PROJECT 10073 RECORD CARD

1. DATE: 25 Oct 63	2. LOCATION: Sioux City, Iowa	12. CONCLUSIONS ☐ Was Balloon ☐ Probably Balloon ☐ Possibly Balloon ☒ Was Aircraft Refueling ☐ Probably Aircraft ☐ Possibly Aircraft ☐ Was Astronomical ☐ Probably Astronomical ☐ Possibly Astronomical ☐ Other ☐ Insufficient Data for Evaluation ☐ Unknown
3. DATE-TIME GROUP Local 10 Min Prior to Sunset GMT 25/2253 Z	4. TYPE OF OBSERVATION ☐ Ground-Visual ☐ Ground-Radar ☒ Air-Visual ☐ Air-Intercept Radar	
5. PHOTOS ☐ Yes ☒ No	6. SOURCE CIVILIAN ([redacted])	
7. LENGTH OF OBSERVATION: 25 Minutes	8. NUMBER OF OBJECTS: one	9. COURSE: Manuvered

10. BRIEF SUMMARY OF SIGHTING

Reilly Babes Case. KC-135 refueling in area. Object appeared to "loom" and then disperse into 10-20 objects. Then appeared as dot moving away from observers a/c. 10 minutes later reappeared approaching observers a/c. Sighting to West at sunset. Object appeared as KC-135 with drogue. Not clear and distinct. No unusual atmospheric conditions could be determined from WX data available.

11. COMMENTS

"Looming" phenonena of KC-135 in area to West approximately 50 miles away.

ATIC FORM 329 (REV 25 SEP 52)

OFFICIAL FILE COPY

FTD (TDEW/UFO)
Wright-Patterson AFB, Ohio
29 Jan 64

Dr J Allen Hynek
2623 Ridge Avenue
Evanston, Illinois

Dear Allen,

Have good news on the 25 Oct 63 sighting of [redacted] and [redacted]. Refueling operations were conducted inthe "High Life" refueling area. There is some discrepancy in the time reported. However, since the prior report indicated that the observation was 10 minutes before sunset I felt that this was a better guide than the stated time. I am enclosing an extract of Sunset and Twilight times from the Ephemeris. With the reported altitude of [redacted] and [redacted] you can no doubt figure this closer than we can. I have also attached portions of SAC Manual 55-14 which gives the refueling procedures for high altitudes and that portion pertaining to "High Life". ONC-306 and 307 cover this area as well as all geographic locations mentioned in their report. Also enclosed is a copy of the FAA report and Mr [redacted] letter. The weather data from Asheville, North Carolina has been ordered and will be forwarded upon arrival.

I thought this might be a good case on which to write a case summary, not necessarily for general release but for our files. Would it be possible for you to do this since the figures concerned with sunset, twilight, distance to refueling area, altitude of the pilot's aircraft, altitude of the air refueling operations aircraft, etc, are quite involved. I am sure that your figures would be much more exact than mine. Therefore, I would appreciate it if you would write up some sort of a summary which includes the geometry of the situation assuming that a "looming" phenomena of the refueling aircraft was the cause of the sighting.

We have completed duplicating the cases from the first nine months of 1963 and should have this portion of the project completed by next weekend. Miscellaneous information including maps of the refueling areas, for the committee, have been forwarded in a separate envelope.

Have fun!

DAVID H MOODY
TSGT, USAF
Aerial Phenomena Branch

TAB

A Initial Report from [redacted] and [redacted]

B Refueling Area Data

C Weather Data

25 oct 63

E. K. Dyer

HEADQUARTERS
821ST STRATEGIC AEROSPACE DIVISION
UNITED STATES AIR FORCE
ELLSWORTH AIR FORCE BASE, SOUTH DAKOTA

REPLY TO ATTN OF: BDOBO

SUBJECT: Civilian Report of UFO

9 DEC 1963

TO: HQ USAF
Wash DC 20330

FTD W/PAFB OHIO

Attached is a report of an Unidentified Flying Object by a civilian pilot.

FOR THE COMMANDER:

CLIFFORD D. COBLE
Major, USAF
Base Operations Officer

1 Atch
Report of UFO

FEDERAL AVIATION AGENCY
Flight Service Station
Box 137
Huron, South Dakota

November 27, 1963

Dear Mr. [redacted]

I wish to acknowledge your letter, dated November 5, 1963, of sighting an unidentified flying object, while in flight to Mitchell.

Your well written description of the sighting has been forwarded to the proper military office for handling.

If I may be of further assistance to you, please do not hesitate to write.

Sincerely yours,

Billy D. Templeton
Chief, Flight Service Station

cc:
CS-520
RCA-afb

TELEPHONE
[redacted]

[redacted]
INC.
[redacted] CONTRACTOR

[redacted]
POMPANO BEACH, FLORIDA

NOVEMBER 5, 1963

FLIGHT INFORMATION CENTER
CIVIL AERONAUTICS ADMINISTRATION
HURON, SOUTH DAKOTA

GENTLEMEN:

YOU MIGHT BE INTERESTED IN A MOST UNUSUAL SIGHTING THAT OCCURRED IN YOUR AREA DURING THE LATE AFTERNOON OF OCTOBER 25, 1963, DURING THE COURSE OF A VFR FLIGHT PLAN FILED BY BONANZA [redacted] BETWEEN ST. LOUIS AND MITCHELL.

THE AIRCRAFT WAS BRUISING AT A TRUE AIRSPEED OF 170 MPH AT AN ALTITUDE OF 6500 FEET ON A HEADING OF 310 MAGNETIC. THE SKY CONDITION WAS CLEAR WITH WINDS FROM THE SOUTHWEST AT APPROXIMATELY 15 KNOTS. AT APPROXIMATELY 1845, WHAT APPEARED TO BE AN UNUSUAL CLOUD WAS SIGHTED BEARING SOUTH. THIS OBJECT SEEMED TO BE SOMEWHERE NORTH OF THE TYNDALL INTERSECTION.

IT FIRST WAS NOTICED AS A DARK, SHARPLY DEFINED MASS, WHICH APPEARED TO BE SLIGHTLY ABOVE OUR ALTITUDE. AT FIRST STUDY IT WAS JUDGED TO BE A LARGE TANKER MAKING DROGUE CONTACT, SINCE THERE WAS A SMALL OBJECT BEHIND IT. IT APPEARED TO BE PARALLELING OUR COURSE. IT THEN BEGAN TO GROW LARGER. ALTHOUGH THE OUTLINES WERE EXTREMELY SHARP AND CONSCISE, IT DID NOT HAVE AN IDENTIFIABLE AIRCRAFT SHAPE.

WE TURNED TOWARDS THE OBJECT. A LACK OF RELATIVE MOVEMENT INDICATED IT WAS NOT AN AIRCRAFT, PROBABLY A CLOUD. HOWEVER, THE SMALL ADJACENT SPECK BEGAN TO GROW LARGER AND THE MAIN OBJECT BEGAN TO SHRINK IN SIZE AND THE WHOLE MASS APPEARED TO RECEDE. AT THIS POINT WE TURNED BACK TO OUR ORIGINAL COURSE TOWARDS MITCHELL. AT THAT TIME THE SINGLE REMAINING MASS DISINTEGRATED INTO APPROXIMATELY 10 TO 20 SMALL OBJECTS AND THE WHOLE GROUP DISAPPEARED WITH THE EXCEPTION OF ONE PRONOUNCED DOT, WHICH LOOKED VERY MUCH LIKE AN AIRCRAFT FROM THE REAR. THIS DOT BECAME PROGRESSIVELY SMALLER AND WE DISCONTINUED OUR WATCH.

AT APPROXIMATELY 1900 WE DISCOVERED THAT THE SHAPE WAS RETURNING AND WE IMMEDIATELY TURNED TOWARDS IT ON A HEADING OF 180. AT THIS TIME THE SUN WAS OVER THE HORIZON BUT THERE WAS CONSIDERABLE LIGHT IN THE SKY AND THE OBJECT WAS CLEARLY BACK-LIGHTED AND THUS SHARPLY ETCHED AGAINST THE SKY.

AT THAT TIME THE RANGE WAS IMPOSSIBLE TO ASSUME. THE OBJECT LOOKED LIKE A 707 MIGHT APPEAR IN A DISTANCE OF TWO MILES, HEAD ON. AT THAT DISTANCE THE INCREASE IN SIZE STOPPED. A SMALL DOT APPEARED TO THE EAST SIDE OF THE MASS. THE DOT BEGAN TO GROW IN SIZE AND THE MAIN MASS BEGAN TO SHRINK. FINALLY THE TWO OBJECTS HAD COMPLETELY CHANGED POSITIONS, THE DOT WAS AS LARGE AS THE ORIGINAL MASS AND THE ORIGINAL MASS WAS GONE. WE CONTINUED ON THIS HEADING TOWARDS THE OBJECT UNTIL 1915. SINCE THE RANGE THEN APPEARED TO BE OPENING AND IT WAS FAST BECOMING DARK, WE DISCONTINUED THE CHASE AND RETURNED TO MITCHELL, LANDING AT APPROXIMATELY 1940.

MY OWN EXPERIENCE AS A RESERVE MILITARY JET PILOT AND THAT OF THE PILOT [redacted], LEFT US WITH NO CONCLUSIONS. IT WAS QUITE OBVIOUSLY WAS NO AIRCRAFT, SINCE AIRCRAFT DO NOT CHANGE SHAPE AND SIZE. FURTHER, THE RELATIVE MOVEMENT DID NOT FIT AN AIRCRAFTS COURSE. ALTHOUGH IT RESEMBLED A CLOUD OF SMOKE THAT COULD HAVE BEEN CAUSED BY ALTITUDE GUNNERY, THE RAPID CHANGE OF SIZE, DISAPPEARANCE AND REAPPEARANCE AND OUR INABILITY TO CLOSE THE RANGE CONSISTENTLY WOULD SEEM TO RULE OUT ANY CONDENSATION. AN EXTREMELY DENSE FLIGHT OF BIRDS COULD HAVE ACCOUNTED FOR THE UNUSUAL MOVEMENTS OF THE SHAPES, BUT AT OUR SPEED WE WOULD HAVE CLOSED ON SUCH A FLOCK.

AFTER A GREAT DEAL OF DISCUSSION, WE WERE FORCED TO CONCEDE THAT IT WAS SIMPLY AN UNIDENTIFIED FLYING OBJECT.

IF THERE IS ANY FURTHER INFORMATION WE CAN ADD, PLEASE FEEL FREE TO CONTACT ME AT THE ABOVE ADDRESS OR MR. [redacted] SPARTA, ILLINOIS.

RESPECTFULLY,

[redacted]

RCR/R

Report

U.F.O. SIGHTING

DATE: October 25, 1963

TIME: Approximately 10 minutes before sunset.

LOCATION: Ten miles N-NW of the Sioux City airport on course for Mitchell, South Dakota.

ALTITUDE: 5,000 feet.

AIRCRAFT: Single engine Bonanza - [redacted]

PILOT: [redacted] - 43
Sparta, Illinois

Private pilot since 1936. 3,000 hours plus.

PASSENGERS: [redacted] - 43
Pompano Beach, Florida

[redacted] is a Naval aviator since World War II, with experience in all types up to the F9F-7.

[redacted], III - 12
Sparta, Illinois

VISIBILITY: Excellent.

WEATHER: Clear.

CLOUD COVER: One tiny cloud was visible in the area of sunset; otherwise, the entire sky was clear.

Initial sighting was by [redacted] at the 8 o'clock position, or a true bearing of about 265° and approximately 3° above the horizon. The first impression was that of a KC-135 in a refueling operation with a fighter and there appeared to be some smoke aft the fighter. This was observed for two or three

minutes and, when it was realized the object was not properly identified as a KC-135, it was called to the attention of the other passengers. The 12-year-old pronounced it a cloud. [redacted] was puzzled. By this time, the stroke had disappeared and there appeared to be a drogue trailing to the left of the main body. The range appeared to be closing and the object getting larger; with the sunset lighting conditions, there was no color, only a dark silhouette, which seemed to be changing rather constantly.

The object lacked symmetry throughout the entire observation and, at no time, did it have the exact appearance of any flying machine known to us. Its silhouette, however, was very definite, sharp, and left no doubt as to whether or not it was a cloud formation. It definitely was not a cloud.

As the range seemed to close, or as the object grew larger, it appeared at one point to have the shape of a small, high-wing monoplane, perhaps a half mile away.

At this point, it was decided to turn toward and clarify the situation. Immediately after turning toward, the drogue appeared to increase in size and the main body diminished in size until the drogue became as large as the original object. A minute or so later, the object began to move away, or diminish in size; always on the same true bearing. We had the feeling that this object was either remaining stationary or in the same relative position to our aircraft, depending on the actual distance involved. We gave chase until the size had diminished to the

point where it became hard to maintain visual contact. Contact would be lost momentarily, and then, regained again only after an intense search of that particular area of the sky, when a tiny black speck could be seen. This black speck was much like a jet being observed at the maximum distance, also in the sky. The elevation was still about 4° above the horizon.

The black speck seemed to remain stationary and quite out of our range so, we took up a N-NE course for Mitchell once again. After two or three minutes, Bates looked over his left shoulder and noted that the black speck was becoming larger and, immediately changed course to head directly toward the black speck, which continued to close, or become larger. As the size increase, [redacted] fancied he saw flickering red and green lights along the upper surface. Reilly could not substantiate this. The lights, if any, were of such low intensity and duration as to be extremely difficult to see. At this point, there was excitement in the cockpit and Bates is unsure about the lights.

As the object continued to approach or grow larger, the splitting action was observed again, and the tiny drogue began to grow and the main body diminished until it was gone. We were unable to approach as closely on this encounter as previously, and the mass had the appearance of a DC-3 at three-quarter's of a mile. Continuing on a course directly for the object, it was observed to break up into perhaps 12 separate and distinct pieces, which seemed to materialize just below

the original mass and then, the pieces seemed to speed away from us at a rapid rate. Once again, the tiny black speck was noted in the twilight, on approximately the same true bearing, 255°, as it had originally been observed. Visibility at that altitude was still very good, although the time was now about 15 minutes after sunset. When the black speck appeared to remain stationary, our course was altered to NE, or altered, and the 25 to 30 minute encounter was ended.

LOCAL MEAN TIME OF SUNSET AND END OF ASTRONOMICAL TWILIGHT—MERIDIAN OF GREENWICH

SUNSET (UPPER LIMB)

Date	Lat. 0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 2	17 53	17 50	17 48	17 45	17 44	17 42	17 40	17 38	17 37	17 36	17 35	17 33	17 32
7	17 51	17 48	17 44	17 39	17 37	17 34	17 31	17 27	17 26	17 24	17 22	17 19	17 17
12	17 50	17 45	17 39	17 33	17 30	17 26	17 22	17 17	17 14	17 12	17 09	17 06	17 02
17	17 49	17 42	17 36	17 28	17 24	17 19	17 13	17 06	17 03	17 00	16 56	16 52	16 48
22	17 48	17 40	17 32	17 23	17 18	17 12	17 05	16 57	16 53	16 49	16 44	16 39	16 33
27	17 47	17 38	17 29	17 18	17 12	17 05	16 57	16 47	16 43	16 38	16 32	16 26	16 19
Nov. 1	17 47	17 37	17 26	17 14	17 07	16 59	16 49	16 38	16 33	16 27	16 21	16 14	16 06
6	17 47	17 36	17 24	17 10	17 02	16 53	16 43	16 30	16 24	16 18	16 10	16 02	15 53
11	17 48	17 35	17 22	17 07	16 58	16 48	16 36	16 22	16 16	16 09	16 01	15 52	15 41
16	17 48	17 35	17 20	17 04	16 54	16 44	16 31	16 16	16 08	16 00	15 52	15 42	15 30
21	17 49	17 35	17 19	17 02	16 52	16 40	16 26	16 10	16 02	15 53	15 44	15 33	15 20
26	17 51	17 35	17 19	17 01	16 50	16 37	16 23	16 05	15 57	15 48	15 37	15 25	15 11
Dec. 1	17 53	17 36	17 19	17 00	16 49	16 36	16 20	16 02	15 53	15 43	15 32	15 19	15 04
6	17 55	17 38	17 20	17 00	16 48	16 35	16 19	15 59	15 50	15 40	15 28	15 14	14 58
11	17 57	17 40	17 22	17 01	16 49	16 35	16 18	15 58	15 49	15 38	15 26	15 11	14 54
16	17 59	17 42	17 23	17 02	16 50	16 36	16 19	15 58	15 49	15 38	15 25	15 10	14 53
21	18 01	17 44	17 25	17 04	16 52	16 38	16 21	16 00	15 50	15 39	15 26	15 11	14 54
26	18 04	17 47	17 28	17 07	16 55	16 40	16 24	16 03	15 53	15 42	15 29	15 15	14 57
31	18 07	17 49	17 31	17 10	16 58	16 44	16 27	16 07	15 57	15 46	15 34	15 20	15 03
36	18 09	17 52	17 34	17 14	17 02	16 48	16 32	16 12	16 03	15 52	15 40	15 26	15 10

END OF ASTRONOMICAL TWILIGHT

Date	Lat. 0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 2	19 02	19 00	19 01	19 04	19 08	19 12	19 18	19 26	19 30	19 35	19 40	19 45	19 53
7	19 00	18 58	18 57	18 58	19 01	19 04	19 08	19 14	19 18	19 22	19 26	19 30	19 36
12	18 59	18 55	18 52	18 52	18 54	18 56	18 59	19 04	19 06	19 10	19 13	19 17	19 21
17	18 59	18 52	18 50	18 48	18 48	18 49	18 51	18 53	18 55	18 58	19 00	19 03	19 07
22	18 58	18 51	18 46	18 43	18 42	18 42	18 43	18 45	18 46	18 47	18 48	18 50	18 52
27	18 57	18 49	18 43	18 38	18 37	18 36	18 36	18 36	18 36	18 37	18 37	18 38	18 40
Nov. 1	18 58	18 49	18 41	18 35	18 33	18 31	18 28	18 27	18 27	18 27	18 28	18 28	18 28
6	18 58	18 48	18 39	18 31	18 28	18 25	18 23	18 20	18 20	18 19	18 18	18 18	18 17
11	19 00	18 48	18 38	18 29	18 25	18 21	18 17	18 14	18 13	18 12	18 11	18 10	18 08
16	19 01	18 48	18 36	18 27	18 21	18 18	18 13	18 09	18 06	18 05	18 04	18 02	18 00
21	19 02	18 49	18 36	18 25	18 20	18 15	18 09	18 04	18 02	17 59	17 58	17 56	17 53
26	19 05	18 49	18 36	18 25	18 19	18 12	18 07	18 01	17 58	17 56	17 53	17 50	17 47
Dec. 1	19 07	18 51	18 37	18 24	18 18	18 12	18 05	17 59	17 56	17 53	17 50	17 47	17 43
6	19 10	18 53	18 38	18 25	18 18	18 12	18 05	17 57	17 54	17 51	17 48	17 44	17 40
11	19 12	18 55	18 40	18 26	18 19	18 12	18 04	17 57	17 54	17 50	17 47	17 42	17 38
16	19 14	18 57	18 42	18 27	18 21	18 14	18 06	17 57	17 55	17 51	17 47	17 43	17 39
21	19 16	18 59	18 44	18 30	18 23	18 16	18 08	18 00	17 56	17 53	17 48	17 44	17 40
26	19 19	19 02	18 47	18 32	18 26	18 18	18 11	18 02	17 59	17 55	17 51	17 48	17 43
31	19 22	19 04	18 50	18 35	18 29	18 21	18 13	18 06	18 02	17 59	17 56	17 52	17 48
36	19 24	19 07	18 52	18 39	18 32	18 25	18 18	18 10	18 08	18 04	18 00	17 56	17 53

SOUTHERN LATITUDES (April to July)

For dates on first line *below*, enter tables above with dates on second line, and apply the correction (in minutes) given on the third line.

Date	Apr. 3	9	14	19	24	Apr. 29	May 4	9	14	20	25	May 30	June 4	10	15	21	26	July 1	7
Use	Oct. 7	12	17	22	27	Nov. 1	Nov. 6	11	16	21	26	Dec. 1	Dec. 6	11	16	21	26	Dec. 31	36
Apply	+15	+15	+15	+15	+14	+14	+13	+13	+12	+11	+10	+9	+7	+6	+5	+4	+2	+1	0

HEADQUARTERS
FOREIGN TECHNOLOGY DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

REPLY TO ATTN OF: TDEW/Capt Quintanilla/69216

SUBJECT: Request for Information on Refueling Operation

15 JAN 1964

TO: Commander
28th Bomb Wing
Ellsworth, South Dakota, 57706

Request information regarding possible use of USAF High Altitude Refueling Area, High Life, on the evening of 25 Oct 63, about 1845 local time. Information desired is to assist in evaluation of a UFO report under AFR 200-2.

FOR THE COMMANDER

for ERIC T de JONCKHEERE
Colonel, USAF
Deputy for Technology
and Subsystems

1st Ind (28DCOIPS)

23 JAN 1964

Hq 28 Bomb Wing (SAC), Ellsworth AFB, SDak

TO: Hq, Foreign Technology Division, Wright-Patterson AFB, Ohio

Records indicate KC-135, #3104 and B-52, #066, departed the High Life Refueling Area at 1720 Local, 25 Oct 63. No other aircraft scheduled into this area until 28 October 63.

JOHN R HINTON, JR
LtCol, USAF
Deputy Commander for Operations

HEADQUARTERS
FOREIGN TECHNOLOGY DIVISION
AIR FORCE SYSTEMS COMMAND
UNITED STATES AIR FORCE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

REPLY TO ATTN OF: TDEW/Capt Quintanilla/69216

30 JAN 1964

SUBJECT: Request for Information on Refueling Operation

TO: 28th Bomb Wing (28 DCOTPS)
Ellsworth, South Dakota, 57706

1. Reference is made to your 1st indorsement, 23 Jan 64, to our letter, TDEW, 15 Jan 64, subject as above. Specific information is needed in order to complete our evaluation. Give inclusive times, altitudes and profile in latitude and longitude of KC-135 #8104 and B-52 #066 while in the immediate area or in the "High Life" area. Please give all available times, locations and altitudes. Report can be classified SECRET if warranted. Would also appreciate the respective organizations and aircraft Commander's names if available.

2. We believe that a rare phenomena call[illegible] "L[illegible]ming" occurred on 25 Oct 63 and that a KC-135 #8104 and B-5[illegible] #06[illegible] were involved. Two experienced Bonanza pilots reported what they believed to be a refueling operation with a KC-135 involved. The pilots could distinguish the features of the KC-135 and could even identify the drogue; however, the closest KC-135 was #8104 and it was located approximately 120 nautical miles from the observer. Possible? Yes, under ideal weather conditions this is possible.

FOR THE COMMANDER

/s/ Hector Quintanilla, Jr., Capt

ERIC T de JONCKHEERE
Colonel, USAF
Deputy for Technology
and Subsystems

Ltr, Hq, Foreign Technology Div, 30 Jan 64

1st Ind (28DCOTPS)

Hq, 28 Bomb Wing (SAC), Ellsworth Air Force Base, SDak

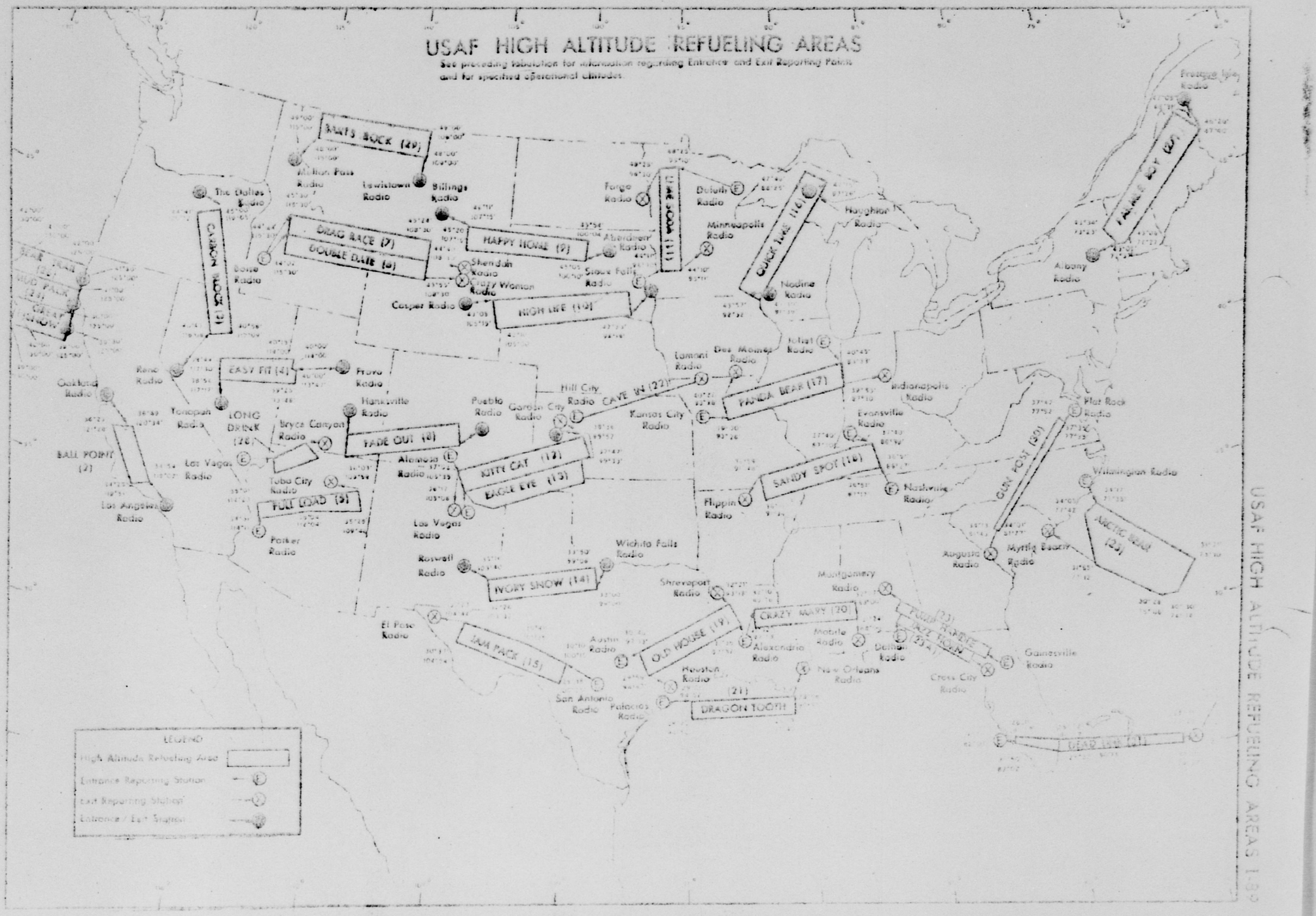
TO: Foreign Technology Div (TDEW)

Kc-135 #8104 and B-52 #066 were in contact from 25/2357Z at 42-50N, 105-12W to 26/0019Z at 44-08N, 101-32W. The refueling altitude was 29,000 Ft. The aircraft commanders of #0104 and #066 were Captain Gardner M Watkins, and Captain Charles W Holmes, respectively. Both are members of the 28th Bomb Wing.

JOHN R HINTON, JR
LtCol, USAF
Deputy Commander for Operations

USAF HIGH ALTITUDE REFUELING AREAS

See preceding tabulation for information regarding Entrance and Exit Reporting Points and for specified operational altitudes.



USAF HIGH ALTITUDE REFUELING AREAS I-29

CHAPTER 1

USAF HIGH ALTITUDE REFUELING AREAS

1. Purpose. To provide SAC crews and operations planning staffs with complete information concerning the high altitude refueling areas. Effective utilization of this information will permit air refueling to be conducted with a minimum of planning and will insure maximum utilization of airspace.

2. Concept of Operation:

a. Except as specified in the following paragraph, all SAC high altitude refueling operations will be confined to the published high altitude refueling areas within the Continental Control Area. These areas have been established as reserved airspace. During a scheduled refueling period, other IFR assigned altitude traffic will not be cleared by FAA through an active refueling area unless the refueling aircraft and the aircraft proposing to traverse the area can be provided radar separation and two-way radio contact is maintained with the aircraft involved and an FAA facility. VFR and IFR-VFR-on-top traffic may traverse the area; however, they are responsible for providing their own separation visually.

b. The following procedures have been established to warn VFR and VFR-on-top traffic of all refueling operations:

(1) The areas are published in the Airman's Guide and USAF Aeronautical Publications. The description of the high altitude refueling areas published in the Airman's Guide will be considered the official document. Changes appearing in the Airman's Guide are automatic pen and ink revisions to SACM 55-14. Periodic revisions to this manual will reflect the current data in the Airman's Guide.

(2) FAA Flight Service Stations include in scheduled broadcasts the fact that air refueling is being conducted in specified areas.

(3) FAA Flight Service Stations issue flight advisory information to VFR traffic known to be operating in the vicinity of active refueling areas.

c. It is recognized that certain essential training and tactical requirements such as large scale missions and no-notice exercises cannot in all cases be confined within the established areas, either in time, altitude, or location. These missions will be held to the absolute minimum and requests for waiver will be approved by this headquarters only on an individual basis in accordance with the following:

(1) Missions will utilize the established areas expanded as required in preference to wholly new areas.

(2) Missions will be conducted on altitude reservation flight plans.

(3) Only priority #7 missions, as defined in SACM 55-3, or higher will be approved. When approved, this headquarters will validate the requirement to CARF.

3. Scheduling Procedures. Controlling agencies of refueling areas will closely monitor the tracks/headings being utilized to insure safe separation between refueling operations. Receiver aircraft

will not enter the area unless radio or electronic rendezvous equipment contact has been established with the respective tanker. The following ground rules are established for the tanker aircraft:

a. Normal Procedures. A complete daily refueling schedule for each refueling area shall be submitted by the scheduling units at an agreed time to the assigned ARTC Centers 24 hours in advance. The schedule will contain the following data on each tanker and receiver aircraft: Identification, type, estimated time of entry at entrance point, flight levels to be used, estimated time of exdt, and exit point. This information will be forwarded via the most convenient and expeditious military or FAA circuit available.

(1) Normally only one group of published flight levels, 240-290 or 310-340, will be scheduled for concurrent use in the same area. Whenever possible, the top altitude of the upper group should be established as 330 to permit other enroute utilization of flight level 350.

(2) Each refueling area will have a specific military unit assigned the responsibility for the scheduling of all refueling activity within that area. An FAA ARTC Center will be assigned the responsibility for coordination with each scheduling unit.

(3) Military units, when flight-planning an altitude reservation that will traverse a published refueling area, will be required to obtain approval from the scheduling unit and will so indicate in the Remarks section of the altitude reservation request. CARF will take action to re-route altitude reservations which do not indicate that approval has been obtained to transit the refueling area. The scheduling unit will insure that the daily refueling schedule does not contain refueling operations which conflict with the approved altitude reservation.

(4) The scheduling unit will notify the assigned ARTC Center of subsequent cancellations as soon as this information is available.

(5) The FAA will consider the tanker and receiver aircraft as one aircraft from point of hookup to point of breakoff for position reporting and separation purposes. The ARTC Centers will, when required, clear other IFR traffic at assigned flight levels through published refueling areas, provided such IFR traffic can be separated by use of ANC or radar separation standards.

(6) The FAA will reserve only those flight levels in the refueling area that are requested in advance through the SAC controlling unit. The flight plans submitted by the refueling units must contain the same flight levels. The flight levels approved by FAA are IFR hard altitude assigned flight levels. Do not use IFR/VFR-on-top flight plan in the high altitude refueling areas.

b. For Single and Dual Track Areas:

(1) Tanker aircraft will not be scheduled to enter the areas at designated entry points at intervals less than one hour. To provide a degree of flexibility for unforeseen conditions, a pad of plus or minus 10 minutes to the scheduled entry time may be provided; however, the area will not be entered prior to the scheduled operational time of the first aircraft.

NOTE: For special missions directed by the parent numbered air force, the time interval may be reduced.

(2) If the tanker aircraft is orbiting at the air refueling control point and the receiver aircraft does not arrive within plus or minus 10 minutes of the scheduled refueling time, the tanker will either depart on the refueling track to exit at the designated exit point or will obtain a revised ARTC clearance and exit the area, avoiding the rendezvous areas. It is imperative that timing be maintained within this limit or a conflict will exist with subsequent refueling formations.

c. Special Procedures for Dual Track Areas:

(1) Since reciprocal refueling tracks are established within dual track areas, aircraft may be scheduled to complete refueling on one track, cross over to the other track prior to exiting the area, and continue refueling in the opposite direction. If this concept is utilized, aircraft will hold at the exit end of the first refueling track, within the published area, and depart the holding area to make good the next scheduled area entry time at the ARCP for opposite direction refueling. It is imperative that scheduling agencies closely monitor this operation. Tankers will not utilize the cross-over procedure unless previously scheduled for the opposite track.

(2) Both tracks in a dual track refueling area may be utilized for refueling in the same or opposite direction (parallel refueling operation) provided all aircraft concerned are briefed on the refueling being conducted on the adjacent track. Simultaneous use of both tracks is not authorized when cross-over to reverse track is scheduled.

(3) While crossing over to the opposite track, the communications will be switched to the appropriate communications-rendezvous plan as defined in Annex I, SACM 100-24, for the opposite track.

(4) Altitude reservation missions are not limited to area entry times and ARCP departure timing described above; however, refueling aircraft formations on the same track will be separated by a minimum of 30 minutes.

4. Priority. The peacetime FAA-JCS Air Traffic Control priorities as defined in SACM 55-3 do not apply to activity in high altitude air refueling areas. During periods of operation, the high altitude refueling areas have the same status as altitude reservations. Permission to traverse the area on IFR or altitude reservation flight plans must be obtained prior to takeoff from the refueling area controlling agency. The controlling agency must, in turn, advise the Central Altitude Reservation Facility (CARF) when the area, or specified altitudes within the area, are cleared to allow a conflicting altitude reservation to operate. Higher headquarters have the authority to grant priority for certain exercises over the normal training. Numbered air forces may clear those areas controlled by agencies under their command jurisdiction. Headquarters SAC clears all areas in which SAC executed missions conflict with the refueling areas. Agencies with responsibilities for planning missions must take cognizance of these refueling areas. The command post of the controlling agency will cancel with CARF all scheduled periods which will not be utilized, except short periods which are due to aborts. Aircraft aborting either on the ground or in the air will call the command post of the controlling agency. In the air, the numbered Air Force short order stations and telephone patch will be utilized. "Bootleg" aircraft may then contact the controlling agency by the same method for possible use of these periods.

5. MARSA. The military assumes responsibility for separation of aircraft within the high altitude refueling areas. The FAA will provide a buffer zone free from IFR traffic around the refueling areas (except for radar monitored flights) but will make no attempt to provide separation between aircraft within the area. Consequently, permission from FAA to extend refueling operations over and above a unit's allotted portion of the daily schedule within the daily time block does not mean that separation is being provided. Only strict adherence to the schedule within the ground rules provided in this manual will insure the safe conduct of the air refueling operations. MARSA between tanker/receiver will be indicated in the Remarks section of the SAC Form 121 or AF Form 175, as appropriate, for both tanker and receiver.

6. Right-of-Way. Civil Air Regulations, Part 60, paragraph 60.14(b), was amended on 15 Feb 60 to give refueling aircraft the same right of way as aircraft being towed.

7. Tactical Doctrine. The SAC Tactical Doctrine will be complied with to the maximum extent. Deviations are authorized when it is necessary to comply with the USAF-FAA agreements reflected in this manual.

8. Flight Levels. Flight levels indicated as operational altitudes are inclusive. Special care must be exercised when using flight level 240, as it is not authorized as an operational level. The tanker crew will be required to secure the best available altimeter setting for the refueling area and assure that refueling operations are not conducted below 24,000 feet MSL.

9. Altitude Clearance. Operations other than refueling will avoid active refueling areas by at least 1,000 feet above or below the published altitudes, except for flight levels above 290, which require 2,000 feet altitude separation.

10. RBS Activity. Aircraft engaged in RBS activity VFR or VFR-on-top adjacent to a high altitude refueling area at altitudes which conflict with the refueling operation will avoid the refueling area by at least 15 nautical miles during the periods of time the refueling area is active.

11. Manual Changes. The procedures contained in this chapter are directive in nature. The refueling areas have been implemented by a formal agreement between USAF and the FAA. Changes to the refueling areas will appear in the Airman's Guide with subsequent changes to this manual. INFORMATION CONTAINED IN THE AIRMAN'S GUIDE TAKES PRECEDENCE OVER THIS MANUAL. Simultaneous publication of a formal change to this manual with the effective date of the change in the Airman's Guide is not possible. The briefing officer will be responsible for briefing the changes to the refueling areas as they become effective in the Airman's Guide. The following procedures will be followed to coordinate changes to existing areas or initiate action to coordinate new areas:

a. Alfa. Numbered air forces will coordinate directly with FAA Region and/or FAA ARTC Center personnel for changes desired to existing areas or to initiate action on establishing a new area. The FAA Liaison Officer at the numbered air force headquarters may be requested to assist in this coordination.

b. Bravo. After approval, the Region will forward the approved coordinates and flight levels to the FAA-SAC Liaison Officer at this headquarters (DOOPF).

c. Charlie. The new area or the changes to a revised area will be effective 12 days after the date of the publishing date of the Airman's Guide in which it first appears.

12. Communications. Communications-rendezvous plans contained in this manual refer to Annex I, SACM 100-24. The following procedures are prescribed for use during refueling operations: All refueling aircraft approaching refueling areas shall establish communication with the appropriate ARTC Center on the center "area discrete" UHF frequency. All tanker and receiver aircraft will report over the entrance and exit points.

a. Receiver aircraft commanders will:

(1) Prior to rendezvous with tanker aircraft, advise Air Traffic Control that the ATC frequency will not be guarded for a specified period while conducting the refueling mission. Further contacts should be addressed through the tanker aircraft involved in the refueling operation.

(2) Upon establishing contact with the tanker aircraft, give the pertinent portion of the current flight plan under which flight is being conducted to the tanker pilot. In the event that tanker and receiver aircrews attended a common briefing prior to flight, and the current flight plan is as briefed, a detailed flight plan need not be given. However, all changes in effect will be relayed in order to insure that the tanker pilot is familiar with the current clearance.

(3) Receive positive position reports from tanker aircraft upon completion of the refueling operation. This will include any changes to the ATC clearance which may have been obtained.

(4) Insure that aircraft proceed in accordance with the ATC clearance or, in the event a change is required, obtain the necessary amendments.

(5) Immediately after breakoff from the tanker, establish communications with the appropriate ARTC Center in order that one of the following services can be effected:

(a) If on an IFR flight plan after completion of the air refueling, ANC or radar separation can be continued between the receiver aircraft and other aircraft operating at assigned altitudes on IFR flight plans,

(b) If on an IFR flight plan, in VFR conditions on top, the receiver can be issued appropriate traffic advisories, or,

(c) If operating VFR, appropriate traffic advisories can be issued to the receiver prior to departing the immediate vicinity of the completed refueling operation. In the event that no pertinent traffic exists, the receiver will so be advised and clearance will be issued to leave the center frequency.

b. Tanker aircraft commanders will:

(1) Insure that they have obtained the current ATC clearance under which the receiver aircraft is operating. In the event the course of the refueling mission deviates from the provisions of this clearance, tanker aircraft commanders will insure that necessary amendments are obtained from ATC for both tanker and receiver aircraft. They will supply:

(a) The flight levels to be used in refueling.

(b) Estimated time in refueling area.

(c) If other than a single direction track through the entire length of refueling area, sufficient description of the route within the area to provide the controller with information necessary to effect separation with other aircraft.

(2) When rendezvous has been completed and visual contact established, be responsible for completing all position reports for both tanker and receiver aircraft.

(3) During refueling operations, designate a crew member to:

(a) Maintain a continuous listening watch on appropriate ATC frequency.

(b) Complete radio calls required for both aircraft.

(4) Furnish the receiver aircraft commander a positive position at the completion of refueling operations together with any amendments or changes to the ATC clearance, if such have been obtained.

c. All procedures outlined in paragraphs 12a and b, above, apply to the tanker task force commander during mass air refuelings whenever aircraft of either the tanker or receiver force is operating under ATC clearance.

13. Numbering. High altitude refueling areas will be numbered consecutively as coordinated and implemented.

14. Grid Navigation. Whenever key ARCPs are located 60° North Latitude or above, grid navigation will be used and all references to headings between aircraft will be in grid.

COLUMNAR DATA HIGH ALTITUDE REFUELING AREAS

ALPHA TRACK				BRAVO TRACK			
ENTRY POINTS	ARCP	EXIT POINT/S	C/R PLAN.	ENTRY POINT/S	ARCP	EXIT POINT	C/R PLAN
Hanksville VOR 179/44 3742N 11056W	3750N 11013W	Pueblo VOR 270/58 3832N 10538W	George Alfa	Pueblo VOR 244/55 3806N 10533W	3759N 10634W	Hanksville VOR 171/69 3716N 11050W	George Bravo
Billings VOR 064/59 4559N 10713W	4557N 10623W	Aberdeen VOR 273/75 4542 1/2N 10005W	Howard Alfa	Aberdeen VOR 254/75 4517 1/2N 10008W	4523N 10118W	Billings VOR 089/59 4533N 10716W	Howard Bravo
Casper VOR 94/51 4250N 10512W	4256N 10422W	Sioux Falls 251/68 4329N 9818W	Norman Alfa	Sioux Falls 231/74 4303N 9817W	4259N 9922.5W	Casper 113/67 4226N 10504W	Norman Bravo
Sioux Falls VOR 029/41 4411N 9613W	4503N 9613W	Fargo VOR 008/104 4825N 9611W	Sam Alfa	Duluth VOR 300/167 4825N 9525W	4743N 9528W	Minneapolis 231/107 4411N 9527W	Sam Bravo
Alamosa VOR 138/34 3650N 10530W	3703N 10442W	Garden City VOR 043/50 3824N 9951W	Thomas Alfa	Garden City VOR 073/50 3800N 9939W	3745N 10042W	Las Vegas VOR 337/49 3628N 10515W	Thomas Bravo
Garden City VORTAC 125/55 3715N 9955W	3700N 10054W	Las Vegas VOR 020/18 3553N 10455W	Owen Alfa				
Las Vegas 020/18	3611N 10357W	Garden City 125/55					
Roswell VOR 098/50 3304N 10342W	3310N 10300W	Wichita Falls VOR 218/32 3337N 9905W	Perry Alfa	Wichita Falls VOR 195/52 3312N 9902W	3306N 10000W	Roswell VOR 118/66 3238N 10338W	Perry Bravo

COLUMNAR DATA HIGH ALTITUDE REFUELING AREAS

NUMBER	NICKNAME	AREA COORDINATES	FLT LVL	MILITARY CONTROLLING UNIT	FAA CONTROLLING CENTER	REMARKS
8	Fade Out Fig 1	3753N 10530W 3848N 10541W 3706N 11048W 3753N 11059W	240-260	6BW, Walker, 15AF	Denver	
9	Happy Home Fig 1	4505N 10010W 4554N 10004W 4611N 10715W 4520N 10716W	310-330	4136th SW Minot 15AF	Denver	
10	High Life Fig 1	4305N 10515W 4210N 10500W 4343N 9820W 4253N 9814W	240-290	28BW, Ellsworth, 15AF	Denver	
11	Lime Soda Fig 1	4411N 9630W 4411N 9510W 4825N 9630W 4825N 9510W	240-290	4321 SW Offutt AFB 2AF	Minneapolis	
12	Kitty Cat Fig 1	3747N 9933W 3836N 9957W 3702N 10535W 3617N 10508W	240-270	95BW, Biggs, 15AF	Albuquerque	Will not be used concurrently with flight levels 280-290 in the Eagle Eye area.
13	Eagle Eye Fig 1	3740N 10000W 3649N 9950W 3547N 10349W 3553N 10455W 3617N 10508W	240-270 280-290	832AD, Cannon, TAC	Albuquerque	Both blocks of flight levels will not be used concurrently.
14	Ivory Snow Fig 1	33151/2N 10340W 32261/2N 10332W 3350N 9906W 3300N 9900W	310-340	6BW, Walker, 15AF	El Paso	

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Billings VOR 064/59 4559N 10713W	4557N 10623W	Aberdeen VOR 273/75 4542 1/2N 10005W	Howard Alfa	Aberdeen VOR 254/75 4517 1/2N 10008W	4523N 10118W	Billings VOR 089/59 4533N 10716W	Howard Bravo
Casper VOR 94/51 4250N 10512W	4256N 10422W	Sioux Falls 251/68 4329N 9818W	Norman Alfa	Sioux Falls 231/74 4303N 9817W	4259N 9922.5W	Casper 113/67 4226N 10504W	Norman Bravo
Sioux Falls VOR 029/41 4411N 9613W	4503N 9613W	Fargo VOR 008/104 4825N 9611W	Sam Alfa	Duluth VOR 300/167 4825N 9525W	4743N 9528W	Minneapolis 231/107 4411N 9527W	Sam Bravo
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Garden City VORTAC 125/55 3715N 9955W	3700N 10054W	Las Vegas VOR 020/18 3553N 10455W	Owen Alfa				
Las Vegas 020/18	3611N 10357W	Garden City 125/55					
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COLUMNAR DATA HIGH ALTITUDE REFUELING AREAS

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10	High Life Fig 1	4305N 10515W 4210N 10500W 4343N 9820W 4253N 9814W	240-290	28BW, Ellsworth, 15AF	Denver	
11	Lime Soda Fig 1	4411N 9630W 4411N 9510W 4825N 9630W 4825N 9510W	240-290	4321 SW Offutt AFB 2AF	Minneapolis	
12	Kitty Cat Fig 1	3747N 9933W 3836N 9957W 3702N 10535W 3617N 10508W	240-270	95BW, Biggs, 15AF	Albuquerque	Will not be used concurrently with flight levels 280-290 in the Eagle Eye area.
13	Eagle Eye Fig 1	3740N 10000W 3649N 9950W 3547N 10349W 3553N 10455W 3617N 10508W	240-270 280-290	832AD, Cannon, TAC	Albuquerque	Both blocks of flight levels will not be used concurrently.
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LOCAL MEAN TIME OF SUNSET AND END OF ASTRONOMICAL TWILIGHT—MERIDIAN OF GREENWICH

SUNSET (UPPER LIMB)

Date	Lat. 0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 2	17 53	17 50	17 48	17 45	17 44	17 42	17 40	17 38	17 37	17 36	17 35	17 33	17 32
7	17 51	17 48	17 44	17 39	17 37	17 34	17 31	17 27	17 26	17 24	17 22	17 19	17 17
12	17 50	17 45	17 39	17 33	17 30	17 26	17 22	17 17	17 14	17 12	17 09	17 06	17 02
17	17 49	17 42	17 36	17 28	17 24	17 19	17 13	17 06	17 03	17 00	16 56	16 52	16 48
22	17 48	17 40	17 32	17 23	17 18	17 12	17 05	16 57	16 53	16 49	16 44	16 39	16 33
27	17 47	17 38	17 29	17 18	17 12	17 05	16 57	16 47	16 43	16 38	16 32	16 26	16 19
Nov. 1	17 47	17 37	17 26	17 14	17 07	16 59	16 49	16 38	16 33	16 27	16 21	16 14	16 06
6	17 47	17 36	17 24	17 10	17 02	16 53	16 43	16 30	16 24	16 18	16 10	16 02	15 53
11	17 48	17 35	17 22	17 07	16 58	16 48	16 36	16 22	16 16	16 09	16 01	15 52	15 41
16	17 48	17 35	17 20	17 04	16 54	16 44	16 31	16 16	16 08	16 00	15 52	15 42	15 30
21	17 49	17 35	17 19	17 02	16 52	16 40	16 26	16 10	16 02	15 53	15 44	15 33	15 20
26	17 51	17 35	17 19	17 01	16 50	16 37	16 23	16 05	15 57	15 48	15 37	15 25	15 11
Dec. 1	17 53	17 36	17 19	17 00	16 49	16 36	16 20	16 02	15 53	15 43	15 32	15 19	15 04
6	17 55	17 38	17 20	17 00	16 48	16 35	16 19	15 59	15 50	15 40	15 28	15 14	14 58
11	17 57	17 40	17 22	17 01	16 49	16 35	16 18	15 58	15 49	15 38	15 26	15 11	14 54
16	17 59	17 42	17 23	17 02	16 50	16 36	16 19	15 58	15 49	15 38	15 25	15 10	14 53
21	18 01	17 44	17 25	17 04	16 52	16 38	16 21	16 00	15 50	15 39	15 26	15 11	14 54
26	18 04	17 47	17 28	17 07	16 55	16 40	16 24	16 03	15 53	15 42	15 29	15 15	14 57
31	18 07	17 49	17 31	17 10	16 58	16 44	16 27	16 07	15 57	15 46	15 34	15 20	15 03
36	18 09	17 52	17 34	17 14	17 02	16 48	16 32	16 12	16 03	15 52	15 40	15 26	15 10

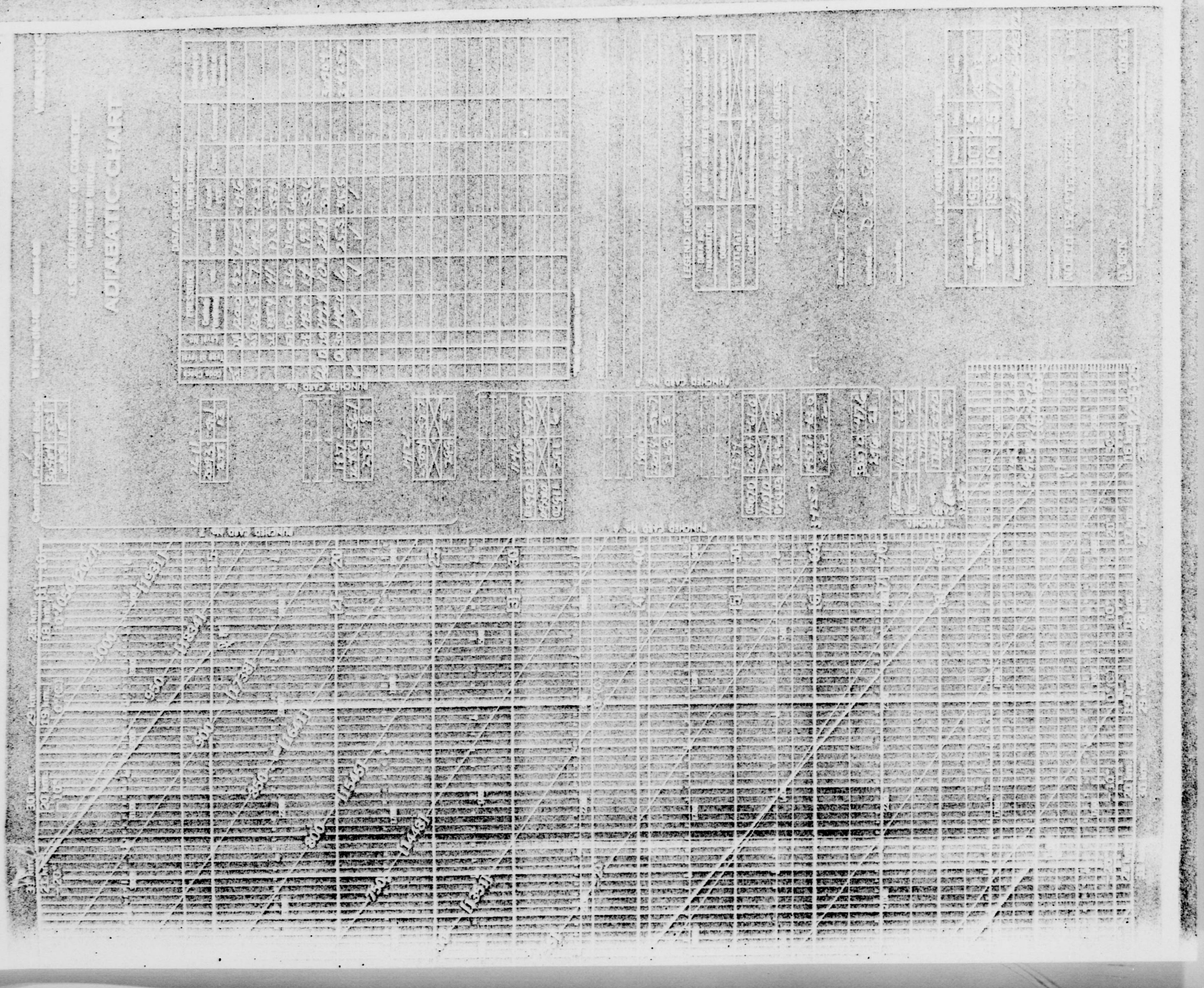
END OF ASTRONOMICAL TWILIGHT

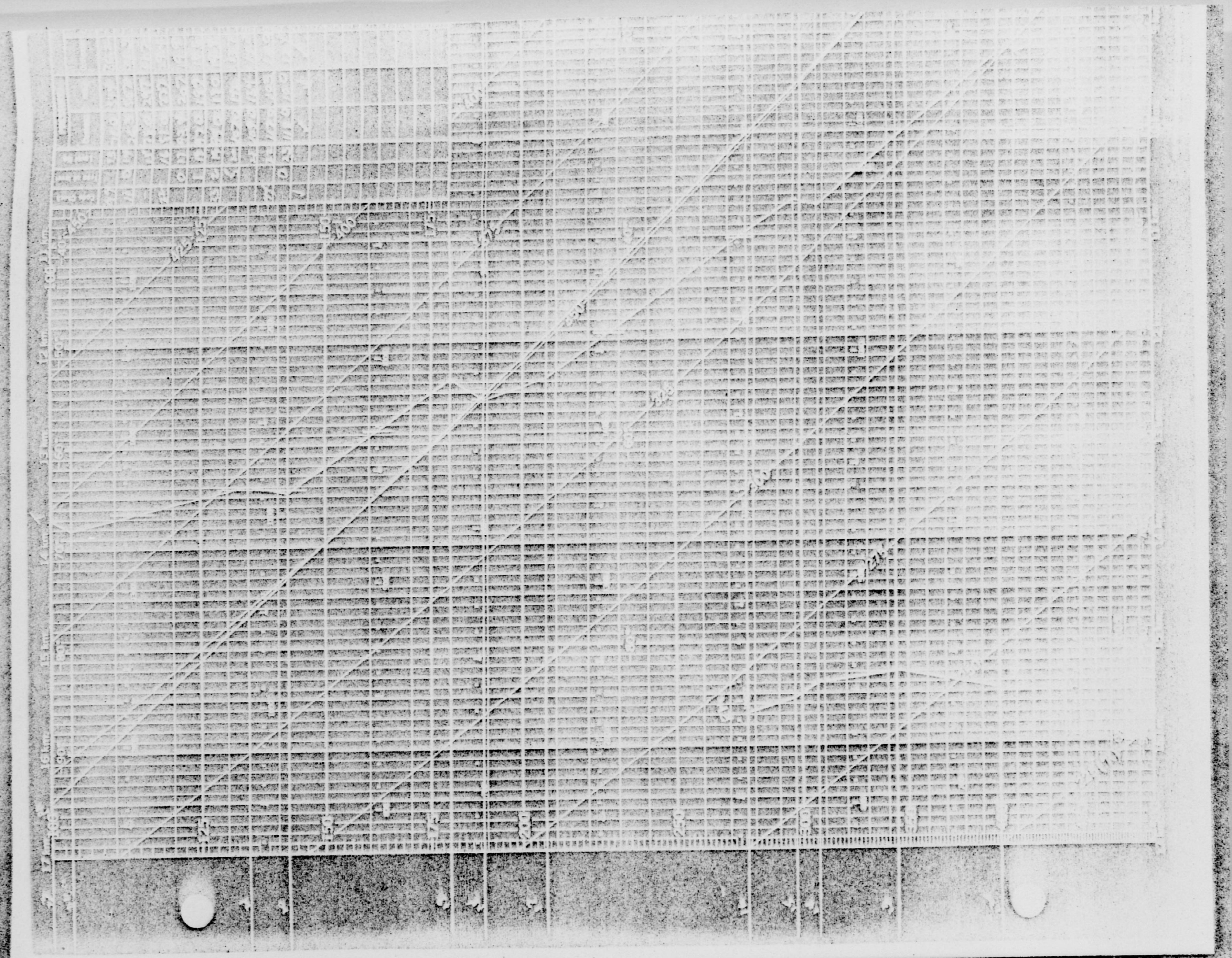
Date														
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 2	19 02	19 00	19 01	19 04	19 08	19 12	19 18	19 26	19 30	19 35	19 40	19 45	19 53	
7	19 00	18 58	18 57	18 58	19 01	19 04	19 08	19 14	19 18	19 22	19 26	19 30	19 36	
12	18 59	18 55	18 52	18 52	18 54	18 56	18 59	19 04	19 06	19 10	19 13	19 17	19 21	
17	18 59	18 52	18 50	18 48	18 48	18 49	18 51	18 53	18 55	18 58	19 00	19 03	19 07	
22	18 58	18 51	18 46	18 43	18 42	18 42	18 43	18 45	18 46	18 47	18 48	18 50	18 52	
27	18 57	18 49	18 43	18 38	18 37	18 36	18 36	18 36	18 36	18 37	18 37	18 38	18 40	
Nov. 1	18 58	18 49	18 41	18 35	18 33	18 31	18 28	18 27	18 27	18 27	18 28	18 28	18 28	
6	18 58	18 48	18 39	18 31	18 28	18 25	18 23	18 20	18 20	18 19	18 18	18 18	18 17	
11	19 00	18 48	18 38	18 29	18 25	18 21	18 17	18 14	18 13	18 12	18 11	18 10	18 08	
16	19 01	18 48	18 36	18 27	18 21	18 18	18 13	18 09	18 06	18 05	18 04	18 02	18 00	
21	19 02	18 49	18 36	18 25	18 20	18 15	18 09	18 04	18 02	17 59	17 58	17 56	17 53	
26	19 05	18 49	18 36	18 25	18 19	18 12	18 07	18 01	17 58	17 56	17 53	17 50	17 47	
Dec. 1	19 07	18 51	18 37	18 24	18 18	18 12	18 05	17 59	17 56	17 53	17 50	17 47	17 43	
6	19 10	18 53	18 38	18 25	18 18	18 12	18 05	17 57	17 54	17 51	17 48	17 44	17 40	
11	19 12	18 55	18 40	18 26	18 19	18 12	18 04	17 57	17 54	17 50	17 47	17 42	17 38	
16	19 14	18 57	18 42	18 27	18 21	18 14	18 06	17 57	17 55	17 51	17 47	17 43	17 39	
21	19 16	18 59	18 44	18 30	18 23	18 16	18 08	18 00	17 56	17 53	17 48	17 44	17 40	
26	19 19	19 02	18 47	18 32	18 26	18 18	18 11	18 02	17 59	17 55	17 51	17 48	17 43	
31	19 22	19 04	18 50	18 35	18 29	18 21	18 13	18 06	18 02	17 59	17 56	17 52	17 48	
36	19 24	19 07	18 52	18 39	18 32	18 25	18 18	18 10	18 08	18 04	18 00	17 56	17 53	

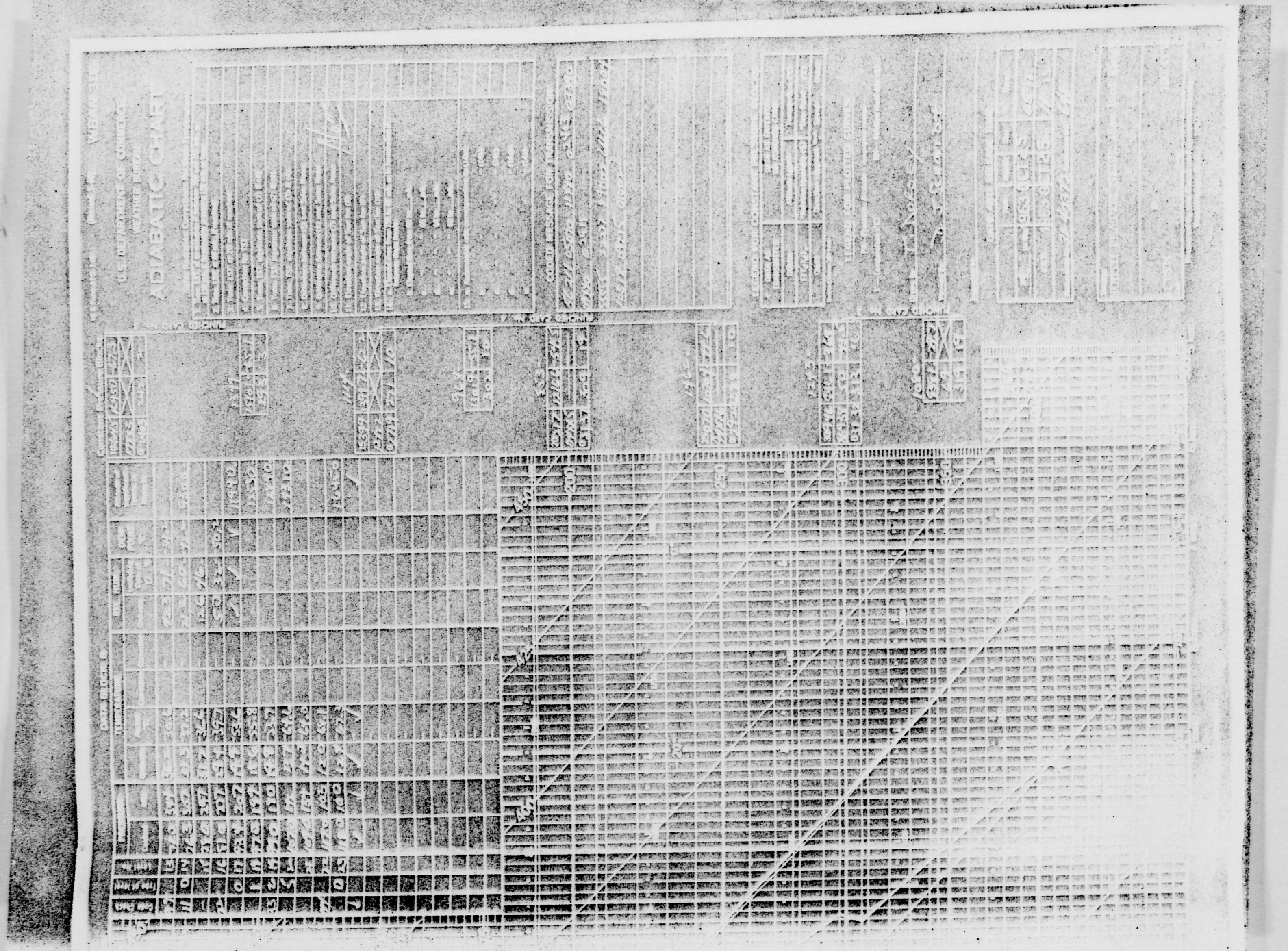
SOUTHERN LATITUDES (April to July)

For dates on first line *below*, enter tables above with dates on second line, and apply the correction (in minutes) given on the third line.

Date	Apr. 3	9	14	19	24	Apr. 29	May 4	9	14	20	25	May 30	June 4	10	15	21	26	July 1	7
Use	Oct. 7	12	17	22	27	Nov. 1	Nov. 6	11	16	21	26	Dec. 1	Dec. 6	11	16	21	26	Dec. 31	36
Apply	+15	+15	+15	+15	+14	+14	+13	+13	+12	+11	+10	+9	+7	+6	+5	+4	+2	+1	0


ADRIATIC CHART

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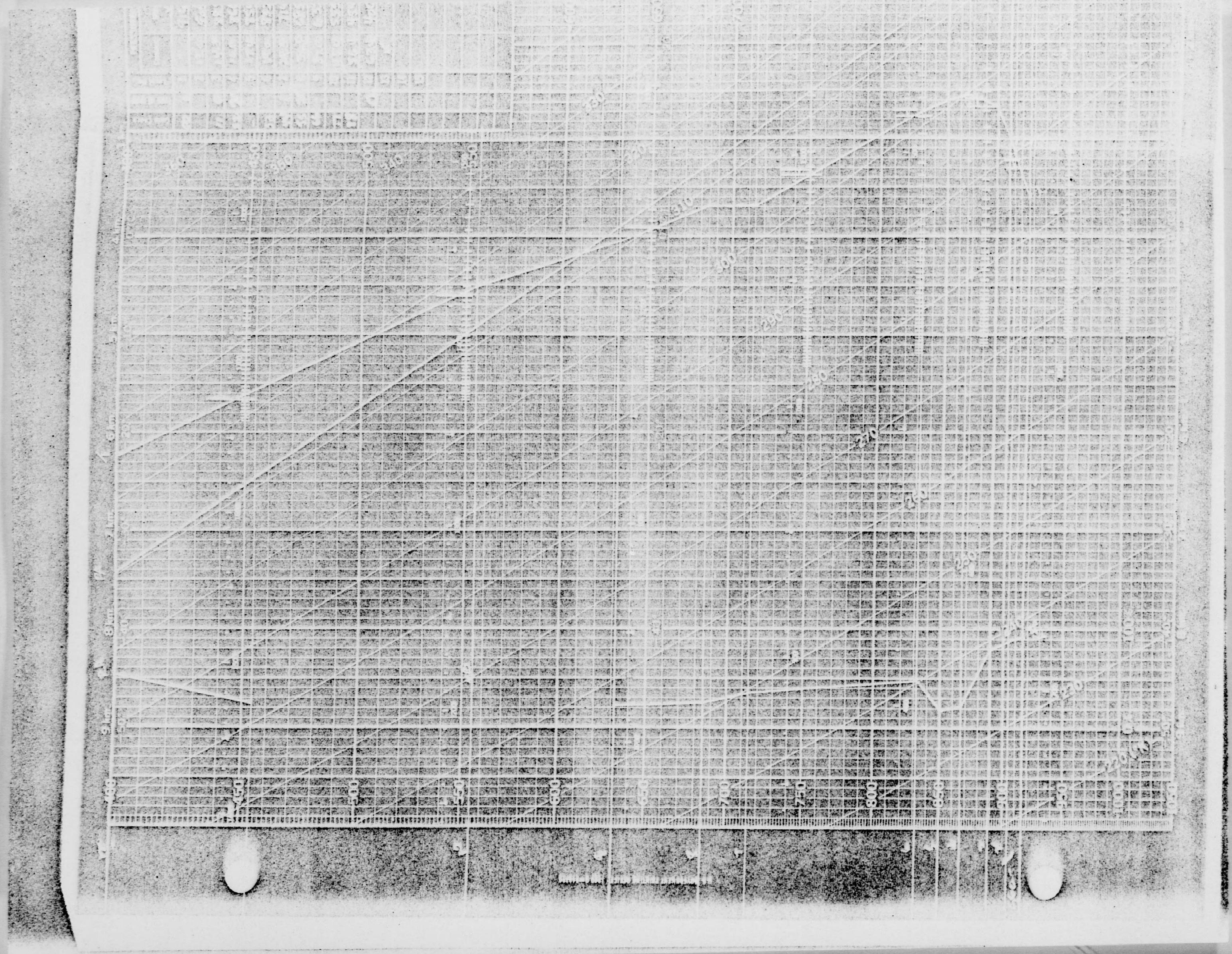

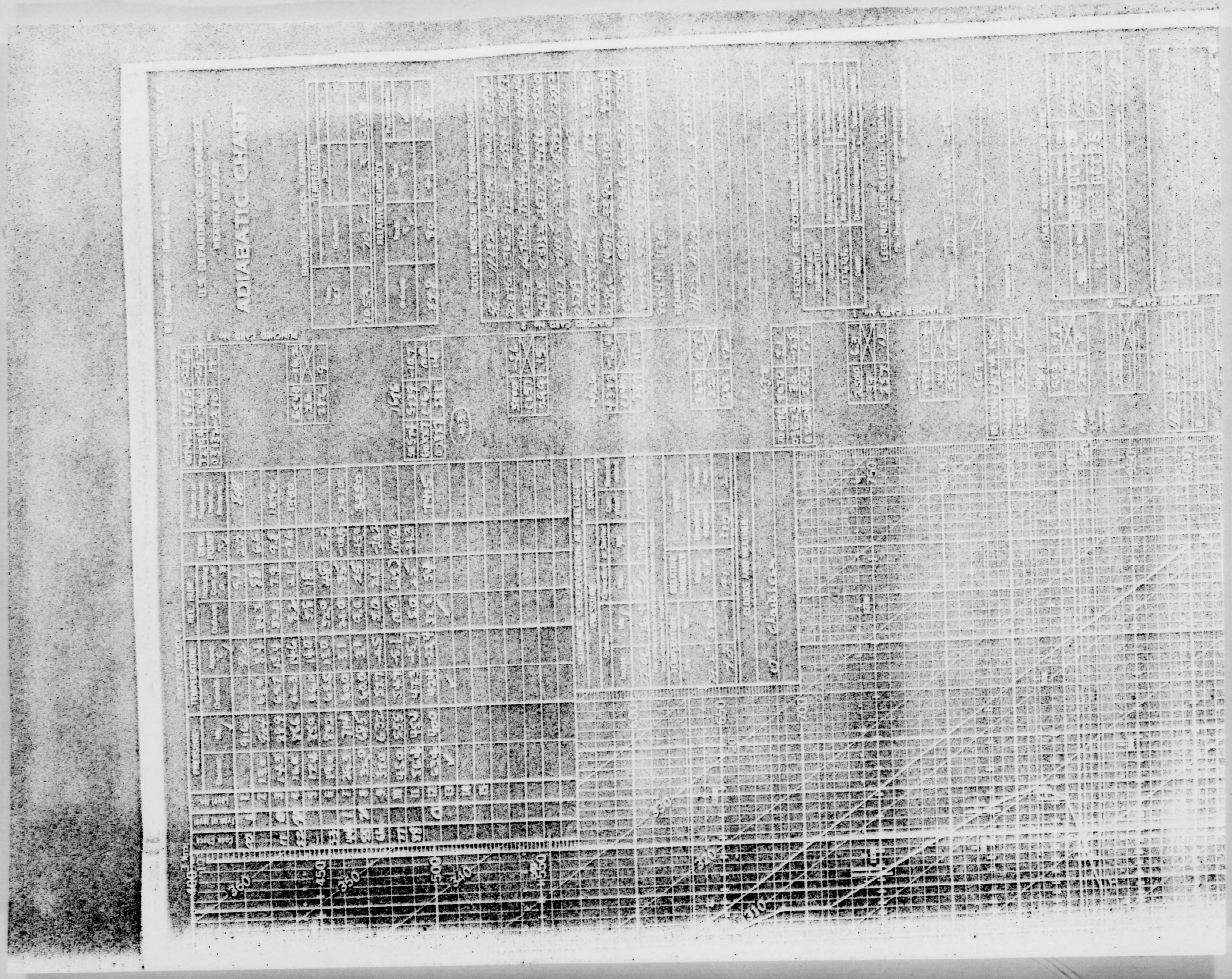
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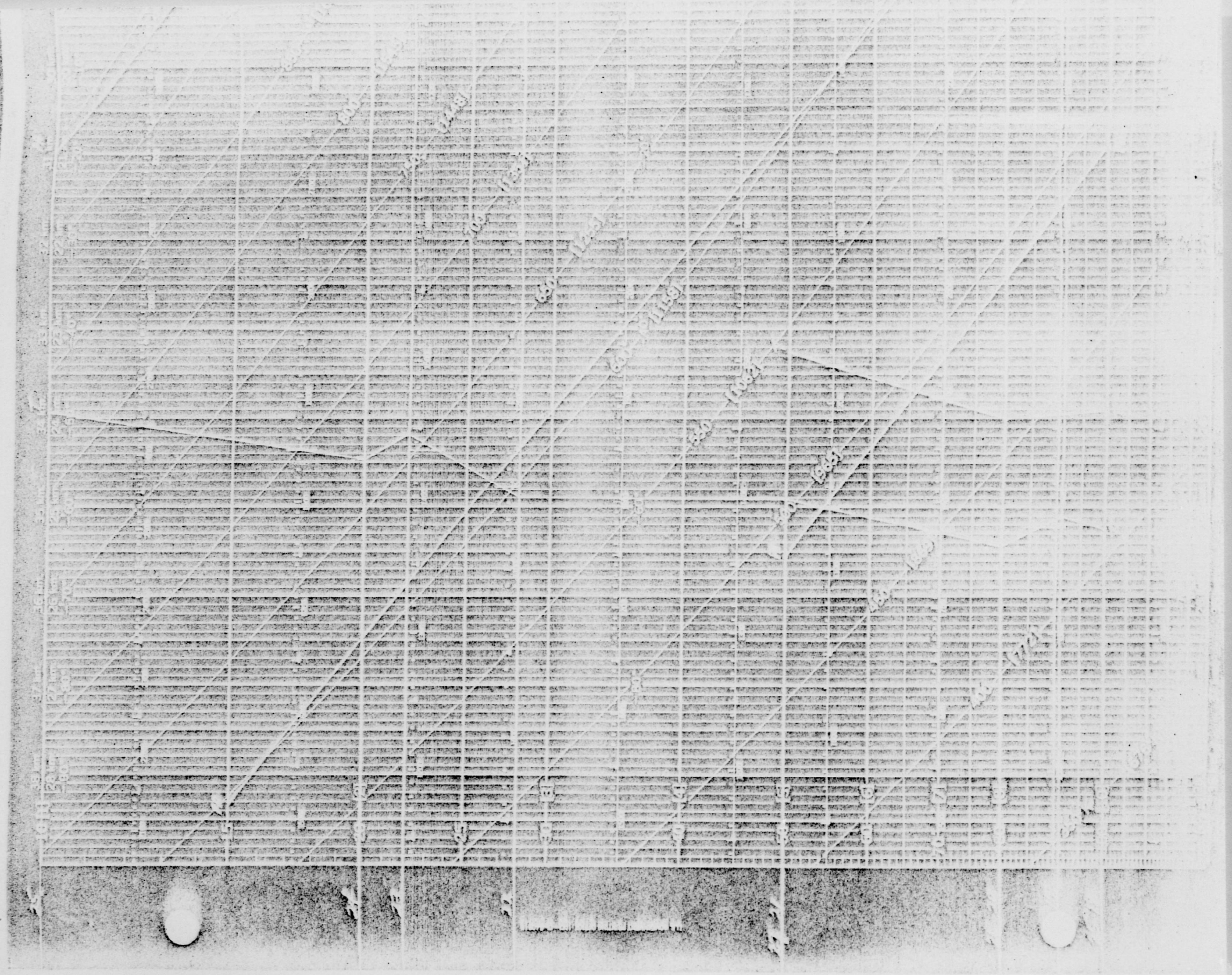

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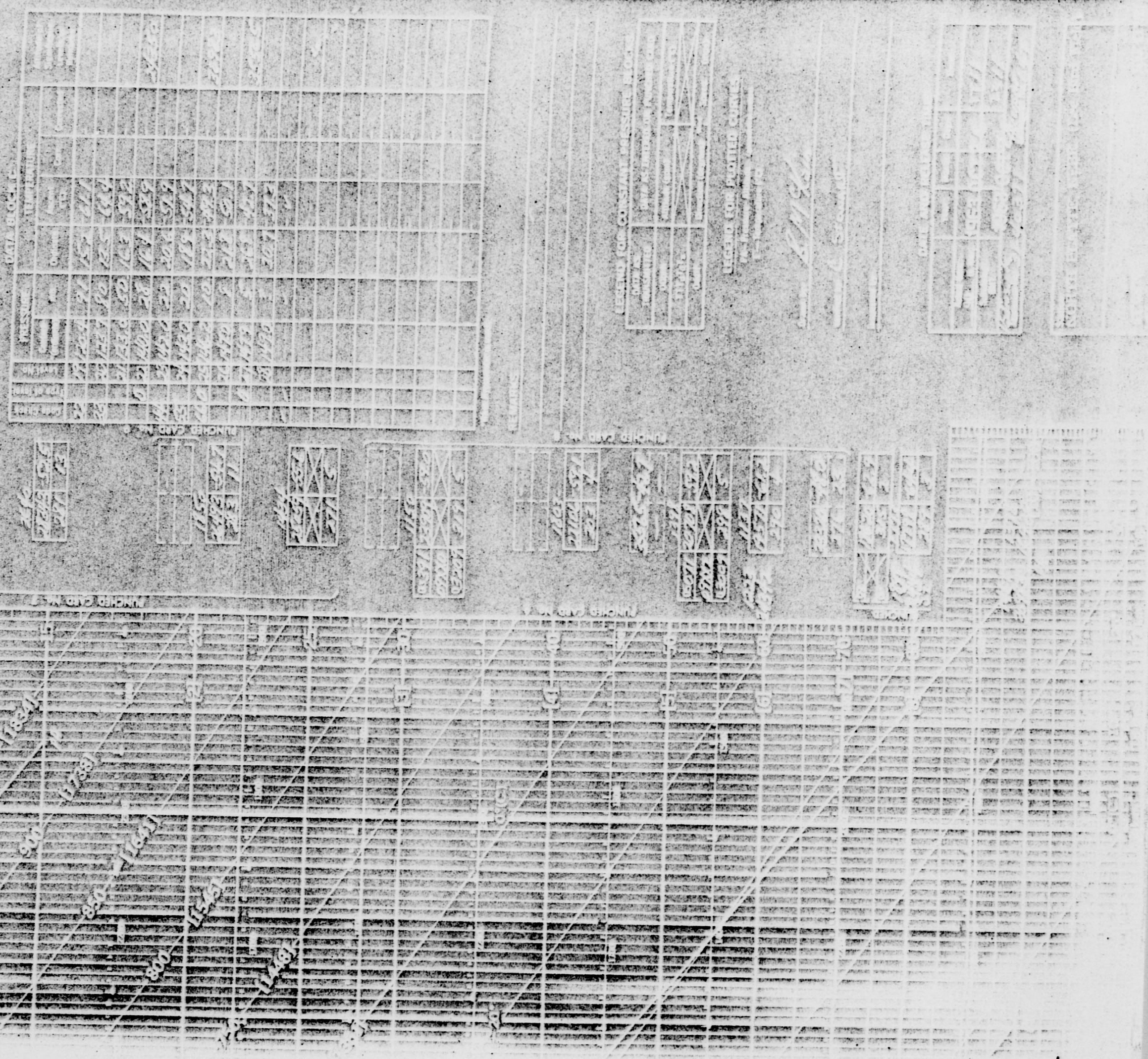

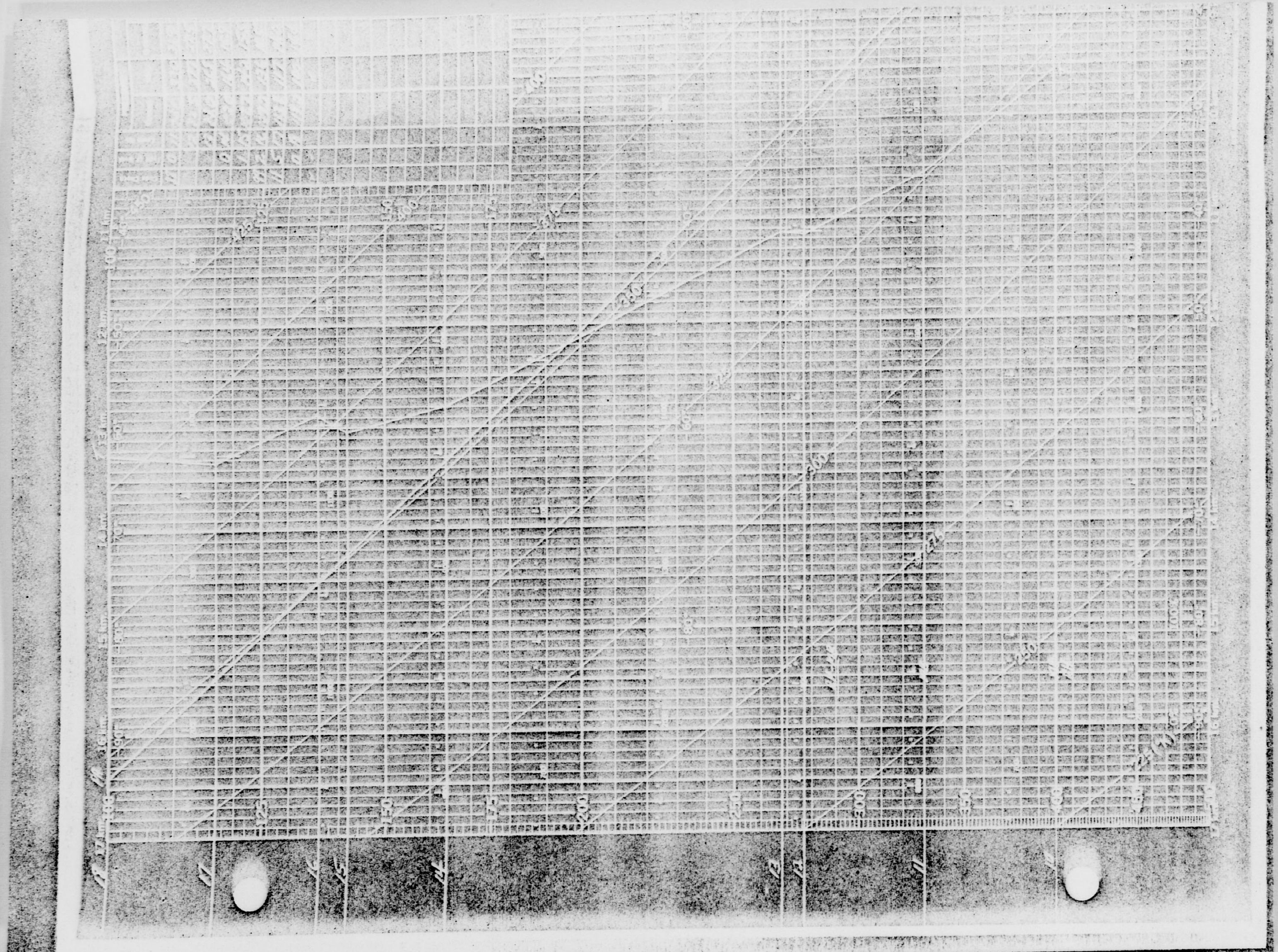

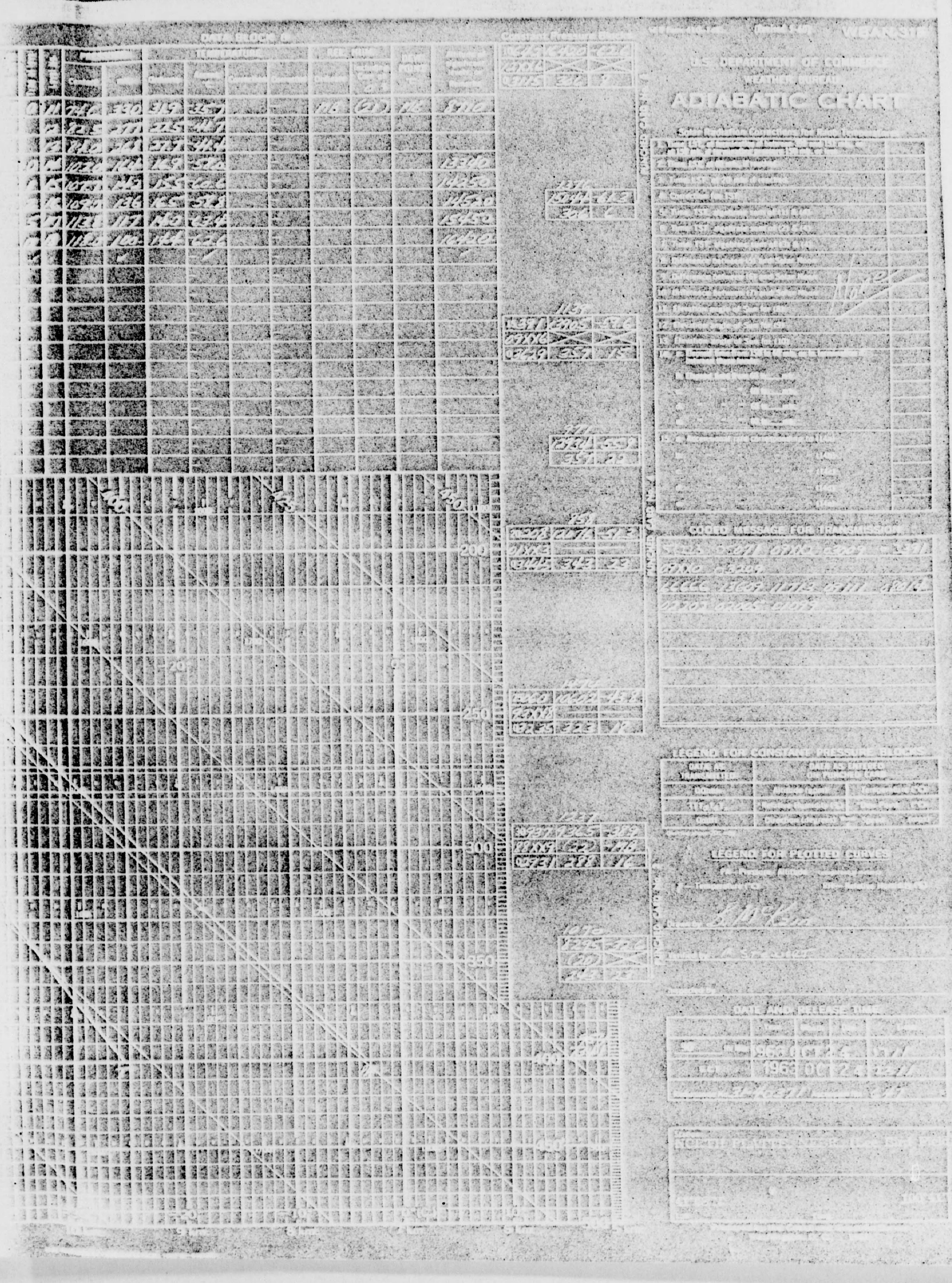
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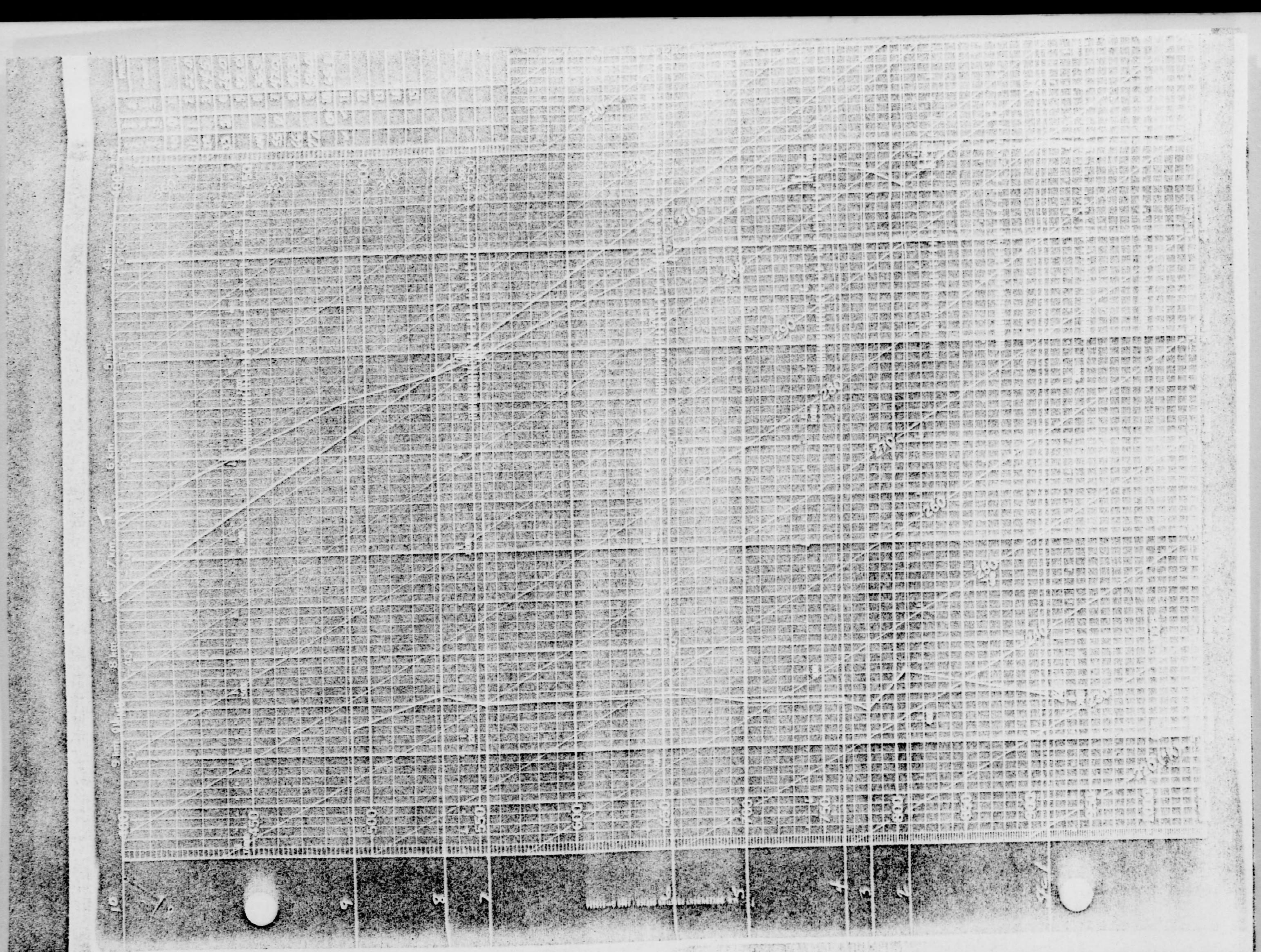
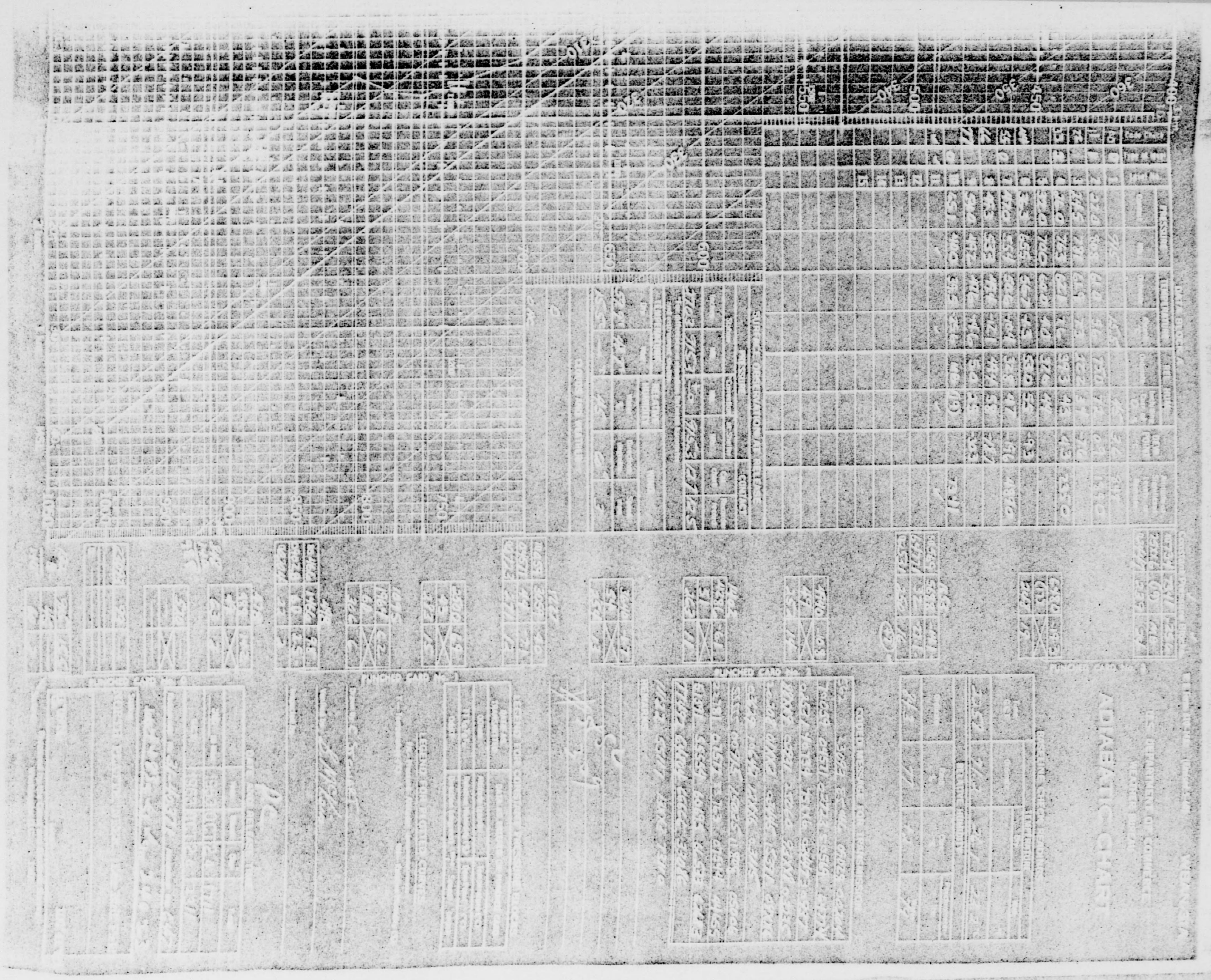
CODED MESSAGE FOR TRANSMISSION
LEGEND FOR CONSTANT PRESSURE SURFACES
LEGEND FOR PLOTTED CURVES
DATE AND RELEASE TIME

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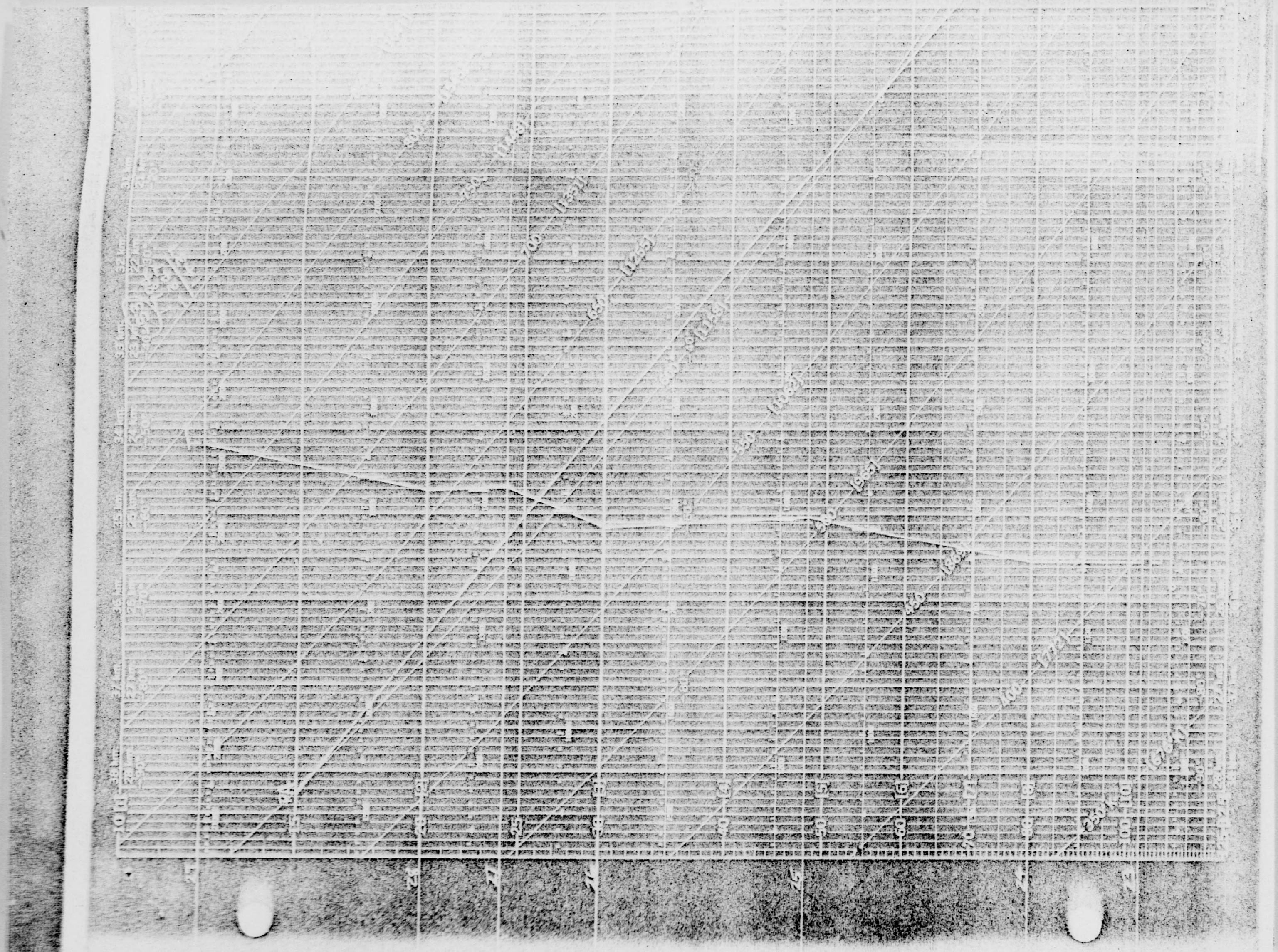

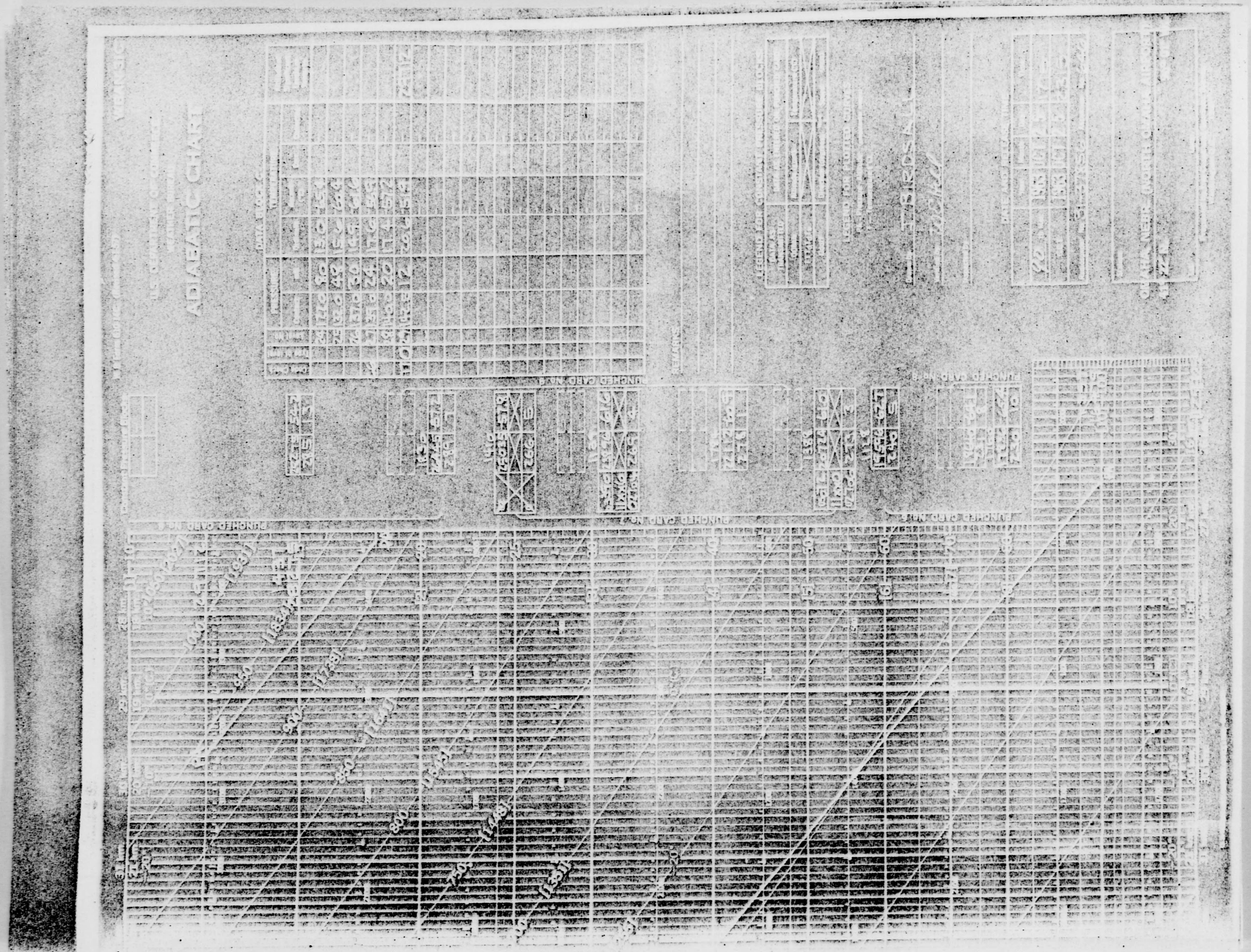
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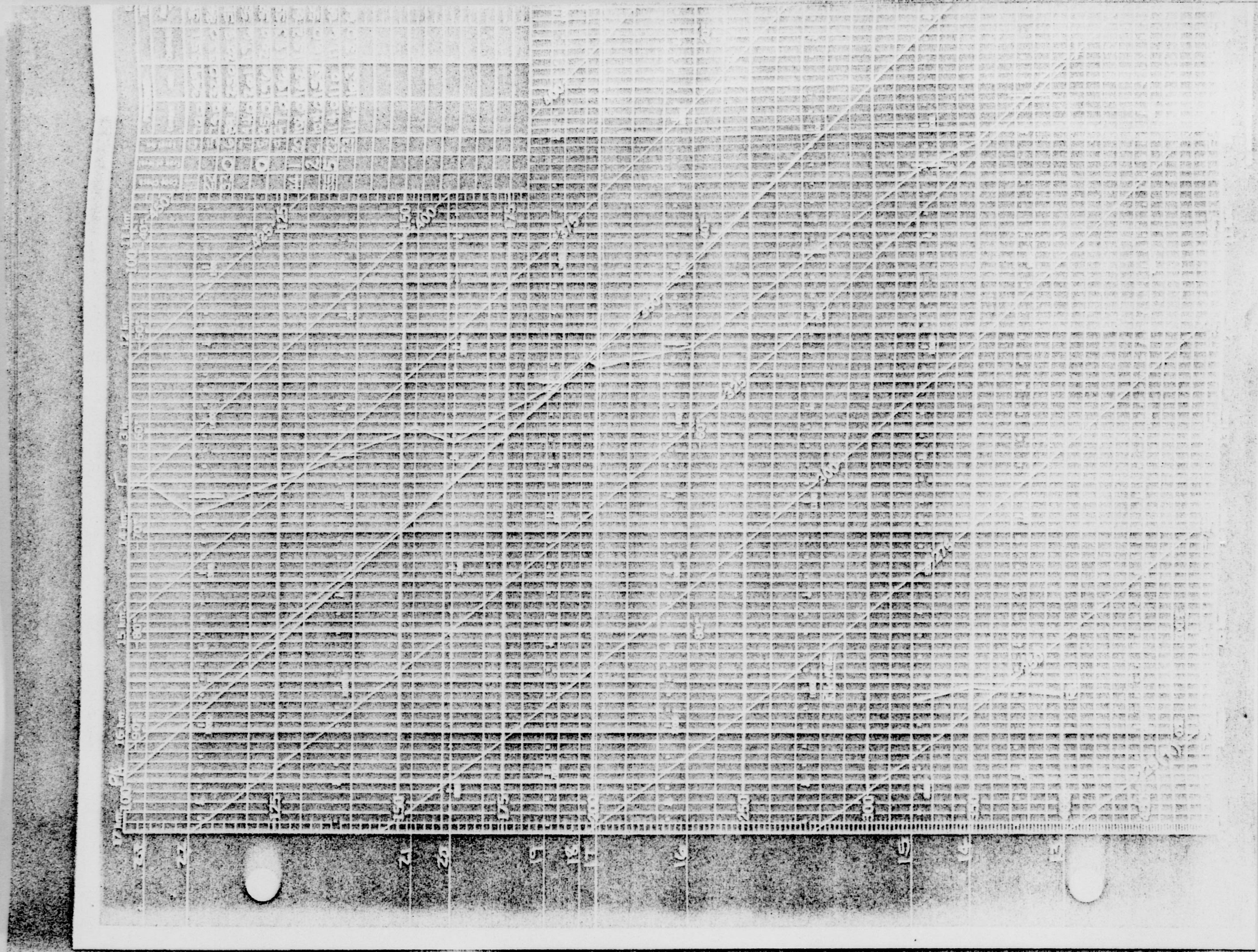

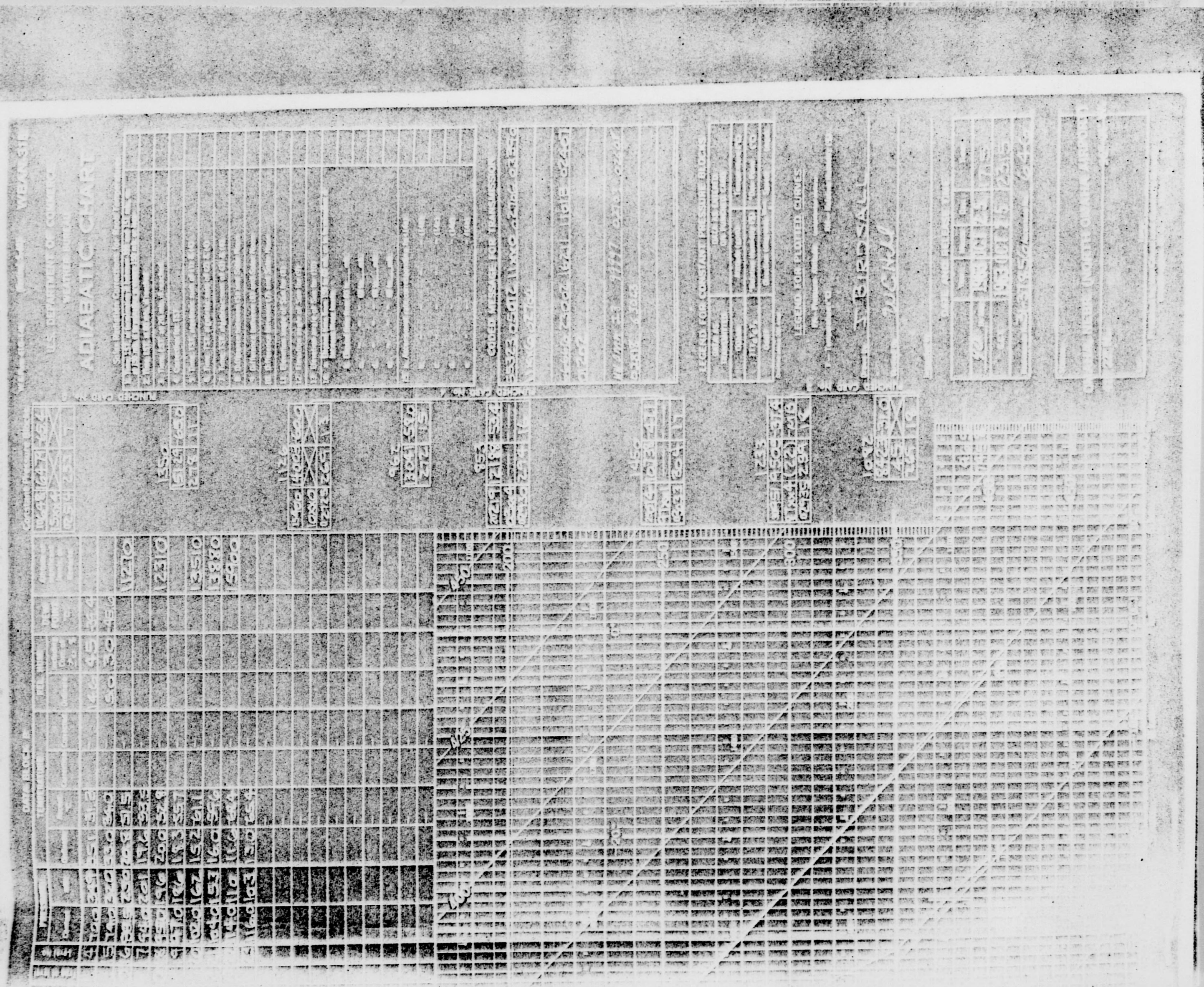
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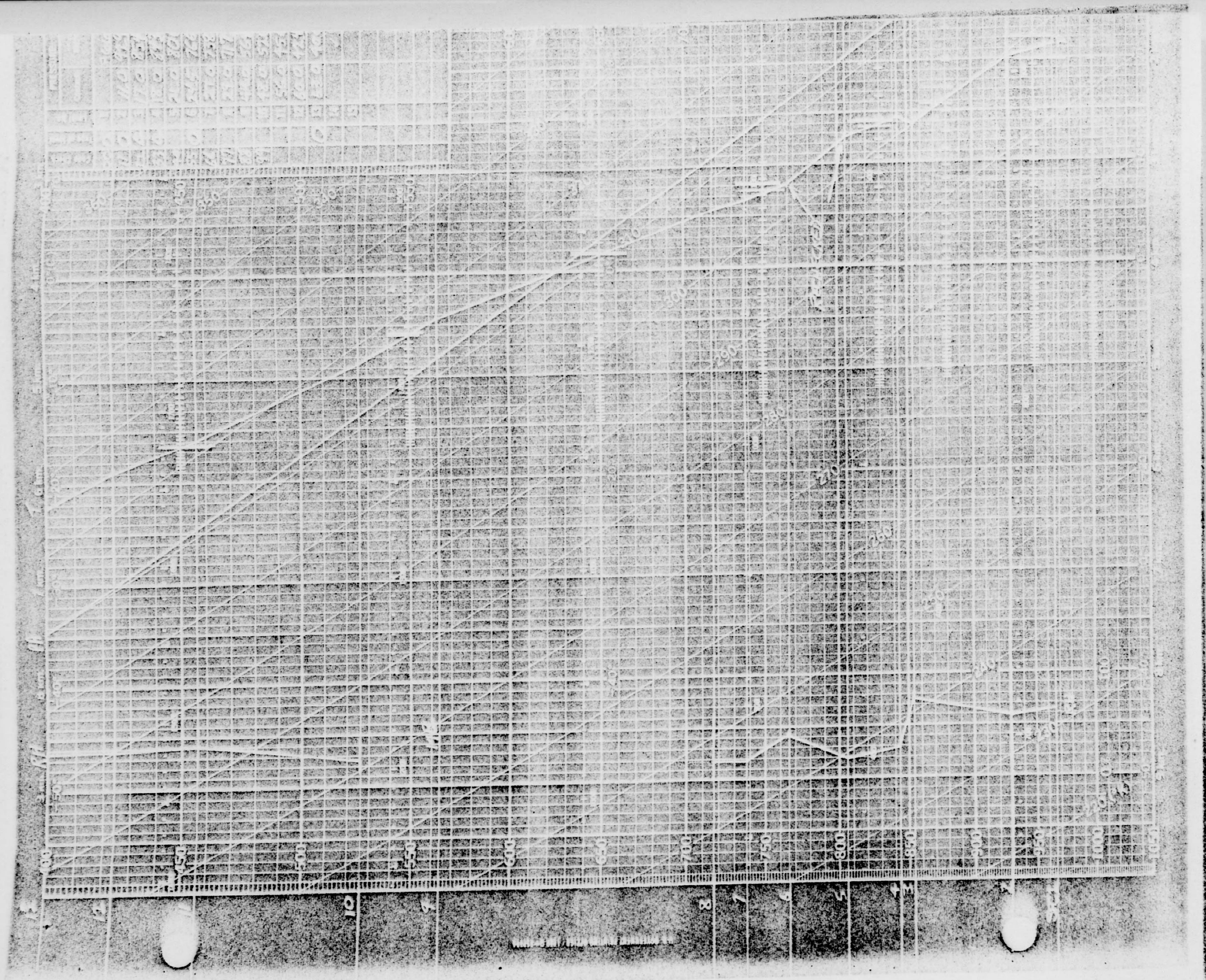

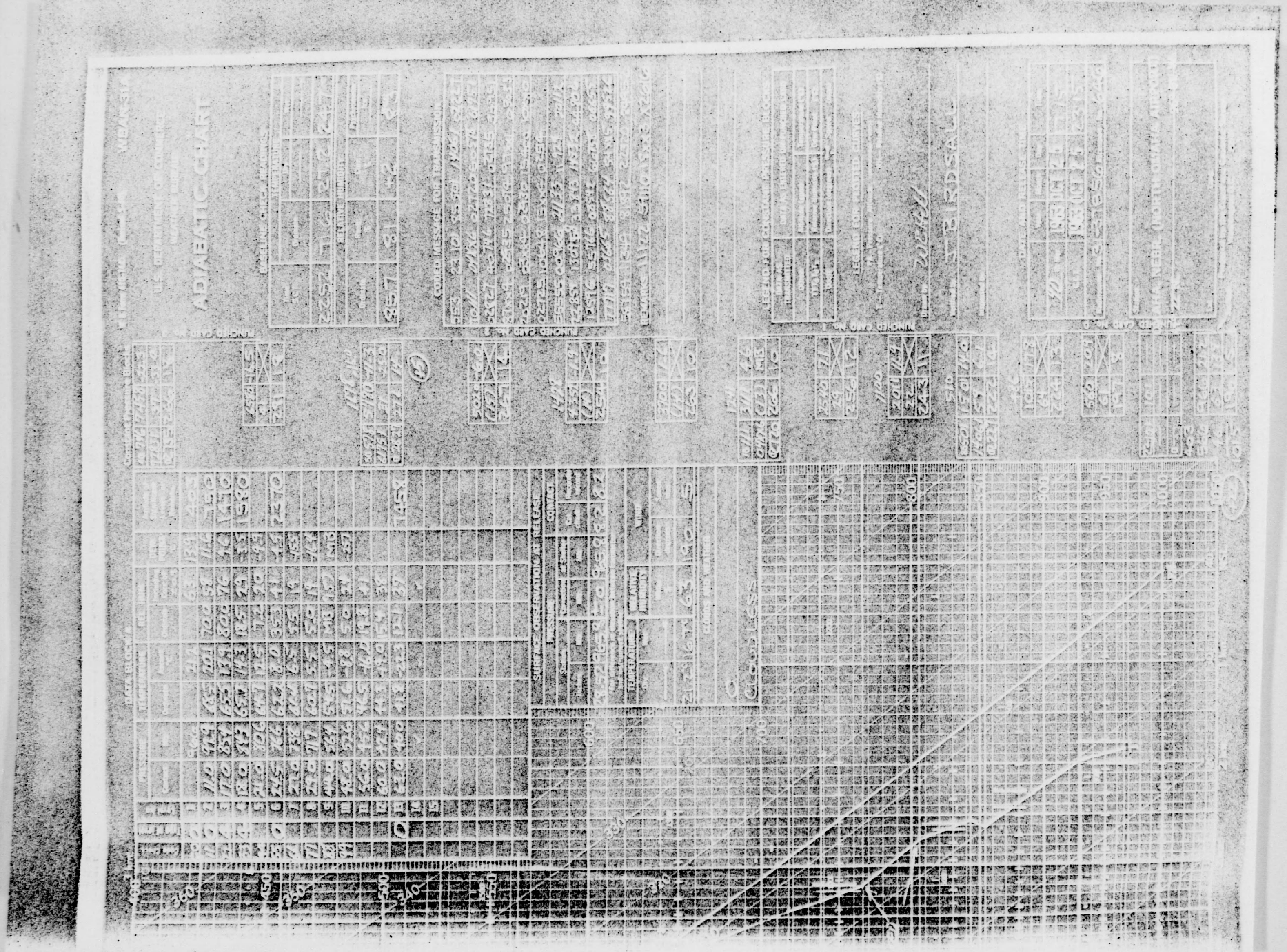
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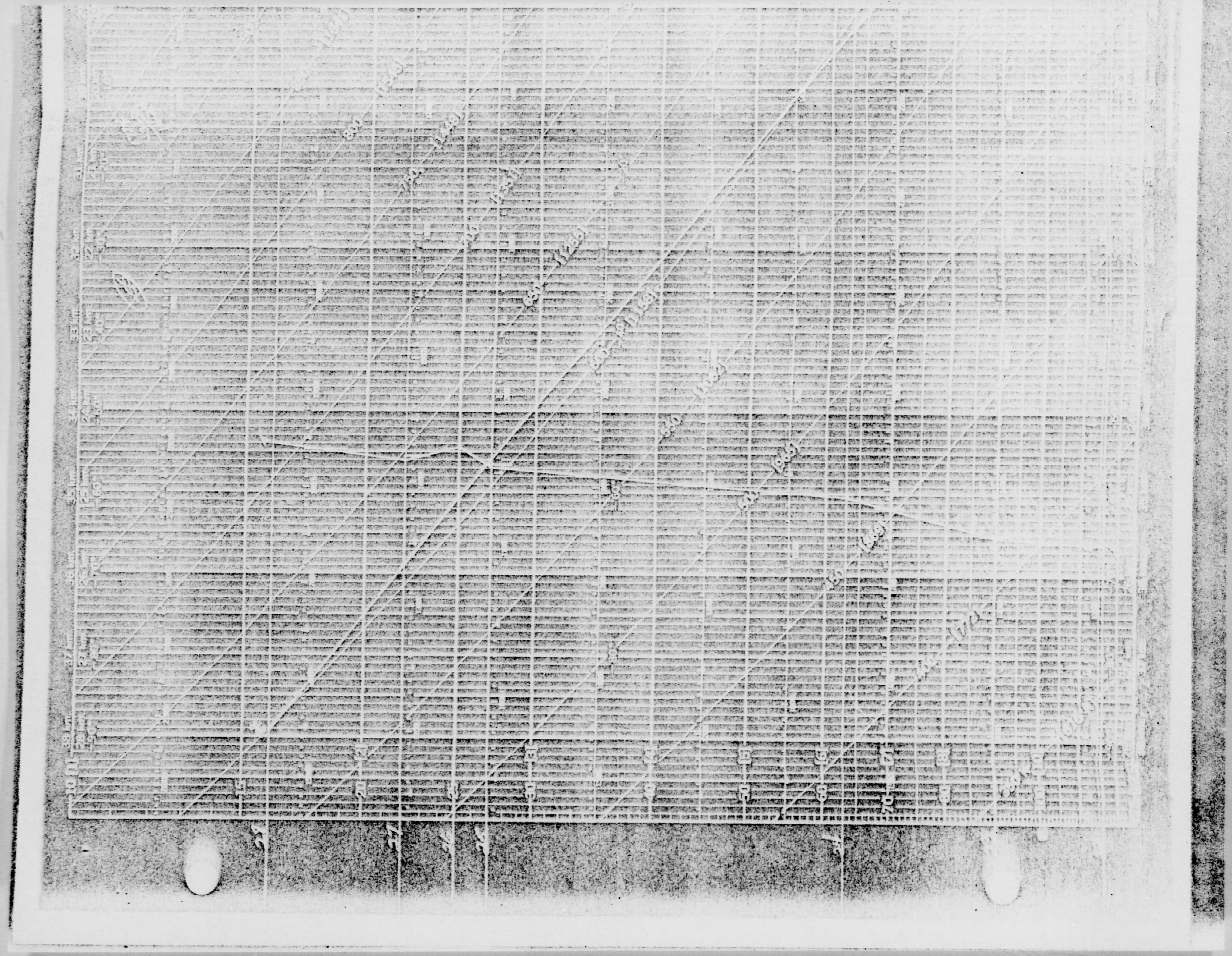
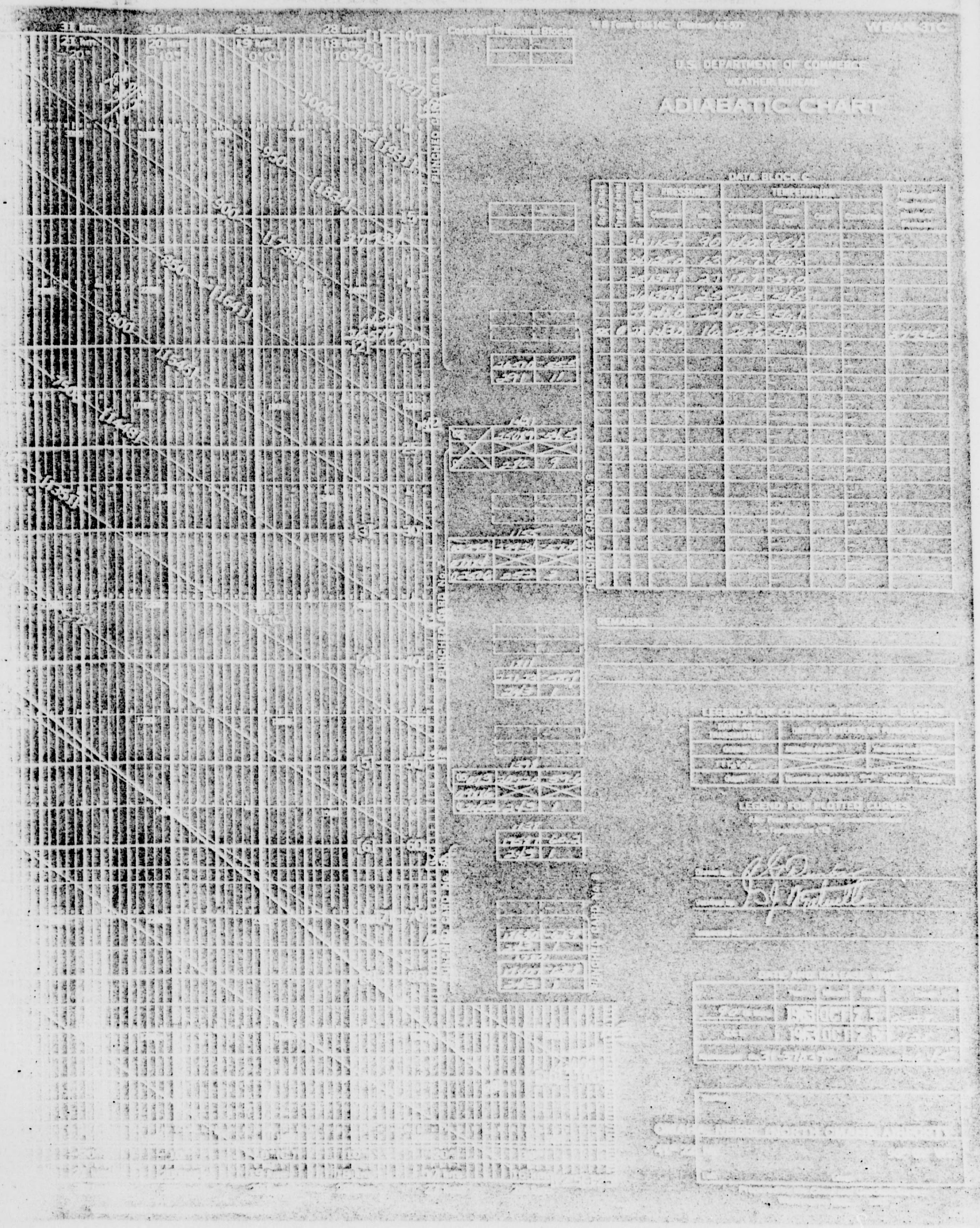
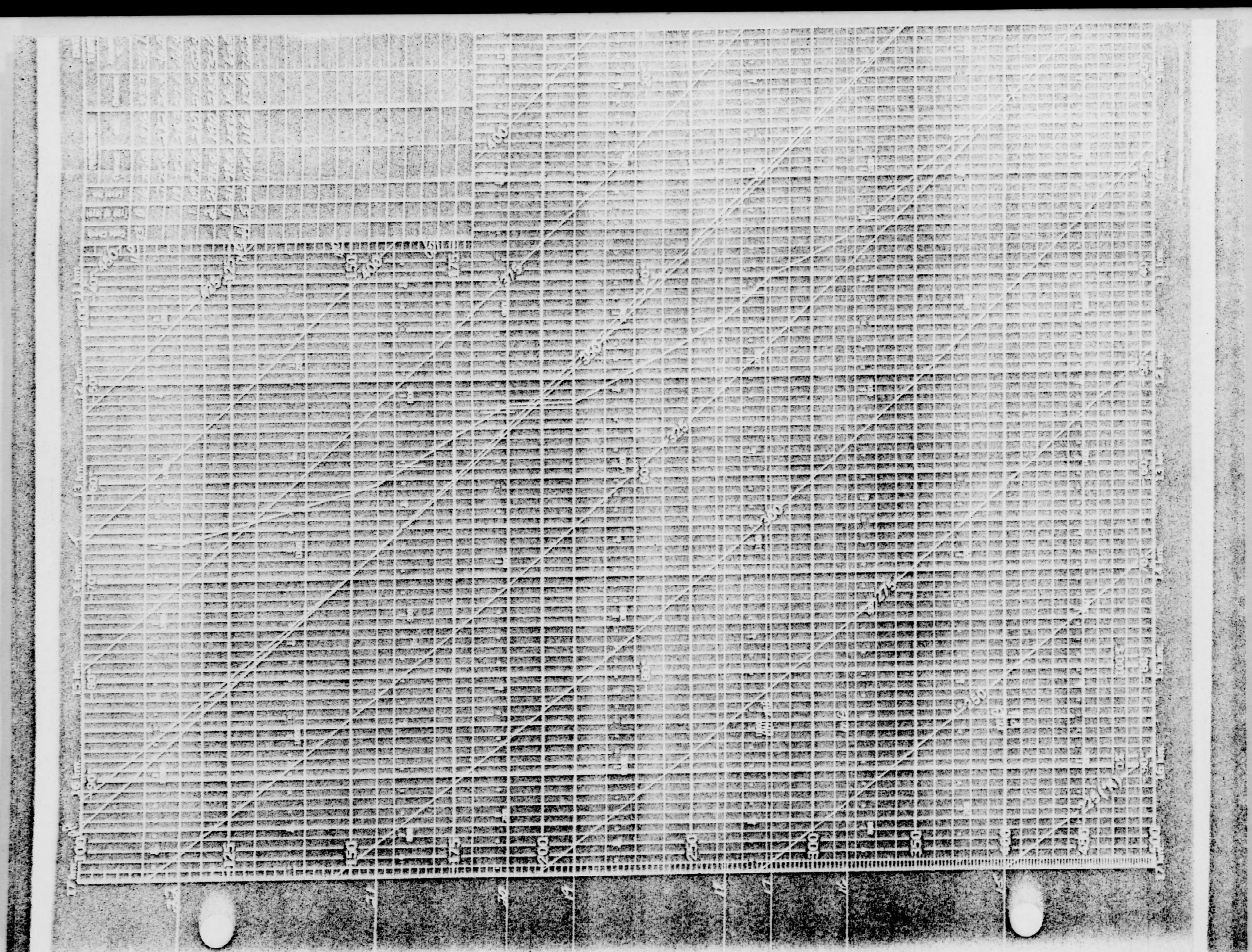
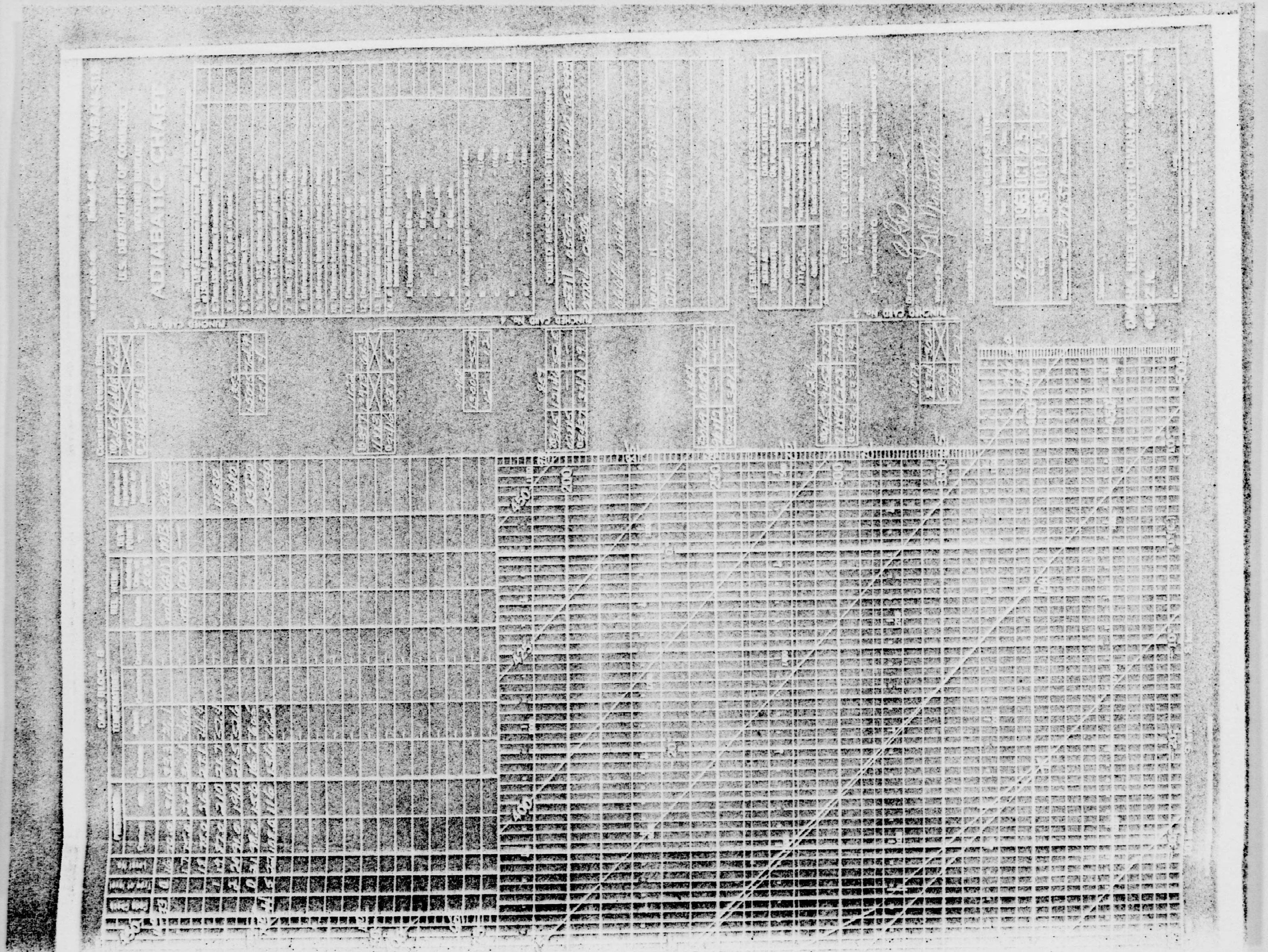



WBAN-3TC
U.S. DEPARTMENT OF COMMERCE
WEATHER BUREAU
ADIABATIC CHART
DATA BLOCK C
LEGEND FOR PLOTTED CURVES

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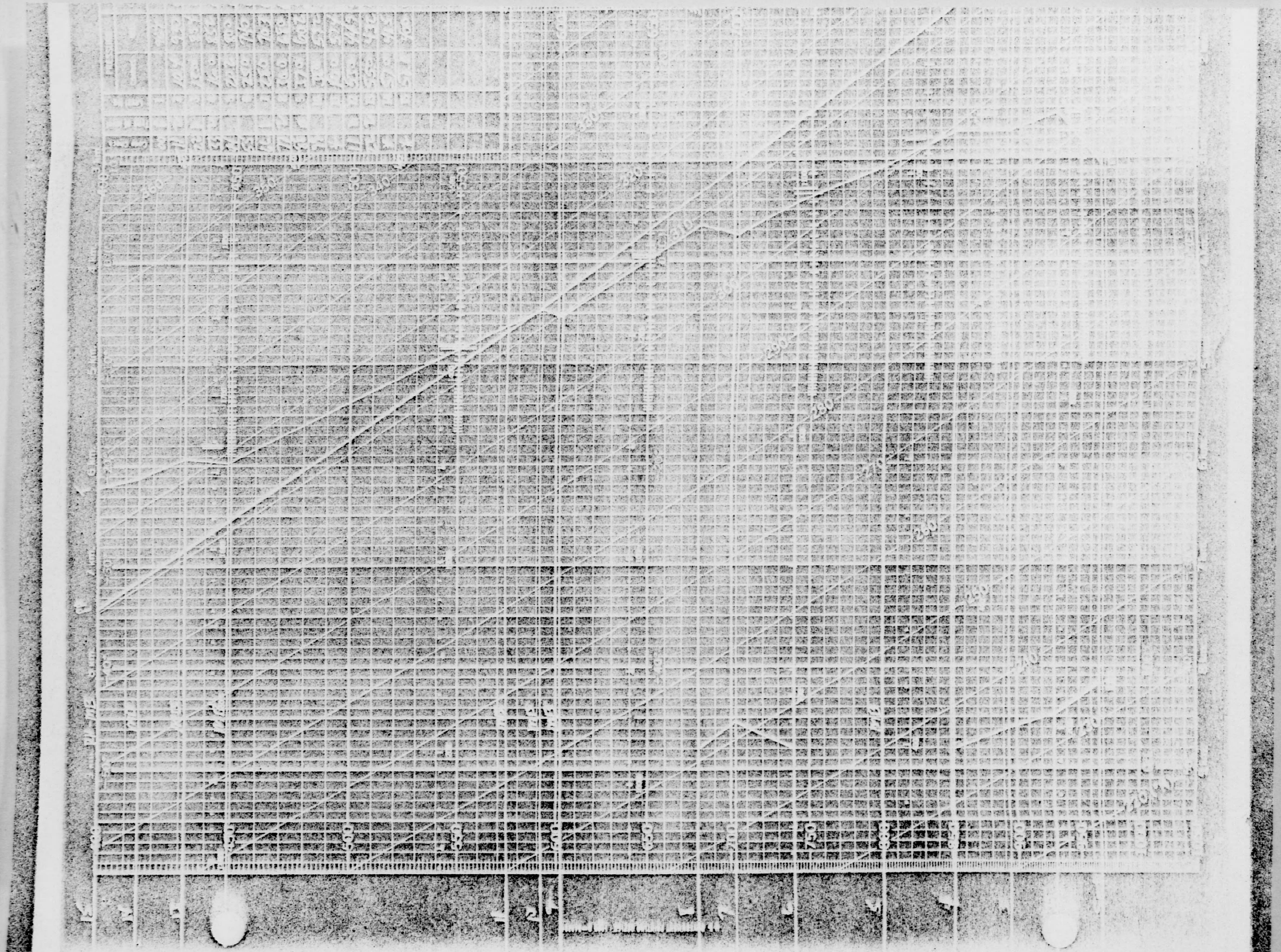

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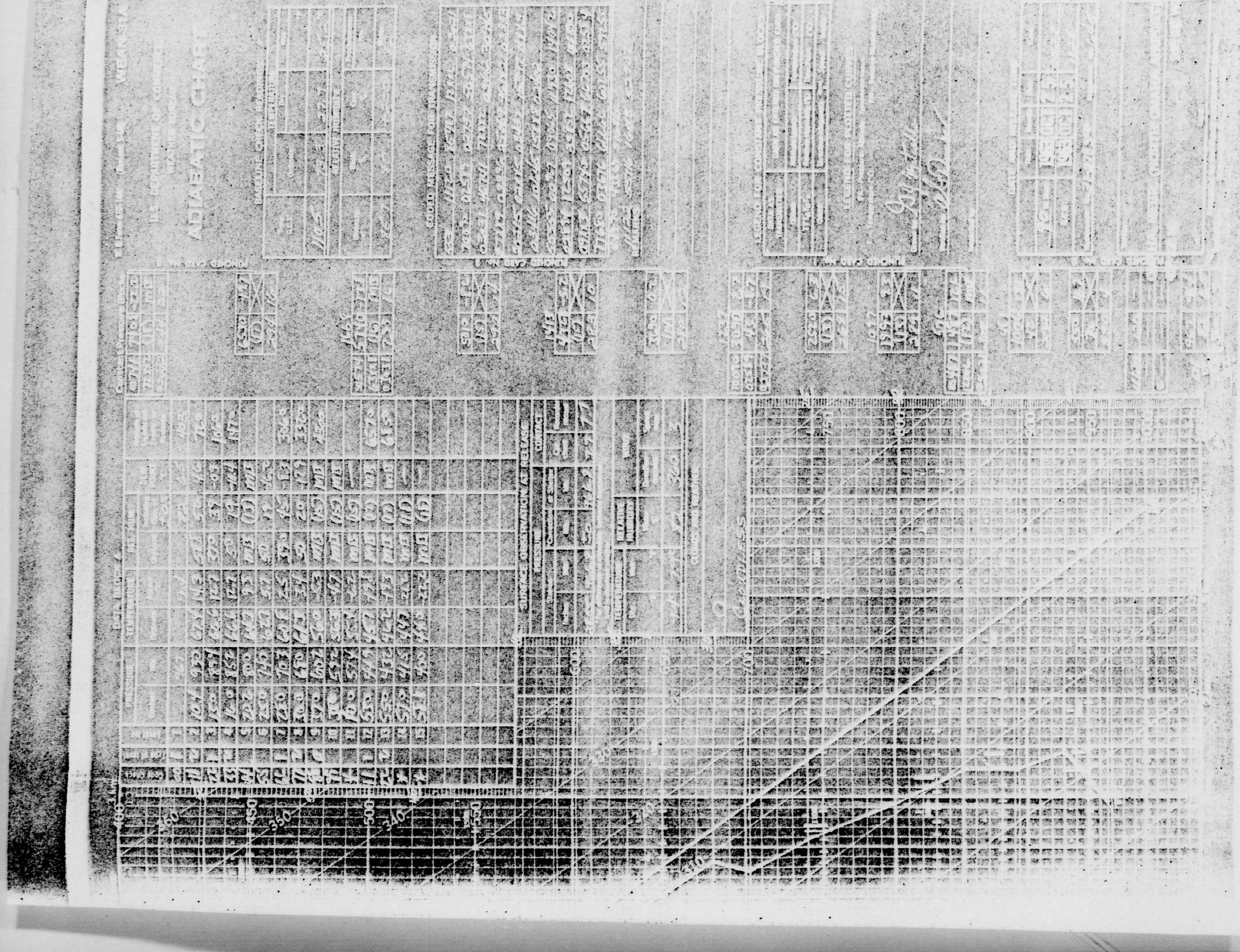
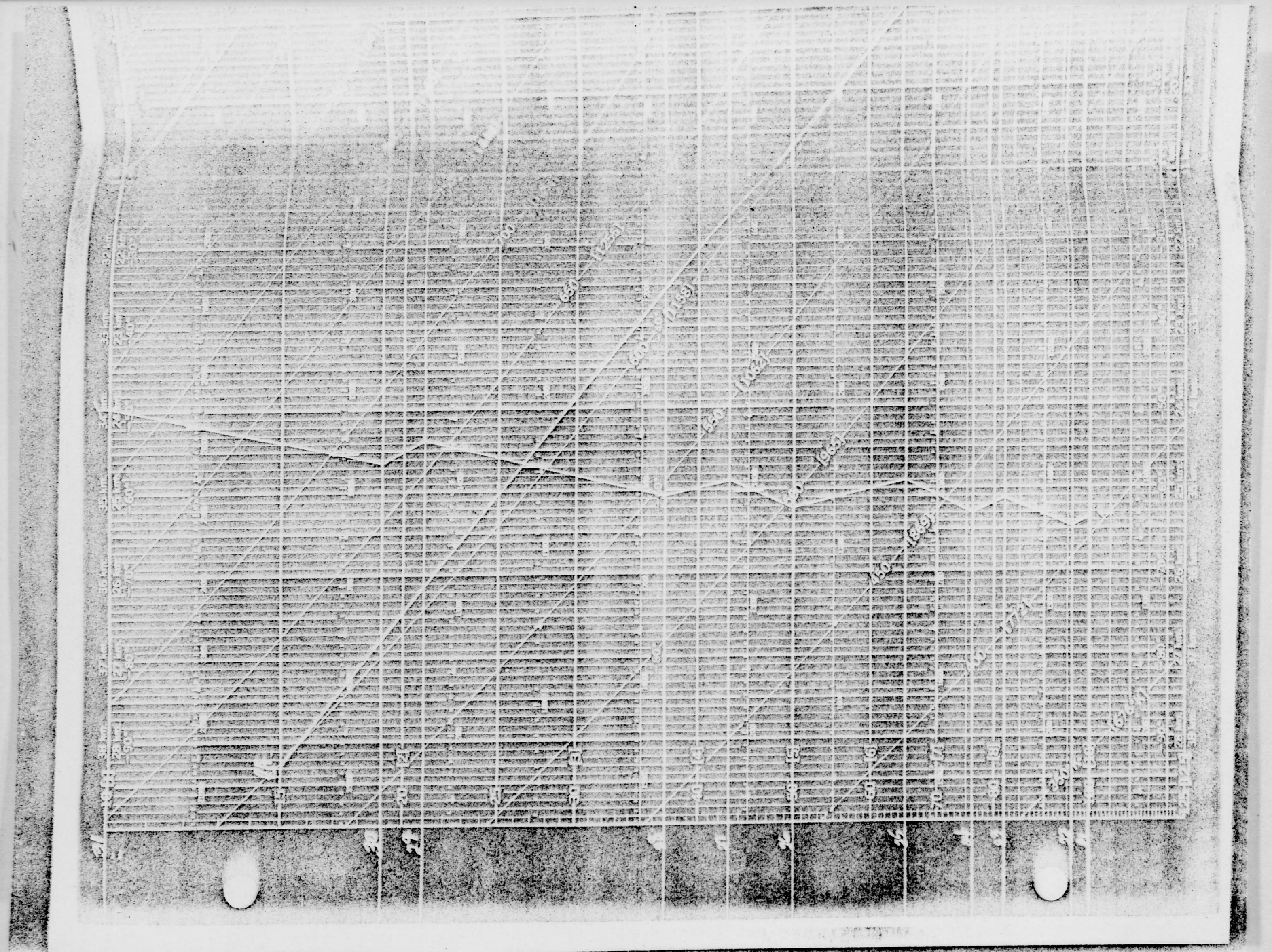
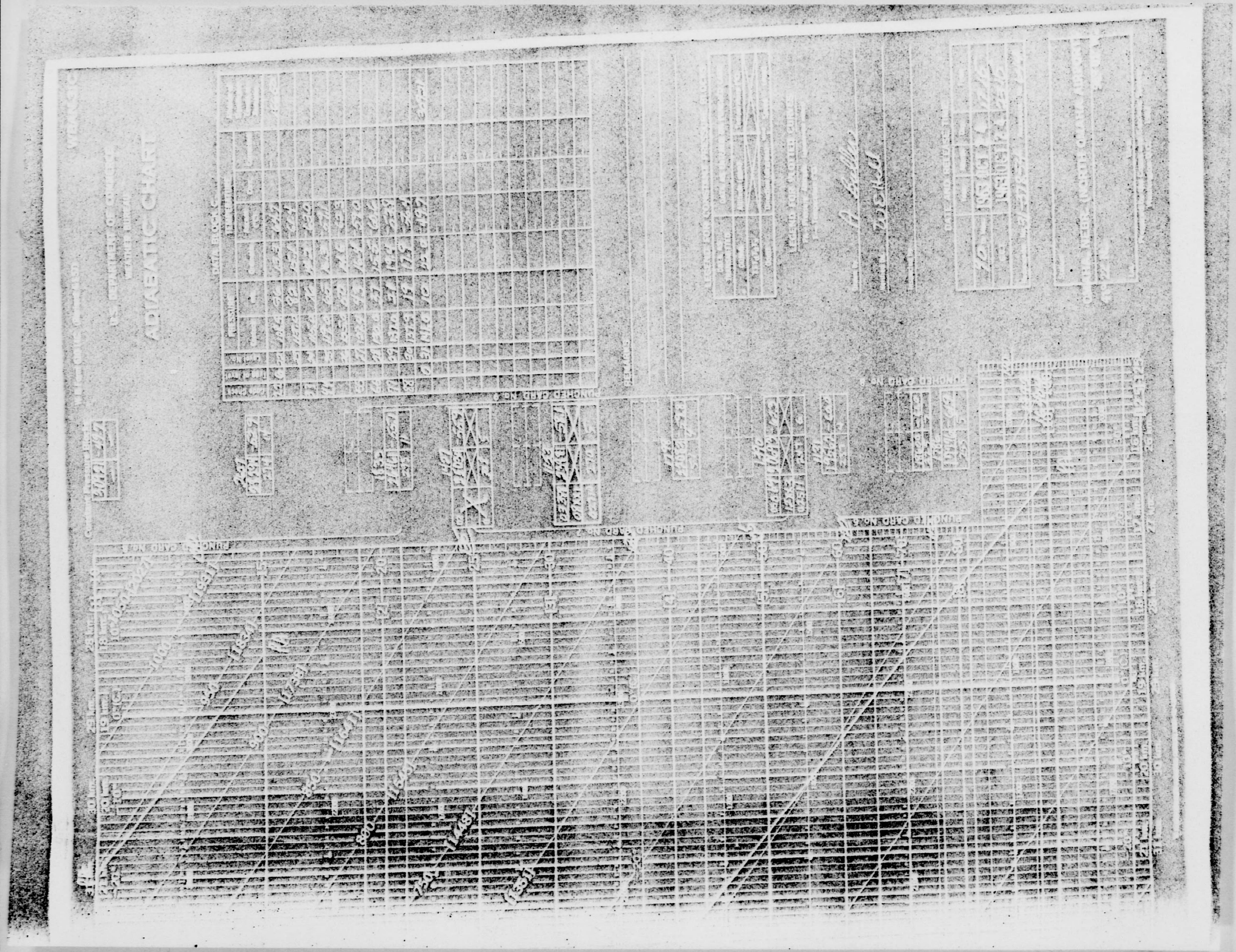
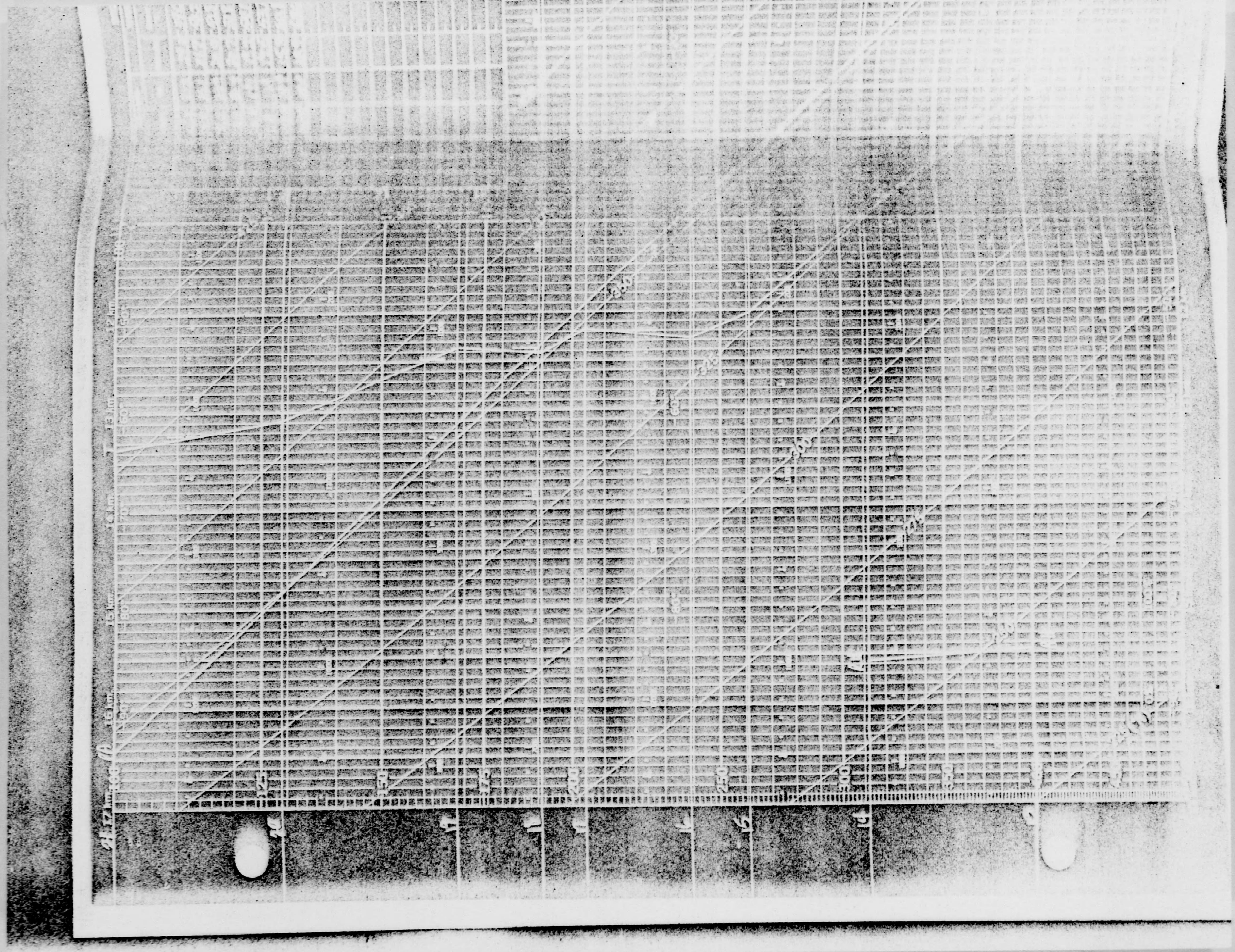
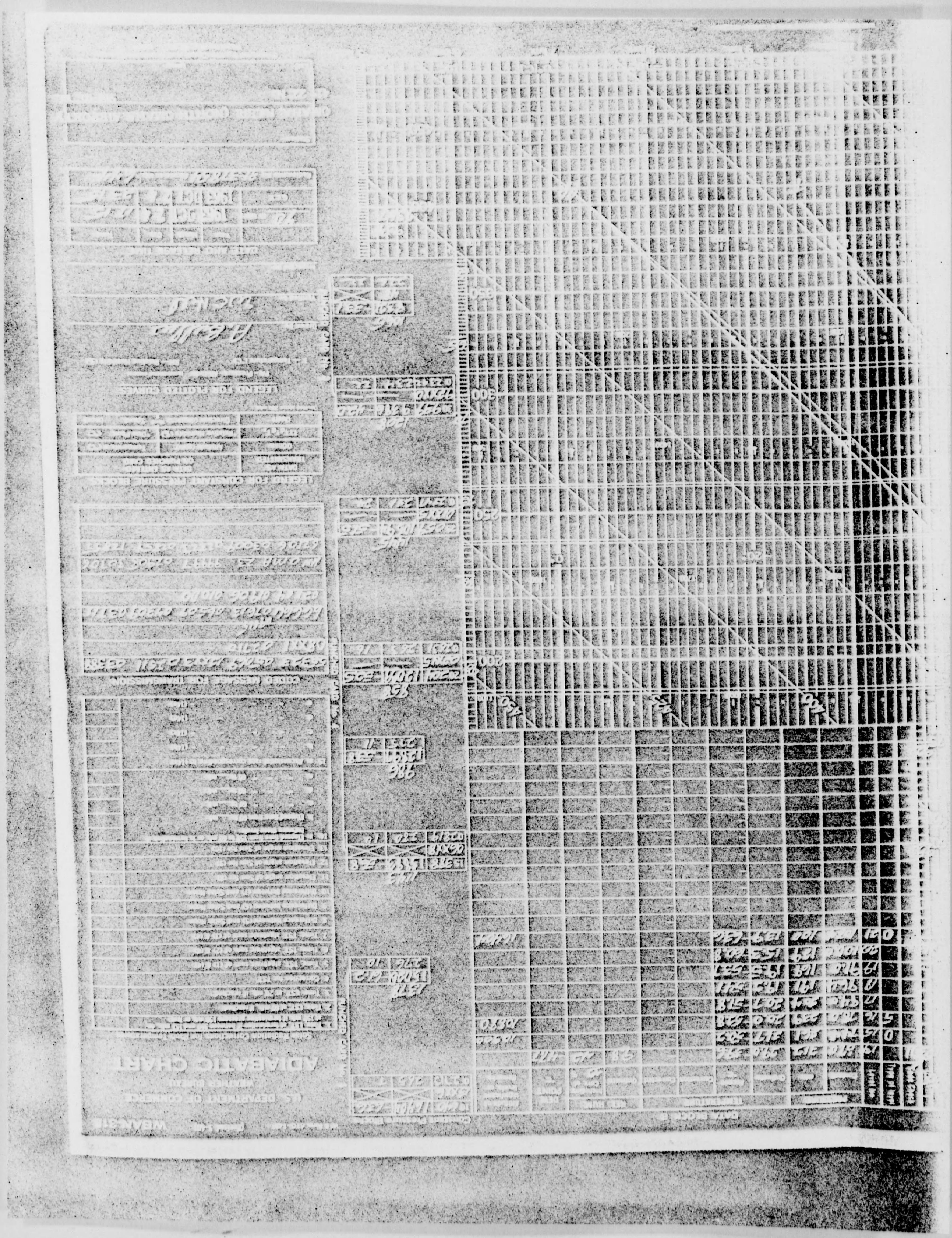
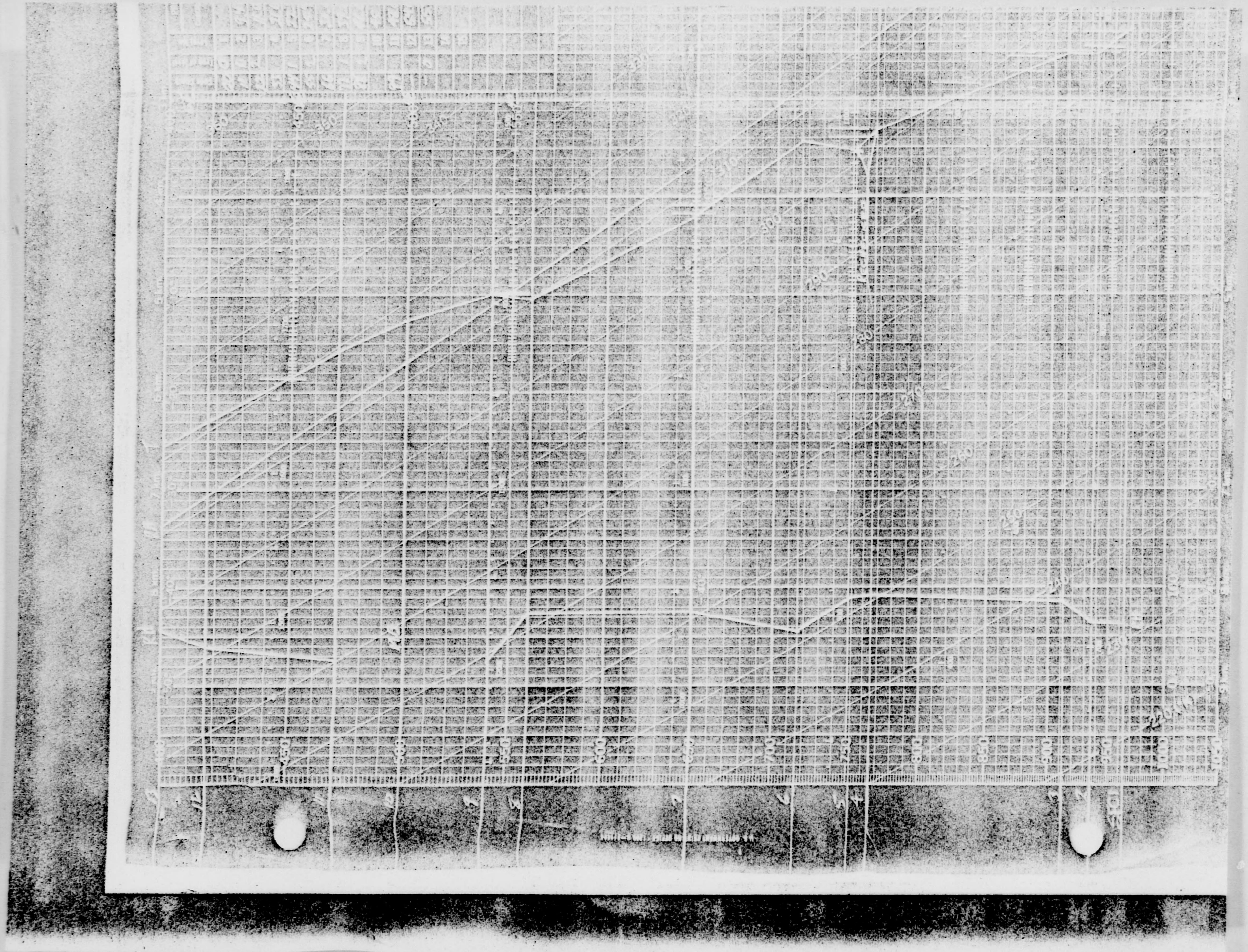





AERONAUTICAL CHART







U.S. DEPARTMENT OF COMMERCE
WEATHER BUREAU

ADIABATIC CHART

AWBAN-51A

DATA BLOCK A

BASELINE CHECK READINGS

SURFACE OBSERVATION AT RELEASE

CODED MESSAGE FOR TRANSMISSION

REMARKS

LEGEND FOR CONSTANT PRESSURE CHARTS

LEGEND FOR PLOTTED CURVES

RAOB DATA AND RELEASE TIME

AFWA, OFFUTT AFB, NEBR. (NORTH OMAHA AIRPORT)

U S. PROHIBITED, RESTRICTED, CAUTION, AND WARNING AREAS ON WORLD AERONAUTICAL CHART 307

NO.	NAME	ACTIVITY	CONTROLLING AGENCY	ALTITUDE	TIME
C-201	Lincoln	Acrobatics	NAS Lincoln, Nebr.	2,700-28,000	Days
C-486	Mankato	Acrobatics	NAS Minneapolis, Minn.	6,000-40,000	Days VFR

Altitude given in feet. P - Prohibited R - Restricted C - Caution W - Warning 6-15-56

Unauthorized flight is not permitted within a Prohibited Area, or within a Restricted Area during the time of use and between the altitudes noted in the tabulation (Authorization may be granted by the controlling agency or by Executive Order of the President).

Flight within Caution Areas is not restricted, but pilots are advised to exercise extreme caution.

AERONAUTICAL SYMBOLS

AERODROMES

Aerodromes with facilities

LAND	WATER	
○	⊕	Civil
◎	◎	Joint Civil and Military
◎	◎	Military

Aerodromes with emergency or no facilities

LAND	WATER	
○		Landing Area
	⚓	Sheltered Anchorage

Methods of ind

Radio Range (With voice)

Radio Range (Without voice)

Nondirectio (With voice)

Nondirectio (Without voice)

Marine Rad (Without voice)

AERODROME DATA AND LANDING FACILITIES INFORMATION

BARGERSVILLE
909 L H 41
Airport of entry
GCA ILS DF
278 119.5 118.1
126.18 257.8

LAND

908	Elevation in feet
L	Minimum lighting
H	Hard surfaced runway
41	Length of longest runway in hundreds of feet

WATER

00	Elevation in feet
L	Minimum lighting
S	Normal sheltered take-off area
62	Length of longest runway in hundreds of feet

NAS ANACOSTIA
00 L S 62
2870

The facility code character is replaced by a dash if specific information is not available or if the facility itself is not available.

GCA ILS — Controlled approach systems.
DF — Direction finding station.
278 119.5 118.1 126.18 257.8 - Control tower transmitting frequencies

Low or medium tower frequency shown first, followed in order by primary VHF local control, VHF approach control, and VHF and UHF military frequencies

VHF C

AIR NAVIGATION LIGHTS

Rotating Light ..... ☆

Rotating Light (With flashing code lights) ..... ·—· ☆

Rotating Light (With course lights and site number) ..... 12 ☆

Flashing Light ..... Fl ☆

Flashing Light (With code) ..... Fl ☆

Lightship ..... ⊕

Marine Light ..... Occ W R G

F—Fixed
Fl—Flashing
Qk Fl—Quick Flashing
I Qk Fl—Interrupted Quick Flashing
Occ—Occulting
Alt—Alternating
Gp—Group
W—White
R—Red
B—Blue
G—Green
(U)—Unwatched
SEC—Sector
sec—Second

Marine lights are white unless colors are indicated; alternating lights are red and white unless otherwise indicated

MISCELLANEOUS

Obstruction, less than 500 feet above ground ..... 1219 ∧

Obstruction, 500 feet or higher above ground ..... 1937 ∧
(Numerals indicate elevation above sea level of top)

Group Obstruction ..... ⩚

Prominent Transmission Line ..... —T———T—

Mooring Mast ..... ⚐

Isogonic Line ..... — — -4°E- — —
Values for 1955

Reporting Point (Compulsory) ..... ▲

Reporting Point (Non-compulsory) ..... △

Ocean Station Vessel (Normal position) .....

International Boundary .....
(Closed to passage of aircraft except through air corridor)

Restricted areas are numbered, and are indicated on the charts as follows:

PROHIBITED AREA (P-78) ..... Prohibited Area — Flight of aircraft prohibited except by specific authority of using agency

RESTRICTED OR WARNING AREA (R-32) OR (W-45) ..... Restricted or Warning Area — Invisible hazards to air navigation

CAUTION AREA (C-54) ..... Caution Area — Visible hazards to air navigation

300
270
240

AERONAUTICAL SYMBOLS

RADIO FACILITIES

All radio facility data are printed in blue with the exception of certain LF/MF facilities such as tower frequencies, radio ranges and associated airways, which are printed in magenta.

Methods of indicating specific voice and CW calls are shown below

Use of the word "Radio" within the box indicates voice facilities.

Radio Range (With voice) — BALTIMORE RADIO 257 BAL

Radio Range (Without voice) — ELGIN 209 VPS "No voice"

Nondirectional Radiobeacon (With voice) — DOUGLAS RADIO 251 DGW

Nondirectional Radiobeacon (Without voice) — DIXIE 388 DXE "No voice"

Marine Radiobeacon (Without voice) — RBn ASHTABULA 314 0m-10m & 30m-40m

Radio Communication Station (With voice) — CS GOWEN RADIO 4470

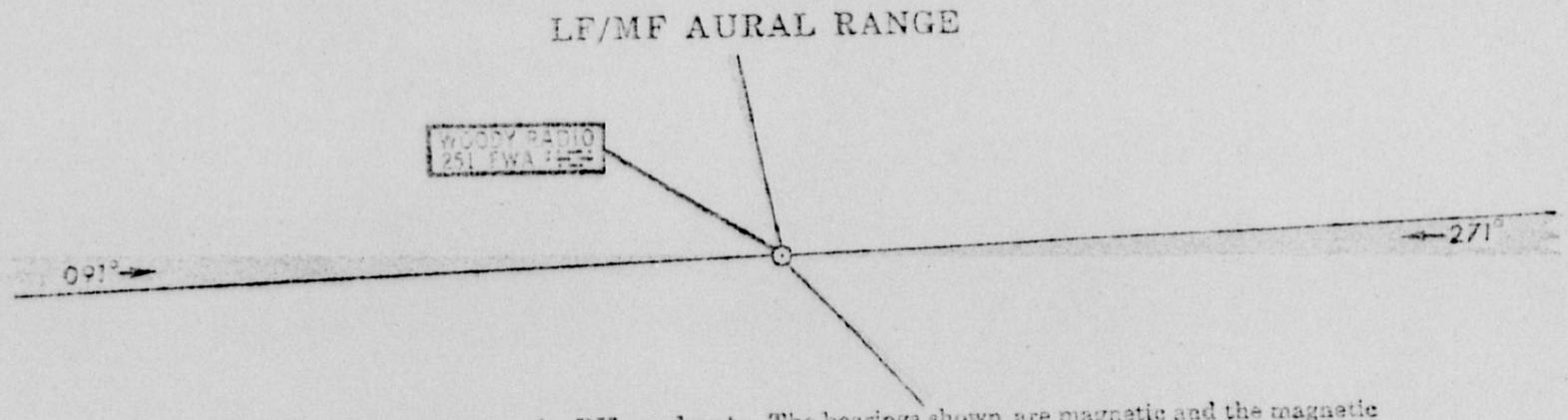
Radio Communication Station (Without voice) — CS KAZAN 5200 CKNX "No voice"

Radio Broadcasting Station — BS CFRB 1010

Radar Beacon (Racon) — RACON 3256 2-1-Z

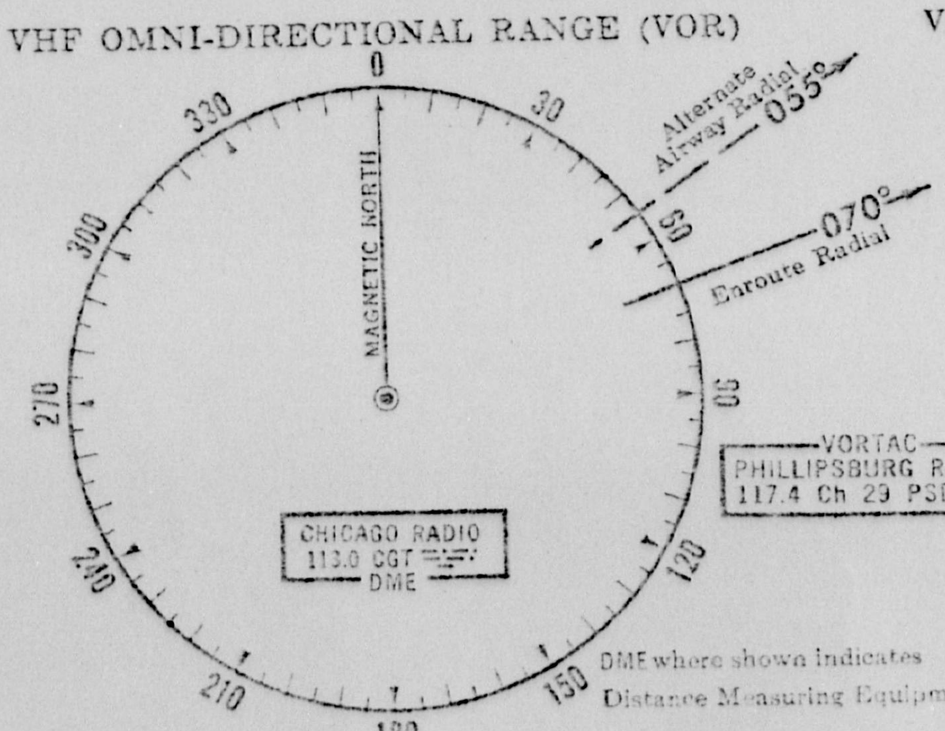
Radio Fan Marker Beacons — 100 watts: NOTT; BATES. 5 watts: DIXIE

LF/MF AURAL RANGE



The heavy line indicates the "N" quadrant. The bearings shown are magnetic and the magnetic variation at the position of the ground station is used for computing them.

VHF OMNI-DIRECTIONAL RANGE (VOR)

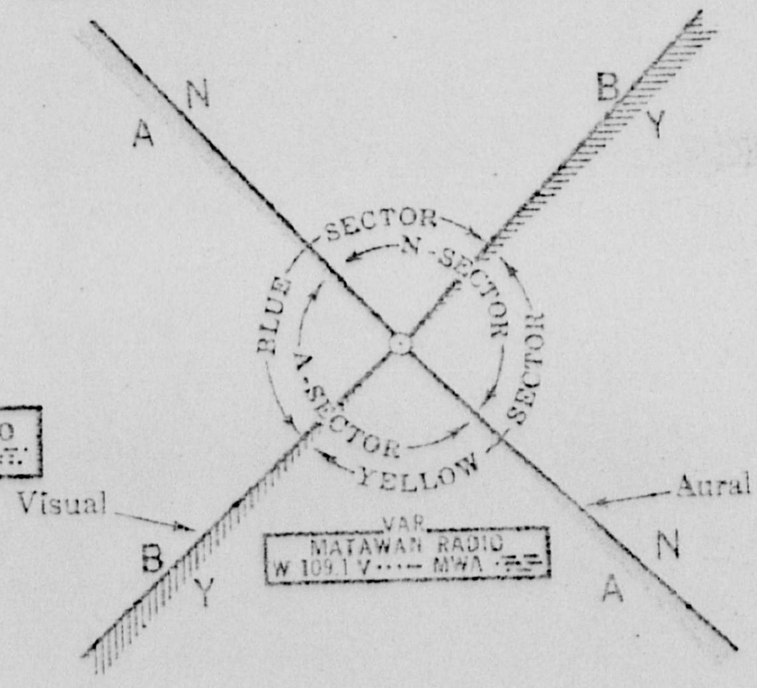


DME where shown indicates Distance Measuring Equipment

Bearings are magnetic from the station.

Radius of circle is 15 nautical miles.

VHF FOUR COURSE VISUAL-AURAL RANGE (VAR)



Letter preceding frequency in box indicates channel indentification.

AIR TRAFFIC CONTROL

Blue tint where shown indicates controlled airspace

Control Zone

(Within continental U.S. all airspace at and above 24000 feet MSL except prohibited and restricted areas is controlled, and blue tint indicates only controlled airspace below 24000 feet)

Controlled Civil Airway

Uncontrolled Civil Airway

Civil airways within continental U.S. effective only below 27000 feet MSL

TOPOGRAPHICAL SYMBOLS

CITIES AND TOWNS

Metropolitan Areas ..... NEW YORK

Large Cities ..... RICHMOND

Cities ..... ARLINGTON

Small Cities ..... Freehold

Large Towns ..... Corville

Towns & Villages ..... Arcola

HIGHWAYS AND ROADS

Dual Lane and Super Highways

Primary Roads

Secondary Roads

Trails

U. S. Road Markers 60

National, State or Provincial Road Markers 37

Road Names ..... ALASKA HIGHWAY

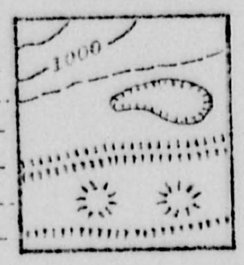
RELIEF FEATURES

Contours { Reliable; Approximate; Depression }

Levees or Eskers

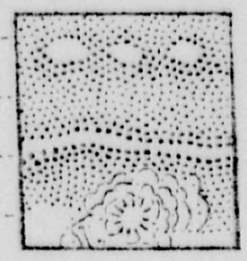
Hachures

Bluffs, Cliffs & Escarpments



Sand { Dunes; Areas; Ridges }

Lava Flow



HYDROGRAPHIC FEATURES

Swamps & Marshes

Tidal Flats (Exposed at low tide)

Danger Line

Rocks Awash

Shoals (Exposed at low tide)

Springs

Wells & Water Holes

Reefs, Coral & Rocky Ledges (Awash at low tide)



Streams & Rivers { Perennial; Intermittent; Probable or Unsurveyed; Braided }

Intermittent Lakes (blue stipple)

Drainage Ditches

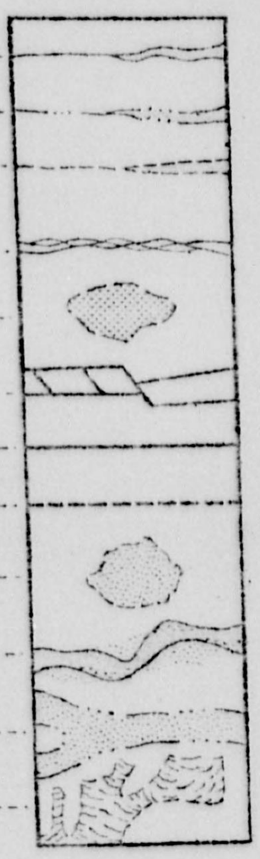
Canals { In use; Abandoned }

Dry Lake Beds (brown stipple)

Sand Deposits in river bed

Dry Washes (brown stipple)

Glaciers and Ice Caps



CULTURAL AND MISCELLANEOUS

Landmarks (with appropriate note) (Numerals indicate elevation above sea level of top)

Oil Tanks

Oil Fields

Dams

Elevations (In feet) { Highest on chart (Highest on chart is devoid of tint); Highest in a general area; Spot }

Mines and Quarries

Mountain Passes

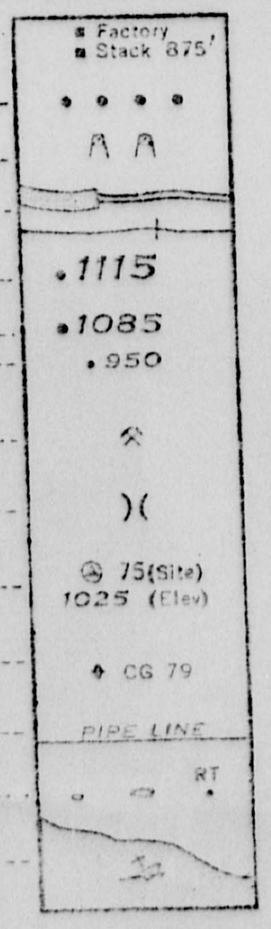
Lookout Stations (Elevation is base of tower)

Coast Guard Stations

Pipe Lines

Race Tracks or Stadiums

Stranded Wrecks

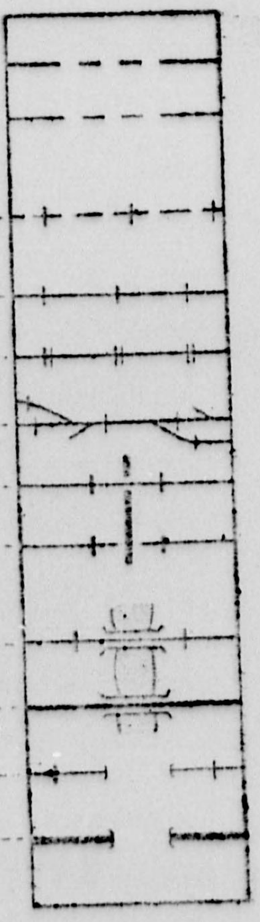


Boundaries { International; State & Provincial }

Railroads { Abandoned or Under Construction; Single Track; Multiple Track; Sidings & Spurs; Overpass; Underpass }

Bridges { Railroad; Highway }

Tunnels { Railroad; Highway }



12-57

DATA PROCESSING DIVISION
CLIMATIC CENTER, USAF
Air Weather Service (MATS)
Asheville, North Carolina

REPLY TO
ATT OF: CCDPD

SUBJECT: Upper Air Data for Sioux City Area 30 Jan 1964

TO: Aerospace Technical Intelligence Center/TDE
Foreign Data Division (Sgt. Mooly)
Wright-Patterson AFB, Ohio

1. Reference: Your telephone conversation with Mr. Worley of this Division at 1115 EST on 28 January 1964.

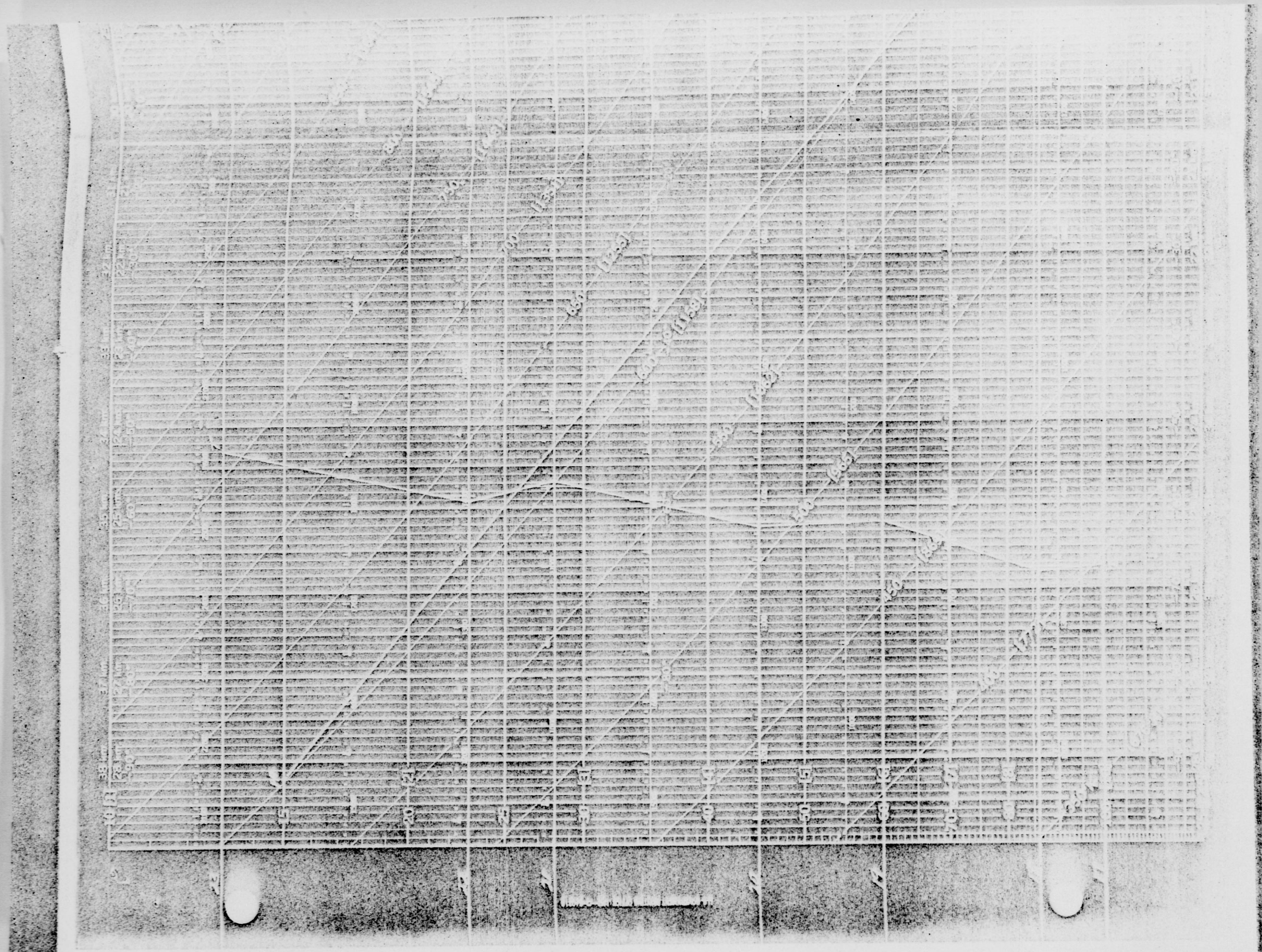
2. Upper air data are not recorded at Sioux City, Iowa. However, we are sending a photocopy of the WBAN-31 forms recorded on 25 October 1963 at Omaha, Nebraska, approximately 75 miles south of Sioux City. Similar data for North Platte, Nebraska, are also included to provide additional coverage for the area.

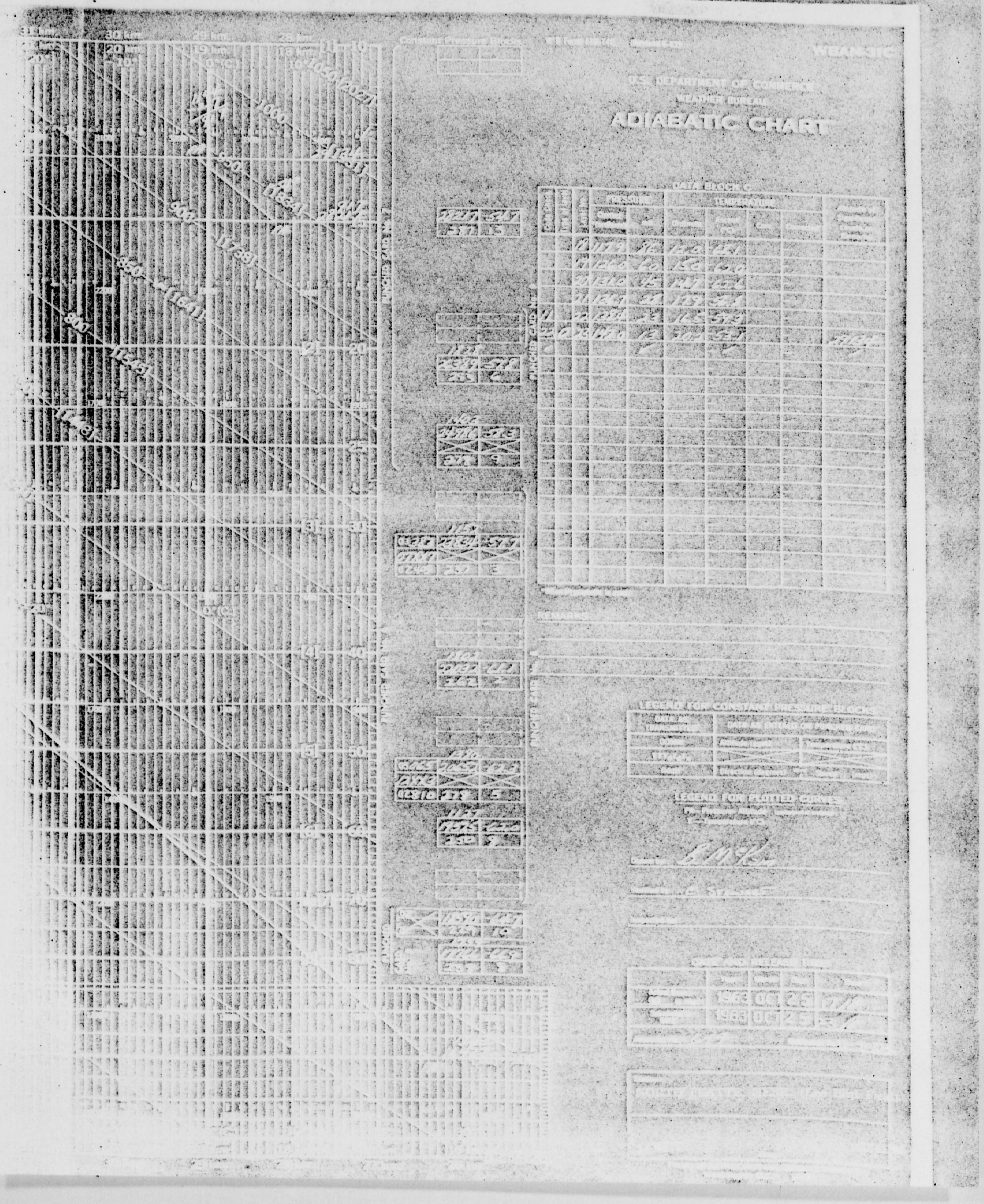
FOR THE DIRECTOR

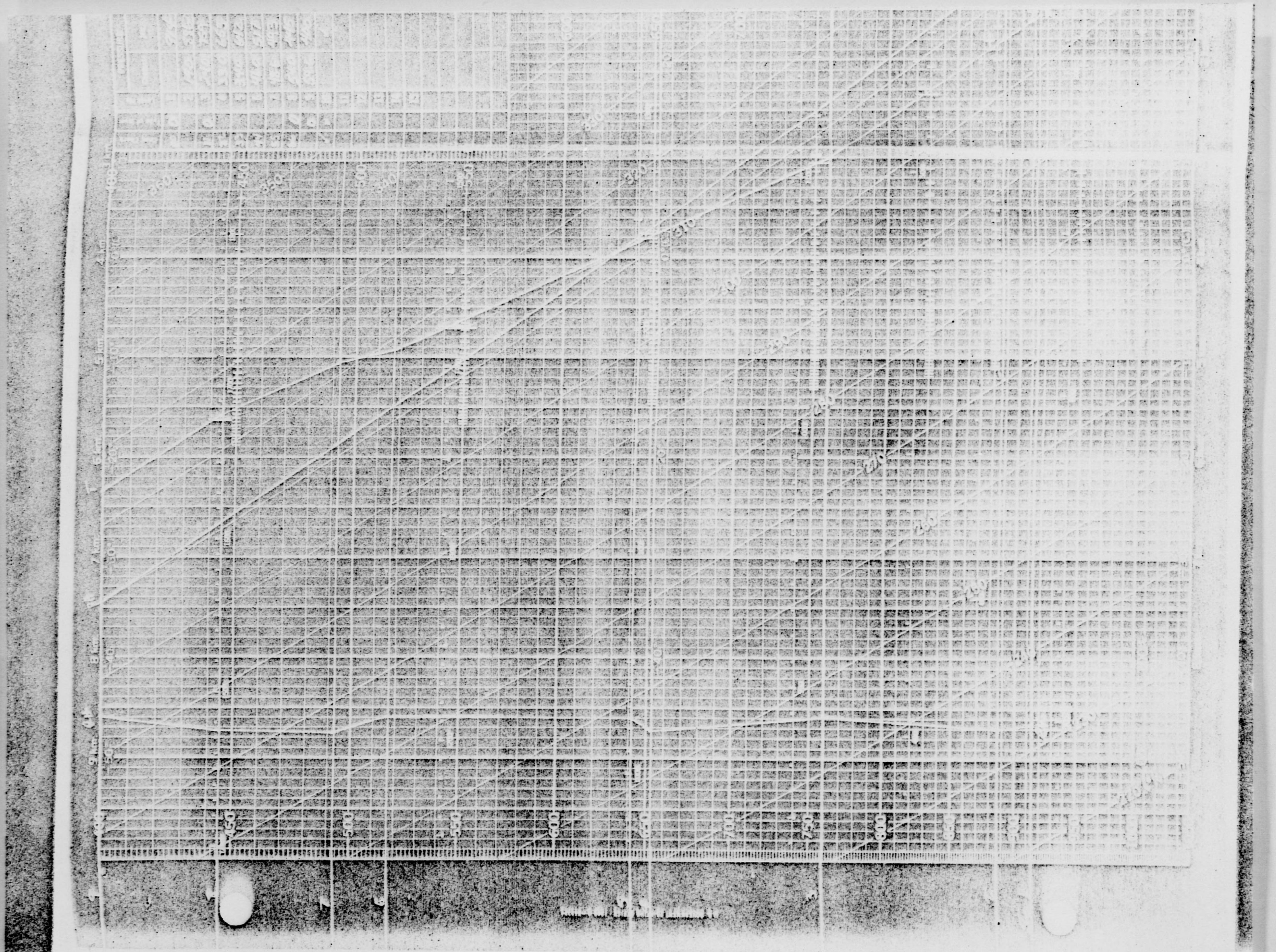
James R. McCoster

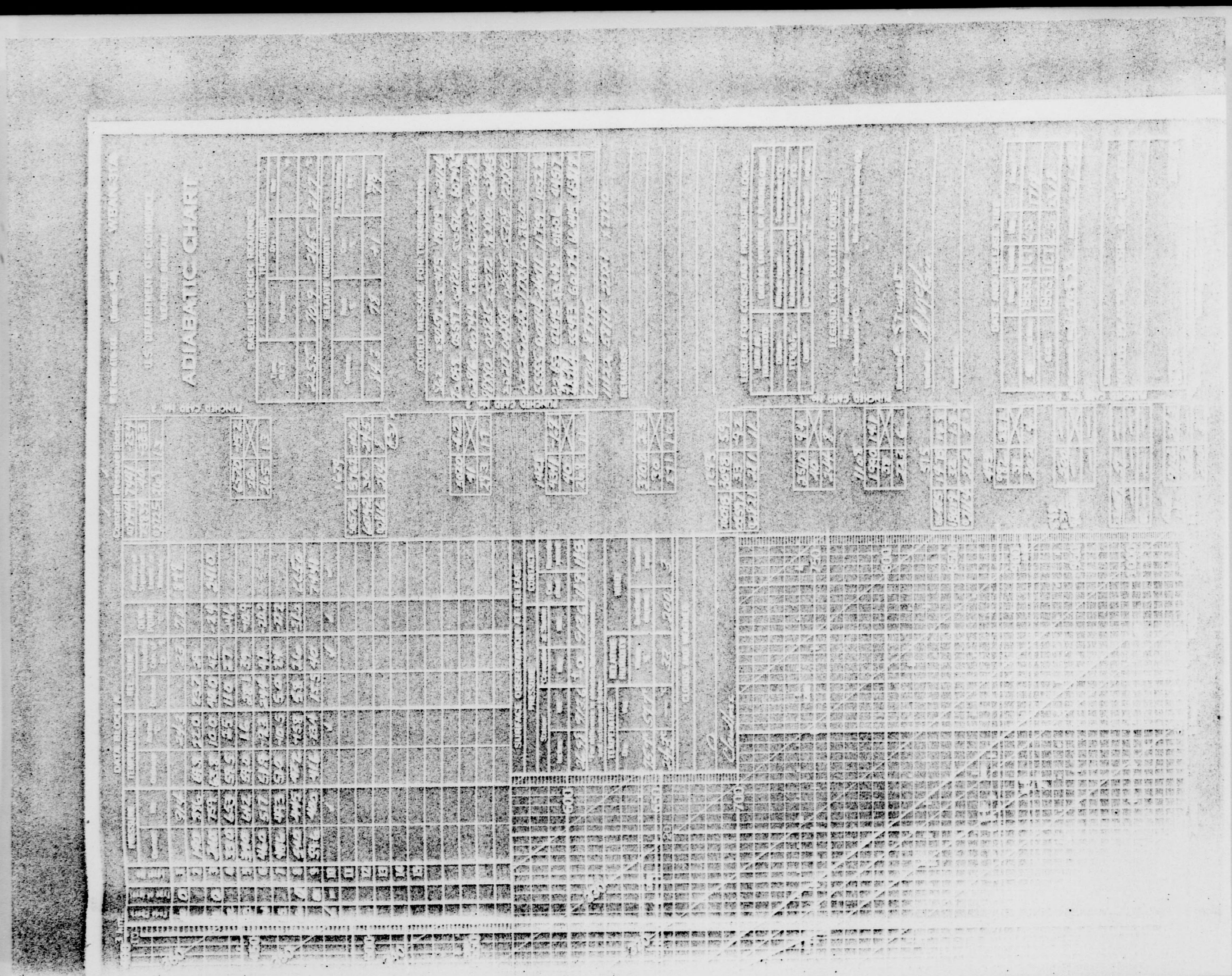
JAMES R. McCOSTER
Chief, Data Processing Division

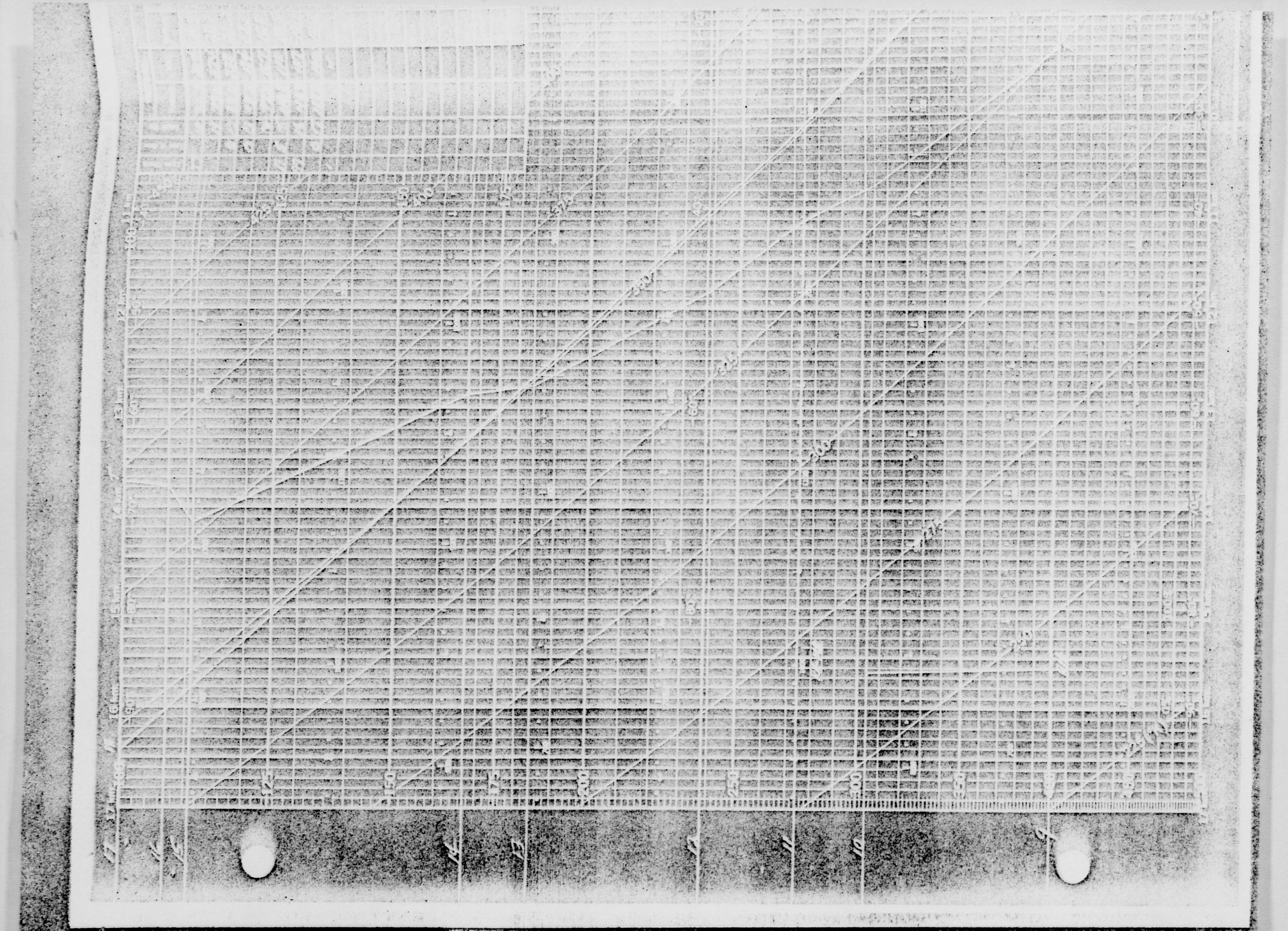
Atch
Photocopies as stated

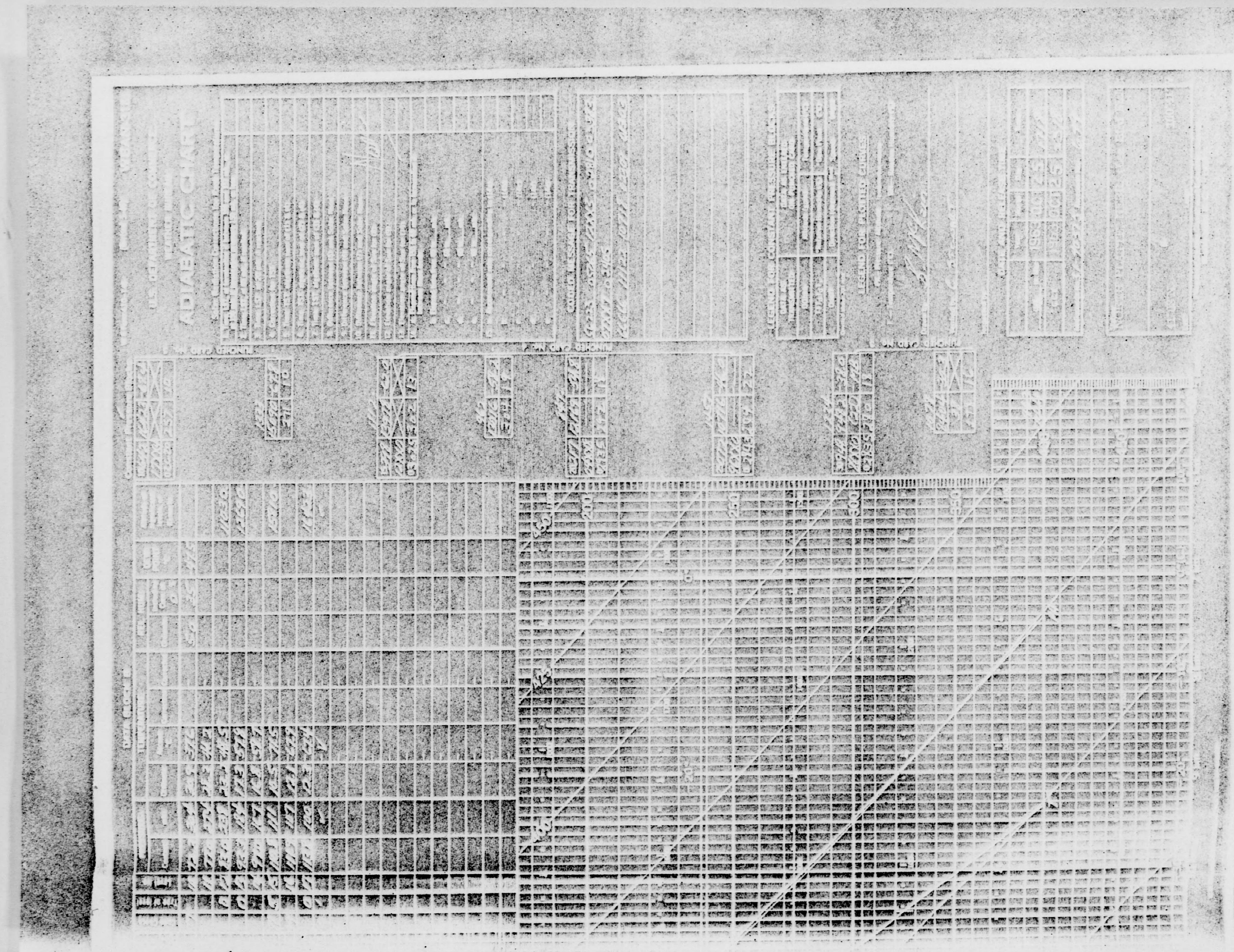


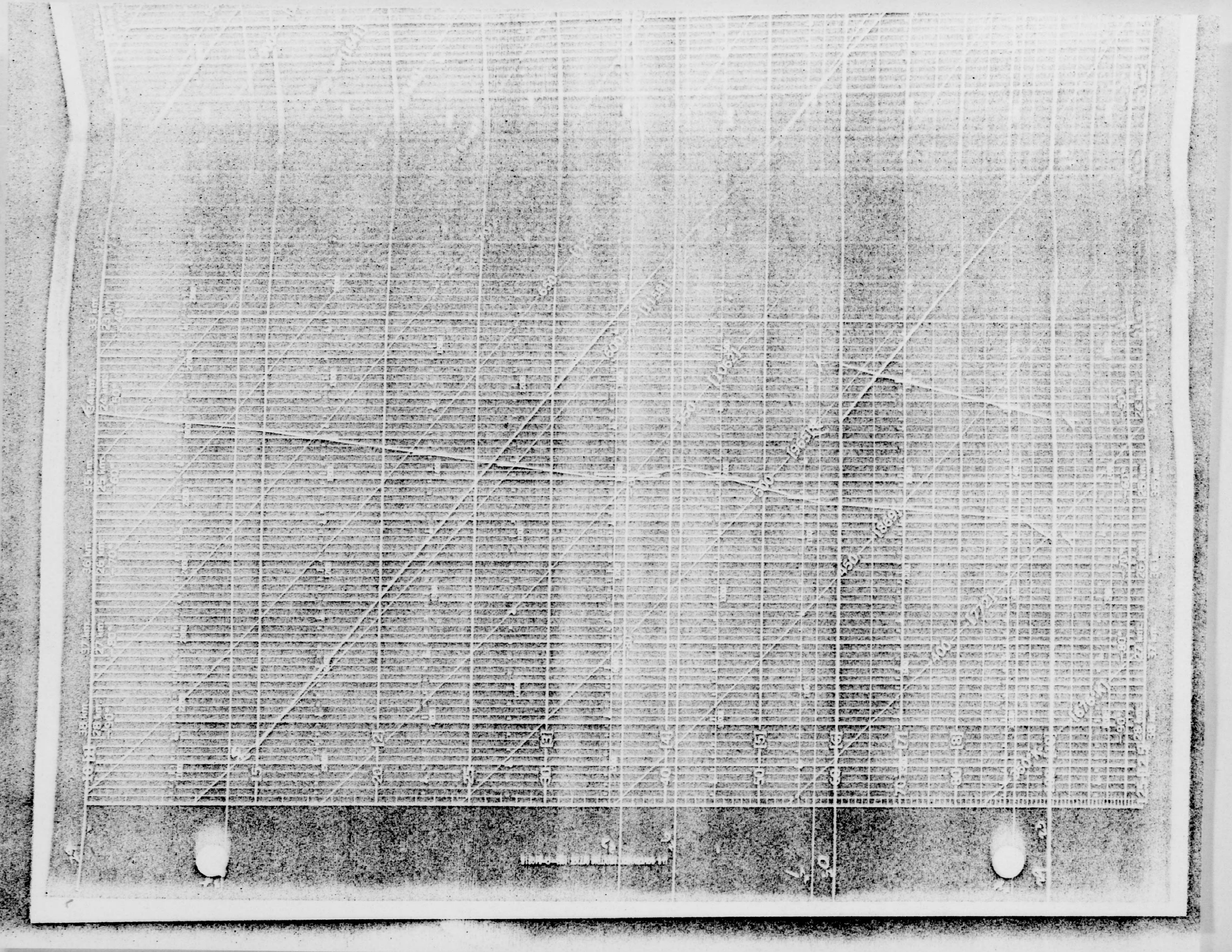

WEATHERIC
U.S. DEPARTMENT OF COMMERCE
WEATHER BUREAU
ADIABATIC CHART
DATA BLOCK C
LEGEND FOR CONSTANT PRESSURE BLOCK
LEGEND FOR PLOTTED CURVES



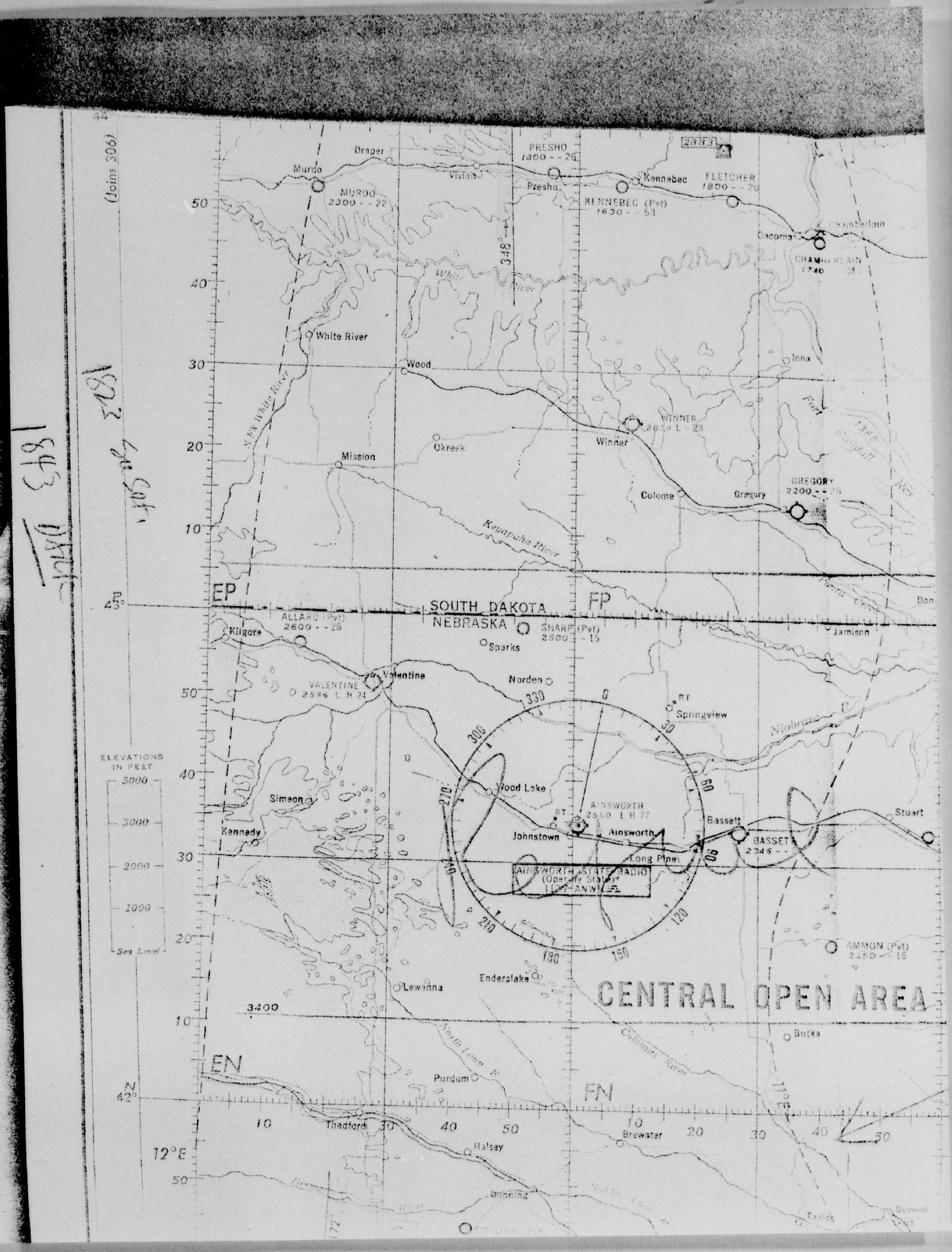

ADJACENTIC CHART



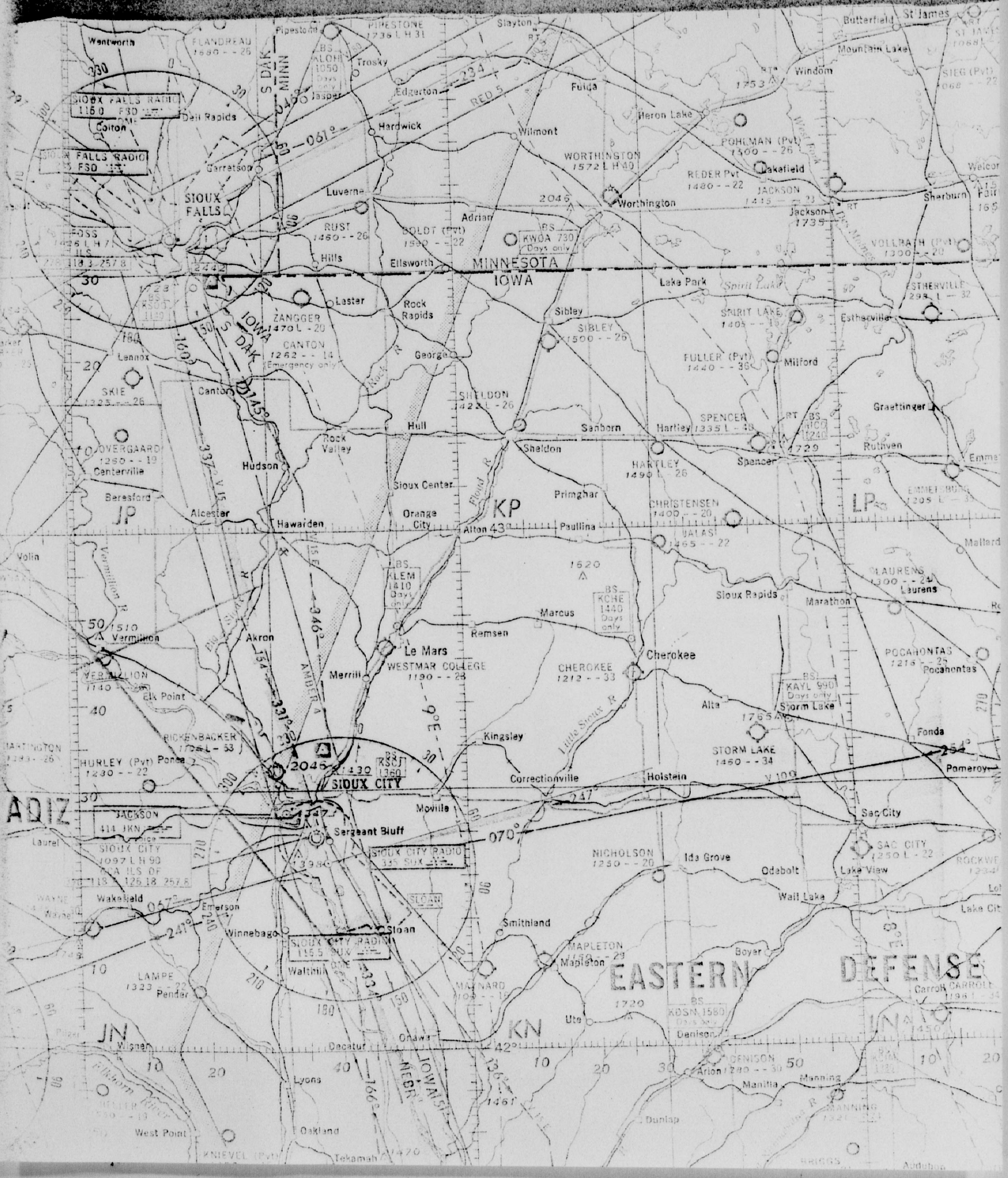

ADRIATIC COAST



SIOUX CITY, IOWA
25 Oct 63, CASE INCLUDES
18 ADIABATIC CHARTS
&
ONE AERONAUTICAL CHART


(Joins 306)
Draper
Murdo
Vivian
PRESHO
1300 - - 26
2883
A
Kennebec
FLETCHER
1800 - - 20
MURDO
2300 - - 22
Presho
KENNEBEC (Pvt)
1630 - - 53
Chamberlain
Oacoma
348°
White River
Wood
Iona
S. Fk. White River
WINNER
2038 L - 28
Winner
Okreek
Mission
Colome
Gregory
GREGORY
2200 - - 28
Keyapaha River
EP
FP
SOUTH DAKOTA
NEBRASKA
ALLARD (Pvt)
2600 - - 25
SHARP (Pvt)
2500 - - 15
Kilgore
Sparks
Jamison
Valentine
Norden
VALENTINE
2586 L H 24
330
0
30
300
RT
Springview
ELEVATIONS
IN FEET
5000
3000
2000
1000
Sea Level
Wood Lake
Simeon
AINSWORTH
2560 L H 77
RT
Bassett
Stuart
Kennedy
Johnstown
Ainsworth
Long Pine
BASSETT
2246 - -
270
240
210
60
90
120
150
180
AINSWORTH STATE RADIO
(Operated by State)
KLNF-ANW 4472
AMMON (Pvt)
2350 - - 16
Lewanna
Enderslake
CENTRAL OPEN AREA
3400
EN
FN
Purdum
Butka
Thedford
Halsey
Brewster
Dunning
Taylor
Burwell
12°E
42°
44°
50
40
30
20
10


Chamberlain
Dacoma
CHAMBERLAIN
1740 - - 29
Kimball
Letcher
Firesteel C
MITCHELL
1293 - H57
Plankinton
Mitchell
Alexandria
Stickney
Iona
Canova
Winfred
Salem
Humboldt
Bridgewater
PLATTE
Platte
1618 - - 28
RT
Armour
Parkston
CLIFFS
1310 - - 13
Freeman
Marion
1545
Parker
PARKER
1340 - - 25
GREGORY
2200 - - 28
Gregory
Tripp
Menno
Lake Andes
Chateau C
Scotland
James
River
Wagner
LAKE ANDES
1464 - 26
Bonesteel
GP
WAGNER
1464 L - 32
Jamison
Avon
Tyndall
Tabor
Hospital
Volin
YANKTON
1282 - - 39
2100
Springfield
Butte
MISSOURI R
Lynch
WOOLF
1395 - - 28
Niobrara R
1210
Lewis and Clark Lake
1575
Yankton
Niobrara
Crofton
Stuart
STUART - ATKINSON
2130 - - 32
Atkinson
1400
Verdigre
Bloomfield
RT
Hartington
HARTINGTON
1383 - - 26
BLOOMFIELD
1673 - - 33
O'Neill
O'NEILL
2100 L - 35
Creighton
CREIGHTON
1535 - - 21
EASTERN ADIZ
Laurel
Hoskins
Randolph
HALL (Pvt)
1890 - - 26
Stafford
Orchard
AMMON (Pvt)
2350 - - 16
OPEN AREA
Wisner
ZONE
WAYNE
1435 L - 30
Wayne
Sutka
PERKINS
2127 - - 25
(Emerg only)
CLEARWATER
1780 - - 20
Neligh
HUBEL (Pvt)
2020 - - 22
NELIGH
1745 - - 31
Oakdale
Pierce
BS
WJAG 780
Days only
1822
STEFAN
1571 L H 58
Hospital
Norfolk
Pilger
Tilden
Cummins ville
ELGIN
1940 - - 14
Elgin
Stanton
RT
Bartlett
NORFOLK STATE RADIO
(Oper by State)
109.6 OFK
Voice 290
TVOR
Madison
Burwell
Ericson
Clarkson
Howells
Newman
Hurnphrey

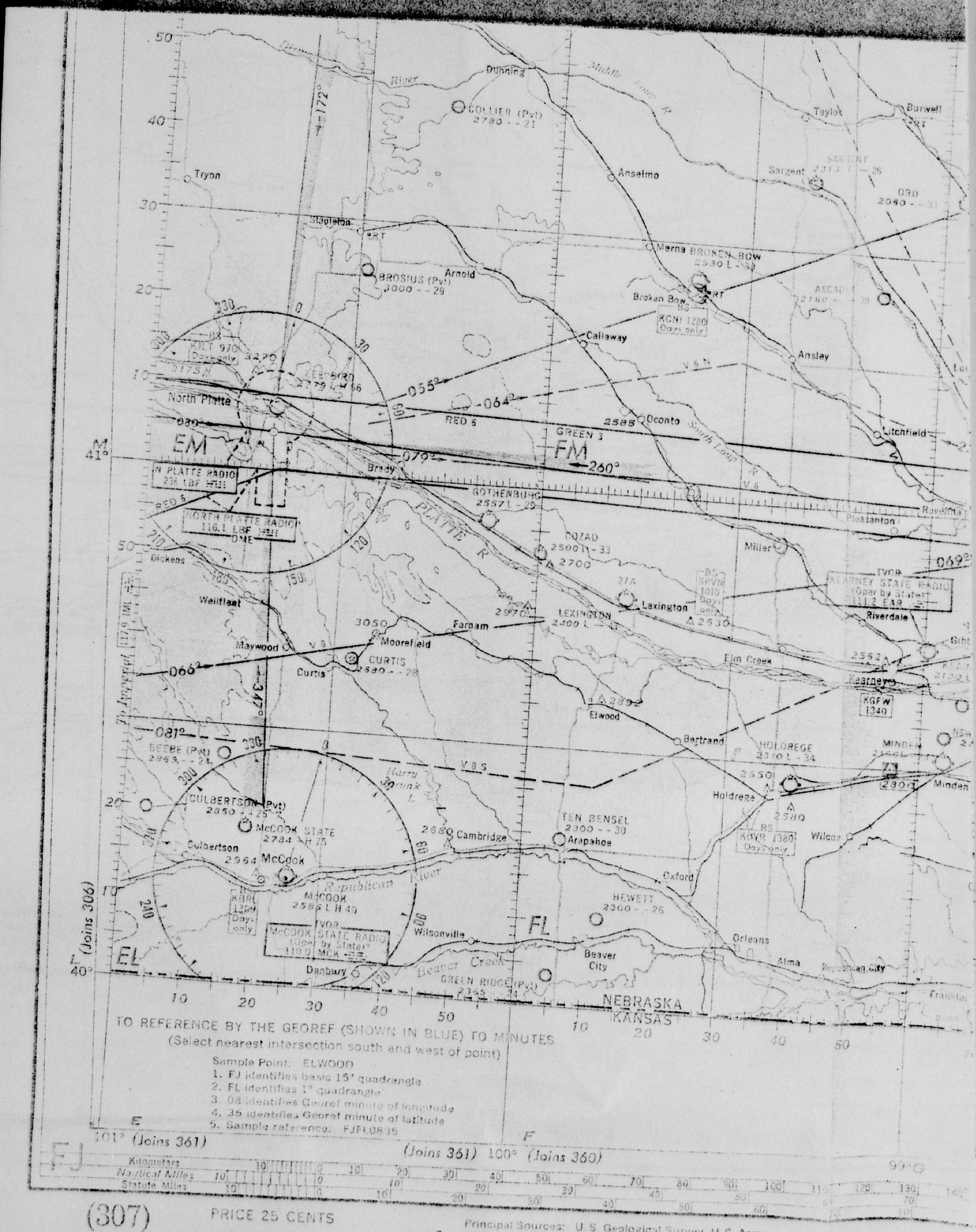

Wentworth
FLANDREAU
1680 - - 25
Pipestone
PIPESTONE
1736 L H 31
Slayton
Butterfield
St James
Mountain Lake
Trosky
Jasper
Edgerton
Fulda
Windom
1753
SIOUX FALLS RADIO
1150 FSD
Dell Rapids
Colton
Hardwick
Wilmont
Heron Lake
POHLMAN (Pvt)
1500 - - 26
Garretson
Luverne
WORTHINGTON
1572 L H 40
REDER Pvt
1480 - - 22
Lakefield
JACKSON
1415 - - 23
Worthington
Sherburn
SIOUX FALLS
FOSS
1426 L H 7
ILS
108.3 - 257.8
2046
Adrian
BS
KWOA 730
Days only
BOLDT (Pvt)
1590 - - 22
RUST
1460 - - 26
Hills
Ellsworth
MINNESOTA
IOWA
Jackson
1735
VOLLRATH (Pvt)
1300 - - 20
Lester
Rock Rapids
Lake Park
Spirit Lake
ESTHERVILLE
298 L - 32
Sibley
ZANGGER
1470 L - 20
CANTON
1262 - - 14
(Emergency only)
SIBLEY
1500 - - 26
SPIRIT LAKE
1405 - - 19
Estherville
George
Lennox
Milford
FULLER (Pvt)
1440 - - 36
SKIE
1325 - - 26
Canton
SHELDON
1423 L - 26
Graettinger
Hull
Sanborn
Hartley
SPENCER
1335 L - 48
BS
KICD
1240
1729
Rock Valley
Sheldon
Ruthven
OVERGAARD
1260 - - 19
Centerville
Hudson
HARTLEY
1490 L - 26
Spencer
Sioux Center
Primghar
Beresford
JP
KP
LP
Alcester
Orange City
Hawarden
Alton
Paullina
CHRISTENSEN
1400 - - 20
UALAS
1465 - - 22
Volin
1620
A
BS
KLEM
1410
Days only
BS
KCHE
1440
Days only
Sioux Rapids
Marathon
LAURENS
1300 - - 24
Laurens
Vermillion
1510
Akron
Marcus
Remsen
Cherokee
Le Mars
WESTMAR COLLEGE
1190 - - 28
CHEROKEE
1212 - - 33
POCAHONTAS
1215 - - 25
Pocahontas
Merrill
Elk Point
Alta
Storm Lake
Kingsley
Little Sioux R
BICKENBACKER
1705 L - 53
HURLEY (Pvt)
1230 - - 22
Ponca
BS
KSCJ
1360
STORM LAKE
1460 - - 34
Fonda
Pomeroy
Correctionville
Holstein
SIOUX CITY
ADIZ
JACKSON
414 JKN
Moville
Sac City
Laurel
Sergeant Bluff
SIOUX CITY
1097 L H 90
DCA ILS DF
118.1 126.18 257.8
SIOUX CITY RADIO
335 SUX
NICHOLSON
1250 - - 20
Ida Grove
SAC CITY
1250 L - 22
Odebolt
Lake View
Wall Lake
Wakefield
Emerson
SLOAN
Sloan
Winnebago
Smithland
SIOUX CITY RADIO
1155 SUX
MAPLETON
1450 - - 29
Mapleton
Boyer
LAMPE
1323 - - 22
Pender
Walthill
MAYNARD
1050 - - 18
EASTERN
DEFENSE
CARROLL
1196 L - 34
Carroll
1720
BS
KDSN 1580
Ute
JN
KN
Denison
Wisner
Decatur
Onawa
Lyons
DENISON
1280 - - 30
Arion
Manilla
Manning
Dunlap
West Point
Oakland
Tekamah
1470
KNIEVEL (Pvt)
BRIGGS
Audubon

CAUTION AREA (C-486)

DEFENSE AREA

St James
Butterfield
Mountain Lake
ST JAMES 1105 L - 27
STEG (Pvt) 1058 - - 22
TEUBNER (Pvt) 1000 - - 25
Mapleton
CHENEY (Pvt) 1000 - - 14
Winnebago
Wells
New Richland
HOPE
CRAFTREE (Pvt) 1180 - - 24
Blooming Prairie
Center
Hayfield
AUSTIN RADIO (Oper by State) 108 R AUM
Clarks Grove
Maple Island
BS KAUS 1480
ALBERT LEA 1244 - H 38
AUSTIN 1237 L H 38
Welcome
Blue Earth
Albert Lea
1690
1670A
Sherburn
Fairmont
1553
FAIRMONT 1161 - H 22
BS KSUM 1370
BLUE EARTH 1102 - - 23
Elmore
Bricelyn
BS KATE 1450
1480
Glenville
Lyla
VOLLRATH (Pvt) 1300 - - 20
ESTHERVILLE 1298 L - 32
Estherville
Armstrong
Buffalo Center
MILLER 1215 - - 18
Lake Mills
Lakota
Bancroft
OTIS 1220 - - 20
Forest City
Manly
Northwood
BEL AIR 1175 - - 15
St Ansgar
Osage
Graettinger
Fenton
Titonka
Burt
MASON CITY 1216 L H 55
1580A
1453
1449
Nora Springs
Ruthven
Emmetsburg
MP
BARKER 1220 - - 25
Garner
Clear Lake
MASON CITY
SPOTTS 1170 - - 26
Rockford
Factory
NP
LP
EMMETSBURG 1205 L - 35
BS ALGA 1600 Days only
Algona
Britt
WICKS 1230 - - 24
MASON CITY RADIO 1149 MCW
Thornton
Marble Rock
KNOOP 1065 - - 30
Mallard
West Bend
Corwith
Sheffield
1556
Luverne
Livermore
Belmond
CLAURENS 1300 - - 24
Laurens
Rolfe
CLARION 1162 L - 27
Goldfield
Rowan
HAMPTON 1150 L - 24
Hampton
Dumont
1340
POCAHONTAS 1216 - - 25
Pocahontas
Gilmore City
Humboldt
HUMBOLDT 1120 - - 19
EAGLE GROVE 1131 - - 26 H
Eagle Grove
Dows
FORT DODGE RADIO 1141 FOD
FORT DODGE 1160 L H 41
Fonda
Manson
Pomeroy
Fort Dodge
Webster City
ALDEN
Iowa Falls
Ackley
MILLER 1230 - - 22
Moorland
KWMT 540 Days only
Williams
Sac City
WEBSTER CITY 1100 - - 25
IOWA FALLS 1140 - - 20
Eldora
NN
SAC CITY 1250 L - 22
Somers
Jewell
Hubbard
Gifford
CLARKE 1050 - - 23
Lake View
ROCKWELL CITY 1234 - - 22
PETERSON 1145 - - 16
Gowrie
Lohrville
Lake City
Dayton
McCallsburg
NIEDERHAUSER 995 L - 26
1110
Carroll CARROLL 1196 L - 34
Grand Junction
Story City
MN
BOONE 1143 L - 25
Boone
WOI 640 Days only
PAUL (Pvt) 1025 - - 22
Marshalltown
IN
Ogden
1370A
1620
AMES 932 L - 3
Ames
Nevada
NELSON 995 - - 23
40 State Center
Melbourne
KINGMAN 995 - -
Cambridge
Jefferson
JEFFERSON 1021 L - 24
Coon Rapids
Madrid
Huxley
Herndon
Perry
Woodward
BAXTER (Pvt) 1000 - - 22
NEWTON 952 L - 26
Colfax
Newton
PRAIRIE CITY 950 - - 30
PERRY 1014 L - 23
Dallas Center
Panora
GUTHRIE CENTER 1083 - - 40
Audubon
1410
1450

To Rochester Johns 308 To Rochester
To La Crosse
To Waterloo
44°
43°
42°
6°E
7°E
8°E



TO REFERENCE BY THE GEOREF (SHOWN IN BLUE) TO MINUTES
(Select nearest intersection south and west of point)

Sample Point: ELWOOD

1. FJ identifies basic 15° quadrangle
2. FL identifies 1° quadrangle
3. 08 identifies Georef minute of longitude
4. 35 identifies Georef minute of latitude
5. Sample reference: FJFL0835

(307) PRICE 25 CENTS

Principal Sources: U. S. Geological Survey, U. S. Army Corps of Engineers, U. S. Air Force, U. S. Dept. of Agriculture, Civil Aeronautics Administration, and the U. S. Coast and Geodetic Survey.

NORFOLK STATE RADIO
(Oper by State)
109.6 OFK
Voice 290

Madison

West Point

RT Bartlett

Beaver Creek

Burwell

Ericson

Spalding

Albion

Newman Grove

Humphrey

CLARKSON
1490 - - 21

Ord

Cedar Rapids

St Edward

Greeley

North Loup

SCOTIA
1930 - - 22

Oconee

COLUMBUS
1439 L H 30

Columbus

CAMP Genoa
1680 - - 26

Fullerton

Silver Creek

Loup City

Elba

LOUP FORKS
1790 - - 40

SANTIN (Pvt)
1650 - - 18

CARLSON (Pvt)
1540 - - 16

DAVID CITY
1614 - - 231

David City

St. Paul

COUTON (Pvt)
2050 - - 24

Palmer

Osceola

Litchfield

GM

HM

STROMSBURG
1668 - - 26

Stromsburg

Central City

Surprise

Goehus

SVERS (Pvt)
1862 - - 13

GRAND ISLAND RADIO
265 GRI

STREAM (Pvt)
1630 - - 26

Ravenna

Pleasanton

ELGIN
1834 - - 21

Grand Island

2198

YORK
1662 L - 30

TVOR

KEARNEY STATE RADIO
(Oper by State)
111.2 EAR

Wood River

GRAND ISLAND RADIO
117.0 GRI

Aurora

York

Riverdale

DOELL (Pvt)
1700 - - 25

1950

Gibbon

2562

KEARNEY
2150 L H 70

Prosser

Kearney

KGFW
1340

KENT (Pvt)
2800

HARVARD
1817 - H 77

Harvard

Fairmont

Friend

SCHMIDT (Pvt)
2100

Kenesaw

Sutton

Exeter

CAUTION

NEWBOLD (Pvt)
2120 - - 20

HASTINGS
1944 L H 60

FAIRMONT
1639 L H 70

MINDEN
2156 L H 71

CLAY CENTER
1800 - - 16

Geneva

Minden

AREA
(C-201)

Fairfield

Pauline

Strang

Tobias

WILBER
1364 - - 23

Western

Wilber

Wilcox

Shickley

SIEBER
1572 - - 22

Blue Hill

Edgar

Little Blue River

Davenport

HAWKS
1644 - - 25

Campbell

Lawrence

BRUNING
1544 - H 68

Belvidere

Beatrice

SCHUTTE (Pvt)
1800 - - 23

FAIRBURY
1489 L H 25

Nelson

HEBRON
1441 - - 31

Hebron

RED CLOUD
1770 - - - 26

Republican City

Red Cloud

Lester

Deshler

Fairbury

Franklin

SUPERIOR
1720 - - - 31

Superior

HL

Chester

GL

JL

Republican River

50 10 20 11°E 30 40 50 10 20 30 40 10°E 50 10

ALTITUDE CONVERSION SCALE

3 5 Meters 10 15

10 20 Feet 30 40 50 60

For conversions above 100 feet, add like numbers

99°G (Joins 360) 98°H 97°J

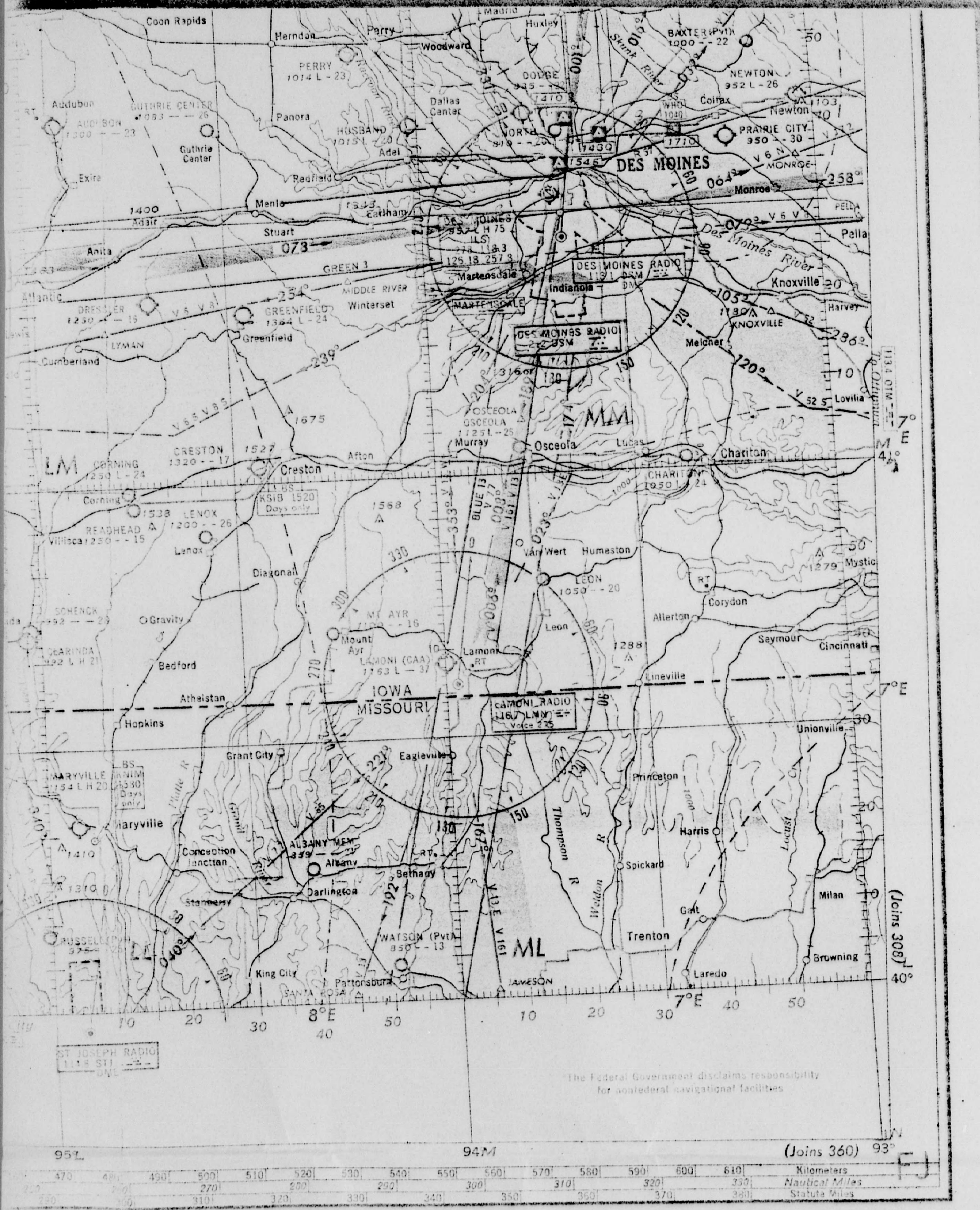
120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310

70 80 90 100 110 120 130 140 150 160 170 180 190

Compiled and printed at Washington D. C. by the U. S. Coast and Geodetic Survey
under authority of the Secretary of Commerce
FEBRUARY 1945 Revised OCTOBER 1957 BASE NO 4

See legend on back of chart for vertical limits of civil airways and control areas

Manilla
Coon Rapi
Dunlap
Woodbine
Mondamin
Portsmouth
Logan
Harlan
Exira
Audubon
Oakland
Tekamah
West Point
Dodge
Scribner
Hooper
California
Missouri Valley
Blair
Arlington
Avoca
Adair
Anita
North Bend
Fremont
Neola
Minden
Atlantic
Linwood
Lewis
Cumberland
Griswold
Yutan
Wahoo
Brainard
Weston
Valparaiso
Ashland
Plattsmouth
Louisville
Malvern
Emerson
Red Oak
Corning
Villisca
Shenandoah
Clarinda
Coin
Bedford
Hopkins
Mitford
Crete
Hickman
Syracuse
Dunbar
Nebraska City
Hamburg
Cortland
Wilber
Sterling
Talmage
Peru
Tarkio
Rockport
Burlington Junction
Maryville
De Witt
Tecumseh
Auburn
Nemaha
Fairfax
Beatrice
Virginia
Humboldt
Pawnee City
Jansen
Wymore
Odell
Endicott
Verdon
Falls City
Rulo
Napier
Sidney
Riverton
Clarinda
Gravity
Omaha
Council Bluffs
Missouri River
Nishnabotna R.
Platte R.
To Kansas City
NEBRASKA
KANSAS
CONVERSION SCALE
Number 1 refers to the figures on both sides of scale.
96° (Joins 360)
97°
SCALE 1:1,000,000
GEOREF 1256
NOTE: It is requested that users of this chart indicate corrections and additions which come to their attention and notify "THE DIRECTOR, U.S. COAST AND GEODETIC SURVEY, WASHINGTON 25, D.C."
Obstructions
500 feet or higher above ground
Less than 500 feet above ground
Under construction, position and elevation unverified



1,000,000

26TH EDITION Aeronautical information on this chart includes data received through Dec 5, 1957

Consult appropriate NOTAMS and Radio Facility Charts for supplemental data and current information.

Next edition is scheduled in approximately six months.

PLATTE RIVER (307)

UNITED STATES

U.S. AIR FORCE EDITION

PLATTE RIVER (307)

U.S. AIR FORCE EDITION

out the United States.
25, D. C.

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(Ref: AF Reg. 67-3)

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RADIOTELEGRAPH CODE AND PHONETIC ALPHABET

INTERNATIONAL (ICAO)

A—ALFA ·—	K—KILO —·—	U—UNIFORM ··—	0—ZE-RO —————
B—BRAVO —···	L—LIMA ·—··	V—VICTOR ···—	1—WUN ·—————
C—CHARLIE —·—·	M—MIKE ——	W—WHISKEY ·——	2—TOO ··———
D—DELTA —··	N—NOVEMBER —·	X—XRAY —··—	3—TREE ···——
E—ECHO ·	O—OSCAR ———	Y—YANKEE —·——	4—FOW-er ····—
F—FOXTROT ··—·	P—PAPA ·——·	Z—ZULU ——··	5—FIFE ·····
G—GOLF ——·	Q—QUEBEC ——·—		6—SIX —····
H—HOTEL ····	R—ROMEO ·—·		7—SEV-en ——···
I—INDIA ··	S—SIERRA ···		8—AIT ———··
J—JULIETT ·———	T—TANGO —		9—NIN-er ————·

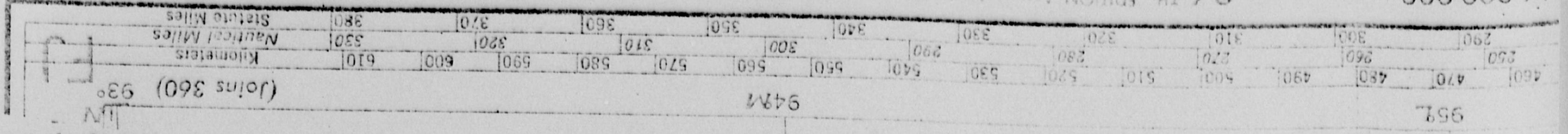
5-1-56

U.S. AIR FORCE EDITION

PLATTE RIVER (307)

UNITED STATES

1:1,000,000
26TH EDITION Aeronautical information on this chart
Dec 5, 1957
Consult appropriate NOTAMS and Radio Facility Charts for
supplemental data and current information
Next edition is scheduled in approximately six months
REF 12 56



out the United States.
25, D. C.

MILITARY CHART SUPPLY
(Ref: AF Reg. 67-3)

1. **Aeronautical Charts, Maps and Publications** distributed by the Aeronautical Chart and Information Center are indexed or listed in the current edition of the "USAF Catalog of Aeronautical Charts and Aeronautical Information Publications". A Bulletin is also published twice monthly which contains important information such as new editions of charts available, replacement charts, hazardous charts, chart correction notices and other pertinent information pertaining to charts and supply.

2. Requisitioning.

a. Outside Continental United States: USAF activities are to submit requisitions to the appropriate Aeronautical Chart and Information Office located within the applicable theater, in accordance with existing theater directives.

b. Within Continental United States: USAF activities are to submit requisitions to Commanding Officer, Aeronautical Chart and Information Center, 2nd and Arsenal Sts., St. Louis 18, Missouri, Attention: Distribution Division. Requisitions will be submitted on available requisition forms or by letter in quadruplicate. When demand is urgent, wire service may be used. Requisitions submitted from a Base or Station will bear the signature, or approval by indorsement, of the Operations officer. Requisitions from Air Force, Wing, or Command Headquarters will bear the signature of the appropriate staff officer. Quantities of charts and maps requested are to be such as to assure the maintenance of a thirty (30) day supply at all times, but not to exceed a sixty (60) day supply.

3. **USAF Requirements for Special Purpose Maps and Charts:** Maps and charts for special purposes, specific missions, and also those maps and charts published by other government agencies which may not be listed in the principal types of aeronautical charts in the current edition of the "USAF Catalog of Aeronautical Charts and Aeronautical Information Publications" should be requisitioned from USAF Aeronautical Chart and Information Center, when the request orginates in the United States. For those USAF requests originating outside the continental United States, the applicable theater USAF Aeronautical Chart and Information Office should be contacted. Charts will be furnished, if available, when sufficiently identified in requisitions as to name or number, scale, projection and publisher. If this information is unknown to requestor, a description of the information required on chart or map should be furnished.

4. Obsolete Charts: Aeronautical charts rendered obsolete by printing of a new edition shall be salvaged if not practicable to correct for conformity with new edition. Disposition is to be made in accordance with provisions of AFR 67-3. Disposition of classified charts is to be made in accordance with provisions of AFR 205-1.

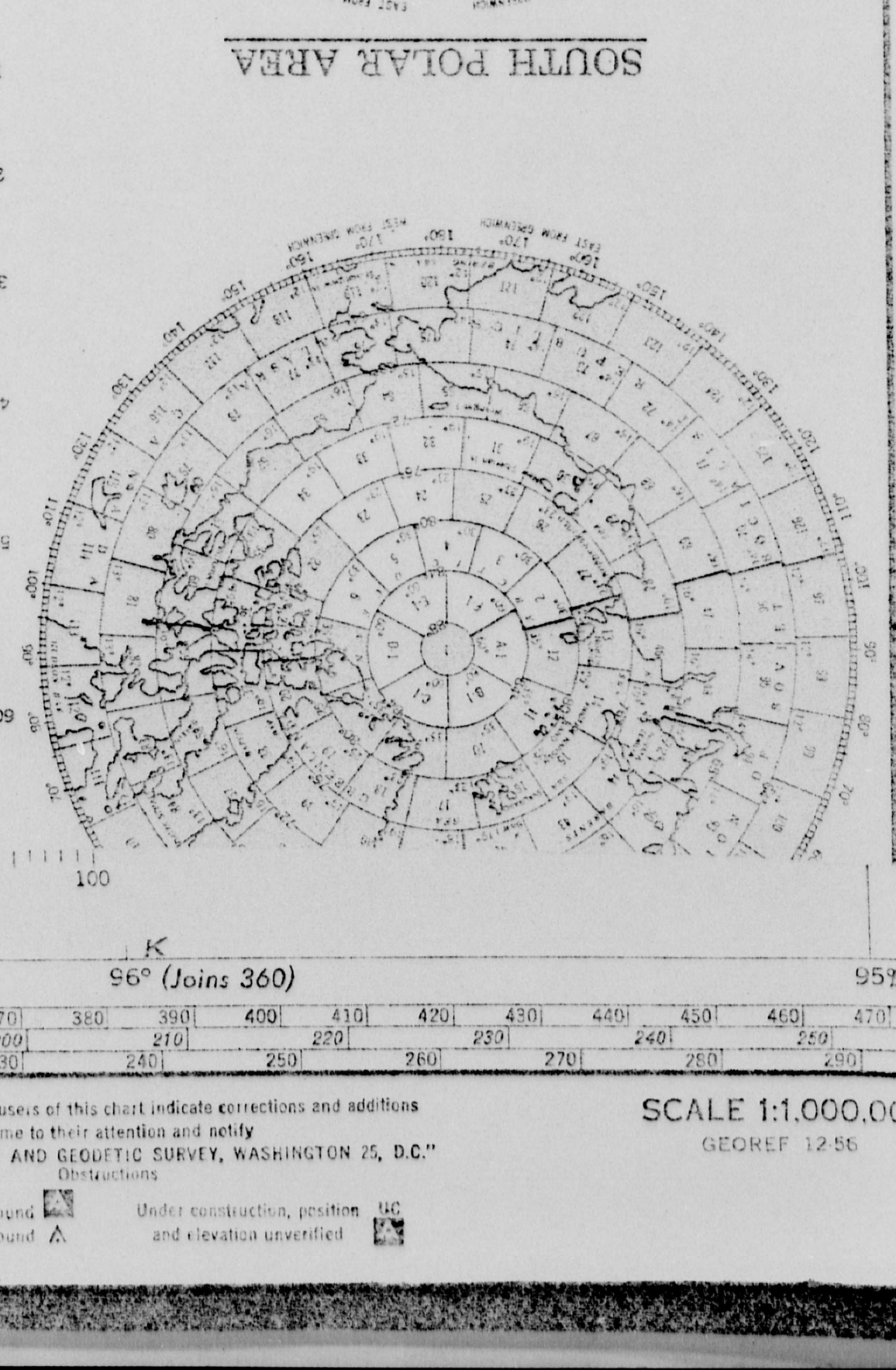
RADIOTELEGRAPH CODE AND PHONETIC ALPHABET
INTERNATIONAL (ICAO)

A—ALFA ·—	K—KILO —·—	U—UNIFORM ··—	0—ZE-RO —————
B—BRAVO —···	L—LIMA ·—··	V—VICTOR ···—	1—WUN ·————
C—CHARLIE —·—·	M—MIKE ——	W—WHISKEY ·——	2—TOO ··———
D—DELTA —··	N—NOVEMBER —·	X—XRAY —··—	3—TREE ···——
E—ECHO ·	O—OSCAR ———	Y—YANKEE —·——	4—FOW-er ····—
F—FOXTROT ··—·	P—PAPA ·——·	Z—ZULU ——··	5—FIFE ·····
G—GOLF ——·	Q—QUEBEC ——·—		6—SIX —····
H—HOTEL ····	R—ROMEO ·—·		7—SEV-en ——···
I—INDIA ··	S—SIERRA ···		8—AIT ———··
J—JULIETT ·———	T—TANGO —		9—NIN-er ————·

S-1-56

*Indicates that there is not sufficient information available to compile charts in this area at a scale of 1:1,000,000. Requisitions for these charts will be filled with the appropriate Universal Water Chart.

SOUTH POLAR AREA



of ciphers to the figures on both sides of scale.

97° J — 96° (Joins 360) — 95° L

NOTE: It is requested that users of this chart indicate corrections and additions which come to their attention and notify "THE DIRECTOR, U.S. COAST AND GEODETIC SURVEY, WASHINGTON 25, D.C."

Obstructions

500 feet or higher above ground

Less than 500 feet above ground

Under construction, position and elevation unverified UC

SCALE 1:1,000,000

GEOREF 12-56

Compiled and printed at Washington, D. C. by the U. S. Coast and Geodetic Survey
under authority of the Secretary of Commerce
FEBRUARY 1945 Revised OCTOBER 1957 BASE NO 4

See legend on back of chart for vertical limits of civil airways and control areas

by, U.S. Army
of Agriculture, Civil
and Geodetic Survey.

WORLD AERONAUTICAL CHART INDEX

Scale of Series 1:1,000,000

UNIVERSAL WATER CHARTS

Universal Water Charts (Scale 1:1,000,000; size 29 × 22 inches) covering 4° of lat. have been published for use in areas of the World Aeronautical Charts in water areas. The user must insert the appropriate long. values for the particular area desired. Water that is plotted within the normal geographical limits and the chart is designed for use in both north and south latitudes.

NOTE: Regulation these charts by name and latitude interval.

Charts published

Charts not published

PACIFIC OCEAN

SOUTH ATLANTIC OCEAN

NORTH ATLANTIC OCEAN

NEWFOUNDLAND

HUDSON BAY

GREENLAND

ICELAND

4. 35 identifies Georef minute of longitude

5. Sample reference: FJFL0835

E

F

101° (Joins 361)

(Joins 361) 100° (Joins 360)

99°C

FJ

Kilometers 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130

Nautical Miles 10 0 10 20 30 40 50 60 70 80

Statute Miles 10 0 10 20 30 40 50 60 70 80

(307) PRICE 25 CENTS

Principal Sources: U.S. Geological Survey, U.S. Army Corps of Engineers, U.S. Air Force, U.S. Dept. of Agriculture, Civil Aeronautics Administration, and the U.S. Coast and Geodetic Survey

1 - 30 NOVEMBER 1963 SIGHTINGS

DATE	LOCATION	OBSERVER	EVALUATION
2	St. Peter, Illinois	Civilians	Astro (METEOR)
2	Bean Blossom, Indiana	[redacted]	Astro (METEOR)
3	40.00N 174.00W (Pacific)	Military	INSUFFICIENT DATA
5	Kindley AFB, Bermuda	Military	Astro (JUPITER)
5	Nebraska - Iowa	Civilian - Military	Astro (METEOR)
8	Conde, Bahia, Brazil	Civilian	Other (HOAX)
11	Duncanville, Texas	[redacted]	INSUFFICIENT DATA
11	40N 173W (Pacific)	Military	INSUFFICIENT DATA
12	St. Claire County, Michigan	Multiple	AIRCRAFT
14	Stead AFB, Nevada	[redacted]	Other (MISSILE)
16	36.5N 72 5W (Atlantic)	Military	Other (FLARE)
17	33N 177W (Pacific)	Multiple	Astro (METEOR)
18	New Platz, New York	Multiple	Astro (METEOR)
18	32.10N 177.20W (Pacific)	Military	SATELLITE
19	Mt. Dora, Florida	Civilian	Other (UNRELIABLE REPOR
19	Phoenix, Arizona	[redacted]	Astro (SPICA)
19	37.00N 173.30W (Pacific)	Military	Astro (METEOR)
21	West Nyak, New York	[redacted]	Astro (METEOR)
21	41.50N 60,30W (Atlantic)	Military	AIRCRAFT
27	Kenema, Sierra Leone, Afroca	[redacted]	Other (MISSILE)
27	Monrovia, Liberia, Africa	Multiple	Other (MISSILE)
27	Pennsylvania	[redacted]	Astro (METEOR)
30	Knoxville, Tennessee	Military - Civilian	Astro (METEOR)

ADDITIONAL REPORTED SIGHTINGS (NOT CASES)

DATE	LOCATION	SOURCE	EVALUATION
Nov	Linwood, N. J.	[redacted] (164)	
2	Pacific Missile Range	[redacted] (Steward Observatory, University of Arizona)	
7-8	California Area	News Clipping	
14	Argentina	"	"
15	"	"	"
16	"	"	"
16	Buenos Aires, Argentina	"	"
16	Hythe, Kent	"	"
28	Argentina	"	"