

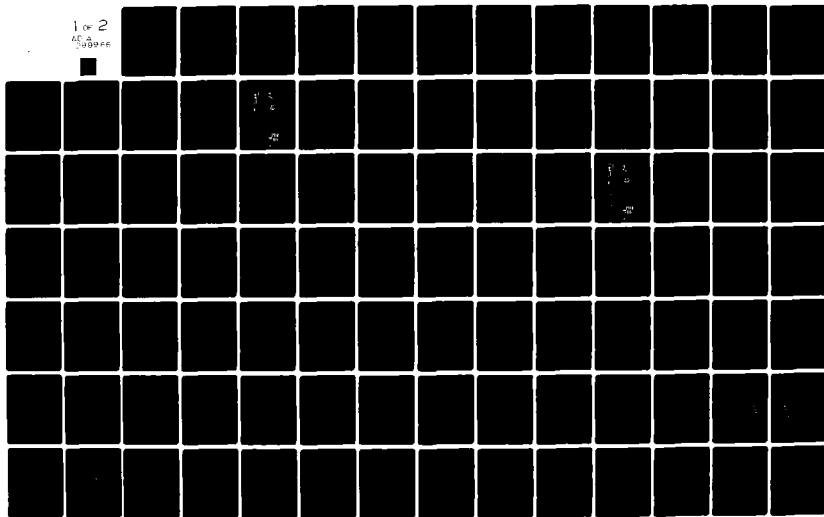
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FEDERAL AVIATION ADMINISTRATION TECHNICAL CENTER ATL--ETC F/G 1/2  
MIAMI INTERNATIONAL AIRPORT DATA PACKAGE NUMBER 5, AIRPORT IMPR--ETC(U)  
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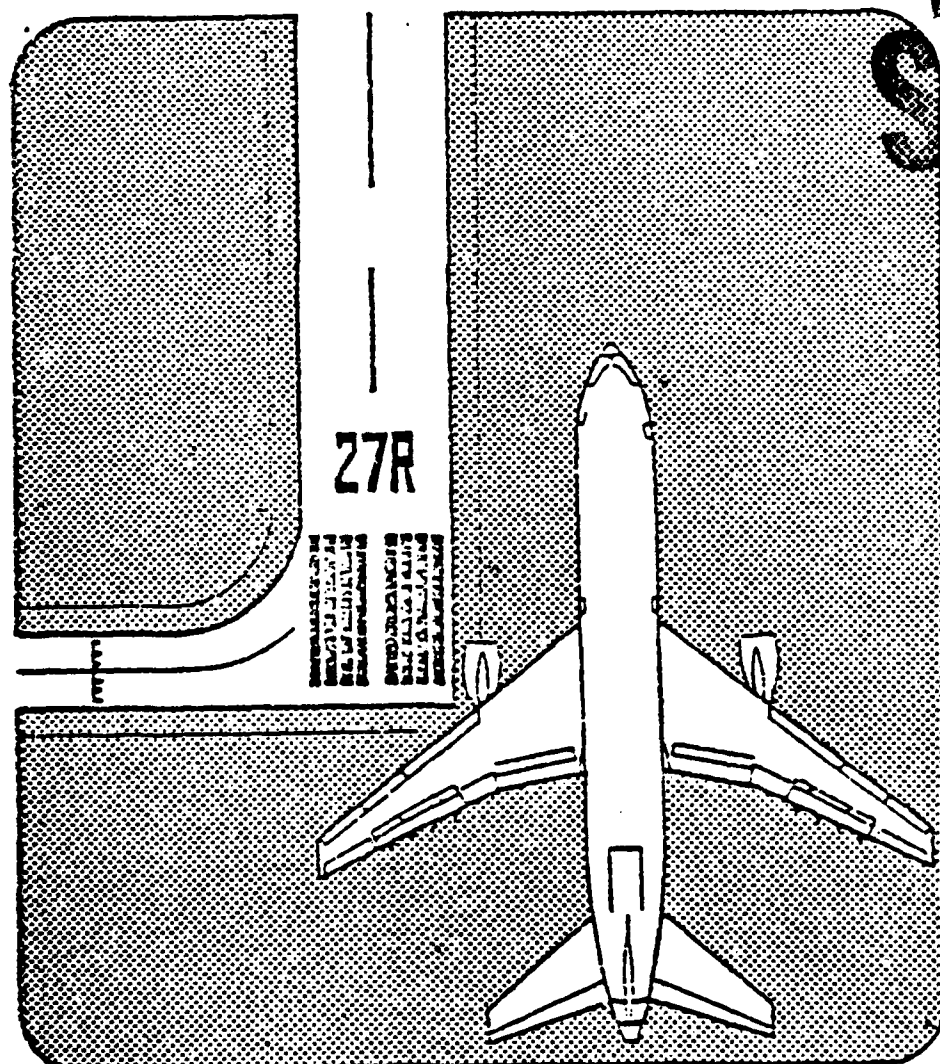
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LEVEL III

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# MIAMI INTERNATIONAL AIRPORT

DATA PACKAGE NO. 5  
AIRPORT IMPROVEMENT  
TASK FORCE DELAY STUDIES



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JUN 9 1981

FEBRUARY 1980

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MIAMI INTERNATIONAL AIRPORT.

Number 1

DATA PACKAGE NO. 15

~~MIAMI~~

AIRPORT IMPROVEMENT TASK FORCE DELAY STUDIES.

FEBRUARY 1980

11

Prepared by:

ANALYSIS BRANCH, ANA-220  
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER  
ATLANTIC CITY, NEW JERSEY 08405

411863 dr

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 Miami International Airport  
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Attachment A

SIMULATION MODEL  
CALIBRATION OUTPUT DATA

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February 1980

This section presents the final calibration output for Miami by showing comparisons between it and the field-data from which the calibration input schedule was derived.

Table 1 summarizes the flow rates, delays, and travel times on an hourly basis. Figures 1-5 show the results plotted on a quarter-hour basis.

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February 1980

Table 1

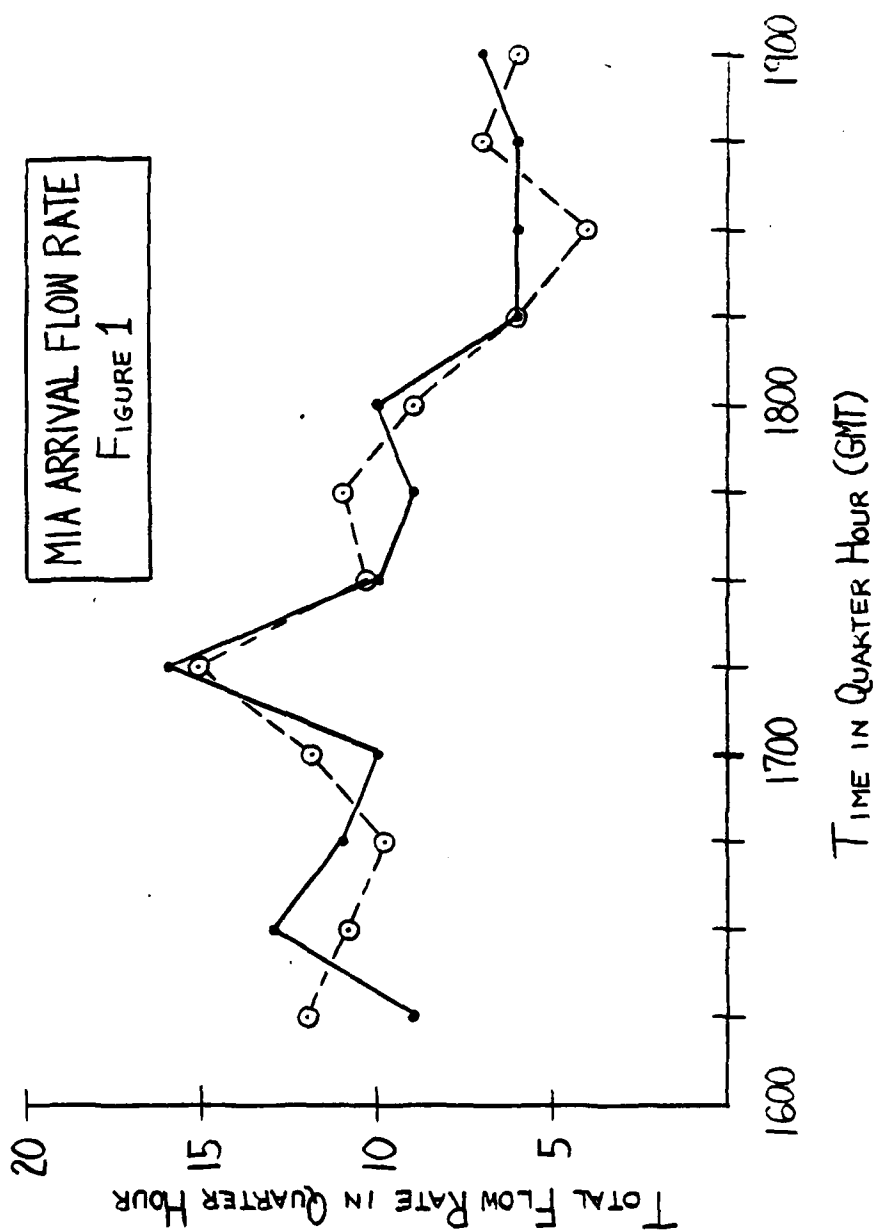
Hourly Comparison of Output Data  
for Simulation Model Calibration

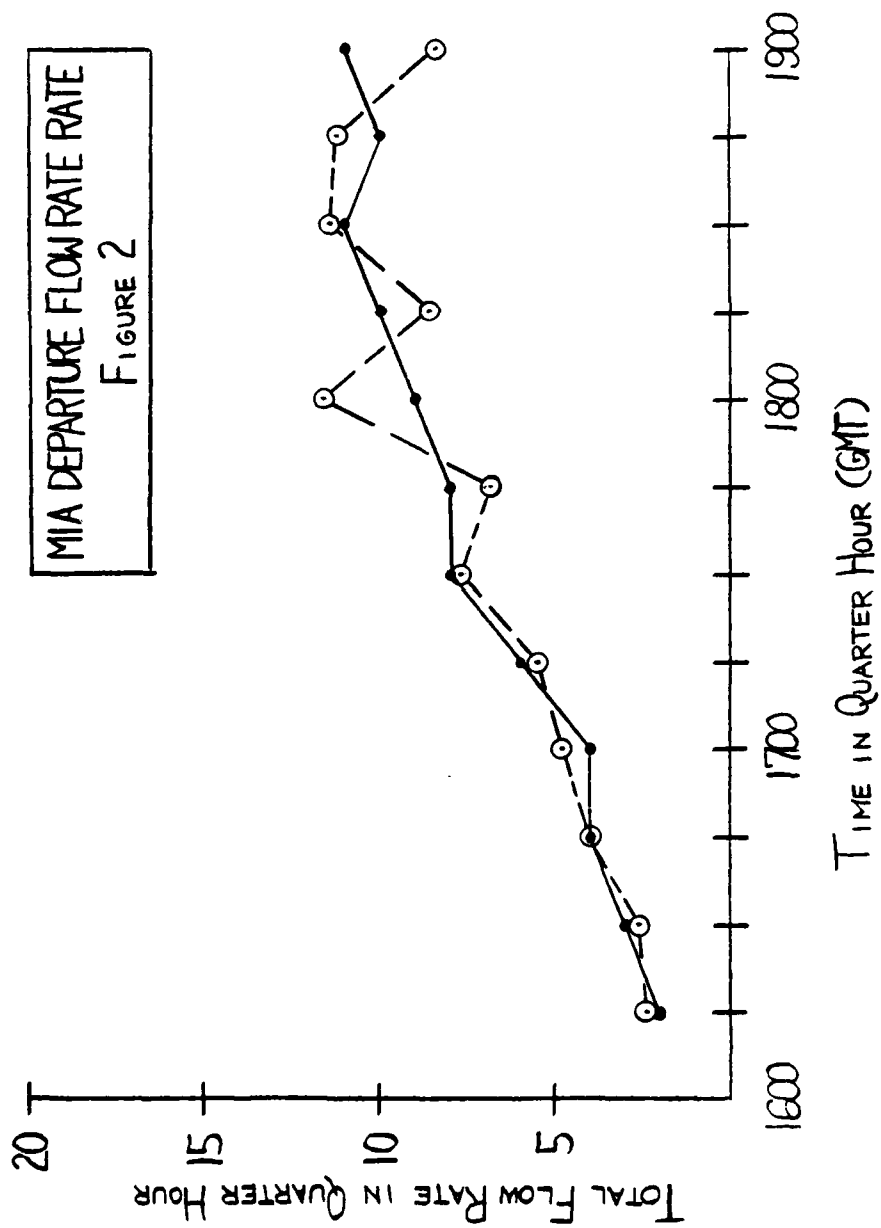
| Time (GMT) | Arrival<br>Flow Rate<br>(a/c per hour) |   |              | Departure<br>Flow Rate<br>(a/c per hour) |   |              |
|------------|----------------------------------------|---|--------------|------------------------------------------|---|--------------|
|            | Data                                   | : | Model (S.D.) | Data                                     | : | Model (S.D.) |
| 1600-1700  | 43.0                                   | : | 44.6 (0.52)  | 13.0                                     | : | 13.8 (0.42)  |
| 1700-1800  | 45.0                                   | : | 45.4 (0.52)  | 31.0                                     | : | 31.6 (0.70)  |
| 1800-1900  | 25.0                                   | : | 23.0 (0.00)  | 42.0                                     | : | 39.6 (0.52)  |

| Time (GMT) | Average Arrival<br>Air Delay<br>(min.) |   |              | Average Fix to<br>Threshold Travel<br>Time (min.) |   |              |
|------------|----------------------------------------|---|--------------|---------------------------------------------------|---|--------------|
|            | Data                                   | : | Model (S.D.) | Data                                              | : | Model (S.D.) |
| 1600-1700  | 1.97                                   | : | 0.77 (0.09)  | 12.56                                             | : | 9.36 (0.09)  |
| 1700-1800  | 2.29                                   | : | 1.79 (0.12)  | 11.96                                             | : | 11.38 (0.12) |
| 1800-1900  | 1.55                                   | : | 0.19 (0.03)  | 11.24                                             | : | 10.12 (0.03) |

| Time (GMT) | Average Arrival<br>Threshold to Gate<br>Travel Time (min.) |   |              | Average Departure<br>Gate to Roll<br>Travel Time (min.) |   |              |
|------------|------------------------------------------------------------|---|--------------|---------------------------------------------------------|---|--------------|
|            | Data                                                       | : | Model (S.D.) | Data                                                    | : | Model (S.D.) |
| 1600-1700  | 2.43                                                       | : | 3.19 (0.07)  | 5.91                                                    | : | 4.58 (0.36)  |
| 1700-1800  | 3.13                                                       | : | 3.12 (0.09)  | 6.62                                                    | : | 6.56 (0.34)  |
| 1800-1900  | 2.92                                                       | : | 2.81 (0.09)  | 5.91                                                    | : | 5.64 (0.11)  |

Data Package No. 5  
Miami International Airport  
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February 1980



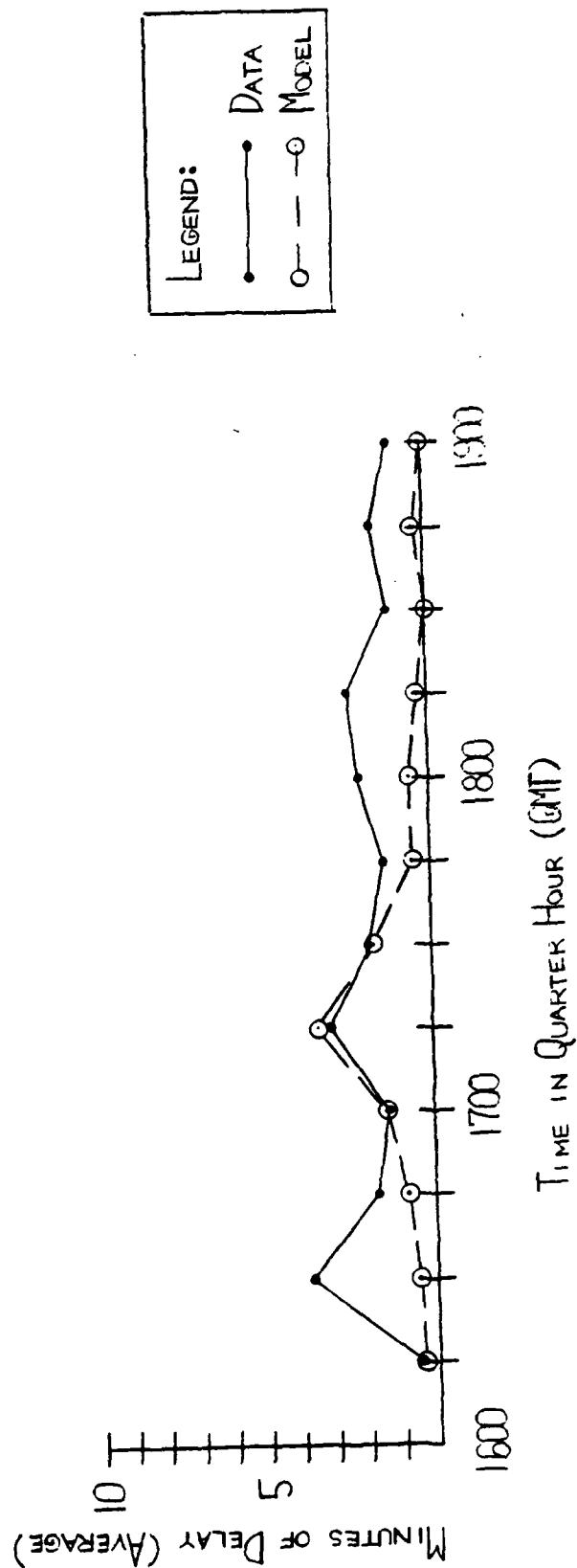


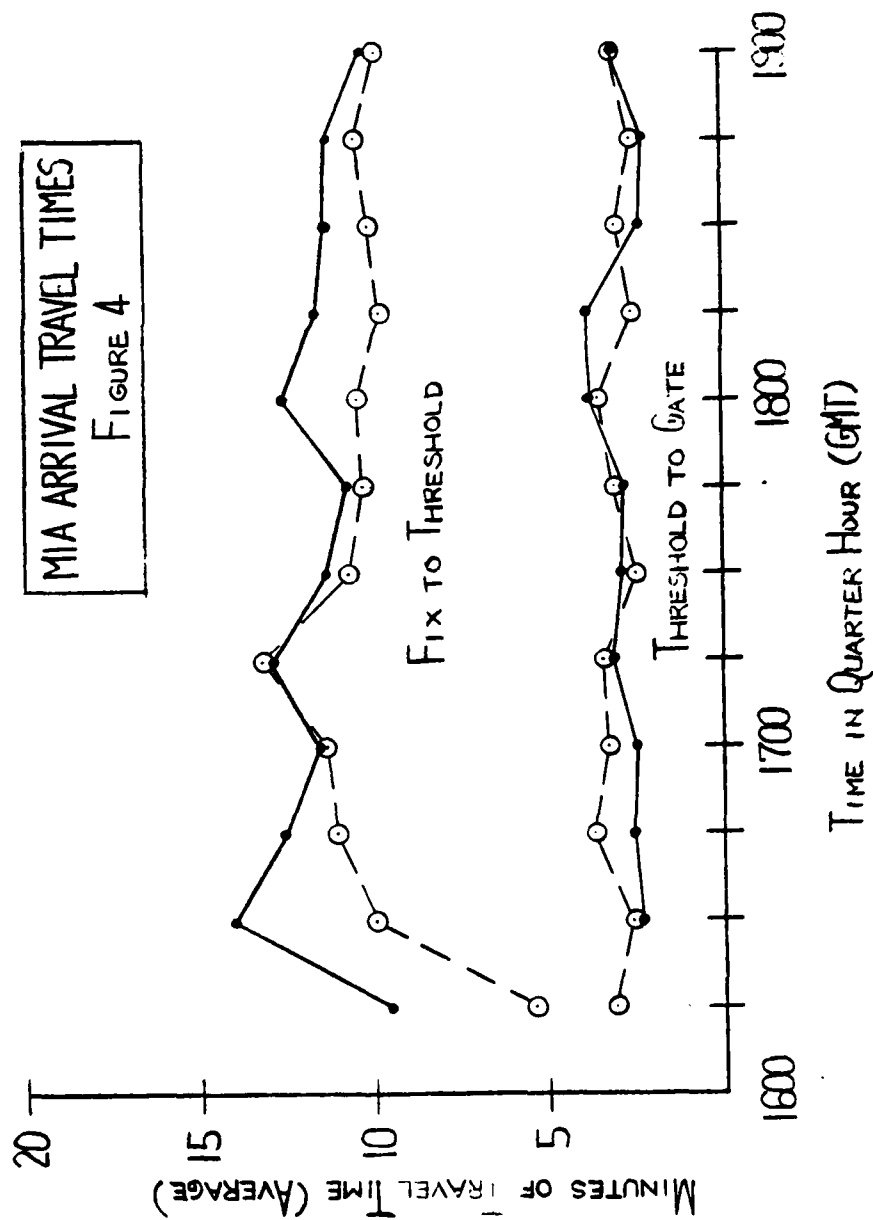
LEGEND:

—●— DATA

- - -○- MODEL

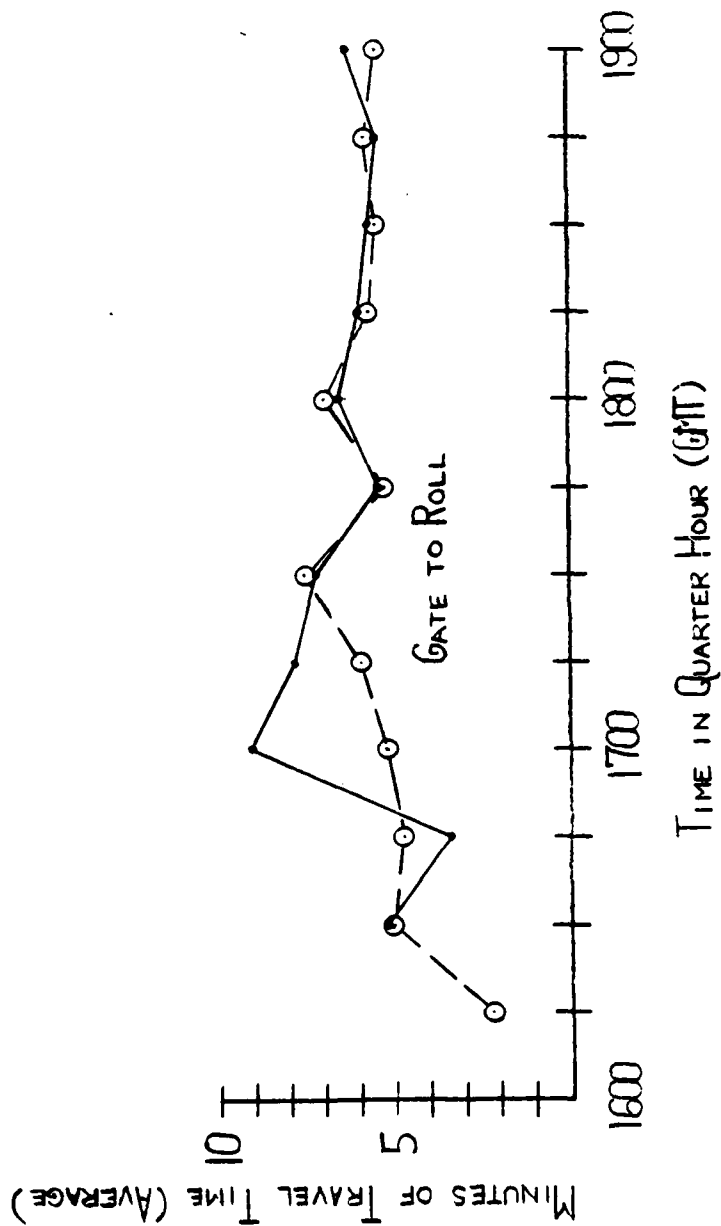
MIA ARRIVAL AIR DELAY  
FIGURE 3





# MIA DEPARTURE TRAVEL TIME

FIGURE 5



Attachment B

CONFIGURATIONS A AND B  
MODEL INPUT DATA

Data Package No. 5  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
February 1980

This section presents the Airfield Simulation Model input data as applied to the experiments in this report. Variation of the inputs controlled the experiments to reflect the desired conditions of each test.

Primarily, aircraft demand schedules (1) and separations were varied in accordance with the runway configuration, weather and ATC System scenario of each experiment.

The basic Configuration A (easterly) and Configuration B (westerly) model input data follows. Aircraft separations are listed under each configuration for all conditions used in the experiments.

Figure 8 closes this section, showing the link-node diagram used to develop the route structure for each experiment.

-----  
(1) See Miami Data Package No. 4 for demand schedule summaries.

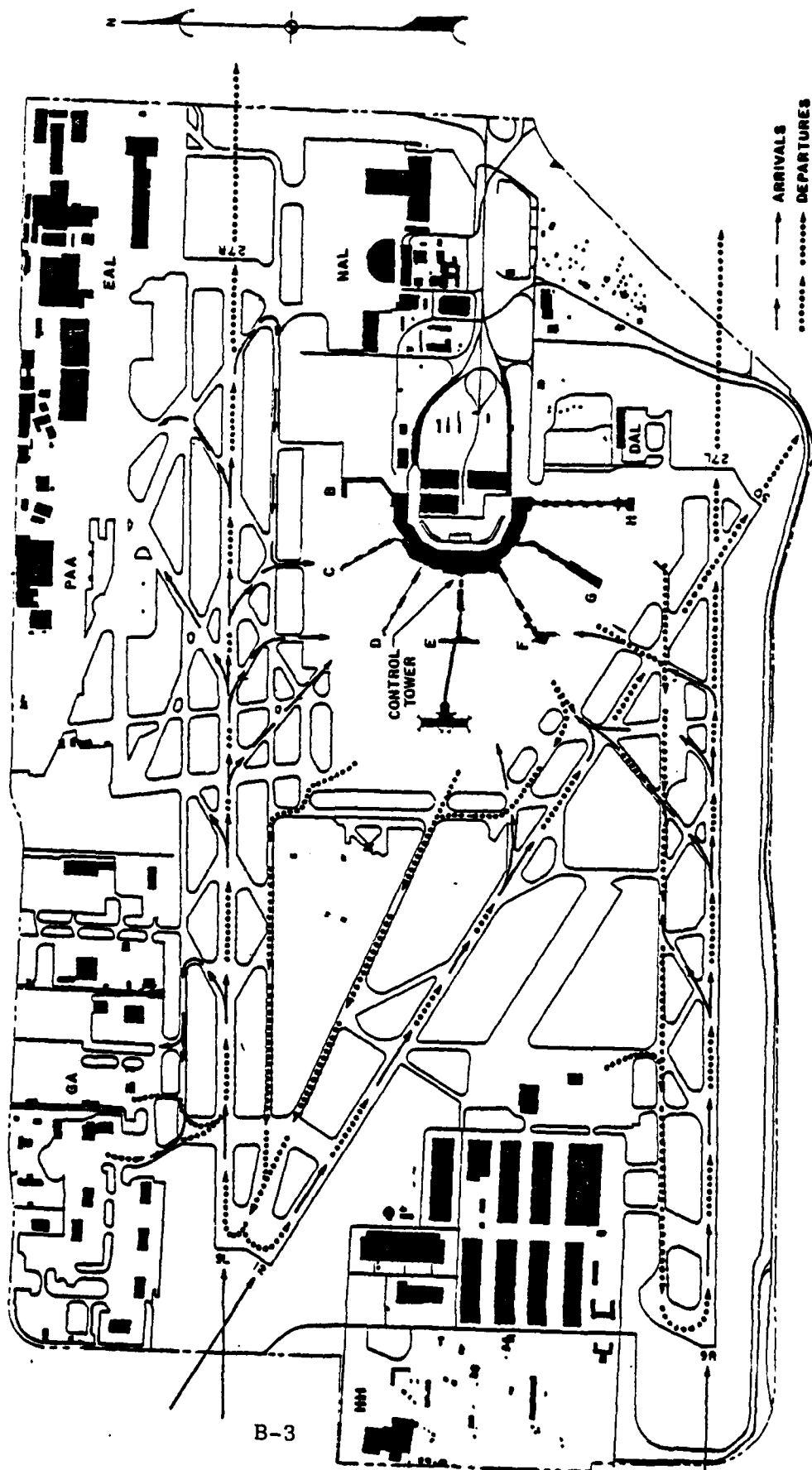


Figure 6  
MIAMI EASTERLY CONFIGURATION

MIAMI INTERNATIONAL AIRPORT  
C-0380 NJL 7-13-76

B-3

# CONFIGURATION A MODEL INPUT DATA

MIAMI INTER. AIRPORT EXPR.-1 ROUTES=1978 CONFIG=78VFR1 DEMAND=78

NUMBER OF RANDOM NUMBER SEEDS

10

RANDUM NUMBER SEEDS

92651 91921 69011 92157 14577 10493 27011 40961 15011 63661

START TIME AND FINISH TIME

118 0 208 0

PRINT OPTIONS

NUMBER OF AIRLINES

F F F F F F F

17

AIRLINE CODES

IA EA DD FF GG HH CI C2 F1 F2  
F3 FA IT OT JT PT GA  
NUMBER OF RUNWAYS

RUNWAY NAMES

9R 9L 12

RUNWAY END LINK NUMBERS

412 432 421

RUNWAY CROSSING LINKS--CLEARANCE TIMES FOR A/C CROSSING ACTIVE RUNWAY

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

19A 2 27. 38. 33. 30. 22. 22. 25. 30. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

22R 2 47. 51. 55. 66. 41. 44. 46. 58. 30. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

269 2 51. 53. 60. 73. 44. 48. 51. 59. 30. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

145 2 61. 61. 66. 79. 59. 59. 65. 77. 30. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

305 3 33. 36. 42. 44. 30. 32. 33. 37. 30. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

530 3 33. 36. 42. 44. 30. 32. 33. 37. 30. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

277 3 55. 59. 65. 73. 48. 52. 56. 66. 30. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

266 3 55. 59. 65. 73. 48. 52. 56. 66. 30. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

276 3 55. 59. 65. 73. 48. 52. 56. 66. 30. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

120 3 60. 69. 71. 73. 52. 57. 62. 73. 30. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

26C 3 60. 69. 71. 73. 52. 57. 62. 73. 30. 30. 30. 30.

RUNWAY CROSSING LINES--OCCUPANCY TIMES (SECS)

| CLASS | TIME  |
|-------|-------|
| 1     | 20.00 |
| 2     | 20.00 |
| 3     | 20.00 |
| 4     | 20.00 |

# RUNWAY CROSSING TIME AND INTERAPPIVAL GAP

| LINK | DELAY | MEAN | STD DEV |
|------|-------|------|---------|
| 198  | 1.50  | 1.00 | .50     |
| 228  | 1.50  | 1.00 | .50     |
| 259  | 1.50  | 1.00 | .50     |
| 345  | 1.50  | 1.00 | .50     |
| 305  | 1.50  | 1.00 | .50     |
| 530  | 1.50  | 1.00 | .50     |
| 277  | 1.50  | 1.00 | .50     |
| 266  | 1.50  | 1.00 | .50     |
| 276  | 1.50  | 1.00 | .50     |
| 120  | 1.50  | 1.00 | .50     |
| 280  | 1.50  | 1.00 | .50     |

NUMBER OF EXITS

23

## DISTANCE IN FEET FROM THRESHOLD TO THE EXIT TAXIWAY (EXIT LINK NO. VERSUS DISTANCE)

|     |        |     |        |     |        |     |        |     |        |
|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|
| 311 | 1120.0 | 255 | 1232.0 | 321 | 2470.0 | 329 | 2682.0 | 719 | 3630.0 |
| 302 | 4222.0 | 316 | 4400.0 | 284 | 4799.0 | 287 | 4972.0 | 270 | 5110.0 |
| 259 | 5732.0 | 323 | 5769.0 | 290 | 5992.0 | 273 | 6140.0 | 272 | 6650.0 |
| 291 | 6702.0 | 280 | 6980.0 | 266 | 6689.0 | 282 | 7589.0 | 121 | 7590.0 |
| 298 | 8052.0 | 178 | 9200.0 | 296 | 9292.0 |     |        |     |        |

NUMBER OF HOLDING AREAS

1

HOLDING AREA NUMBERS

90

NUMBER OF G/A RASING AREAS

6

G/A RASING AREA NUMBERS

|   |    |    |    |    |    |
|---|----|----|----|----|----|
| 9 | 16 | 17 | 18 | 19 | 20 |
|---|----|----|----|----|----|

# AIRLINE GATES

|    | 4  | 5  | 6  | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|----|----|----|----|----|----|----|----|----|----|----|
| JA |    |    |    |    |    |    |    |    |    |    |
| EA | 1  | 2  | 3  |    |    |    |    |    |    |    |
| DD | 3  | 4  |    |    |    |    |    |    |    |    |
| FE | 6  | 7  | 21 |    |    |    |    |    |    |    |
| GG |    |    |    |    |    |    |    |    |    |    |
| HH | 5  | 6  | 7  | 8  |    |    |    |    |    |    |
| CI | 7  | 8  | 9  | 10 |    |    |    |    |    |    |
| C2 | 3  | 4  | 9  | 17 |    |    |    |    |    |    |
| F1 | 6  | 8  | 9  | 17 |    |    |    |    |    |    |
| F2 | 17 | 18 | 19 | 20 |    |    |    |    |    |    |
| F3 | 14 | 15 | 16 | 18 |    |    |    |    |    |    |
| FA | 21 | 22 | 23 |    |    |    |    |    |    |    |
| IT | 17 | 18 | 19 | 20 | 21 | 22 | 23 |    |    |    |
| OT | 24 | 2  |    |    |    |    |    |    |    |    |
| JT | 2  | 24 |    |    |    |    |    |    |    |    |
| PT | 12 | 7  |    |    |    |    |    |    |    |    |
| GA | 7  | 12 |    |    |    |    |    |    |    |    |

## TRUNCATION LIMITS

UPPER LIMIT = 3.00  
LOWER LIMIT = 3.00

## DEPARTURE, QUEUE LENGTH AND INTERARRIVAL GAP

QUEUE = 6 MEAN = 2.00 STD DEV = 0.00  
LENGTHS OF COMMON APPROACH PATHS FROM OUTER MARKER TO THRESHOLD IN NAUTICAL MILES (RUNWAY NO. 4/C CLASS, LENGTH)

|   |   |      |
|---|---|------|
| 1 | 1 | 7.00 |
| 1 | 2 | 7.00 |
| 1 | 3 | 3.00 |
| 1 | 4 | 3.00 |
| 2 | 1 | 7.00 |
| 2 | 2 | 7.00 |
| 2 | 3 | 3.00 |
| 2 | 4 | 3.00 |
| 3 | 1 | 7.00 |
| 3 | 2 | 7.00 |
| 3 | 3 | 3.00 |
| 3 | 4 | 3.00 |

# TAXIWAY TWO-WAY PATHS

|          |     |     |     |
|----------|-----|-----|-----|
| LINKS 2  | 372 |     |     |
| LINKS 2  | 295 |     |     |
| LINKS 2  | 292 | 370 |     |
| LINKS 2  | 372 | 295 |     |
| LINKS 2  | 213 | 376 |     |
| LINKS 2  | 370 | 292 |     |
| LINKS 2  | 368 | 259 |     |
| LINKS 3  | 362 | 197 | 363 |
| LINKS 3  | 330 | 305 | 382 |
| LINKS 3  | 352 | 116 | 115 |
| LINKS 3  | 382 | 305 | 530 |
| LINKS 3  | 296 | 245 | 244 |
| LINKS 3  | 363 | 197 | 362 |
| LINKS 4  | 245 | 246 | 247 |
| LINKS 4  | 212 | 213 | 376 |
| LINKS 4  | 352 | 117 | 118 |
| LINKS 4  | 246 | 245 | 244 |
| LINKS 5  | 356 | 172 | 171 |
| LINKS 5  | 350 | 107 | 106 |
| LINKS 5  | 106 | 107 | 108 |
| LINKS 5  | 373 | 145 | 144 |
| LINKS 6  | 115 | 352 | 117 |
| LINKS 6  | 353 | 117 | 352 |
| LINKS 7  | 379 | 209 | 208 |
| LINKS 7  | 374 | 220 | 221 |
| LINKS 7  | 379 | 210 | 211 |
| LINKS 7  | 380 | 224 | 223 |
| LINKS 8  | 354 | 175 | 176 |
| LINKS 10 | 516 | 149 | 148 |
| LINKS 10 |     |     |     |

LINKS 10

377

211

210

379

209

208

207

206

205

380

LINKS 11

212

377

211

210

379

209

208

207

206

205

380

LINKS 13

380

205

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211

211

377

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213

376

LINKS 14

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377

211

210

379

209

208

207

206

205

380

LINKS 4

358

171

172

356

LINKS 7

526

385

513

386

177

176

175

LINKS 8

354

175

176

177

386

513

385

526

# VECTORED DELAY INPUTS

FIX DELAY EVALUATION LEVEL HOLDING PCT. MAXIMUM VECTORED DELAY MINIMUM HOLDING DELAY  
 TAKE-OFF QUEUE SWITCH FOR RUNWAY 1 = 99 ALTERNATE RUNWAYS ARE 0 0 0 0

TAKE-OFF QUEUE SWITCH FOR RUNWAY 2 = 99 ALTERNATE RUNWAYS ARE 0 0 0 0

TAKE-OFF QUEUE SWITCH FOR RUNWAY 3 = 99 ALTERNATE RUNWAYS ARE 0 0 0 0

GATE HOLD LIMIT = 8 HOLD TIME = .50

GATE HOLD LIMIT = 8 HOLD TIME = .50

GATE HOLD LIMIT = 8 HOLD TIME = .50

## AIRSPACE DELAYS

FIX OCCURRENCE PERCENTAGE HOLD MEAN HOLD SIGMA  
 A/C DEPARTURE RUNWAY OCCUPANCY TIME IN SECONDS (A/C CLASS, MEAN, AND STD. DEV.)

|   |       |      |
|---|-------|------|
| 1 | 39.00 | 4.00 |
| 2 | 39.00 | 4.00 |
| 3 | 34.00 | 4.00 |
| 4 | 34.00 | 4.00 |

TOUCH-AND-GO RUNWAY OCCUPANCY TIME IN SECONDS (A/C CLASS, MEAN, AND STD. DEV.)

|   |      |      |
|---|------|------|
| 1 | 0.00 | 0.00 |
| 2 | 0.00 | 0.00 |
| 3 | 0.00 | 0.00 |
| 4 | 0.00 | 0.00 |



THE ARRIVAL RUNWAY OCCUPANCY TIME IN SECONDS BY A/C CLASS (DISTANCE IN FEET FROM THRESHOLD TO POINT OF TAXI-WAY V.M.U.S. LINE)

CLASS 1  
4972.0 40.00 5110.0 54.00 5992.0 51.00 6140.0 52.00 6649.0 48.00  
6650.0 67.00 6702.0 48.00 6980.0 64.00 7590.0 55.00 8052.0 58.00  
9200.0 76.00 9292.0 65.00

CLASS 2  
3630.0 43.00 4222.0 47.00 4400.0 55.00 4799.0 35.00 4972.0 44.00  
5110.0 49.00 5732.0 47.00 5769.0 44.00 5992.0 48.00 6140.0 52.00  
6649.0 54.00 6650.0 51.00 6702.0 49.00 6980.0 60.00 7589.0 64.00  
7590.0 64.00 8052.0 59.00 9200.0 71.00

CLASS 3  
1120.0 25.00 1232.0 30.00 2473.0 30.00 2682.0 35.00 3630.0 40.00  
4222.0 46.00 4400.0 55.00 4972.0 49.00 5110.0 53.00 5732.0 56.00  
5992.0 53.00 6649.0 60.00 6702.0 64.00 6980.0 60.00 7590.0 66.00  
9200.0 79.00

CLASS 4  
1120.0 24.00 1232.0 22.00 2470.0 37.00 2682.0 43.00 4222.0 54.00  
4999.0 59.00 5732.0 66.00 5769.0 68.00 5992.0 70.00 6702.0 75.00

TAXIING SPEEDS IN MPH

A/C LATENCY DISTRIBUTION IN MINUTES (RANDOM NUMBER VERSUS TIME)

5.00 10.00 15.00 20.00 25.00 30.00 5.00

0.00

| FIX | TRAVEL TIMES | CLASS | FIX TO R/W DIST. | AVERAGE SPEED |
|-----|--------------|-------|------------------|---------------|
| FIX | RUNWAY       |       |                  |               |
| 1   | 1            | 1     | 34.50            | 180.20        |
| 1   | 1            | 2     | 34.50            | 180.00        |
| 1   | 1            | 1     | 25.50            | 139.10        |
| 1   | 2            | 2     | 25.50            | 139.10        |
| 1   | 2            | 3     | 25.50            | 180.00        |
| 1   | 2            | 4     | 25.50            | 180.00        |
| 1   | 3            | 1     | 18.00            | 180.00        |
| 2   | 1            | 1     | 33.00            | 198.00        |
| 2   | 1            | 2     | 33.00            | 198.00        |
| 2   | 1            | 3     | 33.00            | 180.00        |
| 2   | 2            | 1     | 37.50            | 204.50        |
| 2   | 2            | 2     | 37.50            | 195.70        |
| 2   | 2            | 3     | 37.50            | 180.00        |
| 3   | 1            | 1     | 28.50            | 190.00        |
| 3   | 1            | 2     | 28.50            | 180.00        |
| 3   | 1            | 3     | 28.50            | 180.00        |
| 3   | 2            | 1     | 27.00            | 190.60        |
| 3   | 2            | 2     | 27.00            | 180.00        |
| 3   | 3            | 2     | 18.00            | 180.00        |
| 4   | 1            | 1     | 30.00            | 225.00        |
| 4   | 1            | 2     | 30.00            | 225.00        |
| 4   | 1            | 3     | 30.00            | 180.00        |
| 4   | 2            | 1     | 31.50            | 222.40        |
| 4   | 2            | 2     | 31.50            | 222.40        |
| 4   | 2            | 3     | 31.50            | 180.00        |
| 4   | 2            | 4     | 31.50            | 180.00        |
| 4   | 3            | 1     | 24.00            | 180.00        |
| 4   | 3            | 2     | 24.00            | 180.00        |
| 5   | 1            | 1     | 24.50            | 180.00        |
| 5   | 2            | 2     | 18.00            | 180.00        |
| 5   | 2            | 3     | 18.00            | 180.00        |
| 5   | 2            | 4     | 34.50            | 180.00        |
| 6   | 1            | 2     | 21.00            | 180.00        |
| 6   | 1            | 3     | 21.00            | 180.00        |
| 6   | 1            | 4     | 21.00            | 180.00        |
| 6   | 2            | 2     | 27.50            | 130.00        |
| 7   | 1            | 2     | 18.00            | 18.00         |
| 7   | 2            | 3     | 18.00            | 180.00        |
| 7   | 2            | 4     | 18.00            | 180.00        |
| 8   | 1            | 1     | 28.50            | 180.00        |
| 8   | 1            | 2     | 28.50            | 180.00        |
| 8   | 1            | 3     | 28.50            | 180.00        |
| 8   | 1            | 4     | 28.50            | 180.00        |
| 8   | 2            | 1     | 28.50            | 180.00        |
| 8   | 2            | 2     | 28.50            | 180.00        |
| 8   | 2            | 3     | 18.00            | 180.00        |
| 8   | 2            | 4     | 18.00            | 180.00        |
| 8   | 3            | 1     | 28.50            | 180.00        |
| 8   | 3            | 2     | 28.50            | 180.00        |
| 8   | 3            | 3     | 28.50            | 180.00        |
| 8   | 3            | 4     | 28.50            | 180.00        |
| 8   | 4            | 1     | .01              | 120.00        |
| 8   | 4            | 2     | .01              | 180.00        |
| 8   | 4            | 3     | .01              | 180.00        |
| 8   | 4            | 4     | .01              | 180.00        |
| 8   | 5            | 1     | .01              | 180.00        |
| 8   | 5            | 2     | .01              | 180.00        |
| 8   | 5            | 3     | .01              | 180.00        |

|    |   |     |        |
|----|---|-----|--------|
| 10 | 2 | .01 | 180.00 |
| 10 | 3 | .01 | 180.00 |
| 10 | 3 | .01 | 180.00 |
| 10 | 3 | .01 | 180.00 |
| 10 | 3 | .01 | 180.00 |
| 10 | 3 | .01 | 180.00 |

128 SEPARATION VALUES IN 4 SETS OF 32, ARRIVAL / ARRIVAL, DEPARTURE / ARRIVAL, DEPARTURE / DEPARTURE, AND DEPARTURE / DEPARTURE. EACH SET OF 32 IS COMPOSED OF 16 PAIRS OF MEAN AND STANDARD DEVIATION. THE 16 SETS ARE POSSIBLE WAYS OF A/C CLASS X FOLLOWED BY A/C CLASS Y. THERE ARE 4 A/C CLASSES -- 1, 1, 1, 1 CLASS.

# THE ORDER OF SETS OF $(X, Y)$ IS :

(1,1), (1,2), (1,3), (1,4), (2,1), (2,2), (2,3), (2,4)  
(3,1), (3,2), (3,3), (3,4), (4,1), (4,2), (4,3), (4,4)

LEAD A/C RUNWAY 0 LEAD A/C FIX 0 TRAIL A/C RUNWAY 0 TRAIL A/C FIX 0

12A SEPARATION VALUES IN 4 SETS OF 32° A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND °/° (MINUTES)

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128 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), O/A (N.KNIFES), N/N (N.MILES) AND A/D (MILES)

TABLE 2

**AIRCRAFT SEPARATIONS  
1978 VFRI, EASTERLY CONFIGURATION**

| LEAD A/C RUNWAY                                                                     | 3    | LEAD A/C FIX | 0    | TRAIL A/C RUNWAY | 1    | TRAIL A/C FIX | 0   |
|-------------------------------------------------------------------------------------|------|--------------|------|------------------|------|---------------|-----|
| 128 SEPARATION VALUES IN 4 SETS OF 32; A/A (MILES); D/A (MINUTES) AND S/D (MINUTES) |      |              |      |                  |      |               |     |
| 0.00                                                                                | 0.00 | 0.00         | 0.00 | 0.00             | 0.00 | 0.00          |     |
| 0.00                                                                                | 0.00 | 0.00         | 0.00 | 0.00             | 0.00 | 0.00          |     |
| 0.00                                                                                | 0.00 | 0.00         | 0.00 | 0.00             | 0.00 | 0.00          |     |
| 0.00                                                                                | 0.00 | 0.00         | 0.00 | 0.00             | 0.00 | 0.00          |     |
| 0.00                                                                                | 0.00 | 0.00         | 0.00 | 0.00             | 0.00 | 0.00          |     |
| 1.98                                                                                | .14  | 1.83         | .13  | 1.69             | .12  | 1.49          | .11 |
| 1.98                                                                                | .14  | 1.83         | .13  | 1.69             | .12  | 1.49          | .11 |
| 1.72                                                                                | .14  | 1.60         | .13  | 1.47             | .12  | 1.22          | .11 |
| 1.72                                                                                | .14  | 1.60         | .13  | 1.47             | .12  | 1.22          | .11 |
| 1.50                                                                                | .08  | 2.00         | .08  | 2.00             | .08  | 2.00          | .08 |
| 1.00                                                                                | .08  | 1.00         | .08  | .83              | .63  | .83           | .08 |
| .33                                                                                 | .08  | .75          | .08  | .58              | .58  | .58           | .08 |
| .83                                                                                 | .08  | .75          | .08  | .58              | .08  | .58           | .08 |
| .93                                                                                 | .16  | .93          | .16  | .93              | .16  | .93           | .16 |
| .66                                                                                 | .14  | .86          | .14  | .86              | .14  | .86           | .14 |
| .78                                                                                 | .18  | .78          | .18  | .78              | .18  | .78           | .18 |
| .80                                                                                 | .24  | .80          | .24  | .80              | .24  | .80           | .24 |
| LEAD A/C RUNWAY                                                                     | 2    | LEAD A/C FIX | 0    | TRAIL A/C RUNWAY | 3    | TRAIL A/C FIX | 0   |

[illegible][illegible]

# A/C SEPARATIONS

128 SEPARATION VALUES IN 4 SETS OF 32: ARRIVAL, DEPARTURE / ARRIVAL, DEPARTURE / DEPARTURE AND ARRIVAL / DEPARTURE  
EACH SET OF 32 IS COMPOSED OF 16 PAIRS OF MEAN AND STANDARD DEVIATION  
THE 16 SETS ARE POSSIBLE WAYS OF A/C CLASS X FOLLOWED BY A/C CLASS Y  
THERE ARE 4 A/C CLASSES -- 1 1 0 CLASS  
2 1 0 CLASS  
3 1 0 CLASS  
4 1 0 CLASS

THE ORDER OF SETS OF (X,Y) IS 1

(1,1), (1,2), (1,3), (1,4), (2,1), (2,2), (2,3), (2,4)  
(3,1), (3,2), (3,3), (3,4), (4,1), (4,2), (4,3), (4,4)

LEAD A/C RUNWAY 0 LEAD A/C FIX 0 TRAIL A/C RUNWAY 0 TRAIL A/C FIX 0  
128 SEPARATION VALUES IN 4 SETS OF 32: A/A (N-MILES), D/A (N-MILES), D/D (MINUTES) AND A/D (MINUTES)

|      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|
| 5.56 | .70  | 6.57 | .65  | 7.59 | .60  | 7.43 | .50  |
| 4.46 | .70  | 4.37 | .65  | 5.39 | .50  | 5.23 | .50  |
| 4.46 | .70  | 4.37 | .65  | 4.29 | .60  | 4.13 | .50  |
| 4.46 | .70  | 4.37 | .65  | 4.29 | .60  | 4.13 | .50  |
| 2.63 | .14  | 2.60 | .13  | 2.60 | .12  | 2.60 | .11  |
| 2.63 | .14  | 2.60 | .13  | 2.60 | .12  | 2.60 | .11  |
| 2.60 | .14  | 2.60 | .13  | 2.60 | .12  | 2.60 | .11  |
| 2.60 | .14  | 2.60 | .13  | 2.60 | .12  | 2.60 | .11  |
| 1.50 | .08  | 1.00 | .08  | 1.00 | .08  | 1.00 | .08  |
| 1.00 | .08  | 1.00 | .08  | 1.00 | .08  | 1.00 | .08  |
| 1.00 | .08  | 1.00 | .08  | 1.00 | .08  | 1.00 | .08  |
| 1.00 | .08  | 1.00 | .08  | 1.00 | .08  | 1.00 | .08  |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

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LEAD A/C RUNWAY 1 LEAD A/C FIX 0 TRAIL A/C RUNWAY 3 TRAIL A/C FIX 0  
128 SEPARATION VALUES IN 4 SETS OF 32: A/A (N-MILES), D/A (N-MILES), D/D (MINUTES) AND A/D (MINUTES)

|      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.63 | .14  | 2.60 | .13  | 2.60 | .12  | 2.60 | .11  |
| 2.63 | .14  | 2.60 | .13  | 2.60 | .12  | 2.60 | .11  |
| 2.60 | .14  | 2.60 | .13  | 2.60 | .12  | 2.60 | .11  |
| 2.60 | .14  | 2.60 | .13  | 2.60 | .12  | 2.60 | .11  |
| 1.50 | .08  | 1.00 | .08  | 1.00 | .08  | 1.00 | .08  |
| 1.00 | .08  | 1.00 | .08  | 1.00 | .08  | 1.00 | .08  |
| 1.00 | .08  | 1.00 | .08  | 1.00 | .08  | 1.00 | .08  |
| 1.00 | .08  | 1.00 | .08  | 1.00 | .08  | 1.00 | .08  |
| .93  | .16  | .93  | .16  | .93  | .16  | .93  | .16  |
| .86  | .14  | .86  | .14  | .86  | .14  | .86  | .14  |
| .78  | .18  | .78  | .18  | .78  | .18  | .78  | .18  |
| .80  | .24  | .80  | .24  | .80  | .24  | .80  | .24  |

TABLE 3

AIRCRAFT SEPARATIONS  
1978 IFRI, EASTERLY CONFIGURATION

| LEAD A/C RUNWAY                             | 3                                                         | LEAD A/C FIX | 0    | TRAIL A/C RUNWAY | 1    | TRAIL A/C FIX | 2    |
|---------------------------------------------|-----------------------------------------------------------|--------------|------|------------------|------|---------------|------|
| 128 SEPARATION VALUES IN 4 SLITS OF 32° A/A | (N-MILES), D/A (N-MILES), D/O (MINUTES) AND A/D (MINUTES) |              |      |                  |      |               |      |
| 0.00                                        | 0.00                                                      | 0.00         | 0.00 | 0.00             | 0.00 | 0.00          | 0.00 |
| 0.00                                        | 0.00                                                      | 0.00         | 0.00 | 0.00             | 0.00 | 0.00          | 0.00 |
| 0.00                                        | 0.00                                                      | 0.00         | 0.00 | 0.00             | 0.00 | 0.00          | 0.00 |
| 2.63                                        | 1.14                                                      | 2.60         | .13  | 2.60             | .12  | 2.60          | .11  |
| 2.63                                        | 1.14                                                      | 2.60         | .13  | 2.60             | .12  | 2.60          | .11  |
| 2.60                                        | 1.14                                                      | 2.60         | .13  | 2.60             | .12  | 2.60          | .11  |
| 1.50                                        | .08                                                       | 2.00         | .08  | 2.00             | .08  | 2.00          | .08  |
| 1.00                                        | .04                                                       | 1.00         | .04  | 1.00             | .04  | 1.00          | .04  |
| 1.00                                        | .04                                                       | 1.00         | .04  | 1.00             | .04  | 1.00          | .04  |
| 1.00                                        | .04                                                       | 1.00         | .04  | 1.00             | .04  | 1.00          | .04  |
| .93                                         | .16                                                       | .93          | .16  | .93              | .16  | .93           | .16  |
| .86                                         | .15                                                       | .86          | .14  | .86              | .14  | .86           | .14  |
| .76                                         | .15                                                       | .78          | .18  | .78              | .18  | .78           | .18  |
| .80                                         | .24                                                       | .80          | .24  | .80              | .24  | .80           | .24  |

[illegible]

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[illegible]

**TABLE 3**  
**(continued)**

120 SEPARATION VALUES IN 4 SETS OF 30 ARRIVAL / DEPARTURE / ARRIVAL • DEPARTURE / DEPARTURE / DEPARTURE

EACH SET OF 30 IS COMPOSED OF 16 PAIRS OF MEAN AND STANDARD DIVIATION

THE 16 SETS ARE POSSIBLE WAYS OF A/C CLASS X FOLLOWED BY A/C CLASS Y

THERE ARE 4 A/C CLASSES -- 1 ! D CLASS

THERE ARE 4 A/C CLASSES -- 1 ! D CLASS  
2 ! C CLASS  
3 ! B CLASS  
4 ! A CLASS

THE ORDER OF SETS OF  $(A \circ X)$  IS

(1,1), (1,2), (1,3), (1,4), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2), (3,3), (3,4), (4,1), (4,2), (4,3), (4,4)

| TIME              | COORD             | STATUS         | TYPE               | MODE            | REMARKS         |
|-------------------|-------------------|----------------|--------------------|-----------------|-----------------|
| 150100            | 150200            | 150300         | 150400             | 150500          | 150600          |
| LEAD A/C RUNWAY 0 | LEAD A/C RUNWAY 0 | LEAD A/C FIX 0 | TRAIL A/C RUNWAY 0 | TRAIL A/C FIX 0 | TRAIL A/C FIX 0 |

120 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (MINUTES), D/D (MINUTES) AND A/D (MINUTES)

[illegible]

120 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (MINUTES), D/D (MINUTES) AND A/D (MINUTES)

[illegible]

TABLE 4

**AIRCRAFT SEPARATIONS  
1978 IFR2, EASTERLY CONFIGURATION**

[illegible]

**TABLE 4**  
**(continued)**

[illegible]TABLE 4  
(continued)

Note that the arrival runway occupancy times for IFR2 conditions are set 5 seconds greater than for IFR1.  
The adjusted IFR2 runway clearance times and occupancy times are as follows:

| RWY XING LINES                        |      |      |      |      |      |      |      |      |      |    |    |    |    |
|---------------------------------------|------|------|------|------|------|------|------|------|------|----|----|----|----|
| RWY XING LINES MIN CONFLUENCE TO IFR2 |      |      |      |      |      |      |      |      |      |    |    |    |    |
| 2                                     | 198  | 32   | 43   | 50   | 30   | 40   | 42   | 42   | 40   | 30 | 30 | 30 | 30 |
| 2                                     | 228  | 52   | 56   | 60   | 71   | 41   | 44   | 46   | 54   | 30 | 30 | 30 | 30 |
| 2                                     | 259  | 56   | 59   | 65   | 78   | 44   | 48   | 51   | 58   | 30 | 30 | 30 | 30 |
| 2                                     | 345  | 68   | 66   | 71   | 84   | 54   | 59   | 65   | 77   | 30 | 30 | 30 | 30 |
| 3                                     | 305  | 38   | 41   | 47   | 49   | 30   | 32   | 33   | 37   | 30 | 30 | 30 | 30 |
| 3                                     | 530  | 38   | 41   | 47   | 49   | 30   | 32   | 33   | 37   | 30 | 30 | 30 | 30 |
| 3                                     | 277  | 60   | 64   | 70   | 78   | 48   | 52   | 56   | 66   | 30 | 30 | 30 | 30 |
| 3                                     | 266  | 60   | 64   | 70   | 78   | 48   | 52   | 56   | 66   | 30 | 30 | 30 | 30 |
| 3                                     | 276  | 60   | 64   | 70   | 78   | 48   | 52   | 56   | 66   | 30 | 30 | 30 | 30 |
| 3                                     | 120  | 65   | 74   | 76   | 78   | 52   | 57   | 62   | 73   | 30 | 30 | 30 | 30 |
| -3                                    | 280  | 65   | 74   | 76   | 78   | 52   | 57   | 62   | 73   | 30 | 30 | 30 | 30 |
| RWY ARRIVAL OCCUPANCY TIMES IFR2      |      |      |      |      |      |      |      |      |      |    |    |    |    |
| 1                                     | 12   |      |      |      |      |      |      |      |      |    |    |    |    |
| 4972                                  | 45.0 | 5110 | 59.0 | 5992 | 56.0 | 6140 | 57.0 | 6649 | 53.0 |    |    |    |    |
| 6650                                  | 72.0 | 6702 | 53.0 | 6980 | 69.0 | 7590 | 60.0 | 8052 | 63.0 |    |    |    |    |
| 9200                                  | 81.0 | 9292 | 70.0 |      |      |      |      |      |      |    |    |    |    |
| 2                                     | 18   |      |      |      |      |      |      |      |      |    |    |    |    |
| 3630                                  | 48.0 | 4222 | 52.0 | 4400 | 60.0 | 4799 | 40.0 | 4972 | 49.0 |    |    |    |    |
| 5110                                  | 54.0 | 5732 | 52.0 | 5769 | 49.0 | 5992 | 53.0 | 6140 | 57.0 |    |    |    |    |
| 6649                                  | 59.0 | 6650 | 56.0 | 6702 | 54.0 | 6980 | 65.0 | 7589 | 69.0 |    |    |    |    |
| 7590                                  | 69.0 | 8052 | 64.0 | 9200 | 82.0 |      |      |      |      |    |    |    |    |
| 3                                     | 16   |      |      |      |      |      |      |      |      |    |    |    |    |
| 1120                                  | 30.0 | 1232 | 35.0 | 2470 | 35.0 | 2682 | 40.0 | 3630 | 45.0 |    |    |    |    |
| 4222                                  | 51.0 | 4400 | 60.0 | 4972 | 54.0 | 5110 | 58.0 | 5732 | 51.0 |    |    |    |    |
| 5992                                  | 58.0 | 6649 | 65.0 | 6702 | 69.0 | 6980 | 65.0 | 7590 | 71.0 |    |    |    |    |
| 9200                                  | 84.0 |      |      |      |      |      |      |      |      |    |    |    |    |
| -4                                    | 10   |      |      |      |      |      |      |      |      |    |    |    |    |
| 1120                                  | 29.0 | 1232 | 27.0 | 2470 | 42.0 | 2682 | 48.0 | 4222 | 59.0 |    |    |    |    |
| 4799                                  | 64.0 | 5732 | 71.0 | 5769 | 73.0 | 5992 | 75.0 | 6702 | 80.0 |    |    |    |    |

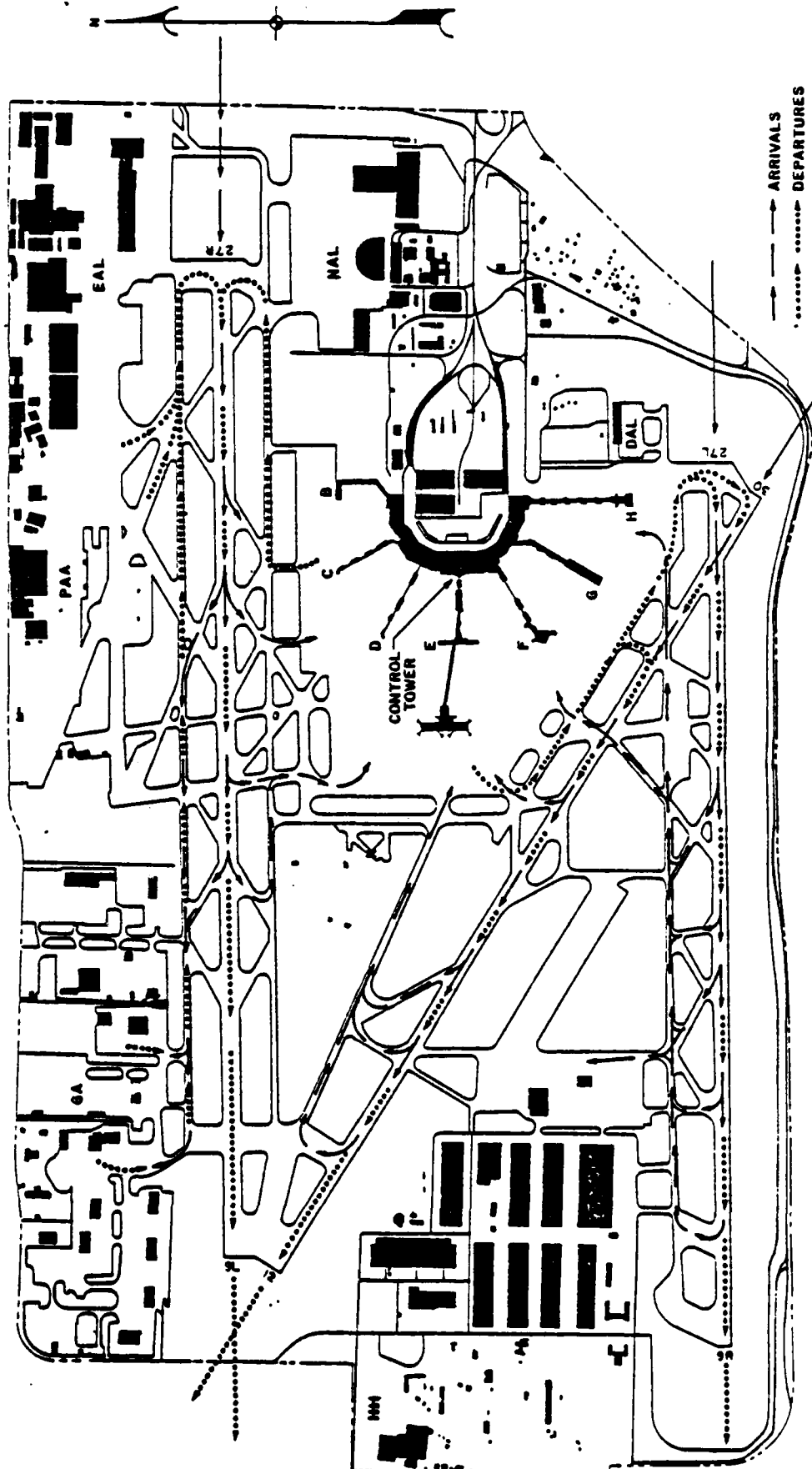


Figure 7  
MIAMI WESTERLY CONFIGURATION

MIAMI INTERNATIONAL AIRPORT  
C-0380 HJL 7-13-76

# CONFIGURATION B MODEL INPUT DATA

MIAMI INTL. AIRPORT EXPEN.-2 ROUTES-1978 CONFIG=8 SEPAR=78VFR1 DEMAND=78

NUMBER OF RANDOM NUMBER SEEDS

10

RANDOM NUMBER SEEDS

82651 91921 69011 92157 14577 10493 27011 40961 15011 63661

START TIME AND FINISH TIME

11Z 0 20Z 0

PRINT OPTIONS

F F F F F F F F F F

NUMBER OF AIRLINES

17

AIRLINE CODES

| IA | LA | OD | FF | GG | HH | C1 | C2 | F1 | F2 |
|----|----|----|----|----|----|----|----|----|----|
| F3 | F4 | IT | JT | JT | PT | GA |    |    |    |

NUMBER OF RUNWAYS

3

RUNWAY NAMES

27R 27L 30

RUNWAY END LINK NUMBERS

422 401 413

RUNWAY CROSSING LINKS--CLEARANCE TIMES FOR A/C CROSSING ACTIVE RUNWAY

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

345 1 19. 37. 39. 40. 28. 30. 31. 35. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

258 1 40. 48. 54. 63. 39. 43. 45. 52. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

259 1 40. 48. 54. 63. 39. 43. 45. 52. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

227 1 46. 51. 59. 71. 43. 47. 49. 58. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

331 1 66. 62. 64. 78. 52. 58. 63. 75. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

178 1 79. 67. 64. 79. 59. 65. 72. 65. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

255 1 79. 62. 64. 78. 59. 65. 72. 65. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

177 2 5. 5. 5. 6. 6. 6. 7. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

120 3 22. 39. 38. 37. 26. 28. 28. 32. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

274 3 36. 44. 44. 46. 31. 34. 34. 39. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

277 3 30. 44. 44. 46. 31. 34. 34. 39. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

297 3 30. 44. 44. 46. 31. 34. 34. 39. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

337 3 65. 64. 63. 74. 49. 54. 58. 68. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

530 3 65. 64. 63. 74. 49. 54. 58. 68. 30. 30. 30.

XNG LINK RUNWAY ARRIVAL ON R/W DEPARTURE ON R/W ARRIVAL ON FINAL

24

# RUNWAY CROSSING LINKS--OCCUPANCY TIMES (SECS)

CLASS TIME

1 20.00

2 20.00

3 20.00

4 20.00

# RUNWAY CROSSING TIME AND INTERARRIVAL GAP

| LINK NO. | MEAN | STD DEV |
|----------|------|---------|
| 345      | 1.50 | 1.00    |
| 258      | 1.50 | 1.00    |
| 259      | 1.50 | 1.00    |
| 227      | 1.50 | 1.00    |
| 331      | 1.50 | 1.00    |
| 198      | 1.50 | 1.00    |
| 255      | 1.50 | 1.00    |
| 178      | 1.50 | 1.00    |
| 120      | 1.50 | 1.00    |
| 276      | 1.50 | 1.00    |
| 277      | 1.50 | 1.00    |
| 267      | 1.50 | 1.00    |
| 305      | 1.50 | 1.00    |
| 530      | 1.50 | 1.00    |

NUMBER OF EXITS  
17

DISTANCE IN FEET FROM THRESHOLD TO THE EXIT TAXIWAY (EXIT LINK NO. VERSUS DISTANCE)

|     |        |     |        |     |        |     |        |     |        |
|-----|--------|-----|--------|-----|--------|-----|--------|-----|--------|
| 295 | 2400.0 | 266 | 2930.0 | 300 | 3390.0 | 323 | 3810.0 | 270 | 4250.0 |
| 293 | 4460.0 | 259 | 4720.0 | 284 | 4780.0 | 316 | 4980.0 | 287 | 5480.0 |
| 307 | 5640.0 | 302 | 6230.0 | 305 | 6890.0 | 321 | 6891.0 | 329 | 7770.0 |
| 304 | 8270.0 | 255 | 9220.0 |     |        |     |        |     |        |

NUMBER OF HOLDING AREAS  
1

HOLDING AREA NUMBERS  
99

NUMBER OF G/A BASING AREAS  
6

G/A BASING AREA NUMBERS

|   |    |    |    |    |    |
|---|----|----|----|----|----|
| 9 | 16 | 17 | 18 | 19 | 20 |
|---|----|----|----|----|----|

# AIRLINE GATES

| IA | 4  | 5  | 6  | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|----|----|----|----|----|----|----|----|----|----|----|
| EA | 1  | 2  | 3  |    |    |    |    |    |    |    |
| 00 | 3  | 4  |    |    |    |    |    |    |    |    |
| FF |    |    |    |    |    |    |    |    |    |    |
| GG | 6  | 7  | 21 |    |    |    |    |    |    |    |
| HH | 5  | 6  | 7  | 8  |    |    |    |    |    |    |
| CI | 7  | 8  | 9  | 10 |    |    |    |    |    |    |
| CI | 3  | 4  | 9  | 17 |    |    |    |    |    |    |
| CI | 6  | 8  | 9  | 17 |    |    |    |    |    |    |
| F1 | 17 | 18 | 19 | 20 |    |    |    |    |    |    |
| F2 | 14 | 15 | 16 | 18 |    |    |    |    |    |    |
| F3 | 21 | 22 | 23 |    |    |    |    |    |    |    |
| F4 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |    |    |    |
| IT | 24 | 2  |    |    |    |    |    |    |    |    |
| UT | 2  | 24 |    |    |    |    |    |    |    |    |
| JT | 12 | 7  |    |    |    |    |    |    |    |    |
| PT | 7  | 12 |    |    |    |    |    |    |    |    |
| GA | 0  |    |    |    |    |    |    |    |    |    |

## TRUNCATION LIMITS

UPPER LIMIT = 3.00

LOWER LIMIT = 3.00

## DEPARTURE QUEUE LENGTH AND INTERARRIVAL GAP

QUEUE = 6 MEAN = 2.00 STD DEV = 0.00

## LENGTHS OF COMMON APPROACH PATHS FROM OUTER MARKER TO THRESHOLD IN NAUTICAL MILES (RUNWAY NO., A/C CLASS, LENGTH)

|   |   |      |
|---|---|------|
| 1 | 1 | 7.00 |
| 1 | 2 | 7.00 |
| 1 | 3 | 3.00 |
| 1 | 4 | 3.00 |
| 2 | 1 | 7.00 |
| 2 | 2 | 7.00 |
| 2 | 3 | 3.00 |
| 2 | 4 | 3.00 |
| 3 | 1 | 7.00 |
| 3 | 2 | 7.00 |
| 3 | 3 | 3.00 |
| 3 | 4 | 3.00 |

[illegible]

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|          |     |     |     |     |     |     |     |     |     |     |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| LINKS 11 | 526 | 177 | 176 | 175 | 354 | 174 | 173 | 356 | 172 | 171 |
| 386      |     |     |     |     |     |     |     |     |     |     |
| 355      |     |     |     |     |     |     |     |     |     |     |
| LINKS 11 |     | 109 | 110 | 111 | 112 | 351 | 113 | 114 | 115 | 116 |
| 350      |     |     |     |     |     |     |     |     |     |     |
| 352      |     |     |     |     |     |     |     |     |     |     |
| LINKS 11 |     | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 363 | 197 |
| 382      |     |     |     |     |     |     |     |     |     |     |
| 362      |     |     |     |     |     |     |     |     |     |     |
| LINKS 11 |     | 197 | 363 | 196 | 195 | 194 | 193 | 192 | 191 | 190 |
| 362      |     |     |     |     |     |     |     |     |     |     |
| LINKS 13 |     | 375 | 501 | 349 | 348 | 347 | 374 | 220 | 221 | 222 |
| 502      |     |     |     |     |     |     |     |     |     |     |
| 223      |     | 224 | 389 |     |     |     |     |     |     |     |
| LINKS 14 |     | 107 | 105 | 350 | 109 | 110 | 111 | 112 | 351 | 113 |
| 114      |     | 115 | 116 | 352 |     |     |     |     |     |     |
| LINKS 14 |     | 385 | 513 | 386 | 177 | 176 | 175 | 354 | 174 | 173 |
| 526      |     |     |     |     |     |     |     |     |     |     |
| 356      |     | 172 | 171 | 358 |     |     |     |     |     |     |
| LINKS 14 |     | 171 | 172 | 356 | 173 | 174 | 354 | 175 | 176 | 177 |
| 356      |     | 513 | 385 | 526 |     |     |     |     |     |     |
| LINKS 14 |     | 116 | 115 | 114 | 113 | 351 | 112 | 111 | 110 | 109 |
| 352      |     | 108 | 107 | 106 |     |     |     |     |     |     |
| LINKS 16 |     | 186 | 187 | 188 | 189 | 382 | 190 | 191 | 192 | 193 |
| 381      |     |     |     |     |     |     |     |     |     |     |
| 194      |     | 195 | 196 | 363 | 197 | 362 |     |     |     |     |

# VECTURING DELAY INPUTS

FIX DELAY EVALUATION LEVEL HOLDING PCT. MAXIMUM VECTURING DELAY MINIMUM HOLDING DELAY

TAKE-OFF QUEUE SWITCH FOR RUNWAY 1 = 99 ALTERNATE RUNWAYS ARE 0 0 0 0 0

TAKE-OFF QUEUE SWITCH FOR RUNWAY 2 = 99 ALTERNATE RUNWAYS ARE 0 0 0 0 0

TAKE-OFF QUEUE SWITCH FOR RUNWAY 3 = 99 ALTERNATE RUNWAYS ARE 0 0 0 0 0

GATE HOLD LIMIT = 8 HOLD TIME = .50

GATE HOLD LIMIT = 6 HOLD TIME = .50

GATE HOLD LIMIT = 8 HOLD TIME = .50

## AIRSPACE DELAYS

FIX OCCURRENCE PERCENTAGE HOLD MEAN HOLD SIGMA

A/C DEPARTURE RUNWAY OCCUPANCY TIME IN SECONDS (A/C CLASS, MEAN, AND STD. DEV.)

|   |       |      |
|---|-------|------|
| 1 | 37.00 | 4.00 |
| 2 | 39.00 | 4.00 |
| 3 | 34.00 | 4.00 |
| 4 | 34.00 | 4.00 |

TOUCH-AND-GO RUNWAY OCCUPANCY TIME IN SECONDS (A/C CLASS, MEAN, AND STD. DEV.)

|   |      |      |
|---|------|------|
| 1 | 0.00 | 0.00 |
| 2 | 0.00 | 0.00 |
| 3 | 0.00 | 0.00 |
| 4 | 0.00 | 0.00 |

03 1 B

# GATE SERVICE TIME DISTRIBUTION (PROBABILITY VS TIME)

|         |     |     |     |     |     |     |     |      |     |
|---------|-----|-----|-----|-----|-----|-----|-----|------|-----|
| CLASS 1 |     |     |     |     |     |     |     |      |     |
| .00     | 31. | .02 | 34. | .07 | 36. | .16 | 37. | .31  | 39. |
| .40     | 39. | .45 | 40. | .50 | 40. | .55 | 40. | .60  | 41. |
| .69     | 42. | .84 | 43. | .93 | 45. | .98 | 46. | 1.00 | 49. |
| CLASS 2 |     |     |     |     |     |     |     |      |     |
| .00     | 21. | .02 | 24. | .07 | 26. | .16 | 27. | .31  | 29. |
| .40     | 29. | .45 | 30. | .50 | 30. | .55 | 30. | .60  | 31. |
| .69     | 32. | .84 | 33. | .93 | 35. | .98 | 36. | 1.00 | 39. |
| CLASS 3 |     |     |     |     |     |     |     |      |     |
| .00     | 14. | .02 | 16. | .07 | 17. | .16 | 18. | .31  | 19. |
| .40     | 20. | .45 | 20. | .50 | 20. | .55 | 20. | .51  | 21. |
| .69     | 21. | .84 | 22. | .93 | 23. | .98 | 24. | 1.00 | 26. |
| CLASS 4 |     |     |     |     |     |     |     |      |     |
| .00     | 14. | .02 | 16. | .07 | 17. | .16 | 18. | .31  | 19. |
| .40     | 20. | .45 | 20. | .50 | 20. | .55 | 20. | .51  | 21. |
| .69     | 21. | .84 | 22. | .93 | 23. | .98 | 24. | 1.00 | 26. |

## A/C APPROACH SPEED IN KNOTS (A/C CLASS, MEAN, STD. DEV.)

|   |        |      |
|---|--------|------|
| 1 | 140.00 | 5.00 |
| 2 | 130.00 | 5.00 |
| 3 | 120.00 | 5.00 |
| 4 | 100.00 | 5.00 |

## RUNWAY EXIT SELECTION--USAGE PERCENTAGE BY EACH A/C CLASS AND BY EACH RUNWAY (EXIT LINK NO. VERSUS PROBABILITY)

|               |      |      |      |      |      |      |      |      |      |
|---------------|------|------|------|------|------|------|------|------|------|
| CLASS 1 RMY 1 |      |      |      |      |      |      |      |      |      |
| 255.          | .50  | 329. | .82  | 287. | .92  | 302. | 1.00 |      |      |
| 302.          | .55  | 287. | .83  | 329. | .92  | 290. | .96  | 259. | 1.00 |
| CLASS 3 RMY 1 |      |      |      |      |      |      |      |      |      |
| 300.          | .24  | 290. | .48  | 302. | .70  | 259. | .85  | 287. | .95  |
| 298.          | 1.00 |      |      |      |      |      |      |      |      |
| CLASS 4 RMY 1 |      |      |      |      |      |      |      |      |      |
| 290.          | .50  | 302. | 1.00 |      |      |      |      |      |      |
| CLASS 1 RMY 2 |      |      |      |      |      |      |      |      |      |
| 321.          | .99  | 316. | 1.00 |      |      |      |      |      |      |
| CLASS 2 RMY 2 |      |      |      |      |      |      |      |      |      |
| 321.          | .40  | 270. | .70  | 316. | 1.00 |      |      |      |      |
| CLASS 3 RMY 2 |      |      |      |      |      |      |      |      |      |
| 321.          | .40  | 270. | .70  | 316. | 1.00 |      |      |      |      |
| CLASS 4 RMY 2 |      |      |      |      |      |      |      |      |      |
| 321.          | .40  | 270. | .70  | 316. | 1.00 |      |      |      |      |
| CLASS 1 RMY 3 |      |      |      |      |      |      |      |      |      |
| 307.          | .68  | 305. | .89  | 304. | 1.00 |      |      |      |      |
| CLASS 2 RMY 3 |      |      |      |      |      |      |      |      |      |
| 107.          | .72  | 305. | .83  | 284. | .92  | 266. | .97  | 323. | 1.00 |
| CLASS 3 RMY 3 |      |      |      |      |      |      |      |      |      |
| 107.          | .40  | 266. | .70  | 284. | .90  | 323. | 1.00 |      |      |
| CLASS 4 RMY 3 |      |      |      |      |      |      |      |      |      |
| 107.          | .40  | 266. | .70  | 284. | .90  | 323. | 1.00 |      |      |

THE ARRIVAL RUNWAY OCCUPANCY TIME IN SECONDS BY A/C CLASS (DISTANCE IN FEET FROM THRESHOLD TO EXIT TAXIWAY VERSUS TIME)

|         |       |        |       |        |       |        |       |        |       |
|---------|-------|--------|-------|--------|-------|--------|-------|--------|-------|
| CLASS 1 |       |        |       |        |       |        |       |        |       |
| 4960.0  | 52.00 | 5480.0 | 41.00 | 5640.0 | 50.00 | 6230.0 | 48.00 | 6890.0 | 60.00 |
| 6871.0  | 63.00 | 7770.0 | 61.00 | 8270.0 | 71.00 | 9220.0 | 74.00 |        |       |
| CLASS 2 |       |        |       |        |       |        |       |        |       |
| 2930.0  | 39.00 | 3810.0 | 43.00 | 4250.0 | 46.00 | 4460.0 | 42.00 | 4720.0 | 43.00 |
| 4780.0  | 48.00 | 4960.0 | 49.00 | 5480.0 | 46.00 | 5840.0 | 53.00 | 6230.0 | 50.00 |
| 6830.0  | 59.00 | 6891.0 | 59.00 | 7770.0 | 57.00 |        |       |        |       |
| CLASS 3 |       |        |       |        |       |        |       |        |       |
| 2400.0  | 34.00 | 2930.0 | 37.00 | 3390.0 | 40.00 | 3810.0 | 45.00 | 4250.0 | 46.00 |
| 4460.0  | 47.00 | 4720.0 | 49.00 | 4780.0 | 51.00 | 4960.0 | 51.00 | 5480.0 | 54.00 |
| 5840.0  | 58.00 | 6230.0 | 59.00 | 6891.0 | 63.00 |        |       |        |       |
| CLASS 4 |       |        |       |        |       |        |       |        |       |
| 2930.0  | 41.00 | 3810.0 | 50.00 | 4250.0 | 54.00 | 4460.0 | 56.00 | 4780.0 | 59.00 |
| 4960.0  | 60.00 | 5840.0 | 69.00 | 6230.0 | 73.00 | 6891.0 | 79.00 |        |       |

TAXIING SPEEDS IN MPH

5.00 10.00 15.00 20.00 25.00 30.00 5.00

A/C LATENCY DISTRIBUTION IN MINUTES (RANDOM NUMBER VERSUS TIME)

3.00



# A/C SEPARATIONS

128 SEPARATION VALUES IN 4 SETS OF 32: ARRIVAL / ARRIVAL, DEPARTURE / DEPARTURE AND ARRIVAL / DEPARTURE

EACH SET OF 32 IS COMPOSED OF 16 PAIRS OF MEAN AND STANDARD DEVIATION

FOR 16 SETS OF 32: 1. 1.0 CLASS 2. 1.0 CLASS 3. 1.0 CLASS 4. 1.0 CLASS

THERE ARE 4 A/C SEPARATION CLASSES

1. 1.0 CLASS 2. 1.0 CLASS 3. 1.0 CLASS 4. 1.0 CLASS

THE ORDER OF SETS OF (X,Y) IS:

(1,1), (1,2), (1,3), (1,4), (2,1), (2,2), (2,3), (2,4)

(3,1), (3,2), (3,3), (3,4), (4,1), (4,2), (4,3), (4,4)

LEAD A/C RUNWAY 0 TRAIL A/C FIX 0 TRAIL A/C RUNWAY 0 TRAIL A/C FIX 0

128 SEPARATION VALUES IN 4 SETS OF 32: A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)

4.11 .70 3.03 .65 5.94 .60 5.78 .50

3.25 .70 3.16 .65 3.96 .60 3.80 .50

3.25 .70 3.16 .65 3.08 .60 2.92 .50

1.94 .14 1.83 .13 1.69 .12 1.40 .11

1.94 .14 1.93 .13 1.69 .12 1.40 .11

1.72 .14 1.60 .13 1.47 .12 1.22 .11

1.72 .14 1.60 .13 1.47 .12 1.22 .11

1.50 .08 2.00 .08 2.00 .08 2.00 .08

1.00 .08 1.00 .08 .83 .08 .83 .08

.83 .08 .75 .08 .58 .08 .58 .08

.83 .08 .75 .08 .58 .08 .58 .08

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TABLE 5

AIRCRAFT SEPARATIONS  
1978 VFR1, WESTERLY CONFIGURATION



128 SEPARATION VALUES IN 4 SETS OF 32, ARRIVAL / ARRIVAL, DEPARTURE / DEPARTURE AND ARRIVAL / DEPARTURE  
EACH SET OF 32 IS COMPOSED OF 16 PAIRS OF MEAN AND STANDARD DEVIATION  
THE 16 SETS ARE POSSIBLE WAYS OF A/C CLASS X FOLLOWED BY A/C CLASS Y  
THERE ARE 4 A/C CLASSES --- 1 D CLASS

THE ORDER OF SETS OF  $(x, y)$  IS ]

$(1,1), (1,2), (1,3), (1,4), (2,1), (2,2), (2,3), (2,4)$   
 $(3,1), (3,2), (3,3), (3,4), (4,1), (4,2), (4,3), (4,4)$

LEAD A/C RUNWAY 0 LEAD A/C FIX 0 TRAIL A/C RUNWAY 0 TRAIL A/C FIX 0  
120 SEPARATION VALUES IN 4 SETS OF 32; A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)

[illegible]

LEAD A/C RUNWAY 1 LEAD A/C FIX 0 TRAIL A/C RUNWAY 3 TRAIL A/C FIX 0  
128 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)

[illegible]

**AIRCRAFT SEPARATIONS  
1978 IFRI, WESTERLY CONFIGURATION**

[illegible]

| LEAD A/C RUNWAY                                                                                       | 2   | LEAD A/C FIX 0 | TRAIL A/C KUNHAY 3 | TRAIL A/C FIX 0 |
|-------------------------------------------------------------------------------------------------------|-----|----------------|--------------------|-----------------|
| 12M SEPARATION VALUES IN 4 SETS OF 32, A/A (IN-MILES), D/A (N-MILES), D/D (MINUTES) AND A/D (MINUTES) |     |                |                    |                 |
| 7.56                                                                                                  | .70 | 6.57           | .65                | 7.59            |
|                                                                                                       |     |                |                    | .50             |
|                                                                                                       | .70 | 4.37           | .65                | 5.39            |
|                                                                                                       |     |                |                    | .50             |
| 4.46                                                                                                  | .70 | 4.37           | .65                | 4.29            |
|                                                                                                       |     |                |                    | .50             |
| 4.46                                                                                                  | .70 | 4.37           | .65                | 4.29            |
|                                                                                                       |     |                |                    | .50             |
| 1.21                                                                                                  | .14 | 1.20           | .13                | 1.20            |
|                                                                                                       |     |                |                    | .11             |
| 1.21                                                                                                  | .14 | 1.20           | .13                | 1.20            |
|                                                                                                       |     |                |                    | .11             |
| 1.20                                                                                                  | .14 | 1.20           | .13                | 1.20            |
|                                                                                                       |     |                |                    | .11             |
| 1.20                                                                                                  | .14 | 1.20           | .13                | 1.20            |
|                                                                                                       |     |                |                    | .11             |
| .50                                                                                                   | .09 | .66            | .08                | .66             |
|                                                                                                       |     |                |                    | .08             |
| .33                                                                                                   | .08 | .33            | .08                | .33             |
|                                                                                                       |     |                |                    | .08             |
| .33                                                                                                   | .08 | .33            | .08                | .33             |
|                                                                                                       |     |                |                    | .08             |
| .33                                                                                                   | .08 | .33            | .08                | .33             |
|                                                                                                       |     |                |                    | .08             |
| .31                                                                                                   | .16 | .31            | .16                | .31             |
|                                                                                                       |     |                |                    | .16             |
| .26                                                                                                   | .14 | .26            | .14                | .26             |
|                                                                                                       |     |                |                    | .14             |
| .26                                                                                                   | .14 | .26            | .14                | .26             |
|                                                                                                       |     |                |                    | .18             |
| .26                                                                                                   | .24 | .26            | .24                | .26             |
|                                                                                                       |     |                |                    | .24             |

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| LEAD A/C RUNWAY 3                                                                                    |      | LEAD A/C FIX 0 |      | TRAIL A/C RUNWAY 2 |      | TRAIL A/C FIX 0 |      |     |
|------------------------------------------------------------------------------------------------------|------|----------------|------|--------------------|------|-----------------|------|-----|
| T28 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES) |      |                |      |                    |      |                 |      |     |
| 70                                                                                                   | 4.56 | 70             | 4.57 | 65                 | 7.59 | 60              | 7.43 | .50 |
| 70                                                                                                   | 4.46 | 70             | 4.37 | 65                 | 5.39 | 60              | 5.23 | .50 |
| 70                                                                                                   | 4.46 | 70             | 4.37 | 65                 | 4.29 | 60              | 4.13 | .50 |
| 70                                                                                                   | 4.46 | 70             | 4.37 | 65                 | 4.29 | 60              | 4.13 | .50 |
| 14                                                                                                   | 1.21 | 14             | 1.20 | 13                 | 1.20 | 12              | 1.20 | .11 |
| 14                                                                                                   | 1.21 | 14             | 1.20 | 13                 | 1.20 | 12              | 1.20 | .11 |
| 14                                                                                                   | 1.20 | 14             | 1.20 | 13                 | 1.20 | 12              | 1.20 | .11 |
| 14                                                                                                   | 1.20 | 14             | 1.20 | 13                 | 1.20 | 12              | 1.20 | .11 |
| 50                                                                                                   | .50  | 50             | .66  | .08                | .66  | .08             | .66  | .08 |
| 33                                                                                                   | .33  | 33             | .33  | .08                | .33  | .08             | .33  | .08 |
| 33                                                                                                   | .33  | 33             | .33  | .08                | .33  | .08             | .33  | .08 |
| 33                                                                                                   | .33  | 33             | .33  | .08                | .33  | .08             | .33  | .08 |
| 31                                                                                                   | .31  | 31             | .16  | .16                | .31  | .16             | .31  | .16 |
| 14                                                                                                   | .26  | 14             | .28  | .14                | .26  | .14             | .28  | .14 |
| 26                                                                                                   | .26  | 26             | .26  | .18                | .26  | .18             | .26  | .18 |
| 26                                                                                                   | .26  | 26             | .26  | .24                | .26  | .24             | .26  | .24 |

**TABLE 6**  
**(continued)**

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|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99  | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |     |

**AIRCRAFT SEPARATIONS  
1978 IFRI, TWO MILE IN-TRAIL  
STAGGERED PARALLEL APPROACHES,  
WESTERLY CONFIGURATION**

LF40 A/C RUNWAY 3 LF40 A/C RUNWAY 1 TRAIL A/C FTX 0  
124 SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (N.MILES), C/D (MINUTES) AND A/D (MINUTES)

[illegible]

LEAD A/C KUNWAY 2 LEAD A/C FIX 0 TRAIL A/C KUNWAY 3 TRAIL A/C FIX 0

|      |     |      |     |      |     |      |     |
|------|-----|------|-----|------|-----|------|-----|
| 5.56 | .70 | 6.57 | .65 | 7.59 | .60 | 7.43 | .50 |
| 4.46 | .70 | 4.37 | .65 | 5.39 | .60 | 5.23 | .50 |
| 4.46 | .70 | 4.37 | .65 | 4.29 | .60 | 4.13 | .50 |
| 4.46 | .70 | 4.37 | .65 | 4.29 | .60 | 4.13 | .50 |
| 1.21 | .14 | 1.20 | .13 | 1.20 | .12 | 1.20 | .11 |
| 1.21 | .14 | 1.20 | .13 | 1.20 | .12 | 1.20 | .11 |
| 1.20 | .14 | 1.20 | .13 | 1.20 | .12 | 1.20 | .11 |
| 1.20 | .14 | 1.20 | .13 | 1.20 | .12 | 1.20 | .11 |
| .50  | .08 | .64  | .03 | .66  | .08 | .66  | .06 |
| .13  | .08 | .33  | .08 | .33  | .08 | .33  | .08 |
| .33  | .04 | .33  | .04 | .33  | .08 | .33  | .08 |
| .33  | .03 | .33  | .03 | .33  | .08 | .33  | .08 |
| .31  | .19 | .31  | .16 | .31  | .16 | .31  | .16 |
| .28  | .14 | .23  | .14 | .26  | .14 | .28  | .14 |
| .26  | .15 | .26  | .18 | .26  | .18 | .26  | .18 |
| .26  | .24 | .26  | .24 | .26  | .24 | .26  | .24 |

LEAD A/C SUMMEY 3 LEAD A/C FIX 0 TRAIL A/C SUMMEY 2 TRAIL A/C FIX 0  
12P SEPARATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/D (MINUTES) AND A/D (MINUTES)

|      |     |      |     |      |     |      |     |
|------|-----|------|-----|------|-----|------|-----|
| 3.56 | .70 | 6.57 | .65 | 7.59 | .60 | 7.43 | .50 |
| 4.46 | .70 | 4.37 | .65 | 5.39 | .60 | 5.23 | .50 |
| 4.46 | .70 | 4.37 | .65 | 4.29 | .60 | 4.13 | .50 |
| 4.46 | .70 | 4.37 | .65 | 4.29 | .60 | 4.13 | .50 |
| 1.21 | .14 | 1.20 | .13 | 1.20 | .12 | 1.20 | .11 |
| 1.21 | .14 | 1.20 | .13 | 1.20 | .12 | 1.20 | .11 |
| 1.20 | .14 | 1.20 | .13 | 1.20 | .12 | 1.20 | .11 |
| 1.20 | .14 | 1.20 | .13 | 1.20 | .12 | 1.20 | .11 |
| .50  | .05 | .56  | .08 | .66  | .03 | .66  | .08 |
| .31  | .03 | .33  | .04 | .33  | .04 | .33  | .08 |
| .33  | .02 | .33  | .03 | .33  | .03 | .33  | .08 |
| .33  | .08 | .33  | .03 | .33  | .08 | .33  | .08 |
| .31  | .16 | .31  | .16 | .31  | .16 | .31  | .16 |
| .29  | .14 | .28  | .14 | .24  | .14 | .28  | .14 |
| .27  | .13 | .26  | .18 | .26  | .13 | .26  | .18 |
| .26  | .24 | .26  | .24 | .26  | .24 | .26  | .24 |

TABLE 7  
(continued)

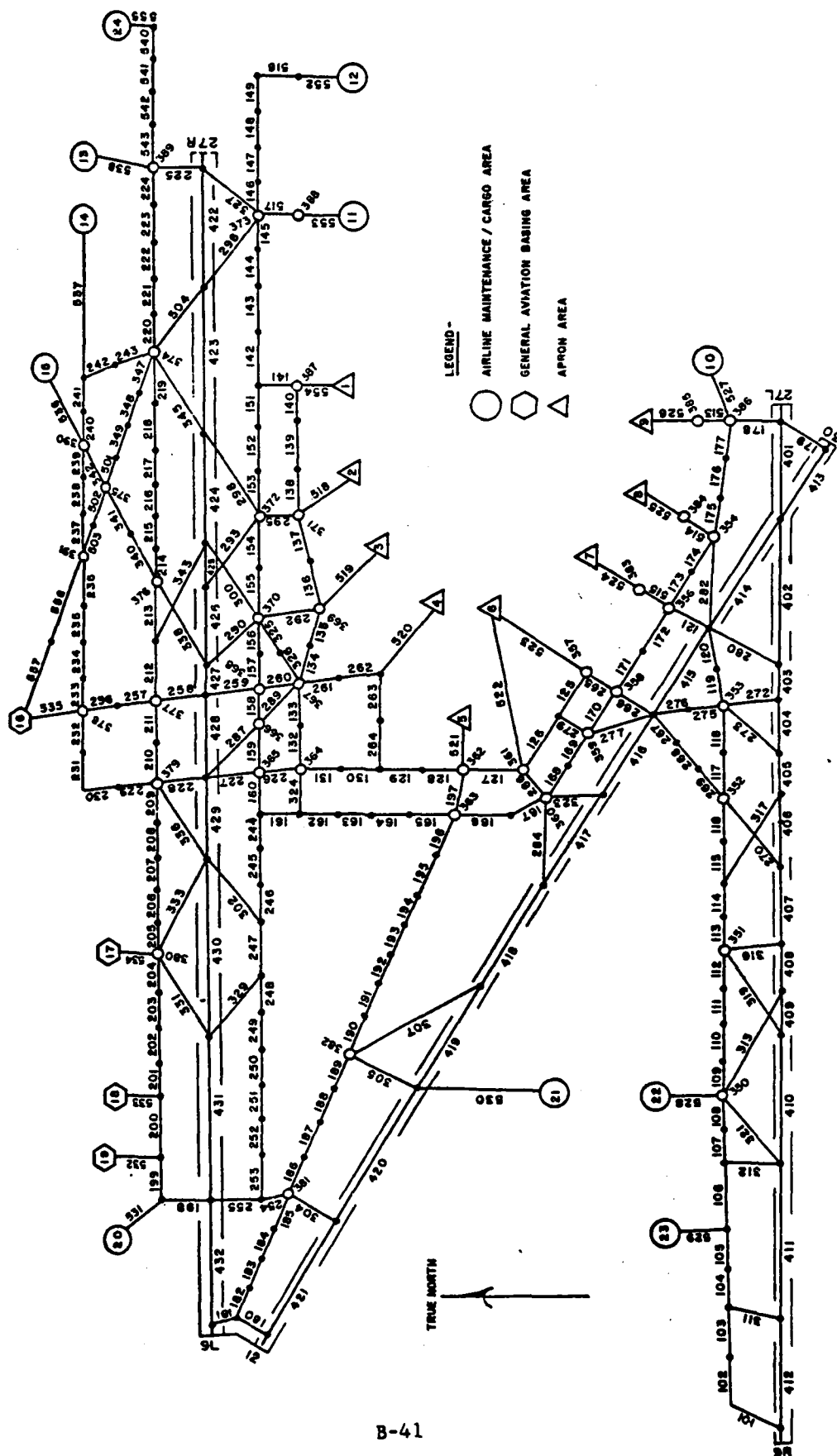
[illegible]

LEAD A/C RUNWAY 2 LEAD A/C FIX 0 TRAIL A/C RUNWAY 1 TRAIL A/C FIX 0  
 294. REGISTRATION VALUES IN 4 SETS OF 32, A/A (N.MILES), D/A (N.MILES), D/D (H.MINUTES) AND A/D (H.MINUTES)

[illegible]

| VECTORIZING DELAY INPUTS |                        |              |                           |
|--------------------------|------------------------|--------------|---------------------------|
| FIX                      | DELAY EVALUATION LEVEL | HULCING PCT. | MAXIMUM VECTORIZING DELAY |
|                          |                        |              | MINIMUM HOLDING DELAY     |

TABLE 7  
(continued)



Attachment C

MIAMI DELAY EXPERIMENTS  
STAGE 1 and STAGE 2

Data Package No. 5  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
February 1980

**TABLE 8**  
**MIAMI DELAY EXPERIMENTS\***  
**STAGE 1**

| Experiment Number | Model            | Study Case <sup>a</sup> | Arrival Runways | Departure Runways | Weather | Demand            | ATC System Scenario <sup>b</sup> | Near-term Improvements <sup>c</sup>         |
|-------------------|------------------|-------------------------|-----------------|-------------------|---------|-------------------|----------------------------------|---------------------------------------------|
| 1                 | ASM <sup>d</sup> | 1                       | 9L, 9R, 12      | 9L, 9R, 12        | VFR1    | Today's           | Today's                          | None                                        |
| 7                 | ASM              | 1                       | 9L, 9R, 12      | 9L, 9R, 12        | VFR1    | 1983 <sup>1</sup> | Today's                          | None (Full G. A.)                           |
| 11                | ASM              | 1                       | 9L, 9R, 12      | 9L, 9R, 12        | VFR1    | 1983 <sup>1</sup> | 1983                             | 1983 <sup>e</sup> (Full G. A.)              |
| 14                | ASM              | 1                       | 9L, 9R, 12      | 9L, 9R, 12        | VFR1    | 1983 <sup>m</sup> | 1983                             | 1983 <sup>e</sup> , g (50% G. A. Reduction) |
| 4                 | ASM              | 4                       | 9L, 9R          | 9L, 9R, 12        | IFR1    | Today's           | Today's                          | None                                        |
| 34                | ASM              | 4                       | 9L, 9R          | 9L, 9R, 12        | IFR1    | 1983 <sup>1</sup> | Today's                          | None (Full G. A.)                           |
| 9                 | ASM              | 4                       | 9L, 9R          | 9L, 9R, 12        | IFR1    | 1983 <sup>m</sup> | 1983                             | g (50% G. A. Reduction)                     |
| 35                | ASM              | 4                       | 9L, 9R          | 9L, 9R, 12        | IFR1    | 1983 <sup>m</sup> | 1983                             | 1983 <sup>e</sup> , g (50% G. A. Reduction) |
| 6                 | ASM              | 8                       | None            | 9L                | IFR2    | Today's           | Today's                          | None                                        |
| 10                | ASM              | 8                       | None            | 9L                | IFR2    | 1983 <sup>m</sup> | 1983                             | g (50% G. A. Reduction)                     |
| 21                | ASM              | 9                       | 9L, 9R          | 9L, 9R, 12        | IFR2    | 1983 <sup>m</sup> | 1983                             | 1983 <sup>e</sup> , g (50% G. A. Reduction) |
| 2                 | ASM              | 2                       | 27L, 27R, 30    | 27L, 27R, 30      | VFR1    | Today's           | Today's                          | None                                        |
| 8                 | ASM              | 2                       | 27L, 27R, 30    | 27L, 27R, 30      | VFR1    | 1983 <sup>1</sup> | Today's                          | None (Full G. A.)                           |
| 36                | ASM              | 2                       | 27L, 27R, 30    | 27L, 27R, 30      | VFR1    | 1983 <sup>1</sup> | 1983                             | 1983 <sup>e</sup> (Full G. A.)              |
| 37                | ASM              | 2                       | 27L, 27R, 30    | 27L, 27R, 30      | VFR1    | 1983 <sup>m</sup> | 1983                             | 1983 <sup>e</sup> , g (50% G. A. Reduction) |
| 3                 | ASM              | 3                       | 27L, 27R        | 27L, 27R, 30      | VFR2    | Today's           | Today's                          | None                                        |
| 38                | ASM              | 3                       | 27L, 27R        | 27L, 27R, 30      | VFR2    | 1983 <sup>m</sup> | Today's                          | None (Full G. A.)                           |
| 17                | ASM              | 3                       | 27L, 27R        | 27L, 27R, 30      | VFR2    | 1983 <sup>m</sup> | 1983                             | g (50% G. A. Reduction)                     |
| 12                | ASM              | 7                       | 27R, 30         | 27L, 27R          | VFR2    | 1983 <sup>m</sup> | 1983                             | 1983 <sup>e</sup> , g (50% G. A. Reduction) |
| 5                 | ASM              | 5                       | 27L, 27R        | 27L, 27R          | IFR1    | Today's           | Today's                          | None                                        |
| 39                | ASM              | 5                       | 27L, 27R        | 27L, 27R          | IFR1    | 1983 <sup>1</sup> | Today's                          | None (Full G. A.)                           |
| 15                | ASM              | 5                       | 27L, 27R        | 27L, 27R          | IFR1    | 1983 <sup>1</sup> | 1983                             | 1983 <sup>e</sup> (Full G. A.)              |
| 20                | ASM              | 5                       | 27L, 27R        | 27L, 27R          | IFR1    | 1983 <sup>m</sup> | 1983                             | 1983 <sup>e</sup> , g (50% G. A. Reduction) |
| 12A               | ASM              | 7                       | 27R, 30         | 27L, 27R          | VFR2    | 1983 <sup>m</sup> | 1983                             | 1983 <sup>e</sup> , g (50% G. A. Reduction) |
| 24                | ASM              | 5                       | 27L, 27R        | 27L, 27R          | IFR1    | Today's           | Today's                          | <sup>i</sup>                                |

<sup>a</sup> Study cases are defined in Figure III-1 of the Miami International Airport Technical Plan (Oct. 1978).

<sup>b</sup> FAA will describe impact of pre-1985 and post-1985 ATC systems on model inputs (as per report No. FAA-EM-78-8A).

<sup>c</sup> Near-term improvements are described in Appendix B of the Miami International Airport Technical Plan.

<sup>d</sup> Airfield Simulation Model.

<sup>e</sup> Improvement items 1, 2, 3, 7, 9, and 10 as defined by the Miami Delay Studies' Task Force on 3/16/79 are modeled in these experiments.

<sup>g</sup> 50% reduction in general aviation achieved by upgrading Opa Locka and Tamiami General Aviation Reliever Airports.

<sup>i</sup> Improvement #6 is the use of 2 mile in-trail staggered parallel approaches.

<sup>1</sup> 1983 full schedule assumes no G. A. relocation out of Miami between 1978 and 1983.

<sup>m</sup> 1983 limited schedule assumes a 50% G. A. reduction at Miami due to upgrading of reliever airports.

<sup>p</sup> All improvements of footnote "e" except for improvement item #10 (aircraft are being towed instead of taxied in 12A).

\*Stage 1 experiments as revised by discussions with the Miami Delay Studies' Task Force since 1/24/79

TABLE 9  
MIAMI DELAY EXPERIMENTS\*  
STAGE 2

| Experiment Number | Model            | Study Case | Arrival Runways | Departure Runways | Weather | Demand                 | ATC             |                          |
|-------------------|------------------|------------|-----------------|-------------------|---------|------------------------|-----------------|--------------------------|
|                   |                  |            |                 |                   |         |                        | System Scenario | Near-term Improvements   |
| 16                | ADM <sup>h</sup> | n.a.       | n.a.            | n.a.              | n.a.    | Todays                 | Todays          | None                     |
| 29                | ADM              | n.a.       | n.a.            | n.a.              | n.a.    | Pre-1985 <sup>m</sup>  | Todays          | None                     |
| 27                | ADM              | n.a.       | n.a.            | n.a.              | n.a.    | Pre-1985 <sup>m</sup>  | Pre-1985        | None                     |
| 28                | ADM              | n.a.       | n.a.            | n.a.              | n.a.    | Pre-1985 <sup>m</sup>  | Todays          | Pre-1985 <sup>e, g</sup> |
| 26                | ADM              | n.a.       | n.a.            | n.a.              | n.a.    | Pre-1985 <sup>m</sup>  | Pre-1985        | Pre-1985 <sup>e, g</sup> |
| 33                | ADM              | n.a.       | n.a.            | n.a.              | n.a.    | Post-1985 <sup>q</sup> | Todays          | None                     |
| 30                | ADM              | n.a.       | n.a.            | n.a.              | n.a.    | Post-1985 <sup>q</sup> | Post-1985       | None                     |
| 32                | ADM              | n.a.       | n.a.            | n.a.              | n.a.    | Post-1985 <sup>q</sup> | Todays          | Post-1985 <sup>r</sup>   |
| 31                | ADM              | n.a.       | n.a.            | n.a.              | n.a.    | Post-1985 <sup>q</sup> | Post-1985       | Post-1985 <sup>r</sup>   |

<sup>e</sup>Improvement items 1, 2, 3, 7, 9, and 10 as defined by the Miami Delay Studies' Task Force on 3/16/79.

<sup>g</sup>50% reduction in general aviation achieved by upgrading Opa Locka and Tamiami General Aviation Reliever Airports.

<sup>h</sup>Annual Delay Model

<sup>m</sup>1983 limited schedule assumes a 50% G. A. reduction at Miami due to upgrading of reliever airports.

<sup>q</sup>Post-1985 Demand to be provided by the Miami Delay Studies' Task Force.

<sup>r</sup>Post-1985 Improvement Package to be provided by the Miami Delay Studies' Task Force.

\*Stage 2 experiments as revised by discussions with the Miami Delay Studies' Task Force since 1/24/79

Attachment D

EXPERIMENTAL RESULTS  
MIAMI STAGE 1 DELAY EXPERIMENTS

Data Package No. 5  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
February 1980

This section presents the results of twelve selected Miami experiments. These results comprise all Stage 1 model runs that utilize "today's" ATC System scenario and taxiway system.

The results are arranged in sets to illustrate various comparisons requested by the Task Force members. VFR and IFR weather conditions have been separated along with each configuration:

- Set 1: VFR EAST- Exp. Nos. 1 and 7.
- Set 2: IFR EAST- Exp. Nos. 4, 34 and 6.
- Set 3: VFR WEST- Exp. Nos. 2, 8, 3 and 38.
- Set 4: IFR WEST- Exp. Nos. 5, 39 and 24.

Each experiment's summary contains a description of the objective, the runway configuration, the related comparison experiments and a table of results. Plots are also included which illustrate key comparisons between experiments.

TABLE 10

SET - 1 DEMAND  
VFR-EASTERLY FLOW

| EXPERIMENT<br>NUMBER |            | RUNWAY<br>9R | RUNWAY<br>9L | RUNWAY<br>12 | TOTAL |
|----------------------|------------|--------------|--------------|--------------|-------|
| 1                    | ARRIVALS   | 142          | 167          | 4            | 313   |
|                      | DEPARTURES | 104          | 167          | 31           | 302   |
|                      | TOTAL      | 246          | 334          | 35           | 615   |
| 7                    | ARRIVALS   | 196          | 194          | 5            | 395   |
|                      | DEPARTURES | 130          | 200          | 40           | 370   |
|                      | TOTAL      | 326          | 394          | 45           | 765   |
|                      | ARRIVALS   |              |              |              |       |
|                      | DEPARTURES |              |              |              |       |
|                      | TOTAL      |              |              |              |       |
|                      | ARRIVALS   |              |              |              |       |
|                      | DEPARTURES |              |              |              |       |
|                      | TOTAL      |              |              |              |       |
|                      | ARRIVALS   |              |              |              |       |
|                      | DEPARTURES |              |              |              |       |
|                      | TOTAL      |              |              |              |       |
|                      | ARRIVALS   |              |              |              |       |
|                      | DEPARTURES |              |              |              |       |
|                      | TOTAL      |              |              |              |       |
|                      | ARRIVALS   |              |              |              |       |
|                      | DEPARTURES |              |              |              |       |
|                      | TOTAL      |              |              |              |       |

## EXPERIMENT NO. 1

### Objective:

To obtain baseline delay estimates for the following runway configuration in VFR1 for 1978 demand:

#### Arrival Runways

9L,9R,12

#### Departure Runways

9R,9L,12

### Related Comparison Experiments:

Calibration was performed using this easterly configuration. Inputs to this experiment were similar, but with 1978 demand.

Experiment 4 examines this configuration with IFR1 weather and 1978 demand.

Experiment 7 compares to this baseline case, wherein demand is increased to the 1983 level under VFR1 conditions.

Data Package No. 5  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
February 1980

TABLE 11

## EXPERIMENT 1 RESULTS

MIAMI INTER. AIRPORT EXPER.-1 ROUTES=1978 CONFIG=A SEPAR=78VFR1 DEMAND=78

| TIME           | AVERAGE FLOW RATES |        |        |        |        |            |        |        |        |        | AVERAGE TRAVEL TIME |           |                |           |
|----------------|--------------------|--------|--------|--------|--------|------------|--------|--------|--------|--------|---------------------|-----------|----------------|-----------|
|                | ARRIVALS           |        |        |        |        | DEPARTURES |        |        |        |        | FIX TO THRESH       |           | THRESH TO GATE |           |
|                | RWY 9L             | RWY 12 | RWY 9L | RWY 12 | RWY 9L | RWY 12     | RWY 9L | RWY 12 | RWY 9L | RWY 12 | TO GATE             | TO GATE   | TO GATE        | TO GATE   |
| 1100-1200      | 22.9               | 21.5   | 0.0    | 0.0    | 0.0    | 44.4       | 46.0   | -1.6   | 1.8    | 14.0   | 1.0                 | 0.0       | 0.0            | 16.8      |
| 1200-1300      | 25.1               | 22.5   | 0.0    | 0.0    | 0.0    | 47.6       | 47.0   | .6     | 15.2   | 15.0   | 4.0                 | 0.0       | 0.0            | 34.2      |
| 1300-1400      | 12.0               | 22.0   | 1.0    | 0.0    | 0.0    | 35.0       | 34.0   | 1.0    | 21.0   | 19.0   | 8.9                 | 0.0       | 0.0            | 48.9      |
| 1400-1500      | 22.7               | 19.9   | 0.0    | 0.0    | 0.0    | 42.6       | 46.0   | -3.4   | 7.0    | 27.9   | 1.1                 | 0.0       | 0.0            | 36.0      |
| 1500-1600      | 18.3               | 23.1   | 0.0    | 0.0    | 0.0    | 41.4       | 38.0   | 3.4    | 10.9   | 15.1   | 3.0                 | 0.0       | 0.0            | 29.0      |
| 1600-1700      | 22.0               | 25.0   | 0.0    | 0.0    | 0.0    | 47.0       | 47.0   | 0.0    | 11.5   | 24.0   | 3.0                 | 0.0       | 0.0            | 38.5      |
| 1700-1800      | 6.0                | 15.0   | 3.0    | 0.0    | 0.0    | 24.0       | 24.0   | 0.0    | 18.6   | 19.0   | 4.0                 | 0.0       | 0.0            | 41.6      |
| 1800-1900      | 13.0               | 18.0   | 0.0    | 0.0    | 0.0    | 31.0       | 31.0   | 0.0    | 9.0    | 22.0   | 3.0                 | 0.0       | 0.0            | 34.0      |
| 1900-2000      | 0.0                | 0.0    | 0.0    | 0.0    | 0.0    | 0.0        | 0.0    | 0.0    | 2.0    | 5.0    | 2.0                 | 0.0       | 0.0            | 9.0       |
| AVERAGE DELAYS |                    |        |        |        |        |            |        |        |        |        |                     |           |                |           |
| TIME           | ARRIVALS           |        |        |        |        | DEPARTURES |        |        |        |        | AVERAGE DELAYS      |           |                |           |
|                | RWY 9L             | RWY 12 | RWY 9L | RWY 12 | RWY 9L | RWY 12     | RWY 9L | RWY 12 | RWY 9L | RWY 12 | ARR DELAY           | DEP DELAY | ARR DELAY      | DEP DELAY |
| 1100-1200      | 1.0                | .5     | 0.0    | 0.0    | 0.0    | 0.0        | .7     | .0     | 1      | 2.0    | 2.0                 | 3.3       | 0.0            | 0.0       |
| 1200-1300      | 1.2                | 3.1    | 0.0    | 0.0    | 0.0    | 2.1        | .0     | .3     | 5.7    | 2.6    | 2.4                 | 0.0       | 0.0            | 3.9       |
| 1300-1400      | .4                 | 1.3    | .3     | 0.0    | 0.0    | 1.0        | .0     | .0     | 3.6    | 2.5    | 3.7                 | 0.0       | 0.0            | 3.2       |
| 1400-1500      | 1.0                | 1.4    | 0.0    | 0.0    | 0.0    | 1.2        | .0     | .1     | 1.7    | 4.3    | 2.0                 | 0.0       | 0.0            | 3.7       |
| 1500-1600      | 1.6                | 2.2    | 0.0    | 0.0    | 0.0    | 1.9        | .0     | .3     | 2.2    | 2.5    | .8                  | 0.0       | 0.0            | 2.2       |
| 1600-1700      | 2.0                | 3.0    | 0.0    | 0.0    | 0.0    | 2.5        | .0     | .1     | 2.5    | 6.1    | 1.3                 | 0.0       | 0.0            | 4.7       |
| 1700-1800      | 0.0                | 2.1    | 2.2    | 0.0    | 0.0    | 1.6        | .0     | .0     | 1.3    | 1.5    | 1.3                 | 0.0       | 0.0            | 1.4       |
| 1800-1900      | .4                 | .7     | 0.0    | 0.0    | 0.0    | .6         | 0.0    | .1     | .9     | 2.9    | .3                  | 0.0       | 0.0            | 2.1       |
| 1900-2000      | 0.0                | 0.0    | 0.0    | 0.0    | 0.0    | 0.0        | 0.0    | 0.0    | 0.0    | .1     | 0.0                 | 0.0       | 0.0            | .0        |
| GRAND TOTAL    |                    |        |        |        |        |            |        |        |        |        |                     |           |                |           |
|                |                    |        |        |        |        |            |        |        |        |        | AVERAGE DELAYS      |           |                |           |
|                |                    |        |        |        |        |            |        |        |        |        | ARR DELAY           | DEP DELAY | ARR DELAY      | DEP DELAY |
|                |                    |        |        |        |        |            |        |        |        |        | .9                  | 2.3       | .9             | 2.3       |
|                |                    |        |        |        |        |            |        |        |        |        | 2.5                 | 4.3       | 2.5            | 4.3       |
|                |                    |        |        |        |        |            |        |        |        |        | 1.0                 | 3.7       | 1.0            | 3.7       |
|                |                    |        |        |        |        |            |        |        |        |        | 1.3                 | 3.9       | 1.3            | 3.9       |
|                |                    |        |        |        |        |            |        |        |        |        | 2.2                 | 2.5       | 2.2            | 2.5       |
|                |                    |        |        |        |        |            |        |        |        |        | 2.6                 | 5.1       | 2.6            | 5.1       |
|                |                    |        |        |        |        |            |        |        |        |        | 1.6                 | 1.6       | 1.6            | 1.6       |
|                |                    |        |        |        |        |            |        |        |        |        | .6                  | 2.4       | .6             | 2.4       |
|                |                    |        |        |        |        |            |        |        |        |        | 0.0                 | .0        | 0.0            | .0        |

## EXPERIMENT NO. 7

### Objective:

To assess the delay impact to aircraft in 1983 for the following runway configuration under VFR1 conditions, assuming no airport or ATC system improvements have been implemented:

Arrival Runways

9L, 9R, 12

Departure Runways

9R, 9L, 12

### Related Comparison Experiments:

Prior experiment 1 serves as the 1978 demand level baseline for comparison to this experiment.

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## EXPERIMENT 7 RESULTS

MIAMI INTER. AIRPORT EXPER.-7 ROUTES=1978 CONFIG=A SEPAR=78VFR1 DEMAND=83

**D-7**

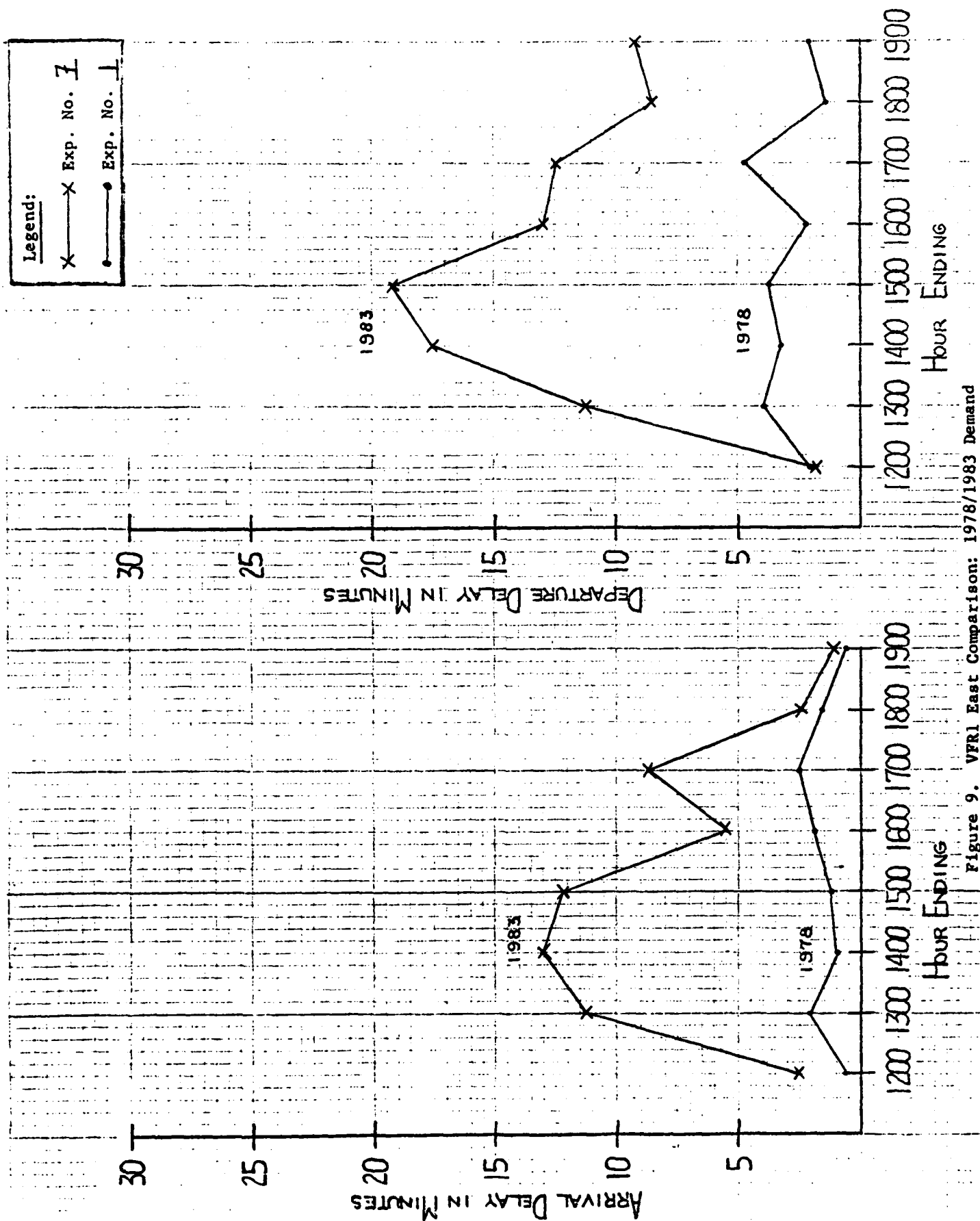


Figure 9. VFR1 East Comparison: 1978/1983 Demand

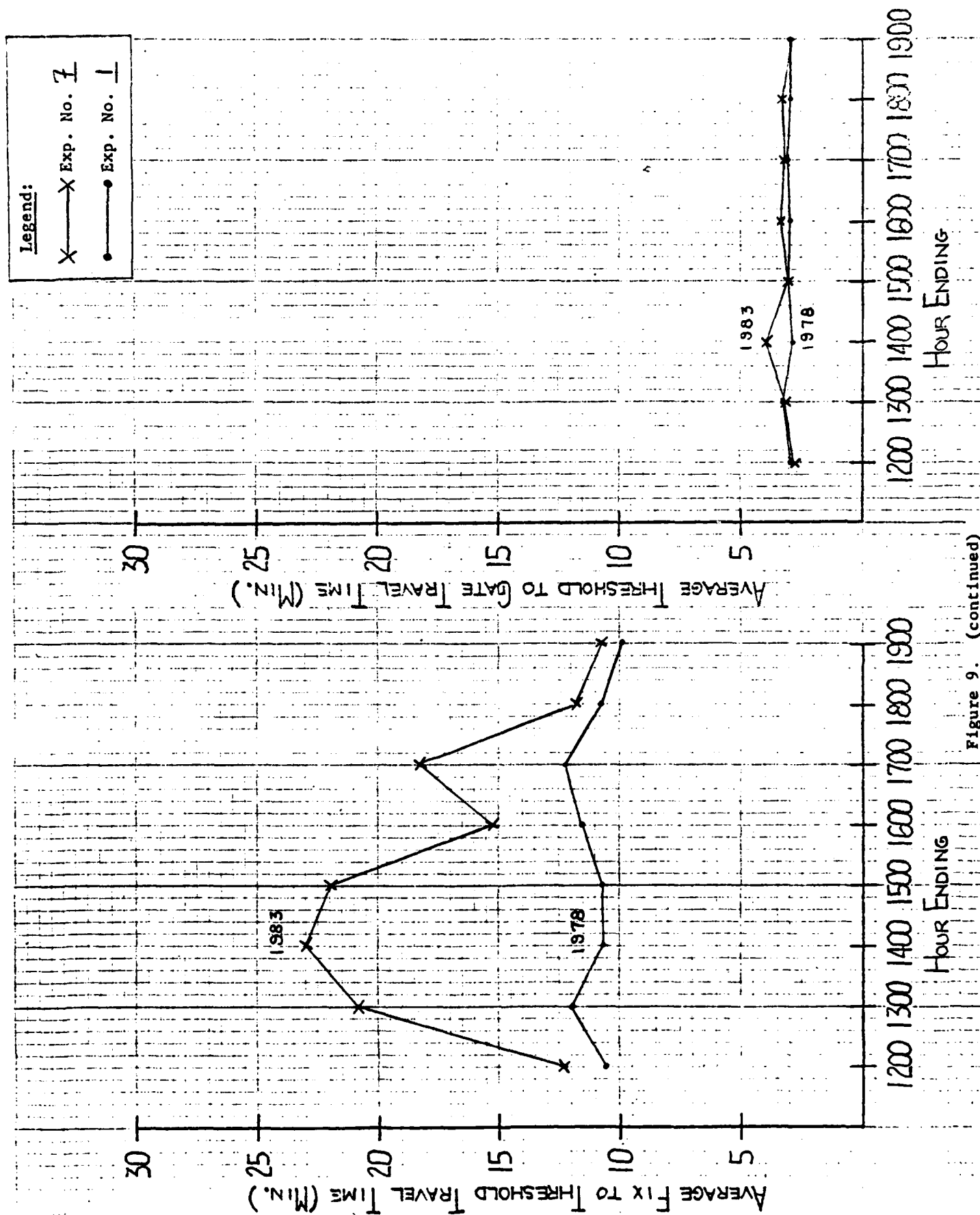


Figure 9. (continued)

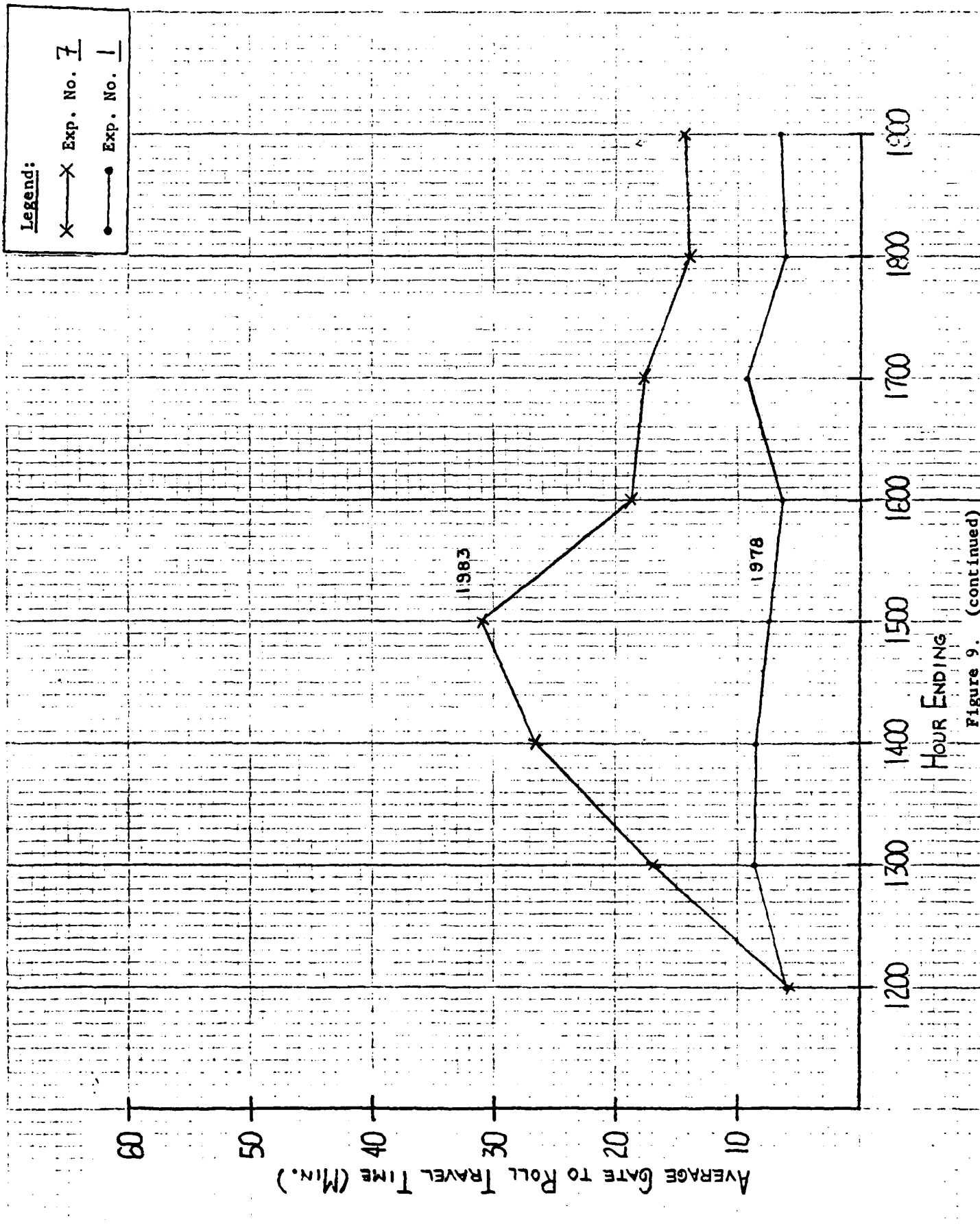


Figure 9. (continued)

TABLE 13

SET - 2 DEMAND  
IFR-EASTERLY FLOW

| EXPERIMENT<br>NUMBER |            | RUNWAY<br>9R | RUNWAY<br>9L | RUNWAY<br>12 | TOTAL |
|----------------------|------------|--------------|--------------|--------------|-------|
| 4 AND 6              | ARRIVALS   | 133          | 135          | 0            | 268   |
|                      | DEPARTURES | 102          | 139          | 29           | 270   |
|                      | TOTAL      | 235          | 274          | 29           | 538   |
| 34                   | ARRIVALS   | 196          | 151          | 0            | 347   |
|                      | DEPARTURES | 128          | 166          | 38           | 332   |
|                      | TOTAL      | 324          | 317          | 38           | 679   |
|                      | ARRIVALS   |              |              |              |       |
|                      | DEPARTURES |              |              |              |       |
|                      | TOTAL      |              |              |              |       |
|                      | ARRIVALS   |              |              |              |       |
|                      | DEPARTURES |              |              |              |       |
|                      | TOTAL      |              |              |              |       |
|                      | ARRIVALS   |              |              |              |       |
|                      | DEPARTURES |              |              |              |       |
|                      | TOTAL      |              |              |              |       |
|                      | ARRIVALS   |              |              |              |       |
|                      | DEPARTURES |              |              |              |       |
|                      | TOTAL      |              |              |              |       |
|                      | ARRIVALS   |              |              |              |       |
|                      | DEPARTURES |              |              |              |       |
|                      | TOTAL      |              |              |              |       |

NOTE: Runway closure during the IFR-2 time period in Experiment No. 6 is performed by the model.

## EXPERIMENT NO. 4

### Objective:

To obtain baseline delay estimates for the following runway configuration in IFR1 for 1978 demand:

Arrival Runways

Departure Runways

9L,9R

9R,9L,12

### Related Comparison Experiments:

Prior experiment 1 examines this configuration with VFR1 weather and 1978 demand.

Experiment 6 assesses the delay impact of moving from IFR1 to IFR2 conditions.

Experiment 34 also compares to this study case, wherein demand is increased to the 1983 level under IFR1 conditions.

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TABLE 14

## EXPERIMENT 4 RESULTS

MIAMI INTER. AIRPORT EXPER.-4 ROUTES=1978 CONFIG=A SEPAR=78IFR1 DEMAND=78

| TIME           | AVERAGE FLOW RATES |        |        |        |        |            |        |        |        |         | AVERAGE TRAVEL TIME |         |              |              |
|----------------|--------------------|--------|--------|--------|--------|------------|--------|--------|--------|---------|---------------------|---------|--------------|--------------|
|                | ARRIVALS           |        |        |        |        | DEPARTURES |        |        |        |         | FIX TO THRESH       |         | GATE TO ROLL |              |
|                | RWY 9R             | RWY 12 | RWY 9L | RWY 12 | DIF    | RWY 9R     | RWY 12 | RWY 9L | RWY 12 | DIF     | THRESH              | TD GATE | THRESH       | GATE TO ROLL |
| 1100-1200      | 18.0               | 24.5   | 0.0    | 0.0    | 0.0    | 0.0        | 42.5   | 48.0   | -5.5   | 1.9     | 12.9                | 1.0     | 0.0          | 15.8         |
| 1200-1300      | 25.3               | 21.5   | 0.0    | 0.0    | 0.0    | 0.0        | 46.8   | 43.0   | 3.8    | 12.6    | 13.1                | 1.9     | 0.0          | 27.6         |
| 1300-1400      | 14.7               | 15.0   | 0.0    | 0.0    | 0.0    | 0.0        | 29.7   | 28.0   | 1.7    | 21.3    | 17.1                | 9.2     | 0.0          | 47.6         |
| 1400-1500      | 16.2               | 17.0   | 0.0    | 0.0    | 0.0    | 0.0        | 33.2   | 39.0   | -5.8   | 9.2     | 22.7                | 1.9     | 0.0          | 33.8         |
| 1500-1600      | 17.6               | 15.0   | 0.0    | 0.0    | 0.0    | 0.0        | 32.6   | 30.0   | 2.6    | 9.1     | 12.2                | 2.0     | 0.0          | 33.3         |
| 1600-1700      | 21.7               | 16.0   | 0.0    | 0.0    | 0.0    | 0.0        | 37.7   | 36.0   | 1.7    | 10.5    | 17.0                | 2.7     | 0.0          | 30.2         |
| 1700-1800      | 8.5                | 13.0   | 0.0    | 0.0    | 0.0    | 0.0        | 21.5   | 20.0   | 1.5    | 19.4    | 14.0                | 4.3     | 0.0          | 37.7         |
| 1800-1900      | 10.8               | 13.0   | 0.0    | 0.0    | 0.0    | 0.0        | 23.8   | 24.0   | -1.2   | 9.0     | 19.0                | 3.0     | 0.0          | 31.0         |
| 1900-2000      | .2                 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0        | .2     | 0.0    | .2     | 2.0     | 5.0                 | 2.0     | 0.0          | 9.0          |
| AVERAGE DELAYS |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| GRAND TOTAL    |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| .60 4.50       |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| TIME           | AVERAGE DELAYS     |        |        |        |        |            |        |        |        |         | AVERAGE TRAVEL TIME |         |              |              |
|                | ARRIVALS           |        |        |        |        | DEPARTURES |        |        |        |         | FIX TO THRESH       |         | GATE TO ROLL |              |
|                | RWY 9R             | RWY 12 | RWY 9L | RWY 12 | TAX IN | RWY 9R     | RWY 12 | RWY 9L | RWY 12 | TAX OUT | THRESH              | TD GATE | THRESH       | GATE TO ROLL |
| 1100-1200      | 1.2                | 3.3    | 0.0    | 0.0    | 0.0    | 0.0        | 2.4    | 0.0    | 0.0    | 0.0     | 12.47               | 2.95    | 12.47        | 9.57         |
| 1200-1300      | 8.0                | 3.6    | 0.0    | 0.0    | 0.0    | 0.0        | 6.0    | 0.0    | 0.0    | 0.0     | 15.96               | 3.00    | 15.96        | 10.68        |
| 1300-1400      | 3.1                | 1.6    | 0.0    | 0.0    | 0.0    | 0.0        | 2.3    | 0.0    | 0.0    | 0.0     | 12.21               | 3.43    | 12.21        | 13.84        |
| 1400-1500      | 2.3                | 1.8    | 0.0    | 0.0    | 0.0    | 0.0        | 2.0    | 0.0    | 0.0    | 0.0     | 11.60               | 2.98    | 11.60        | 11.14        |
| 1500-1600      | 5.0                | 3.5    | 0.0    | 0.0    | 0.0    | 0.0        | 4.3    | 0.0    | 0.0    | 0.0     | 14.02               | 3.43    | 14.02        | 6.74         |
| 1600-1700      | 7.0                | .4     | 0.0    | 0.0    | 0.0    | 0.0        | 4.2    | 0.0    | 0.0    | 0.0     | 13.92               | 3.01    | 13.92        | 6.94         |
| 1700-1800      | 2.5                | 1.1    | 0.0    | 0.0    | 0.0    | 0.0        | 1.7    | 0.0    | 0.0    | 0.0     | 11.06               | 3.06    | 11.06        | 7.51         |
| 1800-1900      | .1                 | .5     | 0.0    | 0.0    | 0.0    | 0.0        | .3     | 0.0    | 0.0    | 0.0     | 9.57                | 3.66    | 9.57         | 6.34         |
| 1900-2000      | .0                 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0        | .0     | 0.0    | 0.0    | 0.0     | 1.24                | .60     | 1.24         | 4.50         |
| AVERAGE DELAYS |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| GRAND TOTAL    |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| 2.5 5.7        |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| 6.1 6.1        |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| 2.7 7.2        |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| 4.7 2.6        |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| 4.2 2.4        |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| 1.8 2.6        |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| .5 2.0         |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |
| .0 .1          |                    |        |        |        |        |            |        |        |        |         |                     |         |              |              |

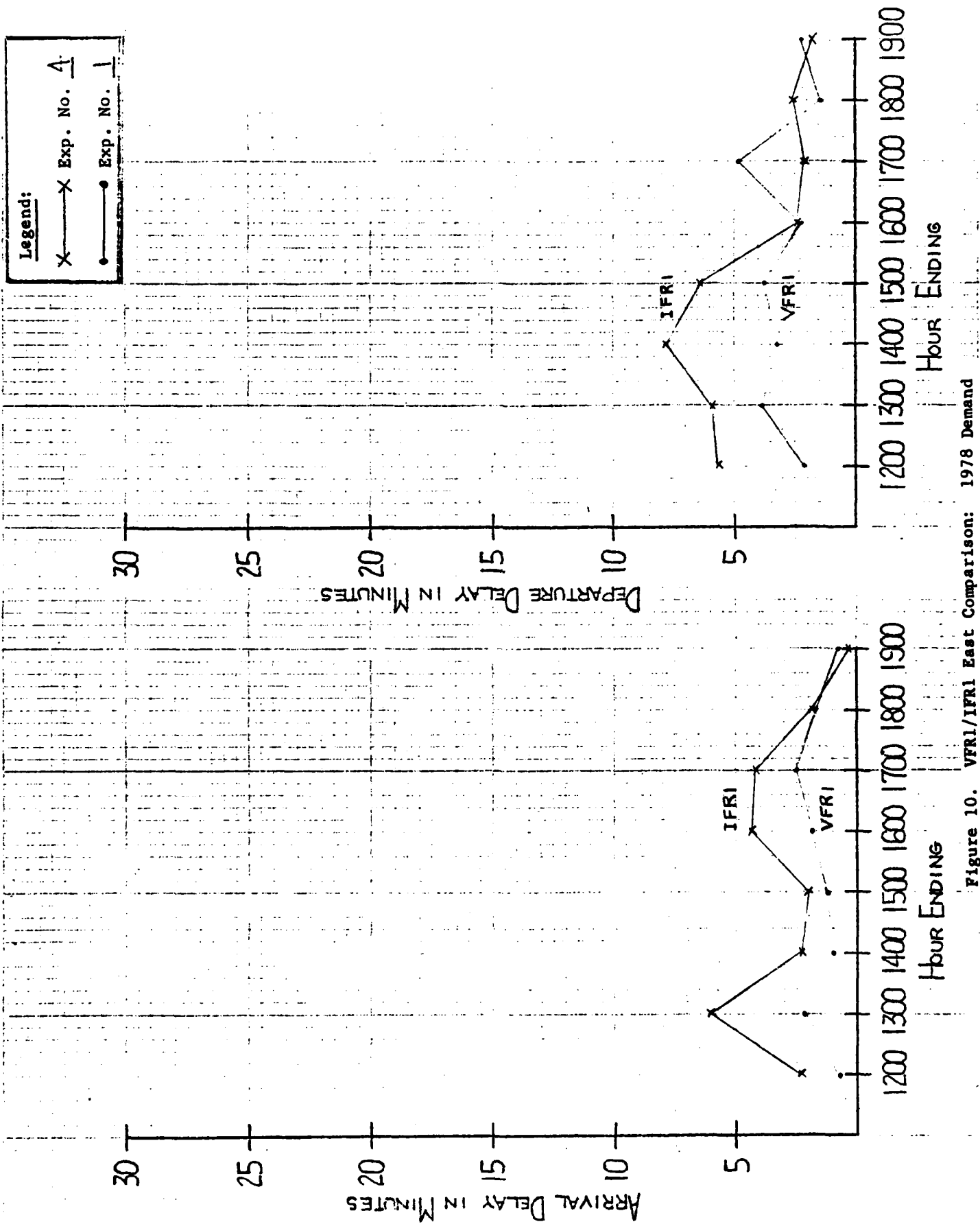


Figure 10. VFR1/IFR1 East Comparison: 1978 Demand

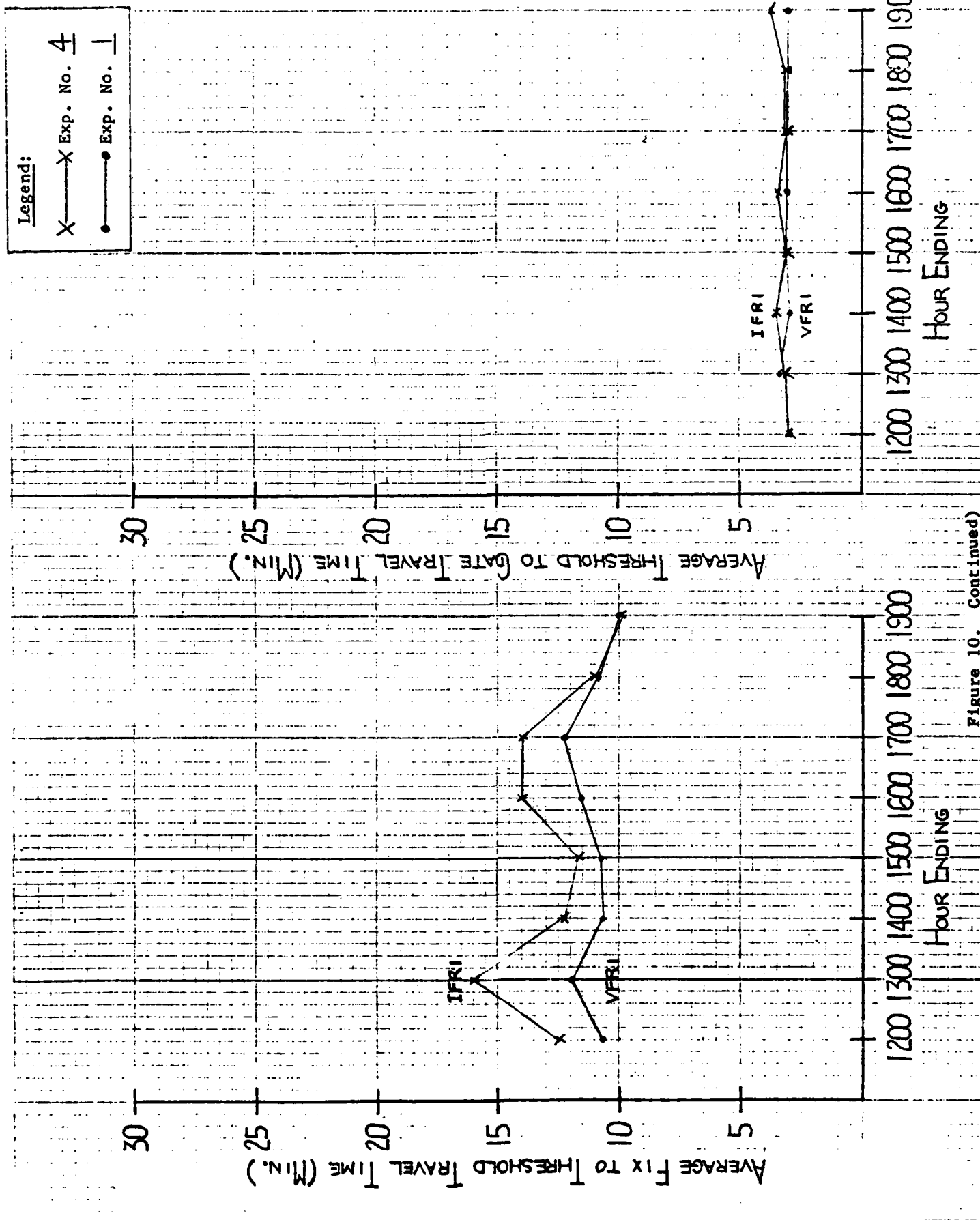


Figure 10. Continued)

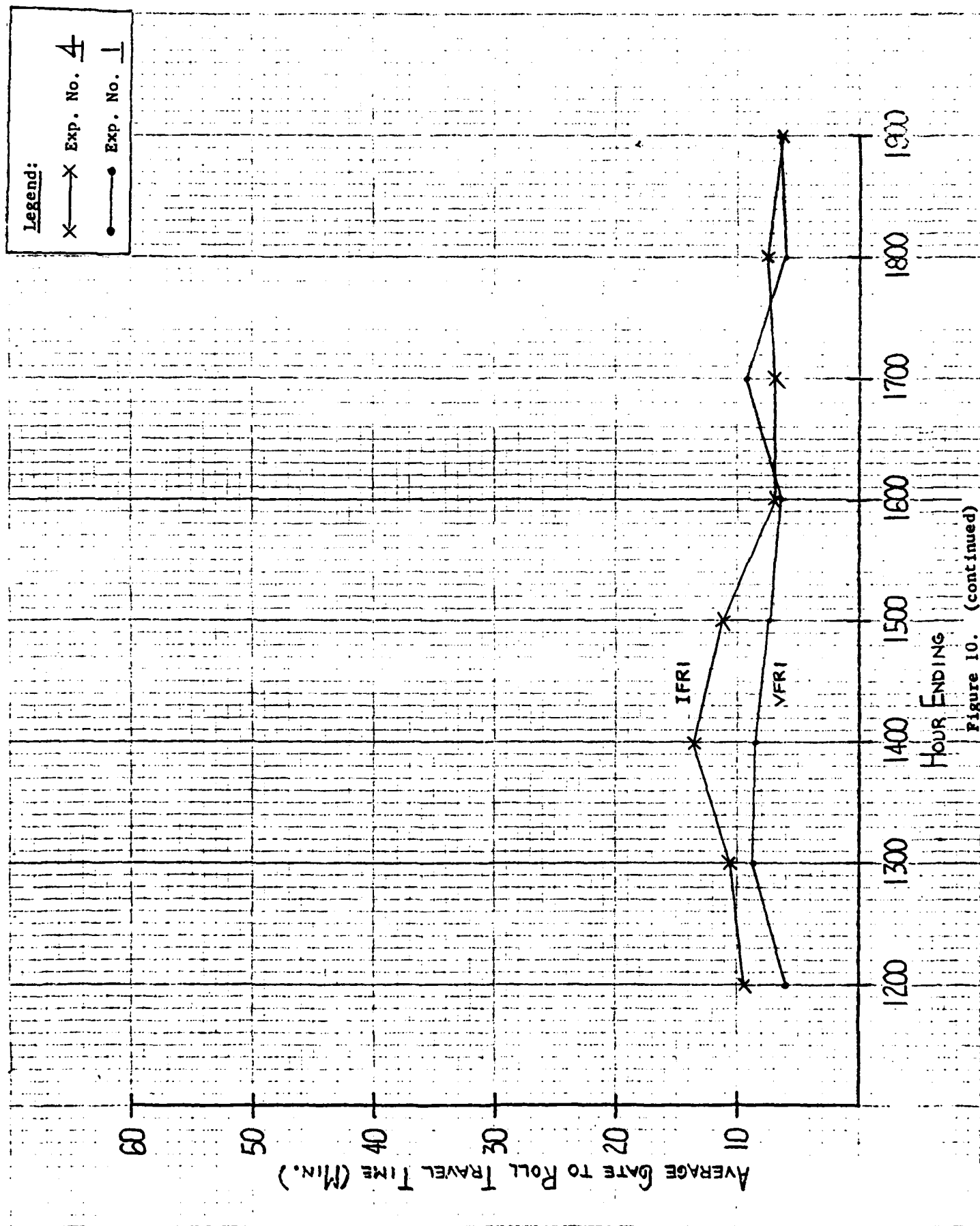


Figure 10. (continued)

## EXPERIMENT NO. 34

### Objective:

To assess the delay impact to aircraft in 1983 for the following runway configuration under IFR1 conditions, assuming no airport or ATC system improvements have been implemented:

Arrival Runways

9L,9R

Departure Runways

9R,9L,12

### Related Comparison Experiments:

Prior experiment 4 serves as the 1978 demand level baseline for comparison to this experiment.

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TABLE 15

## EXPERIMENT 34 RESULTS

MIAMI INTER. AIRPORT EXPER.-34 ROUTES=1978 CONFIG=A SEPAR=781FR1 DEMAND=83

| TIME        | ARRIVALS |      |     |     |     |          |        |       |       |      | DEPARTURES |     |     |     |      |          |         |      |     |     | AVERAGE TRAVEL TIME |                |              |
|-------------|----------|------|-----|-----|-----|----------|--------|-------|-------|------|------------|-----|-----|-----|------|----------|---------|------|-----|-----|---------------------|----------------|--------------|
|             | RWY 9L   |      |     |     |     | RWY 12   |        |       |       |      | RWY 9L     |     |     |     |      | RWY 12   |         |      |     |     | FIX TO THRESH       | THRESH TO GATE | GATE TO ROLL |
|             | 9R       | RWY  | RWY | RWY | TOT | DE- HAND | DIF    | RWY   | RWY   | RWY  | 9R         | RWY | RWY | RWY | TOT  | DE- HAND | DIF     | RWY  | RWY | RWY |                     |                |              |
| 1100-1200   | 19.9     | 18.2 | 0.0 | 0.0 | 0.0 | 38.1     | 51.0   | -12.9 | 3.0   | 9.0  | 3.1        | 0.0 | 0.0 | 0.0 | 15.1 | 17.0     | -1.9    | 0.0  | 0.0 | 0.0 | 14.19               | 3.12           | 6.66         |
| 1200-1300   | 23.4     | 24.4 | 0.0 | 0.0 | 0.0 | 47.8     | 54.0   | -6.2  | 14.3  | 18.5 | 3.9        | 0.0 | 0.0 | 0.0 | 36.7 | 54.0     | -17.3   | 0.0  | 0.0 | 0.0 | 27.54               | 3.38           | 15.69        |
| 1300-1400   | 24.8     | 24.8 | 0.0 | 0.0 | 0.0 | 49.6     | 42.0   | 7.6   | 9.9   | 14.4 | 2.8        | 0.0 | 0.0 | 0.0 | 27.1 | 58.0     | -30.9   | 0.0  | 0.0 | 0.0 | 34.78               | 6.22           | 34.01        |
| 1400-1500   | 23.4     | 19.6 | 0.0 | 0.0 | 0.0 | 43.0     | 41.0   | 2.0   | 11.6  | 11.6 | 3.3        | 0.0 | 0.0 | 0.0 | 26.5 | 32.0     | -5.5    | 0.0  | 0.0 | 0.0 | 25.80               | 8.22           | 65.72        |
| 1500-1600   | 24.3     | 19.6 | 0.0 | 0.0 | 0.0 | 43.9     | 59.0   | -15.1 | 6.9   | 12.5 | 4.5        | 0.0 | 0.0 | 0.0 | 23.9 | 38.0     | -14.1   | 0.0  | 0.0 | 0.0 | 27.90               | 9.82           | 92.92        |
| 1600-1700   | 21.7     | 15.0 | 0.0 | 0.0 | 0.0 | 36.7     | 35.0   | 1.7   | 7.5   | 17.1 | 5.2        | 0.0 | 0.0 | 0.0 | 29.8 | 33.0     | -3.2    | 0.0  | 0.0 | 0.0 | 37.87               | 6.53           | 116.84       |
| 1700-1800   | 19.0     | 15.5 | 0.0 | 0.0 | 0.0 | 34.5     | 40.0   | -5.5  | 7.0   | 16.0 | 4.3        | 0.0 | 0.0 | 0.0 | 27.3 | 67.0     | -39.7   | 0.0  | 0.0 | 0.0 | 41.25               | 10.11          | 118.60       |
| 1800-1900   | 14.9     | 10.6 | 0.0 | 0.0 | 0.0 | 25.5     | 25.0   | .5    | 6.8   | 19.1 | 4.8        | 0.0 | 0.0 | 0.0 | 30.7 | 33.0     | -2.3    | 0.0  | 0.0 | 0.0 | 34.31               | 12.10          | 121.87       |
| 1900-2000   | 3.9      | 1.8  | 0.0 | 0.0 | 0.0 | 5.7      | 0.0    | 5.7   | 22.0  | 30.5 | 5.1        | 0.0 | 0.0 | 0.0 | 57.6 | 0.0      | 57.6    | 0.0  | 0.0 | 0.0 | 27.68               | 10.08          | 130.75       |
| GRAND TOTAL |          |      |     |     |     |          |        |       |       |      |            |     |     |     |      |          |         |      |     |     |                     |                |              |
| TIME        | ARRIVALS |      |     |     |     |          |        |       |       |      | DEPARTURES |     |     |     |      |          |         |      |     |     | AVERAGE DELAYS      |                |              |
|             | RWY 9L   |      |     |     |     | RWY 12   |        |       |       |      | RWY 9L     |     |     |     |      | RWY 12   |         |      |     |     | ARR DELAY           | DEP DELAY      | CNG          |
|             | 9R       | RWY  | RWY | RWY | TOT | RWY      | TAX IN | RWY   | RWY   | RWY  | 9R         | RWY | RWY | RWY | TOT  | RWY      | TAX OUT | RWY  | RWY | RWY |                     |                |              |
| 1100-1200   | 4.3      | 4.2  | 0.0 | 0.0 | 0.0 | 4.3      | .0     | .1    | 1.9   | 2.5  | 2.3        | 0.0 | 0.0 | 0.0 | 2.3  | .0       | .1      | 0.0  | 0.0 | 0.0 | 4.4                 | 2.4            | 0.0          |
| 1200-1300   | 28.3     | 8.1  | 0.0 | 0.0 | 0.0 | 18.0     | .0     | .3    | 9.2   | 11.4 | 7.1        | 0.0 | 0.0 | 0.0 | 9.8  | .0       | 1.1     | 0.0  | 0.0 | 0.0 | 18.3                | 10.9           | 0.0          |
| 1300-1400   | 35.4     | 14.7 | 0.0 | 0.0 | 0.0 | 25.1     | .0     | 2.9   | 30.7  | 26.3 | 13.4       | 0.0 | 0.0 | 0.0 | 26.6 | .1       | 2.1     | .9   | 0.0 | 0.0 | 28.0                | 29.7           | 0.0          |
| 1400-1500   | 26.5     | 3.1  | 0.0 | 0.0 | 0.0 | 15.9     | .0     | 5.2   | 56.8  | 23.4 | 47.3       | 0.0 | 0.0 | 0.0 | 41.7 | .0       | 10.4    | 9.2  | 0.0 | 0.0 | 21.1                | 61.2           | 0.0          |
| 1500-1600   | 29.9     | 3.2  | 0.0 | 0.0 | 0.0 | 18.0     | .0     | 6.7   | 72.8  | 25.7 | 83.0       | 0.0 | 0.0 | 0.0 | 50.4 | .0       | 22.7    | 15.3 | 0.0 | 0.0 | 24.6                | 88.4           | 0.0          |
| 1600-1700   | 44.3     | 5.1  | 0.0 | 0.0 | 0.0 | 28.1     | .0     | 3.3   | 108.4 | 31.0 | 66.8       | 0.0 | 0.0 | 0.0 | 59.1 | .0       | 27.1    | 26.4 | 0.0 | 0.0 | 31.4                | 112.7          | 0.0          |
| 1700-1800   | 56.6     | 5.8  | 0.0 | 0.0 | 0.0 | 32.1     | .0     | 7.2   | 96.1  | 27.8 | 62.8       | 0.0 | 0.0 | 0.0 | 53.5 | .0       | 22.6    | 38.4 | 0.0 | 0.0 | 39.3                | 114.5          | 0.0          |
| 1800-1900   | 37.7     | 7.4  | 0.0 | 0.0 | 0.0 | 24.7     | .0     | 8.7   | 101.7 | 29.7 | 52.4       | 0.0 | 0.0 | 0.0 | 51.9 | .0       | 23.7    | 42.2 | 0.0 | 0.0 | 33.5                | 117.9          | 0.0          |
| 1900-2000   | 19.7     | 6.6  | 0.0 | 0.0 | 0.0 | 19.1     | .0     | 7.5   | 78.1  | 24.7 | 53.8       | 0.0 | 0.0 | 0.0 | 47.6 | .0       | 17.2    | 61.9 | 0.0 | 0.0 | 26.7                | 126.7          | 0.0          |

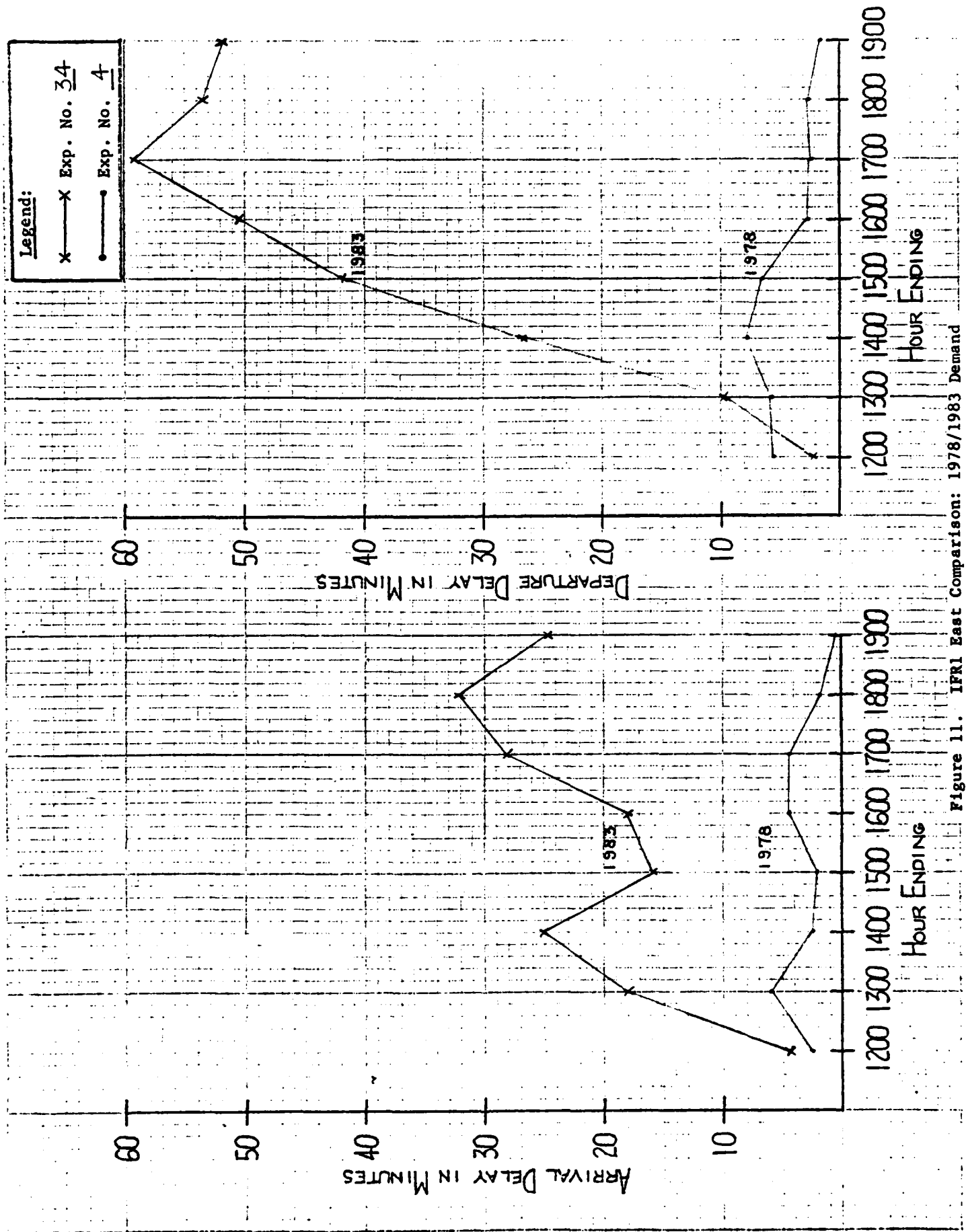


Figure 11. IFRI East Comparison: 1978/1983 Demand

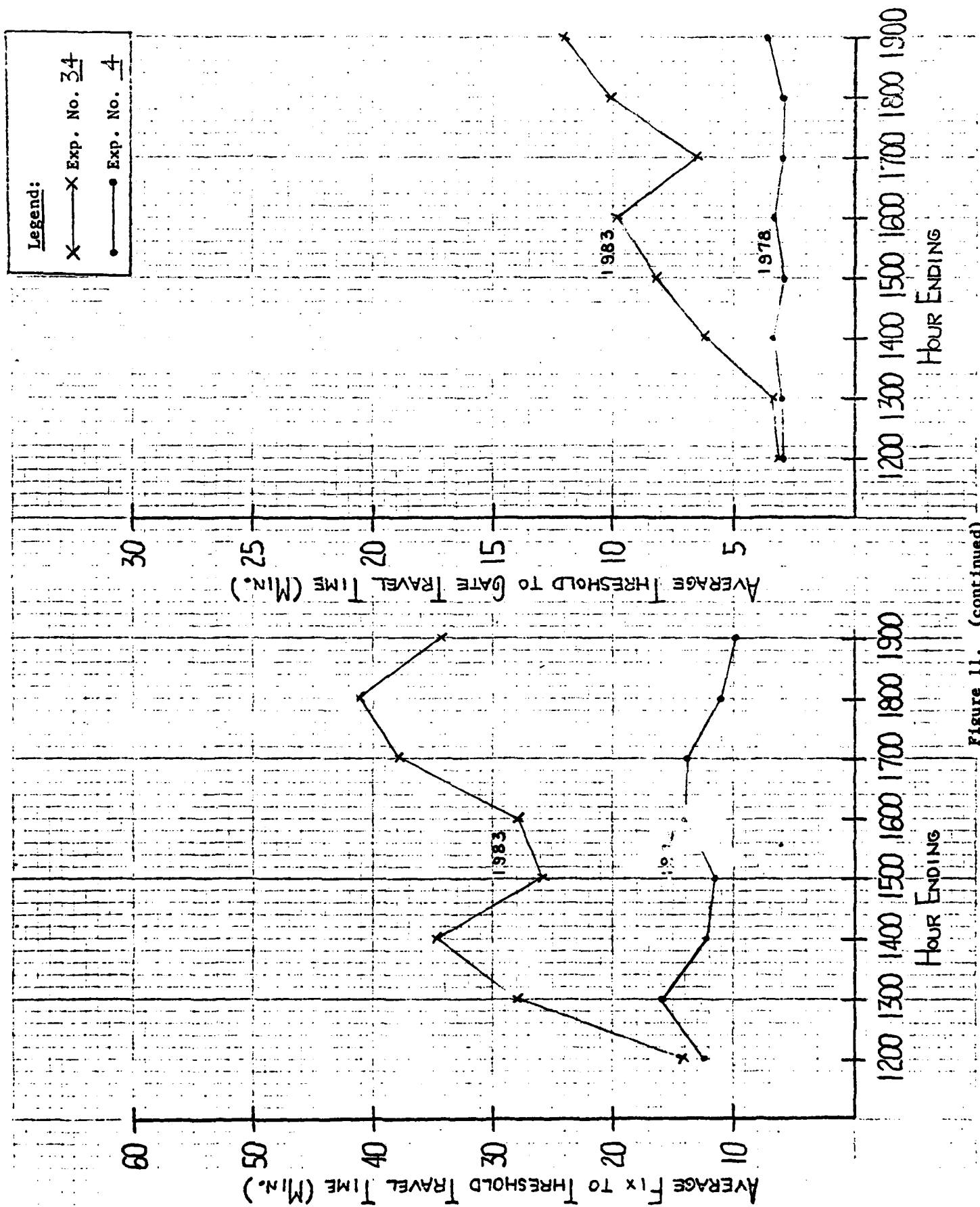


Figure 11. (continued)

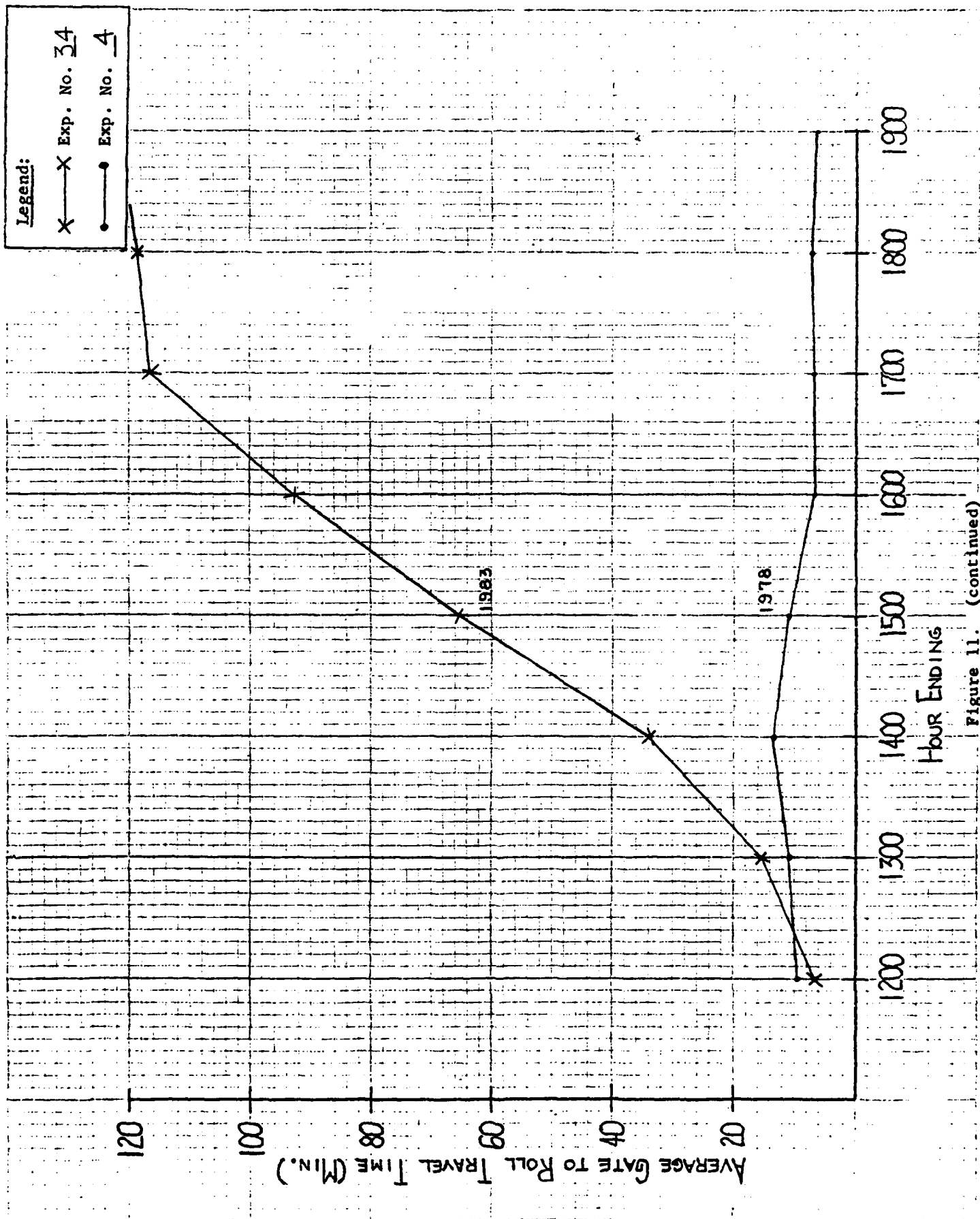


Figure 11. (continued)

## EXPERIMENT NO. 6

### Objective:

To assess the delay impact to aircraft in 1978 for the following runway configuration under IFR2 conditions:

Arrival Runways

Departure Runways

None

9L

### Related Comparison Experiments:

Prior experiment 4 examines this configuration with IFR1 weather and 1978 demand.

(An IFR1/IFR2/IFR1 situation was used for this experiment, with the IFR2 conditions lasting from 1300 to 1400 hours. This enables the recovery of the airport from the IFR2 deterioration to be studied.)

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## EXPERIMENT 6 RESULTS

**MIAMI INTER. AIRPORT EXP.**-76 ROUTES TO/FR. MIAMI. 200 NEWER PLANE. 1976. 100% CAPACITY. 100% NEW ROOF.

**PRELIMINARY**

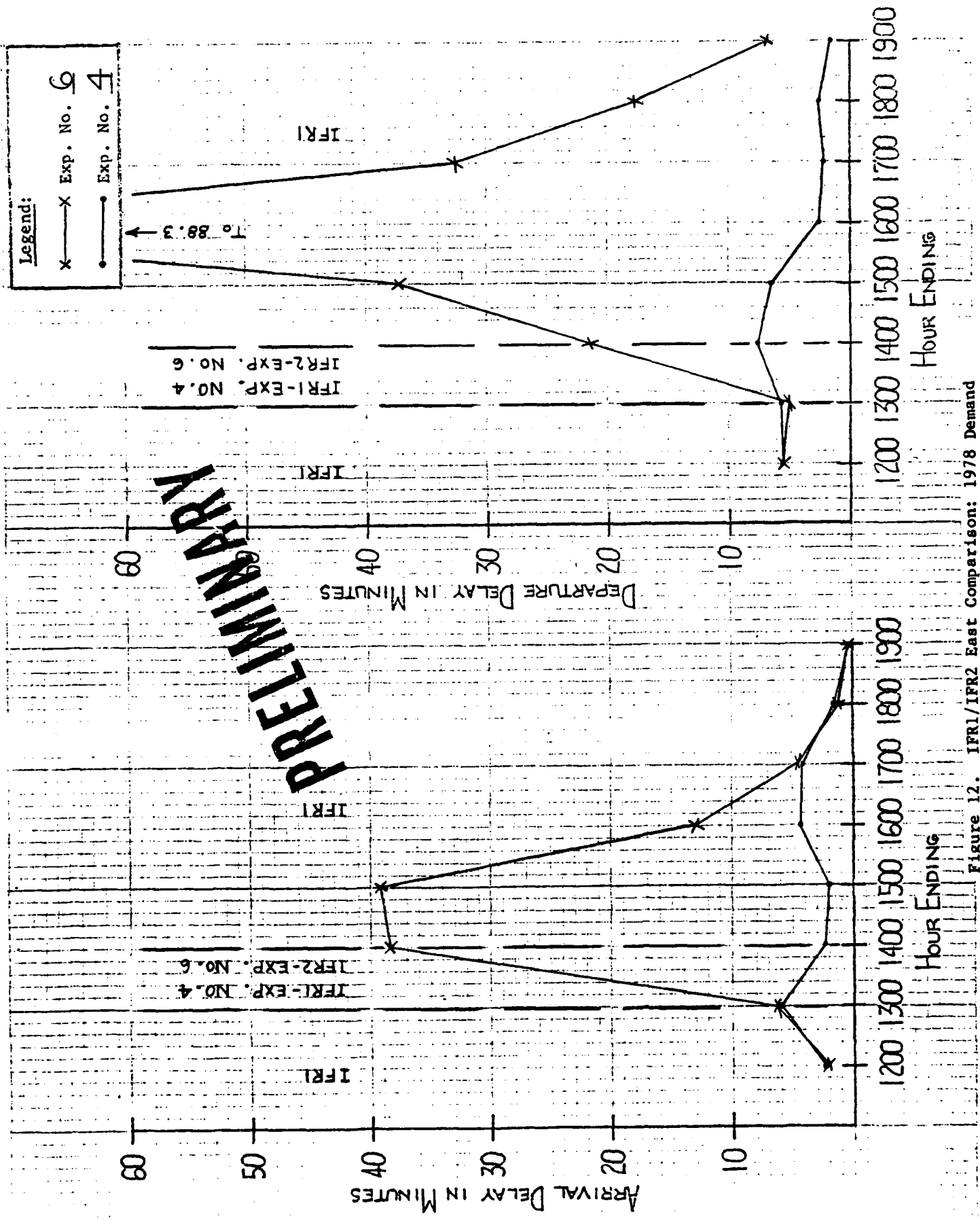


Figure 12. IFR1/IFR2 East Comparison: 1978 Demand

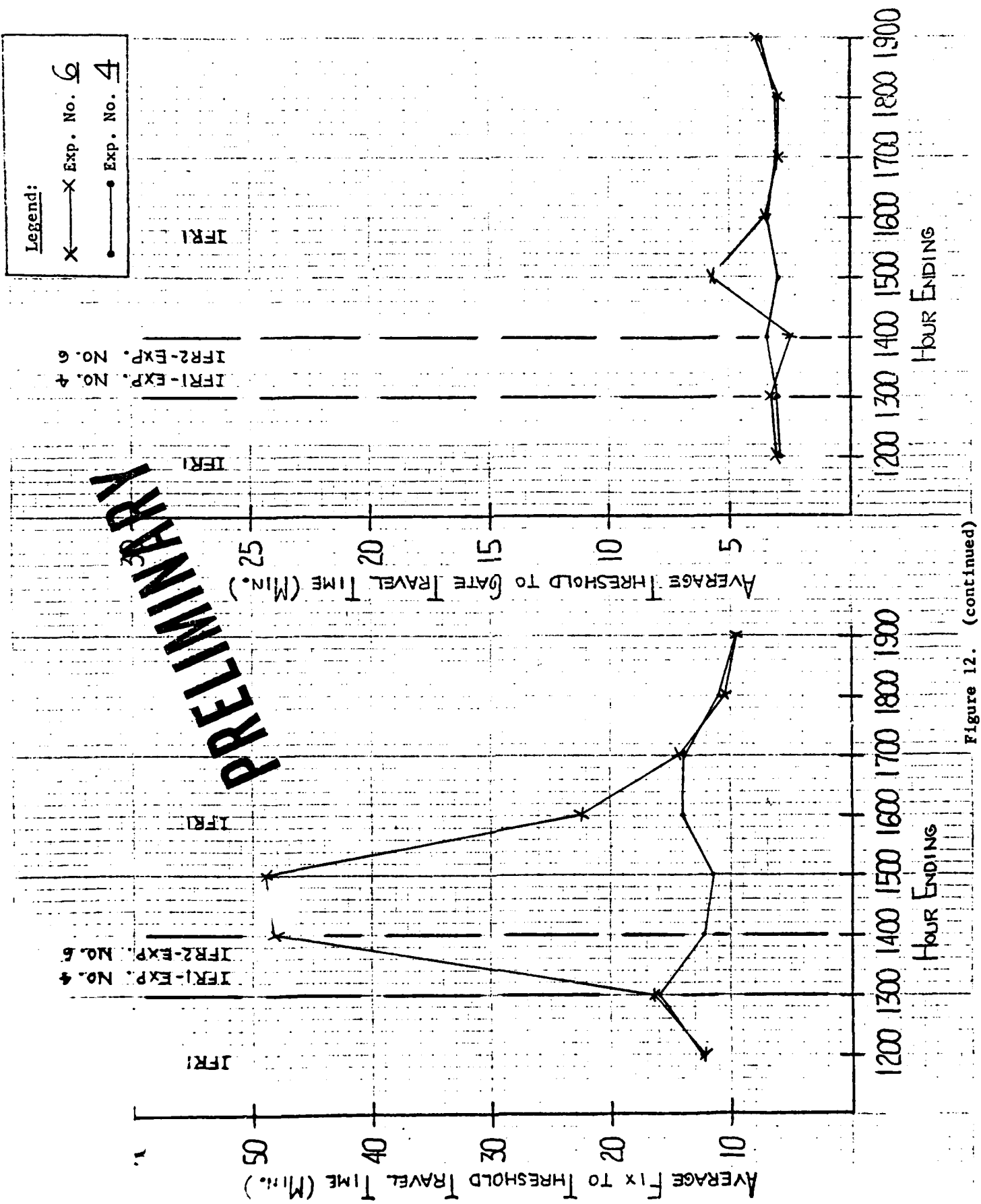


Figure 12. (continued)

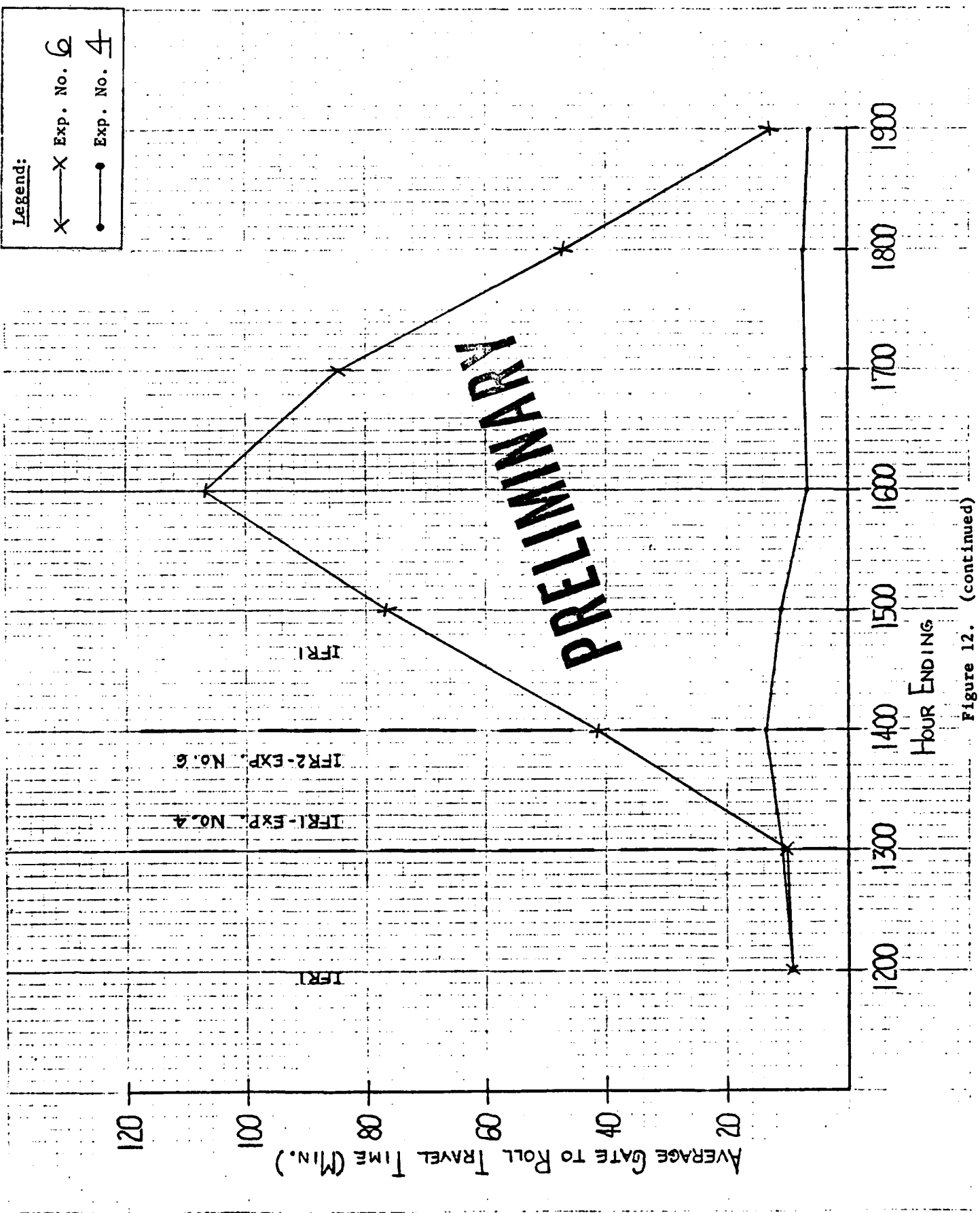


Figure 12. (continued)

TABLE 17

SET - 3 DEMAND  
VFR-WEASTERLY FLOW

| EXPERIMENT<br>NUMBER |            | RUNWAY<br>27R | RUNWAY<br>27L | RUNWAY<br>30 | TOTAL |
|----------------------|------------|---------------|---------------|--------------|-------|
| 2                    | ARRIVALS   | 162           | 24            | 130          | 316   |
|                      | DEPARTURES | 169           | 133           | 0            | 302   |
|                      | TOTAL      | 331           | 157           | 130          | 618   |
| 8                    | ARRIVALS   | 192           | 31            | 172          | 395   |
|                      | DEPARTURES | 195           | 172           | 3            | 370   |
|                      | TOTAL      | 387           | 203           | 175          | 765   |
| 3                    | ARRIVALS   | 202           | 114           | 0            | 316   |
|                      | DEPARTURES | 169           | 133           | 0            | 302   |
|                      | TOTAL      | 371           | 247           | 0            | 618   |
| 38                   | ARRIVALS   | 240           | 155           | 0            | 395   |
|                      | DEPARTURES | 196           | 171           | 3            | 370   |
|                      | TOTAL      | 436           | 326           | 3            | 765   |
|                      | ARRIVALS   |               |               |              |       |
|                      | DEPARTURES |               |               |              |       |
|                      | TOTAL      |               |               |              |       |
|                      | ARRIVALS   |               |               |              |       |
|                      | DEPARTURES |               |               |              |       |
|                      | TOTAL      |               |               |              |       |
|                      | ARRIVALS   |               |               |              |       |
|                      | DEPARTURES |               |               |              |       |
|                      | TOTAL      |               |               |              |       |

## EXPERIMENT NO. 2

### Objective:

To obtain baseline delay estimates for the following runway configuration in VFR1 for 1978 demand:

Arrival Runways

27L, 27R, 30

Departure Runways

27L, 27R, 30

### Related Comparison Experiments:

Experiment 5 examines this westerly configuration with IFR1 weather and 1978 demand.

Experiment 3 assesses the delay impact of VFR2 conditions and 1978 demand.

Experiment 8 compares to this baseline case, wherein demand is increased to the 1983 level under VFR1 conditions.

Data Package No. 5  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
February 1980

TABLE 18

## EXPERIMENT 2 RESULTS

MIAMI INTER. AIRPORT EXPER.-2 ROUTES=1978 CONFIG=B SEPAR=78VFR1 DEMAND=78

| TIME | AVERAGE FLOW RATES |         |        |     |           |            |         |         |        |     | AVERAGE TRAVEL TIME |     |         |         |        |                |           |     |         |         |              |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           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|      | ARRIVALS           |         |        |     |           | DEPARTURES |         |         |        |     | FIX TO THRESH       |     |         |         |        | THRESH TO GATE |           |     |         |         | GATE TO ROLL |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           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|         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |           |     |         |         |        |     |
|      | RWY 27R            | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF        | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH           | DIF | RWY 27R | RWY 27L | RWY 30 | TOT            | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30       | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT | DE-THRESH | DIF | RWY 27R | RWY 27L | RWY 30 | TOT |

## EXPERIMENT NO. 8

### Objective:

To assess the delay impact to aircraft in 1983 for the following runway configuration under VFR1 conditions, assuming no airport or ATC system improvements have been implemented:

Arrival Runways

27L,27R,30

Departure Runways

27L,27R,30

### Related Comparison Experiments:

Prior experiment 2 serves as the 1978 demand level baseline for comparison to this experiment.  
Experiment 38 assesses the delay impact of VFR2 conditions and 1983 demand.

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Miami International Airport  
Airport Improvement Task Force Delay Studies  
February 1980

TABLE 19  
EXPERIMENT 8 RESULTS

MIAMI INTER. AIRPORT EXPER.-8 ROUTES=1978 CONFIG=8 SEPAR=78VFR1 DEMAND=83

| TIME           | AVERAGE FLOW RATES |         |        |     |     |            |        |         |         |        | AVERAGE TRAVEL TIME |     |                |          |              |       |       |      |       |
|----------------|--------------------|---------|--------|-----|-----|------------|--------|---------|---------|--------|---------------------|-----|----------------|----------|--------------|-------|-------|------|-------|
|                | ARRIVALS           |         |        |     |     | DEPARTURES |        |         |         |        | FIX TO THRESH       |     | THRESH TO GATE |          | GATE TO ROLL |       |       |      |       |
|                | RWY 27R            | RWY 27L | RWY 30 | RWY | RWY | DE- HAND   | DIF    | 27R     | 27L     | 30     | RWY                 | RWY | TOT            | DE- HAND | DIF          | 10.63 | 4.26  | 4.35 |       |
| 1100-1200      | 21.9               | 4.8     | 22.2   | 0.0 | 0.0 | 48.9       | 55.0   | -6.1    | 9.9     | 6.8    | 0.0                 | 0.0 | 0.0            | 16.7     | 21.0         | -9.3  | 15.09 | 4.75 | 12.00 |
| 1200-1300      | 29.8               | 6.2     | 24.8   | 0.0 | 0.0 | 60.8       | 58.0   | 2.8     | 20.6    | 32.4   | 1.0                 | 0.0 | 0.0            | 54.0     | 63.0         | -9.0  | 17.31 | 4.16 | 16.33 |
| 1300-1400      | 26.4               | 3.0     | 18.0   | 0.0 | 0.0 | 47.4       | 52.0   | -4.6    | 26.1    | 29.8   | 1.0                 | 0.0 | 0.0            | 56.9     | 66.0         | -9.1  | 17.11 | 4.47 | 32.01 |
| 1400-1500      | 24.9               | 5.0     | 21.0   | 0.0 | 0.0 | 50.9       | 44.0   | 6.9     | 28.5    | 14.0   | 0.0                 | 0.0 | 0.0            | 42.5     | 33.0         | 9.5   | 13.51 | 4.52 | 21.55 |
| 1500-1600      | 24.3               | 4.0     | 27.3   | 0.0 | 0.0 | 55.6       | 71.0   | -15.4   | 24.2    | 22.4   | 0.0                 | 0.0 | 0.0            | 39.6     | 45.0         | 3.6   | 20.69 | 4.29 | 17.67 |
| 1600-1700      | 24.7               | 4.0     | 25.7   | 0.0 | 0.0 | 54.4       | 38.0   | 16.4    | 25.4    | 12.6   | 1.0                 | 0.0 | 0.0            | 39.0     | 35.0         | 4.0   | 11.59 | 3.71 | 13.07 |
| 1700-1800      | 23.1               | 2.0     | 15.7   | 0.0 | 0.0 | 40.8       | 46.0   | -5.2    | 28.5    | 34.9   | 0.0                 | 0.0 | 0.0            | 63.4     | 72.0         | -8.6  | 10.52 | 4.29 | 16.14 |
| 1800-1900      | 16.9               | 2.0     | 14.6   | 0.0 | 0.0 | 33.5       | 31.0   | 2.5     | 28.8    | 19.1   | 0.0                 | 0.0 | 0.0            | 47.9     | 35.0         | 12.9  | 11.76 | 2.89 | 11.45 |
| 1900-2000      | 0.0                | 0.0     | 2.7    | 0.0 | 0.0 | 2.7        | 0.0    | 2.7     | 1.0     | 0.0    | 0.0                 | 0.0 | 0.0            | 1.0      | 0.0          | 1.0   |       |      |       |
| AVERAGE DELAYS |                    |         |        |     |     |            |        |         |         |        |                     |     |                |          |              |       |       |      |       |
| TIME           | ARRIVALS           |         |        |     |     | DEPARTURES |        |         |         |        | ARR.                |     | DEF.           |          | GRAND TOTAL  |       |       |      |       |
|                | RWY 27R            | RWY 27L | RWY 30 | RWY | RWY | TOT        | TAX IN | RWY 27R | RWY 27L | RWY 30 | RWY                 | RWY | TOT            | RWY CRS  | TAX OUT      | DELAY | DELAY |      |       |
| 1100-1200      | .9                 | 1.9     | 1.8    | 0.0 | 0.0 | 1.4        | .0     | 1.7     | .6      | 0.0    | 0.0                 | 0.0 | 1.3            | .1       | .4           | 0.0   | 1.5   | 1.7  |       |
| 1200-1300      | 7.8                | 7.1     | 4.2    | 0.0 | 0.0 | 6.3        | .0     | .7      | 11.2    | 3.3    | 1.4                 | 0.0 | 0.0            | 6.3      | .0           | 3.2   | 7.1   | 9.6  |       |
| 1300-1400      | 14.6               | .5      | 1.2    | 0.0 | 0.0 | 8.6        | .0     | .4      | 18.8    | 1.8    | 2.1                 | 0.0 | 0.0            | 9.6      | .0           | 2.2   | 9.0   | 13.8 |       |
| 1400-1500      | 15.3               | 1.2     | 1.2    | 0.0 | 0.0 | 8.1        | .1     | .3      | 27.1    | 1.2    | 0.0                 | 0.0 | 0.0            | 18.6     | .0           | 3.0   | 8.5   | 29.0 |       |
| 1500-1600      | 3.2                | 1.7     | 6.0    | 0.0 | 0.0 | 4.4        | .1     | .4      | 17.3    | 2.4    | 0.0                 | 0.0 | 0.0            | 10.4     | .0           | 3.6   | 4.5   | 18.6 |       |
| 1600-1700      | 4.5                | 3.1     | 20.9   | 0.0 | 0.0 | 12.2       | .1     | .2      | 15.3    | 2.2    | 4.6                 | 0.0 | 0.0            | 10.8     | .0           | 2.2   | 1.4   | 14.5 |       |
| 1700-1800      | 3.5                | 1.4     | .9     | 0.0 | 0.0 | 2.4        | .0     | .1      | 13.8    | 4.3    | 0.0                 | 0.0 | 0.0            | 8.6      | .0           | 1.1   | .5    | 10.2 |       |
| 1800-1900      | 3.6                | 0.0     | 2.0    | 0.0 | 0.0 | 2.7        | 0.0    | .5      | 13.4    | .7     | 0.0                 | 0.0 | 0.0            | 8.3      | .0           | 2.8   | 3.2   | 13.4 |       |
| 1900-2000      | 0.0                | 0.0     | 2.3    | 0.0 | 0.0 | 2.3        | 0.0    | 0.0     | .0      | 0.0    | 0.0                 | 0.0 | 0.0            | .0       | 0.0          | 7.3   | 2.3   | 7.4  |       |

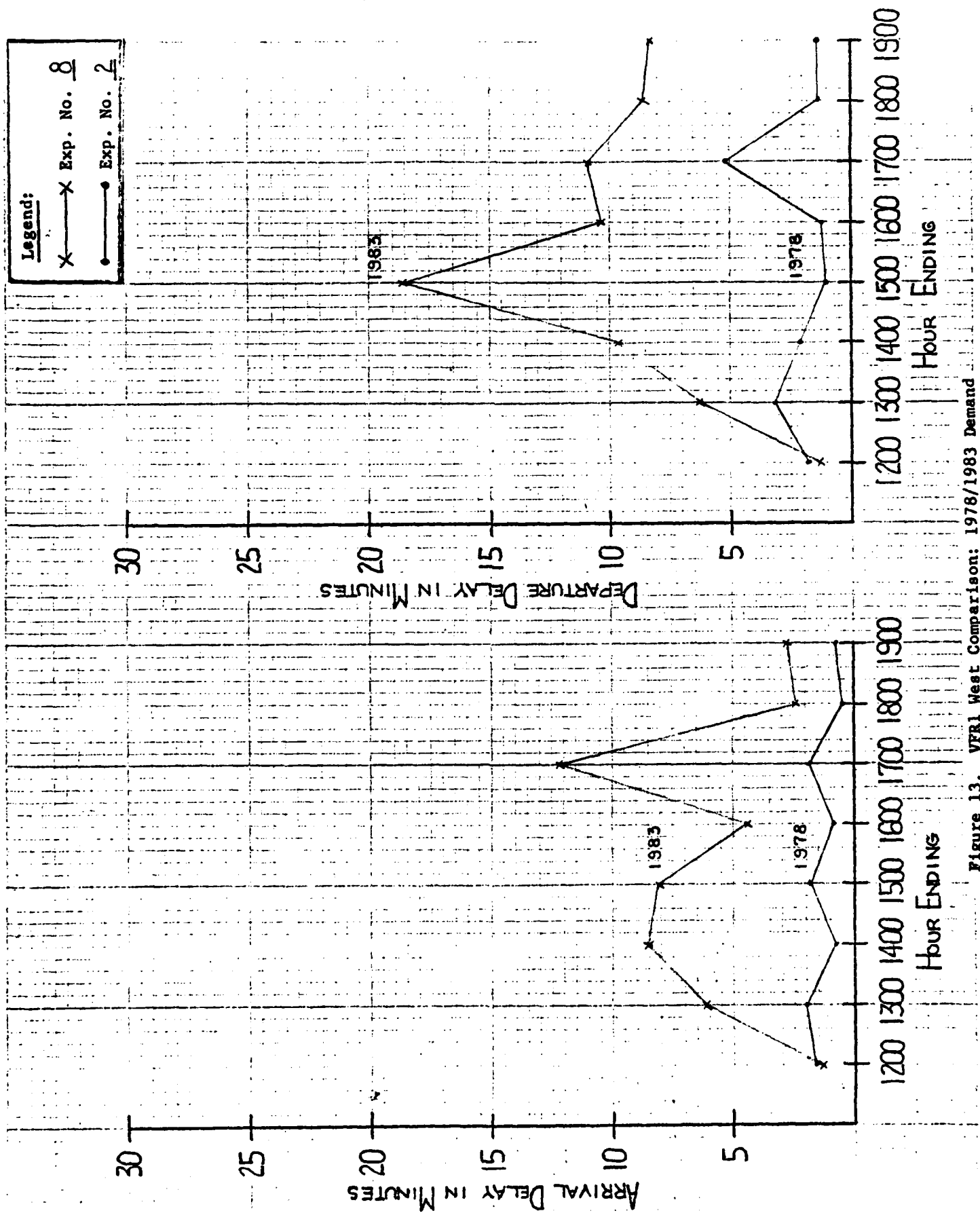


Figure 13. VFR1 West Comparison: 1978/1983 Demand

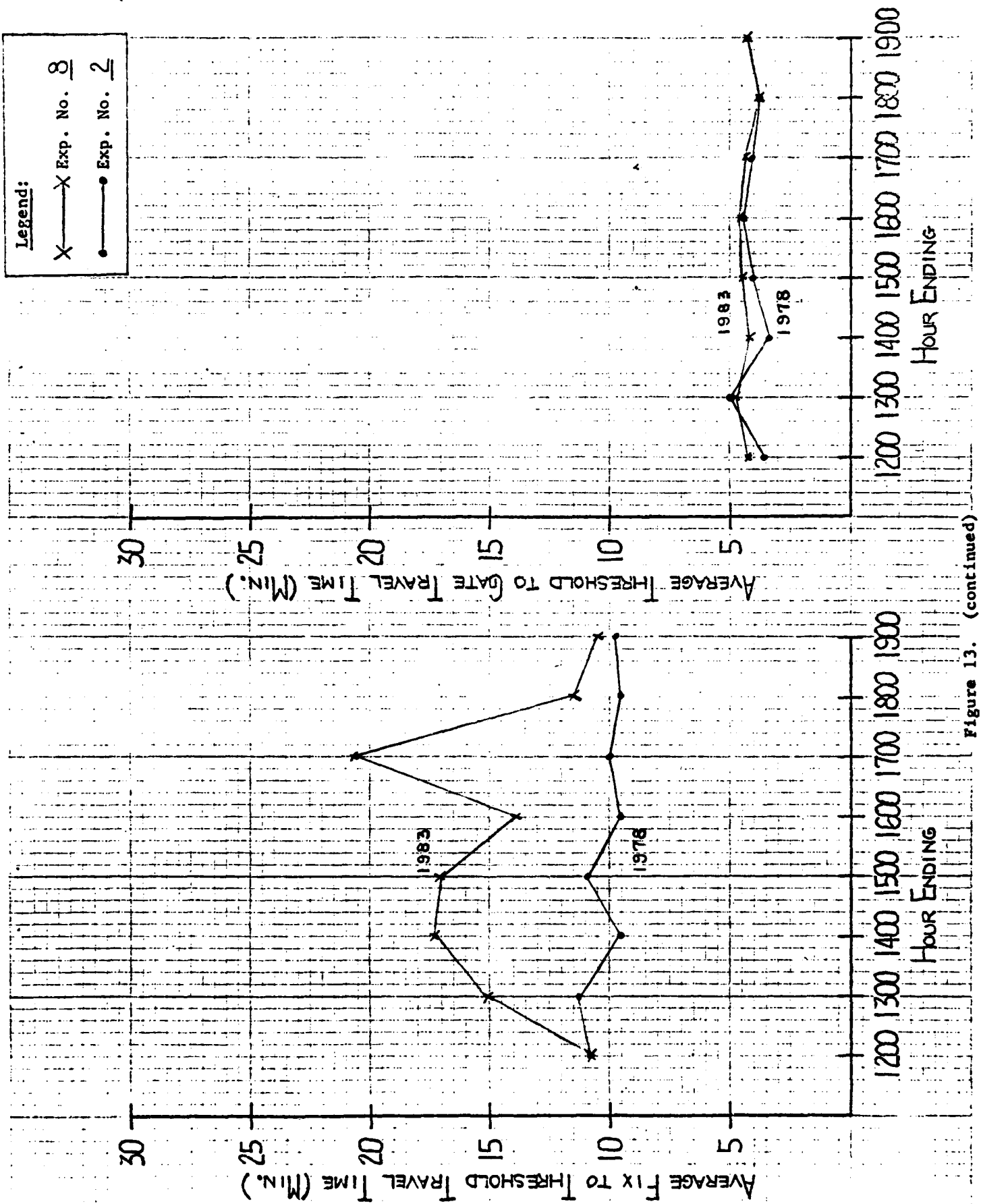


Figure 13. (continued)

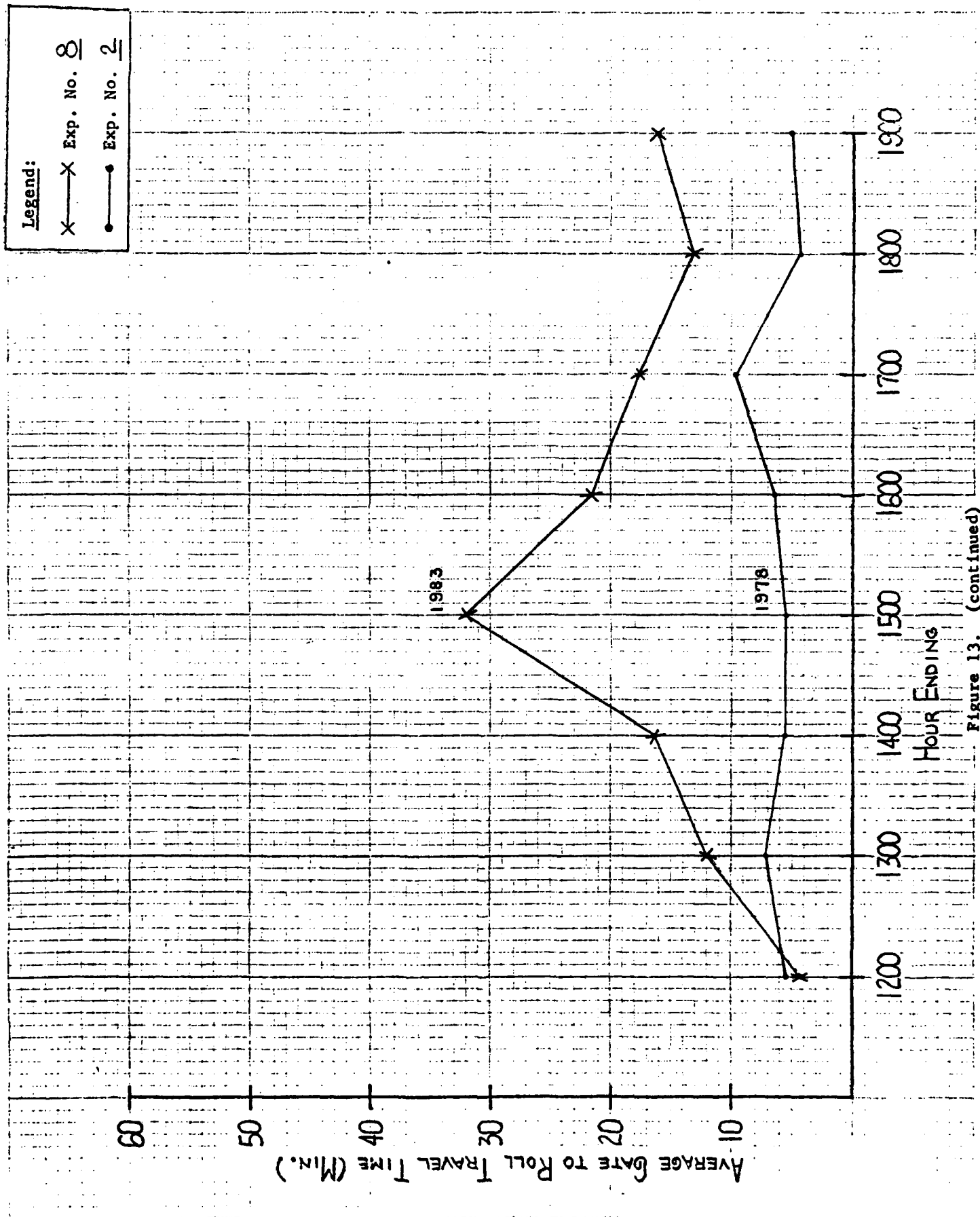


Figure 13. (continued)

### EXPERIMENT NO. 3

#### Objective:

To assess the delay impact to aircraft in 1978 for the following runway configuration under VFR2 conditions (This experiment also establishes baseline delay estimates for comparison to experiment 38):

Arrival Runways

27L, 27R

Departure Runways

27L, 27R, 30

#### Related Comparison Experiments:

Prior experiment 2 examines this configuration with VFR1 weather and 1978 demand.

Experiment 38 also compares to this study case, wherein demand is increased to the 1983 level under VFR2 conditions.

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Airport Improvement Task Force Delay Studies  
February 1980

TABLE 20

## EXPERIMENT 3 RESULTS

MIAMI INTER. AIRPORT EXPER.-3 ROUTES=1978 CONFIG=B SEPAR=78VFR2 DEMAND=78

| TIME      | AVERAGE FLOW RATES |        |         |        |         |            |         |        |         |        | AVERAGE TRAVEL TIME |                |             |             |
|-----------|--------------------|--------|---------|--------|---------|------------|---------|--------|---------|--------|---------------------|----------------|-------------|-------------|
|           | ARRIVALS           |        |         |        |         | DEPARTURES |         |        |         |        | FIX TO THRESH       | THRESH TO GATE | GATE TO ROL |             |
|           | RWY 27L            | RWY 30 | RWY 27L | RWY 30 | RWY 27L | RWY 30     | RWY 27L | RWY 30 | RWY 27L | RWY 30 | THRESH              | TO GATE        | TO ROL      |             |
| 1100-1200 | 29.0               | 20.0   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 10.15               | 4.09           | 5.42        |             |
| 1200-1300 | 25.0               | 23.0   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 9.56                | 4.77           | 6.81        |             |
| 1300-1400 | 23.0               | 11.0   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 9.57                | 3.67           | 7.08        |             |
| 1400-1500 | 23.5               | 15.0   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 8.61                | 4.13           | 8.77        |             |
| 1500-1600 | 28.4               | 15.0   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 9.59                | 4.57           | 7.73        |             |
| 1600-1700 | 30.0               | 14.0   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 12.56               | 4.19           | 12.32       |             |
| 1700-1800 | 25.1               | 5.0    | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 10.86               | 3.89           | 8.47        |             |
| 1800-1900 | 18.0               | 10.0   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 7.74                | 4.43           | 5.95        |             |
| 1900-2000 | 0.0                | 1.0    | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 0.00                | 4.93           | 4.08        |             |
|           |                    |        |         |        |         |            |         |        |         |        |                     |                |             | GRAND TOTAL |
| TIME      | AVERAGE DELAYS     |        |         |        |         |            |         |        |         |        | AVERAGE DELAYS      |                |             |             |
|           | ARRIVALS           |        |         |        |         | DEPARTURES |         |        |         |        | ARR DELAY           | DEF DELAY      |             |             |
|           | RWY 27L            | RWY 30 | RWY 27L | RWY 30 | RWY 27L | RWY 30     | RWY 27L | RWY 30 | RWY 27L | RWY 30 |                     |                |             |             |
| 1100-1200 | 2.5                | .9     | 0.0     | 0.0    | 0.0     | 0.0        | 1.8     | .7     | 0.0     | 0.0    | 1.9                 | 2.4            |             |             |
| 1200-1300 | .8                 | 1.5    | 0.0     | 0.0    | 0.0     | 0.0        | 3.4     | 1.9    | 0.0     | 0.0    | 1.5                 | 4.4            |             |             |
| 1300-1400 | 1.6                | .7     | 0.0     | 0.0    | 0.0     | 0.0        | 4.5     | 2.5    | 0.0     | 0.0    | 1.4                 | 4.6            |             |             |
| 1400-1500 | 2.2                | .3     | 0.0     | 0.0    | 0.0     | 0.0        | 5.5     | 1.5    | 0.0     | 0.0    | 1.5                 | 5.3            |             |             |
| 1500-1600 | 3.5                | .8     | 0.0     | 0.0    | 0.0     | 0.0        | 3.5     | 1.2    | 0.0     | 0.0    | 3.0                 | 4.8            |             |             |
| 1600-1700 | 6.9                | 1.0    | 0.0     | 0.0    | 0.0     | 0.0        | 12.0    | 1.3    | 0.0     | 0.0    | 5.4                 | 9.6            |             |             |
| 1700-1800 | 3.5                | 0.0    | 0.0     | 0.0    | 0.0     | 0.0        | 8.9     | 1.4    | 0.0     | 0.0    | 3.0                 | 5.8            |             |             |
| 1800-1900 | 1.1                | .0     | 0.0     | 0.0    | 0.0     | 0.0        | 3.0     | .8     | 0.0     | 0.0    | .9                  | 3.2            |             |             |
| 1900-2000 | 0.0                | 0.0    | 0.0     | 0.0    | 0.0     | 0.0        | .2      | .2     | 0.0     | 0.0    | 0.0                 | 1.0            |             |             |

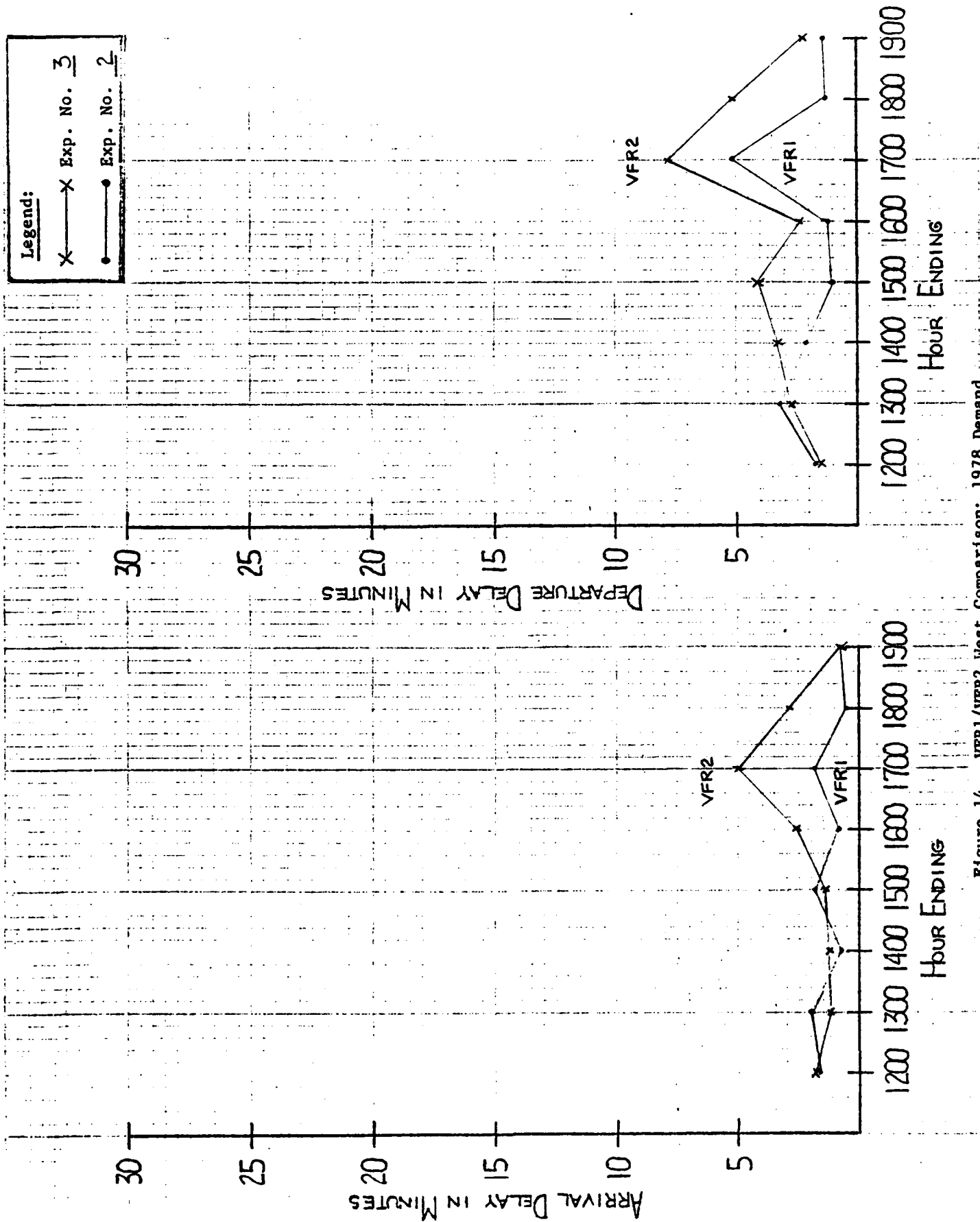


Figure 14. VFR1/VFR2 West Comparison: 1978 Demand

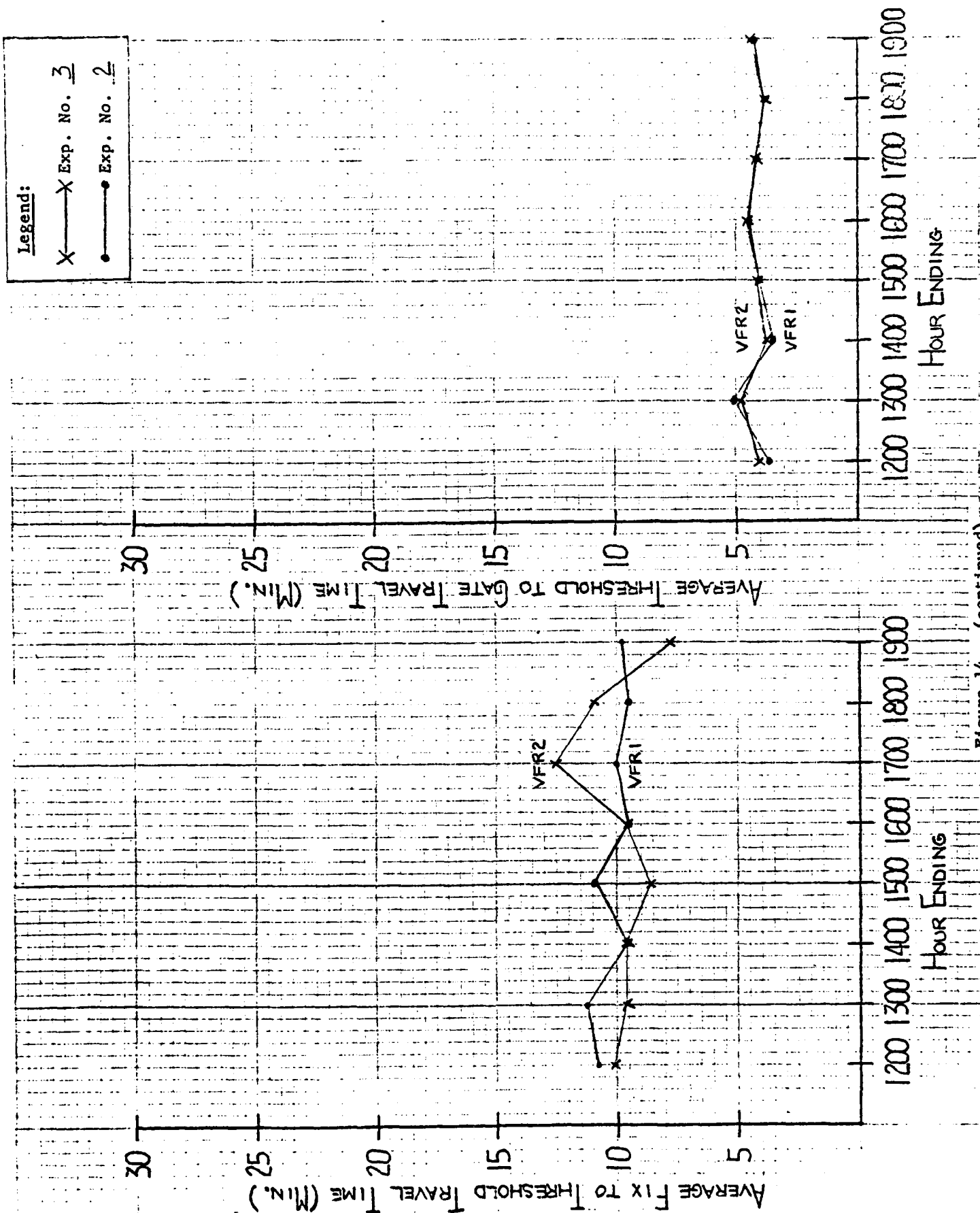


Figure 14. (continued)

AD-A099 966

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MIAMI INTERNATIONAL AIRPORT DATA PACKAGE NUMBER 5; AIRPORT IMPR--ETC(U)  
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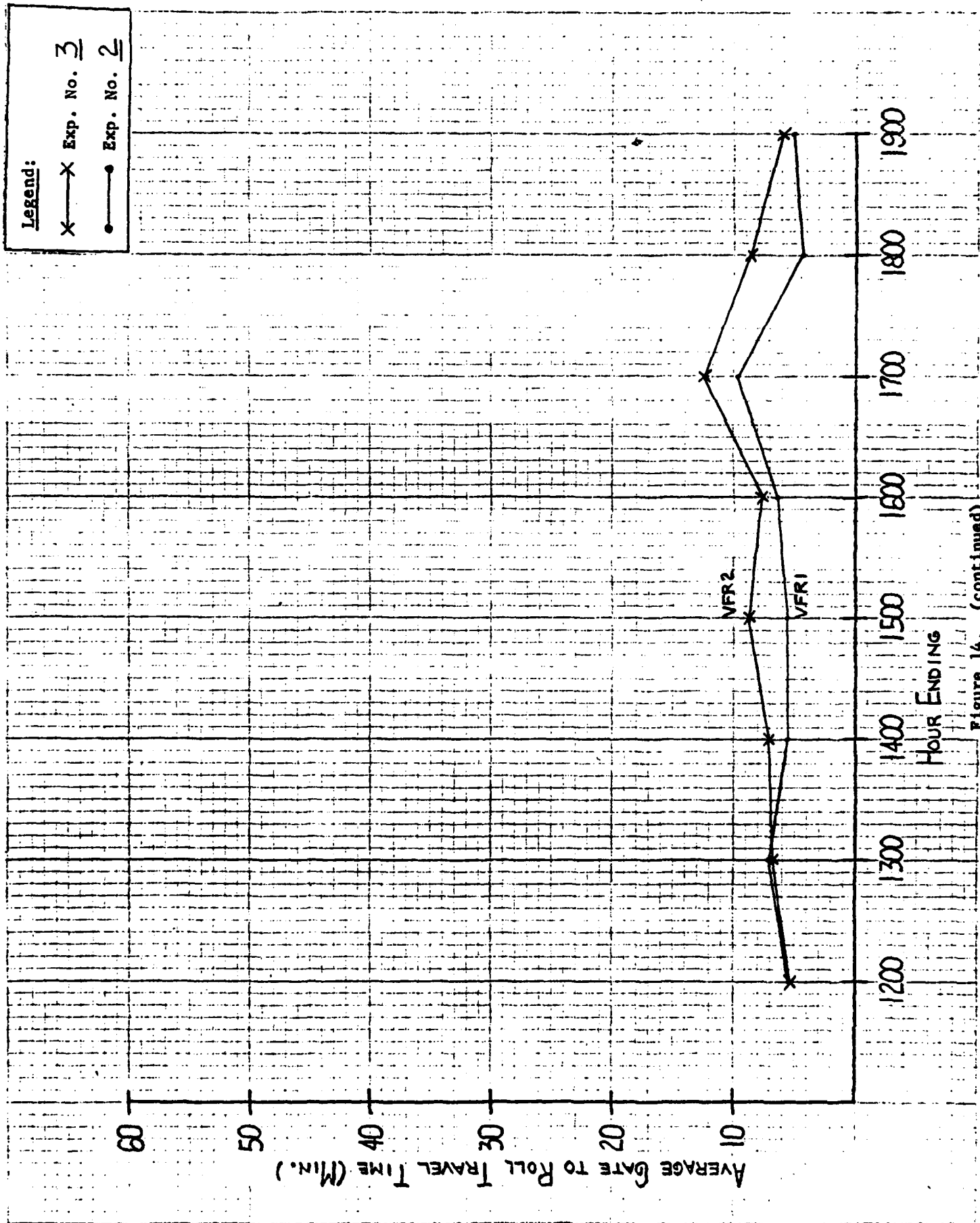


Figure 14. (continued)

## EXPERIMENT NO. 38

### Objective:

To assess the delay impact to aircraft in 1983 for the following runway configuration under VFR2 conditions, assuming no airport or ATC system improvements have been implemented:

Arrival Runways

27L,27R

Departure Runways

27L,27R,30

### Related Comparison Experiments:

Prior experiment 3 serves as the 1978 demand level baseline for comparison to this experiment.

Prior experiment 8 examines this configuration with VFR1 weather and 1983 demand.

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Miami International Airport  
Airport Improvement Task Force Delay Studies  
February 1980

TABLE 21

## EXPERIMENT 38 RESULTS

MIAMI INTER. AIRPORT EXPER.-38 ROUTES=1978 CONFIG-B SEPAR-78VFR2 DEMAND=83

| TIME        | AVERAGE FLOW RATES |        |         |        |         |            |         |        |         |        | AVERAGE TRAVEL TIME |                |              |  |
|-------------|--------------------|--------|---------|--------|---------|------------|---------|--------|---------|--------|---------------------|----------------|--------------|--|
|             | ARRIVALS           |        |         |        |         | DEPARTURES |         |        |         |        | FIX TO THRESH       | THRESH TO GATE | GATE TO KOLL |  |
|             | RWY 27L            | RWY 30 | RWY 27L | RWY 30 | RWY 27L | RWY 30     | RWY 27L | RWY 30 | RWY 27L | RWY 30 | THRESH              | TO GATE        | KOLL         |  |
| 1100-1200   | 24.1               | 23.8   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 9.91                | 4.58           | 4.70         |  |
| 1200-1300   | 29.4               | 23.2   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 15.91               | 5.32           | 14.13        |  |
| 1300-1400   | 26.7               | 20.0   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 26.02               | 4.66           | 21.66        |  |
| 1400-1500   | 27.1               | 17.0   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 34.30               | 5.10           | 35.60        |  |
| 1500-1600   | 27.2               | 25.1   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 31.66               | 5.06           | 25.39        |  |
| 1600-1700   | 26.6               | 18.9   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 40.10               | 4.76           | 22.69        |  |
| 1700-1800   | 26.9               | 14.0   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 57.46               | 5.34           | 17.41        |  |
| 1800-1900   | 27.9               | 12.0   | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 54.80               | 4.36           | 22.65        |  |
| 1900-2000   | 24.1               | 1.0    | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 66.50               | 3.39           | 26.92        |  |
| GRAND TOTAL |                    |        |         |        |         |            |         |        |         |        |                     |                |              |  |
| TIME        | AVERAGE DELAYS     |        |         |        |         |            |         |        |         |        | AVERAGE DELAYS      |                |              |  |
|             | ARRIVALS           |        |         |        |         | DEPARTURES |         |        |         |        | ARR. DELAY          | DEP. DELAY     |              |  |
|             | RWY 27L            | RWY 30 | RWY 27L | RWY 30 | RWY 27L | RWY 30     | RWY 27L | RWY 30 | RWY 27L | RWY 30 | DELAY               | DELAY          |              |  |
| 1100-1200   | 2.0                | 1.3    | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 1.8                 | 2.1            |              |  |
| 1200-1300   | 14.4               | .8     | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 9.3                 | 11.6           |              |  |
| 1300-1400   | 31.7               | 1.1    | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 19.0                | 19.1           |              |  |
| 1400-1500   | 40.9               | .7     | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 26.3                | 32.7           |              |  |
| 1500-1600   | 40.2               | 2.5    | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 22.8                | 22.5           |              |  |
| 1600-1700   | 53.2               | 2.4    | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 32.3                | 19.5           |              |  |
| 1700-1800   | 74.7               | .5     | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 50.0                | 14.4           |              |  |
| 1800-1900   | 66.0               | 1.3    | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 47.2                | 20.0           |              |  |
| 1900-2000   | 62.0               | 1.5    | 0.0     | 0.0    | 0.0     | 0.0        | 0.0     | 0.0    | 0.0     | 0.0    | 59.5                | 24.0           |              |  |

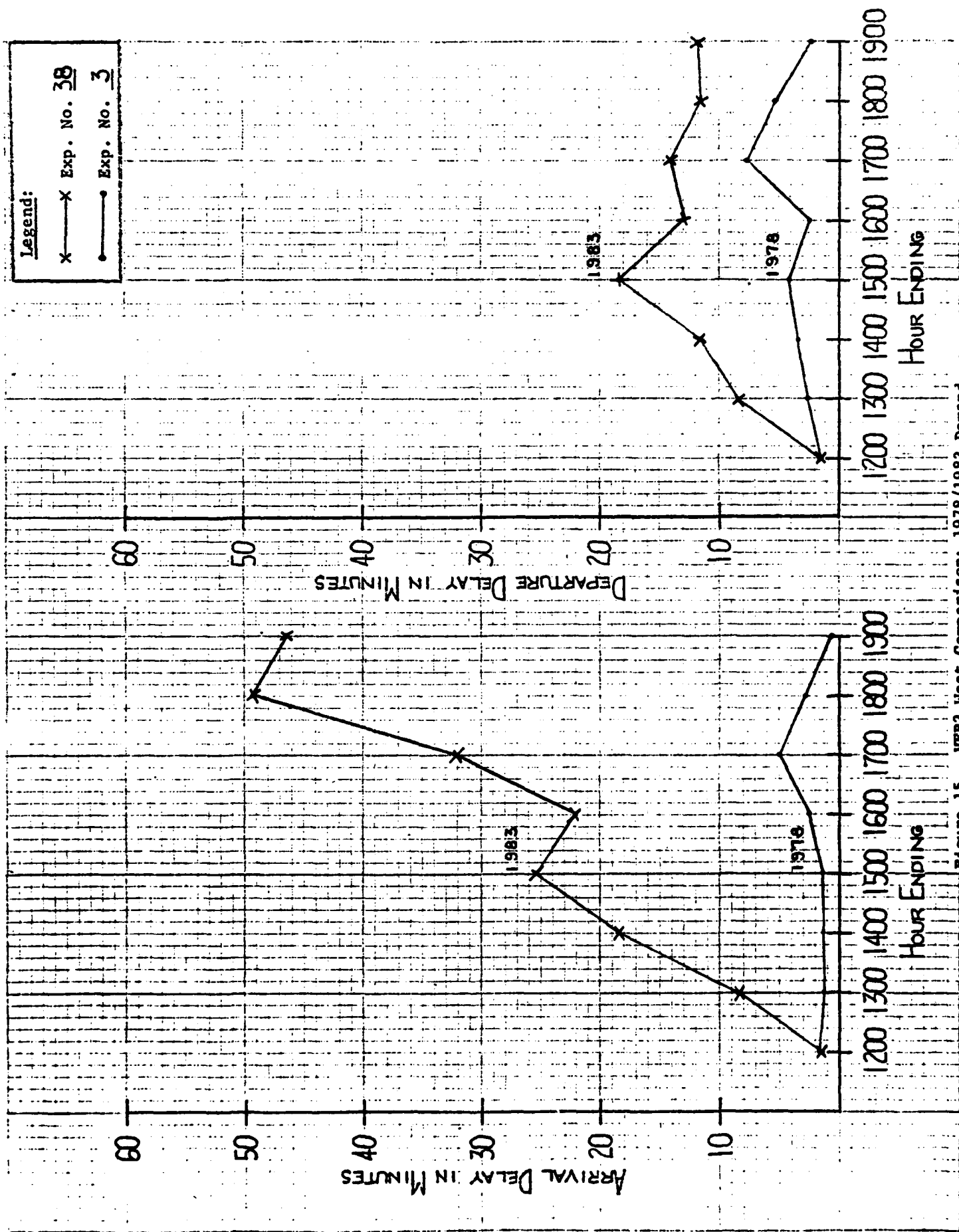


Figure 15. VFR2 West Comparison: 1978/1983 Demand

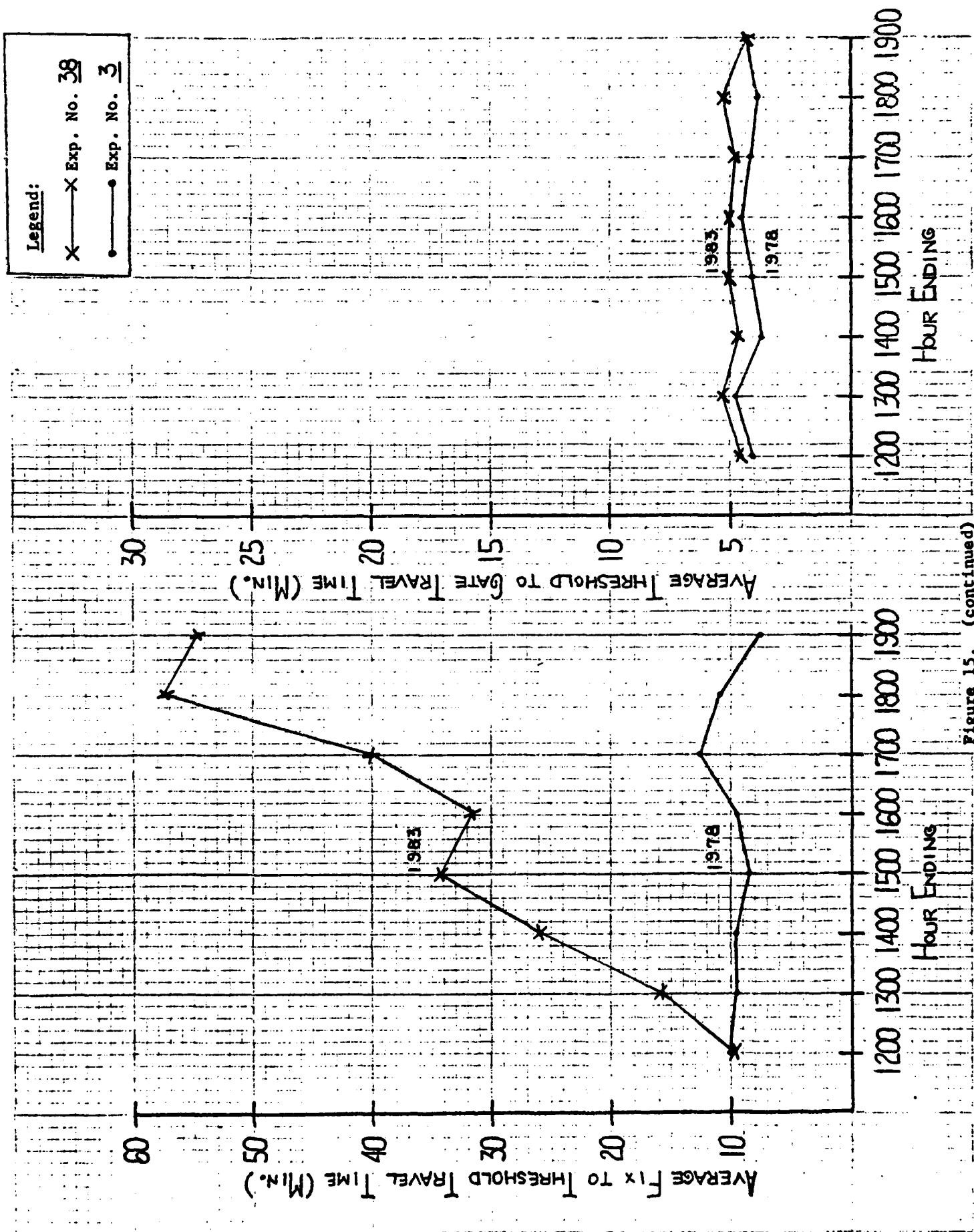


Figure 15. (continued)

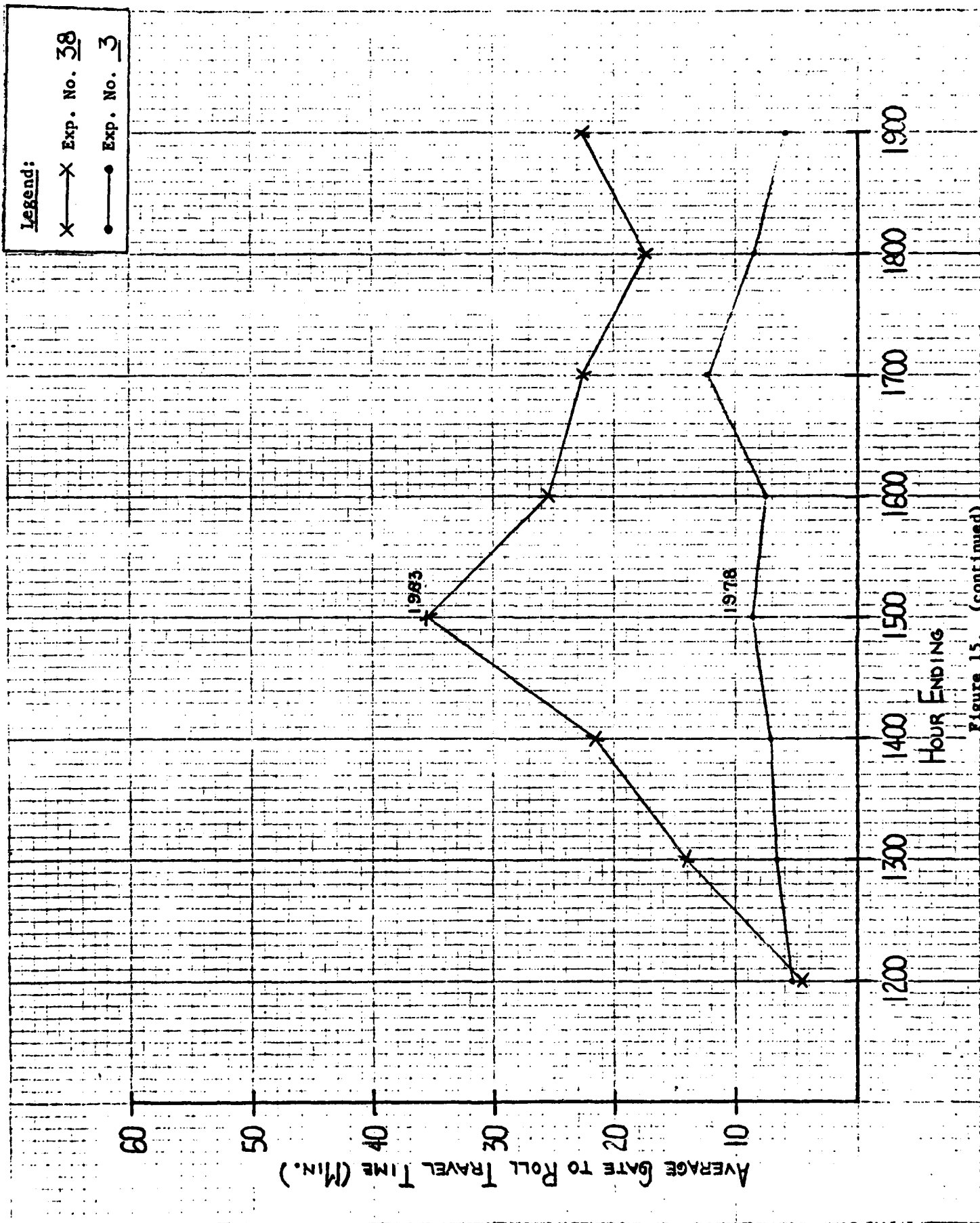


Figure 15. (continued)

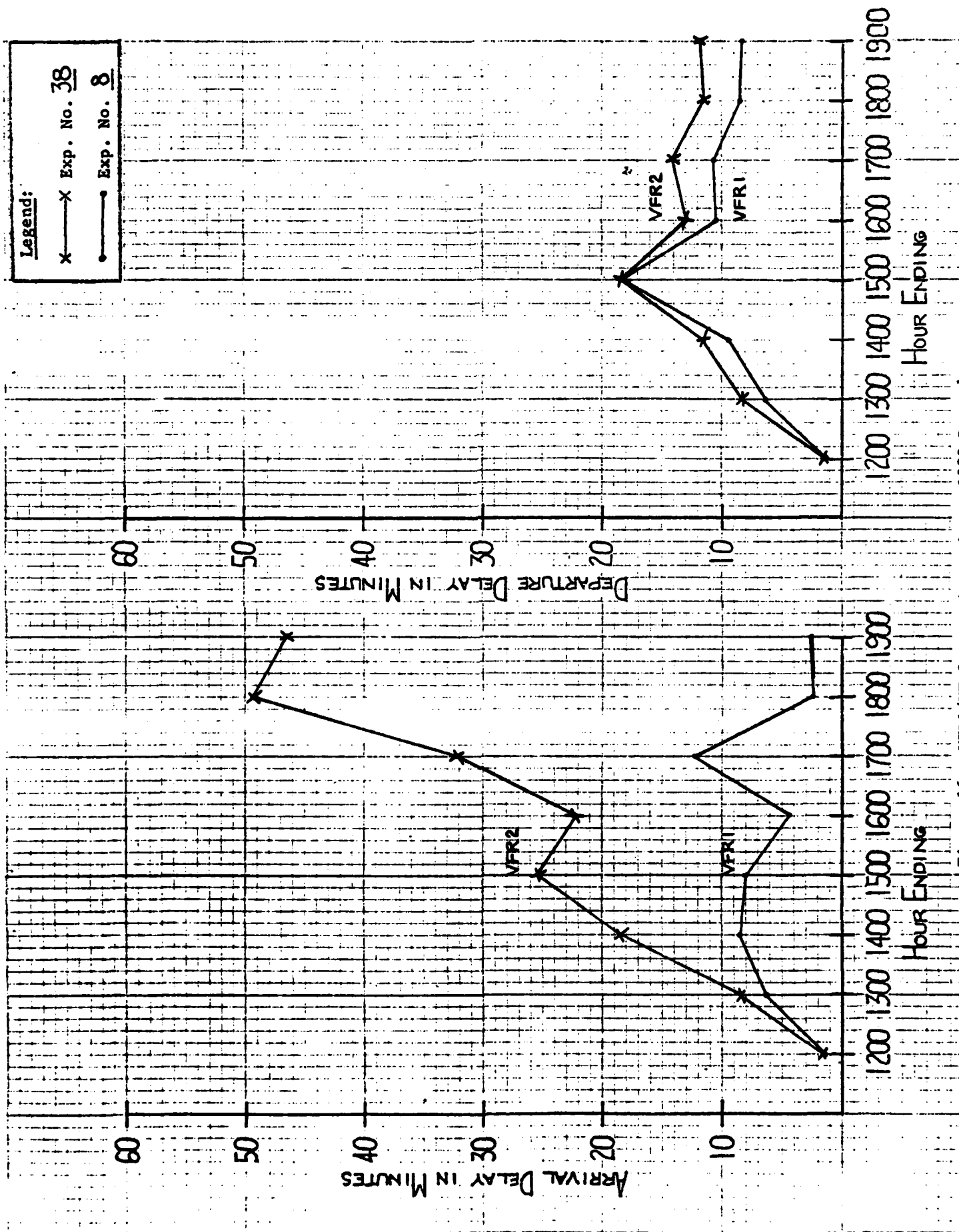


Figure 16. VFR1/VFR2 West Comparison: 1983 Demand

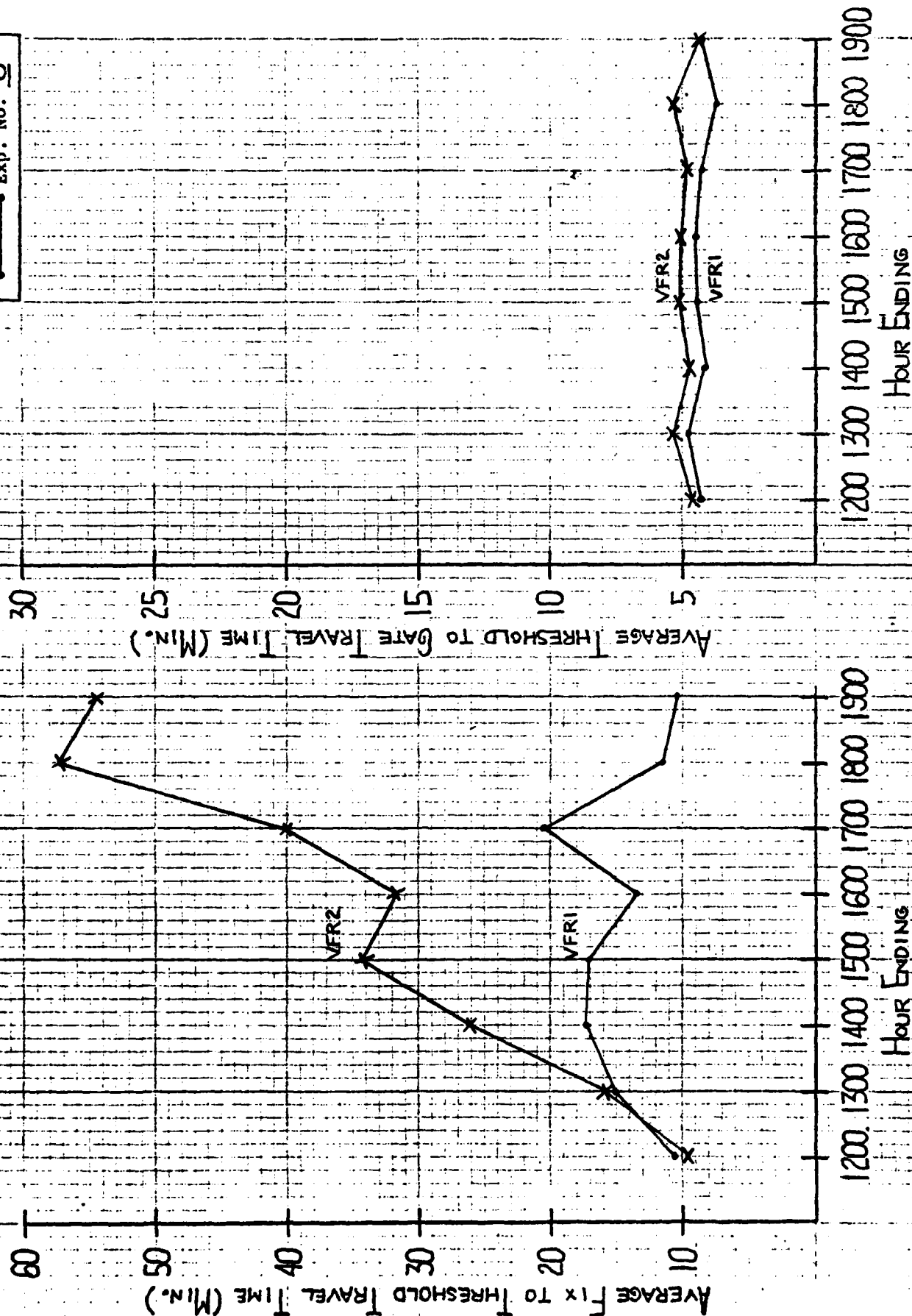
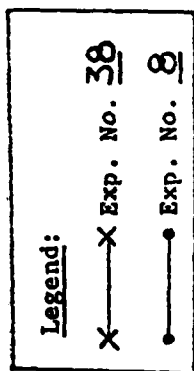


Figure 16. (continued)

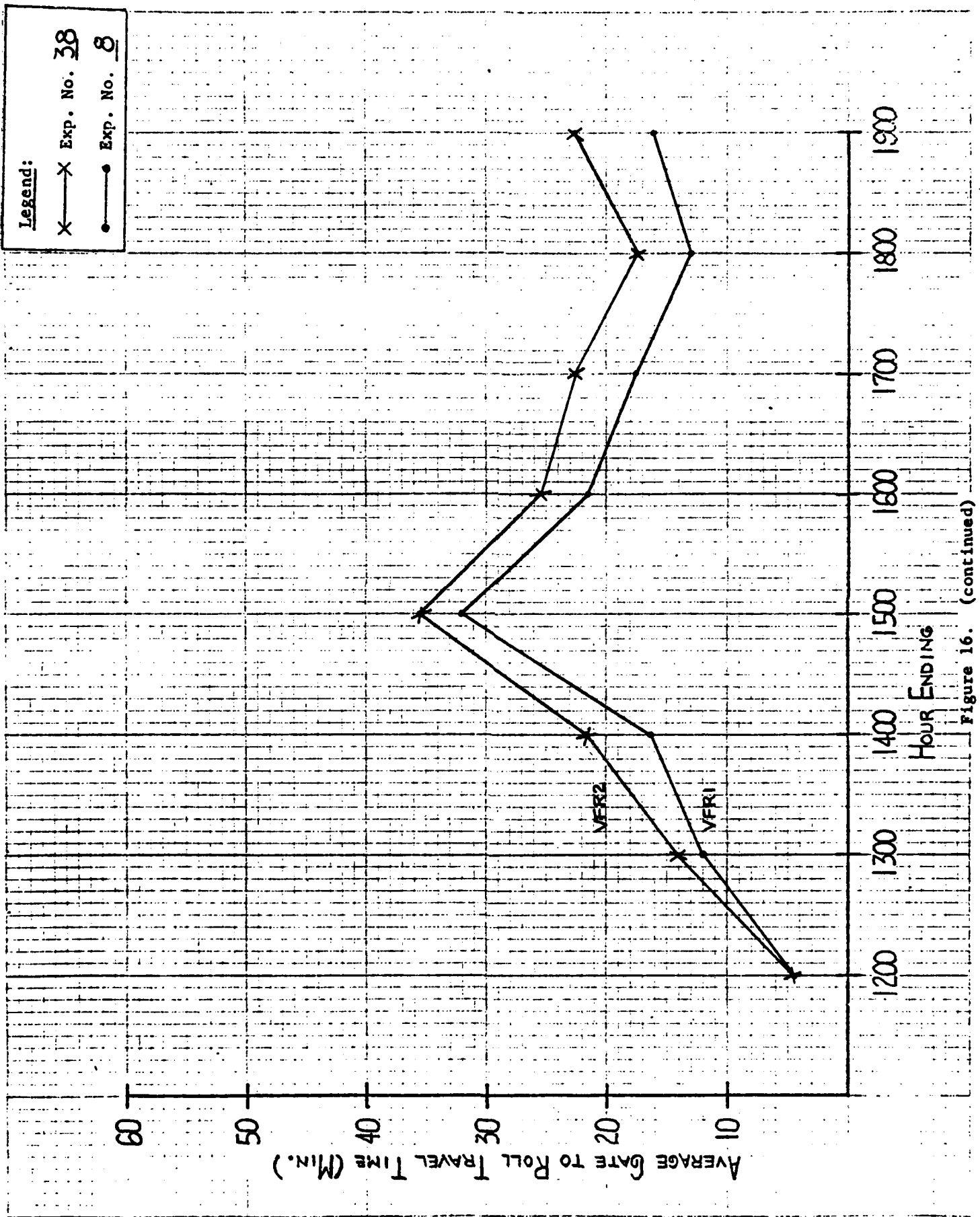


Figure 16. (continued)

TABLE 22

SET - 4 DEMAND  
IFR-WESTERLY FLOW

| EXPERIMENT<br>NUMBER |            | RUNWAY<br>27R | RUNWAY<br>27L | RUNWAY<br>30 | TOTAL |
|----------------------|------------|---------------|---------------|--------------|-------|
| 5 AND 24             | ARRIVALS   | 155           | 109           | 0            | 264   |
|                      | DEPARTURES | 144           | 125           | 0            | 269   |
|                      | TOTAL      | 299           | 234           | 0            | 533   |
| 39                   | ARRIVALS   | 197           | 150           | 0            | 347   |
|                      | DEPARTURES | 165           | 167           | 0            | 332   |
|                      | TOTAL      | 362           | 317           | 0            | 679   |
|                      | ARRIVALS   |               |               |              |       |
|                      | DEPARTURES |               |               |              |       |
|                      | TOTAL      |               |               |              |       |
|                      | ARRIVALS   |               |               |              |       |
|                      | DEPARTURES |               |               |              |       |
|                      | TOTAL      |               |               |              |       |
|                      | ARRIVALS   |               |               |              |       |
|                      | DEPARTURES |               |               |              |       |
|                      | TOTAL      |               |               |              |       |
|                      | ARRIVALS   |               |               |              |       |
|                      | DEPARTURES |               |               |              |       |
|                      | TOTAL      |               |               |              |       |
|                      | ARRIVALS   |               |               |              |       |
|                      | DEPARTURES |               |               |              |       |
|                      | TOTAL      |               |               |              |       |

## EXPERIMENT NO. 5

### Objective:

To obtain baseline delay estimates for the following runway configuration in IFR1 for 1978 demand:

Arrival Runways

27L,27R

Departure Runways

27L,27R

### Related Comparison Experiments:

Prior experiment 2 examines this configuration with VFR1 weather and 1978 demand.

Experiment 39 examines this configuration with IFR1 weather and 1983 demand.

Experiment 24 examines this configuration with IFR1 weather, 1978 demand, and 2 mile in-trail staggered parallel approaches.

Data Package No. 5  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
February 1980

TABLE 23

## EXPERIMENT 5 RESULTS

MIAMI INTER. AIRPORT EXPER.-5 ROUTES=1978 CONFIG=B SEPAR=78IFR1 DEMAND=78

| AVERAGE FLOW RATES |          |         |        |     |     |      |          |        |         |         |            |     |     |     |          |         |               |                |              |           |                     |             |             |  |
|--------------------|----------|---------|--------|-----|-----|------|----------|--------|---------|---------|------------|-----|-----|-----|----------|---------|---------------|----------------|--------------|-----------|---------------------|-------------|-------------|--|
| TIME               | ARRIVALS |         |        |     |     |      |          |        |         |         | DEPARTURES |     |     |     |          |         |               |                |              |           | AVERAGE TRAVEL TIME |             |             |  |
|                    | RWY 27R  | RWY 27L | RWY 30 | RWY | RWY | TOT  | DE- MAND | DIF    | RWY 27R | RWY 27L | RWY 30     | RWY | RWY | TOT | DE- MAND | DIF     | FIX TO THRESH | THRESH TO GATE | GATE TO ROLL | ARR DELAY | DEF DELAY           | GRAND TOTAL | GRAND TOTAL |  |
|                    |          |         |        |     |     |      |          |        |         |         |            |     |     |     |          |         |               |                |              |           |                     |             |             |  |
| 1100-1200          | 19.9     | 18.8    | 0.0    | 0.0 | 0.0 | 38.7 | 42.0     | -3.3   | 8.6     | 5.0     | 0.0        | 0.0 | 0.0 | 0.0 | 13.6     | 15.0    | -1.4          | 10.60          | 4.36         | 5.79      |                     |             |             |  |
| 1200-1300          | 23.3     | 23.2    | 0.0    | 0.0 | 0.0 | 46.5 | 46.0     | .5     | 16.9    | 16.8    | 0.0        | 0.0 | 0.0 | 0.0 | 33.7     | 36.0    | -2.3          | 14.62          | 4.78         | 8.18      |                     |             |             |  |
| 1300-1400          | 17.0     | 12.0    | 0.0    | 0.0 | 0.0 | 29.0 | 28.0     | 1.0    | 21.4    | 23.2    | 0.0        | 0.0 | 0.0 | 0.0 | 44.6     | 43.0    | 1.6           | 10.50          | 3.80         | 8.41      |                     |             |             |  |
| 1400-1500          | 21.5     | 12.6    | 0.0    | 0.0 | 0.0 | 34.1 | 35.0     | -9     | 18.3    | 12.8    | 0.0        | 0.0 | 0.0 | 0.0 | 31.1     | 34.0    | -2.9          | 10.41          | 4.14         | 11.56     |                     |             |             |  |
| 1500-1600          | 18.3     | 13.4    | 0.0    | 0.0 | 0.0 | 31.7 | 29.0     | 2.7    | 13.8    | 11.2    | 0.0        | 0.0 | 0.0 | 0.0 | 25.0     | 21.0    | 4.0           | 10.74          | 5.14         | 10.41     |                     |             |             |  |
| 1600-1700          | 23.1     | 14.0    | 0.0    | 0.0 | 0.0 | 37.1 | 38.0     | -9     | 18.0    | 12.0    | 0.0        | 0.0 | 0.0 | 0.0 | 30.0     | 31.0    | -1.0          | 13.55          | 4.07         | 6.78      |                     |             |             |  |
| 1700-1800          | 16.9     | 5.0     | 0.0    | 0.0 | 0.0 | 21.9 | 21.0     | .9     | 15.0    | 22.0    | 0.0        | 0.0 | 0.0 | 0.0 | 37.0     | 37.0    | 0.0           | 9.74           | 4.19         | 5.39      |                     |             |             |  |
| 1800-1900          | 14.0     | 10.0    | 0.0    | 0.0 | 0.0 | 24.0 | 24.0     | 0.0    | 19.9    | 11.0    | 0.0        | 0.0 | 0.0 | 0.0 | 30.9     | 31.0    | -1            | 8.63           | 4.67         | 6.10      |                     |             |             |  |
| 1900-2000          | 1.0      | 0.0     | 0.0    | 0.0 | 0.0 | 1.0  | 1.0      | 0.0    | 6.1     | 4.0     | 0.0        | 0.0 | 0.0 | 0.0 | 10.1     | 9.0     | 1.1           | 9.50           | 3.39         | 3.22      |                     |             |             |  |
| AVERAGE DELAYS     |          |         |        |     |     |      |          |        |         |         |            |     |     |     |          |         |               |                |              |           |                     |             |             |  |
| TIME               | ARRIVALS |         |        |     |     |      |          |        |         |         | DEPARTURES |     |     |     |          |         |               |                |              |           | AVERAGE DELAYS      |             |             |  |
|                    | RWY 27R  | RWY 27L | RWY 30 | RWY | RWY | TOT  | CRS      | TAX IN | RWY 27R | RWY 27L | RWY 30     | RWY | RWY | TOT | CRS      | TAX OUT | FIX TO THRESH | THRESH TO GATE | GATE TO ROLL | ARR DELAY | DEF DELAY           | GRAND TOTAL | GRAND TOTAL |  |
|                    |          |         |        |     |     |      |          |        |         |         |            |     |     |     |          |         |               |                |              |           |                     |             |             |  |
| 1100-1200          | 2.0      | 1.5     | 0.0    | 0.0 | 0.0 | 1.8  | 0.0      | .1     | 1.2     | 3.2     | 0.0        | 0.0 | 0.0 | 0.0 | 1.9      | .0      | .9            | 0.0            | 0.0          | 1.9       | 2.9                 |             |             |  |
| 1200-1300          | 5.3      | 6.1     | 0.0    | 0.0 | 0.0 | 5.7  | 0.0      | .4     | 4.8     | 3.5     | 0.0        | 0.0 | 0.0 | 0.0 | 4.2      | .0      | 1.6           | 0.0            | 0.0          | 6.1       | 5.8                 |             |             |  |
| 1300-1400          | 4.0      | .3      | 0.0    | 0.0 | 0.0 | 2.5  | 0.0      | .1     | 4.6     | 4.4     | 0.0        | 0.0 | 0.0 | 0.0 | 4.5      | .0      | 1.6           | 0.0            | 0.0          | 2.5       | 6.1                 |             |             |  |
| 1400-1500          | 2.2      | .8      | 0.0    | 0.0 | 0.0 | 1.7  | .0       | .0     | 11.7    | .7      | 0.0        | 0.0 | 0.0 | 0.0 | 7.1      | .0      | .9            | .1             | 0.0          | 1.7       | 8.1                 |             |             |  |
| 1500-1600          | 2.7      | 1.0     | 0.0    | 0.0 | 0.0 | 2.0  | .0       | .6     | 7.5     | 1.9     | 0.0        | 0.0 | 0.0 | 0.0 | 5.2      | .0      | 2.1           | .1             | 0.0          | 2.7       | 7.4                 |             |             |  |
| 1600-1700          | 6.4      | .5      | 0.0    | 0.0 | 0.0 | 4.2  | 0.0      | .2     | 4.0     | 1.5     | 0.0        | 0.0 | 0.0 | 0.0 | 3.0      | .0      | 1.1           | 0.0            | 0.0          | 4.4       | 4.2                 |             |             |  |
| 1700-1800          | 1.7      | .8      | 0.0    | 0.0 | 0.0 | 1.5  | 0.0      | .1     | 2.7     | 2.3     | 0.0        | 0.0 | 0.0 | 0.0 | 2.5      | .0      | .5            | 0.0            | 0.0          | 1.6       | 2.9                 |             |             |  |
| 1800-1900          | 1.0      | .6      | 0.0    | 0.0 | 0.0 | .8   | 0.0      | .3     | 2.9     | 1.4     | 0.0        | 0.0 | 0.0 | 0.0 | 2.3      | .0      | 1.1           | 0.0            | 0.0          | 1.2       | 3.4                 |             |             |  |
| 1900-2000          | 0.0      | 0.0     | 0.0    | 0.0 | 0.0 | 0.0  | 0.0      | 0.0    | .2      | .8      | 0.0        | 0.0 | 0.0 | 0.0 | .4       | 0.0     | .0            | 0.0            | 0.0          | 0.0       | .5                  |             |             |  |

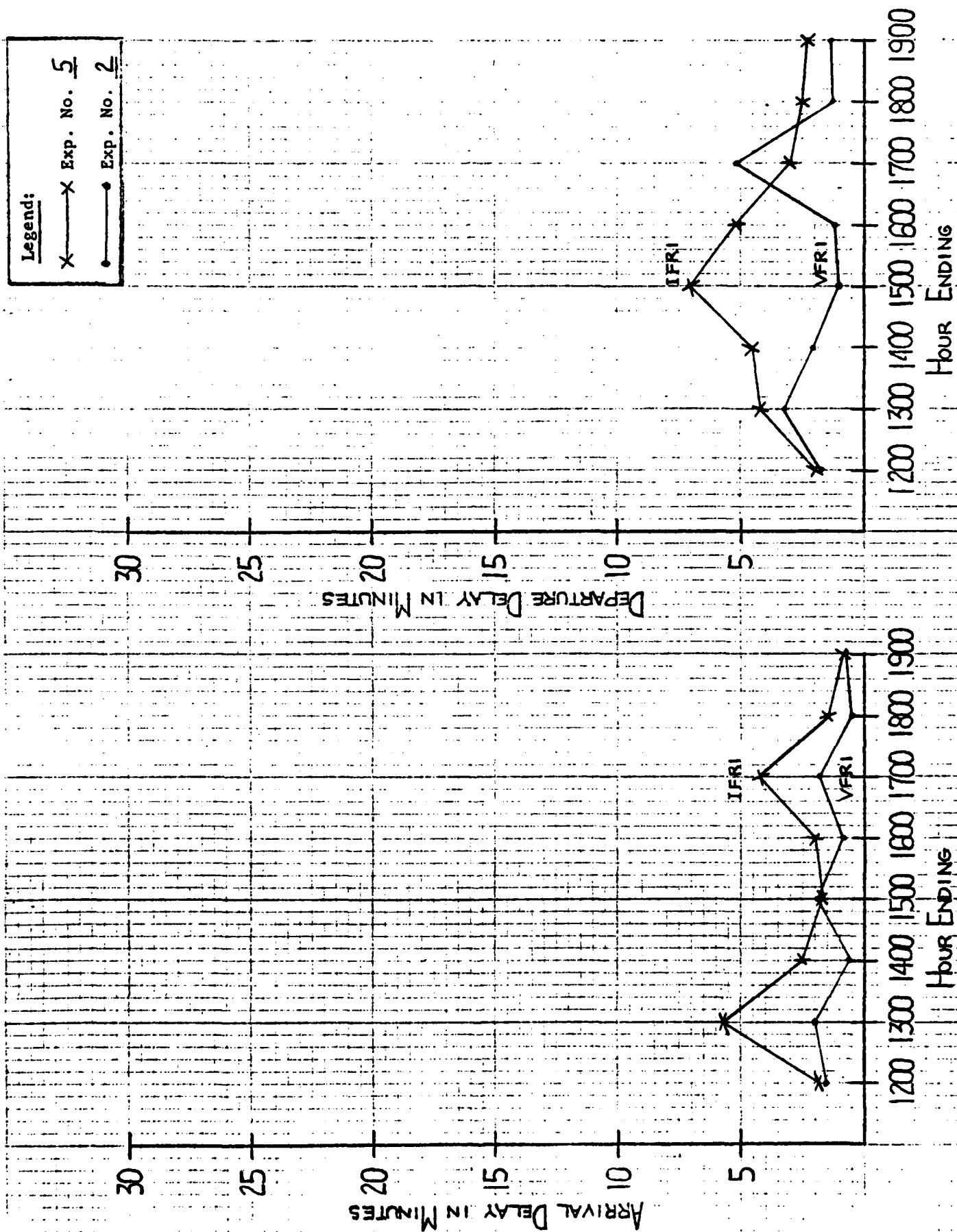


Figure 17. VFR1/IFR1 West Comparison: 1978 Demand

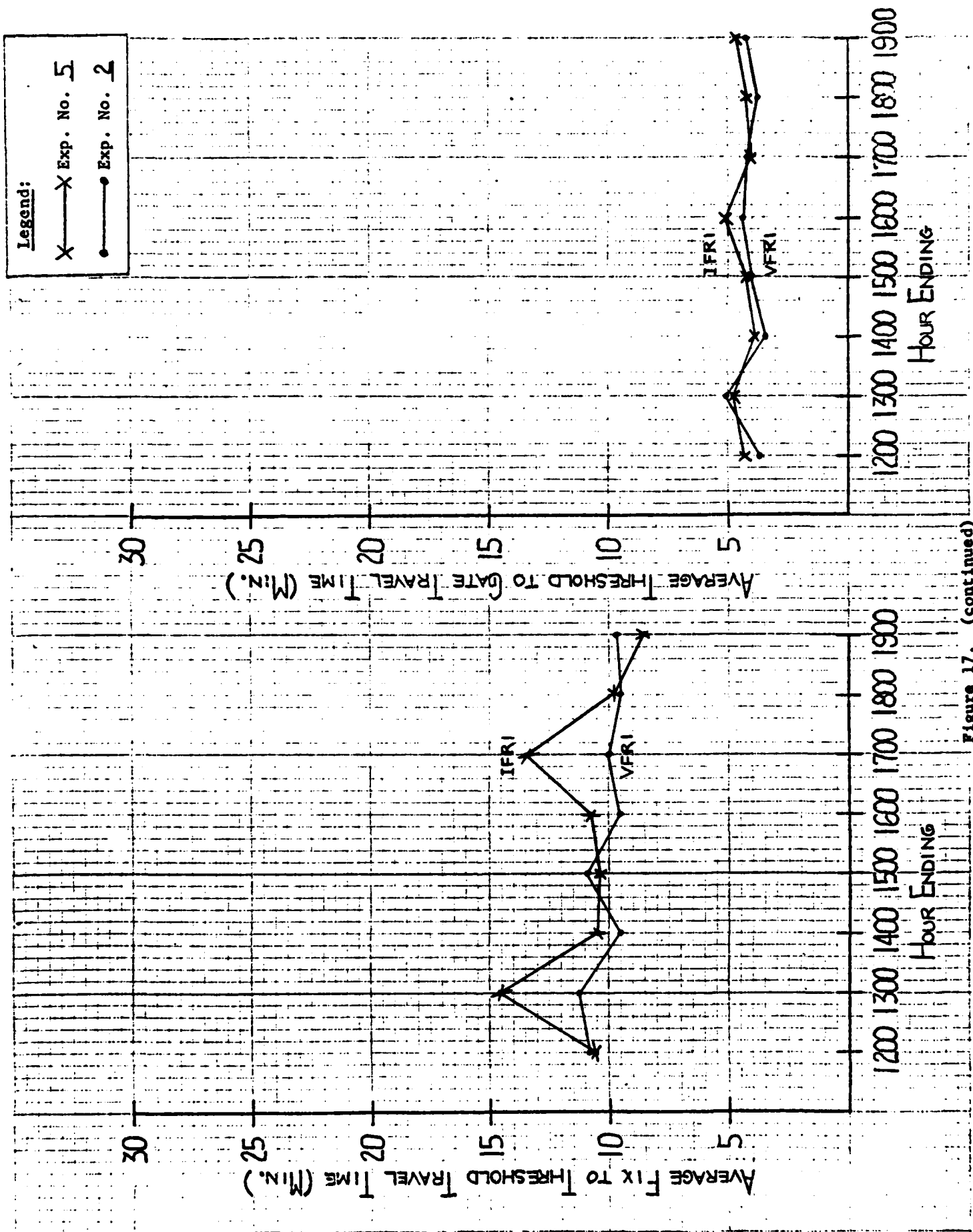


Figure 17. (continued)

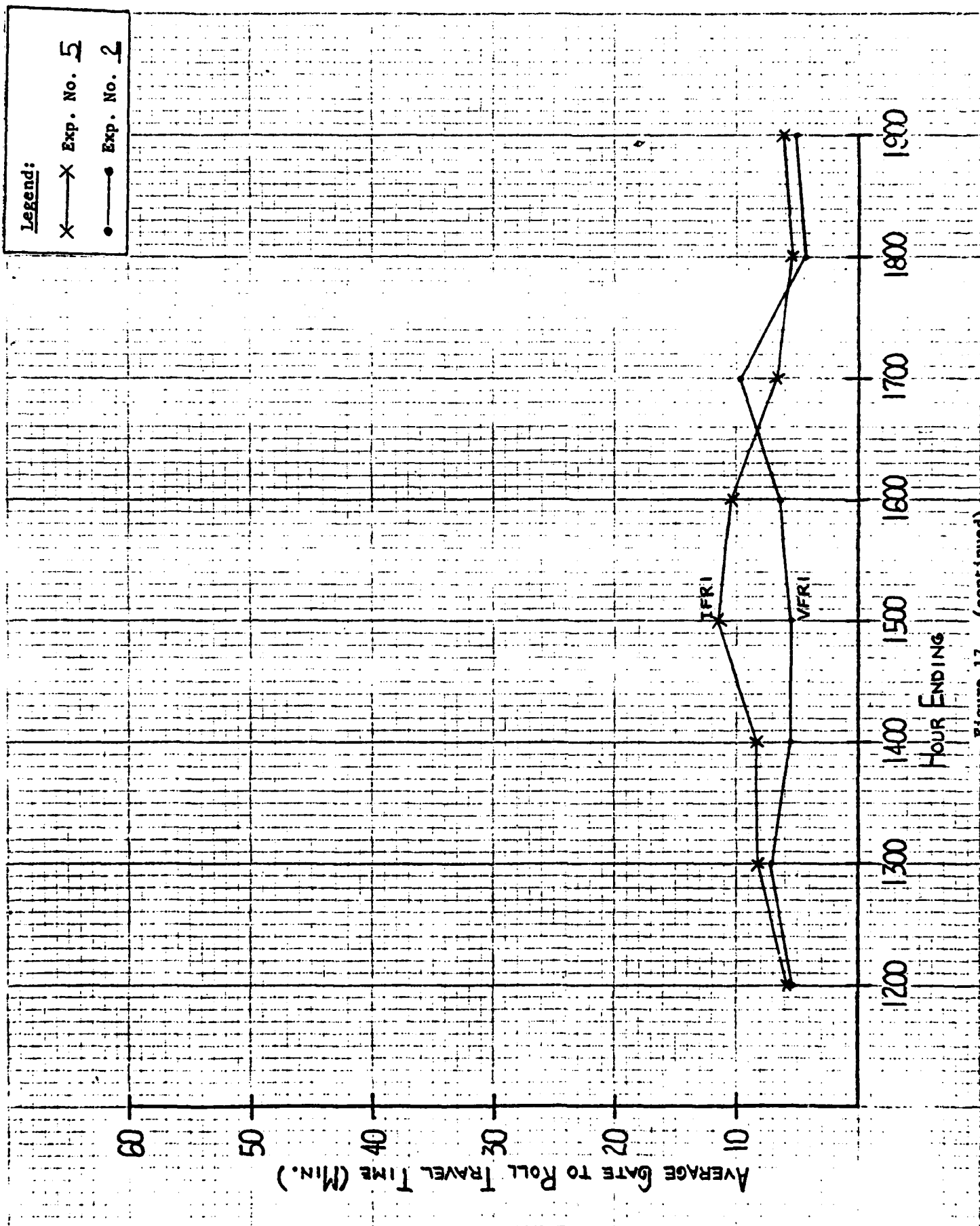


Figure 17. (continued)

## EXPERIMENT NO. 39

### Objective:

To assess the delay impact to aircraft in 1983 for the following runway configuration under IFR1 conditions, assuming no airport or ATC system improvements have been implemented:

Arrival Runways

27L,27R

Departure Runways

27L,27R

### Related Comparison Experiments:

Prior experiment 5 serves as the 1978 demand level baseline for comparison to this experiment.

Data Package No. 5  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
February 1980

TABLE 24

## EXPERIMENT 39 RESULTS

MIAMI INTER. AIRPORT EXPER.-39 ROUTES-1978 CONFIG-B SEPAR-78IFK1 DEMAND-B3

| AVERAGE FLOW RATES |         |         |        |     |     |          |        |         |         |            |     |     |          |         |                     |                |                    |       |       |
|--------------------|---------|---------|--------|-----|-----|----------|--------|---------|---------|------------|-----|-----|----------|---------|---------------------|----------------|--------------------|-------|-------|
| ARRIVALS           |         |         |        |     |     |          |        |         |         | DEPARTURES |     |     |          |         | AVERAGE TRAVEL TIME |                |                    |       |       |
| TIME               | RWY 27R | RWY 27L | RWY 30 | RWY | TOT | DE- HAND | DIF    | RWY 27R | RWY 27L | RWY 30     | RWY | TOT | DE- HAND | DIF     | FIX TO THRESH       | THRESH TO GATE | GATE TO ROLL       |       |       |
| 1100-1200          | 18.7    | 20.9    | 0.0    | 0.0 | 0.0 | 39.6     | 50.0   | -10.4   | 8.8     | 6.8        | 0.0 | 0.0 | 0.0      | 15.6    | 18.0                | -2.4           | 12.32              | 4.57  | 5.08  |
| 1200-1300          | 25.1    | 24.4    | 0.0    | 0.0 | 0.0 | 49.5     | 54.0   | -4.5    | 18.1    | 16.4       | 0.0 | 0.0 | 0.0      | 34.5    | 54.0                | -19.5          | 20.50              | 6.10  | 14.98 |
| 1300-1400          | 23.6    | 19.3    | 0.0    | 0.0 | 0.0 | 42.9     | 39.0   | 3.9     | 15.2    | 22.3       | 0.0 | 0.0 | 0.0      | 37.5    | 61.0                | -23.5          | 26.64              | 5.22  | 23.83 |
| 1400-1500          | 24.1    | 16.4    | 0.0    | 0.0 | 0.0 | 40.5     | 41.0   | -0.5    | 12.5    | 26.9       | 0.0 | 0.0 | 0.0      | 39.4    | 32.0                | 7.4            | 25.48              | 15.71 | 55.35 |
| 1500-1600          | 21.1    | 21.4    | 0.0    | 0.0 | 0.0 | 42.5     | 60.0   | -17.5   | 12.8    | 17.4       | 0.0 | 0.0 | 0.0      | 30.2    | 39.0                | -8.8           | 29.54              | 19.92 | 65.63 |
| 1600-1700          | 17.6    | 18.6    | 0.0    | 0.0 | 0.0 | 36.2     | 41.0   | -4.8    | 12.6    | 17.7       | 0.0 | 0.0 | 0.0      | 30.3    | 32.0                | -1.7           | 33.97              | 12.13 | 70.53 |
| 1700-1800          | 14.9    | 7.6     | 0.0    | 0.0 | 0.0 | 22.5     | 34.0   | -11.5   | 10.4    | 22.5       | 0.0 | 0.0 | 0.0      | 32.9    | 64.0                | -31.1          | 40.25              | 12.86 | 40.74 |
| 1800-1900          | 14.4    | 6.5     | 0.0    | 0.0 | 0.0 | 20.9     | 28.0   | -7.1    | 9.4     | 17.1       | 0.0 | 0.0 | 0.0      | 26.5    | 32.0                | -5.5           | 36.52              | 6.81  | 53.67 |
| 1900-2000          | 2.9     | 0.0     | 0.0    | 0.0 | 0.0 | 2.9      | 0.0    | 2.9     | 15.2    | 1.9        | 0.0 | 0.0 | 0.0      | 17.1    | 0.0                 | 17.1           | 11.80              | 2.06  | 77.85 |
| AVERAGE DELAYS     |         |         |        |     |     |          |        |         |         |            |     |     |          |         |                     |                |                    |       |       |
| TIME               | RWY 27R | RWY 27L | RWY 30 | RWY | TOT | RWY CRS  | TAX IN | RWY 27R | RWY 27L | RWY 30     | RWY | TOT | RWY CRS  | TAX OUT | RWY CMB             | ARR DELAY      | AVERAGE DELAYS DEP |       |       |
| 1100-1200          | 4.4     | 2.4     | 0.0    | 0.0 | 0.0 | 3.3      | 0.0    | 2.1     | 1.7     | 0.0        | 0.0 | 0.0 | 1.7      | .1      | .5                  | 3.4            | 2.5                |       |       |
| 1200-1300          | 17.7    | 6.5     | 0.0    | 0.0 | 0.0 | 12.2     | .0     | 8.2     | 11.2    | 0.0        | 0.0 | 0.0 | 9.6      | 0.0     | 2.9                 | 13.7           | 12.5               |       |       |
| 1300-1400          | 31.2    | 2.3     | 0.0    | 0.0 | 0.0 | 18.2     | .0     | 21.1    | 13.3    | 0.0        | 0.0 | 0.0 | 16.4     | 0.0     | 4.1                 | 19.3           | 21.0               |       |       |
| 1400-1500          | 25.1    | 2.0     | 0.0    | 0.0 | 0.0 | 15.7     | .0     | 45.4    | 8.5     | 0.0        | 0.0 | 0.0 | 19.8     | .0      | 27.8                | 27.2           | 53.0               |       |       |
| 1500-1600          | 34.0    | 5.7     | 0.0    | 0.0 | 0.0 | 19.7     | .0     | 50.4    | 18.1    | 0.0        | 0.0 | 0.0 | 31.7     | 0.0     | 21.8                | 34.9           | 63.2               |       |       |
| 1600-1700          | 47.1    | 6.9     | 0.0    | 0.0 | 0.0 | 25.8     | .0     | 54.8    | 15.3    | 0.0        | 0.0 | 0.0 | 29.0     | .0      | 25.9                | 33.4           | 67.8               |       |       |
| 1700-1800          | 50.5    | .8      | 0.0    | 0.0 | 0.0 | 31.6     | .0     | 36.8    | 7.1     | 0.0        | 0.0 | 0.0 | 17.0     | .0      | 7.7                 | 40.4           | 38.1               |       |       |
| 1800-1900          | 39.4    | 1.1     | 0.0    | 0.0 | 0.0 | 29.7     | .0     | 48.7    | 3.8     | 0.0        | 0.0 | 0.0 | 19.8     | .0      | 15.2                | 33.6           | 51.2               |       |       |
| 1900-2000          | 9.0     | 0.0     | 0.0    | 0.0 | 0.0 | 9.0      | .0     | 32.5    | .4      | 0.0        | 0.0 | 0.0 | 23.0     | 0.0     | 11.5                | 9.9            | 76.0               |       |       |

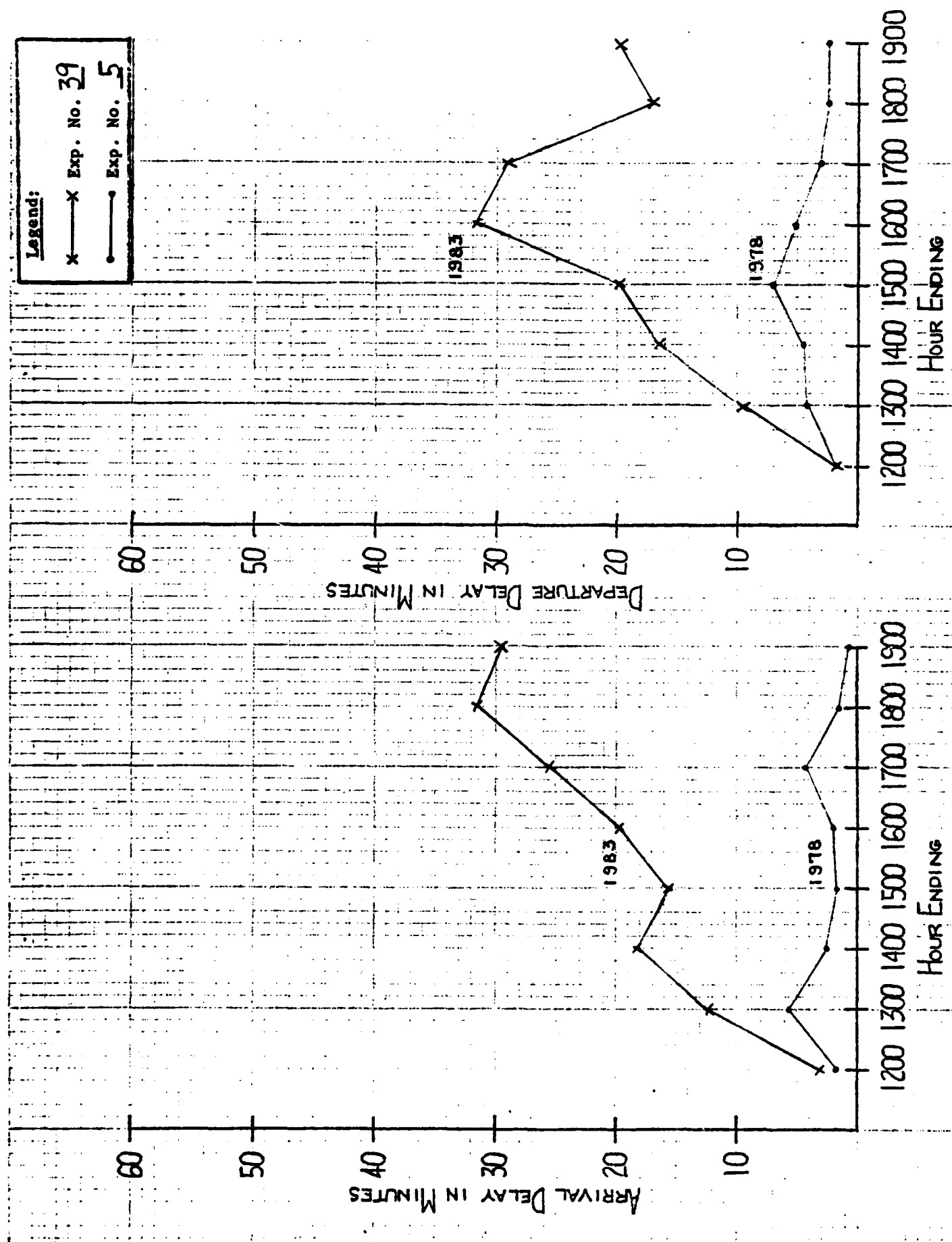


Figure 18. IFR1 West Comparison: 1978/1983 Demand

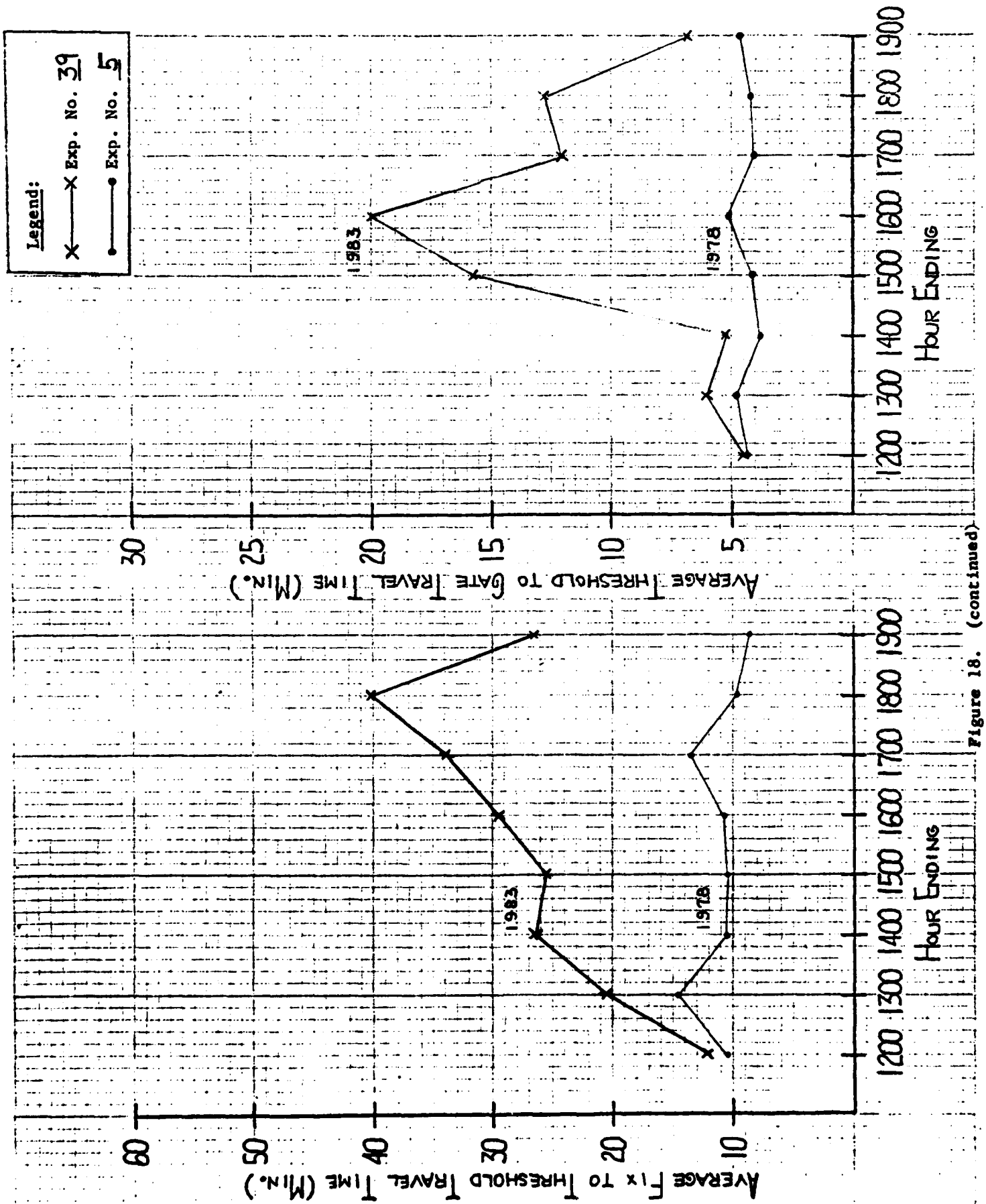


Figure 18. (continued)

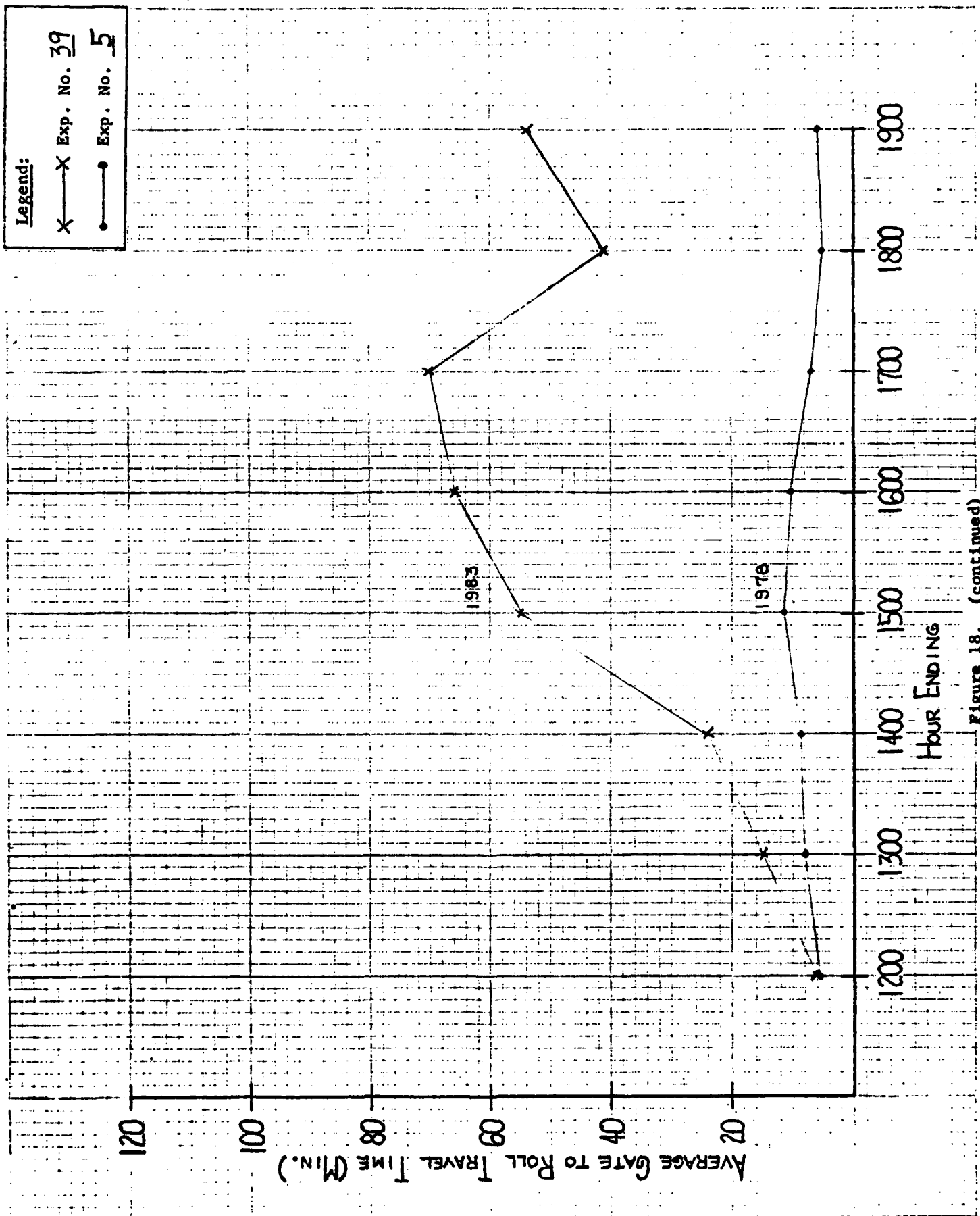


Figure 18. (continued)

## EXPERIMENT NO. 24

### Objective:

To assess the delay impact to aircraft of using 2 mile in-trail, staggered parallel approaches for the following runway configuration under IFR1 conditions and 1978 demand:

Arrival Runways

Departure Runways

27L, 27R

27L, 27R

### Related Comparison Experiments:

Prior experiment 5 serves as the 1978 demand level baseline for comparison to this experiment, wherein the conditions of this study case were identical except for the 2 mile in-trail, staggered parallel approach.

Data Package No. 5  
Miami International Airport  
Airport Improvement Task Force Delay Studies  
February 1980

## EXPERIMENT 24 RESULTS

MIAMI INTER. AIRPORT EXP. -24 ROUTES=1978 CONFIG=B SEPAR=78IFR1-STAG DEMAND=78

**D-60**

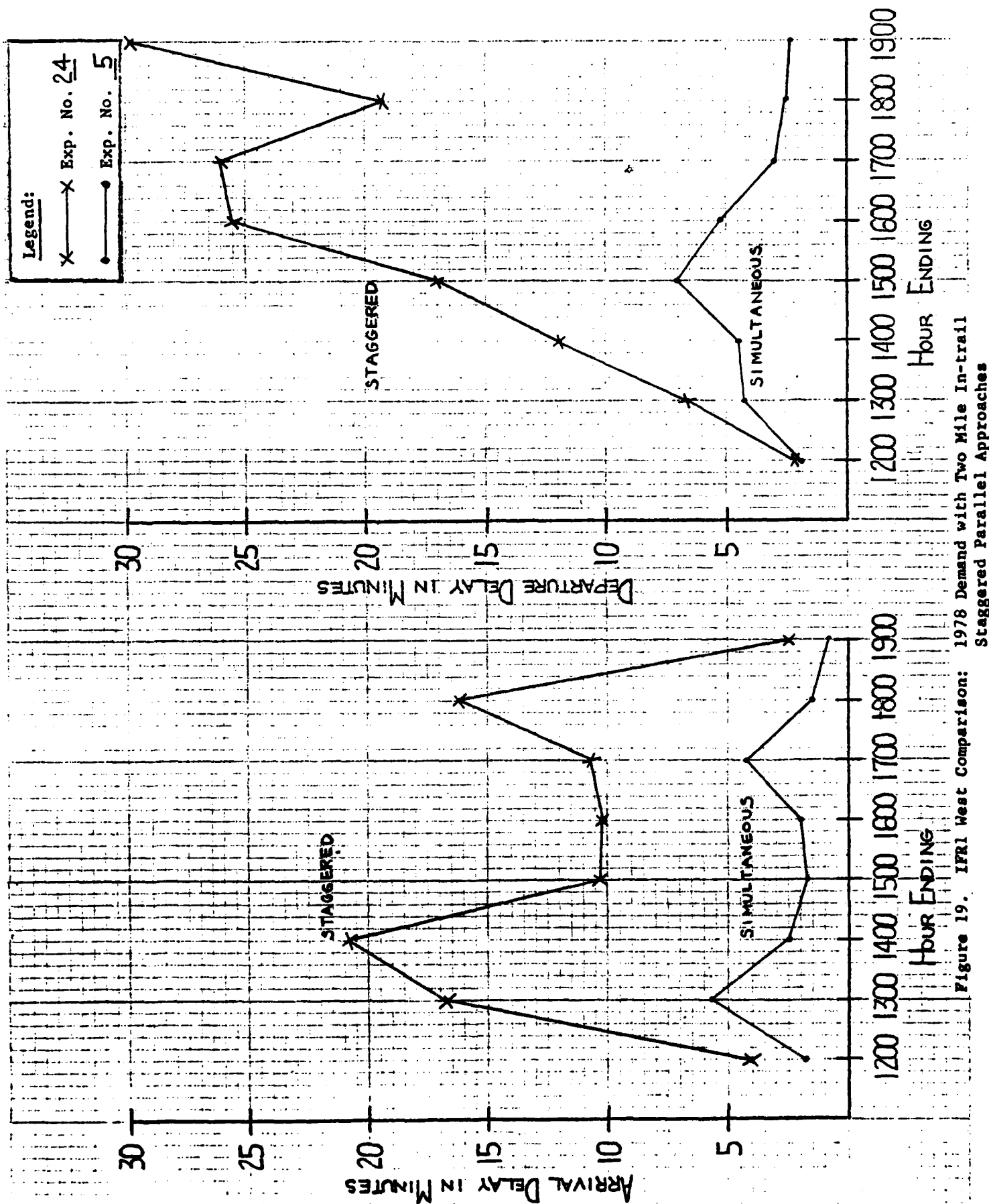


Figure 19. IFR West Comparison: 1978 Demand with Two Mile In-trail  
 Staggered Parallel Approaches

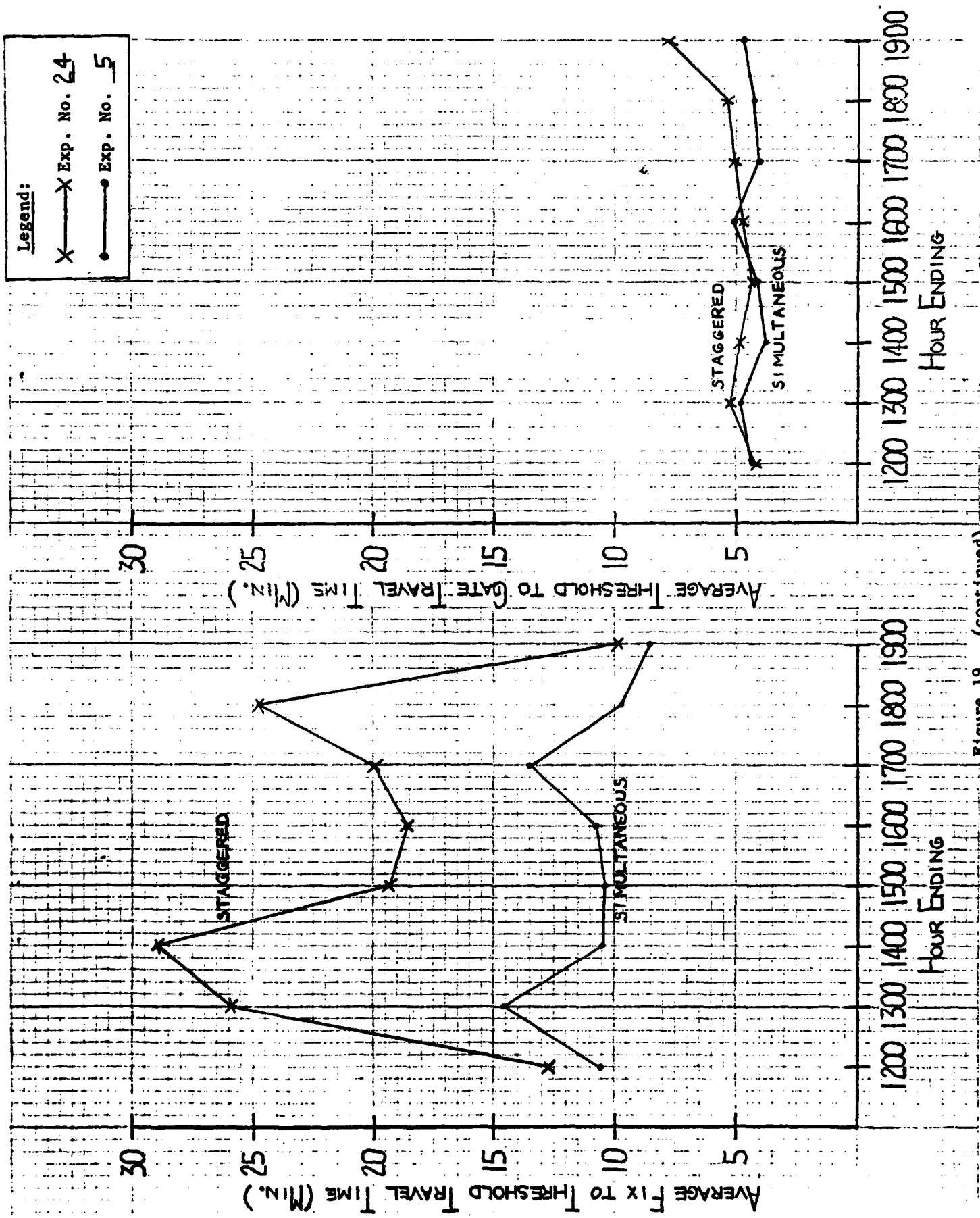


Figure 19. (continued)

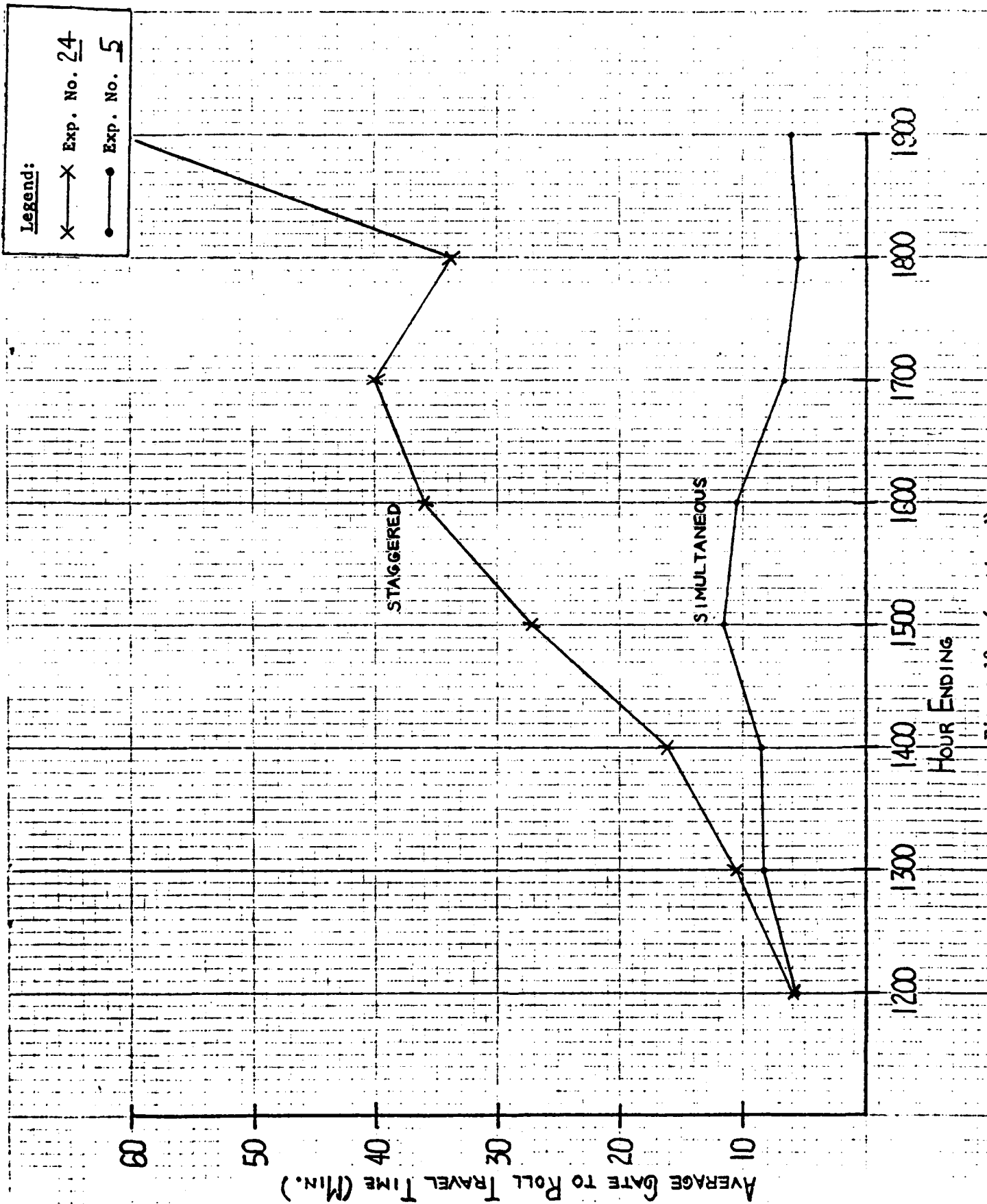


Figure 19. (continued)

**DATE**  
**ILME**