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MIAMI INTERNATIONAL AIRPORT DATA PACKAGE NUMBER 7. AIRPORT IMPR--ETC(U)
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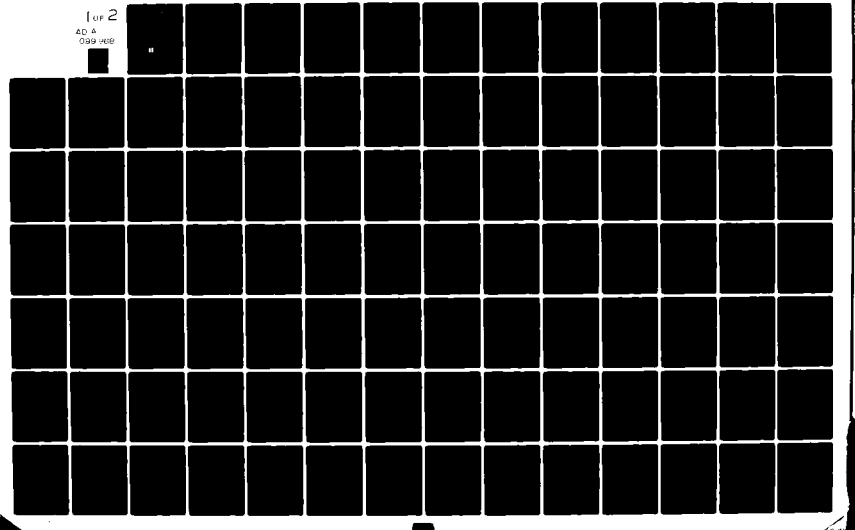
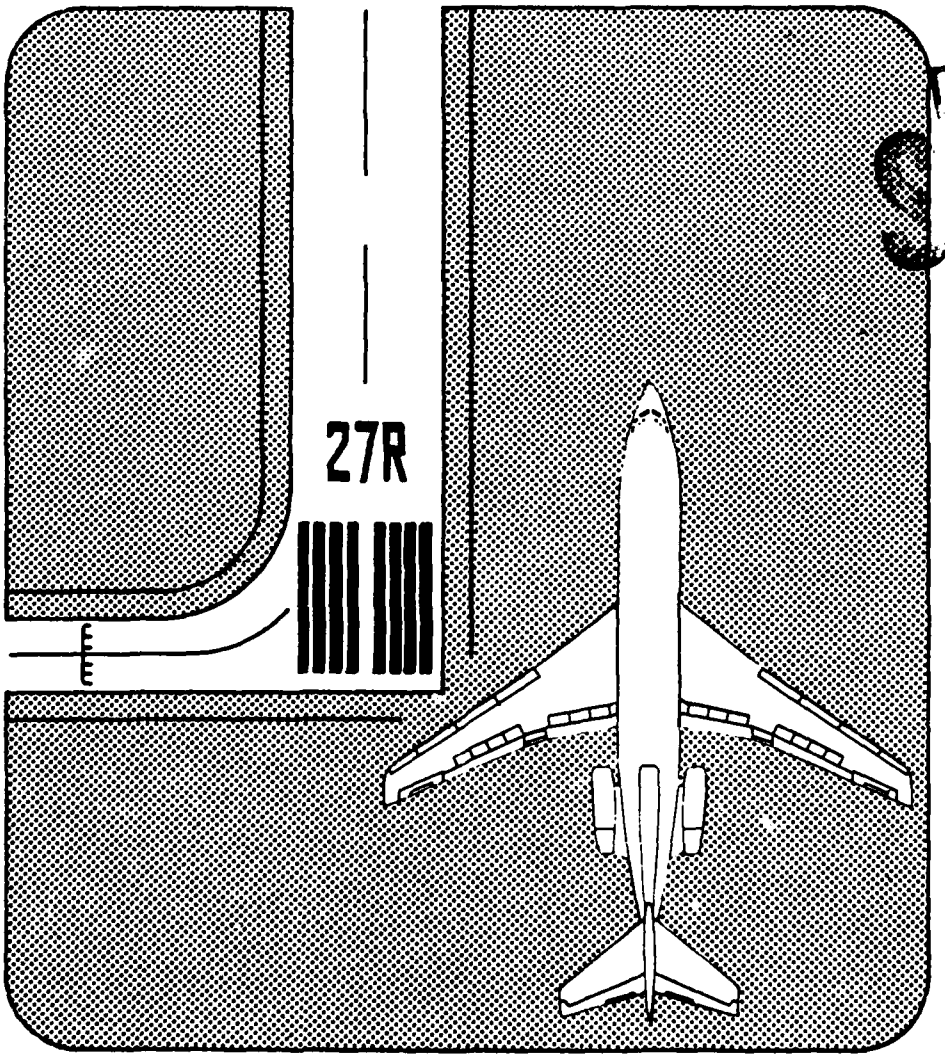


MIAMI INTERNATIONAL AIRPORT

DATA PACKAGE NO. 7

AIRPORT IMPROVEMENT TASK FORCE DELAY STUDIES



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MIAMI INTERNATIONAL AIRPORT.

DATA PACKAGE ~~NO~~. 7.
Number

~~MIAMI~~

AIRPORT IMPROVEMENT TASK FORCE DELAY STUDIES.

(11) JUL~~Y~~ 1980

Prepared by:

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41186

PREFACE

This data package presents the key results of the Miami Stage 1 Airfield Simulation Model experiments, organized by comparison sets which demonstrate the relationship between various demand/improvement/ATC system scenario combinations that exist in the experimental design.

The annual delay estimates for various demand/improvement/ATC System scenario combinations are also included in this package. These estimates were developed from an analysis of the Airfield Simulation Model experiments, as opposed to employing the Annual Delay Model as originally envisioned. The annual weather group/demand factor ratios were applied to the simulation results of selected experiments to develop the annual delay estimates.

The major intent of this data package is to compare the experimental results and annual delay estimates in a manner that will assist the Miami Delay Studies Task Force in preparing its final report.

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1. INTRODUCTION

1.1 GENERAL.

Airfield operations at the Miami International Airport are expected to increase in the immediate future. A study of the effects of this increase in air traffic demand and proposed improvements at the airport (procedures, hardware, and airport design) was initiated in September 1976. The results of the initial capacity study appeared in an Interim Report (October 1977) issued by the Miami International Airport Improvement Program Task Force. The present delay study was based upon the report and a technical plan prepared in October 1978, along with a Federal Aviation Administration report (FAA-EM-78-8A) entitled "Parameters of Future ATC Systems Relating to Airport Capacity/Delay" (June 1978).

1.2 OBJECTIVE.

The purpose of this effort was:

1. To estimate current levels of airport delay and to identify causes of delay associated with operations in the airspace, airfield, and apron/gate systems.

2. To estimate the potential benefits of reducing aircraft delay through alternative air traffic control procedures, airport use policies, and facility developments.

3. To estimate current and future relationships between air traffic demand and aircraft delay as an aid to future planning.

4. To estimate the potential benefits of increased aircraft capacity and reduced aircraft delay for proposed improvements in air traffic control systems resulting from the FAA Engineering and Development program.

1.3 BACKGROUND.

The airport delay study began with a description of the present day air traffic control procedures at the Miami International Airport. A report was prepared in September 1976, (FAA-NA-76-164) which summarized the ground/airborne scenarios. The next step was the preparation of a technical plan which included a list of the experiments to be performed and information regarding the application of the airfield simulation model. Various steps and milestones were planned along with a description of data requirements for the computer (model) runs.

The effort was accomplished by the Airport Improvement Task Force reviewing a series of data packages containing information on the preparation of the model runs, revisions to the experimental design (suggested by the Task Force), and the results of the experiments. The data packages contained information on the calibration of the model based on field data, description of the model inputs for the experiments, air traffic demand forecasts (including runway and aircraft class distributions), results of experiments and preliminary analysis of those results.

Comments on each of the data packages by the Task Force were incorporated into subsequent work performed on the program.

2. DISCUSSION.

2.1 AIR TRAFFIC CONTROL PROCEDURES.

The air traffic control service at the Miami International Airport is extended to each airline company, general aviation, the airport authority, the local and regional residents, and the general public. The ATC procedures employed at the airport are responsive to a variety of geographic and airfield conditions. The desired result is a safe level of service which holds delays to minimum throughout the day by applying present air traffic control rules and regulations.

Some specific service conditions reflected in the ATC procedures are:

1. The assignment, when possible, of arrivals to runways closest to their gate areas.

2. The assignment of departures to runways based on the route of flight (with the exception of B747 aircraft which must use runway 9R/27L).

The ATC procedures are considered in the study in two ways. The separations maintained between arrivals and departures are used as model inputs for the computer run. The present day conditions at the airfield are reflected in the gate and runway distributions used for experiments with VFR conditions and no airport design improvements.

2.2 EXPERIMENTAL DESIGN AND MODEL APPLICATION.

The Stage 1 experiments shown in table 1 represent the finalized Airfield Simulation Model experiments that resulted during the course of this effort. Experiments 11B, 14AA, 35A, and 21N, for example, are reruns of experiments 11, 14, 35, and 21 as presented in Miami Data Package No. 6. These reruns were performed to correct for errors found in the arrival runway occupancy times and exit probabilities for the runway 9R extension.

The Stage 2 experiments shown in table 2 were initially to be performed by application of the Annual Delay Model. It was decided to base the annual delay estimates on results obtained from the Airfield Simulation Model, however, due to the complexity of developing accurate capacity/delay curves required as input to the Annual Delay Model. The weather group/demand factor ratios initially developed for application of the Annual Delay Model were taken into account while developing the annual delay estimates.

TABLE 1

MIAMI DELAY EXPERIMENTS*

STAGE 1

Experiment Number	Model	Study Case[a]	Arrival Runways	Departure Runways	Weather	Demand	ATC System Scenario[b]	Near-term Improvements[c]
1	ASM[d]	1	9L, 9R, 12	9L, 9R, 12	VFR1	Todays	Todays	None
7	ASM	1	9L, 9R, 12	9L, 9R, 12	VFR1	1983[l]	Todays	None (Full G. A.)
11B	ASM	1	9L, 9R, 12	9L, 9R, 12	VFR1	1983[l]	1983	1983[e] (Full G. A.)
14AA	ASM	1	9L, 9R, 12	9L, 9R, 12	VFR1	1983[m]	1983	1983[e, g] (50% G. A. Reduction)
4	ASM	4	9L, 9R	9L, 9R, 12	IFR1	Todays	Todays	None
34	ASM	4	9L, 9R	9L, 9R, 12	IFR1	1983[l]	Todays	None (Full G. A.)
9	ASM	4	9L, 9R	9L, 9R, 12	IFR1	1983[m]	1983	g (50% G. A. Reduction)
35A	ASM	4	9L, 9R	9L, 9R, 12	IFR1	1983[m]	1983	1983[e, g] (50% G. A. Reduction)
6	ASM	8	None	9L	IFR2	Todays	Todays	None
10	ASM	8	None	9L	IFR2	1983[m]	1983	g (50% G. A. Reduction)
21M	ASM	9	9L	9L, 9R, 12	IFR2	1983[m]	1983	1983[e, g] (50% G. A. Reduction)
2	ASM	2	27L, 27R, 30	27L, 27R, 30	VFR1	Todays	Todays	None
8	ASM	2	27L, 27R, 30	27L, 27R, 30	VFR1	1983[l]	Todays	None (Full G. A.)
36	ASM	2	27L, 27R, 30	27L, 27R, 30	VFR1	1983[l]	1983	1983[e] (Full G. A.)
37	ASM	2	27L, 27R, 30	27L, 27R, 30	VFR1	1983[m]	1983	1983[e, g] (50% G. A. Reduction)
3	ASM	3	27L, 27R	27L, 27R, 30	VFR2	Todays	Todays	None
38	ASM	3	27L, 27R	27L, 27R, 30	VFR2	1983[l]	Todays	None (Full G. A.)
17	ASM	3	27L, 27R	27L, 27R, 30	VFR2	1983[m]	1983	g (50% G. A. Reduction)
12	ASM	7	27R, 30	27L, 27R	VFR2	1983[m]	1983	1983[e, g] (50% G. A. Reduction)
5	ASM	5	27L, 27R	27L, 27R	IFR1	Todays	Todays	None
39	ASM	5	27L, 27R	27L, 27R	IFR1	1983[l]	Todays	None (Full G. A.)
15	ASM	5	27L, 27R	27L, 27R	IFR1	1983[l]	1983	1983[e] (Full G. A.)
20N	ASM	5	27L, 27R	27L, 27R	IFR1	1983[m]	1983	1983[e, g] (50% G. A. Reduction)
12A	ASM	7	27R, 30	27L, 27R	VFR2	1983[m]	1983	1983[p, g] (50% G. A. Reduction)
40	ASM	5	27L, 27R	27L, 27R	VFR1	1983[l]	Todays	None(Full G.A.)
11A	ASM	1	9L,9R,12	9L,9R,12	VFR1	1983[m]	1983	Reliever Upgrading Only

[a] Study cases are defined in Figure III-1 of the Miami International Airport Technical Plan (Oct. 1978).

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

[c] Near-term improvements are described in Appendix B of the Miami International Airport Technical Plan.

[d] Airfield Simulation Model.

[e] 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.

[g] 50% reduction in general aviation achieved by upgrading Opa Locka and Tamiami General Aviation Reliever Airports.

[i] Improvement #6 is the use of 2 mile in-trail staggered parallel approaches.

[l] 1983 full schedule assumes no G. A. relocation out of Miami between 1978 and 1983.

[m] 1983 limited schedule assumes a 50% G. A. reduction at Miami due to upgrading of reliever airports.

[p] 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 2

MIAMI DELAY EXPERIMENTS*

STAGE 2

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

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

[g] 50% reduction in general aviation achieved by upgrading Opa Locka and Tamiami General Aviation Reliever Airports.

[h] Annual Delay Model

[m] 1983 limited schedule assumes a 50% G. A. reduction at Miami due to upgrading of reliever airports.

[q] Post-1985 Demand to be provided by the Miami Delay Studies' Task Force.

[r] 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

2.2.1 Air Traffic Control Scenarios.

The time frame for the air traffic control scenario indicated the aircraft separation values to be used for the experiments for either VFR or IFR weather conditions. Persent day VFR separation values were established by calibrating the model (i.e., matching model output to field data collected at the facility). The base values for arrival-to-arrival and departure-to-departure separations were obtained from the FAA report on "Parameters of Future ATC Systems Relating to Airport Capacity/Delay" (FAA-EM-78-8A). The remaining values for separation followed the results obtained through calibration.

2.2.2 Airport Design Improvements.

The airport design improvements were initially identified in the Miami International Airport Improvement Task Force Interim Report. The near-term improvements were noted in table 1, Miami Delay Experiments.

The near-term improvements included:

Improvement No. 1:

Improve the taxiway system of runway 9L/27R. Install runway centerline lighting and touch-down zone lighting on runway 9L. Install dual, 250-foot baseline RVR systems on runway 9L/27R.

Improvement No. 2:

Install runway centerline lighting and dual, 250-foot baseline RVR systems on runway 9R/27L.

Improvement No. 3:

Install High Intensity Runway Lights, an Instrument Landing System and an Approach Lighting System on runway 30. Provide paved, blast protection shoulders on runways 12/30 and 9R/27L. Implement operational procedures to make greater use of the intersection take-off position on runway 30 and simultaneous use of runways 12 and 9R.

Improvement No. 4:

Upgrade Opa Locka and Tamiami General Aviation Reliever Airports, to encourage low performance general aviation aircraft to relocate out of MIA.

Improvement No. 6:

Use 2 mile, in-trail staggered parallel approaches at MIA, to improve capacity without the extra tower staff required for full, independent parallel approaches.

Improvement No. 7:

Install Vortex Advisory System (VAS) monitors at both ends of all three runways at MIA.

Improvement No. 9:

Extend runway 9R/27L by 3650 feet. Relocate the easterly and westerly landing thresholds on runway 9R/27L to positions 2200 feet down the runway, for the purpose of noise abatement. Provide a dual parallel taxiway system and new exit taxiways on runway 9R/27L.

Improvement No. 10:

Ask the airlines to taxi, rather than tow their aircraft between their bases and their gates, anv vice versa, during peak traffic periods.

Various near-term improvements were introduced into different experiments to determine their effectiveness in reducing delays and processing the air traffic demand. The improvements were introduced into the experiments by changing the model inputs and the runway demand distributions.

2.2.3 Air Traffic Demand.

Actual and forecasted air traffic demands were prepared for the 1978, 1983, and 1988 time periods. Demands for the 1983 and 1988 time periods were prepared for both the full G.A. and limited G.A. cases so as to study the effect of reliever airport upgrading.

Each air traffic demand applied to an experiment required a specified arrival and departure runway distribution and individual gate assignments by airline.

The basis for the initial VFR distribution of traffic was the field data collected at the airport during the week of October 30, 1978. Data reduction programs calculated the actual distribution of traffic over the runways and gates.

When the experiment required another weather condition or an improvement in airport design, the aircraft schedule was changed to reflect the proper weather condition or the revised airport operation. After the computer simulation of a particular experiment, the delay and travel time summaries were analyzed to determine whether the results represented logical operating conditions for the airport.

2.3 EXPERIMENTAL RESULTS.

Each experiment produced a summary of hourly results which was reduced to tabular form. The information in the table included: average flow rates for each runway, average total flow rate for the airport, average arrival and departure delay for each runway (including average delay for all runways), average runway crossing delays, average taxiway delays and average gate hold conditions. In addition, average travel times were listed for the airborne arrivals (arrival fix to threshold), arrival ground travel (threshold to gate) and departure ground travel (gate to roll including gate hold time). The tables for each experiment are shown in appendix A.

The summaries of the experiments were used to calculate the total delays and travel times accumulated during each hour of the simulation. These accumulated values formed a convenient means of comparing between experiments as will be seen in section 2.4.

Tables of average delays are also included in section 2.4 as another aid in comparing between experiments. The peak hour average delay shown in these tables is the maximum of the average hourly runway delays across the simulation time period. The 1100-1900 hours average delay is the total accumulated delay across the experiment, divided by the number of aircraft that were processed across the experiment.

The results of the simulation model runs formed the basis for calculation of the annual delays for the airport. Experiments 1 and 2 were rerun for a time period of 0000 to 2400 to serve as a guide for calculating the total delays for an average day. These results indicated that under the easterly configuration, 88.8 percent of the daily arrival delays are 88.0 percent of the daily departure delays occurred in the time period of 1200 to 1900 hours. The results also indicated that under the westerly configuration, 87.8 percent of the daily arrival delays and 89.6 percent of the daily departure delays occurred between 1200 to 1900 hours.

It was assumed that the average day was representative of 1 month of activity which comprised about 8.5 percent of the total delays. The results of the simulation experiments whose conditions matched those required for the annual delay calcaultion were used as a base for the determination of total annual delay (additional simulation experiments were performed to develop annual delay estimates for the 1988 time frame).

2.4 COMPARISON OF EXPERIMENTAL RESULTS

The comparison of experimental results was directed towards satisfying the objectives of this effort and determining:

1. The effect of demand on delay.

2. Peak average runway delays (airborne arrival and departure runway queue).

3. Average delays over the simulation time period (total delays, both airborne and ground).

4. Annual delay estimates.

5. The percentage reduction in delay, travel time, and estimated annual delays due to proposed procedures, hardware improvement options, and airport design improvements for near-term and far-term implementation.

The following comparisons were made:

1. 1978 baseline versus 1983 do-nothing case.

2. 1983 do-nothing case versus 1983 separations and reliever upgrading without airfield improvements.

3. 1983 do-nothing case versus 1983 separations and airfield improvements without reliever upgrading.

4. 1983 do-nothing case versus 1983 separations and airfield improvements with reliever upgrading.

5. 1983 separations and reliever upgrading without airfield improvements versus 1983 separations and airfield improvements without reliever upgrading.

6. 1983 separations and reliever upgrading without airfield improvements versus 1983 separations and airfield improvements with reliever upgrading.

7. 1983 separations and airfield improvements without reliever upgrading versus 1983 separations and airfield improvements with reliever upgrading.

8. Effect of runway 30.

9. Towing versus taxiing between maintenance areas and gates.

(Note: The 1983 do-nothing case refers to 1978 airport operations with 1983, full G.A. demand.)

COMPARISON OF 1978 BASELINE WITH 1983 DO-NOTHING CASE

The basis for comparing the 1978 baseline with the 1983 do-nothing case includes the VFR1, VFR2, and IFR1 weather conditions for easterly and westerly traffic flows. These configurations represent those predominantly exercised during the year at Miami International Airport.

The purpose of these comparisons is to study the effect of increased 1983 demand on today's airport under 1978 ATC. This increased demand assumes no G. A. relocation out of Miami between 1978 and 1983.

EXPERIMENTS	CONFIGURATION
#1 and #7	VFR1 - Easterly Flow
#2 and #8	VFR1 - Westerly Flow
#4 and #34	IFR1 - Easterly Flow
#5 and #39	IFR1 - Westerly Flow
#3 and #38	VFR2 - Westerly Flow

Figures 1 through 5 show the average delays and travel times for arrival and departure aircraft. Table 3 gives a direct comparison of the experiments showing the total delays and travel times that accumulated during the simulations. The results of each comparison are noted on the table.

Tables 4 and 5 show the peak average runway delays, the average total delays over the simulation time period, and the annual delay estimates for the 1978 baseline and the 1983 do-nothing case.

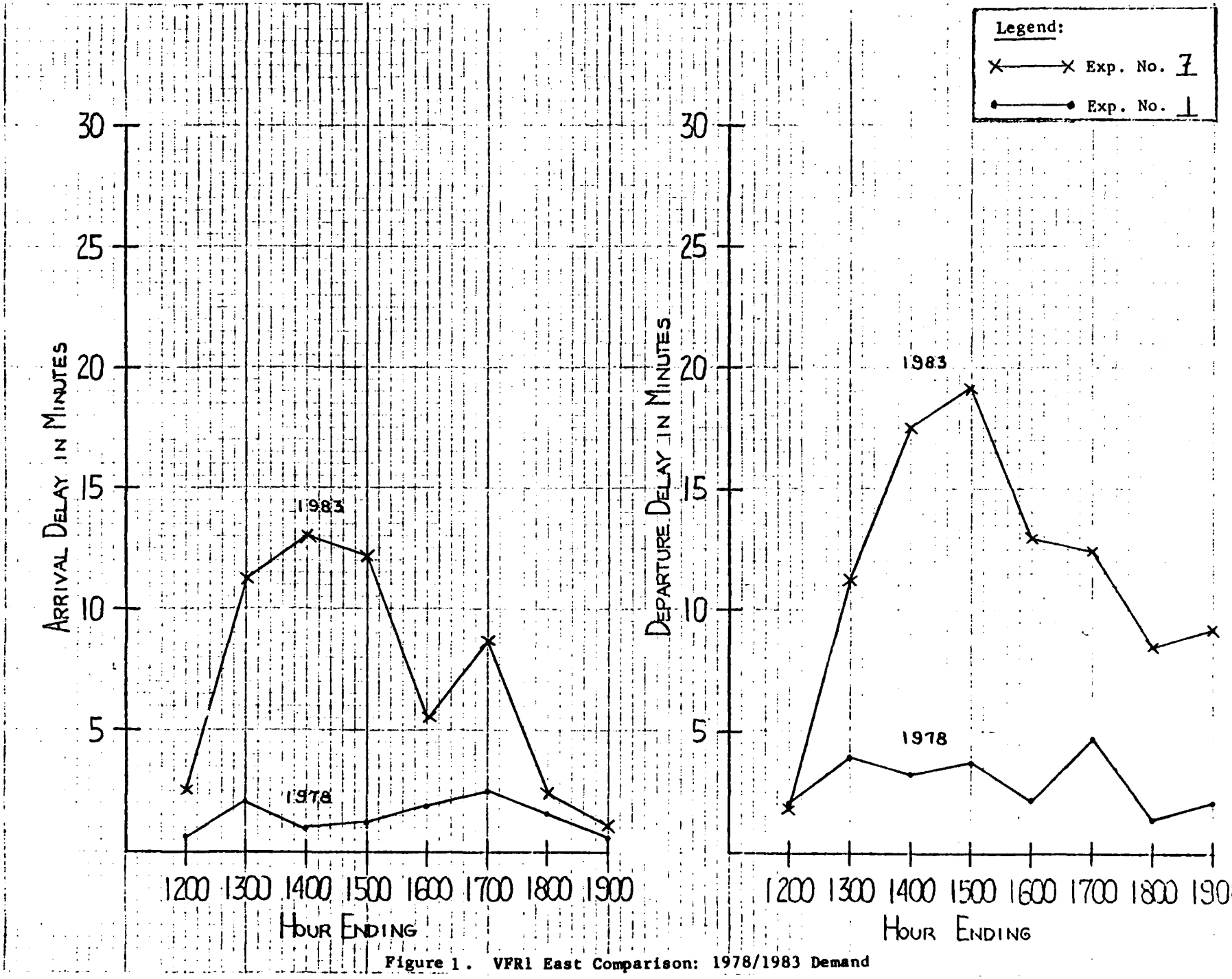
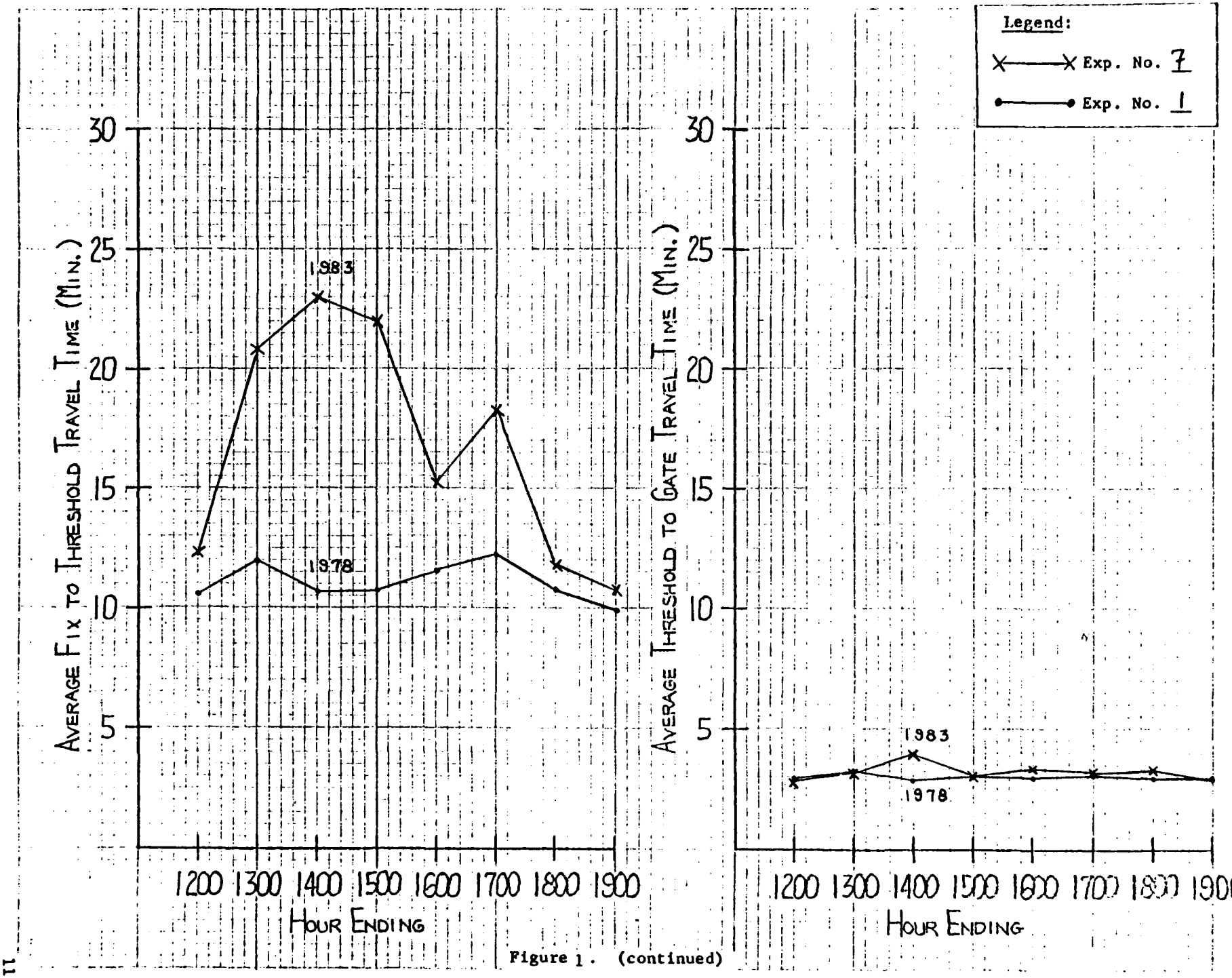


Figure 1. VFR1 East Comparison: 1978/1983 Demand



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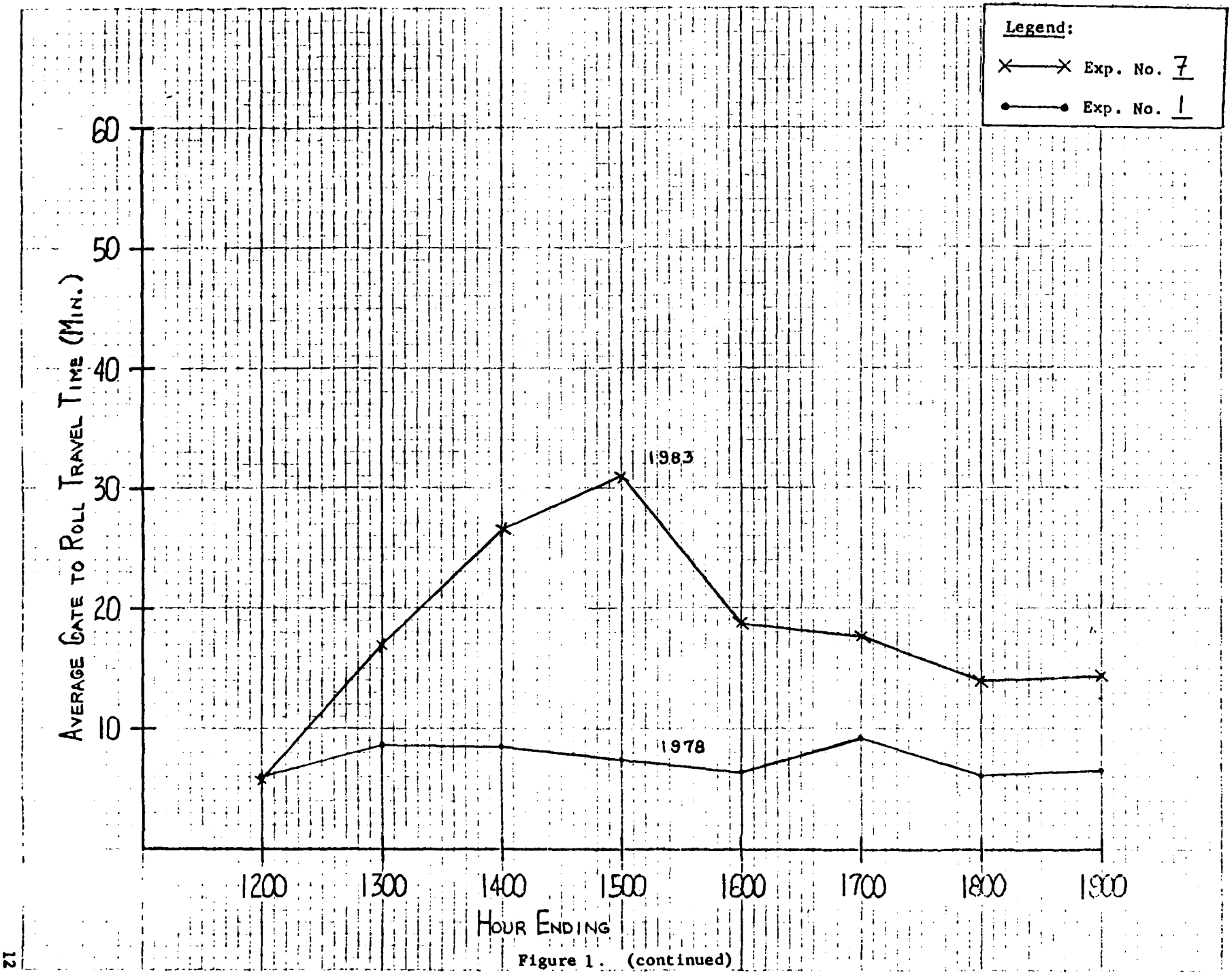

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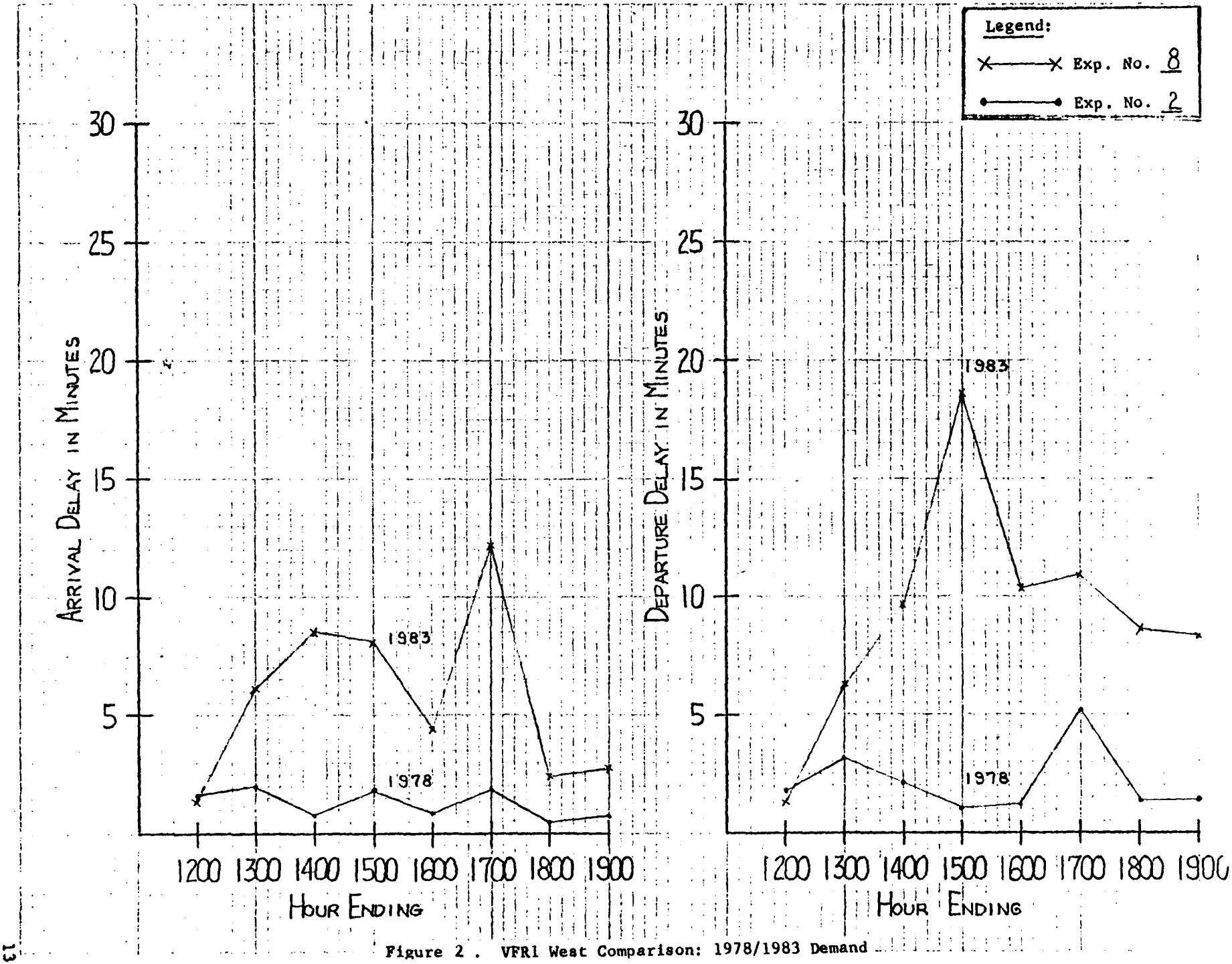
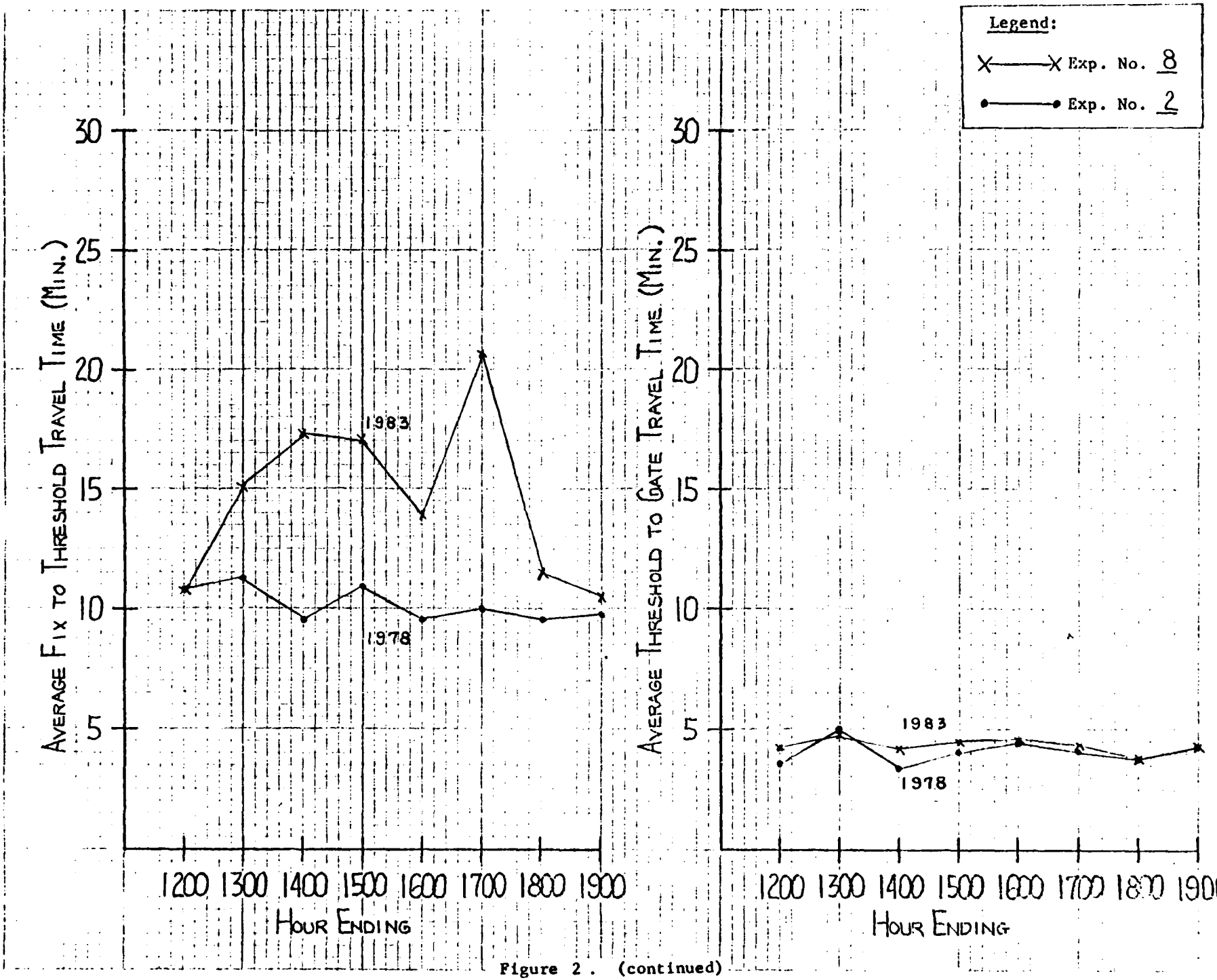


Figure 2 . VFR1 West Comparison: 1978/1983 Demand



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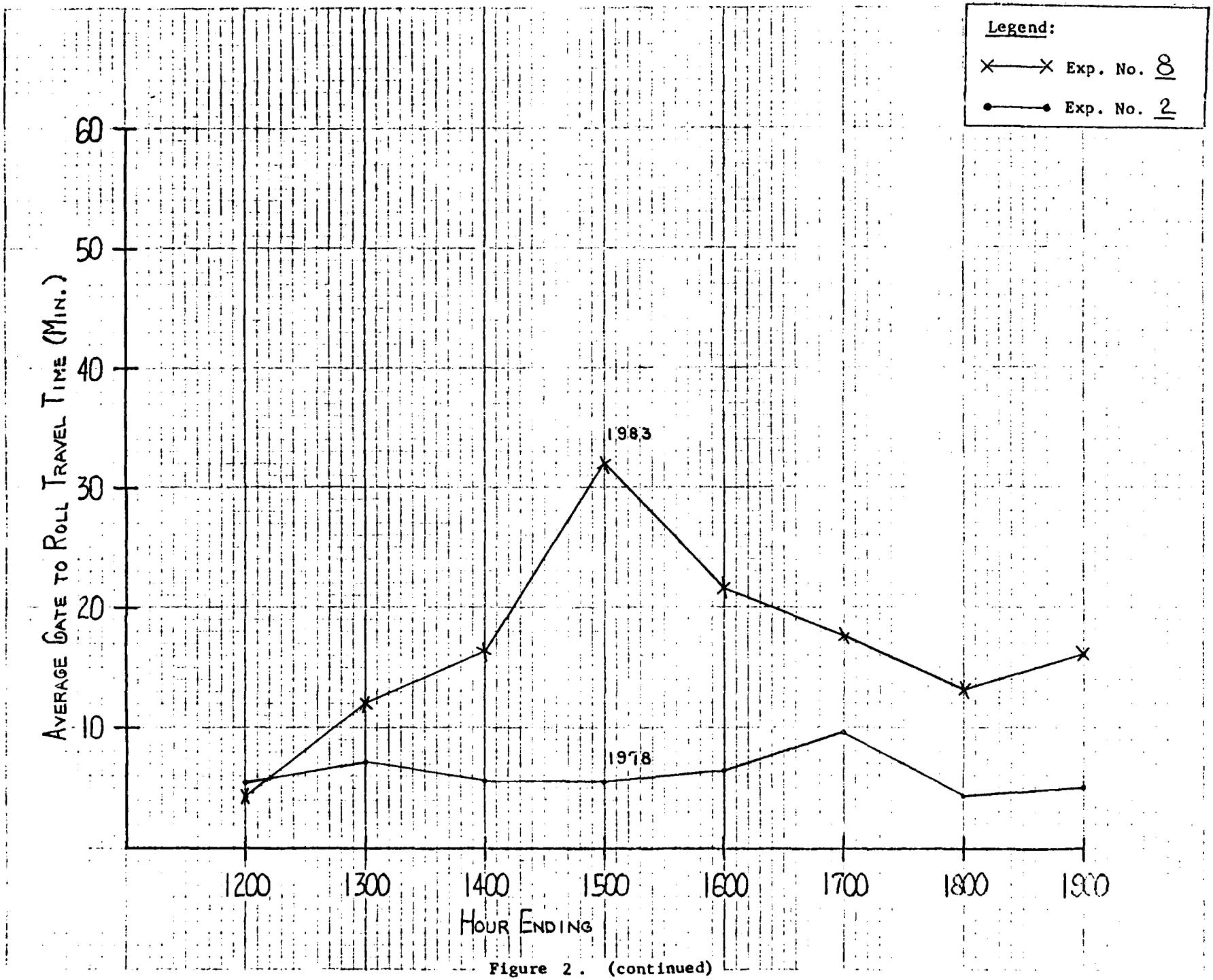

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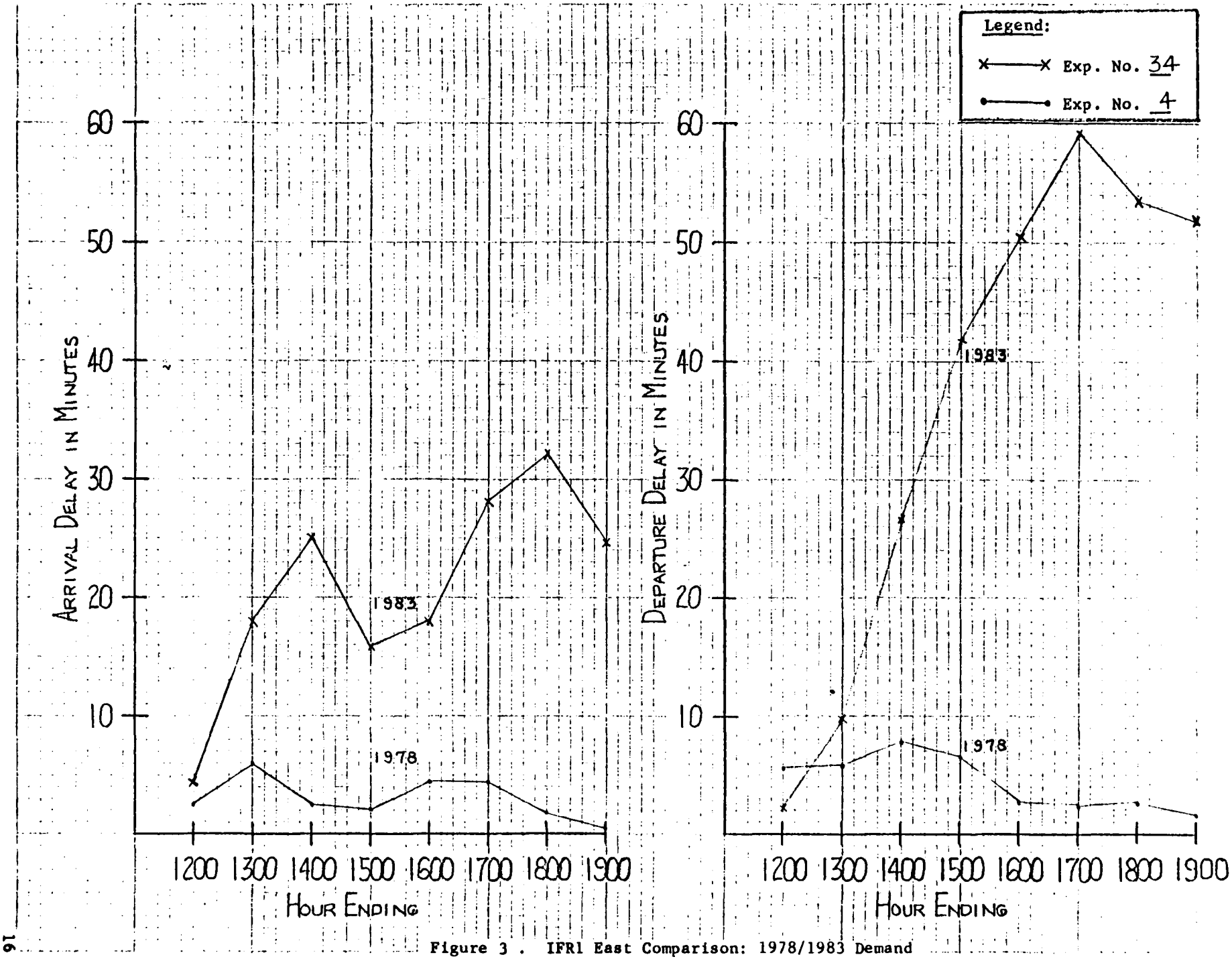
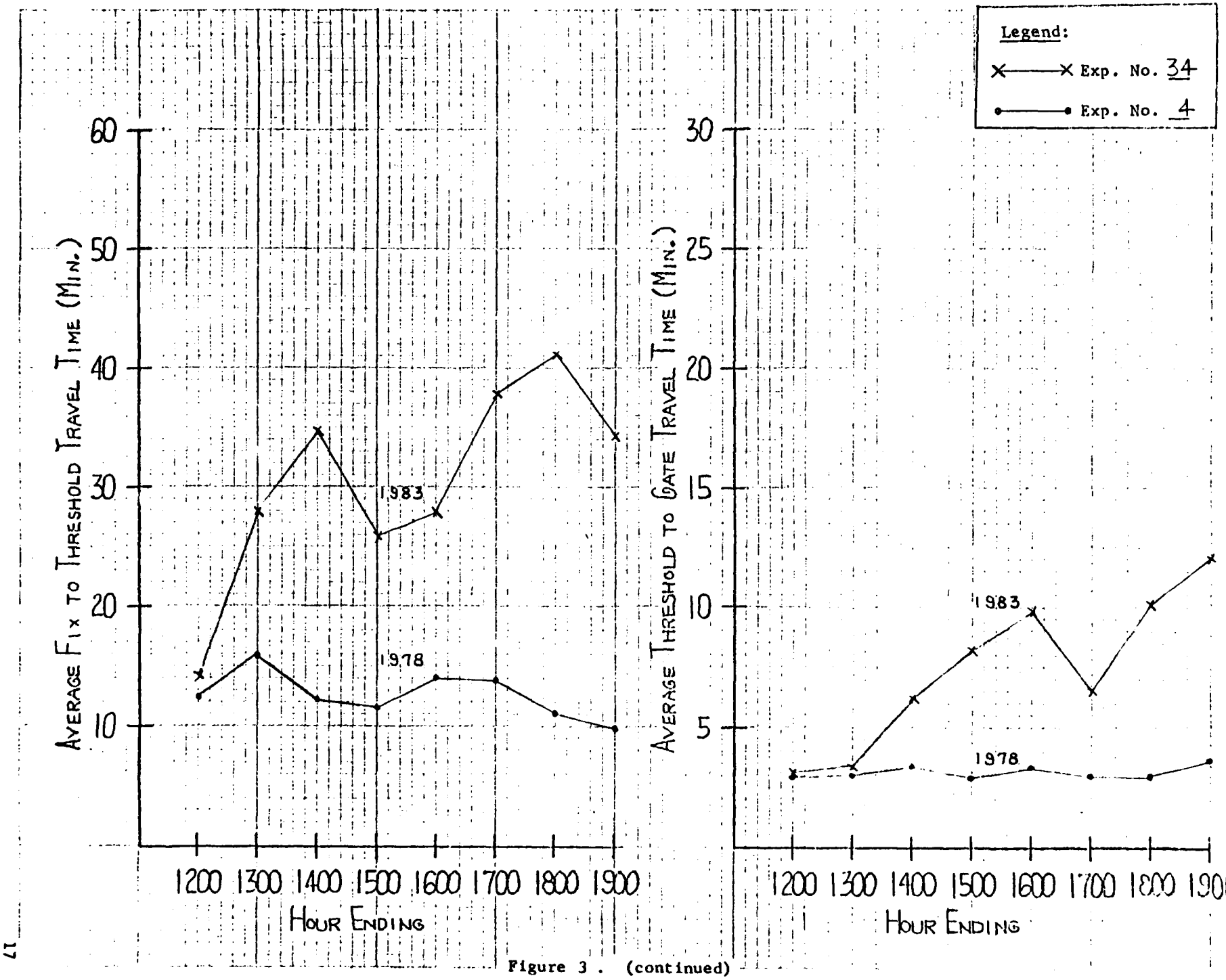


Figure 3 . IFR1 East Comparison: 1978/1983 Demand



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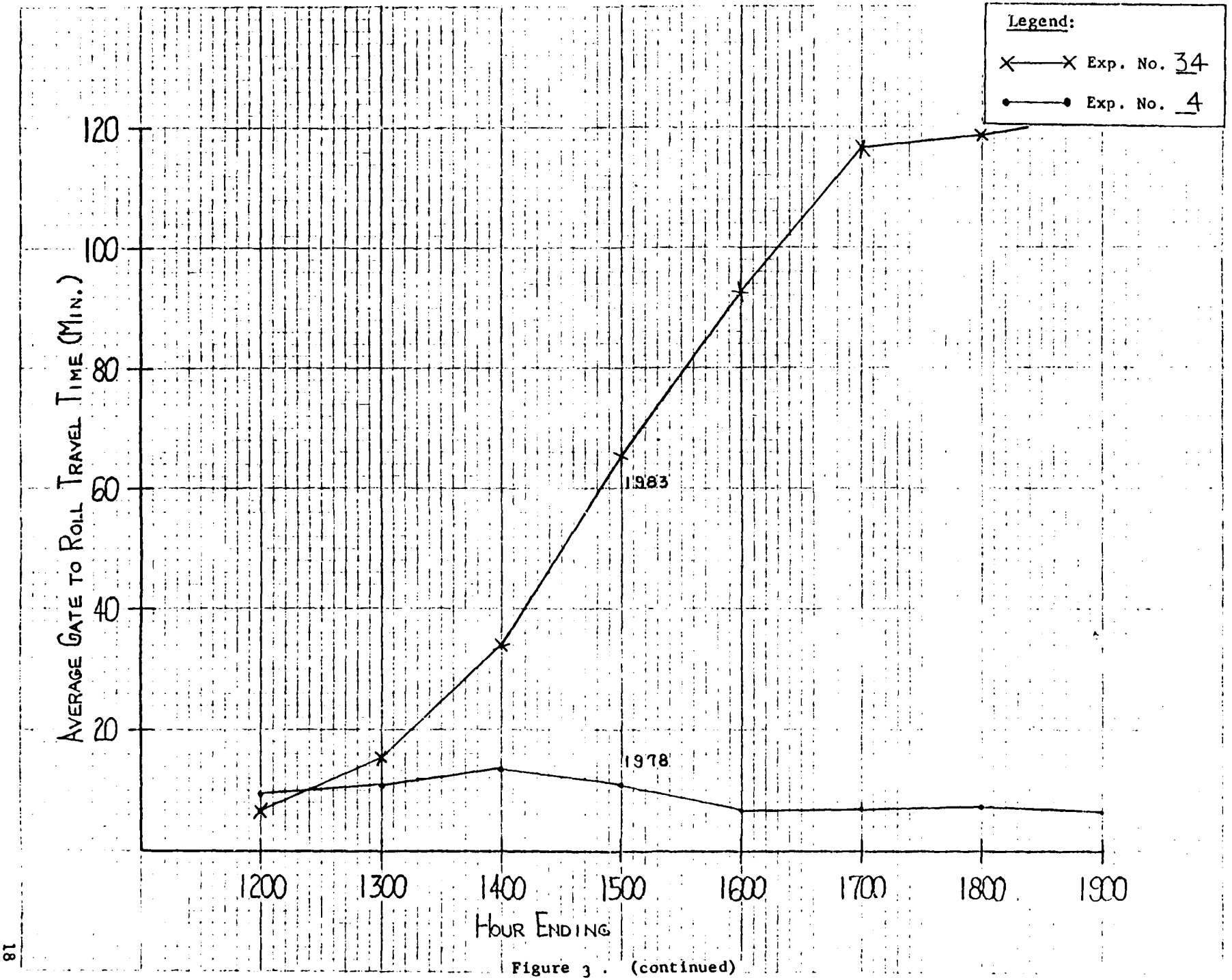

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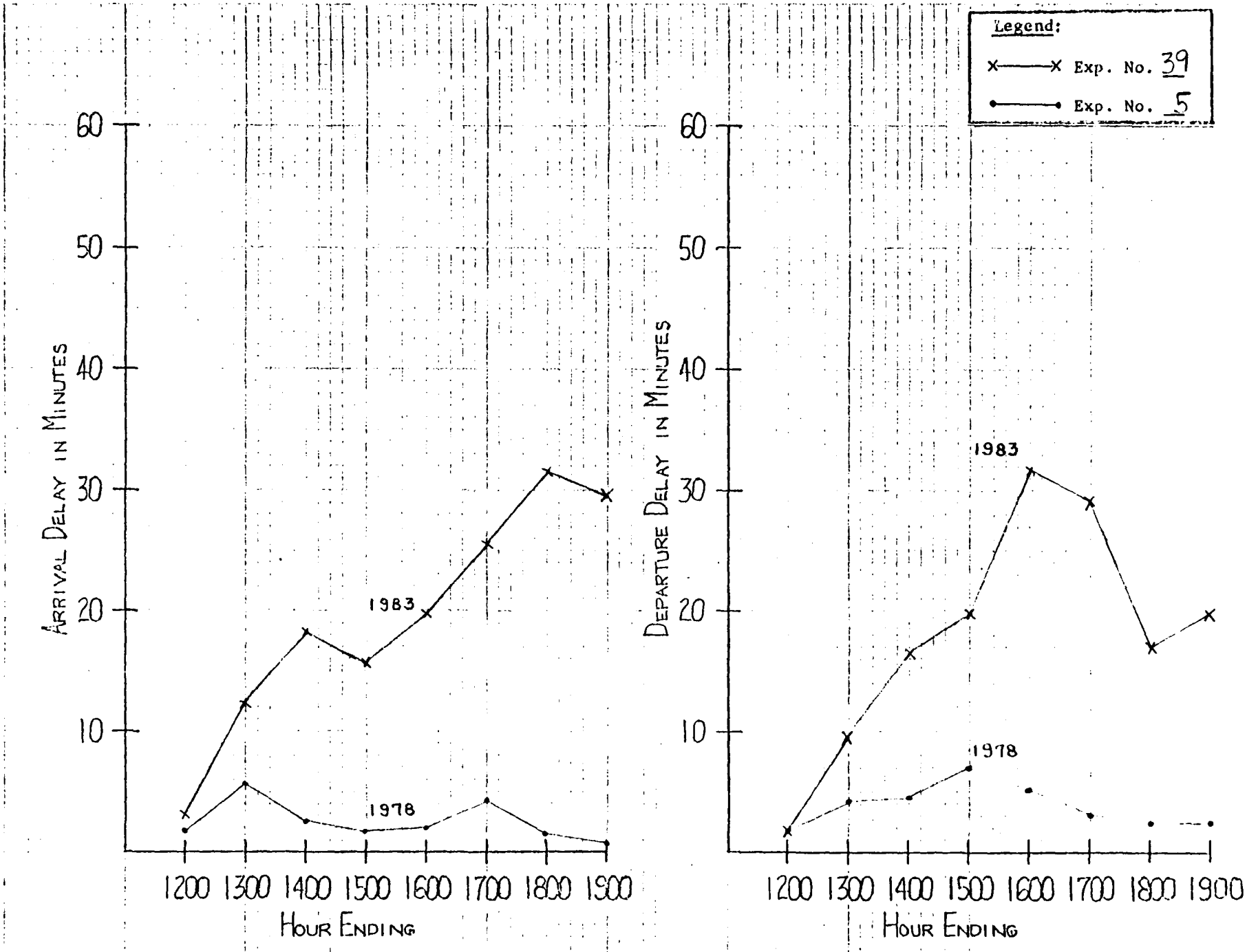
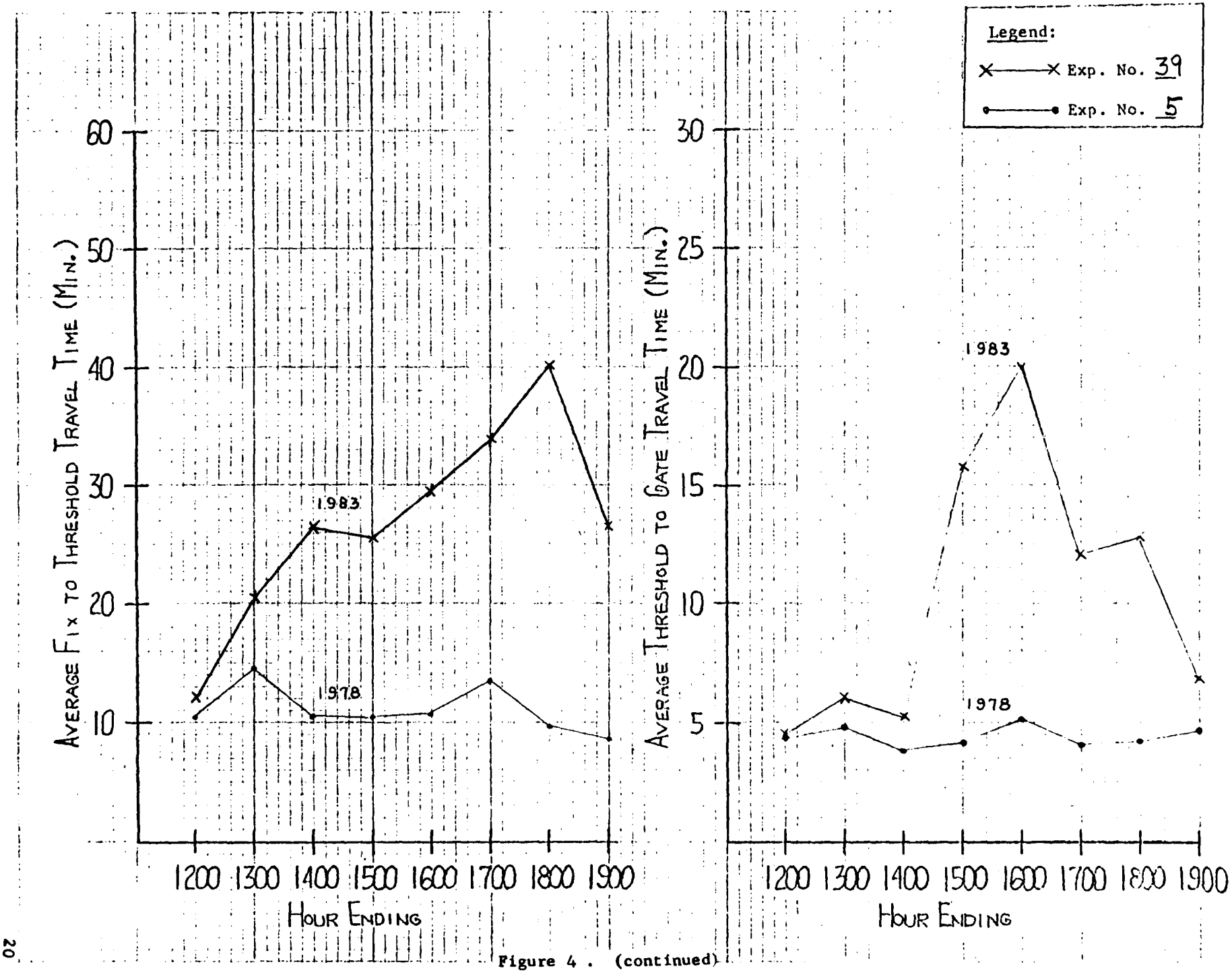


Figure 4. IFR1 West Comparison: 1978/1983 Demand



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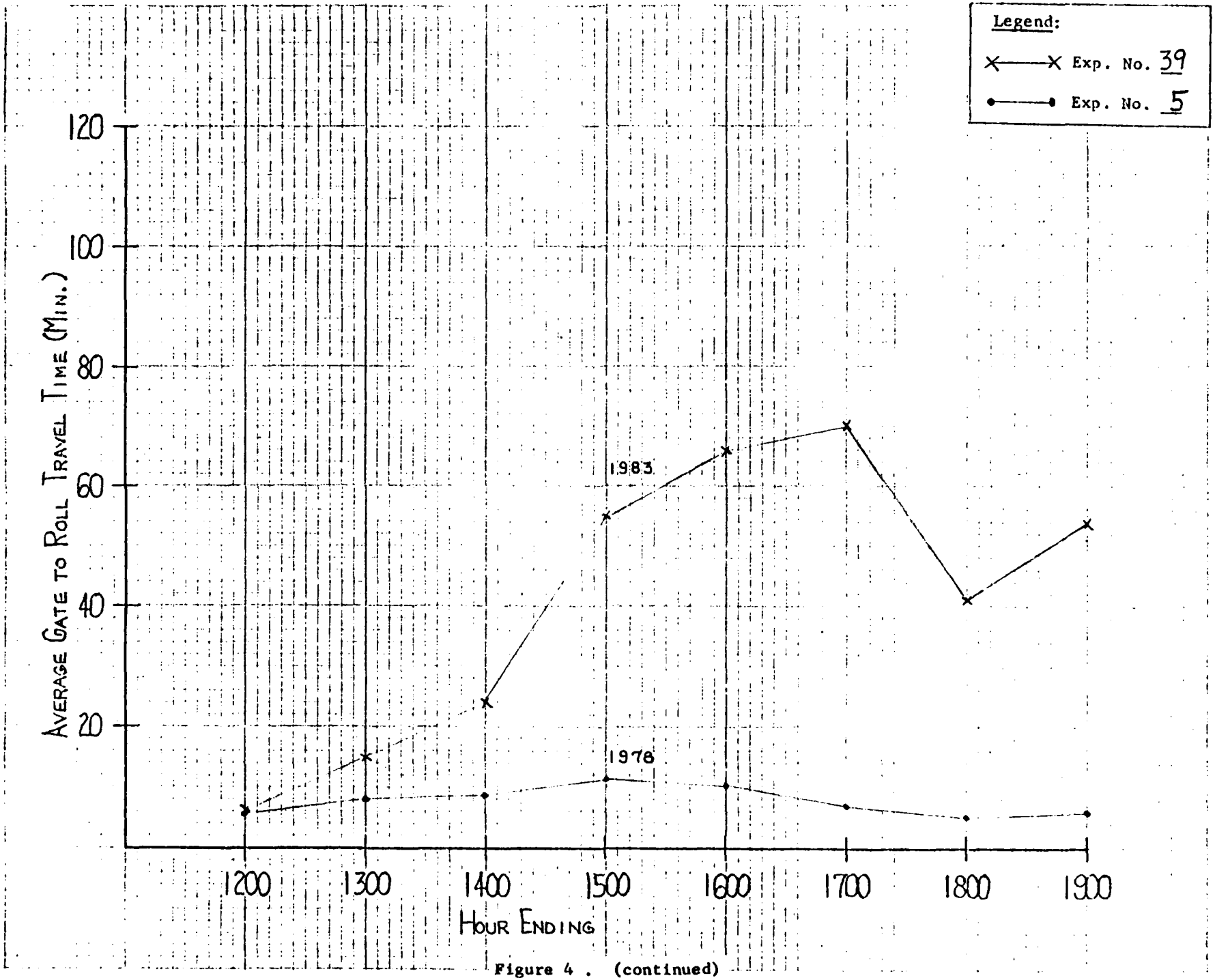

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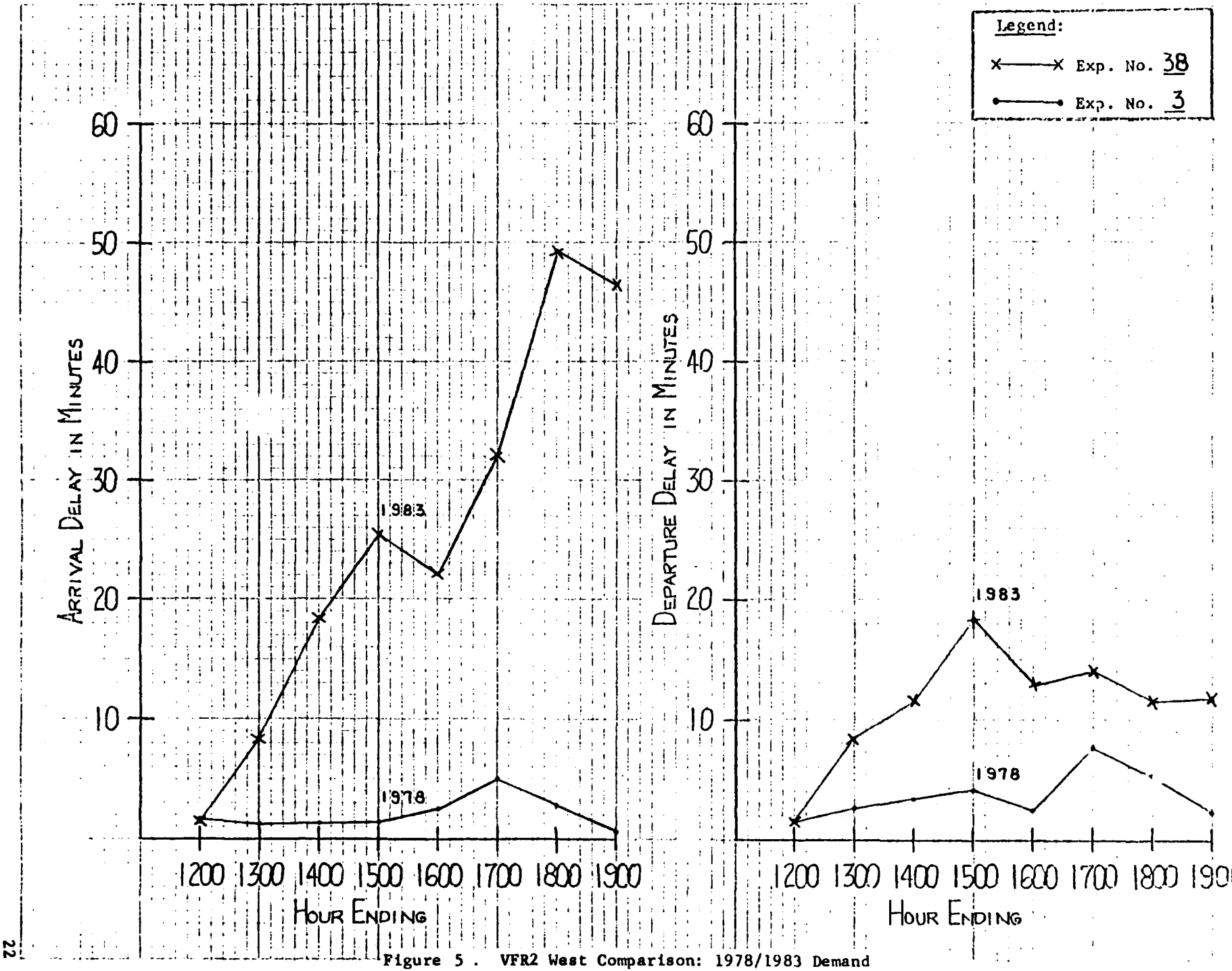
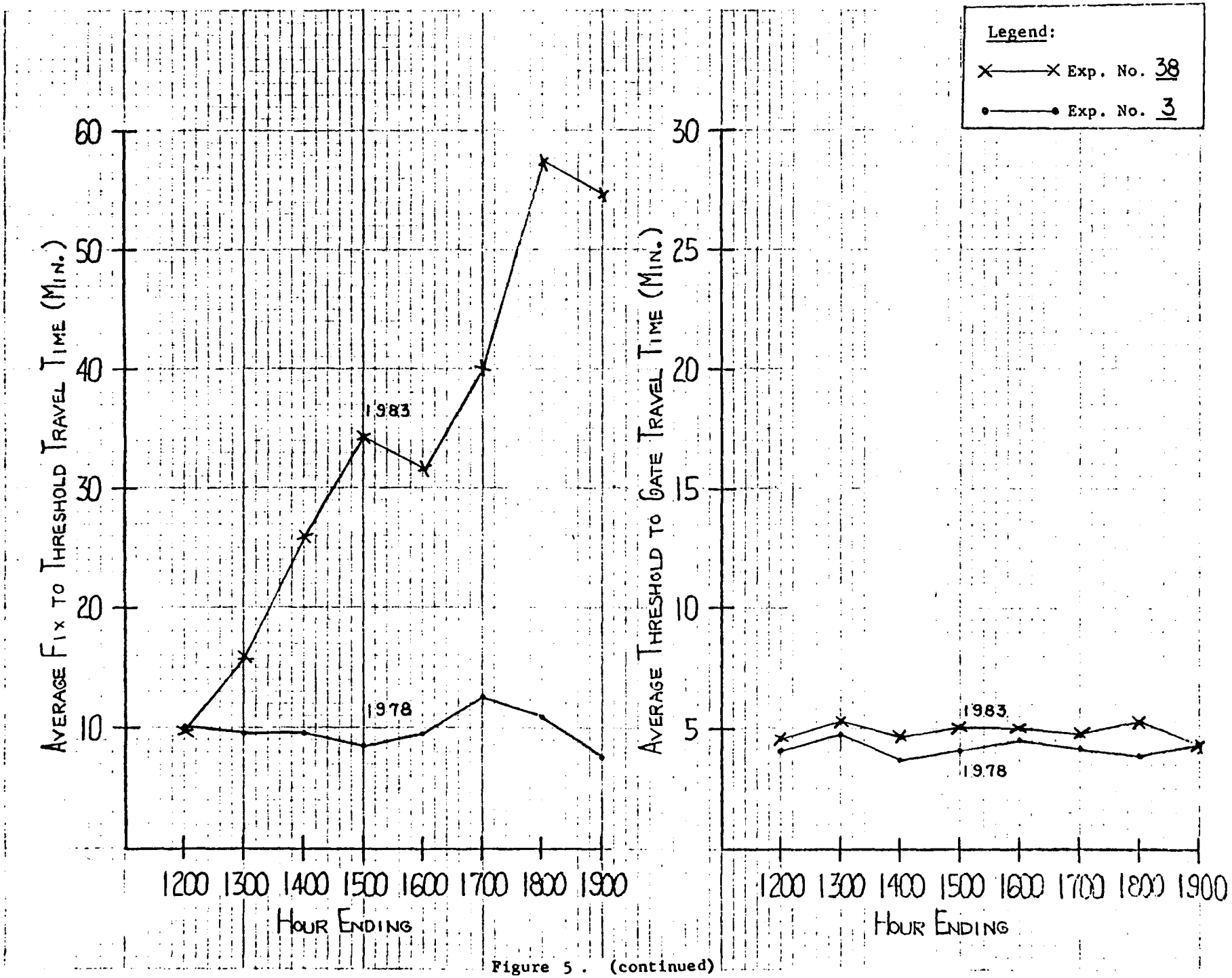


Figure 5 . VFR2 West Comparison: 1978/1983 Demand



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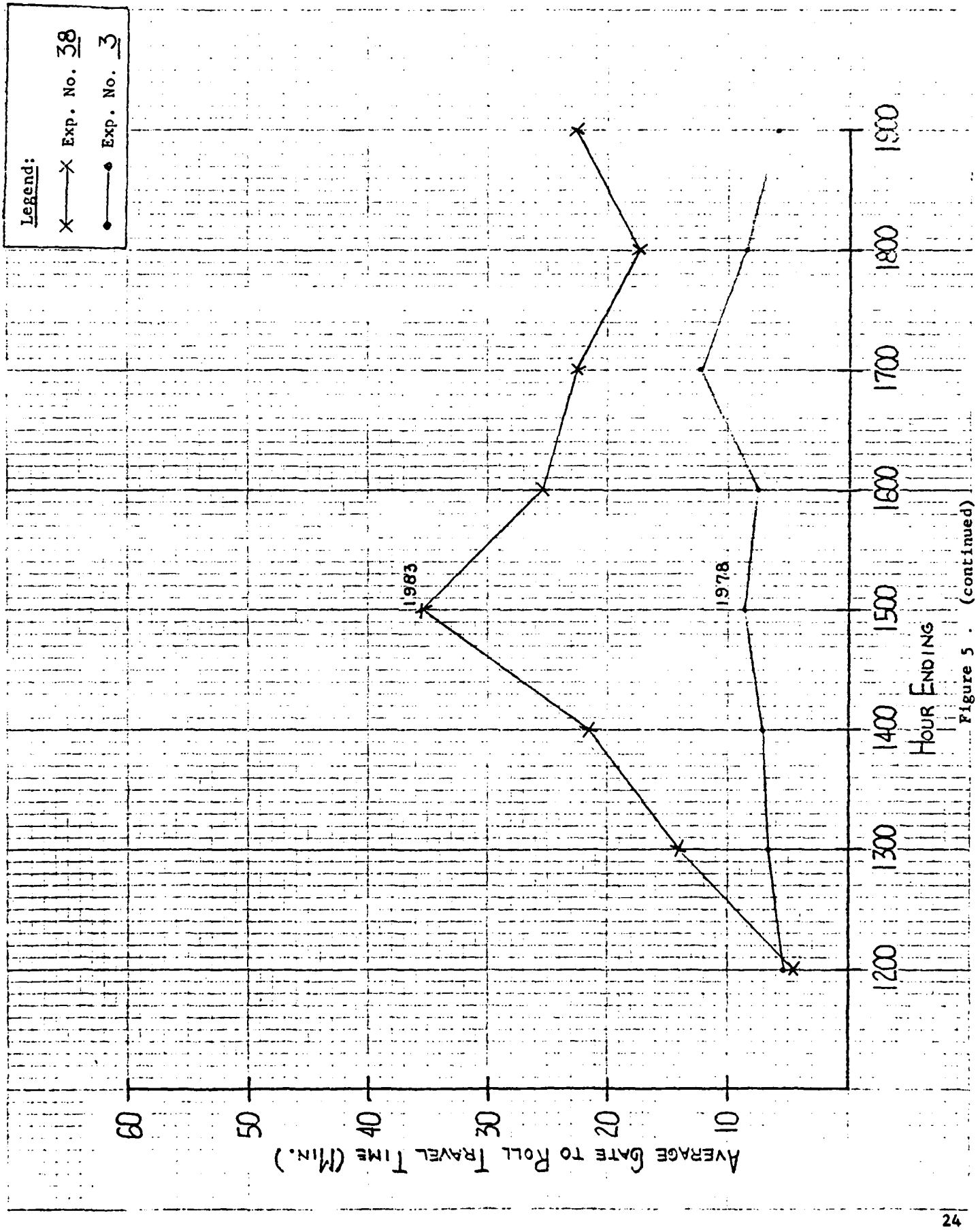


Figure 5 . (continued)

Table 3

COMPARISON OF EXPERIMENTS

EXPERIMENT	ARRIVALS			DEPARTURES				TOTAL	TRAVEL TIMES			
	RUNWAY (AIR)	TAXI	RUNWAY X-ING	RUNWAY	TAXI	RUNWAY X-ING	GATE HOLD	GROUND DELAYS	ARRIVAL AIR	ARRIVAL GROUND	DEPART. GROUND	TOTAL
CONFIGURATION: EASTERLY WEATHER: VFR1												
IMPROVEMENT: 1978 BASELINE VERSUS 1983 DO-NOTHING CASE.												
RESULTS: 536.2 % INCREASE IN AIRBORNE ARRIVAL DELAY. 469.3 % INCREASE IN DEPARTURE RUNWAY DELAY. EXCESSIVE GATE HOLDS INVOKED. 132.3 % INCREASE IN TOTAL TRAVEL TIMES.								EXP.	ARRIVE		DEPART	
								1	9L, 9R, 12		9L, 9R, 12	
								7	9L, 9R, 12		9L, 9R, 12	
1	473.3	48.8	1.4	816.8	65.4	19.2	0.2	951.8	3493.5	958.0	2140.8	6592.3
7	3011.0	85.1	5.5	4650.3	432.2	24.8	542.3	5731.2	6827.0	1267.0	7219.6	15313.6
CONFIGURATION: WESTERLY WEATHER: VFR1												
IMPROVEMENT: 1978 BASELINE VERSUS 1983 DO-NOTHING CASE.												
RESULTS: 462.2 % INCREASE IN AIRBORNE ARRIVAL DELAY. 544.1 % INCREASE IN DEPARTURE RUNWAY DELAY. EXCESSIVE GATE HOLDS INVOKED. 120.2 % INCREASE IN TOTAL TRAVEL TIMES.								EXP.	ARRIVE		DEPART	
								2	27L, 27R, 30		27L, 27R, 30	
								8	27L, 27R, 30		27L, 27R, 30	
2	422.5	101.9	10.8	553.6	339.0	5.0	3.3	1013.6	3233.4	1307.8	1793.6	6334.8
8	2375.4	140.7	18.9	3565.6	864.5	10.5	886.8	5487.0	5862.1	1709.3	6378.7	13950.1
CONFIGURATION: EASTERLY WEATHER: IFR1												
IMPROVEMENT: 1978 BASELINE VERSUS 1983 DO-NOTHING CASE.												
RESULTS: 688.0 % INCREASE IN AIRBORNE ARRIVAL DELAY. 703.0 % INCREASE IN DEPARTURE RUNWAY DELAY. EXCESSIVE GATE HOLDS INVOKED. 433.2 % INCREASE IN TOTAL TRAVEL TIMES.								EXP.	ARRIVE		DEPART	
								4	9L, 9R		9L, 9R, 12	
								34	9L, 9R		9L, 9R, 12	
4	860.4	235.2	3.5	1100.4	106.7	9.4	13.1	1468.3	3472.5	845.1	2367.5	6685.1
34	6780.0	1337.6	4.2	11037.1	4177.6	6.3	7640.0	24202.8	9761.9	2327.8	23552.6	35642.3

Table 3 (cont.)

COMPARISON OF EXPERIMENTS

EXPERIMENT	ARRIVALS			DEPARTURES				TOTAL	TRAVEL TIMES			
	RUNWAY (AIR)	TAXI	RUNWAY X-ING	RUNWAY	TAXI	RUNWAY X-ING	GATE HOLD	GROUND DELAYS	ARRIVAL AIR	ARRIVAL GROUND	DEPART. GROUND	TOTAL
CONFIGURATION: WESTERLY	WEATHER: IFR1											
IMPROVEMENT: 1978 BASELINE VERSUS 1983 DO-NOTHING CASE												
RESULTS: 643.7 % INCREASE IN AIRBORE ARRIVAL DELAY, 468.1 % INCREASE IN DEPARTURE RUNWAY DELAY, EXCESSIVE GATE HOLDS INVOKED, 270.4 % INCREASE IN TOTAL TRAVEL TIMES.								EXP.	ARRIVE		DEPART	
								5	27L, 27R		27L, 27R	
								39	27L, 27R		27L, 27R	
5	743.3	66.8	0.8	981.5	303.3	5.0	5.1	1362.5	3022.8	1163.7	1972.6	6159.1
39	5528.2	2050.2	4.6	5575.6	3869.3	2.9	3139.4	14642.0	7865.5	3066.2	11883.8	22815.5
CONFIGURATION: WESTERLY	WEATHER: VFR 2											
IMPROVEMENT: 1978 BASELINE VERSUS 1983 DO-NOTHING CASE,												
RESULTS: 1430.4 % INCREASE IN AIRBORNE ARRIVAL DELAY. 313.0 % INCREASE IN DEPARTURE RUNWAY DELAY. EXCESSIVE GATE HOLDS INVOKED. 251.5 % INCREASE IN TOTAL TRAVEL TIMES								EXP.	ARRIVE		DEPART	
								3	27L, 27R		27L, 27R, 30	
								38	27L, 27R		27L, 27R, 30	
3	685.8	68.7	2.6	1103.2	357.5	9.5	6.8	1548.3	3125.5	1341.5	2282.4	6749.4
38	10495.7	215.0	4.6	4556.5	1350.7	9.0	1165.4	7301.2	13724.9	1900.7	8101.8	23727.4
CONFIGURATION:	WEATHER:											
IMPROVEMENT:												
RESULTS:								EXP.	ARRIVE		DEPART	

TABLE 4

AVERAGE DELAYS

EXP	DEMAND	WEATHER	IMPROVEMENTS	ATC	PEAK HOUR AVERAGE DELAY (MINUTES)		1100-1900 HRS. AVERAGE DELAY (MINUTES)	
					ARR	DEP	ARR	DEP
1	Todays	VFR1-E	None	Todays	2.5	4.7	1.7	3.1
7	1983[l]	VFR1-E	None	Todays	13.1	19.2	7.9	15.2
2	Todays	VFR1-W	None	Todays	2.0	5.2	1.7	3.1
8	1983[l]	VFR1-W	None	Todays	12.2	18.6	6.4	14.4
4	Todays	IFR1-E	None	Todays	6.0	7.8	4.1	4.8
34	1983[l]	IFR1-E	None	Todays	32.1	59.1	25.0	83.2
5	Todays	IFR1-W	None	Todays	5.7	7.1	3.1	5.1
39	1983[l]	IFR1-W	None	Todays	31.6	31.7	25.5	49.7
3	Todays	VFR2-W	None	Todays	5.0	7.8	2.7	5.1
38	1983[l]	VFR2-W	None	Todays	59.5	18.4	27.1	19.1

WEATHER: VFR1- Ceiling above 1500 ft. and visibility over 5 mi.
VFR2- Ceiling between 1000 ft. and 1500 ft. and visibility between 3 and 5 mi.
IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.
IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

DEMAND: 1983[l]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.
1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

TABLE 5

ANNUAL DELAY ESTIMATES

1978 BASELINE vs. 1983 DO-NOTHING CASE

EXP.	DEMAND	IMPROVEMENT	SEPARATION	ANNUAL DELAY (hours)		
				ARRIVAL	DEPARTURE	TOTAL
1,2 4,5	TODAYS	NONE	1978	3,193	5,791	8,984
7,34 8,39	1983[1]	NONE	1978	18,027	34,940	52,967
				ANNUAL OPERATIONS TOTAL X 1000		
1,2 4,5	TODAYS	NONE	1978	346.384		
7,34 8,39	1983[1]	NONE	1978	380.200		
				AVERAGE ANNUAL DELAY (minutes)		
				ARRIVAL	DEPARTURE	TOTAL
1,2 4,5	TODAYS	NONE	1978	0.6	1.0	1.6
7,34 8,39	1983[1]	NONE	1978	2.8	5.5	8.4

DEMAND: 1983[1]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.

1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

COMPARISON OF 1983 DO-NOTHING CASE WITH 1983 SEPARATIONS AND RELIEVER UPGRADING WITHOUT AIRFIELD IMPROVEMENTS.

The basis for comparing the 1983 do-nothing case with the 1983 separations and reliever upgrading without airfield improvements includes the IFR1 and VFR2 weather conditions for easterly and westerly traffic flows.

The purpose of these comparisons is to study the effect of a limited 1983 demand on today's airport under 1983 ATC. The 1983 demand is limited due to a 50 percent G. A. reduction at Miami due to reliever airport upgrading.

EXPERIMENTS	CONFIGURATION
#34 and #9	IFR1 - Easterly Flow
#38 and #17	VFR2 - Westerly Flow

Figures 6 and 7 show the average delays and travel times for arrival and departure aircraft. Table 6 gives a direct comparison of the experiments showing the total delays and travel times that accumulated during the simulations.

Table 7 shows the peak average runway delays and the average total delays per aircraft over the simulation time period.

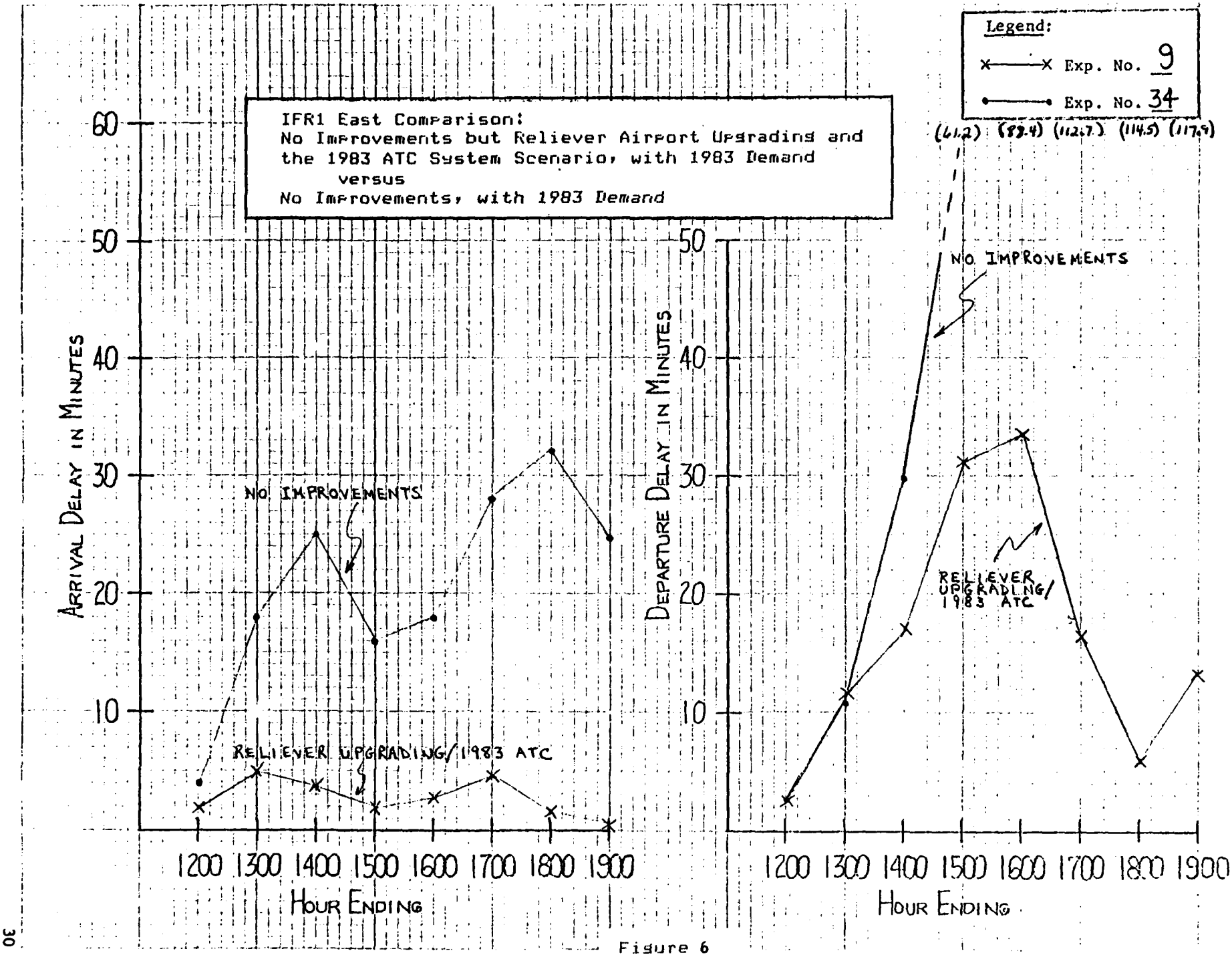

IFR1 East Comparison:
No Improvements but Reliever Airport Upgrading and the 1983 ATC System Scenario, with 1983 Demand
versus
No Improvements, with 1983 Demand
Legend:
Exp. No. 9
Exp. No. 34
(41.2) (83.4) (112.7) (114.5) (117.9)
ARRIVAL DELAY IN MINUTES
DEPARTURE DELAY IN MINUTES
NO IMPROVEMENTS
RELIEVER UPGRADING/ 1983 ATC
NO IMPROVEMENTS
RELIEVER UPGRADING/ 1983 ATC
10
20
30
40
50
60
1200 1300 1400 1500 1600 1700 1800 1900
HOUR ENDING
1200 1300 1400 1500 1600 1700 1800 1900
HOUR ENDING

Figure 6

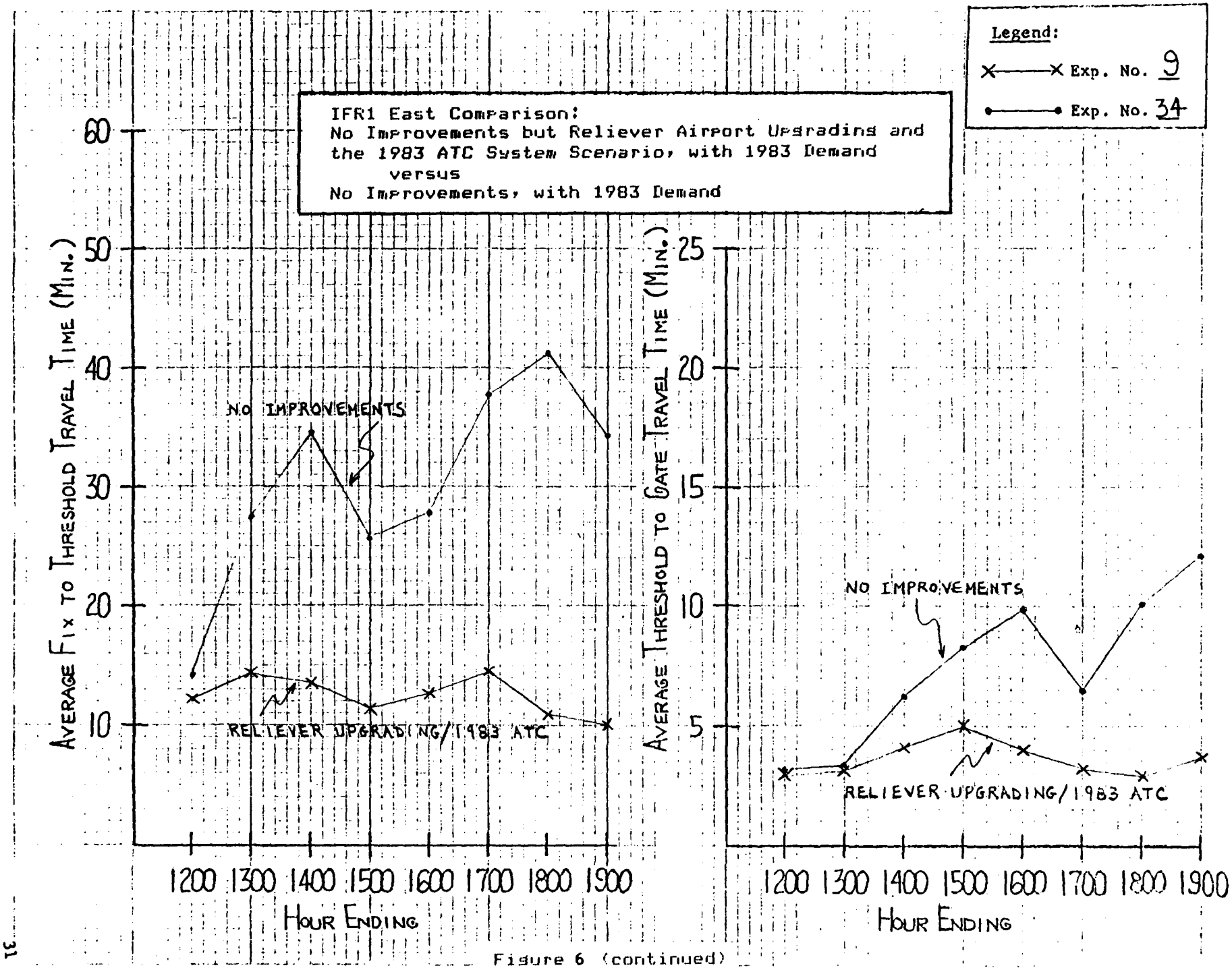


Figure 6 (continued)

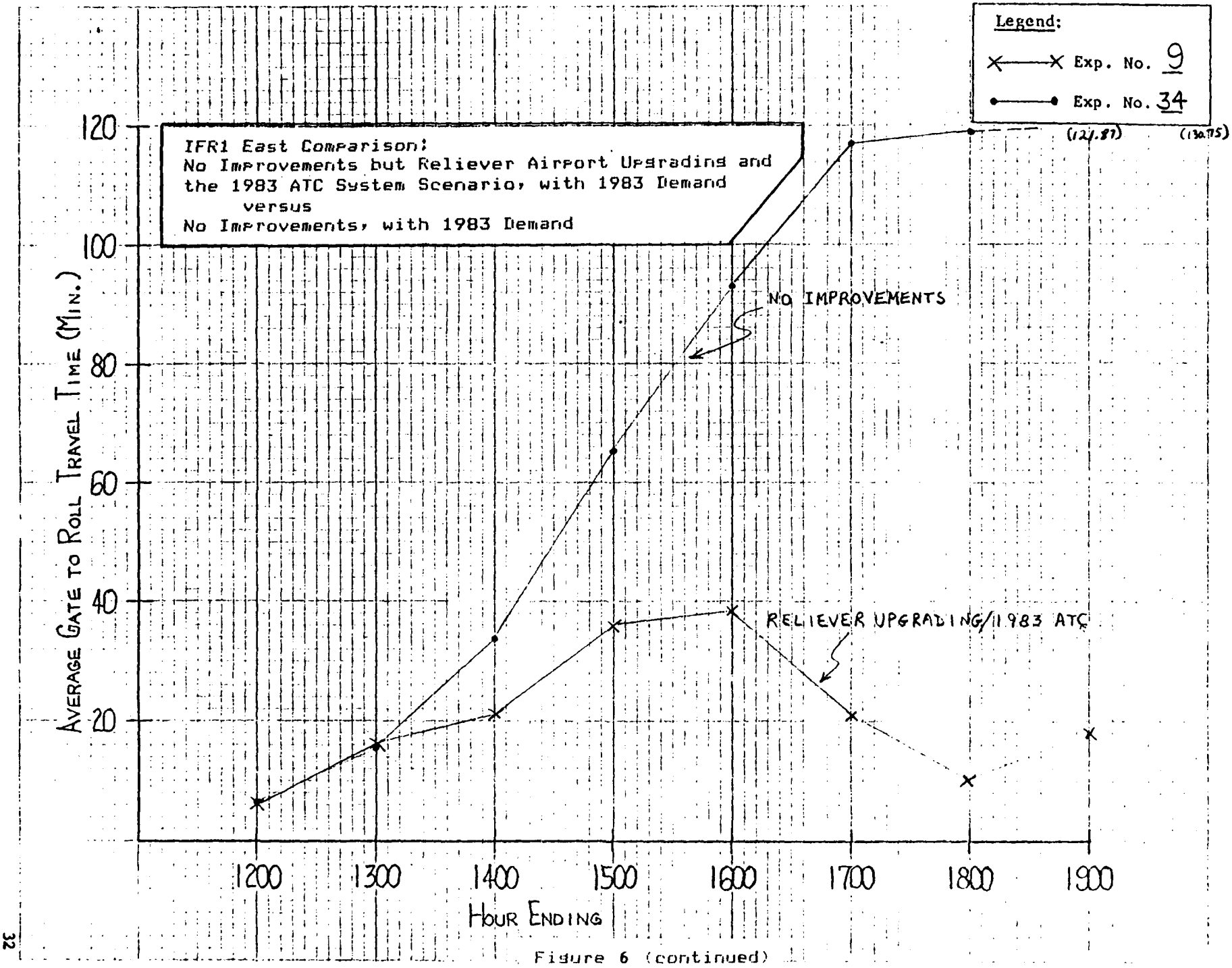


Figure 6 (continued)

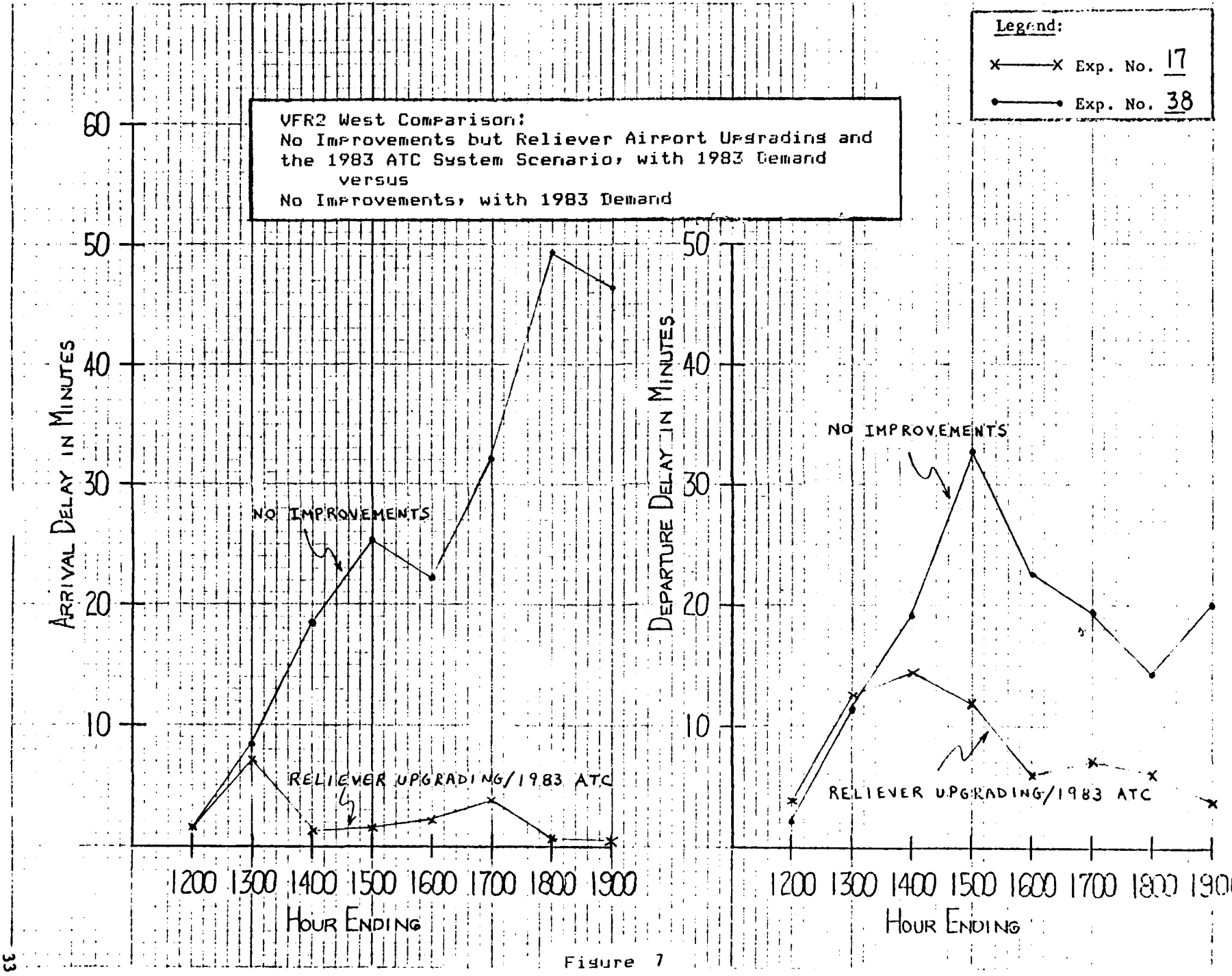

VFR2 West Comparison:
No Improvements but Reliever Airport Upgrading and the 1983 ATC System Scenario, with 1983 Demand
versus
No Improvements, with 1983 Demand
Legend:
Exp. No. 17
Exp. No. 38
ARRIVAL DELAY IN MINUTES
DEPARTURE DELAY IN MINUTES
NO IMPROVEMENTS
RELIEVER UPGRADING/1983 ATC
HOUR ENDING
60
50
40
30
20
10
1200
1300
1400
1500
1600
1700
1800
1900

Figure 7

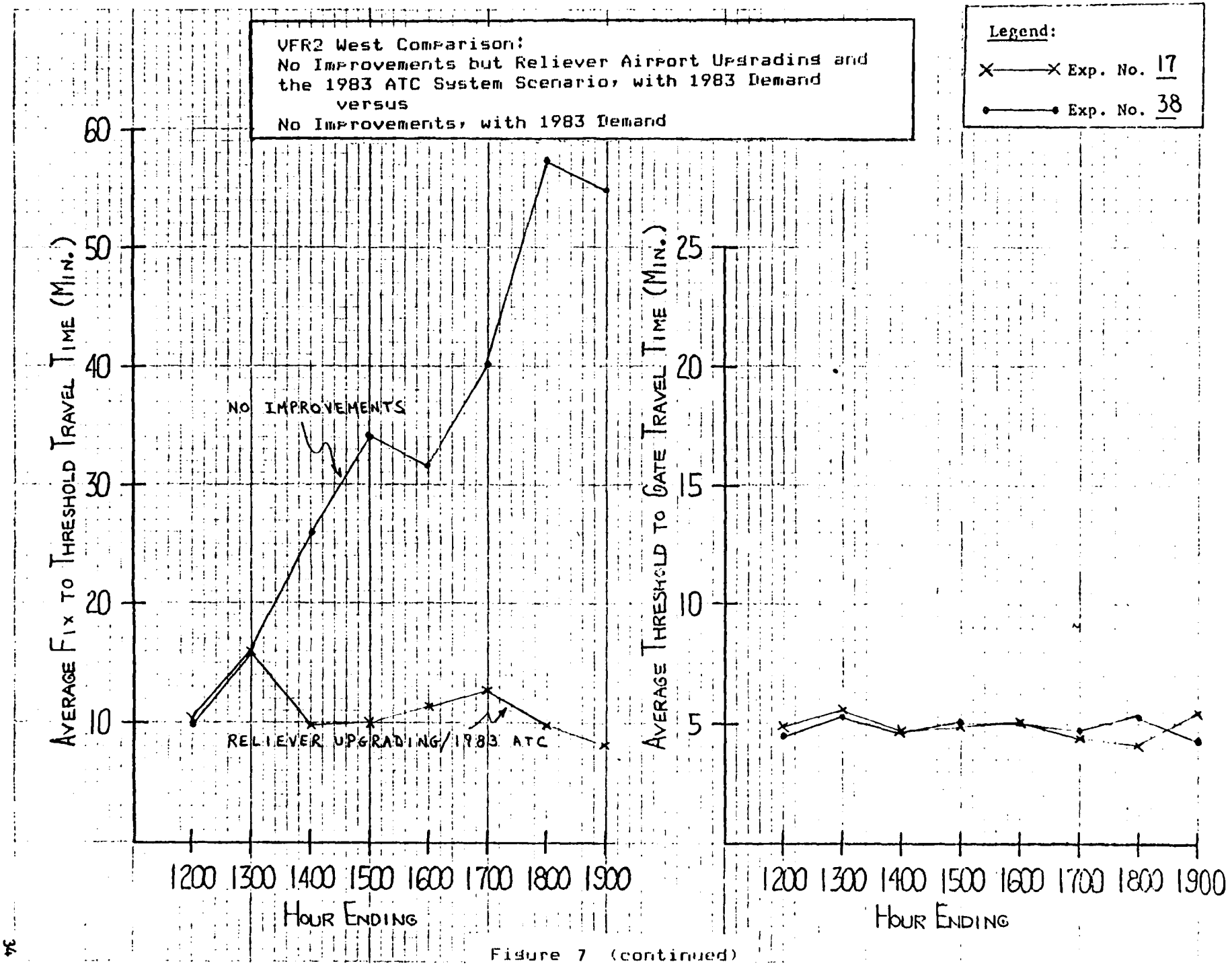


Figure 7 (continued)

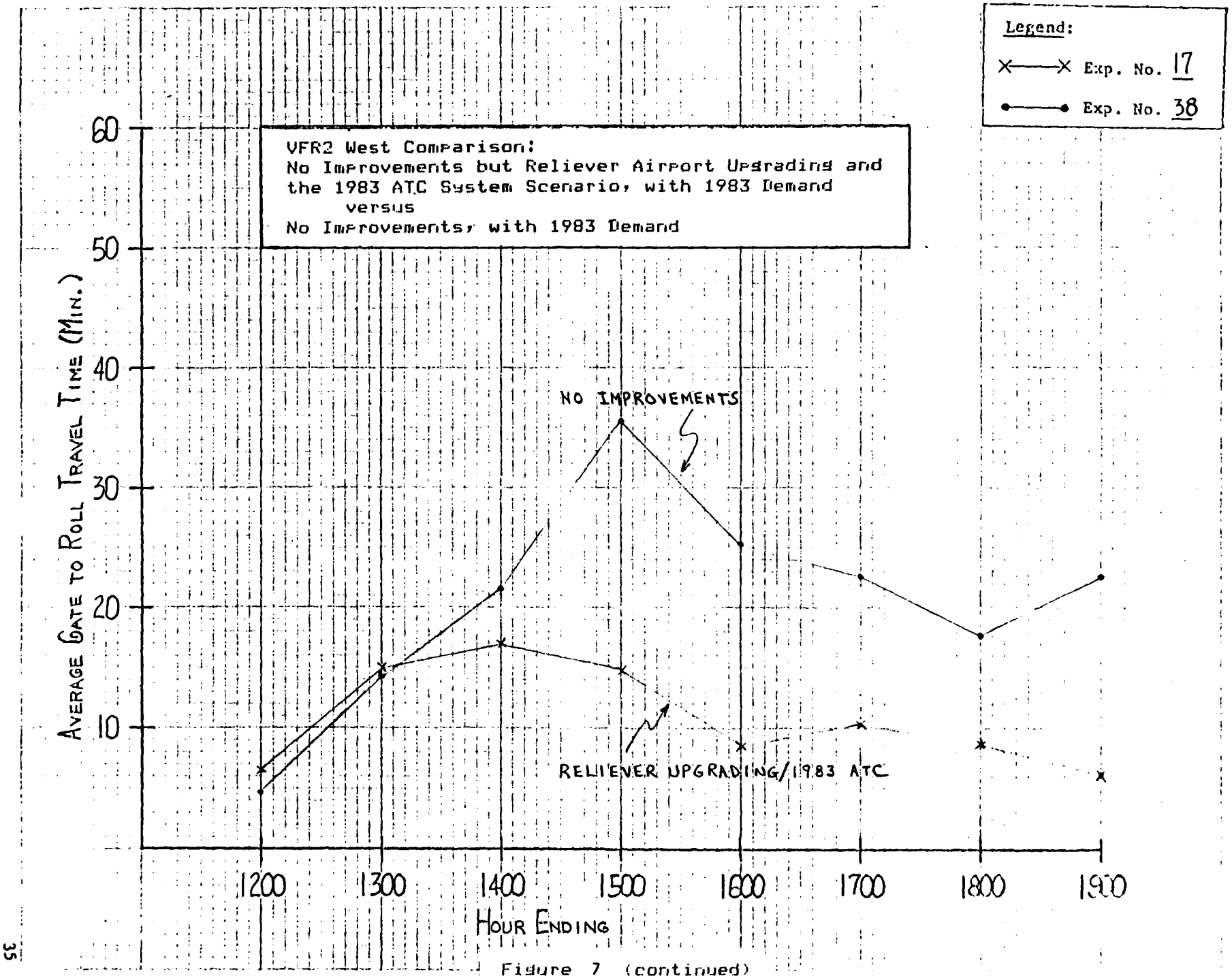


Figure 7 (continued)

Table 6

COMPARISON OF EXPERIMENTS

EXPERIMENT	ARRIVALS			DEPARTURES				TOTAL	TRAVEL TIMES			
	RUNWAY (AIR)	TAXI	RUNWAY X-ING	RUNWAY	TAXI	RUNWAY X-ING	GATE HOLD	GROUND DELAYS	ARRIVAL AIR	ARRIVAL GROUND	DEPART. GROUND	TOTAL
CONFIGURATION: EASTERLY	WEATHER: IFR 1											
IMPROVEMENT: 1983 DO-NOTHING CASE VERSUS 1983 SEPARATIONS AND RELIEVER OPERATING WITH TODAY'S AIRCRAFT												
RESULTS: 85.3% DECREASE IN AIRBORNE ARRIVAL DELAY. 62.8% DECREASE IN DEPARTURE RUNWAY DELAY. 89.3% DECREASE IN GATE HOLD DELAY. 65.7% DECREASE IN TOTAL TRAVEL TIMES								EXP.	ARRIVE		DEPART	
								34	9L, 9R		9L, 9R, 12	
								9	9L, 9R		9L, 9R, 12	
34	6780.0	1337.6	4.2	11037.1	4177.6	6.3	7640.0	24202.8	9761.9	2327.8	23552.6	35642.3
* 9	994.0	168.8	9.7	4108.8	329.1	6.8	820.4	5443.6	4278.4	1201.1	6756.0	12235.5
CONFIGURATION: WESTERLY	WEATHER: VFR 2											
IMPROVEMENT: 1983 DO-NOTHING CASE VERSUS 1983 SEPARATIONS AND RELIEVER OPERATIONS WITH TODAY'S AIRPORT												
RESULTS: 91.1% DECREASE IN AIRBORNE ARRIVAL DELAY. 54.8% DECREASE IN DEPARTURE RUNWAY DELAY. 93.7% DECREASE IN GATE HOLD DELAY. 59.4% DECREASE IN TOTAL TRAVEL TIMES.								EXP.	ARRIVE		DEPART	
								38	27L, 27R		27L, 27R, 30	
								17	27L, 27R		27L, 27R, 30	
38	10495.7	215.0	4.6	4556.5	1350.7	9.0	1165.4	7301.2	13724.9	1900.7	8101.8	23727.4
* 17	929.2	177.8	5.3	2061.7	780.7	9.2	73.6	3108.3	4073.0	1750.4	3809.2	9632.6
CONFIGURATION:	WEATHER:											
IMPROVEMENT:												
RESULTS:								EXP.	ARRIVE		DEPART	
*												

Note: Asterick (*) denotes improved experiments.

TABLE 7

AVERAGE DELAYS

EXP	DEMAND	WEATHER	IMPROVEMENTS	ATC	PEAK HOUR AVERAGE DELAY (MINUTES)		1100-1900 HRS. AVERAGE DELAY (MINUTES)	
					ARR	DEP	ARR	DEP
34	1983[l]	IFR1-E	None	Todays	32.1	59.1	25.0	83.2
9	1983[m]	IFR1-E	g	1983	4.9	22.5	3.5	16.7
38	1983[l]	VFR2-W	None	Todays	59.5	18.4	27.1	19.1
17	1983[m]	VFR2-W	g	1983	7.2	10.1	3.1	8.9

WEATHER: VFR1- Ceiling above 1500 ft. and visibility over 5 mi.
VFR2- Ceiling between 1000 ft. and 1500 ft. and visibility between 3 and 5 mi.
IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.
IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

DEMAND: 1983[l]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.
1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

COMPARISON OF 1983 DO-NOTHING CASE WITH 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITHOUT RELIEVER UPGRADING.

The basis for comparing the 1983 do-nothing case with the 1983 separations and airfield improvements without reliever upgrading includes the VFR1 and IFR1 weather conditions for easterly and westerly traffic flows.

The purpose of these comparisons is to study the effect of a full 1983 demand on the improved airport under 1983 ATC.

EXPERIMENTS	CONFIGURATION
#7 and #11B	VFR1 - Easterly Flow
#8 and #36	VFR1 - Westerly Flow
#39 and #15	IFR1 - Westerly Flow

Figures 8 through 10 show the average delays and travel times for arrival and departure aircraft. Table 8 gives a direct comparison of the experiments showing the total delays and travel times that accumulated during the simulation.

Tables 9 and 10 show the peak average runway delays, the average total delays over the simulation time period, and the annual delay estimates for these comparison cases.

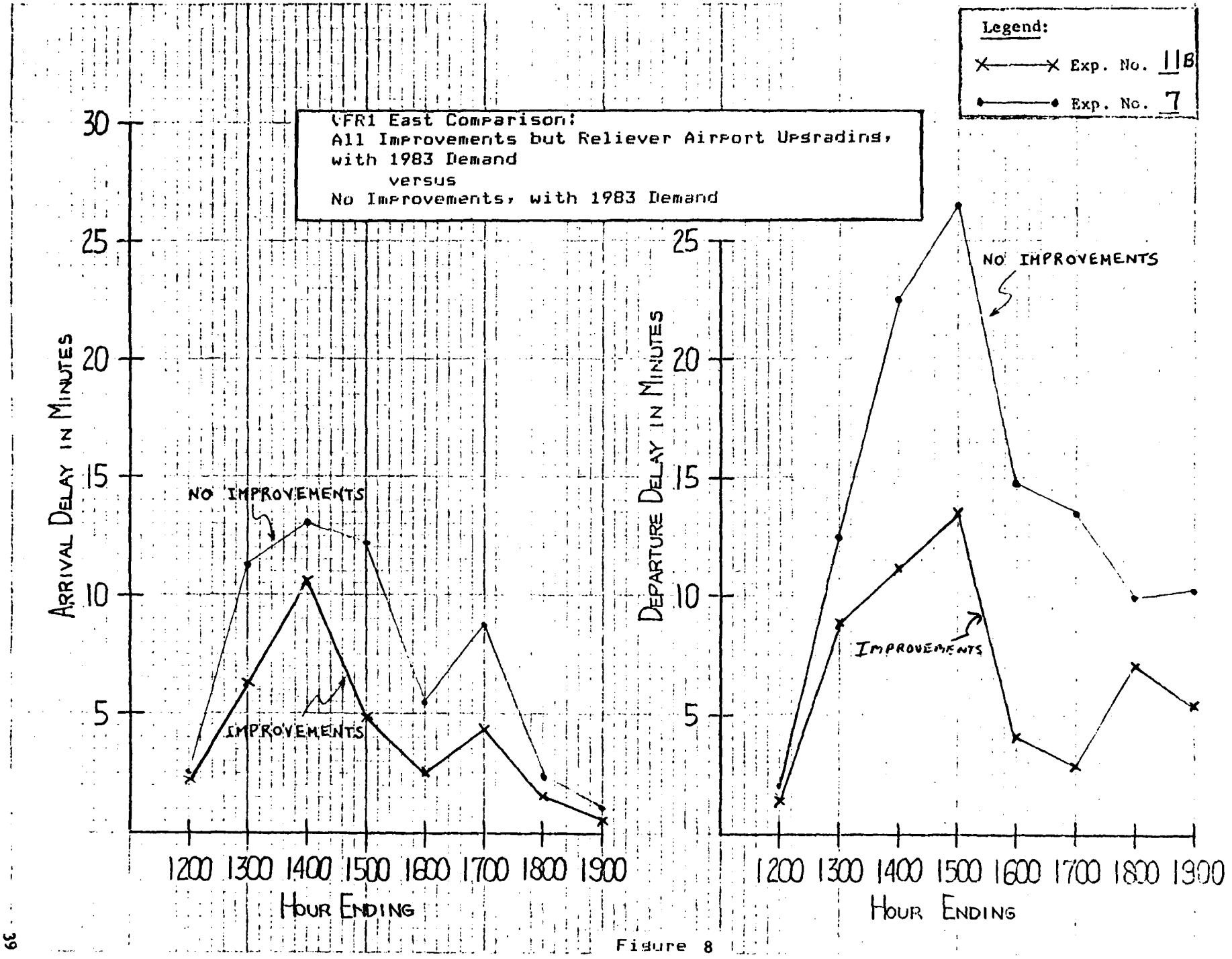

Legend:
Exp. No. 11B
Exp. No. 7
VFR1 East Comparison:
All Improvements but Reliever Airport Upgrading,
with 1983 Demand
versus
No Improvements, with 1983 Demand
ARRIVAL DELAY IN MINUTES
DEPARTURE DELAY IN MINUTES
NO IMPROVEMENTS
IMPROVEMENTS
HOUR ENDING
1200 1300 1400 1500 1600 1700 1800 1900

Figure 8

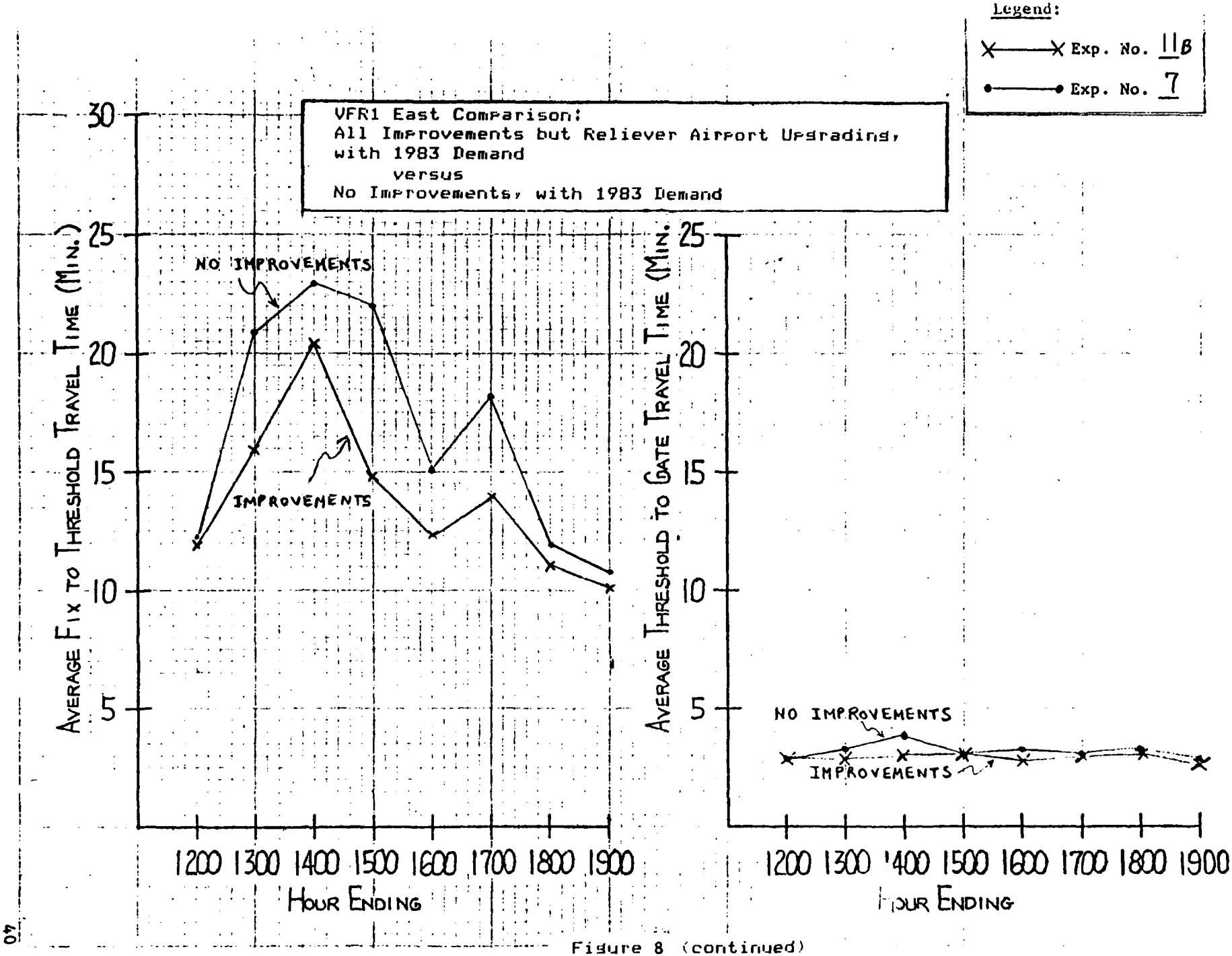


Figure 8 (continued)

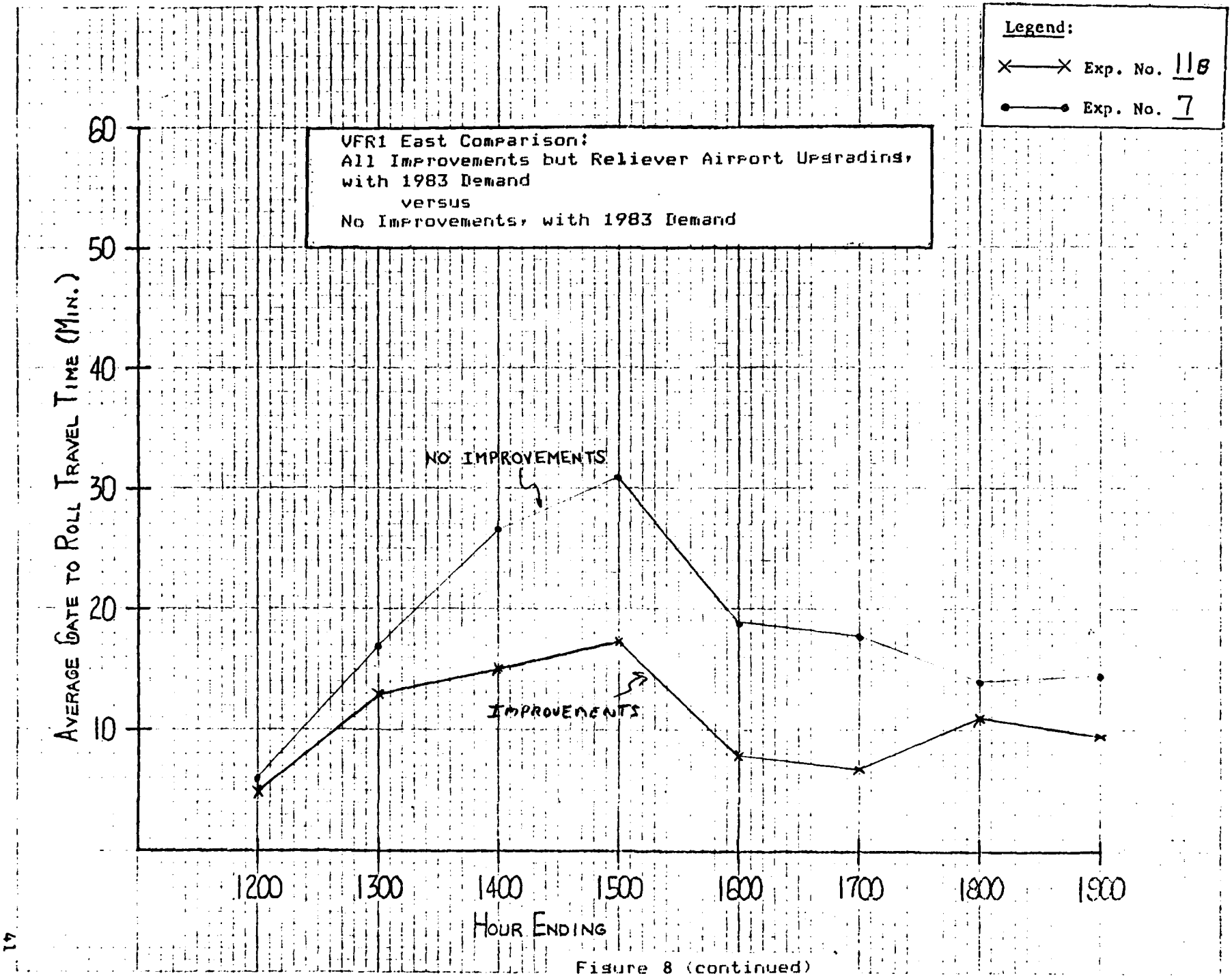


Figure 8 (continued)

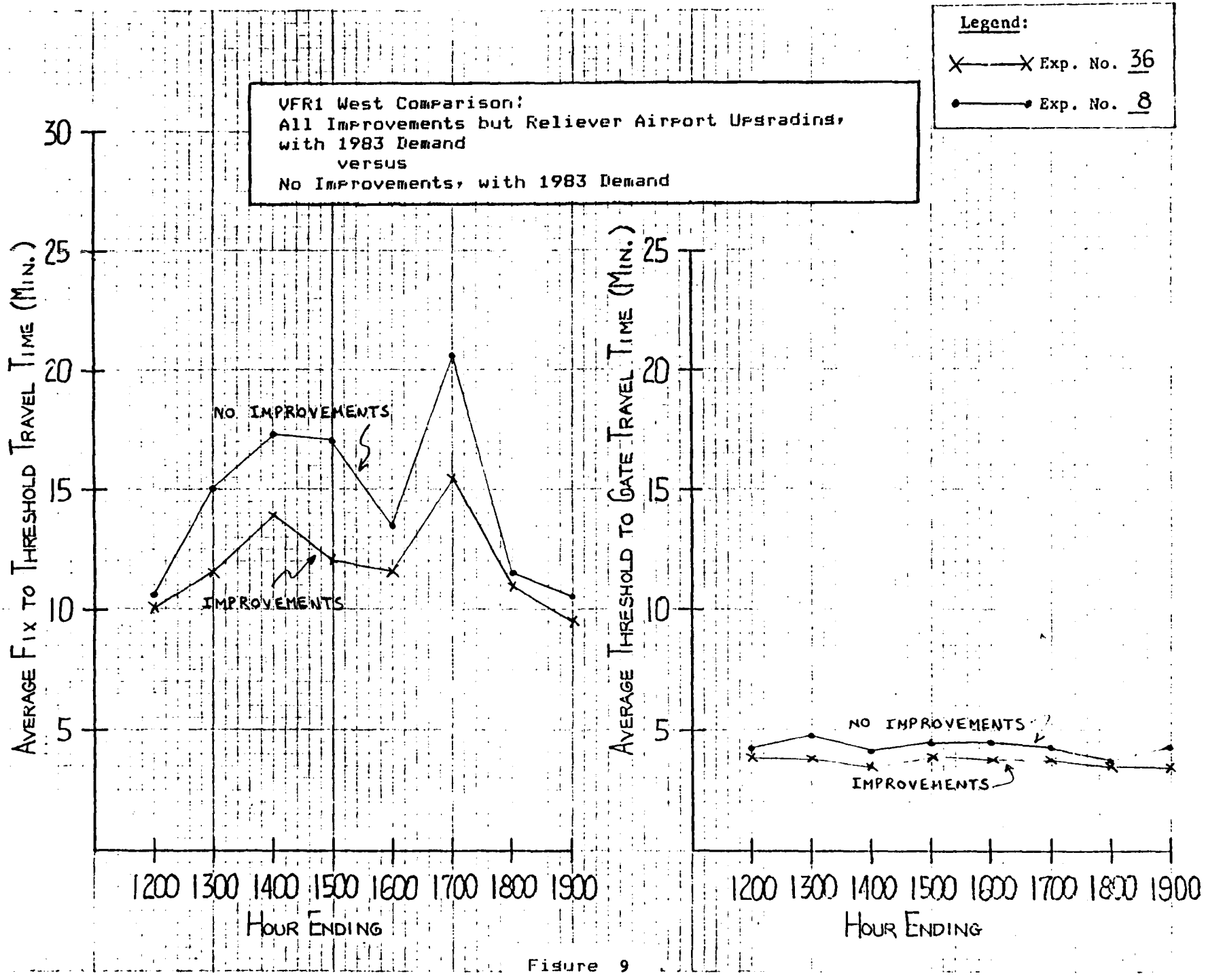

Legend:
Exp. No. 36
Exp. No. 8
VFR1 West Comparison:
All Improvements but Reliever Airport Upgrading,
with 1983 Demand
versus
No Improvements, with 1983 Demand
Average Fix to Threshold Travel Time (Min.)
30
25
20
15
10
5
NO IMPROVEMENTS
IMPROVEMENTS
1200 1300 1400 1500 1600 1700 1800 1900
Hour Ending
Average Threshold to Gate Travel Time (Min.)
25
20
15
10
5
NO IMPROVEMENTS
IMPROVEMENTS
1200 1300 1400 1500 1600 1700 1800 1900
Hour Ending

Figure 9

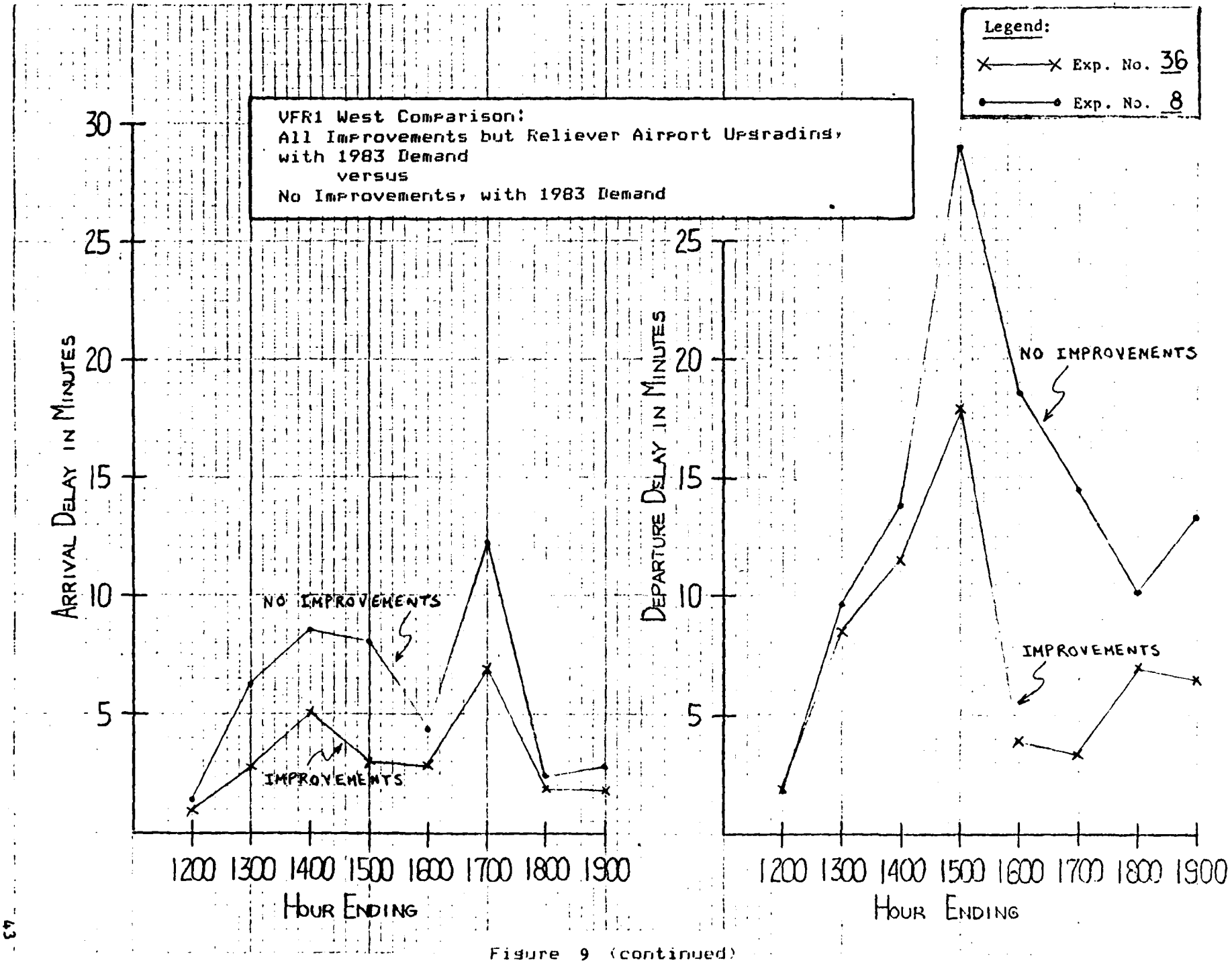


Figure 9 (continued)

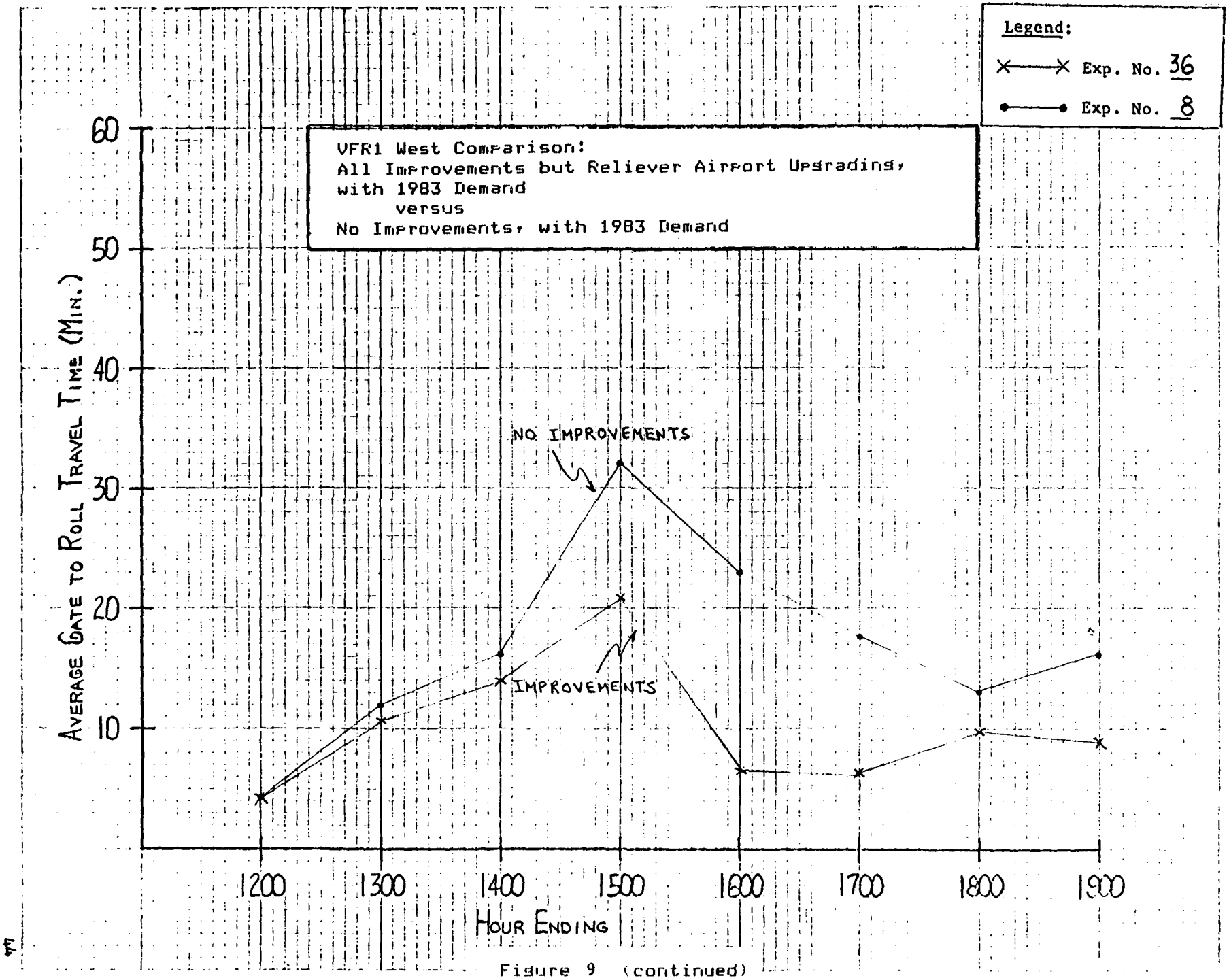


Figure 9 (continued)

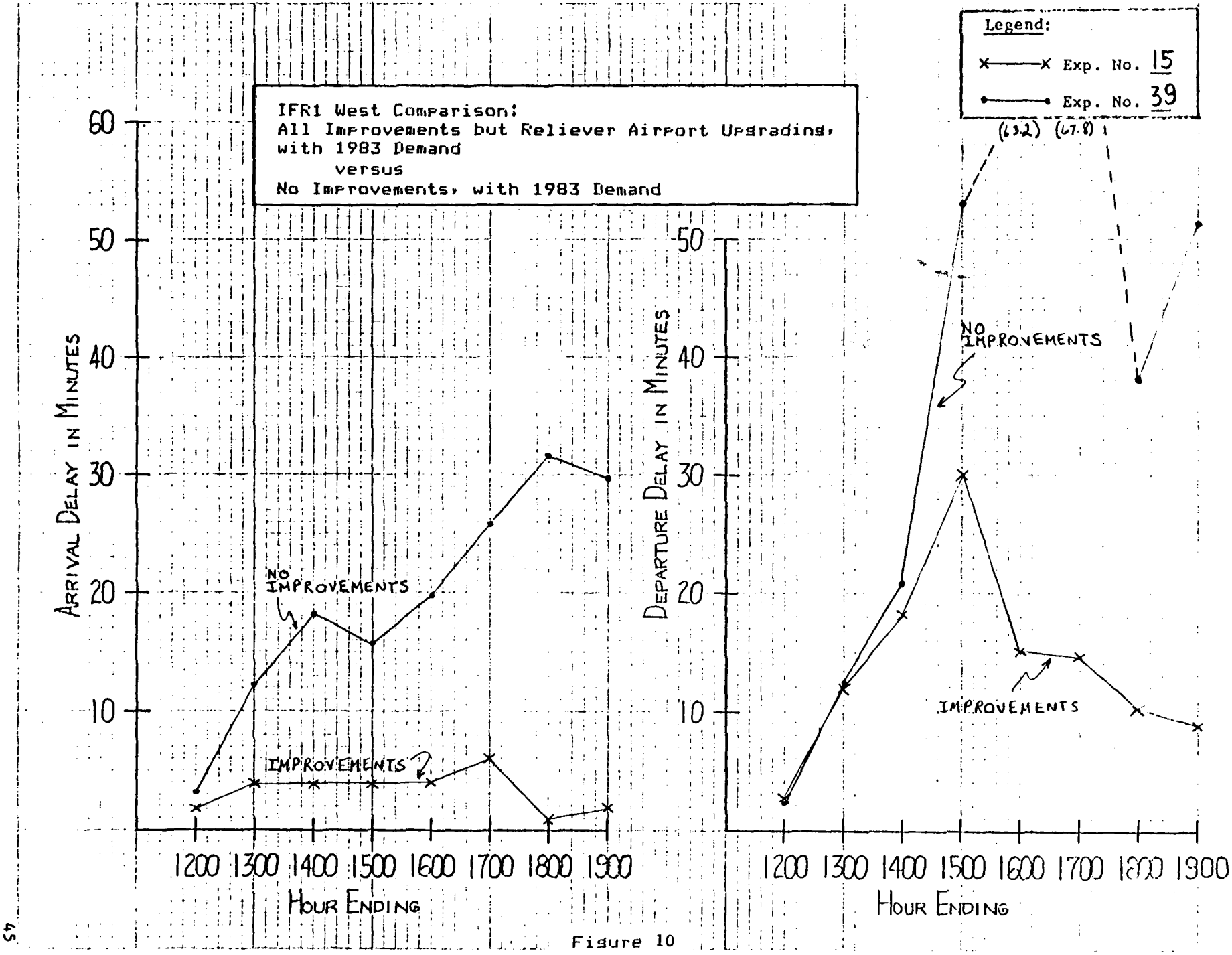

IFR1 West Comparison:
All Improvements but Reliever Airport Upgrading, with 1983 Demand
versus
No Improvements, with 1983 Demand
Legend:
Exp. No. 15
Exp. No. 39
Arrival Delay in Minutes
Departure Delay in Minutes
NO IMPROVEMENTS
IMPROVEMENTS
(63.2)
(67.8)
10
20
30
40
50
60
1200 1300 1400 1500 1600 1700 1800 1900
Hour Ending

Figure 10

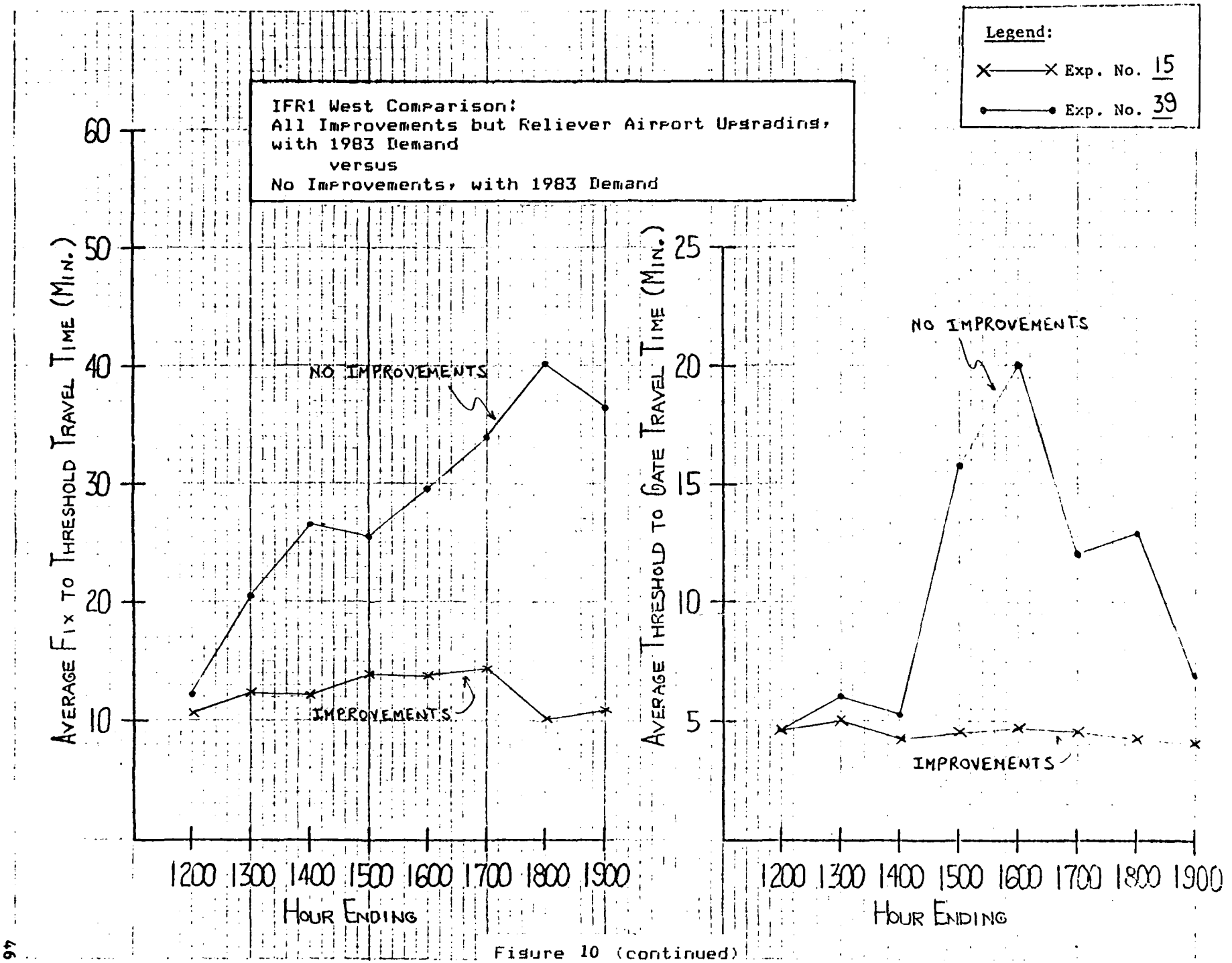


Figure 10 (continued)

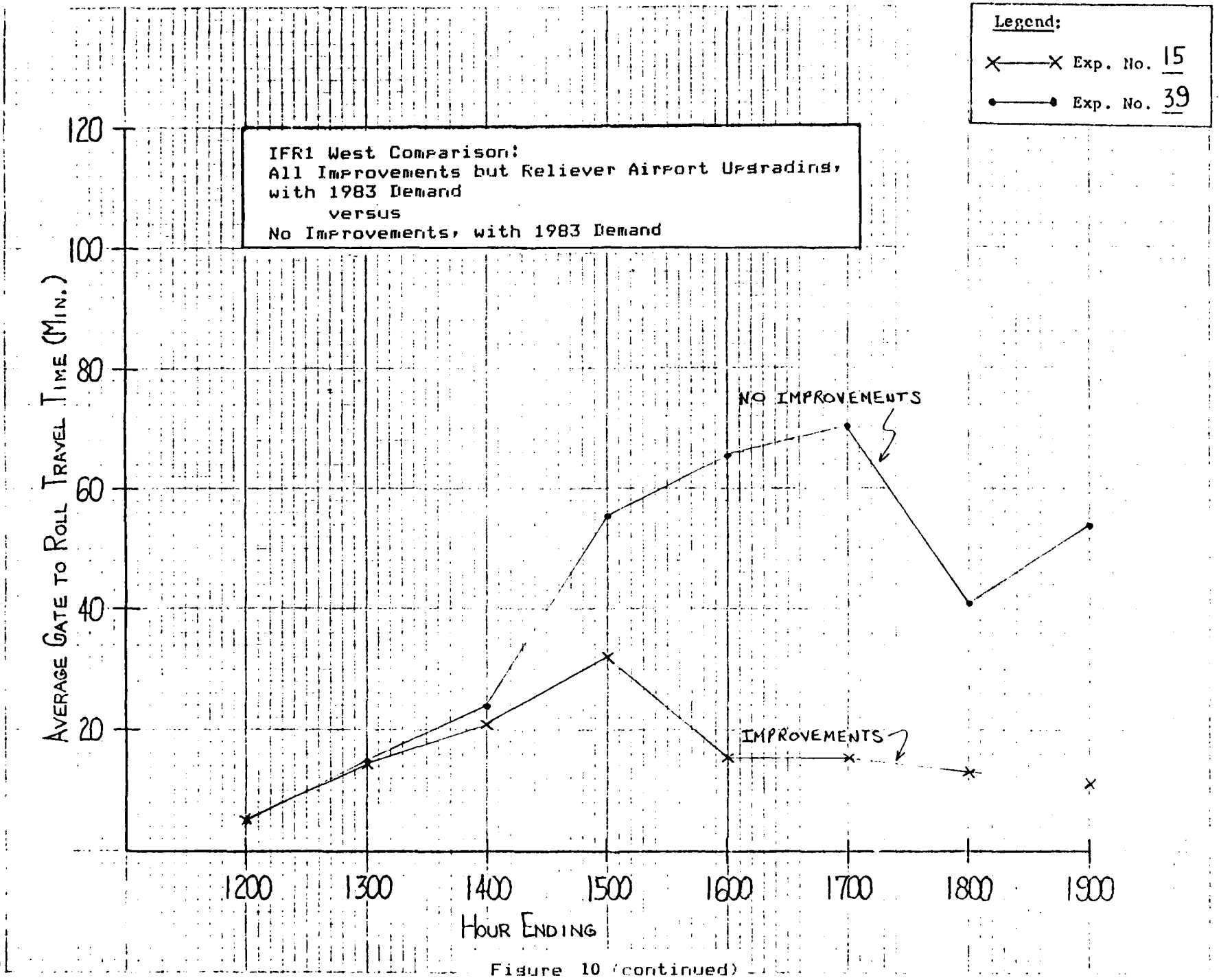


Figure 10 (continued)

Table 8

COMPARISON OF EXPERIMENTS

EXPERIMENT	ARRIVALS			DEPARTURES				TOTAL	TRAVEL TIMES			
	RUNWAY (AIR)	TAXI	RUNWAY X-ING	RUNWAY	TAXI	RUNWAY X-ING	GATE HOLD	GROUND DELAYS	ARRIVAL AIR	ARRIVAL GROUND	DEPART. GROUND	TOTAL
CONFIGURATION: EASTERLY **WEATHER: VFR 1**												
IMPROVEMENT: 1983 DO-NOTHING CASE VERSUS 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITHOUT RELIEVER UPGRADING												
RESULTS: 42.2% DECREASE IN AIRBORNE ARRIVAL DELAY. 43.1% DECREASE IN DEPARTURE RUNWAY DELAY. 75.1% DECREASE IN GATE HOLD DELAY. 28.3% DECREASE IN TOTAL TRAVEL TIMES.								**EXP.**	**ARRIVE**		**DEPART**	
								7	9L, 9R, 12		9L, 9R, 12	
								11B	9L, 9R, 12		9L, 9R, 12	
7	3011.0	85.1	5.5	4650.3	423.2	24.8	542.3	5731.2	6827.0	1267.0	7219.6	15313.6
* 11B	1741.1	3.1	4.1	2646.2	33.2	4.5	135.0	2826.1	5557.3	1152.1	4271.1	10980.5
CONFIGURATION: WESTERLY **WEATHER: VFR 1**												
IMPROVEMENT: 1983 DO-NOTHING CASE VERSUS 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITHOUT RELIEVER UPGRADINGS.												
RESULTS: 47.7% DECREASE IN AIRBORNE ARRIVAL DELAY 27.6% DECREASE IN DEPARTURE RUNWAY DELAY. 62.1% DECREASE IN GATE HOLD DELAY. 26.6% DECREASE IN TOTAL TRAVEL TIMES.								**EXP.**	**ARRIVE**		**DEPART**	
								8	27L, 27R, 30		27L, 27R, 30	
								36	27L, 27R, 30		27L, 27R, 30	
8	2375.4	140.7	18.9	3565.6	864.5	10.5	886.8	5487.0	5862.1	1709.3	6378.7	13950.1
* 36	1242.0	13.0	17.6	2583.1	147.5	12.8	336.3	3110.3	4741.0	1465.2	4030.2	10236.4
CONFIGURATION: WESTERLY **WEATHER: IFR 1**												
IMPROVEMENT: 1983 DO-NOTHING CASE VERSUS 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITHOUT RELIEVER UPGRADINGS												
RESULTS: 78.2% DECREASE IN AIRBORNE ARRIVAL DELAY. 37.2% DECREASE IN DEPARTURE RUNWAY DELAY. 90.8% DECREASE IN GATE HOLD DELAY. 48.3% DECREASE IN TOTAL TRAVEL TIMES.								**EXP.**	**ARRIVE**		**DEPART**	
								39	27L, 27R		27L, 27R	
								15	27L, 27R		27L, 27R	
39	5528.2	2050.2	4.6	5575.6	3869.3	2.9	3139.4	14642.0	7865.5	3066.2	11[illegible]3.8	22815.5
* 15	1204.5	92.0	5.4	3503.8	1282.7	3.4	287.4	5174.7	4315.9	1555.6	5889.3	11790.8

Note: Asterick (*) denotes improved experiments.

TABLE 9

AVERAGE DELAYS

EXP	DEMAND	WEATHER	IMPROVEMENTS	ATC	PEAK HOUR AVERAGE DELAY (MINUTES)		1100-1900 HRS. AVERAGE DELAY (MINUTES)	
					ARR	DEP	ARR	DEP
7	1983[l]	VFR1-E	None	Todays	13.1	19.2	7.9	15.2
11B	1983[l]	VFR1-E	1983[e]	1983	10.6	12.1	4.4	7.6
8	1983[l]	VFR1-W	None	Todays	12.2	18.6	6.4	14.4
36	1983[l]	VFR1-W	1983[e]	1983	6.9	13.1	3.2	8.3
39	1983[l]	IFR1-W	None	Todays	31.6	31.7	25.5	47.7
15	1983[l]	IFR1-W	1983[e]	1983	6.0	13.7	3.8	15.3

WEATHER: VFR1- Ceiling above 1500 ft. and visibility over 5 mi.
VFR2- Ceiling between 1000 ft. and 1500 ft. and visibility between 3 and 5 mi.
IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.
IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

DEMAND: 1983[l]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.
1983[m]- Lim . schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

TABLE 10

ANNUAL DELAY ESTIMATES

1983 DO-NOTHING vs. 1983 AIRPORT WITHOUT RELIEVER UPGRADING IN 1983

EXP.	DEMAND	IMPROVEMENT	SEPARATION	ANNUAL DELAY (hours)		
				ARRIVAL	DEPARTURE	TOTAL
7,8 39	1983[1]	NONE	1978	18,027	34,940	52,967
11B, 36,15	1983[1]	1983[e]	1983	9,502	17,991	27,493
				ANNUAL OPERATIONS TOTAL X 1000		
7,8 39	1983[1]	NONE	1978	380.200		
11B, 36,15	1983[1]	1983[e]	1983	380.200		
				AVERAGE ANNUAL DELAY (minutes)		
				ARRIVAL	DEPARTURE	TOTAL
7,8, 39	1983[1]	NONE	1978	2.8	5.5	8.4
11B, 36,15	1983[1]	1983[e]	1983	1.5	2.8	4.3

DEMAND: 1983[1]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.

1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

COMPARISON OF 1983 DO-NOTHING CASE WITH 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITH RELIEVER UPGRADING.

The basis for comparing the 1983 do-nothing case with the 1983 separations and airfield improvements with reliever upgrading includes the VFR1, VFR2, and IFR1 weather conditions for easterly and westerly traffic flow.

The purpose of these comparisons is to study the effect of a limited 1983 demand on the improved airport under 1983 ATC. The 1983 demand is limited due to a 50 percent G. A. reduction at Miami due to reliever airport upgrading.

EXPERIMENTS	CONFIGURATION
#7 and #14AA	VFR1 - Easterly Flow
#8 and #37	VFR1 - Westerly Flow
#34 and #35A	IFR1 - Easterly Flow
#39 and #20N	IFR1 - Westerly Flow
#38 and #12	VFR2 - Westerly Flow

Figures 11 through 15 show the average delays and travel times for arrival and departure aircraft. Table 11 gives a direct comparison of the experiments showing the total delays and travel times that accumulated during the simulation.

Tables 12 and 13 show the peak average runway delays, the average total delays over the simulation time period, and the annual delay estimates for these comparison cases.

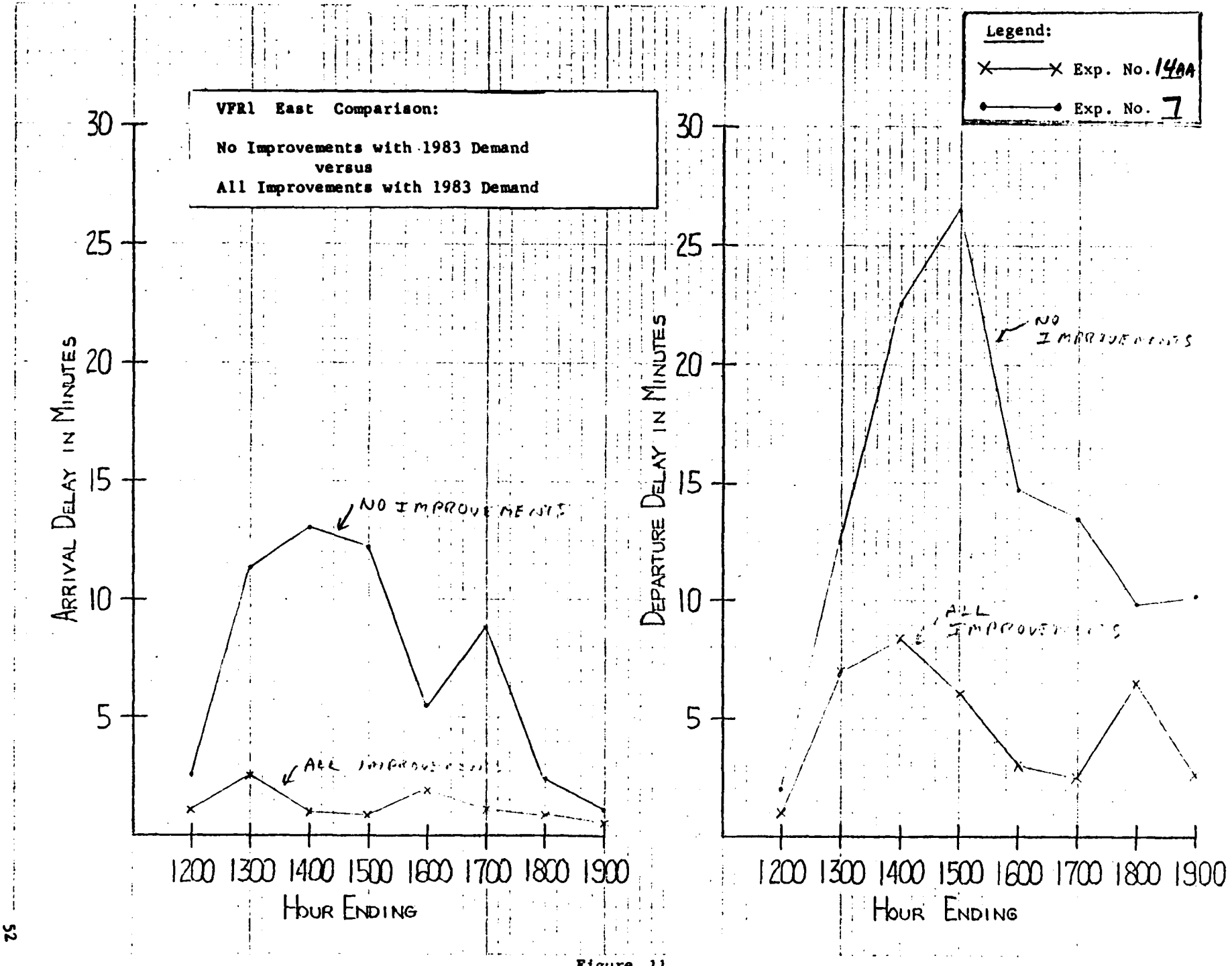

VFR1 East Comparison:
No Improvements with 1983 Demand
versus
All Improvements with 1983 Demand
Legend:
Exp. No. 14AA
Exp. No. 7
Arrival Delay in Minutes
Departure Delay in Minutes
Hour Ending
NO IMPROVEMENTS
ALL IMPROVEMENTS
5
10
15
20
25
30
1200
1300
1400
1500
1600
1700
1800
1900

Figure 11

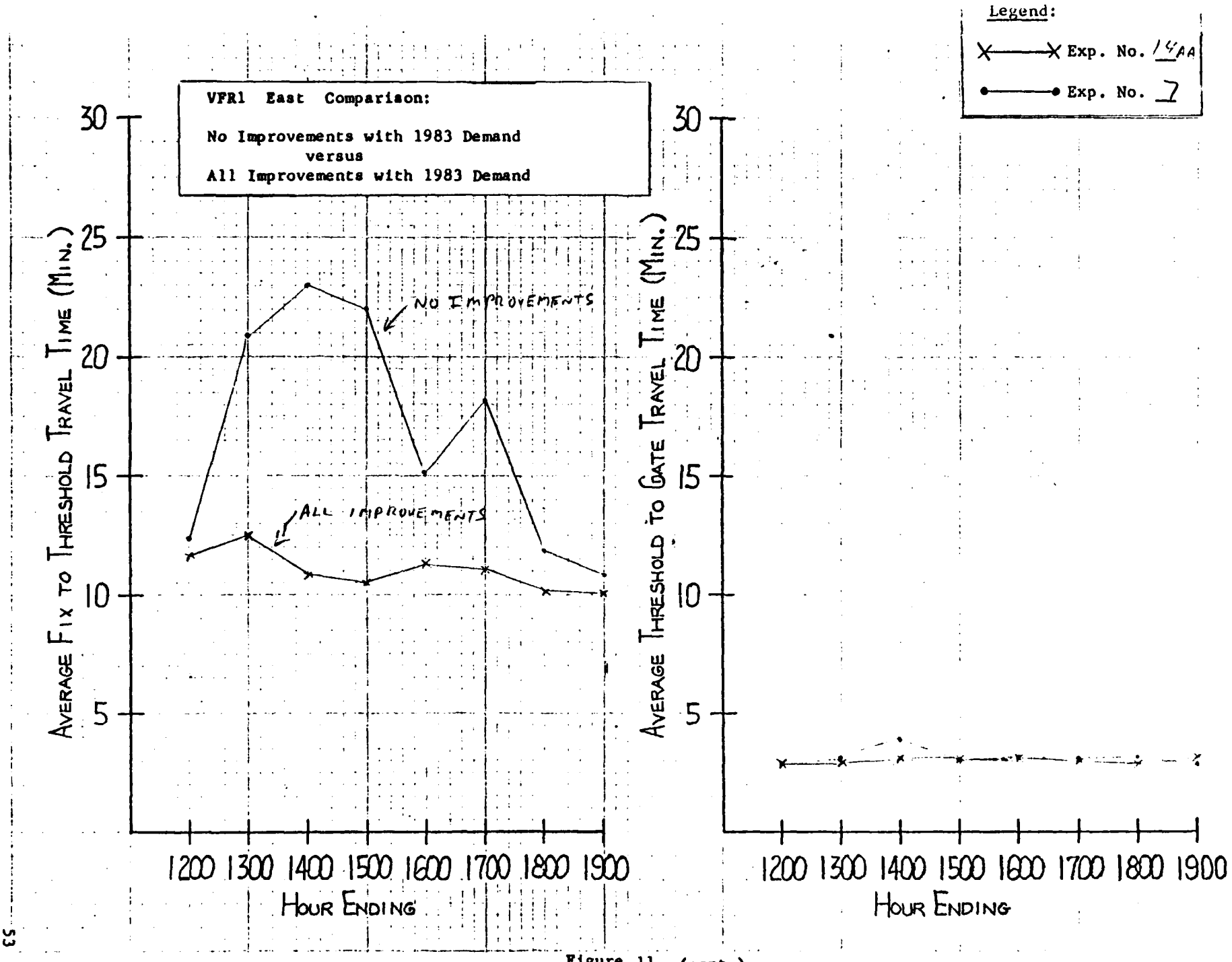


Figure 11 (cont.)

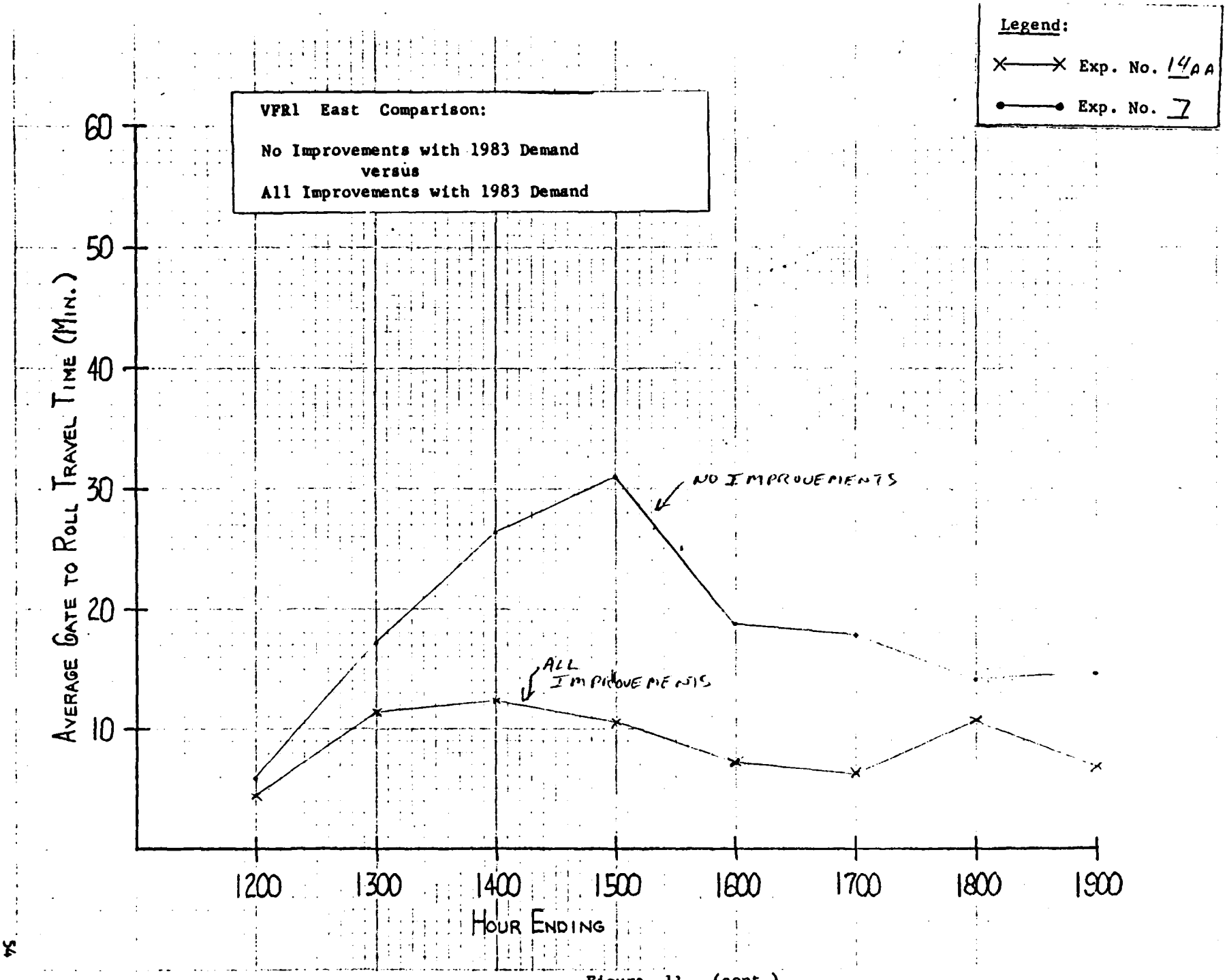


Figure 11 (cont.)

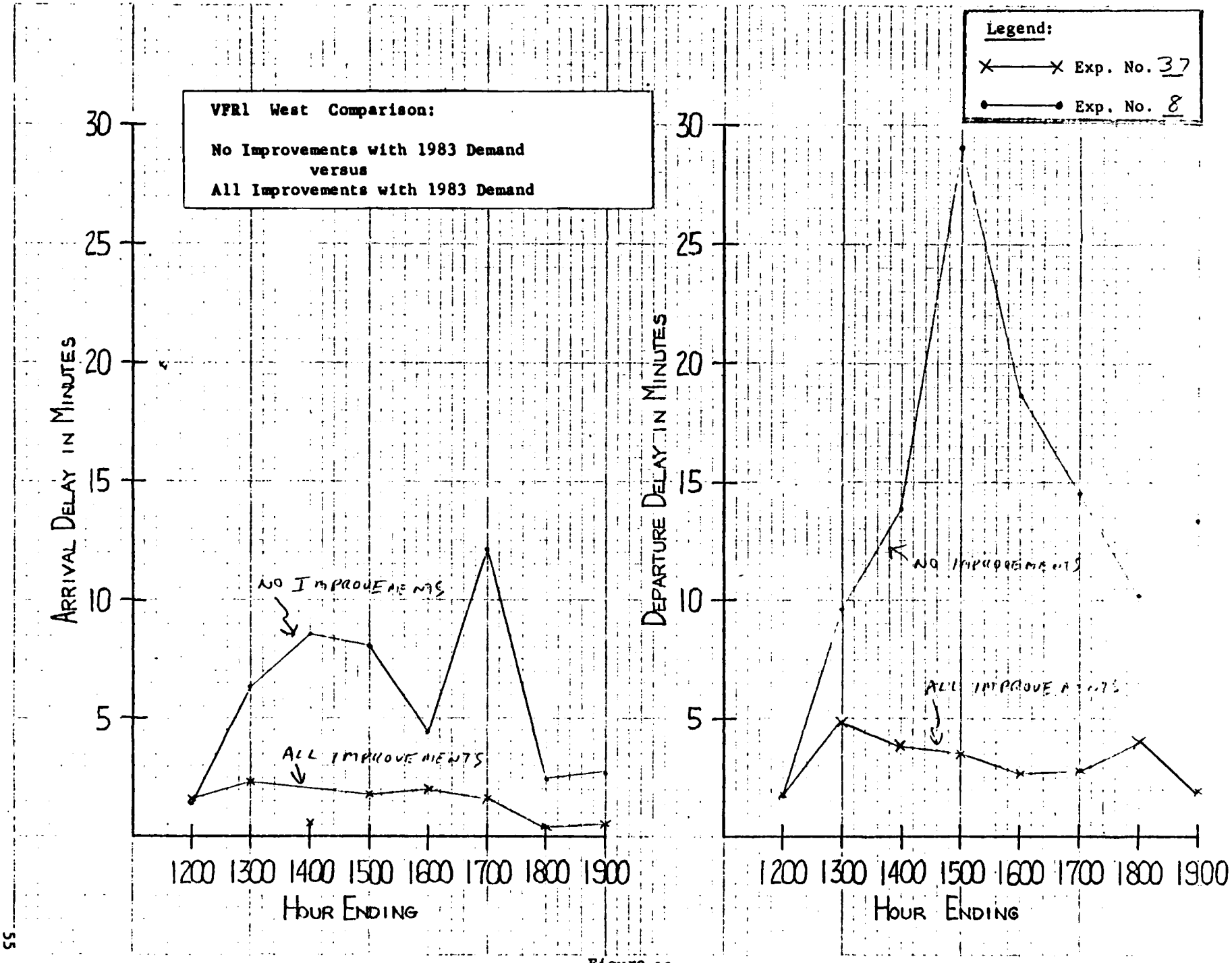

VFR1 West Comparison:
No Improvements with 1983 Demand
versus
All Improvements with 1983 Demand
Legend:
Exp. No. 37
Exp. No. 8
Arrival Delay in Minutes
Departure Delay in Minutes
30
25
20
15
10
5
NO IMPROVEMENTS
ALL IMPROVEMENTS
1200 1300 1400 1500 1600 1700 1800 1900
Hour Ending

Figure 12

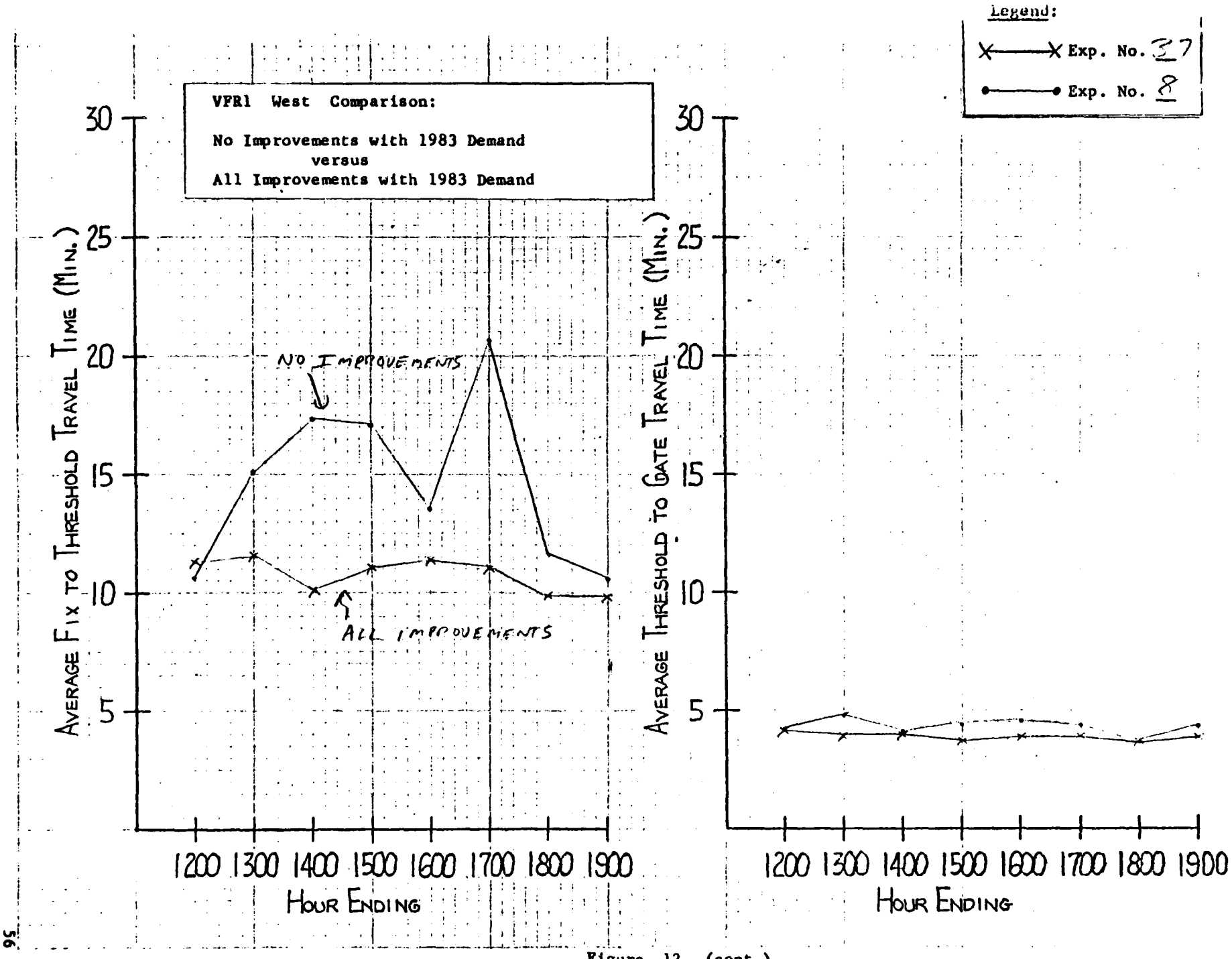


Figure 12 (cont.)

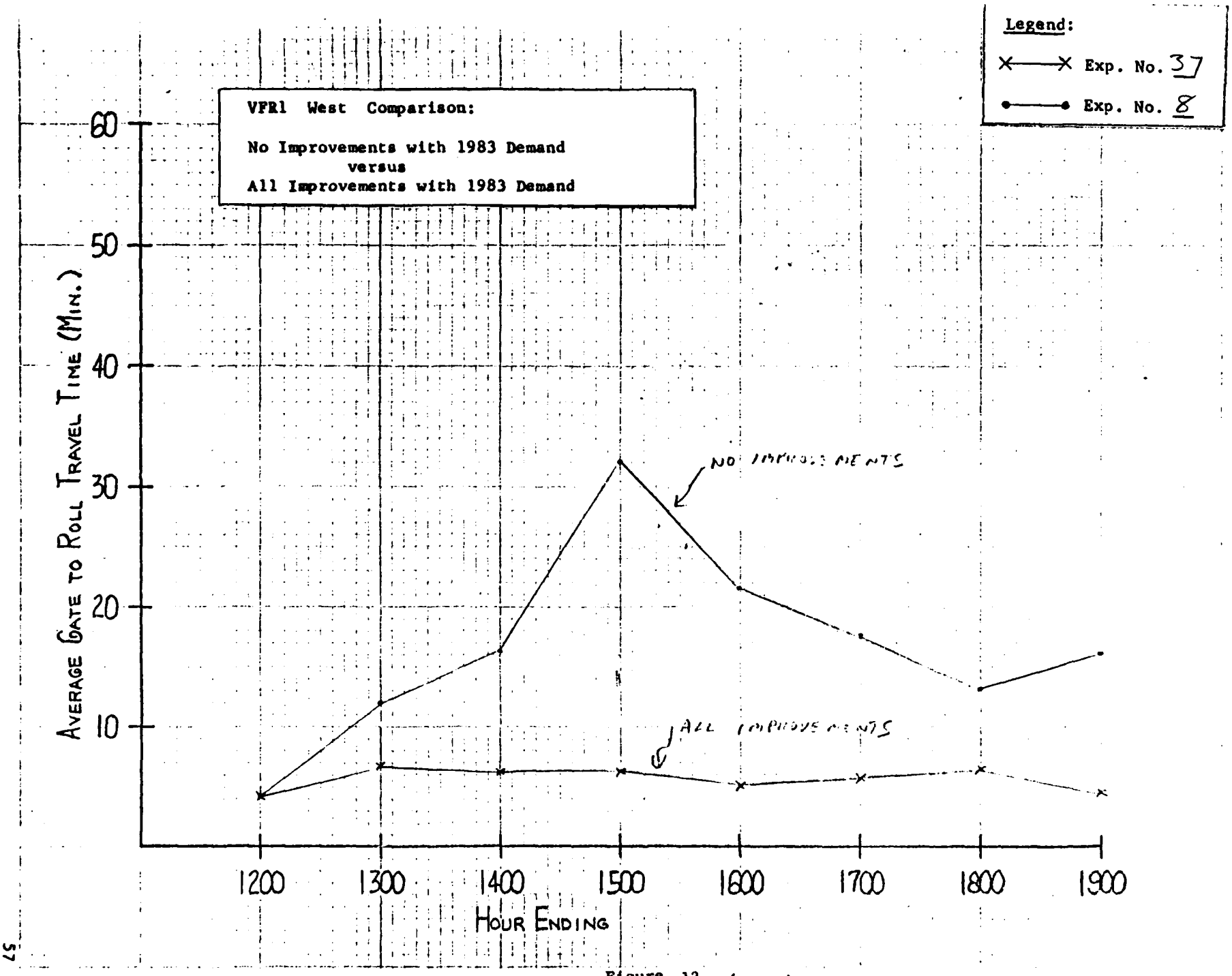


Figure 12 (cont.)

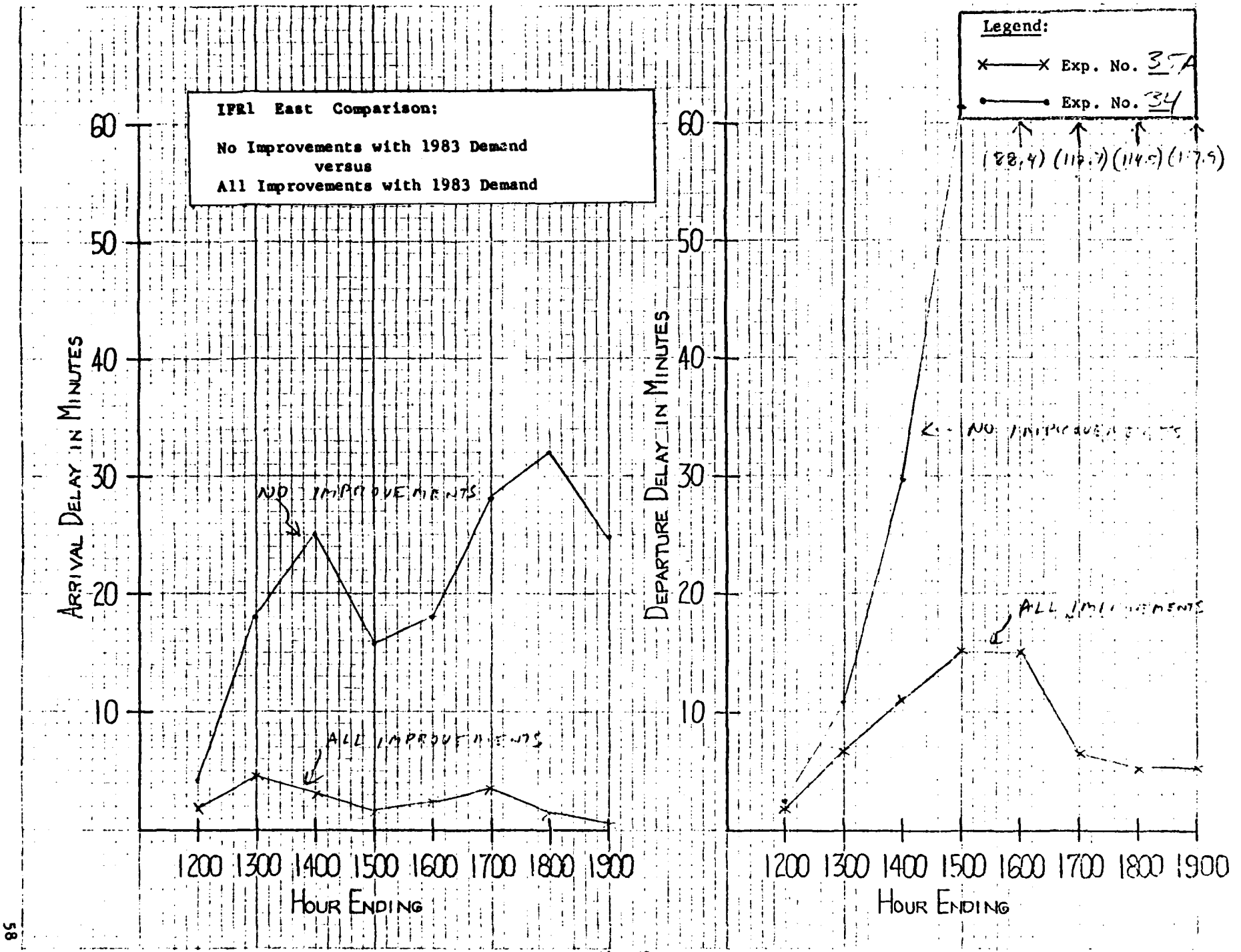

IFR1 East Comparison:
No Improvements with 1983 Demand
versus
All Improvements with 1983 Demand
Legend:
Exp. No. 35
Exp. No. 34
(88.4) (119.7) (114.9) (117.9)
ARRIVAL DELAY IN MINUTES
DEPARTURE DELAY IN MINUTES
NO IMPROVEMENTS
ALL IMPROVEMENTS
HOUR ENDING
HOUR ENDING
10
20
30
40
50
60
1200 1300 1400 1500 1600 1700 1800 1900

Figure 13

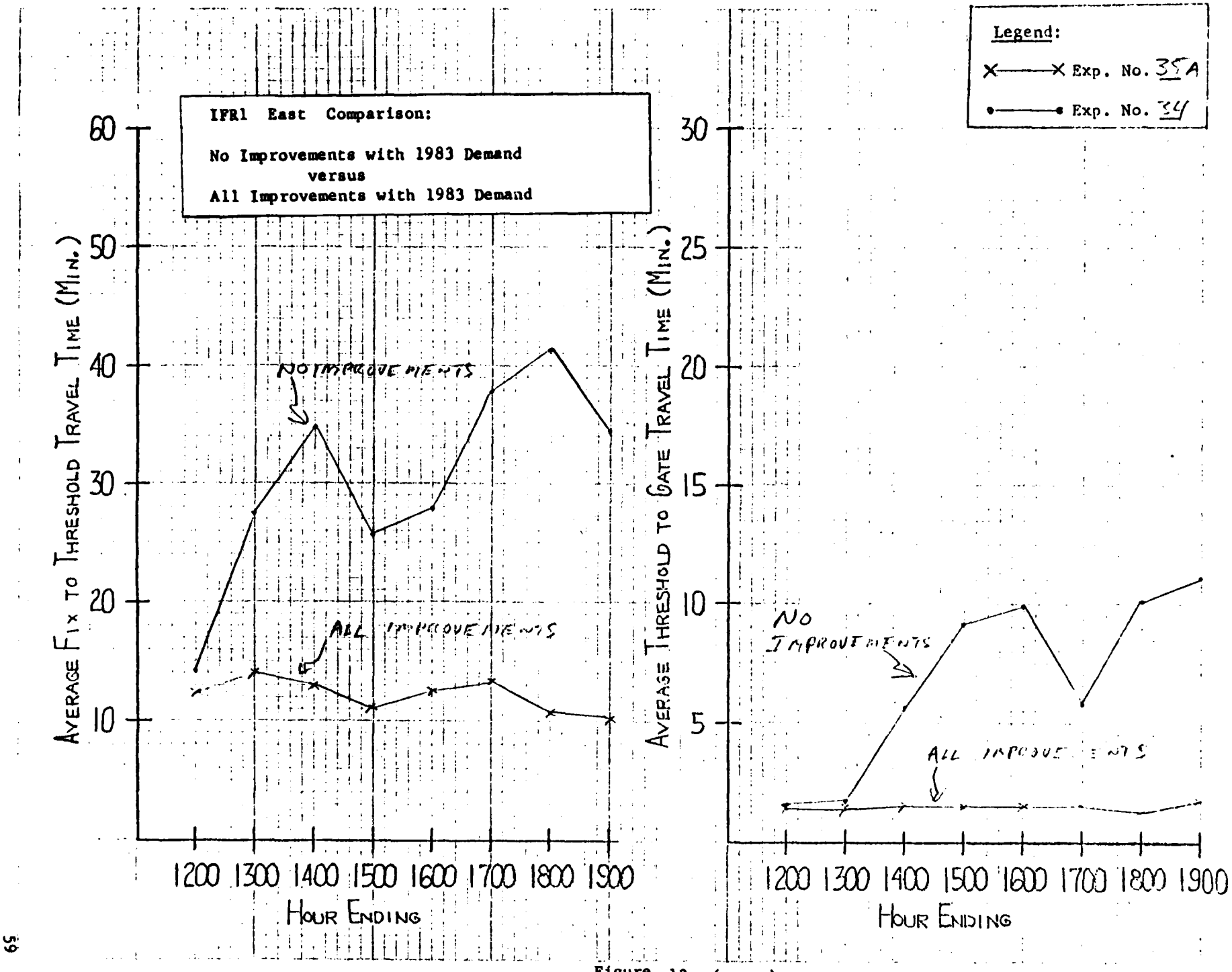


Figure 13 (cont.)

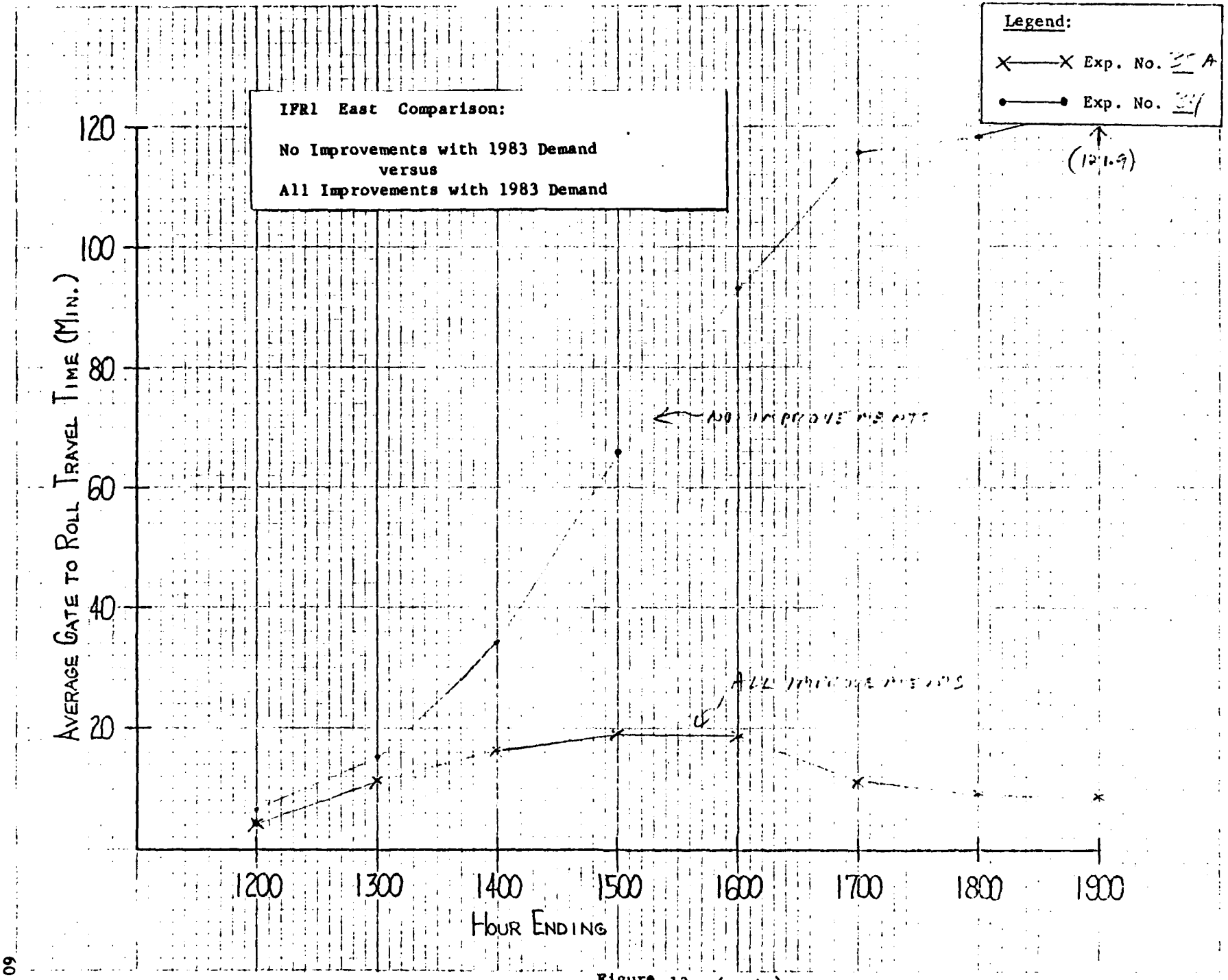


Figure 13 (cont.)

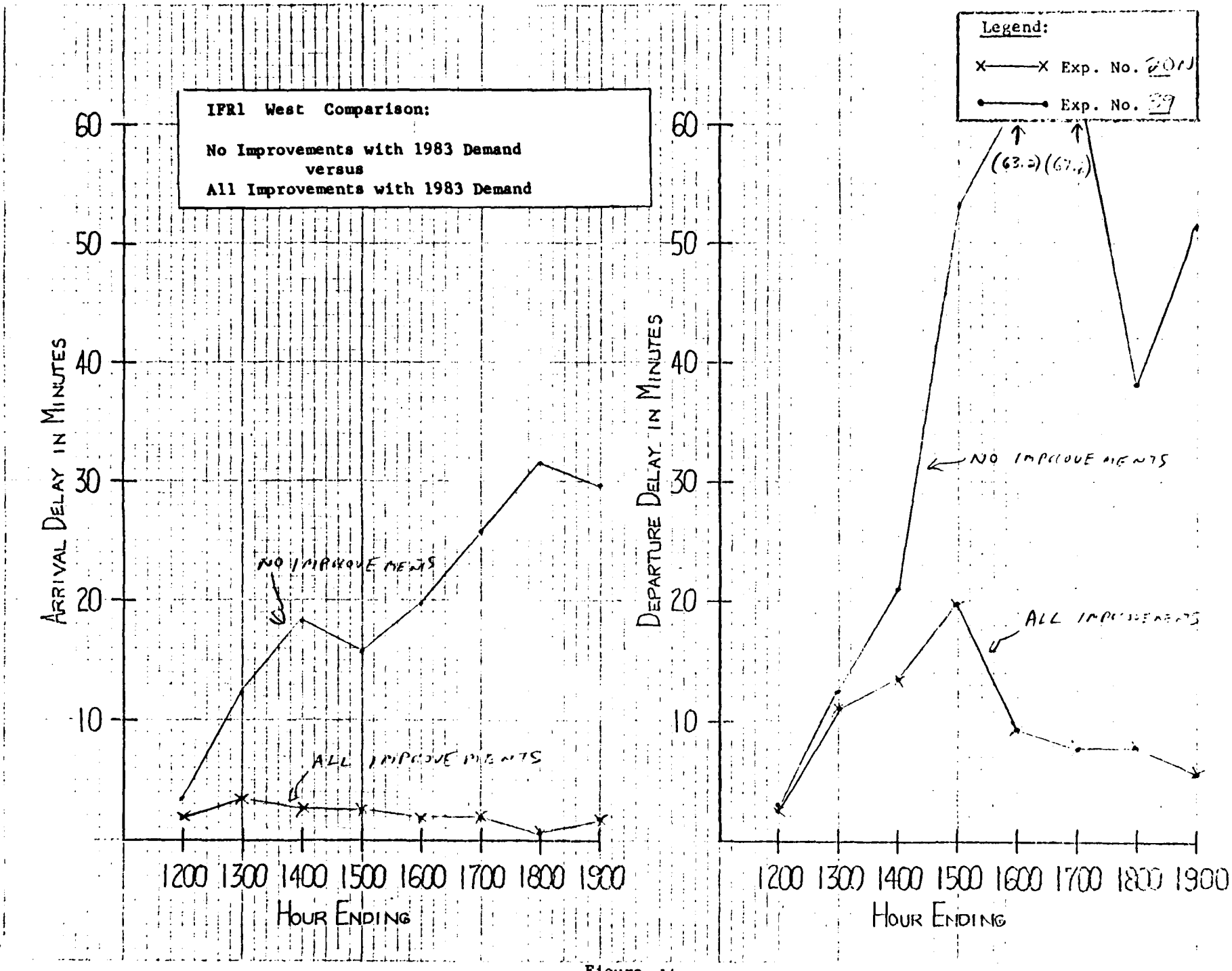

IFR1 West Comparison:
No Improvements with 1983 Demand
versus
All Improvements with 1983 Demand
Legend:
Exp. No. 201
Exp. No. 99
ARRIVAL DELAY IN MINUTES
DEPARTURE DELAY IN MINUTES
HOUR ENDING
1200 1300 1400 1500 1600 1700 1800 1900
10 20 30 40 50 60
NO IMPROVEMENTS
ALL IMPROVEMENTS
(63.2) (67.4)

Figure 14

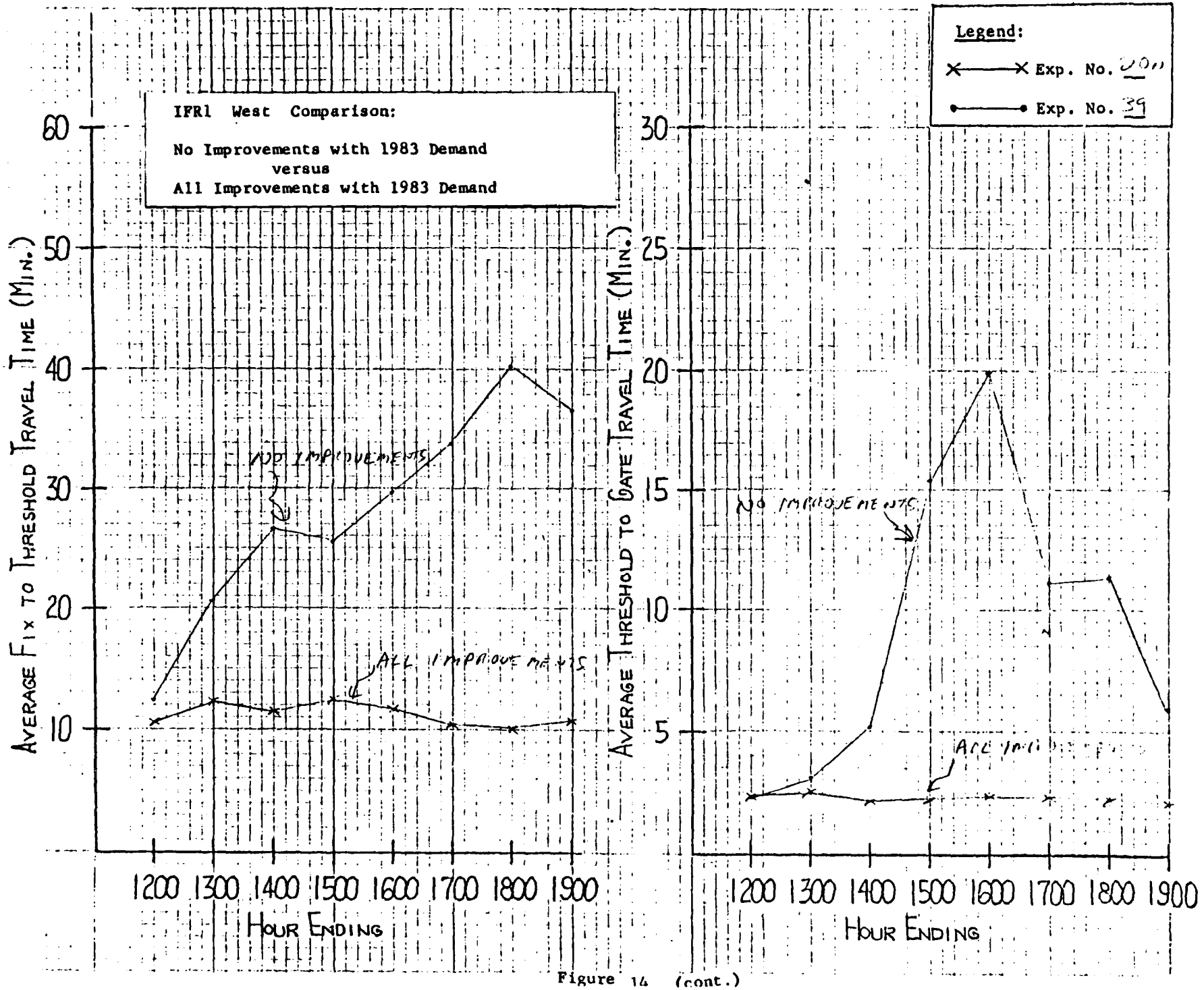


Figure 14 (cont.)

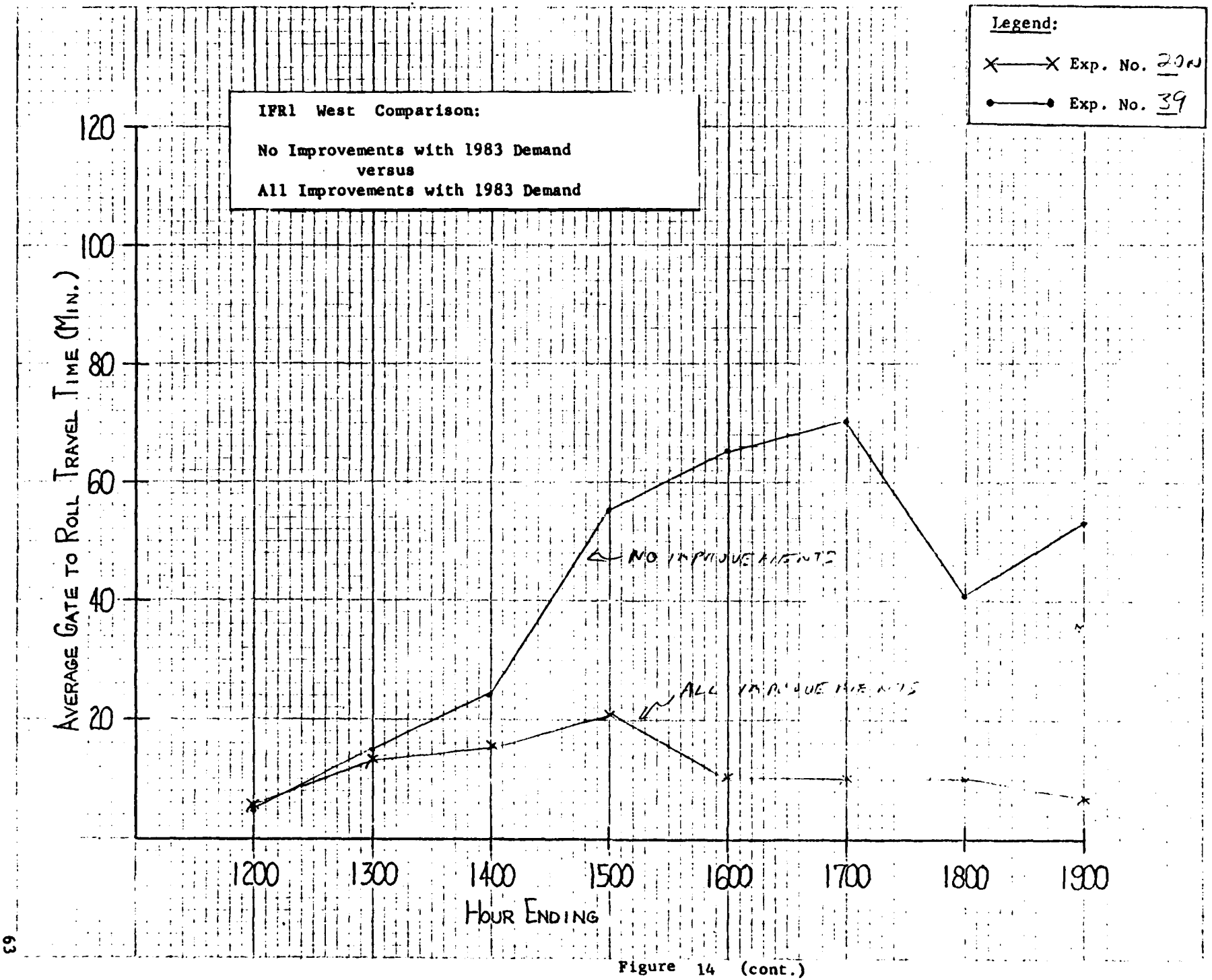


Figure 14 (cont.)

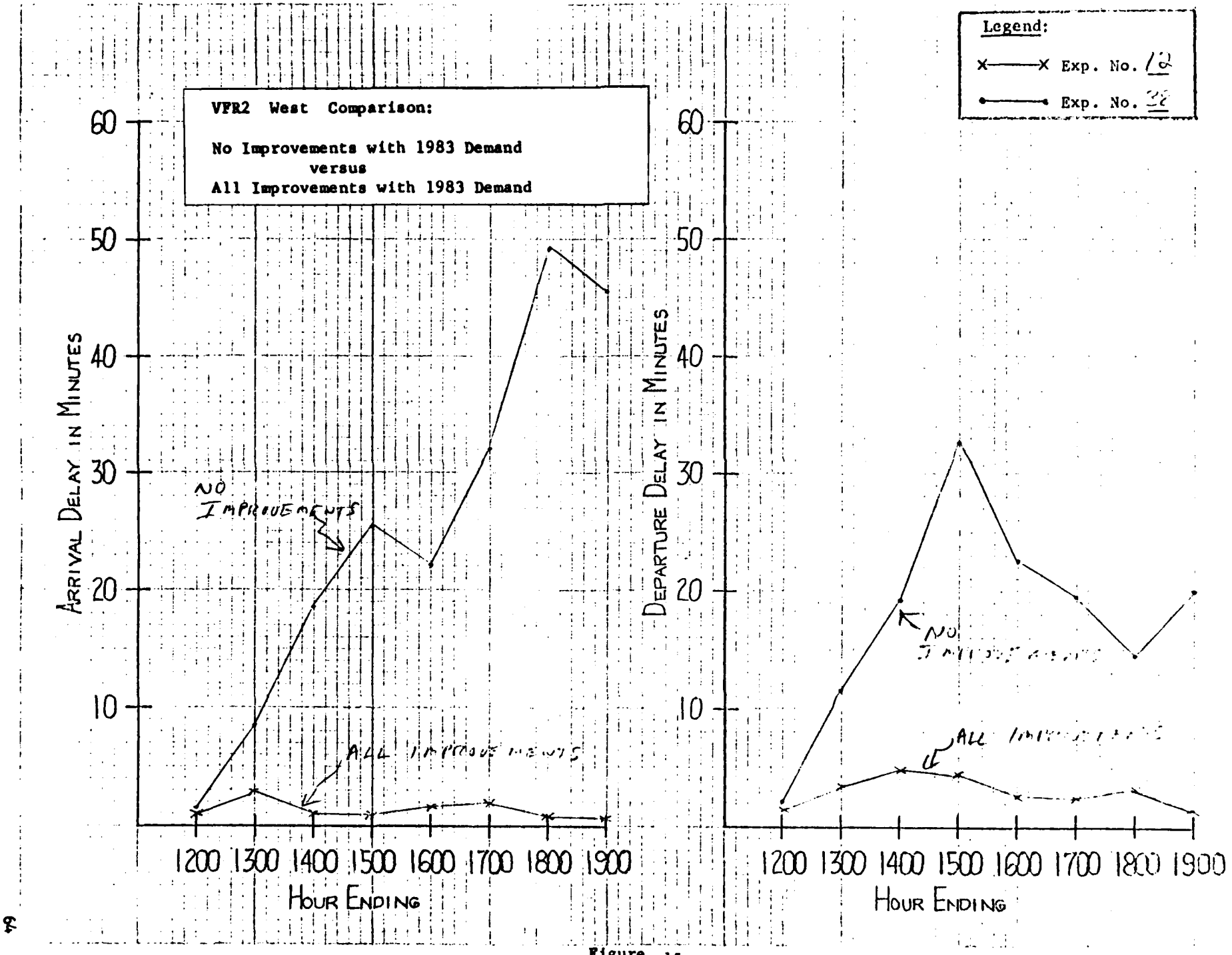

VFR2 West Comparison:
No Improvements with 1983 Demand
versus
All Improvements with 1983 Demand
Legend:
Exp. No. 12
Exp. No. 22
Arrival Delay in Minutes
Departure Delay in Minutes
NO IMPROVEMENTS
ALL IMPROVEMENTS
10
20
30
40
50
60
1200 1300 1400 1500 1600 1700 1800 1900
Hour Ending

Figure 15

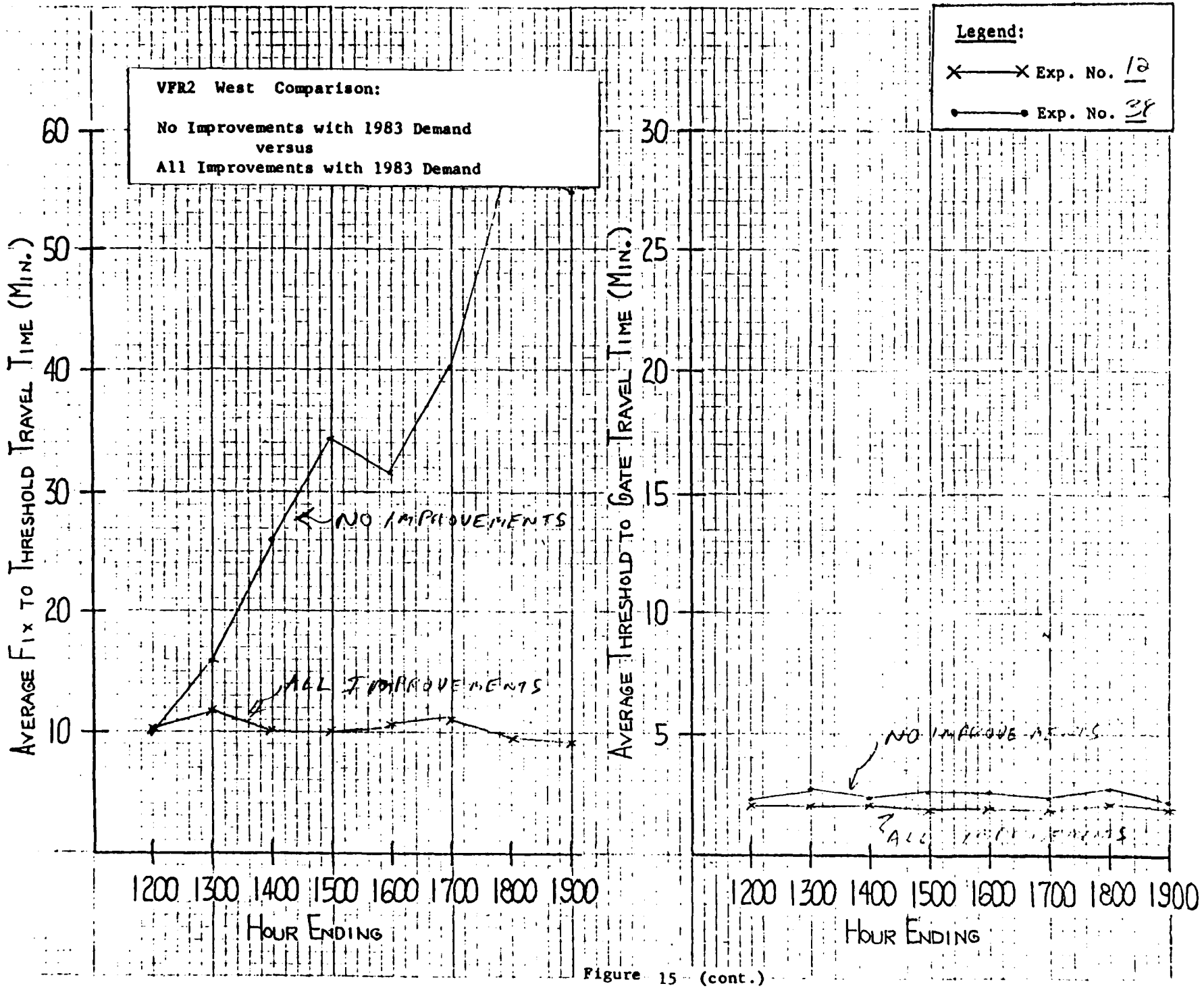


Figure 15 (cont.)

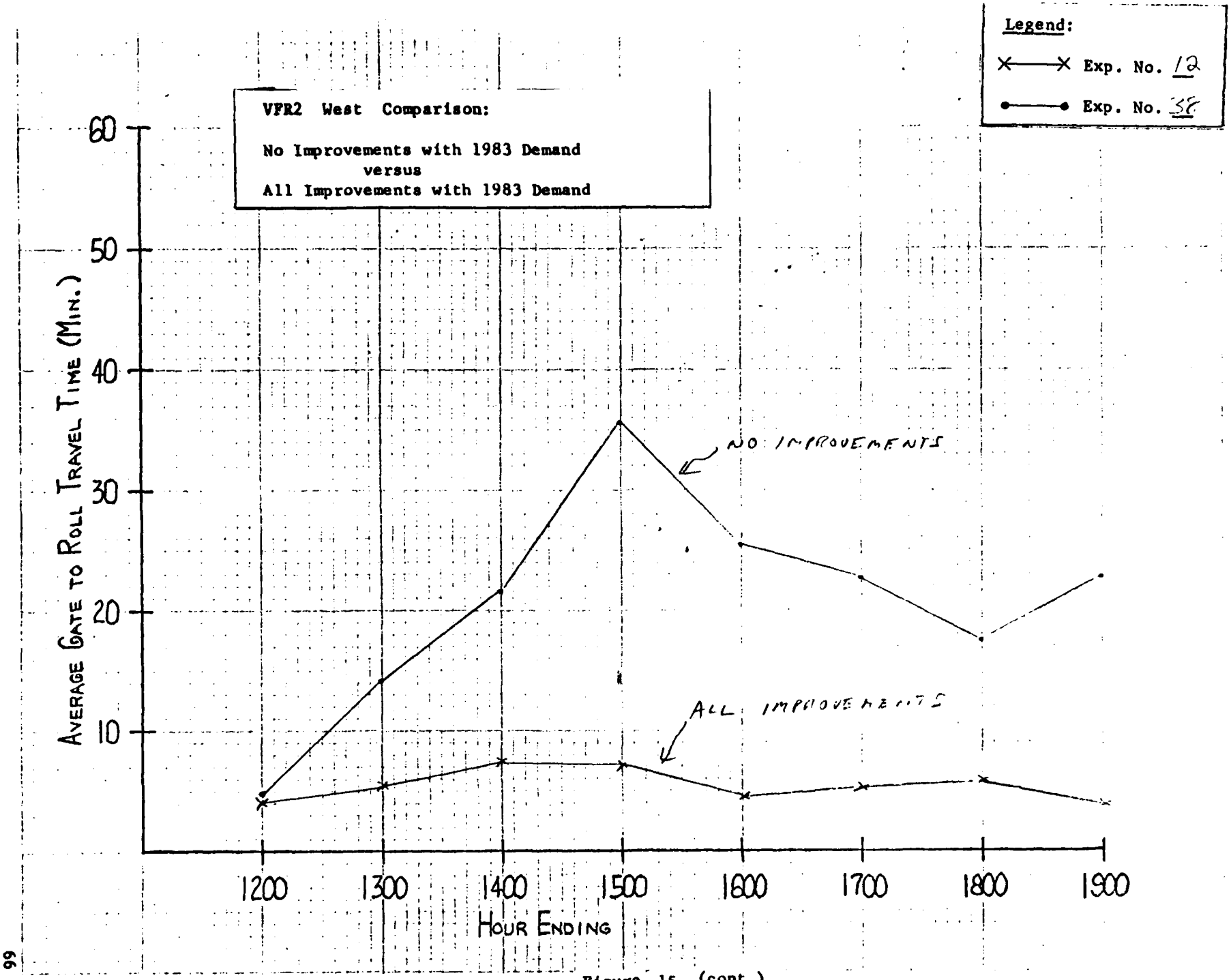


Figure 15 (cont.)

Table 11

COMPARISON OF EXPERIMENTS

EXPERIMENT	ARRIVALS			DEPARTURES				TOTAL GROUND DELAYS	TRAVEL TIMES			
	RUNWAY (AIR)	TAXI	RUNWAY X-ING	RUNWAY	TAXI	RUNWAY X-ING	GATE HOLD		ARRIVAL AIR	ARRIVAL GROUND	DEPART. GROUND	TOTAL
CONFIGURATION: EASTERLY	**WEATHER: VFR1**											
IMPROVEMENT: 1983 DO-NOTHING CASE VERSUS 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITH RELIEVER UPGRADING												
RESULTS: 83.9% DECREASE IN AIRBORNE ARRIVAL DELAY. 64.1% DECREASE IN DEPARTURE RUNWAY DELAY. 99.1% DECREASE IN GATE HOLD DELAY. 47.3% DECREASE IN TOTAL TRAVEL TIMES.								EXP.	ARRIVE		DEPART	
								7	9L, 9R, 12		9L, 9R, 12	
								14AA	9L, 9R, 12		9L, 9R, 12	
7	3011.0	85.1	5.5	4650.3	423.2	24.8	542.3	5731.2	6827.0	1267.0	7219.6	15313.6
* 14AA	483.8	3.4	7.6	1670.2	42.0	3.0	4.8	1730.9	3917.1	1053.5	3092.3	8062.9
CONFIGURATION: WESTERLY	**WEATHER: VFR 1**											
IMPROVEMENT: 1983 DO-NOTHING CASE VERSUS 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITH RELIEVER UPGRADING												
RESULTS: 77.8% DECREASE IN AIRBORNE ARRIVAL DELAY. 71.4% DECREASE IN DEPARTURE RUNWAY DELAY. ELIMINATION OF GATE HOLD DELAY. 48.7% DECREASE IN TOTAL TRAVEL TIMES								EXP.	ARRIVE		DEPART	
								8	27L, 27R, 30		27L, 27R, 30	
								37	27L, 27R, 30		27L, 27R, 30	
8	2375.4	140.7	18.9	3565.6	864.5	10.5	886.8	5487.0	5862.1	1709.3	6378.7	13950.1
* 37	528.3	7.0	16.5	1019.7	88.5	5.8	0.0	1137.5	3854.9	1371.0	1930.0	7155.9
CONFIGURATION: EASTERLY	**WEATHER: IFR1**											
IMPROVEMENT: 1983 DO-NOTHING CASE VERSUS 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITH RELIEVER UPGRADING												
RESULTS: 87.0% DECREASE IN AIRBORNE ARRIVAL DELAY 76.6% DECREASE IN DEPARTURE RUNWAY DELAY. 99.3% DECREASE IN GATE HOLD DELAY. 74.1% DECREASE IN TOTAL TRAVEL TIMES.								EXP.	ARRIVE		DEPART	
								34	9L, 9R		9L, 9R, 12	
								35A	9L, 9R		9L, 9R, 12	
34	6780.0	1337.6	4.2	11037.1	4177.6	6.3	7640.0	24202.8	9761.9	2327.8	23[illegible]2.[illegible]	35642.3
* 35A	881.1	2.5	3.1	2586.4	75.7	2.0	51.7	2721.4	4166.1	1008.9	4048.3	9223.3

Note: Asterick (*) denotes improved experiments.

Table 11 (cont.)

COMPARISON OF EXPERIMENTS

EXPERIMENT	ARRIVALS			DEPARTURES				TOTAL	TRAVEL TIMES			
	RUNWAY (AIR)	TAXI	RUNWAY X-ING	RUNWAY	TAXI	RUNWAY X-ING	GATE HOLD	GROUND DELAYS	ARRIVAL AIR	ARRIVAL GROUND	DEPART. GROUND	TOTAL
CONFIGURATION: WESTERLY	WEATHER: IFR 1											
IMPROVEMENT: 1983 DO-NOTHING CASE VERSUS 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITH RELIEVER UPGRADING												
RESULTS: 86.8% DECREASE IN AIRBORNE ARRIVAL DELAY. 57.6% DECREASE IN DEPARTURE RUNWAY DELAY. 99.4% DECREASE IN GATE HOLD DELAY. 58.6% DECREASE IN TOTAL TRAVEL TIMES.								EXP.	ARRIVE		DEPART	
								39	27L, 27R		27L, 27R	
								20N	27L, 27R		27L, 27R	
39	5528.2	2050.2	4.6	5575.6	3869.3	2.9	3139.4	14642.0	7865.5	3066.2	11883.8	22815.5
* 20N	728.8	93.4	4.5	2363.1	978.1	2.3	17.3	3458.6	3783.9	1541.5	4119.7	9445.1
CONFIGURATION: WESTERLY	WEATHER: VFR 2											
IMPROVEMENT: 1983 DO-NOTHING CASE VERSUS 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITH RELIEVER UPGRADING												
RESULTS: 95.2% DECREASE IN AIRBORNE ARRIVAL DELAY. 74.9% DECREASE IN DEPARTURE RUNWAY DELAY. ELIMINATION OF GATE HOLD DELAY. 70.7% DECREASE IN TOTAL TRAVEL TIMES.								EXP.	ARRIVE		DEPART	
								38	27L, 27R		27L, 27R, 30	
								12	27R, 30		27L, 27R	
38	10495.7	215.0	4.6	4556.5	1350.7	9.0	1165.4	7301.2	13724.9	1900.7	8101.8	23727.4
* 12	504.8	5.9	11.4	914.9	89.6	14.6	0.3	1036.8	3772.0	1356.0	1833.6	6961.6
CONFIGURATION:	WEATHER:											
IMPROVEMENT:												
RESULTS:								EXP.	ARRIVE		DEPART	
*												

Note: Asterick (*) denotes improved experiments.

TABLE 12

AVERAGE DELAYS

EXP	DEMAND	WEATHER	IMPROVEMENTS	ATC	PEAK HOUR AVERAGE DELAY (MINUTES)		1100-1900 HRS. AVERAGE DELAY (MINUTES)	
					ARR	DEP	ARR	DEP
7	1983[l]	VFR1-E	None	Todays	13.1	19.2	7.9	15.2
14AA	1983[m]	VFR1-E	1983[e,g]	1983	2.6	8.1	1.4	5.2
8	1983[l]	VFR1-W	None	Todays	12.2	18.6	6.4	14.4
37	1983[m]	VFR1-W	1983[e,g]	1983	2.3	4.5	1.6	3.4
34	1983[l]	IFR1-E	None	Todays	32.1	59.1	25.0	83.2
35A	1983[m]	IFR1-E	1983[e,g]	1983	4.6	14.8	2.6	8.6
39	1983[l]	IFR1-W	None	Todays	31.6	31.7	25.5	47.7
20N	1983[m]	IFR1-W	1983[e,g]	1983	3.5	9.7	2.5	10.5
38	1983[l]	VFR2-W	None	Todays	59.5	18.4	27.1	19.1
12	1983[m]	VFR2-W	1983[e,g]	1983	2.9	4.6	1.5	3.1

WEATHER: VFR1- Ceiling above 1500 ft. and visibility over 5 mi.
VFR2- Ceiling between 1000 ft. and 1500 ft. and visibility between 3 and 5 mi.
IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.
IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

DEMAND: 1983[l]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.
1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

TABLE 13

ANNUAL DELAY ESTIMATES
1983 DO-NOTHING vs. 1983 AIRPORT WITH RELIEVER UPGRADING IN 1983

EXP.	DEMAND	IMPROVEMENT	SEPARATION	ANNUAL DELAY (hours)		
				ARRIVAL	DEPARTURE	TOTAL
7,34 8,39	1983[l]	NONE	1978	18,027	34,940	52,967
14AA,37 20N,35A	1983[m]	1983[e,g]	1983	2,873	9,632	12,505
				ANNUAL OPERATIONS TOTAL X 1000		
7,34 8,39	1983[l]	NONE	1978	380,200		
14AA,37 20N,35A	1983[m]	1983[e,g]	1983	340,200		
				AVERAGE ANNUAL DELAY (minutes)		
				ARRIVAL	DEPARTURE	TOTAL
7,34 8,39	1983[l]	NONE	1978	2.8	5.5	8.4
14AA,37 20N,35A	1983[m]	1983[e,g]	1983	0.5	1.7	2.2

DEMAND: 1983[l]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.
1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

COMPARISON OF 1983 SEPARATIONS AND RELIEVER UPGRADING WITHOUT AIRFIELD IMPROVEMENTS WITH 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITHOUT RELIEVER UPGRADING.

The basis for comparing the 1983 separations and reliever upgrading without airfield improvements case with the 1983 separations and airfield improvements without reliever upgrading case includes the VFR1 weather condition under easterly traffic flow.

This comparison shows the relationship between using a limited 1983 demand on today's airport under 1983 ATC as opposed to using a full 1983 demand on the improved airport under 1983 ATC.

EXPERIMENTS	CONFIGURATION
#11A and #11B	VFR1 - Easterly Flow

Figure 16 shows the average delays and travel times for arrival and departure aircraft. Table 14 gives a direct comparison of the experiments showing the total delays and travel times athat accumulated during the simulations.

Table 15 shows the peak average runway delays, and the average total delays over the simulation time period.

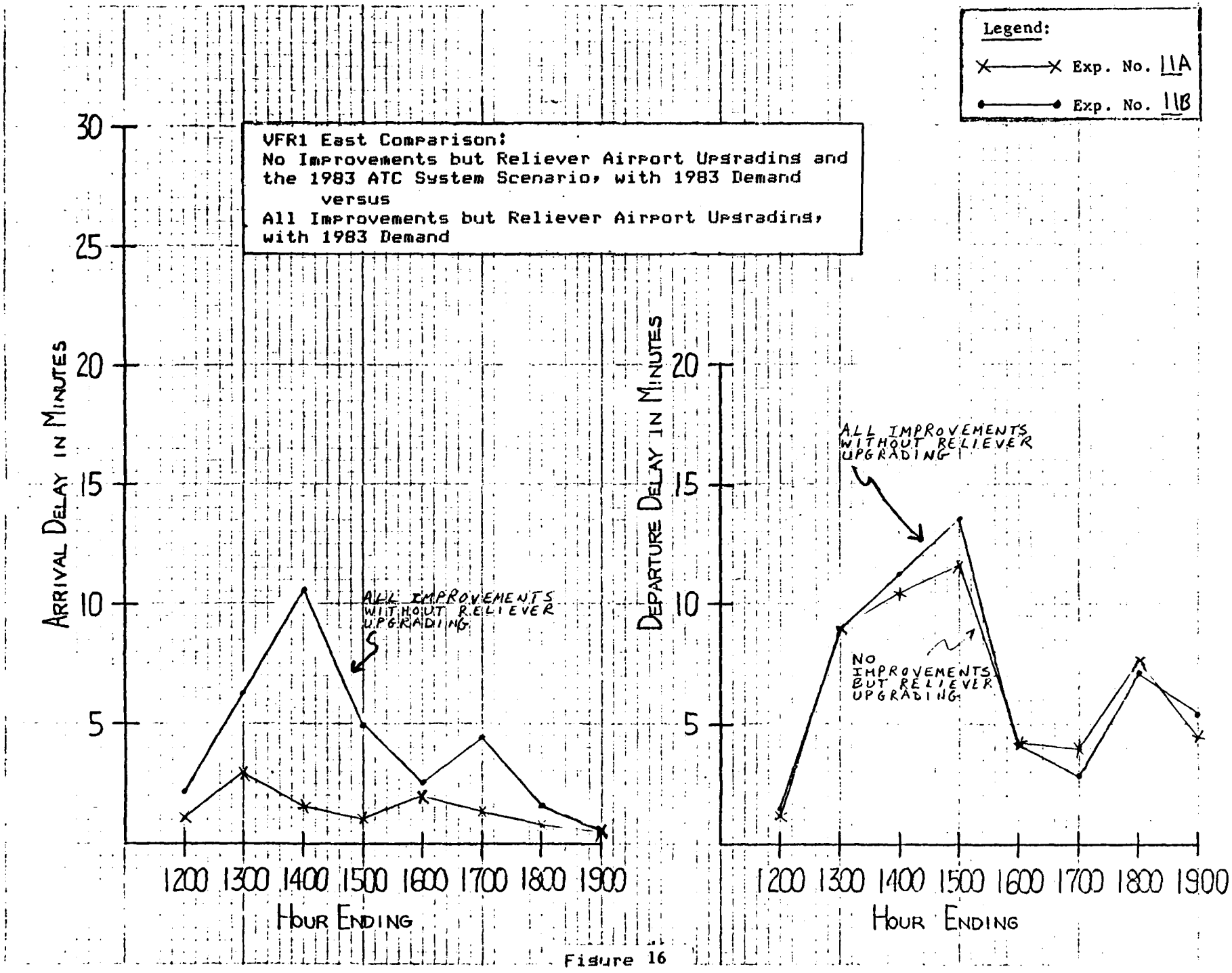

Legend:
Exp. No. 11A
Exp. No. 11B
VFR1 East Comparison:
No Improvements but Reliever Airport Upgrading and the 1983 ATC System Scenario, with 1983 Demand
versus
All Improvements but Reliever Airport Upgrading, with 1983 Demand
ARRIVAL DELAY IN MINUTES
30
25
20
15
10
5
ALL IMPROVEMENTS WITHOUT RELIEVER UPGRADING
1200 1300 1400 1500 1600 1700 1800 1900
HOUR ENDING
DEPARTURE DELAY IN MINUTES
20
15
10
5
ALL IMPROVEMENTS WITHOUT RELIEVER UPGRADING
NO IMPROVEMENTS BUT RELIEVER UPGRADING
1200 1300 1400 1500 1600 1700 1800 1900
HOUR ENDING

Figure 16

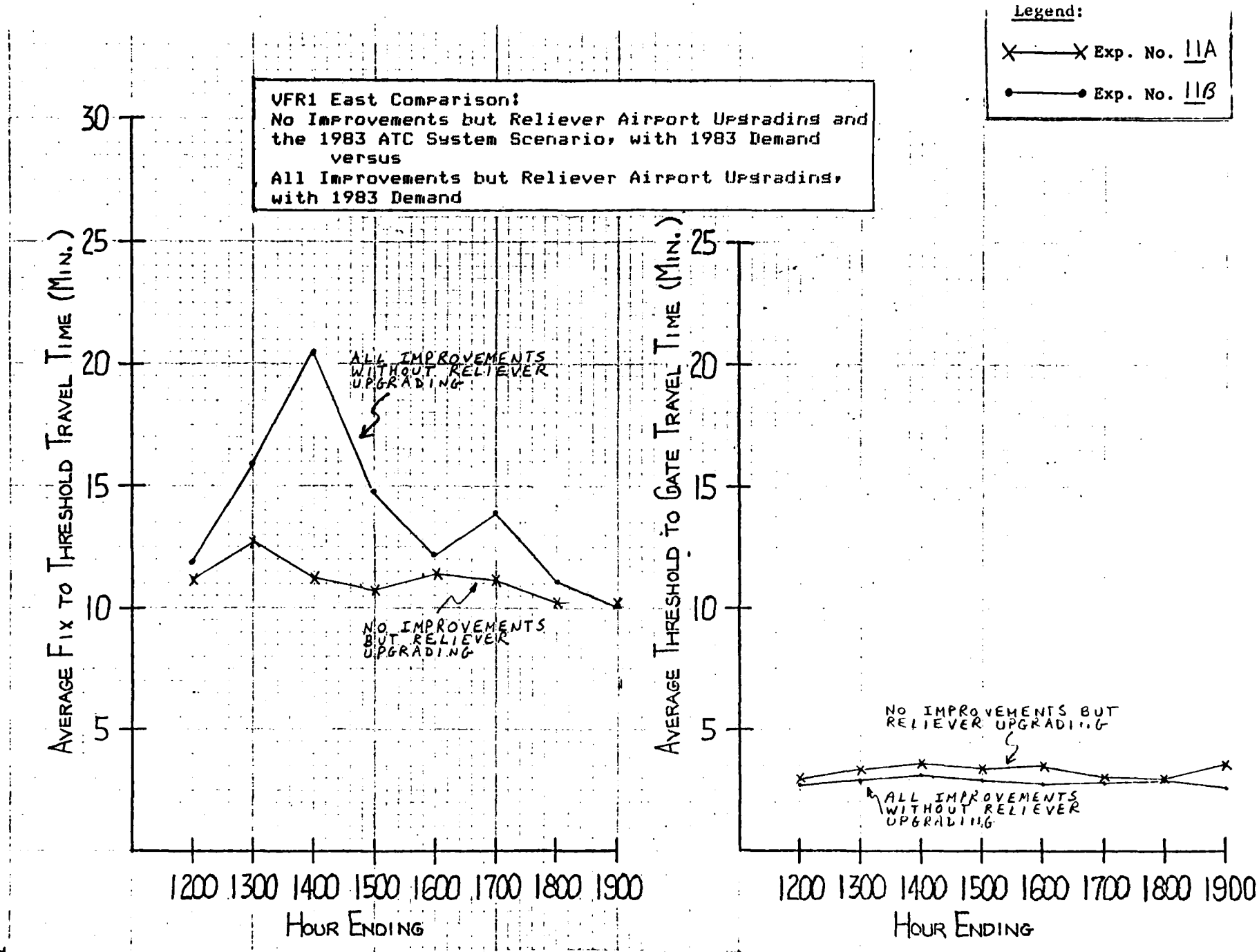


Figure 16 (continued)

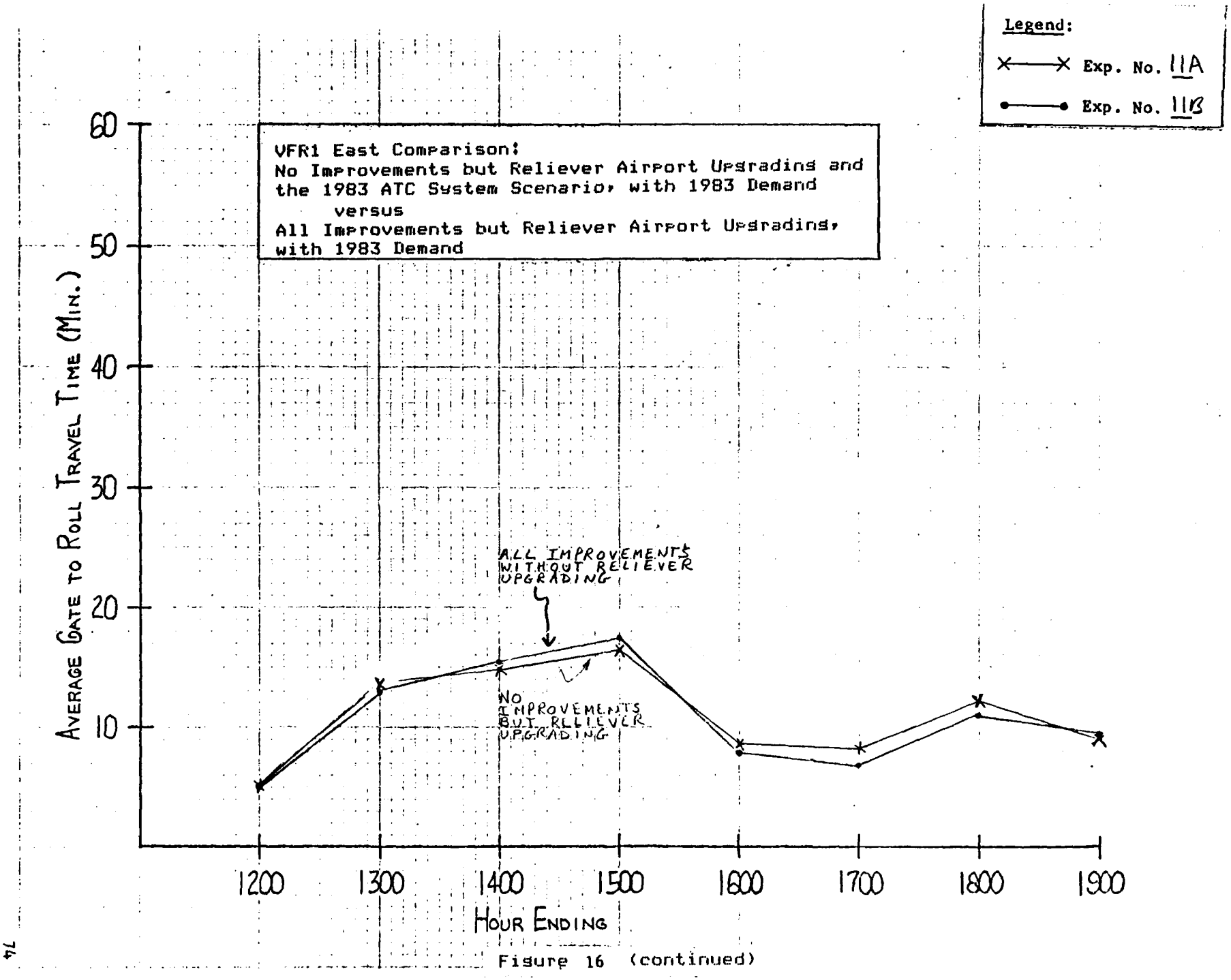


Figure 16 (continued)

Table 14

COMPARISON OF EXPERIMENTS

EXPERIMENT	ARRIVALS			DEPARTURES				TOTAL	TRAVEL TIMES			
	RUNWAY (AIR)	TAXI	RUNWAY X-ING	RUNWAY	TAXI	RUNWAY X-ING	GATE HOLD	GROUND DELAYS	ARRIVAL AIR	ARRIVAL GROUND	DEPART. GROUND	TOTAL
CONFIGURATION: EASTERLY WEATHER: VFR1												
IMPROVEMENT: 1983 SEPARATIONS AND RELIEVER UPGRADING WITHOUT AIRFIELD IMPROVEMENTS VS. 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS W/O RELIEVER UPGRADING												
RESULTS: THE 1983 AIRPORT IMPROVES TAXI-IN AND TAXI-OUT DELAYS EVEN THOUGH THE DEMAND IS FULL G.A. A 50% G.A. REDUCTION USING TODAY'S AIRPORT GENERALLY OUTPERFORMS THE IMPROVED AIRPORT WITH NO G.A. REDUCTION.								EXP.	ARRIVE		DEPART	
								11A	9L, 9R, 12		9L, 9R, 12	
								11B	9L, 9R, 12		9L, 9R, 12	
11A	540.1	100.6	5.7	2124.9	170.3	15.6	74.8	2491.9	3973.3	1165.7	3871.7	9010.7
11B	1741.1	3.1	4.1	2646.2	33.2	4.5	135.0	2566.1	5557.3	1168.1	4271.1	10996.5
CONFIGURATION: WEATHER:												
IMPROVEMENT:												
RESULTS:								EXP.	ARRIVE		DEPART	
CONFIGURATION: WEATHER:												
IMPROVEMENT:												
RESULTS:								EXP.	ARRIVE		DEPART	

TABLE 15

AVERAGE DELAYS

EXP	DEMAND	WEATHER	IMPROVEMENTS	ATC	PEAK HOUR AVERAGE DELAY (MINUTES) ARR	PEAK HOUR AVERAGE DELAY (MINUTES) DEP	1100-1900 HRS. AVERAGE DELAY (MINUTES) ARR	1100-1900 HRS. AVERAGE DELAY (MINUTES) DEP
11A	1983[m]	VFR1-E	9	1983	2.9	10.5	1.8	7.3
11B	1983[l]	VFR1-E	1983[e]	1983	10.6	12.1	4.4	7.6

WEATHER: VFR1- Ceiling above 1500 ft. and visibility over 5 mi.
VFR2- Ceiling between 1000 ft. and 1500 ft. and visibility between 3 and 5 mi.
IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.
IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

DEMAND: 1983[l]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.
1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

COMPARISON OF 1983 SEPARATIONS AND RELIEVER UPGRADING WITHOUT AIRFIELD IMPROVEMENTS WITH 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITH RELIEVER UPGRADING.

The basis for comparing the 1983 separations and reliever upgrading without airfield improvements with the 1983 separations and airfield improvements with reliever upgrading includes the IFR1, IFR2, and VFR2 weather conditions under easterly and westerly traffic flow.

The purpose of this comparison is to study the effect of the improved airport under limited, 1983 demand and 1983 ATC.

EXPERIMENTS	CONFIGURATION
#9 and #35A	IFR1 - Easterly Flow
#10 and #21N	IFR2 - Easterly Flow
#17 and #12	VFR2 - WEsterly Flow

Figures 17 thru 19 show the average delays and travel times for the comparison experiments. The results of the experiments are shown in table 16.

Table 17 shows the peak average runway delays and the average total delays over the simulation time period.

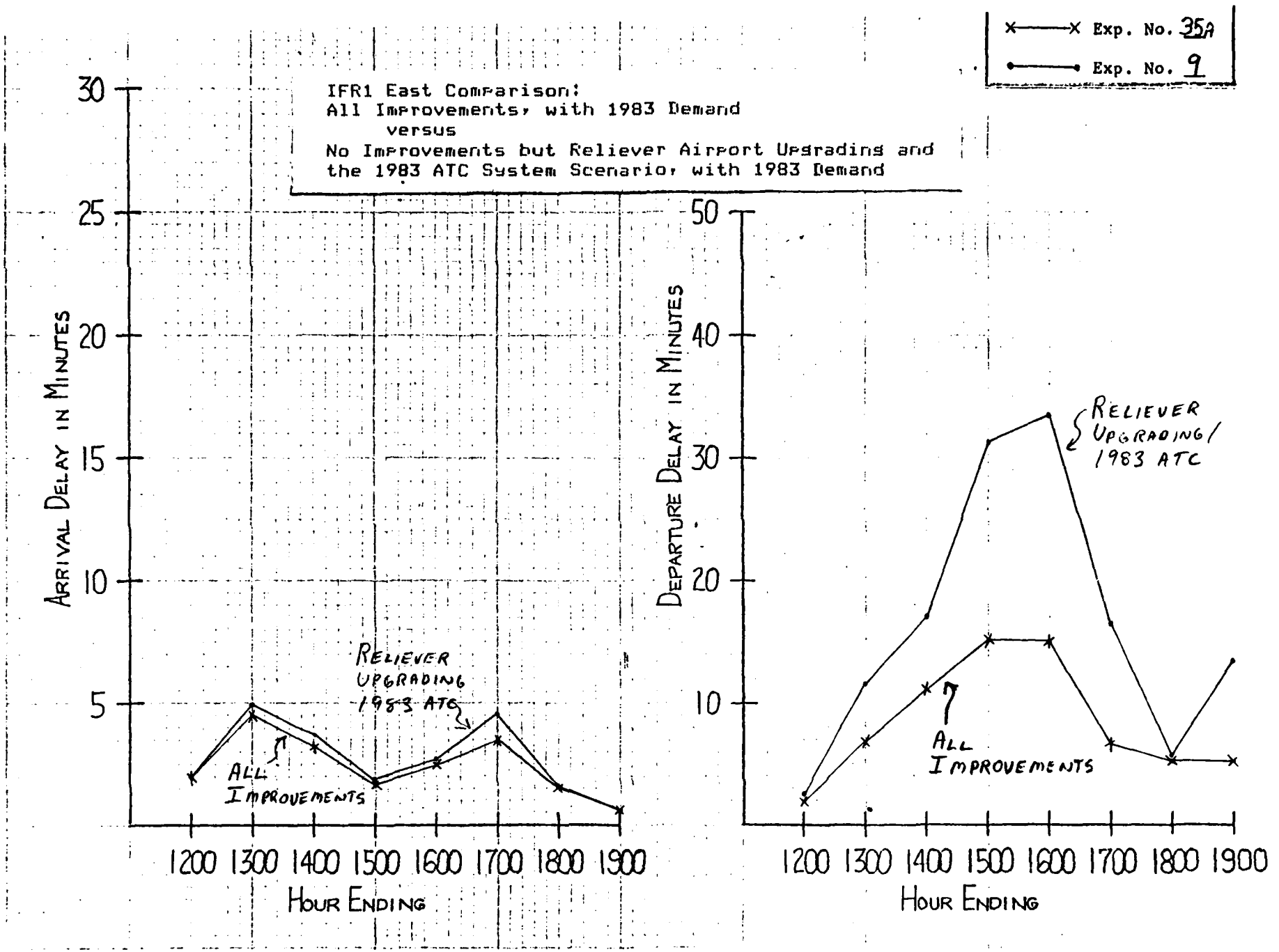

Exp. No. 35A
Exp. No. 9
IFR1 East Comparison:
All Improvements, with 1983 Demand
versus
No Improvements but Reliever Airport Upgrading and
the 1983 ATC System Scenario, with 1983 Demand
Arrival Delay in Minutes
30
25
20
15
10
5
Reliever Upgrading 1983 ATC
All Improvements
1200 1300 1400 1500 1600 1700 1800 1900
Hour Ending
Departure Delay in Minutes
50
40
30
20
10
Reliever Upgrading/ 1983 ATC
All Improvements
1200 1300 1400 1500 1600 1700 1800 1900
Hour Ending

Figure 17

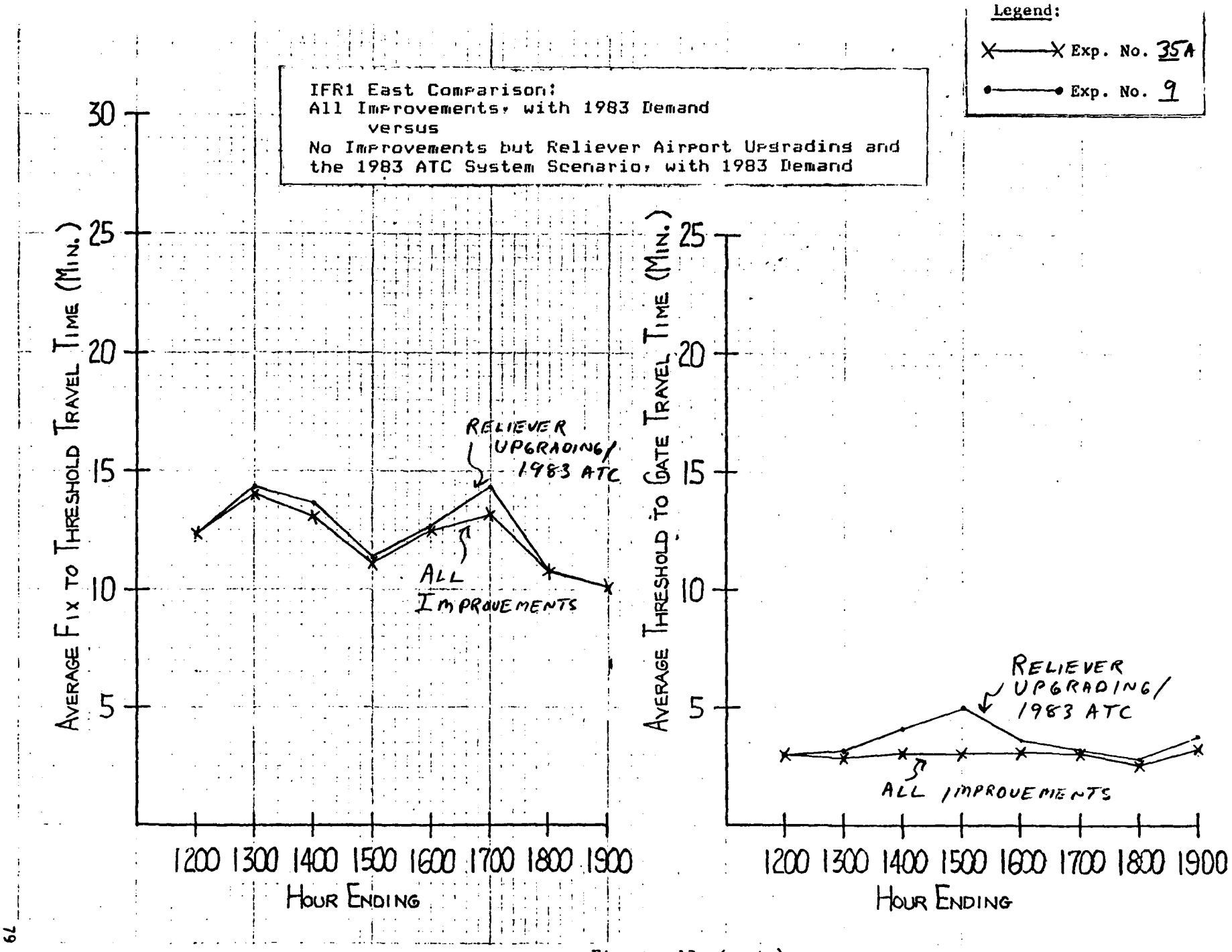


Figure 17 (cont.)

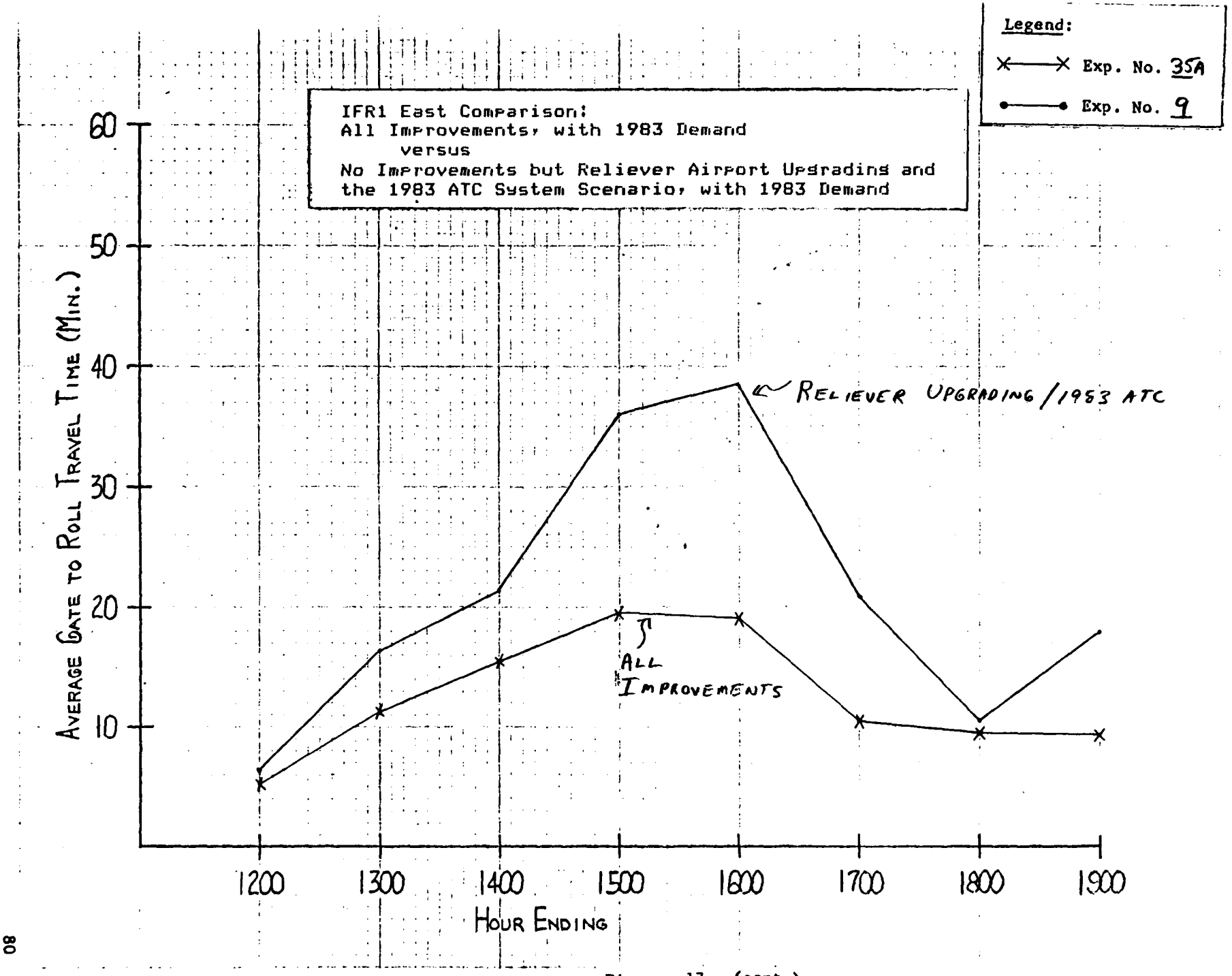


Figure 17 (cont.)

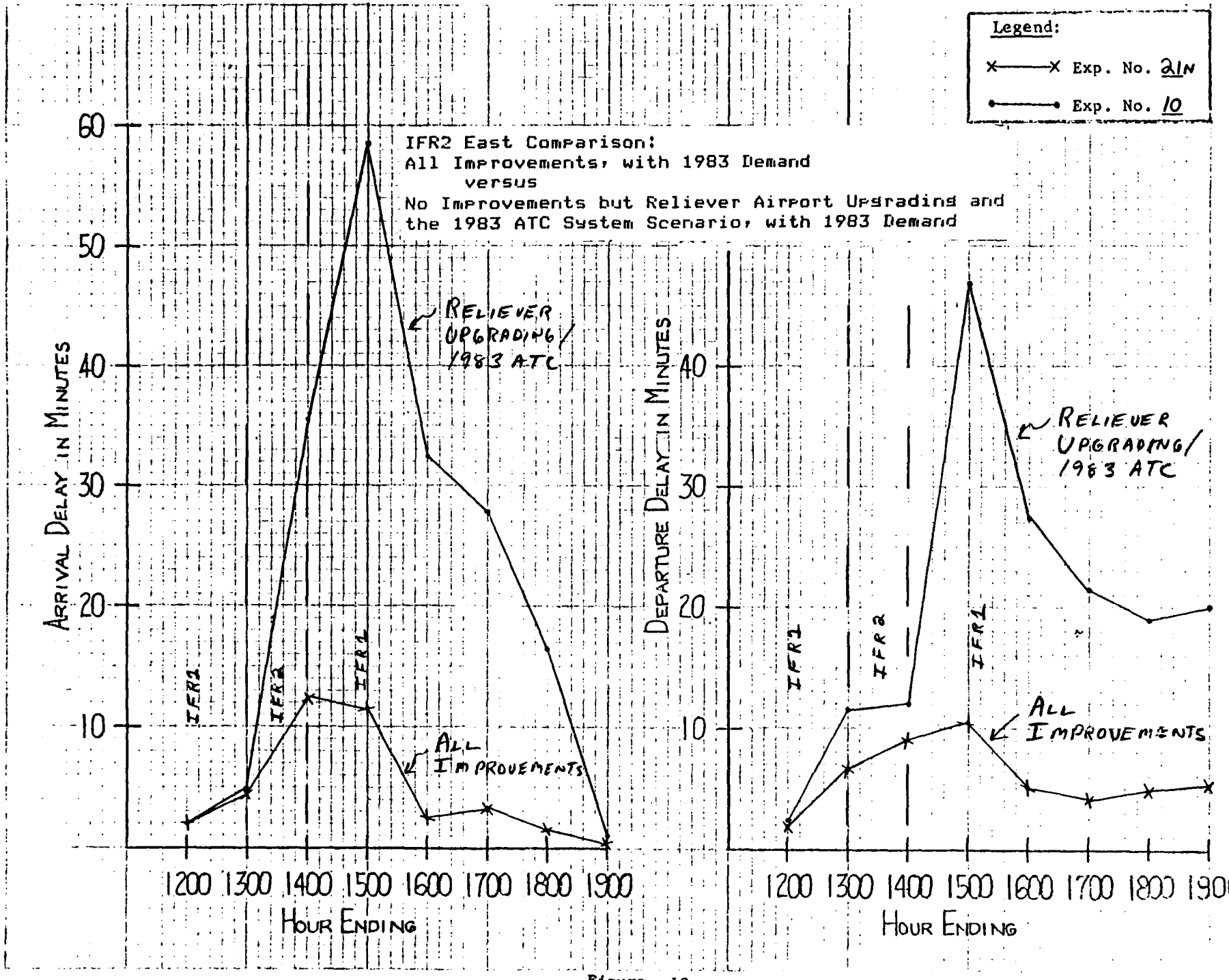

Legend:
Exp. No. 21N
Exp. No. 10
IFR2 East Comparison:
All Improvements, with 1983 Demand
versus
No Improvements but Reliever Airport Upgrading and
the 1983 ATC System Scenario, with 1983 Demand
ARRIVAL DELAY IN MINUTES
DEPARTURE DELAY IN MINUTES
HOUR ENDING
1200 1300 1400 1500 1600 1700 1800 1900
10 20 30 40 50 60
IFR2
IFR1
RELIEVER UPGRADING/ 1983 ATC
ALL IMPROVEMENTS

Figure 18

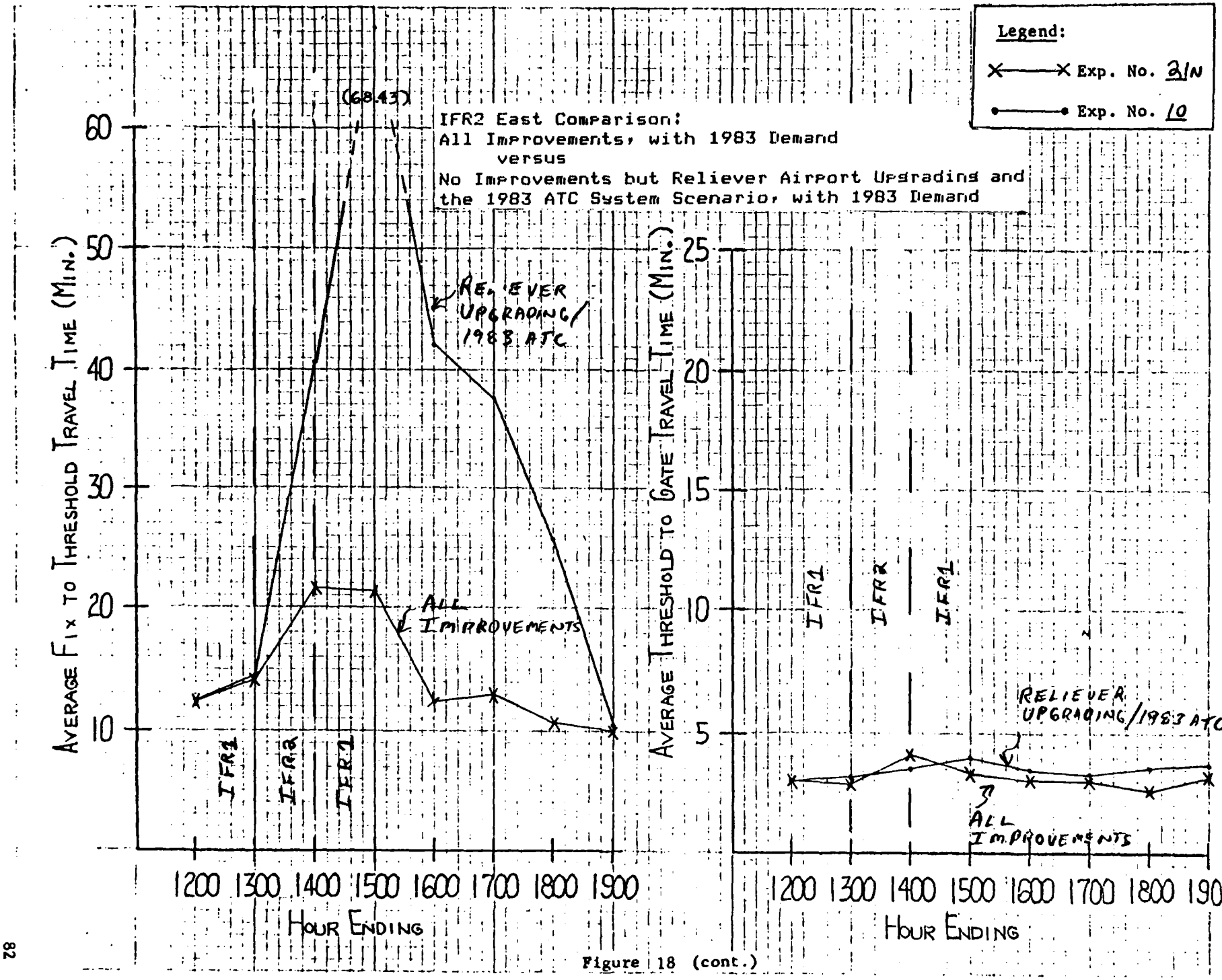


Figure 18 (cont.)

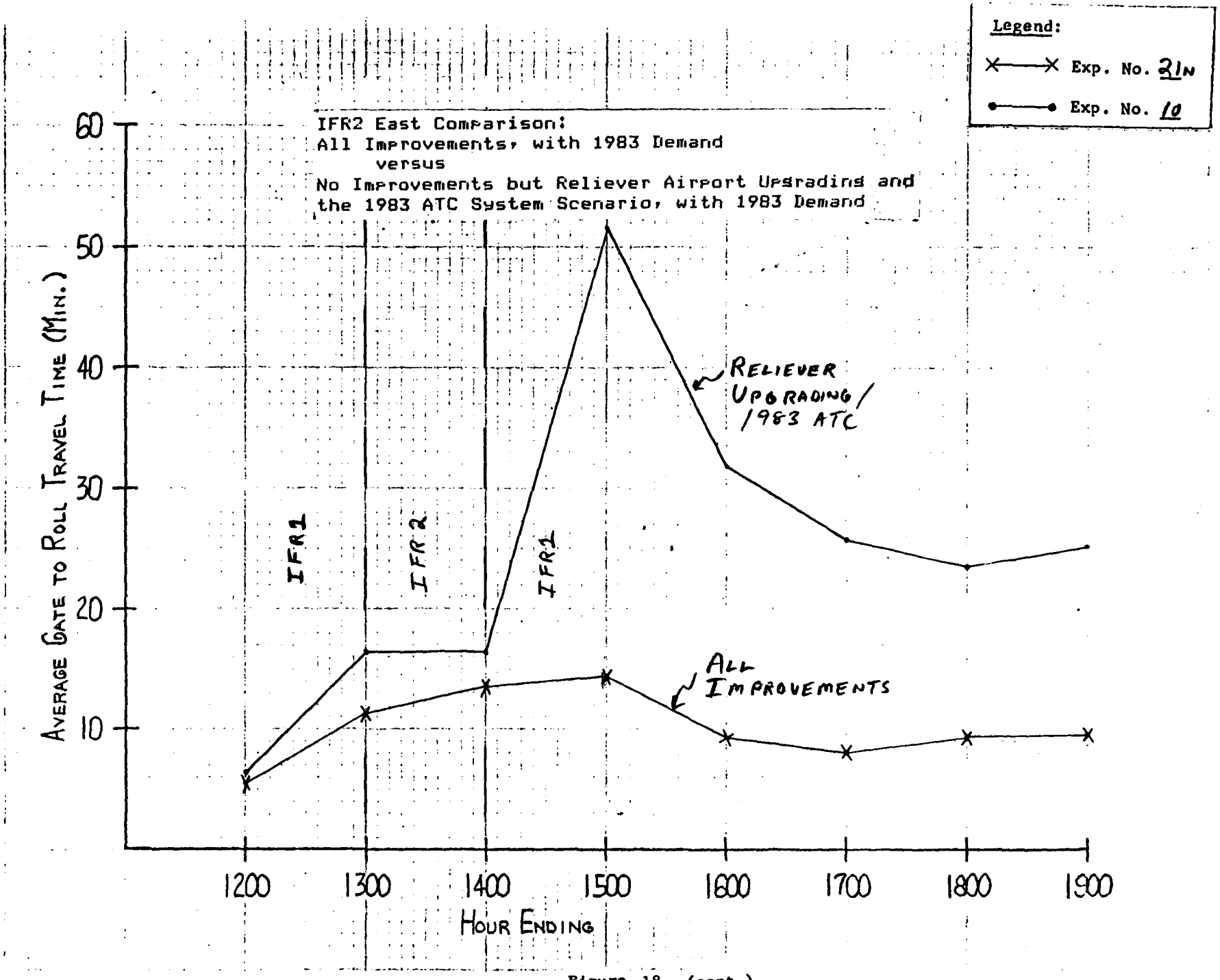


Figure 18 (cont.)

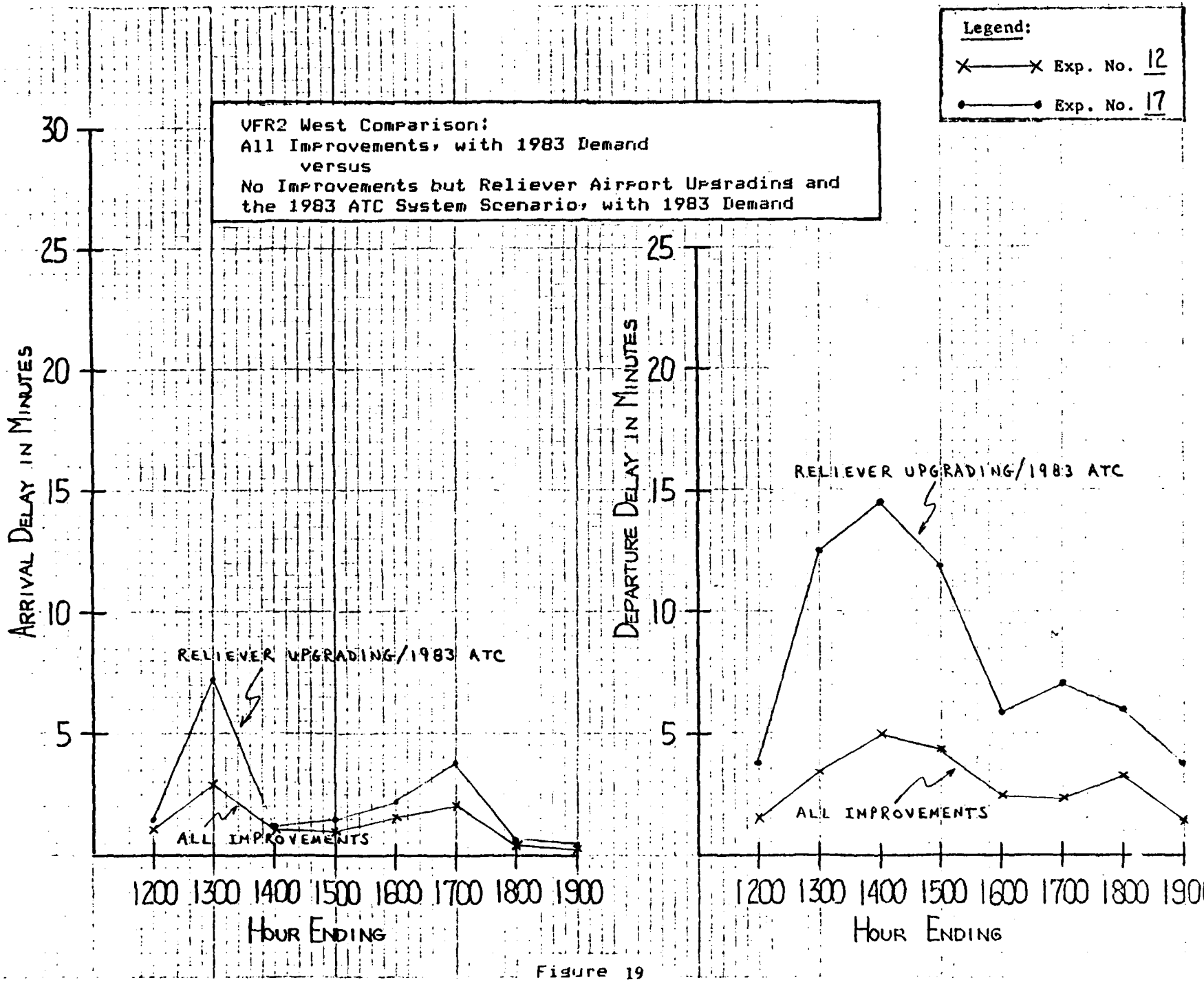

Legend:
Exp. No. 12
Exp. No. 17
VFR2 West Comparison:
All Improvements, with 1983 Demand
versus
No Improvements but Reliever Airport Upgrading and
the 1983 ATC System Scenario, with 1983 Demand
ARRIVAL DELAY IN MINUTES
DEPARTURE DELAY IN MINUTES
RELIEVER UPGRADING/1983 ATC
ALL IMPROVEMENTS
HOUR ENDING
1200 1300 1400 1500 1600 1700 1800 1900
5 10 15 20 25 30

Figure 19

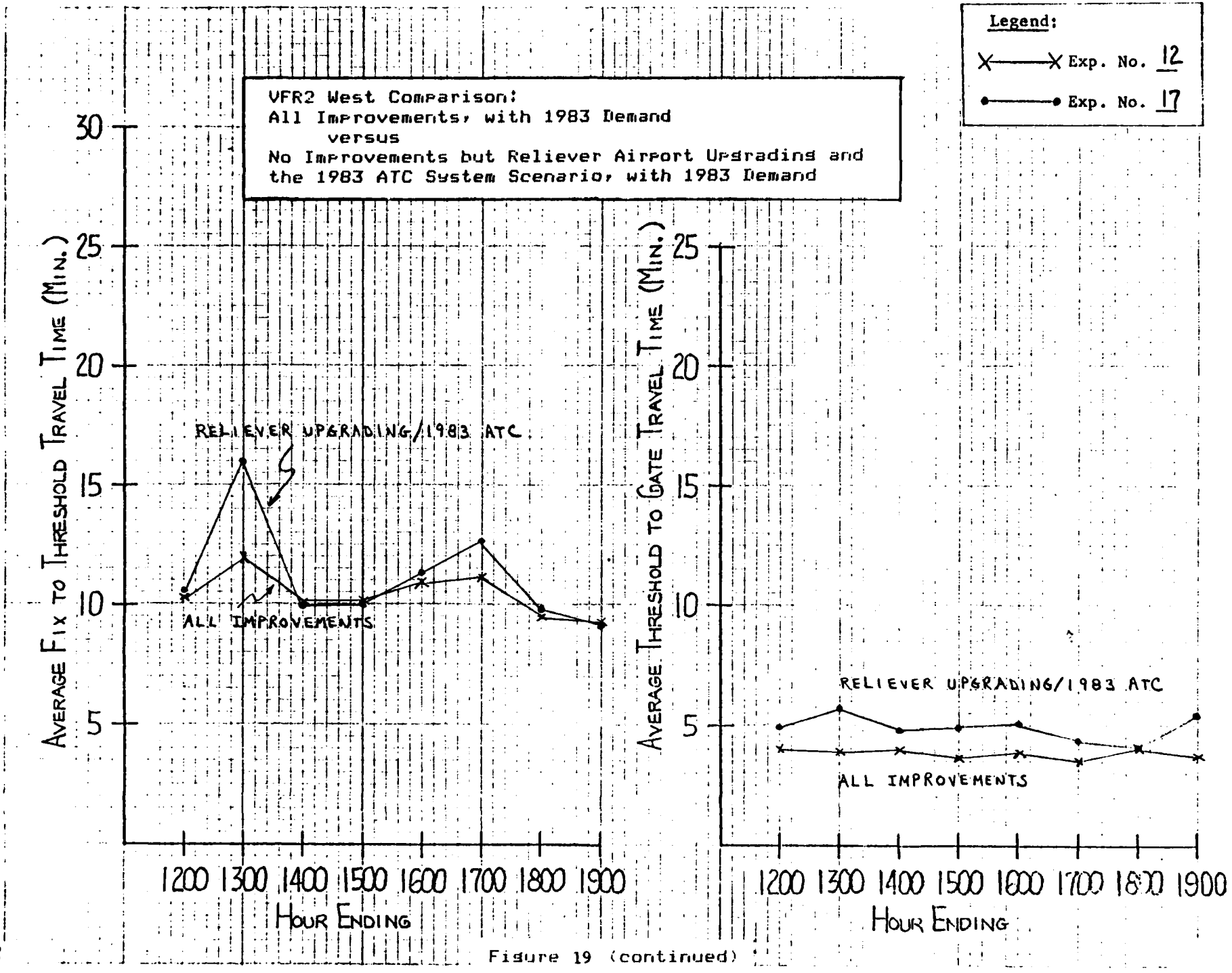


Figure 19 (continued)

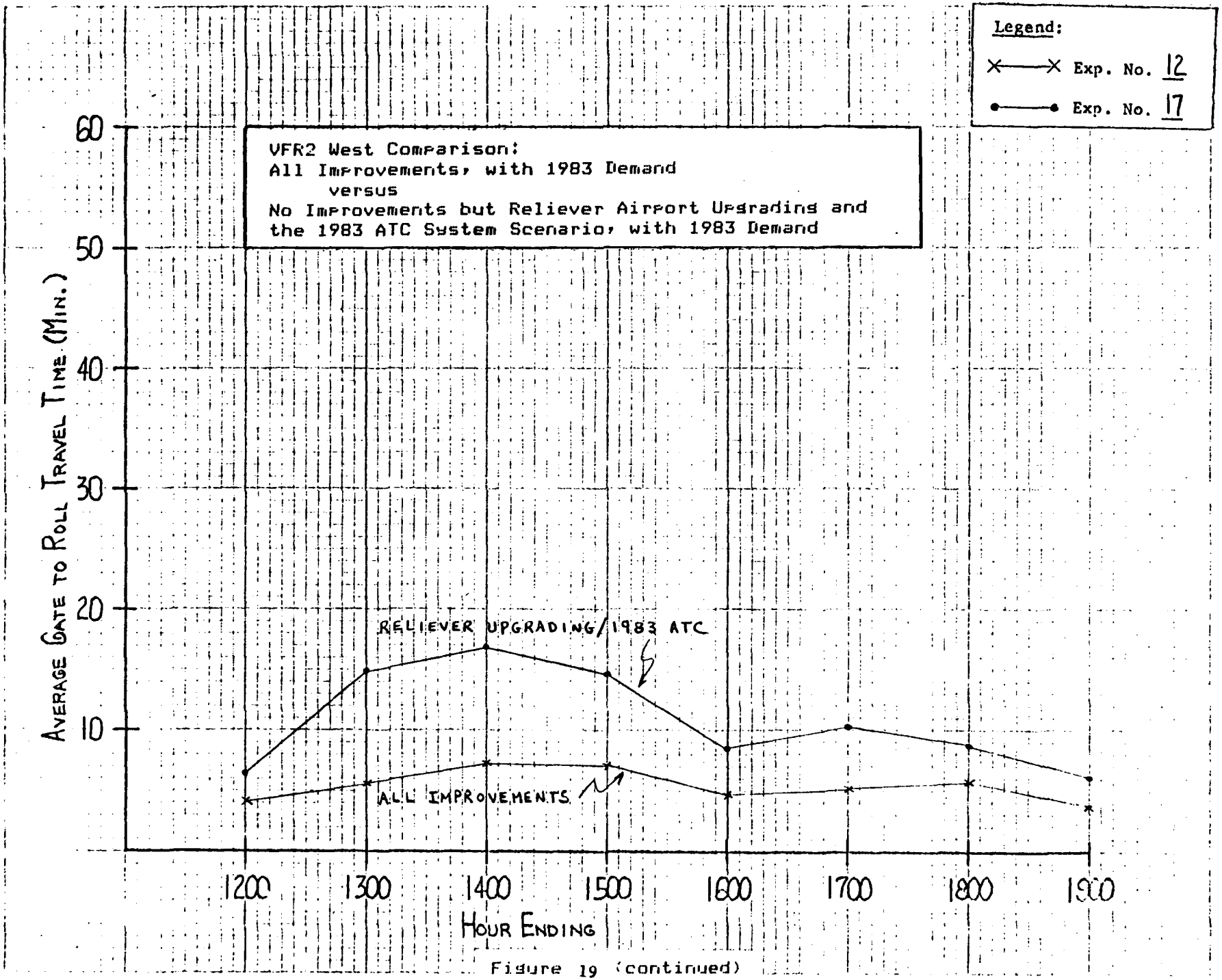


Figure 19 (continued)

Table 16

COMPARISON OF EXPERIMENTS

EXPERIMENT	ARRIVALS			DEPARTURES				TOTAL	TRAVEL TIMES			
	RUNWAY (AIR)	TAXI	RUNWAY X-ING	RUNWAY	TAXI	RUNWAY X-ING	GATE HOLD	GROUND DELAYS	ARRIVAL AIR	ARRIVAL GROUND	DEPART. GROUND	TOTAL

CONFIGURATION: EASTERLY **WEATHER:** IFR1

IMPROVEMENT: 1983 SEPARATIONS AND RELIEVER UPGRADING WITHOUT AIRFIELD IMPROVEMENTS VS. 1983 SEPARATIONS AND AIRFIELD IMPROV. WITH RELIEVER UPGRADING

RESULTS: 98.5% DECREASE IN TAXI-IN DELAY. 77.0% DECREASE IN TAXI-OUT DELAY.
37.1% DECREASE IN DEPARTURE RUNWAY DELAY.
93.7% DECREASE IN GATE HOLD DELAY.
24.6% DECREASE IN TOTAL TRAVEL TIMES. 50% DECREASE IN TOTAL GROUND DELAY.

EXP.	ARRIVE	DEPART
9	9L, 9R	9L, 9R, 12
35A	9L, 9R	9L, 9R, 12

9	994.0	168.8	9.7	4108.8	329.1	6.8	820.4	5443.6	4278.4	1201.1	6756.0	12235.5
* 35A	881.1	2.5	3.1	2586.4	75.7	2.0	51.7	2721.4	4166.1	1008.9	4048.3	9223.3

CONFIGURATION: EASTERLY **WEATHER:** IFR2

IMPROVEMENT: 1983 SEPARATIONS AND RELIEVER UPGRADING WITHOUT AIRFIELD IMPROVEMENTS VS. 1983 SEPARATIONS AND AIRFIELD IMPROV. WITH RELIEVER UPGRADING

RESULTS: 78.5% DECREASE IN AIRBORNE ARRIVAL DELAY.
70.7% DECREASE IN TOTAL GROUND DELAYS.
54.1% DECREASE IN TOTAL TRAVEL TIMES.

EXP.	ARRIVE	DEPART
10.	NONE	9L
21N	9L	9L, 9R, 12

10	7662.0	135.2	9.6	5355.5	755.9	6.5	551.3	6814.0	10913.8	1160.7	8128.5	20203.0
* 21N	1644.9	2.4	2.2	1938.1	31.2	2.7	21.7	1998.2	4904.8	1045.4	3324.8	9274.9

CONFIGURATION: WESTERLY **WEATHER:** IFR2

IMPROVEMENT: 1983 SEPARATIONS AND RELIEVER UPGRADING WITHOUT AIRFIELD IMPROVEMENTS VS. 1983 SEPARATIONS AND AIRFIELD IMPROV. WITH RELIEVER UPGRADING.

RESULTS: 45.7% DECREASE IN AIRBORNE ARRIVAL DELAY.
66.6% REDUCTION IN TOTAL GROUND DELAYS.
28.2% DECREASE IN TOTAL TRAVEL TIMES.

EXP.	ARRIVE	DEPART
17	27L, 27R	27L, 27R, 30
12	27R, 30	27L, 27R

17	929.2	177.8	5.3	2061.7	780.7	9.2	73.6	3108.3	4073.0	1750.4	3609.2	9632.6
* 12	504.8	5.9	11.4	914.9	89.6	14.7	0.3	1036.8	3722.0	1356.0	1833.6	6911.6

Note: Asterick (*) denotes improved experiments.

TABLE 17

AVERAGE DELAYS

EXP	DEMAND	WEATHER	IMPROVEMENTS	ATC	PEAK HOUR AVERAGE DELAY (MINUTES)		1100-1900 HRS. AVERAGE DELAY (MINUTES)	
					ARR	DEP	ARR	DEP
9	1983[m]	IFR1-E	g	1983	4.9	22.5	3.5	16.7
35A	1983[m]	IFR1-E	1983[e,g]	1983	4.6	14.8	2.6	8.6
10	1983[m]	IFR2-E	g	1983	58.5	39.9	23.2	21.2
21N	1983[m]	IFR2-E	1983[e,g]	1983	12.3	10.0	4.9	6.3
17	1983[m]	VFR2-W	g	1983	7.2	10.1	3.1	8.9
12	1983[m]	VFR2-W	1983[e,g]	1983	2.9	4.6	1.5	3.1

WEATHER: VFR1- Ceiling above 1500 ft. and visibility over 5 mi.
VFR2- Ceiling between 1000 ft. and 1500 ft. and visibility between 3 and 5 mi.
IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.
IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

DEMAND: 1983[l]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.
1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

COMPARISON OF 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITHOUT RELIEVER UPGRADING WITH 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITH RELIEVER UPGRADING.

The basis for comparing the 1983 separations and airfield improvements without reliever upgrading with the 1983 separations and airfield improvements with reliever upgrading includes the VFR1 and IFR1 weather conditions under easterly and westerly traffic flow.

The purpose of this comparison is to study the effect of limited 1983 demand on the improved airport under 1983 ATC. The limited 1983 demand assumes a 50 percent reduction in G.A. traffic at Miami due to reliever airport upgrading.

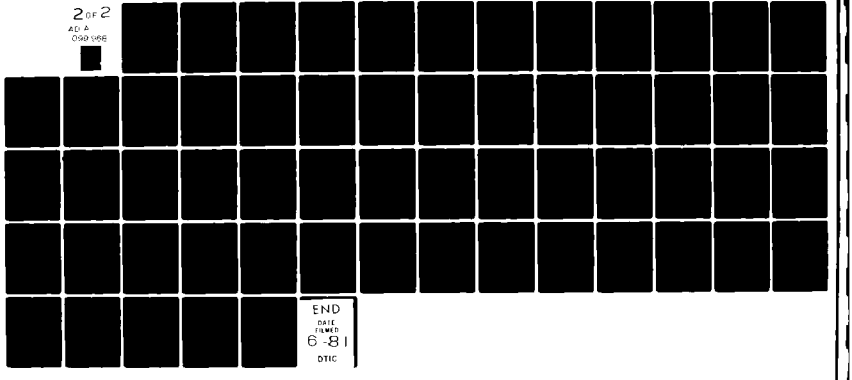
EXPERIMENTS	CONFIGURATION
#11B and 14AA	VFR1 - Easterly Flow
#36 and #37	VFR1 - Westerly Flow
#15 and #20N	IFR1 - Westerly Flow

Figures 20 through 22 show the average delays and travel times for arrival and departure aircraft. Table 18 gives a direct comparison of the experiments showing the total delays and travel times accumulated during the simulation. The results of each comparison is noted on the table.

The effect of the reliever upgrading on the peak average runway delays and the average total delays are shown in table 19. The annual delay estimates for these comparison cases are shown in table 20.

AD-A099 968 FEDERAL AVIATION ADMINISTRATION TECHNICAL CENTER ATL--ETC F/G 1/2
MIAMI INTERNATIONAL AIRPORT DATA PACKAGE NUMBER 7. AIRPORT IMPR--ETC(U)
JUL 80

UNCLASSIFIED NL



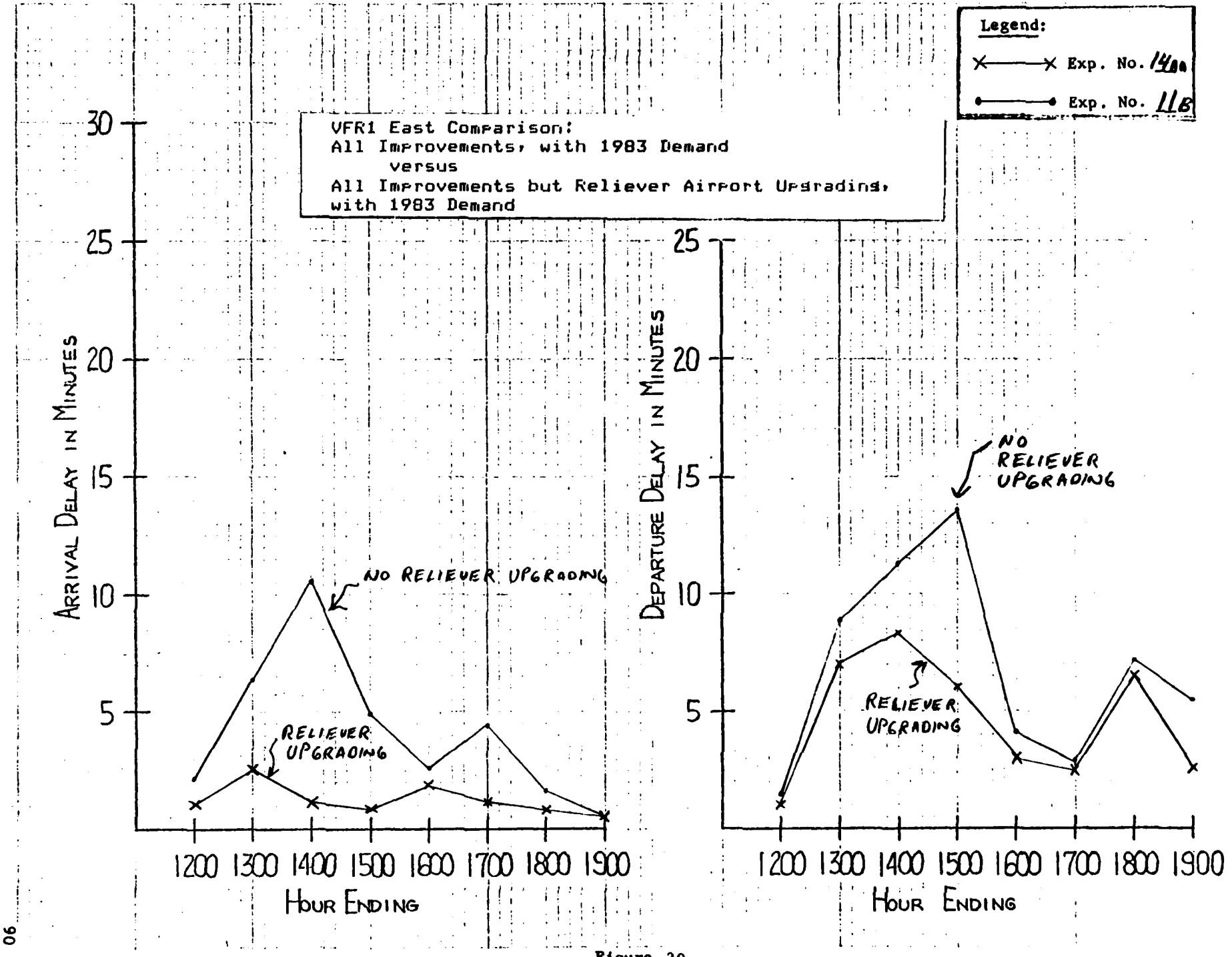

Legend:
Exp. No. 14aa
Exp. No. 11B
VFR1 East Comparison:
All Improvements, with 1983 Demand
versus
All Improvements but Reliever Airport Upgrading,
with 1983 Demand
ARRIVAL DELAY IN MINUTES
30
25
20
15
10
5
NO RELIEVER UPGRADING
RELIEVER UPGRADING
1200 1300 1400 1500 1600 1700 1800 1900
HOUR ENDING
DEPARTURE DELAY IN MINUTES
25
20
15
10
5
NO RELIEVER UPGRADING
RELIEVER UPGRADING
1200 1300 1400 1500 1600 1700 1800 1900
HOUR ENDING

Figure 20

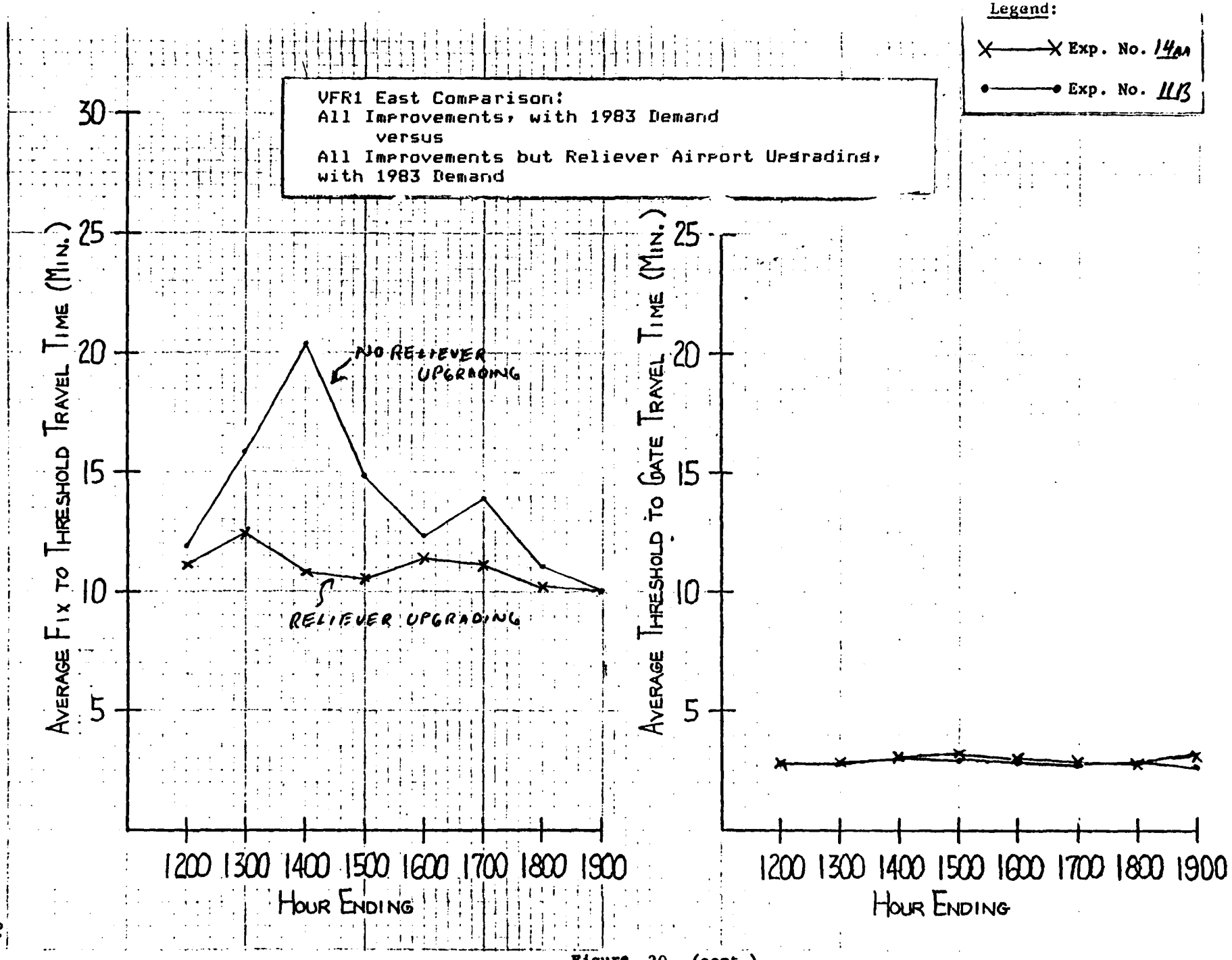


Figure 20 (cont.)

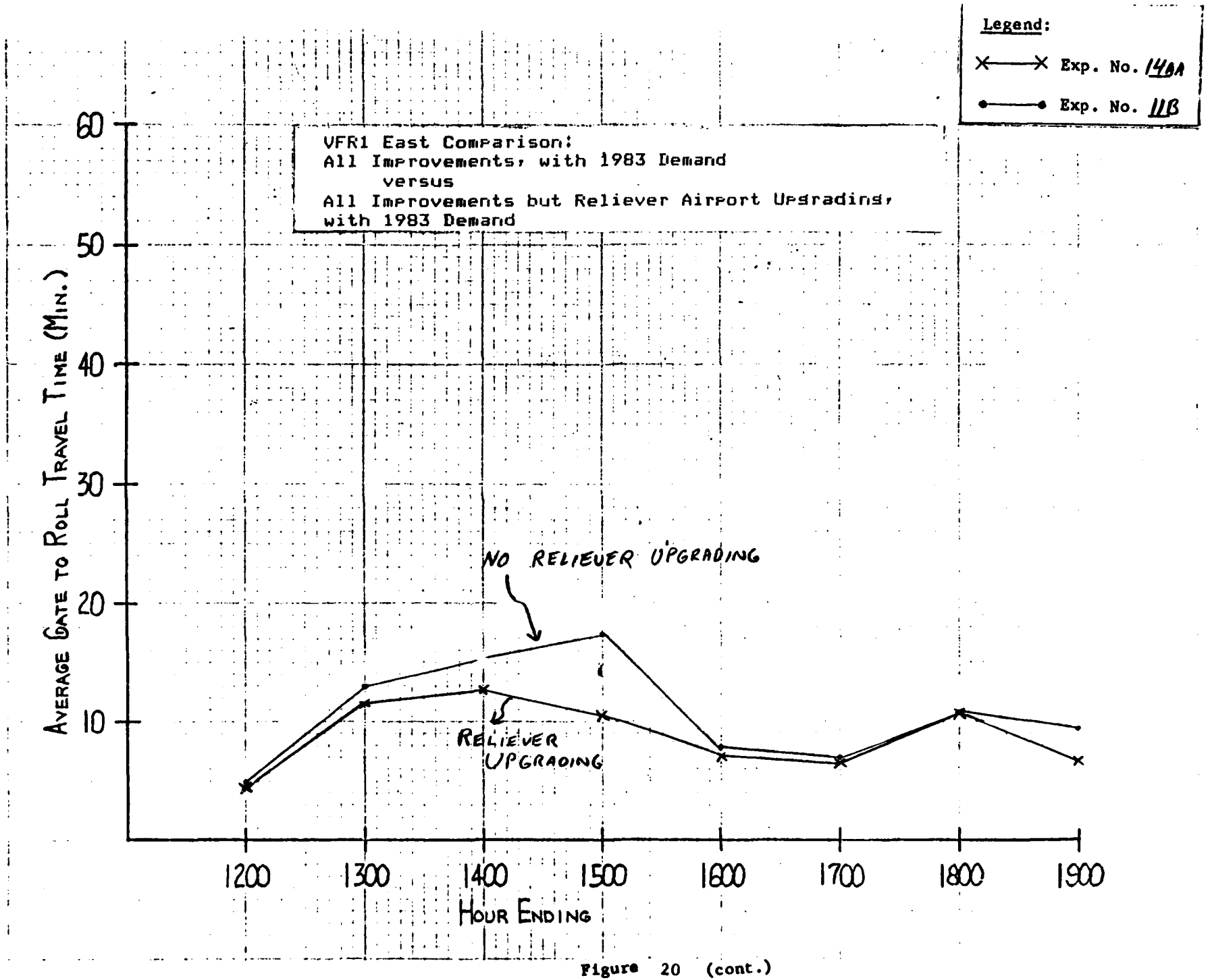


Figure 20 (cont.)

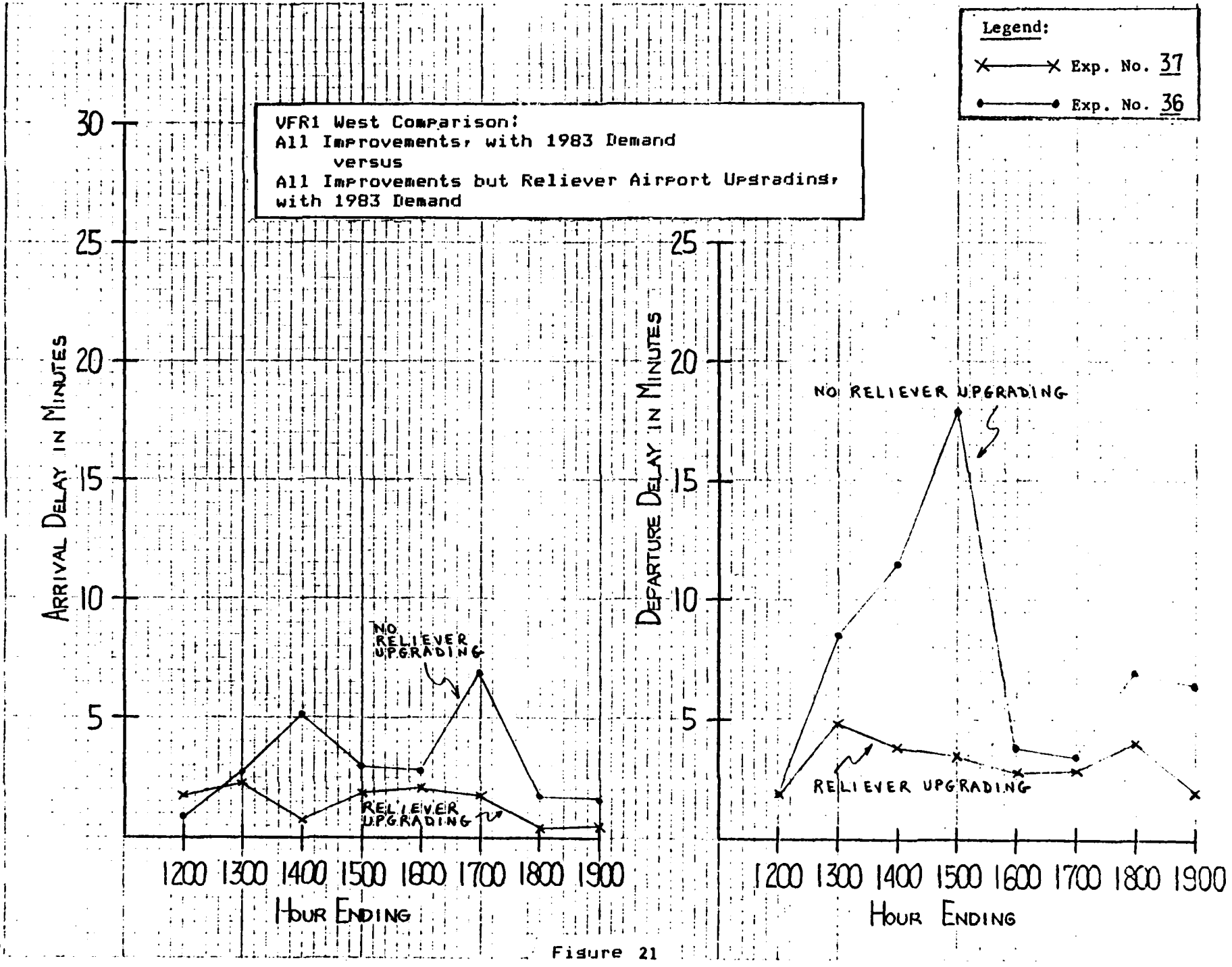

VFR1 West Comparison:
All Improvements, with 1983 Demand
versus
All Improvements but Reliever Airport Upgrading, with 1983 Demand
Legend:
Exp. No. 37
Exp. No. 36
ARRIVAL DELAY IN MINUTES
DEPARTURE DELAY IN MINUTES
30
25
20
15
10
5
NO RELIEVER UPGRADING
RELIEVER UPGRADING
1200 1300 1400 1500 1600 1700 1800 1900
HOUR ENDING

Figure 21

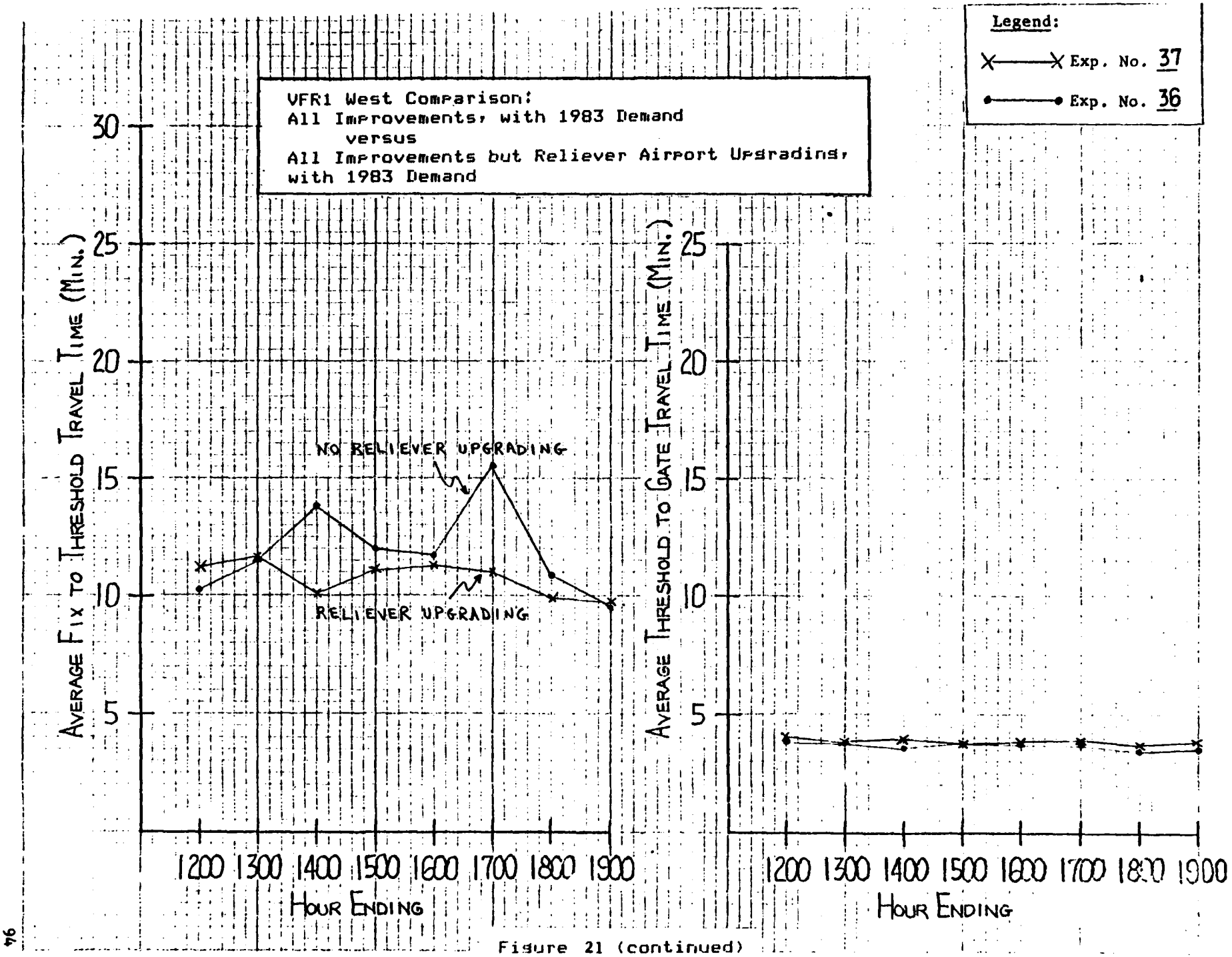


Figure 21 (continued)

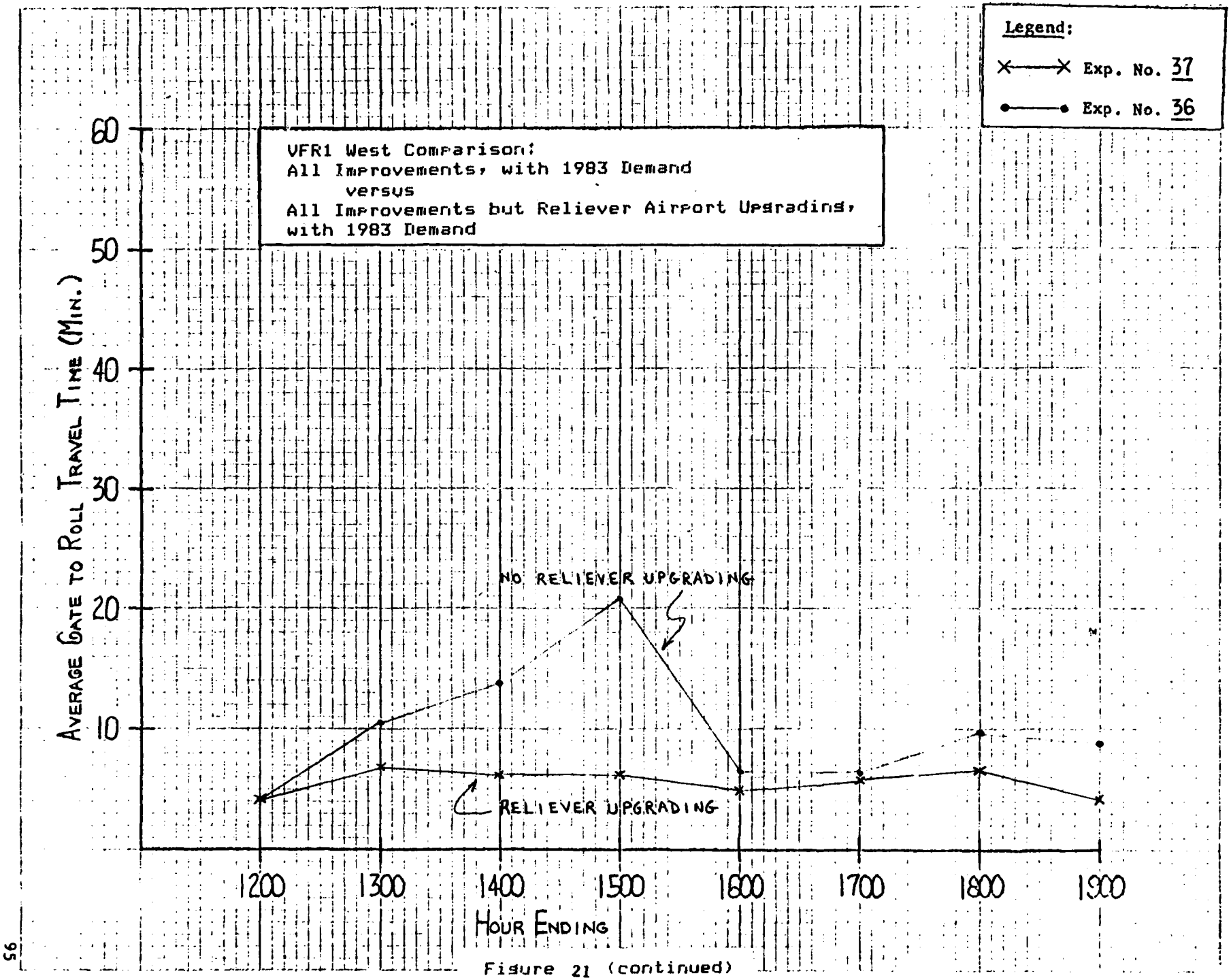


Figure 21 (continued)

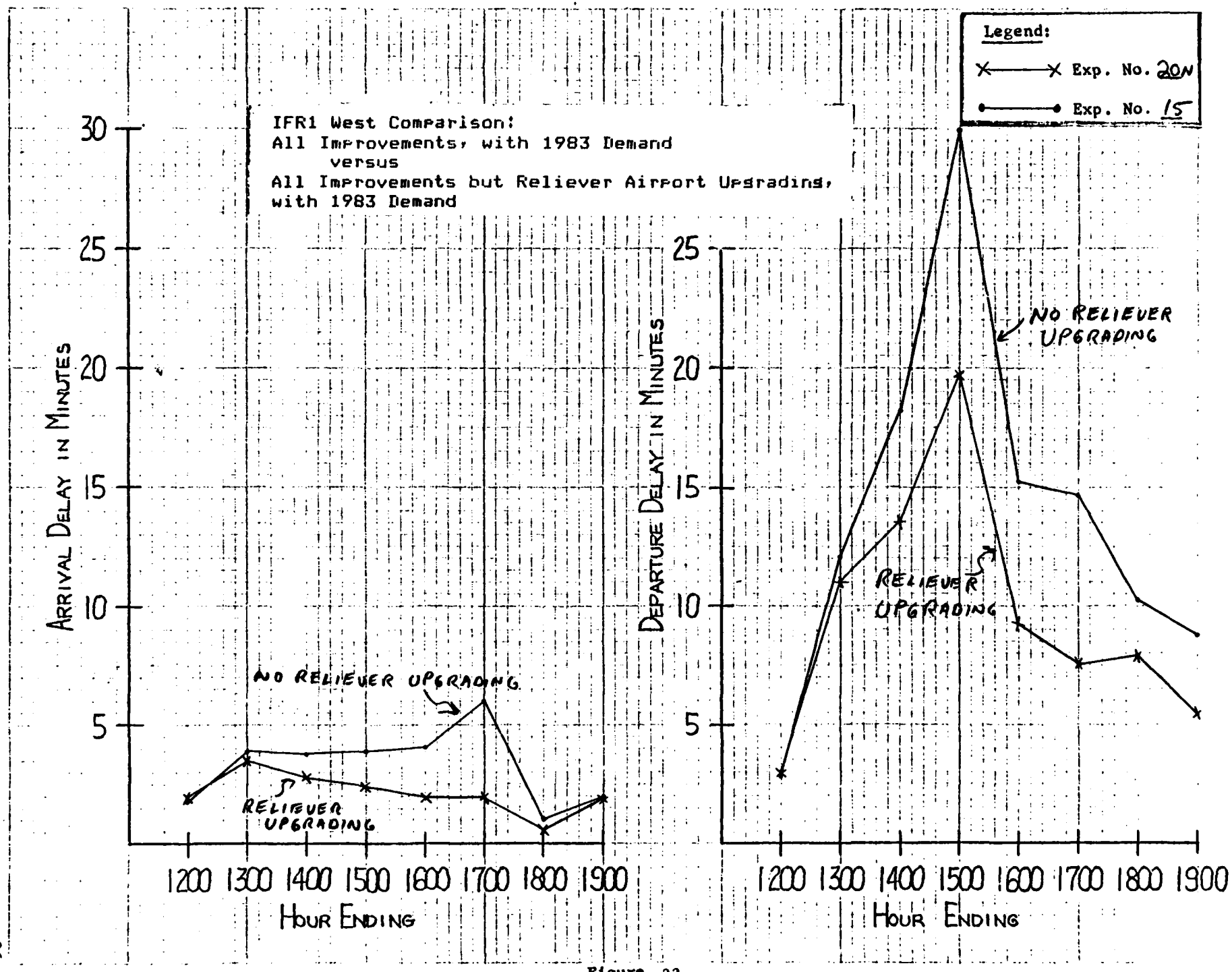

IFR1 West Comparison:
All Improvements, with 1983 Demand
versus
All Improvements but Reliever Airport Upgrading,
with 1983 Demand
Legend:
Exp. No. 20N
Exp. No. 15
ARRIVAL DELAY IN MINUTES
DEPARTURE DELAY IN MINUTES
HOUR ENDING
NO RELIEVER UPGRADING
RELIEVER UPGRADING
1200 1300 1400 1500 1600 1700 1800 1900
5 10 15 20 25 30

Figure 22

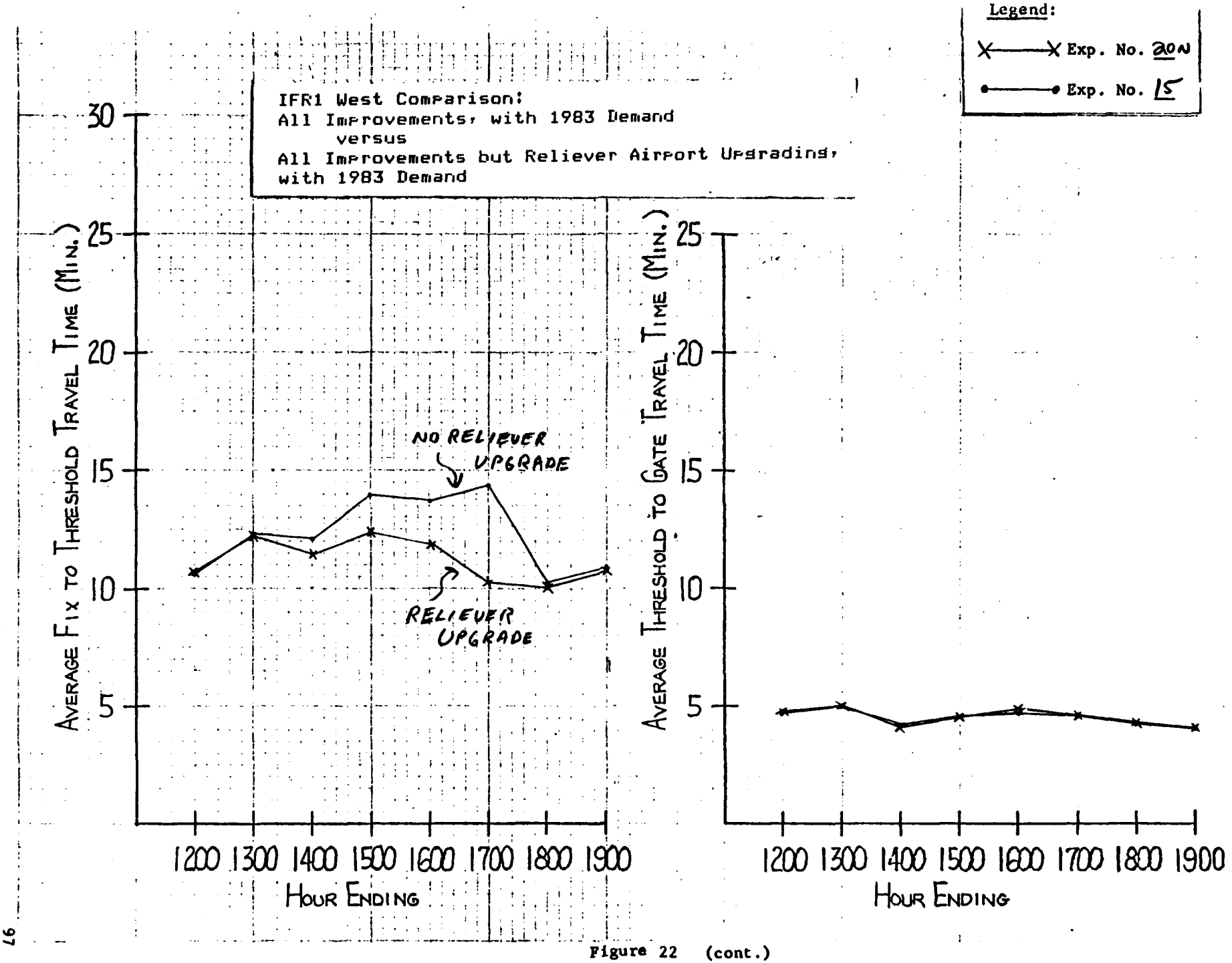


Figure 22 (cont.)

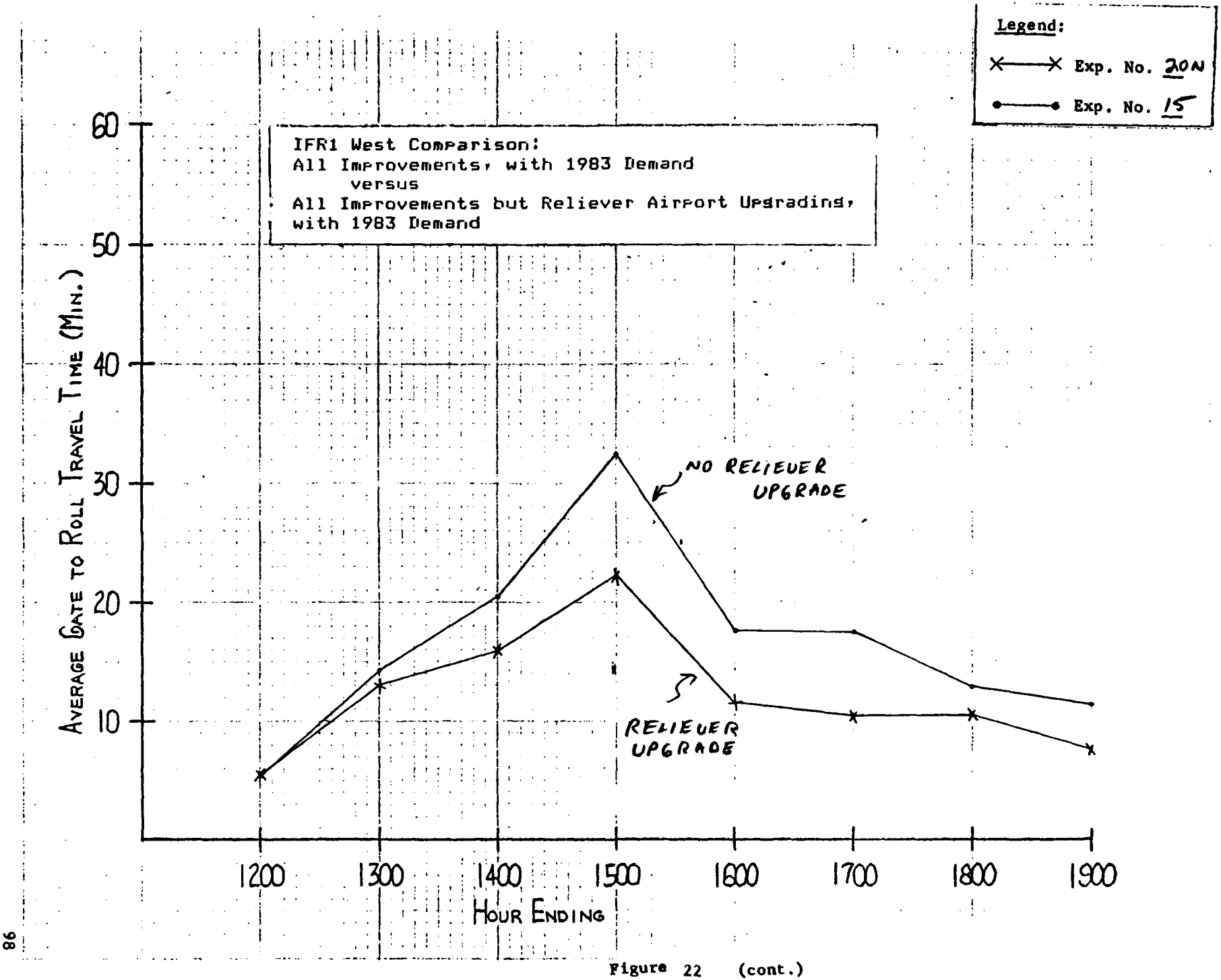


Figure 22 (cont.)

Table 18

COMPARISON OF EXPERIMENTS

EXPERIMENT	ARRIVALS			DEPARTURES				TOTAL	TRAVEL TIMES			
	RUNWAY (AIR)	TAXI	RUNWAY X-ING	RUNWAY	TAXI	RUNWAY X-ING	GATE HOLD	GROUND DELAYS	ARRIVAL AIR	ARRIVAL GROUND	DEPART. GROUND	TOTAL
CONFIGURATION: EASTERLY WEATHER: VFR 1												
IMPROVEMENT: 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITHOUT RELIEVER UPGRADING VS. 1983 SEPARATIONS AND AIRFIELD IMPROV. WITH RELIEVER UPGRADING												
RESULTS: 72.2% DECREASE IN AIRBONE ARRIVAL DELAY. 36.9% DECREASE IN DEPARTURE RUNWAY DELAY. 38.8% DECREASE IN TOTAL GROUND DELAYS. 26.6% DECREASE IN TOTAL TRAVEL TIMES. 96.4% DECREASE IN GATE HOLD.								EXP.	ARRIVE		DEPART	
								11B	9L, 9R, 12		9L, 9R, 12	
								14AA	9L, 9R, 12		9L, 9R, 12	
11B	1741.1	3.1	4.1	2646.2	33.2	4.5	135.0	2826.1	5557.3	1152.1	4271.1	10980.5
*14AA	483.8	3.4	7.6	1670.2	42.0	3.0	4.8	1730.9	3917.1	1053.5	3092.3	8062.9
CONFIGURATION: WESTERLY WEATHER: VFR 1												
IMPROVEMENT: 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITHOUT RELIEVER UPGRADING VS. 1983 SEPARATIONS AND AIRFIELD IMPROV. WITH RELIEVER UPGRADING.												
RESULTS: 57.5% DECREASE IN AIRBORNE ARRIVAL DELAY. 60.5% DECREASE IN DEPARTURE RUNWAY DELAY. 63.4% DECREASE IN TOTAL GROUND DELAYS. 30.1% DECREASE IN TOTAL TRAVEL TIMES. ELIMINATION OF GATE HOLD.								EXP.	ARRIVE		DEPART	
								36	27L, 27R, 30		27L, 27R, 30	
								37	27L, 27R, 30		27L, 27R, 30	
36	1242.0	13.0	17.6	2583.1	147.5	12.8	336.3	3110.3	4741.0	1465.2	4030.2	10236.4
* 37	526.3	7.0	16.5	1019.7	88.5	5.8	0.0	1137.5	3854.9	1371.0	1930.0	7155.9
CONFIGURATION: WESTERLY WEATHER: IFR 1												
IMPROVEMENT: 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITHOUT RELIEVER UPGRADING VS. 1983 SEPARATIONS AND AIRFIELD IMPROVEMENTS WITH RELIEVER UPGRAD												
RESULTS: 39.6% DECREASE IN AIRBORNE ARRIVAL DELAY. 32.6% DECREASE IN DEPARTURE RUNWAY DELAY. 33.2% DECREASE IN TOTAL GROUND DELAYS. 19.9% DECREASE IN TOTAL TRAVEL TIMES. 94.0% DECREASE IN GATE HOLD.								EXP.	ARRIVE		DEPART	
								15	27L, 27R		27L, 27R	
								20N	27L, 27R		27L, 27R	
15	1204.5	92.0	5.4	3503.8	1282.7	3.4	287.4	5174.7	4315.9	1585.6	5889.3	11790.8
* 20N	728.8	93.4	4.5	2363.1	978.1	2.3	17.3	3458.6	3783.9	1541.5	4119.7	9445.1

Note: Asterick (*) denotes improved experiments.

TABLE 19

AVERAGE DELAYS

EXP	DEMAND	WEATHER	IMPROVEMENTS	ATC	PEAK HOUR AVERAGE DELAY (MINUTES)		1100-1900 HRS. AVERAGE DELAY (MINUTES)	
					ARR	DEP	ARR	DEP
11B	1983[l]	VFR1-E	1983[e]	1983	10.6	12.1	4.4	7.6
14AA	1983[m]	VFR1-E	1983[e,g]	1983	2.6	8.1	1.4	5.2
36	1983[l]	VFR1-W	1983[e]	1983	6.9	13.1	3.2	8.3
37	1983[m]	VFR1-W	1983[e,g]	1983	2.3	4.5	1.6	3.4
15	1983[l]	IFR1-W	1983[e]	1983	6.0	13.7	3.8	15.3
20N	1983[m]	IFR1-W	1983[e,g]	1983	3.5	9.7	2.5	10.5

WEATHER: VFR1- Ceiling above 1500 ft. and visibility over 5 mi.
VFR2- Ceiling between 1000 ft. and 1500 ft. and visibility between 3 and 5 mi.
IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.
IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

DEMAND: 1983[l]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.
1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

TABLE 20

ANNUAL DELAY ESTIMATES
1983 AIRPORT WITHOUT RELIEVER UPGRADING IN 1983 vs.
1983 AIRPORT WITH RELIEVER UPGRADING IN 1983

EXP.	DEMAND	IMPROVEMENT	SEPARATION	ANNUAL DELAY (hours)		
				ARRIVAL	DEPARTURE	TOTAL
11B, 35,15	1983[1]	1983[e]	1983	9,502	17,991	27,493
14AA, 37,20N	1983[m]	1983[e,g]	1983	2,873	9,632	12,505
				ANNUAL OPERATIONS TOTAL X 1000		
11B, 35,15	1983[1]	1983[e]	1983	380.200		
14AA, 37,20N	1983[m]	1983[e,g]	1983	340.200		
				AVERAGE ANNUAL DELAY (minutes)		
				ARRIVAL	DEPARTURE	TOTAL
11B, 35,15	1983[1]	1983[e]	1983	1.5	2.8	4.3
14AA, 37,20N	1983[m]	1983[e,g]	1983	0.5	1.7	2.2

DEMAND: 1983[1]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.
1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

EFFECT ON RUNWAY 30.

The basis for comparing the effect of runway 30 includes the VFR1 weather condition under westerly traffic flow.

The purpose of this comparison is to study the effect of closing runway 30 to arrival and departure operations under VFR1 westerly flow.

EXPERIMENTS	CONFIGURATION
#40 and #8	VFR1 - Westerly Flow

Figure 23 shows the average delays and travel times for the comparison experiments. Table 21 gives a direct comparison of the experiments showing the total delays and travel times that accumulated during the simulations.

The effect of using runway 30 on the peak average runway delays and the average total delay per aircraft is shown in table 22.

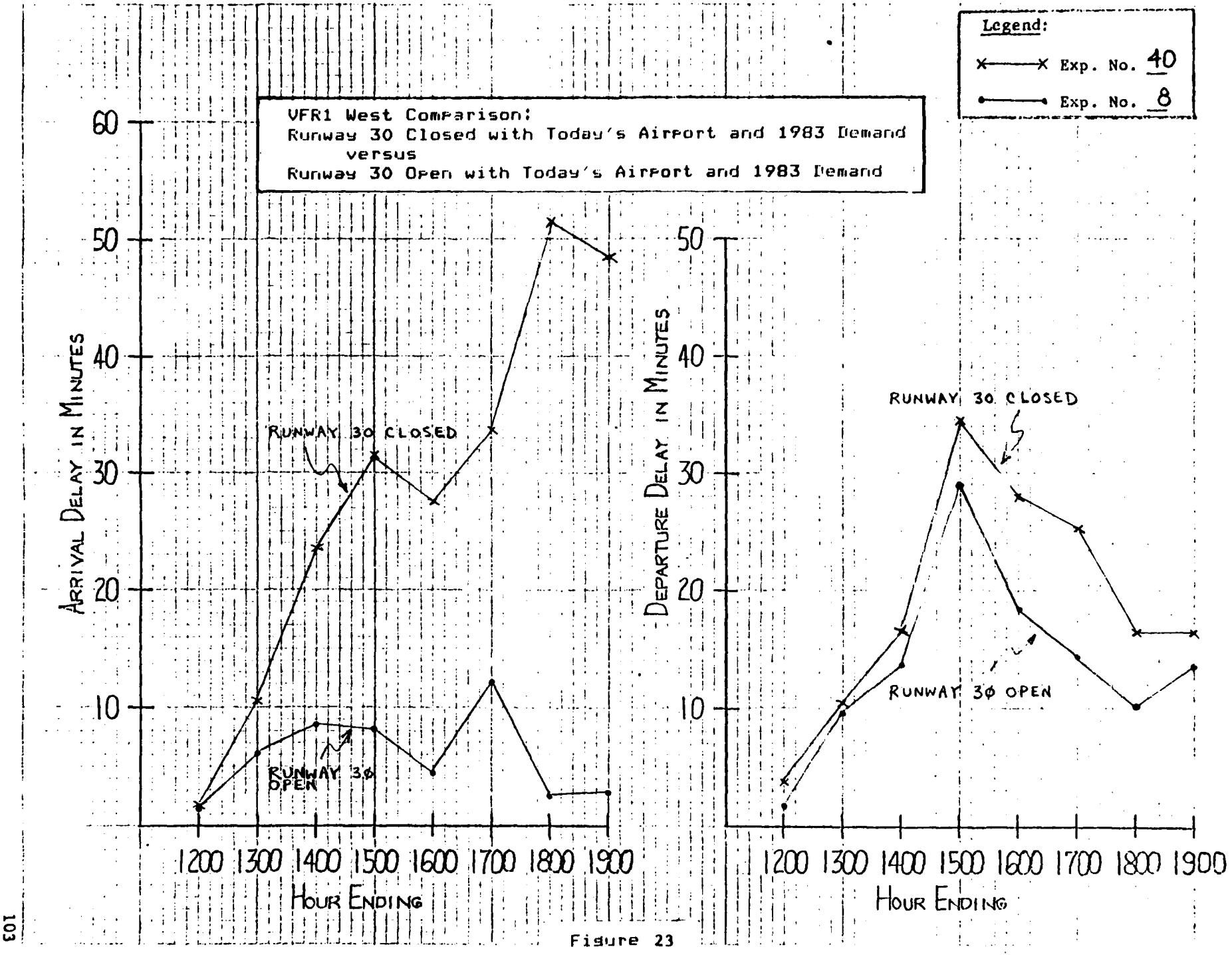

VFR1 West Comparison:
Runway 30 Closed with Today's Airport and 1983 Demand
versus
Runway 30 Open with Today's Airport and 1983 Demand
Legend:
Exp. No. 40
Exp. No. 8
Arrival Delay in Minutes
Departure Delay in Minutes
RUNWAY 30 CLOSED
RUNWAY 30 OPEN
RUNWAY 30 CLOSED
RUNWAY 30 OPEN
10
20
30
40
50
60
1200 1300 1400 1500 1600 1700 1800 1900
Hour Ending
1200 1300 1400 1500 1600 1700 1800 1900
Hour Ending

Figure 23

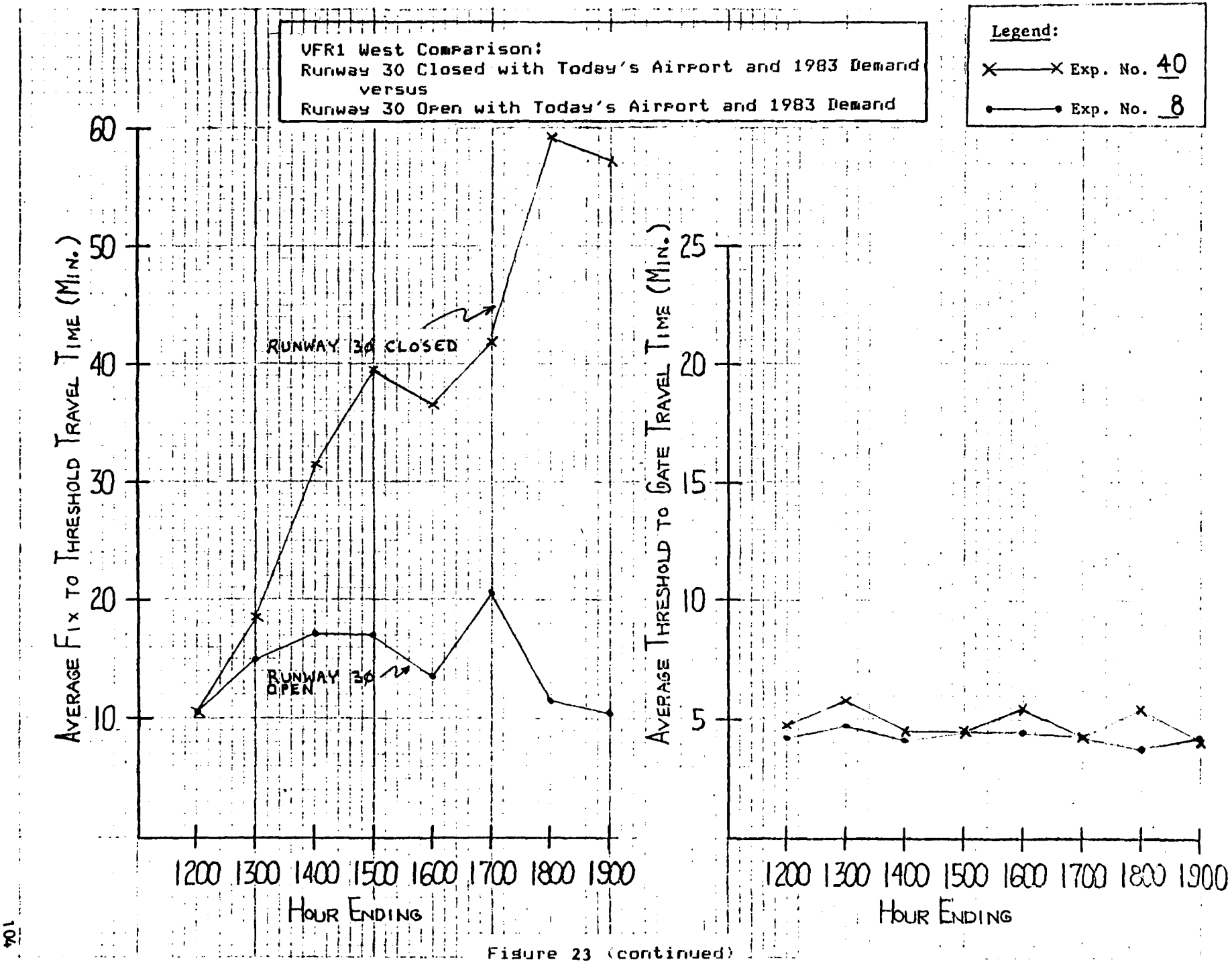


Figure 23 (continued)

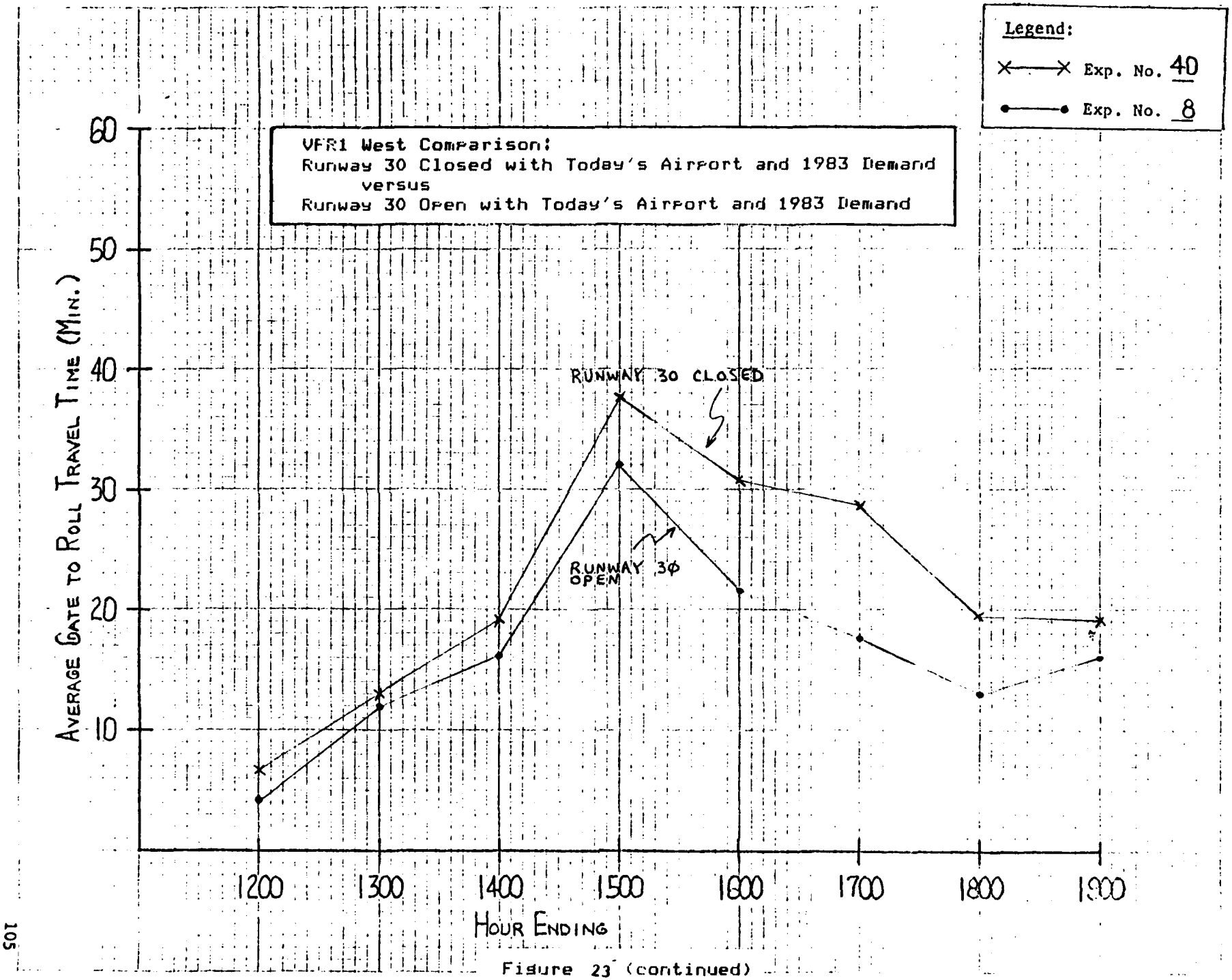


Figure 23 (continued)

Table 21

COMPARISON OF EXPERIMENTS

EXPERIMENT	ARRIVALS			DEPARTURES				TOTAL	TRAVEL TIMES			
	RUNWAY (AIR)	TAXI	RUNWAY X-ING	RUNWAY	TAXI	RUNWAY X-ING	GATE HOLD	GROUND DELAYS	ARRIVAL AIR	ARRIVAL GROUND	DEPART. GROUND	TOTAL

CONFIGURATION: WESTERLY | WEATHER: VFR 1

IMPROVEMENT: RUNWAY 30 CLOSED WITH TODAY'S AIRPORT AND 1983 DEMAND VS. RUNWAY 30 OPEN WITH TODAY'S AIRPORT AND 1983 DEMAND

RESULTS: 400% INCREASE IN AIRBORNE ARRIVAL DELAY BY CLOSING RUNWAY 30,
32.8% INCREASE IN DEPARTURE RUNWAY DELAY BY CLOSING RUNWAY 30.
66.0% INCREASE IN GATE HOLD DELAY BY CLOSING RUNWAY 30.
35.7% INCREASE IN TOTAL GROUND DELAYS BY CLOSING RUNWAY 30,
81.0% INCREASE IN TOTAL TRAVEL TIMES BY CLOSING RUNWAY 30,

EXP.	ARRIVE	DEPART
40	27L, 27R	[illegible], 27R
8	27L, 27R, [illegible]	27L, 27R, 30

40	11876.1	202.4	4.6	4736.[illegible]	1022.[illegible]	2.4	[illegible]	[illegible]	[illegible]	[illegible]	8257.[illegible]	[illegible]
* 8	2375.4	140.7	18.9	3565.6	864.5	10.5	826.8	5487.0	5862.1	[illegible]	[illegible]	[illegible]

CONFIGURATION: | WEATHER:

IMPROVEMENT:

RESULTS:

EXP.	ARRIVE	DEPART

*												

CONFIGURATION: | WEATHER:

IMPROVEMENT:

RESULTS:

EXP.	ARRIVE	DEPART

*												

Note: Asterick (*) denotes improved experiments.

TABLE 22

AVERAGE DELAYS

EXP	DEMAND	WEATHER	IMPROVEMENTS	ATC	PEAK HOUR AVERAGE DELAY (MINUTES)		1100-1900 HRS. AVERAGE DELAY (MINUTES)	
					ARR	DEP	ARR	DEP
40	1983[l]	VFR1-W	None	Todays	63.3	22.8	30.6	19.6
8	1983[l]	VFR1-W	None	Todays	12.2	18.6	6.4	14.4

WEATHER: VFR1- Ceiling above 1500 ft. and visibility over 5 mi.
VFR2- Ceiling between 1000 ft. and 1500 ft. and visibility between 3 and 5 mi.
IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.
IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

DEMAND: 1983[l]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.
1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

COMPARISON OF TOWING VERSUS TAXIING BETWEEN MAINTENANCE AREAS AND GATES.

The basis for comparing towing versus taxiing between aircraft maintenance areas and gates includes the VFR2 weather conditions under westerly traffic flow.

The purpose of this comparison is to study the effect of taxiing aircraft under their own power between their maintenance areas and gates as opposed to having them externally towed.

EXPERIMENTS	CONFIGURATION
#12A and #12	VFR2 - Westerly Flow

Figure 24 shows the average delays and travel times for the comparison experiments. Table 23 shows the total delays and travel times accumulated during the simulations.

The effect of towing versus taxiing on the peak average runway delays and the average total delays is shown in table 24.

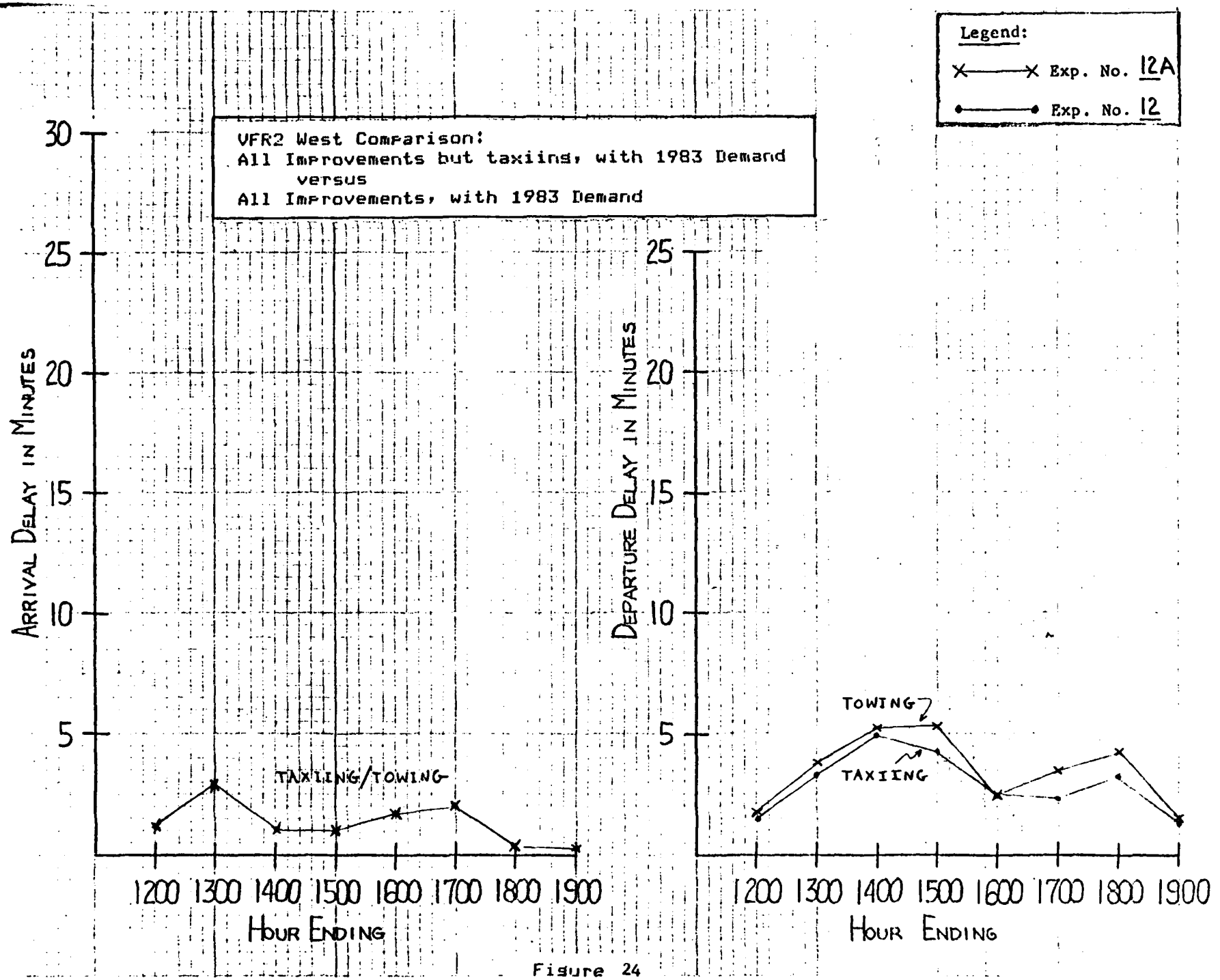

Legend:
Exp. No. 12A
Exp. No. 12
VFR2 West Comparison:
All Improvements but taxiing, with 1983 Demand
versus
All Improvements, with 1983 Demand
Arrival Delay in Minutes
Departure Delay in Minutes
30
25
20
15
10
5
TAXIING/TOWING
TOWING
TAXIING
1200 1300 1400 1500 1600 1700 1800 1900
Hour Ending
1200 1300 1400 1500 1600 1700 1800 1900
Hour Ending

Figure 24

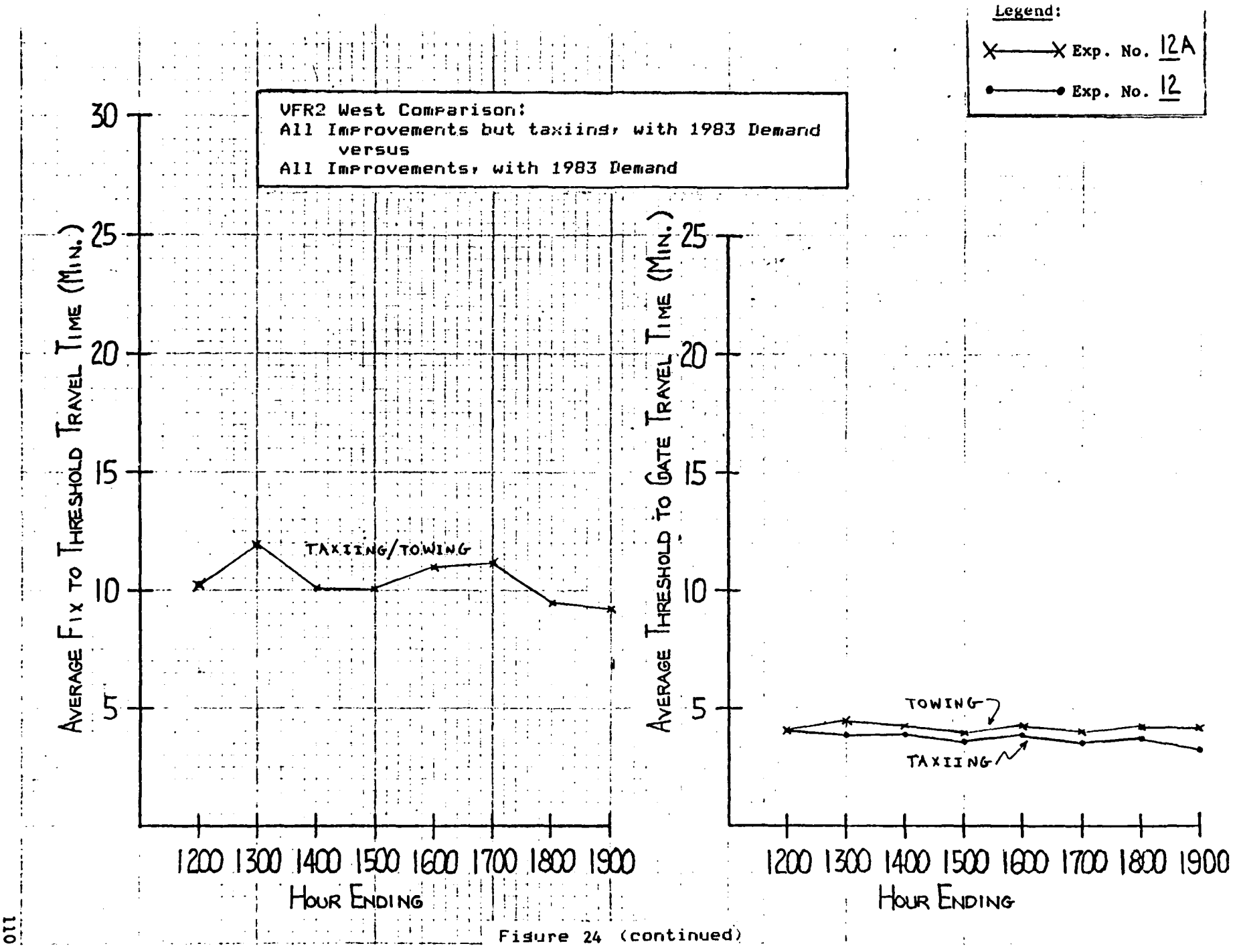


Figure 24 (continued)

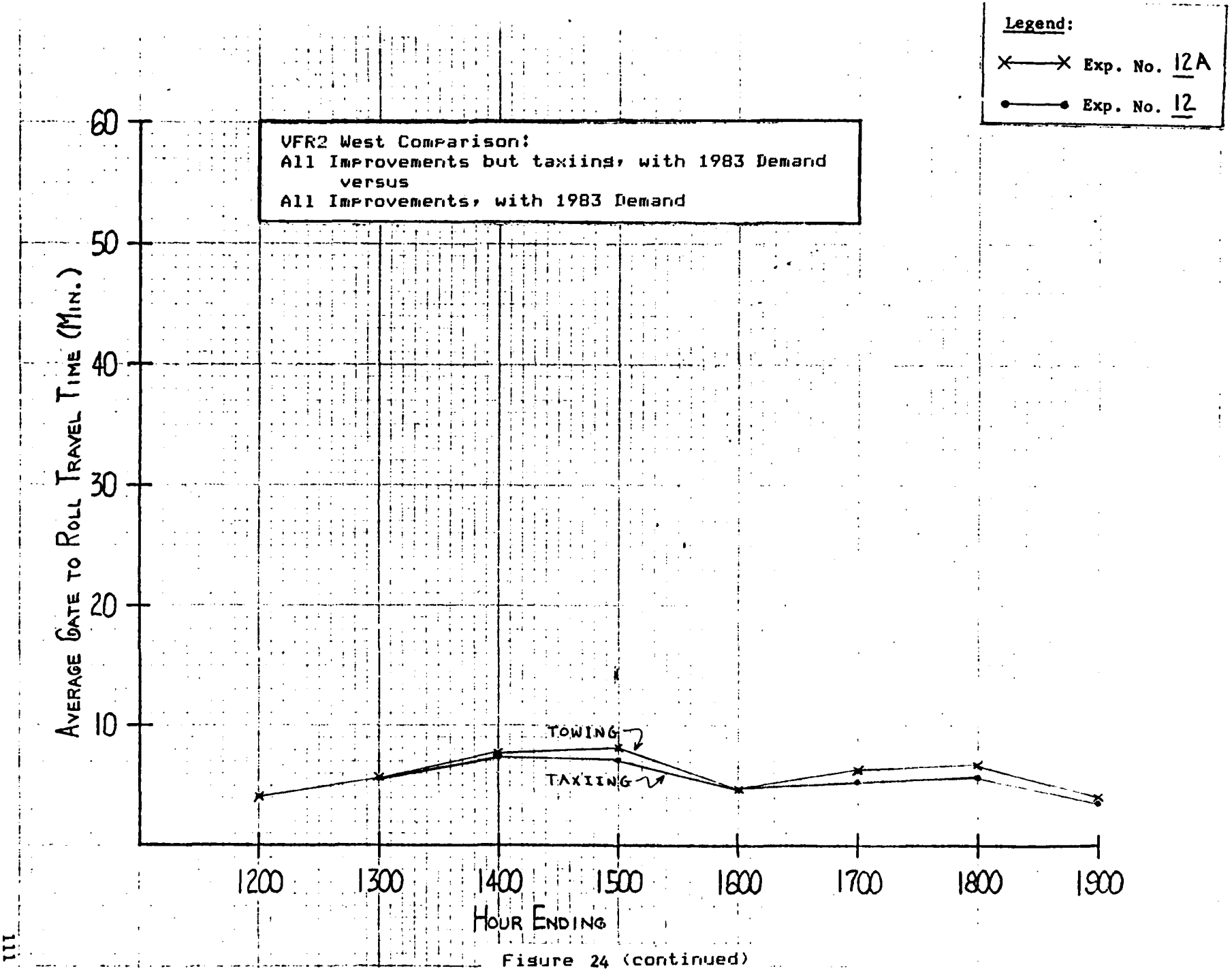


Figure 24 (continued)

Table 23

COMPARISON OF EXPERIMENTS

EXPERIMENT	ARRIVALS			DEPARTURES				TOTAL	TRAVEL TIMES			
	RUNWAY (AIR)	TAXI	RUNWAY X-ING	RUNWAY	TAXI	RUNWAY X-ING	GATE HOLD	GROUND DELAYS	ARRIVAL AIR	ARRIVAL GROUND	DEPART. GROUND	TOTAL
CONFIGURATION: WESTERLY WEATHER: VFR2												
IMPROVEMENT: TOWING VERSUS TAXIING BETWEEN MAINTENANCE AREAS AND GATES.												
RESULTS: 95.3 % DECREASE IN TAXI-IN DELAY BY TAXIING AIRCRAFT. 64.5% DECREASE IN TAXI-OUT DELAY BY TAXIING AIRCRAFT. 23.6% DECREASE IN TOTAL GROUND DELAYS BY TAXIING AIRCRAFT.								EXP.	ARRIVE		DEPART	
								12A	27R, 30		27L, 27R	
								12	27R, 30		27L, 27A	
12A	513.6	126.7	12.8	949.7	252.6	15.4	0.1	1356.5	3725.2	1476.6	2030.1	7234.9
* 12	504.8	5.9	11.4	914.9	89.6	14.7	0.3	1036.8	3772.0	1356.0	1833.6	6977.6
CONFIGURATION:												
WEATHER:												
IMPROVEMENT:												
RESULTS:								EXP.	ARRIVE		DEPART	
*												
CONFIGURATION:												
WEATHER:												
IMPROVEMENT:												
RESULTS:								EXP.	ARRIVE		DEPART	
*												

Note: Asterick (*) denotes improved experiments.

TABLE 24

AVERAGE DELAYS

EXP	DEMAND	WEATHER	IMPROVEMENTS	ATC	PEAK HOUR AVERAGE DELAY (MINUTES)		1100-1900 HRS. AVERAGE DELAY (MINUTES)	
					ARR	DEP	ARR	DEP
12A	1983[m]	VFR2-W	1983[p,g]	1983	2.9	4.7	1.8	3.7
12	1983[m]	VFR2-W	1983[e,g]	1983	2.9	4.6	1.5	3.1

WEATHER: VFR1- Ceiling above 1500 ft. and visibility over 5 mi.
VFR2- Ceiling between 1000 ft. and 1500 ft. and visibility between 3 and 5 mi.
IFR1- Ceiling between 200 ft. and 1000 ft. and/or visibility between 2400 ft. RVR and 3 mi.
IFR2- Ceiling between 200 ft. and 1000 ft. and/or visibility between 1800 ft. RVR and 2300 ft. RVR.

DEMAND: 1983[l]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.
1983[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS: [e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

[p]All improvements of footnote "e" except for improvement #10. (Aircraft are being towed instead of taxied under footnote "p").

2.5 ANALYSIS OF RESULTS (INTERPRETATION).

The results of the experiments performed under the delay studies of the Miami International Airport Task Force have demonstrated the relationship of air traffic demand and delay, and identified the delay reduction benefits of various near-term and far-term improvements.

Several performance measures have been introduced to indicate the changes which occur as improvements are introduced into the air traffic control scenario, the airport design and the demand. These measures include the peak hour average delays (runway delays), the 1100-1900 hour average delays (total delays), and the total, accumulated delays and travel times during a simulation time period. They are calculated under different estimates of air traffic demand and operating conditions.

Table 25 presents a summary of the annual delay estimates for the various demands, the improvements and the ATC system scenarios. The results are plotted in figures 25 through 30 to illustrate both present and future operating conditions at the airport. Selected data points have been connected to emphasize the effect of various demand/improvement/ATC system scenario options.

TABLE 25

SUMMARY OF ANNUAL DELAYS (ESTIMATES)

DEMAND	ATC	IMPROVEMENT	ANNUAL DELAY (HOURS)					AVERAGE ANNUAL DELAY (MIN.)		
			ARRIVAL		DEPARTURE		TOTAL			
			EAST	WEST	EAST	WEST		ARRIVAL	DEPARTURE	TOTAL
TODAYS	TODAYS	NONE	2,189	1,004	3,616	2,176	8,984	0.6	1.0	1.6
1983[l]	TODAYS	NONE	13,342	4,685	25,349	9,591	52,967	2.8	5.5	8.3
1983[l]	1983	NONE	8,212	3,770	17,716	4,770	34,467	1.9	3.5	5.4
1983[l]	1983	1983[e]	7,327	2,182	12,529	5,462	27,493	1.5	2.8	4.3
1983[m]	TODAYS	1983[e,g]	3,341	1,174	10,959	4,146	19,620	0.8	2.7	3.5
1983[m]	1983	1983[e,g]	1,969	829	7,589	2,043	12,505	0.5	1.7	2.2
1988[l]	TODAYS	NONE	36,591	12,849	51,909	19,640	120,989	7.0	10.2	17.2
1988[m]	TODAYS	1983[e,g]	14,757	5,181	25,840	9,777	55,556	3.1	5.6	8.7
1988[m]	1983	1983[e,g]	5,818	2,671	14,492	3,901	26,882	1.2	2.6	3.8
1988[m]	1988	1983[e,g]	2,410	1,107	12,616	3,396	19,528	0.5	2.3	2.8

DEMAND:

[l]- Full G.A. schedule assumes no G.A. relocation out of Miami between 1978 and 1983.

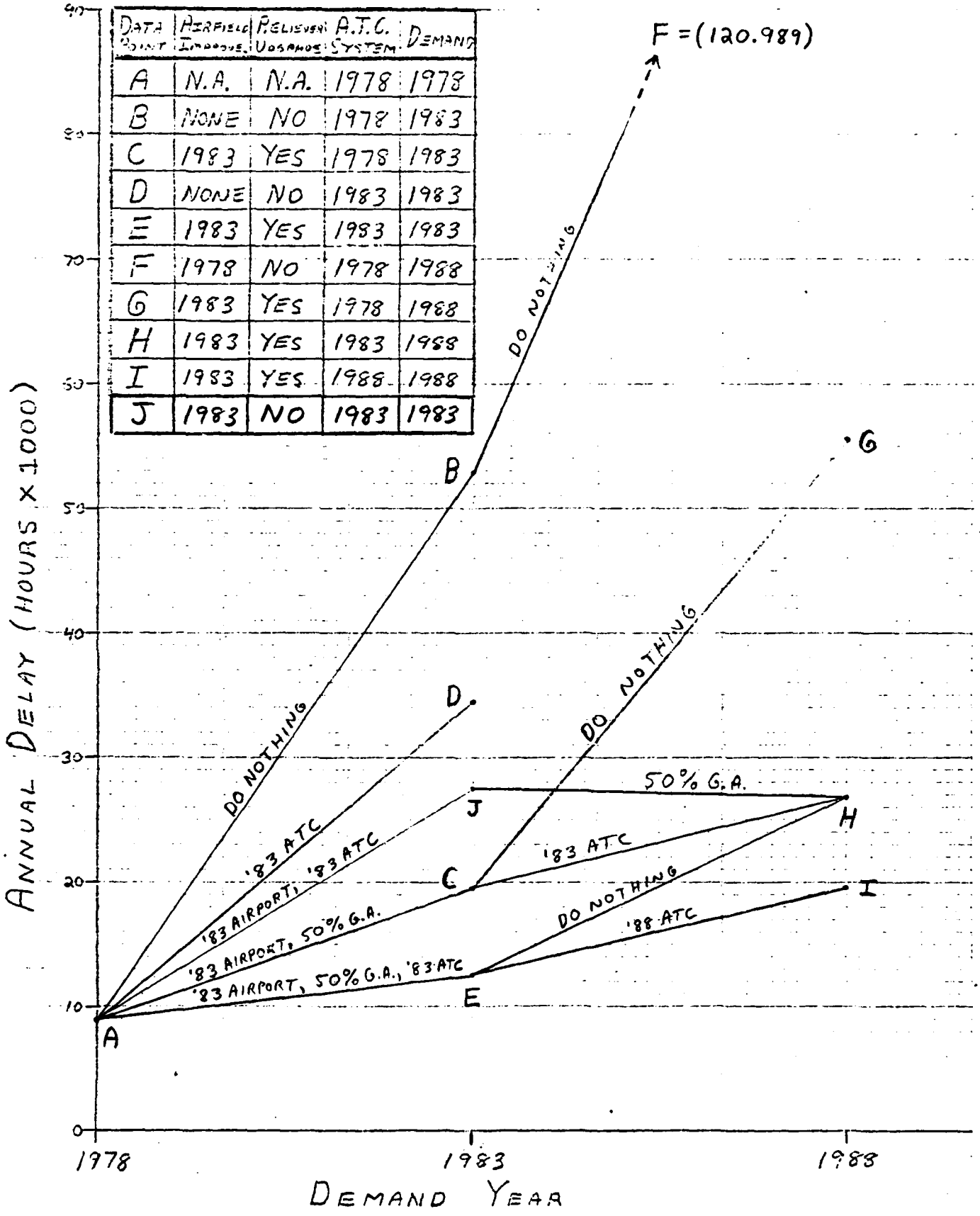
[m]- Limited G.A. schedule assumes a 50% reduction in G.A. at Miami due to reliever airport upgrading.

IMPROVEMENTS:

[e]Improvement items 1, 2, 3, 7, 9, and 10 as shown in Miami Data Package No. 6, Attachment B.

[g]50% reduction in G.A. achieved by reliever airport upgrading.

DEMAND	ANNUAL OPERATIONS
TODAYS	346,384
1983[l]	380,200
1983[m]	340,200
1988[l]	422,100
1988[m]	382,100



DATA POINT	AIRFIELD IMPROVE.	RELIEVER VOR/RMOS	A.T.C. SYSTEM	DEMAND
A	N.A.	N.A.	1978	1978
B	NONE	NO	1978	1983
C	1983	YES	1978	1983
D	NONE	NO	1983	1983
E	1983	YES	1983	1983
F	1978	NO	1978	1988
G	1983	YES	1978	1988
H	1983	YES	1983	1988
I	1983	YES	1988	1988
J	1983	NO	1983	1983

Figure 25
TOTAL ANNUAL DELAY

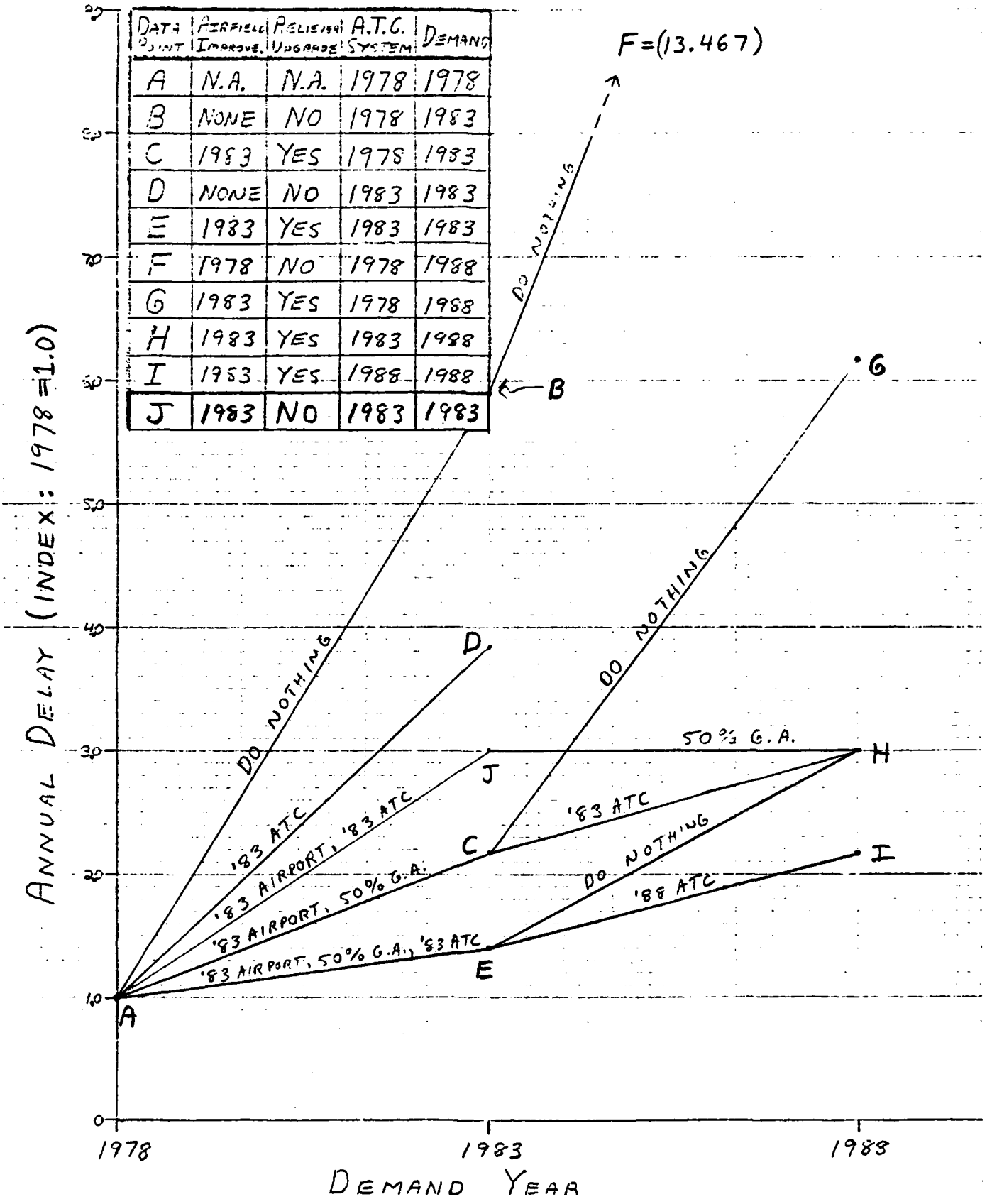


Figure 26
NORMALIZED TOTAL ANNUAL DELAY

DATA POINT	HERFIELD IMPROVE.	RELIEVER UPGRADE	A.T.C. SYSTEM	DEMAND
A	N.A.	N.A.	1978	1978
B	NONE	NO	1978	1983
C	1983	YES	1978	1983
D	NONE	NO	1983	1983
E	1983	YES	1983	1983
F	1978	NO	1978	1988
G	1983	YES	1978	1988
H	1983	YES	1983	1988
I	1983	YES	1988	1988
J	1983	NO	1983	1983

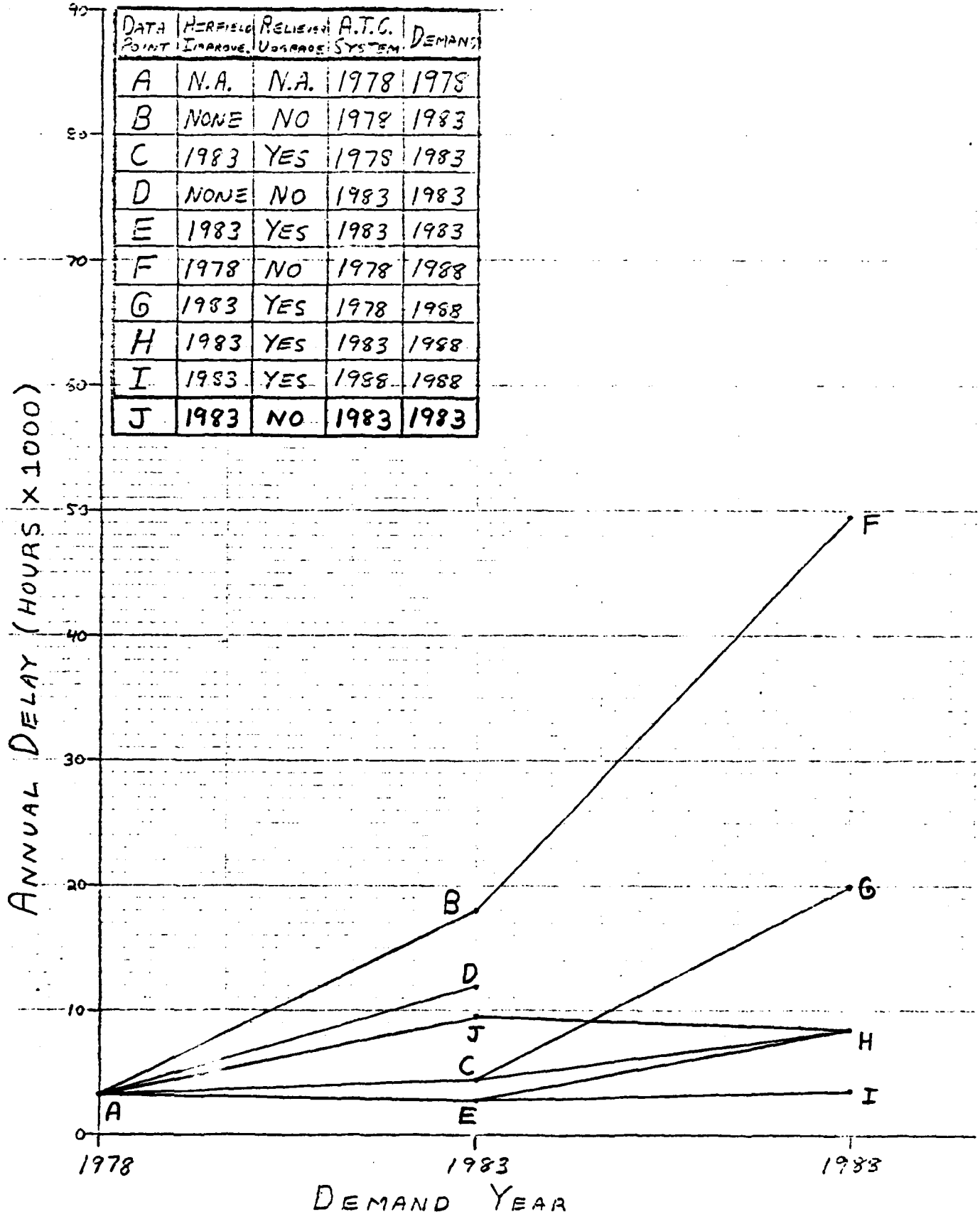


Figure 27
ANNUAL ARRIVAL DELAY

Data Point	Airfield Improve.	Reliever Upgrade	A.T.C. System	Demand
A	N.A.	N.A.	1978	1978
B	None	No	1978	1983
C	1983	Yes	1978	1983
D	None	No	1983	1983
E	1983	Yes	1983	1983
F	1978	No	1978	1988
G	1983	Yes	1978	1988
H	1983	Yes	1983	1988
I	1983	Yes	1988	1988
J	1983	NO	1983	1983

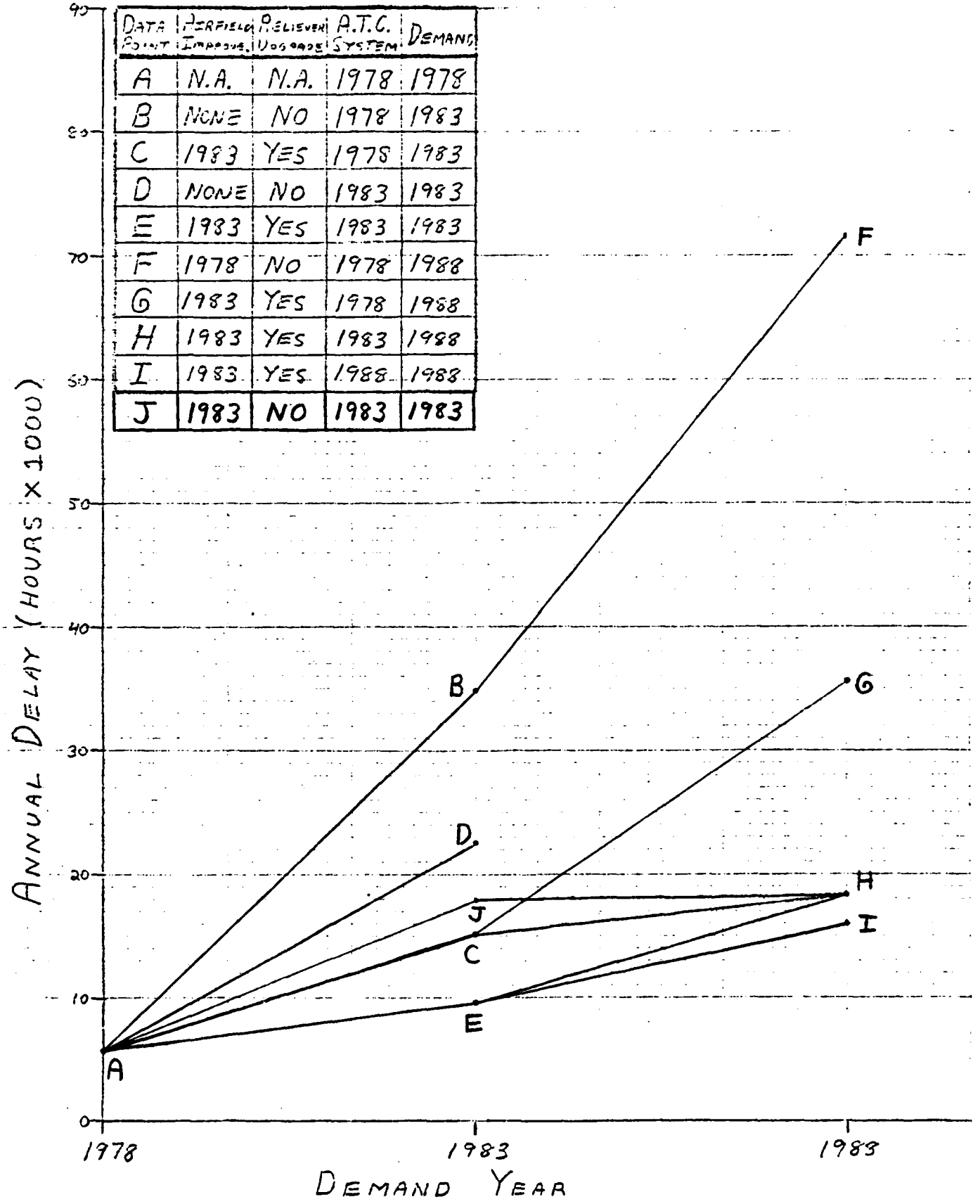


Figure 28
ANNUAL DEPARTURE DELAY

Data Point	Airfield Improve.	Relievers Upgrade	A.T.C. System	Demand
A	N.A.	N.A.	1978	1978
B	None	No	1978	1983
C	1983	Yes	1978	1983
D	None	No	1983	1983
E	1983	Yes	1983	1983
F	1978	No	1978	1988
G	1983	Yes	1978	1988
H	1983	Yes	1983	1988
I	1983	Yes	1988	1988
J	1983	No	1983	1983

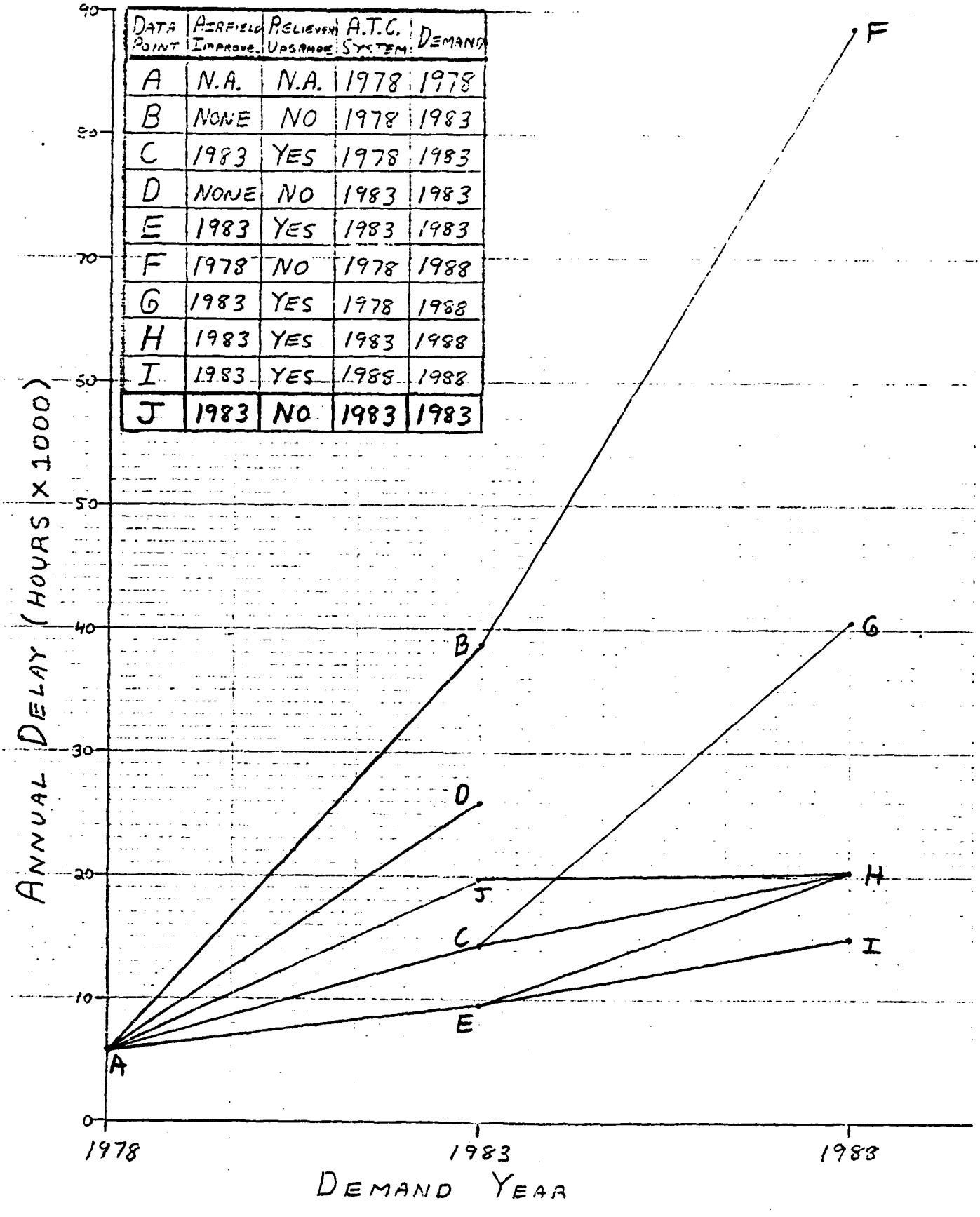


Figure 29
ANNUAL DELAY ATTRIBUTABLE TO EASTERLY FLOW

Data Point	Airfield Improve.	Reliever Upgrade	A.T.C. System	Demand
A	N.A.	N.A.	1978	1978
B	None	No	1978	1983
C	1983	Yes	1978	1983
D	None	No	1983	1983
E	1983	Yes	1983	1983
F	1978	No	1978	1988
G	1983	Yes	1978	1988
H	1983	Yes	1983	1988
I	1983	Yes	1988	1988
J	1983	No	1983	1983

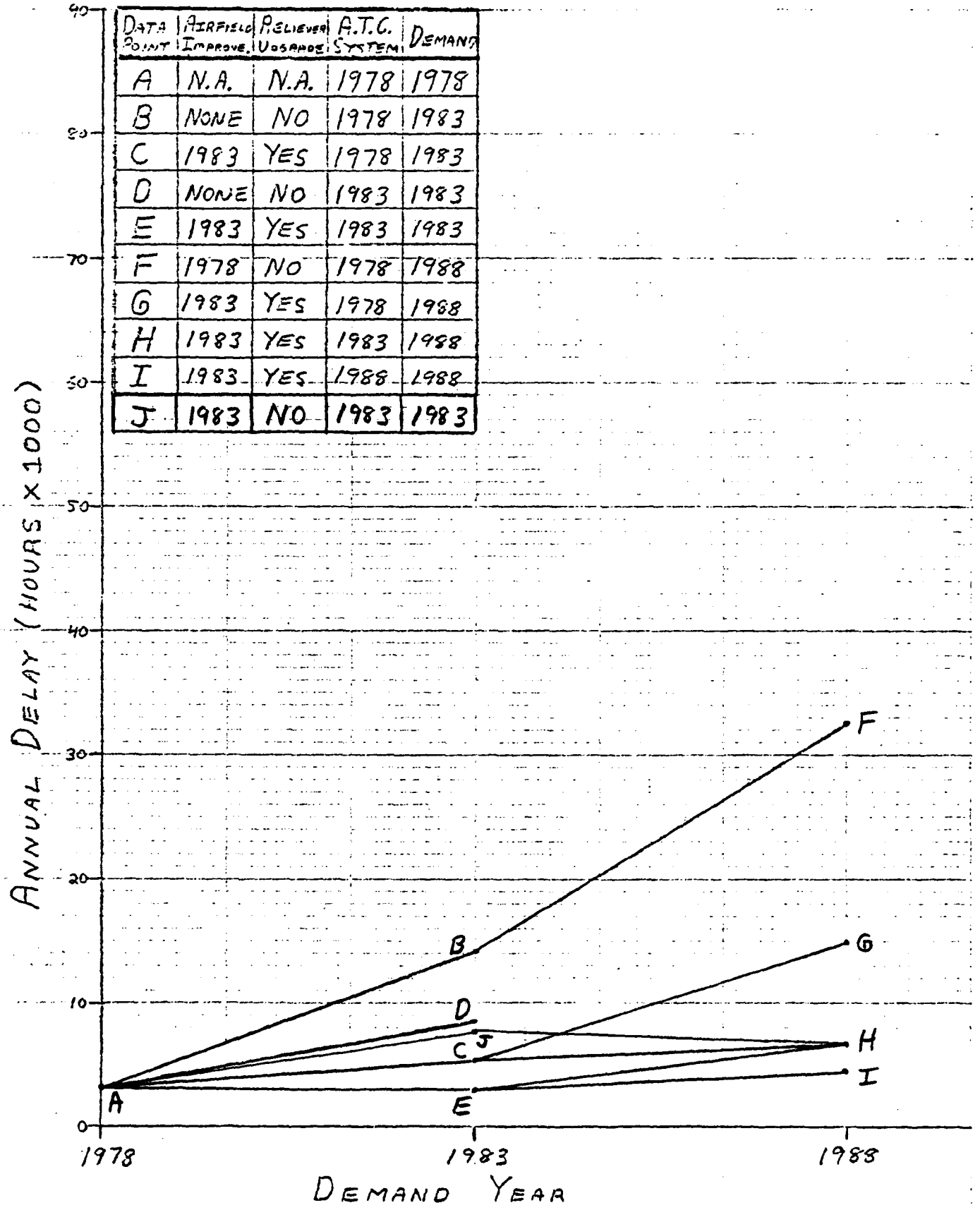


Figure 30
ANNUAL DELAY ATTRIBUTABLE TO WESTERLY FLOW

APPENDIX A

Computer Output of Experimental Results

EXPERIMENT 1 RESULTS

MIAMI INTER. AIRPORT EXPER.-1 ROUTES=1978 CONFIG=A SEPAR=78VFR1 DEMAND=79

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	DE-MAND	DIF
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	18.0	-1.2
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	37.0	-2.8
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	47.0	1.9
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	37.0	-1.0
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	27.0	2.0
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	40.0	-1.5
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	40.0	1.6
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	35.0	-1.0
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	9.0	0.0

AVERAGE TRAVEL TIME

TIME	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	10.64	2.97	6.02
1200-1300	11.99	3.34	8.76
1300-1400	10.67	2.91	8.47
1400-1500	10.68	3.07	7.41
1500-1600	11.56	3.01	6.45
1600-1700	12.26	3.11	9.23
1700-1800	10.83	2.97	6.07
1800-1900	9.91	3.00	6.59
1900-2000	0.00	0.00	4.43

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	RWY CRS	TAX IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	RWY CRS	TAX OUT	RWY CNG
1100-1200	1.0	.5	0.0	0.0	0.0	.7	.0	.1	2.0	2.0	3.3	0.0	0.0	2.1	.1	.1	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	.0	.3	0.0
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	.1	.4	0.0
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	.1	.1	.0
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	.1	.2	0.0
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	.1	.3	0.0
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	.0	.1	0.0
1800-1900	.4	.7	0.0	0.0	0.0	.6	0.0	.1	.9	2.9	.3	0.0	0.0	2.1	.1	.2	0.0
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	.0	0.0	0.0

GRAND TOTAL AVERAGE DELAYS

TIME	ARR DELAY	DEP DELAY
1100-1200	.9	2.3
1200-1300	2.5	4.3
1300-1400	1.0	3.7
1400-1500	1.3	3.9
1500-1600	2.3	2.5
1600-1700	2.6	5.1
1700-1800	1.6	1.6
1800-1900	.6	2.4
1900-2000	0.0	.0

EXPERIMENT 2 RESULTS

MIAMI INTER. AIRPORT EXPER.-2 ROUTES=1978 CONFIG=8 SEPAR=78VFR1 DEMAND=78

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF
1100-1200	24.9	4.0	20.0	0.0	0.0	48.9	51.0	-2.1	11.0	5.0	0.0	0.0	0.0	16.0	18.0	-2.0
1200-1300	27.1	4.0	15.0	0.0	0.0	46.1	45.0	1.1	18.8	17.0	0.0	0.0	0.0	35.8	37.0	-1.2
1300-1400	18.0	1.0	18.0	0.0	0.0	37.0	36.0	1.0	22.8	26.0	0.0	0.0	0.0	48.8	47.0	1.8
1400-1500	15.4	4.0	19.9	0.0	0.0	39.3	41.0	-1.7	22.1	13.0	0.0	0.0	0.0	35.1	37.0	-1.9
1500-1600	21.7	3.0	17.1	0.0	0.0	41.8	41.0	.8	14.3	12.0	0.0	0.0	0.0	26.3	27.0	-.7
1600-1700	22.9	4.0	17.0	0.0	0.0	43.9	43.0	.9	27.0	16.0	0.0	0.0	0.0	43.0	40.0	3.0
1700-1800	16.0	1.0	12.0	0.0	0.0	29.0	29.0	0.0	18.0	20.7	0.0	0.0	0.0	38.7	40.0	-1.3
1800-1900	16.0	2.0	11.0	0.0	0.0	29.0	29.0	0.0	21.8	13.3	0.0	0.0	0.0	35.1	35.0	.1
1900-2000	0.0	1.0	0.0	0.0	0.0	1.0	1.0	0.0	7.2	3.0	0.0	0.0	0.0	10.2	9.0	1.2

AVERAGE TRAVEL TIME

TIME	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	10.79	3.67	5.47
1200-1300	11.22	5.07	7.14
1300-1400	9.52	3.46	5.72
1400-1500	10.92	4.06	5.67
1500-1600	9.54	4.42	6.49
1600-1700	10.03	4.19	9.79
1700-1800	9.57	3.81	4.20
1800-1900	9.71	4.27	5.06
1900-2000	9.50	4.03	3.95

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX OUT	RWY CNG
1100-1200	1.5	.6	1.9	0.0	0.0	1.6	.0	.0	2.2	.5	0.0	0.0	0.0	1.7	.0	.8	0.0
1200-1300	1.8	.8	2.6	0.0	0.0	2.0	.0	.8	5.5	.7	0.0	0.0	0.0	3.2	.0	1.5	.0
1300-1400	.4	1.6	.9	0.0	0.0	.7	.0	.1	2.0	2.1	0.0	0.0	0.0	2.1	.0	1.0	0.0
1400-1500	1.1	1.5	2.7	0.0	0.0	1.9	.1	.1	1.2	.8	0.0	0.0	0.0	1.0	.0	1.1	0.0
1500-1600	.9	1.9	.8	0.0	0.0	.9	.1	.5	1.6	.7	0.0	0.0	0.0	1.2	.0	2.3	0.0
1600-1700	2.4	1.3	1.2	0.0	0.0	1.8	.0	.3	7.9	.8	0.0	0.0	0.0	5.2	.0	1.7	.1
1700-1800	.7	0.0	.4	0.0	0.0	.5	0.0	.1	1.7	1.0	0.0	0.0	0.0	1.3	.0	.3	0.0
1800-1900	.7	0.0	.7	0.0	0.0	.7	.0	.6	1.8	.8	0.0	0.0	0.0	1.4	.0	.8	0.0
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	.2	0.0	0.0	0.0	.2	0.0	.7	0.0

GRAND TOTAL AVERAGE DELAYS

TIME	ARR DELAY	DEP DELAY
1100-1200	1.7	2.5
1200-1300	2.8	4.7
1300-1400	.8	3.2
1400-1500	2.1	2.2
1500-1600	1.6	3.5
1600-1700	2.2	7.0
1700-1800	.6	1.6
1800-1900	1.3	2.3
1900-2000	0.0	.9

EXPERIMENT 3 RESULTS

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

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF
1100-1200	29.0	20.0	0.0	0.0	0.0	49.0	49.0	0.0	10.7	5.0	0.0	0.0	0.0	15.7	18.0	-2.3
1200-1300	25.0	23.0	0.0	0.0	0.0	48.0	48.0	0.0	19.3	17.0	0.0	0.0	0.0	36.3	37.0	-.7
1300-1400	23.0	11.0	0.0	0.0	0.0	34.0	35.0	-1.0	20.0	26.0	0.0	0.0	0.0	46.0	47.0	-1.0
1400-1500	23.5	15.0	0.0	0.0	0.0	38.5	43.0	-4.5	25.2	13.0	0.0	0.0	0.0	38.2	37.0	1.2
1500-1600	28.4	15.0	0.0	0.0	0.0	43.4	39.0	4.4	13.8	12.0	0.0	0.0	0.0	25.8	27.0	-1.2
1600-1700	30.0	14.0	0.0	0.0	0.0	44.0	47.0	-3.0	22.9	14.6	0.0	0.0	0.0	37.5	40.0	-2.5
1700-1800	25.1	5.0	0.0	0.0	0.0	30.1	26.0	4.1	22.1	22.4	0.0	0.0	0.0	44.5	40.0	4.5
1800-1900	18.0	10.0	0.0	0.0	0.0	28.0	28.0	0.0	23.0	13.0	0.0	0.0	0.0	36.0	35.0	1.0
1900-2000	0.0	1.0	0.0	0.0	0.0	1.0	1.0	0.0	6.0	3.0	0.0	0.0	0.0	9.0	9.0	0.0

AVERAGE TRAVEL TIME

TIME	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	10.15	4.09	5.42
1200-1300	9.56	4.77	6.81
1300-1400	9.57	3.67	7.08
1400-1500	8.61	4.13	8.77
1500-1600	9.59	4.57	7.73
1600-1700	12.56	4.19	12.32
1700-1800	10.86	3.89	8.47
1800-1900	7.74	4.43	5.95
1900-2000	0.00	4.93	4.08

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX OUT	RWY CNG
1100-1200	2.5	.9	0.0	0.0	0.0	1.8	0.0	.1	1.8	.7	0.0	0.0	0.0	1.5	.1	.9	0.0
1200-1300	.8	1.5	0.0	0.0	0.0	1.2	0.0	.4	3.4	1.9	0.0	0.0	0.0	2.7	.0	1.6	0.0
1300-1400	1.6	.7	0.0	0.0	0.0	1.3	0.0	.1	4.5	2.5	0.0	0.0	0.0	3.3	.1	1.2	0.0
1400-1500	2.2	.3	0.0	0.0	0.0	1.4	.0	.0	5.5	1.5	0.0	0.0	0.0	4.1	.0	1.1	.0
1500-1600	3.5	.8	0.0	0.0	0.0	2.6	.0	.4	3.5	1.2	0.0	0.0	0.0	2.4	.0	2.3	0.0
1600-1700	6.9	1.0	0.0	0.0	0.0	5.0	0.0	.4	12.0	1.3	0.0	0.0	0.0	7.8	.0	1.6	.1
1700-1800	3.5	0.0	0.0	0.0	0.0	2.9	0.0	.0	8.9	1.4	0.0	0.0	0.0	5.2	.0	.6	.0
1800-1900	1.1	.0	0.0	0.0	0.0	.7	0.0	.2	3.0	.8	0.0	0.0	0.0	2.2	.0	.9	0.0
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	.2	0.0	0.0	0.0	.2	.0	.7	0.0

GRAND TOTAL AVERAGE DELAYS

TIME	ARR DELAY	DEP DELAY
1100-1200	1.9	2.4
1200-1300	1.5	4.4
1300-1400	1.4	4.6
1400-1500	1.5	5.3
1500-1600	3.0	4.8
1600-1700	5.4	9.6
1700-1800	3.0	5.8
1800-1900	.9	3.2
1900-2000	0.0	1.0

EXPERIMENT 4 RESULTS

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

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	DE-MAND	DIF
1100-1200	18.0	24.5	0.0	0.0	0.0	42.5	48.0	-5.5	1.9	12.9	1.0	0.0	0.0	15.8	16.0	-.2
1200-1300	25.3	21.5	0.0	0.0	0.0	46.8	43.0	3.8	12.6	13.1	1.9	0.0	0.0	27.6	35.0	-7.4
1300-1400	14.7	15.0	0.0	0.0	0.0	29.7	28.0	1.7	21.3	17.1	9.2	0.0	0.0	47.6	46.0	1.6
1400-1500	16.2	17.0	0.0	0.0	0.0	33.2	39.0	-5.8	9.2	22.7	1.9	0.0	0.0	33.8	31.0	2.8
1500-1600	17.6	15.0	0.0	0.0	0.0	32.6	30.0	2.6	9.1	12.2	2.0	0.0	0.0	23.3	21.0	2.3
1600-1700	21.7	16.0	0.0	0.0	0.0	37.7	36.0	1.7	10.5	17.0	2.7	0.0	0.0	30.2	32.0	-1.8
1700-1800	8.5	13.0	0.0	0.0	0.0	21.5	20.0	1.5	19.4	14.0	4.3	0.0	0.0	37.7	36.0	1.7
1800-1900	10.8	13.0	0.0	0.0	0.0	23.8	24.0	-.2	9.0	19.0	3.0	0.0	0.0	31.0	32.0	-1.0
1900-2000	.2	0.0	0.0	0.0	0.0	.2	0.0	.2	2.0	5.0	2.0	0.0	0.0	9.0	9.0	0.0

AVERAGE TRAVEL TIME

TIME	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	12.47	2.95	9.57
1200-1300	15.96	3.00	10.68
1300-1400	12.21	3.43	13.84
1400-1500	11.60	2.98	11.14
1500-1600	14.02	3.43	6.74
1600-1700	13.92	3.01	6.94
1700-1800	11.06	3.06	7.51
1800-1900	9.57	3.66	6.34
1900-2000	1.24	.60	4.50

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	RWY CRS	TAX IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	RWY CRS	TAX OUT	RWY CNG
1100-1200	1.2	3.3	0.0	0.0	0.0	2.4	.0	.0	.6	6.6	1.3	0.0	0.0	5.6	.0	.1	0.0
1200-1300	8.0	3.6	0.0	0.0	0.0	6.0	.0	.2	7.9	3.8	7.4	0.0	0.0	5.8	.0	.3	0.0
1300-1400	3.1	1.6	0.0	0.0	0.0	2.3	.0	.3	9.3	4.1	11.0	0.0	0.0	7.8	.0	1.1	.0
1400-1500	2.3	1.8	0.0	0.0	0.0	2.0	.0	.2	4.2	7.1	4.9	0.0	0.0	6.4	.1	.4	.3
1500-1600	5.0	3.5	0.0	0.0	0.0	4.3	.0	.3	1.4	3.2	1.7	0.0	0.0	2.4	.0	.2	0.0
1600-1700	7.0	.4	0.0	0.0	0.0	4.2	.0	.0	2.9	1.5	3.3	0.0	0.0	2.1	.0	.3	0.0
1700-1800	2.5	1.1	0.0	0.0	0.0	1.7	.0	.1	3.1	1.7	1.7	0.0	0.0	2.5	.0	.2	0.0
1800-1900	.1	.5	0.0	0.0	0.0	.3	0.0	.2	1.3	1.9	1.1	0.0	0.0	1.6	.0	.3	0.0
1900-2000	.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	.3	.1	.0	0.0	0.0	.1	0.0	0.0	0.0

GRAND TOTAL AVERAGE DELAYS

TIME	ARR DELAY	DEP DELAY
1100-1200	2.5	5.7
1200-1300	6.1	6.1
1300-1400	2.7	8.9
1400-1500	2.2	7.2
1500-1600	4.7	2.6
1600-1700	4.2	2.4
1700-1800	1.8	2.6
1800-1900	.5	2.0
1900-2000	.0	.1

EXPERIMENT 5 RESULTS

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

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIME FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
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	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	14.9	14.8	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	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	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	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	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	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	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	10.1	9.0	1.1	9.50	3.39	3.22

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
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	1.9	.0	.9	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	4.2	.0	1.6	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	4.5	.0	1.6	.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	7.1	.0	.9	.1	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	5.2	.0	2.1	.1	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	3.0	.0	1.1	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	2.5	.0	.5	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	2.3	.0	1.1	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	.4	0.0	.0	0.0	0.0	.5

MIAMI INTER. AIRPORT EXPER.-6 ROUTES=1978 CONFIG=A SEPAR=78IFR1-IFR2 DEMAND=78

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	18.0	24.3	0.0	0.0	0.0	0.0	42.3	48.0	-5.7	1.9	12.3	.9	0.0	0.0	0.0	15.6	16.0	-.4	12.55	2.92	10.44
1200-1300	23.4	20.6	0.0	0.0	0.0	0.0	44.0	43.0	-4.7	11.5	13.1	1.3	0.0	0.0	0.0	25.9	35.0	-9.5	16.01	2.91	10.07
1300-1400	3.3	0.0	0.0	0.0	0.0	0.0	3.3	28.0	-29.4	.1	42.7	2.4	0.0	0.0	0.0	45.2	46.0	-10.3	81.46	2.82	10.87
1400-1500	25.8	22.8	0.0	0.0	0.0	0.0	48.6	39.0	-19.8	9.7	20.9	1.4	0.0	0.0	0.0	32.0	31.0	-9.3	51.32	3.15	23.29
1500-1600	21.0	24.7	0.0	0.0	0.0	0.0	45.7	30.0	-4.1	12.4	14.8	2.3	0.0	0.0	0.0	29.5	21.0	-.8	26.87	2.96	10.46
1600-1700	22.4	16.4	0.0	0.0	0.0	0.0	38.8	36.0	-1.3	9.9	17.1	3.0	0.0	0.0	0.0	30.0	32.0	-2.8	14.29	3.00	7.12
1700-1800	8.1	13.2	0.0	0.0	0.0	0.0	21.3	20.0	-.0	19.8	14.0	4.0	0.0	0.0	0.0	37.8	36.0	-1.0	10.82	3.00	7.80
1800-1900	11.0	13.0	0.0	0.0	0.0	0.0	24.0	24.0	-.0	9.0	18.6	3.0	0.0	0.0	0.0	30.6	32.0	-2.4	9.52	3.74	6.38
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	2.0	5.4	2.0	0.0	0.0	0.0	9.4	9.0	-2.0	0.00	0.00	4.53
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	2.0	3.0	1.0	0.0	0.0	0.0	6.0	4.0	-.0	0.00	0.00	4.62
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	1.0	2.0	0.0	0.0	0.0	0.0	3.0	3.0	-.0	0.00	0.00	4.07
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	-.0	0.00	0.00	4.92
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	1.0	1.0	0.0	0.0	0.0	0.0	2.0	2.0	-.0	0.00	0.00	1.66
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.00	0.00	0.00

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	1.0	3.6	0.0	0.0	0.0	0.0	2.5	.0	.0	1.1	7.6	1.2	0.0	0.0	0.0	6.5	.1	.1	0.0	2.5	6.6
1200-1300	7.7	4.2	0.0	0.0	0.0	0.0	6.1	.0	.1	6.2	4.4	4.8	0.0	0.0	0.0	5.2	.0	.3	0.0	6.2	5.5
1300-1400	70.6	0.0	0.0	0.0	0.0	0.0	70.6	.1	0.0	8.2	4.1	27.3	0.0	0.0	0.0	5.5	.0	.7	.1	70.7	6.3
1400-1500	33.8	50.7	0.0	0.0	0.0	0.0	41.6	.0	.1	35.9	10.3	22.0	0.0	0.0	0.0	19.1	.0	.1	.1	41.7	19.3
1500-1600	7.7	25.1	0.0	0.0	0.0	0.0	17.2	.0	.2	4.0	7.4	2.0	0.0	0.0	0.0	5.7	.1	.5	0.0	17.3	6.2
1600-1700	7.1	1.1	0.0	0.0	0.0	0.0	4.6	.0	.0	2.6	1.9	4.6	0.0	0.0	0.0	2.4	.0	.2	0.0	4.6	2.7
1700-1800	1.8	1.1	0.0	0.0	0.0	0.0	1.4	.0	.1	3.3	2.1	1.5	0.0	0.0	0.0	2.6	.0	.2	0.0	1.5	2.9
1800-1900	.0	.5	0.0	0.0	0.0	0.0	.3	0.0	.3	1.4	1.9	1.1	0.0	0.0	0.0	1.7	.0	.3	0.0	.5	2.0
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.3	.1	.0	0.0	0.0	0.0	.1	0.0	0.0	0.0	0.0	.1
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EXPERIMENT 7 RESULTS

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

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	DE-MAND	DIF
1100-1200	22.8	22.0	0.0	0.0	0.0	44.8	55.0	-10.2	2.9	11.7	2.3	0.0	0.0	16.9	21.0	-4.1
1200-1300	30.1	27.9	1.0	0.0	0.0	59.0	60.0	-1.0	15.4	25.3	4.6	0.0	0.0	45.3	63.0	-17.7
1300-1400	24.1	26.1	0.0	0.0	0.0	50.2	51.0	-.8	21.0	30.6	7.0	0.0	0.0	58.6	66.0	-7.4
1400-1500	24.0	26.6	1.0	0.0	0.0	51.6	44.0	7.6	20.5	28.6	5.8	0.0	0.0	54.9	33.0	21.9
1500-1600	30.7	27.6	1.0	0.0	0.0	59.3	70.0	-10.7	14.1	23.0	4.5	0.0	0.0	41.6	45.0	-3.4
1600-1700	27.3	24.8	2.0	0.0	0.0	54.1	39.0	15.1	16.2	20.9	5.3	0.0	0.0	42.4	35.0	7.4
1700-1800	20.0	20.7	0.0	0.0	0.0	40.7	44.0	-3.3	20.4	33.0	5.4	0.0	0.0	58.8	72.0	-13.2
1800-1900	17.0	16.4	0.0	0.0	0.0	33.4	32.0	1.4	17.5	25.9	5.1	0.0	0.0	48.5	35.0	13.5
1900-2000	0.0	1.9	0.0	0.0	0.0	1.9	0.0	1.9	2.0	1.0	0.0	0.0	0.0	3.0	0.0	3.0

AVERAGE TRAVEL TIME

TIME	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	12.31	2.89	5.97
1200-1300	20.87	3.20	17.01
1300-1400	23.00	3.91	26.68
1400-1500	22.04	3.00	30.98
1500-1600	15.17	3.27	18.77
1600-1700	18.23	3.15	17.83
1700-1800	11.83	3.26	14.04
1800-1900	10.73	2.83	14.51
1900-2000	13.99	2.93	6.00

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	RWY CRS	TAX IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	RWY CRS	TAX OUT	RWY CNG
1100-1200	3.5	1.7	0.0	0.0	0.0	2.6	.0	.0	1.8	1.8	2.1	0.0	0.0	1.8	.1	.1	0.0
1200-1300	17.3	5.2	.5	0.0	0.0	11.3	.0	.2	12.4	11.2	9.4	0.0	0.0	11.3	.1	1.0	.0
1300-1400	4.8	20.7	0.0	0.0	0.0	13.1	0.0	.6	21.3	17.3	8.3	0.0	0.0	17.6	.1	1.8	3.2
1400-1500	2.3	21.7	.5	0.0	0.0	12.2	.0	.1	22.8	18.6	9.1	0.0	0.0	19.2	.0	1.9	5.3
1500-1600	5.1	6.1	.6	0.0	0.0	5.5	.0	.2	14.8	11.2	15.3	0.0	0.0	13.0	.1	1.1	.5
1600-1700	10.8	7.0	.4	0.0	0.0	8.7	.0	.4	20.3	6.7	12.0	0.0	0.0	12.5	.1	.9	.0
1700-1800	3.6	1.3	0.0	0.0	0.0	2.4	.0	.0	6.5	10.1	6.3	0.0	0.0	8.5	.0	.9	.4
1800-1900	1.1	1.2	0.0	0.0	0.0	1.1	.0	.1	12.9	7.2	6.2	0.0	0.0	9.2	.1	.6	.3
1900-2000	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	.4	1.7	0.0	0.0	0.0	.8	0.0	.1	0.0

GRAND TOTAL AVERAGE DELAYS

TIME	ARR DELAY	DEP DELAY
1100-1200	2.7	2.0
1200-1300	11.5	12.5
1300-1400	13.7	22.6
1400-1500	12.3	26.5
1500-1600	5.7	14.7
1600-1700	9.1	13.5
1700-1800	2.5	9.9
1800-1900	1.3	10.2
1900-2000	3.0	.9

EXPERIMENT 8 RESULTS

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

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF
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	-4.3
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
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
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
1500-1600	24.3	4.0	27.3	0.0	0.0	55.6	71.0	-15.4	26.2	22.4	0.0	0.0	0.0	48.6	45.0	3.6
1600-1700	24.7	4.0	25.7	0.0	0.0	54.4	38.0	16.4	25.4	12.4	1.0	0.0	0.0	39.0	35.0	4.0
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
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
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 TRAVEL TIME

TIME	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	10.63	4.26	4.35
1200-1300	15.09	4.75	12.00
1300-1400	17.31	4.16	16.30
1400-1500	17.11	4.47	32.01
1500-1600	13.51	4.52	21.55
1600-1700	20.69	4.29	17.67
1700-1800	11.59	3.71	13.07
1800-1900	10.52	4.29	16.14
1900-2000	11.76	2.89	11.45

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX OUT	RWY CNG
1100-1200	.9	1.9	1.8	0.0	0.0	1.4	.0	.1	1.7	.6	0.0	0.0	0.0	1.3	.1	.4	0.0
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	0.0
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	1.9
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	2.0	8.4
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
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
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
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	2.3
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	0.0

GRAND TOTAL AVERAGE DELAYS

TIME	ARR. DELAY	DEP DELAY
1100-1200	1.5	1.7
1200-1300	7.1	9.6
1300-1400	9.0	14.8
1400-1500	8.5	29.0
1500-1600	5.0	18.6
1600-1700	12.4	14.5
1700-1800	2.5	10.2
1800-1900	3.2	13.4
1900-2000	2.3	7.4

EXPERIMENT 9 RESULTS

MIAMI INTER. AIRPORT EXPER.-9 ROUTES=1978 CONFIG=A SEPAR=83IFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	24.7	21.9	0.0	0.0	0.0	0.0	46.6	52.0	-5.4	2.5	11.8	2.5	0.0	0.0	0.0	16.8	19.0	-2.2	12.36	3.00	6.26
1200-1300	29.2	21.1	0.0	0.0	0.0	0.0	50.3	47.0	-2.1	15.0	20.2	3.1	0.0	0.0	0.0	38.3	50.0	-13.	14.40	3.08	16.43
1300-1400	27.1	17.0	0.0	0.0	0.0	0.0	44.1	44.0	-2.0	17.5	25.9	5.4	0.0	0.0	0.0	48.8	56.0	-21.1	13.65	4.10	21.36
1400-1500	27.0	13.0	0.0	0.0	0.0	0.0	40.0	38.0	-.0	16.2	11.5	7.4	0.0	0.0	0.0	35.1	32.0	-18.0	11.38	5.00	36.04
1500-1600	25.2	26.0	0.0	0.0	0.0	0.0	51.2	60.0	-8.8	21.2	15.5	2.8	0.0	0.0	0.0	39.5	31.0	-9.5	12.69	3.57	38.30
1600-1700	25.8	19.0	0.0	0.0	0.0	0.0	44.8	36.0	-.0	18.3	20.0	3.8	0.0	0.0	0.0	42.1	34.0	-1.4	14.40	3.21	20.94
1700-1800	14.1	16.0	0.0	0.0	0.0	0.0	30.1	31.0	-.9	20.1	22.3	3.6	0.0	0.0	0.0	46.0	59.0	-14.4	10.83	2.92	10.46
1800-1900	15.9	12.0	0.0	0.0	0.0	0.0	27.9	27.0	-.0	14.8	21.8	8.3	0.0	0.0	0.0	44.9	34.0	-3.5	10.10	3.77	17.96
1900-2000	0.0	2.0	0.0	0.0	0.0	0.0	2.0	2.0	-.0	3.4	0.0	.1	0.0	0.0	0.0	3.5	0.0	-.0	9.00	2.74	9.28

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	2.5	1.3	0.0	0.0	0.0	0.0	2.0	.0	.0	6.3	1.4	3.4	0.0	0.0	0.0	2.4	.0	.0	0.0	2.0	2.5
1200-1300	5.0	4.7	0.0	0.0	0.0	0.0	4.9	.0	.2	17.5	6.1	13.6	0.0	0.0	0.0	11.1	.0	.5	.1	5.1	11.6
1300-1400	5.4	1.2	0.0	0.0	0.0	0.0	3.7	.0	.9	32.1	4.2	9.1	0.0	0.0	0.0	14.7	.0	.4	2.0	4.7	17.1
1400-1500	2.7	.4	0.0	0.0	0.0	0.0	1.9	.1	1.8	39.0	2.4	18.0	0.0	0.0	0.0	22.5	.0	1.5	7.2	3.7	31.3
1500-1600	2.1	3.4	0.0	0.0	0.0	0.0	2.7	.0	.5	35.2	6.4	8.6	0.0	0.0	0.0	22.2	.1	1.2	10.1	3.3	33.5
1600-1700	6.5	2.1	0.0	0.0	0.0	0.0	4.6	.0	.1	26.0	3.4	7.7	0.0	0.0	0.0	13.6	.0	.3	2.5	4.8	16.5
1700-1800	.8	2.2	0.0	0.0	0.0	0.0	1.6	.0	.0	3.1	7.2	3.4	0.0	0.0	0.0	5.2	.0	.5	.1	1.6	5.8
1800-1900	.3	1.0	0.0	0.0	0.0	0.0	.6	.1	.4	8.4	7.2	17.8	0.0	0.0	0.0	9.6	.0	3.4	.2	1.1	13.3
1900-2000	0.0	.5	0.0	0.0	0.0	0.0	.5	0.0	0.0	3.2	0.0	.6	0.0	0.0	0.0	3.4	.0	.2	0.0	.5	3.6

EXPERIMENT 10 RESULTS

MIAMI INTER. AIRPORT EXPER.-10 ROUTES=1978 CONFIG=A SEPAR=83IFR1-IFR2 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	24.7	21.9	0.0	0.0	0.0	0.0	46.6	52.0	-5.4	2.6	11.8	2.4	0.0	0.0	0.0	16.8	19.0	-2.2	12.38	3.01	6.22
1200-1300	29.2	21.1	0.0	0.0	0.0	0.0	50.3	47.0	-2.1	15.1	20.2	3.3	0.0	0.0	0.0	38.7	50.0	-13.6	14.42	3.08	16.30
1300-1400	1.0	0.0	0.0	0.0	0.0	0.0	1.0	44.0	-45.1	0.0	38.6	1.1	0.0	0.0	0.0	39.7	56.0	-29.9	40.78	3.52	16.24
1400-1500	29.3	24.4	0.0	0.0	0.0	0.0	53.8	38.0	-29.3	14.1	23.4	4.9	0.0	0.0	0.0	42.4	32.0	-19.4	68.43	4.00	51.62
1500-1600	30.1	31.0	0.0	0.0	0.0	0.0	61.1	60.0	-28.2	15.0	18.1	2.9	0.0	0.0	0.0	36.0	31.0	-14.4	42.10	3.46	31.80
1600-1700	30.6	19.6	0.0	0.0	0.0	0.0	50.1	36.0	-14.1	14.3	19.9	4.2	0.0	0.0	0.0	38.4	34.0	-10.0	37.55	3.33	25.65
1700-1800	27.0	16.0	0.0	0.0	0.0	0.0	43.0	31.0	-2.1	16.8	25.2	4.8	0.0	0.0	0.0	46.8	59.0	-22.2	25.86	3.58	23.47
1800-1900	17.1	12.0	0.0	0.0	0.0	0.0	29.1	27.0	-.0	20.6	22.1	8.1	0.0	0.0	0.0	50.8	34.0	-5.4	10.51	3.73	24.86
1900-2000	0.0	2.0	0.0	0.0	0.0	0.0	2.0	2.0	-.0	3.9	1.2	.3	0.0	0.0	0.0	5.4	0.0	-.0	8.95	2.97	12.45
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.00	0.00	0.00
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.00	0.00	0.00
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.00	0.00	0.00
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.00	0.00	0.00
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.00	0.00	0.00

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	2.5	1.4	0.0	0.0	0.0	0.0	2.0	.0	.0	6.8	1.3	3.2	0.0	0.0	0.0	2.4	.0	.0	0.0	2.0	2.4
1200-1300	5.0	4.8	0.0	0.0	0.0	0.0	4.9	.0	.2	17.4	6.1	11.2	0.0	0.0	0.0	10.9	.0	.5	.0	5.1	11.5
1300-1400	35.6	0.0	0.0	0.0	0.0	0.0	35.6	0.0	.8	0.0	5.9	28.1	0.0	0.0	0.0	7.5	.0	4.3	.2	36.4	12.0
1400-1500	61.2	55.6	0.0	0.0	0.0	0.0	58.5	.1	.9	88.5	14.8	20.6	0.0	0.0	0.0	39.9	.0	4.0	3.0	59.5	46.9
1500-1600	51.1	14.1	0.0	0.0	0.0	0.0	32.3	.0	.4	29.2	15.2	19.6	0.0	0.0	0.0	21.6	.1	2.5	3.1	32.7	27.2
1600-1700	43.8	2.9	0.0	0.0	0.0	0.0	27.9	.0	.3	27.0	11.0	17.3	0.0	0.0	0.0	17.5	.0	1.8	2.0	28.2	21.3
1700-1800	24.7	2.3	0.0	0.0	0.0	0.0	16.4	.0	.6	23.6	9.7	16.9	0.0	0.0	0.0	15.4	.0	2.4	1.2	17.0	19.0
1800-1900	1.2	.8	0.0	0.0	0.0	0.0	1.1	.1	.4	18.9	7.4	19.1	0.0	0.0	0.0	14.0	.0	3.6	2.5	1.5	20.1
1900-2000	0.0	.4	0.0	0.0	0.0	0.0	.4	0.0	0.0	4.2	2.0	2.1	0.0	0.0	0.0	5.3	.0	.3	1.2	.4	6.9
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EXPERIMENT 11A RESULTS

MIAMI INTER. AIRPORT EXPER.-11A ROUTES=1978 CONFIG=A SEPAR=83VFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	26.9	20.4	0.0	0.0	0.0	0.0	47.3	50.0	-2.7	3.3	13.0	3.0	0.0	0.0	0.0	19.3	21.0	-1.7	11.20	2.94	5.04
1200-1300	29.0	24.6	0.0	0.0	0.0	0.0	53.6	54.0	-3.1	21.1	22.0	3.0	0.0	0.0	0.0	46.1	52.0	-7.6	12.72	3.30	13.79
1300-1400	26.7	20.0	0.0	0.0	0.0	0.0	46.7	46.0	-2.4	22.9	27.0	5.7	0.0	0.0	0.0	55.6	57.0	-9.0	11.24	3.61	14.89
1400-1500	25.4	15.9	1.0	0.0	0.0	0.0	42.3	41.0	-1.1	20.7	12.2	7.3	0.0	0.0	0.0	40.2	33.0	-1.8	10.74	3.39	16.42
1500-1600	27.0	27.4	1.3	0.0	0.0	0.0	55.7	59.0	-4.4	13.4	17.8	2.1	0.0	0.0	0.0	33.3	34.0	-2.5	11.43	3.45	8.64
1600-1700	23.0	18.7	.7	0.0	0.0	0.0	42.4	38.0	-.0	12.6	19.8	3.9	0.0	0.0	0.0	36.3	35.0	-1.2	11.17	3.02	8.15
1700-1800	14.0	18.0	1.0	0.0	0.0	0.0	33.0	33.0	-.0	20.3	27.6	6.5	0.0	0.0	0.0	54.4	62.0	-8.8	10.24	3.01	12.17
1800-1900	16.0	16.0	1.0	0.0	0.0	0.0	33.0	33.0	-.0	13.4	21.6	4.7	0.0	0.0	0.0	39.7	35.0	-4.1	10.13	3.59	9.01
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	3.3	0.0	.8	0.0	0.0	0.0	4.1	0.0	-.0	0.00	0.00	10.22

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	1.6	.6	0.0	0.0	0.0	0.0	1.1	.0	.2	2.2	.9	1.1	0.0	0.0	0.0	1.2	0.0	.0	0.0	1.3	1.2
1200-1300	2.6	3.2	0.0	0.0	0.0	0.0	2.9	.0	.5	11.9	6.0	2.7	0.0	0.0	0.0	8.4	.0	.5	.0	3.4	9.0
1300-1400	1.6	1.5	0.0	0.0	0.0	0.0	1.6	.0	.5	17.5	3.7	3.1	0.0	0.0	0.0	9.3	.1	.3	.8	2.1	10.4
1400-1500	1.4	.5	3.7	0.0	0.0	0.0	1.1	.0	.1	16.6	2.0	7.4	0.0	0.0	0.0	10.5	.0	.4	.7	1.2	11.6
1500-1600	1.3	2.7	2.0	0.0	0.0	0.0	2.0	.0	.4	3.3	4.5	.6	0.0	0.0	0.0	3.8	.0	.3	.0	2.4	4.2
1600-1700	1.4	1.0	5.7	0.0	0.0	0.0	1.3	.0	.1	5.2	2.4	4.5	0.0	0.0	0.0	3.6	.1	.3	0.0	1.5	4.0
1700-1800	.3	1.2	0.0	0.0	0.0	0.0	.8	.0	.0	3.0	8.8	8.0	0.0	0.0	0.0	6.5	.0	1.1	.0	.8	7.6
1800-1900	.4	.5	0.0	0.0	0.0	0.0	.5	.0	.4	4.4	2.2	6.3	0.0	0.0	0.0	3.7	.1	.7	.0	.8	4.5
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	4.5	0.0	0.0	0.0	4.6	0.0	.1	0.0	0.0	4.7

EXPERIMENT 11B RESULTS

MIAMI INTER. AIRPORT EXPER.-11B ROUTES=1983 CONFIG=A SEPAR=83VFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	24.6	22.0	0.0	0.0	0.0	0.0	46.6	55.0	-8.4	3.0	12.0	4.0	0.0	0.0	0.0	19.0	20.0	-1.0	11.94	2.84	4.93
1200-1300	32.4	29.0	1.0	0.0	0.0	0.0	62.4	60.0	-6.0	19.4	27.6	3.0	0.0	0.0	0.0	50.0	63.0	-14.0	15.93	2.82	13.00
1300-1400	21.0	28.8	0.0	0.0	0.0	0.0	49.8	51.0	-7.2	25.1	31.6	7.6	0.0	0.0	0.0	64.3	65.0	-14.7	20.45	3.11	15.27
1400-1500	23.1	25.2	1.0	0.0	0.0	0.0	49.3	44.0	-1.9	13.5	30.2	5.4	0.0	0.0	0.0	49.1	34.0	.4	14.72	3.03	17.34
1500-1600	31.9	26.6	1.0	0.0	0.0	0.0	59.5	70.0	-12.4	17.0	21.3	5.7	0.0	0.0	0.0	44.0	45.0	-.6	12.32	2.91	7.96
1600-1700	26.0	23.4	2.0	0.0	0.0	0.0	51.4	39.0	-.0	13.0	18.3	4.3	0.0	0.0	0.0	35.6	34.0	1.0	13.93	2.84	6.76
1700-1800	21.0	21.0	0.0	0.0	0.0	0.0	42.0	44.0	-2.0	21.8	34.4	5.4	0.0	0.0	0.0	61.6	71.0	-8.4	11.05	3.06	11.00
1800-1900	16.0	16.5	0.0	0.0	0.0	0.0	32.5	32.0	-1.5	15.2	23.8	4.6	0.0	0.0	0.0	43.6	37.0	-1.8	10.14	2.69	9.36
1900-2000	0.0	1.5	0.0	0.0	0.0	0.0	1.5	0.0	-.0	2.0	.8	0.0	0.0	0.0	0.0	2.8	0.0	1.0	13.28	3.08	6.37

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	3.4	.9	0.0	0.0	0.0	0.0	2.2	.0	.0	1.1	1.7	.3	0.0	0.0	0.0	1.3	.0	.0	0.0	2.3	1.4
1200-1300	8.6	3.9	1.1	0.0	0.0	0.0	6.3	.0	.0	8.2	9.5	5.8	0.0	0.0	0.0	8.8	.0	.1	.0	6.3	8.9
1300-1400	.8	17.8	0.0	0.0	0.0	0.0	10.6	0.0	.0	9.4	12.2	4.7	0.0	0.0	0.0	10.2	.0	.1	1.0	10.6	11.3
1400-1500	1.0	8.7	.5	0.0	0.0	0.0	4.9	0.0	.0	7.7	15.3	2.9	0.0	0.0	0.0	12.1	0.0	.2	1.4	4.9	13.6
1500-1600	2.3	3.0	0.0	0.0	0.0	0.0	2.6	.0	.0	7.1	2.3	1.4	0.0	0.0	0.0	4.0	.0	.0	0.0	2.6	4.1
1600-1700	4.9	4.1	.1	0.0	0.0	0.0	4.4	.0	.0	3.1	2.2	3.3	0.0	0.0	0.0	2.7	.0	.0	0.0	4.4	2.8
1700-1800	2.5	.7	0.0	0.0	0.0	0.0	1.6	.0	.0	5.5	8.2	4.3	0.0	0.0	0.0	6.9	.0	.2	.1	1.6	7.1
1800-1900	.3	.8	0.0	0.0	0.0	0.0	.6	.0	.0	6.9	4.2	5.1	0.0	0.0	0.0	5.3	.0	.0	.0	.6	5.4
1900-2000	0.0	2.3	0.0	0.0	0.0	0.0	2.3	0.0	0.0	.9	1.7	0.0	0.0	0.0	0.0	1.2	0.0	.1	0.0	2.3	1.4

EXPERIMENT 12 RESULTS

MIAMI INTER. AIRPORT EXPER.-12 ROUTES=1983 CONFIG=B SEPAR=83VFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	20.0	0.0	27.4	0.0	0.0	0.0	47.4	54.0	-6.6	15.0	6.0	0.0	0.0	0.0	0.0	21.0	21.0	0.0	10.28	4.03	4.09
1200-1300	25.0	0.0	30.5	0.0	0.0	0.0	55.5	50.0	-1.1	22.0	29.9	0.0	0.0	0.0	0.0	51.9	52.0	-.1	11.94	3.84	5.42
1300-1400	24.0	0.0	19.1	0.0	0.0	0.0	43.1	44.0	-2.0	26.9	26.1	0.0	0.0	0.0	0.0	53.0	57.0	-4.1	10.10	3.95	7.31
1400-1500	24.0	0.0	19.0	0.0	0.0	0.0	43.0	42.0	-1.0	21.1	15.0	0.0	0.0	0.0	0.0	36.1	33.0	-1.0	10.11	3.66	7.10
1500-1600	30.3	0.0	27.1	0.0	0.0	0.0	57.4	64.0	-7.6	14.9	19.0	0.0	0.0	0.0	0.0	33.9	34.0	-1.1	10.85	3.83	4.67
1600-1700	17.7	0.0	24.9	0.0	0.0	0.0	42.6	35.0	-.0	21.1	15.0	0.0	0.0	0.0	0.0	36.1	35.0	-.0	11.07	3.56	5.19
1700-1800	14.0	0.0	17.0	0.0	0.0	0.0	31.0	32.0	-1.0	25.0	34.0	0.0	0.0	0.0	0.0	59.0	62.0	-3.0	9.47	4.10	5.70
1800-1900	9.0	0.0	23.0	0.0	0.0	0.0	32.0	31.0	-.0	20.6	17.0	0.0	0.0	0.0	0.0	37.6	35.0	-.4	9.20	3.73	3.74
1900-2000	1.0	0.0	1.0	0.0	0.0	0.0	2.0	2.0	-.0	.3	0.0	0.0	0.0	0.0	0.0	.3	0.0	-.1	9.50	3.23	1.85

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	1.1	0.0	1.4	0.0	0.0	0.0	1.2	.0	.0	1.9	.5	0.0	0.0	0.0	0.0	1.5	0.0	.0	0.0	1.3	1.5
1200-1300	2.1	0.0	3.5	0.0	0.0	0.0	2.9	.0	.0	4.4	1.7	0.0	0.0	0.0	0.0	2.8	.1	.4	0.0	3.0	3.3
1300-1400	1.5	0.0	.5	0.0	0.0	0.0	1.1	.0	.0	7.9	1.2	0.0	0.0	0.0	0.0	4.6	.0	.3	0.0	1.1	4.9
1400-1500	1.2	0.0	.6	0.0	0.0	0.0	1.0	.1	.0	6.9	.5	0.0	0.0	0.0	0.0	4.2	.0	.0	.0	1.0	4.3
1500-1600	2.0	0.0	1.1	0.0	0.0	0.0	1.6	.0	.0	2.7	1.4	0.0	0.0	0.0	0.0	2.0	.1	.4	0.0	1.6	2.4
1600-1700	.6	0.0	3.0	0.0	0.0	0.0	2.0	.0	.0	2.6	1.2	0.0	0.0	0.0	0.0	2.0	.0	.2	0.0	2.0	2.3
1700-1800	.1	0.0	.6	0.0	0.0	0.0	.4	.1	.0	2.3	3.1	0.0	0.0	0.0	0.0	2.7	.1	.4	0.0	.5	3.2
1800-1900	.2	0.0	.3	0.0	0.0	0.0	.3	0.0	.0	1.2	.8	0.0	0.0	0.0	0.0	1.0	.0	.3	0.0	.3	1.3
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.8	0.0	0.0	0.0	0.0	0.0	.8	0.0	0.0	0.0	0.0	.8

EXPERIMENT 12A RESULTS

MIAMI INTER. AIRPORT EXPER.-12A ROUTES=1983 CONFIG=B SEPAR=83VFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	20.0	0.0	27.4	0.0	0.0	0.0	47.4	54.0	-6.6	15.0	6.0	0.0	0.0	0.0	0.0	21.0	21.0	0.0	10.29	4.06	4.29
1200-1300	25.0	0.0	30.6	0.0	0.0	0.0	55.6	50.0	-1.0	22.0	29.9	0.0	0.0	0.0	0.0	51.9	52.0	-.1	11.91	4.44	5.80
1300-1400	24.0	0.0	19.0	0.0	0.0	0.0	43.0	44.0	-2.0	26.2	26.1	0.0	0.0	0.0	0.0	52.3	57.0	-4.8	10.12	4.20	7.74
1400-1500	24.0	0.0	19.0	0.0	0.0	0.0	43.0	42.0	-1.0	21.8	15.0	0.0	0.0	0.0	0.0	36.8	33.0	-1.0	10.12	3.97	8.08
1500-1600	30.1	0.0	26.8	0.0	0.0	0.0	56.9	64.0	-8.1	15.0	19.0	0.0	0.0	0.0	0.0	34.0	34.0	-1.0	10.97	4.20	4.78
1600-1700	17.9	0.0	25.2	0.0	0.0	0.0	43.1	35.0	-.0	21.0	15.0	0.0	0.0	0.0	0.0	36.0	35.0	-.0	11.13	4.09	6.39
1700-1800	14.0	0.0	17.0	0.0	0.0	0.0	31.0	32.0	-1.0	25.0	34.0	0.0	0.0	0.0	0.0	59.0	62.0	-3.0	9.46	4.22	6.67
1800-1900	9.0	0.0	23.0	0.0	0.0	0.0	32.0	31.0	-.0	21.0	17.0	0.0	0.0	0.0	0.0	38.0	35.0	-.0	9.21	4.18	4.02
1900-2000	1.0	0.0	1.0	0.0	0.0	0.0	2.0	2.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	9.50	3.28	0.00

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	1.1	0.0	1.4	0.0	0.0	0.0	1.3	.0	.0	2.1	.5	0.0	0.0	0.0	0.0	1.6	0.0	.1	0.0	1.3	1.7
1200-1300	2.1	0.0	3.5	0.0	0.0	0.0	2.9	.0	.6	4.1	1.7	0.0	0.0	0.0	0.0	2.7	.1	.9	0.0	3.5	3.7
1300-1400	1.6	0.0	.4	0.0	0.0	0.0	1.1	.0	.3	7.7	1.1	0.0	0.0	0.0	0.0	4.4	.0	9	0.0	1.4	5.3
1400-1500	1.2	0.0	.6	0.0	0.0	0.0	1.0	.1	.3	7.6	.5	0.0	0.0	0.0	0.0	4.7	.0	.5	0.0	1.4	5.3
1500-1600	2.2	0.0	1.2	0.0	0.0	0.0	1.7	.0	.4	2.7	1.4	0.0	0.0	0.0	0.0	2.0	.1	.4	0.0	2.1	2.5
1600-1700	.6	0.0	3.1	0.0	0.0	0.0	2.1	.0	.6	3.4	1.1	0.0	0.0	0.0	0.0	2.4	.0	1.0	0.0	2.6	3.5
1700-1800	.1	0.0	.6	0.0	0.0	0.0	.4	.1	.2	2.9	3.0	0.0	0.0	0.0	0.0	3.0	.1	1.1	0.0	.6	4.2
1800-1900	.1	0.0	.3	0.0	0.0	0.0	.3	0.0	.4	1.2	.9	0.0	0.0	0.0	0.0	.1	.0	.5	0.0	.7	1.6
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EXPERIMENT 14AA RESULTS

MIAMI INTER. AIRPORT EXPER. 14AA ROUTES=1983 CONFIG=A SEPAR=83VFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100 1200	27.0	20.3	0.0	0.0	0.0	0.0	47.3	50.0	-2.7	4.0	13.0	3.0	0.0	0.0	0.0	20.0	21.0	-1.0	11.16	2.82	4.54
1200 1300	29.0	24.7	0.0	0.0	0.0	0.0	53.7	54.0	-3.0	23.5	22.0	3.0	0.0	0.0	0.0	48.5	52.0	-4.5	12.48	2.83	11.41
1300 1400	26.7	20.0	0.0	0.0	0.0	0.0	46.7	46.0	-2.3	22.5	27.0	5.6	0.0	0.0	0.0	55.1	57.0	-6.4	10.78	3.07	12.37
1400 1500	25.3	16.0	1.0	0.0	0.0	0.0	42.3	41.0	-1.0	19.0	13.0	7.4	0.0	0.0	0.0	39.4	32.0	1.0	10.52	3.29	10.53
1500 1600	27.1	27.0	1.6	0.0	0.0	0.0	55.7	59.0	-4.3	13.0	17.0	2.2	0.0	0.0	0.0	32.2	35.0	-1.8	11.31	3.01	7.08
1600 1700	22.9	19.0	.4	0.0	0.0	0.0	42.3	38.0	-.0	12.0	20.0	3.8	0.0	0.0	0.0	35.8	35.0	-1.0	11.10	2.91	6.39
1700 1800	14.0	18.0	1.0	0.0	0.0	0.0	33.0	33.0	-.0	20.9	28.0	7.7	0.0	0.0	0.0	56.6	59.0	-3.4	10.21	2.77	10.76
1800 1900	16.0	16.0	1.0	0.0	0.0	0.0	33.0	33.0	-.0	13.7	21.0	3.4	0.0	0.0	0.0	38.1	38.0	-3.3	10.12	3.12	6.74
1900 2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	2.4	0.0	.9	0.0	0.0	0.0	3.3	0.0	-.0	0.00	0.00	8.89

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100 1200	1.5	.6	0.0	0.0	0.0	0.0	1.1	.0	.0	1.9	.6	1.1	0.0	0.0	0.0	1.0	0.0	.1	0.0	1.1	1.0
1200 1300	2.3	3.0	0.0	0.0	0.0	0.0	2.6	.0	.0	7.3	6.1	6.8	0.0	0.0	0.0	6.7	.0	.3	0.0	2.7	7.0
1300 1400	.8	1.5	0.0	0.0	0.0	0.0	1.1	.0	.0	12.5	4.4	10.7	0.0	0.0	0.0	8.1	.0	.1	.0	1.1	8.3
1400 1500	1.1	.5	3.7	0.0	0.0	0.0	.9	.0	.0	7.5	1.6	8.1	0.0	0.0	0.0	5.9	.0	.1	.1	.9	6.1
1500 1600	1.2	2.6	2.0	0.0	0.0	0.0	1.9	.0	.0	2.0	3.4	2.3	0.0	0.0	0.0	2.8	.0	.2	0.0	1.9	3.0
1600 1700	1.2	1.1	3.5	0.0	0.0	0.0	1.2	.0	.0	2.1	2.5	2.7	0.0	0.0	0.0	2.4	.0	.1	0.0	1.3	2.5
1700 1800	.3	1.1	0.0	0.0	0.0	0.0	.8	.0	.0	3.9	8.2	6.4	0.0	0.0	0.0	6.4	.0	.1	0.0	.8	6.5
1800 1900	.4	.5	0.0	0.0	0.0	0.0	.5	.1	.0	2.7	2.3	2.5	0.0	0.0	0.0	2.5	.0	.1	0.0	.5	2.6
1900 2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	5.9	0.0	0.0	0.0	3.8	0.0	.1	0.0	0.0	3.9

EXPERIMENT 15 RESULTS

MIAMI INTER. AIRPORT EXPER.-15 ROUTES=1983 CONFIG=B SEPAR=83IFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	22.3	23.5	0.0	0.0	0.0	0.0	45.8	50.0	-4.2	9.4	5.9	0.0	0.0	0.0	0.0	15.3	22.0	-6.7	10.62	4.69	5.22
1200-1300	30.3	22.2	0.0	0.0	0.0	0.0	52.5	54.0	-5.7	17.3	23.8	0.0	0.0	0.0	0.0	41.1	54.0	-19.6	12.35	4.99	14.20
1300-1400	25.4	19.3	0.0	0.0	0.0	0.0	44.7	39.0	-.0	25.7	25.7	0.0	0.0	0.0	0.0	51.4	61.0	-29.2	12.14	4.20	20.65
1400-1500	23.9	16.0	0.0	0.0	0.0	0.0	39.9	41.0	-1.1	25.2	26.6	0.0	0.0	0.0	0.0	51.8	32.0	-9.4	13.90	4.58	32.38
1500-1600	29.4	24.3	0.0	0.0	0.0	0.0	53.7	60.0	-7.4	16.8	19.7	0.0	0.0	0.0	0.0	36.5	39.0	-11.9	13.75	4.73	17.71
1600-1700	26.7	20.7	0.0	0.0	0.0	0.0	47.4	41.0	-1.0	21.5	14.3	0.0	0.0	0.0	0.0	35.8	32.0	-8.1	14.36	4.59	17.55
1700-1800	21.0	12.0	0.0	0.0	0.0	0.0	33.0	34.0	-2.0	25.7	31.5	0.0	0.0	0.0	0.0	57.2	64.0	-14.9	10.22	4.33	12.87
1800-1900	18.0	12.0	0.0	0.0	0.0	0.0	30.0	28.0	-.0	23.4	19.0	0.0	0.0	0.0	0.0	42.4	32.0	-4.5	10.92	4.12	11.21
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	.4	0.0	0.0	0.0	0.0	.4	0.0	-4.1	0.00	0.00	2.45

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	2.6	1.1	0.0	0.0	0.0	0.0	1.8	0.0	.2	3.2	1.7	0.0	0.0	0.0	0.0	2.6	.0	.2	0.0	2.0	2.8
1200-1300	5.1	2.1	0.0	0.0	0.0	0.0	3.9	.0	.7	11.3	8.7	0.0	0.0	0.0	0.0	9.7	.0	2.4	.0	4.6	12.1
1300-1400	5.8	1.0	0.0	0.0	0.0	0.0	3.8	.0	.2	18.4	8.5	0.0	0.0	0.0	0.0	13.4	.0	3.7	1.1	3.9	18.2
1400-1500	6.1	.6	0.0	0.0	0.0	0.0	3.9	.0	.3	16.0	5.8	0.0	0.0	0.0	0.0	10.8	0.0	17.3	1.9	4.2	30.0
1500-1600	5.2	2.7	0.0	0.0	0.0	0.0	4.1	.0	.3	19.0	7.4	0.0	0.0	0.0	0.0	12.7	.0	1.9	.6	4.4	15.2
1600-1700	9.2	1.8	0.0	0.0	0.0	0.0	6.0	.0	.1	18.9	5.9	0.0	0.0	0.0	0.0	13.7	.0	.1	.9	6.1	14.7
1700-1800	1.4	.4	0.0	0.0	0.0	0.0	1.0	0.0	.2	13.2	6.2	0.0	0.0	0.0	0.0	9.4	.0	.2	.6	1.2	10.2
1800-1900	2.5	1.3	0.0	0.0	0.0	0.0	2.0	.0	.0	12.5	1.8	0.0	0.0	0.0	0.0	7.7	.0	.2	.9	2.0	8.8
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	1.8

EXPERIMENT 17 RESULTS

MIAMI INTER. AIRPORT EXPER.-17 ROUTES=1978 CONFIG=B SEPAR=83VFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	27.0	17.3	0.0	0.0	0.0	0.0	44.3	54.0	-9.7	12.4	6.0	0.0	0.0	0.0	0.0	18.4	21.0	-2.6	10.60	4.91	6.48
1200-1300	32.9	25.7	0.0	0.0	0.0	0.0	58.6	49.0	-.1	19.5	22.2	0.0	0.0	0.0	0.0	41.7	52.0	-12.9	16.06	5.62	14.99
1300-1400	27.1	17.0	0.0	0.0	0.0	0.0	44.1	45.0	-1.0	27.8	33.2	0.0	0.0	0.0	0.0	61.0	57.0	-8.9	9.83	4.73	16.97
1400-1500	26.0	18.0	0.0	0.0	0.0	0.0	44.0	47.0	-4.0	24.0	15.6	0.0	0.0	0.0	0.0	39.6	33.0	-2.3	10.02	4.91	14.79
1500-1600	35.1	18.0	0.0	0.0	0.0	0.0	53.1	57.0	-7.9	14.9	17.1	1.0	0.0	0.0	0.0	33.0	34.0	-3.3	11.31	5.11	8.54
1600-1700	27.9	16.0	0.0	0.0	0.0	0.0	43.9	36.0	-.0	21.9	14.8	1.0	0.0	0.0	0.0	37.7	35.0	-.6	12.65	4.40	10.20
1700-1800	22.0	12.0	0.0	0.0	0.0	0.0	34.0	34.0	-.0	24.9	32.7	0.0	0.0	0.0	0.0	57.6	62.0	-5.0	9.80	4.17	8.75
1800-1900	13.0	17.0	0.0	0.0	0.0	0.0	30.0	30.0	-.0	18.2	17.9	0.0	0.0	0.0	0.0	36.1	35.0	-3.9	9.18	5.46	6.19
1900-2000	1.0	1.0	0.0	0.0	0.0	0.0	2.0	2.0	-.0	3.4	.5	0.0	0.0	0.0	0.0	3.9	0.0	-.0	11.75	4.35	12.93

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	2.2	.4	0.0	0.0	0.0	0.0	1.5	.0	.3	3.2	.5	0.0	0.0	0.0	0.0	2.3	.1	1.4	0.0	1.8	3.8
1200-1300	11.8	1.4	0.0	0.0	0.0	0.0	7.2	.0	.9	15.4	5.5	0.0	0.0	0.0	0.0	10.1	.0	2.5	.0	8.1	12.5
1300-1400	1.7	.4	0.0	0.0	0.0	0.0	1.2	0.0	.4	13.2	4.6	0.0	0.0	0.0	0.0	8.5	.0	5.4	.5	1.6	14.5
1400-1500	1.5	1.4	0.0	0.0	0.0	0.0	1.5	.0	.4	14.5	1.3	0.0	0.0	0.0	0.0	9.3	.0	1.5	1.0	2.0	11.9
1500-1600	2.9	.8	0.0	0.0	0.0	0.0	2.2	.0	.9	5.8	2.7	.2	0.0	0.0	0.0	4.0	.1	1.8	.0	3.1	5.9
1600-1700	5.6	.7	0.0	0.0	0.0	0.0	3.8	.0	.2	8.3	2.7	1.5	0.0	0.0	0.0	5.9	.0	1.1	0.0	4.1	7.1
1700-1800	.7	.5	0.0	0.0	0.0	0.0	.6	0.0	.1	4.8	4.8	0.0	0.0	0.0	0.0	4.8	.0	1.2	0.0	.7	6.0
1800-1900	.4	.6	0.0	0.0	0.0	0.0	.5	.0	.6	2.4	1.1	0.0	0.0	0.0	0.0	1.8	.0	1.9	0.0	1.1	3.7
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	1.5	0.0	0.0	0.0	0.0	3.6	0.0	5.9	0.0	0.0	9.5

EXPERIMENT 20N RESULTS

MIAMI INTER. AIRPORT EXPER.-20N ROUTES=1983 CONFIG=B SEPAR=83IFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	22.6	23.5	0.0	0.0	0.0	0.0	46.1	50.0	-3.9	8.6	6.2	0.0	0.0	0.0	0.0	14.8	17.0	-2.2	10.69	4.75	5.29
1200-1300	28.5	21.4	0.0	0.0	0.0	0.0	49.9	51.0	-5.0	16.4	24.6	0.0	0.0	0.0	0.0	41.0	50.0	-11.2	12.32	5.07	13.02
1300-1400	23.9	18.1	0.0	0.0	0.0	0.0	42.0	37.0	-.0	26.1	27.9	0.0	0.0	0.0	0.0	54.0	58.0	-15.2	11.49	4.11	15.87
1400-1500	23.0	16.0	0.0	0.0	0.0	0.0	39.0	39.0	-.0	22.7	23.3	0.0	0.0	0.0	0.0	46.0	32.0	-1.2	12.45	4.57	22.24
1500-1600	27.2	24.3	0.0	0.0	0.0	0.0	51.5	55.0	-3.5	14.4	19.5	0.0	0.0	0.0	0.0	33.9	36.0	-3.3	11.88	4.87	11.61
1600-1700	22.8	20.7	0.0	0.0	0.0	0.0	43.5	41.0	-1.0	19.8	14.5	0.0	0.0	0.0	0.0	34.3	32.0	-1.0	10.30	4.65	10.42
1700-1800	20.1	12.0	0.0	0.0	0.0	0.0	32.1	33.0	-1.9	24.0	30.9	0.0	0.0	0.0	0.0	54.9	62.0	-8.1	10.10	4.41	10.52
1800-1900	17.9	12.0	0.0	0.0	0.0	0.0	29.9	28.0	-.0	20.0	18.5	0.0	0.0	0.0	0.0	38.5	31.0	-.6	10.82	4.16	7.72
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	.5	0.0	0.0	0.0	0.0	.5	0.0	-.1	0.00	0.00	3.23

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	2.7	1.0	0.0	0.0	0.0	0.0	1.9	0.0	.2	3.3	2.2	0.0	0.0	0.0	0.0	2.8	.0	.2	0.0	2.1	3.0
1200-1300	4.6	2.1	0.0	0.0	0.0	0.0	3.5	.0	.8	9.2	8.5	0.0	0.0	0.0	0.0	8.7	.0	2.3	0.0	4.4	11.0
1300-1400	3.9	1.1	0.0	0.0	0.0	0.0	2.7	.0	.1	12.5	7.0	0.0	0.0	0.0	0.0	9.7	0.0	3.7	.2	2.8	13.5
1400-1500	3.7	.6	0.0	0.0	0.0	0.0	2.4	.0	.2	8.2	5.7	0.0	0.0	0.0	0.0	6.9	0.0	12.8	.1	2.6	19.8
1500-1600	1.2	2.7	0.0	0.0	0.0	0.0	1.9	.0	.3	6.2	7.9	0.0	0.0	0.0	0.0	7.2	.0	2.0	0.0	2.2	9.2
1600-1700	2.3	1.6	0.0	0.0	0.0	0.0	1.9	.0	.1	7.6	7.3	0.0	0.0	0.0	0.0	7.5	.0	.1	0.0	2.1	7.6
1700-1800	.8	.4	0.0	0.0	0.0	0.0	.6	0.0	.2	9.3	6.4	0.0	0.0	0.0	0.0	7.7	.0	.2	.0	.9	7.9
1800-1900	2.3	1.3	0.0	0.0	0.0	0.0	1.9	.0	.0	7.7	2.5	0.0	0.0	0.0	0.0	5.2	.0	.2	.0	1.9	5.5
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	2.4

EXPERIMENT 21N RESULTS

MIAMI INTER. AIRPORT EXPER.-21N ROUTES=1983 CONFIG=X35A SEPAR=83IFR1-IFR2 DEMAND

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	24.5	22.0	0.0	0.0	0.0	0.0	46.5	52.0	-5.5	3.0	11.8	2.6	0.0	0.0	0.0	17.4	19.0	-1.6	12.39	2.99	5.40
1200-1300	30.1	21.0	0.0	0.0	0.0	0.0	51.1	47.0	-1.4	20.3	20.2	1.6	0.0	0.0	0.0	42.1	50.0	-9.5	14.13	2.85	11.25
1300-1400	1.4	30.6	0.0	0.0	0.0	0.0	32.0	44.0	-13.4	30.7	20.0	7.2	0.0	0.0	0.0	57.9	56.0	-7.6	21.80	4.06	13.62
1400-1500	25.0	26.4	0.0	0.0	0.0	0.0	51.4	38.0	-.0	12.8	18.0	7.1	0.0	0.0	0.0	37.9	32.0	-1.7	21.33	3.28	14.28
1500-1600	25.7	25.9	0.0	0.0	0.0	0.0	51.6	60.0	-8.4	13.2	15.0	2.9	0.0	0.0	0.0	31.1	31.0	-1.6	12.41	3.05	9.28
1600-1700	23.3	19.1	0.0	0.0	0.0	0.0	42.4	34.0	-.0	12.0	20.0	3.6	0.0	0.0	0.0	35.6	34.0	-.0	12.95	3.05	7.93
1700-1800	13.9	16.0	0.0	0.0	0.0	0.0	29.9	31.0	-1.1	20.1	24.0	4.8	0.0	0.0	0.0	48.9	58.0	-9.1	10.79	2.62	9.31
1800-1900	16.1	12.0	0.0	0.0	0.0	0.0	28.1	27.0	-.0	13.0	20.0	7.2	0.0	0.0	0.0	40.2	34.0	-2.9	10.04	3.26	9.40
1900-2000	0.0	2.0	0.0	0.0	0.0	0.0	2.0	2.0	-.0	2.9	0.0	0.0	0.0	0.0	0.0	2.9	0.0	-.0	8.99	2.71	8.22
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.00	0.00	0.00
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.00	0.00	0.00
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.00	0.00	0.00
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.00	0.00	0.00
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	0.00	0.00	0.00

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	2.6	1.3	0.0	0.0	0.0	0.0	2.0	.0	.0	1.9	1.5	3.8	0.0	0.0	0.0	1.9	0.0	.0	0.0	2.0	1.9
1200-1300	4.7	4.6	0.0	0.0	0.0	0.0	4.6	.0	.0	8.2	4.0	16.3	0.0	0.0	0.0	6.6	.0	.1	0.0	4.6	6.8
1300-1400	1.5	12.7	0.0	0.0	0.0	0.0	12.3	.0	.0	6.7	10.7	10.3	0.0	0.0	0.0	8.7	.0	.1	.3	12.3	9.1
1400-1500	1.2	21.5	0.0	0.0	0.0	0.0	11.6	.0	.0	5.8	13.5	8.1	0.0	0.0	0.0	10.0	.0	.2	.1	11.7	10.3
1500-1600	1.6	3.3	0.0	0.0	0.0	0.0	2.5	.0	.0	4.4	5.1	5.1	0.0	0.0	0.0	5.0	.0	.1	0.0	2.5	5.1
1600-1700	4.1	2.1	0.0	0.0	0.0	0.0	3.2	.0	.0	2.8	3.3	11.3	0.0	0.0	0.0	3.9	.0	.0	0.0	3.2	4.0
1700-1800	.8	2.1	0.0	0.0	0.0	0.0	1.5	.0	.0	2.6	6.9	2.8	0.0	0.0	0.0	4.7	.0	.1	0.0	1.5	4.9
1800-1900	.3	.8	0.0	0.0	0.0	0.0	.5	.0	.0	3.2	2.4	16.2	0.0	0.0	0.0	5.2	.0	.0	0.0	.6	5.2
1900-2000	0.0	.5	0.0	0.0	0.0	0.0	.5	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	2.6	0.0	.1	0.0	.5	2.8
2000-2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2100-2200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2200-2300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2300-2400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2400-2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EXPERIMENT 34 RESULTS

MIAMI INTER. AIRPORT EXPER.-34 ROUTES=1978 CONFIG=A SEPAR=78IFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIME FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
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	15.1	17.0	-1.9	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	36.7	54.0	-17.3	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	27.1	58.0	-30.9	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	26.5	32.0	-5.5	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	4.6	0.0	0.0	23.9	38.0	-14.1	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	29.8	33.0	-3.2	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	27.3	67.0	-39.7	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	30.7	33.0	-2.3	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	57.6	0.0	57.6	27.68	10.08	130.75

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	RWY CRS	TAX IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	TOT	RWY CRS	TAX OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
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	2.3	.0	.1	0.0	4.4	2.4
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	9.8	.0	1.1	0.0	18.3	10.9
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	26.6	.1	2.1	.9	28.0	29.7
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	41.7	.0	10.4	9.2	21.1	61.2
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	50.4	.0	22.7	15.3	24.6	88.4
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	59.1	.0	27.1	26.4	31.4	112.7
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	53.5	.0	22.6	38.4	39.3	114.5
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	51.9	.0	23.7	42.2	33.5	117.9
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	47.6	.0	17.2	61.9	26.7	126.7

EXPERIMENT 35A RESULTS

MIAMI INTER. AIRPORT EXPER.-35A ROUTES=1983 CONFIG=A SEPAR=83IFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	24.5	22.0	0.0	0.0	0.0	0.0	46.5	52.0	-5.5	3.0	11.8	2.6	0.0	0.0	0.0	17.4	19.0	-1.6	12.39	2.99	5.40
1200-1300	30.1	21.0	0.0	0.0	0.0	0.0	51.1	47.0	-1.4	20.3	20.2	1.6	0.0	0.0	0.0	42.1	50.0	-9.5	14.13	2.85	11.25
1300-1400	26.4	17.0	0.0	0.0	0.0	0.0	43.4	44.0	-2.0	25.5	26.0	3.0	0.0	0.0	0.0	54.5	56.0	-11.0	13.07	3.08	15.45
1400-1500	27.0	13.0	0.0	0.0	0.0	0.0	40.0	38.0	-.0	18.5	11.7	6.4	0.0	0.0	0.0	36.6	32.0	-6.4	11.15	3.02	19.62
1500-1600	25.9	25.9	0.0	0.0	0.0	0.0	51.8	60.0	-8.2	12.6	15.3	6.6	0.0	0.0	0.0	34.5	31.0	-2.9	12.51	3.06	19.05
1600-1700	25.1	19.1	0.0	0.0	0.0	0.0	44.2	36.0	-.0	12.1	20.0	4.8	0.0	0.0	0.0	36.9	34.0	-.0	13.21	3.07	10.41
1700-1800	13.9	16.0	0.0	0.0	0.0	0.0	29.9	31.0	-1.1	21.0	24.0	4.7	0.0	0.0	0.0	49.7	59.0	-9.3	10.79	2.63	9.61
1800-1900	16.1	12.0	0.0	0.0	0.0	0.0	28.1	27.0	-.0	13.2	20.0	7.3	0.0	0.0	0.0	40.5	34.0	-2.8	10.05	3.25	9.36
1900-2000	0.0	2.0	0.0	0.0	0.0	0.0	2.0	2.0	-.0	2.8	0.0	0.0	0.0	0.0	0.0	2.8	0.0	-.0	8.93	2.71	8.08

AVERAGE DELAYS

TIME	ARRIVALS RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 9R	RWY 9L	RWY 12	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	2.6	1.3	0.0	0.0	0.0	0.0	2.0	.0	.0	1.9	1.5	3.8	0.0	0.0	0.0	1.9	0.0	.0	0.0	2.0	1.9
1200-1300	4.7	4.6	0.0	0.0	0.0	0.0	4.6	.0	.0	8.2	4.0	16.3	0.0	0.0	0.0	6.6	.0	.1	0.0	4.6	6.8
1300-1400	4.4	1.2	0.0	0.0	0.0	0.0	3.2	.0	.0	14.9	3.3	38.4	0.0	0.0	0.0	10.7	.0	.1	.4	3.2	11.1
1400-1500	2.3	.3	0.0	0.0	0.0	0.0	1.7	.0	.0	9.2	1.7	53.7	0.0	0.0	0.0	14.8	.0	.2	.1	1.7	15.1
1500-1600	1.8	3.3	0.0	0.0	0.0	0.0	2.5	.0	.0	4.4	4.4	47.9	0.0	0.0	0.0	12.9	.0	1.4	.7	2.6	15.0
1600-1700	4.5	2.1	0.0	0.0	0.0	0.0	3.5	.0	.0	3.1	3.6	22.9	0.0	0.0	0.0	6.4	.0	.0	.0	3.5	6.5
1700-1800	1.0	2.0	0.0	0.0	0.0	0.0	1.5	0.0	.0	2.2	7.9	2.9	0.0	0.0	0.0	5.0	.0	.1	0.0	1.5	5.2
1800-1900	.4	.8	0.0	0.0	0.0	0.0	.6	.0	.0	3.1	2.4	15.7	0.0	0.0	0.0	5.1	0.0	.0	0.0	.6	5.2
1900-2000	0.0	.4	0.0	0.0	0.0	0.0	.4	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	2.4	.0	.2	0.0	.4	2.6

EXPERIMENT 36 RESULTS

MIAMI INTER. AIRPORT EXPER.-36 ROUTES=1983 CONFIG=B SEPAR=83VFR1 DEMAND=83

AVERAGE FLOW RATES

	ARRIVALS									DEPARTURES									AVERAGE TRAVEL TIMES		
TIME	RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	23.0	5.3	23.8	0.0	0.0	0.0	52.1	55.0	-2.9	10.6	7.0	0.0	0.0	0.0	0.0	17.6	21.0	-3.4	10.12	3.89	4.35
1200-1300	31.6	5.7	23.2	0.0	0.0	0.0	60.5	58.0	-.4	22.9	32.7	1.0	0.0	0.0	0.0	56.6	63.0	-9.8	11.52	3.78	10.65
1300-1400	27.4	3.0	18.0	0.0	0.0	0.0	48.4	52.0	-4.0	28.6	30.2	1.0	0.0	0.0	0.0	59.8	66.0	-16.0	13.85	3.56	13.96
1400-1500	21.0	5.2	21.0	0.0	0.0	0.0	47.2	44.0	-.8	33.6	13.1	0.0	0.0	0.0	0.0	46.7	33.0	-2.3	11.98	3.81	20.86
1500-1600	26.0	3.8	30.1	0.0	0.0	0.0	59.9	71.0	-11.9	21.2	22.8	0.0	0.0	0.0	0.0	44.0	45.0	-3.3	11.69	3.77	6.53
1600-1700	23.0	4.0	22.9	0.0	0.0	0.0	49.9	38.0	-.0	23.1	12.2	1.0	0.0	0.0	0.0	36.3	35.0	-2.0	15.52	3.74	6.32
1700-1800	24.1	2.0	16.0	0.0	0.0	0.0	42.1	46.0	-3.9	30.1	35.0	0.0	0.0	0.0	0.0	65.1	72.0	-8.9	10.91	3.48	9.71
1800-1900	15.9	2.0	15.0	0.0	0.0	0.0	32.9	31.0	-2.0	24.9	19.0	0.0	0.0	0.0	0.0	43.9	35.0	-.0	9.47	3.54	8.95
1900-2000	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	11.69	3.27	0.00

AVERAGE DELAYS

	ARRIVALS										DEPARTURES									GRAND TOTAL AVERAGE DELAYS	
TIME	RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	ARR DELAY	DEP DELAY
1100-1200	.6	1.8	.9	0.0	0.0	0.0	.9	.0	.0	2.1	.7	0.0	0.0	0.0	0.0	1.5	.1	.2	0.0	.9	1.9
1200-1300	3.6	3.0	1.5	0.0	0.0	0.0	2.7	.0	.2	11.3	4.0	3.4	0.0	0.0	0.0	7.0	.1	1.5	0.0	2.9	8.5
1300-1400	8.5	.7	.7	0.0	0.0	0.0	5.1	0.0	.0	18.1	1.8	.8	0.0	0.0	0.0	9.6	.0	.4	1.6	5.1	11.5
1400-1500	5.8	.8	.7	0.0	0.0	0.0	3.0	.1	.0	17.8	1.0	0.0	0.0	0.0	0.0	13.1	.0	.2	4.6	3.1	17.9
1500-1600	2.1	1.6	3.5	0.0	0.0	0.0	2.8	.1	.0	4.9	2.1	0.0	0.0	0.0	0.0	3.5	.1	.2	.2	2.9	3.9
1600-1700	1.3	5.1	12.8	0.0	0.0	0.0	6.9	.0	.0	4.0	1.6	5.1	0.0	0.0	0.0	3.2	.0	.1	0.0	6.9	3.4
1700-1800	2.5	.7	.8	0.0	0.0	0.0	1.7	.1	.0	10.1	3.8	0.0	0.0	0.0	0.0	6.7	.0	.2	.1	1.8	7.0
1800-1900	2.3	1.4	.8	0.0	0.0	0.0	1.6	0.0	.0	10.0	.8	0.0	0.0	0.0	0.0	6.0	.0	.2	.3	1.6	6.5
1900-2000	0.0	0.0	2.2	0.0	0.0	0.0	2.2	0.0	.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0

EXPERIMENT 37 RESULTS

MIAMI INTER. AIRPORT EXPER.-37 ROUTES=1983 CONFIG=B SEPAR=B3VFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	19.8	4.0	23.9	0.0	0.0	0.0	47.7	56.0	-8.3	15.0	6.0	0.0	0.0	0.0	0.0	21.0	21.0	0.0	11.25	4.11	4.36
1200-1300	28.2	3.0	25.3	0.0	0.0	0.0	56.5	49.0	-.8	21.6	30.0	-0.0	0.0	0.0	0.0	51.6	52.0	-.4	11.61	3.88	6.92
1300-1400	21.0	4.0	17.8	0.0	0.0	0.0	42.8	44.0	-2.0	29.1	26.0	0.0	0.0	0.0	0.0	55.1	57.0	-2.3	10.15	3.96	6.24
1400-1500	26.5	1.0	15.0	0.0	0.0	0.0	42.5	41.0	-.5	19.3	15.0	0.0	0.0	0.0	0.0	34.3	33.0	-1.0	11.15	3.67	6.28
1500-1600	27.6	5.0	22.3	0.0	0.0	0.0	54.9	59.0	-4.6	15.2	18.0	1.0	0.0	0.0	0.0	34.2	34.0	-.8	11.35	3.86	5.04
1600-1700	19.9	3.0	20.7	0.0	0.0	0.0	43.6	39.0	-.0	20.8	13.8	1.0	0.0	0.0	0.0	35.6	35.0	-.2	11.05	3.89	5.76
1700-1800	12.0	5.0	17.0	0.0	0.0	0.0	34.0	34.0	-.0	25.0	34.0	0.0	0.0	0.0	0.0	59.0	62.0	-3.2	9.92	3.69	6.45
1800-1900	11.0	5.0	15.0	0.0	0.0	0.0	31.0	31.0	-.0	21.0	17.2	0.0	0.0	0.0	0.0	38.2	35.0	-.0	9.75	3.87	4.29
1900-2000	0.0	0.0	1.0	0.0	0.0	0.0	1.0	1.0	-.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.0	9.50	3.14	0.00

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	.9	1.9	2.2	0.0	0.0	0.0	1.7	.1	.0	2.0	1.1	0.0	0.0	0.0	0.0	1.8	.0	.0	0.0	1.7	1.8
1200-1300	1.5	2.2	3.1	0.0	0.0	0.0	2.3	.0	.0	7.5	2.4	0.0	0.0	0.0	0.0	4.5	.0	.3	0.0	2.3	4.8
1300-1400	.6	.7	.9	0.0	0.0	0.0	.7	.1	.0	5.3	1.6	0.0	0.0	0.0	0.0	3.5	.0	.3	0.0	.8	3.8
1400-1500	2.2	0.0	1.1	0.0	0.0	0.0	1.8	.0	.0	5.6	.6	0.0	0.0	0.0	0.0	3.4	.0	.0	0.0	1.8	3.5
1500-1600	2.2	.8	2.2	0.0	0.0	0.0	2.1	.1	.0	3.0	1.6	1.7	0.0	0.0	0.0	2.3	.0	.4	0.0	2.1	2.7
1600-1700	1.8	.5	1.7	0.0	0.0	0.0	1.7	.1	.1	3.2	1.5	5.1	0.0	0.0	0.0	2.6	.0	.2	0.0	1.8	2.8
1700-1800	.0	.5	.7	0.0	0.0	0.0	.4	.0	.0	2.1	4.7	0.0	0.0	0.0	0.0	3.6	.0	.4	0.0	.5	4.0
1800-1900	.3	.3	.8	0.0	0.0	0.0	.5	.0	.0	1.7	1.3	0.0	0.0	0.0	0.0	1.5	.0	.3	0.0	.5	1.9
1900-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	0.0

EXPERIMENT 38 RESULTS

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

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF
1100-1200	24.1	23.8	0.0	0.0	0.0	47.9	55.0	-7.1	9.7	6.7	0.0	0.0	0.0	16.4	21.0	-4.6
1200-1300	29.4	23.2	0.0	0.0	0.0	52.6	58.0	-5.4	20.7	27.2	1.0	0.0	0.0	48.9	63.0	-14.1
1300-1400	26.7	20.0	0.0	0.0	0.0	46.7	52.0	-5.3	26.5	29.1	1.0	0.0	0.0	56.6	66.0	-9.4
1400-1500	27.1	17.0	0.0	0.0	0.0	44.1	44.0	.1	27.3	19.0	0.0	0.0	0.0	46.3	33.0	13.3
1500-1600	27.2	25.1	0.0	0.0	0.0	52.3	71.0	-18.7	24.6	21.2	0.0	0.0	0.0	45.8	45.0	.8
1600-1700	26.6	18.9	0.0	0.0	0.0	45.5	38.0	7.5	25.2	12.1	1.0	0.0	0.0	38.3	35.0	3.3
1700-1800	26.9	14.0	0.0	0.0	0.0	40.9	46.0	-5.1	25.1	31.2	0.0	0.0	0.0	56.3	72.0	-15.7
1800-1900	27.9	12.0	0.0	0.0	0.0	39.9	31.0	8.9	25.5	22.5	0.0	0.0	0.0	48.0	35.0	13.0
1900-2000	24.1	1.0	0.0	0.0	0.0	25.1	0.0	25.1	11.4	2.0	0.0	0.0	0.0	13.4	0.0	13.4

AVERAGE TRAVEL TIME

TIME	FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	9.91	4.58	4.70
1200-1300	15.91	5.32	14.13
1300-1400	26.02	4.66	21.66
1400-1500	34.30	5.10	35.60
1500-1600	31.66	5.06	25.39
1600-1700	40.10	4.76	22.69
1700-1800	57.46	5.34	17.41
1800-1900	54.80	4.36	22.65
1900-2000	66.50	3.39	26.92

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX OUT	RWY CNG
1100-1200	2.0	1.3	0.0	0.0	0.0	1.6	0.0	.2	1.7	1.2	0.0	0.0	0.0	1.5	.1	.5	0.0
1200-1300	14.4	.8	0.0	0.0	0.0	8.4	.0	.9	12.4	5.8	1.0	0.0	0.0	8.4	.0	3.2	.0
1300-1400	31.7	1.1	0.0	0.0	0.0	18.6	.0	.5	19.4	5.1	.7	0.0	0.0	11.7	.0	5.3	2.1
1400-1500	40.9	.7	0.0	0.0	0.0	25.4	.0	.9	28.1	4.7	0.0	0.0	0.0	18.4	.0	7.4	6.9
1500-1600	40.2	2.5	0.0	0.0	0.0	22.1	.0	.7	20.2	4.7	0.0	0.0	0.0	13.0	.0	4.2	5.2
1600-1700	53.2	2.4	0.0	0.0	0.0	32.1	.0	.2	20.2	2.4	1.2	0.0	0.0	14.1	.0	1.7	3.7
1700-1800	74.7	.5	0.0	0.0	0.0	49.3	.0	.6	18.4	6.2	0.0	0.0	0.0	11.6	.0	1.4	1.4
1800-1900	66.0	1.3	0.0	0.0	0.0	46.5	.0	.7	19.9	2.7	0.0	0.0	0.0	11.9	.0	3.5	4.5
1900-2000	62.0	1.5	0.0	0.0	0.0	59.5	0.0	.0	21.0	.2	0.0	0.0	0.0	17.8	0.0	2.5	3.6

GRAND TOTAL AVERAGE DELAYS

TIME	ARR. DELAY	DEP DELAY
1100-1200	1.8	2.1
1200-1300	9.3	11.6
1300-1400	19.0	19.1
1400-1500	26.3	32.7
1500-1600	22.8	22.5
1600-1700	32.3	19.5
1700-1800	50.0	14.4
1800-1900	47.2	20.0
1900-2000	59.5	24.0

EXPERIMENT 39 RESULTS

MIAMI INTER. AIRPORT EXPER.-39 ROUTES=1978 CONFIG-B SEPAR-7DIFRT DEMAND-83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	DE-MAND	DIF
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
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
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
1400-1500	24.1	16.4	0.0	0.0	0.0	40.5	41.0	-.5	12.5	26.9	0.0	0.0	0.0	39.4	32.0	7.4
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
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
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
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
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

AVERAGE TRAVEL TIME

FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
12.32	4.57	5.08
20.50	6.10	14.98
26.64	5.22	23.83
25.48	15.71	55.35
29.54	19.92	65.63
33.97	12.13	70.53
40.25	12.86	40.74
36.52	6.81	53.67
11.80	2.06	77.85

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	TOT	RWY CRS	TAX OUT	RWY CNG
1100-1200	4.4	2.4	0.0	0.0	0.0	3.3	0.0	.0	2.1	1.7	0.0	0.0	0.0	1.9	.1	.5	0.0
1200-1300	17.7	6.5	0.0	0.0	0.0	12.2	.0	1.5	8.2	11.2	0.0	0.0	0.0	9.6	0.0	2.9	0.0
1300-1400	31.2	2.3	0.0	0.0	0.0	18.2	.0	1.1	21.1	13.3	.0	0.0	0.0	16.4	0.0	4.1	.5
1400-1500	25.1	2.0	0.0	0.0	0.0	15.7	.0	11.5	45.4	3.5	0.0	0.0	0.0	19.8	.0	27.8	5.4
1500-1600	34.0	5.7	0.0	0.0	0.0	19.7	.0	15.3	50.1	18.1	0.0	0.0	0.0	31.7	0.0	21.8	9.7
1600-1700	47.1	6.9	0.0	0.0	0.0	25.8	.0	7.5	54.9	15.3	0.0	0.0	0.0	29.0	.0	25.9	13.0
1700-1800	50.5	.8	0.0	0.0	0.0	31.6	.0	8.8	36.8	7.1	0.0	[illegible]	0.0	17.0	.0	7.7	13.3
1800-1900	39.4	1.1	0.0	0.0	0.0	29.7	.0	3.9	48.7	3.8	0		0.0	19.8	.0	15.2	16.2
1900-2000	9.0	0.0	0.0	0.0	0.0	9.0	0.0	.9	32.5	.4	0.0	0.0	0.0	23.0	0.0	11.5	41.5

GRAND TOTAL AVERAGE DELAYS

ARR DELAY	DEP DELAY
3.4	2.5
13.7	12.5
19.3	21.0
27.2	53.0
34.9	63.2
33.4	67.8
40.4	38.1
33.6	51.2
9.9	76.0

EXPERIMENT 40 RESULTS

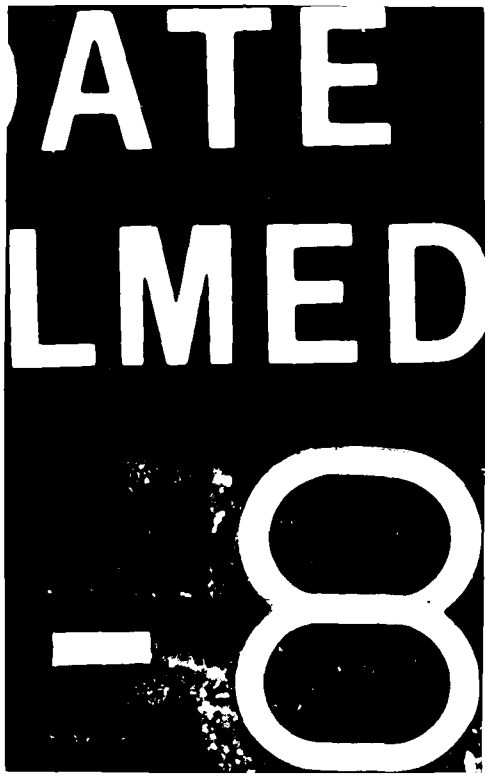
MIAMI INTER. AIRPORT EXPER.-40 ROUTES=1978 CONFIG=B SEPAR=78VFR1 DEMAND=83

AVERAGE FLOW RATES

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	DE-MAND	DIF	AVERAGE TRAVEL TIMES FIX TO THRESH	THRESH TO GATE	GATE TO ROLL
1100-1200	23.3	23.9	0.0	0.0	0.0	0.0	47.2	55.0	-7.8	11.7	4.9	0.0	0.0	0.0	0.0	16.6	21.0	-4.4	10.07	4.71	6.63
1200-1300	28.2	20.1	0.0	0.0	0.0	0.0	48.3	58.0	-17.5	22.9	29.7	0.0	0.0	0.0	0.0	52.6	63.0	-14.8	18.46	5.79	13.01
1300-1400	27.2	18.0	0.0	0.0	0.0	0.0	45.2	52.0	-24.3	26.4	27.3	0.0	0.0	0.0	0.0	53.7	66.0	-27.1	31.41	4.59	19.29
1400-1500	26.2	20.0	0.0	0.0	0.0	0.0	46.2	44.0	-22.1	27.0	13.1	0.0	0.0	0.0	0.0	40.1	33.0	-20.0	39.47	4.55	37.48
1500-1600	27.5	26.7	0.0	0.0	0.0	0.0	54.2	71.0	-38.9	23.5	21.7	0.0	0.0	0.0	0.0	45.2	45.0	-19.8	36.49	5.45	30.81
1600-1700	27.0	19.3	0.0	0.0	0.0	0.0	46.3	38.0	-30.6	26.3	17.3	0.0	0.0	0.0	0.0	43.6	35.0	-11.2	41.86	4.32	28.43
1700-1800	26.1	14.0	0.0	0.0	0.0	0.0	40.1	46.0	-36.5	25.5	32.3	0.0	0.0	0.0	0.0	57.8	72.0	-25.4	59.38	5.48	19.52
1800-1900	28.3	13.0	0.0	0.0	0.0	0.0	41.3	31.0	-26.2	26.5	24.7	0.0	0.0	0.0	0.0	51.2	35.0	-9.2	57.26	4.07	19.20
1900-2000	25.0	1.0	0.0	0.0	0.0	0.0	26.0	0.0	-.2	8.2	.8	0.0	0.0	0.0	0.0	9.0	0.0	-.2	70.12	3.57	20.12

AVERAGE DELAYS

TIME	ARRIVALS RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI IN	DEPARTURES RWY 27R	RWY 27L	RWY 30	RWY	RWY	RWY	TOT	RWY CRS	TAXI OUT	RWY CNG	GRAND TOTAL AVERAGE DELAYS ARR DELAY	DEP DELAY
1100-1200	2.3	1.2	0.0	0.0	0.0	0.0	1.7	.0	.2	4.5	.6	0.0	0.0	0.0	0.0	3.4	.1	.2	0.0	1.9	3.7
1200-1300	16.7	1.8	0.0	0.0	0.0	0.0	10.5	.0	1.2	10.8	5.4	0.0	0.0	0.0	0.0	7.7	.0	2.8	.0	11.7	10.5
1300-1400	38.5	.9	0.0	0.0	0.0	0.0	23.5	.0	.4	19.4	3.9	0.0	0.0	0.0	0.0	11.5	.0	3.2	2.0	23.9	16.7
1400-1500	54.5	1.3	0.0	0.0	0.0	0.0	31.5	.0	.3	32.4	3.0	0.0	0.0	0.0	0.0	22.8	.0	2.0	9.5	31.8	34.4
1500-1600	51.1	3.3	0.0	0.0	0.0	0.0	27.5	.0	1.0	23.3	4.9	0.0	0.0	0.0	0.0	14.4	.0	5.1	8.3	20.5	28.0
1600-1700	55.9	2.4	0.0	0.0	0.0	0.0	33.6	.0	.2	24.5	3.5	0.0	0.0	0.0	0.0	16.2	.0	2.2	6.9	33.8	25.3
1700-1800	78.7	.7	0.0	0.0	0.0	0.0	51.5	.0	.7	18.6	6.9	0.0	0.0	0.0	0.0	12.1	.0	2.4	2.1	52.2	16.6
1800-1900	70.8	.3	0.0	0.0	0.0	0.0	48.6	0.0	.4	18.6	2.3	0.0	0.0	0.0	0.0	10.8	.0	2.6	3.0	48.9	16.4
1900-2000	65.8	1.5	0.0	0.0	0.0	0.0	63.3	0.0	0.0	14.6	.2	0.0	0.0	0.0	0.0	13.5	0.0	1.6	2.1	63.3	17.1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