# FACILITY PLANNING FACTORS FOR NAVAL SHORE ACTIVITIES

## Appendix C
## Runway Capacity Handbook-Fixed Wing

NAVFAC P-80.1
JUNE 1972

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON, D. C. 20390

DISTRIBUTION:

SNDL PART I (one copy each except as indicated)

| | | |
|---|---|---|
| List | 21A | Fleet Commanders in Chief |
| | 23A | Force Commanders (2 copies) |
| | 24A | Naval Air Force Commanders (2 copies) |
| | 27C | Sea Frontier Commanders |
| | 42A | Fleet Air Commands (2 copies) |
| | 42B | Fleet Air Wings |
| | 50A | Unified Commands |
| | 50B | Specified Commands |

SNDL PART II (one copy each except as indicated)

| | | |
|---|---|---|
| List | A1 | Immediate Office of the Secretary:SO2 only (5 copies) |
| | A2A | Independent Offices: Comptroller and ONR only |
| | A3 | Chief of Naval Operations: 03, 03EG, 09BF, 098, 82, 90, 96, 513, 514, 515 (1 copy each) 405, 442 (3 copies each) |
| | A4A | Chief of Naval Material (2 copies) |
| | A6 | Headquarters, U.S. Marine Corps MC-COA only (10 copies) |
| | B1 | Secretary of Defense: DASD(I&L) only |
| | B2 | Joint Chiefs of Staff: FCS-F4 only (3 copies) |
| | B3 | Colleges |
| | FA5 | Air Facility LANT |
| | FA6 | Air Station LANT |
| | FA7 | Station LANT: Argentia, Charleston, Keflavik, Mayport, Roosevelt Road only |
| | FA25 | Public Works Center LANT |
| | FB6 | Air Facility PAC |
| | FB7 | Air Station PAC |
| | FB8 | Auxiliary Air Station PAC |
| | FB9 | Air Support Unit |
| | FB10 | Station PAC: Adak, Guam, Midway Island only |
| | FC4 | Air Facility NAVEUR |
| | FC7 | Station NAVEUR |
| | FF1 | Naval District Commandants |
| | FG11 | Training Command - Morocco |
| | FJ60 | Naval War College |
| | FKA1A | Air Systems Command Hq. AIR 4012 only (11 copies) |
| | FKA6B1 | Air Facility CNM |
| | FKN1 | Facilities Engineering Command Division (10 copies) |
| | FKN2 | Construction Battalion Center (4 copies) |
| | FKN3 | Construction O in C |
| | FKN5 | Public Works Center NAVFACENGCOM (3 copies) |
| | FKR1A | Air Station NAVAIRSYSCOM |
| | FKR4B | Missile Range Facility |
| | FKR7A | Air Systems Command Representative |
| | FR1 | Air Reserve (4 copies) |
| | FR2 | Air Station NAR |
| | FT1 | Chief of Naval Training (4 copies) |
| | FT2 | Chief of Naval Air Training (4 copies) |
| | FT3 | Chief of Naval Advanced Air Training (4 copies) |

| | |
|---|---|
| FT6 | Air Station CNT |
| FT7 | Air Facility CNT |
| FT20 | Construction Training Unit (5 copies) |
| FT37 | Scol CEC Officers (55 copies) |
| FT40 | Schools Command |
| FT42 | Scol Construction |
| FT62 | Training Publications Center (3 copies) |
| V3 | Marine Corps Air Base Commanders |
| V5 | Marine Corps Air Station |
| V11 | Marine Corps Institute |
| V12 | Marine Corps Development and Education Command (6 copies) |
| V15 | Marine Corps District |
| V16 | Marine Corps Base |
| V22 | Marine Air Reserve Training Unit |

Stocked: Naval Publications and Forms Center
5801 Tabor Avenue
Philadelphia, Pa. 19120

## FOREWORD

This appendix to NAVFAC P-80 provides planning procedures to determine and evaluate practical hourly and daily capacity of various runway/taxiway configurations at Naval and Marine Corps Air Installations supporting fixed wing aircraft. The procedures developed herein are not applicable to helicopter or joint use (Navy-Marine Corps/Civilian) installations.

Procedures, examples and worksheets are provided for the computation of capacities for Instrument Flight Rules (IFR), Visual Flight Rules (VFR) and Carrier Practice Landings (CPL).

TABLE OF CONTENTS

********************

LIST OF FIGURES
AND TABLES

*******************



Note: Figures and Tables used in Section III (EXAMPLES) are not listed above.

## Section I. INTRODUCTION

This Appendix describes the procedures necessary to compute the hourly and daily aircraft handling capacity of an air station's runway system. The following basic factors are considered in the process:

- Type of aircraft (Not including Helicopters)
- Type of operations performed
- Runway/taxiway design
- Use of runways
- IFR Capability

This procedure does not consider such items as personnel support, fueling requirements, ramp/gate/apron size, civilian landing OPS at joint use installations (will require special studies), etc. These factors could be a limiting constraint on an air station's ability to accommodate a specific aircraft demand and would have to be considered in an overall station capacity evaluation.

It should be recognized that there is a range of capacity values for any given station depending on the number of individual or combinations of runways that can be used. Runway use at any one time is related to the runway layout as well as operational factors including wind direction and velocity (crosswind and tailwind limitations), prevailing visibility and ceiling (VFR and IFR conditions), available runway lengths, location of arresting gear, position of navigational facilities, environmental considerations (noise abatement procedures) and applicable air traffic control rules and regulations.

Typical air station runway layouts showing possible runway uses (operating configurations) are included on Figure 1-1. The selection of all possible operating configurations is necessary to calculate the range of capacities associated with a station. However, the selection of the primary operating configuration may be sufficient for study purposes in some cases.

Throughout the capacity procedures, reference is made to aircraft class (I, II, and III). These classes have been developed for capacity calculation purposes. A description of the classes and aircraft type they represent are shown on Table 1-1.

Capacity procedures are separately described for three types of operations; namely,

- Under VFR conditions
- Under IFR conditions
- Carrier Practice Landing (CPL) procedures

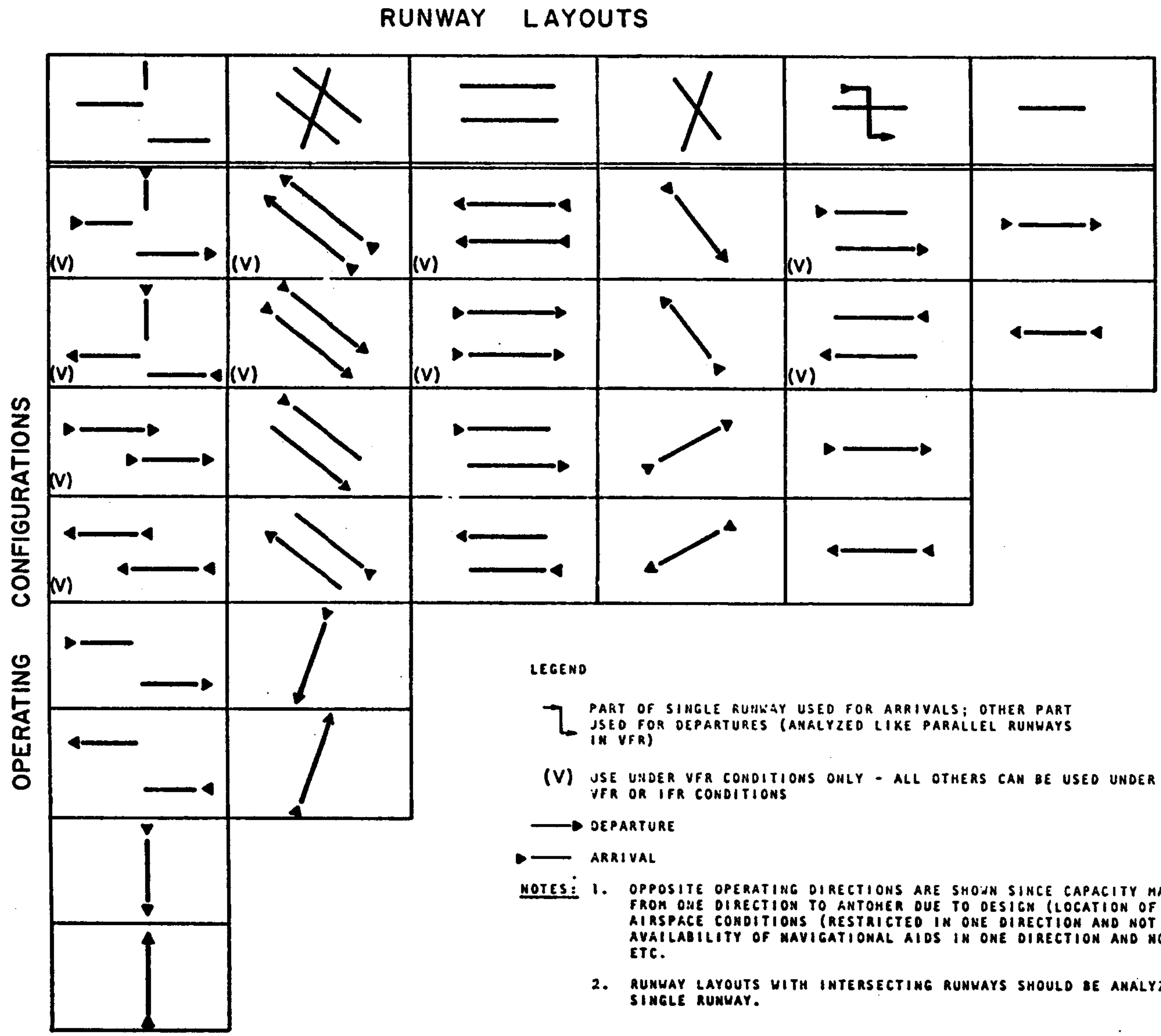
As applicable, these procedures should be followed for each individual runway operating configuration for which capacity is required.

In order to calculate capacity, a forecast of aircraft activity has to be developed. Where an existing station with its current activity is being analyzed, a field survey can be used to develop forecast data. Where aircraft traffic changes are contemplated for an existing station or a new station is being planned for, other forecast techniques will have to be employed. For each analysis the forecast activity should be grouped into the three aircraft classes shown on Table 1-1. A further breakdown may then be required with respect to number of aircraft landing, taking off, performing touch and go's, taking off in pairs (side by side; not formations of two aircraft), and/or operating in formations of two, three or four. It should be noted that the forecast activity breakdown may differ significantly between VFR, IFR and CPL operating conditions.

Helicopter operations are not treated in these capacity procedures. At installations which support both helicopter and fixed wing aircraft on the same runway, consideration shall be given to providing a separate helicopter landing area before any evaluation is made as to the need for an additional fixed wing runway.

Figure 1-1

# TYPICAL RUNWAY LAYOUTS AND OPERATING CONFIGURATIONS




LEGEND

PART OF SINGLE RUNWAY USED FOR ARRIVALS; OTHER PART USED FOR DEPARTURES (ANALYZED LIKE PARALLEL RUNWAYS IN VFR)

(V) USE UNDER VFR CONDITIONS ONLY - ALL OTHERS CAN BE USED UNDER VFR OR IFR CONDITIONS

DEPARTURE

ARRIVAL

NOTES: 1. OPPOSITE OPERATING DIRECTIONS ARE SHOWN SINCE CAPACITY MAY VARY FROM ONE DIRECTION TO ANTOHER DUE TO DESIGN (LOCATION OF EXITS), AIRSPACE CONDITIONS (RESTRICTED IN ONE DIRECTION AND NOT ANOTHER), AVAILABILITY OF NAVIGATIONAL AIDS IN ONE DIRECTION AND NOT ANOTHER, ETC.

2. RUNWAY LAYOUTS WITH INTERSECTING RUNWAYS SHOULD BE ANALYZED AS SINGLE RUNWAY.

Table 1-1

U. S. NAVY AIRCRAFT CLASSES
FOR CAPACITY CALCULATIONS

| Class | Description | Final Approach Speed (Knots) | Type |
|---|---|---|---|
| I | Jet Aircraft | 100-150 | A4, A6, A7, F4, F8, T-1, T-2, T-33, F9, F-10, T-39, C-141, A-3, A-5, A-2 |
| II | Turbo-Prop and Piston Aircraft | 100-150 | C-54, C-118, T-29, C-130, C-121, P-2, P-3, C-119, C-131 |
| III | Turbo-Prop and Piston Aircraft | Less than 100 | C-47, C-117, C-45, T-28, T-34, U11A, OV-10, S-2, C-1, E-1, U-6 |

## Section II. CAPACITY PROCEDURES

This section describes the procedures necessary to calculate VFR, IFR, Carrier Landing Practice and Daily Capacities.

1. DEFINITIONS. Before proceeding, the following definitions should be reviewed:

   a. Hourly Arrival Capacity (HAC): the hourly aircraft movement rate which can be sustained at a reasonable average delay imposed on aircraft using a runway for arrivals only.

   b. Hourly Departure Capacity (HDC): the hourly aircraft movement rate which can be sustained at a reasonable average delay imposed on aircraft using a runway for departures only.

   c. Hourly Mixed Capacity (HMC): the hourly aircraft movement rate which can be sustained at a reasonable average delay imposed on aircraft using a runway for arrivals and departures at the same time.

   d. Hourly Total Capacity (HTC): the summation of all available hourly capacities. In the case of a single runway used for arrivals and departures at the same time, HTC = HMC; where multiple runways are used for arrivals (only) and departures (only), HTC = the sum of HAC and HDC.

   e. Daily Capacity: number of aircraft that can be accommodated on a daily basis on an air station's runway system.

only necessary to forecast the extent to which any of these operations are likely or planned to occur, during any period of interest such as an hour, two hours, half day, etc., in order to determine a runway capacity appropriate for the intended use. VFR Runway Capacity Analysis Work Sheets with provisions for logging the forecast of aircraft activity and calculations of HDC, HAC and HMC are presented on Tables 2-3, 2-4 and 2-5 respectively. Instructions for application of these Tables follow later in this Section.

b. Aircraft Takeoff Considerations. A runway used exclusively for takeoff will have a capacity dependent on the class of aircraft using the runway, and on the extent to which takeoffs are conducted singly, in formations or paired. When aircraft of a given class are operated singly, an average hourly departure capacity (HDC) can be established which is typical for VFR operations of the class from most any runway. This movement rate is largely controlled by average speed and the separation required for aircraft of the particular class and are noted below:

HDC - Hourly Departure Capacity-Movements Per Hour

| Class of Aircraft | HDC |
|---|---|
| I | 49 |
| II | 63 |
| III | 90 |

If some of the takeoffs are conducted in formations or in pairs (side-by-side), then the number of aircraft which can be accommodated in a given time is increased.

2. VFR RUNWAY CAPACITY ANALYSIS. This paragraph describes the procedures to determine hourly capacity of a runway used for normal air station operations in VFR conditions. For procedures to determine the capacity of the same runway in IFR conditions, or when it is used for CLP - see paragraphs 3 or 4 respectively.

These procedures should be repeated for each runway for which a capacity determination is required. A single analysis may be applicable to both directions of a runway if the operations are forecast to be identical, and the runway is symmetrical in terms of effective landing length and turnoffs available, for either landing direction.

a. Forecast of Aircraft Activity. The capacity of a runway for accommodating aircraft operations depends significantly on how the runway is used, specifically in consideration of the following:

(1) The degree of mixing of various aircraft classes.

(2) Whether it is used for takeoffs only, landings only, or the degree to which they are mixed on a single runway.

(3) The type of takeoff operations, namely, made singly, in formations, or paired (side by side).

(4) The type of landing operations, namely, singly, in formations, performing touch-and-go's, or at reduced separation.

These procedures allow for accountability of these variables normally encountered in air station operations. In application of the procedures to a given runway it is then

Stated another way, the time required to handle each aircraft in formation, or paired, is less than the equivalent of one movement when aircraft takeoff singly.

The runway capacity analyses uses procedures which consider the effect of formations and paired takeoffs by converting this activity to "equivalent" single aircraft movements, i.e. two aircraft taking off paired equal one equivalent movement (equivalent movement factor equals 0.50); ten Class I aircraft taking off in formations of two equals six equivalent movements (equivalent movement factor equals 0.60). A breakdown of takeoff equivalent movement factors are listed below:

TAKEOFF EQUIVALENT MOVEMENT FACTOR

| | Class of Aircraft | | |
|---|---|---|---|
| Type of Takeoff | I | II | III |
| Single | 1.00 | 1.00 | 1.00 |
| Formation of 2 | .60 | .63 | .69 |
| Formation of 3 | .47 | .51 | .59 |
| Formation of 4 | .41 | .45 | .54 |
| Pairs | .50 | .50 | .50 |

The takeoff factors appropriate for the various classes of aircraft and number of aircraft in each formation are also shown on the appropriate Analysis Work Sheets.

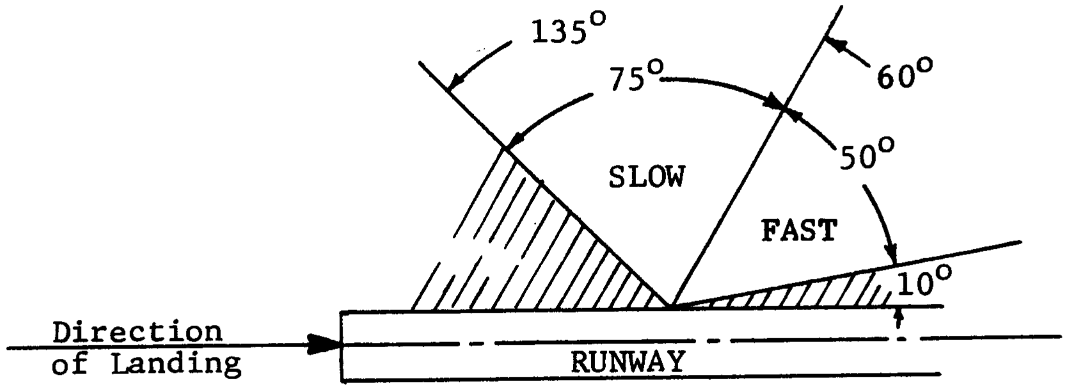
When more than one class of aircraft is using the same runway, the hourly departure capacity (HDC) will be influenced by the relative amount each class of aircraft contributes to the total operations during the period under consideration. The Work Sheets describe the steps necessary to properly account for the mix of aircraft by class. A weighted HDC is computed for each class and totaled for the mix of operations forecast for the runway analysis.

c. Runway Rating. A runway used for landing, either exclusively or mixed with takeoff operations, will have a capacity influenced by the length of time that landing aircraft occupy the runway. Subsequent arriving or departing aircraft must wait until a landing aircraft has cleared the runway at an exit (or is a sufficient distance along the runway if reduced runway separation criteria are in use).

Average runway occupancy time (Runway Rating) will be influenced by landing speed (Class of Aircraft), field elevation, length of runway and by the number, type and location of turnoffs (exits) available along the runway.

Turnoffs which will contribute most to a favorable Runway Rating are those which are located along the runway close to the point where landing aircraft will have slowed to a safe turnoff speed in a normal deceleration. Turnoffs too close to the threshold will not be usable for fast aircraft. Turnoffs far down the runway will require a time consuming rollout. The contribution of each turnoff may thus vary depending on the speed class of aircraft using the runway.

The type of turnoff will also influence Runway Rating. A low angled turnoff in the direction of landing may normally be used at higher speed than one requiring close to a $90^{o}$ turn. For purposes of determining Runway Rating, the types of usable turnoffs will be classified as follows:




Note: Shaded areas outside usable turnoff range.

The usability of each available runway exit should be considered when determining the number of equivalent usable turnoffs which contribute to the Runway Rating. For example, one class of aircraft destined for a parking area on one side of the runway cannot reasonably use a turnoff leading to the opposite side, and some turnoffs may lead to conflict with takeoffs or other ground traffic.

A chart for use in determining Runway Rating for each aircraft class is provided on Figure 2-1. Examples illustrating use of the Runway Rating chart are included in Section III of this Handbook. When using the chart the following considerations should be kept in mind.

> Usable turnoffs are in terms of equivalent "slow" turnoffs. A "fast" turnoff within the "Range of Usable Turnoffs" should be counted as two "slow" turnoffs.

- Turnoffs which are located outside the "Range of Usable Turnoffs" on the chart should not be used in determining Runway Ratings.
- "Fast" turnoffs which are located outside the "fast" range but are in the "slow" range on the chart should be counted as equivalent to only one "slow" turnoff.
- When no usable turnoffs exist except at the end of the runway use the "End Only" line on the chart.
- If only one turnoff exists (before the end of the runway) and it is located beyond the "Range of Usable Turnoffs" on the chart, use the "0" line to determine Runway Rating.

When "Reduced Separation" is authorized for any class of aircraft, the average time interval between landings will no longer be controlled by Runway Rating. An effective Runway Rating of 25 seconds is used for all operations of aircraft using "Reduced Separation".

d. Aircraft Landing Considerations. A runway used exclusively for landing will have a capacity dependent on the class of aircraft using the runway, and the extent to which landings are conducted singly, in formations or as touch-and-go's. When aircraft of a given class are operated singly, an average hourly arrival capacity (HAC) can be established for each Runway Rating, which is typical for VFR operations of the class onto most any runway with the same rating. Intermittent low approaches are considered as touch-and-go's. HAC values for each class of aircraft for a range of Runway Ratings are presented in Table 2-1.

Similar considerations as those used for takeoff are included in the runway capacity analysis procedure. Landings in formation and touch-and-go's are converted to "equivalent" single aircraft movements. The "equivalent movement factors" to be used for the conversion of aircraft landings to equivalent movements will vary with HAC, since a formation interval or touch-and-go, takes the same amount of time regardless of aircraft class or Runway Rating.

The landing equivalent movement factors appropriate for the various classes of aircraft and number of aircraft in each formation are presented on Table 2-2.

When more than one class of aircraft is using the same runway, the total hourly arrival capacity (HAC) will be influenced by the relative amount each class of aircraft contributes to the total operations during the period under consideration. To properly account for the mix of aircraft by class, the Work Sheet include the steps necessary to compute weighted HAC.

e. Mixed Takeoff and Landing Considerations. Runways used for mixed takeoffs and landings will have an average hourly mixed capacity (HMC) dependent on the mix of aircraft by class and on the mix of operations between takeoffs and landings. Aircraft types are designated by class depending on their typical terminal area operating speeds. When more than one class of aircraft is using a runway, a fast aircraft may follow a slow one, and vice versa, in landing or takeoff. The efficiency with which runways and airspace can be used decreases when speed classes are mixed.

When takeoffs and landings are mixed, the runway capacity will vary depending on the percent of total operations, during the period under consideration, which are reserved for landings, considering that landing operations will most always be given priority. A typical runway may display variations in HMC as the percent of landings changes as shown in the following example:

| % Landings | HMC |
|---|---|
| 0% | 49 (HDC) |
| 25 | 42 |
| 50 | 43 |
| 75 | 39 |
| 100 | 32 (HAC) |

To properly account for the mix of aircraft by class and the mix of operations by percent of landings, the Work Sheet includes the steps necessary to compute the equivalent takeoff and landing movements by class, and the percent of equivalent movements which are landing.

A chart showing the relationship of Runway Rating, mix of aircraft classes, and percent landings, is presented on Figure 2-2. This chart is used in conjunction with the procedures outlined on the Work Sheet to determine HMC for the appropriate aircraft and operating mix.

f. Aircraft Capacity. The values of HDC - hourly departure capacity; HAC - hourly arrival capacity, and HMC - hourly mixed capacity, determined by these procedures, calculates the number of equivalent single aircraft movements which could take place on the runway being analyzed considering the factors described above under "Forecast of Aircraft Activity"; these capacities are identified on the Work Sheets with a subscript "E", for example, $(HAC)_E$. The procedures also then allow for conversion of the "equivalent" capacities into a value representative of the actual number of aircraft involved, that is, a pair equals two aircraft and a formation of 2, 3 and 4, equals 2, 3 and 4 aircraft; the actual capacity is identified on the Work Sheet with a subscript "A", for example, $(HAC)_A$. It is noted that throughout these procedures, touch-and-go traffic are considered arrivals only and are not counted twice (an arrival and takeoff) as is the normal control tower traffic counting procedures. Therefore the forecast of touch-and-go traffic must count such operations as arrivals only.

g. Use of Capacity Analysis Work Sheets. As applicable, the following three work sheets are to be used for the calculation of hourly capacity:

(1) Table 2-3: "VFR Hourly Departure Capacity (HDC) Analysis Work Sheet" - used to calculate the capacity of a runway used for departures only.

(2) Table 2-4: "VFR Hourly Arrival Capacity (HAC) Analysis Work Sheet" - used to calculate the capacity of a runway used for arrivals only.

(3) Table 2-5: "VFR Hourly Mixed Capacity (HMC) Analysis Work Sheet" - used to calculate the capacity of a runway used for arrivals and departures (at the same time).

Each Work Sheet provides step by step procedures requiring either simple arithmetic computations or use of specified tables or charts. The following items regarding use of these tables are noted:

(1) Most steps require use of previously computed values (from prior steps) and the "procedure" identifies the applicable steps and process.

(2) Where "boxes" are shown below each step adjacent to sub-total and grand total lines, the appropriate addition of values should be made and entered; subsequent steps require use of sub-total and grand total values and are denoted in the procedures with subscripts "S" and "G" respectively.

(3) Some values are constants and have therefore been pre-printed on the Work Sheets.

3. IFR CAPACITY PROCEDURES. Determination of an air station's IFR capability is dependent primarily upon the availability of radar ATC services. Such services may be provided by D.O.D. or F.A.A. ATC facilities or a combination of military and civil units in a joint operation. In joint facilities the F.A.A. normally is responsible for the radar approach control function while the military operates the Precision Approach Radar (PAR) positions of Ground Controlled Approach (GCA) facilities.

At those airfields not provided with their own radar facilities, surveillance radar service for departures and arrivals may be provided by adjacent F.A.A. or D.O.D. terminal radar air traffic control units or by the enroute Air Route Traffic Control Center (ARTCC) of the area.

Stations without terminal radar services may operate IFR with conventional air traffic control service provided by the ARTCC or by the NAS control tower.

a. The following variables must be determined to compute IFR capacity:

   . Forecast of Activity in terms of Aircraft Class (I, II, III); if more than one class is involved, capacity is computed by weighting individual class capacity by percent distribution of each class.

   . Availability of radar service

   . Type Approach Aid: PAR (single or multiple); Conventional (VOR, TACAN, NDB).

   . Airspace Limitations:
   Restrictive - single departure path
   Unrestrictive - more than one departure path

- Runway Operating Configuration: (single, multiple dependent or multiple independent runways)

b. Tables 2-6 and 2-7 respectively are to be used to compute IFR capacity of a single or parallel runway configurations. Application of these tables is illustrated through use of examples contained in Section III of this Handbook.

The capacity of a runway used exclusively for low approaches is computed using Table 2-7 for "unrestricted airspace" and "independent runway" conditions at a Ratio = 4.0.

4. CARRIER PRACTICE LANDING CAPACITY PROCEDURES. The capacity of Carrier Practice Landing activities on a runway whether performed at an outlying field or on a runway set-aside for that purpose at a conventional station, has been established at a standard 80 approaches per hour. This value is based on:

- normal rectangular practice pattern
- four aircraft within pattern

Increasing number of aircraft in pattern will not materially increase capacity.

Therefore HTC = 80 arrivals per hour; 160 total movements by count.

5. DAILY CAPACITY ANALYSIS. This paragraph describes the procedures to determine total daily capacity of an air station. The procedure derives the total number of aircraft which can be accommodated within a specified operating period (such as a day or part of a day), for the runway configurations forecast to be available, and for the mix of aircraft and types of aircraft movements forecast to be operated during the period.

The procedure requires that the following data be developed for each daily capacity analysis:

- Choice of runway configurations which will be available during the period for operational use, considering forecast wind direction, wind velocity, ceiling and visibility.
- The number of hours of the day when each runway configuration will be used, considering daylight hours, weather forecasts and other operational factors bearing on choice and availability of runways.
- The hourly capacities for each runway operating configuration forecast to be used during the period of the analysis. The hourly runway capacity should be determined in accordance with Paragraphs 2 (VFR), 3 (IFR), or 4 (CPL) as appropriate for the forecast operating conditions.

a. For a single runway airport, or for the periods of time at any airport when a runway is used for both arrivals and departures, the runway capacity will be the mixed capacity of the runway, in aircraft per hour, multiplied by the number of hours the particular runway is usable. If during the day a change of operating condition is to be considered, such as a period of IFR operation, or a different runway is used, the new mixed capacity for this runway configuration multiplied by the hours it is usable, will give the partial day capacity for this condition. The total daily capacity will then be the sum of the capacities of all the single runway operating configurations usable.

b. <u>For multiple runway</u> operations when two runways are used simultaneously, one for takeoff and one for landing, the total hourly capacity is the sum of the separate capacities of the two runways. However, the total hourly capacity of such a two runway operating configuration may not be representative of the number of aircraft that can be accommodated over a longer term (daily or partial day). This will be true whenever the forecast mix of takeoff and landing operations does not match the relationship of the takeoff to landing capacity of the two runways. For example: two runways, one with HAC=40 and the other with HDC=60 will have a total hourly capacity of 100; however, an aircraft activity forecast of 200 movements with 50% landings will not be accommodated in two hours since only 40 landings per hour will take place. The effective capacity of the two runways is only 80 movements per hour, limited by HAC=40. In this case since the ratio* of arrivals to departures equals 1.00 (as indicated by "50% of landings"), the total capacity is twice the limiting (lowest value).

* $\text{Ratio} = \dfrac{\text{Arrivals}}{\text{Departures}}$

However, where ratios other than 1.00 are involved, it is necessary to compute hourly total capacity as follows:

$$\text{Hourly Total Capacity} = \frac{\text{HAC x (1 + Ratio)}}{\text{Ratio}}$$

"or"

$$\text{HDC x (1 + Ratio)},$$

whichever is less - application of this procedure is demonstrated through use of examples in Section III of this Handbook.

It is noted that in the calculation of Ratio, touch and go operations are considered as arrivals only. For example, given a traffic demand of 200 aircraft performing touch and go's, 300 "full-stop" arrivals and 250 departures, the

$$\text{Ratio} = \frac{200 + 300}{250} = \frac{500}{250} = 2.0$$

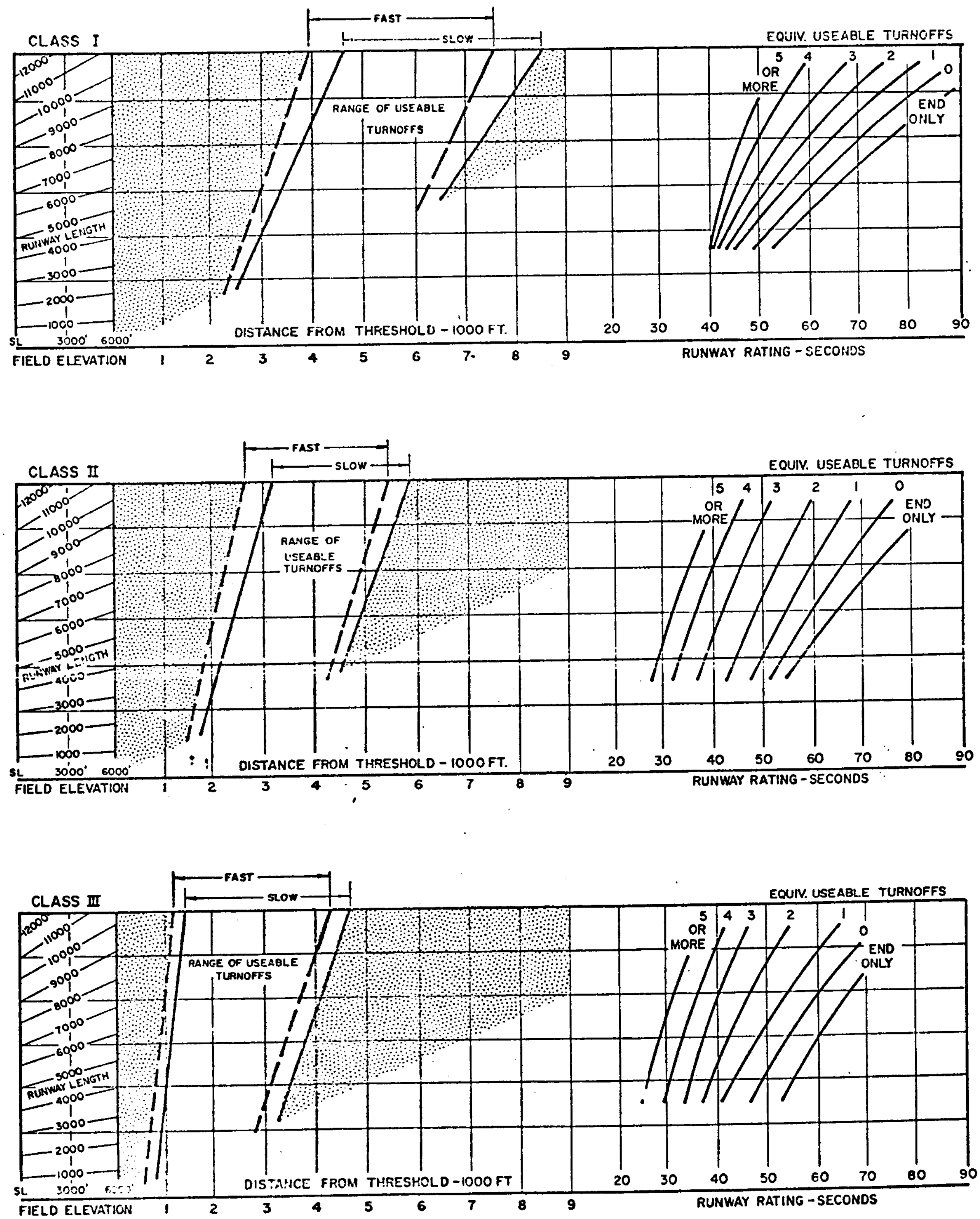



FIGURE 2-1

RUNWAY RATING

AVERAGE LANDING OCCUPANCY TIME-SECONDS

Table 2-1

HAC - HOURLY ARRIVAL CAPACITY - Movements Per Hour

| Aircraft Class | Runway Rating | | | | | |
|---|---|---|---|---|---|---|
| | 30 | 40 | 50 | 60 | 70 | 80 |
| I | 50 | 47 | 44 | 40 | 35 | 30 |
| II | 57 | 52 | 47 | 42 | 38 | 33 |
| III | 63 | 62 | 58 | 53 | 47 | 41 |

Use of Table: Enter with Runway Rating for each aircraft class as obtained in Step 2 on Tables 2-4 or 2-5 and read HAC below. Interpolate as required.

---

Table 2-2

EQUIVALENT MOVEMENT FACTORS

For Touch & Go or Landings in Formation

| Landing Procedure | HAC - Movements per Hour | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 |
| Formation of 2 | .58 | .59 | .61 | .62 | .64 | .65 | .67 | .68 |
| Formation of 3 | .45 | .47 | .49 | .50 | .52 | .55 | .56 | .57 |
| Formation of 4 | .37 | .40 | .42 | .44 | .46 | .48 | .50 | .52 |
| Touch and Go | .17 | .20 | .23 | .25 | .27 | .30 | .33 | .37 |

Use of Table: Enter HAC obtained above (Table 2-1) for each aircraft class and read Equivalent Movement Factors below. Interpolate as required.

| Step No. | ① | | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|---|---|
| Procedure | From Field Survey or Forecast | | Constants | ①×② | ③$_S$ ÷ ③$_G$ | Constants | ④$_S$ × ⑤ | ⑥$_G$ × ①$_G$ / ③$_G$ |
| Step Definition | Takeoff Demand: Type Operation | Takeoff Demand: No. of Aircraft | Equivalent Movement Factors | Takeoff Equivalent Movements | Class Distribution | Class HDC's | Weighted $(HDC)_E$ | Weighted $(HDC)_A$ |
| Aircraft Class I | Single | | 1.00 | | | | | |
| | FORMATION of 2 | | .60 | | | | | |
| | FORMATION of 3 | | .47 | | | | | |
| | FORMATION of 4 | | .40 | | | | | |
| | Pairs | | .50 | | | | | |
| Sub-Totals $_I$ | | S | | S | S | 49 | S | |
| Aircraft Class II | Single | | 1.00 | | | | | |
| | FORMATION of 2 | | .63 | | | | | |
| | FORMATION of 3 | | .51 | | | | | |
| | FORMATION of 4 | | .45 | | | | | |
| | Pairs | | .50 | | | | | |
| Sub-Totals $_{II}$ | | S | | S | S | 63 | S | |
| Aircraft Class III | Single | | 1.00 | | | | | |
| | FORMATION of 2 | | .69 | | | | | |
| | FORMATION of 3 | | .59 | | | | | |
| | FORMATION of 4 | | .54 | | | | | |
| | Pairs | | .50 | | | | | |
| Sub-Totals $_{III}$ | | S | | S | S | 90 | S | |
| ALL CLASSES Grand-Totals | | ①$_G$ | | ③$_G$ | ④$_G$ | | ⑥$_G$ | |

**Table 2–3**

**VFR HOURLY DEPARTURE CAPACITY (HDC) ANALYSIS WORK SHEET**

| Step No. | ① | (1A) | (1B) | (1C) | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Procedure | FROM FIELD SURVEY OR FORECAST | | | | USE Fig. No. 2-1 | USE TABLE No. 2-1 | USE TABLE No. 2-2 | (1A) × ④ | (1B) × ④ | ⑤$_G$ + ⑥$_G$ | ⑤$_S$ ÷ ⑦$_G$ | ⑥$_S$ ÷ ⑦$_G$ | ⑧$_S$ × ③ | Constants | ⑨$_S$ × ⑪ | ⑩$_G$ + ⑫$_G$ | ⑬$_G$ (1C)$_G$ ÷ ⑦$_G$ |
| Step Definition | LANDING DEMAND | | | | Runway Rating | Class HAC | Equivalent Movement Factors | Non Touch & Go Equivalent Movements | Touch & Go Equivalent Movements | Total Equivalent Movement | Non Touch & Go Class Distribution | Touch & Go Class Distribution | Non Touch & Go Weighted HAC | Touch & Go HAC's | Touch & Go Weighted HAC | Weighted (HAC)$_E$ | Weighted (HAC)$_A$ |
| | Type Operation | No. of Aircraft: Non Tch & Go | No. of Aircraft: Touch & Go | Total | | | | | | | | | | | | | |
| Aircraft Class I | Single | | | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | | | | | | |
| | Touch & Go | | | (Repeat Value) | | | | | (Repeat Value) | | | | | 53 | | | |
| | Sub-Total$_I$ | S | S | | | | | S | S | | S | S | S | | S | | |
| Aircraft Class II | Single | | | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | | | | | | |
| | Touch & Go | | | (Repeat Value) | | | | | (Repeat Value) | | | | | 60 | | | |
| | Sub-Total$_{II}$ | S | S | | | | | S | S | | S | S | S | | S | | |
| Aircraft Class III | Single | | | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | | | | | | |
| | Touch & Go | | | (Repeat Value) | | | | | (Repeat Value) | | | | | 66 | | | |
| | Sub-Total$_{III}$ | S | S | | | | | S | S | | S | S | S | | S | | |
| ALL CLASSES | Grand Total | G | + G | = G | | | | ⑤$_G$ | ⑥$_G$ | ⑦$_G$ | G | G | ⑩$_G$ | | ⑫$_G$ | ⑬$_G$ | |

**Table 2–4**

**VFR HOURLY ARRIVAL CAPACITY (HAC) ANALYSIS WORK SHEET**

| Step No. | | 1 | 1A | 1B | 1C | 1D | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14A | 14B | 14C | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Procedure | | FROM FIELD SURVEY OR FORECAST | | | | | USE Fig. No. 2-1 | USE TABLE No. 2-1 | USE TABLE No. 2-2 | 1A × 4 | 1B × 4 | $5_S + 6_S$ | CONSTANTS | 1D × 8 | $1C_G + 1D_G$ | $7_S + 9_S$ | $7_G \div 11_G$ | $11_S \div 11_G$ | $2 \times \frac{5_S}{7_G}$ | "20" $\times \frac{6_G}{7_G}$ | $14A_G + 14B_G$ | USE Fig. No. 2-2 | $15_G \times \frac{10_G}{11_G}$ |
| Step Definition | | TYPE OPERATION | No. of LANDING AIRCRAFT: Non Touch & Go | No. of LANDING AIRCRAFT: Touch & Go | No. of LANDING AIRCRAFT: Total | No. of Takeoff Aircraft | Class Runway Rating | Class HAC's | Landing Equivalent Movement Factors | Non Touch & Go Equivalent Movements | Touch & Go Equivalent Movements | Total Landing Equivalent Movements | Takeoff Equivalent Movement Factors | Takeoff Equivalent Movements | Total Takeoffs And Landings | Total Take-off & Land. Equivalent Movements | Percent Landing | Class Distribution | Weighted Runway Rating: Non Touch & Go | Weighted Runway Rating: Touch & Go | Weighted Runway Rating: Total | $(HMC)_E$ | $(HMC)_A$ |
| Aircraft CLASS I | | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF | 2 | | | | | | | | | | | .80 | | | | | | | | | | |
| | | 3 | | | | | | | | | | | .47 | | | | | | | | | | |
| | | 4 | | | | | | | | | | | .41 | | | | | | | | | | |
| | | Touch & Go | | | | | | | | | | | | | | | | | | | | | |
| | | Pairs | | | | | | | | | | | .50 | | | | | | | | | | |
| Sub-Total I | | | S | S | | S | | | | S | S | S | | S | | S | | S | S | | | | |
| Aircraft CLASS II | | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF | 2 | | | | | | | | | | | .63 | | | | | | | | | | |
| | | 3 | | | | | | | | | | | .51 | | | | | | | | | | |
| | | 4 | | | | | | | | | | | .46 | | | | | | | | | | |
| | | Touch & Go | | | | | | | | | | | | | | | | | | | | | |
| | | Pairs | | | | | | | | | | | .50 | | | | | | | | | | |
| Sub-Total II | | | S | S | | S | | | | S | S | S | | S | | S | | S | S | | | | |
| Aircraft CLASS III | | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF | 2 | | | | | | | | | | | .69 | | | | | | | | | | |
| | | 3 | | | | | | | | | | | .59 | | | | | | | | | | |
| | | 4 | | | | | | | | | | | .54 | | | | | | | | | | |
| | | Touch & Go | | | | | | | | | | | | | | | | | | | | | |
| | | Pairs | | | | | | | | | | | .50 | | | | | | | | | | |
| Sub-Total III | | | S | S | | S | | | | S | S | S | | S | | S | | S | S | | | | |
| ALL CLASSES | | Grand Total | G | G | $1C_G$ | $1D_G$ | | | | $5_G$ | $6_G$ | $7_G$ | | $9_G$ | | G | | G | G | | | | |

(Repeat Value)

* CROSS CHECK: Does $5_G + 6_G = 7_G$; Does $7_G + 9_G = 11_G$

**Table 2–5**

**VFR HOURLY MIXED CAPACITY (HMC) ANALYSIS WORK SHEET**

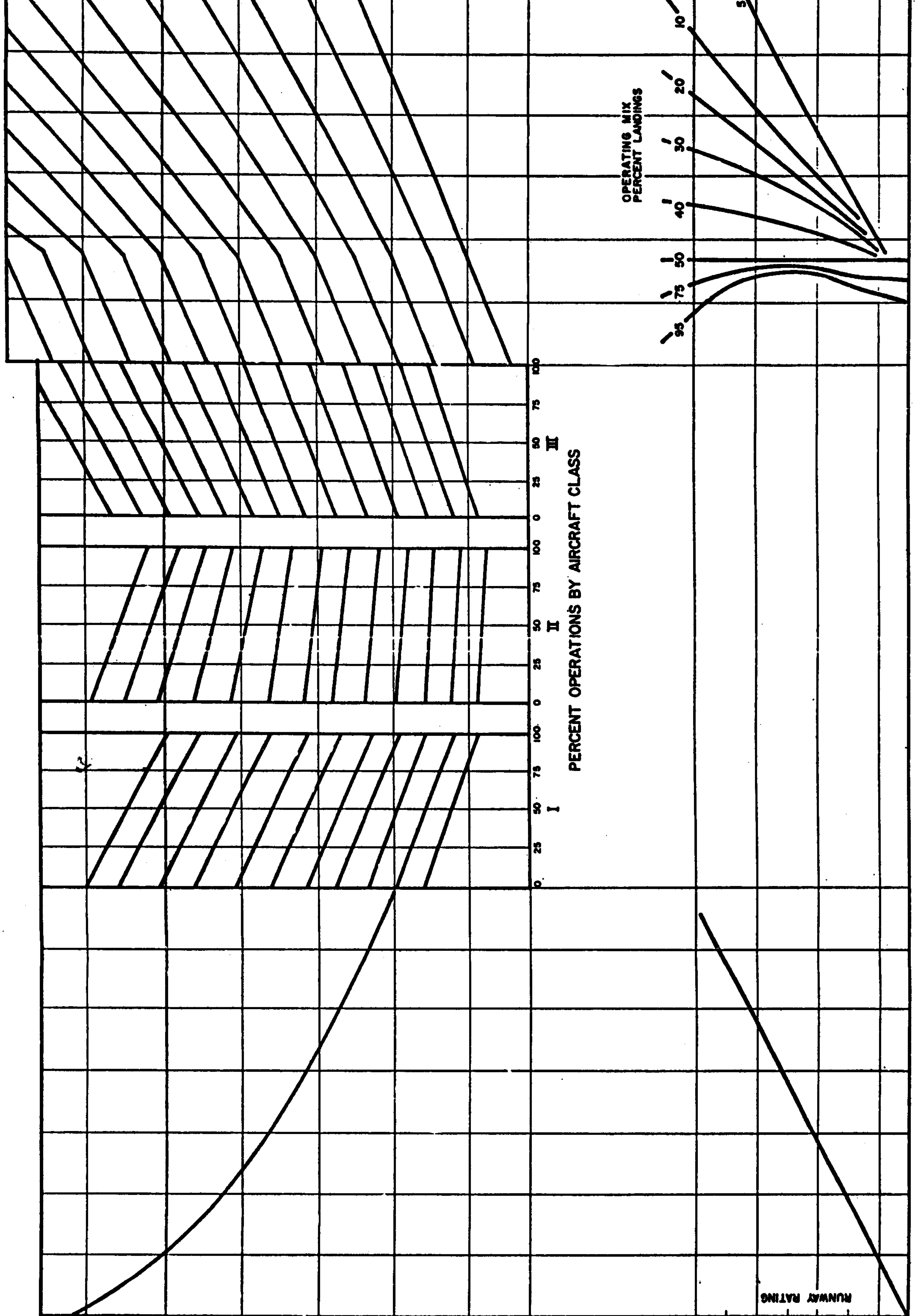



Figure 2-2
VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

## Table 2-6

### IFR CAPACITY (SINGLE RUNWAY)

| Type Navaid | Radar | | | | | | | | | | | | Non-Radar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PAR (1) | | | | | | PAR (2) & Conventional | | | | | | Conventional |
| Runway Rating | 30 | | 60 | | 90 | | 30 | | 60 | | 90 | | All Rating |
| Aircraft Class | I&II | III | I&II | III | I&II | III | I&II | III | I&II | III | I&II | III | All Classes |
| Ratio | | | | | | | | | | | | | |
| (UNRESTRICTED AIRSPACE) | | | | | | | | | | | | | |
| .2 | 46 | 46 | 43 | 43 | 41 | 41 | 46 | 46 | 43 | 43 | 41 | 41 | 28 |
| .4 | 42 | 42 | 36 | 36 | 34 | 34 | 42 | 42 | 36 | 36 | 34 | 34 | 25 |
| .6 | 42 | 42 | 37 | 37 | 32 | 32 | 42 | 42 | 37 | 37 | 32 | 32 | 21 |
| .8 | 40 | 34 | 34 | 34 | 29 | 29 | 40 | 40 | 34 | 34 | 29 | 29 | 18 |
| 1.0 | 38 | 30 | 32 | 30 | 30 | 30 | 38 | 38 | 32 | 32 | 30 | 30 | 16 |
| 1.2 | 37 | 28 | 33 | 28 | 29 | 28 | 39 | 39 | 33 | 33 | 29 | 29 | 15 |
| 1.5 | 33 | 25 | 33 | 25 | 30 | 25 | 40 | 25 | 33 | 25 | 33 | 33 | 13 |
| 2.0 | 30 | 23 | 30 | 23 | 30 | 23 | 40 | 33 | 33 | 33 | 30 | 30 | 12 |
| 3.0 | 27 | 20 | 27 | 20 | 27 | 20 | 40 | 29 | 33 | 29 | 29 | 29 | 11 |
| 4.0 | 27 | 20 | 27 | 20 | 27 | 20 | 37 | 27 | 35 | 27 | 31 | 27 | 10 |
| (RESTRICTED AIRSPACE) | | | | | | | | | | | | | |
| .2 | 30 | 30 | 24 | 24 | 24 | 24 | 30 | 30 | 24 | 24 | 24 | 24 | 28 |
| .4 | 28 | 28 | 21 | 21 | 21 | 21 | 28 | 28 | 21 | 21 | 21 | 21 | 25 |
| .6 | 24 | 24 | 21 | 21 | 21 | 21 | 24 | 24 | 21 | 21 | 21 | 21 | 21 |
| .8 | 24 | 24 | 22 | 22 | 22 | 22 | 24 | 24 | 22 | 22 | 22 | 22 | 18 |
| 1.0 | 26 | 26 | 22 | 22 | 20 | 20 | 26 | 26 | 22 | 22 | 20 | 20 | 16 |
| 1.2 | 26 | 26 | 22 | 22 | 20 | 20 | 26 | 26 | 22 | 22 | 20 | 20 | 15 |
| 1.5 | 26 | 25 | 23 | 23 | 21 | 21 | 26 | 26 | 23 | 23 | 21 | 21 | 13 |
| 2.0 | 27 | 23 | 23 | 23 | 21 | 21 | 27 | 27 | 23 | 23 | 21 | 21 | 12 |
| 3.0 | 27 | 20 | 24 | 20 | 20 | 26 | 28 | 28 | 24 | 24 | 21 | 21 | 11 |
| 4.0 | 25 | 19 | 25 | 19 | 22 | 19 | 30 | 27 | 25 | 25 | 23 | 23 | 10 |

PAR (1) - PAR with single approach capability
PAR (2) - PAR with multiple approach capability
Conventional - Conventional navaid (VOR, TACAN, NDE)
I, II, III - Indicates applicable aircraft class
Unrestricted Airspace - More than one departure path capability
Restricted Airspace - Single departure path capability

Ratio $= \frac{\text{Arrival Demand}}{\text{Departure Demand}}$

## Table 2-7

### IFR CAPACITIES (PARALLEL RUNWAYS)

| | Radar | | | | | | | | | | | | Non-Radar | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type Navaid | PAR (1) | | | | | | PAR (2) & Conventional | | | | | | Con. | |
| Runway Rating | All Ratings | | | | | | All Ratings | | | | | | All Ratings | |
| Aircraft Class | I | | II | | III | | I | | II | | III | | All Classes | |
| Ratio | (UNRESTRICTED AIRSPACE) | | | | | | | | | | | | | |
| | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. |
| .2 | 54 | 59 | 54 | 72 | 54 | 72 | 54 | 59 | 54 | 72 | 54 | 72 | 28 | 36 |
| .4 | 45 | 69 | 45 | 70 | 45 | 53 | 45 | 69 | 45 | 84 | 45 | 77 | 25 | 28 |
| .6 | 45 | 53 | 45 | 53 | 40 | 40 | 45 | 79 | 45 | 80 | 45 | 59 | 21 | 21 |
| .8 | 45 | 45 | 45 | 45 | 34 | 34 | 45 | 68 | 45 | 67 | 45 | 50 | 18 | 18 |
| 1.0 | 40 | 40 | 40 | 40 | 30 | 30 | 46 | 60 | 46 | 60 | 44 | 44 | 16 | 16 |
| 1.2 | 37 | 37 | 37 | 37 | 27 | 28 | 46 | 55 | 46 | 55 | 40 | 40 | 15 | 15 |
| 1.5 | 33 | 33 | 33 | 33 | 25 | 25 | 45 | 50 | 45 | 50 | 37 | 37 | 13 | 13 |
| 2.0 | 30 | 30 | 30 | 30 | 23 | 23 | 45 | 45 | 45 | 45 | 33 | 33 | 12 | 12 |
| 3.0 | 27 | 27 | 27 | 27 | 20 | 20 | 40 | 40 | 40 | 40 | 29 | 29 | 11 | 11 |
| 4.0 | 25 | 25 | 25 | 25 | 19 | 19 | 38 | 38 | 38 | 38 | 27 | 28 | 10 | 10 |
| | (RESTRICTED AIRSPACE) | | | | | | | | | | | | | |
| | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. |
| .2 | 30 | 36 | 30 | 36 | 30 | 36 | 30 | 36 | 30 | 36 | 30 | 36 | 28 | 36 |
| .4 | 28 | 42 | 28 | 42 | 28 | 42 | 28 | 42 | 28 | 42 | 28 | 42 | 25 | 28 |
| .6 | 27 | 48 | 27 | 48 | 27 | 40 | 27 | 48 | 27 | 48 | 27 | 48 | 21 | 21 |
| .8 | 25 | 45 | 25 | 45 | 25 | 34 | 25 | 54 | 25 | 54 | 25 | 50 | 18 | 18 |
| 1.0 | 26 | 40 | 26 | 40 | 26 | 30 | 26 | 60 | 26 | 60 | 26 | 44 | 16 | 16 |
| 1.2 | 26 | 37 | 26 | 37 | 26 | 28 | 26 | 55 | 26 | 55 | 26 | 40 | 15 | 15 |
| 1.5 | 25 | 33 | 25 | 33 | 25 | 25 | 25 | 50 | 25 | 50 | 25 | 37 | 13 | 13 |
| 2.0 | 25 | 30 | 25 | 30 | 22 | 23 | 25 | 45 | 25 | 45 | 25 | 33 | 12 | 12 |
| 3.0 | 25 | 27 | 25 | 27 | 20 | 20 | 25 | 40 | 25 | 40 | 25 | 29 | 11 | 11 |
| 4.0 | 25 | 25 | 25 | 25 | 19 | 19 | 26 | 38 | 26 | 38 | 26 | 28 | 10 | 10 |

PAR (1) - PAR with single approach capability
PAR (2) - PAR with multiple approach capability
Con. - Conventional navaid (VOR, TACAN, NDE)
I, II, III - Indicates applicable aircraft class
Dep. - Release of departure dependent on assured landing on parallel runway (per ATC criteria)
Ind. - Release of departure not dependent on assured landing on parallel runway (per ATC criteria)

Ratio = $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

## Section III. EXAMPLES

Using the procedures outlined in Section II, this section demonstrates the techniques involved by means of examples, covering the following basic areas:

- Runway Rating
- VFR Capacity
- IFR Capacity
- Daily Capacity
- Application of Figure 2-2

a. Runway Rating. To successfully calculate the runway rating for a given runway direction, adherence to 6 steps is necessary. These steps, listed below, apply to Figure 2-1 which is reproduced in this section for clarification.

(1) For each class, enter the runway rating figure with the field elevation.

(2) Proceed upward until the proper runway length line is intersected.

(3) Draw a line representing the runway, directly across the figure. On this "runway" plot the runway exits where they actually exist based on distance from threshold.

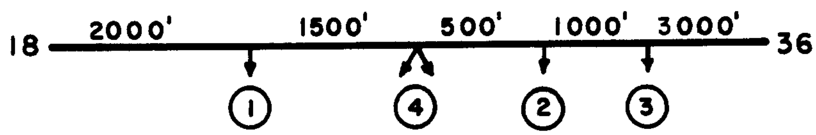
(4) Sum up the number of "slow" exits within the slow range.

(5) Sum up the number of "fast" exits within the fast range; multiply this number by two. If a fast exit falls in the "slow" range, but out of the fast range, count it as a "slow" exit.

(6) The sum of steps 4 and 5 are the equivalent usable exits. Extend the horizontal runway line over to the appropriate usable turnoff lines and read the runway rating on the axis below.

(Example 1)

R/W 18-36 is 8,000 feet long and is at sea level (sl). Calculate the runway rating in the R/W 18 direction for all three classes of aircraft. The plan view of Runway 18-36 looks like:



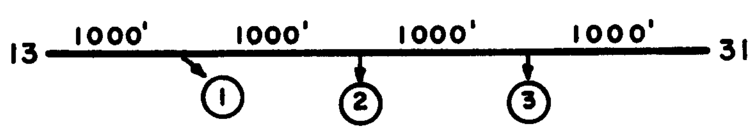

Exits 1 2 and 3 are "slow."
Exit 4 is "fast."

Utilizing the aforementioned steps and Figure 2-1 (Example) on page C-33, the runway ratings are calculated to be:

| | |
|---|---|
| Class I | 48 sec. |
| Class II | 38 sec. |
| Class III | 39 sec. |

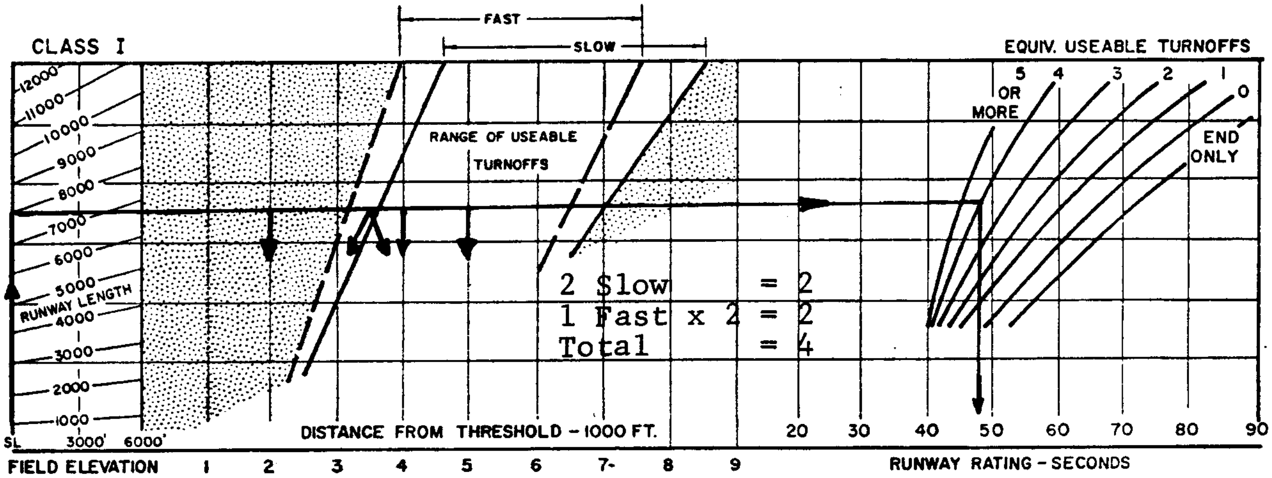
(Example 2)

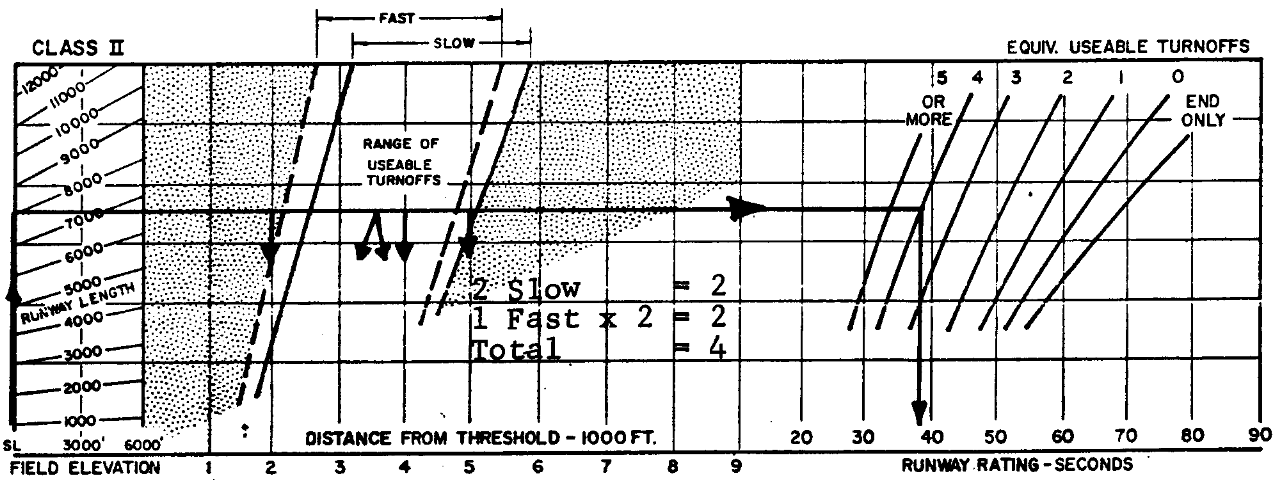
R/W 13-31 is 4,000 feet long and is 3,000 feet above sea level. The layout of exits as shown below:




Exits 2 and 3 are "slow."
Exit 1 is "fast."

Calculate the runway rating in the R/W 13 direction for Class III aircraft.  The calculations are shown on Figure 2-1 (Example) on page C-34 with the rating calculated at 30 sec.



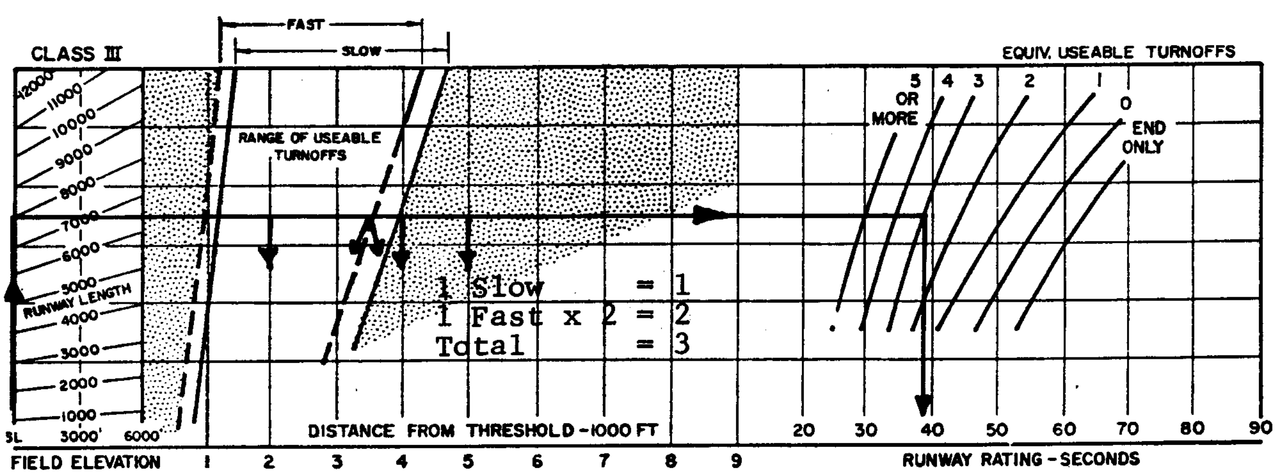




FIGURE 2-1 (Example)

**RUNWAY RATING**

AVERAGE LANDING OCCUPANCY TIME-SECONDS

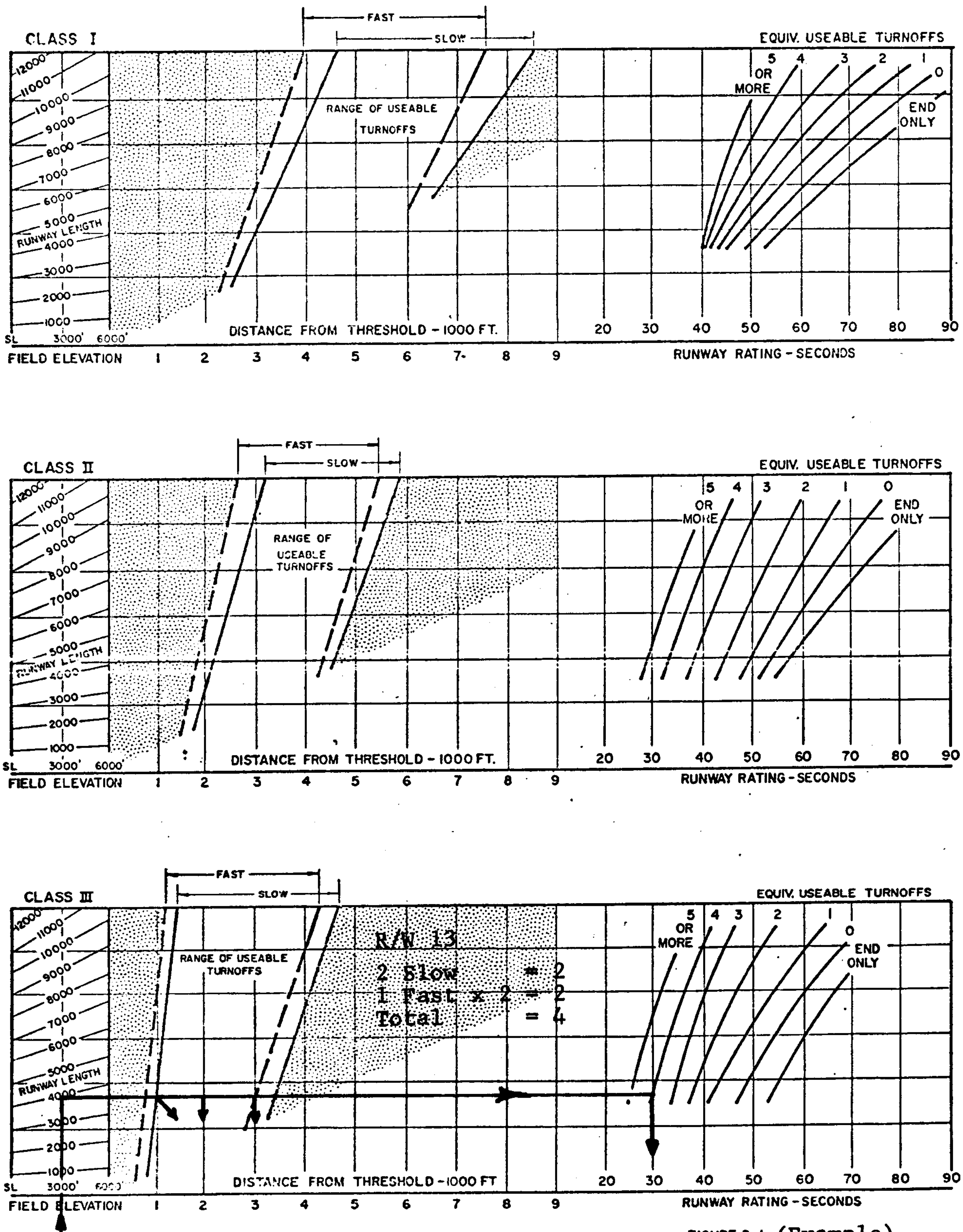



FIGURE 2-1 (Example)

RUNWAY RATING

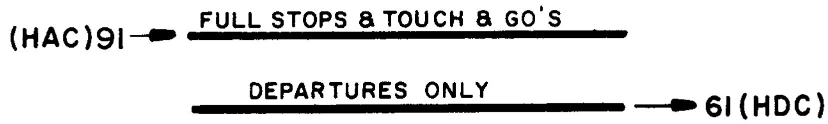
AVERAGE LANDING OCCUPANCY TIME-SECONDS

b. VFR Capacity. In these examples, the calculation of VFR runway capacities use Figure 2-2, Tables 2-1, 2-2, 2-3, 2-4, and 2-5. These figures and tables are reproduced for these examples on page numbers C-40 to C-44 (Example 1) and C-45 to C-49 (Example 2).

(Example 1)

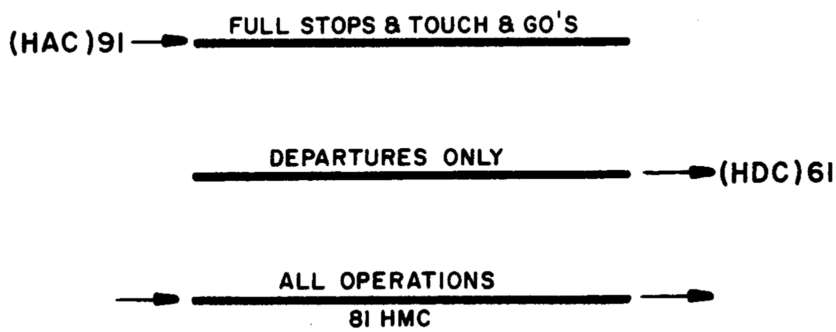
| | |
|---|---|
| Mission | Jet fighter base. |
| Base Layout | Two 10,000' parallel runways, 1,500' centerline separation. 3,000' above sea level. |
| Manner of Operations | Arrivals on one runway; departures on the other. |
| Type of Aircraft | A6, A4, F4 |
| Aircraft Classification | Class I |
| Operations Conducted | Formation arrivals and departures; Touch and Go's |
| Daily Activity (from survey) | 300 single departures, 300 single arrivals, 100 aircraft in formation departures of 2, 100 aircraft in formation departures of 4, 100 aircraft in formation arrivals of 2, 100 aircraft in formation arrivals of 4, 600 Touch and Go's. |
| Exits | Two usable slows) = 4 equivalent turnoffs<br>One usable fast )<br>Runway Rating = 55 sec.<br>(Assumed previous calculation) |

Results




At a ratio of 2.2 (1100 arrivals divided by 500 departures per example "daily activity" input), the hourly total capacity equals 132 operations per hour; refer calculation procedure discussed on page numbers C-20 and C-21.

Question: What is the capacity if a third parallel is added 5,000' from the existing outboard runway? Mixed operations on new runway.



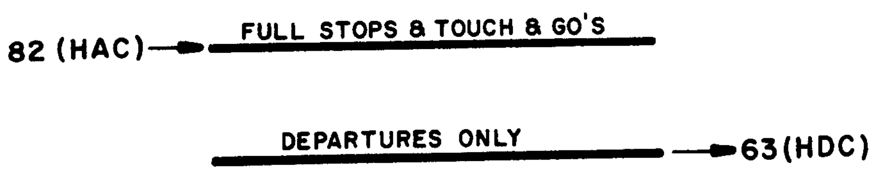

Total capacity = 132 (from above calculation) + 81 = 213 operations per hour.

(Example 2)

The air station undergoes a partial change in mission. Several squadrons of P-3's are moved in to serve as a coastal anti-submarine group. It is now necessary to recompute capacity with this new demand.

| | |
|---|---|
| Mission | Jet fighter training, Coastal watch |
| Base Layout | Same as previous example. |
| Aircraft Classification | I and II |
| Manner of Operation | Same as previous example. |
| Operations Conducted | Touch and Go's; Formations |
| Daily Activity | Same as previous example except for a 200 movement increase in single arrivals and departures generated by the P-3's. |
| Exits | Runway rating = 55 (Class I)<br>Runway rating = 43 (Class II)<br>(assumed previous calculation) |

Results:




At a ratio of 1.86 (1300 arrivals divided by 700 departures per example "daily activity" input), the hourly total capacity equals 126 operations per hour; refer calculation procedure discussed on page numbers C-20 and C-21.

Question: What is the capacity if the ratio of arrivals to departures equals 2.0?

$$\text{Hourly Total Capacity (HTC)} = \frac{\text{HAC x (1 + Ratio)}}{\text{Ratio}}$$

"or"

HDC x (1 + Ratio),

whichever is less.

$$\text{Therefore, HTC} = \frac{82 \text{ x } (1 + 2)}{2} = \frac{82 \text{ x } 3}{2} = 123$$

(Other formula results in higher value of 189.)

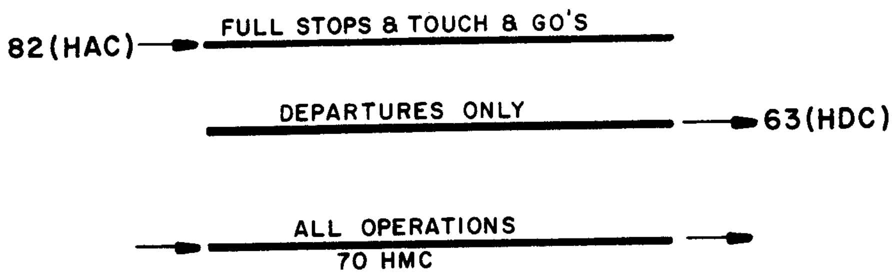
Question: What is the capacity if the ratio equals 0.8?

HTC = HDC x (1 + Ratio) =

63 x 1.8 = 113.4 (113)

(Other formula results in higher value of 184.5.)

Question: What is the capacity if a third parallel is added 5,000' from the existing outboard runway? Mixed operations are to be conducted on this runway.




Total Capacity = 126 (from above calculation based on Ratio = 1.86) + 70 = 196 operations per hour.

| Step No. | | ① | | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|---|---|---|
| Procedure | | From Field Survey or Forecast | | Constants | ①×② | $③_S \div ③_G$ | Constants | $④_S \times ⑤$ | $⑥_G \times \frac{①_G}{③_G}$ |
| Step Definition | | Takeoff Demand: Type Operation | No. of Aircraft | Equivalent Movement Factors | Takeoff Equivalent Movements | Class Distribution | Class HDC's | Weighted $(HDC)_E$ | Weighted $(HDC)_A$ |
| Aircraft Class I | | Single | 300 | 1.00 | 300 | | | | |
| | FORMATION of | 2 | 100 | .60 | 60 | | | | |
| | FORMATION of | 3 | – | .47 | – | | | | |
| | FORMATION of | 4 | 100 | .40 | 40 | | | | |
| | | Pairs | – | .50 | – | | | | |
| | | $\text{Sub-Totals}_{I}$ | S 500 | | S 400 | S 1.0 | 49 | S 49 | |
| Aircraft Class II | | Single | | 1.00 | | | | | |
| | FORMATION of | 2 | | .63 | | | | | |
| | FORMATION of | 3 | | .51 | | | | | |
| | FORMATION of | 4 | | .45 | | | | | |
| | | Pairs | | .50 | | | | | |
| | | $\text{Sub-Totals}_{II}$ | S | | S | S | 63 | S | |
| Aircraft Class III | | Single | | 1.00 | | | | | |
| | FORMATION of | 2 | | .69 | | | | | |
| | FORMATION of | 3 | | .59 | | | | | |
| | FORMATION of | 4 | | .54 | | | | | |
| | | Pairs | | .50 | | | | | |
| | | $\text{Sub-Totals}_{III}$ | S | | S | S | 90 | S | |
| ALL CLASSES | | Grand-Totals | $①_G$ 500 | | $③_G$ 400 | $④_G$ 1.0 | | $⑥_G$ 49 | 61 |

Table 2–3/EXAMPLE 1

VFR HOURLY DEPARTURE CAPACITY (HDC) ANALYSIS WORK SHEET

| Step No. | | 1 | 1A | 1B | 1C | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Procedure | | FROM FIELD SURVEY OR FORECAST | | | | USE Fig. No. 2-1 | USE TABLE No. 2-1 | USE TABLE No. 2-2 | 1A × 4 | 1B × 4 | $5_G + 6_G$ | $5_S \div 7_G$ | $6_S \div 7_G$ | $8_S \times 3$ | Constants | $9_S \times 11$ | $10_G + 12_G$ | $13_G \times 1C_G \div 7_G$ |
| Step Definition | | LANDING DEMAND: Type Operation | No. of Aircraft: Non Tch & Go | Touch & Go | Total | Runway Rating | Class HAC | Equivalent Movement Factors | Non Touch & Go Equivalent Movements | Touch & Go Equivalent Movements | Total Equivalent Movement | Non Touch & Go Class Distribution | Touch & Go Class Distri-bution | Non Touch & Go Weighted HAC | Touch & Go HAC's | Touch & Go Weighted HAC | Weighted $(HAC)_E$ | Weighted $(HAC)_A$ |
| Aircraft Class I | | Single | 300 | | | | | 1.00 | 300 | | | | | | | | | |
| | FORMATION OF | 2 | 100 | | | | | .61 | 61 | | | | | | | | | |
| | | 3 | – | | | | | – | – | | | | | | | | | |
| | | 4 | 100 | | | | | .43 | 43 | | | | | | | | | |
| | | Touch & Go | | 600 | (Repeat Value) | 55 | 42 | .24 | | 144 (Repeat Value) | | | | | 53 | | | |
| Sub-Total I | | | S 500 | S 600 | | | | | S 404 | S 144 | | S .74 | S .26 | S 31 | | S 14 | | |
| Aircraft Class II | | Single | | | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF | 2 | | | | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | | | | |
| | | Touch & Go | | | (Repeat Value) | | | | | (Repeat Value) | | | | | 60 | | | |
| Sub-Total II | | | S | S | | | | | S | S | | S | S | S | | S | | |
| Aircraft Class III | | Single | | | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF | 2 | | | | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | | | | |
| | | Touch & Go | | | (Repeat Value) | | | | | (Repeat Value) | | | | | 66 | | | |
| Sub-Total III | | | S | S | | | | | S | S | | S | S | S | | S | | |
| ALL CLASSES | Grand Total | | G 500 + | G 600 = | G 1100 | | | | $5_G$ 404 | $6_G$ 144 | $7_G$ 548 | G .74 | G .26 | $10_G$ 31 | | $12_G$ 14 | $13_G$ 45 | 91 |

Table 2–4/EXAMPLE 1

VFR HOURLY ARRIVAL CAPACITY (HAC) ANALYSIS WORK SHEET

Table 2-1/Example 1

HAC - HOURLY ARRIVAL CAPACITY - Movements Per Hour

| Aircraft Class | Runway Rating | | | | | |
|---|---|---|---|---|---|---|
| | 30 | 40 | 50 | 60 | 70 | 80 |
| I | 50 | 47 | 44 | 40 | 35 | 30 |
| II | 57 | 52 | 47 | 42 | 38 | 33 |
| III | 63 | 62 | 58 | 53 | 47 | 41 |

Interpolate between 44 and 40; Use 42.

Table 2-2/Example 1

EQUIVALENT MOVEMENT FACTORS
For Touch & Go or Landings in Formation

| Landing Procedure | HAC - Movements per Hour | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 |
| Formation of 2 | .58 | .59 | .61 | .62 | .64 | .65 | .67 | .68 |
| Formation of 3 | .45 | .47 | .49 | .50 | .52 | .55 | .56 | .57 |
| Formation of 4 | .37 | .40 | .42 | .44 | .46 | .48 | .50 | .52 |
| Touch and Go | .17 | .20 | .23 | .25 | .27 | .30 | .33 | .37 |

For 42, interpolate and use .61
.49*
.43
.24

*This value not needed in example.

| Step No. | ① | ①A | ①B | ①C | ①D | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭A | ⑭B | ⑭C | ⑮ | ⑯ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Procedure | FROM FIELD SURVEY OR FORECAST | | | | | USE Fig. No. 2-1 | USE TABLE No. 2-1 | USE TABLE No. 2-2 | ①A×④ | ①B×④ | $⑤_S + ⑥_S$ | CONSTANTS | ①D×⑧ | $①C_G + ⑩_G$ | $⑦_S + ⑨_S$ | $⑦_G \div ⑪_G$ | $⑪_S \div ⑪_G$ | $2 \times \frac{⑤_G}{⑦_G}$ | $\text{"20"} \times \frac{⑥_G}{⑦_G}$ | $⑭A_G + ⑭B_G$ | USE Fig. No. 2-2 | $⑮_G \times \frac{⑩_G}{⑪_G}$ |
| Step Definition | TYPE OPERATION | No. of LANDING AIRCRAFT: Non Touch & Go | Touch & Go | Total | No. of Takeoff Aircraft | Class Runway Rating | Class HAC's | Landing Equivalent Movement Factors | Non Touch & Go Equivalent Movements | Touch & Go Equivalent Movements | Total Landing Equivalent Movements | Takeoff Equivalent Movement Factors | Takeoff Equivalent Movements | Total Takeoffs And Landings | Total Take-off & Land. Equivalent Movements | Percent Landing | Class Distribution | Weighted Runway Rating: Non Touch & Go | Touch & Go | Total | $(HMC)_E$ | $(HMC)_A$ |
| Aircraft CLASS I | Single | 300 | | | 300 | | | 1.00 | 300 | | | 1.00 | 300 | | | | | | | | | |
| | FORMATION OF 2 | 100 | | | 100 | | | .61 | 61 | | | .80 | 60 | | | | | | | | | |
| | 3 | – | | | – | | | – | – | | | .47 | – | | | | | | | | | |
| | 4 | 100 | | | 100 | | | .43 | 43 | | | .41 | 41 | | | | | | | | | |
| | Touch & Go | | 600 | | | 55 | 42 | .24 | | 144 | | | | | | | | | | | | |
| | Pairs | | | | – | | | | | | | .50 | – | | | | | | | | | |
| | Sub-Total I | S 500 | S 600 | | S 500 | | | | S 404 | S 144 | S 548 | | S 401 | | S 949 | | S 1.0 | S 41 | | | | |
| Aircraft CLASS II | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | .83 | | | | | | | | | | |
| | 3 | | | | | | | | | | | .51 | | | | | | | | | | |
| | 4 | | | | | | | | | | | .46 | | | | | | | | | | |
| | Touch & Go | | | | | | | | | | | | | | | | | | | | | |
| | Pairs | | | | | | | | | | | .50 | | | | | | | | | | |
| | Sub-Total II | S | S | | S | | | | S | S | S | | S | | S | | S | S | | | | |
| Aircraft CLASS III | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | .69 | | | | | | | | | | |
| | 3 | | | | | | | | | | | .59 | | | | | | | | | | |
| | 4 | | | | | | | | | | | .54 | | | | | | | | | | |
| | Touch & Go | | | | | | | | | | | | | | | | | | | | | |
| | Pairs | | | | | | | | | | | .50 | | | | | | | | | | |
| | Sub-Total III | S | S | | S | | | | S | S | S | | S | | S | | S | S | | | | |
| ALL CLASSES | Grand Total | G 500 | G 600 | $①C_G$ 1100 | $①D_G$ 500 | | | | $⑤_G$ 404 | $⑥_G$ 144 | $⑦_G$ 548 | | $⑨_G$ 401 | 1600 | G 949 | .58 | G 1.0 | G 41 | 5 | 46 | 48 | 81 |

* CROSS CHECK: Does $①A_G + ①B_G = ①C_G$; Does $⑦_G + ⑨_G = ⑪_G$

**Table 2-5/EXAMPLE 1**

**VFR HOURLY MIXED CAPACITY (HMC) ANALYSIS WORK SHEET**

1) Enter with Runway Rating = 46 from column 14c, Table 2-5 on page C-43

2) Parallel line to percent operations: Class I = 100% from column 13, Table 2-5.

3) Proceed vertically at Operating Mix Percent Landings = 57, from Column 12, Table 2-5.

4) Read $(HMC)_E$ = 48 at intersection of lines.

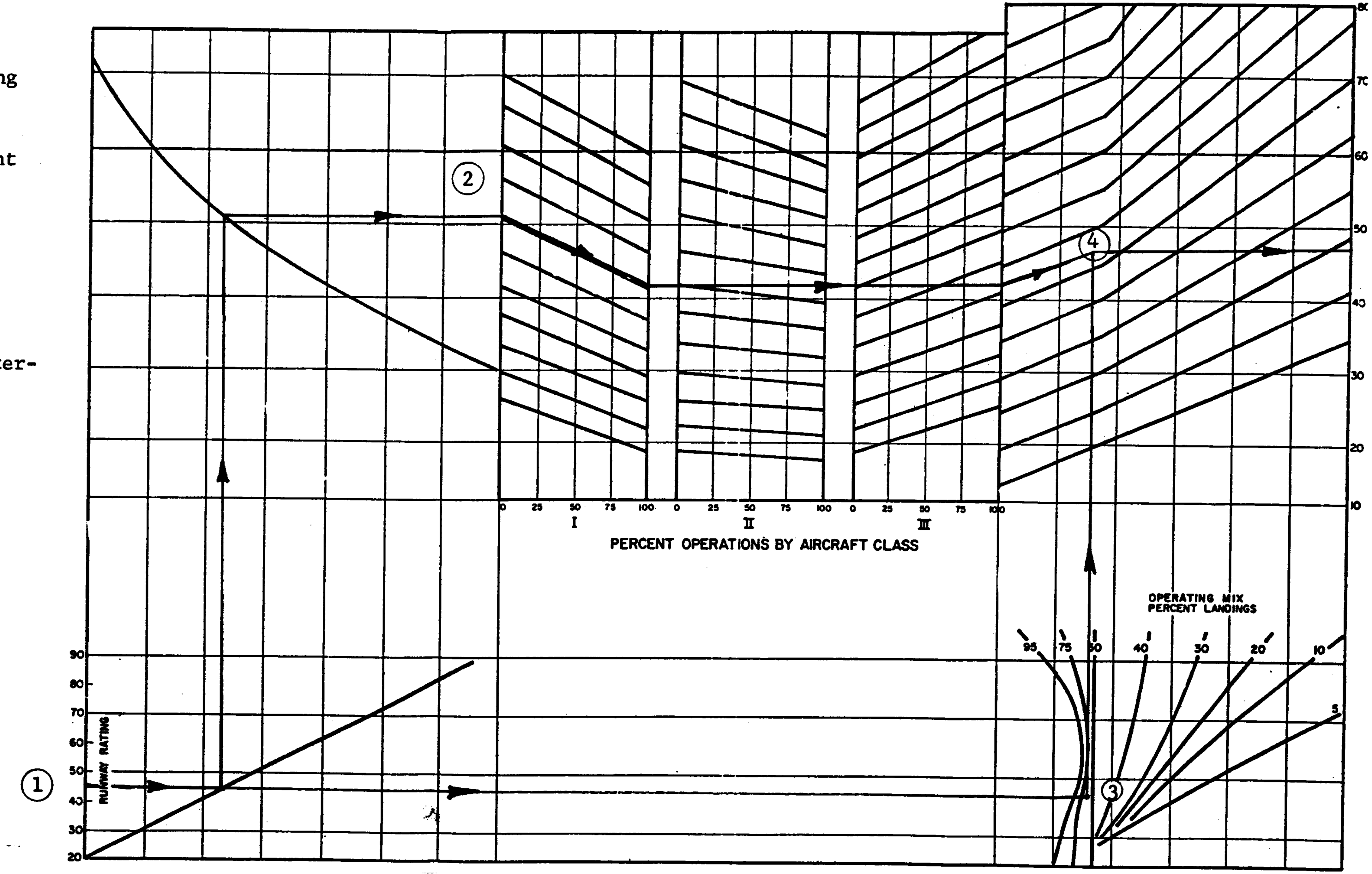



Figure 2-2/EXAMPLE 1
VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

| Step No. | ① | | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|---|---|
| Procedure | From Field Survey or Forecast | | Constants | ①×② | $③_S \div ③_G$ | Constants | $④_S \times ⑤$ | $⑥_G \times \frac{①_G}{③_G}$ |
| Step Definition | Takeoff Demand | | Equivalent Movement Factors | Takeoff Equivalent Movements | Class Distribution | Class HDC's | Weighted $(HDC)_E$ | Weighted $(HDC)_A$ |
| | Type Operation | No. of Aircraft | | | | | | |
| Aircraft Class I | Single | 300 | 1.00 | 300 | | | | |
| | FORMATION of 2 | 100 | .60 | 60 | | | | |
| | FORMATION of 3 | — | .47 | — | | | | |
| | FORMATION of 4 | 100 | .40 | 40 | | | | |
| | Pairs | — | .50 | — | | | | |
| Sub-Totals I | | S 500 | | S 400 | S .67 | 49 | S 33 | |
| Aircraft Class II | Single | 200 | 1.00 | 200 | | | | |
| | FORMATION of 2 | | .63 | | | | | |
| | FORMATION of 3 | | .51 | | | | | |
| | FORMATION of 4 | | .45 | | | | | |
| | Pairs | | .50 | | | | | |
| Sub-Totals II | | S 200 | | S 200 | S .33 | 63 | S 21 | |
| Aircraft Class III | Single | | 1.00 | | | | | |
| | FORMATION of 2 | | .69 | | | | | |
| | FORMATION of 3 | | .59 | | | | | |
| | FORMATION of 4 | | .54 | | | | | |
| | Pairs | | .50 | | | | | |
| Sub-Totals III | | S | | S | S | 90 | S | |
| ALL CLASSES Grand-Totals | | $①_G$ 700 | | $③_G$ 600 | $④_G$ 1.0 | | $⑥_G$ 54 | 63 |

**Table 2–3/EXAMPLE 2**

**VFR HOURLY DEPARTURE CAPACITY (HDC) ANALYSIS WORK SHEET**

| Step No. | | ① | ①A | ①B | ①C | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Procedure | | FROM FIELD SURVEY OR FORECAST | | | | USE Fig. No. 2-1 | USE TABLE No. 2-1 | USE TABLE No. 2-2 | ①A × ④ | ①B × ④ | ⑤G + ⑥G | ⑤S ÷ ⑦G | ⑥S ÷ ⑦G | ⑧S × ③ | Constants | ⑨S × ⑪ | ⑩G + ⑫G | ⑬G ÷ ⑦G ①C G |
| Step Definition | | LANDING DEMAND: Type Operation | No. of Aircraft: Non Tch & Go | Touch & Go | Total | Runway Rating | Class HAC | Equivalent Movement Factors | Non Touch & Go Equivalent Movements | Touch & Go Equivalent Movements | Total Equivalent Movement | Non Touch & Go Class Distribution | Touch & Go Class Distribution | Non Touch & Go Weighted HAC | Touch & Go HAC's | Touch & Go Weighted HAC | Weighted $(HAC)_E$ | Weighted $(HAC)_A$ |
| Aircraft Class I | FORMATION OF | Single | 300 | | | | | 1.00 | 300 | | | | | | | | | |
| | | 2 | 100 | | | | | .61 | 61 | | | | | | | | | |
| | | 3 | – | | | | | – | – | | | | | | | | | |
| | | 4 | 100 | | | | | .43 | 43 | | | | | | | | | |
| | | Touch & Go | | 600 | | (Repeat Value) 55 | 42 | .24 | | 144 | | | | | 53 | | | |
| Sub-Total I | | | S 500 | S 600 | | | | | S 404 | S 144 (Repeat Value) | | S .54 | S .19 | S .23 | | S 10 | | |
| Aircraft Class II | FORMATION OF | Single | 200 | | | | | 1.00 | 200 | | | | | | | | | |
| | | 2 | | | | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | | | | |
| | | Touch & Go | | – | | (Repeat Value) 43 | 51 | | | – | | | | | 60 | | | |
| Sub-Total II | | | S 200 | S – | | | | | S 200 | S – (Repeat Value) | | S .27 | S – | S 14 | | S – | | |
| Aircraft Class III | FORMATION OF | Single | | | | | | 1.00 | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | | | | |
| | | Touch & Go | | | | (Repeat Value) | | | | | | | | | 66 | | | |
| Sub-Total III | | | S | S | | | | | S | S (Repeat Value) | | S | S | S | | S | | |
| ALL CLASSES | Grand Total | | G 700 + | G 600 = | G 1300 | | | | ⑤G 604 | ⑥G 144 | ⑦G 748 | G .81 | G .19 | ⑩G 37 | | ⑫G 10 | ⑬G 47 | 82 |

Table 2-4/EXAMPLE 2

VFR HOURLY ARRIVAL CAPACITY (HAC) ANALYSIS WORK SHEET

Table 2-1/Example 2

HAC - HOURLY ARRIVAL CAPACITY - Movements Per Hour

| Aircraft Class | Runway Rating 30 | 40 | 50 | 60 | 70 | 80 |
|---|---|---|---|---|---|---|
| I | 50 | 47 | 44 | 40 | 35 | 30 |
| II | 57 | 52 | 47 | 42 | 38 | 33 |
| III | 63 | 62 | 58 | 53 | 47 | 41 |

Class I: Interpolate between 44 & 40; Use 42.

Class II: Interpolate between 52 & 47; Use 51.

Table 2-2/Example 2

EQUIVALENT MOVEMENT FACTORS
For Touch & Go or Landings in Formation

| Landing Procedure | HAC - Movements per Hour 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 |
|---|---|---|---|---|---|---|---|---|
| Formation of 2 | .58 | .59 | .61 | .62 | .64 | .65 | .67 | .68 |
| Formation of 3 | .45 | .47 | .49 | .50 | .52 | .55 | .56 | .57 |
| Formation of 4 | .37 | .40 | .42 | .44 | .46 | .48 | .50 | .52 |
| Touch and Go | .17 | .20 | .23 | .25 | .27 | .30 | .33 | .37 |

Class I: Interpolate between 40 & 45; Use .61/.49*/.43/.24

Class II: Values not needed in this example.

*Value not needed in this example.

| Step No. | 1 | 1A | 1B | 1C | 1D | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14A | 14B | 14C | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Procedure | FROM FIELD SURVEY OR FORECAST | | | | | USE Fig. No. 2-1 | USE TABLE No. 2-1 | USE TABLE No. 2-2 | $1A \times 4$ | $1B \times 4$ | $7_S \div 6_S$ | CONSTANTS | $1D \times 8$ | $1C_G + 1D_G$ | $7_S + 9_S$ | $7_G \div 11_G$ | $11_S \div 11_G$ | $2 \times \frac{5}{7_G}$ | $\text{"20"} \times \frac{6}{7_G}$ | $14A_G + 14B_G$ | USE Fig. No. 2-2 | $15_G \times \frac{10_G}{11_G}$ |
| Step Definition | TYPE OPERATION | No. of LANDING AIRCRAFT: Non Touch & Go | Touch & Go | Total | No. of Takeoff Aircraft | Class Runway Rating | Class HAC's | Landing Equivalent Movement Factors | Non Touch & Go Equivalent Movements | Touch & Go Equivalent Movements | Total Landing Equivalent Movements | Takeoff Equivalent Movement Factors | Takeoff Equivalent Movements | Total Takeoffs And Landings | Total Take-off & Land. Equivalent Movements | Percent Landing | Class Distribution | Weighted Runway Rating: Non Touch & Go | Touch & Go | Total | $(HMC)_E$ | $(HMC)_A$ |
| Aircraft CLASS I | Single | 300 | | | 300 | | | 1.00 | 300 | | | 1.00 | 300 | | | | | | | | | |
| | Formation of 2 | 100 | | | 100 | | | .61 | 61 | | | .60 | 60 | | | | | | | | | |
| | Formation of 3 | – | | | – | | | – | – | | | .47 | – | | | | | | | | | |
| | Formation of 4 | 100 | | | 100 | | | .43 | 43 | | | .41 | 41 | | | | | | | | | |
| | Touch & Go | | 600 | | | 55 | 42 | .24 | | 144 | | | | | | | | | | | | |
| | Pairs | | | | – | | | | | | | .50 | – | | | | | | | | | |
| Sub-Total I | | S 500 | S 600 (Repeat Value) | | S 500 | | | | S 404 | S 144 (Repeat Value) | S 548 | | S 401 | | S 949 | | S .82 | S 30 | | | | |
| Aircraft CLASS II | Single | 200 | | | 200 | | | 1.00 | 200 | | | 1.00 | 200 | | | | | | | | | |
| | Formation of 2 | – | | | – | | | – | – | | | .63 | – | | | | | | | | | |
| | Formation of 3 | – | | | – | | | – | – | | | .51 | – | | | | | | | | | |
| | Formation of 4 | – | | | – | | | – | – | | | .46 | – | | | | | | | | | |
| | Touch & Go | | – | | | 43 | 51 | – | | – | | | | | | | | | | | | |
| | Pairs | | | | – | | | | | | | .50 | – | | | | | | | | | |
| Sub-Total II | | S 200 | S – (Repeat Value) | | S 200 | | | | S 200 | S – (Repeat Value) | S 200 | | S 200 | | S 400 | | S .18 | S 12 | | | | |
| Aircraft CLASS III | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | Formation of 2 | | | | | | | | | | | .69 | | | | | | | | | | |
| | Formation of 3 | | | | | | | | | | | .59 | | | | | | | | | | |
| | Formation of 4 | | | | | | | | | | | .54 | | | | | | | | | | |
| | Touch & Go | | | | | | | | | | | | | | | | | | | | | |
| | Pairs | | | | | | | | | | | .50 | | | | | | | | | | |
| Sub-Total III | | S | S (Repeat Value) | | S | | | | S | S (Repeat Value) | S | | S | | S | | S | S | | | | |
| ALL CLASSES Grand Total | | G 700 | G 600 | $1C_G$ 1300 | $1D_G$ 700 | | | | $5_G$ 604 | $6_G$ 144 | $7_G$ 748 | | $9_G$ 601 | 2000 | G 1349 | .55 | G 1.0 | G 42 | 4 | 46 | 47 | 70 |

* CROSS CHECK: Does $5_G + 6_G = 7_G$; Does $7_G + 9_G = 11_G$

Table 2–5/EXAMPLE 2

VFR HOURLY MIXED CAPACITY (HMC) ANALYSIS WORK SHEET

1. Enter with Runway Ratings = 46 from column 14C, Table 2-5 on page C-48
2. Parallel line to Percent Operations:
   Class I = 82
   Class II = 18
   from Column 13, Table 2-5.
3. Proceed vertically at Operating Mix Percent Landings = 55, from Column 12, Table 2-5.
4. Read $(HMC)_E$ = 47 at intersection of lines.

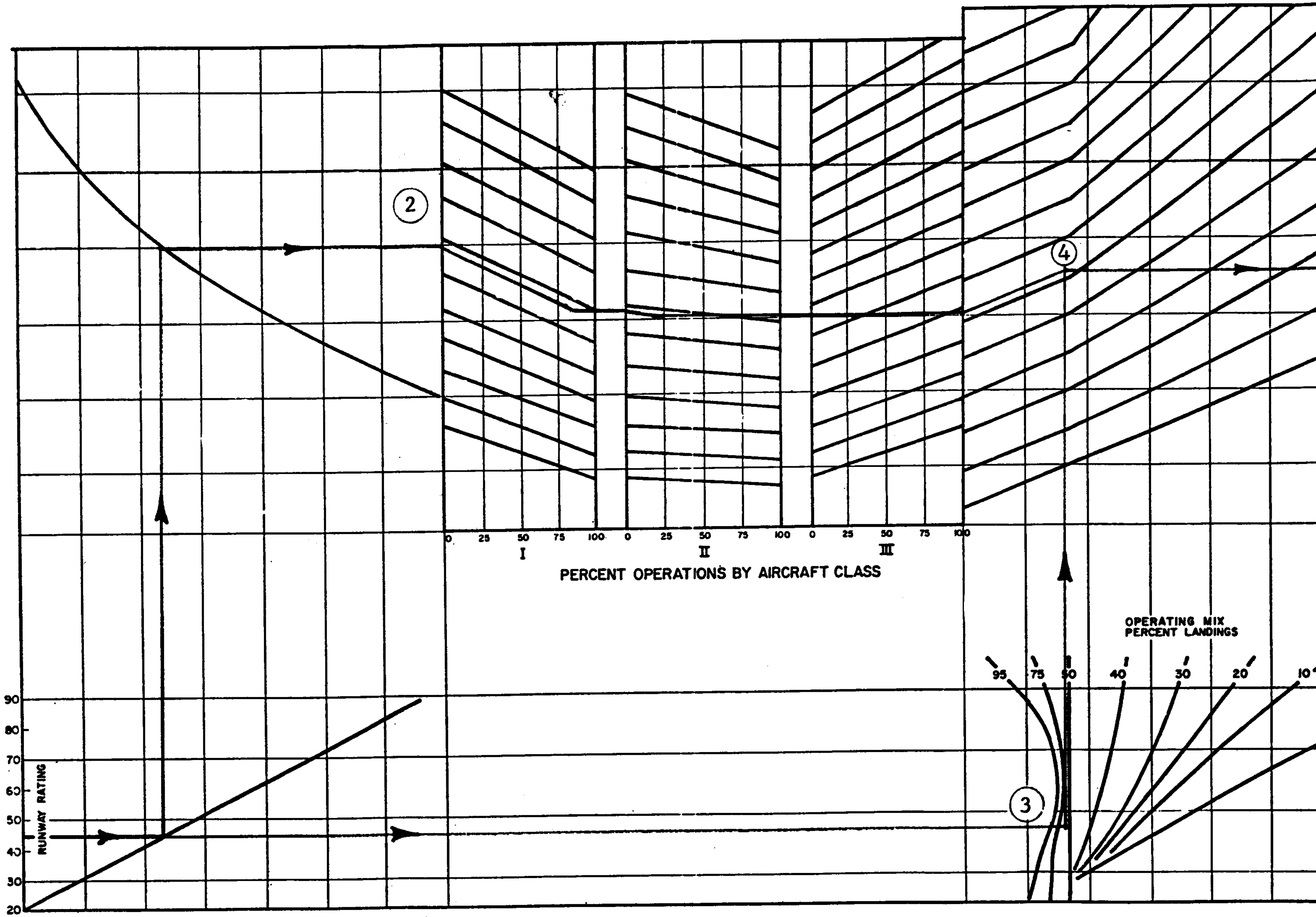



Figure 2-2/EXAMPLE 2
VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

c. IFR Capacity. IFR runway capacities are computed using Tables 2-6 and 2-7. A series of examples follow indicating the use of these tables, which are reproduced here for convenience.

Examples.

(1) Compute the IFR capacity of:

| | |
|---|---|
| Layout | Single Runway |
| Type Navaid | Conventional |
| Airspace | Unrestricted |
| Radar | Yes |
| Aircraft Class | III |
| Ratio (Arrivals/ Departures) | 1.0 |
| Runway Rating | 60 |

Refer Table 2-6 (Example) on page C-53; Capacity = 32 operations/hour.

(2) Compute the IFR capacity of

| | |
|---|---|
| Layout | Single Runway |
| Type Naviad | PAR (1) |
| Airspace | Unrestricted |
| Radar | Yes |
| Aircraft Class | II |
| Ratio (Arrivals/ Departures | 1.2 |
| Runway Rating | 90 |

Refer Table 2-6 (Example) on page C-54; Capacity = 29 operations/hour.

(3) Compute the IFR capacity of:

| | |
|---|---|
| Layout | Single Runway |
| Type Navaid | Conventional |
| Airspace | Restricted |
| Radar | No |
| Aircraft Class | III |
| Ratio (Arrivals/ Departures) | 1.0 |
| Runway Rating | 75 |

Refer to Table 2-6 (Example) on page C-55; Capacity = 16 operations/hour.

(4) Compute the IFR capacity of:

| | |
|---|---|
| Layout | Close Parallels - Dependent |
| Type Navaid | PAR (2) |
| Airspace | Unrestricted |
| Radar | Yes |
| Aircraft Class | 50% I 50% III |
| Ratio (Arrivals/ Departures) | 1.0 |
| Runway Rating | 75 |

Refer to Table 2-7 (Example) on page C-56;
Capacity = 46 operations/hour (Class I)
Capacity = 44 operations/hour (Class II)
Average = (0.5 x 46) + (0.5 x 44) = 45

(5) Compute the IFR capacity of:

| | |
|---|---|
| Layout | Parallels - Dependent |
| Type Navaid | PAR (1) |
| Airspace | Restricted |
| Radar | Yes |
| Aircraft Class | I |
| Ratio (Arrivals/ Departures) | 1.5 |
| Runway Rating | 60 |

Refer to Table 2-7 (Example) on page C-57;
Capacity = 25 operations/hour.

(6) Compute the IFR capacity of:

| | |
|---|---|
| Layout | Single Runway |
| Type Navaid | PAR (1) |
| Airspace | Restricted |
| Radar | Yes |
| Aircraft Class | 30% I; 50% II, 20% III |
| Ratio (Arrivals/ Departures) | 1.0 |
| Runway Rating | I @ 60; II @ 90; III @ 30 |

Refer to Table 2-6 (Example) on page C-58;
Capacity: Class I = 22; II = 20; III = 26

Weighted Capacity = Sum of each class capacity times percent class distribution

= (22 x 0.30) + (20 X 0.50) + (26 x 0.20)
= 6.6 + 10 + 5.2
= 21.8 (Use 21)*

* Always drop fractional values.

Table 2-6 (Example 1)

IFR CAPACITY (SINGLE RUNWAY)

| Type Navaid | Radar | | | | | | | | | | | | Non-Radar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PAR (1) | | | | | | PAR (2) & Conventional | | | | | | Conventional |
| Runway Rating | 30 | | 60 | | 90 | | 30 | | 60 | | 90 | | All Rating |
| Aircraft Class | I&II | III | I&II | III | I&II | III | I&II | III | I&II | III | I&II | III | All Classes |
| Ratio | | | | | | | | | | | | | |
| **(UNRESTRICTED AIRSPACE)** | | | | | | | | | | | | | |
| .2 | 46 | 46 | 43 | 43 | 41 | 41 | 46 | 46 | 43 | 43 | 41 | 41 | 28 |
| .4 | 42 | 42 | 36 | 36 | 34 | 34 | 42 | 42 | 36. | 36 | 34 | 34 | 25 |
| .6 | 42 | 42 | 37 | 37 | 32 | 32 | 42 | 42 | 37 | 37 | 32 | 32 | 21 |
| .8 | 40 | 34 | 34 | 34 | 29 | 29 | 40 | 40 | 34 | 34 | 29 | 29 | 18 |
| 1.0 | 38 | 30 | 32 | 30 | 30 | 30 | 38 | 38 | 32 | 32 | 30 | 30 | 16 |
| 1.2 | 37 | 28 | 33 | 28 | 29 | 28 | 39 | 39 | 33 | 33 | 29 | 29 | 15 |
| 1.5 | 33 | 25 | 33 | 25 | 30 | 25 | 40 | 25 | 33 | 25 | 33 | 33 | 13 |
| 2.0 | 30 | 23 | 30 | 23 | 30 | 23 | 40 | 33 | 33 | 33 | 30 | 30 | 12 |
| 3.0 | 27 | 20 | 27 | 20 | 27 | 20 | 40 | 29 | 33 | 29 | 29 | 29 | 11 |
| 4.0 | 27 | 20 | 27 | 20 | 27 | 20 | 37 | 27 | 35 | 27 | 31 | 27 | 10 |
| **(RESTRICTED AIRSPACE)** | | | | | | | | | | | | | |
| .2 | 30 | 30 | 24 | 24 | 24 | 24 | 30 | 30 | 24 | 24 | 24 | 24 | 28 |
| .4 | 28 | 28 | 21 | 21 | 21 | 21 | 28 | 28 | 21 | 21 | 21 | 21 | 25 |
| .6 | 24 | 24 | 21 | 21 | 21 | 21 | 24 | 24 | 21 | 21 | 21 | 21 | 21 |
| .8 | 24 | 24 | 22 | 22 | 22 | 22 | 24 | 24 | 22 | 22 | 22 | 22 | 18 |
| 1.0 | 26 | 26 | 22 | 22 | 20 | 20 | 26 | 26 | 22 | 22 | 20 | 20 | 16 |
| 1.2 | 26 | 26 | 22 | 22 | 20 | 20 | 26 | 26 | 22 | 22 | 20 | 20 | 15 |
| 1.5 | 26 | 25 | 23 | 23 | 21 | 21 | 26 | 26 | 23 | 23 | 21 | 21 | 13 |
| 2.0 | 27 | 23 | 23 | 23 | 21 | 21 | 27 | 27 | 23 | 23 | 21 | 21 | 12 |
| 3.0 | 27 | 20 | 24 | 20 | 20 | 26 | 28 | 28 | 24 | 24 | 21 | 21 | 11 |
| 4.0 | 25 | 19 | 25 | 19 | 22 | 19 | 30 | 27 | 25 | 25 | 23 | 23 | 10 |

PAR (1) - PAR with single approach capability
PAR (2) - PAR with multiple approach capability
Conventional - Conventional navaid (VOR, TACAN, NDE)
I, II, III - Indicates applicable aircraft class
Unrestricted Airspace - More than one departure path capability
Restricted Airspace - Single departure path capability

Ratio = $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

## Table 2-6 (Example 2)

### IFR CAPACITY (SINGLE RUNWAY)

| Type Navaid | Radar | | | | | | | | | | | | Non-Radar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PAR (1) | | | | | | PAR (2) & Conventional | | | | | | Conventional |
| Runway Rating | 30 | | 60 | | 90 | | 30 | | 60 | | 90 | | All Rating |
| Aircraft Class | I&II | III | I&II | III | I&II | III | I&II | III | I&II | III | I&II | III | All Classes |
| Ratio | | | | | | | | | | | | | |
| (UNRESTRICTED AIRSPACE) | | | | | | | | | | | | | |
| .2 | 46 | 46 | 43 | 43 | 41 | 41 | 46 | 46 | 43 | 43 | 41 | 41 | 28 |
| .4 | 42 | 42 | 36 | 36 | 34 | 34 | 42 | 42 | 36 | 36 | 34 | 34 | 25 |
| .6 | 42 | 42 | 37 | 37 | 32 | 32 | 42 | 42 | 37 | 37 | 32 | 32 | 21 |
| .8 | 40 | 34 | 34 | 34 | 29 | 29 | 40 | 40 | 34 | 34 | 29 | 29 | 18 |
| 1.0 | 38 | 30 | 32 | 30 | 30 | 30 | 38 | 38 | 32 | 32 | 30 | 30 | 16 |
| 1.2 | 37 | 28 | 33 | 28 | 29 | 28 | 39 | 39 | 33 | 33 | 29 | 29 | 15 |
| 1.5 | 33 | 25 | 33 | 25 | 30 | 25 | 40 | 25 | 33 | 25 | 33 | 33 | 13 |
| 2.0 | 30 | 23 | 30 | 23 | 30 | 23 | 40 | 33 | 33 | 33 | 30 | 30 | 12 |
| 3.0 | 27 | 20 | 27 | 20 | 27 | 20 | 40 | 29 | 33 | 29 | 29 | 29 | 11 |
| 4.0 | 27 | 20 | 27 | 20 | 27 | 20 | 37 | 27 | 35 | 27 | 31 | 27 | 10 |
| (RESTRICTED AIRSPACE) | | | | | | | | | | | | | |
| .2 | 30 | 30 | 24 | 24 | 24 | 24 | 30 | 30 | 24 | 24 | 24 | 24 | 28 |
| .4 | 28 | 28 | 21 | 21 | 21 | 21 | 28 | 28 | 21 | 21 | 21 | 21 | 25 |
| .6 | 24 | 24 | 21 | 21 | 21 | 21 | 24 | 24 | 21 | 21 | 21 | 21 | 21 |
| .8 | 24 | 24 | 22 | 22 | 22 | 22 | 24 | 24 | 22 | 22 | 22 | 22 | 18 |
| 1.0 | 26 | 26 | 22 | 22 | 20 | 20 | 26 | 26 | 22 | 22 | 20 | 20 | 16 |
| 1.2 | 26 | 26 | 22 | 22 | 20 | 20 | 26 | 26 | 22 | 22 | 20 | 20 | 15 |
| 1.5 | 26 | 25 | 23 | 23 | 21 | 21 | 26 | 26 | 23 | 23 | 21 | 21 | 13 |
| 2.0 | 27 | 23 | 23 | 23 | 21 | 21 | 27 | 27 | 23 | 23 | 21 | 21 | 12 |
| 3.0 | 27 | 20 | 24 | 20 | 20 | 26 | 28 | 28 | 24 | 24 | 21 | 21 | 11 |
| 4.0 | 25 | 19 | 25 | 19 | 22 | 19 | 30 | 27 | 25 | 25 | 23 | 23 | 10 |

PAR (1) - PAR with single approach capability
PAR (2) - PAR with multiple approach capability
Conventional - Conventional navaid (VOR, TACAN, NDE)
I, II, III - Indicates applicable aircraft class
Unrestricted Airspace - More than one departure path capability
Restricted Airspace - Single departure path capability

Ratio = $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

Table 2-6 (Example 3)

IFR CAPACITY (SINGLE RUNWAY)

| Type Navaid | Radar | | | | | | | | | | | | Non-Radar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PAR (1) | | | | | | PAR (2) & Conventional | | | | | | Conventional |
| Runway Rating | 30 | | 60 | | 90 | | 30 | | 60 | | 90 | | All Rating |
| Aircraft Class | I&II | III | I&II | III | I&II | III | I&II | III | I&II | III | I&II | III | All Classes |
| Ratio | | | | | | | | | | | | | |
| | (UNRESTRICTED AIRSPACE) | | | | | | | | | | | | |
| .2 | 46 | 46 | 43 | 43 | 41 | 41 | 46 | 46 | 43 | 43 | 41 | 41 | 28 |
| .4 | 42 | 42 | 36 | 36 | 34 | 34 | 42 | 42 | 36 | 36 | 34 | 34 | 25 |
| .6 | 42 | 42 | 37 | 37 | 32 | 32 | 42 | 42 | 37 | 37 | 32 | 32 | 21 |
| .8 | 40 | 34 | 34 | 34 | 29 | 29 | 40 | 40 | 34 | 34 | 29 | 29 | 18 |
| 1.0 | 38 | 30 | 32 | 30 | 30 | 30 | 38 | 38 | 32 | 32 | 30 | 30 | 16 |
| 1.2 | 37 | 28 | 33 | 28 | 29 | 28 | 39 | 39 | 33 | 33 | 29 | 29 | 15 |
| 1.5 | 33 | 25 | 33 | 25 | 30 | 25 | 40 | 25 | 33 | 25 | 33 | 33 | 13 |
| 2.0 | 30 | 23 | 30 | 23 | 30 | 23 | 40 | 33 | 33 | 33 | 30 | 30 | 12 |
| 3.0 | 27 | 20 | 27 | 20 | 27 | 20 | 40 | 29 | 33 | 29 | 29 | 29 | 11 |
| 4.0 | 27 | 20 | 27 | 20 | 27 | 20 | 37 | 27 | 35 | 27 | 31 | 27 | 10 |
| | (RESTRICTED AIRSPACE) | | | | | | | | | | | | |
| .2 | 30 | 30 | 24 | 24 | 24 | 24 | 30 | 30 | 24 | 24 | 24 | 24 | 28 |
| .4 | 28 | 28 | 21 | 21 | 21 | 21 | 28 | 28 | 21 | 21 | 21 | 21 | 25 |
| .6 | 24 | 24 | 21 | 21 | 21 | 21 | 24 | 24 | 21 | 21 | 21 | 21 | 21 |
| .8 | 24 | 24 | 22 | 22 | 22 | 22 | 24 | 24 | 22 | 22 | 22 | 22 | 18 |
| 1.0 | 26 | 26 | 22 | 22 | 20 | 20 | 26 | 26 | 22 | 22 | 20 | 20 | 16 |
| 1.2 | 26 | 26 | 22 | 22 | 20 | 20 | 26 | 26 | 22 | 22 | 20 | 20 | 15 |
| 1.5 | 26 | 25 | 23 | 23 | 21 | 21 | 26 | 26 | 23 | 23 | 21 | 21 | 13 |
| 2.0 | 27 | 23 | 23 | 23 | 21 | 21 | 27 | 27 | 23 | 23 | 21 | 21 | 12 |
| 3.0 | 27 | 20 | 24 | 20 | 20 | 26 | 28 | 28 | 24 | 24 | 21 | 21 | 11 |
| 4.0 | 25 | 19 | 25 | 19 | 22 | 19 | 30 | 27 | 25 | 25 | 23 | 23 | 10 |

PAR (1) - PAR with single approach capability
PAR (2) - PAR with multiple approach capability
Conventional - Conventional navaid (VOR, TACAN, NDB)
I, II, III - Indicates applicable aircraft class
Unrestricted Airspace - More than one departure path capability
Restricted Airspace - Single departure path capability

Ratio = $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

Table 2-7 (Example 4)

IFR CAPACITIES (PARALLEL RUNWAYS)

| | Radar | | | | | | | | | | | | Non-Radar | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type Navaid | PAR (1) | | | | | | PAR (2) & Conventional | | | | | | Con. | |
| Runway Rating | All Ratings | | | | | | All Ratings | | | | | | All Ratings | |
| Aircraft Class | I | | II | | III | | I | | II | | III | | All Classes | |
| Ratio | (UNRESTRICTED AIRSPACE) | | | | | | | | | | | | | |
| | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. |
| .2 | 54 | 59 | 54 | 72 | 54 | 72 | 54 | 59 | 54 | 72 | 54 | 72 | 28 | 36 |
| .4 | 45 | 69 | 45 | 70 | 45 | 53 | 45 | 69 | 45 | 84 | 45 | 77 | 25 | 28 |
| .6 | 45 | 53 | 45 | 53 | 40 | 40 | 45 | 79 | 45 | 80 | 45 | 59 | 21 | 21 |
| .8 | 45 | 45 | 45 | 45 | 34 | 34 | 45 | 68 | 45 | 67 | 45 | 50 | 18 | 18 |
| 1.0 | 40 | 40 | 40 | 40 | 30 | 30 | 46 | 60 | 46 | 60 | 44 | 44 | 16 | 16 |
| 1.2 | 37 | 37 | 37 | 37 | 27 | 28 | 46 | 55 | 46 | 55 | 40 | 40 | 15 | 15 |
| 1.5 | 33 | 33 | 33 | 33 | 25 | 25 | 45 | 50 | 45 | 50 | 37 | 37 | 13 | 13 |
| 2.0 | 30 | 30 | 30 | 30 | 23 | 23 | 45 | 45 | 45 | 45 | 33 | 33 | 12 | 12 |
| 3.0 | 27 | 27 | 27 | 27 | 20 | 20 | 40 | 40 | 40 | 40 | 29 | 29 | 11 | 11 |
| 4.0 | 25 | 25 | 25 | 25 | 19 | 19 | 38 | 38 | 38 | 38 | 27 | 28 | 10 | 10 |
| | (RESTRICTED AIRSPACE) | | | | | | | | | | | | | |
| | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. |
| .2 | 30 | 36 | 30 | 36 | 30 | 36 | 30 | 36 | 30 | 36 | 30 | 36 | 28 | 36 |
| .4 | 28 | 42 | 28 | 42 | 28 | 42 | 28 | 42 | 28 | 42 | 28 | 42 | 25 | 28 |
| .6 | 27 | 48 | 27 | 48 | 27 | 40 | 27 | 48 | 27 | 48 | 27 | 48 | 21 | 21 |
| .8 | 25 | 45 | 25 | 45 | 25 | 34 | 25 | 54 | 25 | 54 | 25 | 50 | 18 | 18 |
| 1.0 | 26 | 40 | 26 | 40 | 26 | 30 | 26 | 60 | 26 | 60 | 26 | 44 | 16 | 16 |
| 1.2 | 26 | 37 | 26 | 37 | 26 | 28 | 26 | 55 | 26 | 55 | 26 | 40 | 15 | 15 |
| 1.5 | 25 | 33 | 25 | 33 | 25 | 25 | 25 | 50 | 25 | 50 | 25 | 37 | 13 | 13 |
| 2.0 | 25 | 30 | 25 | 30 | 22 | 23 | 25 | 45 | 25 | 45 | 25 | 33 | 12 | 12 |
| 3.0 | 25 | 27 | 25 | 27 | 20 | 20 | 25 | 40 | 25 | 40 | 25 | 29 | 11 | 11 |
| 4.0 | 25 | 25 | 25 | 25 | 19 | 19 | 26 | 38 | 26 | 38 | 26 | 28 | 10 | 10 |

PAR (1) - PAR with single approach capability
PAR (2) - PAR with multiple approach capability
Con. - Conventional navaid (VOR, TACAN, NDE)
I, II, III - Indicates applicable aircraft class
Dep. - Release of departure dependent on assured landing on parallel runway (per ATC criteria)
Ind. - Release of departure not dependent on assured landing on parallel runway (per ATC criteria)

Ratio = $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

## Table 2-7 (Example 5)

IFR CAPACITIES (PARALLEL RUNWAYS)

| Type Navaid | Radar: PAR (1) | | | | | | PAR (2) & Conventional | | | | | | Non-Radar: Con. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Runway Rating | All Ratings | | | | | | All Ratings | | | | | | All Ratings | |
| Aircraft Class | I | | II | | III | | I | | II | | III | | All Classes | |
| Ratio | (UNRESTRICTED AIRSPACE) | | | | | | | | | | | | | |
| | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. |
| .2 | 54 | 59 | 54 | 72 | 54 | 72 | 54 | 59 | 54 | 72 | 54 | 72 | 28 | 36 |
| .4 | 45 | 69 | 45 | 70 | 45 | 53 | 45 | 69 | 45 | 84 | 45 | 77 | 25 | 28 |
| .6 | 45 | 53 | 45 | 53 | 40 | 40 | 45 | 79 | 45 | 80 | 45 | 59 | 21 | 21 |
| .8 | 45 | 45 | 45 | 45 | 34 | 34 | 45 | 68 | 45 | 67 | 45 | 50 | 18 | 18 |
| 1.0 | 40 | 40 | 40 | 40 | 30 | 30 | 46 | 60 | 46 | 60 | 44 | 44 | 16 | 16 |
| 1.2 | 37 | 37 | 37 | 37 | 27 | 28 | 46 | 55 | 46 | 55 | 40 | 40 | 15 | 15 |
| 1.5 | 33 | 33 | 33 | 33 | 25 | 25 | 45 | 50 | 45 | 50 | 37 | 37 | 13 | 13 |
| 2.0 | 30 | 30 | 30 | 30 | 23 | 23 | 45 | 45 | 45 | 45 | 33 | 33 | 12 | 12 |
| 3.0 | 27 | 27 | 27 | 27 | 20 | 20 | 40 | 40 | 40 | 40 | 29 | 29 | 11 | 11 |
| 4.0 | 25 | 25 | 25 | 25 | 19 | 19 | 38 | 38 | 38 | 38 | 27 | 28 | 10 | 10 |
| | (RESTRICTED AIRSPACE) | | | | | | | | | | | | | |
| | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. | Dep. | Ind. |
| .2 | 30 | 36 | 30 | 36 | 30 | 36 | 30 | 36 | 30 | 36 | 30 | 36 | 28 | 36 |
| .4 | 28 | 42 | 28 | 42 | 28 | 42 | 28 | 42 | 28 | 42 | 28 | 42 | 25 | 28 |
| .6 | 27 | 48 | 27 | 48 | 27 | 40 | 27 | 48 | 27 | 48 | 27 | 48 | 21 | 21 |
| .8 | 25 | 45 | 25 | 45 | 25 | 34 | 25 | 54 | 25 | 54 | 25 | 50 | 18 | 18 |
| 1.0 | 26 | 40 | 26 | 40 | 26 | 30 | 26 | 60 | 26 | 60 | 26 | 44 | 16 | 16 |
| 1.2 | 26 | 37 | 26 | 37 | 26 | 28 | 26 | 55 | 26 | 55 | 26 | 40 | 15 | 15 |
| 1.5 | 25 | 33 | 25 | 33 | 25 | 25 | 25 | 50 | 25 | 50 | 25 | 37 | 13 | 13 |
| 2.0 | 25 | 30 | 25 | 30 | 22 | 23 | 25 | 45 | 25 | 45 | 25 | 33 | 12 | 12 |
| 3.0 | 25 | 27 | 25 | 27 | 20 | 20 | 25 | 40 | 25 | 40 | 25 | 29 | 11 | 11 |
| 4.0 | 25 | 25 | 25 | 25 | 19 | 19 | 26 | 38 | 26 | 38 | 26 | 28 | 10 | 10 |

PAR (1) - PAR with single approach capability
PAR (2) - PAR with multiple approach capability
Con. - Conventional navaid (VOR, TACAN, NDB)
I, II, III - Indicates applicable aircraft class
Dep. - Release of departure dependent on assured landing on parallel runway (per ATC criteria)
Ind. - Release of departure not dependent on assured landing on parallel runway (per ATC criteria)
Ratio = $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

## Table 2-6 (Example 6)

**IFR CAPACITY (SINGLE RUNWAY)**

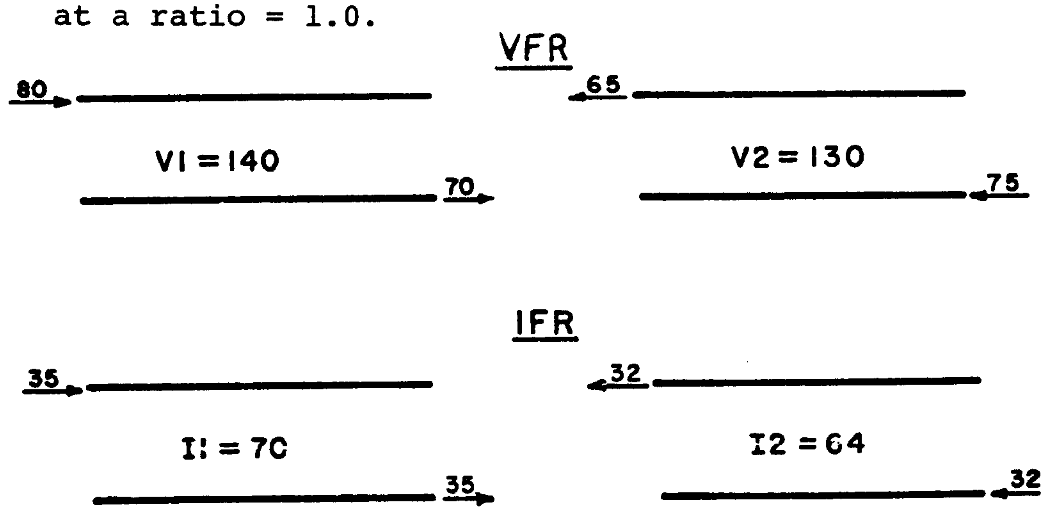
| Type Navaid | Radar PAR (1) | | | | | | Radar PAR (2) & Conventional | | | | | | Non-Radar Conventional |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Runway Rating | 30 | | 60 | | 90 | | ~~90~~ | | 60 | | 90 | | All Rating |
| Aircraft Class | I&II | III | I&II | III | I&II | III | I&II | III | I&II | III | I&II | III | All Classes |
| Ratio | | | | | | | | | | | | | |
| **(UNRESTRICTED AIRSPACE)** | | | | | | | | | | | | | |
| .2 | 46 | 46 | 43 | 43 | 41 | 41 | 46 | 46 | 43 | 43 | 41 | 41 | 28 |
| .4 | 42 | 42 | 36 | 36 | 34 | 34 | 42 | 42 | 36 | 36 | 34 | 34 | 25 |
| .6 | 42 | 42 | 37 | 37 | 32 | 32 | 42 | 42 | 37 | 37 | 32 | 32 | 21 |
| .8 | 40 | 34 | 34 | 34 | 29 | 29 | 40 | 40 | 34 | 34 | 29 | 29 | 18 |
| 1.0 | 38 | 30 | 32 | 30 | 30 | 30 | 38 | 38 | 32 | 32 | 30 | 30 | 16 |
| 1.2 | 37 | 28 | 33 | 28 | 29 | 28 | 39 | 39 | 33 | 33 | 29 | 29 | 15 |
| 1.5 | 33 | 25 | 33 | 25 | 30 | 25 | 40 | 25 | 33 | 25 | 33 | 33 | 13 |
| 2.0 | 30 | 23 | 30 | 23 | 30 | 23 | 40 | 33 | 33 | 33 | 30 | 30 | 12 |
| 3.0 | 27 | 20 | 27 | 20 | 27 | 20 | 40 | 29 | 33 | 29 | 29 | 29 | 11 |
| 4.0 | 27 | 20 | 27 | 20 | 27 | 20 | 37 | 27 | 35 | 27 | 31 | 27 | 10 |
| **(RESTRICTED AIRSPACE)** | | | | | | | | | | | | | |
| .2 | 30 | 30 | 24 | 24 | 24 | 24 | 30 | 30 | 24 | 24 | 24 | 24 | 28 |
| .4 | 28 | 28 | 21 | 21 | 21 | 21 | 28 | 28 | 21 | 21 | 21 | 21 | 25 |
| .6 | 24 | 24 | 21 | 21 | 21 | 21 | 24 | 24 | 21 | 21 | 21 | 21 | 21 |
| .8 | 24 | 24 | 22 | 22 | 22 | 22 | 24 | 24 | 22 | 22 | 22 | 22 | 18 |
| 1.0 | 26 | 26 | 22 | 22 | 20 | 20 | 26 | 26 | 22 | 22 | 20 | 20 | 16 |
| 1.2 | 26 | 26 | 22 | 22 | 20 | 20 | 26 | 26 | 22 | 22 | 20 | 20 | 15 |
| 1.5 | 26 | 25 | 23 | 23 | 21 | 21 | 26 | 26 | 23 | 23 | 21 | 21 | 13 |
| 2.0 | 27 | 23 | 23 | 23 | 21 | 21 | 27 | 27 | 23 | 23 | 21 | 21 | 12 |
| 3.0 | 27 | 20 | 24 | 20 | 20 | 26 | 28 | 28 | 24 | 24 | 21 | 21 | 11 |
| 4.0 | 25 | 19 | 25 | 19 | 22 | 19 | 30 | 27 | 25 | 25 | 23 | 23 | 10 |

**PAR (1)** - PAR with single approach capability
**PAR (2)** - PAR with multiple approach capability
**Conventional** - Conventional navaid (VOR, TACAN, NDE)
**I, II, III** - Indicates applicable aircraft class
**Unrestricted Airspace** - More than one departure path capability
**Restricted Airspace** - Single departure path capability

**Ratio** = $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

d. <u>Daily Capacity</u>. Daily capacity is computed by applying the following steps:

(1) List all possible operating configurations; for this example assume touch and go traffic is negligible. In other words, the air station is assumed to operate at a ratio = 1.0.




(2) Estimate the % VFR and IFR weather during the average day. It may also be desirable to calculate the daily capacity on a basis of 100% VFR weather or 100% IFR weather. This example assumes the following:

85% VFR 15% IFR

(3) Estimate the % use of each operating priority; assumed as follows:

| | |
|---|---|
| V 1 | 60% |
| V 2 | 25% |
| I 1 | 10% |
| I 2 | 5% |

(4) Calculate a "weighted" average hourly capacity

| | | |
|---|---|---|
| 140 x .6 | = | 84.0 |
| 130 x .25 | = | 32.5 |
| 70 x .10 | = | 7.0 |
| 64 x .05 | = | 3.2 |
| | | 126.7 (127) |

(5) It is unrealistic to assume that all available hours would be subject to peak hour demand. It can be assumed that the hours of peak demand and hours of slack demand could be identified (or stipulated) for any particular air station. This can be accomplished as follows:

- For each operating hour determine the expected demand level as a decimal percentage of 1.
- Sum these percentages to obtain the hours of utilization.

Assuming the following hourly utilization, the hourly utilization sum = 8.8.

| Hour | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % of Peak Demand | .3 | .8 | 1 | 1 | .8 | .6 | .9 | 1 | 1 | .7 | .4 | .3 |

Note: Facility assumed open only 12 hours per day in this example.

.. Subjectively reduce "hours utilization" to account for periods of time that the runway facilities are not available for aircraft operations; as for example, emergencies, missed approaches, runway maintenance, other non-pilot utilization, etc.

.. Consider reduction of up to 15% for conventional operation and up to 50% for Carrier Practice Landing Operations - suggested per recommendation of NATRACOM as contained in Technical Report 583, Volume II of IV, prepared by Operations Research, Inc., under contract for the Department of Navy.

In the example, 8.8 hours would reduce to approximately 7.5 hours.

(6) Multiply the weighted hourly capacity times the total hours of utilization.

$$127 \times 7.5 = 952.5$$

Daily capacity = (953) operations/day

e. <u>Application of Figure 2-2</u>. The following additional examples demonstrate the particular use of Figure 2-2:

(1) Given: Runway Rating = 65
Percent Operations by Class: 100% I
Operating Mix Percent Landings: 30%

Determine $(HMC)_E$

Answer: 42 (Refer Figure 2-2/EXAMPLE on page C-63)

(2) Given: Runway Rating = 60
Percent Operations by Class: 100% II
Operating Mix Percent Landings: 30%

Determine $(HMC)_E$

Answer: 51 (Refer Figure 2-2/EXAMPLE on page C-64)

(3) Given: Runway Rating = 45
Percent Operations by Class: 100% III
Operating Mix Percent Landings: 45%

Determine $(HMC)_E$

Answer: 65 (Refer Figure 2-2/EXAMPLE on page C-65)

(4) Given: Runway Rating = 60
Percent Operations by Class: 50% I
50% III
Operating Mix Percent Landings: 15%

Determine $(HMC)_E$

Answer: 55 (Refer Figure 2-2/EXAMPLE on page C-66) ven: Runway Rating = 65

Percent Operations:
Class I = 100%

Percent Landings = 30%

swer: $(HMC)_E$ = 42

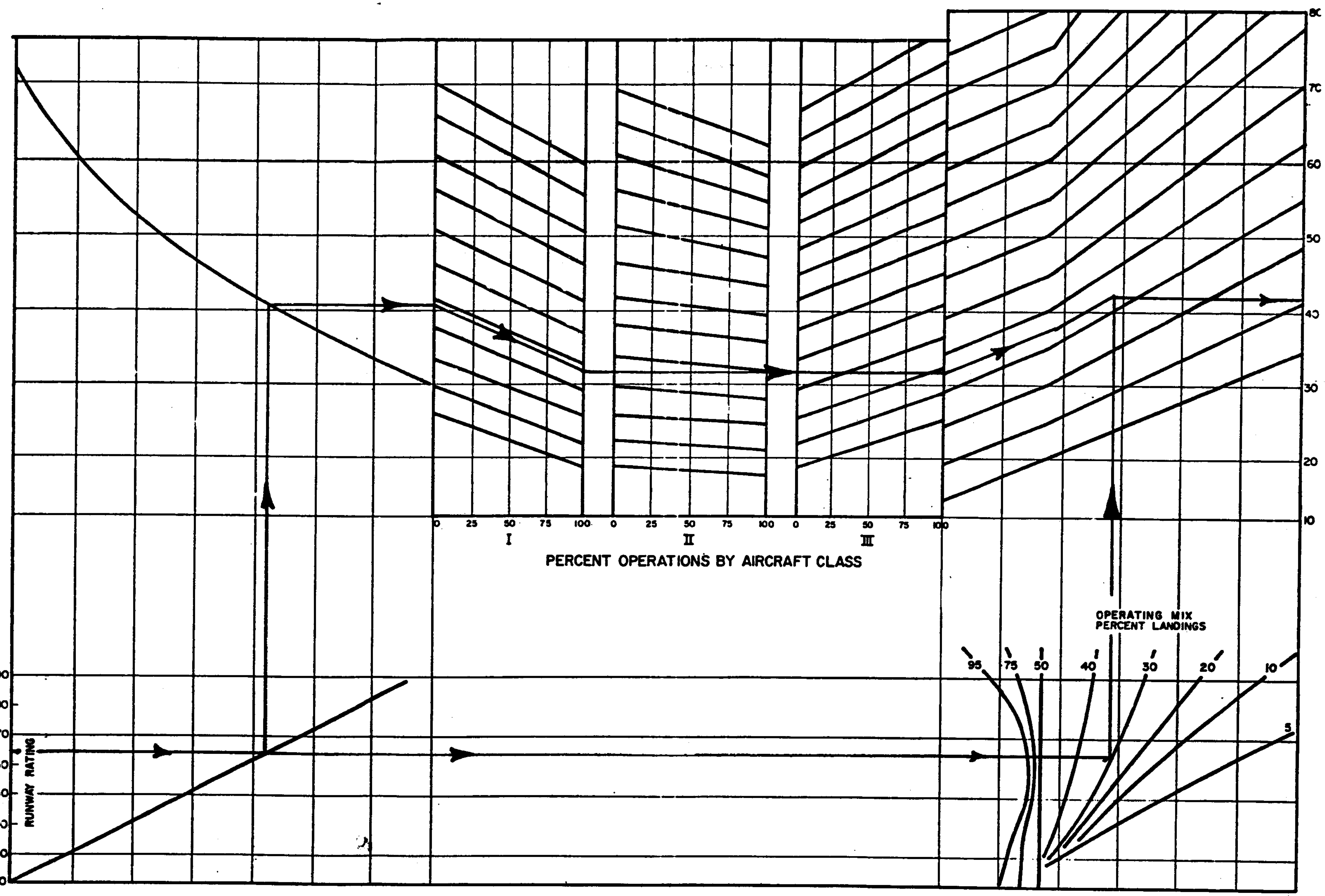



Figure 2-2/EXAMPLE
VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

Given: Runway Rating = 60

Percent Operations:
Class II = 100%

Percent Landings = 30%

Answer: $(HMC)_E$ = 51

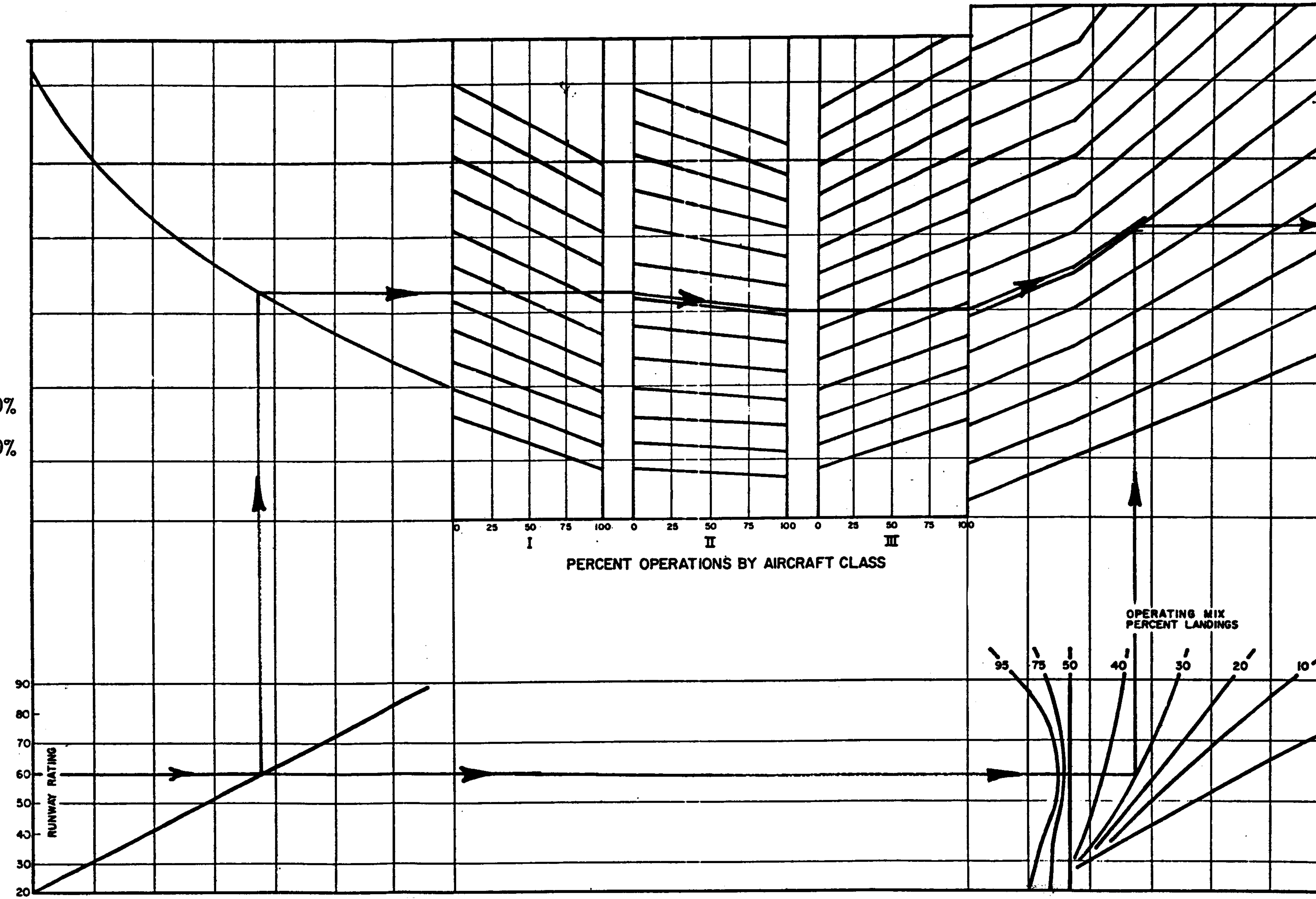



Figure 2-2/EXAMPLE
VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

iven: Runway Rating = 45

Percent Operations:
Class III = 100%

Percent Landings = 45%

nswer: $(HMC)_E$ = 65

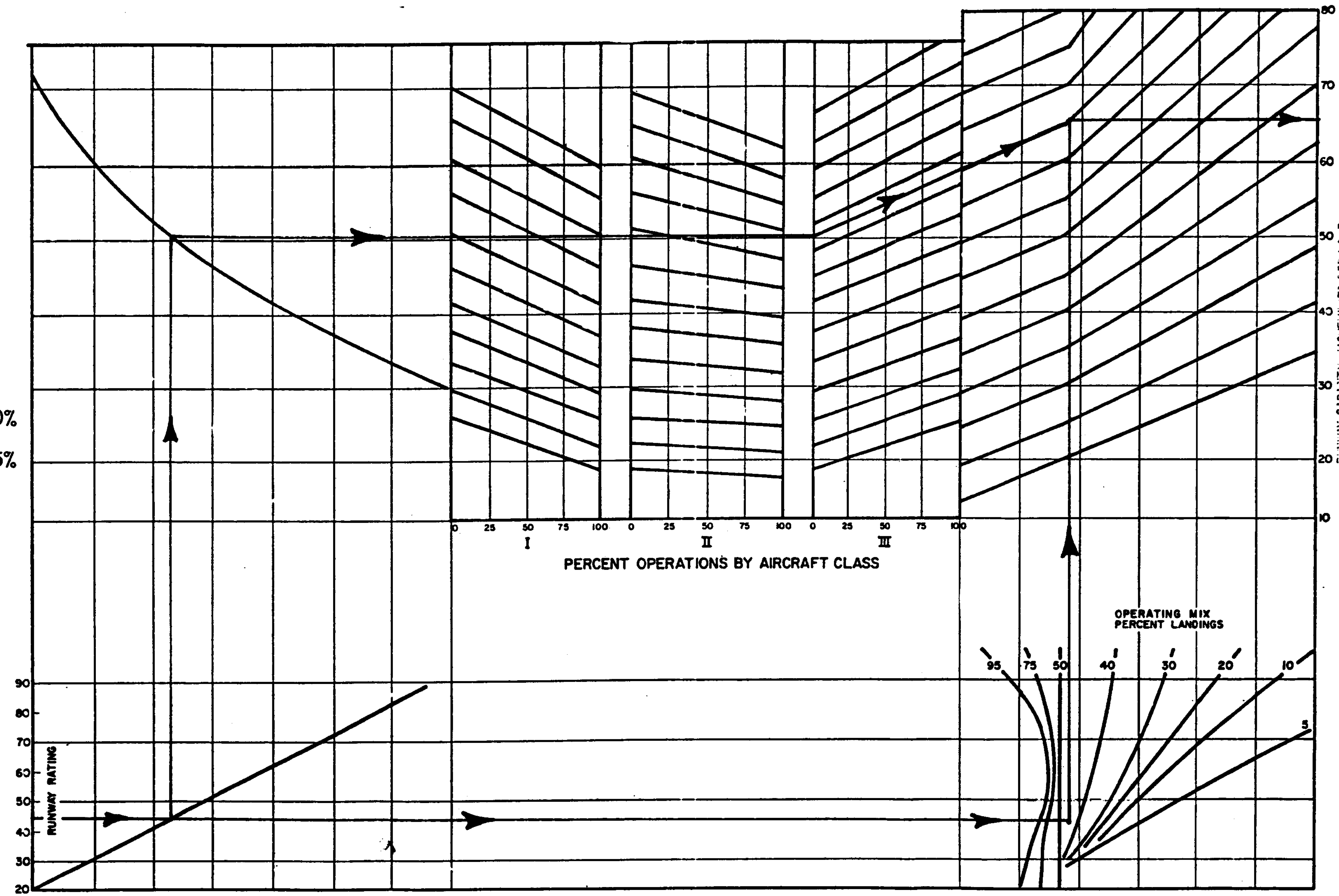



Figure 2-2/EXAMPLE
VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

ven: Runway Rating = 60

Percent Operations:
Class I = 50%
Class III = 50%

Percent Landings = 15%

swer: $(HMC)_E$ = 55

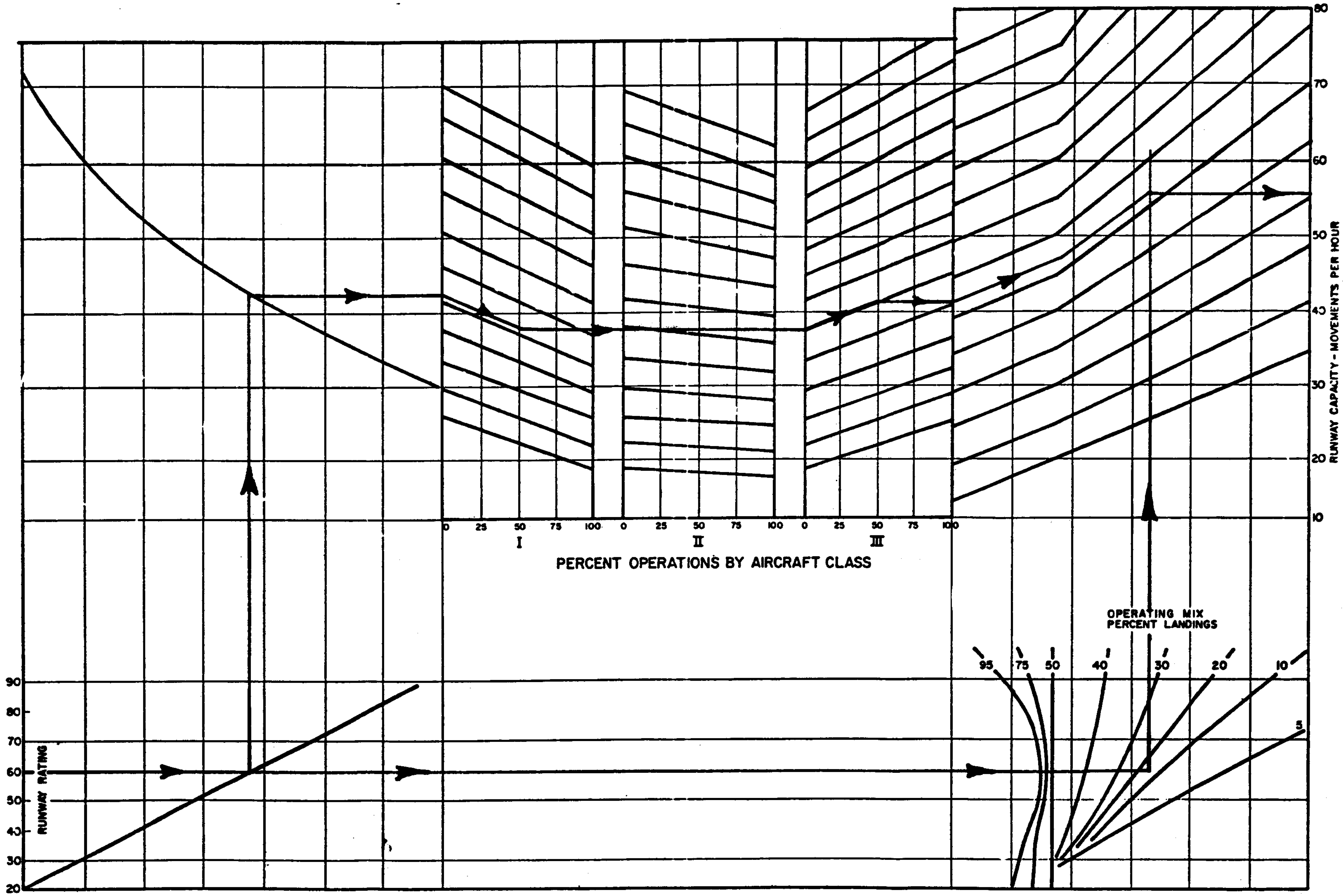



Figure 2-2/EXAMPLE
VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

## Section IV. WORK SHEETS

For use in the calculation of runway capacities, extra copies of the following figures and tables are provided:

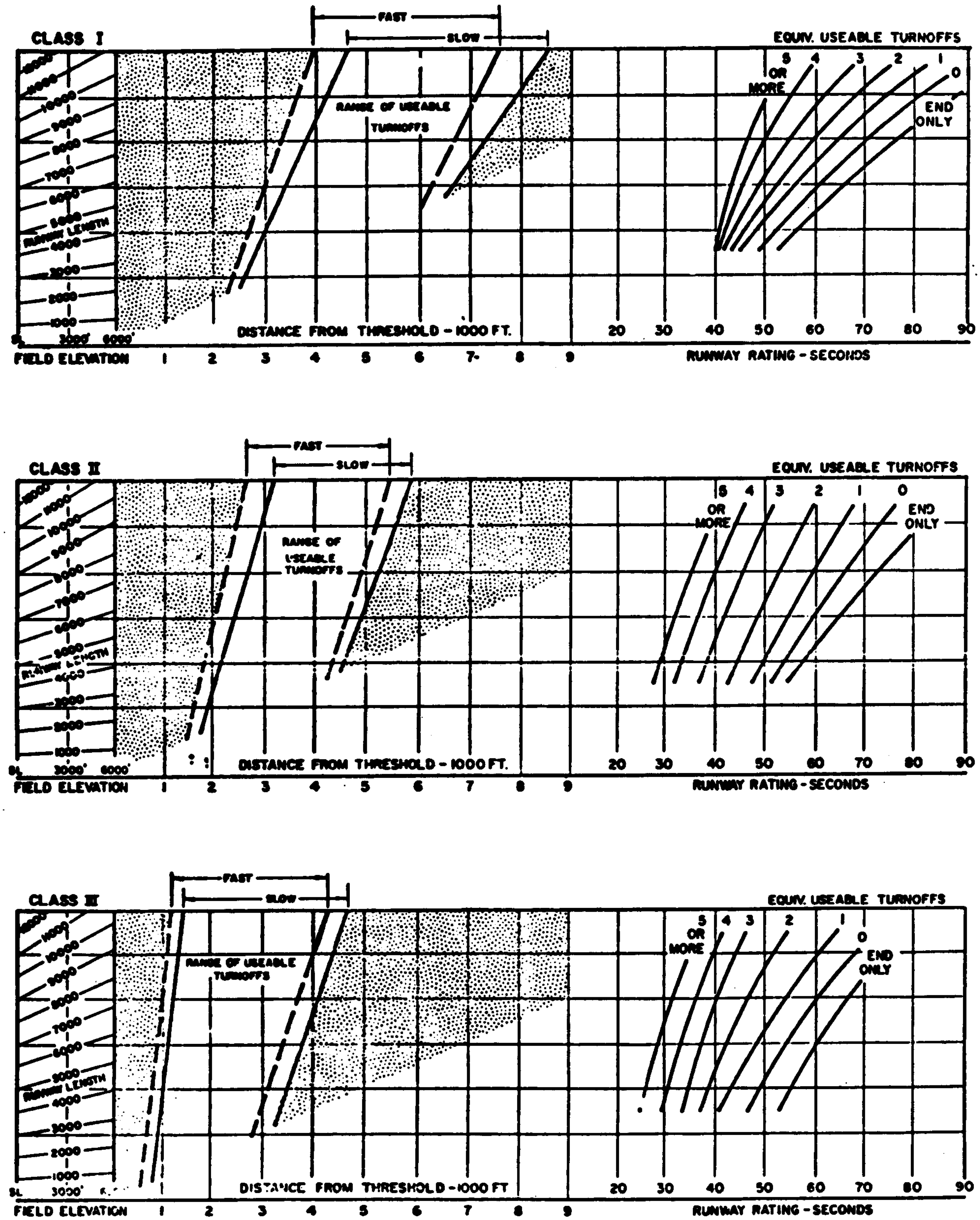



FIGURE 2-1

**RUNWAY RATING**

AVERAGE LANDING OCCUPANCY TIME-SECONDS

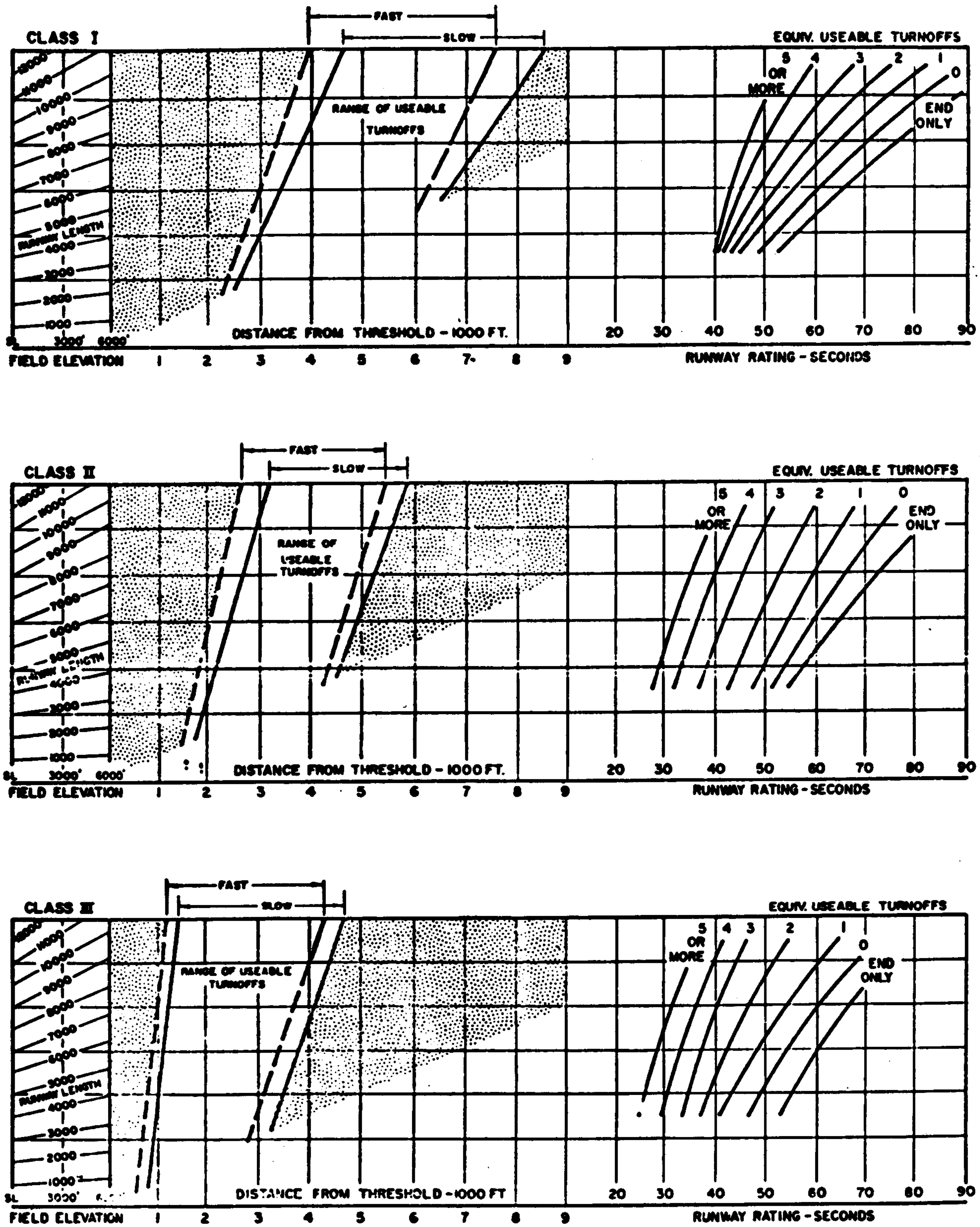



FIGURE 2-1

RUNWAY RATING

AVERAGE LANDING OCCUPANCY TIME-SECONDS

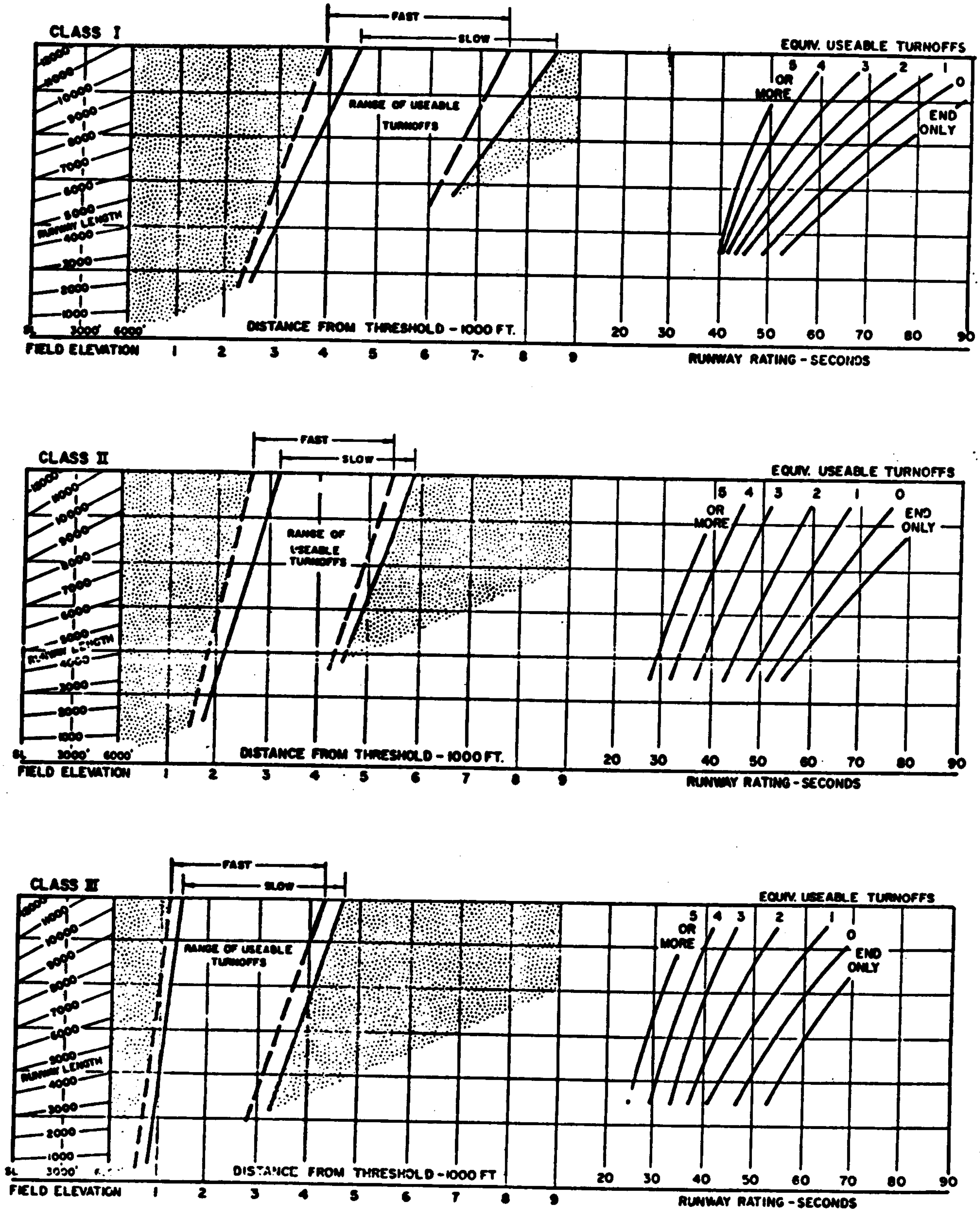



FIGURE 2-1

# RUNWAY RATING

AVERAGE LANDING OCCUPANCY TIME-SECONDS

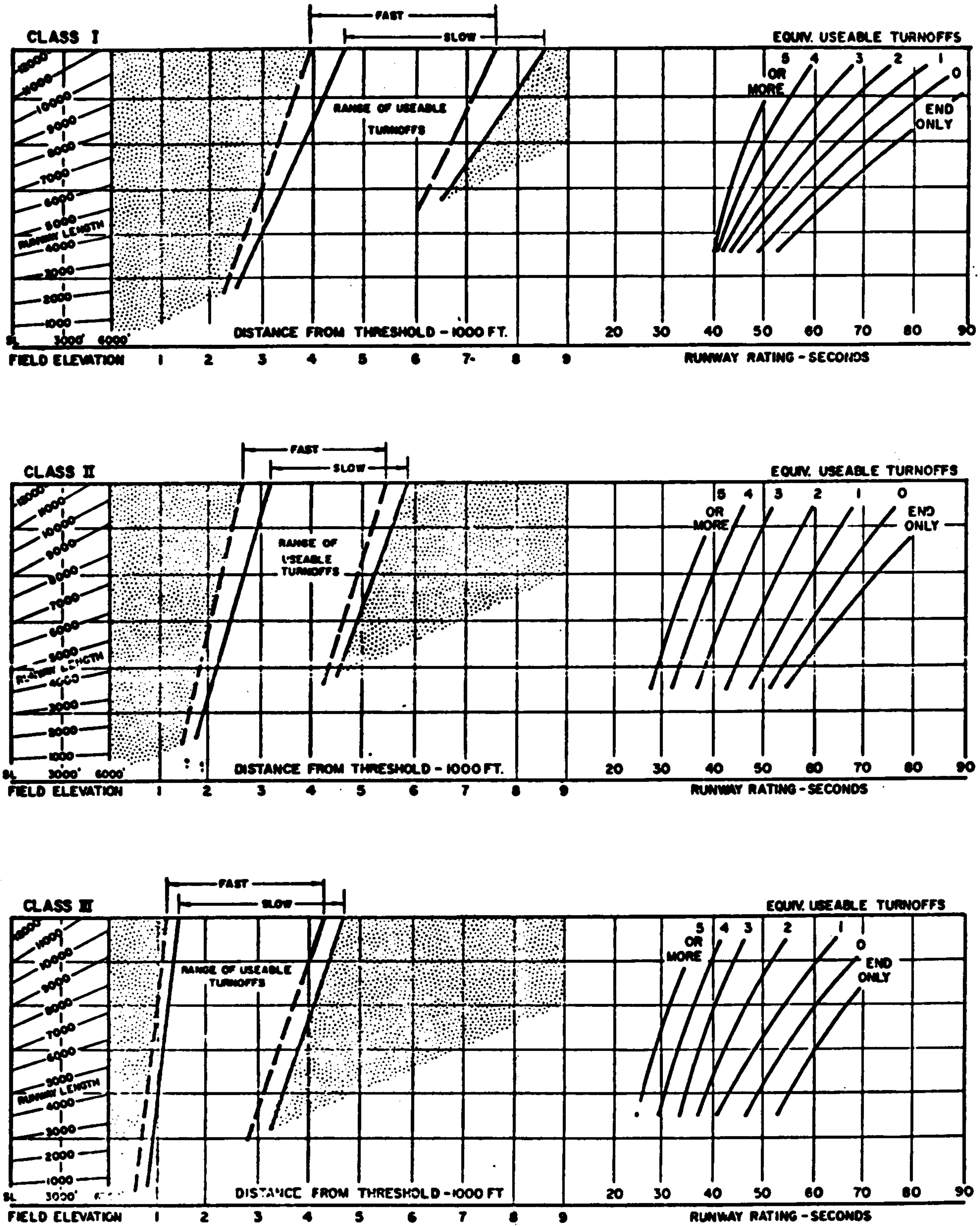



FIGURE 2-1

# RUNWAY RATING

AVERAGE LANDING OCCUPANCY TIME-SECONDS

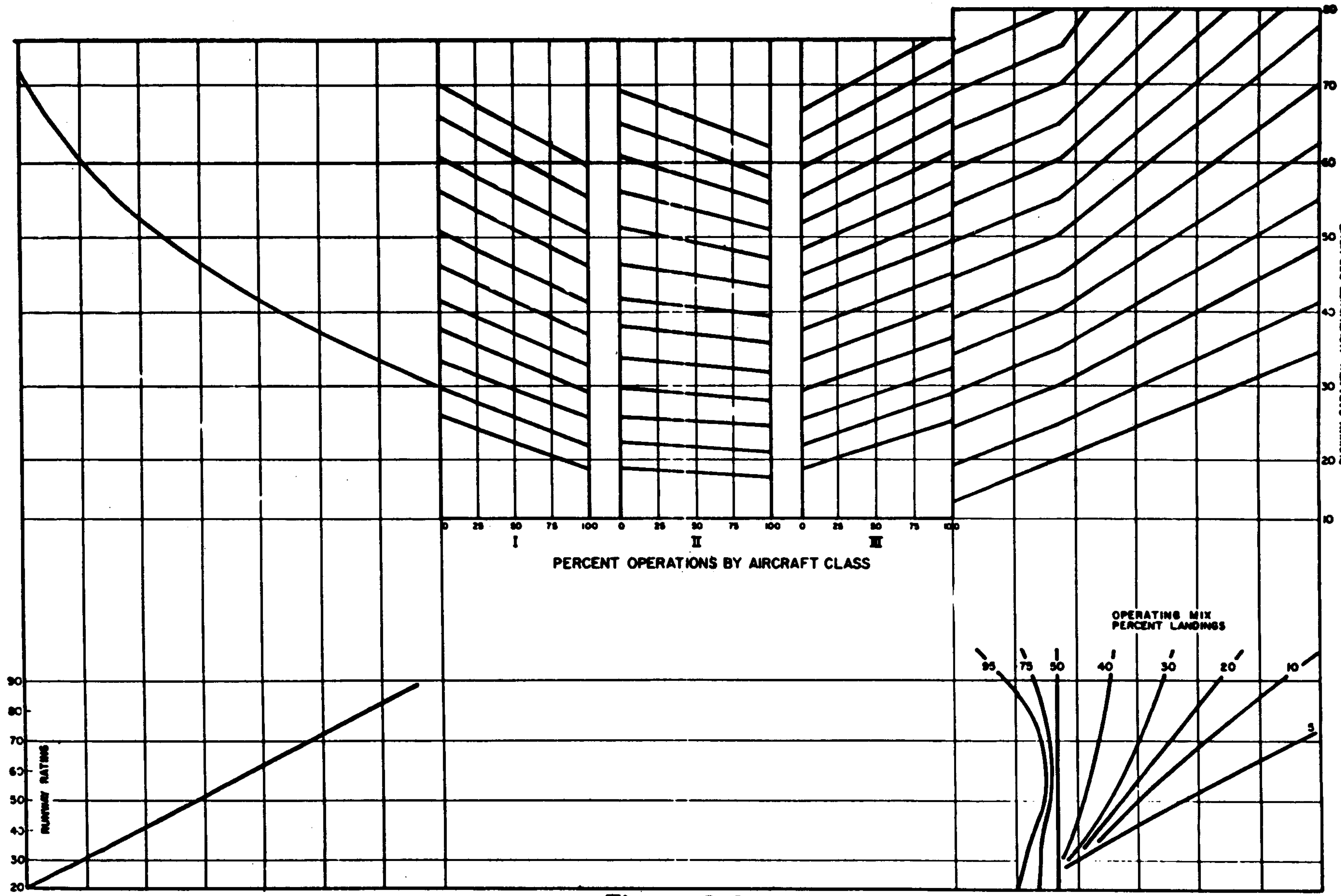



Figure 2-2
VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

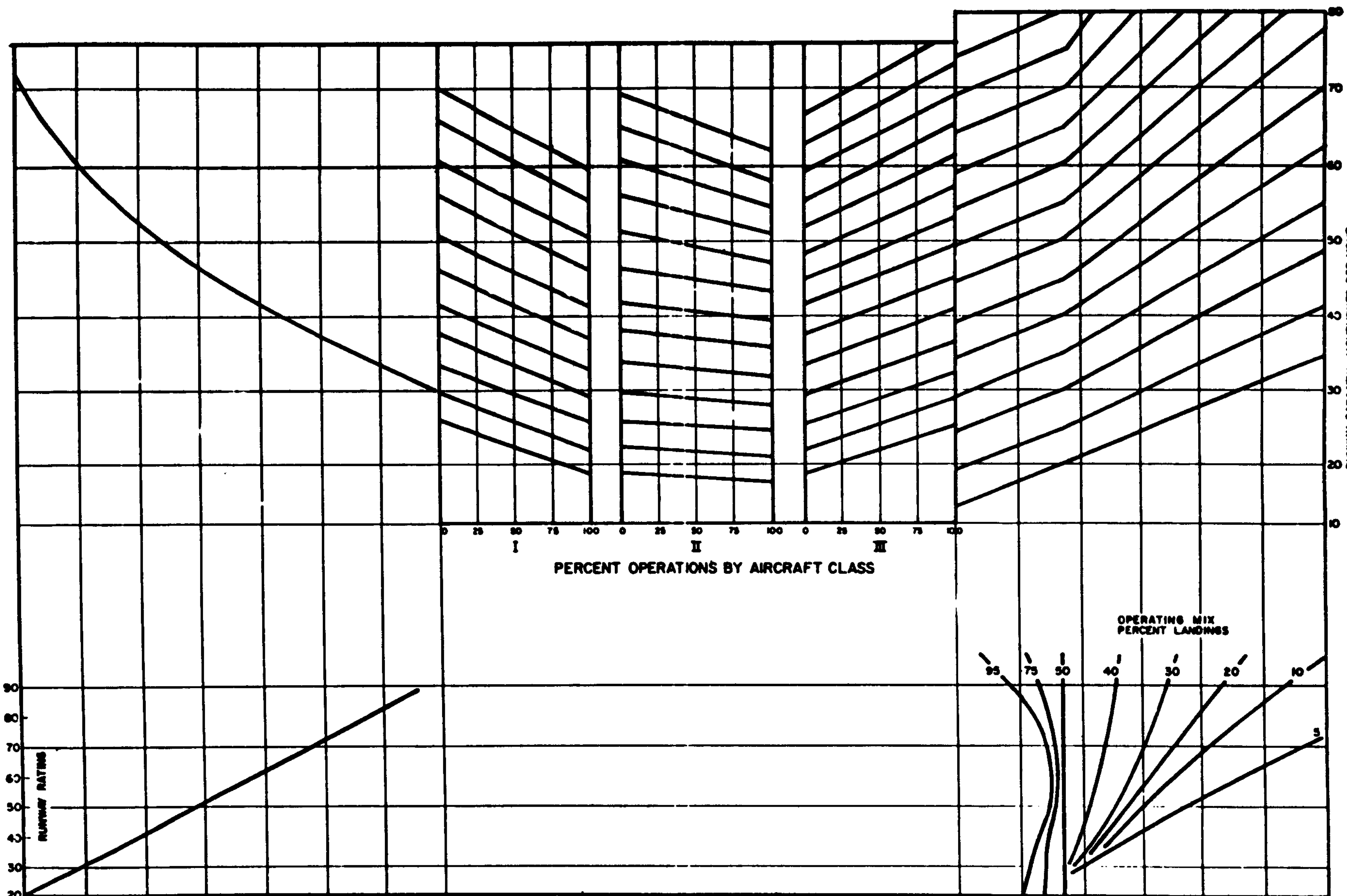



Figure 2-2

VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

Table 2-1

HAC - HOURLY ARRIVAL CAPACITY - Movements Per Hour

| Aircraft Class | Runway Rating | | | | | |
|---|---|---|---|---|---|---|
| | 30 | 40 | 50 | 60 | 70 | 80 |
| I | 50 | 47 | 44 | 40 | 35 | 30 |
| II | 57 | 52 | 47 | 42 | 38 | 33 |
| III | 63 | 62 | 58 | 53 | 47 | 41 |

Use of Table: Enter with Runway Rating for each aircraft class as obtained in Step 2 on Tables 2-4 or 2-5 and read HAC below. Interpolate as required.

---

Table 2-2

EQUIVALENT MOVEMENT FACTORS
For Touch & Go or Landings in Formation

| Landing Procedure | HAC - Movements per Hour | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 |
| Formation of 2 | .58 | .59 | .61 | .62 | .64 | .65 | .67 | .68 |
| Formation of 3 | .45 | .47 | .49 | .50 | .52 | .55 | .56 | .57 |
| Formation of 4 | .37 | .40 | .42 | .44 | .46 | .48 | .50 | .52 |
| Touch and Go | .17 | .20 | .23 | .25 | .27 | .30 | .33 | .37 |

Use of Table: Enter HAC obtained above (Table 2-1) for each aircraft class and read Equivalent Movement Factors below. Interpolate as required.

Table 2-1

HAC - HOURLY ARRIVAL CAPACITY - Movements Per Hour

| Aircraft Class | Runway Rating | | | | | |
|---|---|---|---|---|---|---|
| | 30 | 40 | 50 | 60 | 70 | 80 |
| I | 50 | 47 | 44 | 40 | 35 | 30 |
| II | 57 | 52 | 47 | 42 | 38 | 33 |
| III | 63 | 62 | 58 | 53 | 47 | 41 |

Use of Table: Enter with Runway Rating for each aircraft class as obtained in Step 2 on Tables 2-4 or 2-5 and read HAC below. Interpolate as required.

---

Table 2-2

EQUIVALENT MOVEMENT FACTORS
For Touch & Go or Landings in Formation

| Landing Procedure | HAC - Movements per Hour | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 |
| Formation of 2 | .58 | .59 | .61 | .62 | .64 | .65 | .67 | .68 |
| Formation of 3 | .45 | .47 | .49 | .50 | .52 | .55 | .56 | .57 |
| Formation of 4 | .37 | .40 | .42 | .44 | .46 | .48 | .50 | .52 |
| Touch and Go | .17 | .20 | .23 | .25 | .27 | .30 | .33 | .37 |

Use of Table: Enter HAC obtained above (Table 2-1) for each aircraft class and read Equivalent Movement Factors below. Interpolate as required.

Table 2–3

VFR HOURLY DEPARTURE CAPACITY (HDC) ANALYSIS WORK SHEET

| Step No. | ① | | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|---|---|
| Procedure | From Field Survey or Forecast | | Constants | ①×② | $③_S \div ③_G$ | Constants | $④_S \times ⑤$ | $⑥_G \times \frac{①_G}{③_G}$ |
| Step Definition | Takeoff Demand: Type Operation | Takeoff Demand: No. of Aircraft | Equivalent Movement Factors | Takeoff Equivalent Movements | Class Distri- bution | Class HDC's | Weighted $(HDC)_E$ | Weighted $(HDC)_A$ |
| Aircraft Class I | Single | | 1.00 | | | | | |
| | FORMATION of 2 | | .60 | | | | | |
| | FORMATION of 3 | | .47 | | | | | |
| | FORMATION of 4 | | .40 | | | | | |
| | Pairs | | .50 | | | | | |
| Sub-Totals I | | S | | S | S | 49 | S | |
| Aircraft Class II | Single | | 1.00 | | | | | |
| | FORMATION of 2 | | .63 | | | | | |
| | FORMATION of 3 | | .51 | | | | | |
| | FORMATION of 4 | | .45 | | | | | |
| | Pairs | | .60 | | | | | |
| Sub-Totals II | | S | | S | S | 63 | S | |
| Aircraft Class III | Single | | 1.00 | | | | | |
| | FORMATION of 2 | | .69 | | | | | |
| | FORMATION of 3 | | .59 | | | | | |
| | FORMATION of 4 | | .54 | | | | | |
| | Pairs | | .50 | | | | | |
| Sub-Totals III | | S | | S | S | 90 | S | |
| ALL CLASSES Grand-Totals | | $①_G$ | | $③_G$ | $④_G$ | | $⑥_G$ | |

**Table 2–3**

**VFR HOURLY DEPARTURE CAPACITY (HDC) ANALYSIS WORK SHEET**

| | Step No. | ① | | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|---|---|---|
| | Procedure | From Field Survey or Forecast | | Constants | ①×② | $③_S \div ③_G$ | Constants | $④_S \times ⑤$ | $⑥_G \times \frac{①_G}{③_G}$ |
| | Step Definition | Takeoff Demand: Type Operation | Takeoff Demand: No. of Aircraft | Equivalent Movement Factors | Takeoff Equivalent Movements | Class Distribution | Class HDC's | Weighted $(HDC)_E$ | Weighted $(HDC)_A$ |
| Aircraft Class I | | Single | | 1.00 | | | | | |
| | | FORMATION of 2 | | .60 | | | | | |
| | | FORMATION of 3 | | .47 | | | | | |
| | | FORMATION of 4 | | .40 | | | | | |
| | | Pairs | | .50 | | | | | |
| | Sub-Totals $_I$ | | S | | S | S | 49 | S | |
| Aircraft Class II | | Single | | 1.00 | | | | | |
| | | FORMATION of 2 | | .63 | | | | | |
| | | FORMATION of 3 | | .51 | | | | | |
| | | FORMATION of 4 | | .45 | | | | | |
| | | Pairs | | .50 | | | | | |
| | Sub-Totals $_{II}$ | | S | | S | S | 63 | S | |
| Aircraft Class III | | Single | | 1.00 | | | | | |
| | | FORMATION of 2 | | .69 | | | | | |
| | | FORMATION of 3 | | .59 | | | | | |
| | | FORMATION of 4 | | .54 | | | | | |
| | | Pairs | | .50 | | | | | |
| | Sub-Totals $_{III}$ | | S | | S | S | 90 | S | |
| ALL CLASSES | Grand-Totals | | $①_G$ | | $③_G$ | $④_G$ | | $⑥_G$ | |

**Table 2–4**

**VFR HOURLY ARRIVAL CAPACITY (HAC) ANALYSIS WORK SHEET**

| Step No. | | 1 | 1A | 1B | 1C | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Procedure | | FROM FIELD SURVEY OR FORECAST | | | | USE Fig. No. 2-1 | USE TABLE No. 2-1 | USE TABLE No. 2-2 | 1A × 4 | 1B × 4 | $5_G + 6_G$ | $5_S \div 7_G$ | $6_S \div 7_G$ | $8_S \times 3$ | Constants | $9_S \times 11$ | $10_G + 12_G$ | $13_G \times \frac{5_G}{7_G}$ |
| Step Definition | | LANDING DEMAND | | | | Runway Rating | Cla[illegible] H[illegible] | Equivalent Movement Factors | Non Touch & Go Equivalent Movements | Touch & Go Equivalent Movements | Total Equivalent Movement | Non Touch & Go Class Distribution | Touch & Go Class Distribution | Non Touch & Go Weighted HAC | Touch & Go HAC's | Touch & Go Weighted HAC | Weighted $(HAC)_E$ | Weighted $(HAC)_A$ |
| | | Type Operation | No. of Aircraft: Non Tch & Go | Touch & Go | Total | | | | | | | | | | | | | |
| Aircraft Class I | Single | | | | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | | | | | | | |
| | Touch & Go | | | | (Repeat Value) | | | | | | (Repeat Value) | | | | | | | |
| | Sub-Total I | | S | S | | | | | S | S | | S | S | S | 53 | S | | |
| Aircraft Class II | Single | | | | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | | | | | | | |
| | Touch & Go | | | | (Repeat Value) | | | | | | (Repeat Value) | | | | | | | |
| | Sub-Total II | | S | S | | | | | S | S | | S | S | S | 60 | S | | |
| Aircraft Class III | Single | | | | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | | | | | | | |
| | Touch & Go | | | | (Repeat Value) | | | | | | (Repeat Value) | | | | | | | |
| | Sub-Total III | | S | S | | | | | S | S | | S | S | S | 66 | S | | |
| ALL CLASSES | Grand Total | | G | G | G | | | | $5_G$ | $6_G$ | $7_G$ | G | G | $10_G$ | | $12_G$ | $13_G$ | |

# Table 2–4

## VFR HOURLY ARRIVAL CAPACITY (HAC) ANALYSIS WORK SHEET

| | Step No. | 1 | 1A | 1B | 1C | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Procedure | FROM FIELD SURVEY OR FORECAST | | | | USE Fig. No. 2-1 | USE TABLE No. 2-1 | USE TABLE No. 2-2 | 1A × 4 | 1B × 4 | $5_G + 6_G$ | $5_S \div 7_G$ | $6_S \div 7_G$ | $8_S \times 3$ | Constants | $9_S \times 11$ | $10_G + 12_G$ | $13_G \times \frac{1C_G}{7_G}$ |
| | Step Definition | LANDING DEMAND | | | | Runway Rating | Class HAC | Equivalent Movement Factors | Non Touch & Go Equivalent Movements | Touch & Go Equivalent Movements | Total Equivalent Movement | Non Touch & Go Class Distribution | Touch & Go Class Distri-bution | Non Touch & Go Weighted HAC | Touch & Go HAC's | Touch & Go Weighted HAC | Weighted $(HAC)_E$ | Weighted $(HAC)_A$ |
| | | Type Operation | No. of Aircraft | | | | | | | | | | | | | | | |
| | | | Non Tch & Go | Touch & Go | Total | | | | | | | | | | | | | |
| Aircraft Class I | | Single | | | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF | 2 | | | | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | | | | |
| | | Touch & Go | | | (Repeat Value) | | | | | | (Repeat Value) | | | | | | | |
| | Sub-Total $_I$ | | S | S | | | | | S | S | | S | S | S | 53 | S | | |
| Aircraft Class II | | Single | | | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF | 2 | | | | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | | | | |
| | | Touch & Go | | | (Repeat Value) | | | | | | (Repeat Value) | | | | | | | |
| | Sub-Total $_{II}$ | | S | S | | | | | S | S | | S | S | S | 60 | S | | |
| Aircraft Class III | | Single | | | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF | 2 | | | | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | | | | |
| | | Touch & Go | | | (Repeat Value) | | | | | | (Repeat Value) | | | | | | | |
| | Sub-Total $_{III}$ | | S | S | | | | | S | S | | S | S | S | 66 | S | | |
| ALL CLASSES | Grand Total | | G | G | G | | | | $5_G$ | $6_G$ | $7_G$ | G | G | $10_G$ | | $12_G$ | $13_G$ | |

| Step No. | ① | 1A | 1B | 1C | 1D | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | 14A | 14B | 14C | ⑮ | ⑯ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Procedure | FROM FIELD SURVEY OR FORECAST | | | | | USE Fig. No. 2-1 | USE TABLE No. 2-1 | USE TABLE No. 2-2 | 1A × 4 | 1B × 4 | $5_S + 6_S$ | CONSTANTS | 1D × 8 | $1C_G + 1D_G$ | $7_S + 9_S$ | $7_G \div 11_G$ | $11_S \div 11_G$ | $2 \times \frac{5_S}{7_G}$ | $"20" \times \frac{6_G}{7_G}$ | $14A_G + 14B_G$ | USE Fig. No. 2-2 | $15_G \times \frac{10_G}{11_G}$ |
| Step Definition | TYPE OPERATION | No. of LANDING AIRCRAFT | | | No. of Takeoff Aircraft | Class Runway Rating | Class HAC's | Landing Equivalent Movement Factors | Non Touch & Go Equivalent Movements | Touch & Go Equivalent Movements | Total Landing Equivalent Movements | Takeoff Equivalent Movement Factors | Takeoff Equivalent Movements | Total Takeoffs And Landings | Total Take-off & Land. Equivalent Movements | Percent Landing | Class Distri-bution | Weighted Runway Rating | | | $(HMC)_E$ | $(HMC)_A$ |
| | | Non Touch & Go | Touch & Go | Total | | | | | | | | | | | | | | Non Touch & Go | Touch & Go | Total | | |
| Aircraft CLASS I | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | .80 | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | .47 | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | .41 | | | | | | | | | | |
| | Touch & Go | | | | | | | | | | | | | | | | | | | | | |
| | Pairs | | | (Repeat Value) | | | | | | | (Repeat Value) | .50 | | | | | | | | | | |
| Sub-Total I | | S | S | | S | | | | S | S | S | | S | | S | | S | S | | | | |
| Aircraft CLASS II | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | .63 | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | .51 | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | .46 | | | | | | | | | | |
| | Touch & Go | | | (Repeat Value) | | | | | | | | | | | | | | | | | | |
| | Pairs | | | | | | | | | | (Repeat Value) | .50 | | | | | | | | | | |
| Sub-Total II | | S | S | | S | | | | S | S | S | | S | | S | | S | S | | | | |
| Aircraft CLASS III | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | .69 | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | .59 | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | .54 | | | | | | | | | | |
| | Touch & Go | | | (Repeat Value) | | | | | | | | | | | | | | | | | | |
| | Pairs | | | | | | | | | | (Repeat Value) | .50 | | | | | | | | | | |
| Sub-Total III | | S | S | | S | | | | S | S | S | | S | | S | | S | S | | | | |
| ALL CLASSES | Grand Total | G | G | $1C_G$ | $1D_G$ | | | | $5_G$ | $6_G$ | $7_G$ | | $9_G$ | | G | | G | G | | | | |

* CROSS CHECK: Does $5_G + 6_G = 7_G$; Does $7_G + 9_G = 11_G$

**Table 2–5**

**VFR HOURLY MIXED CAPACITY (HMC) ANALYSIS WORK SHEET**

| Step No. | 1 | 1A | 1B | 1C | 1D | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14A | 14B | 14C | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Procedure | FROM FIELD SURVEY OR FORECAST | | | | | USE Fig. No. 2-1 | USE TABLE No. 2-1 | USE TABLE No. 2-2 | $1A \times 4$ | $1B \times 4$ | $5_S + 6_S$ | CONSTANTS | $1D \times 8$ | $1C_G + 1D_G$ | $7_S + 9_S$ | $7_G \div 11_G$ | $11_S \div 11_G$ | $2 \times \frac{5_S}{7_G}$ | $"20" \times \frac{6_G}{7_G}$ | $14A_G + 14B_G$ | USE Fig. No. 2-2 | $15_G \times \frac{10_G}{11_G}$ |
| Step Definition | TYPE OPERATION | No. of LANDING AIRCRAFT: Non Touch & Go | Touch & Go | Total | No. of Takeoff Aircraft | Class Runway Rating | Class HAC's | Landing Equivalent Movement Factors | Non Touch & Go Equivalent Movements | Touch & Go Equivalent Movements | Total Landing Equivalent Movements | Takeoff Equivalent Movement Factors | Takeoff Equivalent Movements | Total Takeoffs And Landings | Total Take-off & Land. Equivalent Movements | Percent Landing | Class Distribution | Weighted Runway Rating: Non Touch & Go | Touch & Go | Total | $(HMC)_E$ | $(HMC)_A$ |
| Aircraft CLASS I | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | .80 | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | .47 | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | .41 | | | | | | | | | | |
| | Touch & Go | | | | | | | | | | | | | | | | | | | | | |
| | Pairs | | (Repeat Value) | | | | | | | (Repeat Value) | | .50 | | | | | | | | | | |
| Sub-Total I | | S | S | | S | | | | S | S | S | | S | | S | | S | S | | | | |
| Aircraft CLASS II | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | .63 | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | .51 | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | .46 | | | | | | | | | | |
| | Touch & Go | | | | (Repeat Value) | | | | | | | | | | | | | | | | | |
| | Pairs | | | | | | | | | (Repeat Value) | | .50 | | | | | | | | | | |
| Sub-Total II | | S | S | | S | | | | S | S | S | | S | | S | | S | S | | | | |
| Aircraft CLASS III | Single | | | | | | | 1.00 | | | | 1.00 | | | | | | | | | | |
| | FORMATION OF 2 | | | | | | | | | | | .69 | | | | | | | | | | |
| | FORMATION OF 3 | | | | | | | | | | | .59 | | | | | | | | | | |
| | FORMATION OF 4 | | | | | | | | | | | .54 | | | | | | | | | | |
| | Touch & Go | | | | (Repeat Value) | | | | | | | | | | | | | | | | | |
| | Pairs | | | | | | | | | (Repeat Value) | | .50 | | | | | | | | | | |
| Sub-Total III | | S | S | | S | | | | S | S | S | | S | | S | | S | S | | | | |
| ALL CLASSES | Grand Total | G | G | $1C_G$ | $1D_G$ | | | | $5_G$ | $6_G^*$ | $7_G$ | | $9_G$ | | G | | G | G | | | | |

* CROSS CHECK: Does $5_G + 6_G = 7_G$; Does $7_G + 9_G = 11_G$

Table 2–5

VFR HOURLY MIXED CAPACITY (HMC) ANALYSIS WORK SHEET