A MODERN FLIGHT DISPATCH CENTER

INTRODUCTION

The transition from piston to jet equipment by the airlines has been a period of constant challenge to say the least and, needless to say, we have not yet solved all our problems. However, we are proud to present the fruits of our efforts to date in the development of tools and procedures to enable Flight Dispatch to measure up to the requirements of the jet age in air transportation. The office layout, techniques and procedures are the result of years of experimenting by this office.

J. H. Bell
Regional Manager
Flight Dispatch
Central Region

PART ONE - Reproduction of SKYLINER article February 1, 1965, entitled "Flight Dispatchers Direct Nerve Center of Airline."

TRANS WORLD AIRLINES, INC.

CENTRAL REGION

A MODERN FLIGHT DISPATCH CENTER

KANSAS CITY, MISSOURI

MAY 20, 1965

INDEX

SKYLINER MATERIAL

Kansas City Flight Dispatcher, Jim Huggins, turned the frequency dial on the SELCAL unit in front of him to 129.0 megacycles, pushed the buttons marked K G L J and a melodic chime rang in the cockpit of Flight 156, almost seven miles in the air. The captain of the 880 responded immediately to the signal. Jim was calling to report a weather change en route which affected the flight plan.

Such messages are only one of the many vital services he and his colleagues must provide to keep TWA's aircraft flying safely and reliably.

The unit Mr. Huggins used to contact Flight 156 is a marvel of communications which permits him and his fellow dispatchers instantaneous contact with TWA aircraft in their region. It is an example of the sophisticated flight information "tools" in the Kansas City Flight Dispatch Center, referred to by E. W. Jacobson, Vice President Transportation, Central Region, as "truly a jet age dispatch office, equipped with the latest and best devices to give better service to the pilot and the passenger." He noted that "better service in this case means an added measure of safety to an already safe operation."

A flight dispatch office could be called the "nerve center" of an airline. It is a world of weather facsimile machines, teletypes, status boards, burn-off computations and "squawk boxes", far removed from the hustle and bustle of the airport lobby and the check-in counters. In this environment works the flight dispatcher, without whom, according to Civil Air Regulations, no U. S. scheduled airline can operate. He must be FAA-certified. He is part meteorologist, part communications specialist, part expert on Civil Air Regulations. Simply stated, he must convert meteorological and other data into terms of operational probability.

There are 21 flight dispatchers assigned to the Kansas City office, representing 443 years of TWA service. They work under the aegis of J. H. (Joe) Bell, regional manager of flight dispatch, himself a 33-year TWA veteran. The Kansas City Flight Dispatch Center was recently remodeled and its facilities are a match for the best in the industry.

Joe Bell and his enthusiastic, conscientious crew have expended a good deal of time working on refinements to certain items of flight information equipment to insure that their operation will be as efficient as is humanly possible. Their work, and that of their colleagues in the TWA dispatch offices in New York and Los Angeles, is extremely important and they know it. Quiet pride pervades their conversation as they discuss flight dispatching.

Personnel assigned to Joe Bell's staff work under a new concept of operational control. Their Central Region, which extends from Dayton, Ohio on the east to Albuquerque, New Mexico on the west, and includes TWA's Florida route segments, has been divided into north and south sectors. Two men work each sector, one handling terminal operations, the other en route operations. A fifth dispatcher functions as the flight dispatch coodinator who oversees all phases of the activity.

Mr. Bell commented that this concept of operations provides for a relatively even distribution of the dispatch workload and contains a built-in flexibility permitting a quick response to accelerated conditions in one sector or the other. If one team is suddenly burdened with peak activity while the other is in a fairly quiet period, a dispatcher can be quickly shifted to work the other sector. More than 200 flights are handled each day by the Kansas City office.

Each flight brings new situations, new decisions. "The timetable is the dispatcher's blueprint," says Mr. Jacobson. "He must coordinate all the operational factors involved to make the timetable a reality. And since safety and reliability are our two most important considerations, his decisions are made with that in mind."

Before each flight, the dispatcher pores over teletype reports showing terminal and en route weather, wind information and official forecasts. He examines weather maps and high-altitude jet airways charts. Reports of field conditions at each airport are assembled. FAA notices regarding the serviceability of navigational aids are studied to make sure that all en route aids are in operation.

Once the dispatcher has determined that all factors are suitable for flight, he issues a normal operation advisory to the stations involved. Approximately one hour before scheduled departure he confers with the captain and a flight plan agreement is reached. The flight plan includes altitude to be flown, elapsed time en route and alternate fields to be used in case a diversion is necessary. The captain and dispatcher then sign a flight release, signifying their mutual acceptance of the plan.

Civil Air Regulations specify that no scheduled airliner may take off without the signatures of the captain and flight dispatcher on the flight release. Both are equally responsible for the safety of the flight and both have full right to cancel, hold or divert a flight. If all factors necessary for a safe operation cannot be met, the trip is delayed or cancelled.

The flight release is simply an agreement, not an order. If the dispatcher wishes to release the flight and the captain does not wish to do so, he may cancel the trip. The reverse is also true, if the captain wants to make the trip but the dispatcher believes it cannot be operated with complete safety.

Each flight is monitored in the flight dispatch office from takeoff to landing. Deviations from estimates, changes of routings, losses or gains of time -- all are noted. A dispatcher must plan ahead for the passengers who will be boarding these flights at stops en route.

An "on time" or "delayed" sign alongside a flight number at a ticket counter is placed there on the basis of information provided by a flight dispatcher.

Once a flight is airborne, however, the dispatcher's key job is to anticipate the conditions ahead of it. He has the responsibility of providing the captain with any information -- weather, navigation aids, airport conditions, air traffic delays -- that may affect the safety of the flight.

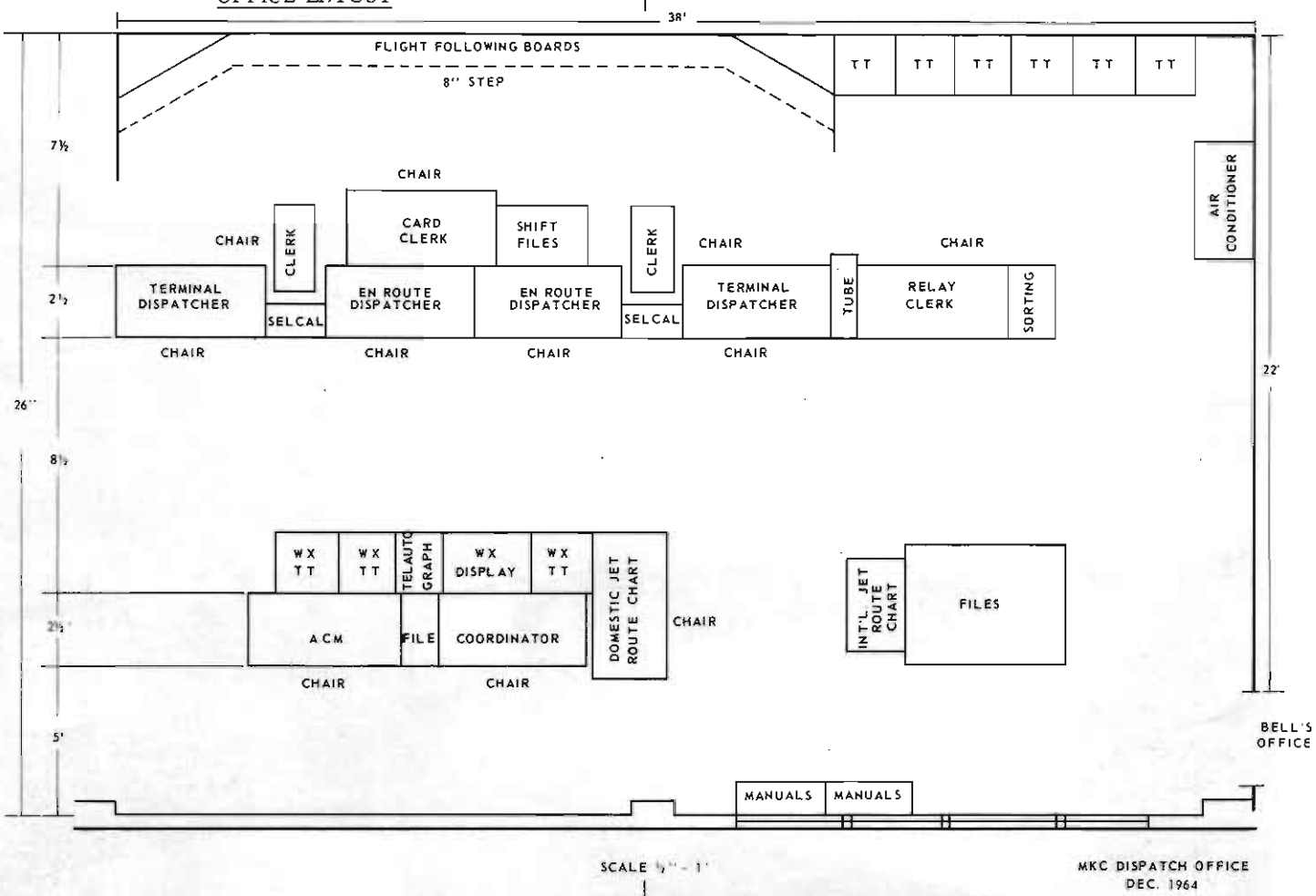
A flight plan is a proposed course of action, subject to many uncertainties, not the least of which is the fickleness of Mother Nature. There are times when passenger safety and comfort considerations require a change in plan. Under adverse conditions, the dispatcher must have ready one or more alternate courses of action, such as diverting flights to airports where weather is satisfactory or re-routing flights around known thunderstorm areas.

The pilot knows that he has a good friend in the flight dispatcher. They share a tremendous responsibility. As Jim Huggins says, "We sweat out the weather just like the pilot upstairs. We get nervous indigestion and pull our hair, too."

TWA's flight dispatchers are a dedicated group of professionals doing an important job as a member of a highly skilled team. Most airline passengers are not aware of the vital role they play in the safe and dependable operation of their flights. The dispatchers themselves know it, however, and that knowledge is the source of their deep satisfaction in the work they do.

PART TWO - Photos and detailed description of equipment, tools and procedures.

OFFICE LAYOUT



The decision to use this floor plan was influenced primarily by the limited space available and the need to retain the proven functional features of the present floor plan.

There are six dispatcher positions, four are regular dispatcher positions, one is the coordinator position and the other is the ACM position. All of these positions have identical communications and their Call Directors contain all local and longline phones and all MKC and CHI ARINC Radio frequencies.

The four dispatchers must be in line and facing the flight progress boards. Flight dispatchers and clerks are positioned in accordance with the normal flow of work and their relationship to one another on a functional basis. We have learned from experience that this arrangement is the best for each position and makes easy access between all positions when they are aiding each other.

The coordinator needs to be as available as possible to all dispatchers and be able to see all boards.

The relay clerk needs to be near the printers, especially the ARINC printers. Further, she must be close to the pneumatic tube and be able to see the boards.

The three weather printers, telautograph, weather display and plotting tables must be directly in back of the dispatchers. ADX and ARINC printers are in the most practical location from the standpoint of noise abatement and availability to clerks.

The Selcal units are placed between the terminal and en route dispatchers so that they are available to all four dispatchers.

The card clerk must be centrally located with reference to all dispatchers.

Clerks do not have specific duties or responsibilities. Each clerk works from one of the clerk positions but is responsible for assisting other clerks when needed. All clerks are responsible for tearing printers, posting the flight progress boards and answering phones.

DISPATCH AND WEATHER OFFICE

WEATHER

Left to Right:

Willie True
J. H. Todd
J. B. Hefley
J. P. Jones

DOORWAY

Captain Don Frazer

DISPATCH

Left to Right:

R. D. Green
N. F. Vickers
Carolyn Evans
G. W. Nicholson
Mary Jolley
Sandy Reed
G. A. Nelson
Mary Denton
S. H. Lyons
J. H. Bell

Mary Jolley
Flight Dispatch Clerk

Sandy Reed
Card Clerk

George Nicholson
Dispatcher

TYPICAL WEATHER BRIEFING

J. H. Todd
Forecaster

Captain Don Frazer

R. D. Green
Dispatcher

NEW CONCEPT OF OPERATIONAL CONTROL

The key to the new concept of dispatch responsibility distribution will be found in the positioning of the four dispatchers in a line. Our zone of control is divided into two areas -- the North Sector and the South Sector. A team of two dispatchers, one terminal man and one en route man, is responsible for a sector.

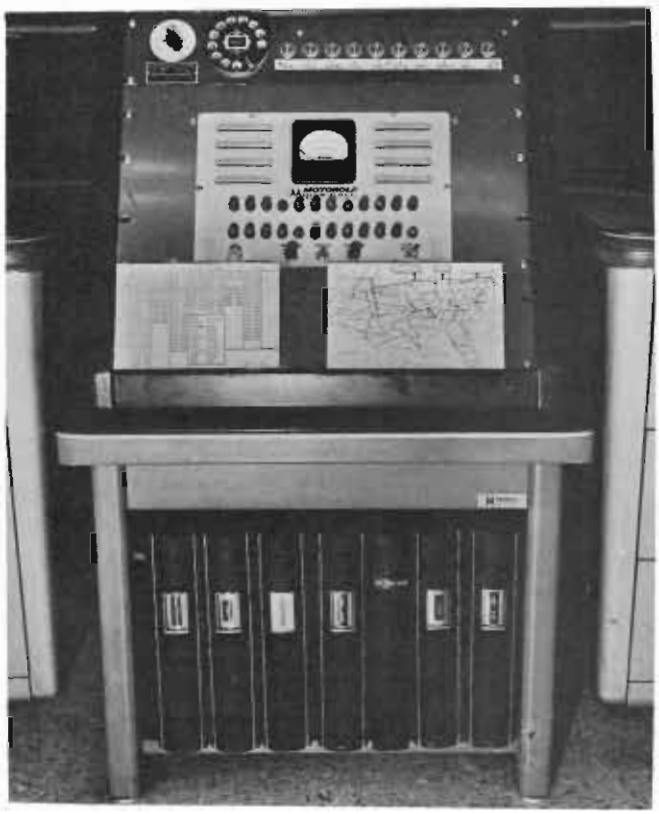
Under normal conditions the terminal man is responsible for the flights from the time they arrive in the terminal area until they depart from the terminal area, including decisions to divert. He also determines destination reserves and alternates.

The en route man, under normal conditions, computes the en route fuel, completes the release and sends it. He also monitors the flights en route, plots the position of severe weather and furnishes this and other information to flights.

The positioning of the dispatchers, the division of their duties and responsibilities and the availability of essential data makes them a fluid team able to support each other at all times under all circumstances.

All dispatcher Call Directors are tied directly to ARINC Radio at MKCXA and by phone line to CHIXA. This provides the dispatchers with direct access to all MKC and CHIXA circuits without reference to any operator or relay artist.

There are four clerk positions. The card clerk and the relay clerk positions have all local and longline phones in their Call Directors. The other two clerk positions have local phones only in their Call Directors.



The two Selcal units are tied directly to ARINC Radio at MKCXA and by phone line to CHIXA. This provides the dispatchers with direct access to all MKC and CHIXA circuits without reference to any operator or relay artist.

The Telautograph provides MKC and MCI local hourly and special weather reports immediately. It also furnishes radar reports on the location and movement of severe weather.

The two regular weather printers provide general weather reports from all over the country, and, in addition, all necessary NOTAM information.

The ORD local printer provides local hourly and special weather reports immediately for ORD and a number of stations in the Chicago area. It also provides radar reports on the location and movement of severe weather.

From our ADX printers we receive weather forecasts, wind and temperature data, operation plans, equipment data and general information on operations. Messages from these printers are torn by the clerks and the messages passed to clerks and/or dispatchers for appropriate handling.

We have two receiving only CHIXA printers and two receiving only MKCXA printers. One printer on each circuit could easily handle the traffic, but we need two copies of each message and an extra printer is the cheapest way to obtain the extra copy. The reason we must have two copies of each message is that two people need a copy immediately. The relay clerk must relay most of this information to one or more stations and, frequently, the message must also go to a dispatcher. We use two colors of paper to avoid confusion or duplication.

The pneumatic tube operates between the Dispatch Center and Airport Teletype. This is our only means of sending messages over the ADX system.

FLIGHT CARDS

Our flight cards are multiple purpose cards and are used primarily in lieu of the old dispatcher work sheets. They make it possible for any dispatcher to pickup flights from another dispatcher without conversation when the workload makes this advisable.

A flight card is prepared for each flight that is scheduled to operate under the dispatch authority of the Kansas City Flight Dispatch office. These are prepared in advance and are revised with each schedule change.

In order that these cards can be reused for each day's operation, they are enclosed in a clear plastic cover. The computation notes and/or actual release is marked on this plastic cover with marking pencil so that while a particular flight is under consideration for release or is actually flying in the MKCWD area, the basic data on the card, as well as the release and related information, is all on the card for ready reference. When not in use the cards are filed in numerical sequence on the card clerk's desk.

When a charter or extra section or other unusual operation is planned in the MKCWD sector, a temporary card is prepared for that specific flight and, while that flight is being operated, the card is handled in the same manner as a card for a scheduled flight.

At a certain time, from three to five hours prior to a flight needing a release, the card is pulled from the numerical file by the card clerk. She will record the plane number and any unscheduled information relating to that flight on the card. This might include unscheduled stops, revised operating times, late operation, plane changes en route, etc. She then passes the card to the proper dispatcher who is to handle that flight.

The dispatcher or dispatchers will add to the other information the figures for the release, fuel, alternate, MGL, etc. The dispatcher or dispatchers, who have participated in the release, will include a code indicating who made the decisions. The card is then passed back to the clerk who will type the release for transmission by longline.

The fuel, alternate and other important data from the card is then posted on the flight following board and the card returned to the numerical file box. At regular intervals, the cards are removed from this file and the data relating to that day's flight is cleaned from the card if the flight has "completed" and the card returned for use on the next day.

Sample cards are enclosed illustrating:

A. Basic card with data and source of data,

B. First action by terminal dispatcher indicating reserves or alternates required by him to destination of each leg,

C. Final action by the en route dispatcher who computes the en route fuel and finalizes the release for typing.

Flight number.

Type of equipment

En route plane change.
Location of change and type used.

Fuel and MGL, when listed in parenthesis, is taken from the Planning and Performance Manual for the type equipment listed. If two fuel and MGL figures are listed, the second is a preferential one.

Route used for the mileage listed if a choice of routes is likely.

En route mileage for the leg.

Normal time for release to be sent if flight is operating on schedule.

Scheduled arrival station and time.

F 182 P ____ B ENROUTE PL CHG STL P ____ C

RLS DUE	RLS SENT			
1230		MKC 1430 (23.5 - 171.5 / 41.0 - 189.0) 2300 3900	STL 1514	
		:34 / 190	194 N.M.	17
1330		STL 1545 (33.0] FUEL THRU TPA IF PSBL (IF 131, NO H_2O TPA)	TPA 1742	
		1:47 / 290 J45-42	790 N.M.	6
	1600	TPA 1815 [20.0] (IF 131, NO H_2O TPA)	MIA 1902	
		:37 / 190	181 N.M.	7

Time release should be issued if flight is operating schedule but the release is not a blanket one.

Page number for locating the computation "pony" for this flight leg in MKCWD computation book.

Station and time for schedule departure.

Vertical line indicates that a blanket release should not be issued through the station due to crew change, long ground time, etc.

Scheduled flight time to next station.

Water for 131 equipment,
1 point
2 point

Fuels for piston flights are also listed in parenthesis but do not list an MGL. Due to burn and fueling problems on certain types, the "R", "L", etc. refer to equipment types. Where "F/T" is listed, the flight should be fueled-through.

Preferential altitude for jet flights.

Fuel and MGL figures listed in brackets are for legs for which a standard fuel is not published. These are computed much like a standard fuel; "normal" burn plus reserve.

Special notes regarding the release or the dispatcher's handling of the flight. These might relate to safety, economics or be precautionary.

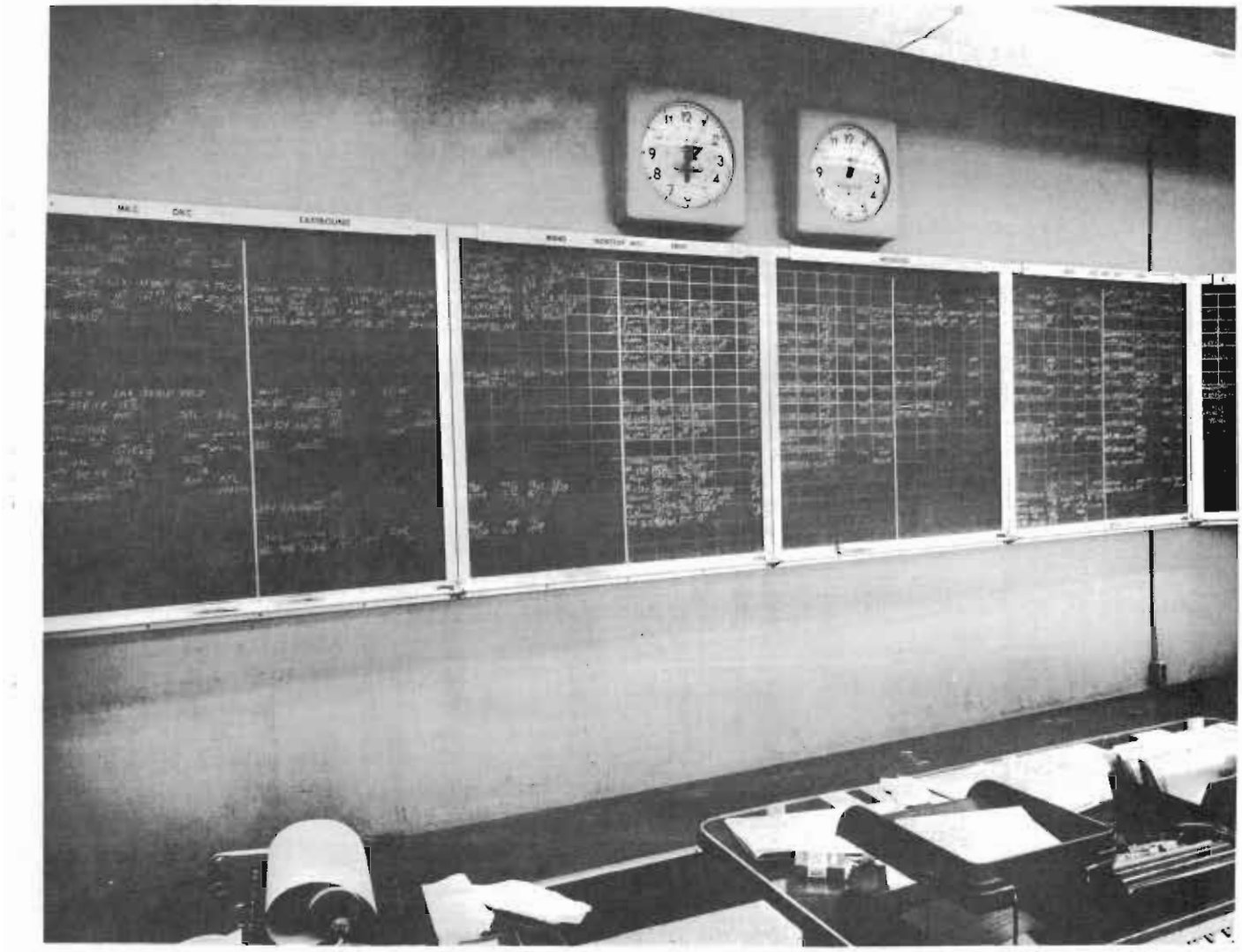
F 182 P 6785 B — ENROUTE PL CHG STL P C

RLS DUE	RLS SENT				
1230		MKC 1430 (23.5 - 171.5 / 41.0 - 189.0) 2300/3900	STL 1514	14.0 S	
		:34 /190 MKC	194 N.M.		17
1330		STL [33.0] FUEL THRU TPA IF PSBL (IF 131, NO H_2O TPA)	TPA 1742	14.0 S	
		1:47 /290 MIA J45-42	790 N.M.		6
	1600	TPA 1815 [20.0] (IF 131, NO H_2O TPA)	MIA 1902	12.0 S	
		:37 /190 IFR	181 N.M.		7

F 182 P 6785 B — ENROUTE PL CHG STL P C

RLS DUE	RLS SENT				
1230		MKC 1430 (23.5 - 171.5 / 41.0 - 189.0) 2300/3900 38.0	STL 1514	14.0 S	
		:34 /190 MKC 194.0	194 N.M.	P	17
1330		STL 1545 [33.0] FUEL THRU TPA IF PSBL (IF 131, NO H_2O TPA) 50.0	TPA 1742	14.0 S	
		1:47 /290 MIA 208.0 J45-42	790 N.M.	P	6
	1600	TPA 1815 [20.0] 22.0 (IF 131, NO H_2O TPA)	MIA 1902	12.0 S	
		:37 /190 IFR 192.0	181 N.M.	P	7

FLIGHT FOLLOWING BOARDS



Our new flight progress boards are designed to provide a complete flight following function. Information by visual reference, covering all flights in the dispatchers area of responsibility, includes: flight number, plane number, captain's name, release fuel, alternate airport (if needed), planned route, flight altitude, estimated time en route for each flight segment, actual time off, estimated arrival time at point of intended landing and actual landing time. This up-to-date progress information assists the dispatcher in carrying out his responsibilities of operational control, dissemination of flight operating information, advance planning for anticipated "non-routine" situations, formulating recovery plans, etc.

JET PERFORMANCE PONIES

These Jet Performance Ponies provide the flight dispatcher a compact, simple means of obtaining quick, accurate jet equipment performance computations.

This Jet Performance Pony provides data for route segments of 900 nautical miles or more.

DISTANCE. Each chart represents computations for a specific type of jet equipment over a particular route. The sample chart attached represents the precomputed data for a Boeing 707-131 from LAX to ORD.

EQUIPMENT. Separate charts are prepared for each type of jet equipment to facilitate re-computing for last minute equipment substitution.

LANDING WEIGHT. The box in the upper right corner indicates the "Chart Entry Landing Weight". The box in the upper left corner adds the FAA/TWA fuel reserve to the average operating weight of the equipment plus the "planned" payload. The result subtracted from the "Chart Entry Landing Weight" shows the amount of fuel that can be planned for Holding or Alternate Fuel without increasing the burnoff fuel which could be adjusted by using the +/- figures after each altitude designation.

ALTITUDE. The column on the left always indicates the optimum altitude adjusted for direction of flight. The others are 4000' or 2000' lower per present policy.

ROUTE, MACH AND WINDS ANALYSIS NUMBER. Under the LAX/ORD line is the Jet Route and mileage on which the data was computed. The Mach number used on these charts is approved operating Mach number for the particular equipment. The Winds Analysis number indicates the proper location of wind segments or MTR as provided by Winds Analysis. Scheduled leg time is shown for comparison to select proper planning altitude.

WIND COMPONENT. The chart provides a range of -60 knots to +140 knots for eastbound legs and -140 knots to +60 knots for westbound. Interpolation of 5 knots is simple.

EXAMPLE. (a) LAX - ORD

(b)	Boeing 131 owe	118,500	
(c)	Payload	29,000	
(d)	Reserve, Alternate and Hold Fuel	20,500	
(e)	Expected landing weight	178,000	(3,000 more than allowed in computations)

(f) Component 33,000, Zero, Temperature -40°
Component 29,000, Zero, Temperature -35°
Component 27,000, Plus 20 knots, Temperature -30°

SOLUTION. Enter optimum column at -35°, 0 Component; find Time 3:33, 48.0 Fuel. At -45°, 3:27 Time, 49.6 Fuel, -40° would then be 3:30. Scheduled time at top of page is 3:23, therefore, schedule cannot be maintained at optimum altitude. Enter /290 column at -30°, 0 Component, Time 3:24, 50.6 Fuel. At -40°, 3:22 Time, 53.0 Fuel. -35° would be 3:23. This being scheduled time you drop to the /270 column, enter -25°, +20 Component; find Time 3:18, Fuel 50.5. At -35°, 3:15 Time, 53.5 Fuel, flight would then be planned to operate at /290 and dispatch release would be computed at /270 which is 52,000 plus 110 pounds per thousand pounds over 175,000 landing weight or 52,330 pounds.

FROM LAX TO ORD

12 B

RSV	10.0
OWE	118.5
P/L	29.0
WT	157.5
HOLD & ALTN	17.5

RTE J64-87 - 1539 NM
M 82 WA# MTR

SKD TIME 3+23

CHART ENTRY 175.0
+ -- #/M TO --
- -- #/M Below.
□ = 4000' STEP CLIMB

12 B

/330 +180 -120 | /290 +140 -100 | /270 +110 -80 | /250 +80 -60 | /230 +60 -40

COMP	TMP	TIME	FUEL	TMP	TIME	FUEL	TMP	TIME	FUEL	TMP	TIME	FUEL	TMP	TIME	FUEL
-60	-35	4:04	55.6	-30	3:54	57.7	-25	3:56	59.7	-20	3:59	62.1	-15		
-40		3:52	53.0		3:43	55.1		3:45	57.0		3:47	59.2			
-20	458	3:42	50.7	479	3:34	53.0	479	3:35	54.7	476	3:37	56.8	468		
0	TAS	3:33	48.0	TAS	3:24	50.6	TAS	3:25	52.2	TAS	3:27	54.2	TAS		
20		3:28	46.2		3:17	48.9		3:18	50.5		3:20	52.4		3:24	54.4
40		3:19	44.5		3:09	47.2		3:10	48.7		3:12	50.5		3:16	52.3
60		3:11	42.9		3:03	45.5		3:04	47.0		3:06	48.8		3:10	50.6
80		3:03	41.4		2:56	44.0		2:58	45.5		2:59	47.1		3:03	48.9
100		2:56	40.0		2:50	42.6		2:52	44.0		2:53	45.6		2:56	47.2
120		2:51	38.8		2:45	41.4		2:47	42.7		2:48	44.3		2:51	45.9
140		2:45	37.6		2:39	40.1		2:41	41.4		2:42	42.9		2:45	44.5
-60	-45	3:59	56.8	-40	3:51	60.4	-35	3:50	63.1	-30	3:49	65.8	-25		
-40		2:47	54.1		3:41	57.8		3:40	60.3		3:39	62.9			
-20	474	3:38	52.0	488	3:32	55.5	493	3:31	57.9	495	3:31	60.5	493		
0	TAS	3:27	49.6	TAS	3:22	53.0	TAS	3:21	55.3	TAS	3:21	57.8	TAS		
20		3:20	48.0		3:16	51.3		3:15	53.5		3:15	55.6		3:16	57.9
40		3:12	46.3		3:08	49.4		3:08	51.8		3:08	54.1		3:10	56.1
60		3:06	44.7		3:02	47.8		3:02	50.1		3:02	52.3		3:04	54.2
80		2:59	43.2		2:56	46.2		2:56	48.4		2:56	50.6		2:57	52.4
100		2:53	41.8		2:51	44.8		2:50	46.9		2:50	49.0		2:51	50.6
120		2:48	40.6		2:46	43.5		2:45	45.5		2:45	47.6		2:46	49.3
140		2:42	39.4		2:40	42.1		2:41	44.2		2:40	46.2		2:42	47.8
-60	-55	4:00	58.0	-50	3:57	61.8	-45	3:54	63.9	-40	3:52	66.8	-35		
-40		3:48	55.3		3:45	58.9		3:44	60.9		3:42	63.8			
-20	469	3:39	53.1	477	3:37	56.5	482	3:35	58.5	488	3:33	61.2	493		
0	TAS	3:29	50.6	TAS	3:27	53.8	TAS	3:25	55.8	TAS	3:23	58.4	TAS		
20		3:22	48.9		3:20	52.0		3:18	53.9		3:17	56.4		3:16	59.9
40		3:13	47.1		3:12	50.1		3:11	52.0		3:09	54.5		3:09	58.0
60		3:07	45.5		3:06	48.4		3:05	50.1		3:03	52.7		3:03	56.1
80		3:00	44.0		2:59	46.7		2:58	48.4		2:57	50.9		2:57	54.2
100		2:54	42.5		2:53	45.2		2:52	46.9		2:52	49.3		2:51	52.5
120		2:48	41.3		2:48	43.9		2:47	45.5		2:47	47.9		2:46	50.9
140		2:43	40.0		2:42	42.5		2:42	44.1		2:41	46.4		2:42	49.3
-60	-65	4:03	58.8	-60	4:01	62.4	-55	3:59	64.8	-50	3:57	67.6	-45		
-40		3:52	56.1		3:50	59.5		3:47	61.6		3:45	64.5			
-20	460	3:42	53.7	466	3:40	56.8	472	3:38	59.1	477	3:37	61.9	482		
0	TAS	3:31	51.1	TAS	3:29	54.1	TAS	3:28	56.2	TAS	3:27	58.9	TAS		
20		3:24	49.4		3:22	52.3		3:21	54.3		3:20	56.9		3:19	60.1
40		3:16	47.5		3:14	50.2		3:13	52.2		3:12	54.9		3:11	57.9
60		3:09	45.7		3:08	48.5		3:07	50.5		3:06	52.8		3:05	55.8
80		3:02	44.2		3:01	46.8		3:00	48.7		2:59	51.0		2:58	53.9
100		2:56	42.6		2:55	45.2		2:54	47.0		2:53	49.3		2:52	52.2
120		2:50	41.4		2:49	43.8		2:48	45.6		2:48	47.9		2:47	50.6
140		2:45	40.0		2:43	42.3		2:43	44.2		2:43	46.4		2:42	49.0

9-64

This Jet Performance Pony provides data for route segments of 900 nautical miles or less.

CONSTRUCTION OF CHART

DISTANCE. Each chart represents computations for all types of jet equipment over a particular route. The sample chart represents flights JFK - ORD for which 660 nautical miles is the conservative distance between the two stations. All mileage values are on the conservative side when more than one route is available.

EQUIPMENT. Each chart provides, on one page, computations over one route for all types of jet equipment now in operation. Space is available for any anticipated equipment expansion program. This type presentation has proven valuable in cases of last minute equipment substitution.

FLIGHT ALTITUDE, FLIGHT LEVEL AND TEMPERATURE. Fuel performance and flight time for each type equipment has been computed at an altitude or flight level 2,000 feet lower than the optimum altitude up to flight level 290 and 4,000 feet lower than the optimum altitude above flight level 290. This is in accordance with the Jet Cruise Policy as revised by Flight Operations Bulletin No. 64-5 dated May 19, 1964. The standard temperature for each altitude and type aircraft is the mean temperature taken from the particular flight planning chart.

LANDING WEIGHT. A landing weight for each type aircraft was determined by adding: (a) average aircraft operating weight empty, (b) maximum payload, and (c) a conservative fuel reserve over the destination.

WIND COMPONENT. The chart is designed to provide computations over a range from 10 knots of non-prevailing wind to 100 knots of prevailing wind, i.e., JFK - ORD, a westbound flight with components from plus 10 to minus 100 knots.

FUEL AND TIME. The foregoing information is the "standard" from which all computations are made, i.e., altitude, temperature and landing weight. For those "standard" conditions, an elapsed time and fuel burnout have been computed for each 10 knot increase or decrease of wind component over the range mentioned above.

CORRECTION FACTORS. Since a "standard" condition is the exception rather than the routine, a means for applying the "standard" computations to any set of conditions is required. The variables are landing weight and altitude temperature. A value in pounds of fuel burned is added to or subtracted from the "standard" fuel burn computation when the final landing weight of the aircraft is determined to be above or below the "standard". Likewise, a value in pounds of fuel burned is added to or subtracted from the "standard" fuel burn computation when the forecasted or the actual altitude temperature varies from the "standard". No attempt has been made to correct time values.

STANDARD RELEASE FUELS. When provided by the Jet Cruise Policy, the standard release fuel and weight values are shown on the chart. This is an aid in that it provides a cross check for accuracy of computations. If final computations vary considerably from the standard release figures with the same corrective factors, an error in computations is evident. For the B707-131 standard water values for the departure station are included.

USING THE CHARTS

KNOWN INFORMATION. (a) JFK - ORD

(b)	Convair 880 owe	89,500
(c)	Assumed full load	25,500
(d)	Reserve and Holding Fuel	13,000
(e)	Expected Landing Weight	128,000
(f)	Component 27,000' minus 35 knots Temperature -35°	

SOLUTION. On the JFK - ORD chart under C (880) equipment enter at -35 knot component, i.e., between -30 and -40. The elapsed flight time is found to be 1:39. The fuel interpolated between the same values is 22,845 pounds. Remembering this is fuel burned under "standard" conditions outlined before. To apply corrective factors, the expected landing weight is 7,000 pounds lighter than "standard". 7 x 45 lbs. fuel = 315 lbs. less fuel burned since the landing weight is less than "standard". 22,845 lbs. minus 315 lbs. = 22,530 pounds fuel burned corrected for weight. The expected temperature at 27,000' is 5° warmer than "standard", therefore, 5 x 40 lbs. = 200 pounds additional fuel burned for higher temperature. 22,530 lbs. plus 200 lbs. = 22,730 pounds of fuel burned corrected for weight and temperature. This is now the planned fuel burnout for this flight. Reserves and alternate fuel are added for the release fuel. This computation requires only a few seconds to complete. The same computation direct from the Convair Planning Charts takes several minutes and, after several interpolations, a time of 1:38 and fuel burn of 22,749 pounds can be arrived at.

RESULT

A flight dispatchers' tool, weight about 10 ounces, which will provide quick and accurate jet performance information as against the regular issued manuals, weight several pounds, which provide no more accurate information in a much more difficult, tedious and time consuming manner.

NOTE: The term "standard" as used herein is intended as a norm, and/or index; a place from which to start, and not pertaining to atmospheric conditions, or as standard fuel release.

JFK-ORD

660 nm.

C	V	B	F	J
89,500 O.W.E. 25,500 Payload 20,000 Reserve 135,000 Lndg. Wt.	87,700 O.W.E. 25,300 Payload 12,000 Reserve 125,000 Lndg. Wt.	118,900 O.W.E. 30,000 Payload 16,100 Reserve 165,000 Lndg. Wt.	126,400 O.W.E. 30,000 Payload 13,600 Reserve 170,000 Lndg. Wt.	137,700 O.W.E. 30,000 Payload 17,300 Reserve 185,000 Lndg. Wt.
27,000' Temp -40°	27,000' Temp -35°	27,000' Temp -35°	31,000' Temp -45°	31,000' Temp -40°
+10 1:32 21,170	+10 1:29 15,765	+10 1:29 24,880	+10 1:26 18,760	+10 1:32 24,855
0 1:33 21,520	0 1:31 16,030	0 1:31 25,290	0 1:28 19,090	0 1:34 25,260
-10 1:35 21,870	-10 1:33 16,305	-10 1:33 25,700	-10 1:30 19,425	-10 1:35 25,665
-20 1:36 22,250	-20 1:34 16,585	-20 1:34 26,140	-20 1:31 19,785	-20 1:37 26,100
-30 1:38 22,650	-30 1:36 16,890	-30 1:36 26,615	-30 1:33 20,170	-30 1:39 26,560
-40 1:40 23,040	-40 1:38 17,190	-40 1:38 27,100	-40 1:35 20,555	-40 1:41 27,025
-50 1:42 23,460	-50 1:40 17,510	-50 1:40 27,620	-50 1:37 20,970	-50 1:43 27,525
-60 1:44 23,900	-60 1:42 17,850	-60 1:43 28,175	-60 1:39 21,405	-60 1:45 28,050
-70 1:46 24,340	-70 1:44 18,190	-70 1:45 28,730	-70 1:41 21,840	-70 1:47 28,575
-80 1:48 24,835	-80 1:46 18570	-80 1:47 29,345	-80 1:43 22,330	-80 1:49 29,165
-90 1:51 25,335	-90 1:49 18,950	-90 1:50 29,960	-90 1:46 22,820	-90 1:52 29,760
-100 1:53 25,875	-100 1:51 19,360	-100 1:52 30,610	-100 1:48 23,340	-100 1:54 30,400
+45/1000 ovr 135,000 +40/ degree warmer	+60/1,000 ovr 125,000 +10/degree warmer	+55/1,000 ovr 165,000 +70/degree colder	+40/1,000 ovr 170,000 +15/degree warmer	+50/1,000 ovr 185,000 +15/degree warmer
31.0-145.0	24.0-136.0	39.0-187.0 2700-4700	29.5-184.5	39.5-215.5

T	P*
142,500 O.W.E. 34,500 Payload 18,000 Reserve 195,000 Lndg. Wt.	CGO* 135,500 O.W.E. 74,500 Payload 51,000 Reserve 225,000 Lndg. Wt.
31,000' Temp -40°	31,000' Temp -40°
+10 1:33 21,010	+10 1:35 22,645
0 1:34 21,330	0 1:36 23,000
-10 1:36 21,770	-10 1:37 23,360
-20 1:37 22,040	-20 1:38 23,745
-30 1:39 22,400	-30 1:40 24,155
-40 1:41 22,790	-40 1:42 24,570
-50 1:43 23,210	-50 1:44 25,000
-60 1:46 23,650	-60 1:47 25,475
-70 1:48 24,090	-70 1:49 25,945
-80 1:50 24,585	-80 1:51 26,465
-90 1:53 25,080	-90 1:54 26,990
-100 1:55 25,600	-100 1:56 27,550
+55/1,000 ovr 195,000 +15/degree warmer	+60/1,000 ovr 225,000 +20/degree warmer
	*for psgr config 331C use T computations

jvc 11-15-64

JET RELEASE ANALYSIS

To facilitate the flight planning computations by the en route dispatcher, a Dispatcher's Release Analysis Message and Worksheet (DRAM) has been developed (see Example A). This DRAM form, which is completed for every jet flight regardless of segment length, is not only a worksheet but is utilized for teletype transmission of flight planning information to the captain of each jet flight operating over segments of 900 nautical miles or more. The completed copy then becomes a source of ready reference information for the dispatcher until termination of the respective flight.

FORM O-164 (2-65) PRINTED IN U.S.A.

DISPATCHER'S RELEASE ANALYSIS MESSAGE AND WORKSHEET

☒ Transmit information within double lines only
☐ Transmit lines preceded by asterisk only

SFOKA LAXWD

DATE 1-13-65

*DRAM FOR CAPT F 138 F FROM SFO TO ORD

PLANE NO. 6758

TAS	NAM
GS	GND

TAS	NAM
GS	GND

TAS	NAM
GS	GND

TAS	NAM
GS	GND

FAA TWA RES 8000

HLDG FUEL 5000

ALTN FUEL NONE

*TOTAL RES 13000

OPTG WGT 126150

*DSPRS PYLD 30000

LNDG WGT 169150

*ENRTE FUEL 40700

WATER —

COMPUTED TOW 209850

*CHART ENTRY 180000

STN LD EST 21000

XPCTD TOW 200850

TOTAL RES 13000

ENRTE FUEL 40700

RLS FUEL 53700

MAX RNWY MGL

*ROUTE J80-60-84

*CRZ M85 ALT 370 ETE 0316 FUEL 39100

*CRZ M85 ALT 330 ETE 0319 FUEL 40700

*CRZ ALT ETE FUEL

*CRZ ALT ETE FUEL

COMP TEMP

COMP TEMP

COMP TEMP

COMP TEMP

T.O. FCST RNWY TEMP WIND ALTSG

*PLANNED RLS: SFO 54.0 IFR 210.0 WATER —

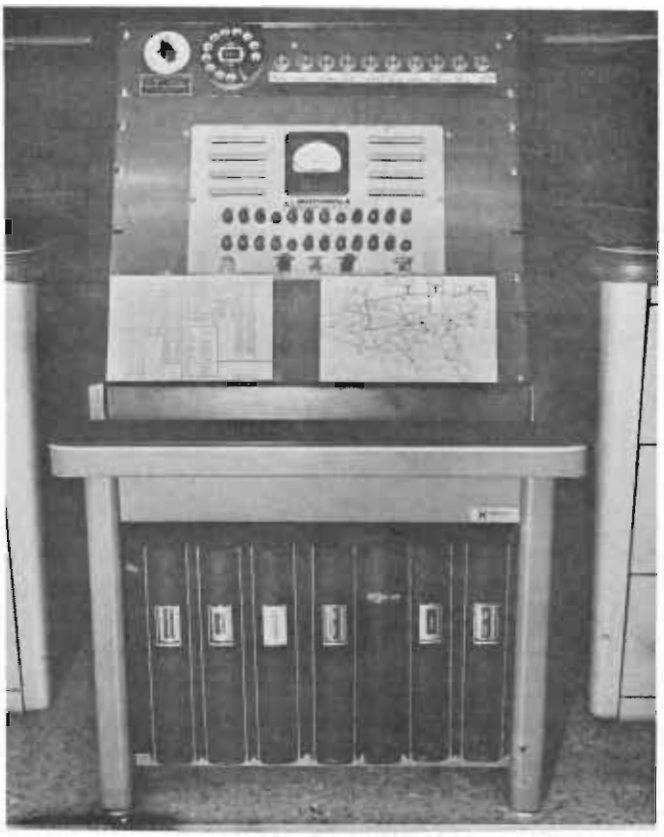
WATER

WATER

*REMARKS

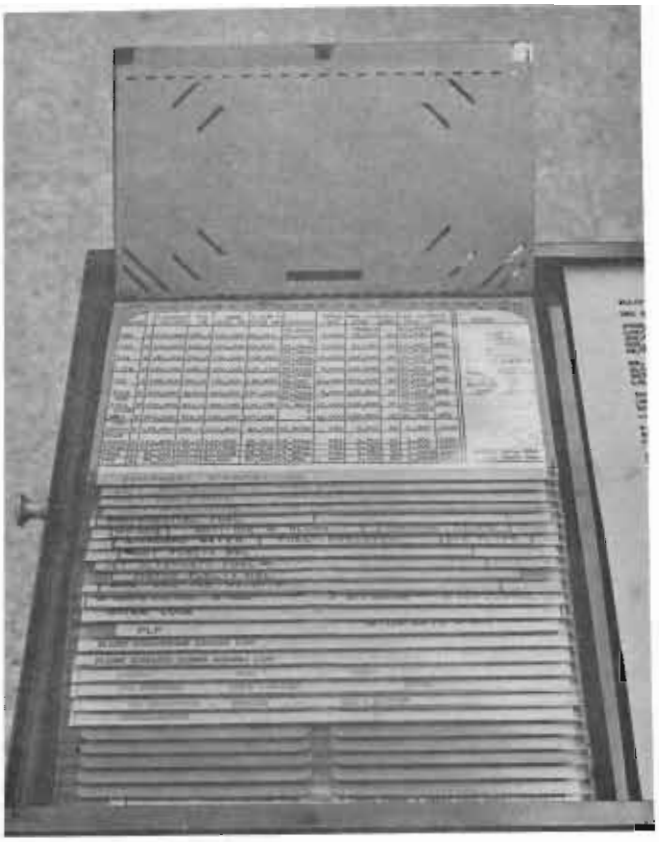
MKC WD BELL 13 0800 Z

COMPUTER'S LIBRARY

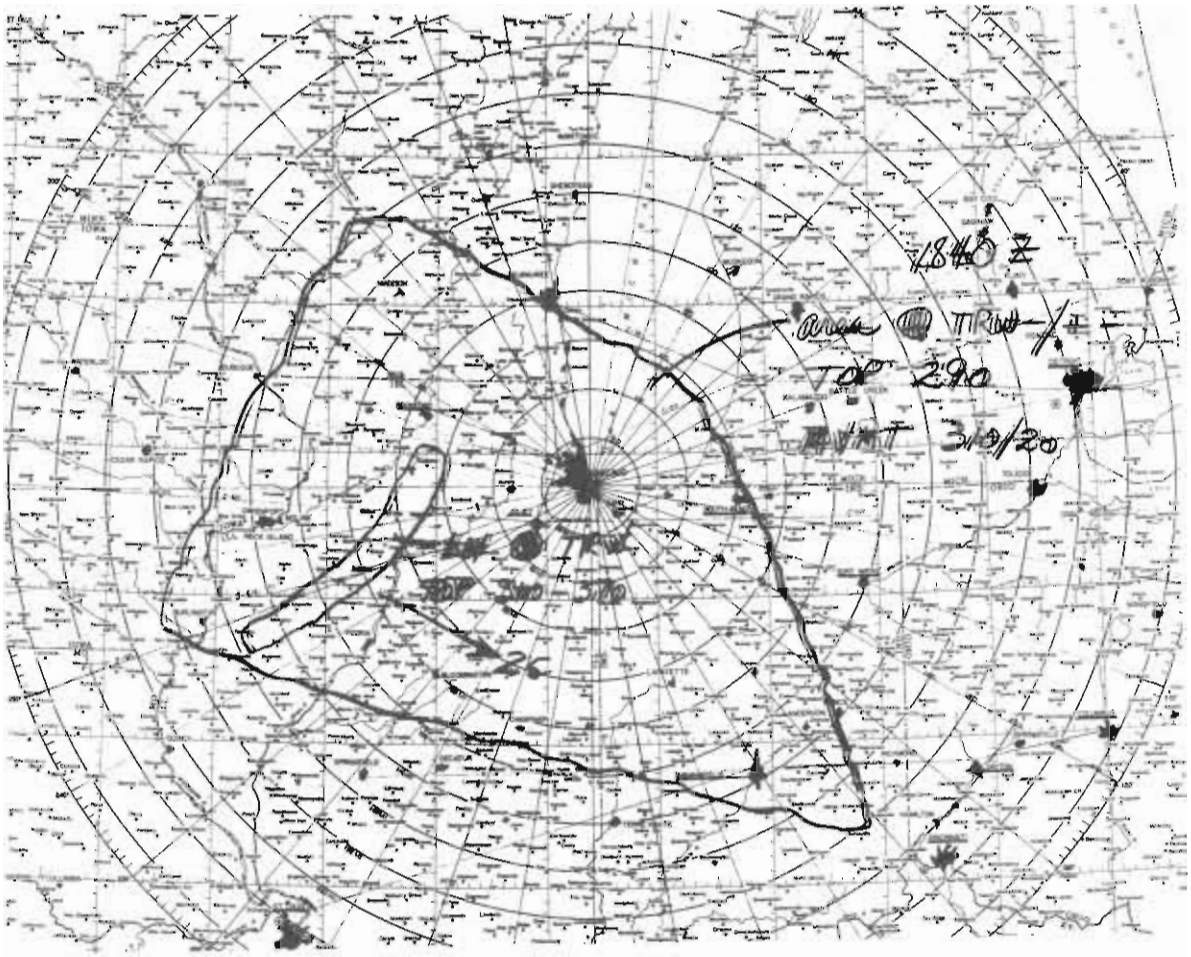


Most of our manuals are kept in large bookcases on the side of the office. However, the needs of the dispatchers are such that we have placed a set of Jet Planning and Performance manuals under each Selcal unit which makes the manuals immediately available to each dispatcher at his desk. Further, because of the size of some of these manuals, we have split them and all have been placed in hard covers.

DATA PULLOUTS



We turned the "popout" shelf on the dispatcher's desks over and placed a cardex file in it. This provides a vast amount of space for data needed by the dispatcher and it is more accessible and easier maintained than under the glass on the desk tops.



TYPICAL RADAR THUNDERSTORM PLOTTING CHART

All telephone and radio work by the dispatchers is done on a single "handset" or "headset" located at each position. Each phone is attached to a retractable extension cord that permits the dispatcher to reach the weather printers and plotting tables and brief crews en route or at terminals on the latest weather data available.

The availability of hourly radar reports on the location, movement and intensity of severe weather makes it possible for Flight Dispatch to keep flight crews updated and enables them to keep to the best route and altitude and penetrate the terminal areas with the least trouble.

Radar reports are entered on these charts as rapidly as they come in (as depicted). The entries are with grease pencil and easily removed from the transparent overlay.

When there are active areas or squall lines it is the custom to use different colored pencils for each hour and leave several hours on the chart in order to follow the tendency and movement more accurately.

Carolyn Evans
Flight Dispatch Clerk

N. F. Vickers
Dispatcher

This position is equipped in its entirety identical to the regular dispatch positions, including all telephone and radio communications.

The purpose of this position is twofold: a convenient place for supervisors or technicians to monitor operations or assist during irregularities without interfering with other dispatchers and their operations, full utilization of an extra dispatcher can be obtained by use of this position.

SUMMARY

In summary, all six dispatcher positions have complete and identical communications; all dispatchers, including coordinators, are currently qualified to work both sectors; essential information on any flight is readily available from the flight card and the flight progress boards without consulting anyone and all dispatchers, including the co-ordinator, are useable at all times for any function.