aircraft and the owner's name and address will be left blank on the form.

(b) The mechanic who makes the installation will complete both copies of the form by filling in the blank items and signing for the installation in the aircraft records and making reference to the FAA Form 337 in his record entry.

(c) The original copy of the completed FAA Form 337 is sent to the owner/operator of the aircraft upon which the component was installed.

(d) The duplicate copy is forwarded to the FAA office for the area where the installing mechanic is operating.

d. *Weight and Balance.* Weight and balance are no longer required on the FAA Form 337. It is imperative that weight and balance checks and computations be made very carefully. Since practically every aircraft manufacturer uses a different method of weight and balance control, it would be impossible to provide a universally adaptable method. The example provided in figure 12 is general in nature and can be modified or revised as needed to fit the aircraft involved. When revising weight and balance data, these general rules should be followed:

(1) The weight and balance data should be kept together in the aircraft records.

(2) When making revisions, use a permanent easily identified method, with full-size sheets of paper large enough to contain complete computations and to minimize the possibilities of their becoming detached or lost.

(3) The pages should be identified with the aircraft by make, model, serial number, and registration number.

(4) The pages should be signed and dated by the person making the revision.

(5) Describe nature of the weight change.

(6) The old weight and balance data should be marked "superseded" and dated.

(7) The new page should show the date of the old figures it supersedes.

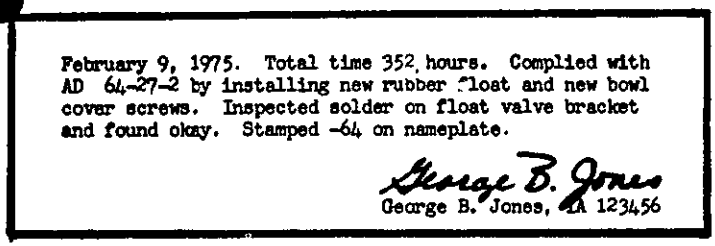
(8) Appropriate fore and/or aft extreme loading conditions should be investigated and the computations shown.

(9) Sample loading computations may be helpful.

(10) On large aircraft, be careful to distinguish between empty weight and operating weights that may include items such as commissary supplies, spare parts, lavatory water, etc.

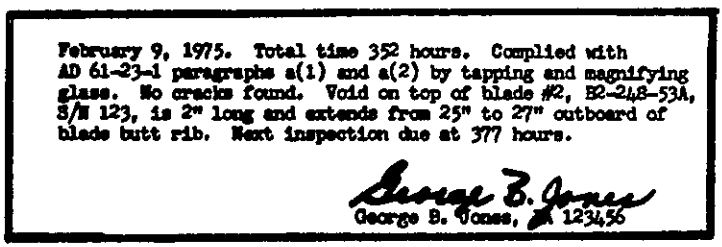
(11) On small aircraft it is often convenient to post a placard in the aircraft indicating the empty weight, useful load, and empty c.g., along with sample loadings or general instructions to cover the most likely used loading conditions (ref. FAR 91.31(b)(3)). Advisory Circular (AC) 135–1C, Air Taxi Aircraft Weight and Balance Control, and AC 91–23A, Pilot's Weight and Balance Handbook, contain useful information applicable to the functions performed by IAs on general aviation aircraft.

Appendix 1.—FIGURES


February 9, 1975. Total time 352 hours. Complied with AD 64-27-2 by installing new rubber float and new bowl cover screws. Inspected solder on float valve bracket and found okay. Stamped -64 on nameplate.

George B. Jones
George B. Jones, A 123456

FIGURE 1.—Typical entry for a one-time compliance with an Airworthiness Directive.


February 9, 1975. Total time 352 hours. Complied with AD 61-23-1 paragraphs a(1) and a(2) by tapping and magnifying glass. No cracks found. Void on top of blade #2, B2-248-53A, S/N 123, is 2" long and extends from 25" to 27" outboard of blade butt rib. Next inspection due at 377 hours.

George B. Jones
George B. Jones, A 123456

FIGURE 2.—Typical entry for a recurring inspection compliance with an Airworthiness Directive.

AIRWORTHINESS DIRECTIVE COMPLIANCE RECORD

Aircraft, Engine, Propeller, Rotor, or Appliance Make _____ Model _____ Ser.No. _____ N _____

AD Number	Subject	Date and Airframe Total Time In Service at Compliance	Method of Compliance	One-Time	Recurring	Next Comp. Due Date/ Hours	Authorized Signature and Number
61-23-1	Inspect Rotor Blades	2-9-75 TT 352	Visual Inspection per par. (a)(1)(2)		X	TT 377hrs.	George B Jones TA 12345
61-23-1	Inspect Rotor Blades	3-10-75 TT 377 hrs.	Visual Inspection per par. (a)(1)(2)		X	TT 402	George B Jones TA 12345
		(and so on)					
64-27-2	Rubber Float and Float Bowl Screw	2-9-75 TT 352	Inspected float, 64 stamped on name plate	X		NA	Chas Mayo TA 3456

Figure 3. Typical entries for a one-time and recurring compliance on a suggested Airworthiness Directive Compliance Record.

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. DESCRIPTION OF WORK ACCOMPLISHED *(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)*

1. Removed right wing from aircraft and removed skin from outer 6 feet. Repaired buckled spar 49" from tip in accordance with Figure 8 in the manufacturer's structural repair handbook #18-1.

   DATE: January 5, 1975, inspected splice in Item 1 and found it to be in accordance with data indicated. Splice is okay to cover. Inspected internal and external wing assembly for hidden damage and condition.

   George B. Jones, IA 123456

2. Primed interior wing structure and replaced skin P/Ns 63-0085, 63-0086, 63-0878 with same material, 2024T3, .025" thick. Rivet size and spacing all the same as original and using procedures in Chapter 2, Section 3 of AC 43.13-1A, dated 1972.

3. Replaced stringers as required and installed 6 splices as per Figure 10 in Handbook #18-1.

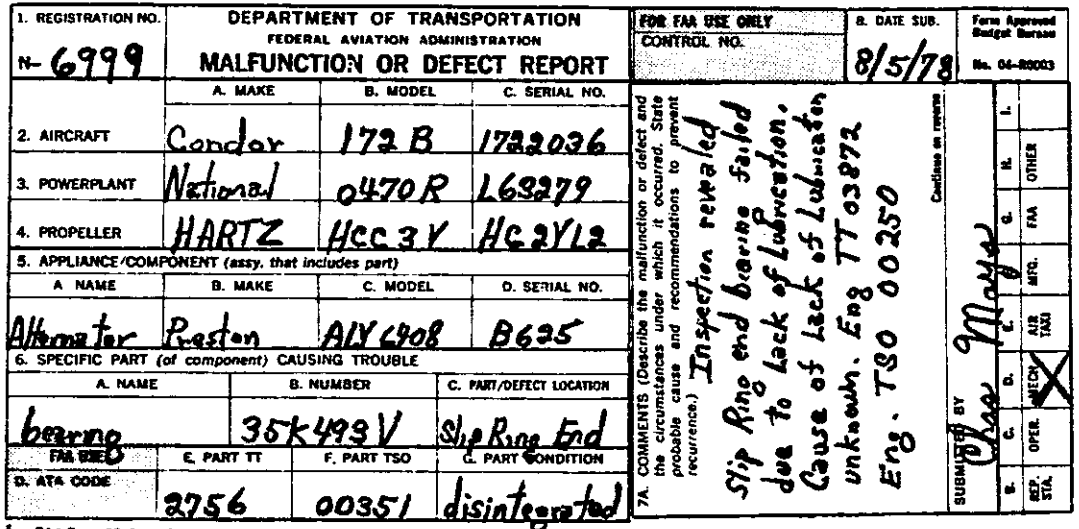
4. Installed wing, rigged aileron, and operationally checked in accordance with maintenance manual.

5. No change in weight or balance.

END

☐ ADDITIONAL SHEETS ARE ATTACHED

FIGURE 4.—Reverse side of FAA Form 337 showing typical entries. Note the specific references in identifying FAA approved or acceptable data. Also note entry regarding inspection of the repair by an IA prior to the cover being applied and an inspection of the wing assembly or hidden damage and condition.



1. REGISTRATION NO. N-6999

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
MALFUNCTION OR DEFECT REPORT

FOR FAA USE ONLY
CONTROL NO.

8. DATE SUB. 8/5/78

Form Approved Budget Bureau No. 04-R0003

	A. MAKE	B. MODEL	C. SERIAL NO.
2. AIRCRAFT	Condor	172 B	1722036
3. POWERPLANT	National	0470 R	L63279
4. PROPELLER	HARTZ	HCC 3 Y	HC 2Y12

5. APPLIANCE/COMPONENT (assy. that includes part)

A. NAME	B. MAKE	C. MODEL	D. SERIAL NO.
Alternator	Prestolite	ALY 4908	B625

6. SPECIFIC PART (of component) CAUSING TROUBLE

A. NAME	B. NUMBER	C. PART/DEFECT LOCATION
bearing	35K493V	Slip Ring End

FAA USE	E. PART TT	F. PART TSO	G. PART CONDITION
D. ATA CODE 2756		00351	disintegrated

7A. COMMENTS (Describe the malfunction or defect and the circumstances under which it occured. State probable cause and recommendations to prevent recurrence.)

Inspection revealed Slip Ring end bearing failed due to lack of Lubrication. Cause of lack of Lubrication unknown. Eng TT 03872 Eng. TSO 00250

Continue on reverse

SUBMITTED BY Wayne

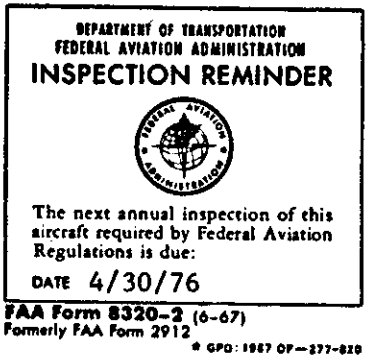
B. REP. STA.	C. OPER.	D. MECH	E. AIR TAXI	F. MFG.	G. FAA	H. OTHER	I.			
		X								

FAA Form 8010—4 (7-78) SUPERSEDES FAA Form 8330-2

FIGURE 5.—The above is a typical FAA Form 8010-4, Malfunction or Defect Report. IA's are urged to use this form for all malfunctions or defects that cannot be attributed to poor maintenance procedures. Provide the information requested in the blocks on the fact of the form. It is not necessary to furnish models and serial numbers when they are not pertinent. Note that item 7 requests information as to how the defect can be corrected.

Operation Limitations	Zeph-Air 63-1A N 40023
RPM	Do not exceed 2300
Oil temp	212° max.
Airspeed limits do not exceed:	
Level flight or climb	95 m.p.h.
Glide or dive	129 m.p.h.
Gross weight	1,220 lbs.
Empty C.G.	14.4" aft of datum
Useful load	453 lbs.
Kinds of operation	VFR-Day
Maximum baggage:	40 lbs. solo front 20 lbs. solo rear

FIGURE 6.—Sample operation limitations placard for a typical light aircraft certificated under Federal Aviation Regulations Part 23.


DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

INSPECTION REMINDER

The next annual inspection of this aircraft required by Federal Aviation Regulations is due:

DATE 4/30/76

FAA Form 8320-2 (6-67)
Formerly FAA Form 2912

* GPO: 1967 OP—277-828

FIGURE 7.—IAs should issue FAA Form 8600-1, Inspection Reminder, after completing inspections and affix them in a conspicuous location in the aircraft. Space is provided on the form to indicate the section of the Federal Aviation Regulation under which the aircraft is being inspected. For example: under 91.169 for annual inspection, the hours in service, if applicable, or the date (shown) the next inspection is due to be performed. The date the next annual inspection is due will be the last day of the month, 12 months following the date of the inspection (i.e., inspection date was 4/15/78; due date for the next annual inspection is 4/30/79). These forms are available at FAA field offices.

DeWitt Field
Hangar #2
Old Town, Maine 04468

Mr. John Q. Public
203 South Street
Bangor, Maine 04401

Dear Mr. Public:

This is to certify that on September 30, 1972, I completed an annual inspection on your aircraft, Zeph-Air 63-1A, S/N 63-1104, N2384, and found it to be in unairworthy condition for the following reasons:

1. Maintenance records entry indicates that the engine had been overhauled but had not been approved for return to service as required by section 43.5 of the Federal Aviation Regulations.

2. Fabric on both horizontal stabilizers tests below allowable minimum of 56 pounds.

3. Number three cylinder compression checks below manufacturer's recommendations.

Your aircraft will be considered to be in an airworthy condition when the above listed discrepancies have been corrected and approved for return to service by a person authorized in Part 43 of the FARs.

George B. Jones
George B. Jones
IA 123456

cc:
FAA General Aviation District Office

FIGURE 8.—Sample discrepancy list to be provided an aircraft owner and a copy to the local FAA General Aviation District Office or Flight Standards District Office, whichever is applicable, when reporting an aircraft "unairworthy" after completing an annual inspection.

January 18, 1974. Total aircraft time 1853.00 hours. Tach reading 975.80. Replaced right main wheel bearing, P/N 19844, upper bushing in R & L landing gear frames, both brake hoses, P/N 34052, and bled brakes. I certify that this aircraft has been inspected in accordance with an annual inspection and was determined to be in airworthy condition.

George B. Jones
George B. Jones, IA 123456

FIGURE 9.—Sample maintenance record entry for an annual inspection that resulted in an "airworthy" aircraft. Note that the date, aircraft total times, and Tach or recorder reading are included. The Tach or recorder reading should not be confused with the total time and should only be shown in ADDITION to the total time entry. Note the mechanic's certificate number is prefixed by the letters "IA" indicating that the mechanic is the holder of an inspection authorization.

January 18, 1974. Total time 1853.00 hours. Tach reading 975.80. I certify that this aircraft has been inspected in accordance with an annual inspection and a list of discrepancies and unairworthy items dated (insert date) has been provided for the aircraft owner or lessee.

George B. Jones
George B. Jones, IA 123456

FIGURE 10.—A sample annual inspection entry when aircraft is found to be "unairworthy". Note that the date, total time, and Tach reading are included.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Form Approved
Budget Bureau No. 04-R060 1

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

FOR FAA USE ONLY
OFFICE IDENTIFICATION

INSTRUCTIONS Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form

1. AIRCRAFT

MAKE	MODEL
ZEPH-AIR	63-1A
SERIAL NO	**NATIONALITY AND REGISTRATION MARK**
63-11046	N 4002J

2. OWNER

NAME (As shown on registration certificate)	ADDRESS (As shown on registration certificate)
John Q. Public	100 Main Street Anywhere, PA 15236

3. FOR FAA USE ONLY

4. UNIT IDENTIFICATION — **5. TYPE**

UNIT	MAKE	MODEL	SERIAL NO	5. TYPE: REPAIR	5. TYPE: ALTERATION
AIRFRAME	ooooooooooooooooooo (As described in item 1 above) ooooooooooooooooooo			X	
POWERPLANT					
PROPELLER					
APPLIANCE	TYPE MANUFACTURER				

6. CONFORMITY STATEMENT

A. AGENCY'S NAME AND ADDRESS	B. KIND OF AGENCY	C. CERTIFICATE NO
George Doe 10 Bank Street Anywhere, PA 15236	X U.S. CERTIFICATED MECHANIC	
	FOREIGN CERTIFICATED MECHANIC	
	CERTIFICATED REPAIR STATION	
	MANUFACTURER	654321

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge

DATE	SIGNATURE OF AUTHORIZED INDIVIDUAL
7/10/74	George Doe George Doe

7. APPROVAL FOR RETURN TO SERVICE

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY						
	FAA FLT STANDARDS INSPECTOR		MANUFACTURER	X	INSPECTION AUTHORIZATION	OTHER (Specify)
	FAA DESIGNEE		REPAIR STATION		CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT	

DATE OF APPROVAL OR REJECTION	CERTIFICATE OR DESIGNATION NO	SIGNATURE OF AUTHORIZED INDIVIDUAL
7/12/74	431256	Ben Frank Ben Frank

FAA Form 337 (7-67) (8320)

FIGURE 11.—Typical completion of the face of FAA Form 337. Detailed instructions for the use of this form are in FAR Part 43 and Advisory Circular 43.9-1C or subsequent revision.

Weight & Balance
Zeph-Air 680
N 5436E
S/N 680 - 628-1

10-17-74
Supersedes computation on
FAA Form 337 of 7/30/70

Installed item 412C, RCA AVQ-50 Weather Radar.

	Weight	Arm	Moment
Aircraft	3990 lbs.	174.6	696654.0
Radar	120 "	124.0	14880.0
	4110 "		711534.0

$$\text{EOG} = \frac{711534}{4110} = 173.1$$

Forward Loading Condition

	Weight	Arm	Moment
Aircraft	4110 lbs.	173.1	711441.0
2 pilots	340 "	94.0	31960.0
2 passengers	340 "	128.0	43520.0
8.5 gal. oil	64 "	191.0	12224.0
Min. fuel, 53.3 gal.	320 "	187.0	59840.0
	5174 "		858985.0

$$\text{CG} = \frac{858985}{5174} = 166.0$$

Forward CG limit = 166.0"

Loading Subtotals

	Weight	Arm	Moment
Corrected Empty Weight	4110.0 lbs.	173.1	711
Usable oil 8.5 ga.	64.0 "	191.0	12
Pilot	170.0 "	94.0	16
	4344.0 "		739

(Use these subtotal figures when checking aircraft loading on loading chart.)

Ben Frank

Ben Frank, IA 431256

FIGURE 12.—Sample weight and balance revision for a typical light, twin-engine aircraft. Note that computations are shown. Form is signed, dated, and identifies the computations or figures it supersedes. It is recommended that manufacturer's weight and balance data forms be used for specific aircraft.

Appendix 2.—PUBLICATIONS

1. STATUS OF FEDERAL AVIATION REGULATIONS. The more frequently amended Parts are sold on subscription service (that is, subscribers receive Changes automatically as issued), while the less active Parts are sold on a single sale basis. Changes to single sale Parts will be sold separately as issued. Information concerning these Changes will be furnished by FAA through its "Status of Federal Aviation Regulations," AC 00–44. Instructions for ordering this free status list are given in the front of each single sale FAR Part.

FAR PART NUMBER	*TITLE*
1	Definitions and Abbreviations
21	Certification Procedures for Products and Parts
23	Airworthiness Standards: Normal, Utility, and Acrobatic Category Airplanes
25	Airworthiness Standards: Transport Category Airplanes
33	Airworthiness Standards: Aircraft Engines
35	Airworthiness Standards: Propellers
39	Airworthiness Directives
43	Maintenance, Preventive Maintenance, Rebuilding, and Alteration
45	Identification and Registration Marking
65	Certification: Airmen Other Than Flight Crewmembers
91	General Operating and Flight Rules
183	Representatives of the Administrator

2. TECHNICAL DATA. The following should be available when taking the Inspection Authorization written test:

a. *Aircraft Type Certificate Data Sheets and Specifications.* Specifications and type certificate data sheets are separated into six volumes using aircraft weight and configuration as the criteria. Volume titles and their contents are:

(1) *Volume I—Single-Engine Airplanes*—contains material for all single-engine, fixed-wing airplanes regardless of maximum certificated takeoff weight.

(2) *Volume II—Small Multiengine Airplanes*—contains material for multiengine, fixed-wing airplanes of 12,500 pounds or less maximum certificated takeoff weight.

(3) *Volume III—Large Multiengine Airplanes*—contains material for multiengine, fixed-wing airplanes of more than 12,500 pounds maximum certificated takeoff weight.

(4) *Volume IV—Rotorcraft, Gliders, and Balloons*—contains material for all rotorcraft, gliders, and manned balloons.

(5) *Volume V—Aircraft Engines and Propellers*—contains material for engines and propellers of all types and models.

(6) *Volume VI—Aircraft Listing and Aircraft Engine and Propeller Listing*—contains information pertaining to older aircraft, engines, and propellers which is not subject to frequent revisions.

b. *Subscription Service.* Volumes I through V are sold on a subscription basis by the Superintendent of Documents. Subscription service includes the basic volume and monthly supplements. Because of infrequent changes to the material, Volume VI is available as a single-sale item. Changes will be incorporated in revised editions. Mail orders for all volumes

to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. For detailed information on ordering, see Advisory Circular 21-15 titled, New Issuance System for "Aircraft Type Certificate Data Sheets and Specifications" and "Aircraft Engine and Propeller Type Certificate Data Sheets and Specifications" or the Advisory Circular Checklist.

c. *Acceptable Methods, Techniques, and Practices.* These advisory circulars replace the policy material formerly contained in CAM 18. Order from GPO.

(1) AC 43.13-1A (plus Changes 1 and 2) Acceptable Methods, Techniques, and Practices—Aircraft Inspection and Repair.

(2) AC 43.13-2A Acceptable Methods, Techniques, and Practices—Aircraft Alterations.

d. *Summary of Airworthiness Directives for Small Aircraft (Volume I).* Presents in volume form all the Airworthiness Directives for small aircraft issued through December 31 of each year. ADs for engines, propellers, and equipment are included in each volume. Each volume is arranged alphabetically by product manufacturer.

e. *Summary of Airworthiness Directives for Large Aircraft (Volume II).* Presents in volume form all the Airworthiness Directives for large aircraft (over 12,500 pounds maximum certificated takeoff weight) issued through December 31 of each year. ADs for engines, propellers, and equipment are included in each volume.

NOTE: The Summary of Airworthiness Directives—Volumes I and II—is sold and distributed for the Superintendent of Documents by the Federal Aviation Administration from Oklahoma City. Requests for subscriptions should be sent to:

U.S. Department of Transportation
Federal Aviation Administration, AAC–23
P.O. Box 25461
Oklahoma City, Oklahoma 73125

Subscription service will consist of the Summary and automatic biweekly updates to each summary for a two-year period. Make certified checks or money orders payable to Federal Aviation Administration.

3. ADVISORY CIRCULARS. Free advisory circulars may be obtained by writing to the U.S. Department of Transportation, Publications Section, M–443.1, Washington, D.C. 20590. If you wish to be placed on the mail list to obtain future free advisory circulars, send your request to: U.S. Department of Transportation, Distribution Requirements Section, M–482.2, Washington, D.C. 20590. The request must specify the subject matter area in which you may be interested, such as:

AC 00 General
AC 10 Procedural
AC 20 Aircraft (includes 30 and 40)
AC 60 Airmen
AC 70 Airspace
AC 90 General Operations
AC 120 Air Carrier and Commercial Operators

4. ORDERING INFORMATION. Refer to the FAA Advisory Circular Checklist, AC 00–2, for ordering instructions for both free and sale AC's. The Checklist also gives stock numbers and prices for AC's sold by the Superintendent of Documents. An AC Checklist may be referred to in any FAA office or may be ordered free from:

U.S. Department of Transportation
Distribution Requirements Section, M–482.3
Washington, D.C. 20590

U.S. GOVERNMENT PRINTING OFFICE : 1978 O - 276-548