

## DOCUMENT RESUME

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The Air Force unnecessarily spends millions of dollars to repair parts when more than sufficient quantities of serviceable parts are available to meet current needs. Findings/Conclusions: The Air Force has not and will not make effective use of available serviceable quantities until substantial changes are initiated because the mechanized system does not notify maintenance personnel of the quantities available to preclude repairs; Air Force personnel are not familiar with the objectives and procedures for using routed repair replacement quantity assets; and, although aware that unneeded repairs are occurring, the Air Force has not instituted management action to make sure that replacement quantities are used to preclude repairs. Neither material management nor maintenance activity officials want to take responsibility for this last action. Recommendations: The Secretary of Defense should direct the Secretary of the Air Force to initiate management action to establish procedures and systems that will periodically identify all assets to be repaired at the depot maintenance level and match these records with the quantity of serviceable replacement parts that can be used to preclude repair; to change regulations to clearly delineate responsibilities for assuring the use of serviceable replacement assets to preclude repairs made by maintenance activities and contractors; and to train material management and maintenance personnel on the system's use and the concept of utilizing available serviceable assets rather than repairing unserviceable assets. (Author/SC)

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# *REPORT TO THE CONGRESS*

*BY THE COMPTROLLER GENERAL  
OF THE UNITED STATES*

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## **Air Force Continues To Repair Parts When Serviceable Parts Are Available**

**Department of Defense**

Unnecessarily, the Air Force spends millions of dollars to repair parts when more than sufficient quantities of serviceable parts are available to meet current needs.

The Air Force needs a system that will identify and match available serviceable parts with parts scheduled for repair, and needs to delineate responsibilities to make sure such a system is used and personnel are trained to use it. The Air Force plans several procedural and data system changes to alleviate the problem.



COMPTROLLER GENERAL OF THE UNITED STATES

WASHINGTON, D.C. 20548

B-133019

To the President of the Senate and the  
Speaker of the House of Representatives

This report shows that the Air Force unnecessarily spends millions of dollars to repair parts when more than sufficient quantities of serviceable parts are available to meet current needs.

Since similar problems have been identified in earlier reports, we made this review to determine whether the Air Force was taking full advantage of opportunities to substitute available replacement parts for planned repair work; the Air Force was not.

This review was made pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the Director, Office of Management and Budget; the Secretary of Defense; and the Secretary of the Air Force.

A handwritten signature in black ink, reading "Luther A. Starks".

Comptroller General  
of the United States

COMPTROLLER GENERAL'S  
REPORT TO THE CONGRESS

AIR FORCE CONTINUES TO  
REPAIR PARTS WHEN SERVICEABLE  
PARTS ARE AVAILABLE  
Department of Defense

D I G E S T

The Air Force continues to repair parts when more serviceable parts are available than are currently needed. By using available serviceable parts, the Air Force could save millions of dollars in repair costs or make available thousands of labor hours for other repair work which might otherwise go undone. (See p. 6.)

This problem is not new. GAO reported in 1964, and the Air Force Audit Agency reported in 1973, 1974, and 1975, that available serviceable parts were not used because a satisfactory system had not been developed to identify and match available serviceable parts with parts to be repaired. In each instance the Air Force agreed that unwarranted repairs were made, but effective remedial action did not follow. (See p. 6.)

The problem worsened when the Air Force eliminated a maintenance control system in January 1976 which matched available serviceable parts with certain planned repair actions on the same item. Although this system was not complete because it did not identify all planned repairs, eliminating it left the Air Force without a system for matching available serviceable parts with any parts planned for repair. (See p. 10.)

There were other contributing causes. Air Force personnel responsible for managing replacement parts and parts repair schedules were not always familiar with objectives and procedures for using available serviceable replacement parts. Also, management did not give adequate attention to establishing effective procedures to make sure that replacements were used to preclude repairs. (See p. 10.)

The Air Force should:

- Establish procedures and systems that will periodically identify all assets subject to repair and match these records with the serviceable replacements.
- Change regulations to clearly delineate responsibilities for making sure that replacement parts are used. This should preclude repairs by maintenance activities and contractors.
- Train material management and maintenance personnel to use the system. (See p. 19.)

Commenting on GAO's report, the Department of Defense stated that the Air Force plans several procedural and data system changes which should alleviate deficiencies cited in this report. For example, the Air Force will stop routinely repairing sub-assemblies. Instead, unserviceable sub-assemblies will be turned in to supply activities and serviceable assets will be issued to maintenance activities through normal supply channels. Turning in un-serviceable subassemblies will provide consumption data on depot repairs which are not currently available, and will allow computation of depot repair requirements. (See p. 19.)

If properly carried out, the planned changes should reduce unwarranted repairs. GAO plans to monitor their effectiveness.

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### ABBREVIATIONS

DOD	Department of Defense
GAO	General Accounting Office

## CHAPTER 1

### INTRODUCTION

The Air Force Logistics Command at Dayton, Ohio, provides logistics support and services for Air Force organizations. Its main functions are to develop procedures and furnish policy guidance to five air logistics centers located at Ogden, Utah; Oklahoma City, Oklahoma; Sacramento, California; San Antonio, Texas; and Warner Robins, Georgia.

In addition to performing routine maintenance work, the Air Force periodically inspects and repairs its weapon systems and support equipment to keep them in serviceable condition. The more comprehensive inspection and repair work are done either by maintenance activities at the five air logistics centers or by contractors. These repair activities inspect the items received, and repair or replace worn, broken, or missing parts. Missing or condemned parts are routinely replaced, while necessary repairs are made to other parts. The repair and overhaul work is directed by the material management activities at the air logistics centers. These management activities also manage the serviceable spare parts replacement inventory.

Air Force Logistics Command Manual 57-3 states that one objective of the repair program is to preclude parts repair when serviceable parts in excess of a 12-month supply are available. In many cases the onhand balances of serviceable parts are in a long-supply or excess status with no foreseeable requirement. In these situations, the decision to replace rather than repair can save repair labor and put onhand serviceable parts to good use. Saved labor hours at Air Force maintenance activities can be eliminated or re-directed to work that might otherwise go undone. Saved labor hours on contract repairs can reduce contract cost.

Our review's objective was to determine whether the Air Force was taking full advantage of opportunities to substitute available replacement parts for planned repair work.

## CHAPTER 2

### DECIDING TO REPLACE OR REPAIR PARTS

The material management activity advises the maintenance activity on the types and quantities of end items to be repaired. However, the material management activity does not direct the repair of the end item's component parts; this decision is left to the maintenance activity. Generally, the maintenance activity disassembles the end item, inspects the component parts, and determines which parts can be repaired. Those parts which cannot be repaired are condemned and replaced with new parts requisitioned from the material management activity. Those parts that can be repaired are processed through maintenance repair lines and used in re-assembling the repaired end item.

Generally, it is more economical to repair parts than to buy new parts. However, purchase of new parts is unnecessary when available serviceable parts exceed foreseeable needs. When this occurs a decision must be made on whether it is more cost effective to replace or repair. Certain information must be available to make this decision:

- The types and quantities of serviceable parts available for use.

- The types and quantities of parts planned for repair.

Once identified, available serviceable parts must be matched against parts scheduled for repair. After identifying matched parts, management would be able to determine if it is more cost effective to replace or repair unserviceable items. Some factors to be considered are:

- Cost of repair.

- Quantity of replacement assets available.

- Cost of supplying serviceable assets to the repair line.

- Cost of returning unserviceable parts to supply warehouses.

- Cost of interrupting repair lines.

- Number of hours needed for other repair work that is not available.



--Number of serviceable parts currently or anticipated to be in excess and subject to disposal.

After determining the quantities of serviceable parts on hand that can be used, the orderly substitution of serviceable parts for planned repair work should be scheduled, and the consequent savings in labor hours rescheduled for other needed repair work. For planned contract repairs, the contractor should be notified that replacement parts are available, thus avoiding contract repair costs.

#### IDENTIFICATION OF REPLACEMENT ITEMS

Available replacement items are identified by the Recoverable Consumption Item Requirements System (DO 41)--a mechanized information gathering system used by the material management activity at each Air Logistics Center to make management decisions. The system manages over 138,000 separate recoverable consumption items, with serviceable and unserviceable balances valued at about \$7 billion.

Once each quarter the system computes each item's requirement over the next 4-1/2 years and applies serviceable and unserviceable parts on hand against the computed requirement. If there is a shortage of serviceable parts, the system identifies the need for repairing unserviceable parts or purchasing new parts. If enough serviceable parts are available to fulfill item requirements, the system forecasts the available serviceable quantities that can be used as replacement parts instead of repairing like parts removed from higher assemblies during overhaul. For each item, the system computes the serviceable quantity not needed for the next 12-month requirement. The 12-month period for current needs is intended to assure that enough parts are available during the period to cover the administrative, production, and supply lead times needed to obtain additional serviceable parts.

The computed quantity of parts not needed for the next 12 months is called the routed repair replacement quantity and can be used until exhausted to avoid future repairs of the item. The DO 41 system, however, does not contain input information on component items of higher assemblies scheduled for repair. Consequently, the system is not capable of identifying and matching available serviceable parts with planned parts repairs.

For the first quarter of fiscal year 1976, the DO 41 system identified about 25,500 items as having serviceable replacement quantities available for use. In total over

1.7 million serviceable parts were available, valued at about \$618 million. The table below shows replacement items data by air logistics center:

Serviceable Replacement Item Data  
First Quarter FY 1976

<u>Air logistics centers</u>	<u>Total number of items with a RRRQ (note a)</u>	<u>Total serviceable quantity available</u>	<u>Total value</u>
San Antonio	6,167	521,519	\$124,080,286
Oklahoma City	3,522	758,865	119,572,682
Warner Robins	6,684	151,347	244,967,647
Sacramento	6,143	72,857	70,097,142
Ogden	<u>2,957</u>	<u>235,430</u>	<u>59,224,774</u>
Total	<u>25,473</u>	<u>1,740,018</u>	<u>\$617,942,531</u>

a/RRRQ--routed repair replacement quantity.

While none of the serviceable quantities computed as available should be needed in the next 12 months, many also have no foreseeable need after 4-1/2 years of requirements have been satisfied. Inventory quantities beyond the 4-1/2 year requirement are categorized as long-supply. The total value of long-supply serviceable assets at June 30, 1975, was \$786 million. Parts in long supply may either be retained in inventory to meet contingency requirements or disposed of if determined to be in excess. By using these serviceable parts for replacement instead of repairing like unserviceable parts, current repair costs are deferred. Where large serviceable quantities are available, repair costs may be deferred indefinitely.

IDENTIFICATION OF ITEMS  
TO BE REPAIRED

Until January 1976 the Air Force had another information system within the maintenance activities, called the Routed Item Control System (G004R), which identified items routed for repair. The maintenance activities defined a routed item as one which was sent from a primary repair shop to a secondary shop for repair and then returned to the primary shop for installation on higher assemblies being repaired there. The Routed Item Control System did not identify component items repaired in the same shop that their next higher assembly was repaired in. Since component items frequently were repaired

in the same shop as their next higher assembly, a substantial number of repairs were not identified in the Routed Item Control System.

One of the purposes of the G004R system was to reduce maintenance operating costs and provide for more effective utilization of maintenance resources by replacing parts, rather than repairing them, when such serviceable parts in excess of a 12-month supply were available. The routed repair replacement quantities computed in the DO 41 requirements system were matched against items scheduled for routed repair and identified in the G004R Routed Item Control System. When an item match occurred, the serviceable quantity was identified for use instead of repairing the unserviceable item. Serviceable replacement quantities could be used until exhausted (down to a 12-month supply), at which time item repair resumed. Resources saved by using serviceable quantities instead of repairing items would be available for work that might otherwise go undone.

In January 1976 the Routed Item Control System was terminated at the direction of the Air Force Logistics Command. This action eliminated the capability to systematically match available replacement quantities with repair actions. Command officials said the system was terminated because it was not effective. One shortcoming was that the system used national stock numbers, whereas maintenance personnel used part numbers.

## CHAPTER 3

### SERVICEABLE REPLACEMENT PARTS NOT USED EFFECTIVELY

In some cases the Air Force repaired parts when more than sufficient quantities of like serviceable parts were available to meet the Air Force's current needs. In many cases the onhand balances of serviceable parts were in a long-supply or excess position. By using available serviceable replacement parts, the Air Force could save millions of dollars in repair costs or make available thousands of labor hours for other needed repair work.

We believe the unnecessary repairs resulted because:

- The Air Force does not have an effective system for identifying and matching available serviceable parts with parts scheduled for repair.
- Air Force personnel responsible for managing replacement parts and repair schedules were not always familiar with the objectives and procedures for using available serviceable parts.
- Adequate management attention has not been devoted to developing effective procedures and clearly delineating responsibilities for making sure that serviceable replacement quantities are properly identified and used in place of repair work.

Unnecessary repairs are a longstanding problem. In our report to the Congress, dated July 27, 1964 (B-133019), we reported that the San Antonio center repaired spare parts and components although sufficient serviceable items were available to meet current or long-range needs. The Air Force Audit Agency in 1973, 1974, and 1975 reported that the problem had not been solved. In each instance the Air Force agreed that unwarranted repairs had taken place, but effective remedial action has not ensued.

To the contrary, the problem was worsened by the elimination of the maintenance control system used to match available serviceable parts with planned repair actions on the same item. Although this system was not complete because it did not identify all planned repairs, its elimination left the Air Force without a system for matching available serviceable parts with any planned repair actions.

The shortage of maintenance resources (a shortfall of about 3.1 million labor hours valued at \$99 million was expected) makes it important that available replacement parts (about \$518 million of serviceable parts) be used properly and unwarranted repairs avoided.

#### OPPORTUNITIES FOR SAVINGS

We selected for review 379 serviceable parts shown by Air Force requirements determinations on July 1, 1975, to be in excess of a 12-month supply, and thus available for use as replacement parts.

The Air Force incurred unnecessary repair costs during fiscal year 1975 by repairing 116 of these items when serviceable quantities in excess of 1 year's estimated requirements were available in the supply system. About 10,000 labor hours costing about \$184,000 were used to repair the 33,660 units involved.

The potential for future savings was even greater. We estimate that future use of the available quantities of 199 of the 379 replacement items selected by us could save the Air Force about \$761,000 in repair costs or make about 41,000 labor hours available for other needed repair work. In some cases, available replacement quantities were sufficient to preclude items repair for several years at the 1975 repair level.

The remaining 180 selected items either had no recorded repair in fiscal year 1975 or were repaired at an activity not included in the review. Although use of available quantities of these items could also avoid future repairs, no savings were estimated because needed data such as repair actions and repair costs were unavailable.

The results of the selected items review are summarized below:

Air logistics centers	Number of items selected	Item repair activity FY 1975		Potential savings	
		No repairs	Repairs	Labor hours	Dollars
San Antonio	188	108	80	28,376	549,765
Oklahoma City	99	60	39	3,577	69,177
Warner Robins	<u>92</u>	<u>12</u>	<u>80</u>	<u>9,008</u>	<u>142,000</u>
Total	<u>379</u>	<u>180</u>	<u>199</u>	<u>40,961</u>	<u>760,942</u>

Potential future savings were derived by multiplying each item unit repair cost for 1975 by the quantity of available replacement units. The Air Force uses a standard cost system; therefore, repairs for the same item generally produce uniform costs. Unit repair costs were computed by multiplying the number of standard direct labor hours required to repair one unit of an item times the standard labor hour sales rate. The labor hour sales rate includes a charge for direct labor, labor overhead, other overhead, and general and administrative expense. The labor hour rate does not include a charge for material. The repair costs cited are only for work accomplished in the unit's repair and do not include work accomplished on the next higher assembly, such as disassembly, inspection, and final assembly.

Estimated savings of \$761,000 are for less than 1 percent of the 25,500 items with serviceable quantities available for use for the first quarter of fiscal year 1976. The estimated savings cannot be projected to the universe because the items we selected for review were items with high dollar value and/or large amounts of serviceable quantities available for use, and may not be representative of the remaining items in the universe. The estimate shows, however, that significant savings could be realized.

We know of no realistic method for placing a dollar value on the total potential savings through avoided repair costs because two principal estimating factors, (1) planned repair actions and (2) repair costs, are not readily available for all items. Also, these factors may vary greatly in the future. For example, recent changes in the national economy, flying hour programs, and overhaul programs have reduced the number of repair actions and increased repair costs and available serviceable quantities. Repair costs have increased 36 percent since 1971.

The serviceable replacement quantities currently available include many long-supply and excess parts. Their use for replacement in lieu of repair offers a highly significant potential to avoid parts repair costs and would not require purchases of replacement stocks. The Air Force does not summarize the total routed repair replacement quantity values by year as it does the long-supply values. However, the growth of serviceable long-supply assets from about \$393 million in 1971 to about \$786 million in 1975 is indicative of the growth in routed repair replacement quantities.

The current shortage of maintenance resources makes it important that resources be used properly and unwarranted repairs avoided. The Logistics Command estimated that 46 million direct labor hours costing \$1.2 billion would be needed by its maintenance activities during fiscal year 1976. Furthermore, in October 1975 it was expected that 3.1 million needed labor hours costing \$99 million would not be available. The use of routed repair replacement quantities instead of repairing parts could substantially reduce the number of labor hours needed but not available.

For example, the San Antonio center reported in November 1975 that its engine overhaul program lacked 27,627 labor hours to fulfill its repair requirement for fiscal year 1976. We found that about 13,000 labor hours could be made available in fiscal year 1976 by using available serviceable quantities instead of repairing selected items on the TF-39 and T-56 engines. This represents about 48 percent of the reported labor hour deficit for the entire fiscal year 1976 engine overhaul program.

Neither maintenance activities nor commercial contractors were making extensive use of available serviceable quantities when repairing major components or end items.

For example, during overhaul of TF-39 engines at the San Antonio maintenance activity in fiscal year 1975, rotor blades were repaired rather than replaced. The repair records show that about 2,000 direct labor hours were used to repair an estimated 6,600 TF-39 rotor blades (National Stock Number 2840-00-109-8552PS). At the same time, requirement records showed that sufficient quantities of serviceable rotor blades were available to preclude all fiscal year 1975 repairs. At the beginning of fiscal year 1976, the requirements records showed that there were 14,687 serviceable rotor blades available for use. About 10,000 serviceable blades were in long-supply. If repair requirements continued at the fiscal year 1975 level, there were enough rotor blades to preclude repairs for over 2 years with a labor savings of about 4,400 hours.

In another instance, an estimated 78 waveguide horns (part of an antenna used on the MA-1 weapons control system) were repaired at the Warner Robins maintenance activity during fiscal year 1975. The waveguide horns (National Stock Number 1270-00-083-7910) were repaired in conjunction with antenna repairs and each horn required 2.2 hours to repair. The requirements record showed that 40 serviceable waveguide horns were available as alternatives to repairing parts. If the replacement quantity of 40 horns had been used, about 88 labor hours could have been saved and redirected to other work.

In another instance, an engine overhaul contractor had not been notified of serviceable quantities available for parts he might repair during overhaul. The contractor had overhaul contracts for the R-4360 and R-2800 engines managed by the San Antonio center and the J57-55 engine managed by the Oklahoma City center.

For the San Antonio contracts, the requirements records showed the serviceable quantities for 210 items valued at about \$15.9 million were available as alternatives to repairing parts. Most of these quantities were in long supply. When informed of this savings opportunity, the San Antonio center agreed that using available serviceable quantities instead of repairing parts could defer repair costs. This center, after analyzing overhaul and requirements data, identified \$5.3 million worth of serviceable parts for use by the contractor as Government-furnished materials in lieu of scheduled repair work. The remaining serviceable parts were not offered to the contractor because they were not needed to meet programmed overhaul requirements. Earlier identification would have enabled the contractor to also use the remaining \$10.6 million of available parts.

For the Oklahoma City contract, the requirements records showed that serviceable quantities of 30 items valued at about \$1 million were available as alternatives to repairing parts. Personnel at the Oklahoma City center stated that use of available replacements could be included in new contracts, but decided against any action on the current contract because it was nearing completion and only a relatively small number of items could be used.

#### WHY REPLACEMENT QUANTITIES ARE NOT USED

The Air Force recognizes the advantage of using available replacement quantities rather than repairing items, but has not developed effective procedures for identifying all



replacement opportunities and changing its normal repair practice to take advantage of these opportunities. The more important underlying problems involve identifying repair actions, training personnel, and providing sufficient management attention.

### Incomplete identification of repair actions

In many cases, maintenance personnel at the centers were not aware that replacement quantities were available to preclude repairs. This happened because the Routed Item Control System did not identify all items being repaired. This system identified only those items routed from one shop to another, and not items repaired in the same shop that their next higher assembly was repaired in. During our review, the Logistics Command eliminated the Routed Item Control System so that even a partial identification system no longer exists.

The identification problem under the Routed Item Control System occurred because there were two conflicting definitions of routed items. Air Force Logistics Command Manual 57-3 defines job-routed repair as components repaired simultaneously with their next higher assembly. Conversely, the maintenance manual (Air Force Logistics Command Manual 66-1) defines routed items as those removed from the next higher assembly and sent to another shop for repair. This definition excludes those component items repaired simultaneously with the next higher assembly in the same shop.

Under the Routed Item Control System, the restrictive maintenance definition limited management visibility of repair actions below major assembly level. The T-56 engine, for example, contains 379 recoverable items which may be repaired during overhaul, but only 83 were identified in the Routed Item Control System as items being repaired. The remaining 296 items were not routed and consequently not identified in the routed-item plan. As a result there was no ready management visibility of repair of these 296 items nor any opportunity for the items to be systematically matched with available replacement quantities in the DO 41 Recoverable Consumption Item Requirements System.

The identification problem is best illustrated by what happens when repairs occur in the same shop. For example, a fourth stage turbine wheel (National Stock Number 2840-00-400-876RW) and its next higher assembly, a turbine rotor, were repaired in the same shop as the T-56 engine. Since the turbine wheel was not routed to another shop for repair it was

not identified in the control system; thus, only the shop repairing it knew how often it was repaired. During fiscal year 1975, the maintenance shop expended 278 labor hours to repair 68 turbine wheels.

At the same time, the item manager responsible for managing the serviceable inventory of turbine wheels was reporting sufficient assets to preclude all repairs. The control system did not match this data with the repair action because the shop repair data was not entered into the control system. Thus, management was not aware of the opportunity to save repair costs of as much as \$5,600 and make 278 labor hours available for other work. At the end of the repair period, 81 serviceable turbine wheels were reported in long supply.

Although the Routed Item Control System did not identify all items being repaired, replacement quantities for routed items were included and being used in some cases to preclude repair. However, since the Logistics Command eliminated the data available on the limited number of routed items contained in the Routed Item Control System, opportunities to systematically match available serviceable parts with planned repairs, and thus avoid costly repairs of like items, have been lost.

#### Personnel not trained well in management of replacement quantities

Quantities of each item available for use as replacements in lieu of repairing unserviceable items are identified and reported to item managers through the DO 41 Recoverable Consumption Item Requirements System. This data is computed and reported each quarter. Item managers at each center are responsible for understanding, monitoring, and making proper use of information on the requirement computations and other reports from the DO 41 system. Item managers, we found, were not always familiar with the meaning and use of routed repair replacement quantities.

At the San Antonio Air Logistics Center, only 3 of 30 item managers interviewed could explain what routed repair replacement quantity represented on their requirement computations. At the Warner Robins Air Logistics Center, we asked four item managers, who managed 38 of the items reviewed, if they notified the maintenance activity of the routed repair replacement quantity's availability. None did. In addition, two told us that they do not know which items within a next-higher assembly are being repaired. The other two said that they were not aware of any regulation which requires them to notify maintenance.

This lack of understanding that the routed repair replacement quantity is available for replacement use in lieu of repairing the part has caused some item managers to reject maintenance requisitions submitted for serviceable parts to replace items normally repaired. For example, the maintenance activity at the San Antonio center requisitioned a serviceable multiple switch (National Stock Number 2835-00-101-9870) in May 1975 to be used instead of repairing the switch during overhaul of a gas turbine engine. The switch was routed for repair, and was identified by the Routed Item Control System as having a serviceable replacement quantity available to preclude repair; however, the item manager responsible for managing the switch directed that the requisition not be filled since it was normal practice for maintenance to repair the switch rather than replace it.

At the Warner Robins Air Logistics Center, we interviewed 24 maintenance personnel responsible for planning and scheduling workloads for items reviewed and asked them why the items were repaired rather than replaced with available serviceable assets. Maintenance planners and schedulers said that components of higher assemblies were normally repaired unless there were peculiar problems such as repair parts shortages, condemned components, or components missing when the higher assembly was received. One scheduler said that he might replace a component part rather than repair it if the component part had to be routed to another shop for repair. These interviews, we believe, indicated that maintenance personnel were unaware that Air Force policy requires the use of available serviceable replacement parts in lieu of repairing like un-serviceable parts.

The most frequent explanation for repairing parts instead of using available serviceable parts was that maintenance procedures or labor standards provide for repair, not replacement, of un-serviceable components during overhaul.

#### Adequate management attention not provided

Sufficient management attention has not been devoted to developing effective procedures and clearly delineating responsibilities for making sure that serviceable replacement quantities are properly identified and used instead of repairing parts. Personnel in both maintenance and material management are involved in the repair or replace decision, but the responsibilities of these organizations and the personnel involved are not well defined. Air Force Logistics Command Manual 57-3 states that available replacement quantities will

be used to preclude job-routed repairs, but does not assign responsibility for initiating action. The manual also does not contain definitive procedural criteria and instructions on the purpose and use of replacement quantities when the repair or overhaul work is performed by a contractor.

In October 1974, the Air Force Audit Agency reported that available replacement quantities were not being used at the San Antonio center to preclude repair. Center management ultimately agreed there was a problem with information exchanged between the material management and maintenance organizations, but believed it was a systems problem that could not be corrected locally and the problem was submitted to the Air Force Logistics Command for resolution. In the interim, Air Force Audit reported the same problem at other centers. In an apparent attempt to alleviate the problem, the Logistics Command, in February 1975, directed all centers to use the Routed Item Control System to match repair actions with available replacement quantities. In May 1975 Air Force Audit summarized its findings at all centers and generally concluded that the command action was responsive to its findings. While command action reemphasized the need to use replacement quantities, it did not correct the problem of being unable to match available replacement quantities with nonrouted repair actions.

The centers terminated the Routed Item Control System at the direction of the Logistics Command in January 1976. This action negated the partial solution provided by the Air Force Logistics Command in February 1975 to Air Force Audit Agency findings.

When questioned by Oklahoma City center personnel about eliminating the matching capability, the Logistics Command staff was not aware of the problem created by the loss of the Routed Item Control System.

In discussions with Air Force Logistics Command personnel in March 1976, we were told a new system was being planned to replace the Routed Item Control System. However, we were informed that the new system would not have a program to provide maintenance activities with data on available replacement quantities for all items repaired.

In October 1976, we again discussed this problem with Air Force Logistics Command personnel. They advised us that the material management activity would be assigned responsibility for developing corrective action, including system changes. They agreed with our findings but believed that

cost effectiveness should be considered in the repair/replace decision on a case by case basis. While we agree with the cost effectiveness application, the Air Force does not have the basic information necessary to make individual repair/replace decisions.

## CHAPTER 4

### AIR FORCE AUDIT FOUND SIMILAR PROBLEMS

During 1973, 1974, and 1975 the Air Force Audit Agency issued six reports on the use of serviceable replacement parts instead of making repairs. Each report addressed the issue of unserviceable units being repaired when serviceable units were available and should have been used. The following, extracted from the audit reports, illustrates the conditions found:

- Aircraft spares were being repaired in the depot maintenance activity while serviceable quantities of the same items, valued at \$112,000, were available for issue from the depot supply activity.
- The requirements system identified as of March 31, 1974, over \$12 million of recoverable, serviceable, long-supply assets applicable to the T-56, TF-39, and J-79 engines. The same items were being repaired by Air Force maintenance activities during engine overhaul and component repair.
- Over \$200,000 of serviceable J-79 blades were identified for disposal while like blades were undergoing repair by the depot maintenance activity.
- Quantities of assets for 13 of 30 line items reviewed were repaired at a cost of \$61,353 when serviceable long-supply assets were available and could have been used to satisfy these requirements.

The reasons identified by Air Force Audit for not using serviceable replacement parts in lieu of repair were:

- The Routed Item Control System was not being used as a management tool, maintenance personnel were not familiar with the system, and some items were not properly identified in the system.
- The unwarranted repair of engine components was caused by a lack of effective procedures to provide for interchange of asset information between the material management and the maintenance activities.
- There was a lack of command emphasis on the value of the Routed Item Control System as a management tool.

Recommendations made to the Logistics Command in the summary audit report were:

- Establish procedures to assure interchange and utilization of asset data between repair and supply functions.
- Fully implement the policy of utilizing available serviceable long-supply assets in depot maintenance to preclude unnecessary repair.
- Require the complete and timely file maintenance of logistics requirement data systems to enhance the management of the aircraft spares inventory.

In response to the audit findings and recommendations, the Logistics Command, in February 1975, directed the centers to use the Routed Item Control System. In evaluating audit findings and possible solutions, the Logistics Command recognized difficulties with the mechanized exchange of data between material managers and maintenance managers. The Command discussed possible solutions to the exchange problem but proposed no specific solution when responding to the audit agency. The Air Force Audit Agency considered command action as responsive to the recommendations, but deferred final audit evaluation until specific solutions to the data exchange problem were developed. As of October 1976 no specific solutions had been developed and, as noted previously, the Routed Item Control System has been terminated.

## CHAPTER 5

### CONCLUSIONS, RECOMMENDATIONS, AGENCY COMMENTS, AND OUR EVALUATIONS

#### CONCLUSIONS

Although reported by GAO as early as 1964 and by the Air Force Audit Agency in 1973, 1974, and 1975, the Air Force continues to repair units when serviceable units beyond immediate or foreseeable needs are available and should be used to avoid repair costs. Ironically, while the Air Force was continuing unwarranted repairs, it was estimating that up to \$99 million of fiscal year 1976 repair requirements would not be fulfilled because sufficient depot maintenance resources were not available.

The Air Force has not and will not make effective use of available serviceable quantities until substantial changes are initiated because:

- The mechanized system does not notify maintenance personnel of the quantities available to preclude repairs.
- Air Force personnel are not familiar with the objectives and procedures for using routed repair replacement quantity assets.
- Although aware that unneeded repairs are occurring the Air Force has not instituted management action to make sure replacement quantities are used to preclude repairs. Neither material management nor maintenance activity officials want to take responsibility for this action.

We believe that significant savings are possible if routed repair replacement quantity assets are effectively and efficiently used to preclude repairs. Additionally, the maintenance resources freed could be eliminated or redirected towards reducing the backlog of unfilled repair requirements. Inasmuch as over 12 years have elapsed since we first reported on the problem, it is obvious that the Air Force must take more vigorous action than it has in the past to bring about improvements.



## RECOMMENDATIONS

We recommend that the Secretary of Defense direct the Secretary of the Air Force to initiate management action to.

- Establish procedures and systems that (1) will periodically identify all assets to be repaired at the depot maintenance level and (2) match these records with the quantity of serviceable replacement parts that can be used to preclude repair.
- Change regulations to clearly delineate responsibilities for assuring the use of serviceable replacement assets to preclude repairs made by maintenance activities and contractors.
- Train material management and maintenance personnel on the system's use and the concept of utilizing available serviceable assets rather than repairing unserviceable assets.

## AGENCY COMMENTS AND OUR EVALUATIONS

We furnished a preliminary draft of this report to the Department of Defense (DOD) for review. Their comments are included as appendix I.

DOD stated that the primary problem appeared to be inadequate procedures and systems to make sure that total asset visibility is maintained during the depot maintenance process in order to utilize available serviceable assets to preclude unnecessary repairs. According to DOD, the Air Force plans several procedural and data system changes which should alleviate the deficiencies cited in this report.

These changes include implementation of an interim maintenance uniform cost accounting system at the Sacramento Air Logistics Center designed to determine comparative costs of repairing component subassemblies versus removing and replacing subassemblies so that cost effectiveness decisions can be made. Concurrent with implementation of the interim system the practice of routinely repairing subassemblies will be discontinued. Unserviceable subassemblies will be turned in to supply activities and serviceable assets will be issued to maintenance activities through normal supply channels.

The Air Force believes that turning unserviceable subassemblies in to supply will provide consumption data on depot repairs which are not currently available to the DO 41

Recoverable Consumption Item Requirements System. This will allow the DO 41 system to compute repair requirements for depot-generated subassemblies.

The above changes, properly carried out, should reduce unwarranted repairs. This will be particularly true after procedures are debugged during the pilot program at Sacramento and expanded to cover depot maintenance activities at the other air logistics centers and at contractors.

DOD did not specifically state whether it planned to apply the new procedures to contractor work; we believe the procedures can and should be. Even recognizing that the Government does not have the same flexibility with contractors that it has inhouse, and that contractor work involves additional economic considerations (such as tasks already negotiated in ongoing contracts), potential savings from the new procedures makes their application to contractors desirable.

DOD did not comment on our recommendations for delineating responsibilities and training personnel. Our subsequent review of the new procedures makes it clear that the material management activity has primary responsibility. These procedures should give them the asset visibility necessary to fully carry out that responsibility.

We believe, however, that to maximize benefits from the new procedures, both material management and maintenance personnel must be made aware of their responsibilities and must be adequately trained in the new procedures. In view of the longstanding nature of the problem cited in this report it is obvious that continued management attention is needed to make sure available serviceable assets are used to preclude repairs.

DOD stated that it and the Air Force would make followup reviews of the effectiveness of the changes in the management of reparable subassemblies. We believe that delineation of responsibilities and adequacy of training also should be covered in the reviews. We plan to monitor the effectiveness of the new procedures.

## CHAPTER 6

### SCOPE OF REVIEW

We evaluated the procedures and practices followed in making the replace or repair decisions. We also reviewed selected items to determine if available replacement quantities were being used to save maintenance resources. From computer records kept at the five air logistics centers, we prepared a special computer listing of items having a routed repair replacement quantity as of June 30, 1975. These replacement quantities were available for use in lieu of repairing like items during the first quarter of fiscal year 1976 (July 1, 1975, to Sept. 30, 1975). The listing, by national stock number, showed the quantity and value of replacement parts and identified the next higher assembly and/or weapon system which used the parts.

From this listing we selected for review items relating to three engines undergoing overhaul by contractors. We also selected for review items both managed and repaired inhouse at three air logistics centers. Items managed and repaired at San Antonio, Texas; Oklahoma City, Oklahoma; and Warner Robins, Georgia; were chosen. Selected items' relationship to higher assemblies and/or weapon systems is set out in the following table:

<u>Weapon systems/ higher assemblies</u>	<u>Air logistics centers</u>			
	<u>San Antonio</u>	<u>Oklahoma City</u>	<u>Warner Robins</u>	<u>Total</u>
C-5A	35	-	-	35
B-52	-	34	-	34
TF-39 engine	38	-	-	38
T-56 engine	15	-	-	15
TF-30-3 engine	-	35	-	35
TF-33-3 engine	-	30	-	30
Automatic test equip.	56	-	-	56
MISTR items (note a)	-	-	92	92
Misc. compon- ents	<u>44</u>	<u>-</u>	<u>-</u>	<u>44</u>
Total	<u>188</u>	<u>99</u>	<u>92</u>	<u>379</u>

a/Management of Items Subject to Repairs (MISTR)--Represents component parts of various systems that are repaired independently of the using system and returned to using organizations or stock.

Our review was conducted at headquarters, Air Force Logistics Command, Wright-Patterson Air Force Base, Dayton, Ohio; and three of its five air logistics centers located in San Antonio, Texas; Warner Robins, Georgia; and Oklahoma City, Oklahoma. We examined pertinent regulations, manuals, records, and supporting documentation pertaining to the management and repair of selected items. Information was also obtained through discussions with various operating personnel and responsible officials.



ASSISTANT SECRETARY OF DEFENSE  
WASHINGTON, D.C. 20301

SR  
INSTALLATIONS AND LOGISTICS

4 MAR 1977

Mr. F. J. Shafer  
Director, Logistics and  
Communications Division  
General Accounting Office  
Washington, D. C. 20548

Dear Mr. Shafer:

This is in reply to your letter to the Secretary of Defense regarding your Draft Report dated December 9, 1976, subject: "Air Force Continues to Repair Parts When Serviceable Parts Are Available," OSD Case #4489, GAO code number 943016.

The findings contained in your Draft Report indicate that the Air Force could achieve substantial savings in repair costs or that thousands of labor manhours could be reallocated to needed repair requirements. As your Draft Report states, the problem of unwarranted repairs has been previously discussed in several General Accounting Office and Air Force Audit Agency reports. The primary problem appears to be that the Air Force has not had adequate procedures and systems to insure that sufficient total asset visibility is maintained during the depot maintenance process in order to utilize available serviceable assets to preclude unnecessary repairs. The Air Force plans to implement several procedural and data system changes which should alleviate the deficiencies cited in your Draft Report. A description of the specific changes being implemented by the Air Force is enclosed herewith.

Follow-up reviews of the effectiveness of the aforementioned changes in the management of reparable subassemblies will be made by the Air Force and this Office.

The opportunity to comment on this report in draft form is appreciated.

Sincerely,

DALE R. MALONE  
Acting Assistant Secretary of Defense  
(Installations and Logistics)

Enclosure  
As Stated



PROPOSED AIR FORCE CORRECTIVE ACTIONS RELATING TO GAO DRAFT REPORT, "AIR FORCE CONTINUES TO REPAIR PARTS WHEN SERVICEABLE PARTS ARE AVAILABLE" (OSD CASE #4489)

An interim maintenance Uniform Cost Accounting system is scheduled for full implementation at the Sacramento Air Logistics Center on April 1, 1977. It is being designed to determine comparative costs of "job-routing" versus "remove and replace" so that cost effectiveness decisions can be made.\* Concurrent with the implementation of the interim Cost Accounting System, the practice of routine job routing of investment item subassemblies will be discontinued. Unserviceable subassemblies will be turned into supply and serviceable assets will be issued to maintenance through normal supply channels. This new procedure should improve asset visibility and help eliminate unwarranted repairs. An exception will be made for those subassemblies in short supply which will automatically be inducted into existing Management of Items Subject to Repair (MISTR) job order requirements.

Turning unserviceable subassemblies in to supply instead of job-routing them will provide consumption data on depot repairs which are not currently available to the D041 computational system. This will allow the D041 system to compute repair requirements for depot generated subassemblies as is presently done for field generated turn-ins. Repair requirements for those depot generated subassemblies, job-routed at present, will be separately negotiated with an organic or contract maintenance activity using the MISTR system. The MISTR system reassesses quantities of serviceable assets available every two weeks. If serviceable assets exceed 90 days supply, requirements may be renegotiated downward.

\*Note: Job Routing refers to the procedure whereby component subassemblies are concurrently repaired at the same maintenance facility that is overhauling the end item.

Enclosure

**PRINCIPAL OFFICIALS**  
**RESPONSIBLE FOR ADMINISTERING**  
**ACTIVITIES DISCUSSED IN THIS REPORT**

**Tenure of office**  
**From**                      **To**

**DEPARTMENT OF DEFENSE**

**SECRETARY OF DEFENSE:**

Harold Brown	Jan. 1977	Present
Donald H. Rumsfeld	Nov. 1975	Jan. 1977
James R. Schlesinger	July 1973	Nov. 1975

**DEPUTY SECRETARY OF DEFENSE:**

Charles W. Duncan, Jr.	Jan. 1977	Present
William P. Clements, Jr.	Jan. 1973	Jan. 1977

**ASSISTANT SECRETARY OF DEFENSE  
(MANPOWER, RESERVE AFFAIRS, AND  
LOGISTICS):**

John P. White	May 1977	Present
Dale R. Babione (acting)	Jan. 1977	May 1977
Frank A. Shrontz	Feb. 1976	Jan. 1977
John J. Bennett (acting)	Mar. 1975	Feb. 1976
Arthur I. Mendolia	June 1973	Mar. 1975

**DEPARTMENT OF THE AIR FORCE**

**SECRETARY OF THE AIR FORCE:**

John Stetson	Apr. 1977	Present
Thomas C. Reed	Jan. 1976	Apr. 1977
James W. Plummer (acting)	Nov. 1975	Jan. 1976
John L. McLucas	July 1973	Nov. 1975

**UNDER SECRETARY OF THE AIR FORCE:**

John Martin (acting)	Nov. 1976	Present
James W. Plummer	Dec. 1973	Nov. 1976

	<u>Tenure of office</u>	
	<u>From</u>	<u>To</u>
ASSISTANT SECRETARY OF THE AIR FORCE (INSTALLATIONS AND LOGISTICS):		
Richard J. Keegan (acting)	Feb. 1977	Present
J. Gordon Knapp	Mar. 1976	Jan. 1977
Frank A. Shrontz	Oct. 1973	Feb. 1976