

**AVIATION FORECASTS
FISCAL YEARS
1969-1980**

January 1969

Department of Transportation
FEDERAL AVIATION ADMINISTRATION
Office of Policy Development
Economics Division

Reproduced by the
CLEARINGHOUSE
for Federal Scientific & Technical
Information Springfield Va. 22151

AVIATION FORECASTS
FISCAL YEARS
1969 - 1980

January 1969

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Office of Policy Development
Economics Division

CONTENTS:

	<u>Page</u>
INTRODUCTION	1
> HIGHLIGHTS OF FISCAL YEAR 1968 ;.....	2
<u>AVIATION INDUSTRY FORECASTS</u>	
(Air Carrier Traffic,	6
Air Carrier Fleet,	9
General Aviation Flying and Aircraft Fleet,	13
Domestic Aviation Fuel Consumption,	15
Civil Aircraft and Engine Production);.....	16
<u>FAA AIR TRAFFIC ACTIVITY FORECASTS</u>	
(Aircraft Operations at Airports with <u>FAA</u> Traffic Control Service	18
<u>FAA</u> En Route Traffic Control Activity,	20
<u>FAA</u> Flight Services);.....	21

TABLES

1. United States Certificated Route Air Carrier Scheduled Passenger Traffic	23
2. Turbine-powered Aircraft on Order by United States Air Carriers	24
3. Total Aircraft in the Service of United States Air Carriers	25
4. Total Revenue Airborne Hours, United States Air Carriers	26
5. Total Revenue Statute Miles, United States Air Carriers	27
6. Active General Aviation Aircraft by Type of Aircraft	28
7. Active General Aviation Aircraft by FAA Region	29
8. Hours Flown in General Aviation	30

TABLES - Continued

	<u>Page</u>
9. Fuel Consumed by United States Domestic Civil Aviation	31
10. Civil Aircraft Production in the United States	32
11. Civil Aircraft Engine Production in the United States	33
12. Total Itinerant and Local Aircraft Operations at Airports with FAA Traffic Control Service	34
13. Itinerant Aircraft Operations at Airports with FAA Traffic Control Service	35
14. Local Aircraft Operations at Airports with FAA Traffic Control Service	36
15. Instrument Operations at Airports with FAA Traffic Control Service	37
16. IFR Aircraft Handled, IFR Departures, and Overs by User Category - FAA Air Route Traffic Control Centers	38
17. Flight Services, Pilot Briefs, Flight Condition Messages and Flight Plans Originated - FAA Flight Service Stations and Combined Station/Towers	39
18. Aircraft Contacted, FAA Flight Service Stations and Combined Station/Towers	40

DISTRIBUTION: ZPO-382; FAT-1 (5 cys ea); FAT-2 (3 cys ea);
FAT-3,4,5,6,7,8 (1 cy ea)

INTRODUCTION

This report presents forecasts of key indicators of aviation activity and of Federal Aviation Administration workload during the period fiscal years 1969-1980. The report has been prepared to meet the planning needs of the various offices and services of FAA for data concerning future trends in aviation activity. During this period significant changes are expected in the volume of air traffic activity and in the type of equipment that will be flying our domestic and international air routes.

Although the report focuses on the period through fiscal year 1975 to provide forecasts required in the preparation of the FAA Five-Year Program, forecasts for fiscal years 1979 and 1980 have also been prepared to meet long-range planning needs. Specific numerical forecasts have also been included for each year from 1969 to 1975 to meet shorter term, fiscal and program planning requirements. It must be recognized, however, that year-to-year fluctuations are difficult to forecast precisely. To a considerable extent, therefore, the data reflect the trend or average conditions expected during the forecast period. In addition, many published forecasts show a range of values reflecting different assumptions. As an aid to uniform planning, only one forecast is presented herein. However, this forecast should be viewed as a level within a band of possible values - some lower, some higher.

HIGHLIGHTS OF FISCAL YEAR 1968

All major measures of FAA workload set new all-time highs in fiscal year 1968 and early reports for fiscal year 1969 indicate another record year in the offing. Uptrends were evident in general aviation as well as in air carrier activities. Military operations, on the other hand, showed relatively little change from a year earlier. In general, growth trends in the various national indicators of aviation activity were in line with forecasts for fiscal year 1968 prepared and published by the FAA in last year's edition of this report.

The 152.6 million revenue passenger enplanements and the 106.5 billion revenue passenger-miles flown by all U.S. certificated route air carriers in fiscal year 1968 were up 20.7 percent and 23.4 percent, respectively, over fiscal year 1967 and were within 1 percent of the amounts forecast a year ago. However, domestic traffic was slightly higher than expected and international traffic somewhat lower. Reported domestic passenger-miles of 81.6 billion were 24.2 percent higher than in fiscal year 1967 and were within 1.4 billion of last year's forecast. U.S. international passenger-miles were at an all-time high of 24.9 billion, up 20.9 percent over the previous year. The latter was slightly less than forecast due most likely to the public response to efforts to improve the balance of international payments. These rates of growth in both the domestic and international areas were near the highest on record and reflected the generally high level of economic activity throughout the year. The outlook for fiscal year 1969 shows continuing gains but at a somewhat lower rate.

The air carriers continued to increase their capacity, as expected, in anticipation of the heavier traffic. Between July 1967 and June 1968, U.S. air carriers added 421 jet aircraft to their fleet, more than in any other year. Most of these were two- and three-engine models. The number of turboprops also increased as added two-engine models offset a drop in the four-engine category. The number of piston aircraft dropped by nearly one-third as the air carriers accelerated their retirement.

Revenue airborne hours and miles flown were up 15.6 percent and 23.3 percent, respectively, over fiscal year 1967. These gains were about five percentage points higher than forecast a year ago due to an underestimation of aircraft utilization.

All measures of general aviation activity were up from a year earlier. The aircraft fleet numbered 114,186 as of January 1, 1968, reflecting the largest annual increase, 9,480, since World War II. The count was about 2,000 higher than forecast and was due almost entirely to an unexpected surge in single-engine piston aircraft. Reported general aviation hours flown were up 6 percent in fiscal year 1968 to 22.9 million but were slightly below the amount forecast last year because of a slightly lower average utilization than anticipated. Business flying remained unchanged over the year, while all other categories showed increases. Instructional flying, after doubling over the two previous years, was up 6.7 percent, but the most noteworthy increase was in commercial flying. The latter increased by almost 11 percent compared with a gain of only 15.6 percent over the preceding four years. This rise undoubtedly reflects the step-up in air taxi operations.

Production of jet transports in fiscal year 1968 surpassed all expectations and rose to 625. This was a gain of over 80 percent over fiscal year 1967, the previous record year. Most of these were two- and three-engine models. Fiscal year 1969 production is not expected to be as high but it will certainly be the second highest on record.

Production of general aviation aircraft was off slightly from a year earlier. In comparison with trends in earlier years, however, the last three years have been on a very high plateau. The 14,419 aircraft produced in fiscal year 1968 was only 460 below the all-time high set in fiscal year 1966. Fiscal year 1967 production was 14,799. The outlook for fiscal year 1969 is for a relatively small gain.

Total aircraft operations at airports with an FAA-operated control tower reached 53.0 million in fiscal year 1968, 11.3 percent above a year earlier and only .1 million less than forecast. Itinerant operations at 32.4 million were 11.3 percent above fiscal year 1967 and varied from the forecast by less than 1 percent. Local operations showed a similar gain over a year earlier but were almost 2 percent over the forecast due undoubtedly to the higher than anticipated level of instructional flying.

Instrument operations in fiscal year 1968 recorded the highest increase on record in both percent and amount and exactly attained the forecast level of 14.6 million. The number of IFR aircraft handled increased by three million in fiscal year 1968 to 18.1 million for a 20-percent rise over fiscal year 1967. An 18-percent increase had been forecast. The difference of two percentage points was attributable

almost entirely to a larger than expected increase in air carrier overflights. Early reports for fiscal year 1969 indicate another record year.

Total flight services provided by the FAA rose by only 9 percent in fiscal year 1968 compared with 17 percent a year earlier. There was a notable reduction in the rate of growth in both pilot briefs and aircraft contacted, although all services were at record high levels. Indications so far in fiscal year 1969 point to a growth somewhat higher than in fiscal year 1968.

AVIATION INDUSTRY FORECASTS

Air Carrier Traffic

Passenger traffic transported by U.S. certificated route air carriers is expected to grow at more than twice the rate for the rest of the national economy through the decade of the 1970's. However, the long-term growth in total revenue passenger-miles of about 11 percent per year is substantially lower than the 18 percent average annual increase between fiscal years 1964 and 1968. The latter rate resulted from a combination of factors such as the unusually high rate of growth in the nation's economy, the war in Viet Nam, and a sharp decline in the average passenger fare. The forecast assumes a return to a more normal and sustainable rate of economic growth than has been experienced in the past four years. In absolute numbers the 106.5 billion revenue passenger-miles flown in fiscal year 1968 will rise to 119.4 billion in fiscal year 1969, to 226.5 billion in fiscal year 1975, and should reach 379 billion by fiscal year 1980 (see Table 1).

U.S. domestic revenue passenger-miles, which grew at an average rate of 19 percent per year between fiscal year 1964 and fiscal year 1968, will increase some 12 percent in fiscal year 1969 and then grow at about 11 percent per year through the next decade. This will raise the number of domestic revenue passenger-miles from 81.6 billion in fiscal year 1968 to 91.2 billion in fiscal year 1969, to 170 billion in fiscal year 1975, and to 288 billion in fiscal year 1980.

U.S. international revenue passenger-miles, which grew at a slightly lower rate than domestic between 1964 and 1968, are expected to increase

by about 13 percent in fiscal year 1969, to 28.2 billion from the 24.9 billion level of the preceding year. The long-term growth rate in this sector will also average about 11 percent annually. This will result in some 54.5 billion U.S. international revenue passenger-miles in fiscal year 1975 and 91 billion by fiscal year 1980. As both domestic and international traffic will grow at about the same rate, the international market will continue to account for a little less than one-fourth of total U.S. air carrier revenue passenger-miles. It is interesting to note that U.S. international air carrier passenger-miles in 1979 are expected to be equal to the 1968 domestic level.

The number of revenue passenger enplanements will grow at a more moderate pace than revenue passenger-miles, as the average passenger trip length gradually increases. From 152.6 million in fiscal year 1968, total enplanements will increase by 10 percent to 168.6 million in fiscal 1969 (see Table 1). This represents a considerable moderation of the 16.5 percent annual growth that occurred in the fiscal 1964-1968 period. The long-term growth in total enplanements should continue at about 10 percent per year through fiscal year 1980 in both domestic and international operations. This will raise the total number of enplanements to 296 million in fiscal year 1975, nearly double the 1968 figure, and to 470 million, or three times the 1968 level, by fiscal year 1980. Because of the much greater trip length characteristic of international travel, international revenue passenger enplanements account for only about one-tenth of total enplanements.

In fiscal year 1969, domestic passenger enplanements will amount to about 151.5 million as compared with 137.5 million a year earlier. U.S. international enplanements will increase to 17.1 from 15.1 million in the same period. By fiscal year 1975, domestic enplanements will increase to 265 million and international to 31 million. The corresponding estimates for fiscal year 1980 are 420 million and 50 million, respectively.

These forecasts are based on the assumption that gross national product (GNP) expressed in constant 1958 dollars, after slowing somewhat in fiscal years 1969 and 1970, will return to a more normal long-term rate of 4.25 percent in fiscal year 1971 and continue at that average rate through the decade. The increase in the general level of prices is assumed to subside from its present high rate to a more modest 2 percent per year by fiscal year 1970. Domestic fares (including tax) per revenue passenger-mile should decrease about 3 percent per year in dollars of constant purchasing power as new larger capacity, and more economical aircraft enter the fleet at a rapid rate. This would be equivalent to an average 1 percent annual decrease in average fares when measured in current dollars. The proportion of GNP which is spent on air transportation should increase steadily from 0.6 percent in fiscal year 1969 to more than 0.85 percent in 1980.

Past experience has shown these factors to be closely associated with the level of domestic passenger traffic. International traffic of U.S. carriers has in the past been closely related to domestic traffic levels. These relationships have been projected to continue in the future.

These assumptions with regard to rates of change in GNP, average fares, and amount spent on air transportation must be viewed as long-term averages and not prediction of the levels in any given year. It is possible, and likely, there will be divergent movements in some years which will then be offset by corrective adjustments in subsequent years with the net change still on the long-term trend.

The final award of new routes and additional service in the trans-pacific area will certainly increase total U.S. international air carrier traffic. However, because of their current indefinite status, it has not been possible to reflect their impact on the forecasts presented herein.

The present forecasts are changed little from those prepared last year. Total revenue passenger-miles differ for corresponding years by not more than 2 percent between the two forecasts. Domestic revenue passenger-miles are forecast slightly higher in the latest forecast, largely because the proportion of GNP used to buy air transportation is expected to be higher. The number of passenger enplanements, however, is expected to be somewhat below the level of the earlier forecast, as the average passenger trip length is increasing faster than previously forecast. The 429 million revenue passenger enplanements expected in fiscal year 1979 is some 3.4 percent below the levels of the previous forecast.

Air Carrier Fleet

The U.S. air carrier fleet contained 2,010 turbine-powered aircraft at the beginning of fiscal year 1969. An additional 940 were on order

as of November 1968 (see Table 2). Of the aircraft on order, two-engine jets accounted for 26 percent, three-engine jets 31 percent, four-engine jets 28 percent and supersonic transports 11 percent. The 34 turboprops on order represent only 4 percent of all orders, compared with 9 percent a year earlier.

Notable in the list in Table 2 is the large number of orders which were placed in 1968 for the new three-engine airbus and the relatively small increase in the order backlog for the four-engine jumbo jet. It is also interesting to note the change from a year ago in the fleet size and orders for the deHavilland Twin Otter by the certificated air carriers. These small STOL aircraft are finding a place in the route structure of some of the helicopter airlines. The numbers are still quite small; however, they do not include those in service or on order by air taxi operators which are classed as general aviation.

The size and expected composition of the fleet, by year, is shown in Table 3. Included are the aircraft on firm order shown in Table 2 plus anticipated orders for aircraft required to meet the needs of expected traffic growth. Estimates of available seat-miles developed by the forecast fleet appear consistent with the revenue passenger-mile forecasts shown in Table 1.

The fleet forecast assumes an evolutionary advance in aircraft technological developments with a continuing improvement in performance and aircraft operating costs. Although the fleet may include some V/STOL aircraft by 1980, both the timing and the specific aircraft types are too indefinite to permit separate identification in the forecast fleet.

All-cargo aircraft were included, although their number was not based on a detailed forecast of the cargo market. In total, the airline fleet is expected to increase from 2,452 aircraft at the beginning of 1968 to 3,600 aircraft in 1980. The present forecast represents a decline in the number of aircraft from the forecast prepared a year ago but virtually no change in overall capacity. The difference reflects primarily the greater-than-expected influx of the large, three-engine airbus into the fleet during the forecast period and the assumption that a two-engine airbus will emerge in the latter half of the decade.

The jet fleet is expected to double its January 1, 1968 size by 1975, with two- and three-engine aircraft accounting for most of the increase. By 1980 the number of jets will have increased to two and one-half times the 1968 total and will comprise more than 90 percent of the fleet as compared with a little over half in 1968. Two- and three-engine aircraft will remain predominant; the three-engine airbus will increase rapidly after its introduction in 1971. The number of four-engine jets will continue to increase through fiscal year 1972, but will decline thereafter as earlier, lower-capacity models are phased out of service and are replaced by a lesser number of high-capacity, four-engine jumbo jets as well as by the two- and three-engine airbus. The Concorde was assumed to enter the fleet in fiscal year 1973, and initial U.S. SST airline service will begin in 1978. However, supersonic transports will number only about 76 by 1980 assuming their limitation to overwater service.

Turboprops will decrease steadily in number, with four-engine turboprops dwindling to insignificance by the end of the period. Piston aircraft will follow a similar pattern. In total, the number of helicopters is expected to show only a modest increase through the forecast period. All of the helicopters added to the fleet will be turbine-powered.

Forecasts of U.S. air carrier revenue airborne hours and revenue miles flown, by aircraft type, are shown in Tables 4 and 5. Average utilization rates and airborne speeds were developed for each aircraft type for each carrier group based on past trends as well as anticipated future use of the aircraft. These unit values were then applied to the corresponding number of aircraft of the given type in each carrier group.

Both series will increase steadily through the forecast period. Airborne hours will increase by about two-thirds between fiscal year 1968 and 1980 while miles flown will increase by 86 percent. The greater gain in miles flown compared with airborne hours is a reflection of the increase in average air speed. Revenue passenger-miles will grow more rapidly than miles flown or airborne hours because of the shift to higher capacity aircraft. Piston and turboprop aircraft utilization will decrease over the period to the extent that jet aircraft will account for some 97 percent of air carrier miles flown by 1980. One- and two-engine turboprops will be the only propeller driven equipment to show any significant amount of flying or mileage over the latter half of the forecast period.

General Aviation Flying and Aircraft Fleet

General aviation is a heterogeneous category which includes all civil flying, except that performed by the interstate and intrastate air carriers operating large aircraft. Its diversity is demonstrated by the inclusion of activity ranging from personal/pleasure flying to scheduled interstate air taxi operations in turbine-powered aircraft, and such uses as aerial application, business and corporate flying, instructional flying, and many more.

Much of the difficulty in projecting future trends in this area results from the heterogeneity of the subject and the lack of a comprehensive data base. Such information as is available indicates a strong upward trend in all activity areas and portends a continued healthy growth through the forecast period.

The general aviation fleet numbered 114,186 active aircraft at the beginning of 1968 and is expected to increase to 170,000 aircraft by 1975 and to 214,000 by 1980. The single-engine piston aircraft which numbered 96,471 in January 1968 are expected to increase to 173,000 at the beginning of 1980. Their proportion of the fleet is expected to dip slightly, however, from 84 percent in 1968 to 81 percent in 1980. The number of multiengine piston aircraft is forecast to double by 1980, from 13,439 in 1968 to 26,650. The most spectacular growth should occur in the area of newer turbine-powered aircraft. A sixfold increase - from just under 1,300 in 1968, to 7,800 aircraft by 1980 - is projected in the fixed-wing, turbine-powered fleet. Most of these aircraft will be turboprops, principally due to their lower cost in comparison to the

turbojets. The rotorcraft fleet will share in the overall growth, but, at the expected level of 4,800 aircraft in 1980, will still constitute only 2.2 percent of the fleet. Most of the helicopters are expected to be turbine-powered.

Table 7 provides a regional distribution of active general aviation aircraft. There will be continued growth throughout the forecast period in the number of aircraft in each FAA region. The most significant rates of growth are expected in the Western and Southern Regions.

Total hours flown in general aviation are expected to increase from an estimated 22.9 million hours in fiscal year 1968 to 42.8 million hours in fiscal year 1980 (see Table 8).

While all use categories will contribute to the growth in total hours flown, commercial and personal flying will experience the highest growth rates. Both scheduled and nonscheduled air taxi operations, which are classed in the commercial category, are expected to show marked gains and become an increasingly important part of the nation's air transportation system. Air taxis are filling a void in air service to small communities which do not generate enough traffic to justify service with large transport-type aircraft. Further, air taxis have been given added impetus from mail contracts awarded by the Post Office Department.

The growth in personal flying will be stimulated by rising per capita incomes and an increasing desire to fly. Instructional flying, which will be influenced by the same factors, will also benefit from promotional learn-to-fly programs but its long-term rate of growth is expected to be somewhat below the high growth rates of the past few years.

Business flying, which is expected to remain the largest segment of general aviation, is forecast to increase from 6.8 million hours in fiscal year 1968 to 12.5 million in 1980, a gain of 84 percent. Its growth, about average for the industry, will be tied more closely to the overall national economy than the other categories of general aviation.

Domestic Aviation Fuel Consumption

Fuel consumed in U.S. domestic civil aviation totalled 6.8 billion gallons in fiscal year 1968 and is expected to nearly double by fiscal year 1975 and to be 150 percent greater by fiscal year 1980 (see Table 9). Jet fuel consumption will account for almost all of the change as users increase consumption from 6.2 billion gallons in fiscal year 1968 to 12.2 and 16.6 billion gallons, respectively, in fiscal years 1975 and 1980. In fiscal year 1968 the air carriers consumed approximately 97 percent of the jet fuel, and they are expected to maintain this relative percentage throughout the forecast period.

Aviation gasoline consumption is expected to decline from 642 million gallons in fiscal year 1968 to 515 million gallons in fiscal year 1970 as the air carriers continue to retire piston-powered aircraft from service. By fiscal year 1975 increases in general aviation gasoline consumption will have offset declines in the air carrier portion and total aviation gasoline consumption is expected to be back to the current level. By fiscal year 1980, the total should be about 835 million gallons, 30 percent above fiscal year 1968.

Civil Aircraft and Engine Production

During the past three years total civil aircraft production has remained on a plateau at the highest level since the post-war years of 1946-1947. Table 10 shows the aircraft produced since fiscal year 1964 and a forecast through fiscal year 1980. Significant during fiscal year 1968 was the production of 625 transport aircraft, the largest number produced during any year on record.

General aviation aircraft production is forecast to better than double from the fiscal year 1968 level of 14,419 aircraft to 33,700 aircraft in fiscal year 1980. Although the production figures for the later years of the forecast remain substantially unchanged from the January 1968 forecast, the short-run projections have been lowered to reflect more recent production figures together with the expectation that the economic growth rate in fiscal years 1969 and 1970 will be somewhat slower than in the years immediately past. The distribution of this demand shows no radical change, with rotorcraft and turbine aircraft each contributing about 2 percent, multiengine piston 14 percent, and with single-engine piston making up the remaining 82 percent of the production. The trend has been toward aircraft with larger capacity, greater speed, longer range, higher cruising altitude capability, and more electronic equipment. This trend is expected to continue. The demand for turbine-powered aircraft, although significant by itself, will continue to be a relatively small portion of the total due to high initial and high hourly operating costs plus their complexity of operation as compared with piston aircraft. The actual production levels as

forecast in Table 10 may vary because of their sensitivity to the general business cycle.

The forecast of air carrier transport aircraft production was based on both the announced orders and additional estimated orders for those U.S. and foreign air carriers which will require additional aircraft to remain competitive and to accommodate the forecast increase in traffic demand. Although all types of two-, three-, and four-engine jets will be produced for the next several years there will be an increasing emphasis on the "jumbo" and "airbus" or large capacity aircraft. Thus, although the present forecast through fiscal year 1980 represents an increase over last year's estimate, due to the increasing size of the aircraft the number manufactured each year is expected to be less than the record number of units produced in the 1968-69 time period.

The forecast of civil aircraft engine production, as shown in Table 11, was based on the aircraft production figures shown in Table 10 and provides for necessary spares. Piston engine production was based solely on general aviation aircraft requirements, while the number of turbojet and turboprop engines account for air carrier requirements as well as general aviation. The turboprop engine production assumes a portion of general aviation aircraft, as well as a portion of converted two-engine piston transports, will be equipped with foreign-manufactured engines.

It will be noted that the turboprop forecast shows an increase over the previous estimate. This increase was due to an increasing requirement for turbine-powered helicopters in general aviation use and does not reflect a change in air carrier requirements.

FAA AIR TRAFFIC ACTIVITY FORECASTS

During the forecast period, fiscal years 1969 through 1980, all FAA airport and airway workload measures will increase. General aviation and air carrier operational activity are estimated to increase significantly, while military activity will remain relatively stable. Tables 12 through 18 show the various measures of air traffic activity and workload at FAA terminal and en route facilities and flight service stations.

Aircraft Operations at Airports with FAA Traffic Control Service

Table 12 shows that total aircraft operations at airports with FAA traffic control service are forecast to increase from 53 million operations in fiscal year 1968 to 171.5 million operations in fiscal year 1980, an increase of over 220 percent. The increase is due to two factors: (1) an increase in overall flight activity and; (2) the installation of FAA air traffic control towers at additional airports.

This year's forecast of total aircraft operations is somewhat lower than last year's due to changes in three basic assumptions: (1) a change in the schedule of new tower installations; (2) less general aviation local flying; (3) a change in the mix of aircraft in the air carrier fleet to larger capacity aircraft which reduced flight frequency requirements.

Historically, the FAA has installed an average of about ten new towers per year. Because of immediate past and present appropriations limitations, this forecast assumes a significant change in this average.

In the fiscal years 1969 through 1972, only nine new tower establishments are scheduled and none are now planned for commissioning in fiscal year 1973. Beginning in fiscal year 1974, this forecast assumes a resumption of new tower installations at a somewhat higher average than in past years due to the backlog that is presently being created.

Table 13 shows that total itinerant operations will increase from 32.4 million in fiscal year 1968 to 100.6 million in 1980, an increase of 210 percent. General aviation itinerant operations are expected to increase their proportion of the total from 65 percent in fiscal year 1968 to over 80 percent in fiscal year 1980, rising from 21.0 million to 81.0 million operations, a gain of 285 percent.

Air carrier itinerant operations are expected to increase by only 87 percent, from 9.9 million to 18.5 million. This relatively modest increase compared with domestic air carrier passenger-mile growth of over 250 percent reflects the impact of the large capacity aircraft on the operations series. If, for example, no change was anticipated in the average aircraft seating capacity, the operations series instead of being forecast at 18.5 million in fiscal year 1980 would be around 35 million.

Military itinerant operations are expected to continue to decline slowly from 1.5 million in fiscal year 1968 to 1.1 million in fiscal year 1980.

Although local operations are estimated to increase from 20.6 million in fiscal year 1968 to 70.9 million in fiscal year 1980, the expected growth is somewhat less than was forecast last year (see Table 14). The

difference is due to the curtailment in the installation of air traffic control towers over the next three years. All of the growth in local operations will stem from general aviation activity, since military local operations are expected to decline slowly from 1.8 million in fiscal year 1968 to 1.2 million in fiscal year 1980. During the forecast period general aviation local operations are expected to grow by 270 percent, from 18.8 million in fiscal year 1968 to 69.7 million in fiscal year 1980.

Instrument operations shown in Table 15 include operations at airports with FAA traffic control service as well as FAA-operated military radar approach control facilities. The forecast shows an increase to 50.6 million instrument operations in fiscal year 1980 compared with 14.6 million instrument operations in fiscal year 1968, an increase of 247 percent. Part of this increase will be attributable to the general rise in the use of air traffic facilities by general aviation flyers.

The forecasts shown in Tables 12 through 15 are predicated upon the continuation of present operating rules and procedures. If these are changed or the new tower installation schedule is significantly changed, the forecasts would have to be adjusted accordingly.

FAA En Route Traffic Control Activity

The number of IFR aircraft handled is used as the measure of IFR activity and workload at the FAA air route traffic control centers. From fiscal year 1968 to fiscal year 1980, this measure is forecast to increase 150 percent, rising from 18.1 million to 45.3 million. Although air carrier IFR aircraft handled will more than double by 1980 and will

continue to be the largest segment of total IFR aircraft handled, its percentage of the total will decline from nearly 60 percent in fiscal year 1968 to about 52 percent in fiscal year 1980. This forecast assumes that for all practical purposes all air carrier flights will operate IFR beginning in fiscal year 1970.

General aviation is the fastest growing segment of IFR aircraft handled. This is a reflection of the increasing IFR capability of general aviation flyers and aircraft and the growth of itinerant general aviation flying. In fiscal year 1968 there were 2.8 million general aviation IFR aircraft handled; this figure is forecast to grow to 17.4 million in fiscal year 1980, a sixfold increase. Military aircraft handled are forecast to remain relatively stable throughout the forecast period between 4.6 and 4.5 million per year.

The forecasts of IFR aircraft handled assume no change in the number of air route traffic control centers and present-day operating rules and procedures. The forecasts would have to be modified if any of these elements change.

FAA Flight Services

Tables 17 and 18 show measures of workload and activity at FAA flight service stations and combined station/towers. Total flight services, which is a weighted workload measure consisting of aircraft contacted, flight plans originated, and pilot briefs, are forecast to increase from 37.1 million in fiscal year 1968 to 154 million in fiscal year 1980, assuming no basic change in the flight service station system. This is a gain of over 300 percent.

Total flight plans originated are estimated to increase from 5.2 million in fiscal year 1968 to 16 million in fiscal year 1980, a 200-percent increase. In the past, the plans have been about evenly distributed between IFR-DVFR and VFR flights. With the increasing sophistication of general aviation flying, IFR flight plans are expected to increase much faster than VFR flight plans. By fiscal year 1980, the former will be more than twice as large as VFR flight plans originated.

Pilot briefs have been the largest in volume and the fastest growing service provided by the flight service stations. This trend is expected to continue with pilot briefs increasing from 8.6 million in fiscal year 1968 to 47.1 million in fiscal year 1980, a 450-percent increase.

Total aircraft contacted by the flight service stations are expected to nearly triple between fiscal year 1968 and fiscal year 1980. Of the 9.5 million aircraft contacted in fiscal year 1968, 85 percent were general aviation aircraft. By fiscal year 1980, 27.8 million aircraft contacts are expected with general aviation accounting for 95 percent of the total. The annual number of military and air carrier aircraft contacted is expected to remain relatively unchanged throughout the forecast period.

Both IFR-DVFR and VFR contacts will increase during the fiscal years 1968-1980 time period, but VFR aircraft contacted will still dominate by a wide margin. Historically, VFR aircraft contacts have represented about 90 percent of the total; this is expected to decrease to 85 percent by 1980.

Table 1

UNITED STATES CERTIFICATED ROUTE AIR CARRIER
SCHEDULED PASSENGER TRAFFIC

Fiscal Year	Revenue Passenger Enplanements (millions)		Revenue Passenger-miles (billions)	
	Total	Domestic	Total	Domestic
1964	83.0	74.4	54.2	41.3
1965	94.5	84.5	62.6	47.3
1966	113.9	102.2	76.4	57.9
1967	126.4	113.5	86.3	65.7
1968	152.6	137.5	106.5	81.6
1969*	168.6	151.5	119.4	91.2
1970*	183.7	164.7	132.2	100.5
1971*	202.2	181.3	147.2	111.8
1972*	223.0	200.0	164.5	125.0
1973*	244.5	219.0	183.0	139.0
1974*	269.5	241.5	204.0	155.0
1975*	296.0	265.0	226.5	170.0
1979*	429.0	384.0	342.0	260.0
1980*	470.0	420.0	379.0	288.0

*Forecast.

Table 2

TURBINE-POWERED AIRCRAFT ON ORDER BY UNITED STATES AIR CARRIERS

Aircraft Type	Aircraft Fleet 6/30/68	Additional Aircraft on Order for Delivery					Total
		1968	1969	1970	1971	1972 or Later	
Total Aircraft	2,010	276	303	70	74	217	940
Jet	1,564	245	299	70	74	115	803
2-engine: BAC-111	59	1	3	-	-	-	4
Boeing 737	19	65	66	1	-	-	132
Douglas DC-9	219	54	52	-	-	-	106
Sud Caravelle	20	-	-	-	-	-	-
3-engine: Boeing 727	485	70	73	2	-	-	145
McDonnell-							
Douglas DC-10	-	-	-	-	16	56	72
Lockheed L-1011	-	-	-	-	18	59	77
4-engine: Boeing 707	377	26	36	-	-	-	62
Boeing 720	134	-	-	-	-	-	-
Boeing 747	-	-	8	62	40	-	110
Convair 880/990	52	-	-	-	-	-	-
Douglas DC-8	199	29	61	5	-	-	95
Turboprop	433	30	4	-	-	-	34
1-engine: Turbo Porter	7	-	-	-	-	-	-
2-engine: F-27/FH-227	106	-	-	-	-	-	-
Convair 580/600	135	11	-	-	-	-	11
DeHav. Twin Otter	4	4	4	-	-	-	8
Grumman G-21T	2	-	-	-	-	-	-
Grumman Gulfstream	1	-	-	-	-	-	-
Nihon YS-11	4	8	-	-	-	-	8
Nord 262	12	-	-	-	-	-	-
Short Skyvan	1	-	-	-	-	-	-
4-engine: AW-650 Argosy	6	2	-	-	-	-	2
Canadair CL-44	15	-	-	-	-	-	-
Lockheed Electra	103	-	-	-	-	-	-
Lockheed Hercules	9	5	-	-	-	-	5
Vickers Viscount	28	-	-	-	-	-	-
Helicopters	13	1	-	-	-	-	1
1-engine: Sikorsky S-62	1	-	-	-	-	-	-
2-engine: Boeing Vertol 107	4	-	-	-	-	-	-
Sikorsky S-61	8	1	-	-	-	-	1
Supersonic Transports	-	-	-	-	-	102	102
Concorde	-	-	-	-	-	38	38
U.S. - SST	-	-	-	-	-	64	64

Note.—Included here are all turbine-powered aircraft on order by United States certificated route, supplemental, intrastate and commercial air carriers to the extent reported by the aircraft manufacturers and air carriers through November 1968. Aircraft on option are excluded. Aircraft leased or to be delivered under a lease agreement are included. Supersonic transport figures relate only to reserved delivery positions.

Table 3

TOTAL AIRCRAFT IN THE SERVICE OF UNITED STATES AIR CARRIERS

(As of January 1)

Aircraft Type	Reported 1968	Forecast										
		1969	1970	1971	1972	1973	1974	1975	1979	1980		
<u>Total Aircraft</u>	<u>2,452</u>	<u>2,591</u>	<u>2,746</u>	<u>2,790</u>	<u>2,860</u>	<u>2,960</u>	<u>3,050</u>	<u>3,180</u>	<u>3,480</u>	<u>3,600</u>		
<u>Fixed-wing Aircraft</u>	<u>2,430</u>	<u>2,571</u>	<u>2,726</u>	<u>2,771</u>	<u>2,839</u>	<u>2,938</u>	<u>3,027</u>	<u>3,156</u>	<u>3,432</u>	<u>3,552</u>		
<u>Jet</u>	<u>1,344</u>	<u>1,824</u>	<u>2,102</u>	<u>2,216</u>	<u>2,309</u>	<u>2,449</u>	<u>2,545</u>	<u>2,687</u>	<u>3,158</u>	<u>3,316</u>		
2-and 3-engine	638	1,004	1,175	1,217	1,293	1,489	1,636	1,801	2,422	2,574		
4-engine	706	820	927	999	1,016	960	906	862	671	666		
SST	-	-	-	-	-	-	3	24	65	76		
<u>Turboprop</u>	<u>444</u>	<u>437</u>	<u>394</u>	<u>364</u>	<u>354</u>	<u>325</u>	<u>321</u>	<u>312</u>	<u>234</u>	<u>196</u>		
1-and 2-engine	248	282	289	287	283	276	273	265	214	176		
4-engine	196	155	105	77	71	49	48	47	20	20		
<u>Piston</u>	<u>642</u>	<u>310</u>	<u>230</u>	<u>191</u>	<u>176</u>	<u>164</u>	<u>161</u>	<u>157</u>	<u>40</u>	<u>40</u>		
1- and 2-engine	377	231	171	143	139	133	131	128	30	30		
4-engine	265	79	59	48	37	31	30	29	10	10		
<u>Helicopter</u>	<u>22</u>	<u>20</u>	<u>20</u>	<u>19</u>	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>48</u>	<u>48</u>		
Piston engine	5	3	-	-	-	-	-	-	-	-		
Turbine engine	17	17	17	19	21	22	23	24	48	48		

Note.—Included here are all passenger and cargo aircraft owned or leased by, and in the domestic or international service of the United States certificated route, supplemental, intrastate and commercial air carriers. Aircraft used for training and aircraft that have been withdrawn from service and are awaiting disposal are not included here. Aircraft in the service of air taxi operators are shown in the general aviation aircraft fleet on another page of this report.

Table 4

TOTAL REVENUE AIRBORNE HOURS, UNITED STATES AIR CARRIERS

(Fiscal years — In millions)

Aircraft Type	Reported	Forecast									
	1968	1969	1970	1971	1972	1973	1974	1975	1979	1980	
<u>Total Aircraft</u>	6.01	6.43	6.97	7.16	7.30	7.64	7.84	8.22	9.53	9.97	
<u>Fixed-wing Aircraft</u>	5.98	6.40	6.94	7.13	7.27	7.61	7.80	8.18	9.46	9.90	
<u>Jet</u>	4.19	5.08	5.84	6.14	6.32	6.74	6.94	7.34	8.86	9.38	
2-and 3-engine 4-engine SST	1.70 2.49 -	2.34 2.74 -	2.82 3.02 -	3.05 3.09 -	3.25 3.07 -	3.85 2.89 -	4.23 2.70 .01	4.73 2.55 .06	6.63 2.03 .20	7.10 2.04 .24	
<u>Turboprop</u>	.97	.98	.89	.83	.80	.74	.73	.71	.56	.48	
1-and 2-engine 4-engine	.55 .42	.67 .31	.69 .20	.68 .15	.67 .13	.66 .08	.65 .08	.63 .08	.52 .04	.44 .04	
<u>Piston</u>	.82	.34	.21	.16	.15	.13	.13	.13	.04	.04	
1-and 2-engine 4-engine	.49 .33	.26 .08	.15 .06	.11 .05	.11 .04	.10 .03	.10 .03	.10 .03	.03 .01	.03 .01	
<u>Helicopter</u>	.03	.03	.03	.03	.03	.03	.04	.04	.07	.07	
Piston engine	*	*	*	-	-	-	-	-	-	-	
Turbine engine	.03	.03	.03	.03	.03	.03	.04	.04	.07	.07	

* Less than 0.005.

Note.—Included here are revenue hours flown by all passenger and cargo aircraft that are owned or leased by, and are in the domestic or international service of the United States certificated route, supplemental, intrastate and contract air carriers. Hours for fiscal year 1968 are partially estimated.

Table 5

TOTAL REVENUE STATUTE MILES, UNITED STATES AIR CARRIERS

(Fiscal years — In millions)

Aircraft Type	Reported	Forecast									
	1968	1969	1970	1971	1972	1973	1974	1975	1979	1980	
<u>Total Aircraft</u>	<u>2,300</u>	<u>2,561</u>	<u>2,796</u>	<u>2,893</u>	<u>2,948</u>	<u>3,109</u>	<u>3,182</u>	<u>3,382</u>	<u>4,042</u>	<u>4,284</u>	
<u>Fixed-wing Aircraft</u>	<u>2,297</u>	<u>2,558</u>	<u>2,793</u>	<u>2,890</u>	<u>2,945</u>	<u>3,105</u>	<u>3,178</u>	<u>3,378</u>	<u>4,034</u>	<u>4,276</u>	
<u>Jet</u>	<u>1,901</u>	<u>2,261</u>	<u>2,550</u>	<u>2,675</u>	<u>2,743</u>	<u>2,922</u>	<u>2,997</u>	<u>3,203</u>	<u>3,912</u>	<u>4,170</u>	
2-and 3-engine	693	925	1,078	1,170	1,247	1,514	1,678	1,898	2,718	2,928	
4-engine	1,208	1,336	1,472	1,505	1,496	1,408	1,313	1,247	987	994	
SST	-	-	-	-	-	-	6	58	207	248	
<u>Turboprop</u>	<u>236</u>	<u>232</u>	<u>203</u>	<u>186</u>	<u>176</u>	<u>159</u>	<u>158</u>	<u>153</u>	<u>117</u>	<u>101</u>	
1-and 2-ending	119	141	143	142	137	132	132	128	105	89	
4-engine	117	91	60	44	39	27	26	25	12	12	
<u>Piston</u>	<u>160</u>	<u>65</u>	<u>40</u>	<u>29</u>	<u>26</u>	<u>24</u>	<u>23</u>	<u>22</u>	<u>5</u>	<u>5</u>	
1-and 2-engine	83	45	25	17	17	16	16	15	3	3	
4-engine	77	20	15	12	9	8	7	7	2	2	
<u>Helicopter</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>8</u>	<u>8</u>	
Piston engine	*	*	*	-	-	-	-	-	-	-	
Turbine engine	3	3	3	3	3	4	4	4	8	8	

* Less than 0.5.

Note.—Included here are revenue miles flown by all passenger and cargo aircraft owned or leased by and in the domestic or international service of the United States certificated route, supplemental, intra-state and contract air carriers. Miles for fiscal year 1968 are partially estimated.

Table 6

ACTIVE GENERAL AVIATION AIRCRAFT BY TYPE OF AIRCRAFT

As of January 1	Total	P i s t o n			Turbine	Rotorcraft	Other
		Single-engine	Multiengine				
1964	85,088	73,626	9,458	245	1,171	588	
1965	88,742	76,136	10,346	306	1,306	648	
1966	95,442	81,134	11,422	574	1,503	809	
1967	104,706	88,621	12,671	915	1,622	877	
1968	114,186	96,471	13,439	1,281	1,899	1,096	
1969*	122,500	103,000	14,500	1,650	2,150	1,200	
1970*	131,000	109,700	15,600	2,050	2,400	1,250	
1971*	139,000	116,000	16,600	2,450	2,650	1,300	
1972*	147,000	122,050	17,800	2,900	2,900	1,350	
1973*	155,000	128,150	19,000	3,350	3,100	1,400	
1974*	162,000	133,400	20,000	3,850	3,300	1,450	
1975*	170,000	139,400	21,200	4,400	3,500	1,500	
1979*	205,000	166,200	25,500	7,000	4,600	1,700	
1980*	214,000	173,000	26,650	7,800	4,800	1,750	

*Forecast.

Table 7

ACTIVE GENERAL AVIATION AIRCRAFT BY FAA REGION

As of January 1	Total	FAA REGION						
		Eastern	Southern	Southwest	Central	Western	Alaskan	Pacific
1964	85,088	17,629	9,439	12,556	23,590	20,218	1,488	112
1965	88,742	18,275	10,032	12,985	24,464	21,304	1,476	136
1966	95,442	20,159	11,110	13,964	25,741	22,661	1,600	146
1967	104,706	22,514	12,562	15,063	27,691	24,930	1,717	145
1968	114,186	24,576	14,145	15,794	30,337	27,353	1,697	175
1969*	122,500	26,200	15,600	16,700	32,300	29,600	1,825	185
1970*	131,000	27,700	17,000	17,700	34,400	31,900	1,950	200
1971*	139,000	29,300	18,300	18,700	36,300	34,000	2,050	225
1972*	147,000	30,600	19,700	19,700	38,200	36,300	2,150	250
1973*	155,000	32,100	21,100	20,800	40,000	38,400	2,250	260
1974*	162,000	33,400	22,400	21,500	41,600	40,300	2,350	275
1975*	170,000	34,900	23,800	22,600	43,300	42,500	2,500	300
1979*	205,000	40,800	30,300	26,800	51,000	52,600	3,000	375
1980*	214,000	42,300	32,100	27,800	52,900	55,200	3,200	400

*Forecast.

Note.—Totals include a small number of aircraft located in foreign countries.

Table 8
HOURS FLOWN IN GENERAL AVIATION
(In millions)

Fiscal Year	Total	Business	Commercial	Instructional	Personal	Other
1964	15.4	5.7	3.2	2.6	3.7	0.2
1965	16.2	5.8	3.3	3.0	3.9	0.2
1966	18.9	6.5	3.4	4.5	4.3	0.2
1967	21.6	6.8	3.7	6.0	4.9	0.2
1968**	22.9	6.8	4.1	6.4	5.4	0.2
1969*	24.2	7.0	4.6	6.4	6.0	0.2
1970*	25.6	7.4	4.9	6.6	6.5	0.2
1971*	27.2	7.8	5.3	6.8	7.1	0.2
1972*	29.0	8.1	5.8	7.0	7.8	0.3
1973*	30.6	8.5	6.1	7.3	8.4	0.3
1974*	32.0	9.0	6.5	7.5	8.7	0.3
1975*	33.6	9.5	6.9	7.7	9.2	0.3
1979*	40.9	11.8	8.9	8.6	11.2	0.4
1980*	42.8	12.5	9.4	8.8	11.7	0.4

*Forecast.

**Preliminary.

Note.—Hours for 1964-1967 have been developed from calendar year data shown in FAA Statistical Handbook of Aviation.

Table 9

FUEL CONSUMED BY UNITED STATES DOMESTIC CIVIL AVIATION

(In millions of gallons)

Fiscal Year	Jet Fuel			Aviation Gasoline			Total Jet Fuel And Aviation Gasoline
	Air Carrier <u>1/</u>	General Aviation <u>2/</u>	Total	Air Carrier <u>1/</u>	General Aviation <u>2/</u>	Total	
1964	2,561	36	2,597	615	255	870	3,467
1965	3,058	61	3,119	557	277	834	3,953
1966	3,907	94 ^r	4,001	464	333	797	4,798
1967	4,568	122	4,690	335	385	720	5,410
1968 **	6,043	152	6,195	230	412	642	6,837
1969*	7,550	180	7,730	110	440	550	8,280
1970*	8,500	200	8,700	50	465	515	9,215
1971*	9,000	215	9,215	30	500	530	9,745
1972*	9,400	230	9,630	25	530	555	10,185
1973*	10,400	250	10,650	20	565	585	11,235
1974*	10,900	260	11,160	20	595	615	11,775
1975*	11,900	285	12,185	20	630	650	12,835
1979*	15,000	440	15,440	5	785	790	16,230
1980*	16,100	485	16,585	5	830	835	17,420

^r Revised.

* Forecast.

** Preliminary

1/ Partially estimated for fiscal years 1964-1968.

2/ Estimated for fiscal years 1964-1968; actual fuel consumption by general aviation aircraft is not reported. Note.—Domestic civil aviation is defined for purposes of this table to include all civil aircraft flights which originate and terminate within the 48 conterminous states, within Hawaii and within Alaska. Fuels consumed by airframe and aircraft engine manufacturers, whether for flight testing or ground testing, are not shown here because they are not available for the domestic industry as a whole and cannot be estimated with any assurance of accuracy. Estimates of fuel consumed by the supplemental, contract and intrastate air carriers are included in the "Air Carrier" columns.

Table 10

CIVIL AIRCRAFT PRODUCTION IN THE UNITED STATES

(Number of Aircraft)

Fiscal Year	Air Carrier Transport Aircraft	General Aviation Aircraft	Total
1964	124	8,944	9,068
1965	189	10,861	11,050
1966	284	14,879	15,163
1967	372	14,799	15,171
1968	625	14,419	15,044
1969*	555	15,000	15,555
1970*	330	16,500	16,830
1971*	200	17,800	18,000
1972*	265	19,600	19,865
1973*	275	21,400	21,675
1974*	270	23,400	23,670
1975*	225	25,400	25,625
1979*	290	32,400	32,690
1980*	250	33,700	33,950

*Forecast.

Note.—Civil aircraft for export are included. Excludes all aircraft produced for military use whether for the United States or for a foreign government. All helicopter production, including air carrier transport helicopters, is included in the column for general aviation aircraft.

Table 11

CIVIL AIRCRAFT ENGINE PRODUCTION IN THE UNITED STATES

(Number of Engines)

Fiscal Year	Turbojet	Turboprop	Piston	Total
1964	540	-	12,532	13,072
1965	1,058	52	15,356	16,466
1966	1,840	149	20,407	22,396
1967	2,170	318	18,324	20,812
1968	2,780	633**	17,806	21,219
1969*	2,300	650	18,800	21,750
1970*	1,600	800	20,650	23,050
1971*	1,150	900	22,850	24,900
1972*	1,400	1,000	25,100	27,500
1973*	1,300	1,150	27,300	29,750
1974*	1,250	1,250	29,950	32,450
1975*	1,150	1,300	32,450	34,900
1979*	1,500	1,750	40,650	43,900
1980*	1,450	1,850	42,050	45,350

* Forecast.

**Preliminary.

Note.—Civil aircraft engines for export are included. Excludes all aircraft engines produced for military use whether for the United States or for a foreign government.

Table 12

TOTAL ITINERANT AND LOCAL AIRCRAFT OPERATIONS
AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In millions)

Fiscal Year	Total	Itinerant	Local
1964	32.9	21.6	11.3
1965	35.6	22.9	12.7
1966	41.2	26.0	15.2
1967	47.6	29.1r	18.5r
1968	53.0	32.4	20.6
1969*	58.5	35.7	22.8
1970*	64.4	39.2	25.2
1971*	70.7	42.5	28.2
1972*	77.5	46.4	31.1
1973*	85.4	50.9	34.5
1974*	94.2	55.8	38.4
1975*	103.8	61.6	42.2
1979*	154.5	90.7	63.8
1980*	171.5	100.6	70.9

r Revised.

* Forecast.

Note.—An aircraft operation is defined as an aircraft arrival at or a departure from an airport with FAA traffic control service. A local operation is performed by an aircraft that: operates in the local traffic pattern or within sight of the tower; is known to be departing for or arriving from flight in local practice areas; or executes simulated instrument approaches or low passes at the airport. All aircraft arrivals and departures other than local (as defined above) are classified as itinerant operations.

Table 13

ITINERANT AIRCRAFT OPERATIONS
AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In millions)

Fiscal Year	Total	Air Carrier	General Aviation	Military
1964	21.6	7.4	12.4	1.8
1965	22.9	7.5	13.7	1.7
1966	26.0	8.2	16.2	1.6
1967	29.1 ^r	8.6	19.0	1.5 ^r
1968	32.4	9.9	21.0	1.5
1969*	35.7	11.0	23.2	1.5
1970*	39.2	11.8	25.9	1.5
1971*	42.5	12.4	28.7	1.4
1972*	46.4	12.8	32.2	1.4
1973*	50.9	13.4	36.1	1.4
1974*	55.8	14.0	40.5	1.3
1975*	61.6	14.8	45.5	1.3
1979*	90.7	17.5	72.1	1.1
1980*	100.6	18.5	81.0	1.1

r Revised.

* Forecast.

Note.—See Table 12 for definition of itinerant operations.

Table 14

LOCAL AIRCRAFT OPERATIONS
AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In millions)

Fiscal Year	Total	General Aviation	Military
1964	11.3	9.3	2.0
1965	12.7	10.8	1.9
1966	15.2	13.5	1.7
1967	18.5 ^r	16.7	1.8 ^r
1968	20.6	18.8	1.8
1969*	22.8	21.0	1.8
1970*	25.2	23.5	1.7
1971*	28.2	26.5	1.7
1972*	31.1	29.5	1.6
1973*	34.5	32.9	1.6
1974*	38.4	36.9	1.5
1975*	42.2	40.7	1.5
1979*	63.8	62.6	1.2
1980*	70.9	69.7	1.2

^r Revised
* Forecast.

Note.—See Table 12 for definition of local operations.

Table 15

INSTRUMENT OPERATIONS AT AIRPORTS
WITH FAA TRAFFIC CONTROL SERVICE

(In millions)

Fiscal Year	Instrument Operations
1964	8.7r
1965	9.6r
1966	10.7
1967	12.1
1968	14.6
1969*	17.7
1970*	20.0
1971*	21.4
1972*	23.5
1973*	26.0
1974*	28.8
1975*	32.1
1979*	44.5
1980*	50.6

r Revised.

* Forecast.

Note.—An instrument operation is defined as the handling by an FAA terminal traffic control facility of the arrival or departure at an airport of an aircraft on an IFR flight plan or the provision of IFR separation to other aircraft by an FAA terminal traffic control facility.

Includes instrument operations at FAA-operated military radar approach control facilities.

Table 16

IFR AIRCRAFT HANDLED, IFR DEPARTURES, AND OVERS BY USER CATEGORY
FAA AIR ROUTE TRAFFIC CONTROL CENTERS
(In millions)

Fiscal Year	Total			Air Carrier			General Aviation			Military		
	Aircraft Handled	IFR Departures	Overs	Aircraft Handled	IFR Departures	Overs	Aircraft Handled	IFR Departures	Overs	Aircraft Handled	IFR Departures	Overs
1964	11.1	4.0	3.1	5.7	2.2	1.2	1.0	.4	.2	4.4	1.4	1.7
1965	12.2	4.6	3.0	6.3	2.5	1.3	1.3	.6	.2	4.6	1.5	1.6
1966	13.5	5.2	3.1	7.4	3.0	1.5	1.7	.7	.2	4.4	1.5	1.4
1967	15.1	5.8	3.4	8.5	3.4	1.7	2.2	1.0	.3	4.3	1.5	1.4
1968	18.1	7.0	4.0	10.8	4.3	2.3	2.8	1.2	.4	4.5	1.6	1.4
1969*	20.9	8.2	4.5	13.1	5.2	2.7	3.2	1.4	.4	4.6	1.6	1.4
1970*	23.0	9.1	4.8	14.9	5.9	3.1	3.6	1.6	.4	4.5	1.6	1.3
1971*	24.5	9.8	4.9	15.6	6.2	3.2	4.3	1.9	.5	4.6	1.7	1.2
1972*	25.7	10.3	5.1	16.1	6.4	3.3	5.0	2.2	.6	4.6	1.7	1.2
1973*	27.3	11.0	5.3	16.9	6.7	3.5	5.8	2.6	.6	4.6	1.7	1.2
1974*	29.1	11.8	5.5	17.6	7.0	3.6	6.9	3.1	.7	4.6	1.7	1.2
1975*	31.2	12.7	5.8	18.6	7.4	3.8	8.0	3.6	.8	4.6	1.7	1.2
1979*	41.4	17.2	7.0	22.0	8.7	4.6	14.9	6.8	1.3	4.5	1.7	1.1
1980*	45.3	18.9	7.5	23.4	9.3	4.8	17.4	7.9	1.6	4.5	1.7	1.1

*Forecast.

Note.—Detail may not add to total due to independent rounding. The aircraft handled count consists of the number of IFR departures multiplied by two plus the number of overs. This concept recognizes that for each departure there is a landing. An IFR departure is defined as an original IFR flight plan filed either prior to departure or after becoming airborne. An over flight originates outside the ARTC area and passes through the area without landing. The forecast data assume present operating rules and procedures and the present number of air route traffic control centers.

Table 17

FLIGHT SERVICES, PILOT BRIEFS, FLIGHT CONDITION MESSAGES
AND FLIGHT PLANS ORIGINATED
FAA FLIGHT SERVICE STATIONS AND COMBINED STATION/TOWERS

(In millions)

Fiscal Year	Flight Services	Pilot Briefs and Flight Condition Messages	Flight Plans Originated		
			Total	IFR-DVFR	VFR
1964	21.4	2.9	3.9	2.0	1.9
1965	24.5	4.1	4.1	2.1	2.0
1966	29.1	5.8	4.4	2.3	2.1
1967	34.0	7.5	4.8	2.4	2.4
1968	37.1	8.6	5.2	2.7	2.5
1969*	42.5	10.6	5.6	3.1	2.5
1970*	48.4	12.5	6.2	3.6	2.6
1971*	53.7	14.3	6.6	3.8	2.8
1972*	60.5	16.5	7.2	4.3	2.9
1973*	68.1	19.0	7.9	4.9	3.0
1974*	76.6	21.8	8.7	5.4	3.3
1975*	86.5	25.0	9.7	6.2	3.5
1979*	136.8	41.5	14.3	9.8	4.5
1980*	154.0	47.1	16.0	11.2	4.8

*Forecast.

Note.—Flight Services is a weighted workload measurement used in Airway Planning Standard No. 5 (the ATS Staffing Standard). The work units reported by each FSS and CS/T which make up this measurement are aircraft contacted, flight plans originated, pilot briefs and flight condition messages. A flight plan may be filed orally or in writing to qualify for inclusion in the activity count shown here.

Table 18

AIRCRAFT CONTACTED
FAA FLIGHT SERVICE STATIONS AND COMBINED STATION/TOWERS

(In millions)

Fiscal Year	Total	IFR-DVFR	VFR	Air Carrier	General Aviation	Military
1964	7.7	.8	6.9	.7	6.0	1.0
1965	8.1	.9	7.2	.7	6.5	.9
1966	8.6	.9	7.7	.7	7.1	.8
1967	9.3	1.0	8.3	.7	7.9	.7
1968	9.5	1.1	8.4	.7	8.1	.7
1969*	10.1	1.2	8.9	.8	8.7	.6
1970*	11.0	1.4	9.6	.8	9.6	.6
1971*	11.9	1.6	10.3	.8	10.5	.6
1972*	13.1	1.9	11.2	.8	11.7	.6
1973*	14.3	2.1	12.2	.8	13.0	.5
1974*	15.6	2.3	13.3	.8	14.3	.5
1975*	17.1	2.5	14.6	.8	15.8	.5
1979*	25.2	3.8	21.4	.9	23.8	.5
1980*	27.8	4.1	23.7	.9	26.4	.5

*Forecast.

Note.—Aircraft contacted represent a record of the number of aircraft with which FAA facilities (FSS, CS/T) have established radio communications contact. One count is made for each en route, landing or departing aircraft contacted by a facility, regardless of the number of contacts made with an individual aircraft. A flight involving contacts with five different facilities, disregarding the number of contacts with each, would be counted as five aircraft contacted. The data forecast in this table are based upon the current number and configuration of the FSS and CS/T. Any change in their number or operation would have a corresponding change in the forecast.