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IONOSPHERIC DATA IN JAPAN

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KOKUBUNJI, TOKYO, JAPAN

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THE RADIO RESEARCH LABORATORIES

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CONTENTS

SITE OF THE RADIO WAVE OBSERVATORIES

Ionospheric observation is carried out at the following four observatories in Japan.

	Latitude	Longitude	Site
Wakkanai	45°23.6′N.	141°41.1′E.	Midori-cho, Wakkanai-shi, Hokkaido
Akita	39°43.5′N.	140°08.2′E.	Tegata Sumiyoshi-cho, Akita-shi, Akita-ken
Kokubunji	35°42.4′N.	139°29.3′E.	Nukuikita-machi, Koganei-shi, Tokyo-to
Yamagawa	31°12.1′N.	130°37.1′E.	Yamagawa-machi, Ibusuki-gun, Kagoshima-ken

Solar radio emission and radio propagation conditions are observed at Hiraiso Branch.

	Latitude	Longitude	Site
Hiraiso	36°22.0′N.	140°37.5′E.	Isozaki-machi, Nakaminato-shi, Ibaraki-ken

SYMBOLS AND TERMINOLOGY

A. IONOSPHERE

All symbols and terminology in the table of ionospheric data are used in accordance with the "URSI Handbook of Ionogram Interpretation and Reduction," 1961.

Terminology

f_0F2, f_0F1, f_0E — The ordinary wave critical frequency for the $F2$, $F1$ and E layers, respectively.

f_0E_s — The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.

f_bE_s — The lowest ordinary wave frequency at which the E_s layer begins to become transparent. This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.

f-min — The frequency below which no echoes are observed.

$M(3000)F2$ — The maximum usable frequency factor for a path of 3000 km for transmission by $F2$ layer.

$M(3000)F1$ — The maximum usable frequency factor for a path of 3000 km for transmission by $F1$ layer.

$h'F2$ — The minimum virtual height, $h'F2$, refers to the highest, most stable stratification observed in the F region and can only be scaled when such stratification is present.

$h'F$ — The natural and most significant F region virtual height parameter is that for lowest F region stratification. This will be denoted by $h'F$. Thus $h'F$ is identical with the current $h'F2$ when F region stratification is absent, e.g., at night, and with the current $h'F1$ when $F1$ stratification is present.

$h'E_s$ — The lowest virtual height of the trace used to give the f_0E_s.

h_pF2 — The virtual height of the $F2$ layer measured on the ordinary

wave branch at a frequency equal to $0.834 f_0F2$.

ypF2 The semi-thickness of the $F2$ layer deduced from a parabolic fit to the "nose" of the electron density distribution with height and based on the observed $h'f$ trace. (The difference between $hpF2$ and the virtual height at $0.969 f_0F2$).

a. Descriptive Letters

The following letters are entered after or used to replace a numerical value on the monthly tabulation sheets.

A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example E_s.

B Measurement influenced by, or impossible because of, absorption in the vicinity of f-min.

C Measurement influenced by, or impossible because of, any non-ionospheric reason.

D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range. Used in a qualifying sense, see below.

E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range. Used in a qualifying sense, see below.

F Measurement influenced by, or impossible because of, the presence of spread echoes.

G Measurement influenced or impossible because the ionization density of the layer is too small to enable it to be made accurately.

H Measurement influenced by, or impossible because of, the presence of a stratification.

L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.

M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.

S Measurement influenced by, or impossible because of, interference or atmospherics.

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

V Forked trace which may influence the measurement.

W Measurement influenced or impossible because the echo lies outside the height range recorded.

X Measurement refers to the extraordinary component.

Y Intermittent trace.

Z Third magneto-ionic component present.

b. Qualifying Letters

The following letters are entered in the first column before a numerical

value on the monthly tabulation sheets.

D greater than.

E less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

O Extraordinary component characteristic deduced from the ordinary component. (Used for x- characteristics only.)

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

U Uncertain or doubtful numerical value.

Z Measurement deduced from the third magneto-ionic component.

c. Description of Standard Types of E_s

The eight standard types of E_s are identified by corresponding lower case letters: *f, l, c, h, q, r, a, s.* These letters suggest the names flat, low, cusp, high, equatorial, retardation, auroral and slant, respectively. It is strongly emphasized that these names are not restrictive. The letter '*n*' is used to designate any E_s trace that does not correspond to any of the eight types.

f An E_s trace which shows no appreciable increase of height with frequency. The trace is usually relatively solid at most latitudes. This classification may only be used at night; apparently flat E_s traces observed in the daytime are classified according to their virtual hight: *h* or *l*.

l A flat E_s trace at or below the normal *E* layer minimum virtual height in the day or below the night *E* layer minimum virtual height at night.

c An E_s trace showing a relatively symmetrical cusp at or below f_0E. This is usually continuous with the normal *E* trace, although when the deviative absorption is large, part or all of the cusp may be missing. (Usually a daytime type.)

h An E_s trace showing a discontinuity in height with the normal *E* layer trace at or above f_0E. The cusp is not symmetrical, the low frequency end of the E_s trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)

q An E_s trace which is diffuse and non-blanketing over a wide frequency range. The spread is most pronounced at the upper edge of the trace. (This type is common in daytime in the vicinity of the magnetic equator.)

r An E_s trace showing an increase in virtual height at the high frequency end similar to group retardation but which is non-blanketing over part or all of its frequency range. This is distinguished from the usual group retardation (as in the case of an occulting thick *E* layer) by the lack of group retardation in the *F* layer traces at corresponding frequencies and the lack of complete blanketing.

a An E_s having a well defined flat or gradually rising lower edge with stratified and diffuse (spread) traces present above it. These

sometimes extend over several hundred kilometers of virtual height.

s A diffuse E_s trace which rises steadily with frequency and usually emerges from another type E_s trace. The rising trace alone is classified as '*s*'; the horizontal trace is classified separately. At high latitudes the slant trace usually starts to rise from a horizontal E_s trace such as E_s-*l* or E_s-*f*, at frequencies which grealy exceed the E layer critical frequency, whereas at low latitudes it usually rises from E_s-*q*, E_s-*c*, or E_s-*h* at frequencies near the regular E critical frequency. Type *s* is never used to determine f_0E_s and $h'E_s$. The slant trace is sometimes observed to start at f_0E without echoes clearly identifiable as E_s echoes being seen.

n The designation '*n*' is used to denote an E_s trace which cannot be classified into one of the standard types. When a trace appears to be intermediate between any two classes a choice should be made whenever possible even if it is uncertain. '*n*' should be used sparingly.

d. Multiple Reflections from E_s

When the ionogram shows the presence of multiple reflections from E_s the number of traces seen should be recorded after the letter indicating the type.

B. SOLAR RADIO EMISSION

Solar radio observations are carried out on 200 and 500 Mc/s at Hiraiso Radio Wave Observatory.

Antennas are a broadside array of 6×4 doublets for 200 Mc/s and a parabolic reflector of 5 meter for 500 Mc/s, each having the total power receiver.

Observations are feasible almost from sunrise to sunset.

a. Time and Unit

The time is expressed as U.T.

The unit is 10^{-22} W·m^{-2}·(c/s)$^{-1}$ for both components of polarization.

b. Daily Data

Flux density

The three-hourly and daily mean values are given.

Variability

The three-hourly and daily mean values are given at 200 Mc/s only.

Variability is expressed in the following four grades:

0=Quiet or no burst,
1=A few bursts,
2=Many bursts,
3=Very many bursts.

The number of bursts exceeding the flux level is counted.

c. Distinctive Events

The phenomena are picked up on the following criteria:

1. Distinct from the prevailing kind of activity,
2. Correlated with other known solar phenomena,
3. Remarkable change-over from one situation to another.

Starting time and *Time of maximum* are given to nearest minute in general, but to nearest a tenth minute for short intense occurrences or clear commencements.

Duration is given in minutes and to nearest a tenth minute, if short or clear.

Descriptive type is denoted by the following symbols:

S =Simple rise and fall of intensity;
C =Complex variation of intensity,
C + =Prolonged broad-band enhancement of radiation, generally of spectral type IV;
F =Group of bursts: multiple peaks probably belonging to the same event, but separated by relatively short period of quietness;
RF =More or less irregular rise and fall of intensity, at metric or decimetric wavelengths;
e =Sudden beginning of burst with steep rise of intensity;
E =Steep rise of intensity of continuum background;
p.i. =post-burst increase;
onset storm=clear-cut beginning of a noise storm.

Peak intensity is the flux density of the highest peak reached during the occurrence, measured above the pre-burst level.

Mean intensity is the flux density averaged over the burst's duration, measured above the pre-burst level; therefore, multiplying the duration, the total energy of the occurrence can be estimated.

C. RADIO PROPAGATION CONDITIONS

a. Field Intensities of WWV and WWVH

Field intensity observations of WWV and WWVH transmitted from Fort Collins, Colorado and Hawaii, respectively, are carried out at Hiraiso Branch. In order to avoid interferences with other standard frequency waves on the same frequency, the upper side-band of 440 c/s is picked up by the use of a narrow band pass filter with ±40 c/s bandwidth.

The *tabulated field intensity* is the average of peak value of the incident upper side-band field intensity in dB above one microvolt per meter. The *duration* of observation is two minutes for WWV and three minutes for WWVH following the time indicated in universal time on the table.

Particulars of the transmitter and receiver are summarized in the following tables:

Transmitter

	WWV	WWVH
Location	Fort Collins, Colorado Long. 105°02′ W Lat. 40°41′ N	Maui, Hawaii Long. 156°28′ W Lat. 20°46′ N
Power	3 kW for the upper side-band	0.5 kW* for the upper side-band
Antenna	$\lambda/2$ vertical	$\lambda/2$ vertical
Distance	9150 km	6270 km

* Reduced from the carrier power of 2 kW with amplitude modulation of 100%.

Receiver

Antenna	4.5 m vertical rod
Bandwidth	±40 c/s for the upper side-band
Calibration	every half an hour

The meaning of *Descriptive symbols* is as follows:

C: Measurement influenced by, or impossible because of, any non-propagational reasons.

S: Measurement influenced by, or impossible because of, interferences or atmospherics.

( ): Inaccurate measurement influenced by interferences, atmospherics, or non-propagational reasons.

<: Less than the following figure.

b. Radio Propagation Quality Figures

Radio propagation quality figures are usually expressed on the scale that ranges from one to five as follows:

1=very poor (very disturbed)
2=poor (disturbed)
3=rather poor (unstable)
4=normal
5=good

The tabulated circuits contain Hamburg (commercial circuit), WWV (10, 15 and 20 Mc/s frequencies broadcast from Fort Collins, Colorado), San Francisco (commercial circuit) and WWVH (10 and 15 Mc frequencies broadcast from Hawaii), which are received at Hiraiso Branch (Lat. 36°22′ N, Long. 140°38′ E).

Warnings of radio propagation which are broadcast from JJY station are expressed in three grades:

N=normal
U=unstable
W=disturbed

The letter W expresses HF propagation disturbances which are expected to occur during the following 12 hours after issue. The letter U and N also means unstable and normal conditions, respectively.

Whole day radio quality indices stand for the averages of the 6-hourly indices of the circuits of Hamburg, WWV and San Francisco.

Start- and end-time of principal geomagnetic storms correlated with radio propagation conditions are tabulated from observations at Kakioka.

c. Sudden Ionospheric Disturbance (S. I. D.)

The data of short wave fade-out (SWF) are prepared from the records of field intensities at Hiraiso, of the following circuits. Start-time, Duration, Type and Importance are obtained from the data of a circuit whose Drop-out Intensity is underlined. Drop-out Intensities of 10, 15 and 20 Mc/s are indicated by (′), (none), and (″), respectively. Characteristics of the phenomenon are classified as follows.

Circuits and Drop-out intensities

C O.....WWV 20, 15 and 10 Mc/s (Fort Collins, Colorado)
S F .....Various frequencies of commercial circuit (San Francisco)
H A.....WWVH 15 and 10 Mc/s (Hawaii)
T O.....JJY 15 and 10 Mc/s (Tokyo)
S H.....BPV 15 and 10 Mc/s (Shanghai)
H B .....Various frequencies of commercial circuit (Hamburg)

Start-time and Duration

Types

S : sudden drop-out and gradual recovery
Slow : slow drop-out taking 5 to 15 minutes and gradual recovery
G : gradual disturbances ; irregular change in both drop-out and recovery

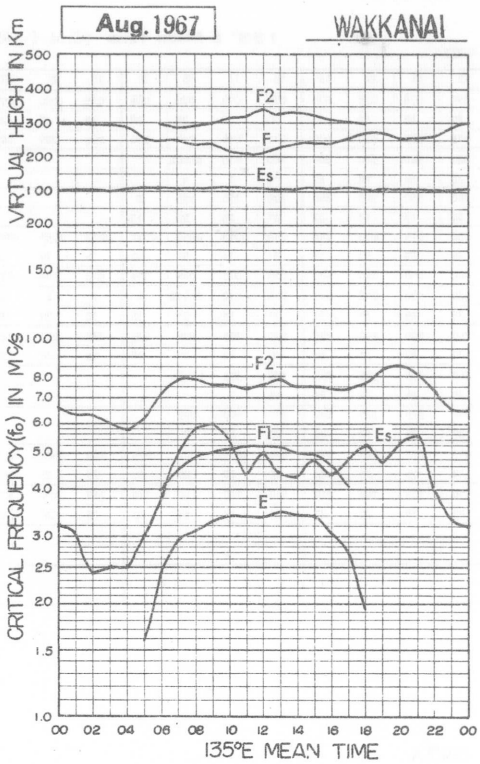
Importances

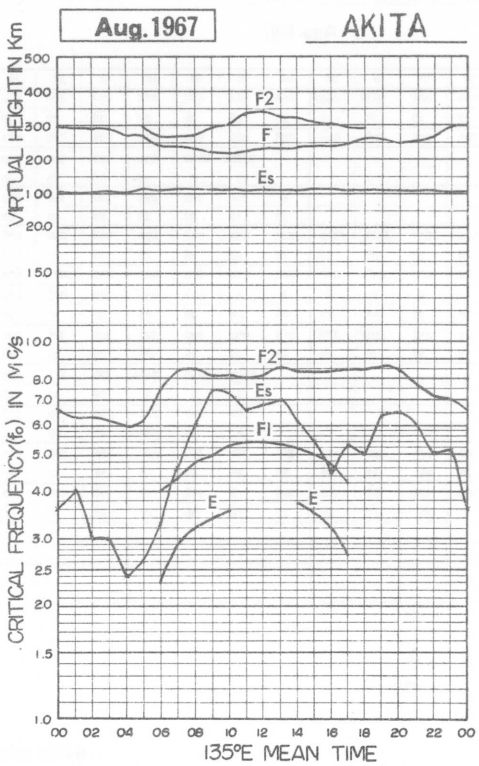
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out ;

1−	1	1+
2−	2	2+
3−	3	3+

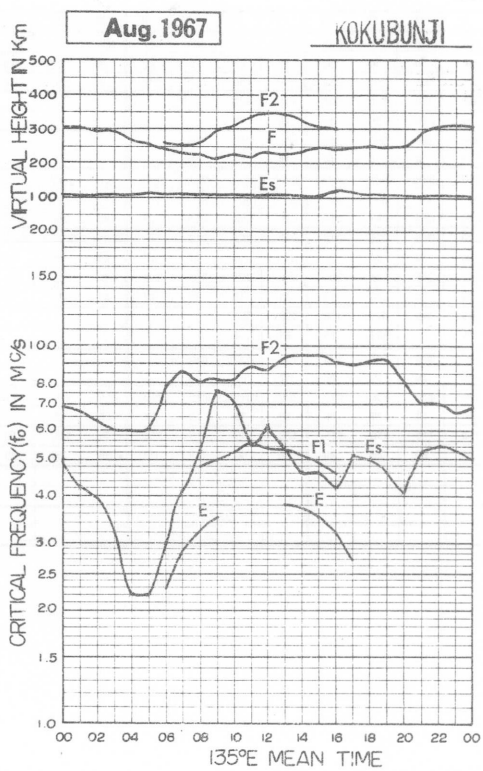
Besides, the time associated phenomena with SID's, that is, solar flare, solar radio noise outburst and crochet (solar flare effect in magnetic record), are given in this table from interchange messages of IUWDS or measurements at Hiraiso.

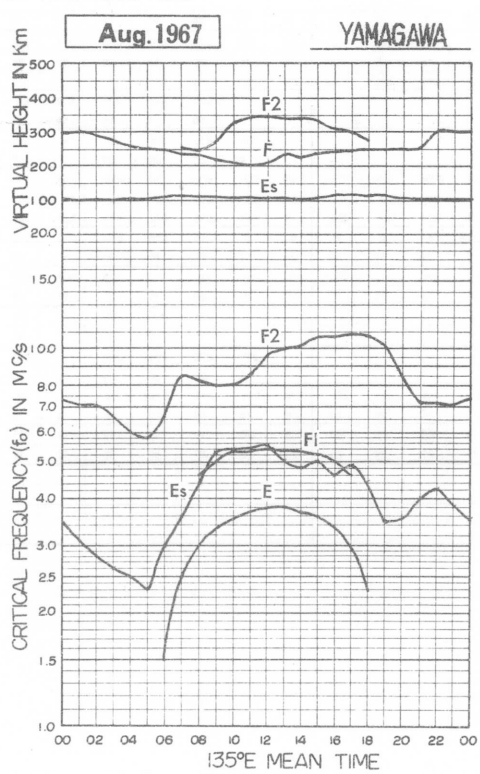
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: WAKKANAI

Aug. 1967

135° E Mean Time (G.M.T. +9h)

CHAR \ HR		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	066	063	063F	060F	058	062	072	078	078	076	076	074	076	078	075	075	074	074	076	084	086	080	074	066
	CNT	17	18	19	19	23	26	26	27	26	28	28	28	27	29	31	31	30	30	29	28	25	26	22	19
	Q R	005	006	008	006	008	007	009	022	014	016	011	010	012	009	010	009	011	014	014	010	009	007	006	007
foF1	MED						U350L	U400	450	490	500	510	520	520	520	500	500	460	410	U360L					
	CNT						5	7	11	15	15	20	25	26	24	26	22	18	7	1					
foE	MED					E	160	245	295	310	330	340	340	340	350	345	340	305	270	195	E				
	CNT					27	17	27	28	28	29	25	24	20	19	19	22	21	23	20	15				
foEs	MED	J032	J031	J024	J025	J025	030	038	050	058	060	054	044	050	044	043	048	044	J048	J052	J047	J053	J055	J040	J033
	CNT	28	28	28	28	28	28	28	28	28	31	30	29	29	29	31	31	31	31	31	30	30	29	29	29
	Q R	022	020	014	012	012	016	010	022	030	027	025	018	020	012	020	023	025	025	044	044	040	028	039	032
f-min	MED	E	E	E	E	E	E	011	015	017	018	020	020	020	020	018	017	016	012	E011E	E	E	E	E	E
	CNT	28	28	28	28	28	28	28	28	28	31	30	29	29	29	31	31	31	31	31	30	30	29	29	29
M (3000) F2	MED	265	265	270F	270F	275	290	300	305	305	305	300	290	290	290	290	295	295	295	295	290	285	285	280	275
	CNT	17	18	19	19	23	26	26	27	26	27	28	28	27	29	31	31	30	30	29	28	25	26	22	19
M (3000) F1	MED						U360L	U360	365L	370	375	375	370	360	355	355	355	350	355	U345L					
	CNT						5	6	9	12	13	17	23	25	24	24	19	16	7	1					
h'F2	MED						300	295	280	290	295	315	320	340	325	325	320	310	300	295					
	CNT						5	13	20	23	25	26	27	27	28	30	29	26	21	7					
h'F	MED	300	295	290	290	280	260	250	250	235	240	215	210	215	225	240	240	240	I255A	270A	270	260	260A	265	280
	CNT	28	26	28	28	28	26	21	15	14	17	19	23	25	26	26	22	20	20	20	20	23	25	25	25
h'Es	MED	105	105	105	100	105	115	115	110	110	110	110	110	110	105	105	110	110	110	110	110	110	110	105	105
	CNT	25	26	27	26	27	28	26	27	28	30	29	28	25	28	25	27	30	30	31	30	29	28	27	25
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: AKITA

Aug. 1967

135° E Mean Time (G.M.T. +9h)

CHAR \ HR		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	067	063	063	062	060	062	075	084	085	081	082	081	082	086	084	083	083	084	084	087	084	076	071	070
	CNT	15	16	16	17	19	24	29	30	30	30	30	30	30	30	30	30	31	29	26	27	25	23	19	16
	Q R	011	005	006	010	009	010	013	011	010	010	012	012	013	009	009	012	015	016	017	010	010	008	006	008
foF1	MED							400	430	480	500	530	540	540	530	520	500	470	420						
	CNT							10	11	19	19	24	26	27	24	25	24	22	8						
foE	MED						150	230	290	320	340	355	360	370	380	370	350	320	270	190					
	CNT						4	13	20	20	11	8	2	3	6	9	14	16	13	2					
foEs	MED	J036	J040	J030	J030	J024	J026	033	J046	J060	J074	J073	J066	J068	J070	J062	J054	J045	J053	J050	J064	J065	J060	J050	J051
	CNT	29	29	29	29	29	29	29	30	30	31	30	29	30	31	30	31	31	30	27	27	28	29	29	29
	Q R	039	021	030	026	019	014	015	022	025	028	026	034	037	059	044	032	030	036	053	037	028	042	033	051
f-min	MED	E014S	E	E	E	E	E	013	016	017	018	018	019	020	019	019	018	017	013	012	E	E014	E013S	E016S	016
	CNT	29	29	29	29	29	29	30	30	30	31	30	29	30	31	31	31	31	30	27	27	28	29	29	29
M (3000) F2	MED	270	270	275	280	280	290	310	310	310	305	295	290	285	285	285	290	295	295	295	295	290	285	275	270
	CNT	15	16	16	17	19	24	29	30	30	30	30	30	30	30	30	30	31	29	26	27	25	23	19	16
M (3000) F1	MED							355	360	360	375	360	350	345	345	345	350	355	355						
	CNT							9	8	16	17	22	24	24	21	23	25	21	8						
h'F2	MED						295	270	270	275	290	310	330	340	330	325	320	305	295	290					
	CNT						8	26	30	29	25	28	30	28	30	30	30	31	29	13					
h'F	MED	295	290	285	280	270	270	240	240A	230	225	220	225	230	230	230	240	240	I245A	265	260	250	260	270	290
	CNT	25	26	29	29	28	28	29	20	16	13	18	17	20	18	17	20	19	19	19	24	26	26	25	24
h'Es	MED	105	105	105	105	105	120	115	115	115	115	115	110	110	110	110	115	120	115	115	110	110	110	110	105
	CNT	27	27	29	26	25	26	27	30	30	31	30	29	29	29	26	29	29	30	27	27	28	29	29	28
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: KOKUBUNJI

Aug. 1967

135° E Mean Time (G.M.T. +9h)

CHAR	HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	068	067	064	060	060	061	078	086	081	082	082	088	087	093	095	095	091	089	091	092	080	070	070	067
	CNT	23	22	23	26	24	27	27	27	23	28	25	28	30	30	29	29	29	29	30	30	29	29	26	18
	Q R	013	016	007	010	010	013	013	013	013	011	015	015	015	014	010	016	020	019	020	008	014	008	010	010
foF1	MED								430L	480	500	520	550	530	530	510	490	460	360						
	CNT								2	6	7	9	11	11	17	21	15	10	1						
foE	MED						150	230	285	325	350	360	I380R	I385R	380	370	350	320	270	170					
	CNT						3	17	15	12	8	5	3	5	7	10	12	20	18	3					
foEs	MED	J050	J042	J040	J032	J022	J022	030	J041	J052	J076	J071	J055	062	J054	046	J046	J042	J051	J050	J046	J041	J052	J054	J052
	CNT	30	30	30	30	27	27	27	27	26	30	29	30	30	30	29	29	29	29	30	30	30	30	30	30
	Q R	025	026	030	031	029	010	012	019	020	035	067	030	029	033	017	018	017	020	030	034	025	035	024	031
f-min	MED	012	012	012	011	011	013	014	014	016	017	025	026	026	025	025	017	015	013	013	012	012	012	012	014
	CNT	30	30	30	30	27	27	27	27	26	30	29	30	30	30	29	29	29	29	30	30	30	30	30	30
M (3000) F2	MED	275	280	280	280	285	295	310	315	310	300	285	280	280	285	285	290	295	295	300	300	295	280	275	275
	CNT	21	22	22	26	24	27	27	27	23	26	25	26	29	30	29	29	29	29	30	29	29	29	26	18
M (3000) F1	MED								340L	360	340	345	360	350	345	345	345	350	380						
	CNT								2	6	7	9	11	10	17	21	15	10	1						
h'F2	MED						340	265	260	260	295	315	330	345	340	325	310	300	285	280					
	CNT						1	16	25	23	25	25	25	29	29	29	29	29	29	21					
h'F	MED	310	310	290	290	270	260	240	230	225	220	225	220	230	225	235	250	240	250	255	250	250	280	310	315
	CNT	29	30	29	30	27	27	24	21	14	13	14	16	14	18	22	20	20	15	13	27	28	29	30	29
h'Es	MED	110	105	110	110	110	120	120	115	115	110	110	110	110	110	110	110	125	120	115	110	110	110	110	110
	CNT	28	28	28	28	23	25	23	26	26	30	29	30	30	28	26	27	29	29	30	30	30	30	30	29
hpF2	MED	380	375	365	370	360	345	310	300	300	330	345	360	365	365	350	350	335	335	330	320	330	365	380	375
	CNT	20	22	22	26	24	27	27	27	23	20	22	24	25	29	29	27	29	29	30	28	27	29	26	17
ypF2	MED	080	080	080	080	075	080	070	070	070	075	075	080	080	075	080	080	075	080	075	075	085	085	080	075
	CNT	20	22	22	26	24	27	27	27	23	20	22	24	25	29	29	27	29	29	30	28	27	29	26	17

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: YAMAGAWA

Aug. 1967

135° E Mean Time (G.M.T. +9h)

CHAR	HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
foF2	MED	073S	071S	071S	067	061	058	066S	085	082	080	080	086	096	100	102	106	106	108	108	102	086	072S	072S	071S
	CNT	22	25	24	27	25	26	29	30	30	31	30	30	30	30	30	30	30	30	30	31	31	30	30	27
	Q R	018	020	016	015	009	009	011	009	015	009	012	015	020	018	017	016	014	014	016	018	010	012	010	021
foF1	MED									460	500L	530	530	540	530	530	520	500	460L	370L					
	CNT									4	12	14	19	18	23	25	23	23	14	2					
foE	MED						E	150	250	300	330	350	370	380	380	370	360	335	295	230	E				
	CNT						13	8	26	26	25	20	15	15	15	16	17	21	26	23	2				
foEs	MED	J035	J031	J028	J026	J025	J023	J030	J036	J044	053	J054	J054	J055	050	048	050	046	J049	J044	J035	J035	J040	J042	J038
	CNT	30	30	30	30	30	30	30	30	30	31	28	30	29	30	30	30	30	30	30	31	31	30	30	30
	Q R	027	015	017	013	009	020	029	022	018	018	030	024	027	026	015	013	020	021	021	027	032	031	031	037
f-min	MED	E015S	013	012	E	E	011	012	014	015	015	018	022	023	024	022	022	017	014	014	013	E014S	E015S	E015S	E015S
	CNT	30	30	30	30	30	30	30	30	30	31	28	30	29	30	30	30	30	30	30	31	31	30	30	30
M (3000) F2	MED	270S	270S	280S	280	280	290	310S	320	325	310	290	280	280	280	280	285	285	290	300	310	295	270S	270S	270S
	CNT	22	25	24	27	25	26	29	30	30	29	29	30	30	29	30	29	30	30	30	31	31	30	30	27
M (3000) F1	MED									370	360L	360	355	355	360	350	340	340	340	350L					
	CNT									3	12	13	17	18	20	21	20	18	9	2					
h'F2	MED							280	255	250	275	325	340	345	340	340	330	310	300	275	265				
	CNT							6	25	28	28	27	28	29	29	30	30	29	30	30	5				
h'F	MED	300	300	290	275	260	255	250	235	230	220	210	200	215	230	225	235	240	245	250	250	250	260	305	300
	CNT	30	30	30	30	30	30	29	27	26	25	22	21	20	20	21	19	21	19	18	28	31	30	30	30
h'Es	MED	105	100	105	100	105	105	115	115	115	115	110	110	110	110	105	110	120	120	120	115	110	105	105	105
	CNT	30	30	30	30	28	27	29	30	30	31	28	30	28	29	29	27	27	29	30	31	31	30	30	29
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA

Aug. 1967 | foF2 | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	A	072	I076A	I081R	075	073	078	075	075	075	084	089	087	081	078
2	F	F	F	F	068F	070	079	078	069	070	073	074	073	074	073	073	069	069	073	086	085	080	073	065
3	064	064	064F	060F	063F	070	072	078H	083	080	082	I079A	076	078	073	074	075	073	076	S	097	091	SF	SF
4	072F	069F	068F	066F	065	076	085	097	087	073	075	072	075	080	076	077	A	A	A	096	SF	SF	072F	SF
5	062F	F	F	F	F	A	A	A	081	A	A	A	A	I076A	I078A	077	070	I073A	076	081	I083A	083S	SF	F
6	F	F	064F	060F	062F	066	080	093	A	A	058	056	060	058	058	061	063	063	064	068	073	073	F	F
7	F	F	062F	057F	058F	060F	074	091	093	083	071	071	073	075	074	074	068	069	A	A	I089A	I083A	077F	070F
8	SF	F	F	F	055F	055	065	064	061	063	067	067	070	068	065	067	064	070	069	073	076	078	071F	F
9	F	F	F	F	F	F	F	093	099	I076A	C	C	C	C	074	066	061	066	071	083	I088S	090	077	063
10	055	053	050	051	049	056	073	080	073	070	066	C	C	C	068	068	064	066	068	072	078	077	071	066
11	066	064	063	061	061	063F	071	067	076	065	076	073	074	065	065	069	071	066	075	078	083	078	077	073
12	066	060	056F	053F	054	050	060	054	056	060	063	060	064	065	064	063	066	064	066	I065A	071	I075A	074F	F
13	F	F	F	F	F	063	062	065	A	074	A	069	A	I073A	075	I077A	073	069	071	083	F	F	F	F
14	068F	066F	064F	060F	056	058	059	I067A	070	070	071	073	075	073	074	071	074	073	078	092	093	091	076	063
15	057	055	055	053F	054F	058F	066F	068	074	065	067	068	076	069H	068	070	I073A	076	I073A	079	080	081F	F	064F
16	F	053F	055F	053F	050F	055F	065	066	071	070	070	067	072	073	072	071	072	074	071	080	F	076F	074F	060F
17	F	057F	F	F	050F	055F	067	077	078	I073A	074	077	079	080	073	076	081	083	086	087	F	080F	070F	066F
18	A	F	053F	056F	053	055	069	076	074	075	076	073	071	080	074	075	071	072	086	093	086	080	070	066
19	063	063F	058	057	058	063	073	090	079	077	093	097	086	085	080	080	078	079	085	088	077	C	C	C
20	C	C	C	C	C	C	C	C	C	079	077	073	074	076	079	073	074	074	083	083	077	073F	F	073F
21	066F	063	061	061	062F	073	080	078	081	076	078	079	081	080	077	074	074	075	072	079	I082S	083	073	F
22	F	F	F	F	064F	063	070	077	083	088	088	087	084	080	083	073H	077	081	081	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	089	081	081	076	080	086	086	082	078	076	083	083	080	076	071
24	069	069	067	064	061	062	067	071	074	080	079	074	079	076	080	080	082	I080R	086	084	F	SF	F	F
25	071F	067	F	F	F	056F	072	069	074	070	073	073	078	078	077	078	I078A	I084A	I091A	090	089	083	077	073
26	073	065F	067F	063F	056F	057	065	083	085	088	090	093	094	093	086	083	086	088	085	090	086	078	078	065F
27	F	F	F	F	F	058F	069	075	073	074	083	078	085	090	086	084	086	088	088	085S	086	085F	077	068
28	066	063F	059F	057	053	061	081	090	094	094	088	087	090	088	086	083	085	090	097	100	086	076	070	066
29	066	066	063	059	058	063	073	089	097	090	094	088	087	092	088	084	081	085	091	089	086	079	072	064
30	063	063	065	063	060	063	075H	093	094	089	081	083	090	090	083	081	085	088	090	093S	086	073	067	066
31	064	063	064	062	062	066	087	101	098	095	093	090	093	091	090	085	089	096	101	096	088	071	067	F
Count	17	18	19	19	23	26	26	27	26	28	28	28	27	29	31	31	30	30	29	28	25	26	22	19
Median	066	063	063F	060F	058	062	072	078	078	076	076	074	076	078	075	075	074	074	076	084	086	080	074	066
U.Q.	068	066	064	062	062	063	075	090	087	086	082	082	085	082	083	080	081	083	086	090	088	083	077	071
L.Q.	063	060	056	056	054	056	066	068	073	070	071	072	073	073	073	071	070	069	072	080	079	076	071	064
Q.R.	005	006	008	006	008	007	009	022	014	016	011	010	012	009	010	009	011	014	014	010	009	007	006	007

foF2

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

W1

IONOSPHERIC DATA

Aug. 1967 | foF1 | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						C	C	C	C	A	A	A	A	A	A	A	490	U400L						
2						U360L	A	450	490	530	A	530	520	520	500	470	460	380	U360L					
3						U360L			470	I500A	530	I530A	530L	I540A	I510A	500	490H	A	A					
4						U350L		460L	470	510H	510	500	500	490	I520A	I500A	A	A	A					
5							A	A	A	A	A	A	A	A	A	A	460	I420A						
6							A	A	A	A	500	510	490H	500H	490	470	450	A	A					
7								A	A	A	A	500	510	I510A	490	480	A	A						
8						330	I380A	440	450	I480A	490	500	490	500	490H	500	430	410						
9							A	A	A	A	C	C	C	C	490H	450	440	A						
10							400	A	A	A	510	C	C	C	500H	480H	450	400	L					
11						330L		I460A	450	480	510	490	520	490	500H	480	430	410L						
12							400	430L	500	470	500	500	I490A	510	480	I470A	450	A	A					
13								A	A	A	A	A	A	A	A	A	A	A	A					
14							A	A	A	I470A	510	510	520	520	A	A	460	A	A					
15								A	A	A	A	500	500	A	U500L	A	A	A	A					
16							U400L	A	A	A	A	540	510H	510	500	480	460H	A	A					
17							A	A	A	A	500	530	I510A	490	530	500H	460H	410						
18							410	430	470	500	500	520	520	510	500	470	A	A	A					
19								I440A	470	500	500	520H	I510A	530	500	500	450							
20						C	C	C	C	480	520H	A	540L	530	530H	500H	500H							
21							A	A	500	500L	530	520	530	540H	500	U480L	U460L							
22								460L	U510L	510	540	I540L	520H	500L	500H		470L	A	A					
23						C	C	C	C	C	510	510L	550	540	500	500	460	A						
24							U400L	400L	510	A	520	I520A	550	I520A	520	530L	A	A						
25							U420L	I460A	500	500	510	500L	560H	U510L	520	A	A	A	A					
26									A	A	L	510	I530L	550	550L	510L	A	A						
27								A	A	A	A	570	570	520	I530A	I520A	L	A						
28									L	A	510	520L	U540L	520L	U500L	I510L	L	L						
29									U500L	A	L	520L	520L	L	540L	500L								
30								470L	510	510L	500	I550L	U540L	530										
31									U460L	490L	U520L	570L	560	510	U570L	A								
Count						5	7	11	15	15	20	25	26	24	26	22	18	7	1					
Median						U350L	U400	450	490	500	510	520	520	520	500	500	460	410	U360L					
U.Q.																								
L.Q.																								
Q.R.																								

foF1

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

W2

IONOSPHERIC DATA

Aug. 1967 | foE | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					C	C	C	C	C	350	355	345	355	325	A	A	A	A	A	A				
2					A	200	275	310	330	340	330	I315A	360	380	360	340	320	290	210	S				
3					110	180	275	300	325	335	355	355	340	A	A	A	A	290	205	E				
4					E	200	255	300	305	315	I330A	I370R	380	405	360	345	315	275	195	E				
5					E	A	280	305	335	370	365	345	340	350	355	340	300	A	A	A				
6					E	190	260	300	320	320	325	I330A	340	350	365	350	315	280	210	S				
7					E	200	270	305	320	340	350	340	305	I300A	300	350	315	285	205	A				
8					E	180	245	295	305	300	A	A	A	370	355	340	310	270	210	E				
9					E	A	255	290	310	320	C	C	C	C	A	330	305	260	195	E				
10					E	160	240	295	320	330	330	C	C	C	300	A	A	A	A	115				
11					E	190	245	295	305	315	A	A	A	I350A	345	330	300	270	A	S				
12					E	170	240	290	305	325	325	330	I340A	I360A	340	345	325	275	I195A	110				
13					E	A	250	295	315	330	330	315	A	A	A	A	A	275	165	A				
14					E	A	240	290	305	320	325	305	I300A	A	A	A	A	A	200	E				
15					E	160	250	295	310	325	330	320	325	305	I310A	335	300	255	195	S				
16					E	155	240	290	305	320	330	315	A	A	A	335	305	275	A	E				
17					E	160	240	295	315	330	335	325	330	I320A	I335A	340	300	255	200	E				
18					E	130	230	285	300	300	A	A	B	A	A	345	305	260	170	A				
19					E	150	250	305	320	335	340	320	A	A	A	A	A	285	190	E				
20					C	C	C	C	C	A	A	I345A	I330A	I315A	300	340	I305A	270	185	S				
21					E	130	240	300	305	330	355	I365A	I375A	I370A	365	340	300	260	190	E				
22					E	A	240	I285A	310	330	A	A	A	A	A	A	305	275	185	C				
23					C	C	C	C	C	C	325	I330A	335	A	A	A	A	A	A	A				
24					E	A	255	300	325	340	360	345	320	300	I310A	310	265	I220A	200	E				
25					E	150	230	290	310	335	340	325	360	I365A	I370A	330	285	A	A	S				
26					E	A	240	290	310	330	335	335	A	A	A	A	A	250	165	E				
27					E	A	250	300	325	335	350	365	360	355	320	290	A	A	A	A				
28					E	A	A	300	325	345	350	A	A	A	A	350	305	260	A	A				
29					E	A	255	300	325	350	350	390	I350A	I345A	I325A	290	A	A	A	A				
30					E	I145A	240	305	325	340	350	360	330	380	350	335	300	250	130	E				
31					E	A	240	290	310	315	340	350	365	365	350	325	295	240	S	E				
Count					27	17	27	28	28	29	25	24	20	19	19	22	21	23	20	15				
Median					E	160	245	295	310	330	340	340	340	350	345	340	305	270	195	E				
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

W 3

IONOSPHERIC DATA

Aug. 1967 | foEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	105	J182	185	J088	J086	J065	J063	040	031	034	J038	J033	J063	J023	J033
2	J063	J041	J023	J033	J030	028	J043	051	054	061	J055	043	G	033G	030G	G	038	032	034	021	J033	J026	J040	J033
3	J024	E	014	J023	G	022	035	043	045	J068	069	J085	071	066	J054	J043	040	048	J078	J070	J033	J043	J033	J043
4	J050	J038	E	E	015	025	031	040	J073	J060	040	G	G	048	J063	084	J128	J140	J136	J123	111	J063	J078	J043
5	J063	J053	J050	J030	J043	J113	J128	128	J080	083M	J098	J093	J110	135	134	104	J061	J163	J141	J074	J103	D	J110	J083
6	J063	J031	J021	J030	J026	031	J056	J087	J085	J074	J068	J065	040	G	G	041	038	J043	038	J050	J034	J043	J053	J053
7	063	J033	J033	J026	J025	032	040	J066	J108	J076	J058	J056	J070	J080	J051	040	J068	J063	138	J133	J134	J090	J060	J060
8	J028	J045	J043	J035	J031	033	J063	J054	044	119	J062	J050	J051	044	G	048	036	039	028	025	J030	J043	J065	J055
9	031	J058	J043	J061	J043	J034	J051	J060	J061	J086	C	C	C	C	040	043	048	J043	J036	J055	J053	J025	J022	J043
10	J038	J024	J033	J043	038	023	J041	J080	J063	J065	069	C	C	C	035	033	033	033M	J030	031	J028	J051	J033	J030
11	J021	J043	J023	J023	020	024	034	J055	043	041	037	044	040	040	G	031G	G	035	028	025	021	J033	J023	J024
12	J031	J043	J028	J021	015	024	040	045	043	045	043	039	052	041	G	J073	J057	J060	J065	J102	J073	J103	J061	J073
13	J043	J053	J030	J053	029	J025	032	J060	J081	J061	J083	J063	111	J083	J059	J078	073M	J075	118	J034	J053	J070	J034	J033
14	J035	J033	018	J043	020	027	041	076	J073	J080	J078	041	040	J043	J056	J060	J044	J055	J080	103	J043	J051	J025	J033
15	J031	J023	J023	J023	015	025	035	044	050	J066	J054	J071	044	J051	043	054	J090	J063	J090	131	J070	J055	J063	030
16	J030	025	J023	J021	J025	J041	037	J050	J063	053	J053	063	J050	041	040	038	033	J103	073	J030	J051	062	E015S	028
17	J023	031	020	J023	J025	J051	043	J060	063	J100	J053	J053	J055	042	038	040	039	042	033	040	J064	J053	J053	021
18	J080	018	J081	E	015	024	032	038	038	041	038	J057	E046B	051	J050	G	063	J063	060	J043	J030	J070	J040	J033
19	J043	J030	J023	032	J041	040	038	046	043	049	G	042	J075	J053	J050	J043	040	035	J037	J053	J065	C	C	C
20	C	C	C	C	C	C	C	C	C	J058	063	J053	J050	J048	043	040	037	G	J044	J065	080	J100	J053	J035
21	J043	J033	J024	J023	J021	035	081	J063	036	045	063	041	042	040	G	G	J060	040	J068	J042	085	J063	J073	J061
22	E	J064	J030	J020	J020	023	031	040	050	J060	J054	043	044	J046	040	J055	060	J069	J055	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	E085C	J053	043	050	043	J043	040	J040	J043	044	J023	J024	J034	J023	E
24	J033	J031	J033	J024	J024	J043	031	032	039	050	051	J056	J054	J070	041	J053	J049	J064	024	J044	104	J073	J090	J021
25	E012S	J024	J083	J053	J041	029	039	052	090	047	043	035	G	050	045	J070	J125	J123	J103	J110	J080	J063	J025	E013S
26	J024	J021	J035	J023	J025	030	035	J086	J065	J060	045	044	040	041	J043	064	J093	053	J053	J053	J063	J083	J055	J080
27	J086	J083	J071	J070	J035	J040	G	048	064	J065	J073	054	J061	050	070	083	060	J075	J058	055	J041	037	J070	J072
28	J040	J023	J019	J030	020	J043	041	041	048	056	050	040	044	040	J055	053	021G	025G	J033	J023	E017S	E015S	E015S	E018S
29	J028	E011S	J023	J030	J031	J024	031	033	039	053	049	044	J059	041	J051	053	J039	J043	J045	J030	064	J043	J030	E012S
30	022	J021	018	018	018	J071	030	G	041	040	042	042	037	033G	G	G	038	043	J051	J098	J063	J071	J030	J040
31	E	014	020	017	014	017	G	033	J083	036	039	038	040	040	055	J061	J105	051	J052	J030	J053	J040	J103	J069
Count	28	28	28	28	28	28	28	28	28	31	30	29	29	29	31	31	31	31	31	30	30	29	29	29
Median	J032	J031	J024	J025	J025	030	038	050	058	060	054	044	050	044	043	048	044	J048	J052	J047	J053	J055	J040	J033
U.Q.	046	043	034	034	031	040	042	062	073	076	068	060	060	052	055	063	063	064	078	074	073	070	064	058
L.Q.	024	023	020	022	019	024	032	040	043	049	043	042	040	040	035	040	038	039	034	030	033	042	025	026
Q.R.	022	020	014	012	012	016	010	022	030	027	025	018	020	012	020	023	025	025	044	044	040	028	039	032

foEs

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Aug. 1967 | f_bEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	A	050	A	078	065	063	060	038	030	030	034	031	050	019	018
2	024	020	E	011	012	G	041	042	045	049	051	041		030G	026G		G	G	029	019	025	025	030	024
3	016		E	E		G	G	G	044	068	050	A	050	061	054	038	035	042	066	E070S	022	030	018	020
4	024	020			012	G	G	G	044	G	038			G	057	073	A	A	A	037	035	035	051	031
5	030	030	021	017	020	A	A	A	070	A	A	A	A	A	A	066	G	A	030	047	A	071	051	042
6	030	019	012	017	015	G	050	075	A	A	G	043	G			G	G	041	037	045	020	040	019	030
7	042	020	027	020	016	G	038	065	081	073	057	G	G	058	G	G	045	043	A	A	A	A	024	032
8	018	040	025	028	022	G	057	040	G	056	040	044	040	G		G	G	G	G	023	025	035	044	043
9	020	018	018	028	023	030	047	046	050	A	C	C	C	C	038	031	G	040	G	045	017	020	020	040
10	030	017	017	027	021	G	G	070	062	065	049	C	C	C	G	033	031	027	026	026	025	032	018	016
11	018	016	018	018	015	G	G	053	G	G	037	042	040	037		030G		025G	027	020	018	020	022	020
12	020	015	012	013	012	G	G	037	040	043	G	G	050	039		050	042	043	055	A	055	A	017	042
13	017	032	030	025	013	020	G	059	A	058	A	056	A	A	058	A	068	060	047	027	035	021	026	021
14	026	016	E	017	016	021	038	A	058	056	045	G	040	041	050	058	039	041	047	080	037	041	020	E016S
15	017	020	020	015	E	G	G	043	047	061	050	048	044	050	040	053	A	063	A	057	029	030	038	019
16	017	011	016	012	023	030	035	048	061	053	050	G	040	040	037	030	G	060	037	020	020	040	S	E015S
17	020	017	016	016	013	043	042	054	052	A	047	050	053	040	038	G	G	038	030	026	046	040	034	017
18	A	E	E		014	G	G	G	G	G	037	040	B	043	043		054	054	047	034	020	034	025	025
19	020	022	016	019	030	030	036	046	042	048		G	072	042	042	040	034	G	G	029	050	C	C	C
20	C	C	C	C	C	C	C	C	C	040	040	050	043	042	040	039	032		042	047	036	020	016	022
21	030	033	020	019	E	030	044	055	G	G	G	040	040	040			044	035	050	042	043	027	030	040
22		022	016	E	E	020	G	030	G	043	040	040	040	040	037	042	G	060	050	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	G	040	048	040	040	035	034	040	042	022	018	028	017	
24	022	020	020	018	016	017	020	028	G	050	050	056	050	061	038	049	048	060	G	043	016	054	018	015
25	S	017	041	036	E	G	037	048	044	044	G	G		045	045	052	A	A	A	075	040	032	020	S
26	020	E	020	017	012	020	G	075	063	056	043	G	040	038	039	042	072	045	040	050	042	047	051	051
27	022	E	018	033	016	023		045	058	064	067	050	050	G	060	070	031	073	057	048	038	026	020	050
28	030	022	012	012	017	025	034	040	048	055	043	040	044	040	037	022	020G	020G	021	018	S	S	S	S
29	020	S	014	027	017	020	020	022	G	051	047	044	046	040	050	044	035	030	030	016	027	020	018	S
30	E015S	016	E	E	013	016	G		G	G	G	G	G	033G			G	042	049	046	018	044	022	025
31		E	016	E	E	017		G	G	G	G	G	G	G	052	060	046	041	029	020	050	040	048	045
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

f_bEs Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

W5

IONOSPHERIC DATA

Aug. 1967 | f-min | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	018	018	018	025	020	018	016	017	012	E	E	E	E	E	E
2	E	E	E	E	E	E	011	012	017	018	025	022	018	017	018	016	017	011	015	E012S	E	E	E015S	E
3	E	E	E	E	E	E	E	017	017	017	020	022	020	020	020	020	018	012	011	E	E	E	E	E
4	E	E	E	E	E	012	011	011	011	018	017	025	024	020	018	018	017	015	012	E	E012S	E	E	E
5	E	E	E	E	E	E	016	017	018	020	020	019	020	020	018	017	017	017	E	E	E	E	E	E
6	E	E	E	E	E	E	015	015	018	020	020	020	019	023	024	025	018	016	014	E011S	E	E	E	E
7	E	E	E	E	E	012	011	013	017	016	023	020	020	026	024	018	016	015	012	E	E	E	E	E
8	E	E	E	E	E	E	E	E	012	017	017	019	020	018	020	017	017	016	011	E	E	E016S	E	E015S
9	E	E	E	E	E	E013S	011	011	016	018	C	C	C	C	020	017	016	011	011	E	E	E	E	E017S
10	E	E	E	E	E	E	011	015	016	017	020	C	C	C	020	018	016	011	011	E	E	E	E	E015S
11	E	E	E	E	E	011	012	016	017	017	019	020	020	020	018	018	013	012	E	E012S	E	E018S	E	E
12	E	E	E	E	E	E	011	016	017	018	017	020	020	020	017	017	017	015	E	E	E	E	E	E
13	E016S	E	E	E	E	E	011	011	016	017	020	020	023	028	020	018	017	012	E	E	E	E016S	E	E
14	E	E	E	E	E	E	012	016	019	017	022	022	018	018	017	017	017	013	011	E	E	E015S	E015S	E016S
15	E	E	E	E	E	011	013	016	018	017	020	020	025	023	020	018	015	011	E	E015S	E	E	E	E015S
16	E	E	E	E	E	E	011	016	017	022	018	018	020	016	017	016	016	012	E	E	E016S	E	E015S	E015S
17	E	E	E	E	E	E	012	015	019	020	020	020	019	020	020	017	016	011	011	E	E016S	E	E	E
18	E	E	E	E	E	E	011	018	017	022	026	019	046	027	021	020	016	011	E	E	E	E	E	E
19	E	E	E	E	E	012	017	020	020	023	020	020	020	022	020	020	018	012	012	E	E	C	C	C
20	C	C	C	C	C	C	C	C	C	018	026	020	020	023	017	020	012	011	011	E013S	E015S	E	E015S	E
21	E	E	E	E	E	E	012	017	017	017	020	022	018	020	019	019	016	012	016	E	E	E	E015S	E
22	E	E	E	E	E	E	011	012	016	017	019	020	020	020	017	017	016	011	E	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	E085C	019	020	020	017	020	017	015	E	E	E	E	E	E	E
24	E	E	E	E	E	E	011	012	015	017	018	020	017	017	011	017	016	E	013	E	E	E014S	E	E
25	E012S	E	E	E	E	011	012	E	018	017	022	023	018	022	020	017	017	E	E	E016S	E	E015S	E016S	E013S
26	E	E	E	E	E	E	011	015	018	018	020	021	021	020	018	017	017	012	011	E	E	E012S	E016S	E015S
27	E	E	E	E	E	E	012	012	016	016	017	019	020	020	017	018	016	012	E	E	E	E	E015S	E
28	E	E	E	E	E	E	E	E	017	019	019	018	019	017	016	012	011	011	E	E	E017S	E015S	E015S	E018S
29	E	E011S	E	E	E	E	011	012	018	017	020	020	020	026	020	016	E	E	E	E	E	E	E	E012S
30	E015S	E	E	E	E	E	016	012	011	017	019	017	021	018	017	017	012	E	E	E	E012S	E015S	E	E
31	E	E	E	E	E	E	E	011	012	018	018	017	017	017	017	016	E	011	E015S	E	E016S	E015S	E	E
Count	28	28	28	28	28	28	28	28	28	31	30	29	29	29	31	31	31	31	31	30	30	29	29	29
Median	E	E	E	E	E	E	011	015	017	018	020	020	020	020	018	017	016	012	E011E	E	E	E	E	E
U.Q.																								
L.Q.																								
Q.R.																								

f-min | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

W6

IONOSPHERIC DATA

Aug. 1967 | M(3000) F2 | 0.01 | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C-	C	C	C	A	285	I290A	I290R	295	275	290	295	295	285	290	285	285	285	265
2	F	F	F	F	295F	270	285	320	315	285	300	285	290	290	300	295	290	290	290	285	295	300	290	265
3	265	265	270F	270F	285F	305	290	290	290	295	300	I285A	280	295	260	295	295	290	280	S	295	300	SF	SF
4	260F	270F	280F	280F	275	295	285	300	315	305	295	290	295	290	275	I285A	A	A	A	290	SF	SF	280F	SF
5	265F	F	F	F	F	A	A	A	285	A	A	A	A	I285A	I275A	290	285	I300A	300	285	I285A	300	SF	F
6	F	F	270F	270F	275F	295	285	280	A	A	260	240	285	265	260	280	285	285	295	280	280	290	F	F
7	F	F	270F	265F	270F	270F	270	275	300	315	280	280	290	295	295	305	310	295	A	A	I285A	I285A	290F	270F
8	SF	F	F	F	275F	275	300	300	280	285	290	285	295	305	290	285	295	295	290	275	275	280	295F	F
9	F	F	F	F	F	F	F	295	305	I315A	C	C	C	C	315	320	310	290	290	275	I280S	300	310	275
10	270	280	270	280	265	290	290	305	295	300	310	C	C	C	290	295	285	295	300	280	280	275	295	275
11	265	270	270	260	275	285F	295	305	305	290	300	300	305	310	285	290	295	300	295	280	285	265	280	280
12	275	255	255F	270F	285	300	300	290	260	330	270	250	300	275	305	305	290	295	300	I295A	270	I275A	285F	F
13	F	F	F	F	F	335	325	315	A	305	A	305	A	I290A	295	I295A	310	305	295	275	F	F	F	F
14	265F	290F	265F	270F	285	295	295	I305A	315	310	310	290	295	290	295	310	295	290	275	290	280	295	290	275
15	270	280	275	280F	280F	285F	320F	310	310	310	295	295	315	285H	280	295	I305A	305	I295A	290	285	310F	F	280F
16	F	270F	280F	270F	280F	290F	310	305	325	315	310	255	295	290	290	300	300	305	295	295	F	290F	310F	290F
17	F	265F	F	F	275F	290F	300	300	335	I295A	295	285	295	305	290	305	300	305	300	300	F	290F	270F	275F
18	A	F	265F	270F	280	275	285	320	315	315	295	300	295	295	290	305	300	280	310	295	290	285	270	275
19	260	255F	250	265	275	285	300	320	310	310	300	315	300	295	295	300	295	290	300	310	285	C	C	C
20	C	C	C	C	C	C	C	C	C	305	300	290	295	290	285	300	295	295	300	300	285	270F	F	280F
21	275F	280	260	280	265F	300	315	295	290	305	295	290	295	295	300	295	295	310	290	280	I275S	290	285	F
22	F	F	F	F	290F	305	315	295	295	315	310	300	310	290	300	290H	295	295	290	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	315	295	290	280	285	290	295	310	290	270	275	275	275	270
24	265	265	275	290	295	295	315	300	290	300	305	295	285	290	285	290	295	I290R	295	300	F	SF	F	F
25	270F	270	F	F	F	285F	305	305	310	300	290	280	285	285	290	285	I290A	I290A	I290A	290	270	280	275	250
26	260	235F	260F	275F	255F	280	310	325	305	310	290	290	285	295	290	295	290	300	295	290	290	280	285	280F
27	F	F	F	F	F	300F	310	305	305	285	290	275	275	295	290	290	285	280	290	285S	285	295F	280	260
28	260	255F	265F	280	270	285	300	305	305	310	305	300	290	290	290	290	290	295	290	305	300	275	265	260
29	260	265	270	270	255	280	295	310	305	305	310	300	285	290	290	300	285	295	300	290	290	280	275	265
30	255	255	260	280	270	285	295H	300	310	330	310	290	290	295	290	285	290	295	285	290S	300	280	265	260
31	270	255	265	275	275	260	295	305	310	300	305	290	290	295	295	300	285	290	300	300	290	270	255	F
Count	17	18	19	19	23	26	26	27	26	27	28	28	27	29	31	31	30	30	29	28	25	26	22	19
Median	265	265	270F	270F	275	290	300	305	305	305	300	290	290	290	290	295	295	295	295	290	285	285	280	275
U.Q.																								
L.Q.																								
Q.R.																								

M(3000) F2 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

W7

IONOSPHERIC DATA

Aug. 1967 | M(3000) F1 0.01 | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						C	C	C	C	A	A	A	A	A	A	A	345	U375L						
2						U345L	A	A	A	A	A	380	360	365	360	360	350	370	U345L					
3						U380L			A	A	A	A	A	I335A	I350A	355	335H	A	A					
4						U360L		370L	I370A	375H	375	380	380	370	I355A	I345A	A	A	A					
5							A	A	A	A	A	A	A	A	A	A	350	I350A						
6							A	A	A	A	375	375	390H	350H	355	350	325	A	A					
7								A	A	A	A	365	355	I355A	365	355	A	A						
8						365	I360A	I355A	380	I355A	390	350	365	355	345H	325	350	350						
9							A	A	A	A	C	C	C	C	365H	380	345	A						
10							365	A	A	A	A	C	C	C	360H	355H	355	350	L					
11						345L		I350A	360	375	360	390	365	370	350H	335	350	355L						
12							325	345L	320	385	385	360	I365A	355	355	A	A	A	A					
13								A	A	A	A	A	A	A	A	A	A	A	A					
14							A	A	A	I355A	I360A	375	365	345	A	A	A	A	A					
15								A	A	A	A	I365A	380	A	U340L	A	A	A	A					
16							U370L	A	A	A	A	350	375H	355	360	360	350H	A	A					
17							A	A	A	A	A	A	I355A	390	340	360H	350H	I360A						
18							330	370	365	360	360	360	I345B	355	350	360	A	A	A					
19								I365A	380	I365A	395	365H	I360A	340	360	360	365							
20						C	C	C	C	395	370H	A	350L	360	360H	360H	360H							
21							A	A	360	380L	360	365	360	335H	360	U375L	I360A							
22								370L	U375L	355	355	I375L	385H	380L	360H		360L	A	A					
23						C	C	C	C	C	385	385L	I350A	350	345	345	355	A						
24							U370L	375L	355	A	I355A	I350A	I350A	I355A	340	A	A	A						
25							A	A	A	380	395	380L	340H	U375L	345	A	A	A	A					
26									A	A	L	385	I360L	345	340L	335L	A	A						
27								A	A	A	A	345	335	345	I340A	I345A	L	A						
28									L	A	375	380L	U350L	345L	U360L	I350L	L	L						
29									U380L	A	A	370L	I350A	L	A	A								
30								360L	375	395L	390	I375L	U350L	360										
31									U370L	390L	U365L	350L	340	355	A	A								
Count						5	6	9	12	13	17	23	25	24	24	19	16	7	1					
Median						U360L	U360	365L	370	375	375	370	360	355	355	355	350	355	U345L					
U.Q.																								
L.Q.																								
Q.R.																								

M(3000) F1 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Aug. 1967 | h'F2 km | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						C	C	C	C	A	310	I310A	I310A	I315A	I330A	330	310	275						
2						320	295	260	290	360	325	365	325	340	325	330	310	295	290					
3						260			295	I295A	310	I345A	345	330	325H	350	320	300	A					
4						270		275	260	285	325	325	345	325	350	I345A	A	A	A					
5							A	A	A	A	A	A	A	I355A	I345A	I335A	335	I315A						
6							I315A	I295A	A	A	465	575	400	445	460	390	350	330	295					
7								I315A	I305A	I300A	A	340	355	350	335	300	305	315						
8						320	I315A	310	315	I285A	360	365	350	325	345	350	320	305						
9							275	270	290	A	C	C	C	C	310	290	300	310						
10							290	I285A	I285A	I285A	350	C	C	C	350	325	320	300	285					
11						300		A	295	310	320	320	315	305	350	320	295	300						
12							320	320L	470	310	415	470	350	400	340	340	340	310	A					
13								A	A	315	A	A	A	A	340	I320A	I295A	I295A	300					
14							300	I315A	320	315	315	340	325	345	325	I305A	310	295	310					
15								275	270	I310A	360	300	320	310H	305L	325	I320A	I280A	A					
16							285	I280A	300	325	310	450	320	335	315	320	310	310	270					
17							300	300	265	I295A	325	320	325	315	350	335	405	280						
18							325	260	295	300	300	325	350	340	315	305	320	I330A	300					
19								250	265	275	305	290	I295A	320	310	315	295							
20						C	C	C	C	275	300	300	345	350	310	310	300							
21							265	310	305	295L	340	325	340	325	300	290L	300							
22								300	290L	290	315	300L	300	290L	310		305	I290A	A					
23						C	C	C	C	C	295	300	340	350	320	310	300	270						
24							260	275	310	320	315	325	370	I325A	335	325	300	A						
25							295	275	300	290	325	320	340	315	320	335	A	A	A					
26									A	290	310	320	310	315	320	310	I300A	270						
27								270	A	A	A	395	365	335	320	I315A	300	A						
28									275	275	285	300L	315	300	300	310	300	285						
29									270	255	290	290	280	320L	320	300								
30								290	285	260	275	315L	310	300										
31									260	265	290	310	340	295	330	295								
Count						5	13	20	23	25	26	27	27	28	30	29	26	21	7					
Median						300	295	280	290	295	315	320	340	325	325	320	310	300	295					
U.Q.																								
L.Q.																								
Q.R.																								

h'F2

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

W9

IONOSPHERIC DATA

Aug. 1967 | h'F | km | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N | Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A	A	250	240	260A	285A	285A	I260A	250	290
2	275	290	300	270	260	265	I260A	A	A	A	A	220	220	200	215	220	240	240	260	275	250	255	250A	290
3	290	295	290	285	280	235	240	260H	A	A	A	A	A	I280A	I275A	235	220H	A	A	A	260	270A	250	255
4	280	300	275	265	290	260	235	250	I230A	245H	200	210	215	250	I250A	I250A	A	A	A	A	I255A	250A	I275A	300A
5	335A	350A	340	320	325	A	A	A	A	A	A	A	A	A	A	A	260	I270A	285A	A	A	A	A	A
6	350A	315	285	285	280	270	A	A	A	A	220	240	210H	195H	230	250	270	I265A	I280A	I280A	275	I280A	300	315
7	I305A	265	295	290	285	260	A	A	A	A	A	240	260	I270A	250	235	A	A	A	A	A	A	260	280A
8	260	A	295	350	285	265	I260A	I255A	235	I250A	215	250	220	210	215H	275	245	260	270	270	275	I280A	I290A	I295A
9	300	310	315	350A	320	290A	A	A	A	A	C	C	C	C	230H	210	240	I255A	270	I270A	265	250	240	A
10	305A	295	295	315	310	260	275	A	A	A	A	C	C	C	210H	200H	215	235	260	270	290	I270A	250	275
11	300	275	290	280	290	260	250	I235A	250	215	220	205	220	210	205H	210	240	250	270	265	270	295	280	265
12	280	295	295	300	275	260	260	260	260	250A	200	205	I210A	215	225	A	A	A	A	A	A	A	270	I270A
13	250	I325A	310A	300	270	245	240	A	A	A	A	A	A	A	A	A	A	I265A	I270A	260	I265A	270	265	275
14	300	280	300	270	265	245	A	A	A	I240A	I215A	205	205	215	A	A	A	I265A	I265A	I280A	290A	I250A	245	245
15	270	275	290	260	270	260	250	A	A	A	A	I215A	225	I235A	250	A	A	A	A	I280A	290A	245A	A	275
16	250	270	290	295	300	280A	270	A	A	A	I255A	225	210H	215	215	240	240H	I235A	I250A	260	280	I260A	245	250
17	295	300	295	280	290	A	A	A	A	A	A	A	I230A	210	250	215H	240	I255A	260	250	I255A	I255A	I280A	285
18	I290A	265	290	295	260	260	250	250	215	210	210	205	I240B	250	260	245	A	A	A	A	250	I260A	275A	280
19	300	325	315	305	I295A	I275A	260A	I255A	250A	I240A	200	200H	I255A	245	250	260A	250	250	270	250	A	C	C	C
20	C	C	C	C	C	C	C	C	C	205	210H	I250A	245	235	260H	240H	230H	220H	I260A	I245A	I260A	300	310	270
21	300A	A	305	290	270	275	I260A	I245A	220	200	200	205	215	215H	240	240	I250A	260A	I275A	I285A	I280A	270	I290A	I295A
22	260	300	290	275	250	245	240	225	215	250	215	200	200H	210	215H	260H	250	I255A	A	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	220	200	I200A	225	250	240	230	I255A	I265A	275	260	275A	260	265
24	285	290	290	275	250	250	235	210	210	I240A	A	A	I215A	I220A	235	A	A	A	265	I265A	260	I265A	270	270
25	280	275	I310A	I315A	290	260	A	A	A	250	200	215	210H	250	265A	A	A	A	A	A	A	275A	260	300
26	320	310	300	265	260	275	250	I250A	I250A	I255A	225	205	200H	225	230	280	A	A	A	A	A	A	A	A
27	310	250	290	I315A	295	260	250	A	A	A	A	260A	275A	260	I260A	I270A	240	A	A	A	A	290A	270	I290A
28	315A	300	265	255	275	260	245A	250A	I255A	I260A	250	210	210	225	230	240	250	250	270	245	240	245	250	300
29	315	285	285	290	305	255	240	240	235	I230A	I220A	250	I245A	240	I260A	I265A	255A	265A	270	250	260	260	250	275
30	315	305	290	270	265	260	250H	225	225	250	215	210	210	220	230	215H	260	A	A	A	245	I255A	275	315
31	275	290	290	270	275	245	240	240	235	215	210H	220	215	245	A	A	A	I265A	260A	250	I250A	I250A	A	A
Count	28	26	28	28	28	26	21	15	14	17	19	23	25	26	26	22	20	20	20	20	23	25	25	25
Median	300	295	290	290	280	260	250	250	235	240	215	210	215	225	240	240	240	I255A	270A	270	260	260A	265	280
U.Q.																								
L.Q.																								
Q.R.																								

h'F | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

W 10

IONOSPHERIC DATA

Aug. 1967 | h'Es km | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	110	110	110	110	105	105	105	105	105	105	105	105	110	105	105
2	100	100	105	105	100	135	115	110	110	110	105	110	G	105	100	G	125	125	115	115	110	105	100	100
3	105	E	105	100	G	125	125	115	115	110	110	110	105	105	105	105	105	105	110	110	110	110	105	105
4	105	100	E	E	125	125	115	115	110	110	110	G	G	140	125	120	115	110	110	110	110	110	105	105
5	105	105	100	105	100	105	115	115	115	115	110	110	110	110	110	110	110	105	115	100	100	120	100	100
6	105	100	100	100	110	120	115	110	115	105	110	110	115	G	G	140	140	115	115	110	110	110	110	110
7	105	105	100	100	100	125	120	115	110	110	110	110	105	105	110	145	115	115	110	110	110	110	110	105
8	105	100	100	100	100	115	110	110	110	110	105	105	110	140	G	125	135	120	115	110	110	110	105	105
9	105	105	105	105	105	115	115	110	110	110	C	C	C	C	100	125	120	115	110	110	110	105	100	100
10	100	100	100	100	100	125	115	110	110	110	110	C	C	C	110	105	105	105	105	115	110	110	110	110
11	105	105	100	100	105	140	120	115	110	110	110	105	105	105	G	100	G	140	125	115	110	110	105	105
12	100	100	100	100	105	140	125	105	115	110	110	115	145	110	G	115	115	115	110	110	110	110	110	105
13	105	100	100	100	100	105	140	115	110	110	110	110	105	105	105	105	110	110	110	110	110	110	105	100
14	100	100	105	105	105	110	110	110	110	110	105	105	105	105	100	100	105	105	115	110	110	110	105	110
15	105	105	105	105	125	140	125	110	110	110	110	110	105	110	145	135	115	115	110	115	115	110	105	105
16	105	105	105	105	120	115	115	110	110	110	110	110	105	105	105	105	125	110	110	110	110	110	S	105
17	105	105	105	105	115	120	115	110	110	110	110	105	105	105	110	115	115	120	115	110	110	110	110	105
18	105	105	110	E	120	120	115	110	110	110	105	105	B	105	105	G	110	110	110	105	105	105	100	100
19	100	100	100	115	110	115	115	110	110	110	G	105	100	100	105	100	105	125	115	110	110	C	C	C
20	C	C	C	C	C	C	C	C	C	110	110	110	110	105	105	110	105	G	120	115	110	110	110	110
21	105	105	105	100	100	115	110	110	115	110	110	110	110	110	G	G	110	120	115	115	110	110	110	110
22	E	105	105	100	100	100	120	115	110	110	110	105	105	105	105	110	115	120	115	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	C	110	110	110	105	105	105	105	100	100	100	100	100	100	E
24	100	100	100	100	100	100	105	105	125	115	110	110	110	110	105	110	110	105	125	110	110	110	110	110
25	S	105	100	100	105	125	120	115	110	110	110	110	G	105	115	110	110	110	110	110	105	105	105	S
26	105	105	105	105	105	120	125	115	110	110	110	110	110	110	110	110	110	120	115	115	115	115	110	110
27	110	110	110	105	100	100	G	125	120	110	110	115	110	110	110	110	110	105	105	105	100	120	110	110
28	105	105	105	100	110	105	105	120	115	115	110	110	105	105	100	100	105	105	100	100	S	S	S	S
29	105	S	100	100	100	100	100	125	120	110	110	110	110	110	110	110	105	105	105	105	110	110	110	S
30	110	110	110	110	110	110	125	G	125	120	115	120	115	110	G	G	135	115	110	110	110	110	105	110
31	E	100	105	105	100	100	G	120	100	115	110	115	125	160	125	120	115	120	110	110	110	105	110	110
Count	25	26	27	26	27	28	26	27	28	30	29	28	25	28	25	27	30	30	31	30	29	28	27	25
Median	105	105	105	100	105	115	115	110	110	110	110	110	110	105	105	110	110	110	110	110	110	110	105	105
U.Q.																								
L.Q.																								
Q.R.																								

h'Es Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

W11

IONOSPHERIC DATA

Aug. 1967 | Types of Es | 135° E Mean Time (G.M.T. +9h) | Wakkanai | Lat. 45° 23.6'N Long. 141° 41.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										c3	c2	c3	c2	c2	13	12	12	12	13	14	f4	f5	f2	f2
2	f3	f2	f	f	1	h	c3	c2	c	c2	c2	1		1	1		c	c	c2	c	f2	f2	f4	f3
3	f		f	f		c	c	c2	c	c2	c2	c4	c2	12	12	12	1	c2 1	c4	c2	f3	f4	f2	f3
4	f2	f2			c	c	c	c	c2	c	1			h	c2	c2	c2	c3	c3	c6	f4	f4	f3	f3
5	f2	f7	f4	f2	12	14	c6	c3	c3	c4	c2	c2	c2	c3	c3	c4	c2	13	c2 12	14	f4	f2 f4	f3	f4
6	f3	f2	f	f2	12	c2	c3	c4	c4	c2	c	1	c			h	h	c3	c2	c2	f2	f4	f2	f2
7	f4	f2	f3	f2	12	c	c2	c2	c2	c3	c2	c	c2	12	c	h	c2	c2	c6	15	f8	f5	f2	f2
8	f	f4	f4	f3	12	c	c4	c3	c2	c2	1	12	1	h		c	h	c2	c2	c2	f4	f4	f4	f3
9	f2	f2	f2	f3	14	12	c4	c4	c2	c4					1	c 1	c	c2	c3	c4	f3	f2	f	f4
10	f3	f2	f2	f3	1	c	c2	c3	c2	c2	c2				1	1	12	1	1	c2	f2	f4	f2	f2
11	f	f2	f	f	1	h	c	c3	c2	c	1	1	1	1		1		h 1	c 1	c2	f	f2	f2	f3
12	f	f2	f2	f	1	h	c2	1 c	c2	c	c	c	h 1	1		c2	c2	c3	13	c7	f7	f6	f2	f2
13	f	f4	f4	f3	1	1	h	c2	c4	c2	c3	c3	13	14	12	13	12	c4	c2	12	f5	f2	f2	f2
14	f3	f2	f	f	1	1	c3	c4	c2	c3	c2	c	1	12	13	12	12	13	c4	c6	f4	f	f2	f
15	f2	f2	f2	f2	c	h	c	c2	c2	c3	c2	c2	c	c2	h 1	h	c4	c4	c6	c3	f3	f3	f4	f2
16	f2	f2	f2	f	c4	c3	c3	c3	c3	c2	c2	c2	1	1	1	1	c	c3	12	c2	f2	f3		f
17	f2	f2	f	f2	c	c2	c2	c3	c2	c3	c2	c2	c2	1	1	c	c	c2	c2	c3	f2	f5	f4	f
18	f4	f	f		c2	c	c	c2	c	c	1	1		1	1		c2	c4	c4	13	f4	f2	f3	f2
19	f2	f2	f	f2	c3	c3	c3	c	c	c		c	13	12	12	12	1	c	c4	c4	f3			
20										1	1	1	1	12	c2	c	1		c4	c4	f2	f2	f2	f2
21	f4	f4	f4	f3	1	c2	c3	c3	c	c2	c	1	1	1			c2	c2	c5	c5	f4	f2	f3	f4
22		f2	f	f	1	1	c	c 1	c	c2	1	1	1	12	1	1	c	c2	c4					
23											c	1	c2	1	12	1	12	13	15	12	f	f3	f	
24	f2	f3	f2	f3	1	1	1	1	c	c2	c	c2	c2	c4	1	c3	c4	14	c	c5	f2	f6	f2	f
25		f2	f5	f4	1	c2	c3	c3	c2	c2	c	c2		12	c 1	c3	c4	14	13	15	f4	f3	f2	
26	f2	f	f2	f2	12	c 1	c	c4	c2	c2	c2	c2	1	1	1	12	14	c 1	c3	c6	f2	f5	f7	f4
27	f3	f2	f2	f6	12	12		c 1	c4	c2	c3	c2	c2	c2	c3	c4	12	16	16	12	f7	f f	f2	f6
28	f2	f3	f2	f	1	12	12	c	c2	c2	c2	1	13	12	12	1	1	1	12	1				
29	f2		f3	f2	12	12	1	c 1	c	c2	c2	c	12	1	12	c2	12	13	14	12	f3	f2	f2	
30	f	f2	f2	f	12	1	c		c	c	c	c	c	1			h	c2	c7	c4	f2	f3	f2	f3
31		f	f	f	1	1		c	1	c	c	c	c	h	c2	c2	c4	c4 1	c3	c2	f4	f8	f4	f6
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

W12

IONOSPHERIC DATA

Aug. 1967 | foF2 | 0.1Mc | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	076F	F	076F	068F	064F	069	081	082	083	081	077	076	083	088	I084R	083	083	I081A	081	I086A	089	083	FS	R
2	FS	FS	FS	FS	FS	FS	082	083S	086	079	078	077	081	083	080	078	075	074	081	088	092	077	068	066
3	065	063	061	063	065	071	075	079H	082	078	082	083	I078A	086	086	084	087	086	I096R	I096R	093	084	079	FS
4	FS	FS	FS	FS	076	074	084	093	086	083	088	086	087	I088A	086	I092A	I099R	A	A	I095A	I091R	084	FS	FS
5	FS	FS	FS	FS	FS	RS	066	081	082	074	080	086	A	A	A	A	082	076	079	089	090	079	070	066
6	066	070S	FS	067	066	067	082	082	I073A	I064A	060	060	063	063	064	064	065	066	065	072	072	072	063	FS
7	FS	063	060	055	052	060	069	084	091	082	083	075	081	089	084	I080A	072	071	076	086	I084R	078S	074	071
8	I068R	I062R	063F	FS	FS	072S	069	066	062H	067	068	071	072	077	076	078	072	072	074	080	083	074	066	066
9	FS	I062R	059S	057	FS	FS	FS	096	089	I073A	071	080	083	087	I082A	072F	I066A	066	I070A	082	089S	082F	F	F
10	063	058	053	051	050	051	069	088	082	072	063	I072C	071	075	071	071	069	068	C	C	C	C	C	C
11	C	C	C	C	C	C	I076R	071	076	I076A	083	081	I072A	069	066	073	079	080	076	078	079	076	073	075S
12	FS	F	063S	F	FS	056	060	059	060	I061A	064	062	I062A	069	072	075	074	073	071	071	067	FS	FS	FS
13	FS	FS	FS	FS	FS	064	064	068	073	082	080	I074A	072	078	081	086	088	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	A	A	A	077	082	089	082	075	084	I084R	088	FS	FS	FS	FS
15	062	055	056	054	055	058	078	082	082	074	I068A	075	076	081	082	078	084	081	C	C	C	FS	FS	A
16	RS	RS	FS	FS	FS	054	066	077	076	073	071	070V	074	076	082	080	081	075	075	078	083	068	065S	FS
17	FS	060S	060S	060S	055	057	069	084	081	072	I075A	082	083	086	084	085	091	I090R	I092R	I086R	I086A	071	FS	065S
18	FS	FS	FS	RS	056	059	073	088	091	081	083	079	081	084	091	079	072	074	C	C	084	074S	071S	068
19	066	064	FS	FS	062	065	082	101R	091	082	089	101	098	096	I096A	093R	090	084	085	082	079	073	FS	FS
20	FS	FS	055S	054S	052	053	071	076	084V	078	I082A	081	I079A	080	083	077	080	084	084	089	072	072	068	071S
21	FS	067S	065	062	062	069	075	087	088	086V	087	088	I086C	084	089	086	082	075	074	081	RS	RS	I080R	076
22	074S	FS	FS	FS	FS	061	066	082	089	082	086	092	094	085	083	083	079	085	088	I091R	084	075S	073	072
23	071	FS	FS	066S	FS	FS	075	089	112	098	I090A	086	086	087	096	097	088	085	I084A	087	087	079	079	077
24	076	073	072	072	064	062	077	082	088	088	I087C	I084C	079	085	087	092	094	094	088	085	070	RS	FS	FS
25	068F	067S	FS	FS	055S	058	071	078	077V	076	075	076	083	086	089	087	083	085	095	I092R	086	085	083	077
26	074	074	071	069	060	060	075	090	089	084	I087A	I097R	106	110	104	096	091	097	093	087	RS	A	A	A
27	A	FS	FS	FS	R	FS	074	086	081	084	I082A	I081A	089	I095R	I096A	I092R	093	096	I098R	I094R	087	I080R	071	FS
28	FS	FS	066S	064	054	059	083	097	100	093	091	087	094	098	097	090	088	094	101	I094R	083	071	072	070
29	067	067	065	062	062	069	079	I098R	099	089	085	092	099	098	099	093	091	091	I095R	090	074	076	073	069
30	062	063	FS	063	059	062	088	I099R	097	092R	093	090	097	I094R	085	083	086	092	I093A	I094R	083R	072R	068	063S
31	062R	062	063	062	061	063S	084	I096R	095	089	091	095	097	100	092	089	I100R	106	I103R	I093R	077	072	069	066
Count	15	16	16	17	19	24	29	30	30	30	30	30	30	30	30	30	31	29	26	27	25	23	19	16
Median	067	063	063	062	060	062	075	084	085	081	082	081	082	086	084	083	083	084	084	087	084	076	071	070
U. Q.	074	067	066	066	064	068	082	090	091	084	087	087	089	089	091	090	090	090	093	092	088	080	074	074
L. Q.	063	062	060	056	055	058	069	079	081	074	075	075	076	080	082	078	075	074	076	082	078	072	068	066
Q. R.	011	005	006	010	009	010	013	011	010	010	012	012	013	009	009	012	015	016	017	010	010	008	006	008

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

foF2

A 1

IONOSPHERIC DATA

Aug. 1967 | foF1 | 0.01Mc | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							380L	450	500H	510	530	560	560	A	A	A	A	A	A					
2						L	410L	I460A	480	530A	I540A	540	530	530	550	530	460	A	L					
3							L	I420A	I510A	540	530	A	A	A	A	540	470	A	A					
4						L	A	A	480	A	540	I540A	530	A	A	A	A	A	A					
5						L	I430A	A	A	I490A	I530A	A	A	A	A	A	A	I440A	A					
6						L	L	A	A	A	510	500	500	510	500	480	470	420	L					
7						L	A	L	I480A	I510A	I560A	I520A	510H	540H	510	I510A	450	L						
8						L	400	450	470	490	510	500	520	I520A	500	490	A	A	A					
9						L	410A	I440A	450A	I470A	I500A	530	I520A	I510A	I490A	480	A	A	A					
10							420	430	A	A	A	I500C	I520A	I500A	480	480	I460A	A	C					
11							370	A	A	A	480	I510A	I520A	520	520	500L	450	400	L					
12							L	420	450	I540A	500	I510A	I520A	I520A	I510A	510	450	L						
13								L	500	A	A	A	A	530	500	520H	460	C						
14								C	C	A	A	A	520	I520A	490	L	490	A	A					
15							L	450	460	A	A	530	540	540H	I500A	A	A	A	C					
16							L	A	I460A	I500A	500	540	530	510	490H	480	460	410	L					
17							400	A	A	570	I540A	I530A	I550A	520	520H	500	A	A	A					
18							L	L	480	500	520	I540A	540R	540	530	490	450	L	C					
19							A	A	A	A	530	510	I530A	I540A	I550A	A	470	L						
20							330	L	I480A	500	I520A	540	I540A	I530A	540	I500A	500	420						
21							A	I420A	460	A	A	540	I540C	I540A	I530A	490	440	L	A					
22								L	530	500	570L	550	560	530	560H	470	470	420L	A					
23							L	L	500	I510A	I520A	530	570	570	520	500	A	A	A					
24							L	410L	470L	480	I540C	I550C	620	560	560L	460	480L	400L						
25						L	400L	430	A	490	530	I560A	560	I540A	I530A	520	I480A	L	A					
26								L	480L	A	A	580	A	A	A	500	420	L						
27							L	L	A	A	A	A	550	A	A	A	480	L						
28							L	L	A	L	520	520	580	580L	540	470	510H	L						
29								L	470	500	540	560	I560A	A	540	550	L	410						
30							L	L	A	590L	550	530L	550	I530A	470	I530A	500L	A						
31							L	L	L	480	560L	560	560	550	I530A	510	470	L						
Count							10	11	19	19	24	26	27	24	25	24	22	8						
Median							400	430	480	500	530	540	540	530	520	500	470	420						
U. Q.																								
L. Q.																								
Q. R.																								

foF1

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A 2

IONOSPHERIC DATA

Aug. 1967 | foE | 0.01Mc | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						180	255	310	345	A	A	A	A	A	A	A	A	A	A					
2						A	A	A	A	A	A	A	A	A	A	355	A	A	A					
3						A	A	A	A	A	A	A	A	A	A	A	A	290	A					
4						A	A	A	A	A	A	A	A	380	375	355	330	A	A					
5						A	I250A	295	I325A	I340A	360	A	A	A	A	A	A	A	A					
6						A	A	A	325	A	A	A	375	380	375	355	320	I270A	215					
7						A	A	300	330	A	A	A	A	A	A	A	A	A	A					
8						A	I220A	280	320	A	A	A	A	A	A	350	325	A	A					
9						A	A	A	A	A	A	A	A	A	A	A	A	265	A					
10						A	235	280	310	355	355	C	A	A	C	A	A	A	C					
11						C	C	285	310	I330A	345	A	A	A	A	A	A	A	A					
12						135	230	280	330	A	A	A	A	A	A	A	320	285	A					
13						A	245	I290A	A	A	A	A	A	370	370	350	320	C	C					
14						C	C	C	C	A	A	A	A	A	A	A	A	A	165					
15						A	225	I280A	315	320A	I330A	A	A	A	A	350	305	255	C					
16						A	225	280	310	340	A	A	A	I370A	360	330	305	255	A					
17						I160A	I225A	290	I320A	350	355	A	A	A	370	350	315	265	A					
18						A	A	270	A	A	A	A	B	380R	375	365	325	285A	C					
19						A	A	I295A	A	A	A	A	A	A	A	A	335	280	A					
20						A	A	A	315	A	A	A	A	A	A	A	A	A	A					
21						A	A	A	315	A	A	A	C	A	A	350	310	265	A					
22						A	A	A	A	A	A	A	A	A	370	355	325	A	A					
23						A	A	A	325	345	A	A	A	A	A	A	315	280	A					
24						B	230	290	A	A	C	C	A	A	A	A	A	A	A					
25						145	205	265	315	335	A	A	A	A	A	345	320	A	A					
26						B	225	285	315	335	350	A	A	A	A	A	315	275	A					
27						A	A	300	325	I340A	355	365	I370A	A	A	A	A	A	S					
28						S	A	300	325	A	A	A	A	A	A	A	A	A	A					
29						A	I230A	300	320	345	360	A	A	A	A	A	A	A	A					
30						A	A	A	A	A	A	A	A	A	375	I340A	I305A	250	S					
31						A	A	285A	325	A	A	360	370	375	365	340	A	A	A					
Count						4	13	20	20	11	8	2	3	6	9	14	16	13	2					
Median						150	230	290	320	340	355	360	370	380	370	350	320	270	190					
U. Q.																								
L. Q.																								
Q. R.																								

foE

Sweep 1.0 Mc to 20.0Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A 3

IONOSPHERIC DATA

Aug. 1967 | foEs | 0.1Mc | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J061	J051	J025	E	E	G	G	039	J048	J066	J064	J050	J052	J121	J088	J077	J083	J115	J084	J086	J065	J043	J064	J074
2	J066	J043	J054	J043	J029	J032	037	J065	J064	J110	J069	J080	J064	J043	J043	047	J044	J063	J080	J079	J057	J019	J030	J022
3	J021	J021	J021	J024	E	J029	032	J049	J078	J060	J079	J064	J136	J118	J080	J066	J047	J052	J046	J045	J059	J064	J053	J081
4	J063	J061	J060	J029	J025	026	J054	J083	J060	J079	J078	J074	053	J185	J175	J175	J145	J184	J164	J186	J074	J084	J074	J044
5	J036	J050	J054	J079	J084	J080	J050	J066	J084	J109	J071	J089	J124	J138	J158	J114	J071	J050	J088	J064	J043	J043	J038	J021
6	J022	E	J030	E	J030	022	J042	J060	J084	J153	J075	J042	J038	G	G	G	040	035	J026	J036	J061	J026	J030	J044
7	J040	J037	J029	J041	J020	022	J054	J043	J070	J118	J077	J081	J044	J053	J054	J082	J038	J061	J120	J045	J078	J066	J053	J056
8	J065	J043	J034	J022	J023	024	028	J050	J080	J086	J083	J065	J048	J060	J057	J063	J065	J074	J064	J054	J065	J074	J070	J073
9	J051	J042	J046	J056	E	J039	J046	J079	J056	J120	J070	J053	J083	J095	J086	J083	J120	J165	J143	J083	J087	J081	J031	J031
10	J020	J020	J020	E	J046	J058	J037	J047	J061	J067	J067	C	J135	D080C	C	D043C	D050C	D078C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	D055C	D057C	J105	J058	J069	J072	J043	J051	J045	J060	J030	J028	J019	J018	J025	J035	J083
12	J081	J045	J033	J050	J043	025	034	J041	J081	J117	J079	J084	J109	J116	J080	J054	G	J040	027	J040	J066	J067	J083	J054
13	J044	J062	J064	J064	J049	J045	G	J045	042	J080	J142	J184	J110	J070	G	J042	041	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	J088	J144	J134	J064	J070	J040	J048	J042	J046	J124	J172	J080	J094	J079	J042
15	J025	J042	J063	J035	015	024	032	036	J045	J077	J068	J084	042	045	J076	J054	J058	J067	C	C	C	J084	J050	J108
16	J050	J084	J063	J040	J036	J029	029	J047	J052	J062	J045	J053	J053	J044	035G	036	037	036	026	J047	J052	J041	J038	J040
17	J025	J029	J023	J013	E	021	J035	J065	J066	J060	J093	J114	J085	J064	J042	J049	J072	J084	J085	J075	J084	J035	J033	J082
18	J077	J078	J054	J044	J050	J036	J036	J043	J043	J041	J076	J066	043	G	G	044	045	J046	C	C	J070	J060	J040	J031
19	J034	J029	J028	J064	J029	J035	J055	J121	J076	J074	J058	J044	J140	J073	J119	J064	036	034	J035	J080	J044	J043	J075	J084
20	J035	J043	J064	J074	J035	J029	J034	J046	J061	J085	J134	J134	J083	J144	J065	J060	J051	J031	027	J049	J068	J054	J077	J028
21	J034	J028	J025	J016	J021	018	J055	J065	J099	J072	J116	J082	C	J120	J146	G	036	034	J048	J043	J074	J050	J053	J051
22	J064	J038	J037	J042	J039	J035	029	040	J074	J078	J060	J066	J083	J059	G	J059	J040	J065	J050	J082	J065	J083	J043	J081
23	J041	J064	J030	J020	J020	J027	029	041	J050	J070	J097	J047	J053	J084	J040	041	J070	J078	J114	J078	J028	J020	J020	J029
24	J036	J028	J025	J025	J020	J020	028	035	J051	043	C	C	J091	J090	J065	J051	J045	032	J036	J045	J053	J139	J063	J086
25	J073	J040	J023	J015	J016	G	031	J044	J061	J048	J060	J101	J055	J067	J059	J050	J074	J053	J077	J123	J083	J086	J043	J083
26	E016B	J031	J024	J039	J020	E016B	033	J050	042	J074	J098	J059	J073	J074	J108	046	G	J065	J056	J064	J188	D	J143	J168
27	J088	J054	J079	J080	J081	J044	J051	J044	J058	J066	J086	J088	J083	J080	J175	J170	J045	J054	J044	J060	J038	J053	J041	J028
28	J025	J033	J020	J030	J019	J021	029	040	J060	J051	J044	044	J047	J047	J070	J043	J040	J053	J050	J041	J025	J020	022M	E016B
29	E016B	E013S	J029	J025	J024	J020	026	033	040	041	046	J054	J079	J053	J059	J063	J037	J036	J039	J049	J078	J075	J059	J035
30	J028	J029	J014	J024	J019	J024	J029	J040	J050	J044	J046	J046	J044	J071	042	J076	J065	J072	J103	J083	J064	J071	J052	J043
31	J036	J033	J028	J025	J038	J034	J027	032	036	041	J049	045	G	044	J075	J081	J088	J040	J029	J064	J028	J038	J030	J053
Count	29	29	29	29	29	29	29	30	30	31	30	29	30	31	30	31	31	30	27	27	28	29	29	29
Median	J036	J040	J030	J030	J024	J026	033	J046	J060	J074	J073	J066	J068	J070	J062	J054	J045	J053	J050	J064	J065	J060	J050	J051
U. Q.	064	050	054	047	038	035	044	062	075	088	086	086	085	106	086	076	070	072	088	082	076	082	067	082
L. Q.	025	029	024	021	019	021	029	040	050	060	060	052	048	047	042	044	040	036	035	045	048	040	034	031
Q. R.	039	021	030	026	019	014	015	022	025	028	026	034	037	059	044	032	030	036	053	037	028	042	033	051

foEs

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Aug. 1967 | **f_bEs** | 0.1Mc | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	020	026	E					G	036	038	040	042	048	070	A	062	070	A	064	A	044	030	046	028
2	026	023	030	028	020	024	033	061	047	061	054	048	042	040	038	045	G	059	026	034	023	018	017	021
3	017	013	E	E		018	026	047	078	054	049	059	A	065	060	042	035	052	039	028	024	041	027	017
4	045	028	026	022	018	024	046	048	036	056	044	057	052	A	064	A	055	A	A	A	054	048	031	032
5	025	036	033	021	040	022	048	058	062	056	057	067	A	A	A	A	059	047	059	028	021	017	016	017
6	E		E		E	019	031	047	A	A	039	040	029				035	029	023	024	021	021	018	023
7	025	028	021	021	013	019	048	039	054	062	066	057	039	039	047	A	032	040	045	027	054	038	042	039
8	029	028	022	017	E	020	026	039	G	038	050	049	042	058	041	047	058	049	049	054	063	039	048	045
9	029	027	013	037		018	041	060	045	A	063	044	071	058	A	041	A	048	A	049	057	027	018	026
10	016	017	011		023	024	034	042	060	057	055	C	064	E062C	C	E043C	E050C	E060C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	E046C	E047C	A	045	062	A	042	048	042	041	028	026	017	016	017	025	059
12	017	020	017	018	017	019	030	034	040	A	042	057	A	060	056	034		034	024	032	016	045	030	042
13	031	039	030	040	018	029		034	038	058	065	A	060	021		G	038	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	A	A	A	044	064	040	047	039	046	073	016	047	054	054	018
15	016	040	019	016	013	022	030	036	043	060	A	048	042	043	067	054	058	058	C	C	C	023	038	A
16	048	059	028	016	015	016	027	046	052	058	044	043	050	042	034G	036	034	032	023	023	024	023	027	017
17	016	017	012	E		019	032	057	063	054	A	057	056	042	033	048	062	060	084	074	A	022	024	035
18	033	038	017	026	013	036	034	042	034	038	048	056	E043R			043	044	040	C	C	033	024	028	020
19	018	016	018	025	017	026	054	062	071	071	042	043	058	063	A	050	036	034	028	018	016	026	029	048
20	019	023	043	021	020	018	020	041	054	045	A	049	A	062	049	056	038	029	025	048	040	028	019	022
21	022	014	015	E	E	017	046	046	043	068	058	045	C	057	065		034	032	047	044	045	025	044	024
22	018	025	019	020	019	017	027	036	045	041	040	042	047	045		037	039	031	039	055	028	028	028	016
23	019	017	017	012	E	016	027	039	047	068	A	047	042	048	040	041	055	068	A	050	024	014	017	018
24	018	018	015	012	013	016	G	035	038	042	C	C	056	044	039	042	039	030	029	041	039	024	034	058
25	040	020	E	012	012		028	042	048	045	045	072	055	058	058	047	059	040	068	082	047	058	028	019
26	B	021	019	020	017	B	027	040	040	060	A	053	061	062	079	038		038	048	061	058	A	A	A
27	A	036	043	024	045	029	028	023	052	060	A	A	045	056	A	074	034	034	020	029	022	018	018	019
28	018	014	014	019	E	016	025	038	048	048	043	040	041	046	040	035	034	034	036	027	019	016	E	B
29	B	S	018	014	013	016	025	G	037	038	045	053	061	053	053	038	033	033	037	030	060	044	018	025
30	019	016	013	016	017	018	027	030	046	040	040	045	043	062	041	057	038	053	A	055	033	030	035	025
31	020	017	013	015	026	032	025	031	036	040	047	044		043	070	046	032	034	028	021	026	024	020	035
Count																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

The Radio Research Laboratories, Japan

f_bEs Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

A 5

IONOSPHERIC DATA

Aug. 1967 | f-min | 0.1Mc | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E016S	E	E	E	E	012	017	017	017	019	021	022	023	021	022	021	014	014	013	E	E013S	E013S	E013S	017
2	E014S	E	E013S	E	E	014	013	017	017	017	028	018	019	021	016	018	013	013	013	017	E014S	E012S	E014S	E013S
3	016	E	E	E	E	013	017	019	018	018	019	023	021	019	021	019	017	014	013	E012S	E013S	E	016	016
4	016	E	E	E	E	E	013	013	E014S	018	017	023	019	024	021	019	017	014	012	E	E013S	017	017	016
5	E012S	E013S	E	E	E	012	013	017	018	019	018	021	020	021	019	018	017	012	012	E	E013S	E012S	016	016
6	E013S	E	E	E	E	012	017	017	017	017	021	016	022	023	021	023	017	018	014	E013S	E012S	E013S	016	E014S
7	016	E	E	E	E	012	017	017	018	018	021	022	020	018	021	018	017	012	013	E012S	016	E013S	E012S	016
8	016	E	E	E	E	012	012	017	017	017	018	017	017	017	019	017	018	014	013	E	017	017	014	E013S
9	E013S	E	E	E	E	013	017	017	017	017	018	018	017	016	017	016	017	012	011	E	E016S	E013S	E016S	E015S
10	E015S	E	E	E	E	E	013	017	012	017	017	C	017	E030C	E042C	E028C	E026C	E018C	C	C	C	C	C	C
11	C	C	C	C	C	C	E031C	E023C	E028C	017	017	017	020	017	017	017	017	012	012	E015S	013	E016S	E016S	E016S
12	E016S	E	E	E	E	E	017	016	017	017	017	018	018	017	018	017	017	014	013	E	016	016	016	016
13	E013S	E	E	E	E	012	012	013	017	018	016	019	018	017	018	017	017	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	018	016	019	019	019	018	018	017	013	012	E	E013S	E014S	016	E013S
15	E013S	E	E	E	E	012	013	016	017	018	018	018	021	019	021	017	017	013	C	C	C	E	E013S	016
16	017	E	E	E	E	E	012	012	017	017	017	018	018	018	021	017	013	013	013	016	E012S	E012S	016	E014S
17	E014S	E	E	E	E	E	012	013	017	018	018	018	023	021	019	019	013	012	012	E	016	E012S	E013S	E014S
18	017	E012S	E	E	E	E	017	014	014	018	024	021	038	028	025	021	017	014	C	C	E	016	E014S	E013S
19	016	E	E	E	E	E	017	026	021	018	022	022	021	021	018	022	018	018	014	E	016	E013S	E013S	016
20	E012S	E	E	E	E	E	014	018	017	017	022	020	022	022	023	019	017	013	012	E013S	E	E014S	E013S	016
21	016	E	E	E	E	012	013	017	018	017	018	018	C	018	022	016	014	013	017	E013S	016	016	E014S	E012S
22	E013S	E	E	E	E	E	012	016	017	018	017	021	021	022	022	017	018	016	012	016	E	E013S	E	E013S
23	E013S	E012S	E	E	E	E	013	017	018	018	020	019	019	020	017	017	016	013	012	E	E013S	E013S	016	016
24	E	E	E	E	E	016	016	013	017	018	C	C	018	018	017	014	014	012	012	014	017	016	016	016
25	014	E	E	E	E	E	013	012	017	017	019	018	018	018	019	018	014	013	012	016	016	016	E013S	016
26	016	E013S	E	E	E	016	015	013	018	018	019	021	018	017	017	017	017	014	013	016	E012S	016	017	016
27	E013S	E	E	E	E	E	011	013	018	018	018	021	021	021	016	018	018	013	E014S	E	E013S	E012S	E013S	E013S
28	E012S	E	E	E	E	E012S	013	012	014	017	017	018	021	018	018	018	014	012	012	E	E014S	016	016	016
29	016	E013S	E	E	E	E	012	012	017	018	017	018	017	025	018	014	013	013	012	E	016	E013S	E013S	E014S
30	E012S	E	E	E	E	E	017	013	018	018	018	019	021	020	019	017	013	013	E016S	E016S	016	016	016	017
31	E014S	E014S	E012S	E	E	E	013	017	018	018	019	018	018	019	017	017	013	014	014	E	016	E014S	E012S	E014S
Count	29	29	29	29	29	29	30	30	30	31	30	29	30	31	31	31	31	30	27	27	28	29	29	29
Median	E014S	E	E	E	E	E	013	016	017	018	018	019	020	019	019	018	017	013	012	E	E014	E013S	E016S	016
U. Q.																								
L. Q.																								
Q. R.																								

f-min

Sweep 1.0 Mc to 20.0Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A6

IONOSPHERIC DATA

Aug. 1967 | M(3000) F2 0.01 | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	275F	F	285F	305F	285F	305	315	305	290	295	305	275	285	285	I280R	285	290	I290A	285	I285A	305	295	FS	R
2	FS	FS	FS	FS	FS	FS	285	285S	290	305	290	285	285	285	295	290	295	285	285	305	305	300	265	270
3	275	275	280	280	280	325	315	310H	300	305	285	295	I280A	285	280	285	295	285	I295R	I300R	305	285	290	FS
4	FS	FS	FS	FS	275	295	285	330	305	290	295	280	280	I280A	285	I290A	I290R	A	A	I295A	I290R	285	FS	FS
5	FS	FS	FS	FS	FS	RS	320	310	300	285	280	285	A	A	A	A	290	295	285	295	295	295	270	275
6	260	255S	FS	280	290	300	295	280	I305A	I270A	260	255	270	280	285	280	285	305	295	285	280	285	280	FS
7	FS	260	285	275	285	290	275	285	310	285	300	280	280	290	300	I300A	305	295	290	285	I285R	285S	270	270
8	I270R	I270R	260F	FS	FS	305S	315	290	285H	285	285	295	280	300	300	295	290	295	285	285	290	290	275	270
9	FS	I280R	270S	260	FS	FS	FS	315	325	I300A	285	290	290	300	I300A	310F	I320A	290	I280A	280	305S	305F	F	F
10	280	285	280	280	280	305	295	315	315	315	315	I300C	280	300	280	295	295	280	C	C	C	C	C	C
11	C	C	C	C	C	C	I310R	300	320	I305A	295	290	I335A	305	280	290	300	305	295	285	280	285	270	275S
12	FS	F	275S	F	FS	305	320	315	300	I285A	295	305	I270A	290	280	290	300	300	300	290	285	FS	FS	FS
13	FS	FS	FS	FS	FS	335	315	325	295	315	290	I310A	290	290	280	280	290	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	A	A	A	295	280	290	305	295	295	I295R	295	FS	FS	FS	FS
15	275	280	280	280	285	275	310	310	320	310	I305A	295	290	290	295	290	305	295	C	C	C	FS	FS	A
16	RS	RS	FS	FS	FS	280	305	315	315	315	310	285V	290	280	295	285	310	305	300	290	305	300	290S	FS
17	FS	270S	270S	285S	275	280	325	300	315	290	I290A	295	285	290	290	290	295	I300R	I300R	I315R	I280A	265	FS	260S
18	FS	FS	FS	RS	280	290	285	305	305	290	290	295	285	280	300	300	305	285	C	C	300	275S	280S	265
19	270	255	FS	FS	275	280	295	295R	325	305	295	295	285	295	I290A	295R	300	310	305	295	290	290	FS	FS
20	FS	FS	255S	265S	295	305	315	315	330V	300	I310A	300	I295A	285	285	290	285	300	290	305	280	265	255	290S
21	FS	265S	275	275	285	305	305	310	315	300V	290	285	I290C	280	295	305	305	315	285	285	RS	RS	I285R	280
22	260S	FS	FS	FS	FS	305	325	310	310	315	280	295	295	295	285	290	290	295	300	I295R	285	280S	275	265
23	280	FS	FS	305S	FS	FS	310	295	310	305	I305A	290	280	275	285	290	295	300	I290A	290	290	275	275	270
24	275	280	280	290	300	285	310	305	305	305	I305C	I290C	280	275	275	285	295	300	305	300	260	RS	FS	FS
25	260F	280S	FS	FS	260S	275	300	315	315V	305	295	285	285	285	290	290	290	285	275	I285R	280	275	270	265
26	255	265	255	275	265	285	310	330	315	290	I280A	I265R	280	285	280	280	295	300	300	290	RS	A	A	A
27	A	FS	FS	FS	R	FS	320	325	315	310	I300A	I280A	270	I280R	I285A	I280R	280	295	I300R	I290R	285	I280R	255	FS
28	FS	FS	275S	280	280	275	295	305	310	305	295	290	280	285	285	290	285	285	290	I300R	310	270	265	265
29	270	270	275	270	265	275	305	I310R	325	315	295	290	285	275	285	280	290	295	I300R	310	285	275	275	285
30	260	270	FS	275	270	275	300	I310R	315	310R	300	290	300	I300R	285	285	295	295	I295A	I305R	315R	280R	275	290S
31	270R	265	275	275	275	285S	300	I320R	295	310	280	285	285	290	285	285	I285R	295	I300R	I305R	280	265	270	265
Count	15	16	16	17	19	24	29	30	30	30	30	30	30	30	30	30	31	29	26	27	25	23	19	16
Median	270	270	275	280	280	290	310	310	310	305	295	290	285	285	285	290	295	295	295	295	290	285	275	270
U. Q.																								
L. Q.																								
Q. R.																								

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

M(3000) F2

A7

IONOSPHERIC DATA

Aug. 1967 | M(3000) F1 0.01 | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							390L	365	375H	355	350	350	340	A	A	A	A	A	A					
2						L	360L	I355A	I345A	A	A	340	360	355	330	330	355	A	L					
3							L	I375A	I340A	I355A	340	A	A	A	A	315	360	A	A					
4						L	A	A	360	I330A	335	A	A	A	A	A	A	A	A					
5						L	A	A	A	I365A	I345A	A	A	A	A	A	A	I350A	A					
6						L	L	A	A	A	375	380	360	355	345	350	340	350	L					
7						L	A	L	A	A	A	I340A	375H	370H	370	I360A	365	L						
8						L	350	360	365	375	I350A	I355A	360	I350A	355	I355A	A	A	A					
9						L	I350A	A	A	I375A	I360A	350	I340A	A	A	380	A	A	A					
10							340	A	A	A	A	C	A	A	350	I350C	A	A	C					
11							370	A	A	A	370	I350A	I350A	345	I355A	325L	345	350	L					
12							L	355	355	I315A	355	I370A	I350A	I345A	I345A	335	355	L						
13								L	340	A	A	A	A	345	340	330H	340	C						
14								C	C	A	A	A	350	I330A	350	L	340	A	A					
15							L	355	370	A	A	340	335	330H	I340A	A	A	A	C					
16							L	A	A	A	360	355	340	355	360H	360	350	355	L					
17							350	A	A	330	I345A	I330A	I325A	350	345H	340	A	A	A					
18							L	L	360	365	350	I340A	I340R	330	330	350	I350A	L	C					
19							A	A	A	A	360	375	I370A	A	A	I350C	355	L						
20							380	L	I330A	380	I365A	350	A	A	345	I350A	345	360						
21							A	I370A	370	A	A	345	I350C	I350A	I340A	350	365	L	A					
22								L	360	380	335L	365	345	355	340H	355	365	355L	A					
23							L	L	360	I355A	I360A	360	335	335	345	345	A	A	A					
24							L	385L	370L	375	I345C	I355C	325	325	330L	370	355L	365L						
25						L	355L	A	A	380	365	I340A	I340A	I340A	I340A	350	I355A	L	A					
26								L	375L	A	A	325	A	A	A	340	370	L						
27							L	L	A	A	A	A	345	A	A	A	345	L						
28							L	L	A	L	365	375	345	325L	350	375	355H	L						
29								L	375	375	360	340	I340A	I340A	I350A	330	L	360						
30							L	L	A	390L	355	365L	360	I360A	385	I345A	320L	A						
31							L	L	L	400	360L	345	345	330	I340A	355	345	L						
Count							9	8	16	17	22	24	24	21	23	25	21	8						
Median							355	360	360	375	360	350	345	345	345	350	355	355						
U. Q.																								
L. Q.																								
Q. R.																								

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

M(3000) F1

A8

IONOSPHERIC DATA

Aug. 1967 | h'F2 km | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							265	280	270	295	300	380	355	345	I355A	330	320	I325A	330					
2						280	280	310A	280	290	340	335	335	325	340	340	290	I310A	290					
3							240	250	I300A	295	325	305	I340A	340	340	345	315	315	280					
4						260	260	255	275	320	320	325	345	I335A	340	I330A	320	I300A	I290A					
5						300	270	280	310	280A	340	350	A	A	A	A	310	300	320					
6						270	280	350	A	A	470	490	430	400	375	380	370	300	300					
7						290	315	275	280	310	310	365	360	325	320	I305A	300	315	300					
8						300	275	300	315	360	300	335	365	340	330	330	340	310	305					
9						335	290	250	270	A	A	355	360A	325	I320A	280	I310A	320	A					
10							320	275	280	315	325	I345C	I350A	330	355	325	340	I335A	C					
11							275	280	280	A	330	325	A	330	395	340	300	290	290					
12							275	300	350	A	325	340	A	355	355	335	310	290						
13								270	325	295	330A	I310A	340	350	320	345	295	C						
14								C	C	A	A	A	330	350	325	300	320	295	A					
15							255	275	275	290	A	355	345	330	320A	320	290	290	C					
16							275	275	255	285	295	360	355	325	320	315	290	285	270					
17							255	290	270	365	I355A	325	320	320	325	330	310	I280A	I280A					
18							280	280	270	285	300	330	340	355	305	305	295	310	C					
19							280	280	265	A	315	290	305	325	I320A	305	295	270						
20							255	265	280	290	I305A	315	I325A	330	325	320	325	285						
21							265	275	280	320	315	320	I320C	340	325	300	285	270	300					
22								265	290	280	305	310	315	315	340	295	300	300	270					
23							255	260	280	285	I290A	310	340	355	325	315	290	A	A					
24							255	255	255	285	I305C	I325C	370	355	340	305	305	280						
25						310	280	260	275	265	300	I330A	340	335	325	320	315	315	A					
26								245	260	290	I315A	345	325	305	I305A	300	290	275						
27							260	255	270	285	I310A	I340A	355	335	I330A	I325A	305	295						
28							265	255	260	275	285	300	345	320	315	290	305	275						
29								265	250	265	280	330	330	290	310	330	300	285						
30							260	250	250	300	300	280	330	305	280	325A	315	300						
31							270	255	245	265	300	320	320	315	I305A	315	305	275						
Count						8	26	30	29	25	28	30	28	30	30	30	31	29	13					
Median						295	270	270	275	290	310	330	340	330	325	320	305	295	290					
U. Q.																								
L. Q.																								
Q. R.																								

h'F2

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A 9

IONOSPHERIC DATA

Aug. 1967 | h'F km | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	320	305	275	250	265	255	245	235	205H	205	220	215	A	A	A	A	A	A	A	A	260	255	I270A	290
2	280A	290	320	300	235	265	240	I230A	I230A	A	A	A	230	215	205	I240A	230H	I255A	270	265	245	235	240	290
3	290	290	280	280	270	240	230	I225A	A	A	A	A	A	A	A	240A	240	I245A	I260A	250	235	280	250	290
4	I295A	300A	280	280	260	240	I230A	I215A	225	I260A	225	A	A	A	A	A	A	A	A	I290A	280	I260A	280	I285A
5	320	I320A	320	280	I270A	270	I260A	A	A	I230A	I215A	A	A	A	A	A	A	I280A	I295A	265	250	250	255	290
6	310	295	275	260	265	260	255	A	A	A	205	210	230	230	230	230	240	240	250	270	275	270	245	300A
7	310	310A	265	290	265	260	I255A	240A	A	A	A	A	190H	190H	I220A	I225A	220	I240A	I265A	265	I285A	290A	A	A
8	280A	I305A	315	315	275	270	235	I220A	225	200	I210A	I225A	215	I240A	240	A	A	A	A	I285A	I280A	275	I260A	I285A
9	290	285	280	I305A	315	280	I240A	A	A	A	A	220A	A	A	A	245	A	A	A	315A	I255A	230	245	285A
10	280	275	275	290	320A	275	I235A	A	A	A	A	C	A	A	I240C	I240C	A	A	C	C	C	C	C	C
11	C	C	C	C	C	C	230	A	A	A	I230A	I230A	I225A	235	A	A	A	240	270	255	270	250	295	I290A
12	255	270A	310	320	280	270	I260A	250	245A	I230A	220	A	A	A	A	220	230	I245A	265	255	245	I290A	285	A
13	A	A	I305A	280A	230	220	235	240	240	A	A	A	A	240	205	220H	I250A	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	A	A	A	220	I235A	220	I240A	230A	A	A	255	A	A	A	260
15	255	I280A	280	275	280	265	I240A	240	I225A	A	A	A	220	AH	A	A	A	A	C	C	C	290	A	A
16	A	A	280A	275	280	290	240	A	A	A	220A	230	I230A	230	220H	230	245	245	245	255	240	240	275	285
17	280	285	290	270	265	285	240	A	A	A	A	I240A	I240A	230	240H	A	A	A	A	A	I270A	290	280	A
18	A	A	290	I300A	275	I275A	I250A	I240A	230	225	I240A	I240A	I235R	230	240	I240A	A	A	C	C	245	270	270	290
19	290	320	330	I300A	285	265	A	A	A	A	205	210	I210A	A	A	I240A	245	I260A	265	235	245	255	290A	I280A
20	270	330	I320A	310	260	255	235	230A	I230A	I225A	A	A	A	A	I230A	I230A	240	240	270	270	I265A	I285A	310	260
21	I295A	290	285	290	265	265	I230A	A	A	A	A	240	I230C	I225A	I230A	240	240	250	I280A	275	I290A	280	I260A	280
22	305	I295A	300	290	240	235	240	240	I230A	225	220	195	225	I220A	190H	230	240	240	I260A	290	245	265	I285A	285
23	290	290	275	230	270	250	240	240	A	A	I220A	240	200	I230A	240	A	A	A	A	I280A	245	245	280	290
24	305	280	270	250	230	245	230	I230A	230	230	I225C	I210C	I235A	245	230	240	250	240	250	250A	280A	300	I300A	I305A
25	I295A	280	290	270	300	280	250	A	A	A	240	I220A	I230A	I240A	A	A	A	A	A	A	A	A	270	300
26	310	305	290	265	270	270	240	I240A	240	A	A	A	A	A	A	240	230	I250A	260	I260A	I250A	A	A	A
27	A	I305A	I305A	310	A	A	240	240	A	A	A	A	230	A	A	A	240	I250A	250	255	255	245	255	290
28	280	275	275	250	200H	270	240	I240A	I240A	I240A	225	200	205	I230A	245	230	240H	I245A	275	245	235	245	270	285
29	300	270	290	280	310	280	235	235	230	220	230	A	A	A	A	235	240	I240A	260	250	I245A	I250A	255	250
30	320	320	280	270	255	270	245	230	I230A	210H	215	250	225	I235A	230	I245A	250A	I260A	I265A	I270A	250	I260A	I290A	300
31	300	310	285	295	295A	295A	245	240	225	205	240	230	230	235	A	A	240	I250A	255	240	235	265	275	I300A
Count	25	26	29	29	28	28	29	20	16	13	18	17	20	18	17	20	19	19	19	24	26	26	25	24
Median	295	290	285	280	270	270	240	240A	230	225	220	225	230	230	230	240	240	I245A	265	260	250	260	270	290
U. Q.																								
L. Q.																								
Q. R.																								

h'F

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

IONOSPHERIC DATA

Aug. 1967 | h'Es km | 135° E Mean Time (G. M. T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	105	105	105	E	E	G	G	130	130	115	125	115	110	110	110	105	105	105	105	105	105	105	105	105
2	105	100	100	100	100	120	115	115	110	110	110	105	105	105	105	130	120	120	115	110	105	110	105	105
3	105	100	105	100	E	110	125	115	115	115	110	105	105	105	105	110	110	120	110	110	100	105	105	105
4	105	105	105	105	105	120	115	110	105	105	105	110	145	120	125	120	120	115	110	110	110	110	110	105
5	105	105	100	105	105	105	120	115	115	115	115	115	115	110	110	110	110	120	115	110	110	110	105	105
6	140	E	140	E	120	120	115	115	115	115	115	115	105	G	G	G	135	130	125	115	115	110	110	105
7	105	105	105	110	125	125	115	120	115	115	110	110	110	110	110	110	110	115	115	110	110	110	105	105
8	105	100	100	105	105	120	120	115	115	115	110	105	105	130	130	130	125	115	115	110	110	110	110	105
9	105	105	105	105	E	120	115	110	110	115	115	110	110	110	110	130	130	125	120	120	120	110	110	105
10	105	105	110	E	105	120	115	120	115	115	115	C	110	110	C	115	110	110	C	C	C	C	C	C
11	C	C	C	C	C	C	C	130	125	115	115	115	110	105	105	105	135	105	110	110	105	110	110	110
12	110	105	105	115	115	140	135	130	120	110	115	110	130	110	110	110	G	125	120	115	110	110	110	105
13	105	105	105	110	105	105	G	125	120	115	105	105	140	100	G	140	130	C	C	C	C	C	C	C
14	C	C	C	C	C	C	C	C	C	110	110	110	110	105	110	105	105	125	115	110	110	110	110	105
15	105	105	105	110	115	125	130	125	120	115	110	110	110	135	120	130	125	120	C	C	C	115	115	110
16	105	105	105	110	125	125	120	115	115	115	115	110	105	110	110	155	135	125	120	115	115	105	105	110
17	110	105	110	110	E	125	115	115	115	115	115	115	110	110	110	130	115	115	115	115	115	110	110	110
18	105	105	100	105	120	120	115	115	115	115	110	110	110	G	G	140	130	120	C	C	110	105	105	105
19	105	100	100	115	120	120	115	115	115	110	140	110	105	105	105	105	145	130	120	120	130	110	110	105
20	105	105	105	105	110	105	105	115	115	110	110	110	110	140	110	110	110	110	120	115	105	105	115	105
21	100	105	105	105	105	125	115	110	110	115	110	115	C	115	110	G	160	155	135	120	115	115	110	110
22	105	105	105	100	105	100	130	120	115	110	110	110	105	115	G	130	120	120	115	115	110	110	110	105
23	105	100	100	100	105	130	130	115	115	115	110	115	110	105	105	125	130	110	115	115	110	115	110	100
24	100	100	100	105	100	105	140	140	110	120	C	C	110	115	115	115	115	115	120	115	115	110	110	110
25	105	105	110	105	110	G	125	115	115	115	115	105	110	115	110	120	115	115	110	110	105	110	105	110
26	B	105	110	105	105	B	140	125	120	140	115	110	110	110	105	140	G	115	120	110	110	115	110	110
27	110	105	105	105	105	105	105	105	120	115	115	115	115	115	110	110	110	110	115	110	110	110	105	105
28	105	100	100	120	105	100	125	120	115	115	115	135	105	105	105	105	105	105	100	100	100	100	110	B
29	B	S	105	105	105	110	140	150	125	125	115	115	110	110	110	110	105	105	105	100	115	110	105	105
30	105	100	105	100	100	105	110	110	115	115	115	110	115	120	155	130	130	125	115	110	110	115	110	110
31	110	105	105	105	100	100	105	140	125	115	115	115	G	145	125	115	115	110	110	105	105	105	105	105
Count	27	27	29	26	25	26	27	30	30	31	30	29	29	29	26	29	29	30	27	27	28	29	29	28
Median	105	105	105	105	105	120	115	115	115	115	115	110	110	110	110	115	120	115	115	110	110	110	110	105
U. Q.																								
L. Q.																								
Q. R.																								

h'Es

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A11

IONOSPHERIC DATA

Aug. 1967 | Types of Es | 135° E Mean Time (G.M.T. +9h) | Akita | Lat. 39° 43.5'N | Long. 140° 08.2'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f2	f3	f					h	h2	c	h	c	c2	c2	c4	14	13	15	14	f4	f3	f3	f6	f4
2	f3	f3	f4	f2	f	c31	c3	c3	c4	c3	c	12	12	12	12	h212	h	h412	c3	f3	f4	f	f2	f2
3	f2	f	f	f		1	h2	c2	c4	c3	c2	12	13	13	12	c2	c2	c3	c5	f5	f2f4	f7	f5	f4
4	f6	f5	f4	f2	f3	c5	c3	c4	12	12	12	c2	h2c2	h2	h2	h5	h2	c4	c4	f6	f3	f3	f5	f6
5	f5	f3	f4	f2	f2	12	h3	c4	c3	c3	c2	c2	c3	c5	c4	c4	c4	c3	c4	f3	f3	f2	f2	f
6	f		f		f	c2	c3	c3	c5	c3	c	c	1				h	h	h2	f3	f3	f3	f2	f2
7	f2	f4	f3	f2f	f	h2	c4	h3	h3	c2	c3	c2	c	c	c2	c4	c2	c3	c2	f5	f4	f4	f6	f6
8	f3	f3	f3	f2	f	c3	c2	c3	c	c2	c2	12	12	h2c	h	h2	h4	c4	c4	f4	f5	f7	f4	f4
9	f3	f4	f2	f3		c2	c3	c4	c3	c3	c3	c2	c4	c3	c4	h 12	h3	h3	c5	f3	f6	f4	f3	f2
10	f2	f3	f2		f2	c3	c4	c2	c5	c3	c4		c2	c		c	c	c3						
11								h	c	c5	c2	c2	c4	c3	c3	c3	h 13	13h	12h2	f3	f2	f3	f3	f5
12	f2	f2	f2	f2	f2	h21	h3	h2	h2	c4	c2	c2	h 12	c2	c2	c2		h2	c3	f6	f3	f4	f3	f3
13	f3	f3	f3	f4	f3	13		h213	c2	c3	13	14	h c2	1 h2		h	h2							
14										c4	c4	c3	c2	12	c2	12	13	h2	c4	f2	f3	f4	f5	f3
15	f4	f5	f3	f3	f	c3	h2	h2	h3	c3	c4	c2	c3	h c2	h4	h3c2	h3	h5				f5	f4	f4
16	f6	f6	f4	f3	f3	h2	c3	c3	c2	c3	c2	c3	13	c2	12	h	h212	h2	c4	f3	f5	f4	f3	f2
17	f2	f2	f	f		c4	c3	c5	c4	c3	c3	c4	c2	c2	c	h3	c312	c5	c51	f4f2	f3	f5	f4	f4
18	f6	f4	f2	f4	f	c6	c4	c3	c2	c2	c2	c2	c			h2	h2	c4			f4	f3	f4	f2
19	f2	f2	f2	f2f2	f2f	c4	c3	c2	c4	c2	h c2	c2	12	13	13	12	h	h2	c3	f2	f	f4	f4	f4
20	f3	f4	f4	f3	f3	12	12	c3	c3	c2	c3	c2	c3	h2c3	c2	c4	c3	c4	c2	f6	f4	f4	f2f2	f3
21	f3	f2	f	f	f2	c	c5	c3	c3	c3	c3	c2		c2	c3		h2	h3	h3	f6	f6	f6	f2	f4
22	f2	f4	f3	f4	f2	12	h312	c3	c3	c2	c2	c2	12	c2		h	c2	c3	c4	f4	f3	f4	f3	f2
23	f2	f2	f2	f2	f	c	h3	c3	c3	c3	c3	c2	c2	12	12	h	h3	c5	c5	f6	f4	f2	f2	f2
24	f2	f2	f2	f	f	1	h21	h212	c3	c2			c2	c2	c2	c3	c3	c4	c5	f6	f4	f6	f6	f4
25	f6	f5	f	f2	f2		h3	c3	c3	c3	c2	12	c2	c2	c3	h2	c3	c5	c6	f6	f6	f5	f7	f4
26		f4	f4	f3	f3		h2	h3	h2	h2c3	c4	c2	c3	c3	c4	h		c3	c4	f4	f4	f4	f6	f5
27	f7	f7	f4	f4	f4	14	14	12h2	h3	c3	c5	c3	c2	c2	c3	c3	c3	c3	c3	f5	f4	f3	f4	f2
28	f2	f2	f2	f3	f f	1 h	h2	h3	c3	c2	c2	h c	12	13	12	12	13	13	15	f4	f2	f2	f	
29			f2	f2	f2	12	h2	h	h2	h	h2	c2	c3	c2	c3	c2	13	13	16	f3	f4	f4	f3	f4
30	f3	f2	f	f2	f	14	1 h	13h	c3	h2	h	c2	c	c2	h	h2h2	h2	c4	c3	f3	f4	f4	f4	f4
31	f3	f2	f	f2	f5	16	12	h2	h2	c2	c2	c2		h2	h3	c3	c2	c4	c3	f3	f6	f3	f5	f4
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

Sweep 1.0 Mc to 20.0 Mc in 15 sec in automatic operation

The Radio Research Laboratories, Japan

A 12

IONOSPHERIC DATA

Aug. 1967 | **foF2** 0.1Mc | **135° E Mean Time** (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	I082S	I080S	I076S	I073S	068	071S	078	081	080	080	077	077	087	092	098S	094	092	092	090	U097S	089	U076S	F	F
2	F	U087F	F	075	U076S	073	086	094	108	091	081	085	090	093	088	083	I082A	083	091S	098S	095S	070	068	067
3	068	069	066	067	065	068	081	074	073	077	084	076	080	090	093	095	098	103	108	108	087	076S	077	076F
4	078	F	F	U088F	F	U081R	092F	087F	081Z	087	I092A	094	095	095	093	102	U111S	114	112S	094	092S	U095S	U088F	F
5	F	F	F	F	F	085F	U074S	087	A	076	A	092	U103R	107	108	105R	094	082	082	094	092S	U064S	064	066
6	066	068F	071R	069	065	071	082	078	076	067	C	065	069	069	072	068	071	068	069	072	073	064	068	060
7	U060F	059	U061F	058F	052	054	070	079	C	080	080	081	087	096	092	086	077	077	087	094S	074	073	U066F	U066V
8	068	F	U062F	061	063	073	067	070	071	071	072	071	068	084R	084	084	075	075	I080A	089	086	068	063	F
9	064	062F	U062F	054	054F	054F	079	091F	A	U073R	071R	083	I091A	098R	095	077	068	066	071	084	095	A	F	U086F
10	F	U066F	058F	053	051	049	066	087	080	076	A	A	077	082	081	080	J073R	077	086	095	074	J066S	068	F
11	069F	F	062	060	064	065	082	080	070	071	078	089	074	075	070	080	091	086	079	084	078S	076S	067	F
12	F	U068F	U068F	F	U066F	057F	059	063	061	067	067	056	U064R	073	082	084	080	077R	077	077	070S	067F	U062F	064
13	F	F	F	F	U073S	052	061	064R	A	085	082	079	078	083	091	098	101S	093	092	093	083S	081S	U086S	F
14	U078S	U080S	U076S	065F	C	C	C	C	C	A	076	086	083	091	095	094	086	087	091	091	080	071F	088R	F
15	U073R	064F	057F	055	052	053	078	086	076	071	A	076R	084	085	092	092	091	089	089	091	073	066F	070	R
16	062	F	F	060F	F	055	067	I079R	081	A	A	076	080	083	095	096	089	080	083	088	091	057	055	056F
17	057	056	056	057	053	056	075	081	079	082	068	I081A	089	094	094	099	101	096	105R	090	062R	U063F	067	061R
18	I060A	062	I058A	057	C	C	C	C	C	086	090	089	085	090	095	085	074	080	090	100R	078	073	071R	U066R
19	068	060F	F	061F	060	064	083	097	108	087	098	101	113	110	112	110	104	089	088	084	I076S	069F	F	F
20	F	F	061F	057F	055	046	070V	084	084	090	087	A	084	083	086	083	086	091	091	091	069	068	067	F
21	066R	067	064	061	063	060	077	091	081	086	092	093	092	090	099	102R	087	078	083	082	080	075	077	079
22	077	U082R	F	U082R	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	102	096	093	095	098	100	102R	J101R	090	093	I094A	086	078	080	080
24	U078F	J082R	073	074	062	062	076	087	086	085	082	090	087	I090A	C	C	C	C	091	080	A	069R	F	F
25	071	072R	067	057	055F	057	074	084	087	078	076	082	085	094	U103R	098	086	088	U098S	U096S	083	088	084	076R
26	077R	078	073	067F	065	061	083	096	088	080	087	U101R	I112A	119	121	105	099	U100S	097	092	087	073	066F	F
27	F	F	065	F	060F	064	080	085	090	088	084	U089A	095	101	100	096	102	J103R	103	099S	080	072	073	071
28	068	064	064	060	057	058	082	096S	101R	090	090	094	097	105	105R	097	096	103R	104R	U096S	073S	069	073S	070
29	067	067	062	060	060	065	088	097	092	081	081	092	109	110	111	I108A	106	107R	107	088	071	070	077	079
30	065	061F	065	059F	056F	060	097S	092	085	088	099S	095	101	095	092	087	087	I095R	104	U102R	078	070	074	067
31	061	060F	062	061	059F	063F	088	109	089	085	092	098	101	096	098	095	107	111	116	092	078	079	072	067
Count	23	22	23	26	24	27	27	27	23	28	25	28	30	30	29	29	29	29	30	30	29	29	26	18
Median	068	067	064	060	060	061	078	086	081	082	082	088	087	093	095	095	091	089	091	092	080	070	070	067
U.Q.	077	078	068	067	065	068	083	092	089	087	091	093	095	098	100	100	101	098	103	096	088	076	077	076
L.Q.	064	062	061	057	055	055	070	079	076	076	076	078	080	084	090	084	081	079	083	088	074	068	067	066
Q.R.	013	016	007	010	010	013	013	013	013	011	015	015	015	014	010	016	020	019	020	008	014	008	010	010

foF2

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K 1

IONOSPHERIC DATA

Aug. 1967 | foF1 | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	500	520L	A	L	550	A	500L	L	A	A					
2							L	L	490	A	A	A	540	A	510	L	A	L	A					
3								L	460L	500L	520	A	A	550	A	520	L	L	A					
4								L	A	A	A	580	530	A	510	A	A	L	A					
5							L	L	A	A	A	A	A	A	A	A	460	A	L					
6							L	L	470	510	C	520	510	520	480	A	460	L	L					
7							L	A	C	A	A	510	510	L	500L	L	460L	L	A					
8							L	440L	480	L	500	490	L	I500A	490	480	L	A	A					
9						L	A	A	A	A	A	A	A	A	I500A	L	L	A	A					
10							L	L	A	A	A	A	A	A	U500L	500	L	L	A					
11							A	L	L	A	A	L	L	500	560	500	A	L	L					
12							L	L	500	490	490	A	510	510	500	490	L	A	A					
13								420	A	A	A	490	I520A	510	500	470	470	A	A					
14						C	C	C	C	A	A	A	L	I530A	I500A	I480A	430	A	A					
15							L	A	460	A	A	A	A	520	500	490	470	A	A					
16							L	A	A	A	A	A	500	530	510	500	420	L	L					
17							L	L	A	A	570	A	A	A	U500L	A	A	A	A					
18						C	C	C	C	540L	540	A	A	U510L	L	L	L	L	A					
19							A	A	A	A	A	580	A	A	L	A	470	360						
20								L	A	A	A	A	A	A	540	A	470	L	A					
21							L	L	L	500L	550L	550L	560	520	540	490	A	A						
22						C	C	C	C	C	C	C	C	C	C	C	C	C	C					
23						C	C	C	C	L	L	L	A	560	L	A	A	A						
24								L	L	L	A	560	A	A	C	C	C	C	A					
25							L	A	A	L	A	540	590	560	520	510	L	A	A					
26								L	A	A	A	A	A	A	520	L	L	A						
27									L	A	A	A	A	A	560	480	470	L						
28							L		A	A	520L	550	550	530	540	470	L	L						
29								L	L	470	L	590	A	570	520	A	A	L						
30								L	L	A	L	L	L	U530L	L	490	A	A	A					
31								L	L	L	570	L	540	L	A	L	A	A						
Count								2	6	7	9	11	11	17	21	15	10	1						
Median								430L	480	500	520	550	530	530	510	490	460	360						
U.Q.																								
L.Q.																								
Q.R.																								

foF1

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K2

IONOSPHERIC DATA

Aug. 1967 | foE | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						180	240	300	325	360	R	R	380	A	A	A	330	A	A					
2						B	240	A	A	A	A	A	A	A	A	A	R	280	A					
3						R	230	I285A	I310A	A	A	A	A	A	A	A	335	275	A					
4						B	230	A	A	A	A	R	I385R	I390R	370	355	A	R	A					
5						B	I225A	290	330	360	370	385	I385R	375	A	A	330	280	A					
6						A	240	A	A	A	C	A	A	A	A	A	315	285	A					
7						B	A	A	C	A	A	A	A	A	A	A	A	270	A					
8						A	240	280	320	355	A	A	A	A	A	A	325	I275A	A					
9						A	A	A	A	A	A	A	A	A	I360R	340	315	A	A					
10						A	A	A	A	A	A	A	A	A	A	325	300	A	A					
11						150	230	280	A	A	A	A	A	A	A	A	A	A	A					
12						A	225	275	R	A	A	A	A	A	370	345	325	275	A					
13						A	A	A	A	A	A	A	R	370	360	350	315	I265A	A					
14						C	C	C	C	A	A	A	A	A	A	A	A	A	A					
15						B	230	280	R	A	A	A	A	A	R	345	305	260	A					
16						B	215	A	A	A	A	A	A	A	A	A	300	255	A					
17						B	A	270	315	340	360	A	A	A	A	A	A	A	A					
18						C	C	C	C	A	A	A	B	A	A	R	325	285	A					
19						B	225	300	330	A	A	A	A	A	A	A	335	275	170					
20						A	A	A	A	355	A	A	A	A	A	A	A	A	A					
21						A	A	A	A	A	A	A	A	A	375	355	310	270	185					
22						C	C	C	C	C	C	C	C	C	C	C	C	C	C					
23						C	C	C	C	A	A	A	A	A	375	360	320	270	160					
24						E	230	305	330	350	370	I375R	385	370	C	C	C	C	A					
25						A	215	275	315	A	A	A	A	380	370	355	320	A	B					
26						A	210	285	320	330	360	R	R	A	365	340	320	260	B					
27						A	I235R	295	325	350	360	A	A	A	A	A	A	A	B					
28						B	R	295	325	A	A	A	A	A	A	A	320	A	B					
29						B	225	280	325	A	A	I380R	R	A	A	A	A	265	B					
30						B	A	A	A	A	A	A	A	400	385	360	310	265	B					
31						A	A	A	A	A	A	A	I390R	390	370	345	310	245	B					
Count						3	17	15	12	8	5	3	5	7	10	12	20	18	3					
Median						150	230	285	325	350	360	I380R	I385R	380	370	350	320	270	170					
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foE

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

K 3

IONOSPHERIC DATA

Aug. 1967 | foEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E016S	E015B	E012B	E013B	E012B	017G	G	G	J037	J086	043	056	060	045	073	046	043	J067	J088	J029	023	J036	J965	J053
2	J055	J051	J021	J029	J017	022	J041	J042	047	J089	J144	J105	J054	J055	J051	J049	J113	J088	J089	J064	J041	J051	J055	J029
3	J036	J035	J029	J025	J016	G	J032	J039	J041	045	J041	J053	068	J054	J084	J041	043	J094Y	J050	J108	J055	J028	J055	J084
4	J064	J061	J024	J018	J045	J028	J038	J041	J105	J088	J140	044	047	J086	J116	J117	J142	J108	J054	J109	J121	J085	J084	J055
5	J042	J055	J067	J084	E011B	020	029	J038	J104	085	D	070	J083	J087	J060	076	039	J051	J029	J041	J029	J055	J053	J028
6	J023	J029	J051Y	J038	J015	017	J041	J074	J061	J117	C	J042	044	044	J043	J051	036	J040	J034	039	J055	J030	J054	J050
7	J054	J054	J055	J043	J046	032	029	J056	C	D	J143	J055	J041	044	046	J054	041	035	J042	J028	J042	J050	J062	J038
8	J042	J029	J025	J018	J014	021	G	033	J041	J055	J055	J043	J055	J088	J042	J060	042	J112	J084	J106	J041	J037	J054	J054
9	J050	J042	J043	J041	J045	022	J060	J053	J167	J134	J071	J071	119M	J055	058	J053	J051	J084	J054	J062	J107	J089	J087	J038
10	J025	J034	J059	J025	J018	J054	J062	J041	J054	076	J145	091	J088	060	J048	J036	035	047M	J054	042	030M	J033	047M	J050
11	J055	J042	J052	066	J040	J037	049	035	J066	056	J088	044	047	044	045	J041	J054	051	J030	J025	J020	J025	J024	J056
12	J051	J051	J051	J036	J055	019	029	035	042	J038	J041	J055	J054	J055	048	G	038	J048	J036	J041	J021	J051	J063	J051
13	J043	J026	J061	J053	J084	J033	032	J041	J084	J104	J071	044	J064	G	G	038	036	J045	J038	J051	J024	J074	J062	J108
14	J036	J028	018	J015	C	C	C	C	C	J147	J124	J055	J067	J077	J067	J055	J038	054	J054	J050	J036	J054	J055	J089
15	J064	J055	J042	J034	J022	J037	031	J045	J040	066	077M	J061	J114	J051	042	043	J038	J053	J066	J037	J053	J054	J078	J072
16	J064	J055	J018	J031	J061	J026	029	J082	J048	084M	J084	J074	056	J041	046	042	033	030	021	J017	J018	J015	J022	J024
17	J025	J018	J016	J016	J018	J021	J029	J038	J061	J077	J084	J143	J085	J071	049	J058	J052	J054	J050	J050	J066	J050	J033	J088
18	J085	J071	J102	J123	C	C	C	C	C	046	J051	J061	067	038	038	041	J046	J041	J064	J110	J089	J084	J041	J060
19	J037	J029	J029	J026	J060	024	J054	057	J084	J078	J109	J055	J088	J122	047	J088	037	032	022	J017	J054	J052	J053	J042
20	J054	J053	J038	J074	J025	J054	J041	J054	J049	J089	J113	115M	077	J069	J063	079M	J043	J054	J038	J036	J051	J139	J053	J084
21	J064	J032	J029	J016	E011B	J025	035	J054	J054	042	044	J085	048	J051	J053	042	J087	J042	J038	J025	J029	J029	J037	J021
22	J061	J036	J030	J064	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	057	J049	039	061M	J049	G	J050	J061	J041	J067	J145	J111	J065	J089	J052
24	J070	J084	J072	J049	J030	J018	030	036	049	J049	J051	047	066	J107	C	C	C	C	J067	J084	J125	J052	J043	J055
25	J029	J063	J030	J043	J029	J026	J029	J054	J055	J090	J113	044	054	J053	041	G	036	J055	J054	J124	J110	J096	J069	J056
26	041	J018	J055	J037	J026	J018	031	038	J054	J054	J075	095	J120	J126	G	040	039	J041	J030	J030	J037	J060	J080	J105
27	J060	J061	J054	J054	J038	J029	025	033	041	J089	J055	J120	J115	J095	J045	J040	J042	J041	J050	J052	J038	J026	J028	J025
28	J041	J031	J024	J017	J016	021	G	J041	J055	069	J038	044	044	044	J041	J041	030G	J055	J028	J029	J030	J029	022	E015S
29	E015S	E012B	E013B	E011B	E	E015B	G	032	038	J041	J041	045	062	048	J042	115M	J056	035	J030	J032	J033	J052	J070	J025
30	J053	J053	J053	J025	J018	J021	J030	J039	J045	J075	J055	J070	J054	G	043	042	J058	J088	J084	J053	J041	J086	J055	J055
31	J065	J042	J043	J027	J017	J026	J029	031	J037	J037	040	040	047	J053	J093	J074	J064	J055	J053	J053	J051	J030	J030	J028
Count	30	30	30	30	27	27	27	27	26	30	29	30	30	30	29	29	29	29	30	30	30	30	30	30
Median	J050	J042	J040	J032	J022	J022	030	J041	J052	J076	J071	J055	062	J054	046	J046	J042	J051	J050	J046	J041	J052	J054	J052
U.Q.	061	055	054	049	045	029	041	054	061	089	113	074	083	077	059	059	055	061	064	064	055	065	065	060
L.Q.	036	029	024	018	016	019	029	035	041	054	046	044	054	044	042	041	038	041	034	030	030	030	041	029
Q.R.	025	026	030	031	029	010	012	019	020	035	067	030	029	033	017	018	017	020	030	034	025	035	024	031

foEs

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K 4

IONOSPHERIC DATA

Aug. 1967 | f_bEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	B	B	B	B	016G			037	040	041	054	055	042	070	041	038	060	052	020	019	025	054	046
2	053	026	016	014	015	020	037	041	041	054	052	075	045	053	046	044	A	040	068	026	037	026	040	025
3	034	026	019	015	B		025	033	040	041	040	053	063	046	072	040	040	040	041	047	040	025	015	040
4	050	041	017	016	025	025	037	035	062	053	A	043	043	067	043	055	087	035	042	056	079	046	052	050
5	026	028	026	030	B	017	025	037	A	074	A	065	064	081	051	070	038	050	027	033	020	E	026	023
6	016	017	016	015	014	016	032	040	040	046	C	041	040	040	040	048	029	038	030	026	046	022	046	019
7	020	025	039	032	014	025	026	045	C	065	056	040	040	040	043	045	037	034	040	025	015	032	040	032
8	025	019	015	012	E	016		033	038	043	040	043	045	052	039	041	040	044	A	054	032	027	041	030
9	025	018	019	016	014	016	054	045	A	065	053	070	A	052	053	048	040	045	045	033	088	A	042	029
10	016	025	026	019	016	032	034	040	053	069	A	A	066	055	045	028	027	036	040	026	018	025	040	027
11	036	034	026	034	028	030	047	035	036	051	055	043	042	039	040	040	051	027	026	022	015	016	018	041
12	040	041	025	017	014	015	027	032	037	037	039	054	046	045	044		037	046	029	017	020	025	016	027
13	028	014	027	028	047	017	027	037	A	080	065	039	055			037	035	043	037	041	017	042	055	027
14	027	019	E	013	C	C	C	C	C	A	053	054	055	073	063	050	038	050	032	040	032	037	042	060
15	026	038	034	028	016	033	027	044	040	063	A	055	074	045	041	040	036	046	059	028	045	051	030	042
16	050	025	E	018	012	014	026	041	047	A	A	058	048	040	041	037	033	028	020	015	015	E	016	019
17	016	015	E	E	013	018	026	036	060	070	051	A	069	063	046	057	050	043	045	045	045	040	030	054
18	A	046	A	045	C	C	C	C	C	040	040	054	056	E038R	E038R	040	041	036	043	065	040	040	040	045
19	026	025	026	025	028	019	054	051	063	058	082	049	059	083	046	073	036	031	022	016	E	028	025	040
20	037	040	026	021	020	030	028	036	046	055	063	A	074	063	046	074	038	028	033	028	029	026	029	041
21	027	019	017	015	B	017	032	032	036	039	040	053	047	043	045	040	053	040	031	022	026	024	019	016
22	042	033	017	050	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	050	048	039	056	046		049	059	040	045	A	064	052	025	041
24	055	043	030	025	020	015	026	036	040	047	051	046	064	A	C	C	C	C	066	075	A	042	017	016
25	017	040	025	022	012	025	026	053	054	045	052	041	051	046	040		034	040	053	087	054	065	066	050
26	040	016	030	033	021	015	026	037	053	052	075	094	A	105		038	036	040	025	029	027	039	051	041
27	040	050	036	030	029	015	025	032	040	083	055	064	070	079	045	039	035	026	021	040	023	015	015	015
28	025	025	019	016	013	016		039	052	058	038	041	040	041	040	036	020G	033	023	026	025	E	016	S
29	S	B	B	B		B		030	035	040	040	044	059	045	038	A	052	033	028	032	032	040	025	020
30	036	029	025	014	015	016	026	038	040	074	050	046	042		040	040	057	051	068	025	029	017	032	041
31	050	025	033	015	014	017	025	031	036	036	039	040	046	051	086	047	050	054	028	041	026	025	016	025
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

f_bEs | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K5

IONOSPHERIC DATA

Aug. 1967 | **f-min** | 0.1Mc | **135° E Mean Time** (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E016S	015	012	013	012	015	015	016	025	025	023	028	030	027	026	025	025	016	015	011	013	014	E015S	E015S
2	014	013	013	012	011	014	015	016	019	020	030	025	025	025	020	017	016	016	013	011	011	013	013	012
3	013	011	011	011	014	014	015	014	017	025	026	026	026	027	026	026	016	015	013	013	013	E015S	013	013
4	E015S	011	011	011	011	015	014	013	013	016	026	027	026	025	026	025	016	013	014	013	013	012	013	E015S
5	E015S	013	011	013	011	013	015	016	025	025	025	026	027	026	019	018	013	016	012	013	011	012	013	011
6	014	012	012	011	011	014	014	013	016	025	C	026	027	026	026	026	019	015	014	012	E015S	013	012	013
7	011	010	013	010	010	013	014	015	C	018	025	025	025	027	026	025	018	014	012	011	013	010	E015S	014
8	E015S	014	011	011	011	012	012	011	015	013	015	018	026	025	025	025	015	014	013	013	014	013	E015S	014
9	E015S	011	013	013	011	011	015	014	016	016	015	025	026	018	018	015	014	012	011	011	E015S	012	012	E015S
10	013	E015S	013	E015S	011	014	013	014	016	014	016	018	025	018	019	016	012	011	010	010	E015S	011	012	013
11	010	010	010	010	010	012	013	013	013	017	025	025	027	025	025	018	015	013	012	012	011	013	E015S	013
12	012	013	013	013	011	012	014	015	015	017	018	027	025	017	025	016	016	016	013	012	012	013	E015S	014
13	E015S	011	013	013	012	012	013	015	015	016	016	018	018	016	018	019	015	013	012	014	013	014	013	013
14	014	E015S	012	010	C	C	C	C	C	025	025	027	026	019	025	017	015	012	011	013	011	E015S	014	014
15	E015S	012	012	010	012	013	014	015	018	018	025	026	015	025	025	016	014	012	013	014	E015S	011	E015S	013
16	E015S	014	011	E	010	013	014	014	015	016	017	025	025	025	025	016	015	013	014	013	013	014	011	012
17	011	011	013	012	E	013	015	013	017	017	025	025	020	025	025	014	014	013	011	012	013	014	013	013
18	E015S	013	011	011	C	C	C	C	C	026	026	026	037	027	026	025	016	013	012	013	014	014	012	014
19	012	014	011	014	013	015	015	025	025	025	027	032	025	025	025	022	020	017	011	011	011	013	012	014
20	013	014	011	010	011	011	014	015	014	017	026	026	025	026	025	025	014	012	013	E015S	014	014	012	014
21	E015S	E015S	011	E	011	011	014	011	013	015	025	025	027	017	021	012	016	012	011	E015S	012	013	013	013
22	014	013	010	011	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	025	025	025	026	026	019	019	012	010	011	011	011	012	010	012
24	010	E	012	010	010	010	015	013	016	016	026	027	025	025	C	C	C	C	013	011	013	E015S	014	014
25	011	E015S	012	011	010	010	014	014	016	019	018	025	026	026	025	014	013	013	016	E015S	E015S	E016S	E015S	014
26	014	010	011	E015S	013	011	013	015	016	016	025	026	025	026	018	015	017	015	015	013	E015S	E015S	014	014
27	011	011	011	011	011	011	012	015	016	015	017	027	020	026	025	015	016	012	014	013	011	013	012	014
28	014	014	010	010	010	014	013	013	015	016	016	026	027	025	025	017	013	013	013	011	011	E015S	E015S	E015S
29	E015S	012	013	011	010	015	013	013	016	018	025	025	027	026	027	016	012	011	015	012	014	011	014	E015S
30	014	012	014	010	011	014	014	014	015	016	025	020	026	025	026	015	017	013	015	014	013	E015S	014	014
31	014	013	013	011	010	011	014	015	013	015	018	025	025	019	015	018	015	012	014	E015S	012	013	011	013
Count	30	30	30	30	27	27	27	27	26	30	29	30	30	30	29	29	29	29	30	30	30	30	30	30
Median	012	012	012	011	011	013	014	014	016	017	025	026	026	025	025	017	015	013	013	012	012	012	012	014
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K6

IONOSPHERIC DATA

Aug. 1967 | M(3000) F2 0.01 | **135° E Mean Time** (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	I270S	I285S	I290S	290	300S	315	310	300	295	290	280	270	270	280S	275	275	280	290	U305S	295	U285S	F	F
2	F	U280F	F	275	U300S	270	275	280	310	315	275	275	270	280	290	290	I290A	290	285S	300S	310S	285	270	270
3	275	285	280	280	295	305	310	305	310	275	310	285	265	270	275	280	285	285	305	305	295	290S	280	280F
4	270	F	F	U285F	F	U300R	310F	295F	295Z	280	I275A	265	270	275	270	275	U295S	305	310S	290	285S	U290S	U285F	F
5	F	F	F	F	F	315F	U295S	310	A	R	A	260	U270R	275	285	285R	300	295	290	290	305S	U290S	270	260
6	265	265F	280R	285	290	295	300	285	310	290	C	270	275	285	300	295	295	300	305	290	295	270	290	285
7	U260F	270	U295F	275F	290	295	310	310	C	290	280	275	280	290	285	295	295	295	295	305S	290	295	U270F	U275V
8	280	F	U265F	270	285	310	310	305	295	270	290	295	270	290R	290	300	300	290	I280A	290	310	310	275	F
9	280	275F	U280F	270	270F	270F	305	320F	A	U315R	285R	285	I275A	290R	290	305	315	300	295	285	315	A	F	U285F
10	F	U300F	290F	275	285	285	290	305	315	A	A	A	285	285	285	300	J285R	290	300	315	315	J280S	270	F
11	290F	F	290	280	280	295	320	330	315	315	295	320	300	300	275	285	295	300	300	295	280S	290S	265	F
12	F	U280F	U275F	F	U290F	325F	325	330	275	300	305	A	U275R	285	290	295	305	305R	300	300	290S	285F	U285F	275
13	F	F	F	F	U335S	315	335	320R	A	295	300	305	270	285	275	270	290S	300	300	300	295S	275S	U285S	F
14	U280S	U280S	U280S	285F	C	C	C	C	C	A	285	290	270	275	285	290	295	295	295	295	310	280F	265R	F
15	U290R	280F	290F	285	280	285	310	330	315	310	A	275R	285	285	290	290	295	300	305	305	300	280F	270	R
16	285	F	F	275F	F	275	305	I320R	320	A	A	300	295	275	285	295	300	325	295	300	320	295	275	265F
17	275	270	285	295	285	295	320	315	310	325	265	I270A	285	285	285	285	295	285	315R	310	300R	U270F	280	260R
18	A	285	A	275	C	C	C	C	C	285	285	290	280	280	295	305	295	285	275	310R	335	285	270R	U275R
19	265	265F	F	270F	280	295	310	310	330	295	290	275	290	280	290	290	305	300	305	295	I290S	275F	F	F
20	F	F	275F	280F	305	300	310V	315	330	320	305	A	295	290	290	285	285	295	290	300	280	270	270	F
21	275R	275	275	245	285	295	310	310	300	295	285	280	285	275	280	295R	300	290	290	300	285	275	270	275
22	260	U280R	F	U295R	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	300	300	285	280	295	280	285R	J305R	290	300	I300A	290	270	275	280
24	U280F	J270R	280	290	320	290	340	330	325	305	285	295	285	I265A	C	C	C	C	305	A	A	270R	F	F
25	280	280R	280	265	260F	265	305	320	330	295	295	290	280	275	U290R	290	285	275	U290S	U300S	280	275	275	275R
26	265R	285	275	295F	285	285	310	315	320	300	275	U270R	A	285	285	290	280	U290S	305	280	290	290	280F	F
27	F	F	275	F	285F	290	325	320	310	320	285	A	270	275	275	275	285	J290R	290	300S	285	275	275	285
28	285	270	275	280	290	290	300	310S	310R	300	290	280	275	285	285R	280	280	290R	305R	U310S	305S	265	280S	275
29	275	280	275	245	265	280	325	325	320	305	280	265	285	285	280	I285A	285	300R	315	310	270	265	260	285
30	265	270F	285	280F	275F	285	330S	335	295	290	290S	280	295	285	285	285	280	I290R	290	U305R	285	265	275	280
31	270	265F	270	275	280F	295F	310	325	325	280	285	275	285	280	285	275	290	295	305	310	265	280	270	275
Count	21	22	22	26	24	27	27	27	23	26	25	26	29	30	29	29	29	29	30	29	29	29	26	18
Median	275	280	280	280	285	295	310	315	310	300	285	280	280	285	285	290	295	295	300	300	295	280	275	275
U. Q.																								
L. Q.																								
Q. R.																								

M(3000) F2

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K7

IONOSPHERIC DATA

Aug. 1967 | M(3000) F1 | 0.01 | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	360	365L	A	L	350	A	330L	L	A	A					
2							L	L	355	A	A	A	335	A	350	L	A	L	A					
3								L	380L	335L	360	A	A	330	A	340	L	L	A					
4								L	A	A	A	330	340	A	345	A	A	L	A					
5							L	L	A	A	A	A	A	A	A	A	365	A	L					
6							L	L	355	330	L	360	355	335	355	A	345	L	L					
7							L	A	C	A	A	365	360	L	360L	L	355L	L	A					
8							L	330L	370	L	350	370	L	I355A	350	340	L	A	A					
9						L	A	A	A	A	A	A	A	A	I350A	L	L	A	A					
10							L	L	A	A	A	A	A	A	I350A	350	L	L	A					
11							A	L	L	A	A	L	L	340	320	340	A	L	L					
12							L	L	335	340	335	A	360	335	350	340	L	A	A					
13								350	A	A	A	400	I350A	355	345	360	340	A	A					
14						C	C	C	C	A	A	A	L	I350A	I355A	I350A	365	A	A					
15							L	A	370	A	A	A	A	330	350	345	340	A	A					
16							L	A	A	A	A	A	R	345	335	340	370	L	L					
17							L	L	A	A	335	A	A	A	U325L	A	A	A	A					
18						C	C	C	C	335L	345	A	A	U345L	L	L	L	L	A					
19							A	A	A	A	A	330	A	A	L	A	355	380						
20								L	A	A	A	A	A	A	335	A	330	L	A					
21							L	L	L	375L	340L	370L	350	360	330	345	A	A						
22						C	C	C	C	C	C	C	C	C	C	C	C	C	C					
23						C	C	C	C	L	L	L	A	345	L	A	A	A						
24								L	L	L	A	350	A	A	C	C	C	C	A					
25							L	A	A	L	A	355	335	345	330	335	L	A	A					
26								L	A	A	A	A	A	A	350	L	L	A						
27									L	A	A	A	A	A	340	360	340	L						
28							L		A	A	365L	360	345	355	330	360	L	L						
29								L	L	400	L	375	A	345	340	A	A	L						
30								L	L	A	L	L	L	U370L	L	365	A	A	A					
31								L	L	L	335	L	355	L	A	L	A	A						
Count								2	6	7	9	11	10	17	21	15	10	1						
Median								340L	360	340	345	360	350	345	345	345	350	380						
U.Q.																								
L.Q.																								
Q.R.																								

M(3000) F1 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Aug. 1967 | h'F2 km | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								265	300	300	310	375	365	355	340	330	305	310	280					
2							280	280	280	260	365	E400A	350	325	325	325	I340A	305	325					
3								230	270	360	300	300	385	360	350	330	320	300	270					
4								230	320	310	I330A	360	335	330	355	350	330	275	255					
5							265	280	A	E550A	A	380	330	355	315	315	300	300	280					
6							260	305	300	355	C	410	380	395	350	350	330	300	300					
7							275	270	C	330	340	355	355	325	320	305	315	310	280					
8							265	300	315	L	340	330	370	340	325	300	290	310	A					
9						340	300	250	A	305	355	370	I335A	315	310	320	280	305	305					
10							305	280	270	A	A	A	E360A	355	330	340	290H	300	290					
11							255	240	250H	280	330	275	315	330	370	355	305	275	270					
12							265	265	285	330	310	A	415	380	315	315	280	290	260					
13								275	A	430	305	300	340	340	340	330	300	275	270					
14						C	C	C	C	A	360	330	360	360	325	310	295	300	270					
15							255	255	260	325	A	355	360	340	330	320	280	280	290					
16							265	255	265	A	A	330	330	350	330	305	285	280	265					
17							250	250	275	280	440	I370A	340	325	340	310	290	280	260					
18						C	C	C	C	310	315	310	350	350	295	300	305	315	300					
19							280	260	270	285	360	360	325	345	310	310	300	260						
20								260	250	280	315	A	360	330	330	375	315	280	270					
21							280	260	255	295	315	320	320	350	330	300	275	260						
22						C	C	C	C	C	C	C	C	C	C	C	C	C	C					
23						C	C	C	C	280	300	300	320	320	345	310	295	270						
24								245	245	295	290	315	355	A	C	C	C	C	280					
25							265	260	260	275	280	305	360	350	310	305	300	300	300					
26								260	255	255	E395A	A	A	360	300	290	290	275						
27									260	A	315	A	360	350	320	305	310	285						
28							260		260	275	290	315	315	320	305	285	295	280						
29								250	255	260	265	370	310	315	315	I310A	305	275						
30								230	230	340	305	320	305	310	315	305	335	285	290					
31								250	250	250	330	300	305	305	I300A	340	300	280						
Count						1	16	25	23	25	25	25	29	29	29	29	29	29	21					
Median						340	265	260	260	295	315	330	345	340	325	310	300	285	280					
U.Q.																								
L.Q.																								
Q.R.																								

h'F2

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K 9

IONOSPHERIC DATA

Aug. 1967 | h'F | km | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	280	285	275	250	255	260	230	215	220	220	225	I220A	A	220	A	245	250	A	A	260	245	255	365	330
2	320	275	310	305	255	260	270	260	230	A	A	A	245	A	260	250	A	290	A	260	250	230	325	305
3	325	305	280	275	250	230	230	215	215	190H	200	A	A	255	A	255	260	280	A	255	250	265	270	320
4	355	330	280	275	275	250	260	215	A	I210A	I220A	230H	235	A	250	A	A	250	A	275	A	280	310	325
5	305	310	300	280	225	265	240	250	A	A	A	A	A	A	A	A	230	A	260	320	245	225	310	330
6	315	325	285	270	265	265	245	265	250	280	C	210	220	225H	220	A	225H	A	275	260	280A	295	300A	270
7	345	340	300A	300	270	275	255	A	C	A	A	190	205	185H	255	280	235	260	A	240	230	260	305	315
8	310	310	310	310	285	260	230	230	225	215	210	245	245	I210A	230	250	A	A	A	300	250	240	350	320
9	290	295	260	315	305	260	A	A	A	A	A	A	A	A	A	265	270	A	A	275	350	A	355	300
10	265	270	295	295	285	305	255	255	A	A	A	A	A	A	A	220	215	E260A	A	250	230	295	350A	340
11	350A	300	290	320A	320	280	A	225	215	A	A	215	190	195H	230	240H	A	250	260	255	255	255	270	330
12	330	325	315	290	260	230	240	240	230	215H	215	A	250A	275	255	220	255	A	A	250	250	280	300	290
13	350	310	305	275	230	255	230	230	A	A	A	195	A	220	215	230	255	A	I260A	260	240	350	330	305
14	280	295	275	275	C	C	C	C	C	A	A	A	A	I250A	I220A	A	250	A	A	270	240	320	350	355
15	250	300	290	290	280	305	240	A	225	A	A	A	A	250	225	270	235	A	A	245	260	330	290	315
16	355	280	275	295	315	260	230	A	A	A	A	A	320	210	250	255	225	225	255	250	230	210	300	330
17	305	310	280	260	270	285	230	225	A	A	280	A	A	A	335	A	A	A	A	250	265	350	300	A
18	A	340	A	375	C	C	C	C	C	220	210	A	A	235	240H	250	265	275	A	280	240	305	330	355
19	315	345	310	330	305	260	A	A	A	A	A	260	A	A	A	A	235	235	255	240	230	290	325	355
20	305	330	310	290	260	275	240	230	A	A	A	A	A	A	255	A	250	260	A	250	250	290	330	315
21	320	315	290	305	270	230	265	230	220	220	225	I245A	230	230	250	240	I240A	I250A	260	250	265	280	320	270
22	E360A	310	285	300	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	A	255	205	A	245	230H	A	A	A	260	A	E310A	E350A	310	305A
24	E355A	350A	310	280	240	255	245	240	225	265	A	280	A	A	C	C	C	C	A	A	A	330	305	305
25	290	310	275	295	310	310	255	A	A	240	I250A	225	270	225	210H	230	235	A	A	A	330	350	365	350
26	350	275	310	265	270	260	240	250	A	A	A	A	A	A	210H	250H	240	I240A	255	260	245	275	360	310
27	375	325	310	325	320	260	240	240	240	A	A	A	A	A	240	230	235	245	250	250	255	240	275	260
28	280	320	285	250	250	265	250	240	A	I230A	225	215	210	210	240	215	230	270	250	240	225	290	275	275
29	295	265	270	290	305	285	230	230	225	225	230	210	I220A	250	225	A	A	250	250	230	280	330	305	270
30	340	335	285	255	270	285	250	230	220	A	240	230	205	210	225H	230	A	A	A	250	240	260	325	300
31	I310A	335	320	275	275	265	240	230	225	210	210	205	250	A	A	250	A	A	255	240	255	280	260	295
Count	29	30	29	30	27	27	24	21	14	13	14	16	14	18	22	20	20	15	13	27	28	29	30	29
Median	310	310	290	290	270	260	240	230	225	220	225	220	230	225	235	250	240	250	255	250	250	280	310	315
U.Q.																								
L.Q.																								
Q.R.																								

h'F

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Aug. 1967 | h'Es km | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	B	B	B	B	125	G	G	120	115	120	115	115	110	110	110	135	110	110	110	110	110	110	110
2	110	105	105	125	125	120	115	115	115	110	110	110	110	110	105	105	120	115	115	110	110	105	105	105
3	105	100	100	105	105	G	120	110	110	115	115	110	110	110	110	110	130	120	115	110	110	110	110	110
4	110	110	115	110	120	120	115	110	110	110	110	130	155	130	125	125	110	115	115	110	110	110	110	110
5	105	110	110	110	B	130	125	120	115	115	115	110	110	110	110	110	145	120	115	110	110	115	115	110
6	125	125	115	120	115	140	115	110	110	110	C	110	110	110	105	105	105	125	120	115	110	110	110	110
7	110	110	110	110	110	125	120	110	C	110	110	110	110	115	110	110	110	125	110	110	110	110	110	105
8	105	105	105	115	135	120	G	120	115	115	110	110	110	110	110	110	130	115	115	110	110	110	110	110
9	110	110	110	110	110	120	115	110	110	110	110	110	110	110	130	130	125	120	115	110	115	110	110	105
10	105	105	110	105	105	110	110	110	110	110	105	105	105	105	105	110	105	105	100	100	100	100	110	105
11	105	100	105	105	115	125	120	115	115	115	115	110	110	110	110	110	110	110	105	105	105	105	105	110
12	110	110	110	110	110	150	140	145	120	110	110	110	110	130	130	G	145	120	120	115	110	110	110	110
13	105	105	110	110	110	110	160	110	110	110	110	110	120	G	G	155	135	120	115	110	110	110	110	110
14	105	105	105	125	C	C	C	C	C	110	110	110	110	110	110	110	110	125	115	110	110	110	110	110
15	110	110	110	110	130	125	130	125	120	110	110	110	110	110	165	135	130	125	115	110	110	110	110	110
16	110	110	145	120	115	130	130	115	115	110	110	110	110	110	110	110	140	130	125	110	110	105	105	105
17	105	105	105	105	115	125	120	120	115	115	115	110	110	110	135	130	110	120	105	115	115	110	110	110
18	105	105	105	105	C	C	C	C	C	110	110	110	110	110	110	135	125	120	110	110	110	110	110	105
19	130	105	100	100	100	125	115	115	110	110	110	110	110	105	110	105	160	140	125	115	115	110	110	110
20	110	110	110	110	105	105	105	120	115	110	110	110	110	110	110	110	110	110	110	110	110	120	120	110
21	110	105	105	105	B	115	120	110	110	110	110	110	110	110	120	160	125	130	130	120	115	110	110	110
22	110	105	105	105	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	110	110	110	105	105	G	145	140	125	115	110	110	110	110	110
24	105	120	120	100	100	105	140	140	120	120	115	120	120	115	C	C	C	C	110	115	110	110	110	110
25	110	110	110	105	110	110	110	115	115	115	110	115	115	120	130	G	130	115	115	110	110	110	110	110
26	110	105	105	105	105	115	130	130	120	115	115	110	110	110	G	160	140	125	110	110	110	110	110	110
27	110	105	110	105	105	105	160	135	120	115	115	110	110	110	115	115	110	115	115	110	110	110	110	110
28	105	105	100	100	105	105	G	120	115	115	110	110	110	110	110	110	105	105	105	100	105	100	105	S
29	S	B	B	B	E	B	G	150	130	110	110	115	115	110	110	110	110	130	120	115	115	110	110	105
30	105	110	110	105	105	110	110	110	110	110	115	110	110	G	170	150	130	115	115	110	110	110	110	110
31	110	110	105	110	110	110	105	130	110	110	110	120	150	135	120	120	115	110	110	110	110	105	105	105
Count	28	28	28	28	23	25	23	26	26	30	29	30	30	28	26	27	29	29	30	30	30	30	30	29
Median	110	105	110	110	110	120	120	115	115	110	110	110	110	110	110	110	125	120	115	110	110	110	110	110
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K11

IONOSPHERIC DATA

Aug. 1967 | Types of Es | **135° E Mean Time** (G. M. T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						1			c	c	c	c	c	1	12	12	h	12	12	f3	f2	f3	f4	f3
2	f2	f2	f2	ff	f	c2	c2	c2	c	12	1	12	12	12	12	12	c	c3	c3	f3	f3	f3	f2	f3
3	f4	f3	f5	f	f		c	c	c2	c	1	12	12	12	12	12	h	c	13	f	f3	f3	f3	f5
4	f4	f4	f2	f	f2	c	c4	c2	c2	12	13	h	h	h2	h2	h2	c2	c2	c3	f3	f4	f7	f5	f5
5	f2	f5	f2	f3		c	h	c2	c3	c2	c5	c2	c2	c2	c2	c3	h	c4	c3	f6	f2	f	f3	f4
6	f	f4	f2	f2	f	h	c3	c2	c2	12		1	1	1	12	12	12	h2	c3	f3	f4	f2	f4	f2
7	f2	f4	f3	f4	f3	c3	c	c3		13	12	1	1	1	12	12	12	h2	12	f4	f3	f3	f4	f5
8	f3	f2	f2	f	f	1		c	c	c2	1	1	1	12	1	12	h	c2	c3	f2	f3	f3	f5	f4
9	f2	f	f4	f2	f2	1	12	13	14	12	12	12	14	13	h	h2	h2	c2	13	f3	f5	f7	f5	f3
10	f2	f2	f2	f	f2	1	13	13	12	13	13	12	13	12	12	12	1	13	13	f3	f3	f3	f5	f4
11	f4	f3	f3	f5	f4	c4	c4	c2	c2	c2	12	12	1	1	12	12	13	12	12	f3	f2	f2	f4	f5
12	f2	f3	f3	f2	f2	h	h1	h2	c2	1	1	12	12	h1	h2		h2	c2	13	f3	f2	f2	f2	f2
13	f2	f2	f4	f3	f3	12	h14	12	12	13	12	1	h2			h	h	c2	c3	f7	f5	f5	f3	f2
14	f3	f2	f	f						12	12	1	12	12	12	12	12	h212	c4	f7	f3	f2	f3	f6
15	f3	f3	f5	f7	f2	h3	h	h3	c	c2	13	12	12	12	h	h	h	h5	c7	f5	f3	f4	f3	f4
16	f4	f4	ff	f4	f2	h	h2	c2	c2	12	12	12	12	1	1	12	h	h2	h	f	f2	f	f2	f4
17	f2	f2	f	f	f	h2	h	c2	c3	c3	c2	c2	12	12	h1	h212	1	c212	12	ff5	f4f2	f3	f7	f4
18	f2	f3	f5	f4						1	1	12	1	1	1	h	h2	c2	14	f4	f3	f4	f7	f2
19	ff4	f2	f5	f3	f2	h3	c2	c2	c3	12	12	12	12	12	12	12	h2	h2	h2	f2	f	f5	f5	f5
20	f5	f3	f3	f2	f3	14	13	112	12	c2	12	13	13	12	12	13	12	12	13	f4	f6	f2f4	ff4	f2
21	f2	f3	f2	f		c2	c2	12	12	1	1	12	12	1	c2	h	h2	h2	h6	f4	f7	f4	f4	f2
22	f3	f3	f2	f4																				
23										c2	c2	1	12	12		h2	h2	h3	c5	f4	f5	f4	f4	f4
24	f4	f2f4	f2f3	f3	f4	12	h	h2	h2	c	c	c	c2	c2					1h	f5f5	f4	f3	f2	f2
25	f3	f4	f3	f5	f2	12	12h	c3	c2	c2	c2	c	c2	c	h		h	14	12	f4	f2	f4	f6	f5
26	f6	f5	f4	f4	f3	1	h	h3	c2	c2	c2	c2	c4	c3		h	h2	h3	12	f4	f3	f4	f3	f3
27	f7	f4	f5	f5	f4	12	h	h	c	c2	c2	c3	c3	13	12	1	12h	1	1	f3	f3	f2	f2	f
28	f2	f2	f	f	f	12		c2	c2	c2	12	1	1	1	12	12	1	12	13	f5	f3	f3	f	
29								h	h2	c	c	c2	c2	12	1	13	13	h212	c5	f5	f7	f5	f2	f3
30	f2	f5	f3	f	f2	13	1	13	12	1	12	1	1		h	h	h2	c3	14	f3	f2	f2	f3	f2
31	f3	f3	f3	f	f2	12	13	h1	1	1	1	1	h	h	c2	c2	c4	c4	13	f5	f3	f3	f3	f4
Count																								
Median																								
U. Q.																								
L. Q.																								
Q. R.																								

Types of Es

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K 12

IONOSPHERIC DATA

Aug. 1967 | hpF2 | km | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	I375S	I345S	I335S	340	325S	295	310	325	335	345	380	390	380	370S	370	360	350	335	U330S	325	U345S	F	F
2	F	U375F	F	375	U335S	380	375	345	310	290	380	A	380	355	340	360	I350A	340	350S	320S	310S	330	380	395
3	380	370	330	370	330	315	320	320	310	385	325	350	415	380	370	375	360	345	330	315	320	335S	365	380F
4	390	F	F	U360F	F	U330R	310F	330F	335Z	345	I365A	380	370	360	370	375	U350S	310	300S	310	A	U345S	U365F	F
5	F	F	F	F	F	315F	U325S	310	A	R	A	410	U365R	375	365	365R	325	330	335	330	320S	U325S	385	420
6	410	415F	365R	365	345	325	325	340	325	355	C	425	380	G	350	G	355	330	330	355	330	380	345	360
7	U420F	350	U340F	375F	345	335	315	300	C	335	375	380	365	350	350	335	330	335	330	310S	340	330	U380F	U410V
8	375	F	U400F	400	370	310	310	325	340	410	345	330	395	355R	335	320	325	360	I355A	330	300	305	395	F
9	370	380F	U345F	390	400F	380F	330	285F	A	A	365R	375	I360A	345R	340	330	315	330	340	340	A	A	F	U370F
10	F	U330F	345F	370	365	350	335	315	300	A	A	A	A	365	350	350	J360R	355	330	300	290	J365S	370	F
11	360F	F	365	370	375	345	280	255	315	300	335	300	325	335	380	370	335	325	325	335	355S	330S	395	F
12	F	U365F	U380F	F	U350F	280F	295	280	400	350	315	A	G	380	340	330	315	325R	330	325	340S	365F	U375F	375
13	F	F	F	F	U270S	315	280	300R	A	A	315	320	380	365	370	380	330S	320	325	320	330S	390S	U350S	F
14	U370S	U380S	U365S	365F	C	C	C	C	C	A	365	340	385	370	350	335	325	330	325	325	300	370F	430R	F
15	U330R	360F	340F	355	365	350	310	280	295	A	A	360R	A	360	350	340	325	320	320	305	320	365F	375	R
16	A	F	F	380F	F	360	320	I290R	300	A	A	330	335	380	360	340	320	285	325	320	280	320	375	400F
17	385	395	360	330	360	345	295	310	305	A	G	I380A	330	355	360	350	330	355	310R	300	310R	U390F	350	A
18	A	355	A	390	C	C	C	C	C	330	360	335	365	365	330	325	340	360	355	315R	275	365	380R	U385R
19	380	405F	F	395F	360	325	305	305	290	330	A	395	360	370	350	335	320	320	310	330	I330S	350F	F	F
20	F	F	385F	365F	330	315	310V	285	285	300	330	A	A	345	350	A	355	330	335	315	355	390	400	F
21	355R	370	375	410	355	330	325	300	325	330	350	360	345	375	365	335R	325	335	340	325	345	370	405	375
22	420	U380R	F	U340R	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	345	340	350	360	350	360	350R	J320R	350	315	I330A	345	390	370	365
24	U390F	J395R	370	360	300	370	275	290	275	320	340	330	360	I380A	C	C	C	C	310	A	A	380R	F	F
25	375	370R	350	385	415F	390	310	290	285	325	310	340	370	380	U350R	335	345	365	U340S	A	365	375	380	385R
26	400R	350	375	325F	340	345	300	300	285	300	A	A	A	380	355	340	355	U335S	310	340	330	340	380F	F
27	F	F	375	F	370F	345	275	295	300	A	345	A	390	375	370	360	360	J345R	335	310S	340	370	375	360
28	355	400	375	355	350	350	315	305S	300R	310	330	355	365	365	350R	350	355	335R	320R	U315S	290S	385	375S	375
29	385	360	370	405	400	355	280	280	280	295	350	405	355	360	360	I365A	370	330R	320	300	375	400	395	340
30	395	400F	355	350F	380F	360	285S	265	310	A	345S	370	330	350	355	345	360	I345R	335	U315R	330	390	385	350
31	395	415F	375	370	380F	325F	310	290	290	340	365	370	355	355	I345A	380	335	340	315	290	390	350	385	375
Count	20	22	22	26	24	27	27	27	23	20	22	24	25	29	29	27	29	29	30	28	27	29	26	17
Median	380	375	365	370	360	345	310	300	300	330	345	360	365	365	350	350	335	335	330	320	330	365	380	375
U.Q.																								
L.Q.																								
Q.R.																								

hpF2 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K13

IONOSPHERIC DATA

Aug. 1967 | ypF2 | km | 135° E Mean Time (G.M.T. +9h) | Kokubunji Tokyo | Lat. 35° 42.4'N | Long. 139° 29.3'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	I070S	I085S	I070S	085	065S	080	065	060	075	050	065	090	095	080S	085	085	105	095	U065S	085	U085S	F	F
2	F	U075F	F	075	U065S	105	110	080	070	090	080	A	115	095	085	070	I080A	100	090S	075S	065S	100	090	085
3	075	080	115	090	075	065	050	080	085	075	060	095	085	095	090	080	070	100	070	075	100	095S	090	070F
4	080	F	F	U075F	F	U065R	055F	085F	075Z	100	I095A	095	090	095	100	090	U085S	090	075S	070	A	U080S	U065F	F
5	F	F	F	F	F	065F	U075S	065	A	R	A	090	U090R	075	080	075R	080	085	085	090	065S	U090S	095	055
6	080	070F	085R	065	075	085	055	100	070	065	C	050	050	G	060	G	075	095	085	070	090	080	085	075
7	U080F	080	U095F	080F	080	090	065	100	C	090	050	090	075	080	080	090	065	075	070	070S	075	080	U090F	U075V
8	075	F	U075F	080	060	065	070	070	070	095	080	085	080	065R	080	065	075	065	I090A	090	055	070	075	F
9	070	090F	U085F	100	075F	080F	070	085F	A	A	075R	075	I095A	075R	095	050	055	065	070	075	A	A	F	U055F
10	F	U070F	075F	075	065	080	080	060	070	A	A	A	A	085	110	065	J090R	090	070	060	070	J090S	090	F
11	080F	F	085	075	075	070	060	075	055	075	075	075	075	070	080	070	075	075	085	065	090S	095S	090	F
12	F	U070F	U070F	F	U090F	080F	075	070	050	055	065	A	G	050	085	075	070	065R	070	065	075S	065F	U065F	070
13	F	F	F	F	U060S	065	055	075R	A	A	070	075	085	065	105	105	095S	075	075	080	085S	085S	U075S	F
14	U060S	U080S	U070S	065F	C	C	C	C	C	A	065	070	090	100	075	080	080	070	070	070	080	060F	050R	F
15	U090R	080F	085F	085	080	080	065	060	075	A	A	070R	A	065	070	080	075	075	075	075	075	085F	085	R
16	A	F	F	085F	F	090	060	I070R	075	A	A	080	070	075	070	070	075	075	080	070	065	110	090	080F
17	065	075	085	080	075	080	060	065	080	A	G	I070A	080	070	070	095	070	075	060R	080	120R	U080F	100	A
18	A	075	A	070	C	C	C	C	C	070	070	095	080	080	065	065	065	070	085	065R	065	075	095R	U090R
19	105	095F	F	080F	095	080	075	070	055	095	A	065	070	100	075	085	075	080	075	055	I080S	090F	F	F
20	F	F	070F	075F	075	090	085V	080	055	055	060	A	A	080	065	A	095	075	070	080	085	090	075	F
21	115R	075	075	085	075	075	065	080	075	070	090	070	080	095	080	075R	070	085	095	070	090	090	065	070
22	070	U075R	F	U070R	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	065	060	095	110	075	100	095R	J080R	100	085	I090A	105	100	080	085
24	U090F	J080R	080	070	080	080	065	080	085	060	090	090	065	I095A	C	C	C	C	075	A	A	095R	F	F
25	065	080R	110	095	060F	095	070	080	055	075	095	080	085	070	U080R	080	075	085	U075S	A	090	080	075	070R
26	070R	090	070	090F	085	085	080	060	070	095	A	A	A	060	090	090	085	U095S	075	090	085	090	070F	F
27	F	F	080	F	080F	085	070	060	065	A	095	A	070	085	080	090	080	J085R	095	090S	100	085	080	070
28	080	075	080	075	080	080	075	065S	075R	090	095	090	085	070	085R	095	075	080R	075R	U075S	085S	090	075S	085
29	075	085	080	095	090	080	075	065	065	085	075	070	085	085	090	I100A	070	095R	060	090	100	080	105	085
30	085	095F	075	090F	095F	080	070S	065	090	A	065S	080	075	075	075	080	090	I070R	075	U085R	090	085	065	085
31	105	080F	090	080	065F	085F	070	060	080	105	075	085	075	085	I090A	070	085	075	065	085	095	100	085	075
Count	20	22	22	26	24	27	27	27	23	20	22	24	25	29	29	27	29	29	30	28	27	29	26	17
Median	080	080	080	080	075	080	070	070	070	075	075	080	080	075	080	080	075	080	075	075	085	085	080	075
U.Q.																								
L.Q.																								
Q.R.																								

ypF2

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

K14

IONOSPHERIC DATA

Aug. 1967 | foF2 | 0.1Mc | **135° E Mean Time** (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J096S	U089F	086S	083	J079S	075S	079	085	076	078	074	081	084	090	095	098	102	104	111	113	U093S	084	J085S	I086S
2	I085S	S	S	081S	F	U069S	063	U095S	104	078	I076A	085	096	100	094	097	096	098	I101A	J103S	I101S	080S	I090S	I092S
3	I089S	U093S	086S	075	I073S	072	072S	086	068	080	085	075	083	090	097	104	106S	111	120	120	083S	U076S	I077S	077
4	078S	082S	U083S	J079S	066S	063S	077S	084H	078	083	087S	100	095	089	096S	106	117	120	106	J097S	J097S	C	C	C
5	C	C	C	C	C	C	C	C	C	074	090	096	107	112	118	126	119	100S	104	121S	091	U071S	070S	I071S
6	U071S	U071S	I073S	I075S	077	066S	072S	080	081	081	078	084	089	092	095	099	083	080S	077	079	J079S	070S	070S	063S
7	F	059	060F	057F	053	049F	J063S	I076S	I076A	080	073S	083	096	096	092	J096S	099	092S	J094S	087S	078	068S	059	J060S
8	065	U061S	057	060F	057	059F	067	J079S	067	070	069	069	075	088	093	088	080	084	J094S	104	091S	U062S	060S	059S
9	061F	057	F	055	054	054	065S	088S	070	069	076	083	093	102	099	096	083H	079	087	U094S	I081S	065S	069S	S
10	S	S	J075S	S	S	U072S	068S	095S	083	077	078	083	084	084	094	093	095	096	111	J100S	070	065S	069	069S
11	069	U070S	062	058	061	063	071	070	073S	083	077	076	076	076	085	095	100S	087S	085	087	083	076S	U072S	070
12	066	062S	FS	FS	067	F	052	068	J074S	072	070	065	073R	080	J099S	101	100	102	099	092S	082	078	069S	063S
13	F	S	S	079S	062F	038	048S	J065S	074	082	075	076	075	077	084	098	109	116	114	101	087	083S	I077S	I072S
14	J077S	J071S	071S	071S	066	058S	065	082	082S	077	079	084	U090R	099	103S	108	107	110S	102	094S	I078A	063S	I065S	J067S
15	I067S	J060S	U060S	059F	F	FS	S	085F	091	I070A	I075C	I082A	I090A	I096A	107	113	104	106	110	114	082	I069S	067	S
16	FS	S	FS	U067S	FS	S	U062S	086S	095	074S	074	U079R	087	099	110	113	107	108	115	120S	103	U063S	058	061
17	J062S	063S	061S	060	054	048	057	085	081	I075C	U070C	083C	I094C	102C	I102C	105	107C	112	106C	I092C	I075C	U068S	069S	I061S
18	C	I069C	063	058	056	054	060S	085	092	085	I093C	093C	I098C	I103C	103	091	091	090	095S	100	088S	I066A	061F	066
19	S	F	F	060S	061	059F	070S	085S	090S	087	089V	098	115	120	J124R	128	122	107	099	099S	087	073	U074S	069
20	065	069	I068S	062F	059	051F	061	082	080	088	C	C	C	C	C	C	C	C	C	095S	082	067	062	063H
21	F	060	064	060	058	056	065	080	077	080	087	094	102S	103	112	110	107	108	105S	I099S	089	I078S	075	080
22	084S	086S	U087S	084	067S	049	056	080	093	082	082	087	102	107	099	097	103	107	110	100	074S	071S	072S	S
23	S	076S	081	U072S	058F	057S	061	U090S	094S	094	091	097	108	114	118S	121	121	112	108	107	084	U070S	U072S	J074S
24	075S	J073S	069S	067	057	050	058	078	080	078	081	087	092	095	103	114	114	111	110	102S	092	078S	083S	085S
25	I088S	091S	095Z	083S	068S	I071S	I078S	095S	094S	I079A	I084A	086	096	108	117	107	101	103	107	115	I099S	087	J082S	084
26	081S	083	J077S	070	064S	059	072S	087	082	076	078	102	122	128	128	124	130	129	131S	123	114	J095S	070S	085V
27	J081S	081S	J079S	069	062	060	I075S	077	086	084	I085A	098	108	112	111	110	114	118	J135S	116	J086S	082	084	086
28	084S	078S	077S	U074S	064	055	066	095S	092	085	088	100	110	112	112	120	118S	123	118S	113	083S	078S	I079S	I076S
29	068S	068S	U066S	062S	060S	062	U088S	096S	082V	075	080S	097	107	117S	122	132S	137S	147S	131S	105	085S	I081S	081	080S
30	U070S	I071S	I071S	U063S	055F	055F	U072S	078	081	096	J098S	105	101	093S	097	101	I102A	110	116S	I102A	090S	072S	I073S	I069S
31	066	U063S	065	FS	S	S	I081S	U094S	083	086	I087C	101	110	107	103	112	113	116	118S	J107S	I098S	J088S	091	086
Count	22	25	24	27	25	26	29	30	30	31	30	30	30	30	30	30	30	30	30	31	31	30	30	27
Median	073S	071S	071S	067	061	058	066S	085	082	080	080	086	096	100	102	106	106	108	108	102	086	072S	072S	071S
U.Q.	084	082	080	075	066	063	072	088	091	084	087	097	107	108	112	113	114	112	115	113	092	080	079	084
L.Q.	066	062	064	060	057	054	061	079	076	075	075	082	087	090	095	097	100	098	099	095	082	068	069	063
Q.R.	018	020	016	015	009	009	011	009	015	009	012	015	020	018	017	016	014	014	016	018	010	012	010	021

The Radio Research Laboratories, Japan

foF2

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

Y 1

IONOSPHERIC DATA

Aug. 1967 | foF1 | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	500L	530	530	540H	540	540L	550L	530H	500H	L					
2							L	A	470L	A	A	550	540	530	550H	A	490H	I470A	A	L				
3								L	L	520	550H	LH	550	540	530	530	500	470	L	A				
4								L	LH	LH	600L	530H	540	510	520	A	A	A	A	A				
5								C	C	L	530H	I530A	560L	530	530H	520H	490	L	360L					
6							L	L	L	L	LH	530H	540	I520A	510	I500A	490H	480H	L	A				
7							L	L	A	500L	LH	520	I520A	540H	520H	L	480L	450	L					
8								L	LH	LH	I500A	500	510H	510	500	500	510L	460L	A					
9								A	430H	510H	520H	500	520	510	510H	470	I470A	A	L					
10							A	LH	L	A	A	A	A	A	A	I500A	I490A	A	380					
11								A	A	I490A	L	A	550H	520	520	520	460	U450L	L					
12								A	L	A	A	L	A	500	510H	520	480	A	L					
13								L	460	480H	500	520	510	520H	530	500	A	450L	L					
14							A	A	L	L	540L	520L	550L	500L	I520A	500	490H	450L	A	A				
15								A	A	A	C	A	A	A	530	500	510L	A	L					
16							A	A	450	A	A	530	520	490	510	A	I500A	460L	A					
17								LH	L	L	590H	510C	540	520C	A	A	L	A	A					
18								A	A	L	540L	530	C	A	A	540	500	A	A					
19								A	L	L	490	L	540	560H	L	520	490L	A	A					
20								L	L	500	C	C	C	C	C	C	C	C	C					
21								L	L	L	520L	550L	L	560	550H	550H	490H	480L	L					
22								L	L	U500L	LH	LH	LH	540	540	560	510H	480	A					
23								L	L	490L	U530L	520	570H	570L	550L	530H	520L	L	L					
24								L		500L	LH	LH	L	560	550	I530A	I510A	440L	L					
25									A	A	A	A	A	A	540L	530	510L	A	L					
26								L	L		L	580L	A	A	A	A	550L	LH	A					
27									L	A	A	A	A	A	500	520H	530H	A	A					
28								L	L	500L	L	U600L	L	U570L	580L	540	LH	L	A					
29									L	490L	600H	560H	530L	540L	U550L	570L	LH	U460H	A					
30									L	LH	A	A	A	A	590L	A	A	A	A					
31									LH	LH	C	610H	590L	570	650L	530	A	A	A					
Count									4	12	14	19	18	23	25	23	23	14	2					
Median									460	500L	530	530	540	530	530	520	500	460L	370L					
U.Q.																								
L.Q.																								
Q.R.																								

foF1 | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y2

IONOSPHERIC DATA

Aug. 1967 | foE | 0.01Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						E	S	270	310	345	365	370	380	370	355	A	A	A	A	A				
2						B	S	255	310	335	B	A	A	A	R	370	340	300	240	B				
3						B	170	240	290	320	A	A	A	A	A	A	A	305	250	B				
4						E	150	250	290	330	I370A	I390A	390	400R	385	370	335	300	235	A				
5						C	C	C	C	345	370	385	385	390	375R	355	335	300	250	B				
6						E	A	A	A	330	A	A	A	A	A	A	335	300	250	A				
7						B	150	250	290	320	360	A	A	A	A	A	A	300	245	A				
8						B	S	255	300	325	330	A	A	A	A	A	A	295	225	B				
9						B	A	A	A	A	350	380	380	380	370	355H	330	295	A	B				
10						B	A	A	A	A	A	A	A	A	A	A	A	A	240	B				
11						E	160	230	290	320	340	A	A	A	A	A	320	I280A	A	B				
12						B	B	240	280	320	340	360R	370R	380	370R	350	330	290	230	B				
13						E	A	240	A	A	A	A	A	380	375	360	335	290	230	B				
14						E	150	255	300	310	350	355	365	365	I355A	I350A	330	I280A	230	B				
15						B	A	240H	290	320	I330C	335	A	A	A	A	325	290	220	B				
16						E	S	245	I290A	310	340	350	A	A	A	A	A	A	A	B				
17						B	135	230	280	A	A	C	C	C	A	A	330	290	A	C				
18						E	C	240	280C	A	A	A	C	A	A	R	A	295	220	B				
19						E	B	260	I305A	330	A	A	A	A	A	A	A	A	A	E				
20						S	S	260	310	345	C	C	C	C	C	C	C	C	C	B				
21						E	170	250	290	A	A	A	400	A	A	I360A	330	I280A	225R	S				
22						B	S	260	315	340	350	370	385	390	385	360	345	300	220	B				
23						E	B	250	300	I325A	350	A	A	A	390	360	335	295	230	S				
24						B	S	270H	310	335H	360H	370	I380A	I370A	360	350	330	290	230	S				
25						E	B	260	310	I340A	360	380	380	380	375	365	340	295	215	S				
26						S	A	255	300H	330H	350	370	375	375	370	350	330	300	225	B				
27						B	S	260	310	335	360	370	370	I365A	360	360	335	300	190	E				
28						E	B	250	300	340	350	A	A	A	A	A	A	295	A	S				
29						B	150	260	310	345	365	380	385	385	365	350R	335	285	230	S				
30						B	S	250	305	345	360	I370A	370	380	I375A	I360A	340	290	210	B				
31						B	B	A	280	320	C	A	390R	I400R	390H	360H	340	290H	200	S				
Count						13	8	26	26	25	20	15	15	15	16	17	21	26	23	2				
Median						E	150	250	300	330	350	370	380	380	370	360	335	295	230	E				
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 3

IONOSPHERIC DATA

Aug. 1967 | foEs | 0.1Mc | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	021	J029	J025	J024	J022	021	021	030	040	J048	J055	046	047	046	J048	J053	041	037	J034	J025	J025	047M	J060	J096
2	J044	J042	J027	J026	J024	J049	J052	J064	J045	J058	J093	J049	J060	J055	037G	052	053	J143	J133	J058	J098	J085	J058	J039
3	J026	J030	J026	J024	020	020	021	030	036	041	043	J061	050	050	J046	072	J046	034	032	J043	J074	J068	J061	J045
4	J024	J024	J036	J030	J025	J027	020	033	J054	038	J046	040	047	049	052	060	J099	J087	J056	076	J026	C	C	C
5	C	C	C	C	C	C	C	C	C	050	040	J062	040	047	G	G	G	G	030	024	020	038	030	019
6	J021	J018	022	J018	J029	J032	J051	J034	J038	038	065	060	049	078	041	053	038	034	029	J031	J025	J030	J056	J044
7	J030	J030	J024	020	012	J025	J038	J052	087	J056	040	J056	J103	044	045	056	J046	040	031	028	J025	J026	J040	J029
8	J052	J030	018	J022	J027	020	026	030	032	035	J084	047	J082	J045	J056	047	J049	J047	J049	J039	J031	J029	J029	J029
9	021	J041	J027	J058	J045	J059	J052	J086	J052	J062	039	044	042	045	043	043	J079	J051	J061	J029	J079	J068	J041	J071
10	J058	J050	J038	J046	J026	J045	J055	J074	J044	075	J094	J089	J069	071	J101	J079	J058	073	030	J043	J035	J033	J031	J038
11	J025	020	020	J022	E015B	J024	J044	J042	072	055	J079	J071	J048	J044	J056	J042	030G	J034	J038	J029	J028	022	022	019
12	J060	J056	J053	J030	J052	E014B	J047	J051	J044	062	J067	054	055	042	051	G	G	J061	028	021	J025	018	J034	J057
13	J030	J039	J059	J028	J030	014	J029	029	J047	036	J054	J050	049	050	045	046	J067	045	026	016	J058	J033	020	J067
14	J044	J040	J022	014	013	013	J064	J071	J056	J064	058	100	J051	J073	J065	050	036	039	J041	J064	J085	J107	J099	J061
15	J083	J062	J061	J043	J029	J044	025	J055	J056	J075	C	J099	110	113	J067	046	048	J052	033	026	J033	J053	J051	E015S
16	J022	J026	J056	J050	J025	019	J039	J055	J053	060M	J055	J053	J059	J044	J046	J052	J059	J057	J044	J028	J026	J031	021	022
17	J029	017	019	020	021	E015B	020	029	J043	034	042	040C	E043C	E042C	092C	086C	050	053	045	J054	J055	J045	J064	J063
18	J079	J071	034	J028	027	J065	J055	J042	060	J045	038C	049	C	069C	J065	047	038	J054	J043	J027	J052	J082	J043	J040
19	J030	J034	J029	J041	J031	J056	J041	J088	J074	070	J054	J085	J079	J085	J048	J070	053	J086	J068	J053	021	021	021	020
20	J054	J032	J046	J034	J028	J035	J072	035	J046	048	C	C	C	C	C	C	C	C	C	J025	J059	J037	023	022
21	J034	J031	J026	021	020	018	020	028	034	J043	J061	J062	J051	J055	J039	J040	J037	J044	033	J035	J036	J021	021	J024
22	J052	J028	J029	021	J019	021	019	034	035	043	043	051	055	060	044	G	G	039	J051	J048	J037	J034	J044	061
23	J041	J024	J024	021	J020	J026	J030	J047	J067	060	J061	069	J047	J042	034G	035G	027G	033	029	024	020	018	021	J024
24	J024	021	021	016	E	E011B	020	029	038	042	043	047	J059	J056	045	054	J064	042	J056	J046	J029	J063	J058	J054
25	J055	J056	J072	J063	J064	J058	J032	038	J056	J152	095	J086	065	J079	059	038	042	J054	039	J025	J034	J044	J034	J052
26	J040	J031	J044	J041	J040	J040	J050	034	038	046	050	051	J081	J094	J095	J122	045	033	J052	J081	J053	J060	J076	J078
27	J049	J033	J029	J030	J025	J021	E015S	030	039	J060	J112	J085	J122	J153	048	J051	040	J059	J053	J043	J053	J043	J041	J034
28	J026	J038	J021	J026	J034	J034	025	030	J054	J053	J053	J055	J061	047	J054	J045	045	044	J051	J049	J037	J041	J052	J028
29	J036	J026	J024	021	020	022	022	020G	J032	037	040	042	043	048	044	047	042	J060	J047	J056	J033	022	J060	023
30	J025	J051	J041	J022	019	020	020	J042	J042	057	105	J105	J116	J071	J064	J070	J166	J168	J102	166M	J107	J051	J085	J061
31	J061	J028	J035	J025	022	021	J024	J036	034	J053	C	J042	044	046	045	052	J065	J069	J053	J029	J063	J071	J064	J031
Count	30	30	30	30	30	30	30	30	30	31	28	30	29	30	30	30	30	30	30	31	31	30	30	30
Median	J035	J031	J028	J026	J025	J023	J030	J036	J044	053	J054	J054	J055	050	048	050	046	J049	J044	J035	J035	J040	J042	J038
U.Q.	052	041	041	034	029	040	050	052	056	060	073	071	074	071	059	056	058	060	053	053	058	060	060	061
L.Q.	025	026	024	021	020	020	021	030	038	042	043	047	047	045	044	043	038	039	032	026	026	029	029	024
Q.R.	027	015	017	013	009	020	029	022	018	018	030	024	027	026	015	013	020	021	021	027	032	031	031	037

foEs

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y4

IONOSPHERIC DATA

Aug. 1967 | **f_bEs** | 0.1Mc | **135° E Mean Time** (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	018	015	015	017	014	G	G	038	041	046	041	042	045	045	051	040	035	031	019	017	043	040	062
2	028	017	016	019	E	029	050	054	040	053	A	042	042	043	E037R	049	G	065	A	018	025	043	046	034
3	022	030	024	022	E	E	G	G	G	038	039	044	048	045	043	043	039	033	032	030	041	034	024	022
4	021	015	024	022	017	016	G	G	040	G	039	040	043	047	050	060	088	081	053	071	023	C	C	C
5	C	C	C	C	C	C	C	C	C	045	G	E062R	G	044					028	023	016	021	029	E
6	020	016	018	015	015	021	021	027	032	G	041	040	040	073	040	053	037	033	028	025	023	017	025	026
7	021	030	016	016	E	015	026	035	A	037	039	041	065	043	043	048	039	036	030	027	017	025	027	028
8	025	023	E	017	017	G	023	G	G	G	058	040	044	041	041	039	039	042	040	039	028	027	018	022
9	E	019	015	022	030	016	026	043	032	035	G	042	040	040	040	G	059	049	036	020	E079S	035	041	031
10	034	026	034	032	016	030	049	028	040	059	071	054	063	066	079	074	053	046	028	043	022	022	018	027
11	E	E	E	014	B	019	020	035	065	051	055	055	046	038	040	040	029G	030	028	023	018	E	016	E
12	022	022	027	014	022	B	043	047	038	052	063	049	055	041	044			054	028	019	023	015	025	029
13	024	021	025	022	023	014	020	G	033	036	039	046	045	041	043	045	065	041	G	016	029	028	E	031
14	025	019	015	E	011	013	041	071	042	037	049	045	045	045	063	042	036	039	040	062	A	024	042	038
15	032	033	024	017	023	030	023	054	055	A	C	A	A	A	046	042	046	051	032	025	033	019	034	S
16	E	019	023	026	015	014	033	043	042	052	052	047	044	041	044	050	054	037	038	026	023	025	E	E
17	019	E	015	E	E	B	G	G	039	E034C	042	E040C	C	C	E092C	075	048	050	045	054	043	030	057	045
18	035	041	021	023	022	032	041	041	056	042	E038C	044	C	E069C	057	045	037	050	040	025	029	A	017	026
19	E	019	022	028	016	023	024	042	034	044	039	056	049	044	042	045	037	057	061	035	E	E	E	E
20	019	022	039	024	020	019	026	032	042	040	C	C	C	C	C	C	C	C	C	021	039	025	020	E
21	026	027	018	012	E	E	G	G	G	039	041	041	037	043	039	038	029	039	032	034	028	E	E	E
22	E	022	017	017	E	E	G	033	034	040	G	047	047	046	042			034	043	045	028	016	E	043
23	016	021	017	E	016	022	029	033	042	040	042	042	042	041	034G	034G	027G	032	029	024	E	E	E	019
24	023	E	E	E		B	G	G	036	041	041	044	054	054	043	054	062	036	035	030	025	047	028	025
25	037	032	032	028	024	031	026	G	050	A	A	080	056	061	051	G	041	048	037	021	030	035	033	038
26	037	028	035	024	040	039	039	032	036	044	046	047	078	093	093	119	043	032	050	045	032	034	046	040
27	022	025	018	015	015	015	S	G	035	053	A	075	097	105	046	041	040	048	049	042	025	021	039	029
28	022	019	E	013	021	E	022	G	043	044	043	050	058	044	053	044	043	042	040	041	032	030	029	025
29	026	023	017	015	015	E	013	019G	027	G	G	041	043	044	043	045	040	032	037	054	032	E	043	015
30	016	018	015	017	E	E	017	021	040	043	084	092	055	071	050	060	A	103	065	A	042	045	034	033
31	024	023	027	015	013	E	020	031	G	029	C	040	044	044	044	046	052	056	040	025	028	040	029	027
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

f_bEs

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y5

IONOSPHERIC DATA

Aug. 1967 | f-min | 0.1Mc | 135° E Mean Time (G.M.T.+9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E015S	E015S	011	E	E	E	E015S	015	015	022	023	025	028	029	023	023	022	015	015	011	E015S	E015S	E015S	E015S
2	E015S	014	014	E	014	015	E015S	015	016	018	037	022	022	025	024	023	021	017	015	014	E014S	E015S	E015S	E015S
3	E015S	014	014	E	014	014	E014S	015	015	015	022	023	026	025	025	025	023	017	015	013	E013S	E014S	012	E013S
4	E015S	012	E	E	E	E	E014S	013	015	022	022	024	024	023	023	022	019	017	015	012	012	C	C	C
5	C	C	C	C	C	C	C	C	C	018	018	025	023	025	024	022	017	015	016	015	012	E014S	014	E015S
6	013	011	011	E	E	E	014	012	014	015	017	018	024	024	023	025	022	016	015	011	011	E015S	E015S	E015S
7	E014S	E015S	014	E	E	012	013	015	015	018	018	024	022	026	024	022	019	016	022	012	E015S	014	E015S	E015S
8	E015S	014	015	011	E	014	E015S	014	014	014	015	023	024	023	025	024	022	014	015	014	014	E015S	014	E015S
9	E015S	014	014	E	E	014	012	014	016	015	022	024	023	023	022	017	015	014	014	014	015	015	015	015
10	014	014	011	E	014	014	014	014	014	015	017	021	025	024	022	022	017	014	012	014	014	014	015	015
11	E015S	014	015	011	015	E	012	012	014	015	016	021	021	023	022	022	015	014	015	015	E014S	E015S	E014S	E015S
12	014	013	011	E	E	014	013	015	014	015	021	022	025	023	022	022	020	015	015	013	015	014	015	014
13	013	014	E	E	E	E	013	011	013	016	015	023	022	025	022	022	016	014	015	014	014	015	015	015
14	014	014	E	E	E	E	013	015	015	018	022	024	024	023	023	017	018	015	014	014	014	E015S	E015S	E015S
15	015	011	011	014	E	014	012	015	015	015	C	022	024	023	022	016	016	014	014	012	014	E014S	E014S	E015S
16	015	012	014	E	E	E	E015S	014	015	015	018	023	023	023	023	022	015	015	014	014	E015S	E015S	E015S	E014S
17	E015S	E015S	E	E	015	015	012	014	014	E024C	E025C	E035C	E043C	E042C	E034C	E028C	E024C	E015C	E014C	E013C	E015S	E015S	E015S	E013S
18	E015S	E015C	E	E	E	E	E013C	E017C	E021C	E028C	E032C	E031C	C	E036C	025	024	022	015	013	011	E014S	E015S	E014S	E015S
19	E015S	015	011	E	E	E	012	015	016	023	018	024	025	024	023	023	023	014	012	E	E015S	E015S	E015S	E015S
20	E015S	015	015	015	E	E014S	E015S	016	018	018	C	C	C	C	C	C	C	C	C	012	014	014	E015S	E015S
21	015	E014S	E	E	E	E	E013S	012	014	015	018	019	023	024	022	016	015	015	012	E015S	E015S	E015S	E015S	E015S
22	E015S	E015S	E	E015S	E015S	012	E015S	E015S	014	015	017	022	023	022	017	016	015	013	014	012	E015S	E015S	E014S	E015S
23	E015S	E015S	014	015	E	E	013	014	015	015	024	025	024	023	022	019	017	014	014	E015S	E015S	E014S	E014S	012
24	E015S	E015S	E015S	E	E	011	E015S	015	016	015	024	022	023	022	018	015	015	011	015	E015S	E015S	E014S	E015S	E015S
25	E015S	012	013	E	E	E	012	014	014	018	015	018	023	017	017	014	019	011	014	E014S	E014S	E014S	E015S	E014S
26	E015S	012	014	014	E	014	011	012	015	015	018	023	023	018	023	017	017	015	015	014	E014S	E015S	E015S	014
27	E014S	011	014	E	E	011	E015S	012	015	015	021	018	017	018	024	017	015	015	012	E	E015S	012	E014S	E015S
28	E015S	E014S	014	011	012	E	013	014	014	015	017	017	017	024	018	015	015	014	011	E015S	E015S	012	E015S	E015S
29	E015S	013	012	011	E	015	012	015	015	015	015	018	023	024	018	016	014	012	011	E015S	014	E015S	E015S	012
30	E015S	E015S	E	E	011	011	E015S	012	015	015	018	017	023	024	023	022	015	013	014	014	011	013	E015S	E015S
31	014	014	E	E	E	012	012	012	013	017	C	023	022	023	017	015	015	012	014	E015S	E015S	E015S	E015S	E014S
Count	30	30	30	30	30	30	30	30	30	31	28	30	29	30	30	30	30	30	30	31	31	30	30	30
Median	E015S	013	012	E	E	011	012	014	015	015	018	022	023	024	022	022	017	014	014	013	E014S	E015S	E015S	E015S
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y6

IONOSPHERIC DATA

Aug. 1967 | M(3000) F2 | 0.01 | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J280S	U290F	280S	285	J295S	300S	315	320	315	330	295	285	275	275	275	275	275	280	290	305	U305S	270	J270S	I280S
2	I275S	S	S	270S	F	U305S	280	U300S	330	310	I265A	265	270	285	275	280	290	290	I295A	J300S	I290S	295S	I275S	I275S
3	I280S	U270S	290S	280	I280S	295	330S	350	340	300	295	255	260	265	270	270	285S	290	300	320	305S	U265S	I265S	260
4	270S	270S	U300S	J295S	275S	275S	300S	315H	310	295	260S	295	280	265	280S	285	295	310	310	J290S	J305S	C	C	C
5	C	C	C	C	C	C	C	C	C	270	270	265	270	280	280	290	295	285S	285	320S	305	U270S	270S	I270S
6	U265S	U270S	I275S	I285S	310	290S	300S	300	320	290	270	275	270	275	285	285	290	290S	300	290	J290S	275S	285S	270S
7	F	270	285F	275F	285	285F	J305S	I310S	I300A	305	295S	270	285	280	285	J280S	300	300S	J310S	320S	295	290S	260	J265S
8	270	U275S	270	280F	280	300F	320	J320S	330	305	315	290	280	290	300	300	275	280	J280S	310	330S	U260S	275S	270S
9	280F	280	F	270	270	280	310S	360S	335	305	290	290	280	280	285	295	280H	290	295	U310S	I305S	260S	260S	S
10	S	S	J295S	S	S	U280S	295S	325S	300	310	300	285	295	260	275	275	265	290	305	J320S	300	295S	260	260S
11	260	U280S	290	265	280	300	325	330	315S	340	285	305	300	280	270	280	300S	300S	295	300	280	275S	U265S	270
12	275	275S	FS	FS	315	F	310	310	J325S	320	320	290	260R	265	J285S	290	290	285	295	305S	285	285	280S	270S
13	F	S	S	300S	325F	315	315S	J315S	325	330	310	290	295	285	255	265	285	300	300	305	300	295S	I290S	I280S
14	J285S	J270S	280S	280S	290	300S	300	315	300S	300	285	285	U265R	280	275S	285	290	295S	305	315S	I295A	270S	I280S	J285S
15	I285S	J300S	U280S	300F	F	FS	S	325F	335	A	I295C	I280A	I280A	A	275	295	290	290	290	335	295	I270S	295	S
16	FS	S	FS	U265S	FS	S	U305S	305S	345	330S	305	U280R	270	275	280	290	290	295	305	320S	350	U290S	265	275
17	J270S	270S	285S	310	305	280	310	330	325	I320C	U270C	265C	I275C	290C	I285C	285	300C	305	310C	I320C	I290C	U270S	285S	I260S
18	C	I275C	270	255	250	265	290S	310	315	295	I285C	280C	I275C	I280C	290	290	295	300	295S	300	310S	I280A	250F	275
19	S	F	F	275S	270	290F	315S	305S	320S	310	290V	260	285	285	J280R	290	300	300	290	290S	295	275	U270S	280
20	275	260	I280S	275F	295	300F	320	340	325	330	C	C	C	C	C	C	C	C	C	305S	295	290	260	270H
21	F	250	270	270	280	285	310	325	325	315	310	275	280S	265	280	280	280	295	295S	I305S	310	I290S	265	270
22	270S	285S	U305S	320	315S	295	315	330	355	315	295	275	285	290	275	290	280	300	310	310	285S	260S	250S	S
23	S	265S	295	U305S	280F	280S	295	U320S	325S	320	300	280	280	280	275S	285	280	295	300	310	300	U255S	U265S	J270S
24	275S	J275S	305S	310	305	300	320	325	340	320	285	275	270	265	270	280	285	295	290	295S	305	265S	265S	270S
25	I275S	275S	280Z	290S	265S	I280S	I300S	315S	340S	A	A	285	265	285	290	285	275	270	280	300	I290S	275	J255S	260
26	260S	280	J285S	280	285S	275	290S	320	330	305	270	265	280	290	290	A	285	290	300S	310	300	305S	260S	265V
27	J260S	265S	J265S	280	270	285	I310S	325	315	335	I285A	275	275	270	275	270	280	280	J310S	325	J280S	260	275	270
28	270S	260S	260S	U270S	280	290	305	315S	335	310	285	280	280	285	270	285	280S	300	305S	310	295S	255S	I270S	I280S
29	270S	280S	U275S	270S	265S	290	U330S	355S	355V	325	280S	285	275	280S	285	280S	285S	300S	320S	335	290S	I255S	270	290S
30	U275S	I260S	I275S	U305S	275F	275F	U320S	320	305	300	J305S	295	290	280S	275	280	I265A	280	310S	I310A	300S	275S	I270S	I275S
31	265	U265S	280	FS	S	S	I315S	U350S	330	315	I285C	280	280	290	265	285	285	285	295S	J290S	I280S	J265S	275	275
Count	22	25	24	27	25	26	29	30	30	29	29	30	30	29	30	29	30	30	30	31	31	30	30	27
Median	270S	270S	280S	280	280	290	310S	320	325	310	290	280	280	280	280	285	285	290	300	310	295	270S	270S	270S
U.Q.																								
L.Q.																								
G.R.																								

The Radio Research Laboratories, Japan

M(3000) F2 | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation | Y7

IONOSPHERIC DATA

Aug. 1967 | M(3000) F1 0.01 | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L	L	360L	370	380	370H	370	350L	A	325H	330H	L					
2							L	A	370L	A	A	350	360	375	340H	A	345H	A	A	L				
3								L	L	345	345H	LH	345	355	360	335	340	330	L	A				
4								L	LH	LH	325L	330H	365	A	A	A	A	A	A	A				
5								C	C	L	360H	A	330L	355	330H	325H	355	L	360L					
6							L	L	L	L	LH	350H	345	A	355	I340A	350H	335H	L	A				
7							L	L	A	350L	LH	380	I370A	345H	335H	L	355L	345	L					
8								L	LH	LH	I365A	395	345H	365	360	350	335L	A	A					
9								A	370H	355H	365H	380	365	370	355H	380	A	A	L					
10							A	LH	L	A	A	A	A	A	A	A	A	A	345					
11								A	A	I360A	L	A	350H	365	345	335	370	U335L	L					
12								A	L	A	A	L	A	390	355H	330	345	A	L					
13								L	350	355H	360	345	370	365H	340	340	A	A	L					
14							A	A	L	L	A	355L	335L	380L	A	350	335H	A	A	A				
15								A	A	A	C	A	A	A	320	350	A	A	L					
16							A	A	A	A	A	370	385	390	350	A	A	345L	A					
17								LH	L	L	340H	390C	335	345C	A	A	A	A	A					
18								A	A	L	350L	360	C	A	A	335	340	A	A					
19								A	L	L	395	L	365	330H	L	345	325L	A	A					
20								L	L	360	C	C	C	C	C	C	C	C	C					
21								L	L	L	375L	355L	L	345	355H	335H	345H	A	L					
22								L	L	U380L	LH	LH	LH	350	355	325	335H	340	A					
23								L	L	370L	U370L	385	350H	335L	360L	340H	330L	L	L					
24								L		360L	LH	LH	L	A	340	A	A	345L	L					
25									A	A	A	A	A	A	A	340	335L	A	L					
26								L	L		L	330L	A	A	A	A	330L	LH	A					
27									L	A	A	A	A	A	400	345H	330H	A	A					
28								L	L	390L	L	A	L	U345L	A	335	LH	L	A					
29									L	385L	360H	355H	370L	360L	U335L	335L	LH	U350H	A					
30									L	LH	A	A	A	A	335L	A	A	A	A					
31									LH	LH	C	330H	320L	335	310L	375	A	A	A					
Count									3	12	13	17	18	20	21	20	18	9	2					
Median									370	360L	360	355	355	360	350	340	340	340	350L					
U.Q.																								
L.Q.																								
Q.R.																								

M(3000) F1 Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Aug. 1967 | h'F2 | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								265	255	275	340	340	355	350	345	345	330	320	290					
2							E370A	290	250	275	A	350	355	325	350	345	325	315	I300A	260				
3								250	245	320	325	450	380	355	350	350	305	310	280	250				
4								255H	275	305	360	300	350	305	370	330	330	290	275	E310A				
5								C	C	320	350	340	350	345	330	315	300	300	300					
6							270	250	255	290	350	370	365	350	335	325	305	320	280	270				
7							280	240	A	300	320	380	330	330	340	330	305	300	280					
8								300	255	300	300	350	370	335	305	315	340	335	300					
9								245	265	300	325	350	350	340	320	305	300H	340	300					
10							300	265	240	290	I315A	350	325	E390A	375	350	340	305	275					
11								230	I275A	260	330	300	345	375	370	330	300	295	290					
12								270	270	280	E325A	L	350	400	330	310	310	305	270					
13								240	275	275	300	335	330	355	400	365	330	290	270					
14							280	E300A	255	270	340	325	360	335	350	320	305	280	270	270				
15								255	250	A	C	A	A	A	350	310	320	300	275					
16							275	275	250	260	330	310	350	355	330	310	305	295	275					
17								265	265	275	420	380	350	330	I330A	335	300	295	270					
18								275	260	290	310	300	I345C	I330C	305	315	315	305	290					
19								255	255	260	290	390	330	320	320	305	295	285	295					
20								240	250	270	C	C	C	C	C	C	C	C	C					
21								255	250	280	315	280	325	350	330	325	300	300	265					
22								255	250	255	330	320	330	305	325	340	320	300	275					
23								250	265	270	290	305	330	340	330	330	315	300	280					
24								240		270	325L	350	340	380	355	335	300	295	270					
25									245	A	A	I320A	345	330	320	320	320	305	295					
26								245	250		360	365	330	330	330	I345A	310	280	275					
27									240	250	I340A	365	I335A	I350A	340	335	330	310	275					
28								245	250	255	325	330	315	325	350	320	305	300	255					
29									245	250	370	345	300	330	325	320	310	290	250					
30									290	295	E325A	E350A	305	E345A	355	330	A	I320A	270					
31									250	275	I270C	330	320	320	350	330	300	300	270					
Count							6	25	28	28	27	28	29	29	30	30	29	30	30	5				
Median							280	255	250	275	325	340	345	340	340	330	310	300	275	265				
U.Q.																								
L.Q.																								
Q.R.																								

h'F2 | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 9

IONOSPHERIC DATA

Aug. 1967 | h'F | km | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	280	280	270	260	250	255	245	230	240	230	230	200	195H	E225A	E250A	A	235H	230H	250	260	230	300	330	E340A
2	325	290	280	260	245	255	A	A	230	I225A	I235A	200	200	200	215H	I240A	225H	A	A	265	255	270	345	295
3	285	300	275	265	250	245	240	230	220	200	195H	220H	E260A	230	220	E240A	E245A	240	270	I245A	235	305	300	300
4	310	295	275	250	255	275	250	235	250H	200H	200	210H	215	A	A	A	A	A	A	A	250	C	C	C
5	C	C	C	C	C	C	C	C	C	A	215H	A	215	240	225H	255H	230	230	235	255	215	250	320	295
6	310	315	300	270	245	240	255	225	220	220	200H	200H	220	A	225	A	240H	240H	250	I260A	250	260	280	295
7	300	320	295	280	260	280	265	245	I240A	210	205H	200	A	230H	230H	I240A	230	250	255	240	240	250	305	350
8	330	310	305	295	290	245	245	220	225H	200H	A	195	210H	225	220	230	245	A	A	265	230	250	300	315
9	295	305	315	330	340	290	270	I220A	200H	200H	200H	200	215	225	220H	225	I255A	A	A	250	I255A	E330A	E350A	300
10	E350A	290	285	300	280	270	I250A	230H	230	I225A	I220A	A	A	A	A	A	A	I230A	250	245	230	300	330	340
11	300	280	250	300	300	250	245	I235A	A	A	I230A	I230A	220H	225	225	245	220	230	265	250	255	245	290	280
12	300	305	330	300	245	200	E300A	I240A	E250A	A	A	275	I230A	205	E245H	230	225	I250A	250	245	250	235	275	300
13	340	330	300	250	225	200	240	225	210	225H	200	A	E250A	200H	240	A	A	A	245	245	250	260	240	360
14	300	300	260	275	250	245	I245A	A	A	215	A	E250A	E250A	230	A	E255A	235H	E270A	A	A	I255A	255	E370A	310
15	270	295	280	245	275	305	260	A	A	A	C	A	A	A	A	265	A	A	250	240	205	270	E285A	250
16	350	300	300	320	295	275	I265A	I250A	I245A	I230A	A	E250A	200	200	250	A	A	255	A	250	220	215H	295	300
17	310	305	270	240	250	270	245	215H	E245A	215C	230H	200	E250C	E240C	A	A	A	A	A	250	270	300	E350A	E355A
18	E355A	E350A	290	335	350	E350A	300	I270A	I255A	240	235	E240A	C	A	A	255	235	I255A	I260A	255	240	I250A	310	290
19	250	320	315	300	245	250	255	I245A	240	E250A	200	A	E260A	E255H	220	E250A	250	I255A	I255A	260	240	230	275	275
20	300	310	300	275	250	255	255	235	230	225	C	C	C	C	C	C	C	C	C	250	255	250	315	295H
21	380	350	300	280	270	250	250	225	225	230	210	235	220	230	205H	215H	220H	E265A	260	255	250	240	280	300
22	300	305	275	250	215	215	250	245	225	200	195H	E250H	I245H	250	230	220	240H	245	I250A	250	240	275	315	325
23	285	300	270	235	260	275	265	245	I235A	220	210	200	200H	205	200	210H	240	240	250	250	225	245	310	315
24	305	275	255	230	220	250	250	235	235	225	210H	200H	A	A	270	A	A	E250A	A	250	245	E310A	330	325
25	320	300	280	275	250	325	255	250	A	A	A	A	A	A	A	230	E255A	A	A	255	250	275	320	330
26	340	300	295	275	300	320	275	240	235	230	250	E250A	A	A	A	A	275	235H	I265A	255	250	225	E350A	320
27	300	305	275	275	270	250	240	230	230	I250A	A	A	A	A	225	240H	250H	A	A	240	225	255	300	300
28	280	290	300	260	270	250	265	240	I230A	E240A	215	A	A	225	A	265	E260H	I275A	I260A	250	230	290	305	290
29	310	295	295	300	310	275	240	230	225	210	205H	195H	215	230	250	250	245H	255H	I250A	240	250	255	E340A	270
30	285	330	280	245	265	290	250	215	230	AH	A	A	A	A	275	A	A	A	A	A	250	300	250	310
31	320	335	310	275	280	260	255	230	220H	210H	I200C	195H	235	240	245	A	A	A	A	240	255	295	290	290
Count	30	30	30	30	30	30	29	27	26	25	22	21	20	20	21	19	21	19	18	28	31	30	30	30
Median	300	300	290	275	260	255	250	235	230	220	210	200	215	230	225	235	240	245	250	250	250	260	305	300
U.Q.																								
L.Q.																								
Q.R.																								

h'F | Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 10

IONOSPHERIC DATA

Aug. 1967 | h'Es km | 135° E Mean Time (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	110	110	110	110	110	135	125	115	115	110	110	110	110	105	105	110	105	105	120	100	100	105	100
2	100	110	120	120	125	120	115	110	110	110	105	105	105	105	105	110	130	120	115	110	105	100	100	100
3	095	095	095	095	095	100	140	120	115	110	105	105	105	105	105	100	105	150	125	115	110	105	110	105
4	100	100	105	110	105	105	140	125	110	115	115	110	150	140	140	125	120	115	110	105	110	C	C	C
5	C	C	C	C	C	C	C	C	C	165	155	125	155	130	G	G	G	G	140	125	120	120	150	150
6	120	115	115	120	115	115	110	105	105	115	105	105	110	100	150	100	145	135	130	120	115	110	115	105
7	100	100	105	110	110	120	120	115	105	115	115	105	105	110	110	110	105	130	125	120	105	110	105	100
8	115	100	100	115	115	140	135	140	130	120	105	110	105	110	105	110	105	125	120	115	110	105	105	100
9	100	115	115	110	110	110	105	105	105	105	150	130	150	145	140	150	115	125	115	120	105	100	100	110
10	100	100	100	100	105	105	105	105	105	105	105	105	105	105	100	100	100	100	130	120	115	120	115	105
11	105	105	105	105	B	125	120	115	115	115	110	110	105	100	100	100	100	100	100	100	105	100	100	100
12	105	105	105	105	105	B	130	130	130	125	120	125	120	145	125	G	G	115	120	115	110	105	105	105
13	100	100	105	100	100	100	105	135	105	130	105	100	125	130	130	130	115	120	145	115	110	100	100	105
14	105	100	105	110	130	125	120	120	115	110	110	110	110	110	105	105	150	130	120	115	110	105	105	110
15	105	105	105	110	110	110	120	115	110	110	C	105	105	105	105	105	125	120	115	115	110	105	105	S
16	125	115	110	100	105	110	125	115	110	105	105	110	105	105	105	100	100	100	100	100	100	110	100	100
17	105	100	100	100	100	B	115	110	110	115	115	115	C	C	105	100	130	125	125	120	110	110	110	105
18	105	105	105	125	125	120	115	115	110	105	105	105	C	100	100	130	135	115	110	105	105	105	105	110
19	110	105	105	100	105	105	110	110	105	105	105	105	105	105	105	100	105	100	100	100	100	100	100	095
20	100	105	105	105	100	115	115	115	115	115	C	C	C	C	C	C	C	C	C	100	100	100	100	100
21	100	100	095	095	100	100	155	125	120	115	110	110	110	105	105	105	100	100	125	120	115	115	115	105
22	105	100	105	095	105	105	135	125	130	120	115	120	125	125	150	G	G	130	115	115	110	105	105	105
23	110	095	095	095	105	105	120	115	115	110	110	110	105	105	105	105	105	140	120	115	115	100	105	100
24	100	100	100	100	E	B	100	150	130	125	125	120	110	110	110	130	125	130	120	110	110	105	105	105
25	105	105	100	100	100	100	100	125	120	110	110	110	115	115	120	155	130	115	115	110	105	105	105	105
26	105	105	100	100	100	100	100	125	125	120	115	115	115	110	110	110	115	125	120	105	105	105	105	105
27	100	100	100	100	100	100	S	150	125	115	115	110	110	105	115	135	135	125	110	105	105	100	100	095
28	095	095	095	125	120	120	115	120	115	115	110	105	105	105	100	105	140	130	120	115	095	105	105	105
29	105	105	105	105	100	105	105	105	105	125	125	120	120	115	115	145	145	130	125	115	115	110	105	100
30	100	110	110	100	100	105	130	105	120	115	110	110	110	110	135	130	120	120	115	110	105	105	105	105
31	105	100	105	100	100	100	100	100	125	100	C	100	170	145	140	125	125	115	110	105	105	105	105	100
Count	30	30	30	30	28	27	29	30	30	31	28	30	28	29	29	27	27	29	30	31	31	30	30	29
Median	105	100	105	100	105	105	115	115	115	115	110	110	110	110	105	110	120	120	120	115	110	105	105	105
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 11

IONOSPHERIC DATA

Aug. 1967 | Types of Es | **135° E Mean Time** (G.M.T. +9h) | Yamagawa | Lat. 31° 12.1'N | Long. 130° 37.1'E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	f2f	f2	f	f3	f3	1	h2	h	c2	c2	c2	c	c	c2	c2	12	1	12	12c2	c212	f3	f3	f2f2	f3
2	f3	f f2	f f2	f f3	f	h3	c4	c6	c2	c4	12	1	1	12	1	c3	h	c5	c5	12	f3	f5	f3	f3
3	f4	f3	f3	f4	f	1	h	c2	c2	c2	c2	12	c2	c2	12	12	12	h21	h2	c4	f4	f4	f5f2	f2f
4	f4	f2	f3f3	f4f2	f4	13	h2	h2	c4	c	c	1	h	h	h2	h3	c4	c6	c6	15	f5f2			
5										h h	h	h2	h	h					h	h2	f	f3	f2	f
6	f4	f	f2	f2	f2	c2	c3	12	12	c	c2	1	1	12	h 1	12	h 12	h 1	h	c312	f2	f3f3	f f3	f2
7	f2	f3	f	f3	f	c2	c3	c4	c3	c3	c	1	13	c2	c	c2	12	h21	h2	h21	f2f2	f3f3	f3f	f3
8	f2f3	f4	f	f2	f3	h	h2	h3	h	c	c3	1	12	1	12	12	12	h2	c41	c4	f3f2	f3	f3	f2
9	f	f f	f	f2	f4	13	13	13	12	12h	h	h	h	h	h	h	c2	h2	c3	c3	f5	f4	f3	f2f4
10	f4	f4	f4	f3	f2f	1313	13	13	c3	c3	c4	12	c2	c3	13	13	15	15	h 12	c51	f3f2	f f2	f f2	f3f2
11	f2	f	f	f2		c2	c5	c4	c3	c3	c3	c2	12	1	12	12h	12	12	13	12	f2f	f	f	f
12	f2	f3	f3	f2	f5		h3	h612	h3	h4	c3	h	h2	h	h			c5	c2	c2	f3	f2	f4	f2f2
13	f2	f2	f3	f3	f3	12	15	h212	12h3	h 12	12	13	h 1	h	h	h2	c5	c31	h	1	f4f2	f5	f	f2f4
14	f2	f2	f3	f3	f	h	c5	c4	c3	c2	c2	c2	c2	c2	c3	12	h 1	h 13	c31	c712	f4f2	f3f	f3	f3
15	f4	f3	f3	f4	f3	14	c2	c5	c4	c4		c3	c4	12	12	13	h31	c61	c2	c3	f4f2	f3f	f5	
16	f f	f3	f4	f3	f6	1 h2	h6	c6	c5	c3	c4	c2	12	12	12	13	16	14	14	14	f4	f2f3	f2	f2
17	f3f2	f	f	f	f		c2	c3	c3	c	c	c			1	12	h 1	h31	h 1	c212	f3f2	f3f2	f3f2	f3f
18	f2f3	f7	f4	f3	f4	c3	c3	c2	c2	1	1	1		1	13	h 1	h 12	c31	c41	13	f4	f4f2	f2f	f2f
19	f2f2	f4f	f3	f5	f4	14	c21	c2	c2	c2	1	13	12	12	12	12	12	13	13	15	f2	f2	f	f
20	f2	f2f2	f4f	f3f	f3	c214	c41	c2	c2	c2										15	f4	f3	f4	f2
21	f3	f4	f4	f2	f	1	h h	h2	c2	c2	1	12	1	12	12	12	12	14	h214	c314	f3f4	f2f2	f	f2
22	f2	f2	f f2	f2	f f2	1	h	h31	h2	c2	c	c2	h2	h2	h			h2	c5	c7	f4	f2	f2	f3
23	f2f3	f4	f4	f	f2	16	c6	c4	c4	c2	c2	12	12	1	1	12	1	h	c2	c31	f f	f	f	f2
24	f2	f	f	f			1	h2	h212	h2	h	c2	c2	c2	c21	h31	h31	h41	c3	1312	f5f2	f5	f5	f2f2
25	f3f2	f4f	f3	f4	f3	14	15	h313	c512	c412	c4	c3	c2	c2	c2	h	h	c5	c5	c71	f5f2	f6	f5	f5
26	f4f	f7	f5	f3	f7	16	15	h4	h3	c2	c2	c	c21	c21	c31	c6	c2	h2	c5	14	f3	f4	f3	f3
27	f2	f3	f6	f3	f2	14		h	h2	c4	c4	c21	c4	c5	c21	h 1	h2	h4	c2	14	f3	f4	f5	f2
28	f3	f2	f2	f2f	f2	c	c6	c	c3	c2	c3	13	13	12	13	13	h213	h212	c213	c 14	f4	f2f2	f2f	f3
29	f4	f3	f3	f	f	12	1	12	1 h	h 1	h 1	c	c	c	c 1	h 1	h 12	h21	h41	c41	f6	f	f5	f3
30	f2	f2f	f2	f2	f	1	h212	12h3	c312	c31	c3	c4	c2	c2	h2c	h2c2	c4	c4	c4	c4	f3	f7	f3f	f3
31	f2	f4	f5	f	f	1	12	14	h212	12h		1	h 1	h 1	h2	h2	h3	c6	c5	15	f5	f3f	f3	f6
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

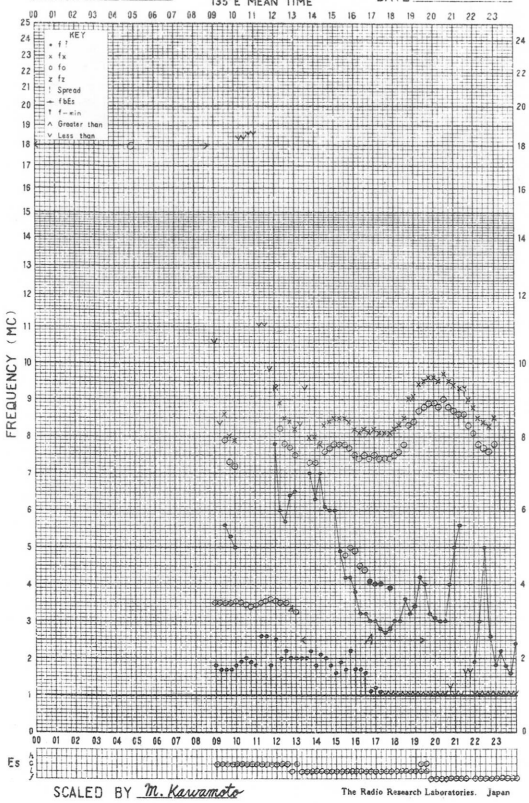
Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y12

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE AUG. 1, 1967

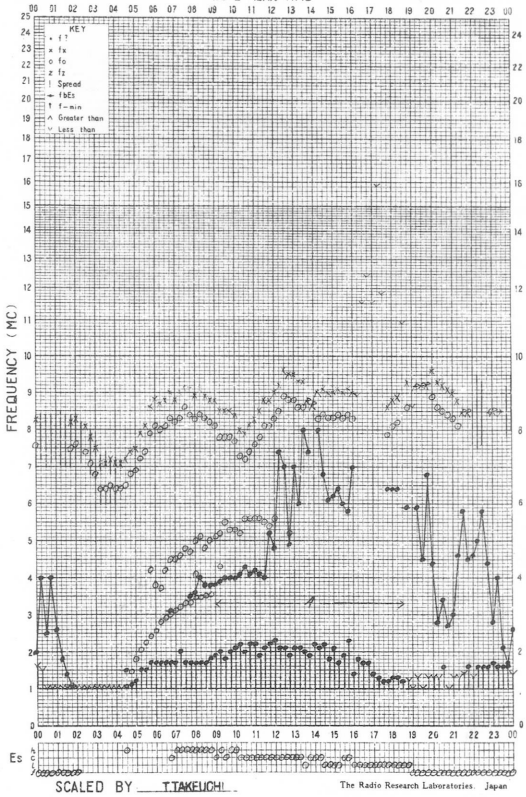


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Aug. 1, 1967

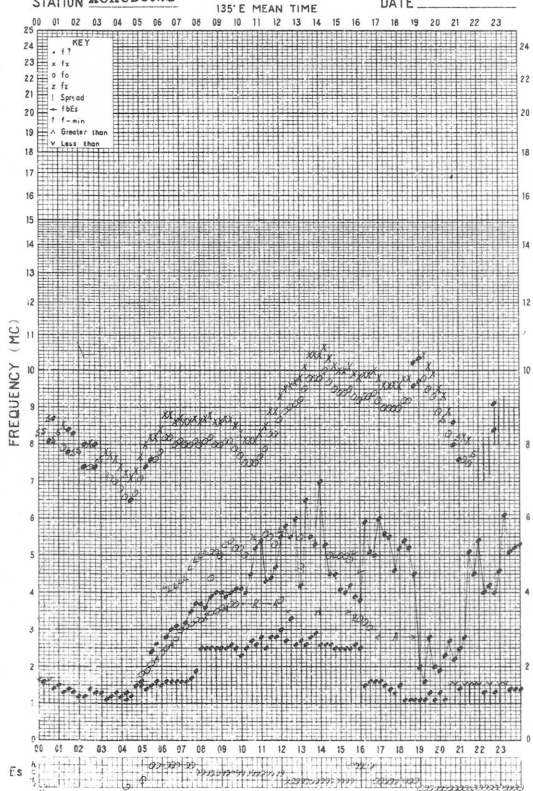


SCALED BY T. TAKEUCHI

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE AUG. 1, 1967

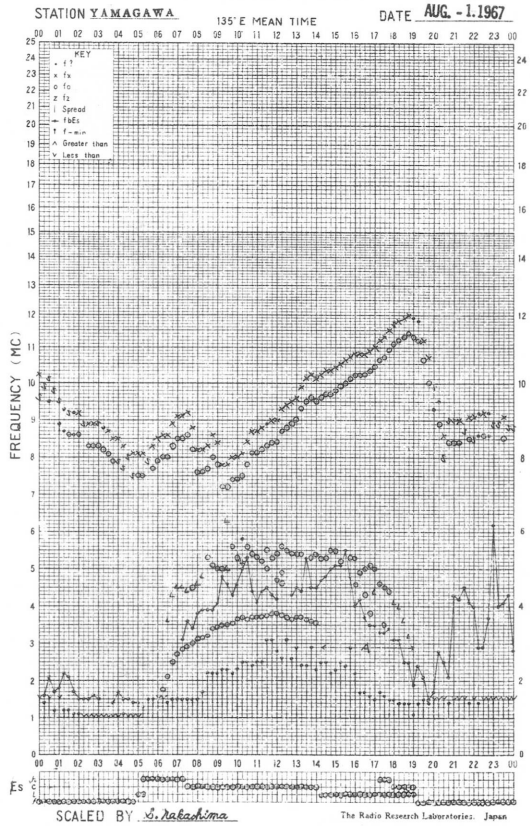


SCALED BY K. Yashikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE AUG. 1, 1967

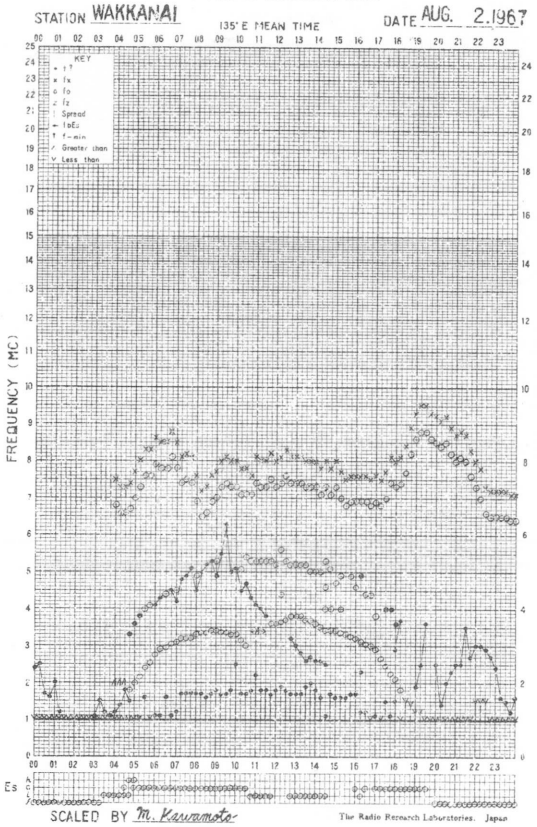


SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

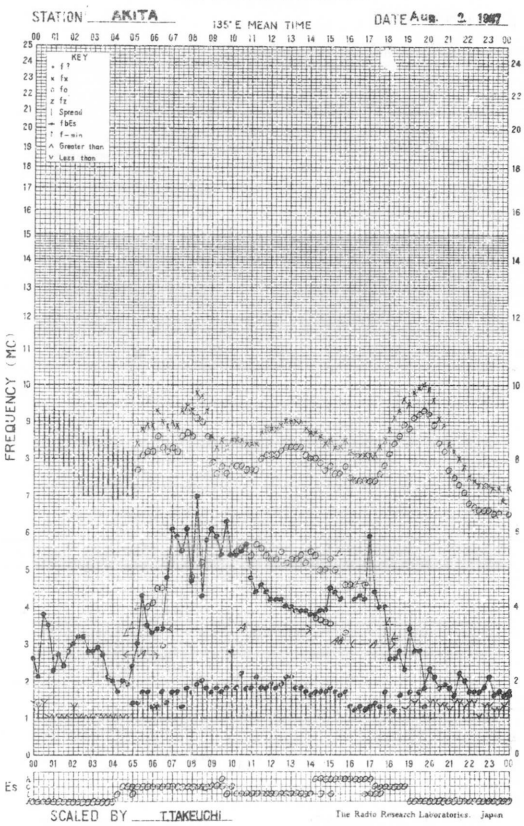
STATION WAKKANAI 135°E MEAN TIME DATE AUG. 2.1967



SCALED BY M. Kawamoto The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

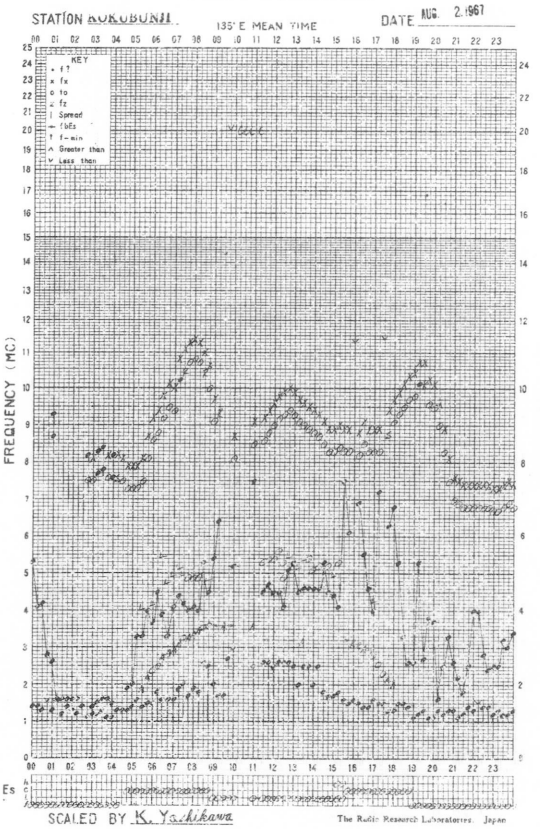
STATION AKITA 135°E MEAN TIME DATE Aug. 2. 1967



SCALED BY T. TAKEUCHI The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

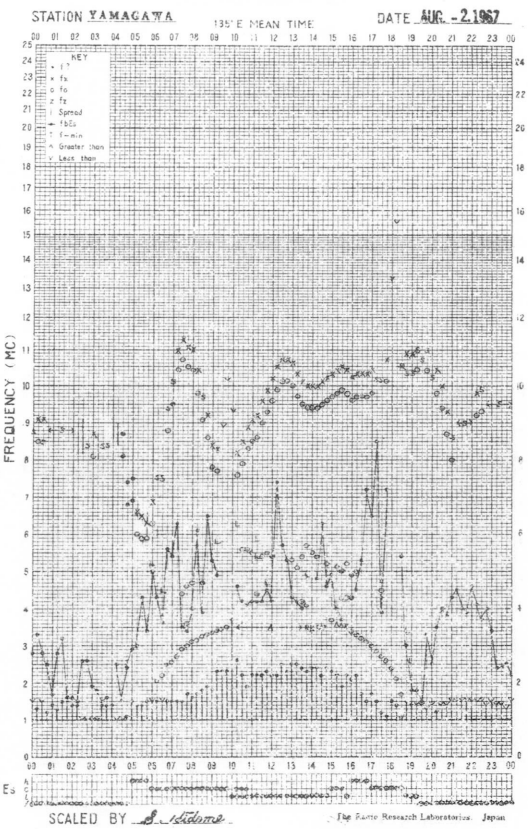
STATION KOKUBUNJI 135°E MEAN TIME DATE AUG. 2.1967



SCALED BY K. Yoshikawa The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

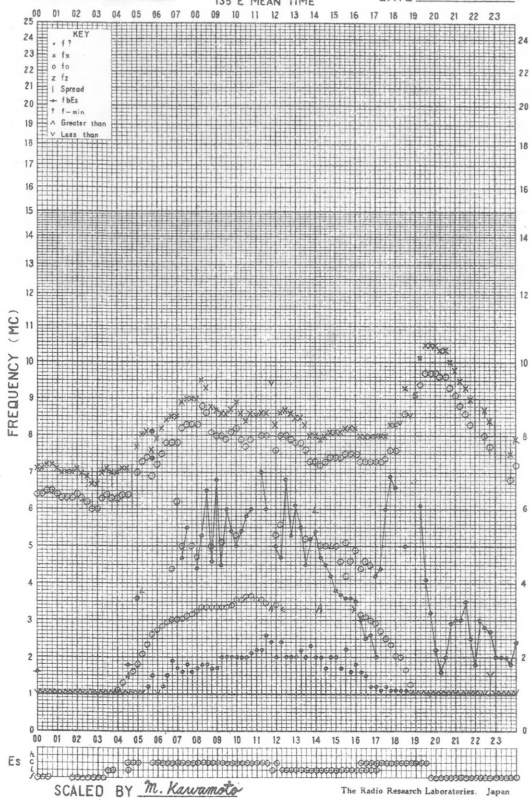
STATION YAMAGAWA 135°E MEAN TIME DATE AUG. 2.1967



SCALED BY S. Kitamura The Radio Research Laboratories, Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE AUG. 3.1967

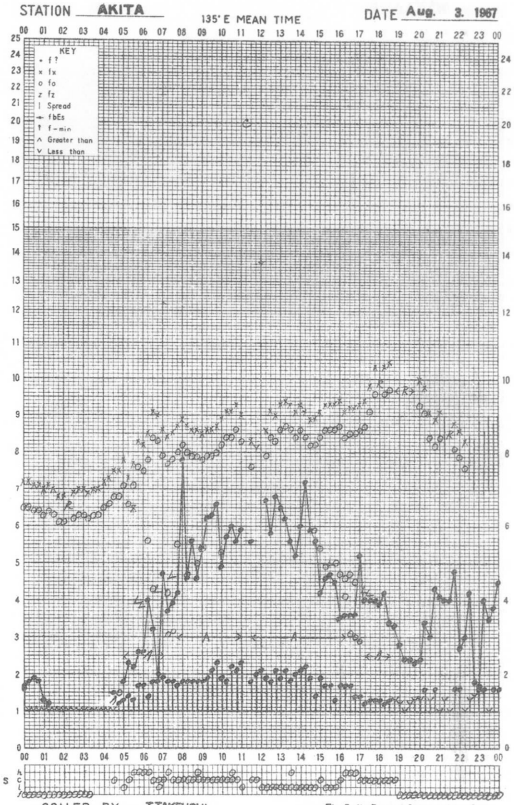


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Aug. 3. 1967

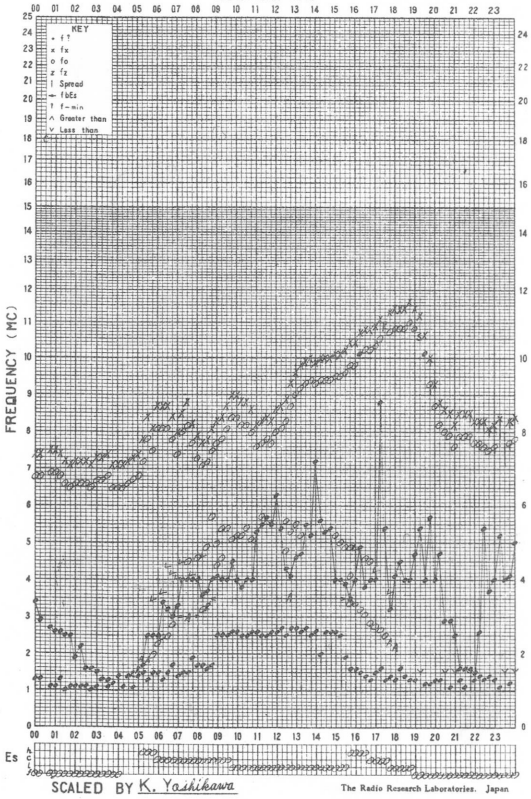


SCALED BY T.TAKEUCHI

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE AUG. 3.1967

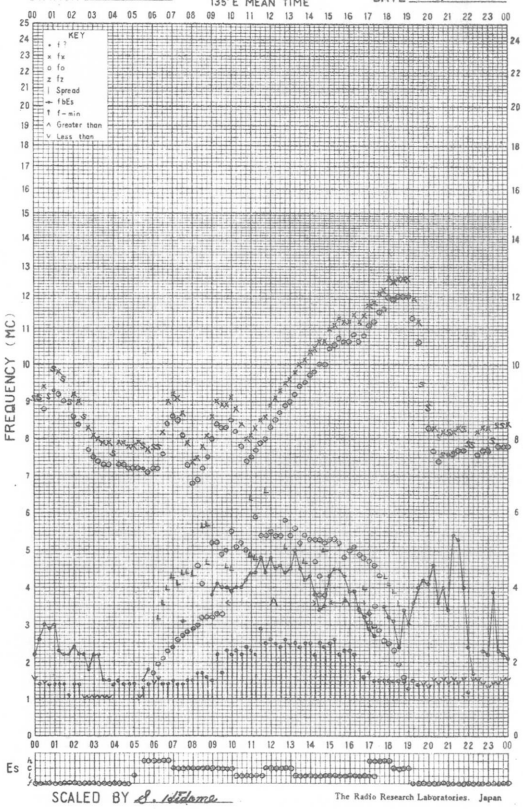


SCALED BY K. Yashikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE AUG. - 3.1967

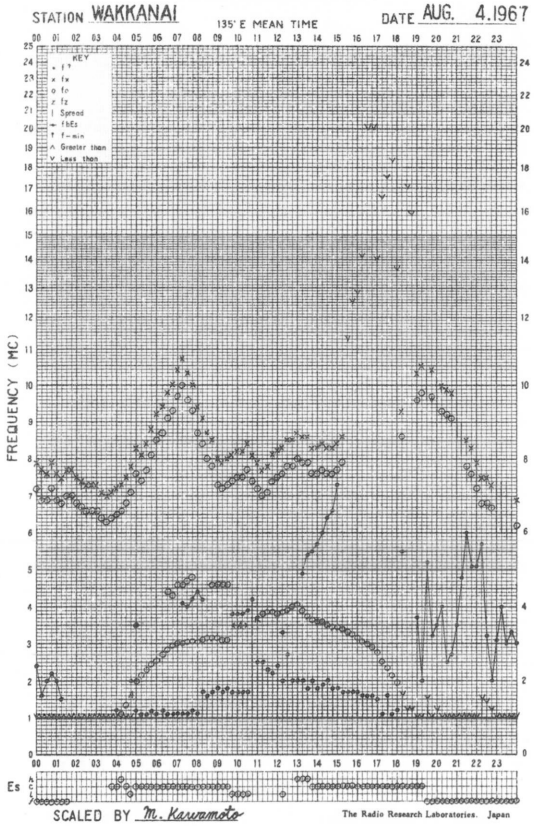


SCALED BY S. Ishikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE AUG. 4.1967

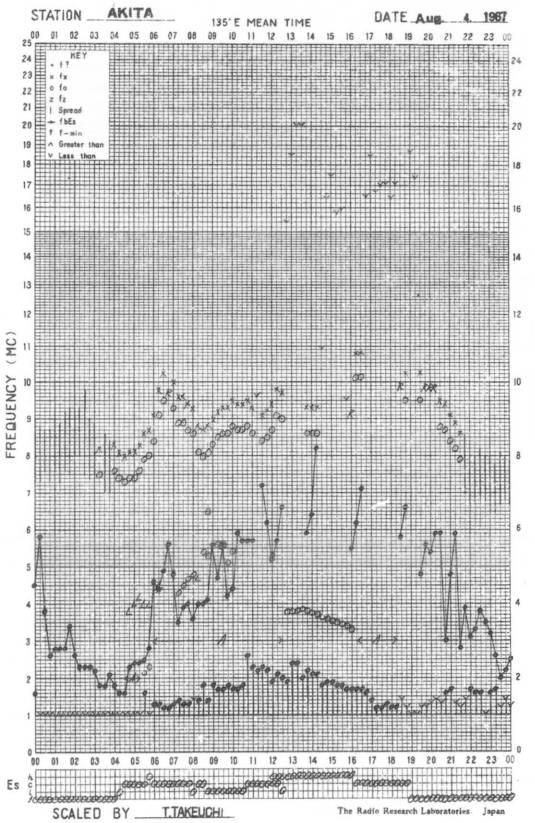


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Aug. 4. 1967

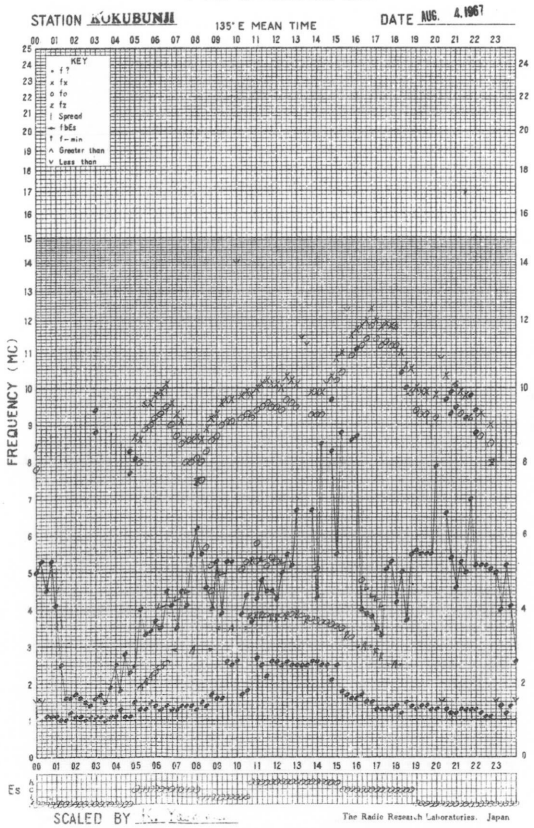


SCALED BY T.TAKEUCHI

The Radio Research Laboratories Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE AUG. 4.1967

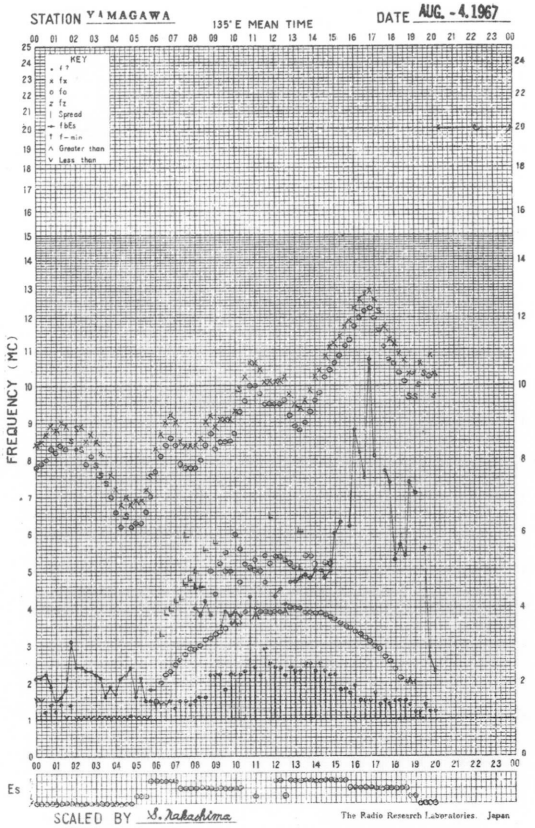


SCALED BY

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE AUG. - 4. 1967

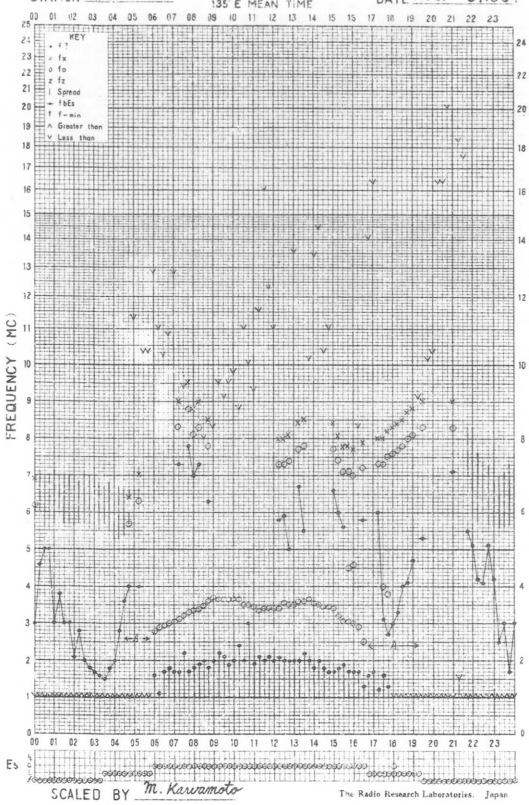


SCALED BY S. Takashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE AUG. 5, 1967

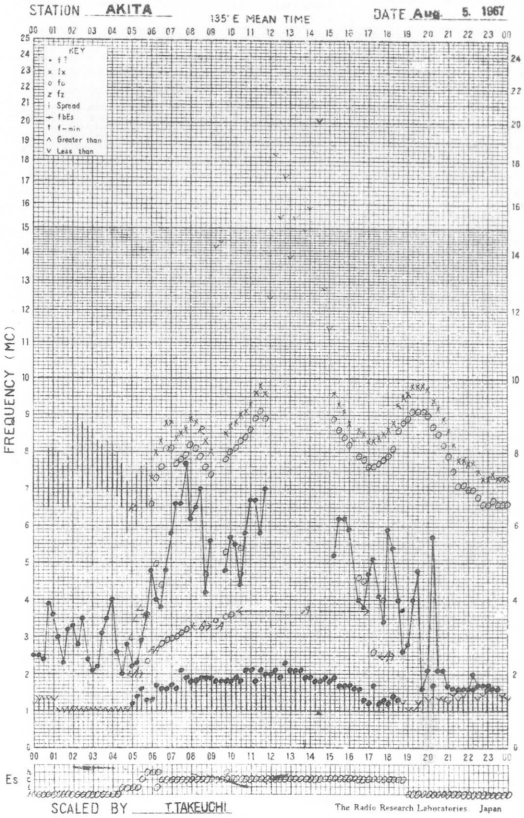


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Aug. 5. 1967

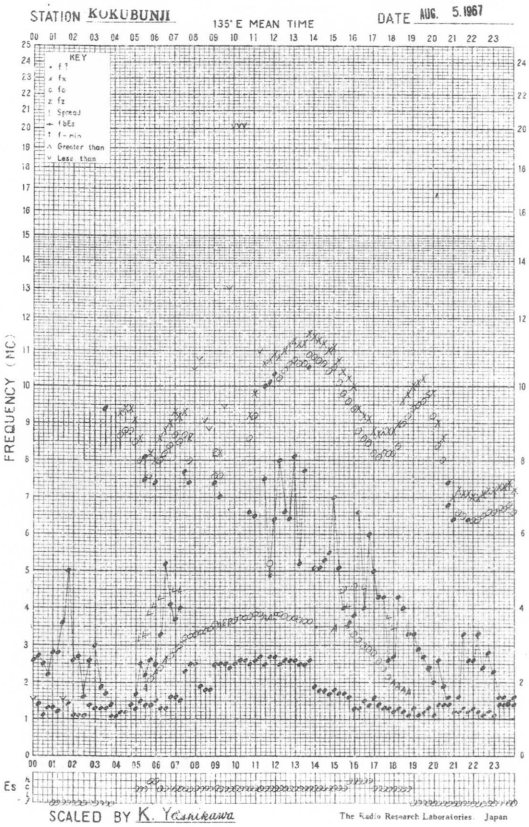


SCALED BY T. TAKEUCHI

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE AUG. 5. 1967

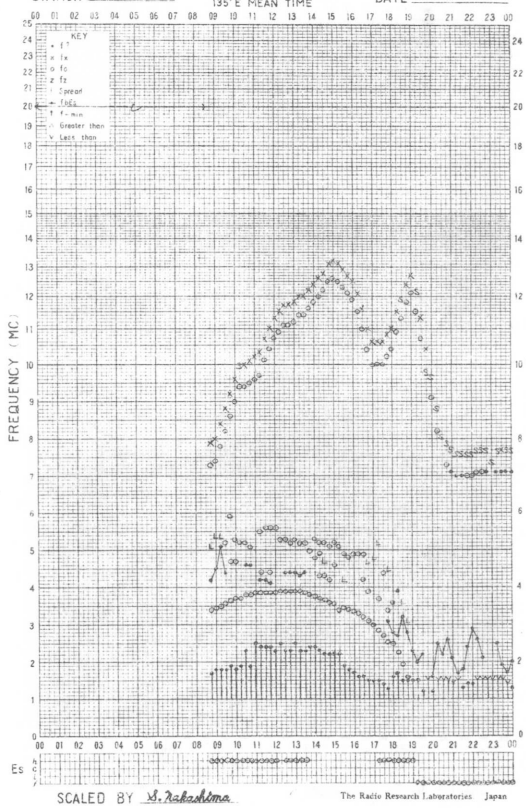


SCALED BY K. Yasukawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE AUG. 5. 1967

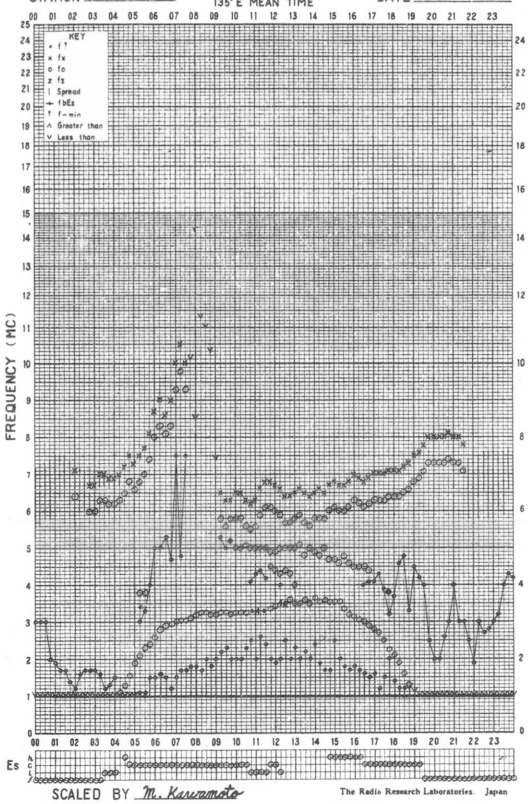


SCALED BY S. Takashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE AUG. 6, 1967



SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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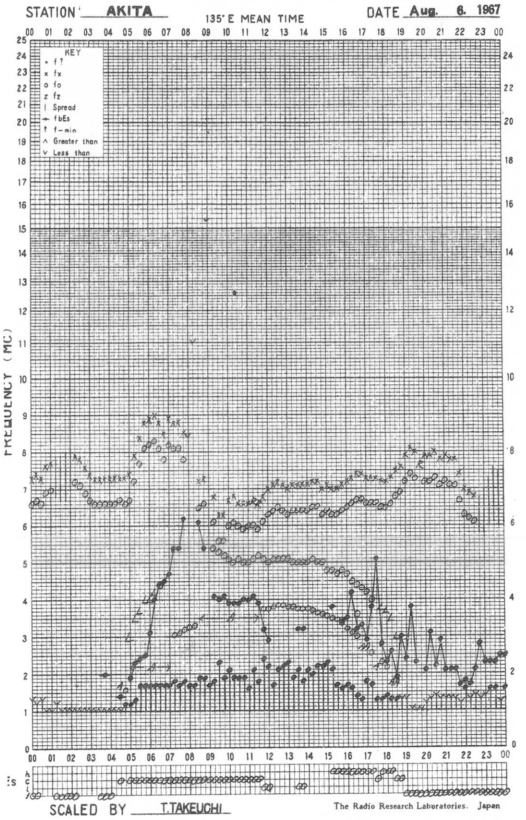

SCALED BY T.TAKEUCHI

The Radio Research Laboratories. Japan

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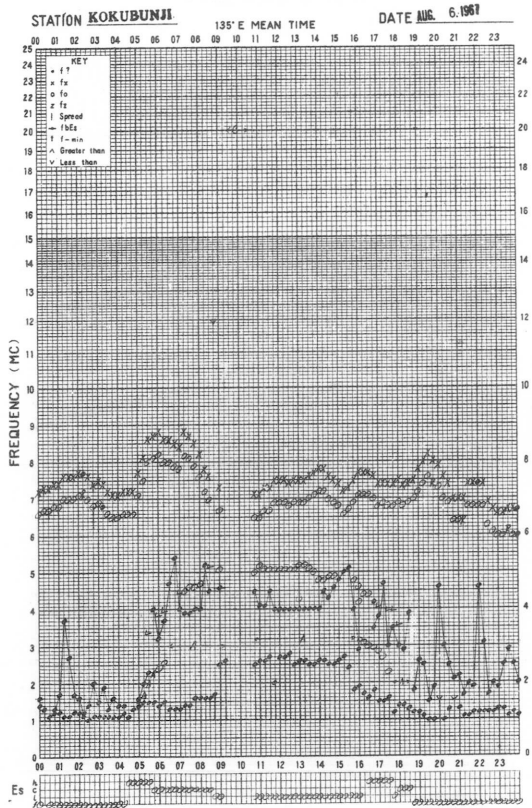

SCALED BY K. Yasuwara

The Radio Research Laboratories. Japan

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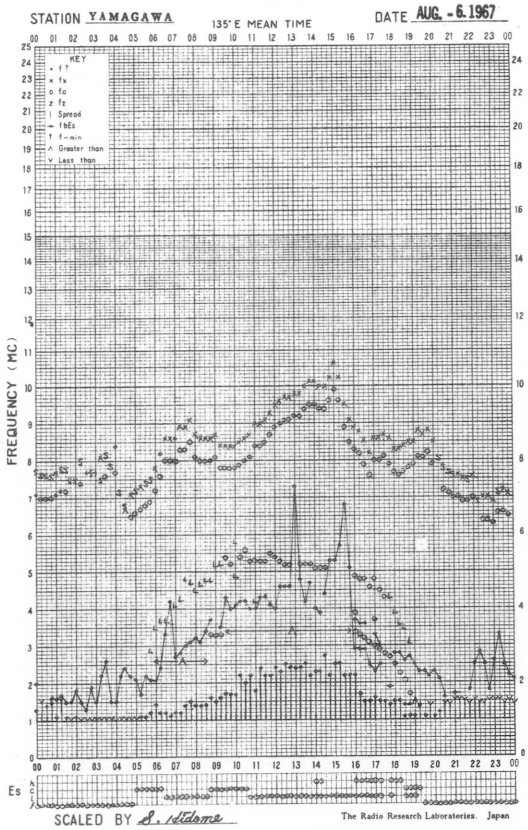

SCALED BY S. Ishidome

The Radio Research Laboratories. Japan

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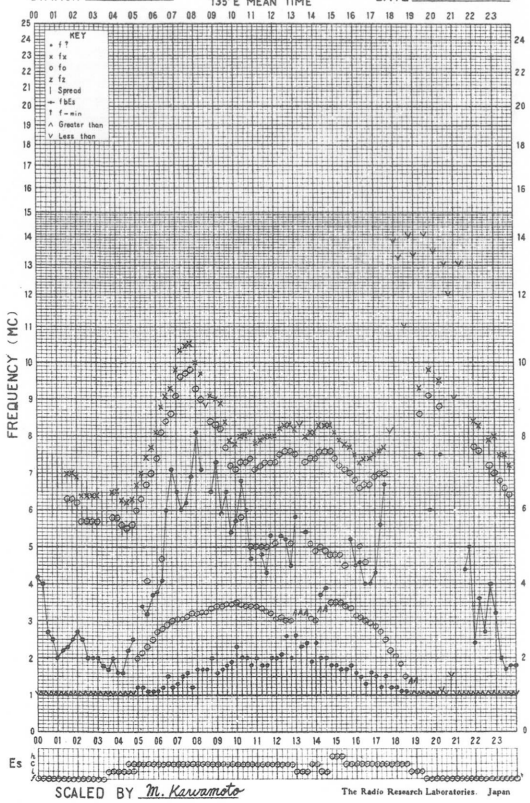

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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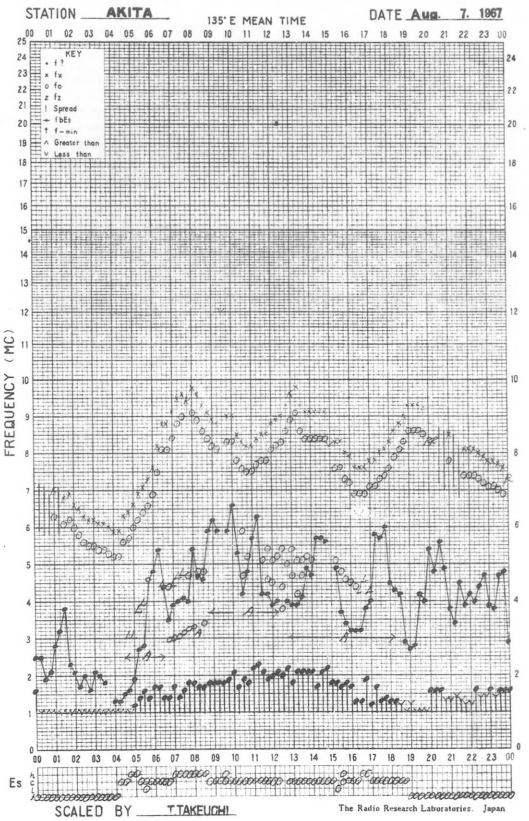

SCALED BY T. TAKEUCHI The Radio Research Laboratories. Japan

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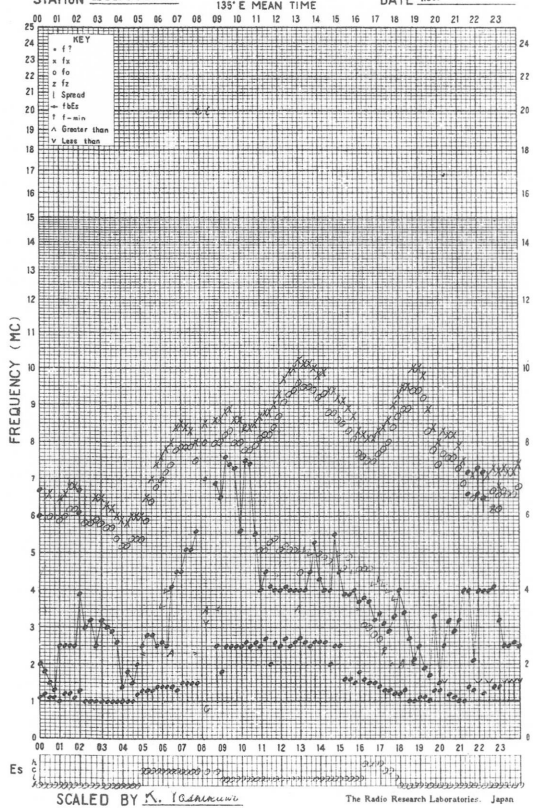

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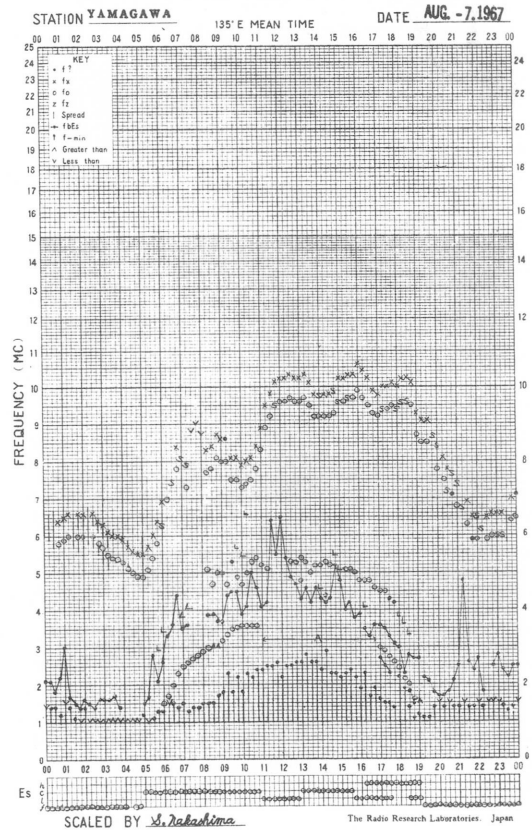

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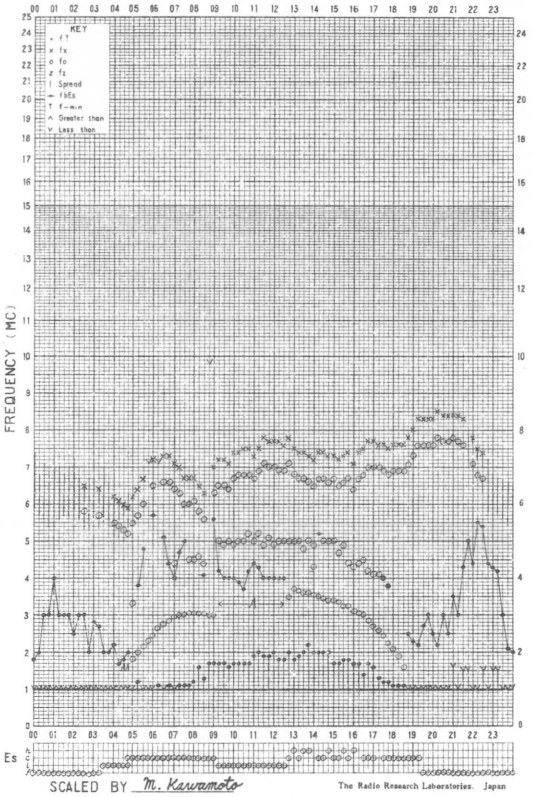

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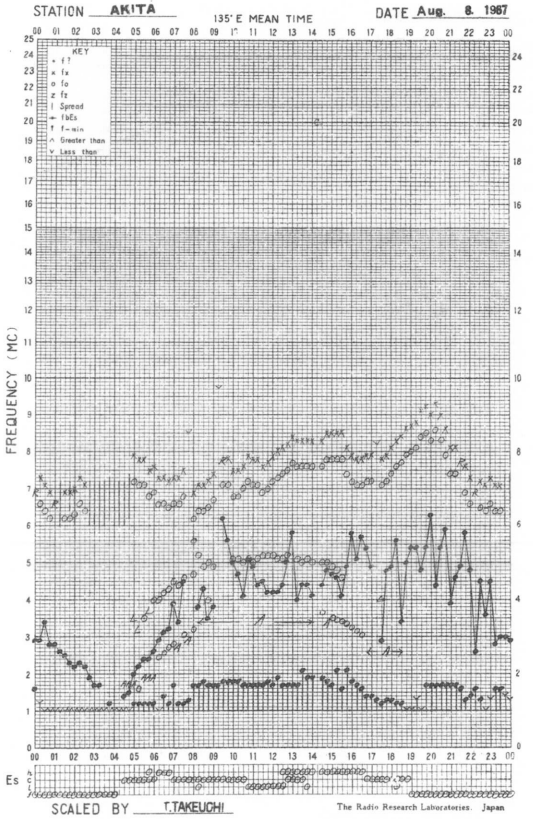

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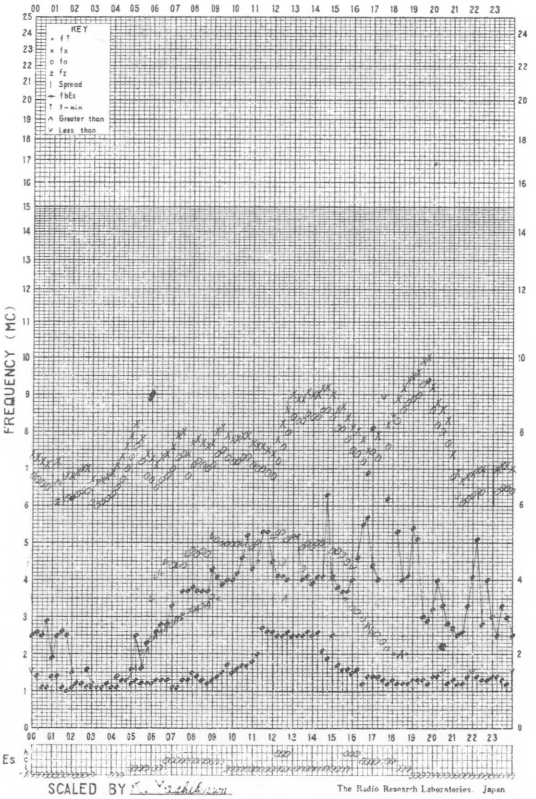

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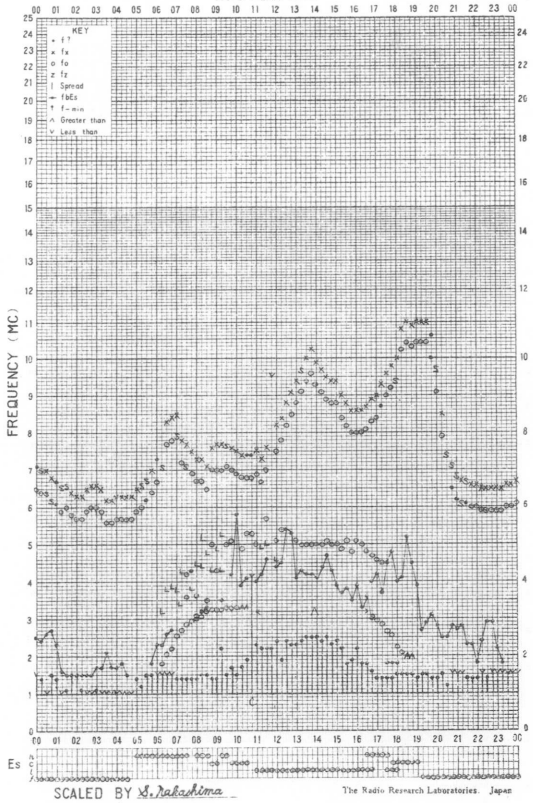

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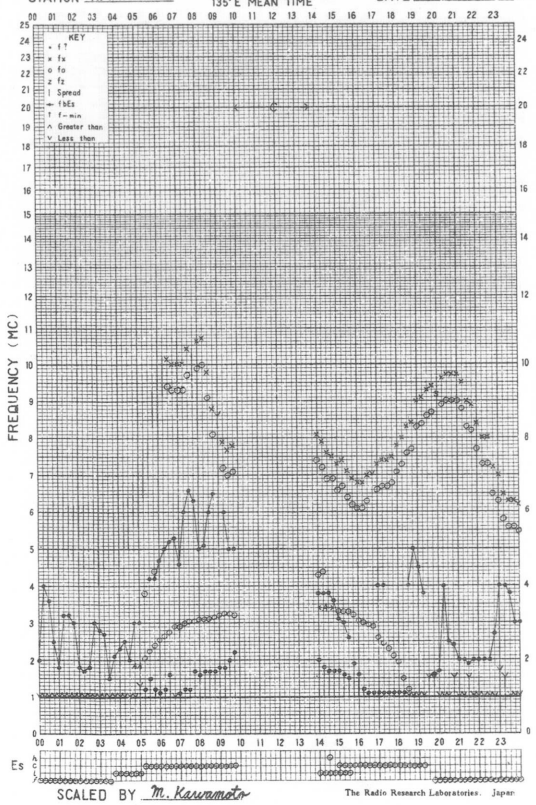

SCALED BY M. Kawamoto The Radio Research Laboratories Japan

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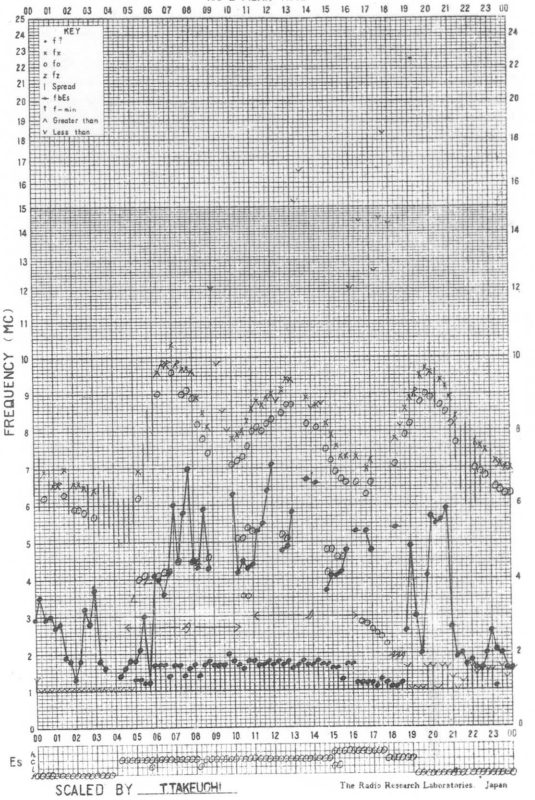

SCALED BY T.TAKEUCHI The Radio Research Laboratories Japan

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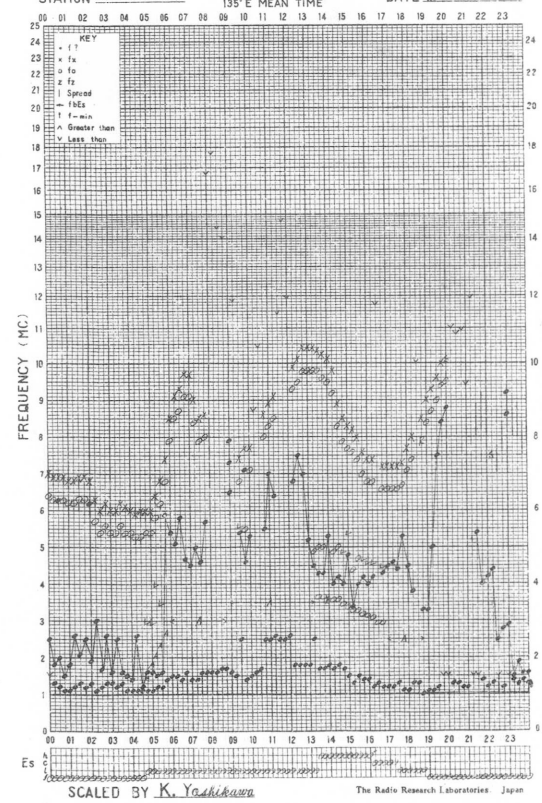

SCALED BY K. Yoshikawa The Radio Research Laboratories Japan

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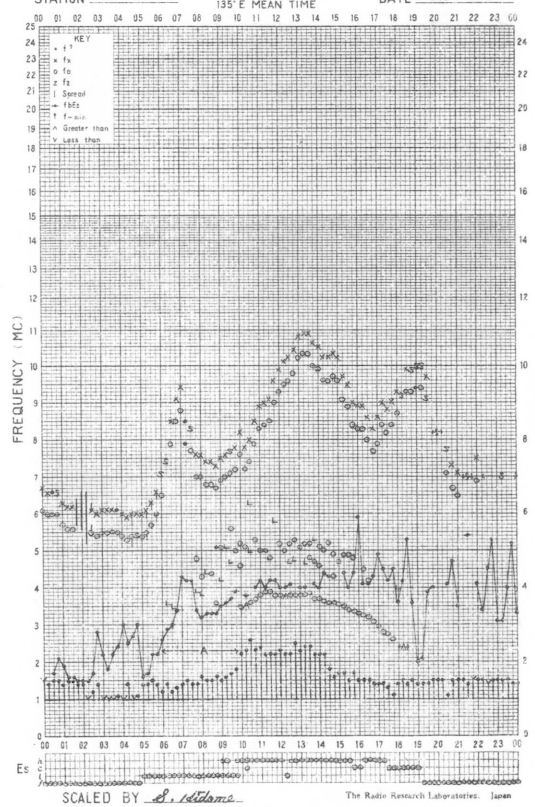

SCALED BY S. Ishitomo The Radio Research Laboratories Japan

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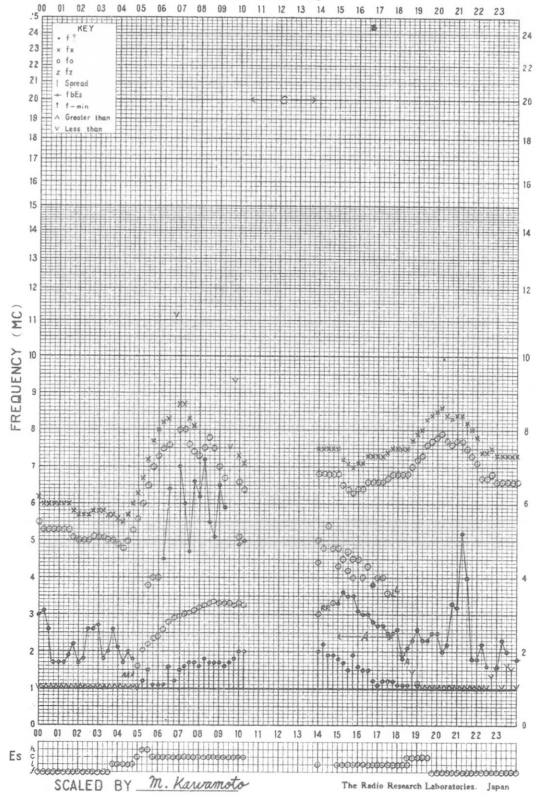

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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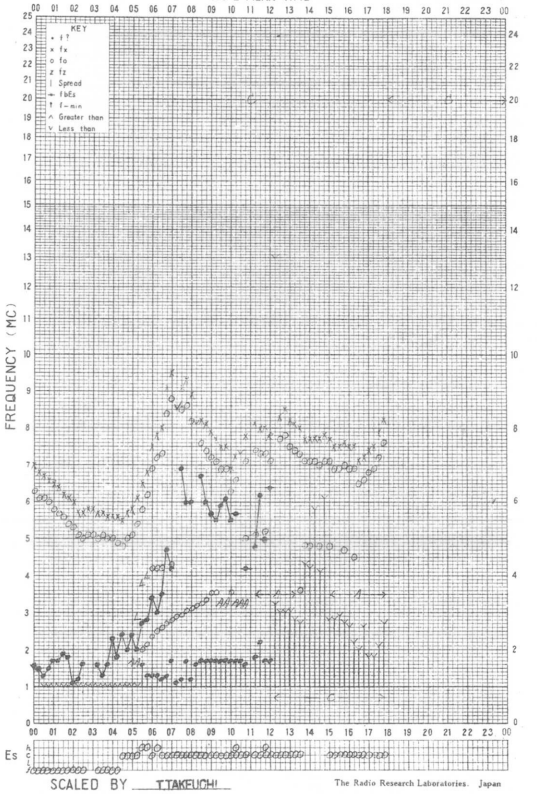

SCALED BY T.TAKEUCHI

The Radio Research Laboratories. Japan

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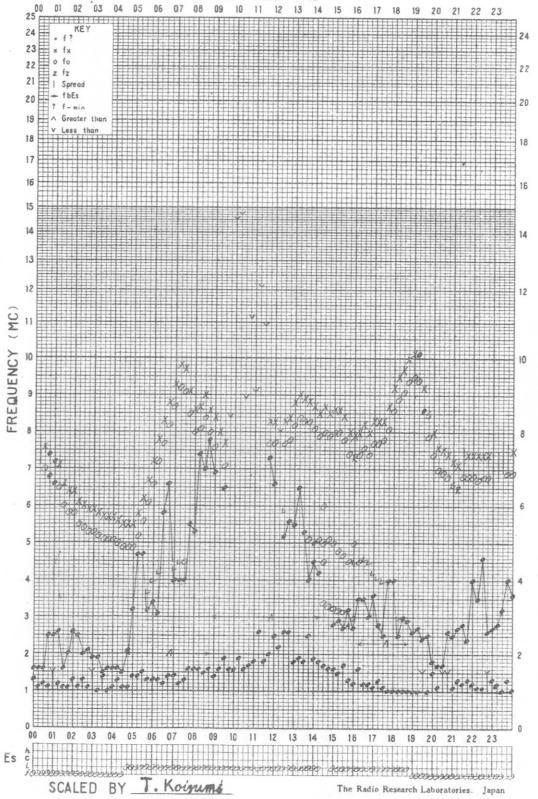

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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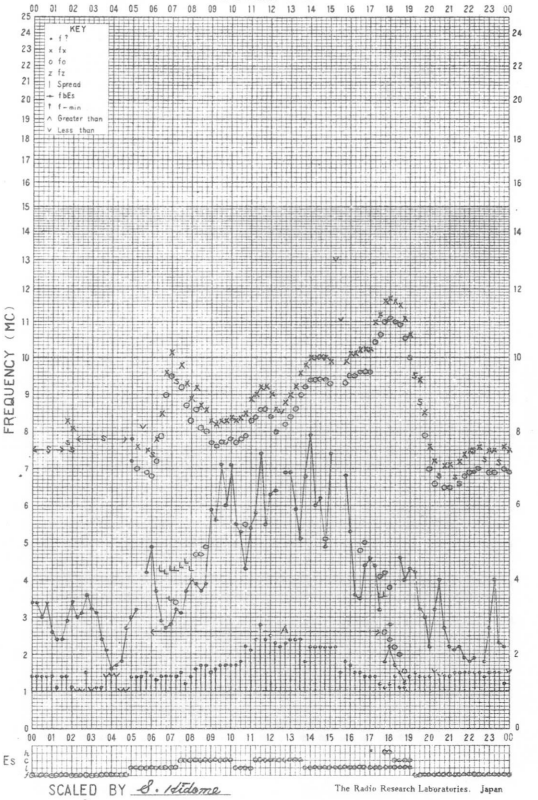

SCALED BY S. Ichijoma

The Radio Research Laboratories. Japan

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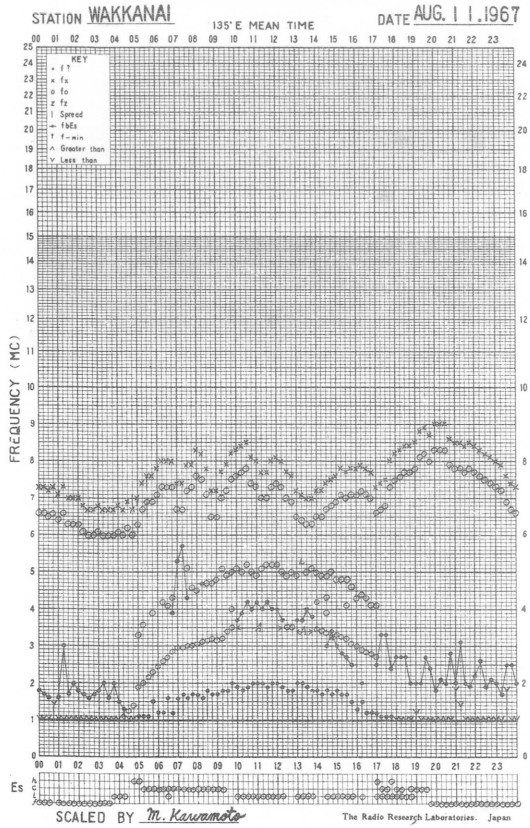

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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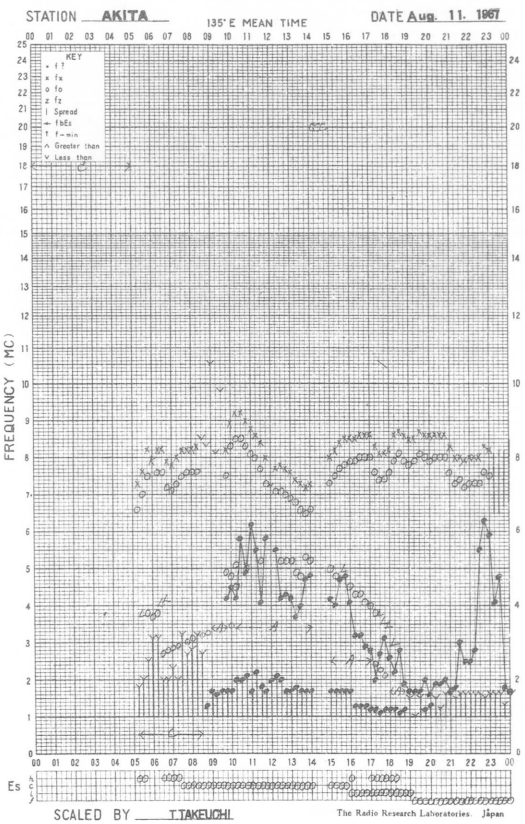

SCALED BY T. TAKEUCHI

The Radio Research Laboratories. Japan

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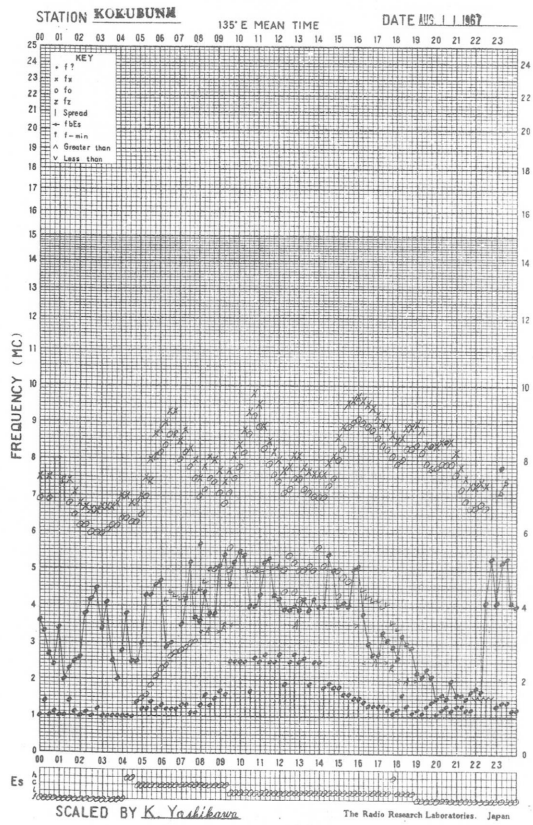

SCALED BY K. Yashikawa

The Radio Research Laboratories. Japan

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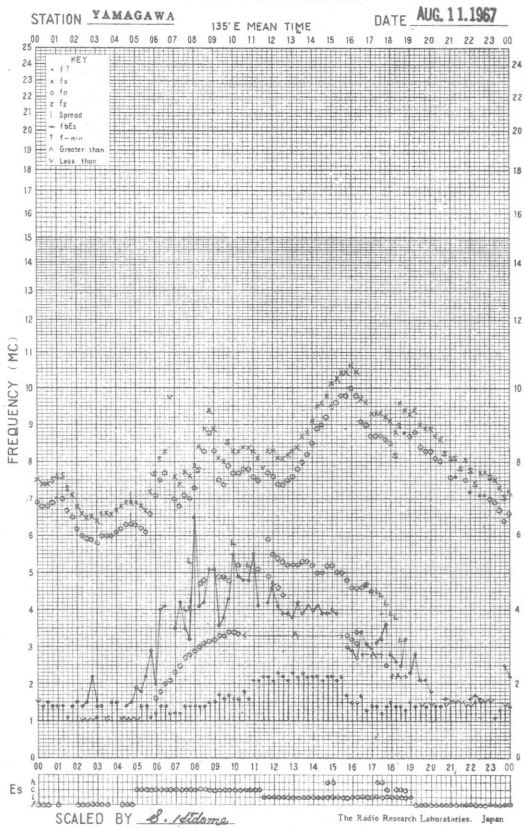

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The Radio Research Laboratories. Japan

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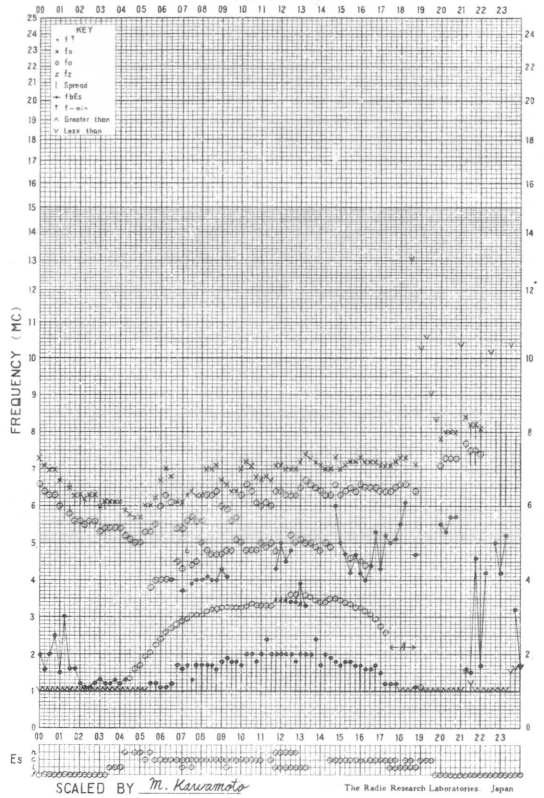

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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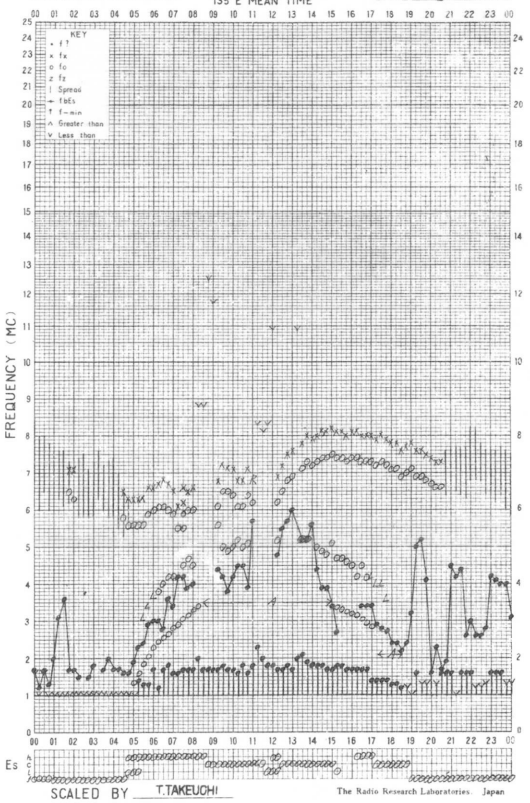

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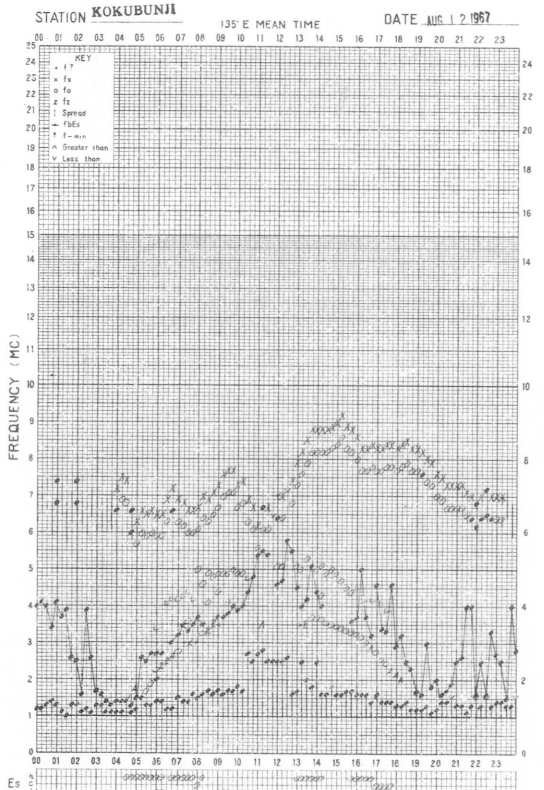

SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

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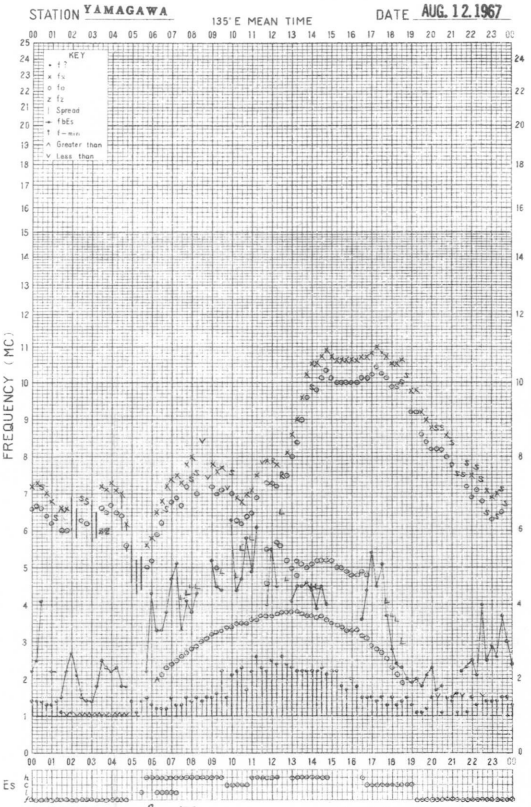

SCALED BY E. Aldoma

The Radio Research Laboratories. Japan

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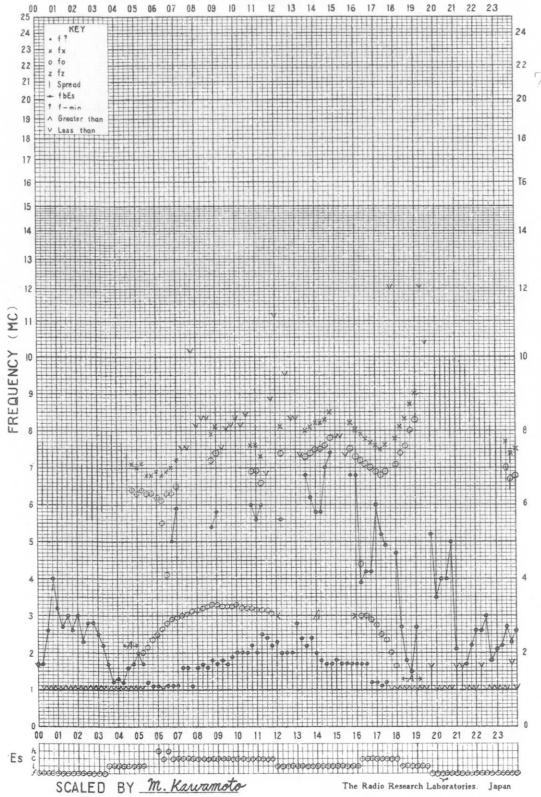

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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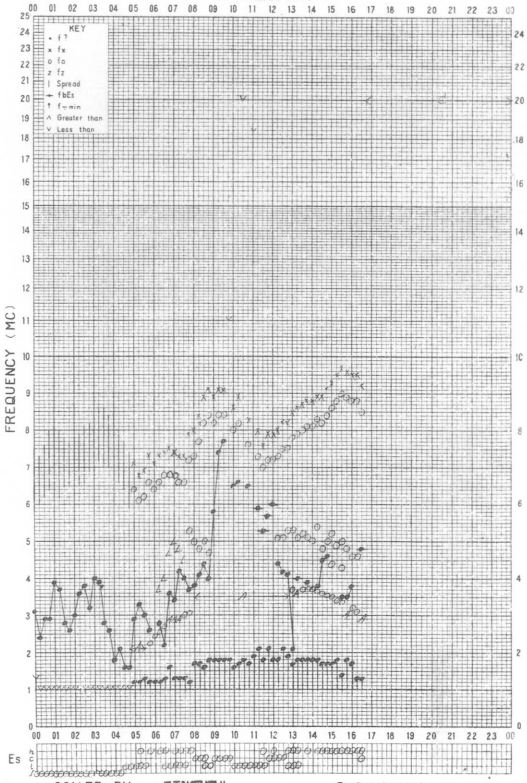

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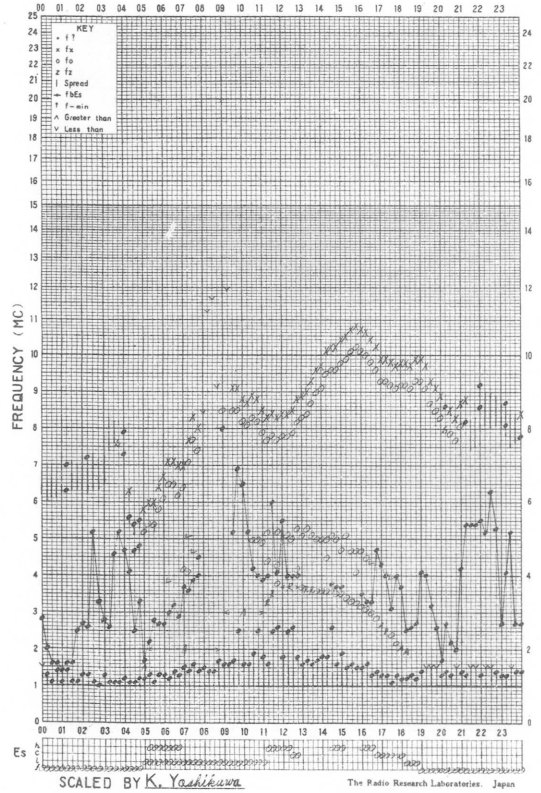

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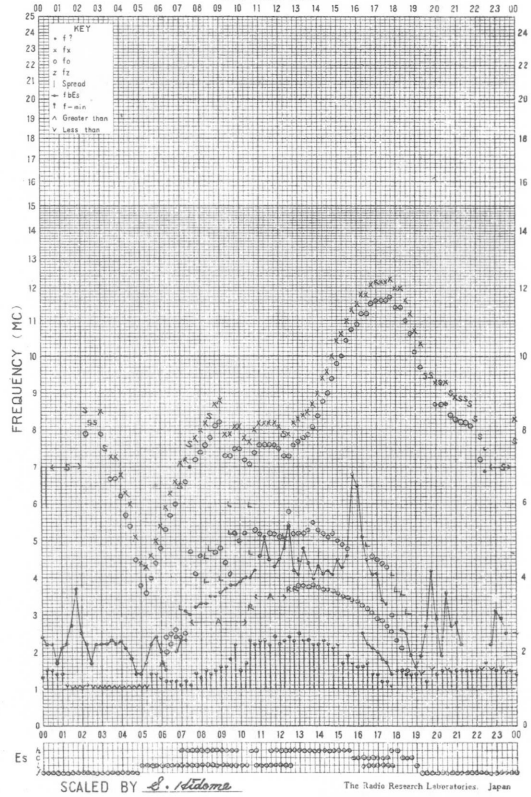

SCALED BY S. Ishidome The Radio Research Laboratories. Japan

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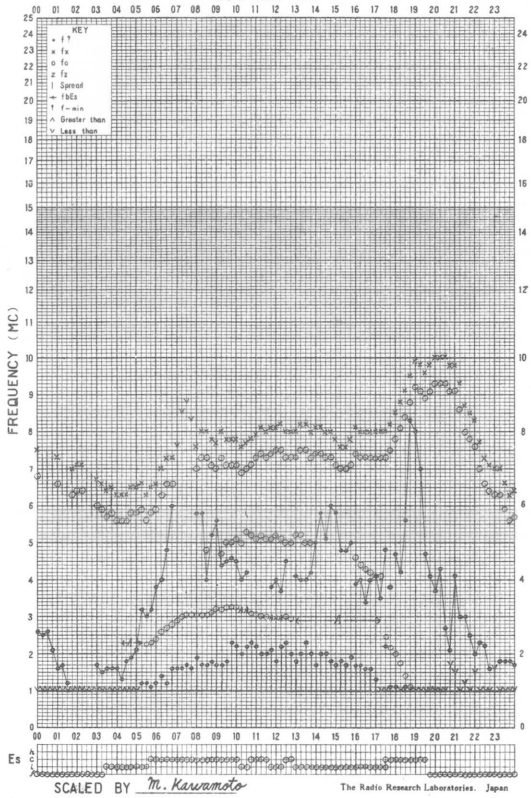

SCALED BY M. Kawamoto

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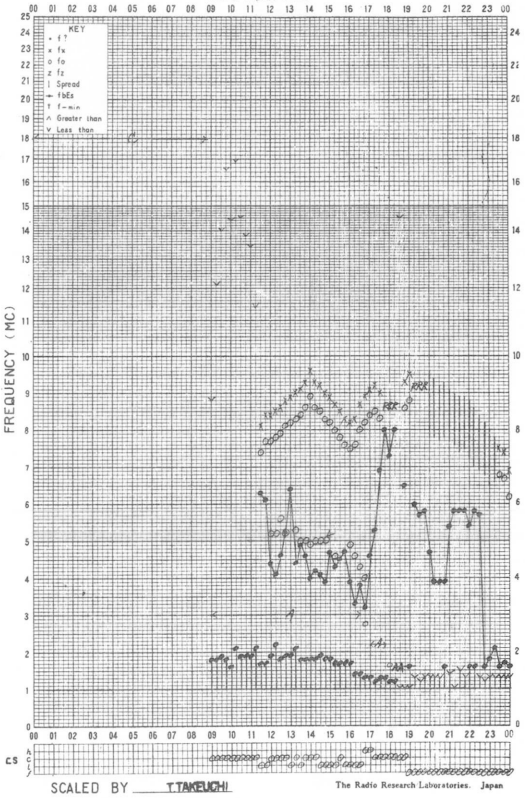

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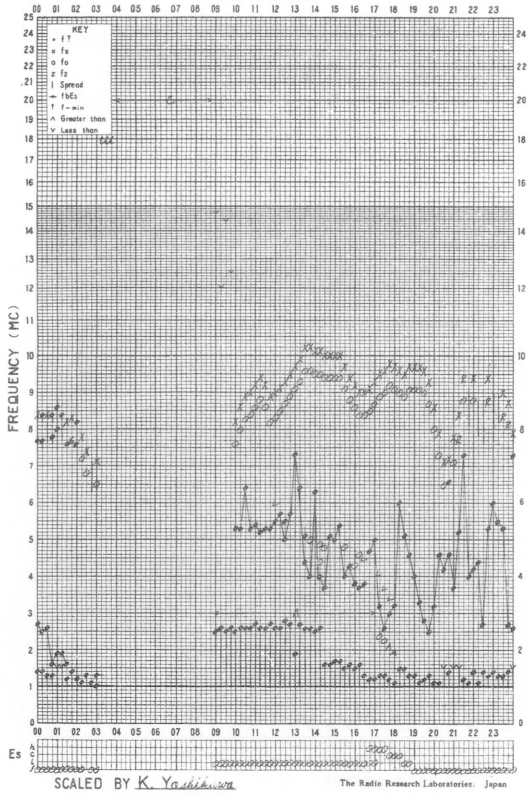

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The Radio Research Laboratories. Japan

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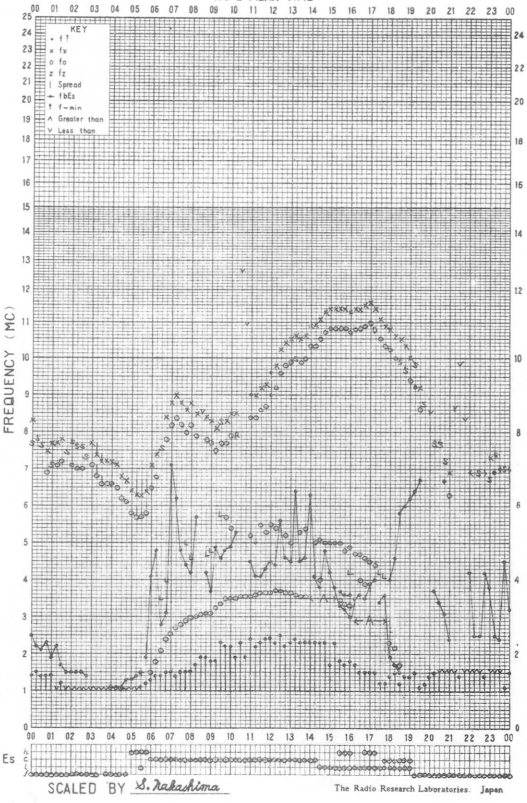

SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

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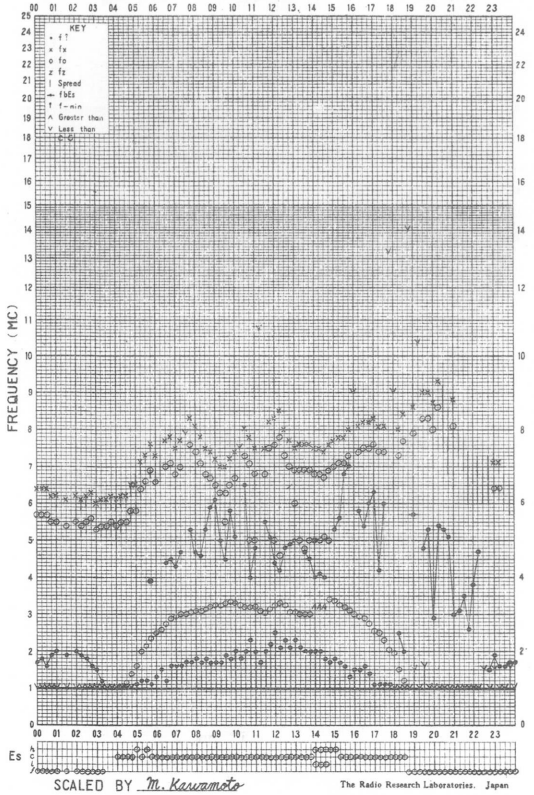

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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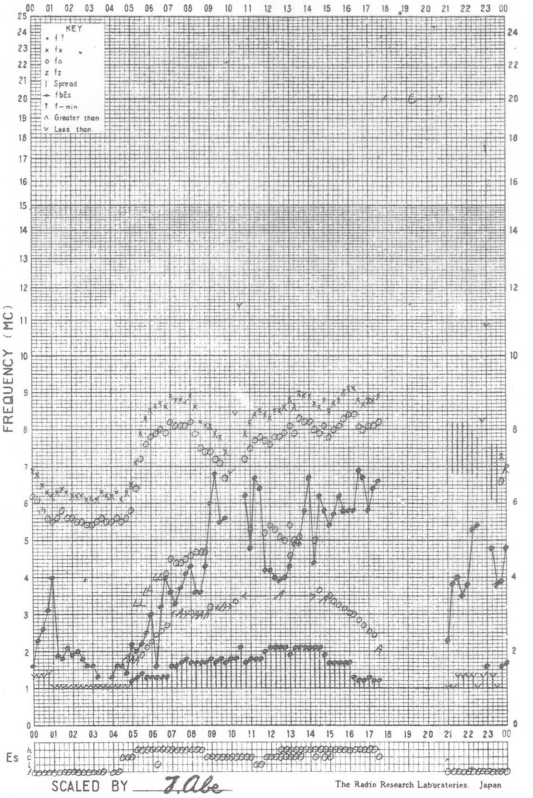

SCALED BY T. Abe The Radio Research Laboratories. Japan

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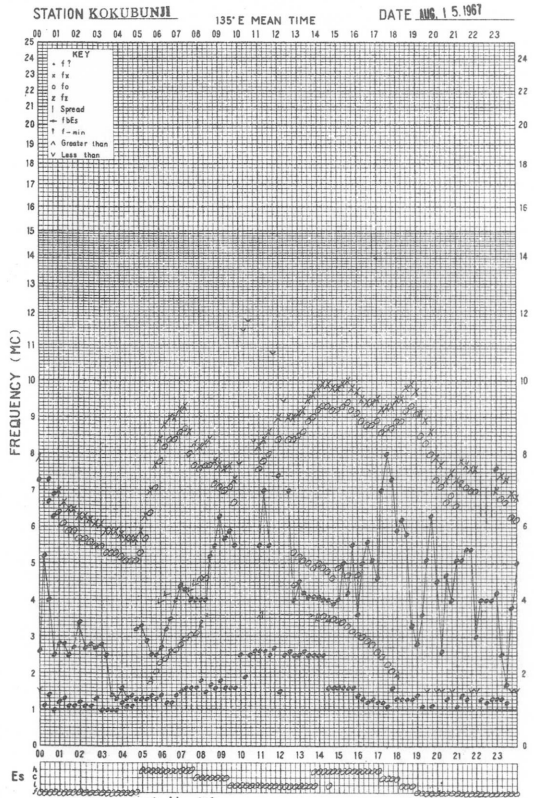

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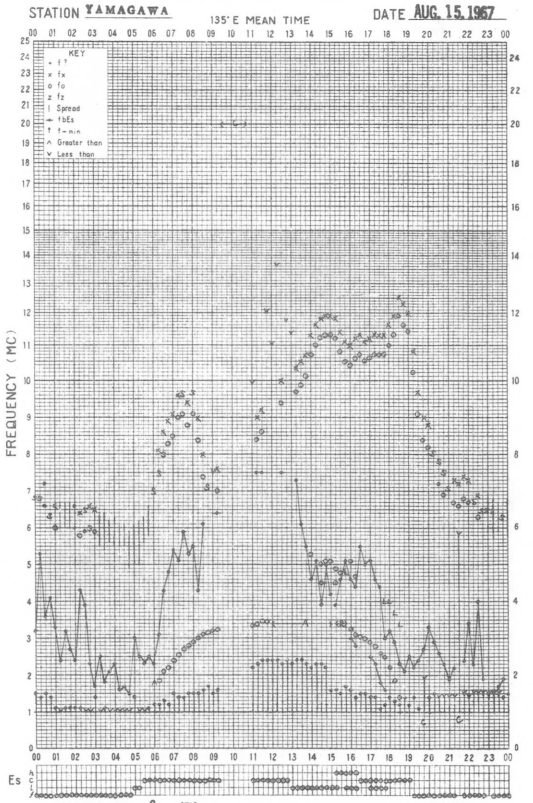

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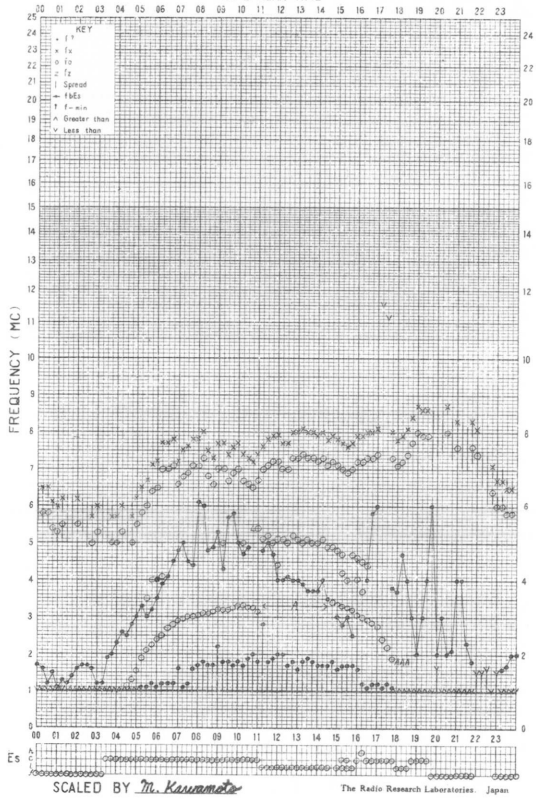

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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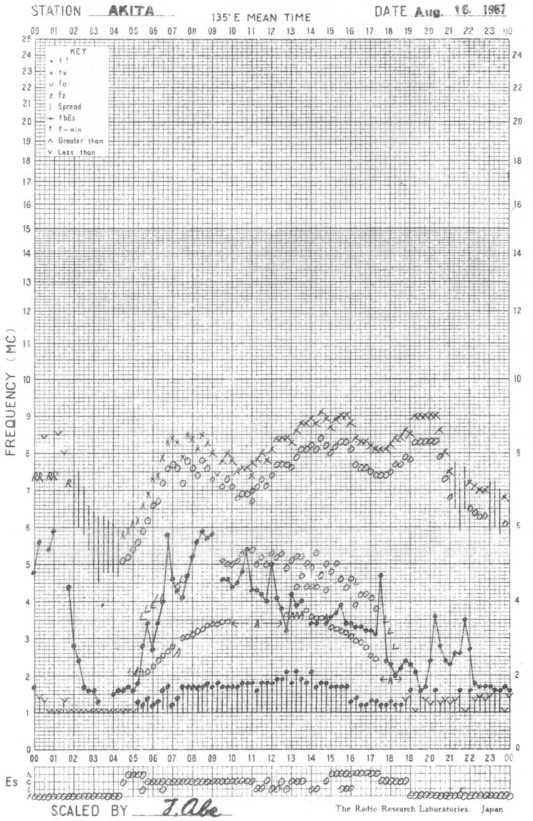

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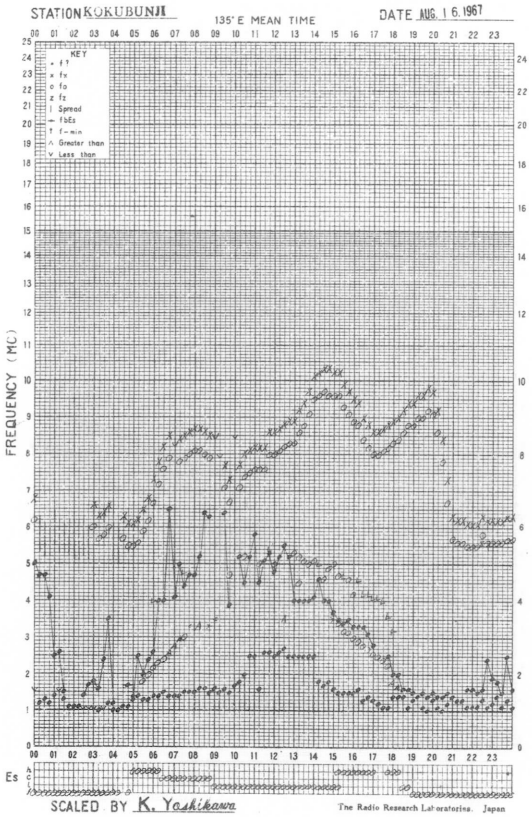

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The Radio Research Laboratories. Japan

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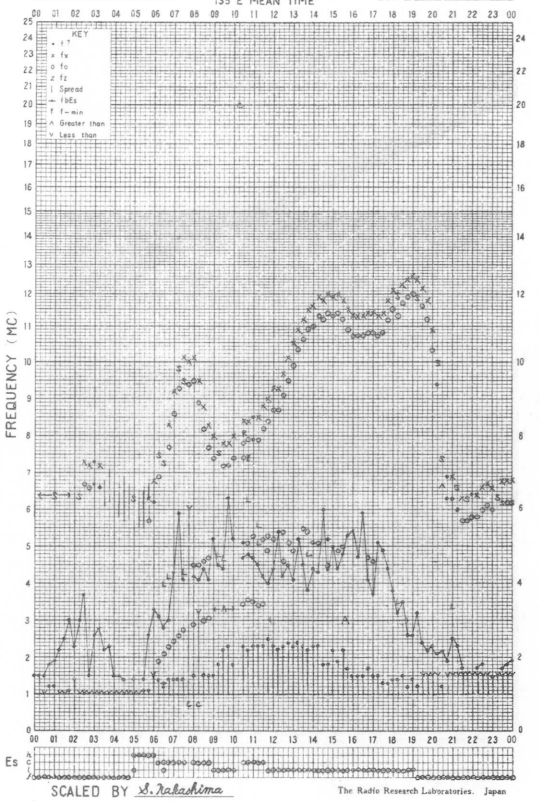

SCALED BY S. Takashima

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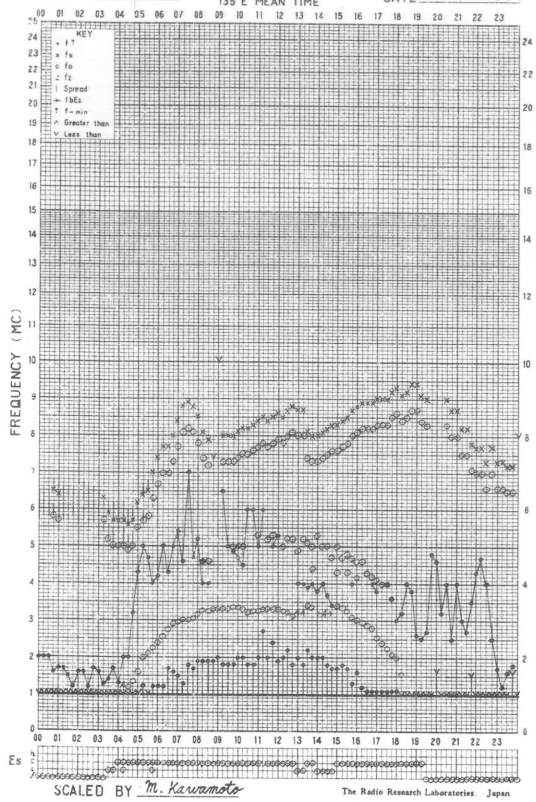
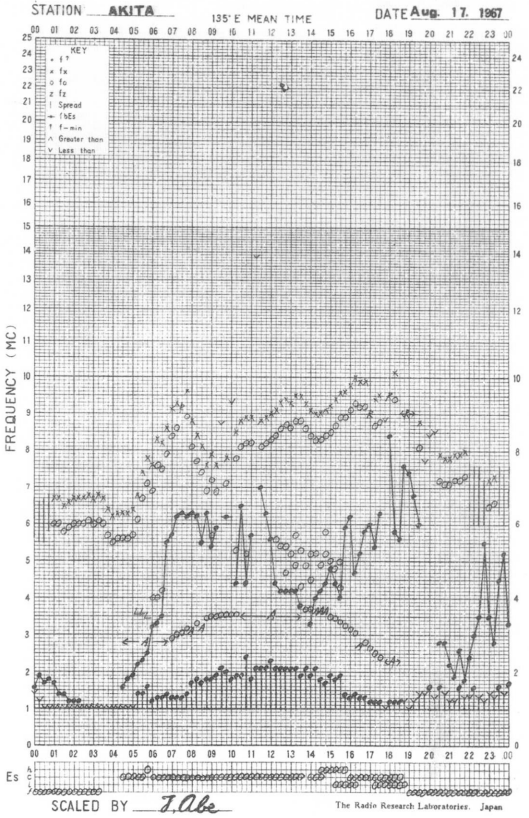
STATION WAKKANAI 135°E MEAN TIME DATE AUG. 17.1967



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Aug. 17. 1967



SCALED BY T. Abe The Radio Research Laboratories. Japan

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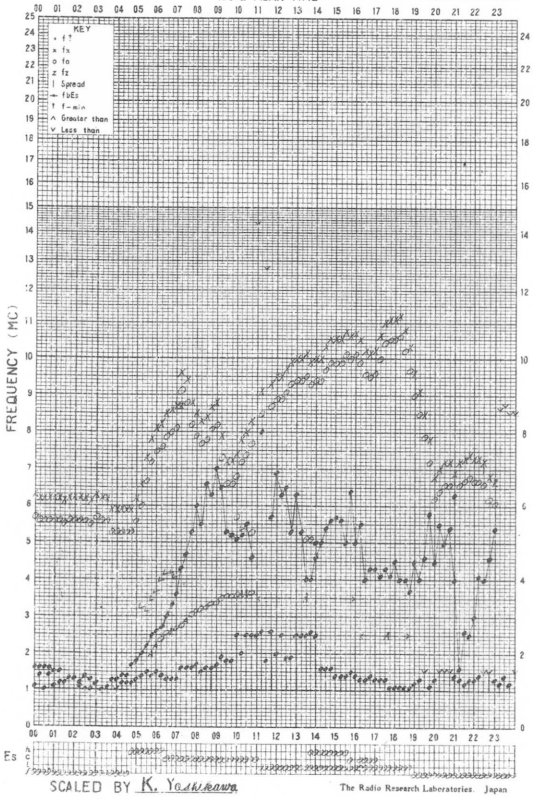
STATION KOKUBUNJI 135°E MEAN TIME DATE: AUG. 17.1967



SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

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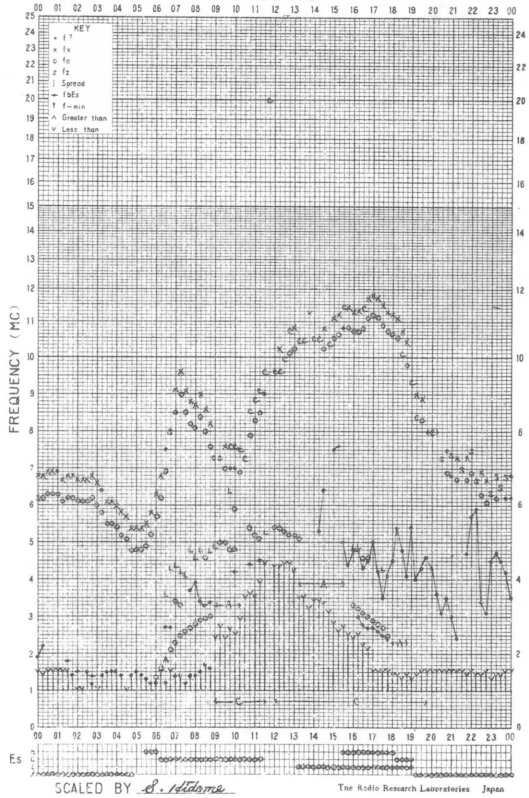

SCALED BY S. Hatakeyama The Radio Research Laboratories Japan

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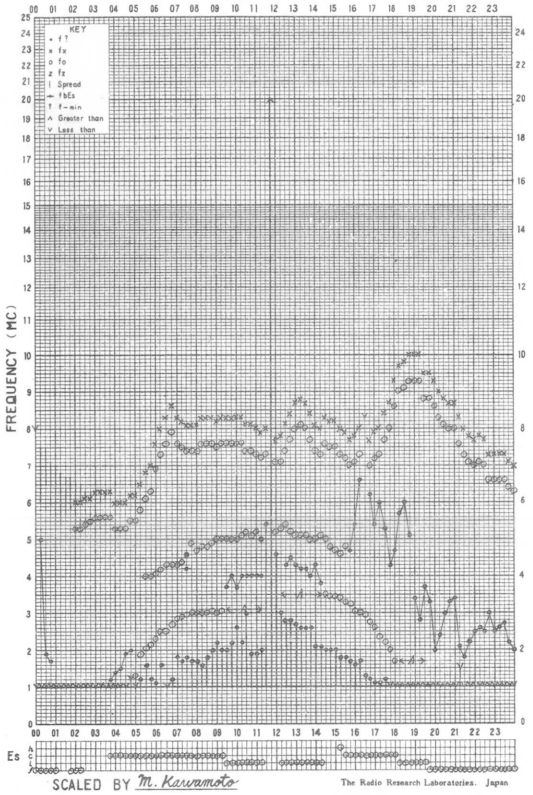

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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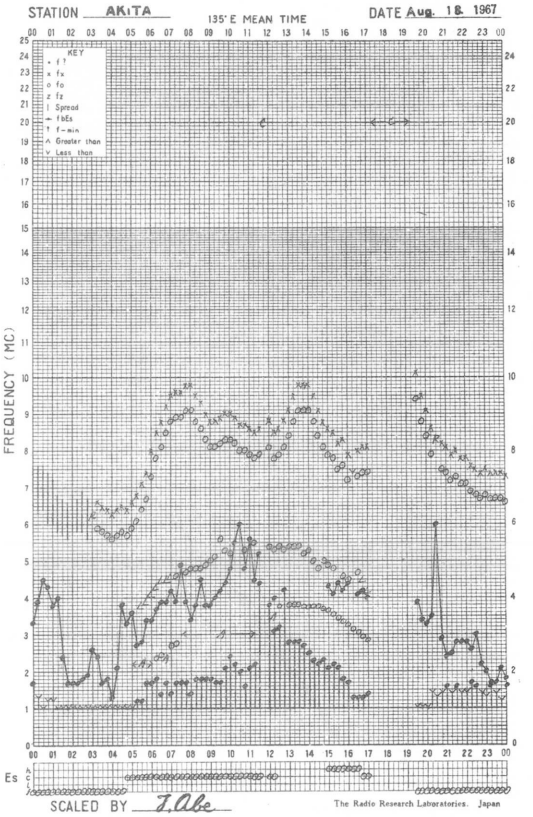

SCALED BY T. Abe

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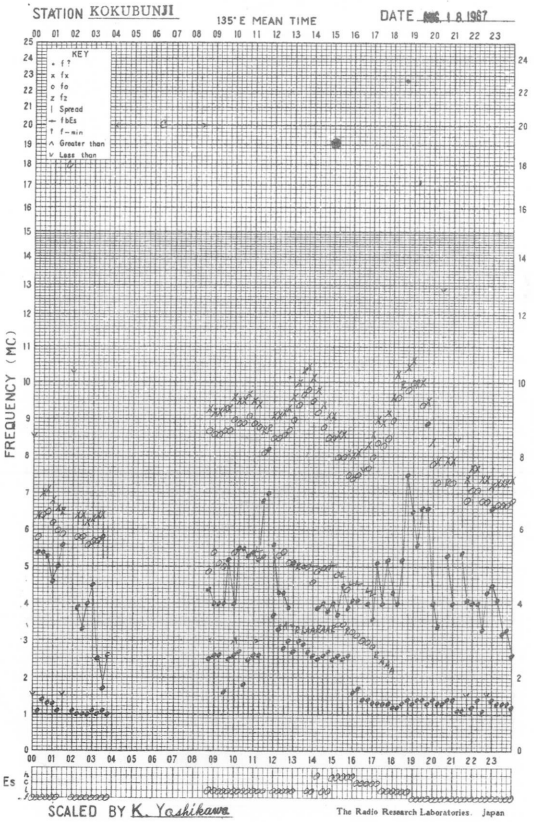

SCALED BY K. Yashikawa

The Radio Research Laboratories. Japan

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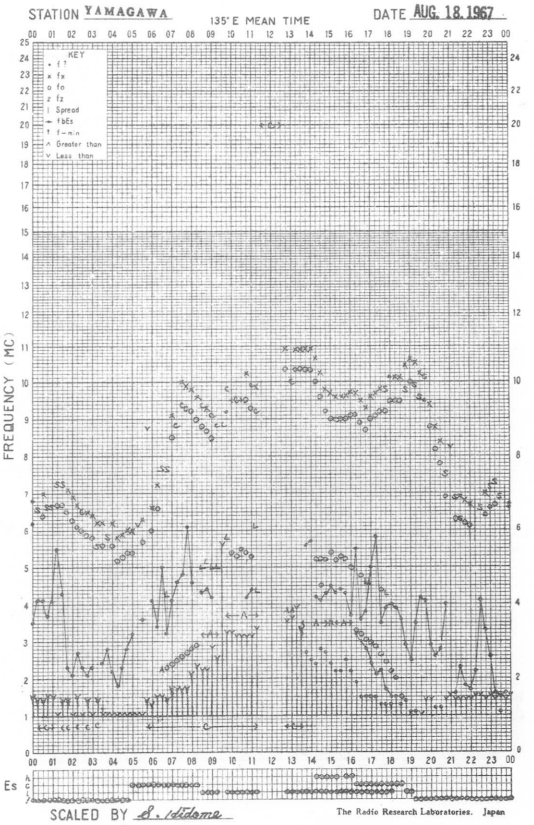

SCALED BY S. Iidoma

The Radio Research Laboratories. Japan

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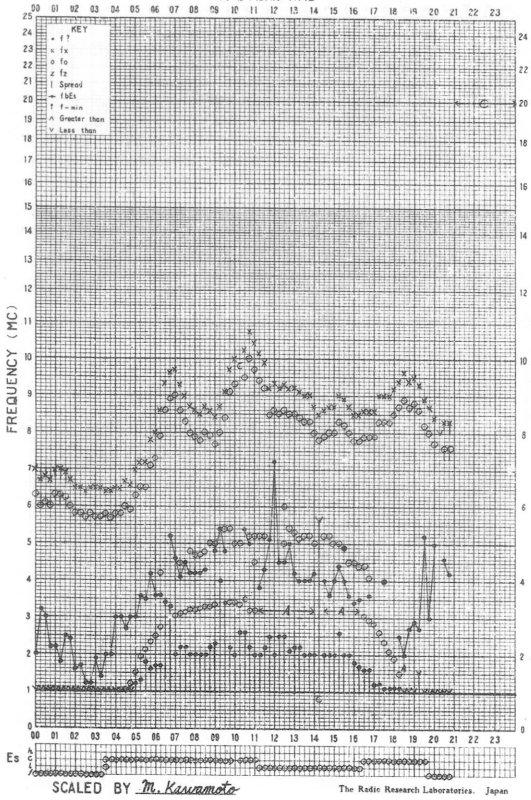

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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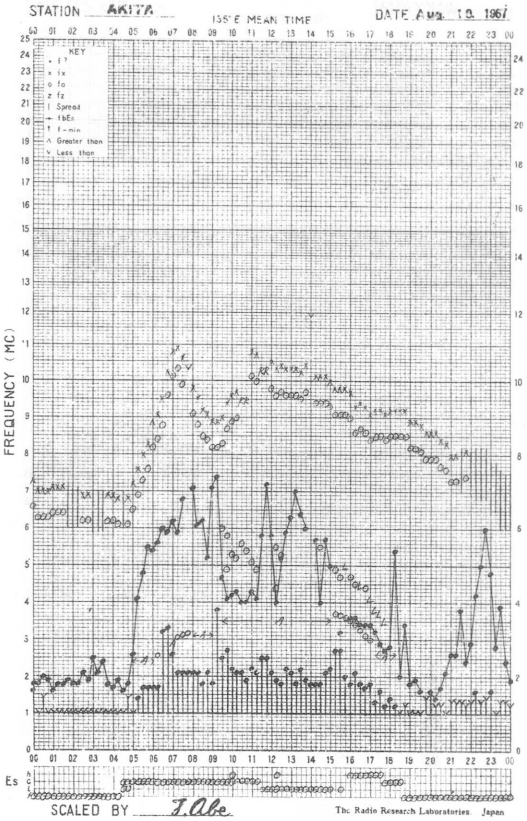

SCALED BY T. Abe The Radio Research Laboratories. Japan

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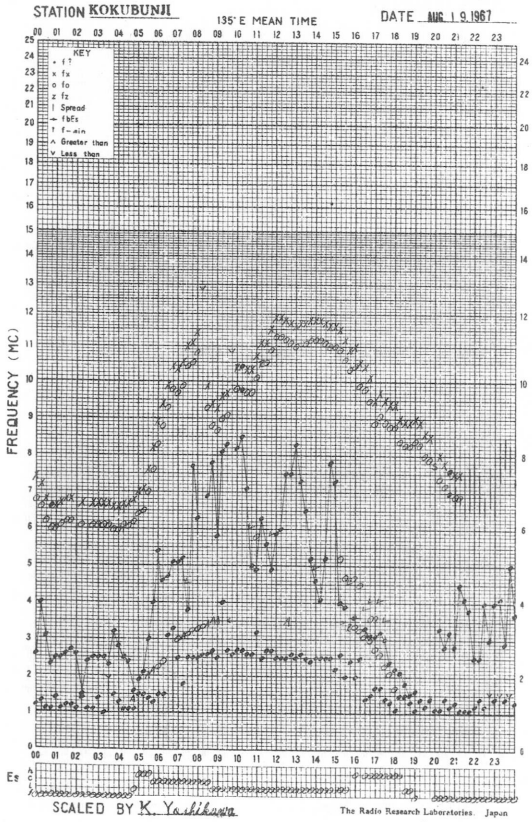

SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

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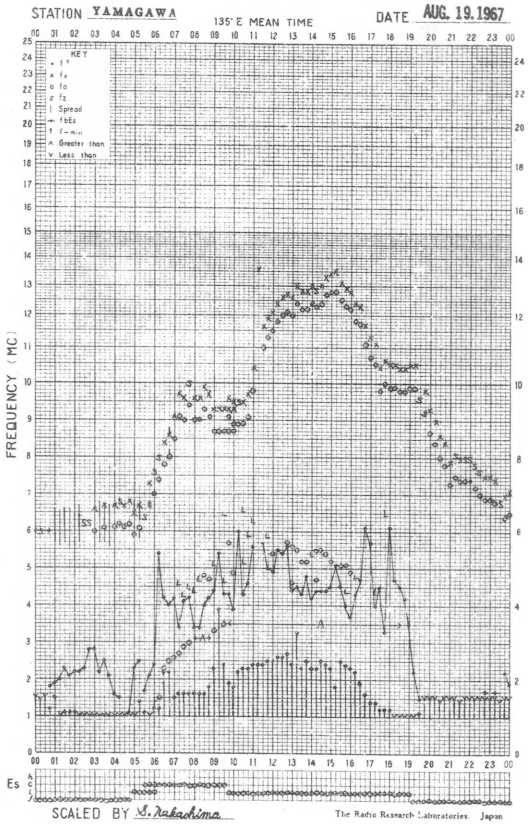

SCALED BY S. Nakashima The Radio Research Laboratories. Japan

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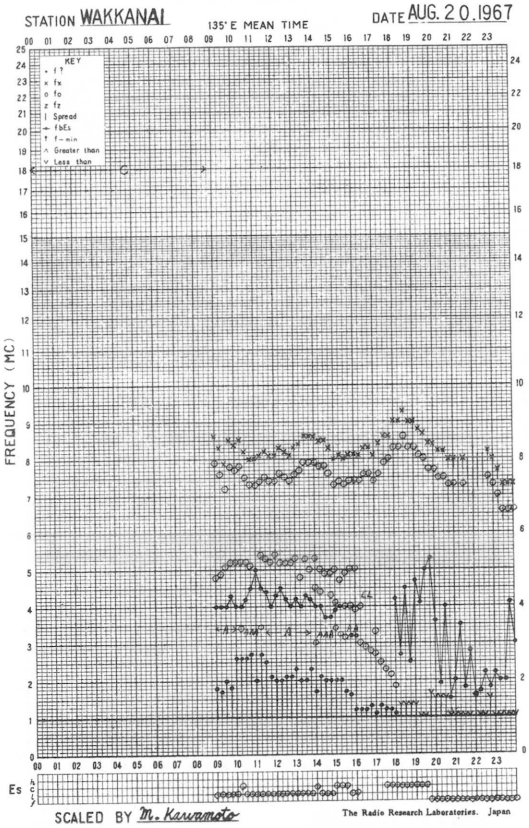

SCALED BY M. Kazumoto

The Radio Research Laboratories. Japan

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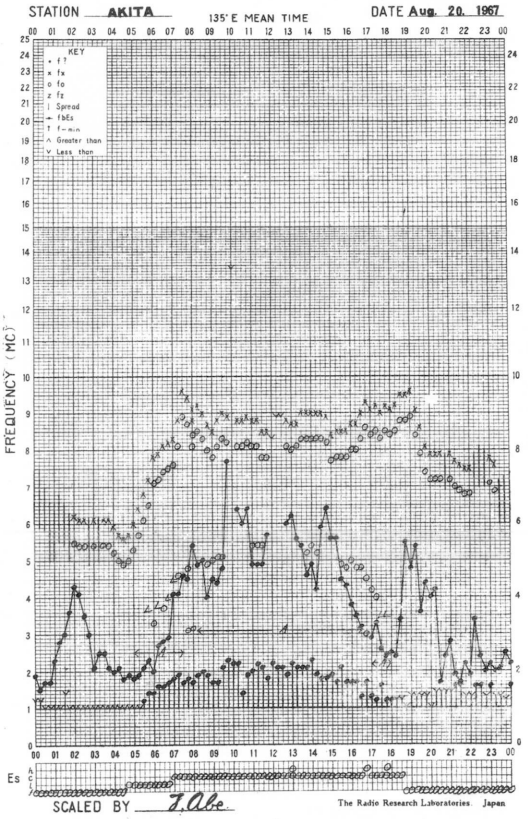

SCALED BY T. Abe

The Radio Research Laboratories Japan

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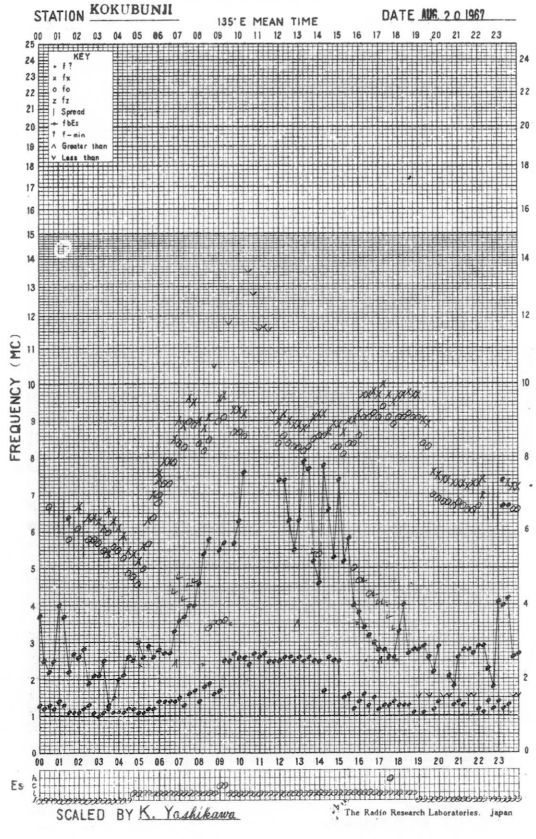

SCALED BY K. Yoshikawa

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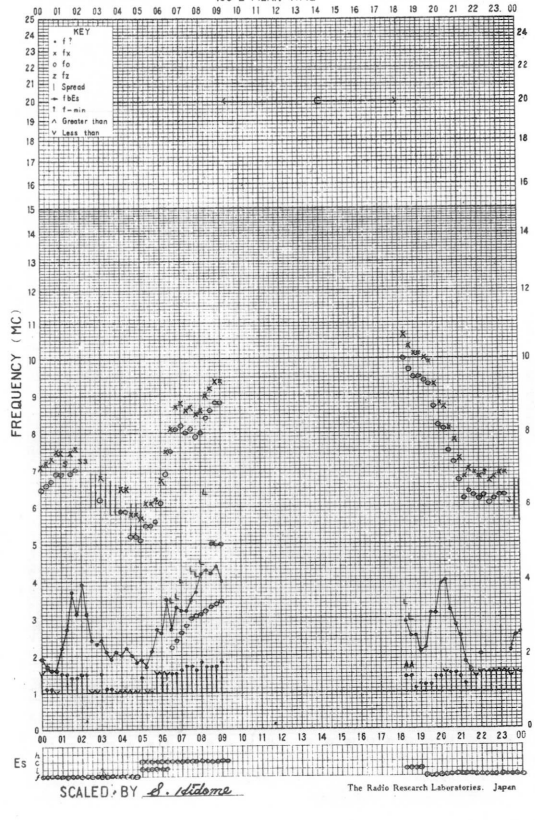

SCALED BY S. Shidome

The Radio Research Laboratories. Japan

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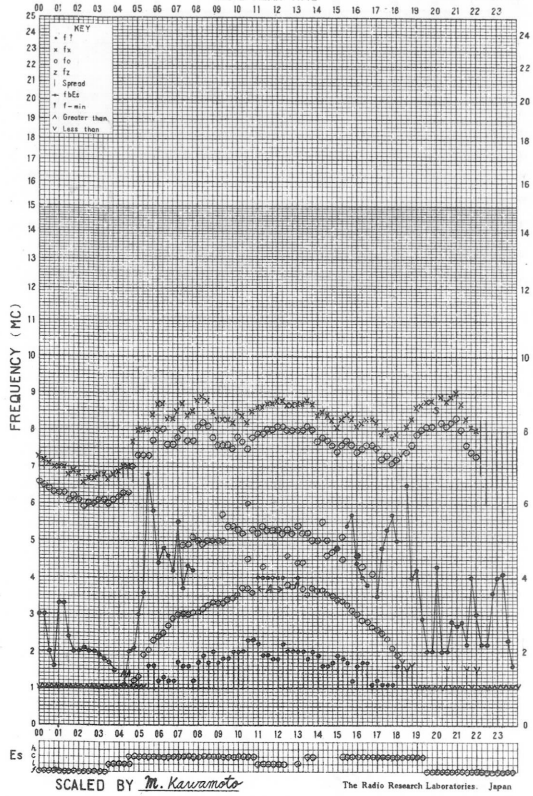

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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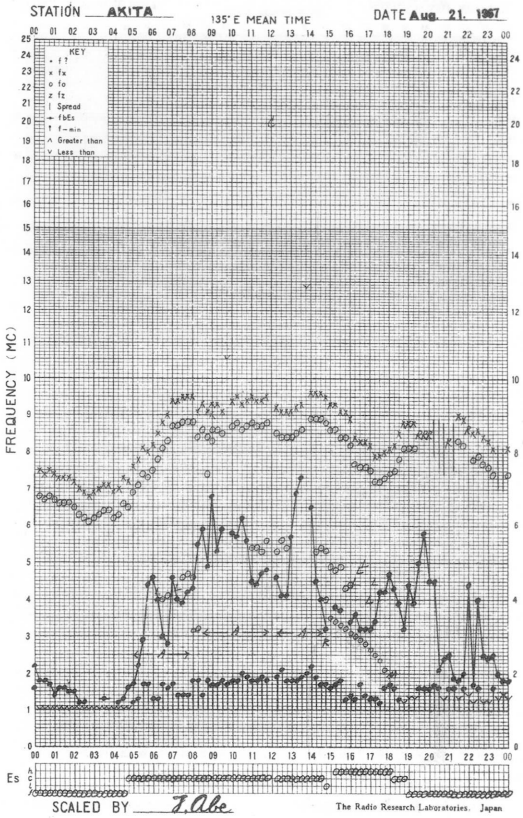

SCALED BY T. Abe The Radio Research Laboratories. Japan

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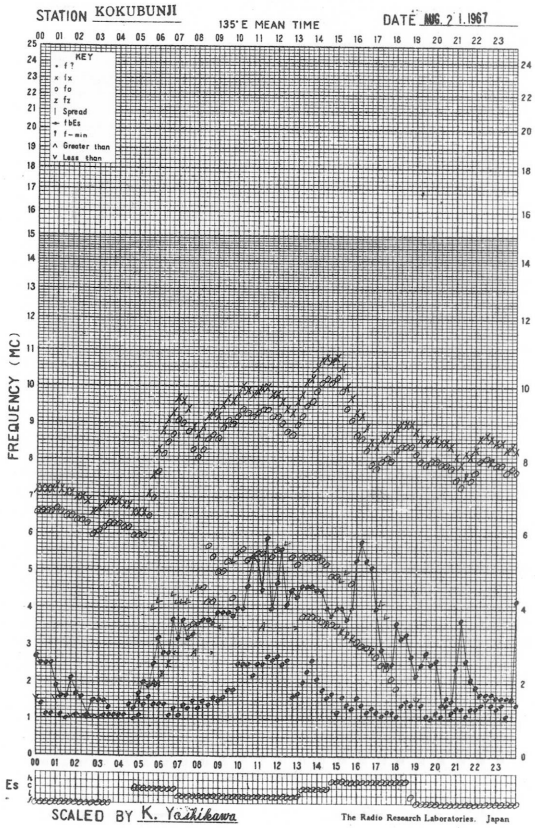

SCALED BY K. Yashikawa The Radio Research Laboratories. Japan

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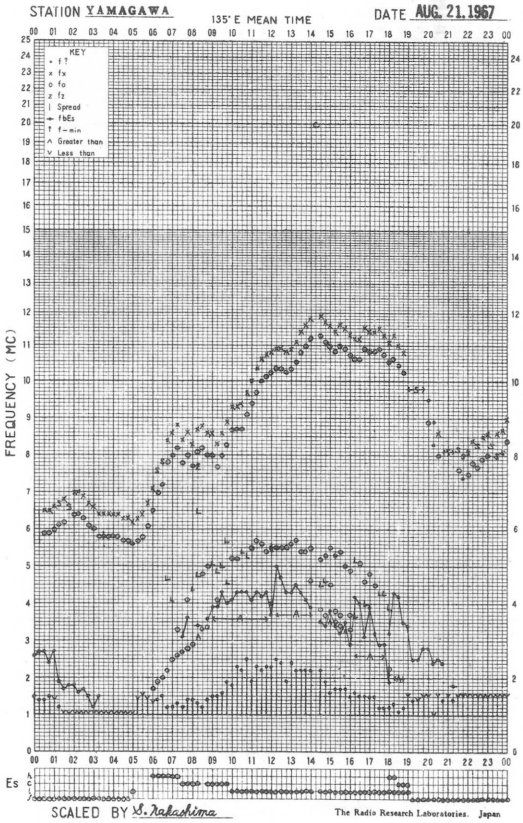

SCALED BY S. Takashima The Radio Research Laboratories. Japan

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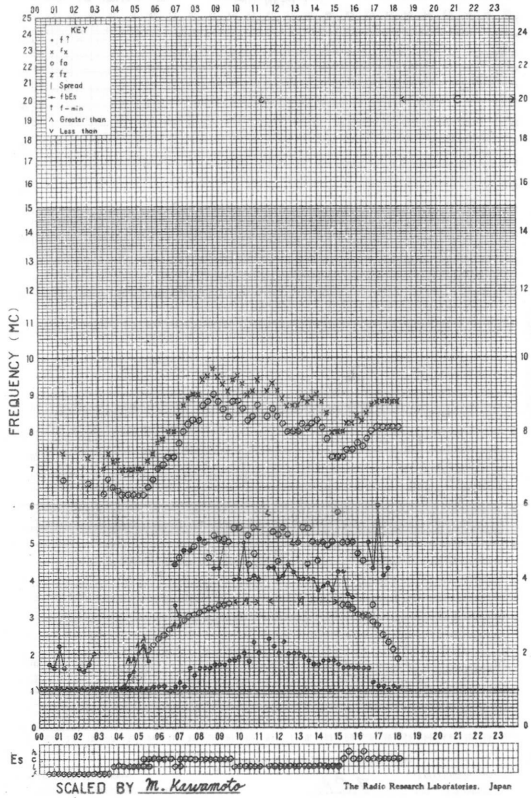

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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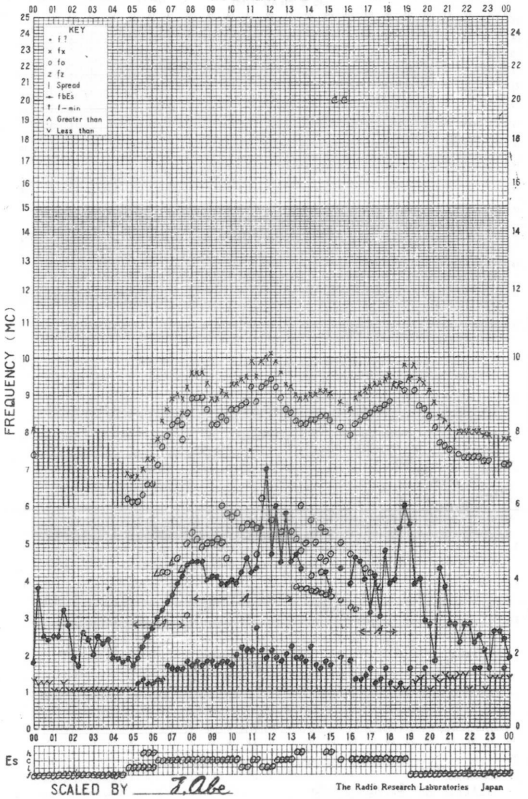

SCALED BY T. Abe The Radio Research Laboratories Japan

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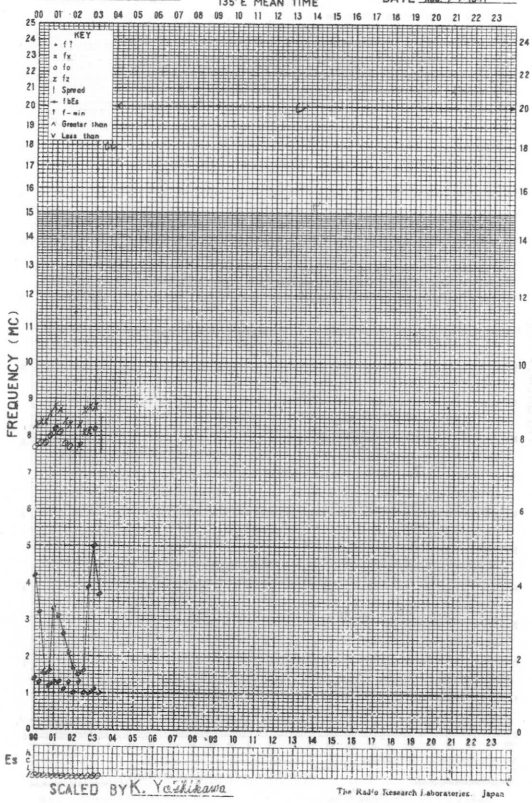

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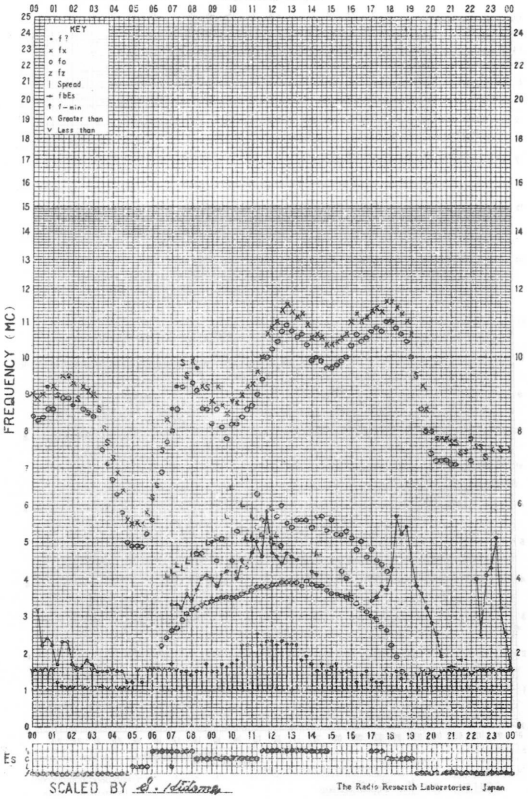

SCALED BY S. Nitsuma The Radio Research Laboratories. Japan

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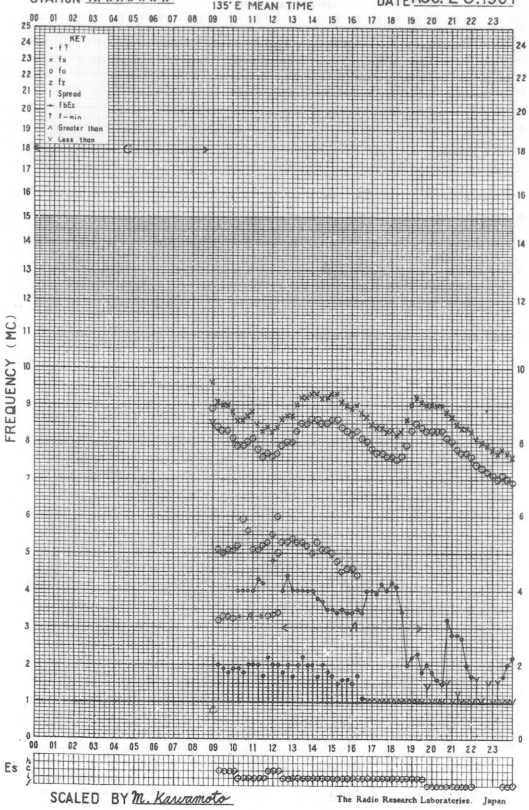

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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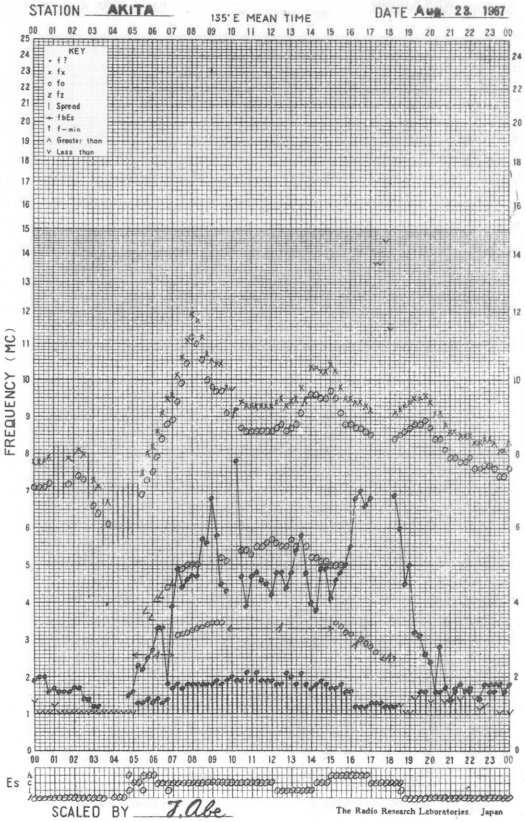

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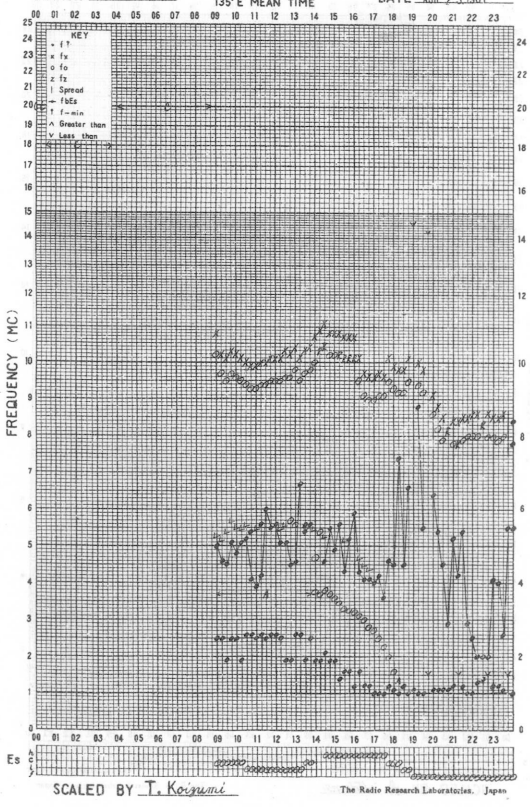

SCALED BY T. Koizumi The Radio Research Laboratories. Japan

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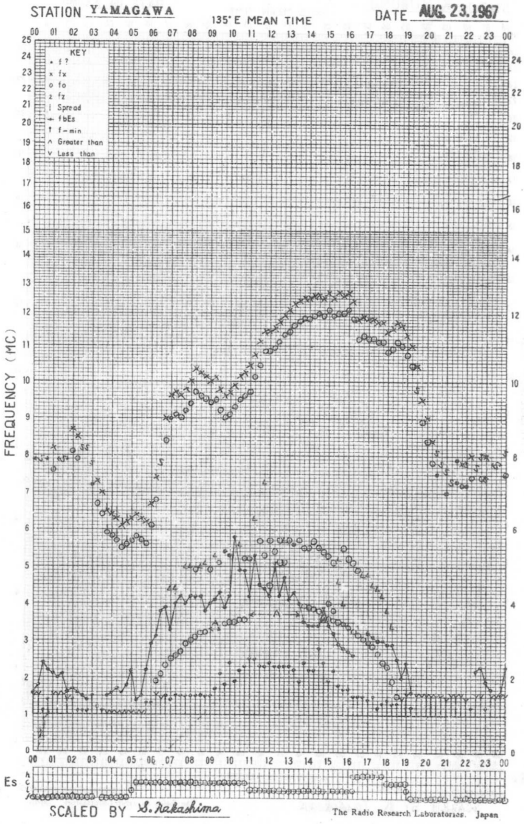

SCALED BY S. Nakashima The Radio Research Laboratories. Japan

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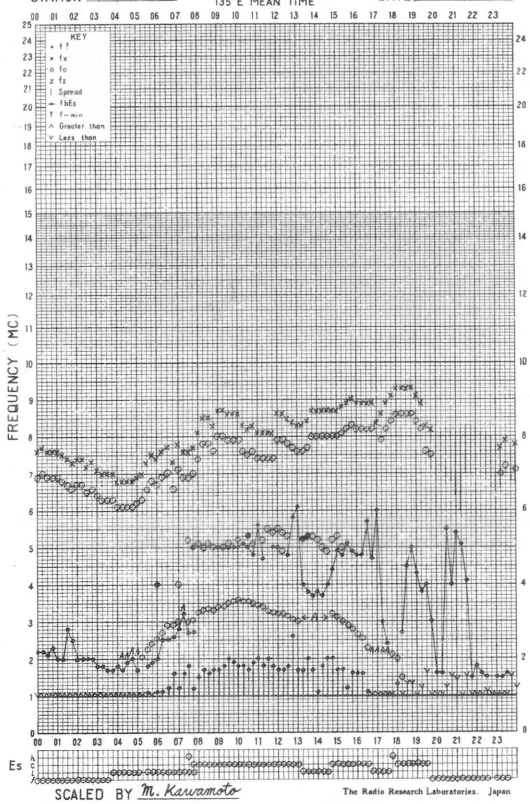
STATION WAKKANAI 135°E MEAN TIME DATE AUG. 2 4.1967



SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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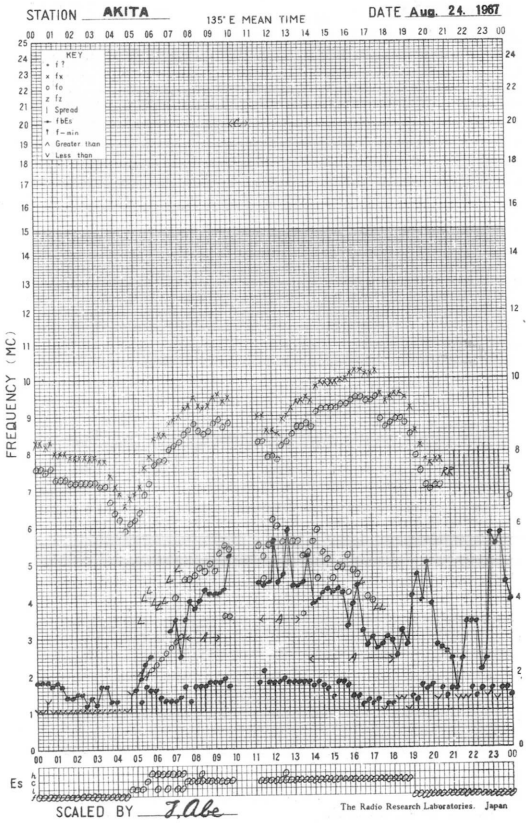

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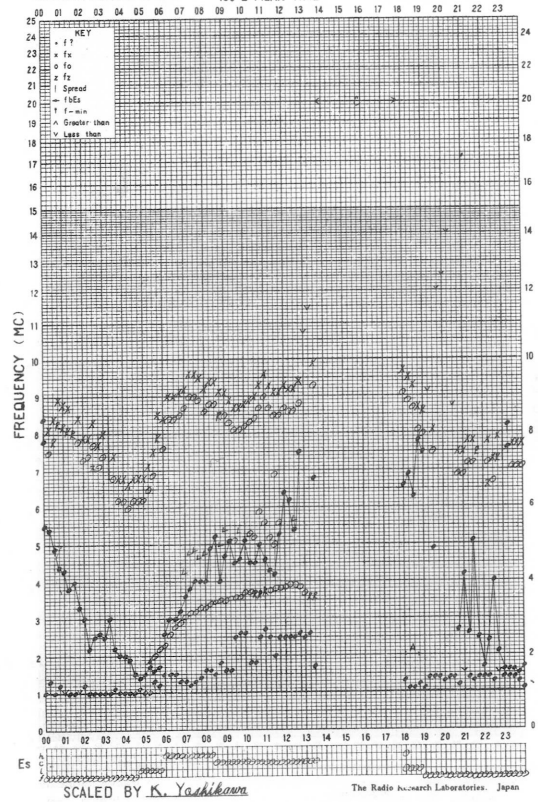

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The Radio Research Laboratories. Japan

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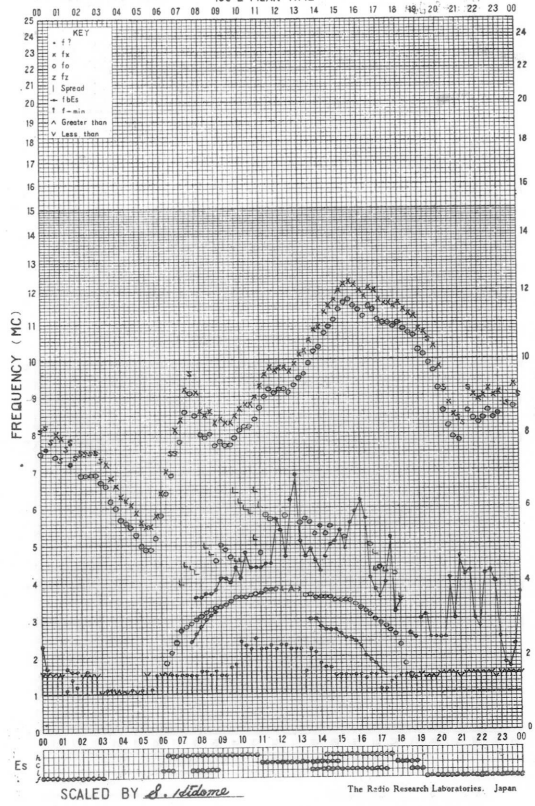

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The Radio Research Laboratories. Japan

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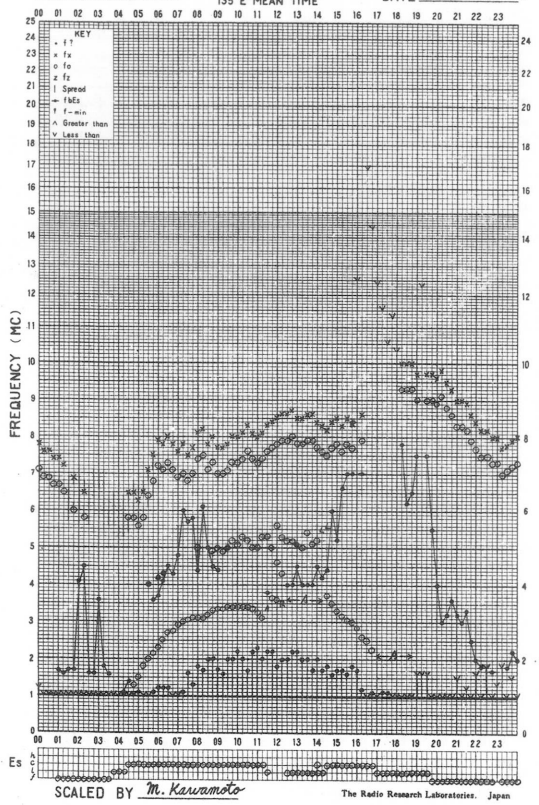

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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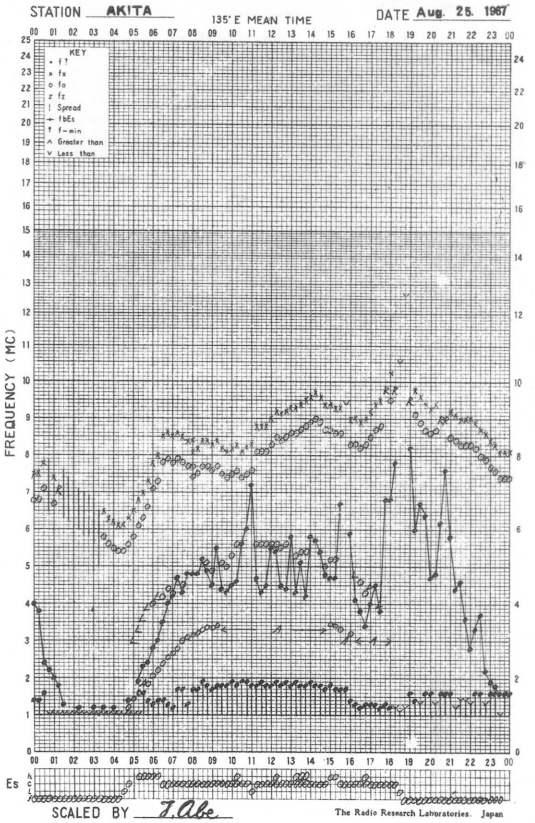

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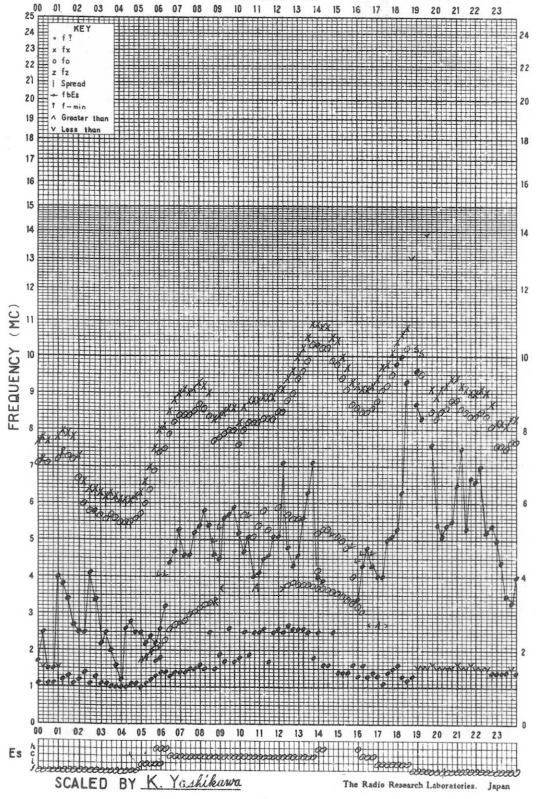

SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

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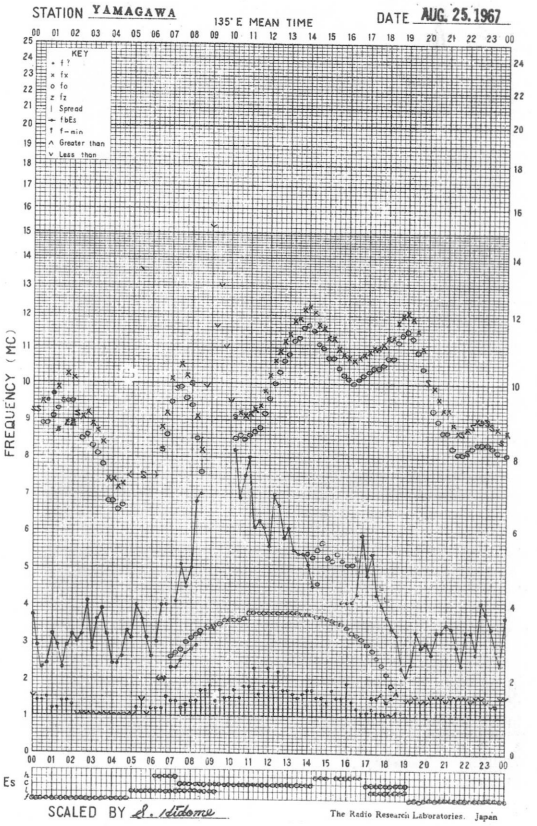

SCALED BY S. Ishioma The Radio Research Laboratories. Japan

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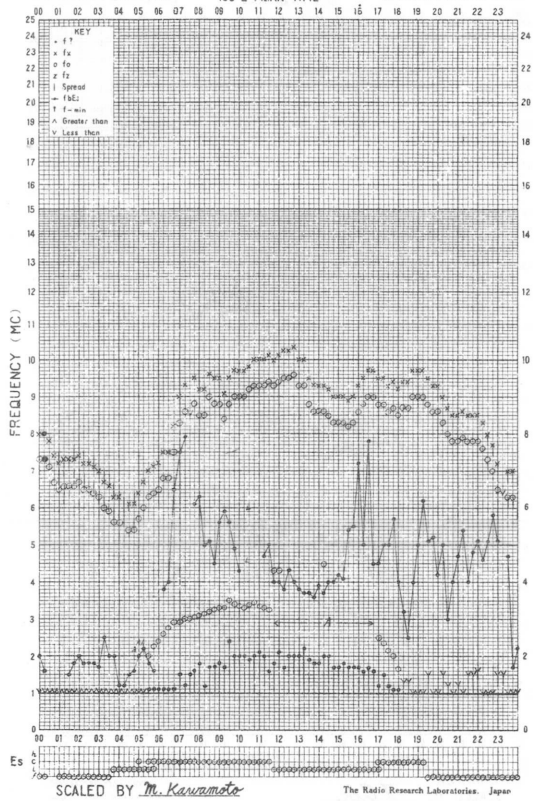

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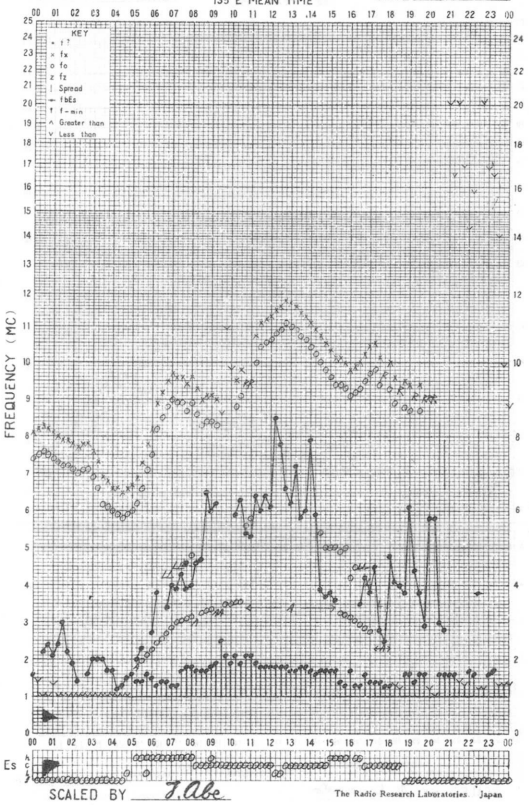

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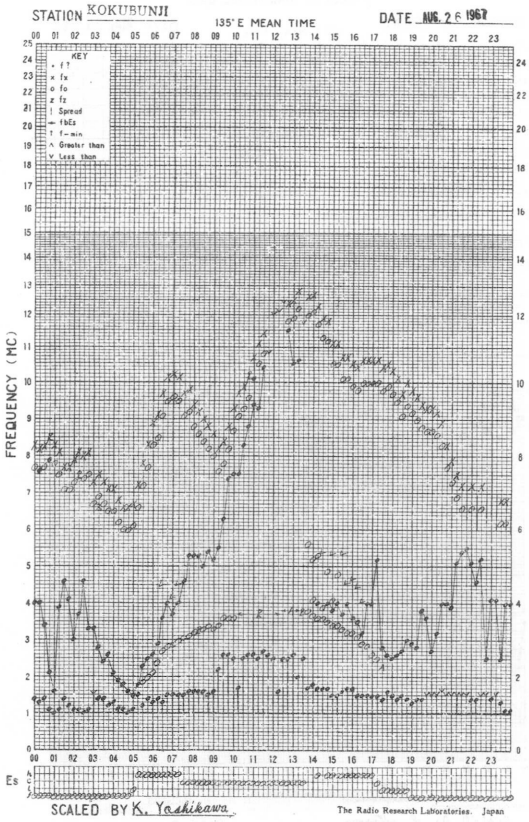

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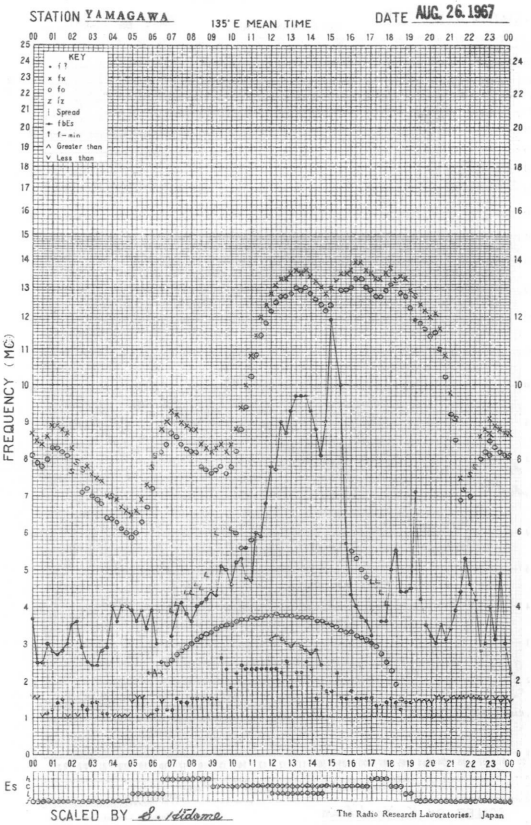

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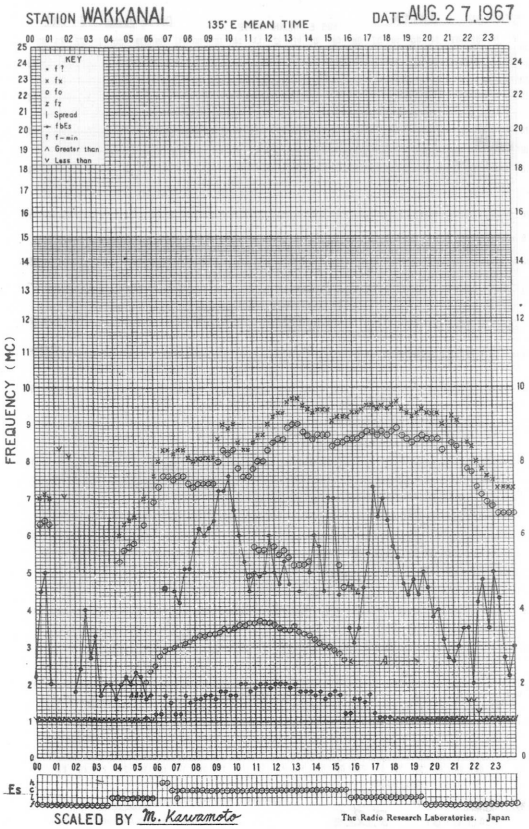

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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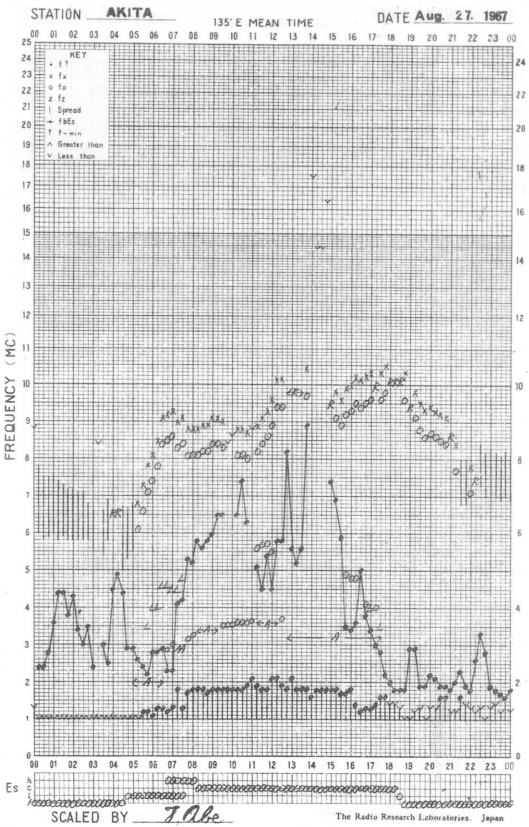

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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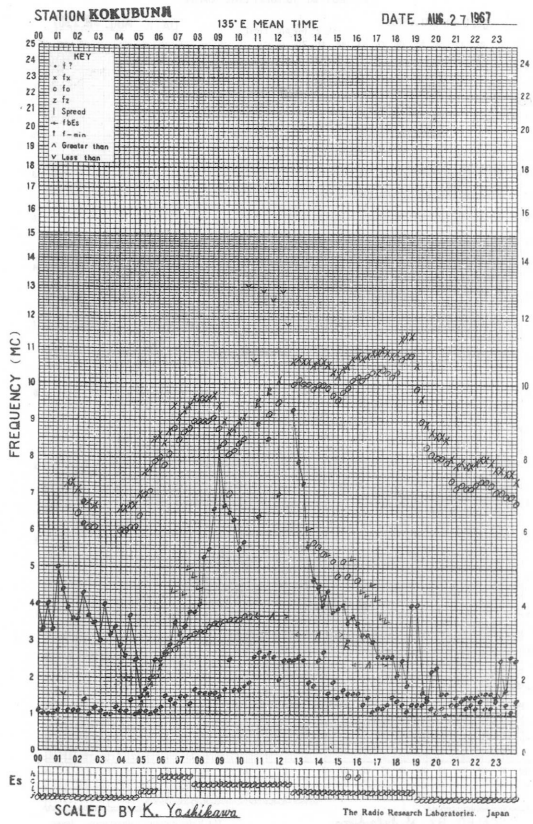

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The Radio Research Laboratories. Japan

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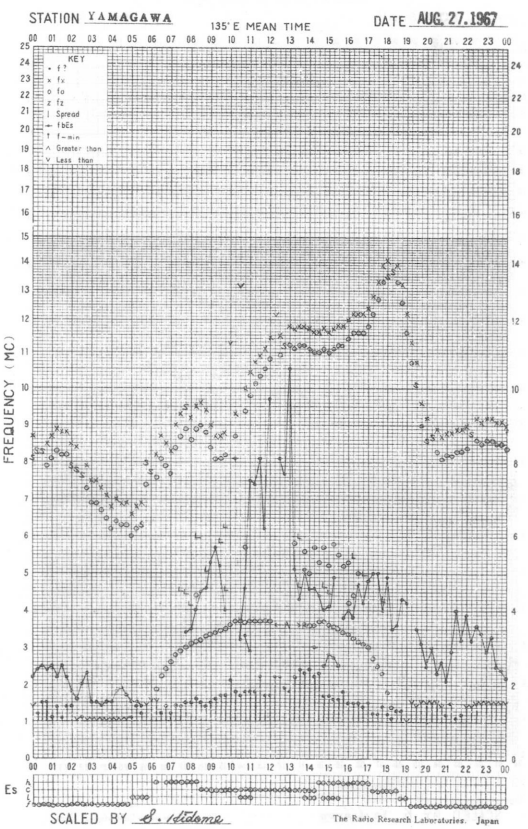

SCALED BY S. Hidoma

The Radio Research Laboratories. Japan

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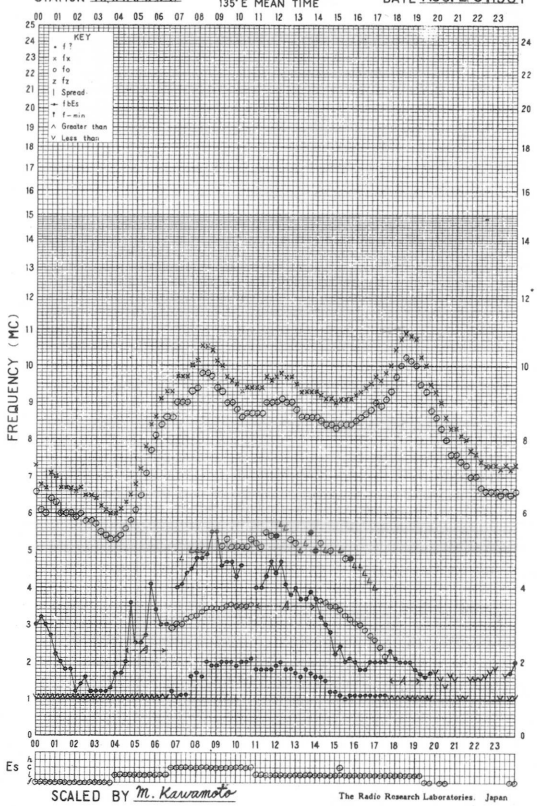

SCALED BY M. Kawamoto

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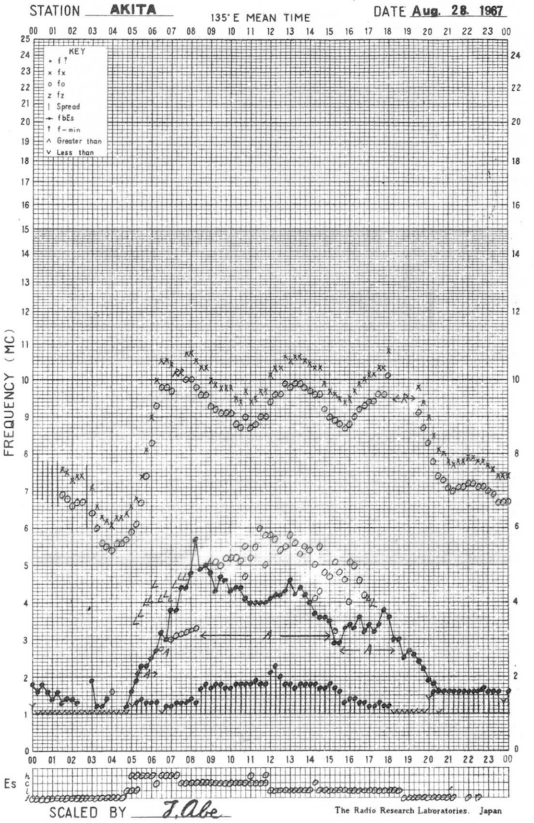
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Aug. 28. 1967

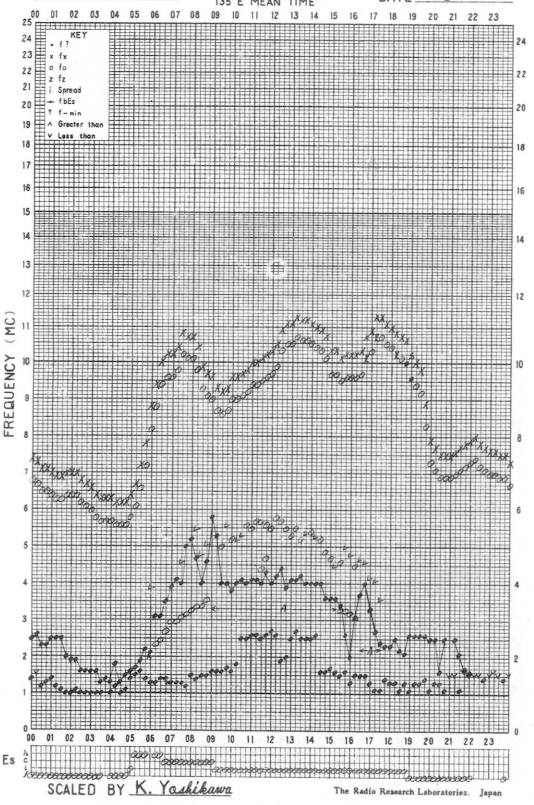


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE AUG. 2 8 1967

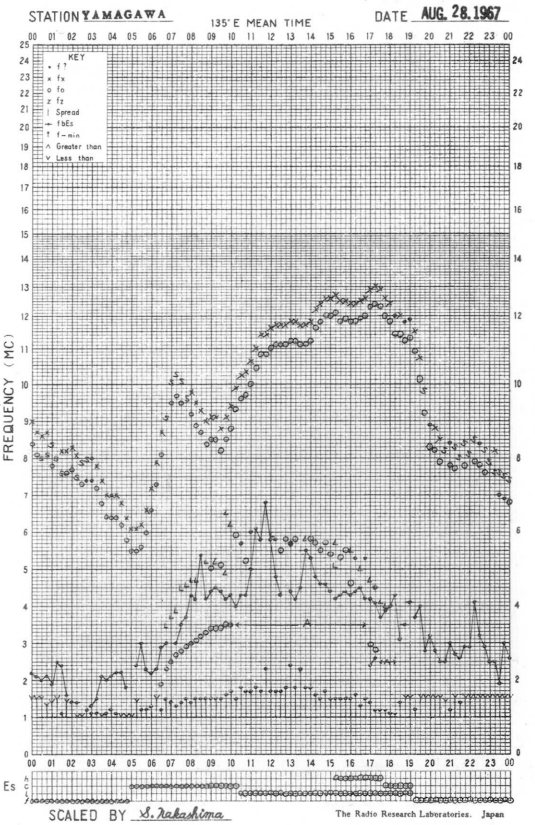


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE AUG. 28, 1967

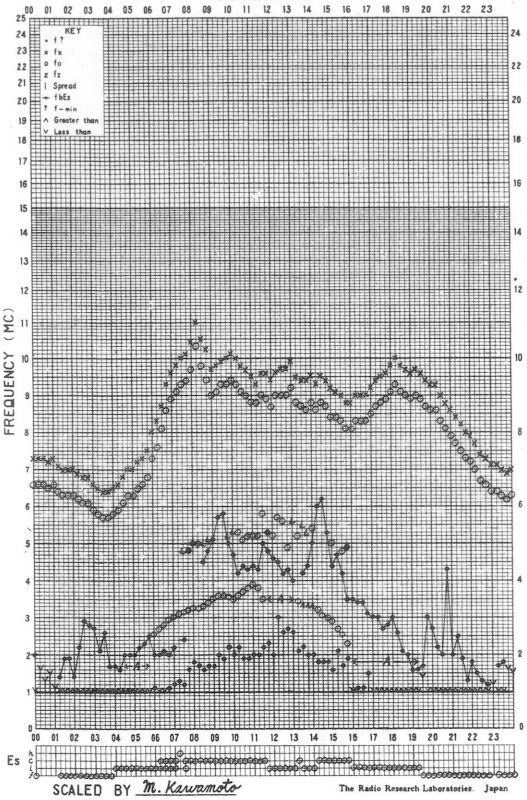


SCALED BY S. Nakashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

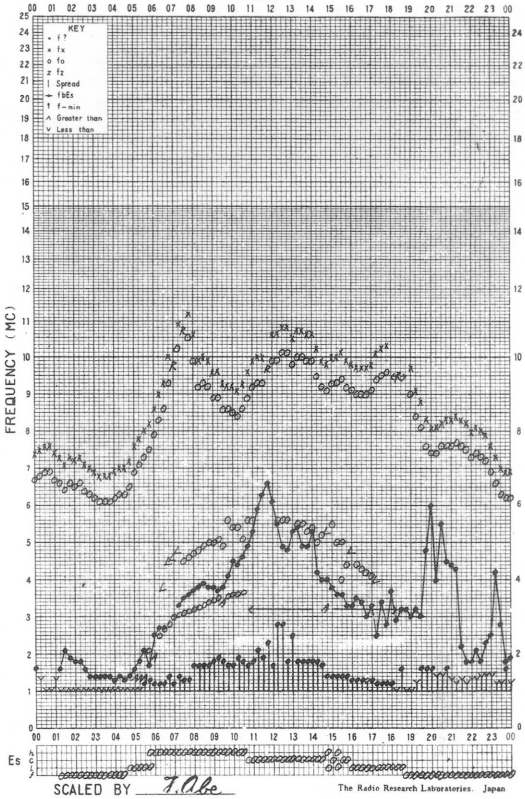
STATION WAKKANAI 135°E MEAN TIME DATE AUG. 29.1967



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

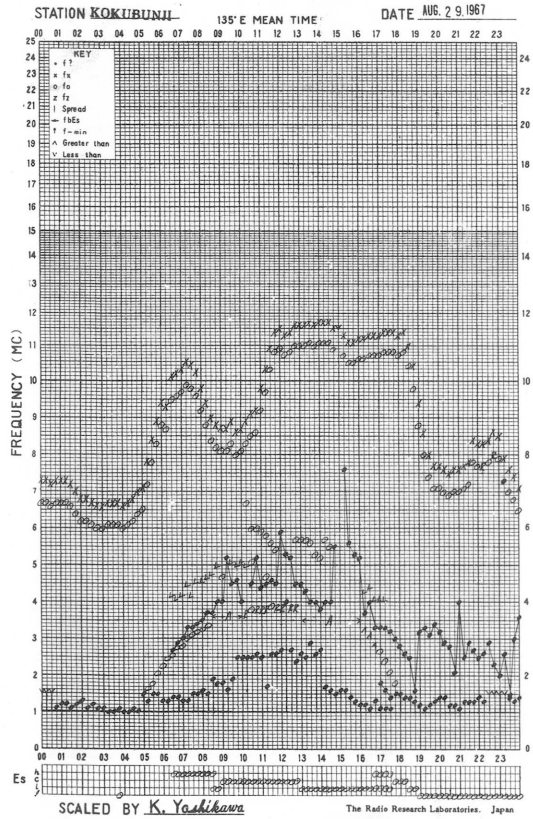
STATION AKITA 135°E MEAN TIME DATE Aug. 29. 1967



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

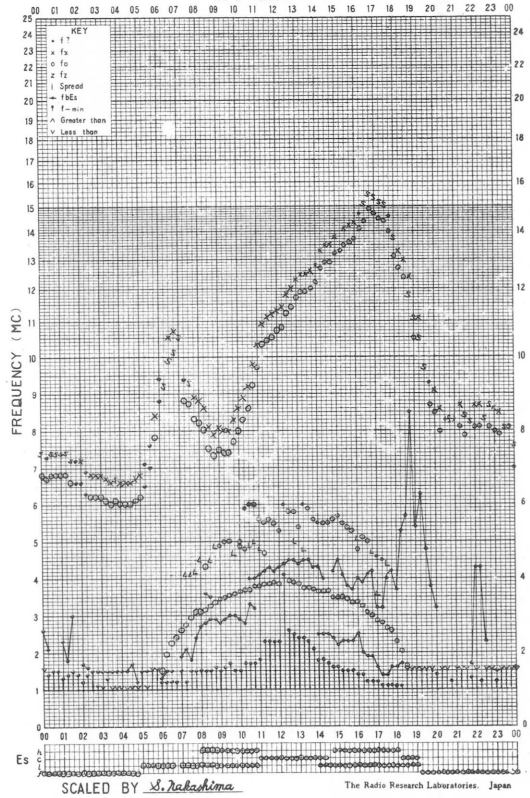
STATION KOKUBUNJI 135°E MEAN TIME DATE AUG. 29.1967



SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

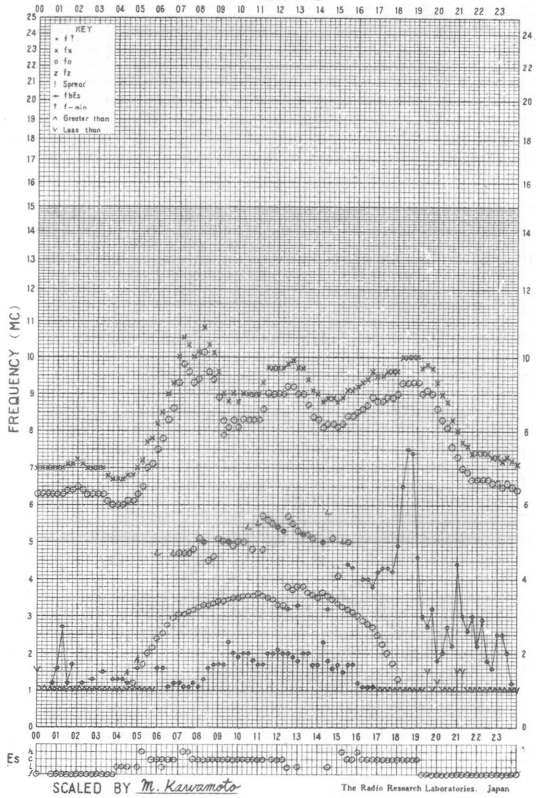
STATION YAMAGAWA 135°E MEAN TIME DATE AUG. 29.1967



SCALED BY S. Nakashima The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE AUG. 30. 1967

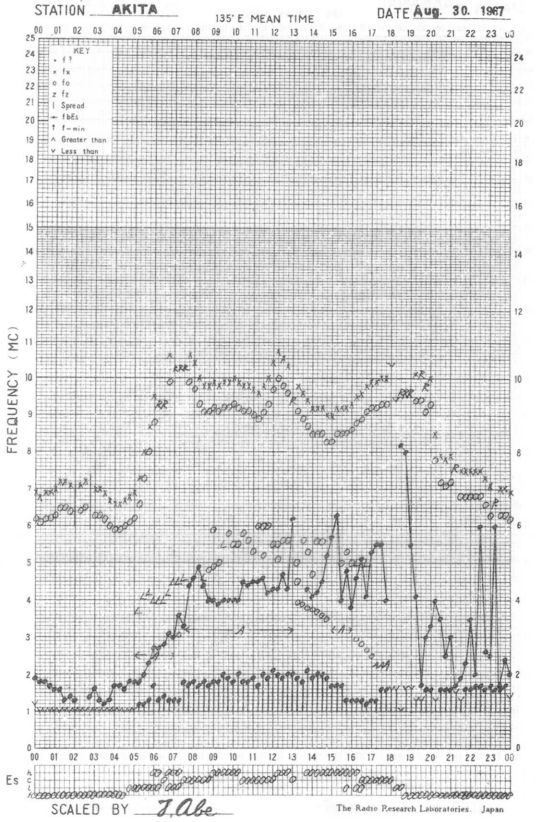


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Aug. 30. 1967

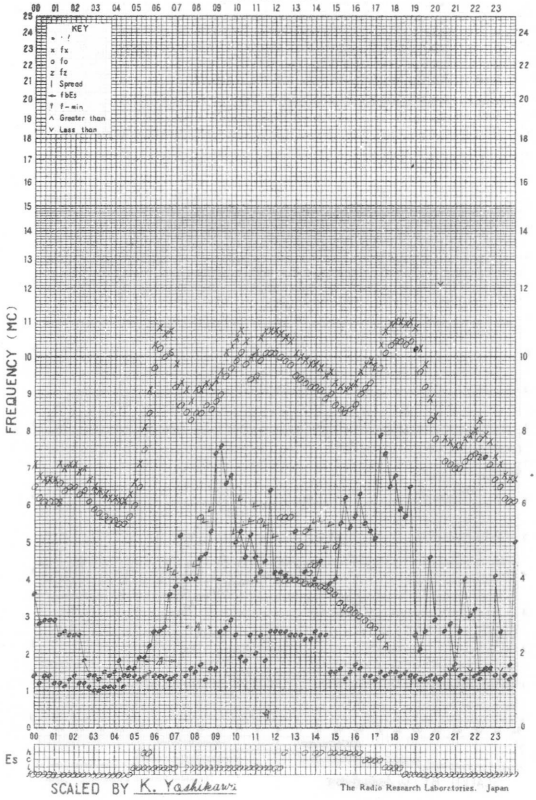


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE AUG. 30 1967

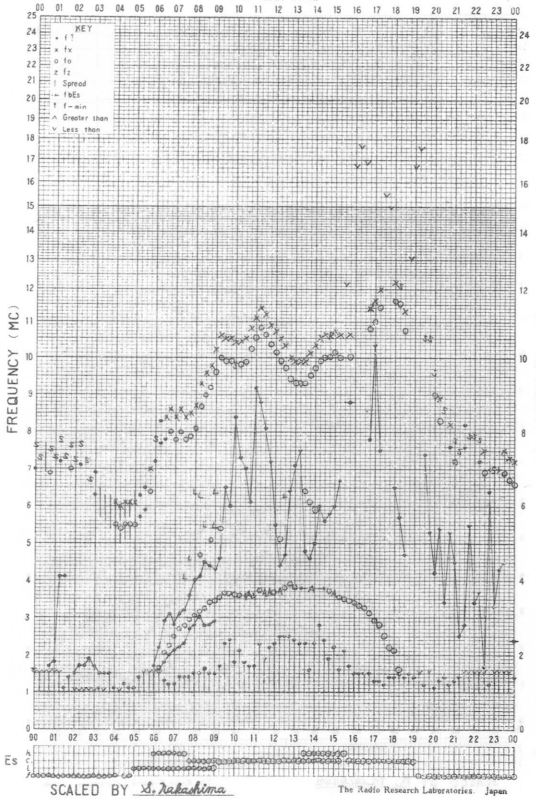


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE AUG. 30. 1967

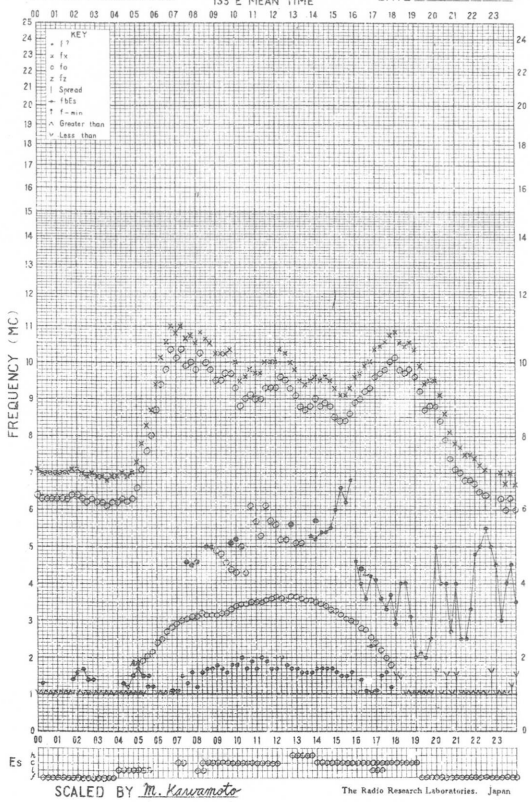


SCALED BY S. Takashima

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE AUG. 31. 1967

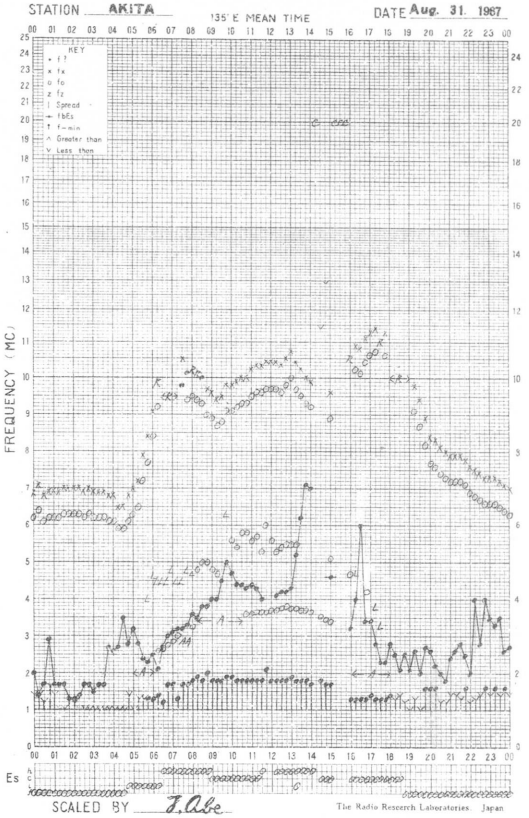


SCALED BY M. Yasumoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Aug. 31. 1967

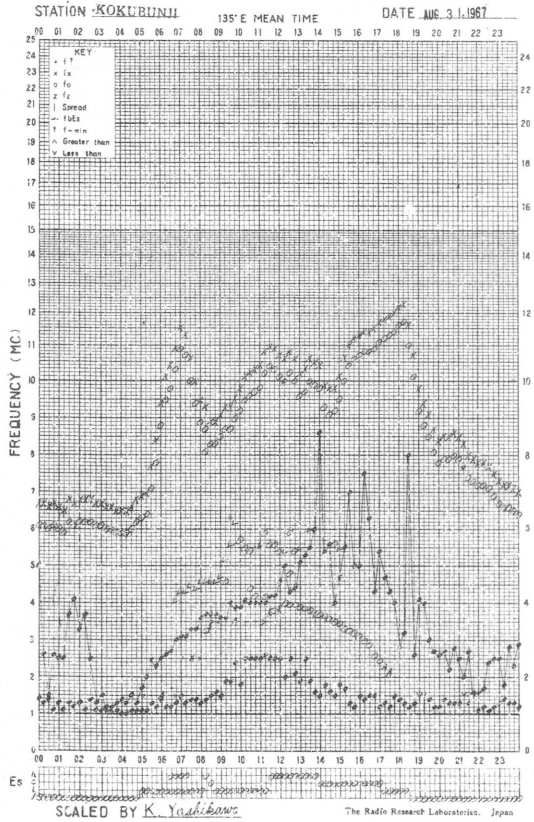


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE AUG. 31. 1967

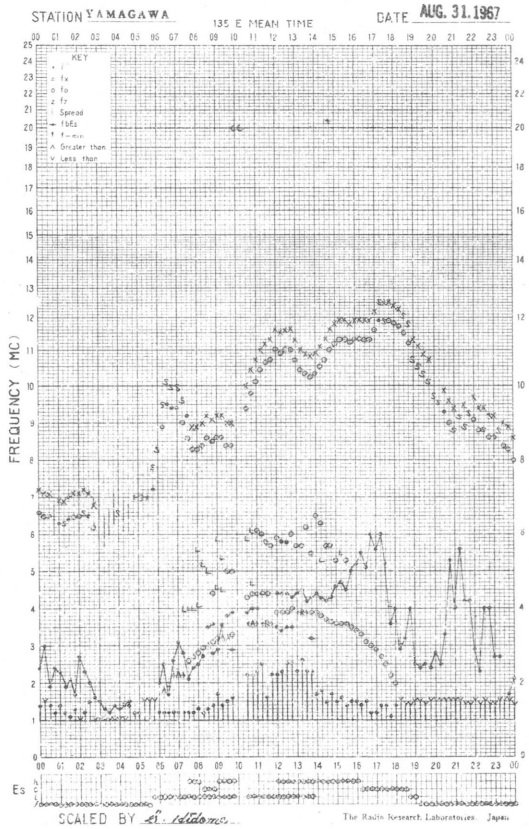


SCALED BY K. Yabikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135 E MEAN TIME DATE AUG. 31. 1967



SCALED BY E. Ishidome

The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: August 1967
Observing station: Hiraiso
Frequency: 200 MHz

	Flux density $10^{-22}Wm^{-2}(Hz)^{-1}$					Variability 0 to 3				
UT Date	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
1	12	12	13	11	12	1	1	0	1	1
2	12	11	18	9	12	0	1	1	1	1
3	9	10	8	10	9	0	0	0	0	0
4	10	10	10	10	10	0	0	0	0	0
5	9	11	11	7	10	0	0	0	0	0
6	13	12	11	-	11	0	0	0	-	0
7	11	13	11	9	12	0	1	1	0	1
8	10	11	10	10	10	1	0	0	0	0
9	13	19	15	-	14	1	0	0	-	0
10	-	-	-	-	-	-	-	-	-	-
11	(15)	12	12	29	12	(0)	0	0	1	0
12	27	27	(21)	24	27	1	2	(1)	1	1
13	18	23	15	8	20	1	1	1	0	1
14	8	9	9	14	8	1	0	1	2	1
15	15	13	10	10	13	1	0	0	0	1
16	11	15	17	19	13	1	1	0	1	1
17	16	14	16	13	16	0	0	0	0	0
18	14	12	14	(15)	13	0	0	1	(1)	0
19	13	17	18	-	15	1	0	0	-	0
20	11	10	12	-	11	0	0	0	-	0
21	-	-	-	8	-	-	-	-	1	-
22	8	-	-	-	(8)	0	-	-	-	(1)
23	-	-	13	13	(13)	-	-	0	0	(0)
24	15	11	16	-	13	0	0	0	-	0
25	13	10	15	11	12	0	0	0	0	0
26	15	13	11	12	12	1	0	0	1	0
27	-	(10)	13	-	12	-	(0)	0	-	0
28	11	10	13	(11)	11	0	0	0	(0)	0
29	11	10	(10)	-	11	0	0	(0)	-	0
30	12	11	14	10	12	0	0	0	0	0
31	12	11	11	10	11	0	0	0	0	0

Note No observations during the following periods:

6th	1950-	2400	18th	1950-	2300
9th	0100-	0200	19th	1950-	2400
9th	0500-	0600	20th	1950- 21st	0930
9th	1950- 11th	0200	22nd	0200- 23rd	0600
12th	0700-	0930	24th	1950-	2400
12th	2230-	2300	27th	0000-	0525
13th	2230-	2300	27th	1950-	2400
14th	2230-	2300	28th	1950-	2300
15th	2230-	2300	29th	0100-	0200
16th	2230-	2300	29th	0600-	0700
17th	2230-	2300	29th	1950-	2400

SOLAR RADIO EMISSION

Flux Density

Month: August 1967
Observing station: Hiraiso Frequency: 500 MHz

Flux density 10^{-22} $Wm^{-2}(Hz)^{-1}$

UT	00-03	03-06	06-09	21-24	Day
Date					
1	37	37	35	35	37
2	37	39	45	36	38
3	34	32	31	36	33
4	34	35	31	34	34
5	37	36	34	35	35
6	33	35	32	32	34
7	34	33	32	36	33
8	32	34	30	34	33
9	34	31	38	32	34
10	30	33	(29)	32	31
11	33	33	34	38	33
12	37	35	33	34	36
13	33	32	31	32	33
14	32	31	30	30	31
15	31	32	31	31	31
16	31	33	33	32	32
17	32	32	32	31	32
18	34	33	32	33	33
19	32	32	33	31	32
20	32	30	32	31	31
21	30	31	32	29	31
22	32	30	30	28	30
23	34	31	-	-	30
24	30	33	(31)	30	31
25	34	31	34	29	32
26	32	30	31	30	30
27	28	28	28	26	28
28	32	32	31	27	30
29	27	31	32	29	29
30	33	32	32	30	31
31	31	31	33	32	31

Note No observations during the following periods:

10th 0700- 0930 24th 0600- 0700
23rd 0600- 2400 26th 2300- 2400

Distinctive Events

(single-frequency observations)

Month: August 1967
Observing station: Hiraiso
Normal observing period: 1950 - 0930 (sunrise to sunset)

Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density $10^{-22}Wm^{-2}(Hz)^{-1}$		Remarks
	MHz	UT	UT	minutes		peak	mean	
1	500	0117.5	0118	2.0	C	380	40	
	200	0118	0118.2	1.5	C	800	200	
	500	0120.5	0120.6	1.0	C	120	40	
	500	0437	0439	3.5	C	10	1	
	200	0436	0438.6	3.5	C	1000	150	
	500	0636	0637.2	3.0	F	180	-	
	200	0654.5	0654.9	1.5	C	6300	940	
2	500	0505	0505.5	4.0	C	30	10	
	200	0504	0505.5	2.5	C	3100	770	
	500	2141.5	2142.5	9.0	C	85	5	
4	500	0646.7	0657.2	6.2	C	50	10	
7	500	0411	0421.5	15.5	C	250	45	
12	500	0510	0510.4	1.0	C	40	15	
	200	0510	0510	0.5	C	5850	930	
14	200	0204	0204.5	1.0	C	200	100	
18	500	2121.5	2123.5	25.0	C	520	10	
	200	2120	2121	2.0	C	260	30	
21	200	2155.8	2156	1.0	C	240	90	
23	500	0514.5	0515.5	6.0	C	190	30	
26	500	0016	0022	84.0	C	500	550	1st peak
			0103.2			11000		2nd peak
			0133.5			500		3rd peak
	200	0016	0023.1	74.0	C	180	50	1st peak
			0028.0			300		2nd peak
			0035.5			280		3rd peak
27	500	0022	0022	1.0	C	380	30	
		0102	0102	1.0	C	360	20	

Measurement of H.F. Field Strength (Upper Side-band of WWV)

Aug. 1967 Frequency: 15 MHz, Bandwidth: ±40 Hz, Receiving Antenna: Rod (4.5 m) Measured at Hiraiso

UT / Date	0015	0115	0215	0315	0415	0515	0615	0715	0815	0915	1015	1115	1215	1315	1415	1515	1615	1715	1815	1915	2015	2115	2215	2315
1	- 4	- 5	<- 6s	- 3	5	8	9	14	13	18	20	15	11	23	13	14	13	8	3	2	1	< 0s	<-11s	<- 9s
2	- 9	- 6	- 2	- 1	4	8	12	18	14	7	3	<- 3s	< 1s	18	10	9	5	10	1	- 1	4	9	S	<- 7s
3	- 9	-10	- 8	- 2	3	7	14	17	1	7	< 11s	(12s	9	21	16	8	8	11	5	0	0	S	S	< 4s
4	-11	- 6	3	- 4	3	9	14	13	9	14	11	< 10s	< 16s	< 24s	< 14s	< 4s	5	- 2	- 2	- 3	5	3	< 6s	<- 6s
5	< 2s	< 5s	<- 6s	0	4	8	13	15	< 6s	0	< 7s	< 17s	(0c	< 13s	12	1	- 6	7	- 9	- 9	- 9	S	<- 4s	< 5s
6	<- 4s	< 6s	- 5	3	6	9	12	13	10	< 4s	< 10s	11	< 19s	< 14s	17	C	C	C	C	C	C	C	C	C
7	- 1	1	1	- 2	7	11	13	2	6	10	14	< 12s	15	< 12s	11	7	- 2	5	-11	- 4	2	0	4	<- 2s
8	< 3s	(4s	0	- 3	9	3	11	10	<- 1s	<- 5s	< 11s	< 8s	< 11s	< 10s	8	- 1	3	0	5	- 4	2	11	<- 2s	< 0s
9	- 2	- 3	- 2	3	7	4	10	7	8	4	3	3	3	6	8	1	6	- 1	- 5	- 3	- 3	3	- 1	- 4
10	5	- 2	2	4	9	8	- 4	3	1	- 8	- 8	<- 9s	<- 5s	- 7	11	- 2	4	15	5	- 8	0	7	3	- 2
11	- 2	0	9	5	7	11	11	13	19	- 3	<- 4s	<-13s	(5s	11	5	18	7	1	- 6	5	- 3	- 5	3	- 8
12	4	- 5	- 4	1	4	6	9	6	10	-10	- 8	<-12s	<- 5s	< 2s	11	3	9	7	9	2	0	1	4	- 4
13	- 4	- 4	- 5	4	10	11	9	7	8	3	- 2	<-11s	< 2s	15	8	8	10	13	- 4	- 1	4	5	- 4	0
14	- 5	- 7	- 5	0	5	8	-14	-14	-10	- 4	<- 7s	5	<- 1s	<- 4s	8	C	C	C	C	C	C	C	C	C
15	C	- 4	-12	- 6	8	5	14	15	11	0	0	- 3	<- 1s	10	10	10	6	6	- 9	2	6	3	- 1	- 6
16	- 6	- 6	7	2	5	15	11	6	4	10	6	1	- 3	8	3	- 6	5	5	- 9	- 3	- 5	- 4	- 4	- 3
17	- 4	1	- 1	- 1	16	14	8	-13	-10	-10	<- 4s	<-12s	-14	- 3	3	7	- 6	- 4	- 6	- 8	5	- 5	5	2
18	- 8	- 6	0	- 8	- 1	7	1	-18	<-19s	<-14s	<- 7s	<- 6s	< 4s	3	4	- 2	- 7	-16	- 5	- 5	-15	-11	<-13s	<- 4s
19	<-32s	- 8	- 6	- 5	4	7	1	- 4	1	<- 5s	- 5	<- 2s	< 3s	0	3	1	11	- 3	1	- 4	4	0	- 3	- 2
20	-10	- 4	- 4	- 3	6	6	0	-13	-13	- 9	- 8	- 7	<- 5s	5	< 17s	< 0s	0	11	6	1	- 1	0	- 5	- 3
21	- 3	- 5	- 1	- 1	9	19	7	2	<-19s	<-12s	-11	- 6	<- 1s	17	5	5	10	1	2	- 5	-11	- 7	- 3	- 2
22	- 4	- 3	- 9	1	5	16	2	7	- 9	- 5	- 7	- 8	<- 1s	8	10	6	10	3	< 3s	- 3	- 6	<- 3s	-13	<- 3s
23	- 9	- 8	0	5	6	12	15	12	1	- 4	<- 4s	<-10s	< 1s	4	12	5	7	2	3	5	3	- 2	<- 9s	< 0s
24	- 4	- 2	3	2	9	13	7	- 4	- 5	- 8	<- 9s	<-10s	<- 2s	15	19	12	8	6	6	- 7	- 4	- 3	- 4	<- 5s
25	- 9	- 6	- 1	- 4	9	6	-13	- 6	- 3	- 6	4	- 5	<- 2s	12	8	6	5	4	5	- 1	2	- 3	- 5	< 0s
26	- 9	-10	- 4	0	9	12	9	- 8	-13	- 9	<- 9s	<- 8s	<- 2s	16	3	3	7	4	6	3	3	- 4	- 4	<- 3s
27	- 4	- 7	- 1	- 3	9	12	16	16	5	- 5	<-12s	<- 6s	<- 3s	2	23	16	12	6	12	2	2	- 2	- 1	< 5s
28	- 6	- 6	1	2	13	6	6	4	1	- 4	- 7	- 9	(-11s	- 4	-10	1	11	10	-16	- 4	- 3	< 2s	- 6	<- 4s
29	- 9	- 9	- 1	-11	7	9	13	0	- 8	- 6	- 7	- 2	<- 1s	7	3	- 8	0	- 7	6	- 1	- 1	<- 3s	- 5	< 1s
30	- 8	- 9	- 8	10	4	1	- 6	-12	0	- 3	- 6	- 5	<- 3s	(- 2s	5	(- 3s	8	- 3	4	- 2	- 1	- 2	- 9	<- 1s
31	- 1	1	- 2	0	5	11	10	- 7	- 9	-10	- 8	- 7	<- 1s	- 4	- 1	3	14	2	- 2	4	3	1	- 3	(3s
Median	(- 4s	(- 5s	- 2	- 1	6	8	9	6	(1s	(- 5s	(- 6s	<- 5s	<- 1s	(7s	(8s	5	7	4	(2s	- 2	0	(- 2s	(- 4s	<- 2s
Median Count	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	29	29	29	29	29	27	27	29
Upper decile	< 3s	< 4s	3	4	10	15	14	16	13	10	11	< 12s	< 15s	< 21s	17	14	12	11	6	4	5	7	< 4s	< 4s
Lower decile	<-10s	<- 9s	<- 8s	- 6	3	4	- 6	-13	<-13s	<-10s	<- 9s	<-12s	<- 5s	<- 4s	< 3s	<- 3s	- 6	- 4	<- 9s	- 8	- 9	<- 5s	<-11s	<- 7s

Measurement of H.F. Field Strength (Upper Side-band of WWVH)

Aug. 1967 Frequency: 15 MHz, Bandwidth: ±40 Hz, Receiving Antenna: Rod (4.5 m) Measured at Hiraiso

UT Date	0045	0145	0245	0345	0445	0545	0645	0745	0845	0945	1045	1145	1245	1345	1445	1545	1645	1745	1845	1945	2045	2145	2245	2345
1	- 7	- 9	- 1	0	7	11	11	17	15	17	15	18	13	14	17	18	15	10	6	0	- 1	<- 9s	<- 8s	<-14s
2	<-20s	<-17s	- 9	0	7	9	11	14	18	19	19	15	14	15	12	9	11	13	- 1	7	0	S	S	(- 5s
3	- 9	- 8	- 4	2	5	8	12	15	17	18	< 13s	7	3	< 1s	< 6s	8	9	5	1	3	- 4	S	S	<- 5s
4	- 8	<-29s	-11	1	4	7	14	17	18	17	15	14	< 13s	< 13s	< 8s	1	13	8	1	2	2	- 2	<- 9s	<- 7s
5	<- 3s	<- 3s	<-11s	<- 2s	3	10	19	16	15	17	17	23	17	11	19	1	- 5	7	- 5	7	3	<- 1s	<- 1s	<- 1s
6	<- 2s	<-12s	- 4	3	7	10	14	15	18	16	12	< 3s	< 2s	7	< 1s	C	C	C	C	C	C	C	C	C
7	<- 9s	- 9	- 2	4	7	11	13	14	18	16	13	13	12	10	< 10s	12	7	15	-10	0	1	0	<- 1s	<- 6s
8	<- 2s	<- 8s	- 7	- 3	4	9	11	15	12	13	14	16	10	10	<- 1s	(-34s	(-25s	- 1	- 2	9	5	3	<- 3s	<- 8s
9	- 8	(- 8s	- 1	1	6	9	13	15	16	13	< 19s	13	8	0	3	-17	10	10	- 5	- 7	4	2	1	- 5
10	2	- 4	1	4	9	13	12	17	17	11	20	14	11	4	<- 3s	11	11	12	0	3	2	1	- 2	- 5
11	- 2	- 5	- 3	2	6	12	14	17	16	14	13	15	8	10	7	3	- 7	7	10	5	- 4	- 5	- 2	-10
12	- 9	- 8	-11	- 2	7	11	18	15	17	16	13	11	7	10	8	13	16	14	13	5	- 1	- 3	- 4	-11
13	-10	-10	- 2	3	8	15	13	18	19	18	16	14	18	13	13	9	11	4	- 3	- 1	- 4	- 5	-12	<-12s
14	-10	- 7	- 4	2	7	15	13	18	16	10	14	16	16	10	2	C	C	C	C	C	C	C	C	C
15	-10	-10	- 4	5	9	14	16	18	16	16	13	15	12	10	11	4	6	16	- 6	1	1	- 1	- 7	-13
16	-11	-12	- 4	2	8	8	12	7	12	18	18	18	10	9	12	- 3	13	11	-11	- 3	- 1	- 1	- 9	-15
17	- 5	0	- 8	1	7	11	17	21	17	16	10	9	3	6	- 4	3	14	- 4	- 3	3	2	0	- 6	-10
18	- 4	- 8	C	- 4	2	8	12	18	17	7	17	14	13	7	2	-27	1	10	11	3	-11	-27	<-10s	<-21s
19	-16	- 9	- 4	1	7	12	9	14	17	14	8	0	8	19	3	3	1	1	- 1	3	0	- 5	- 6	-10
20	-13	-13	- 7	- 4	4	0	15	16	17	13	13	11	2	<- 6s	2	5	0	3	5	1	-10	- 4	- 5	<-11s
21	-12	-14	- 8	0	4	10	15	15	17	18	15	14	12	10	4	<-17s	-10	9	4	- 8	- 5	- 7	-12	-10
22	-13	- 9	- 8	- 2	9	9	14	17	21	17	17	11	20	13	16	13	17	19	- 4	2	2	- 1	<- 4s	-10
23	-13	-12	- 5	- 3	5	12	15	16	18	19	13	16	17	17	15	11	16	8	8	6	- 2	- 4	< 2s	-10
24	-10	-13	- 8	1	7	13	18	18	16	12	16	18	16	20	26	1	8	6	2	7	- 3	- 4	<- 4s	-12
25	-12	-11	-11	7	5	13	16	18	19	19	19	21	18	17	14	7	- 1	12	2	1	0	- 1	< 1s	- 5s
26	-21	-13	- 1	- 3	2	12	11	19	16	19	20	16	21	10	<- 1s	-13	-11	6	3	3	-11	- 4	(- 1s	-11
27	-10	- 9	- 3	3	9	13	19	19	17	20	23	14	16	12	<- 5s	-21	- 4	20	5	- 3	0	- 2	< 5s	- 8
28	- 9	- 8	- 5	1	8	10	19	22	22	16	18	18	20	18	5	<-20s	-14	13	- 3	- 1	1	<- 1s	<- 3s	-12
29	-10	- 6	- 7	- 2	6	11	18	18	18	20	15	11	19	10	- 4	15	9	11	1	- 7	0	- 5	<- 2s	-13
30	-13	- 8	-10	- 5	- 5	15	15	18	19	16	18	18	13	10	< 0s	-17	4	5	4	- 1	3	- 3	< 4s	- 9
31	- 1	- 6	- 4	1	9	11	19	19	21	15	13	14	15	8	3	-14	-11	6	9	2	0	- 2	(- 3s	- 5
Median	(-10s	(- 9s	- 5	1	7	11	14	17	17	16	(15s	14	(13s	(10s	(5s	3	7	9	1	2	0	(- 3s	<- 3s	(-11s
Median Count	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	29	29	29	29	29	29	27	27	29
Upper decile	- 2	<- 4s	- 1	4	9	15	19	19	21	19	20	18	20	18	17	13	16	16	10	7	3	1	< 2s	<- 5s
Lower decile	<-16s	<-14s	-11	<- 4s	2	8	11	14	15	11	< 12s	7	< 3s	< 1s	<- 4s	<-21s	-11	1	- 6	- 7	-10	<- 7s	<-10s	<-14s

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Aug. 1967	Whole Day Index	H B 06 12 18 / 12 18 24	T H 00 06 12 18 / 06 12 18 24	W W V 00 06 12 18 / 06 12 18 24	S F 00 06 12 18 / 06 12 18 24	W W V H 00 06 12 18 / 06 12 18 24	Warning 00 06 12 18 / 06 12 18 24	Principal magnetic storms Start	End	ΔH
1	5-	4 5 5	- C C C	5 5 5 5	4 4 4 4	4 4 4 4	N N N N			
2	4+	5 4 5	- C 4 4	5 4 4 5	4 4 (4) 4	4 4 4 4	N N N N			
3	4+	4 5 5	- C 4 4	4 5 5 5	4 4 4 3	4 4 4 4	N N N N			
4	4+	5 (5) 4	- C 4 4	5 5 5 5	(4) 4 (3) 3	4 4 4 4	N N N N			
5	4-	4 4 (4)	- C 4 4	4 4 4 4	(4) 3 3 C	4 4 4 4	N N N N			
6	4o	(4 4 5)	- (4) 4 4	4 4 4 4	C 4 3 3	4 4 4 4	N N N N			
7	4-	4 4 4	- (4) 4 4	4 (3) 4 4	4 4 3 4	4 4 4 4	N N N N			
8	4o	4 5 4	- (4) 4 4	4 (4) 4 3	4 4 4 4	(4) 4 4 4	N N N N			
9	4o	4 4 4	- 4 4 5	3 4 4 4	4 4 4 4	4 4 4 3	N N N N			
10	4o	4 4 3	- 4 4 4	4 3 4 4	4 4 (4) 5	4 4 4 4	N N N N			
11	4-	3 4 3	- (3) 4 3	4 4 4 4	4 5 (3) 4	4 4 4 4	N N U U	0555	18xx	63γ
12	4o	4 4 4	- 3 (3 3)	5 4 4 4	4 4 4 4	4 4 4 4	N N N N			
13	4+	4 5 4	- (3) 3 3	(4) 4 4 (4)	4 5 4 4	4 4 4 4	N N N N			
14	4-	4 4 4	- (2) 3 4	3 3 3 3	4 (3) 4 4	4 4 4 4	N N N N			
(15)	4o	4 4 4	- 4 5 4	3 4 4 4	4 4 4 4	4 4 4 4	N N N N			
(16)	4o	(4) 4 4	- 4 4 4	4 4 3 4	4 4 4 4	4 4 4 (4)	N N N N			
(17)	4-	4 4 4	- (3) 4 4	4 3 3 3	4 4 (4) 4	4 4 4 4	N N N N			
18	3+	4 3 3	- 3 3 3	3 3 3 2	4 3 (4) 3	3 4 4 3	N N N N			
19	4o	4 (4) C	- (3) 4 4	4 4 4 4	4 (4) C C	4 4 4 4	U N N N			
20	4o	(4 4) C	- 4 4 4	3 4 4 4	4 C (4 4)	4 4 4 4	N N N N			
21	4o	(4 4) C	- 4 5 5	4 4 4 4	4 4 (4) C	4 4 4 (4)	N N N N			
22	4o	4 4 4	- 4 5 5	4 4 4 5	4 4 4 3	4 4 4 4	N N N N			
23	4+	4 4 4	- 4 5 4	5 4 5 4	4 4 4 4	4 4 4 4	N N N N			
24	4o	4 4 4	- 4 4 4	4 4 4 4	4 4 4 4	4 4 5 4	N N N N			
25	4o	5 3 3	- 4 4 4	4 4 4 4	4 4 4 C	4 4 4 4	N N N N			
26	4o	4 5 4	- 4 4 4	3 3 4 4	4 4 4 4	4 4 4 4	N N N N			
27	4o	4 4 4	- 4 4 4	3 4 4 4	4 5 5 4	4 4 4 (4)	N N N N			
28	4o	3 4 5	- 4 3 4	4 4 3 4	4 4 (4) 4	4 4 (4) 4	N N N N			
29	4o	4 4 5	- 4 5 4	4 4 4 4	4 C (4) 3	4 4 4 4	N N N N			
30	4+	5 5 4	- 4 4 4	4 4 4 5	4 4 4 4	4 4 4 4	N N N N			
31	4o	4 4 4	- 4 4 4	4 4 4 4	4 4 4 4	4 4 4 4	N N N N			

IQSY GEOALERT and ADALERT
(Western Pacific Region)

* = MAGSTORM

° = MAGCALME

Δ = COSMIC EVENT

( ) = Regular World Day

\- = impossible to evaluate

( ) = inaccurate

C = artificial accident

--- = continuing magnetic storm

SUDDEN IONOSPHERIC DISTURBANCES

(S.I.D.)

HIRAISO

Time in U.T.

Aug. 1967	S W F										Correspondence		
	Drop-out Intensities (db)						Start-time	Dura-tion	Type	Imp.	Flare	Solar Noise	Mag.
	CO	SF	HA	TO	HB	SH							
1		22					17.31	25	S	1+	x		
2	-'	>25				-	00.44	30	S	2	x	x	
	-												
	32"												
2		10					21.41	11	S	1-		x	
2		9					22.55	18	Slow	1-			
3		11			4		04.40	12	S	1-			
3		11			21		09.23	37	Slow	2-	x		
4	21"	20	18	13		15	01.40	11	S	2-	x		
4		16					15.15	23	S	1	x		
4	16"	24			13		22.18	24	S	2-		x	
18	20	22	-	-			00.43	19	S	1+	x		
18	28	45		-			02.23	60	Slow	3	x	x	
18		25					19.52	50	Slow	2-	x		
18	16	-	-	13'	15		21.23	25	S	1		x	
19	-	40	-				00.00	40	S	3-	x		
19	12"	12	-		11		06.05	25	S	1			
22	-	8	-				22.04	11	S	1-	x		
23			10'		14		05.18	12	S	1	x	x	
24	15	11					23.27	29	S	2-	x		
26	10	21				15	00.18	27	Slow	1+	x	x	
27	7	8		9			01.02	10	S	1	x	x	
28					14		12.10	10	Slow	1	x		
29					10		13.32	27	S	1	x		
29	28	33					20.46	27	Slow	2+	x		
	11"												
30	12	23	-		13		00.25	40	Slow	2			
	16"												
30	10	18			22		05.01	40	S	2	x		
	15'												
31		12					21.48	25	S	1-		x	

IONOSPHERIC DATA IN JAPAN FOR AUGUST 1967

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