PART A

IONOSPHERIC DATA

ISSUED

APRIL 1965

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO
IONOSPHERIC DATA

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The CRPL-F series bulletins are issued as part of the responsibility of the Central Radio Propagation Laboratory for the exchange and distribution of ionospheric and related geophysical data. Part A, "Ionospheric Data," and Part B, "Solar-Geophysical Data," of the CRPL-F series present a variety of data collected by CRPL in the course of its research and service activities. Through the CRPL-F series, as part of the general exchange of scientific information, these data are made available for use by others in research on radio propagation and the ionosphere, and in other geophysical applications.

In the CRPL-F series, Part A, tables of monthly median values of vertical-incidence ionospheric data are presented accompanied by graphs of critical frequencies and $M(3000)F_2$. The tables include the number of values entering into the median determination (count). When available, the upper and lower quartile values (indicated by UQ and LQ) are listed for $f_{oF2}$, $f_{oF1}$, $f_{oEs}$, $M(3000)F_2$, $h'F_2$ and $h'F$. Space limitations do not permit inclusion of quartile values for the other characteristics. The tables are prepared by machine methods and the graphs are plotted automatically.

The tables and graphs present the ionospheric data as received from the originating laboratory. Responsibility for the accuracy and reliability of the data rests entirely with the originator. Medians of data for the U.S. stations are computed by CRPL in accordance with the recommendations of the World-Wide Soundings Committee.

Data will appear in the F-series, Part A, only when the complete daily-hourly tabulations have been received by the CRPL or the World Data Center A for Airglow and Ionosphere. In general, priority of publication is given to the most current data. Data received too long after the month of observation may experience an indefinitely prolonged delay before finding space in the F series, Part A.

Information on symbols, terminology and conventions may be found in the "URSI Handbook of Ionogram Interpretation and Reduction of the World-Wide Soundings Committee," edited by W. R. Piggott and K. Rawer (Elsevier, 1961), which supersedes previous documents. A list of symbols is available from CRPL on request.

### Units and Abbreviations of Ionospheric Data Tables

- $f_{oF2}$, $f_{oEs}$ - - - Tenths of a megacycle
- $f_{oF1}$, $f_{oE}$ - - - Hundredths of a megacycle
- $h'F_2$, $h'F$, $h'E$ - Kilometers
- $M(3000)F_2$ - - - Hundredths
- MED - Median
- CNT - Count
- UQ - Upper Quartile
- LQ - Lower Quartile
Key to Points of Ionospheric Data Graphs

- foF2: x
- foE : o
- M(3000)F2 : ◊
- foF1: Δ
- foEs: +

< Less-than value indicated.  > Greater-than value indicated.
- - - Interpolated value indicated.

The following table contains the latest available information on twelve-month smoothed average of observed Zurich relative sunspot numbers, beginning with the minimum of April 1954. Final numbers are listed through June 1964, the succeeding values being based on provisional data.

Smoothed Observed Zurich Relative Sunspot Number

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WORLD-WIDE SOURCES OF IONOSPHERIC DATA

THE IONOSPHERIC DATA PRESENTED IN THE 100 TABLES AND
GRAPHS OF THIS ISSUE WERE ASSEMBLED BY THE CENTRAL RADIO
PROPAGATION LABORATORY FOR ANALYSIS, CORRELATION, AND
DISTRIBUTION. THE FOLLOWING ARE THE SOURCES OF THE DATA.

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COCOS IS.

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(CENTRAL RADIO PROPAGATION LABORATORY)
ANCHORAGE, ALASKA
BOULDER, COLORADO
MAUI, HAWAII
### TABLES AND GRAPHS OF IONOSPHERIC DATA

**February 1965 - August 1963**

#### Boulder, Colorado (105°0'W)

| Time | Frequency (kHz) | U | F | U | F | U | F | U | F | U | F | U | F |
|------|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00   | 210 - 245      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 01   | 245 - 270      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 02   | 270 - 290      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 03   | 290 - 300      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 04   | 300 - 302      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 05   | 301 - 302      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 06   | 302 - 304      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 07   | 304 - 306      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 08   | 306 - 308      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 09   | 308 - 310      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 10   | 310 - 312      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 11   | 312 - 315      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 12   | 315 - 317      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 13   | 317 - 320      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 14   | 320 - 323      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 15   | 323 - 325      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 16   | 325 - 328      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 17   | 328 - 330      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 18   | 330 - 332      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 19   | 332 - 335      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 20   | 335 - 338      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 21   | 338 - 340      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 22   | 340 - 343      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 23   | 343 - 345      |   |   |   |   |   |   |   |   |   |   |   |   |   |

#### Anchorage, Alaska (150°0'W)

| Time | Frequency (kHz) | U | F | U | F | U | F | U | F | U | F | U | F |
|------|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00   | 158 - 180      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 01   | 180 - 205      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 02   | 205 - 230      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 03   | 230 - 255      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 04   | 255 - 280      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 05   | 280 - 305      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 06   | 305 - 330      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 07   | 330 - 355      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 08   | 355 - 380      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 09   | 380 - 405      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 10   | 405 - 430      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 11   | 430 - 455      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 12   | 455 - 480      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 13   | 480 - 505      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 14   | 505 - 530      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 15   | 530 - 555      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 16   | 555 - 580      |   |   |   |   |   |   |   |   |   |   |   |   |   |

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**ANALYSIS**

- Frequency ranges in kHz with U and F indicating upper and lower limits, respectively.
- Observations include L, F, E, and M classes.
### GOOLEY HEAD

**LAT. 43.65 LONG. 177.8E**

**DECEMBER 1964**

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### ATHENS

**LAT. 30.0N LONG. 23.4W**

**NOVEMBER 1964**

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### CRITICAL FREQUENCY (109 HZ) IN M/C/S

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### MED CNT

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### LAT. 38.0N LONG. 23.6E

**SWEEP 1.0 MC TO 20.0 MC IN 7 SEC**

**TIME 180.0E**

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### DISCUSSION

- The chart displays various parameters such as MEO, CNT, and frequency readings for different locations.
- The data is collected over a period of time, indicated by the HR values.
- The chart includes a section on critical frequency and MED CNT, which are important in understanding radio wave propagation.
### Yamagawa Japan

**September 1963**

#### foF2

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### Taipei China

**September 1963**

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The images contain graphs and tables representing data on ionospheric parameters such as foF2, foE, foEs, and critical frequency, along with time intervals from 00 to 24 in 4-hour increments. The data is organized by month and year, with specific details for Yamagawa Japan and Taipei China.
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CRPL REPORTS

(A detailed list of CRPL publications is available from the Central Radio Propagation Laboratory on request.)

Catalog of Data.
A catalog of records and data on file at the U.S. IGY World Data Center A for Airglow and Ionosphere, Boulder Laboratories, National Bureau of Standards, Boulder, Colorado, which includes a fee schedule to cover the cost of supplying copies, is available upon request.

CRPL-F (Part A), "Ionospheric Data."
CRPL-F (Part B), "Solar Geophysical Data."
These monthly bulletins have limited distribution and are sent, in general, only to those individuals and scientific organizations that collaborate in the exchange of ionospheric, solar, geomagnetic, or other radio propagation data of interest to the CRPL. Others may purchase copies of the same data from the U.S. IGY World Data Center A for Airglow and Ionosphere, National Bureau of Standards, Boulder, Colorado.

"Ionospheric Predictions."
This series of publications is issued monthly, three months in advance, as an aid in determining the best sky-wave frequencies for high frequency communications over any transmission path, at any time of day for average conditions for the month.
(NOTE: Tested sets of punched cards of the predicted numerical coefficients of numerical maps of the Ionospheric Predictions, for use with electronic computers, may be purchased by arrangement with the Prediction Services Section, CRPL, Boulder Laboratories, Boulder, Colorado.)
