F—216

IONOSPHERIC DATA IN JAPAN

FOR DECEMBER 1966

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KOKUBUNJI, TOKYO, JAPAN

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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 Radio Wave Observatory.

	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.

$hpF2$ — 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 *F*2 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 *hpF*2 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} $W \cdot m^{-2} \cdot (c/s)^{-1}$ 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 Washington D.C. and Hawaii, respectively, are carried out at Hiraiso Radio Wave Observatory. In order to avoid interferences with several 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 of ± 40 c/s bandwidth.

Tabulated *field intensity* is the average of peak value of the incident upper side-band field intensity in dB above one microvolt per meter. Tne *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	Washington, D.C. Long. 76°51′ W Lat. 39°00′ N	Maui, Hawaii Long. 156°28′ W Lat. 20°46′ N
Power	3 kW for the upper side-band	0.5kW * for the upper side-band
Antenna	$\lambda/2$ vertical	$\lambda/2$ vertical
Distance	10050 km	6270 km

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

Receiver

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

Descriptive symbols are 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.

( ): Unaccurate 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 (frequencies 10, 15, 20Mc broadcast from Washington, D.C.), San Francisco (commercial circuit) and WWVH (frequencies 10, 15Mc broadcast from Hawaii), which are received at Hiraiso Radio Wave Observatory near Tokyo.

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

N=normal
U=unstable
W=disturbed

The letter W expresses disturbed condition expected to be during the following 12 hours after issue. The letter U and N means also unstable or normal conditions, respectively.

Whole day radio quality indices are the averages of the 6-hourly indices of Hamburg WWV and S. F.

Start- and end-time of principal geomagnetic storms closely correlated to 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 preparated from the field intensity records on following circuits received at Hiraiso. Characteristics of the phenomenon are classified as follows.

Circuits and Drop-out intensity

WS.....WWV 20 Mc, 15 Mc and 10 Mc (Washington)
SF.....Various commercial circuits (San Francisco)
HA.....WWVH 15 Mc and 10 Mc (Hawaii)
TO.....JJY 15 Mc and 10 Mc (Tokyo)
SH.....BPV 15 Mc and 10 Mc (Shanghai)
HB .....Various commercial circuits(Hamburg)

Start-time and Duration, Types and Importances are described from the data of a circuit whose Drop-out Intensity is underlined. Drop-out Intensities of 10 Mc ('), 15 Mc (none) and 20 Mc ('').

Start-times and Durations

Types

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

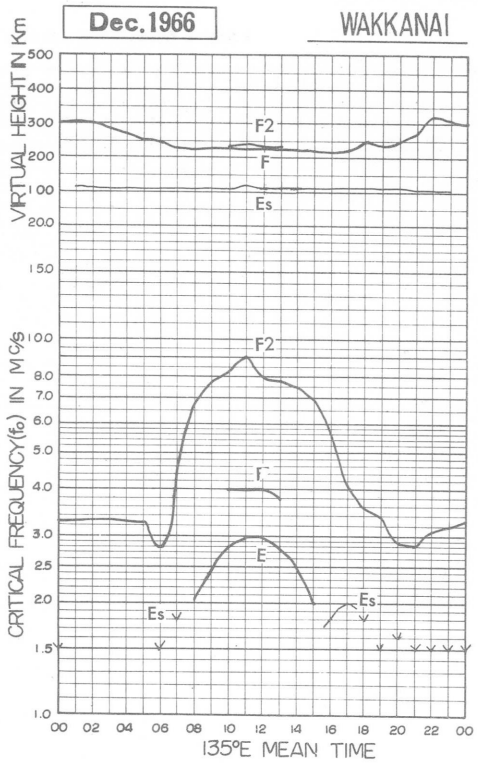
Importances

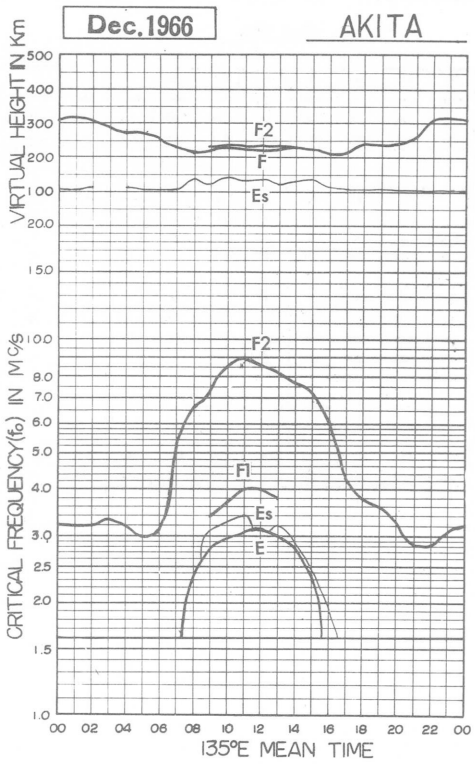
Degrees of SWF are classified into 9 grades according to the amplitude of fade-out;

1−	1	1+
2−	2	2+
3−	3	3+

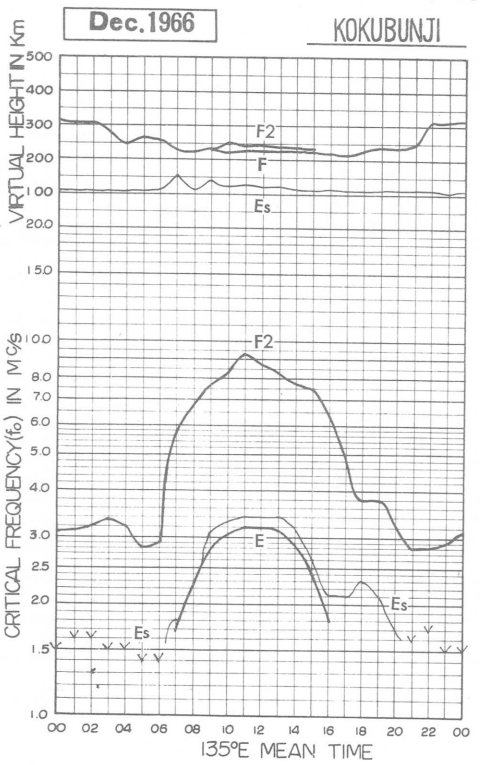
Besides, the time associated phenomena of SID's, that is, solar flare, solar radio noise outburst and crochet (solar flare effect in magnetic record) are given in this table from interchange messages or measurements at Hiraiso.

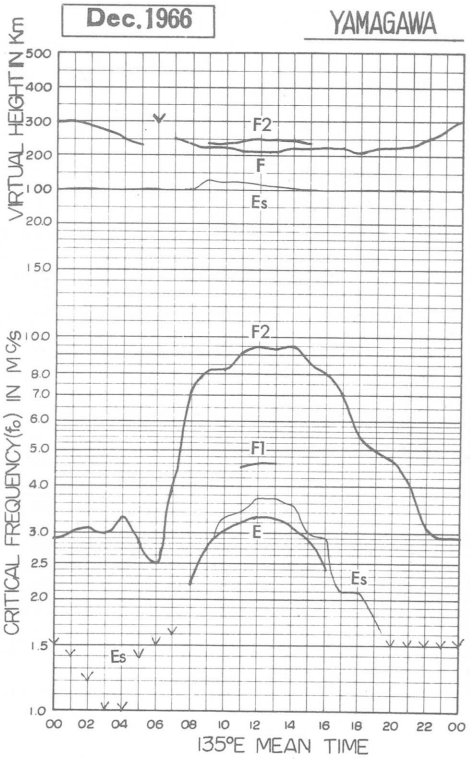
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: WAKKANAI

Dec. 1966

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	033	033	033	033	033	033	028	047	068	077	084	090	080	078	075	069	055	041	036	034	029	028	031	032
	CNT	25	26	25	26	25	23	26	26	25	27	29	30	30	30	30	29	29	29	27	26	26	26	22	25
	Q R	003	003	005	005	004	003	007	008	009	009	013	013	007	006	008	006	010	009	005	005	006	009	006	004
foF1	MED										U400L	U400L	400	400	380L	U340L									
	CNT										2	9	15	16	6	2									
foE	MED			E	E	E	E	E	150	205	250	280	295	295	280	250	200	E							
	CNT			1	1	2	4	1	2	20	24	26	28	27	28	28	22	3							
foEs	MED	E015S	E	E	E	E	E	E015	E018	G	G	G	G	G	G	G	G	018	020	E018	E015S	E016	E015	E015	E015S
	CNT	28	28	28	28	27	26	26	26	25	26	29	30	29	30	30	29	29	29	26	26	27	28	28	28
	Q R								D009									D008	D015	D008	D005	D008			
f-min	MED	E015S	E	E	E	E	E	E	E	012	016	017	017	017	017	016	012	E015S	E012S	E012S	E012S	E012S	E	E	E012S
	CNT	28	28	28	28	27	26	26	26	25	26	29	30	29	30	30	29	29	29	26	26	27	28	28	28
M (3000) F2	MED	280	280	280	290	290	315	320	335	350	345	340	345	345	340	340	345	330	325	330	330	320	295	280	280
	CNT	25	26	25	26	25	23	26	26	25	27	29	30	30	30	30	29	29	29	27	26	26	26	22	25
M (3000) F1	MED										U400L	U400L	395	400	400L	U405L									
	CNT										2	9	15	16	6	2									
h'F2	MED										235	240	245	235	235	230									
	CNT										2	9	15	16	6	2									
h'F	MED	300	300	300	285	270	250	245	225	220	225	230	230	230	230	230	220	215	225	250	240	250	280	320	305
	CNT	28	28	27	28	28	26	25	26	25	27	29	29	29	31	31	29	29	29	27	26	26	26	27	28
h'Es	MED	105	110	110	110	110	110	110	110	110	110	110	115	110	110	110	110	110	110	110	110	110	105	105	105
	CNT	3	10	10	10	8	6	10	13	10	14	15	11	8	11	12	14	15	15	13	6	9	11	8	5
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: AKITA

Dec. 1966

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	032	032	032	033	032	030	031	053	066	075	086	090	086	081	076	072	061	042	038	036	033	028	028	031
	CNT	31	31	29	30	30	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30
	Q R	003	003	002	003	003	003	004	006	008	009	014	014	011	009	007	010	007	005	008	007	004	004	005	004
foF1	MED										340	370	400	400	380L	340L									
	CNT										7	7	15	11	10	2									
foE	MED								E	230	275	295	305	310	300	275	235	E							
	CNT								25	30	29	28	27	30	29	29	27	25							
foEs	MED	E	E	E	E	E	E	E	E	G	031	033	034	G	032	029	025	J020	E	E	E	E	E	E	E
	CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31
	Q R																								
f-min	MED	E	E	E	E	E	E	E	E	017	017	017	018	018	018	017	017	E	E	E	E	E	E	E	E
	CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31
M (3000) F2	MED	285	285	285	295	305	300	315	335	355	345	340	340	340	345	345	345	350	330	325	325	325	295	280	280
	CNT	31	31	29	30	30	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30
M (3000) F1	MED										385	405	380	380	400L	410L									
	CNT										7	7	15	11	10	2									
h'F2	MED										230	240	235	240	235	230									
	CNT										23	30	31	31	30	6									
h'F	MED	310	315	305	285	270	270	255	225	215	220	230	225	220	225	230	225	210	215	240	240	245	U260	310	315
	CNT	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	29	31	31
h'Es	MED	105	105	110	110	110	105	105	105	140	120	140	130	130	120	130	135	110	105	105	105	105	105	105	105
	CNT	7	5	5	4	10	7	6	7	12	25	24	27	19	19	17	22	20	15	15	15	13	12	10	11
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: KOKUBUNJI

Dec. 1966

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	031	031	032	033	032	028	029	056	068	076	083	093	086	082	077	075	064	048	038	038	032	028	028	029
	CNT	28	28	28	27	27	26	26	26	27	31	30	29	30	30	28	29	28	28	27	30	29	29	28	28
	Q R	003	003	003	004	004	005	004	007	013	008	013	015	010	005	008	006	006	005	008	008	006	005	005	005
foF1	MED										380L	400L	420L	430L	420L	400L	300L								
	CNT										4	2	3	4	4	1	1								
foE	MED								170	230	280	305	320	320	315	290	250	180							
	CNT								8	26	29	30	28	27	25	24	15	17							
foEs	MED	E015	E016B	E016B	E015B	E015B	E014B	E014B	018	G	031	033	034	034	034	032	026	021	021	023	021	017	E016	E017	E015
	CNT	28	28	28	27	27	26	26	26	27	31	30	29	30	30	29	29	29	30	30	29	29	30	29	28
	Q R	D008	D007	D006	D006	D006	D007												D012	D013	D010	D009	D010	D010	D006
f-min	MED	014	014	013	013	013	014	014	014	015	015	016	016	016	016	016	015	015	014	014	014	014	014	014	014
	CNT	28	28	28	27	27	26	26	26	27	31	30	29	30	30	29	29	29	30	30	29	29	30	29	28
M (3000) F2	MED	275	280	275	290	305	280	300	340	350	345	335	340	335	340	340	340	345	330	320	320	315	305	270	270
	CNT	28	28	28	27	27	26	26	26	27	31	30	29	30	30	28	29	28	28	27	30	29	29	28	28
M (3000) F1	MED										385L	400L	380L	375L	390L	385L	400L								
	CNT										4	2	3	4	4	1	1								
h'F2	MED									225	230	250	245	245	245	240	230	I255A							
	CNT									3	22	29	30	29	28	20	8	1							
h'F	MED	315	305	305	280	250	270	260	230	225	230	225	230	230	230	225	225	220	215	230	240	235	250	310	310
	CNT	28	28	28	27	27	26	26	26	27	31	31	30	30	30	29	29	28	28	27	29	29	29	28	28
h'Es	MED	110	110	110	110	110	110	110	155	115	140	130	130	120	120	115	110	115	110	110	110	110	110	110	105
	CNT	11	13	13	11	12	9	6	14	11	20	20	18	20	22	21	19	17	19	21	19	15	12	14	10
hpF2	MED	365	350	350	330	290	330	310	260	250	255	270	265	270	260	260	260	250	270	285	280	280	300	350	360
	CNT	28	28	28	27	27	26	26	26	27	31	30	29	30	30	27	29	28	28	27	30	29	29	28	28
ypF2	MED	060	060	060	055	060	065	055	050	050	050	050	050	050	050	050	050	050	055	055	050	055	055	060	065
	CNT	28	28	28	27	27	26	26	26	27	31	30	29	30	30	27	29	28	28	27	30	29	29	28	28

IONOSPHERIC DATA
LIST OF MEDIAN VALUES

OBSERVED AT: YAMAGAWA

Dec. 1966

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	029	030	031	030	033	028	025	041	073	082	082	091	095	094	095	086	080	070	055	050	047	040	031	029
	CNT	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	Q R	003	003	004	004	006	004	005	006	012	012	013	013	010	012	016	014	013	010	009	011	014	013	005	005
foF1	MED											440L	450L	460	460										
	CNT											1	7	5	5										
foE	MED									220	275	305	320	330	325	315	290	240							
	CNT									29	29	28	28	27	26	27	28	30							
foEs	MED	E015S	E014S	E012	E	E	E014	E015S	016S	G	G	033	034	037	037	036	030	029	021	021	018	E015	E015S	E015S	E015S
	CNT	31	31	31	31	31	30	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31
	Q R	D005						D006	D006						005	009			007	D007	D006	D006	D006	D008	D006
f-min	MED	E015S	E014S	E012	E	E	E012	E015S	E015S	014	013	014	015	016	016	015	015	014	E015S	E015S	E015S	E015S	E015S	E015S	E015S
	CNT	31	31	31	31	31	30	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31
M (3000) F2	MED	270	280	285	295	310	285	280	305	345	340	340	335	330	325	330	335	335	340	330	310	320	305	295	270
	CNT	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
M (3000) F1	MED											365L	380L	380	370										
	CNT											1	7	5	5										
h'F2	MED										240	240	245	250	250	250	240	240							
	CNT										6	25	31	31	31	29	20	1							
h'F	MED	U300	300	290	270	250	U235	E300	250	230	230	225	215	210	215	225	225	225	220	205	225	225	230	250	U275
	CNT	31	31	31	31	31	30	30	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	30	31
h'Es	MED	100	100	100	100	100	100	100	100	100	125	120	120	115	110	105	100	100	100	100	100	100	100	100	100
	CNT	9	7	5	8	10	6	9	15	13	15	20	24	25	30	29	28	28	24	19	16	15	13	12	10
hpF2	MED																								
	CNT																								
ypF2	MED																								
	CNT																								

IONOSPHERIC DATA

Dec. 1966 | foF2 | 0.1 Mc | 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	F	034F	F	F	F	036	028	053	084	105	112	096	085	087	076	072	073	049	037	035	026	027	F	033F
2	033F	033	033	032	033	034	026	050	070	089	097	095	078	083	079	057	046	033	029	034	033	038	F	F
3	F	030F	030F	F	F	SF	025H	044	067	081	093	093	081	076	072	070	060	033	042	040	039	036	036	SF
4	034F	036F	036F	036F	036F	SF	043F	053	C	C	080	087	077	080	069	068	054	036	034	033	036	037	037	031
5	035F	F	F	040F	044F	037	021H	049	074	086	089H	093	083	078	084	072	053	038	036	033	035	036	036	036
6	038	036	037	037	036	033	027	050	073	085	I093R	104	091	084	087	070	063	047	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	070	082	090	093	076	091	076	053	037	035	027	025	026	030	031
8	033	033	034	035	033	033	027	051	071	074	077	091	079H	075	080	066	061	036	033	A	A	023	F	F
9	A	F	F	028F	030F	030F	030	044	063	076H	084	087	077	075	075H	063	050	045	033	028	029	023	025	028
10	030	032	033	032	033	033	031	047	063H	083	084	082	078	075	072	070H	051	048	033	034	029	030	F	034F
11	033F	033F	037F	034	034	035	025	050	072	082	086	083H	089	085H	068	067	055H	040	032	034	027	F	F	033F
12	033F	033F	033F	030F	033F	034	029	045	056	077	082	080	077	U081R	076	068	050	044	036	038	032	024	028	028F
13	028F	030	032	033	035	034	037	057	072	083	081	081	073	076	077	073	057	048	047	034	030	028	030	032
14	032	031	030	035	030	C	C	C	C	C	104	096	081	079	072	074	060	I050A	035	029	031	029	034	032
15	032	029	026	026	SF	SF	024	048	068	097	115	112	099H	089	080	078	067	044	041	041	039	038	036	037
16	036	034	035	033	035	033	034	048	070	080	084	092	085	078	084	070	055	043	037	037	029	A	A	030
17	029	033	032	033	032	032	030	055	070H	072	083H	090H	082	083	074	060	053	037	034	031	036	040	034	036
18	036	035	036	036	034	037	034	045	065	068	086	094	085	071H	068	062	060	040	038	038	027	030	031	033
19	034	033	036	036	036	035	033	050	073	070	081	080	082	072	073	062	049H	047	036	030	027	027	033	037
20	033	034	037	036	035	036	025	042	064	068	066	076	I071C	079	073	064H	058H	037	031	031	028	031	031	033
21	033	033	033	035	032	032	028	042	064	077	081	080	077	078	075	068	054	043	034	034	031	028	032	033
22	033	032	031	030	032	034	027	043	062	080H	094	097	084	090	070	069	055	041	036	027	024	024	028	030
23	030	031	033	032	035	033	025	039	068	082	075	U098R	081	072	073	C	C	C	C	C	C	025	028	031
24	031	032	032	030	031	027	032	040	062	I076C	093R	080	075	073	080	070	056H	045	030	034H	028	023	029	030
25	032	033	033	033	033	038	025	040	058	074	086	092	074	C	C	068H	052H	040	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	083	078	079H	070Z	071	064	I039S	036	033	033	033	036	033
27	036	033	I030A	028	030	029	021	037	067	070	097H	109	079	072H	078	067	048	047	I040C	I039C	031	029	030	031
28	033	036	038	030	030	033	033	047	068	078	103	091	077	080	083	067	I050A	045	038	034	026	026	033	034
29	031	031	031	030	I030C	C	C	C	C	C	C	C	C	063	080	069	056	034	026	029	024	023	026	030
30	030	031	031	031	031	031	024	038	063	074	077	082	071	072H	068	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	076	080	090	084	079	067	074	044H	030	040	027	023	023	025	028
Count	25	26	25	26	25	23	26	26	25	27	29	30	30	30	30	29	29	29	27	26	26	26	22	25
Median	033	033	033	033	033	033	028	047	068	077	084	090	080	078	075	069	055	041	036	034	029	028	031	032
U. Q.	034	034	036	035	035	035	032	050	072	083	094	095	084	081	080	072	060	046	038	035	033	033	034	034
L. Q.	031	031	031	030	031	032	025	042	063	074	081	082	077	075	072	066	050	037	033	030	027	024	028	030
Q. R.	003	003	005	005	004	003	007	008	009	009	013	013	007	006	008	006	010	009	005	005	006	009	006	004

foF2

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

W 1

IONOSPHERIC DATA

Dec. 1966 | foF1 | 0.01 Mc | 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										400L	400	400	370		330									
2										U400L		U400L	400	U400L										
3											U400L	410												
4										C		410												
5											U390L	U400L		U390L										
6													400											
7													410											
8												420L	370											
9																								
10																								
11													400											
12													400L											
13																								
14										C				360										
15											U400L		400											
16													400L											
17																								
18												410L	I400A											
19											360	360			U350L									
20													C											
21														370L										
22												410L	400	400										
23												400L	400L											
24											390	40C	400											
25												360	360	C	C									
26										C	C	400	400											
27												410L												
28											U410L	A	A											
29										C	C	C	C	370										
30											U400L		400L											
31											400L	400												
Count										2	9	15	16	6	2									
Median										U400L	U400L	400	400	380L	U340L									
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1 | Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation | W 2

IONOSPHERIC DATA

Dec. 1966 | f_0E | 0.01 Mc | 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								A	230	250	A	A	A	270	235	A	A							
2								A	A	250	285	295	290	265	220	195	A							
3								S	210	I240A	280	300	300	280	I245A	I210A	S							
4							S	A	C	C	290	285	290	280	265	205	A							
5								A	215	265	290	290	295	280	235	200	A							
6					E	E	S	A	215	250	280	I280A	295	275	235	190	S							
7								C	C	260	280	290	295	250	235	205	A							
8								A	200	250	285	300	300	280	250	205	S							
9								A	A	270	300	305	300	295	265	A	S							
10								S	220	265	300	I300B	B	B	B	B	S							
11						E		135	215	275	290	300	295	290	250	205	S							
12								170	B	B	285	B	B	B	B	B	S							
13								A	205	265	290	300	300	I295B	275	215	E							
14								C	C	C	280	300	290	280	I250A	210	E							
15			E	E	E			A	215	250	I265A	290	300	290	250	180	S							
16						E	E	S	200	245	275	280	295	285	260	200	A							
17								S	200	250	280	300	290	280	255	200	S							
18								A	200	235	270	290	295	I270A	I245A	A	S							
19							S	A	200	265	290	295	290	280	250	170	S							
20						E		S	205	255	290	295	I285C	275	250	200	S							
21							S	S	205	250	280	295	290	280	I245R	200	S							
22								S	210	250	275	300	300	280	235	200	S							
23								A	A	A	A	295	290	290	250	C	C							
24								S	210	C	A	290	300	290	250	205	S							
25								S	205	245	290	300	300	I295C	I290C	200	E							
26								C	C	C	C	270	280	250	245	180	S							
27								A	A	I230A	255	275	290	270	250	190	A							
28								S	200	240	265	285	285	270	240	S	S							
29								C	C	C	C	C	C	260	260	200	S							
30								S	190	240	280	280	290	285	230	C	C							
31								C	C	235	250	I275A	300	A	A	A	S							
Count			1	1	2	4	1	2	20	24	26	28	27	28	28	22	3							
Median			E	E	E	E	E	150	205	250	280	295	295	280	250	200	E							
U.Q.																								
L.Q.																								
Q.R.																								

f_0E

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

W 3

IONOSPHERIC DATA

Dec. 1966 | foEs | 0.1 Mc | 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	E016S	016	J020	015	J043	J025	E	J025	030	053	032	J050	051	024	025	023	023	J021	J030	E016S	E013S	E	E	E
2	E015S	E	013	018	E	E	J031	J024	025	028	027G	G	G	G	030	030	030	J023	022	J024	E016S	015	E016S	E
3	E	E015S	E	014	E	E	E015S	E017S	G	030	G	020G	G	020G	026	023	E016S	021	E	E	J030	021	040	024
4	J023	017	E	E	E	E	E015S	027	C	C	G	G	G	G	G	G	019	E012S	024	E015S	E012S	E012S	015	E015S
5	E015S	E	E	E	E	E	E	023	G	030	G	G	020G	015G	G	G	019	021	020	J023	E016S	E015S	E012S	E015S
6	E016S	E	E	E	E	E	021	J034	G	G	G	037	G	G	023G	G	024	J028	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	G	024G	038	032	026	G	030	030	J028	J021	J024	J030	J025	E	E
8	E015S	015	J023	J025	015	J021	J021	J026	G	020G	G	036	038	G	G	G	023	J051	J100	J053	J053	J023	E016S	E016S
9	J038	J030	J023	015	015	J024	J028	J024	J033	030	G	G	G	G	G	027	J083	J035	J051	E015S	E017S	015	021	J030
10	E017S	E017S	015	E	E	E	J024	E016S	G	030	038	E032B	E031B	E030B	E030B	E026B	E013S	J031	J025	J032	J021	021	E015S	E015S
11	E014S	015	E	E	E	E	E	G	G	G	G	G	G	G	G	G	E015S	E	E015S	E016S	E	E	E	E015S
12	E	E	E	E	E	E	E	G	E020B	E028B	G	E034B	E036B	E030B	E032B	E023B	E019S	E017S	E017S	E017S	E016S	E020S	E018S	E015S
13	J021	J025	E	E	E	E	E	J023	G	G	G	G	G	E030B	G	G	018	J041	J021	E	E016S	018	E016S	E016S
14	E	E	E	E	E	C	C	C	C	C	G	G	G	G	032	G	025	J063	J025	E012S	018	E016S	E015S	E
15	E012S	013	E	E	E	J027	023	J024	020G	G	031	035	G	023G	G	023	E015S	J024	J023	E012S	020	020	E015S	E
16	E012S	015	E	E	E	E	E	E016S	G	G	031	G	G	G	021G	019G	J022	E018S	E020S	E012S	J026	J060	039	J023
17	E015S	E	E	018	E	E	E	E016S	G	G	027G	G	G	G	G	G	E016S	E017S	E015S	E	E016S	E	E012S	E
18	E016S	E	E	E	E	E	022	J023	G	022G	030	G	040	033	028	023	E015S	E017S	E016S	E016S	015	E	E017S	E016S
19	E015S	E	E	E	E	E	E015S	020	025	024G	G	G	G	G	G	021	E017S	E012S	E012S	E	E015S	E	E	E016S
20	E016S	E	J023	E	013	E	E015S	E015S	G	G	G	035	C	032	G	G	E015S	E	E012S	E	E015S	E	E015S	E
21	E	018	E	E	014	E	E015S	E015S	G	G	G	032	G	G	G	G	E017S	E014S	019	E015S	E	E015S	E	E
22	E	E	E	E	E	E	E	E015S	025	G	032	G	G	G	G	G	E016S	E	E	E	E	E015S	E015S	E015S
23	E015S	E	E	016	E	J030	020	023	J040	032	030	G	G	038	028	C	C	C	C	C	C	E	E	E012S
24	E016S	E	E	E	016	E	024	E015S	G	C	030	G	G	G	G	020G	E015S	J020	E	E015S	E016S	033	022	022
25	E	E	E	E	E	E	E	E017S	028	032	043	G	037	C	C	G	E	E	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	G	G	G	G	G	019	E015S	E015S	E013S	E	E016S	E	E
27	E	E015S	J054	J033	013	014	014	J030	024	040	G	G	G	G	G	023	021	E	C	C	E016S	E014S	016	E
28	E015S	E	J023	E	E	E016S	E017S	E016S	025	031	038	081	J083	038	J055	J053	J153	J033	018	018	E	E014S	E	E012S
29	E015S	014	023	014	C	C	C	C	C	C	C	C	C	G	031	024	E017S	E015S	E012S	E015S	E	J030	018	J030
30	E015S	E	J028	017	014	E	E	E015S	G	G	019G	021G	023G	035	033	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	045	J060	031	G	030	J033	J033	024	025	E016S	E015S	J030	E015S	E	E012S
Count	28	28	28	28	27	26	26	26	25	26	29	30	29	30	30	29	29	29	26	26	27	28	28	28
Median	E015S	E	E	E	E	E	E015	E018	G	G	G	G	G	G	G	G	018	020	E018	E015S	E016	E015	E015	E015S
U.Q.	E016	015	022	015	013	014	021	024	025	030	031	034	032	030	030	024	024	028	023	017	020	020	016	016
L.Q.	E	E	E	E	E	E	E	E015	G	G	G	G	G	G	G	G	E016	E013	E015	E012	E012	E	E	E
Q.R.								D009									D008	D015	D008	D005	D008			

IONOSPHERIC DATA

Dec. 1966 | f_bEs | 0.1 Mc | 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	S	E	012	E	E	E		017	019	G	028	029	028	020	020	021	016	016	020	S	S			
2	S		E	E			017	018	022	017	019G				018	017	017	017	017	016	S	014	S	
3		S		E			S	S		027		019G		017G	025	021	S	015			S	E	021	019
4	019	012					S	015	C	C							016	S	S	S	S	S	014	S
5	S							020		021			020G	015G			015	S	E	016	S	S	S	S
6	S						E015S	030				033			019G		022	021	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C		020G	018	025	022		018G	021	023	016	015	017	020		
8	S	E	013	017	E	017	015	020		020G		021G	026				020	020	019	A	A	E017S	S	S
9	A	019	017	E	E	017	017	018	024	020						025	033	017	017	S	S	014	019	020
10	S	S	015				E	S		G	G	B	B	B	B	B	S	018	017	027	019	017	S	S
11	S	015															S		S	S				S
12									B	B		B	B	B	B	B	S	S	S	S	S	S	S	S
13	S	017						016						B			G	016	015		S	015	S	S
14						C	C	C	C	C					026		020	A	016	S	016	S	S	
15	S	E				014	015	018	018G		029	G		018G		G	S	015	018	S	015	S	S	
16	S	012						S			023				020G	016G	018	S	S	S	020	A	A	015
17	S			016				S			023G						S	S	S		S		S	
18	S						020	016		019G	G		040	028	027	023	S	S	S	S	015		S	S
19	S						S	015	017	017G						G	S	S	S		S			S
20	S		016		E		S	S				G	C	G			S		S		S		015	S
21		013			E		S	S				G					S	S	016	S		S		
22								S	G		G						S					S	S	S
23	S			E		020	017	018	022	027	029			G	G	C	C	C	C	C	C			S
24	S				E		017	S		C	027					017G	S	016		S	S	016	E016S	S
25								S	G	G	G		G	C	C				C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C						G	S	S	S		S		
27			A	E	E	E	013	018	022	027						G	019		C	C	S	S	E	
28	S		017			S	S	S	G	G	020G	073	064	G	027	040	A	022	016	014		S		S
29	S	E	E	E	C	C	C	C	C	C	C	C	C		G	G	S	S	S	S		017	015	016
30	S		020	016	013			S			019G	019G	020G	020G	020G	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	036	G	030		028	027	023	G	S	S	S	015	S		S
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

f_bEs Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

W 5

IONOSPHERIC DATA

Dec. 1966 | f-min | 0.1 Mc | **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	E016S	E	E	E	E	E	E	E	012	012	011	011	E	E	E	E	E	E015S	E015S	E016S	E013S	E	E	E
2	E015S	E	E	E	E	E	E016S	E	E	E	011	016	012	011	E	E	E	E015S	E016S	E015S	E016S	E	E016S	E
3	E	E015S	E	E	E	E	E015S	E017S	015	017	015	012	011	E	E	E	E016S	E	E	E	E015S	E	E	E016S
4	E016S	E	E	E	E	E	E015S	E	C	C	016	016	012	013	012	015	E	E012S	E015S	E015S	E012S	E012S	E	E015S
5	E015S	E	E	E	E	E	E	E	012	011	017	013	016	011	016	011	E	E015S	E	E	E016S	E015S	E012S	E015S
6	E016S	E	E	E	E	E	E015S	E	012	017	016	013	020	019	E	011	E015S	E015S	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	018	016	015	013	016	018	012	E	E014S	E	E	E	E	E	E
8	E015S	E	E	E	E	E	E	E	011	011	011	013	012	016	016	012	E016S	E	E011S	E012S	E	E017S	E016S	E016S
9	E	E	E	E	E	E	E	E	011	017	019	019	021	020	020	017	E015S	E	E016S	E015S	E017S	E	E	E
10	E017S	E017S	E	E	E	E	E	E016S	018	020	024	032	031	030	030	026	E013S	E	E012S	E016S	E	E	E015S	E015S
11	E014S	E	E	E	E	E	E	E	018	018	017	020	020	020	017	015	E015S	E	E015S	E016S	E	E	E	E015S
12	E	E	E	E	E	E	E	E	020	028	026	034	036	030	032	023	E019S	E017S	E017S	E017S	E016S	E020S	E018S	E015S
13	E015S	E	E	E	E	E	E	E	017	020	022	025	023	030	020	018	E	E	E	E	E016S	E	E016S	E016S
14	E	E	E	E	E	C	C	C	C	C	017	018	017	016	017	011	E	E	E	E012S	E	E016S	E015S	E
15	E012S	E	E	E	E	E	E	E	012	011	012	017	017	012	012	012	E015S	E	E	E012S	E014S	E012S	E015S	E
16	E012S	E	E	E	E	E	E	E016S	012	016	017	017	023	018	012	011	011	E018S	E020S	E012S	E	E	E	E012S
17	E015S	E	E	E	E	E	E	E016S	012	012	013	021	023	020	017	013	E016S	E017S	E015S	E	E016S	E	E012S	E
18	E016S	E	E	E	E	E	E	E	011	013	018	020	022	020	017	012	E015S	E017S	E016S	E016S	E	E	E017S	E016S
19	E015S	E	E	E	E	E	E015S	E	E	E	015	017	017	017	017	013	E017S	E012S	E012S	E	E015S	E	E	E016S
20	E016S	E	E	E	E	E	E015S	E015S	013	013	018	017	C	017	018	012	E015S	E	E012S	E	E015S	E	E	E015S
21	E	E	E	E	E	E	E015S	E015S	017	012	020	020	022	021	017	017	E017S	E014S	E	E015S	E	E015S	E	E
22	E	E	E	E	E	E	E	E015S	017	017	019	020	018	016	015	012	E016S	E	E	E	E	E015S	E015S	E015S
23	E015S	E	E	E	E	E	E	E012S	013	018	018	018	017	018	017	C	C	C	C	C	C	E	E	E012S
24	E016S	E	E	E	E	E	E016S	E015S	011	C	016	012	016	017	018	011	E015S	E	E	E015S	E016S	E013S	E016S	E013S
25	E	E	E	E	E	E	E	E017S	012	013	018	018	017	C	C	E	E	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	019	019	017	017	015	E012S	E015S	E015S	E013S	E	E016S	E	E
27	E	E015S	E	E	E	E	E	E	011	017	018	017	019	016	016	012	E	E	C	C	E016S	E014S	E	E
28	E015S	E	E	E	E	E016S	E017S	E016S	016	012	017	012	017	016	012	E017S	E011S	E	E	E	E	E014S	E	E012S
29	E015S	E	E	E	C	C	C	C	C	C	C	C	C	017	016	011	E017S	E015S	E012S	E015S	E	E	E	E
30	E015S	E	E	E	E	E	E	E015S	012	017	012	012	011	011	011	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	017	017	018	018	018	015	016	E015S	E015S	E016S	E015S	E011S	E015S	E	E012S
Count	28	28	28	28	27	26	26	26	25	26	29	30	29	30	30	29	29	29	26	26	27	28	28	28
Median	E015S	E	E	E	E	E	E	E	012	016	017	017	017	017	016	012	E015S	E012S	E012S	E012S	E012S	E	E	E012S
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1966 | 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	F	235F	F	F	F	335	285	315	330	350	350	355	355	345	345	335	345	335	330	345	345	285	F	275F
2	280F	275	280	315	310	325	315	350	355	335	350	360	355	360	365	355	330	340	310	335	305	285	F	F
3	F	280F	300F	F	F	SF	310H	340	350	335	340	345	355	340	335	345	365	295	335	330	320	315	260	SF
4	290F	285F	280F	280F	305F	SF	325F	345	C	C	350	350	350	340	350	345	350	335	310	295	320	295	325	275
5	270F	F	F	285F	320F	325	300H	325	350	350	330H	340	350	320	335	360	340	320	335	335	290	300	305	285
6	290	280	270	295	310	350	305	350	335	340	I335R	335	345	335	340	340	320	340	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	345	350	360	355	335	350	355	340	335	335	340	310	300	265	275
8	290	280	290	315	275	305	305	355	365	355	350	360	340H	330	305	370	360	320	335	A	A	305	F	F
9	A	F	F	290F	295F	295F	335	345	370	340H	335	345	350	345	335H	340	335	320	310	320	320	315	290	290
10	285	280	280	280	305	310	330	340	315H	325	330	345	340	350	340	335	335	360	335	330	305	295	F	280F
11	275F	265F	275F	290	320	345	320	330	355	340	335	305	350	305H	355	330	315H	330	275	325	335	F	F	275F
12	270F	285F	290F	275F	295F	340	345	355	350	350	340	350	345	U335R	355	355	310	335	330	340	345	305	285	300F
13	270F	275	275	295	285	295	325	335	350	345	345	345	340	335	310	355	310	315	335	315	335	260	265	260
14	265	270	270	315	295	C	C	C	C	C	335	340	345	335	335	325	315	I320A	330	295	290	275	265	260
15	255	250	240	240	SF	SF	325	310	335	330	330	340	325H	335	340	345	345	320	295	310	290	310	285	295
16	285	295	280	275	275	305	340	355	355	340	355	350	345	345	355	345	345	300	325	325	330	A	A	285
17	305	260	280	280	285	290	315	350	355H	350	335H	320H	345	365	340	355	330	350	330	305	315	325	280	285
18	285	300	290	305	290	295	325	330	360	355	325	345	355	325H	340	325	335	300	310	330	335	280	290	280
19	290	285	285	290	290	315	320	330	345	345	335	325	345	345	340	355	330H	340	335	335	315	305	280	295
20	275	285	270	280	285	315	350	340	350	355	360	345	I345C	355	340	330H	330H	310	315	325	315	295	290	275
21	280	285	290	310	280	290	315	335	355	340	320	365	340	350	345	340	315	345	340	325	325	295	265	280
22	275	275	270	285	280	340	350	335	355	325H	330	335	345	345	310	345	325	315	330	335	325	290	285	275
23	285	270	275	285	315	345	325	320	345	355	345	U345R	335	335	340	C	C	C	C	C	C	310	315	285
24	285	280	280	290	290	310	340	350	325	I330C	355R	365	350	340	345	345	330H	335	310	325H	330	265	285	275
25	280	275	285	275	280	330	360	330	345	345	350	365	330	C	C	370H	310H	325	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	335	345	315H	335Z	370	365	I325S	325	305	295	275	305	265
27	280	275	I280A	295	285	310	300	315	345	335	330H	355	350	345H	350	355	325	300	I335C	I335C	315	275	275	270
28	275	285	320	300	280	275	295	330	355	345	320	350	350	330	350	335	I340A	335	335	335	320	310	275	305
29	270	275	290	285	I290C	C	C	C	C	C	C	C	C	360	350	350	330	320	315	325	330	285	280	280
30	285	275	285	290	290	315	315	330	345	350	345	345	340	335H	355	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	355	355	345	355	360	360	360	340H	335	315	335	325	315	270	280
Count	25	26	25	26	25	23	26	26	25	27	29	30	30	30	30	29	29	29	27	26	26	26	22	25
Median	280	280	280	290	290	315	320	335	350	345	340	345	345	340	340	345	330	325	330	330	320	295	280	280
U.Q.																								
L.Q.																								
Q.R.																								

M(3000) F2 Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1966 | 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										400L	400	400	405		410									
2										U400L		U410L	400	U395L										
3											U400L	395												
4										C		390												
5											U400L	U400L		U400L										
6													400											
7													410											
8												405L	425											
9																								
10																								
11													400											
12													400L											
13																								
14										C				410										
15											U405L		420											
16													400L											
17																								
18												390L	I405A											
19											390	395			U400L									
20													C											
21														405L										
22												390L	395	385										
23												390L	400L											
24											390	400	385											
25												390	415	C	C									
26										C	C	400	390											
27												390L												
28											U400L	A	A											
29										C	C	C	C	430										
30											U400L		400L											
31											410L	400												
Count										2	9	15	16	6	2									
Median										U400L	U400L	395	400	400L	U405L									
U.Q.																								
L.Q.																								
Q.R.																								

M(3000)F1 Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

IONOSPHERIC DATA

Dec. 1966 | 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										240	235	225	235		230									
2										230		225	220	235										
3											240	235												
4										C		250												
5											240	245		230										
6													235											
7													250											
8												250	225											
9																								
10																								
11													250											
12													240											
13																								
14										C				240										
15											245		225											
16													235											
17																								
18												245	235											
19											245	240			235									
20													C											
21														235										
22												250	230	260										
23												250	250											
24											230	230	240											
25												245	225	C	C									
26										C	C	235	245											
27												240												
28											250	A	A											
29										C	C	C	C	215										
30											235		225											
31											235	250												
Count										2	9	15	16	6	2									
Median										235	240	245	235	235	230									
U. Q.																								
L. Q.																								
Q. R.																								

h'F2

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1966 | 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	345	315	330	300	285	240	275	240	225	240	220	220	210	235	215	225	215	215	250	230	220	280	325	330
2	300	300	295	250	250	225	270	220	215	215	230	225	220	225	220	200	210	225	240	240	250	275	320	305
3	305	300	265	280	290	235	240H	210	220	200H	225	235	220	230	220	220	210	220	235	225	240	270	325	285
4	335	270	290	280	250	250	240	220	C	C	200H	210	210	225H	225	220	210	225	260	275	250	270	240	300
5	310	340	300	295	250	225	220H	230	230	225	225	235	230H	225	235	220	210	220	250	250	270	270	260	290
6	300	270	305	270	250	210	275S	220	225	225	235	245	235	240	230	210	215	220	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	215	235	240	225	225H	240	225	210	225	235	225	300	E310A	325	300
8	300	300	300	295	290	250	255	225	220	220	225	225	215	240	220	220	220	220	260	A	A	S	360	305
9	I335A	315	305	285	275	260	225	225	220	225	200H	240	240	235	235	220	I225A	255	240	250	265	245	350	350
10	310	305	300	290	260	225	240	230	210	225	230	240	235	245	240	215	200	220	275	275A	275	300	325	335
11	325	325	300	285	220	220	210	225	220	230	215H	225	240	230	225	230	220	210	250	255	250	325	350	350
12	300	285	290	300	265	230	210	220	210	230	235	230	240	245	230	225	210	230	250	245	230	E290S	345	300
13	350	335	300	290	275	245	245	220	210	230	225	225	240	245	240	230	220	225	235	245	250	320	350	370
14	350	330	315	260	240	C	C	C	C	C	230H	230	230	230	240	225	240	I250A	235	265	280	350	335	350
15	350	400	400	410	320	260	275	230	235	215H	240	230	220	225	235	220	220	230	250	260	275	260	300	285
16	295	260	295	300	320	270	240	220	220	195H	235	230	230	240	240	230	225	265	250	240	250	A	A	320
17	300	310	300	295	260	260	250	225	215H	225	220H	200H	240	230	225	220	225	220	250	250	260	230	290	300
18	285	275	275	270	270	270	260	245	225	215	220	245	I235A	225	225	225	225	270	250	240	230	280	305	300
19	290	290	290	270	265	240	260	225	225	220	225	210	230	225	230	210	225	225	220	220	260	255	290	280
20	305	290	310	285	270	250	230	225	220	220	210	235	I225C	220	225	220	210	205	225	225	250	270	300	330
21	310	300	300	270	240	250	250	245	210	225	230	225	240	225	240	220	225	220	240	250	230	275	320	300
22	280	295	310	300	300	225	235	240	220	220H	240	245	230	250	235	230	210	225	250	225	230	310	325	325
23	295	310	300	280	255	250	250	250	225	230	230	235	215	235	240	C	C	C	C	C	C	240	300	300
24	300	295	295	290	285	250	245	215	220	I230C	210	200	225	230	220H	220	225	240	220	200H	245	400	310	310
25	300	300	270	275	275	235	220	250	215	230	240	225	210	I210C	I205C	210	180H	200	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	230	215	200H	210H	220	220	215	270	260	275	335	250	325
27	300	300	A	310	300	250	A	270	225	245	210H	225	205H	210H	230	220	205	240	I230C	I230C	250	305	310	300
28	310	280	250	225	270	310	275	250	225	230	250	A	A	240	240	I210A	I235A	260	245	235	250	280	315	275
29	310	300	295	300	I275C	C	C	C	C	C	C	C	C	210	230	215	210	230	260	255	240	350	345	310
30	295	300	350	285	285	250	225	240	220	225	235	240	220	225	220	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	230	230	225	230	230	225	230	200	210	250	225	260	300	350	350
Count	28	28	27	28	28	26	25	26	25	27	29	29	29	31	31	29	29	29	27	26	26	26	27	28
Median	300	300	300	285	270	250	245	225	220	225	230	230	230	230	230	220	215	225	250	240	250	280	320	305
U.Q.																								
L.Q.																								
Q.R.																								

h'F

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1966 | $h'Es$ 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	S	100	100	100	105	110	E	110	150	120	115	105	100	100	105	105	105	100	100	S	S	E	E	E
2	S	E	110	105	E	E	110	110	105	105	105	G	G	G	125	105	105	100	100	110	S	100	S	E
3	E	S	E	110	E	E	S	S	G	115	G	105	G	105	105	105	S	110	E	E	110	100	105	105
4	105	105	E	E	E	E	S	110	C	C	G	G	G	G	G	G	105	S	100	S	S	S	100	S
5	S	E	E	E	E	E	E	115	G	110	G	G	105	105	G	G	100	100	100	110	S	S	S	S
6	S	E	E	E	E	E	125	110	G	G	G	105	G	G	105	G	115	110	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	G	110	110	105	105	G	125	115	110	110	110	110	105	E	E
8	S	110	110	110	110	110	110	110	G	105	G	150	145	G	G	G	155	110	110	110	105	100	S	S
9	105	105	105	110	110	110	110	105	110	105	G	G	G	G	G	120	110	110	110	S	S	105	105	110
10	S	S	105	E	E	E	110	S	G	110	100	B	B	B	B	B	S	115	110	110	105	105	S	S
11	S	110	E	E	E	E	E	G	G	G	G	G	G	G	G	G	S	E	S	S	E	E	E	S
12	E	E	E	E	E	E	E	G	B	B	G	B	B	B	B	B	S	S	S	S	S	S	S	S
13	110	110	E	E	E	E	E	110	G	G	G	G	G	B	G	G	135	110	110	E	S	100	S	S
14	E	E	E	E	E	C	C	C	C	C	G	G	G	G	110	G	125	110	110	S	110	S	S	E
15	S	110	E	E	E	110	100	110	105	G	110	140	G	100	G	150	S	110	110	S	110	110	S	E
16	S	100	E	E	E	E	E	S	G	G	105	G	G	G	100	100	100	S	S	S	110	105	105	105
17	S	E	E	110	E	E	E	S	G	G	110	G	G	G	G	G	S	S	S	E	S	E	S	E
18	S	E	E	E	E	E	125	110	G	110	125	G	120	110	110	110	S	S	S	S	110	E	S	S
19	S	E	E	E	E	E	S	110	110	105	G	G	G	G	G	125	S	S	S	E	S	E	E	S
20	S	E	115	E	110	E	S	S	G	G	G	125	C	150	G	G	S	E	S	E	S	E	130	S
21	E	110	E	E	100	E	S	S	G	G	G	130	G	G	G	G	S	S	110	S	E	S	E	E
22	E	E	E	E	E	E	E	S	150	G	130	G	G	G	G	G	S	E	E	E	E	S	S	S
23	S	E	E	110	E	110	110	110	110	110	110	G	G	125	125	C	C	C	C	C	C	E	E	S
24	S	E	E	E	110	E	110	S	G	C	110	G	G	G	G	105	S	100	E	S	S	115	100	105
25	E	E	E	E	E	E	E	S	150	160	145	G	125	C	C	G	E	E	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	G	G	G	G	G	160	S	S	S	E	S	E	E
27	E	S	110	110	110	110	110	110	110	120	G	G	G	G	G	125	110	E	C	C	S	S	110	E
28	S	E	110	E	E	S	S	S	160	150	125	115	115	125	120	115	110	110	110	110	E	S	E	S
29	S	110	110	110	C	C	C	C	C	C	C	C	C	G	145	125	S	S	S	S	E	105	105	105
30	S	E	100	100	100	E	E	S	G	G	105	105	100	125	120	C	C	C	C	C	C	C	C	C
31	C	C	C	C	C	C	C	C	C	115	115	115	G	110	105	110	125	100	S	S	110	S	E	S
Count	3	10	10	10	8	6	10	13	10	14	15	11	8	11	12	14	15	15	13	6	9	11	8	5
Median	105	110	110	110	110	110	110	110	110	110	110	115	110	110	110	110	110	110	110	110	110	105	105	105
U. Q.																								
L. Q.																								
Q. R.																								

$h'Es$ Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

The Radio Research Laboratories, Japan

W 11

IONOSPHERIC DATA

Dec. 1966 | 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		f	f2	f	f2	f		1	h 1	c	1	12	12	1	1	1	1	f2	f2					
2			f	f			f2	1	1	1	1				c 1	1 h	1	f2	f	f		f		
3				f						1		1		1	1	1		f			f	f	f2	f
4	f	f						1									1		f				f	
5								1		1			1	1			1	f	f	f				
6							c	14				1			1		c	f						
7											1	1	1	1		c 1	c 13	f2	f	f	f	f		
8		f	f	f2	f	f2	f	12		1		h 1	h 1				h	f2	f2	f2	f3	f		
9	f2	f	f	f	f	f2	f2	12	1	1						1	c2	f	f			f	f	f
10			f				f			1	1							f	f2	f2	f	f		
11		f																						
12																								
13	f	f						1									h	f	f			f		
14															1		c	f2	f		f			
15		f				f2	f2	1	1		1	h		1		h		f	f2		f	f		
16		f									1				1	1	1				f	f2	f3	f
17				f2							1													
18							f	1		1	c		c	1	1	1					f			
19								1	1	1						c								
20			f2		f							c		n									f	
21		f			f							h							f					
22									h		h													
23				f		f2	f	1	1	1	1			c	c									
24					f		f				1					1		f				f f	f	f
25									h	h	h		c											
26																	h							
27			f3	f2	f	f	f	1	1	1						c	f						f	
28			f2						h	h	c 1	c21	c2	c	c3	c2	c3	f2	f	f				
29		f	f	f											h	c						f	f	f
30			f2	f	f						1	1	1	c 1	c 1									
31										c2	c2	1		1	12	1	c	f			f2			
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

Sweep 1.0 Mc to 18.0 Mc in 40 sec in automatic operation

IONOSPHERIC DATA

Dec. 1966 | foF2 | 0.1 Mc | 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	032	034	F	033	036	036	032	055	088	116	121	099	079	086	078	074	079	046	035	036	036	I028R	031	034
2	037	036	034	037	033	029	028	062	065	075	096	107	096	082	076	066	057	036	033	027	033	031	034	F
3	035	032	036	034	031	029	026	053	065	078	089	101	086	076	073	071	061	041	032	039	034	034	F	036S
4	033	035	034	F	F	F	036	056	076	069	081	089	079	081	081	066	059	038	038	044	046	036	035	033
5	033	036F	F	033	034	FS	026	051	069	083	106	091	086	078	079	076	058	041	038	041	036	036	037	036
6	037	037	038	038	037	032	031	063	061	085	097	116	100	088	088	078	065	056	045	041	029	029	032	036
7	036	037	036	038	036	031	031	055	066	076	086	084	090	086	081	089	061	046	035	036	025	026	026	028
8	031	031	032	034	033	031	032	061	066	069	080	086	078	076	084	072	065	044	035	036	026	024	025	030S
9	031F	031	032	032F	036	031	I032A	053	069	073	081	079	075	074H	076	078	058	042	041R	039S	I031A	028	029	031
10	031	032	032	034	032	028	031	056	078	079	085	085	092	078	067	076	061	035H	037	034	034	029	029	031
11	032	034	034	035	039	026H	029	054	072	081	086	086H	089	091	080	067	058	041	031	033	031	023	028	031
12	034	033	033	033	034	030	030	052	061	068	082	083	076	081	083	068	067	042	042	038	031	023	025	028
13	029	030	031	031	031	031	035	064	077	078	085	086	083	085	076	076	060	046	042	039	026	026	029	031
14	032	032	034	036	028	029	029	052	072	096	102	096	091	076	075	076	063	051	049	034	I034A	030	031	033
15	034	031	032	029	031	036	028	051	072	098	107	112	094	087	079	075	069	050	046	043	044	041	036	036
16	036	034	031	033	032	033	035	056	080	072	086	096	087	079	076	085	066	041	046	036	034	029	026	028
17	029	031	032	034	033	032	030	061	066	072	082	087	092H	089	065	066	056	041	037	034	035	040	026	029
18	032	030	032	032	032	033	036	052	066	073	073	093R	086	072	069	062	059	042	041	044	032	026	032	035
19	I037R	039S	041	039F	039	030	032	056	063H	076	072	081	081	081	074	066	054	044	043	036	030	029	027	031S
20	030	031	032	033	031	029	032	049	066	076	083	074	076H	081	076	074	061H	044H	038	036	041	029	029	029
21	031	031	031	032	031	029	027	046	068	066	071	088	084	086	067	070	067	049	037	036	031	028	028	032
22	032	032	032	032	034	033	031	044	061	068	093	094	088	077	080	069H	065	039	042	030	029	025	027	030S
23	031	031	034	033	036	030	030	050	059	076	085	091	089R	081	076	079	069	042	034H	031	033	028	028	030
24	031	032	032	031	031	031	033	056	057	069	I095R	I082R	082	074H	073	071	055	039	044	029	030	I022C	027	028
25	030	031	032	030	032	034	026	045	060	066	088	091	078	081	090	065	056	046	039	034R	035R	024	026	029
26	026	029	030	030	030	029	028	052	064	072	103	090	075H	073	071	066	055	041	043	041	031	028	032S	030
27	032	035	034	031F	030F	026	028S	041	066	075	094	103	086	068	071	069	061	046	051	042	034	028H	029	032
28	033	034	041	031	028	028	033	052	069	072	091	100	094	076	075	072	054	043	046	041	031	025	026	031
29	031	030	032	035	032	030	032	047	069	084	074	101	079	082H	062Z	086	I060A	046	I034A	I032A	033	024	025	028
30	029	029	030	033	031	028	027	048	068	070	080	081	081	071	076	064H	063	039	037	032	024	026	027	029
31	030	032	033	031	032	033	038	053	071	076	084	088	085	083	076	072	065	040	031	039	033	024	026	028
Count	31	31	29	30	30	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30
Median	032	032	032	033	032	030	031	053	066	075	086	090	086	081	076	072	061	042	038	036	033	028	028	031
U.Q.	034	034	034	034	034	032	032	056	072	079	095	099	090	085	080	076	065	046	043	041	034	029	031	033
L.Q.	031	031	032	031	031	029	028	050	064	070	081	085	079	076	073	066	058	041	035	034	030	025	026	029
Q.R.	003	003	002	003	003	003	004	006	008	009	014	014	011	009	007	010	007	005	008	007	004	004	005	004

foF2

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 1

IONOSPHERIC DATA

Dec. 1966 | foF1 | 0.01 Mc | 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										L	L	400	L	390L										
2										L	370	L	420	L	L									
3										L	370	400	L	400L	L									
4										L	L	400	L	370										
5										L	L	420	410L	L										
6										L	L	400	L	380L										
7										L	L	L	L	L										
8										L	L	L	L	L										
9										L	L	L	L											
10											L	L	L	L										
11										L	L	400L	L	L										
12										360	L	410L	420	L										
13										L	370	420L	L	L										
14										L	390	L	L	L										
15											L	400	L	L										
16										380	L	L	L	L										
17										360	350	420	400	380L										
18										320		420L	L	370	320L									
19											L	L	400	L										
20										L	L	L	LH	400L										
21										340	L	400	L	L	L									
22										L	420	L	420L	380L										
23											L	L	L	L										
24											420L	410	390	350L										
25											L	L	400	L										
26										320	L	410	410L	400	360									
27										L	L	400	400L	L	L									
28											L	L	L	A										
29										330L	LH	L	L	L										
30											L	L	390	L										
31										L	L	L	L	L										
Count										7	7	15	11	10	2									
Median										340	370	400	400	380L	340L									
U.Q.																								
L.Q.																								
Q.R.																								

foF1

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 2

IONOSPHERIC DATA

Dec. 1966 | foE | 0.01 Mc | 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								190	I240A	I275A	300	300	305	300	I260A	I215A	E							
2								A	A	I270A	295	300	305	285	255	A	E							
3								180	235	275	300	310	310	300	270	225R	E							
4								B	230	I270A	290	305	305	290	275	235	E							
5								185	240	280	300	305	305	300	270	220	E							
6								190	245	280	295	305	305	300	270	230	E							
7								A	220	275	295	305	310	300	275	I225A	E							
8								E	I225A	275	290	300	I300A	305	275	240	A							
9								A	240	A	A	A	310	305	285	A	E							
10								E	245	285	310	315	310	300	I280A	A	B							
11								E	230	285	300	I310A	315	310	290	255	E							
12								E	245	285	300	I310A	315	315	295	255	195							
13								E	235	I280A	300	305	310	305	I280A	245	A							
14								E	230	285	300	310	315	300	280	245	E							
15								E	230R	275	290	305	315	295	275	255	E							
16								E	235	270	295	305	315	305	285	250	E							
17								E	230	270	300	310	310	300	275	230	B							
18								B	225	260	300	310	315	I290A	265	215	E							
19								E	220	275	285	300	310	I305A	290R	235R	E							
20								E	225	275	I290A	300	310	295	285	235	E							
21								E	220	265	I285A	I300A	I305A	305	I280A	245	E							
22								E	230	280	295	305	315	300	275	225	E							
23								E	210	I265A	290	300	310	300	270	A	B							
24								E	230	265	I285A	305	305	300	275	230	E							
25								B	I215B	270	A	A	310	I300A	I270A	235	E							
26								E	I225A	260	285	295	300	I290A	I250A	215	B							
27								E	200	I255A	I280A	300A	305	A	A	I235A	E							
28								E	I210R	255	275	300	305	I300A	I260A	I220A	E							
29								E	210	265	280	A	A	A	A	I240A	E							
30								E	215	265	285	I295A	300	I295A	I270A	235	E							
31								E	230	A	A	A	300	305	285	230	E							
Count								25	30	29	28	27	30	29	29	27	25							
Median								E	230	275	295	305	310	300	275	235	E							
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 3

IONOSPHERIC DATA

Dec. 1966 | foEs | 0.1 Mc | 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	E	J013E	J013E	J016E	J017	E	E	G	025	037	026G	033	J020G	J024G	J033	024	J023	J016E	J052	E	J016E	J015E	E	E
2	E	J014E	J013E	J015E	J019	J018	J021	J025	J053	J053	J026G	G	G	G	G	J029	J023	J019	J025	J023	J037	J028	E	E
3	J013E	E	E	J016E	J021	E	E	G	026	030	025G	J023G	G	G	G	022G	J019	J013E	J015E	E	J018	J024	J018	J016E
4	J020	J024	E	E	E	J016E	E	E018B	025	J035	G	G	J024G	J028G	J032	031	J017	E	E	E	J013E	J015E	J025	J018
5	E	J016E	J014E	J013E	E	E	E	G	026	J034	J045	J024G	G	G	G	024	J023	J015E	E	J013E	J019	J018	E	J012E
6	E	E	E	E	J016E	E	E	G	G	031	034	033	032	G	G	J020G	J024	J013E	J075	J051	J037	J018	J018	J020
7	J022	J016E	J017	E	J017	J025	J019	J024	J027	J053	032	038	J045	J045	035	028	J032	J052	J048	J027	J028	J020	E	J024
8	J025	J015E	E	E	E	J015E	J013E	J016E	J029	J034	033	033	036	G	030	G	020	J025	J021	J021	J015E	J027	J036	J015E
9	E	E	J023	E	E	J028	J061	J042	J028	J040	036	034	033	032	036	034	J040	J027	J024	J032	J044	J033	J024	J021
10	J016E	J023	E	E	E	J014E	J016E	E	G	031	G	035	037	038	030	026	E019B	J018	E	E	E	E	E	J016E
11	J015E	E	E	E	E	J013E	J015E	E	G	G	034	034	G	G	G	G	G	E	E	J013E	E	E	E	E
12	E	J013E	E	E	E	E	E	E	G	026G	035	J034	033	033	G	026	G	J027	J025	J015E	J020	J014E	J013E	E
13	E	E	J013E	E	J013E	J013E	J013E	E	G	029	G	G	G	G	J032	028	J020	E	J013E	J020	E	J021	J013E	E
14	E	E	E	E	E	E	E	J016E	G	J038	G	G	G	032	G	G	J043	J021	J029	J078	J044	J038	J078	J019
15	J019	J016E	E	J015E	J016E	J013E	J013E	019	G	G	033	035	039	035	G	G	E	J014E	J014E	E	J022	J016E	E	J015E
16	E	J014E	J018	E	J023	E	J016E	E	G	028	G	J017G	G	G	029	G	E	J019	E	J023	J016E	E	E	J047
17	J023	J024	J016E	J020	J017	E	E	E	025	032	032	030G	031G	G	029	G	J021	025M	E	E	E	E	E	E
18	E	E	J025	E	E	E	E	E019B	G	J029	033	038	G	032	G	G	E	E	E	E	E	E	E	E
19	E	E	E	E	E	E	E019S	E	G	J023G	033	031	034	032	G	G	E	E	J014E	J013E	E	E	E	J018
20	J013E	E	E	J013E	E	E	E	E	G	034	J044	033	G	G	G	025	J016E	E	J020	J013E	J020	E	E	E
21	J017	E	J019	J023	J019	J018	J018	J029	J024	G	035	032	036	032	030	J029	E	J016E	J021	J021	J016E	E	J019	J029
22	J013E	E	E	E	J013E	J015E	E	E	G	031	034	038	G	G	G	026	E	J025	J021	J018	E	E	E	E
23	E	E	E	E	E	E	E	E	G	032	034	033	G	G	G	027	J022	J014E	E	E	E	E	J013E	E
24	E	E	J016E	E	E	J025	J017	E	G	030	J040	J037	028G	J033	030	J024	E	J020	J021	E	E	C	E	E
25	E	E	E	E	E	E	E	E021B	E022B	032	036	040	033	J032	035	025	J028	J021	J016E	J022	J018	J019	J013E	J013E
26	E	E	E	J023	J028	J017	J016E	E	J024	G	J047	037	J034	J042	030	G	J040	E	E	E	E	E	E	E
27	E019S	E	E	J033	J040	E	E020S	020	028	J032	033	J037	035	031	034	J026	J024	E	E	J032	E	E	J013E	J013E
28	J024	J017	J015E	J014E	E	E	E	J019	G	G	031	037	J044	J040	030	J026	J023	J024	J035	J025	J026	J019	J018	J018
29	E	J013E	J014E	J013E	J023	J017	J024	J013E	G	G	G	034	J040	J047	J032	J031	J093	J044	J060	J043	J050	J032	J024	J018
30	J013E	J016E	J015E	J013E	J013E	J014E	E	E	G	027	G	038	037	J040	029	027	J020	J020	J014E	J013E	J013E	J016E	J025	J038
31	J016E	J019	E	E	E	J013E	E	E	G	029	049	J045	G	032	G	027	019	J013E	J018	J019	J016E	E	E	E
Count	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31
Median	E	E	E	E	E	E	E	E	G	031	033	034	G	032	029	025	J020	E	E	E	E	E	E	E
U.Q.	E017E	E	E	E	017	E	E017E	019	025	034	035	037	036	033	032	027	024	024	025	023	022	020	018	018
L.Q.	E	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	E	E	E	E	E	E	E	E
Q.R.																								

foEs

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Dec. 1966 | f_bEs | 0.1 Mc | 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					E				U025R	032	024G	033	018	017G	029	023	018		E					
2					E	E	018	018	024	032	019G					023	019	017	019	019	018	E		
3					E				U026R	030	023G	022G				021G	018				E	E	E	
4	E	E						B	024	028			023G	027G	023	028	017						E	E
5									026	029	020	018G				023	E				E	E		
6										031	034	033	032			018G	020		023	029	020	E	E	E
7	E		E		E	018	E	020	017	026	032	035	036	039	034	026	025	026	020	017	021	E		E
8	020								027	019	033	024	033		030		019	E	E	E		018	019	
9			E			E	A	031	019	024	034	034	033	032	036	033	033	023	018	023	A	018	018	E
10		E								031		035	037	038	030	026	B	017						
11											034	034												
12										025G	033	033	033	033		026		023	E		E			
13										029					032	028	019			E		E		
14										022				032			035	E	022	022	A	020	E	E
15	E							019			033	034	039	035							E			
16			E		E					028		017G			029			E		E				E
17	E	E		E	E				024	029	028	022G	029G		029		020	021						
18			E					B		G	033	034		031										
19							S			020G	031	031	033	032										E
20										032	032	032				025			E		E			
21	E		E	E	E	E	E	024	017		033	032	034	032	029	018			018	018			E	E
22										030	032	035				024		E	E	E				
23										029	034	032				027	019							
24						018	E			029	032	027	027G	027	030	020		018	020			C		
25								B	B	028	032	035	033	031	034	025	021	E		E	E	E		
26				017	E	E			023		034	035	G	031	028		021							
27	S			E	023		S	019	027	029	032	032	032	030	031	024	021			018				
28	E	E						E			030	033	032	040	028	024	E	E	024	E	017	E	E	E
29					018	E	E					033	033	038	029	031	A	018	A	A	E	E	E	E
30										027		033	036	035	029	026	020	E					E	018
31		E								028	031	034		032		027	019		E	E				
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

f_bEs | Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1966 | f-min | 0.1 Mc | 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	E	E	E	E	E	E	E	E	E	017	017	017	018	017	E	017	E	E	E	E	E	E	E	E
2	E	E	E	E	E	E	E	E	E	E	017	017	017	017	017	E	E	E	E	E	E	E	E	E
3	E	E	E	E	E	E	E	E	E	018	017	017	018	018	C17	017	E	E	E	E	E	E	E	E
4	E	E	E	E	E	E	E	018	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E
5	E	E	E	E	E	E	E	E	017	017	E	017	017	018	C17	E	E	E	E	E	E	E	E	E
6	E	E	E	E	E	E	E	E	017	017	017	017	C17	017	E	017	E	E	E	E	E	E	E	E
7	E	E	E	E	E	E	E	E	C17	017	E	017	017	018	C17	E	E	E	E	E	E	E	E	E
8	E	E	E	E	E	E	E	E	E	017	017	018	018	018	017	018	C17	E	E	E	E	E	E	E
9	E	E	E	E	E	E	E	E	017	017	018	024	018	C23	C19	C17	E	E	E	E	E	E	E	E
10	E	E	E	E	E	E	E	E	018	022	025	023	025	029	026	018	019	E	E	E	E	E	E	E
11	E	E	E	E	E	E	E	E	018	021	018	018	021	019	019	020	E	E	E	E	E	E	E	E
12	E	E	E	E	E	E	E	E	017	017	018	018	018	018	018	017	E	E	E	E	E	E	E	E
13	E	E	E	E	E	E	E	E	019	018	022	028	024	025	025	018	017	E	E	E	E	E	E	E
14	E	E	E	E	E	E	E	E	017	017	018	018	019	018	018	E	E	E	E	E	E	E	E	E
15	E	E	E	E	E	E	E	E	020	020	018	017	018	018	017	017	E	E	E	E	E	E	E	E
16	E	E	E	E	E	E	E	E	C17	018	017	017	018	018	017	017	E	E	E	E	E	E	E	E
17	E	E	E	E	E	E	E	E	017	019	020	018	020	020	019	018	019	E020S	E	E	E	E	E	E
18	E	E	E	E	E	E	E	019	E	019	019	020	020	019	020	018	E	E	E	E	E	E	E	E
19	E	E	E	E	E	E	E019S	E	019	017	017	018	018	017	017	017	E	E	E	E	E	E	E	E
20	E	E	E	E	E	E	E	E	017	017	018	018	018	018	017	017	E	E	E	E	E	E	E	E
21	E	E	E	E	E	E	E	E	017	017	018	018	017	017	018	018	E	E	E	E	E	E	E	E
22	E	E	E	E	E	E	E	E	017	018	018	018	019	018	018	017	E	E	E	E	E	E	E	E
23	E	E	E	E	E	E	E	E	017	017	017	018	019	018	018	017	017	E	E	E	E	E	E	E
24	E	E	E	E	E	E	E	E	017	019	019	020	020	019	020	019	E	E	E	E	E	C	E	E
25	E	E	E	E	E	E	E	021	022	017	017	017	018	018	017	017	E	E	E	E	E	E	E	E
26	E	E	E	E	E	E	E	E	E	019	019	020	020	020	020	020	020	E	E	E	E	E	E	E
27	E019S	E	E	E	E	E	E020S	E	E	017	017	017	017	017	017	017	E	E	E	E	E	E	E	E
28	E	E	E	E	E	E	E	E	017	017	017	018	017	017	017	017	E	E	E	E	E	E	E	E
29	E	E	E	E	E	E	E	E	E	017	017	017	017	017	017	017	017	E	E	E	E	E	E	E
30	E	E	E	E	E	E	E	E	017	017	017	017	017	018	017	017	E	E	E	E	E	E	E	E
31	E	E	E	E	E	E	E	E	E	017	017	017	017	018	017	017	E	E	E	E	E	E	E	E
Count	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31
Median	E	E	E	E	E	E	E	E	017	017	017	018	018	018	017	017	E	E	E	E	E	E	E	E
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Dec. 1966 | 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	285	285	F	305	310	315	305	325	335	330	345	345	355	340	350	350	355	330	345	355	340	I305R	290	280
2	280	305	300	340	335	305	325	345	370	345	325	345	355	355	360	360	350	360	340	305	305	315	325	F
3	290	280	275	290	305	310	350	360	355	345	340	335	350	355	355	345	350	350	320	350	305	290	F	305S
4	290	290	295	F	F	F	325	335	360	355	350	325	370	350	350	365	340	345	325	320	305	310	320	305
5	295	270F	F	285	305	FS	305	355	335	335	350	345	330	345	315	340	330	320	330	315	330	300	305	290
6	295	300	285	295	330	315	325	365	360	335	330	310	340	340	345	345	340	330	335	340	335	280	290	295
7	295	280	285	295	325	325	325	330	360	355	335	335	335	340	325	360	365	340	325	335	290	300	280	280
8	270	290	290	305	305	290	345	345	370	350	340	350	360	355	345	350	345	335	320	340	335	285	285	295S
9	285F	295	305	315F	335	325	I320A	335	350	330	345	355	345	315H	355	360	350	310	320R	340S	I295A	285	265	275
10	265	280	285	295	305	290	305	330	365	355	340	330	340	350	355	345	355	285H	325	305	315	280	270	280
11	280	275	270	295	340	280H	315	335	345	345	335	315H	335	340	350	345	330	335	330	330	330	295	270	305
12	285	290	280	285	295	300	335	330	335	350	330	350	325	345	330	370	360	335	320	340	330	325	270	280
13	275	275	275	300	295	300	320	350	365	345	345	340	360	340	330	345	335	320	335	315	320	285	250	240
14	265	275	290	310	320	275	285	345	345	345	325	345	320	345	345	340	335	310	320	320	I310A	285	250	275
15	265	235	260	250	250	285	330	315	320	325	335	330	330	335	345	335	335	325	310	295	305	310	315	290
16	300	295	295	280	275	290	325	345	355	350	335	355	335	355	345	340	350	335	315	325	330	315	265	280
17	300	285	290	295	305	315	300	330	380	350	350	355	345H	365	355	350	370	320	335	320	290	310	310	295
18	295	305	295	295	300	285	325	340	370	345	345	350R	355	340	350	345	340	340	315	360	355	290	295	275
19	I280R	285S	295	285F	310	355	310	335	355H	345	345	340	335	345	355	345	345	320	330	320	335	315	290	295S
20	275	265	280	305	310	285	315	350	360	355	335	340	325H	345	355	350	330H	305H	325	315	340	310	310	295
21	275	265	265	290	305	290	325	330	355	335	345	330	335	335	360	335	355	330	335	325	330	320	265	280
22	290	285	270	285	295	295	325	330	355	335	335	350	330	310	345	325H	350	370	350	340	305	280	280	265S
23	275	275	285	295	320	340	305	330	355	340	335	345	340R	365	345	350	365	340	315H	325	335	310	260	270
24	290	280	295	290	290	290	310	355	350	335	I335R	I360R	335	345H	335	345	365	295	340	325	325	I300C	280	285
25	295	295	295	295	310	325	340	335	355	350	350	345	345	365	340	325	355	325	335	325R	315R	305	265	315
26	270	260	280	280	280	270	285	335	350	345	355	340	350	340	355	355	355	325	335	330	325	290	300S	285
27	285	290	285	300F	300F	360	305S	330	345	345	335	330	345	365	340	355	345	310	300	335	355	265H	270	285
28	280	295	325	355	260	260	305	345	355	340	330	340	330	355	335	350	355	315	325	340	325	270	275	265
29	290	275	275	295	290	300	315	340	335	320	325	335	355	345H	335Z	350	I340A	330	I350A	I330A	340	270	270	265
30	280	285	285	305	310	305	275	335	355	345	350	355	345	355	345	330H	355	340	325	320	295	290	265	260
31	265	280	280	265	280	290	305	335	350	355	340	340	335	350	345	345	355	315	295	335	335	285	270	255
Count	31	31	29	30	30	29	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30
Median	285	285	285	295	305	300	315	335	355	345	340	340	340	345	345	345	350	330	325	325	325	295	280	280
U. Q.																								
L. Q.																								
Q. R.																								

M(3000) F2 Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1966 | 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										L	L	395	L	385L										
2										L	415	L	380	L	L									
3										L	390	380	L	380L	L									
4										L	L	375	L	400										
5										L	L	385	375L	L										
6										L	L	375	L	390L										
7										L	L	L	L	L										
8										L	L	L	L	L										
9										L	L	L	L											
10											L	L	L	L										
11										L	L	400L	L	L										
12										415	L	370L	380	L										
13										L	405	375L	L	L										
14										L	405	L	L	L										
15											L	380	L	L										
16										385	L	L	L	L										
17										415	420	400	400	405L										
18										420		380L	L	415	415L									
19											L	L	375	L										
20										L	L	L	LH	375L										
21										385	L	375	L	L	L									
22										L	360	L	380L	405L										
23											L	L	L	L										
24											380L	380	385	415L										
25											L	L	375	L										
26										385	L	385	400L	410	410									
27										L	L	375	375L	L	L									
28											L	L	L	A										
29										380L	LH	L	L	L										
30											L	L	390	L										
31										L	L	L	L	L										
Count										7	7	15	11	10	2									
Median										385	405	380	380	400L	410L									
U.Q.																								
L.Q.																								
Q.R.																								

M(3000) F1 Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1966 | 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										230	230	230	225	240										
2										225	240	230	230	225	220									
3										240	235	235	230	235	230									
4										220	220	235	225	225										
5										240	230	230	240	225										
6										240	240	250	235	235										
7										230	245	240	240	225										
8										225	240	240	235	235										
9										230	235	235	225											
10											285	235	255	240										
11										235	235	240	240	250										
12										235	250	235	240	255										
13										230	230	235	240	255										
14										235	255	230	255	220										
15											235	255	230	235										
16										225	230	230	240	230										
17										210	230	240	250	235										
18										225		245	240	240	230									
19											235	240	245	240										
20										215	225	225	280	250										
21										220	235	255	260	255	235									
22										250	255	235	245	235										
23											245	235	255	225										
24											240	240	245H	230										
25											245	240	225	235										
26										230	240	240	230	225	230									
27										250	255	230	235	215	230									
28											255	240	235	230										
29										220	230	230	240	240										
30											235	215	240	235										
31										230	240	240	235	230										
Count										23	30	31	31	30	6									
Median										230	240	235	240	235	230									
U.Q.																								
L.Q.																								
Q.R.																								

h'F2 Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

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IONOSPHERIC DATA

Dec. 1966 | 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	325	330	350	290	265	260	255	215	230	230	215	215	205	200	225	220	215	215	230	230	225	220	315	315
2	300	270	290	245	235	255	265	215	205H	215	185H	210	225	215	215	215	210	205	235	I260A	260	260	275	325
3	285	320	305	270	280	255	240	215	220	220	195	225	230	215	215	215	210	210	240	225	255	280	290	265
4	290	300	305	285	280	280	245	220	225	205	190H	190H	190H	205	230	230	205	215	255	250	240	220	255	255
5	310	330	325	300	275	225	240	210	225	225	240	225	215	220	225	225	205H	215	230	235	255	275	250	295
6	300	285	300	280	235	275	260	205	190H	240	240	225	230	215	230	220	205	205	230	230	245	305	290	285
7	300	320	315	280	250	250	240	225	210	225	235	230	A	A	250	220	205	240	250	230	I260A	280	310	315
8	340	315	305	280	255	290	240	210	215	210	240	225	230	200H	230	200H	210	225	230	210	245	A	I315A	330
9	320	290	285	265	245	240	I255A	230	190H	215	230	235	225	235	235	225	215	240	245	235	I260A	275	310	330
10	325	325	315	265	245	280	240	230	215	235	215	225	245	I240A	230	240	215	205	245	245	240	275	305	310
11	325	315	320	290	230	250	260	225	225	230	230	215	240	240	230	230	210	210	240	240	235	285	330	290
12	325	290	310	320	285	245	225	210	205H	180H	230	210	220	240	240	220	220	220	245	235	230	240	315	300
13	330	325	310	280	290	275	260	225	225	220	215	215	240	240	240	240	205	230	240	230	250	300	350	370
14	340	340	300	260	210	310	290	240	220	235	195H	200H	200H	230	230	240	225A	220	240	250	I275A	290	330	330
15	330	390	355	400	360	280	245	240	220	230	235	215	I220A	230	225	230	225	210	240	240	260	240	255	295
16	275	265	290	310	335	290	220	215	225	220	225	190H	200H	225	225H	240	215	215	240	230	260	230	300	300
17	300	310	320	285	290	245	275	230	215	200	200	210	200	215	210	230	210	230	230	240	285	230	E240E	305
18	280	255	270	250	275	290	245	230	220	200	230	235	235	230	230	230	235	215	270	220	225	E270E	285	320
19	310	275	270	265	240	205	E280S	235	210	225	230	215	210	230	230	220H	205	225	230	240	240	255	310	315
20	300	320	320	285	255	280	255	220	210	230	220	215	200H	220	230	230	205H	195	245	240	230	260	260	310
21	320	335	320	290	255	270	240	240	230	215	230	215	240	230	230	230	210	230	240	245	235	245	310	320
22	295	300	350	295	290	240	245	210	210	240	230	240	225	215	240	210H	210	215	225	225	260	E300E	285	325
23	305	325	300	290	255	240	260	240	205	230	240	235	225	235	205H	230	220	205	215	245	245	240	320	315
24	300	305	290	300	300	290	265	210	210	195H	205	230	220	220	235	230	225	240	230	245	255	C	340	310
25	290	290	285	285	250	235	235	225	220	220H	240	235	220	190H	255	215	205	255	235	240	215	240	340	275
26	320	330	310	295	300	325	290	235	225	215	240	230	215	210	205H	220	220	270	240	240	250	E310E	295	300
27	325S	295	295	320	I280A	210	325S	245	240	235	240	215	205	210	220	215H	215	215	245	225	230	E290E	340	305
28	325	295	235	220	300	340	280	220	215	220	225	235	235	I230A	205	210	210	245	255	215	225	E340E	320	340
29	295	320	315	275	270	270	255	235	220	205	180H	230	230	I230A	200H	225	I240A	220	I235A	I250A	240	E350E	320	320
30	300	315	300	270	255	270	295	220	215	220	190H	230	205	235	230	210	210	220	245	220	270	305	350	360
31	340	325	300	330	305	275	255	230	215	205H	215	240	215	225	220	225	220	210	300	255	230	E310E	310	350
Count	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	29	31	31
Median	310	315	305	285	270	270	255	225	215	220	230	225	220	225	230	225	210	215	240	240	245	U260	310	315
U.Q.																								
L.Q.																								
Q.R.																								

h'F | Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

IONOSPHERIC DATA

Dec. 1966 | 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	E	E	E	E	110	E	E	G	155	140	105	150	100	105	100	105	100	E	115	E	E	E	E	E
2	E	E	E	E	105	105	105	105	105	105	105	G	G	G	G	125	105	100	100	100	100	100	E	E
3	E	E	E	E	110	E	E	G	155	165	110	105	G	G	G	105	105	E	E	E	105	105	105	E
4	105	105	E	E	E	E	E	B	150	105	G	G	105	105	105	140	105	E	E	E	E	E	105	130
5	E	E	E	E	E	E	E	G	155	105	100	105	G	G	G	155	105	E	E	E	120	105	E	E
6	E	E	E	E	E	E	E	G	G	E165G	150	140	E145G	G	G	100	100	E	105	105	105	115	105	105
7	105	E	105	E	110	105	105	105	105	105	155	140	125	120	120	115	110	105	100	105	105	105	E	105
8	105	E	E	E	E	E	E	E	105	105	165	115	125	G	165	G	150	125	105	100	E	110	105	E
9	E	E	110	E	E	115	105	105	105	105	125	135	130	140	145	140	110	105	105	105	105	135	100	100
10	E	100	E	E	E	E	E	E	G	E165G	G	150	140	125	130	105	B	100	E	E	E	E	E	E
11	E	E	E	E	E	E	E	E	G	G	155	125	G	G	G	G	G	E	E	E	E	E	E	E
12	E	E	E	E	E	E	E	E	G	110	140	120	140	E165G	G	160	G	115	115	E	140	E	E	E
13	E	E	E	E	E	E	E	E	G	120	G	G	G	G	105	140	130	E	E	105	E	105	E	E
14	E	E	E	E	E	E	E	E	G	105	G	G	G	155	G	G	120	125	105	105	100	105	110	105
15	105	E	E	E	E	E	E	140	G	G	165	140	140	135	G	G	E	E	E	E	105	E	E	E
16	E	E	105	E	115	E	E	E	G	165	G	105	G	G	165	G	E	105	E	115	E	E	E	105
17	105	105	E	105	115	E	E	E	165	115	110	100	105	G	155	G	100	100	E	E	E	E	E	E
18	E	E	115	E	E	E	E	B	G	130	125	125	G	115	G	G	E	E	E	E	E	E	E	E
19	E	E	E	E	E	E	S	E	G	110	155	155	140	135	G	G	E	E	E	E	E	E	E	105
20	E	E	E	E	E	E	E	E	G	125	120	135	G	G	G	155	E	E	105	E	105	E	E	E
21	125	E	115	110	110	105	105	100	105	G	135	130	130	135	130	140	E	E	140	125	E	E	115	120
22	E	E	E	E	E	E	E	E	G	E170G	140	125	G	G	G	160	E	105	105	105	E	E	E	E
23	E	E	E	E	E	E	E	E	G	165	165	150	G	G	G	155	100	E	E	E	E	E	E	E
24	E	E	E	E	E	105	110	E	G	160	110	105	105	100	130	105	E	100	100	E	E	C	E	E
25	E	E	E	E	E	E	E	B	B	130	150	135	140	110	155	E155G	110	105	E	130	140	125	E	E
26	E	E	E	110	110	110	E	E	130	G	120	120	125	110	115	G	110	E	E	E	E	E	E	E
27	S	E	E	110	110	E	S	150	160	120	125	125	130	130	125	110	105	E	E	105	E	E	E	E
28	105	105	E	E	E	E	E	105	G	G	155	125	125	115	115	115	110	105	105	105	105	105	105	105
29	E	E	E	E	105	105	105	E	G	G	G	145	110	110	115	110	115	105	105	105	105	105	105	105
30	E	E	E	E	E	E	E	E	G	130	G	130	140	125	130	155	100	105	E	E	E	E	105	105
31	E	105	E	E	E	E	E	E	G	130	150	155	G	165	G	150	150	E	105	100	E	E	E	E
Count	7	5	5	4	10	7	6	7	12	25	24	27	19	19	17	22	20	15	15	15	13	12	10	11
Median	105	105	110	110	110	105	105	105	140	120	140	130	130	120	130	135	110	105	105	105	105	105	105	105
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 11

IONOSPHERIC DATA

Dec. 1966 | 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					f				h2 12	h3 12	12	h 12	1	1	1	12	1		f2					
2					f2	f2	f3	12	12 h	13	12					c2	1	f2	f3	f3	f2	f2		
3					f2				h2	h	12	12				12	12				f	f2	f	
4	f2	f2							h 1	14			12	13	12	h2	1						f3	f
5									h2	12	12	12				h2	1				f2	f2		
6										h 12	h2 12	h2	h			12	12		f4	f3	f4	f	f2	f
7	f2		f		f2	f3	f3	13	1	12 h	h 1	h2	h3	c2	c2	c3	13	f3	f3	f	f5	f2		f2
8	f3								12	12	h	c	c		h		h	f	f	f		f2	f2	
9			f2			f	f4	13	1	12 h	h2	h	h	h	h2	h2	c3	f3	f2	f3	f2	f2 f	f2	f2
10		f								h		h	h	h	h	1		f						
11											h	h												
12										12	h	c2	h	h		h		f4	f3		f			
13										c					1	h	h 1			f		f2		
14										12				h			c3	f2	f3	f2	f3	f2	f	f
15	f							h 1			h	h 12	h2	h							f2			
16			f2		f					h		1			h 1			f		f2				f2
17	f2	f		f2	f2				h2	c2	1	1	1		h		1	f						
18			f							h	h	h2		c2										f
19										12	h	h 1	h	h										
20										h2	c	h				h			f2		f2			
21	f		f2	f2	f2	f2	f2	14	1		h2	h	h	h 1	h2	h			f	f2			f2	f
22										h	h	h				h		f	f	f				
23										h	h	h 12				h 12	1							
24						f2	f2			h	1 h2	1 h	1	1	h	1		f	f					
25										h	h2	h2 1	h2	c	h2 1	h 1	12	f2 f		f f2	f2	f		
26				f2	f2	f2			h2		h2	h2	h	c2	c		1							
27				f2	f4			h	h2	c2	h2	h	h2 1	h2	h3 1	c2	12			f2				
28	f2	f2						1			h	h2	h2	c3	c	c2	1	f2	f3	f3	f2	f	f	f2
29					f2	f2	f2					h c	c2	c3	c2	c3	c3	f	f3	f4	f2 f	f3 f	f2	f2
30										h2		h2	h2 12	h2	h2	h	1	f					f	f2
31		f2								h	h c2	h c2		h		h2	h2		f	f				
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

Sweep 1.6 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

A 12

IONOSPHERIC DATA

Dec. 1966 | foF2 | 0.1 Mc | 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	032	031	J033F	J035F	036Z	030	031	062	085	113	125	103	074R	U079R	088	076	079	048	038	035	035	022	030	033
2	031	034	033	038	038	024	029	068	073	078	089	105	U106R	076	077	064	059	038	030	025	030	028	029	032
3	032	U033R	U031F	034	U033R	027	029	056	062	067	084	J100R	J101R	084R	071	069	J074R	046	A	031	030	J029F	F	030F
4	033	032F	032	031V	030F	031	031	062	080	U074R	C	C	U080R	078	073R	U075R	064	043	034	U040R	042	029	028	027
5	028	030	030	033	032	036	026	057	061	079	102R	096	086R	082	077	073R	064	047	038	040	035	028	032F	033
6	034	035	035	036	033	032	034	067	062	077R	J100R	108	106	U083R	088	084	073R	050	044	032	029	027	030	033
7	035	034	033	035	033	028	031	062	U072R	071	083	085	085	081R	079R	092R	067R	050	038	040	030	027	025	027
8	030	030	031	032	033	027	033	065R	062	074R	083	093	088	082	064	080R	062	045	040	I032C	C	022	025	028
9	031	031	032	C	C	C	C	C	I066R	070R	084	086	082	079	C	C	C	042	042	048	030	026	025	027
10	029	030	032	032	033	024	027	059	081	075	080	085	090H	084	074	071	065	037	033	038	036	032	030	031
11	032	034	034	036	040	024H	028	061	075	079R	093	091	094	U085R	082	U074R	059	046	039	034	031	023	025	027
12	030	032	030	031	032	027	028	058	064	065	080	094	086	081	R	072	068	048	037	040	031	029	027	028
13	028	027	030	031	029	C	C	C	C	080	076	086	089	080	081	071	069	047	040	036	026	025	030	032
14	033	033	036	040	024	025	029	062	U083R	090	090	094	085	091	077	074	065	051	A	J041R	036	032	C	C
15	C	C	C	C	C	C	C	C	C	113	110	096R	094	094R	077	076	068	057	047	046R	046	041	037	035
16	035	035	031	031	030	030	036	056	069R	084	082	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	078R	079	089	080	083	078R	073	067	045	037	039	038	035	032	030
18	032	030	031	032	033	032	035	060	U072R	072	083	078	091	088	069	068	063	050	032R	046	029	025	029	029
19	032	032	035	034	035	030	026	056	068	083	080	075	081	084	073	065	061	040	043	040	033	030	028	031
20	033	030	030	033	031	026	028	057	067	077R	U077R	076R	080	083	082	076R	056	048	035R	040	037	030	024	025
21	027	030	030	031	032	028	027	050R	074	070	070	080	081	090	093R	075	064	050	045	037	029	026	028	030
22	033	032	031	032	032	029	030	054	059	075R	093	093	090	092	084	092	069	048	038	032	029	027	028	028
23	031	031	032	034	034	025	029	055	063	069	083	092	087	080	078	073	063	045	037	026	031	029	026	028
24	031	031	032	031	030	030	032	055	057H	056	087	102	077	080	071R	077	062	047	042	034	030	033	029	031
25	031	031	033	033	U035R	030	030	U051R	059	064	078	083	093	079	073	087R	063	044	049	036	038	022	023	028
26	027	025	030	030	026	025	025	052	063	U075R	097	100	U096R	079	071R	070	062	048	J050R	042	035	028	031	032
27	033	035R	033Z	039	034	028	024	045	062	J076R	J105R	J106R	082	J076R	J069R	J074R	061	A	050	049	033	033	029	C
28	C	C	C	C	C	C	C	C	C	073	085	108	084	078	J074R	076	064	A	A	044	032	025	023	025
29	030	025F	029	033	024	028	031	052	084	080	J080R	090	079	089	068	079R	A	J053R	042	I032A	033	A	I030A	029
30	031	031	031	033	030	025	025	055	071	077	075	075	079	J076R	072R	078	056	050R	033	032	026	024	023	026
31	027	028	031	028	030	030	030	056	076R	079	080	093	083	079	080	U077R	070	051	032	037	043	U031R	024	025
Count	28	28	28	27	27	26	26	26	27	31	30	29	30	30	28	29	28	28	27	30	29	29	28	28
Median	031	031	032	033	032	028	029	056	068	076	083	093	086	082	077	075	064	048	038	038	032	028	028	029
U.Q.	033	033	033	035	034	030	031	062	075	079	093	100	091	084	080	078	068	050	043	040	036	030	030	032
L.Q.	030	030	030	031	030	025	027	055	062	071	080	085	081	079	072	072	062	045	035	032	030	025	025	027
Q.R.	003	003	003	004	004	005	004	007	013	008	013	015	010	005	008	006	006	005	008	008	006	005	005	005

foF2

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

The Radio Research Laboratories, Japan

K 1

IONOSPHERIC DATA

Dec. 1966 | foF1 | 0.01 Mc | 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	L	L	L	L									
2										390L	L	L	L	L		300L								
3											L	L	L	L	L									
4										L	C	C	L	L	L									
5											L	420L	L	L	L									
6										L	L	S	L	420L	L	L								
7											L	L	L	A	A									
8									L	L	L	L	L	410L										
9										L	L	L	L	L	C	C	C							
10										L	L	L	L											
11										L	L	L	430L	L	L									
12												L	L	L										
13									C	380L	420L	L	L	L	L									
14									L	L	L	L		L										
15									C	370L	L	L	L	L										
16										L	L	C	C	C	C	C	C							
17									C	L	370L	L	450L		L									
18											L	420L	L	L	L	L								
19											L	L	430L	L		L								
20										L	L	L	L	420L	L									
21												L	L	L	L									
22										L	L	A	L	L	L									
23									L	L	L	L	U430L	L	L	L								
24										L	L	L	L	L										
25											L	L	L	L	L									
26										380L	L	L	L	L	A	L								
27										L	L	L	L	L		L								
28									C		L	L	L	L	L									
29										L	L	L	L	L	L		A							
30										L	L	L	L	L	400L	L								
31										L	L	440L	L	410L	L									
Count										4	2	3	4	4	1	1								
Median										380L	400L	420L	430L	420L	400L	300L								
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

K 2

IONOSPHERIC DATA

Dec. 1966 | foE | 0.01 Mc | 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								B	260	270	300	310	310	300	285	A	A							
2								B	230	275	I300A	I310A	A	A	270	240	155							
3								170	230	290	305	325	330	310	280	255	195							
4								170	250	A	C	C	310	305	285	240	200							
5								170	245	285	310	I320A	I320A	310	285	A	B							
6								160	245	I280R	305	315	325	310	290	I220A	175							
7								B	240	275	300	315	325	320	295	A	A							
8								A	215	285	305	I315R	335	320	295	A	A							
9								C	I250A	I280A	310	I325R	330	330	C	C	C							
10								A	225	310	325	335	335	I330A	315	260	180							
11								B	B	300	305	I325B	330	325R	305	B	220							
12								A	225	290	325	330	330	325	310	270	175							
13								C	C	280	I300R	320	B	B	R	B	B							
14								B	235	310	320	330	335	315	300	255	I200A							
15								C	C	285	I310A	315	325	I320R	300	R	B							
16								170	235	285	300	C	C	C	C	C	C							
17								C	C	270	280	315	320	320	300	250	200							
18								A	I230A	280	300	320	320	320	295	240	180							
19								A	200	290	305	310	A	A	295	250	165							
20								B	230	290	310	320	320	305	295	A	190							
21								B	225	285	310	315	300	315	A	A	A							
22								165	215	285	310	320	I320A	315	300	250	A							
23								B	235	280	305	325	325	315	290	260	B							
24								160	230	270	300	320	315	I315R	I290A	260	175							
25								A	220	280	300	315	315	300	285	A	170							
26								B	225	270	295	315	315	A	A	A	B							
27								A	230	290	305	A	320	A	A	A	190							
28								C	C	265	300	310	315	305	A	A	165							
29								B	230	270	310	320	I315A	305	290	250	A							
30								180	250	I280A	305	315	320	I310A	285	250	A							
31								B	225	A	305	315	I315A	I310A	I290A	A	220							
Count								8	26	29	30	28	27	25	24	15	17							
Median								170	230	280	305	320	320	315	290	250	180							
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

K 3

IONOSPHERIC DATA

Dec. 1966 | foEs | 0.1 Mc | 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	E015B	E013B	E014B	020M	E015B	E013B	J013	E015B	G	G	G	G	036	036	029	030	J022	022	018	J025	E014B	023	020	E015S
2	E014B	020	026	019	020	E015B	E013B	E017B	G	032	J032	J051	J036	035	J025G	G	020	023	J028	021	022	E016S	E014B	E015S
3	E015S	E016B	E013B	E016B	018	J029	E013B	G	G	032	029G	G	038	G	025G	G	G	017	J052	030	J024	J034	022	024
4	021M	J018	023	018	017	E014B	E014B	G	024G	J041	C	C	G	033	034	029	G	E014B	018	E016S	E014B	E015S	E014B	E014B
5	J028	J025	E015B	E013B	E012B	E013B	E014B	021	028	031	G	035	034	G	031	030	024	E015S	E014B	E014B	E014B	E016S	018	E014B
6	E014B	E014B	E016B	E013B	E013B	E014B	E016B	G	G	033	033	G	G	020G	G	022	G	E015S	E015S	E014B	E014B	018	E015S	E015S
7	E015S	J025	024	E013B	021	020	020	021	G	G	035	034	039	J050	J040	J041	J040	J021	J029	J029	J025	J025	J025	E014B
8	021	E014B	J024	E013B	E014B	E013B	E016B	020	G	022G	035	035	040	036	036	J028	J029	025	J030	C	C	021	024	020
9	J038	022	E013B	C	C	C	C	C	J039	J037	G	J028G	036	036	C	C	C	J030	024	024	J024	J024	J024	J025
10	J025	021	E016S	E015S	E013B	E014B	E014B	020	030	G	G	038	039	039	G	G	G	E016B	E014B	E013B	E013B	E014B	E014B	E015B
11	E016B	E013B	E013B	E013B	E013B	E012B	E013B	E015B	E027B	G	G	E038B	G	G	G	E028B	G	E012B	E013B	E014B	E013B	E013B	E013B	E016S
12	E016S	E014B	E014B	E012B	E012B	E013B	E014B	020	029	G	035	036	034	G	036	030	024	E013B	028	J023	021M	E013B	020M	E015S
13	J023	E015B	E013B	E015B	E015B	C	C	C	C	031	G	G	E039B	E040B	G	030	021	021	J021	023	020	E019S	J025	022
14	022	022	021	E011B	E012B	E014B	E014B	023	G	J029G	G	G	G	G	037	030	047	J037	J082	J053	J023	017	C	C
15	C	C	C	C	C	C	C	C	C	G	035	031G	G	025G	035	G	028	018	E014B	J024	023	J025	J024	J025
16	022	021	020	J025	E013B	023	E014B	G	G	031	032	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	031	J040	G	G	036	G	021G	G	J019	J023	E015S	E013B	E013B	E017S	E015S
18	J024	020	021	023	E014B	E014B	E013B	J022	025	035	035	G	029G	J034	G	G	G	E015S	E013B	E014B	E014B	E016S	E015S	E014B
19	E013B	E014B	016	E014B	E012B	018	E014B	020	025	031	038	G	035	032	G	G	G	E014B	E015S	E014B	E014B	E013B	E016S	E013B
20	E015S	023	E014B	E012B	018	018	E013B	020	G	033	034	034	G	032	031	031	G	023	023	021	023	019	020	E015S
21	E015S	E015S	E011B	E014B	E012B	022	022	J024	J026	033	034	039	G	037	033	019	J039	J029	023	022	E014B	E014B	J024	024
22	E014B	022	J021	020	019	E014B	E016B	G	G	030	034	J050	J042	G	G	G	030	023	023	020	021	E013B	E013B	E014B
23	E013B	E014B	E015B	E012B	E013B	E014B	E013B	018	J025	G	G	035	029G	J038	030	G	E015B	E014B	E015S	020M	E014B	E015S	E015B	E015B
24	E014B	E013B	E013B	E011B	018M	E015B	E012B	G	G	G	033	037	G	038	032	G	022	E015S	E014B	020	E015S	E013B	E014B	E016S
25	E013B	E013B	E014B	019	E013B	E014B	E016B	022	025	G	035	034	038	035	034	J037	G	E014B	019	024	020	E013B	E014B	018
26	E013B	E014B	019	019	J025	J024	018	017	G	G	034	J041	040	033	J041	033	J060	J060	J025	022	018	E014B	E013B	E014B
27	E014B	E013B	E013B	E012B	026	E013B	022	021	G	032	J042	033	035	J043	J037	024	J030	J085	J040	E013B	E015B	E012B	021M	C
28	C	C	C	C	C	C	C	C	C	J028	J029G	034	036	035	035M	J025	G	J066	J065	J042	J042	J030	J025	J021
29	E013B	E014B	J017	018	J018	022M	E013B	E016B	J029	G	G	036	J033	G	032	J036	069M	J027	J042	J038	J030	J043	J033	J027
30	J033	020M	017	018	J024	J022	017M	G	G	033	G	G	J029G	J043	033	032	J025	J051	J024	E016S	017	023	E016S	019
31	021	021	020	J021	023	E012B	020	E016B	G	032	035	G	J060	035	032	J027	019G	022	019	019	E014B	E013B	E014B	E014B
Count	28	28	28	27	27	26	26	26	27	31	30	29	30	30	29	29	29	30	30	29	29	30	29	28
Median	E015	E016B	E016B	E015B	E015B	E014B	E014B	018	G	031	033	034	034	034	032	026	021	021	023	021	017	E016	E017	E015
U.Q.	022	021	020	019	019	020	E016	021	025	032	035	036	038	036	035	030	030	027	028	024	023	023	024	020
L.Q.	E014	E014	E014	E013	E013	E013	E013	G	G	G	G	G	G	G	G	G	G	E015	E015	E014	E014	E013	E014	E014
Q.R.	D008	D007	D006	D006	D006	D007												D012	D013	D010	D009	D010	D010	D006

The Radio Research Laboratories, Japan

foEs

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

K 4

IONOSPHERIC DATA

Dec. 1966 | f_bEs | 0.1 Mc | 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	B	B	B	E	B	B	E	B					036	035	027	027	022	E	E	016	B	E	E	S
2	B	E	016	E	E	B	B	B		032	031	040	033	033	025G		019	E	014	016	E	S	B	S
3	S	B	B	B	E	015	B			032	028G		037		025G			015	A	022	020	016	E	015
4	E	E	E	E	E	B	B		023G	031	C	C		033	033	029		B	E	S	B	S	B	B
5	017	016	B	B	B	B	B	021	028	031		034	033		029	027	021	S	B	B	B	S	E	B
6	B	B	B	B	B	B	B			033	032			020G		E022R		S	S	B	B	E	S	S
7	S	021	E	B	E	E	E	021			034	034	038	040	040	040	040	016	015	021	014	016	E	B
8	E	B	015	B	B	B	B	020		022G	034	032	040	034	034	028	025	018	027	C	C	016	E	E
9	016	E	B	C	C	C	C	C	032	033		028G	036	036	C	C	C	020	016	016	017	017	020	019
10	016	015	S	S	B	B	B	020	027			037	039	039				B	B	B	B	B	B	B
11	B	B	B	B	B	B	B	B	B			B				B		B	B	B	B	B	B	S
12	S	B	B	B	B	B	B	020	029		035	036	034		035	029	022	B	E	016	017	B	E	S
13	E	B	B	B	B	C	C	C	C	031			B	B		028	021	016	018	E	E	S	016	017
14	E	E	E	B	B	B	B	021		022G					036	030	045	033	A	015	E	014	C	C
15	C	C	C	C	C	C	C	C	C		033	031G		025G	031		027	017		015	015	016	017	023
16	E	E	E	E	B	E	B			030	E032R	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	031	033			035		021G		016	016	S	B	B	S	S
18	016	E	E	E	B	B	B	019	025	033	032		029G	034				S	B	B	B	S	S	B
19	B	B	E	B	B	E	B	019	025	030	037		033	032				B	S	B	B	B	S	B
20	S	E	B	B	016	E	B	020		033	033	034		032	031	026		E	017	E	E	017	016	S
21	S	S	B	B	B	E	016	020	024	032	033	035		037	031	018	024	022	E	E	B	B	E	E
22	B	E	014	E	E	B	B			030	033	048	037				023	015	016	E	E	B	B	B
23	B	B	B	B	B	B	B	017	025			035	027G	023	030		B	B	S	E	B	S	B	B
24	B	B	B	B	E	B	B				032	037		037	E032R		021	S	B	E	S	B	B	S
25	B	B	B	E	B	B	B	018	025		031	034	033	034	029	029		B	E	016	E	B	B	E
26	B	B	E	E	016	019	E	017			034	040	040	033	040	029	040	033	015	016	E	B	B	B
27	B	B	B	B	013	B	E	021		032	033	033	035	033	030	024	016	A	E	B	B	B	E	C
28	C	C	C	C	C	C	C	C	C	023	023G	033	035	033	029	025		A	A	030	021	017	017	015
29	B	B	E	E	E	015	B	B	G			036	033		032	034	A	019	032	A	024	A	A	022
30	021	E	E	E	016	016	E			032			029G	036	031	030	023	022	017	S	E	017	S	015
31	015	014	E	014	015	B	E	B		026	031		038	031	030	026	019G	017	015	015	B	B	B	B
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

K 5

IONOSPHERIC DATA

Dec. 1966 | f-min | 0.1 Mc | 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	015	013	014	014	015	013	014	015	014	016	015	016	015	015	014	014	015	E015S	E015S	014	014	E015S	013	E015S
2	014	013	013	013	013	015	013	017	014	014	015	016	015	015	015	014	013	014	013	014	014	E016S	014	E015S
3	E015S	016	013	016	012	011	013	013	014	016	016	015	016	016	016	014	015	013	E015S	014	014	014	014	013
4	014	015	014	013	013	014	014	013	014	015	C	C	016	016	013	015	014	014	014	E016S	014	E015S	014	014
5	014	013	015	013	012	013	014	014	016	015	016	016	015	014	015	013	015	E015S	014	014	014	E016S	012	014
6	014	014	016	013	013	014	016	013	015	016	015	015	017	015	016	015	016	E015S	E015S	014	014	014	E015S	E015S
7	E015S	013	E015S	013	012	014	014	015	016	015	017	015	026	022	016	015	015	013	012	014	013	014	014	014
8	014	014	013	013	014	013	016	013	015	015	014	016	018	016	016	014	013	012	013	C	C	E015S	014	014
9	013	014	013	C	C	C	C	C	015	016	028	017	023	025	C	C	C	014	E015S	014	013	014	013	013
10	E015S	014	E016S	E015S	013	014	014	015	015	016	021	026	026	026	025	021	016	016	014	013	013	014	014	015
11	016	013	013	013	013	012	013	015	027	025	027	038	024	026	017	028	017	012	013	014	013	013	013	E016S
12	E016S	014	014	012	012	013	014	013	014	016	016	023	022	016	016	016	014	013	014	012	E016S	013	E015S	E015S
13	E015S	015	013	015	015	C	C	C	C	024	026	025	039	040	028	026	018	013	013	E015S	014	E019S	013	E015S
14	E015S	014	013	011	012	014	014	014	015	016	018	016	016	016	015	016	014	013	012	011	011	012	C	C
15	C	C	C	C	C	C	C	C	C	015	016	017	015	015	016	020	016	014	014	014	014	014	014	013
16	E015S	014	011	013	013	013	014	014	014	015	E024C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	016	016	016	016	017	016	015	016	013	E015S	E015S	013	013	E017S	E015S
18	013	014	014	013	014	014	013	016	015	014	015	016	015	016	018	016	015	E015S	013	014	014	E016S	E015S	014
19	013	014	012	014	012	013	014	013	013	015	016	017	017	015	016	015	015	014	E015S	014	014	013	E016S	013
20	E015S	014	014	012	014	013	013	016	016	016	018	018	015	017	016	013	016	E017S	013	014	014	E016S	014	E015S
21	E015S	E015S	011	014	012	014	015	013	015	015	017	016	023	022	016	014	014	013	E015S	013	014	014	013	014
22	014	014	012	012	014	014	016	015	016	015	017	023	021	018	016	015	013	013	012	014	014	013	013	014
23	013	014	015	012	013	014	013	016	014	016	016	016	023	016	017	016	015	014	E015S	014	014	E015S	015	015
24	014	013	013	011	012	015	012	013	015	016	017	017	016	026	024	014	014	E015S	014	013	E015S	013	014	E016S
25	013	013	014	013	013	014	016	013	014	015	015	016	017	016	016	014	013	014	014	013	E015S	013	014	014
26	013	014	014	013	011	014	014	014	014	015	015	015	017	017	016	016	017	014	013	013	012	014	013	014
27	014	013	013	012	011	013	014	014	015	015	015	015	018	015	014	015	014	013	E015S	013	E015S	012	013	C
28	C	C	C	C	C	C	C	C	C	014	015	015	015	016	015	016	015	011	013	013	013	013	014	013
29	013	014	013	012	013	011	013	016	015	016	015	015	016	015	016	014	013	013	E015S	013	013	013	011	011
30	011	013	013	013	013	014	014	014	016	016	014	015	015	015	014	014	013	012	014	E016S	013	014	E016S	013
31	014	012	012	011	012	012	014	016	013	013	016	015	015	015	015	012	014	014	014	013	014	013	014	014
Count	28	28	28	27	27	26	26	26	27	31	30	29	30	30	29	29	29	30	30	29	29	30	29	28
Median	014	014	013	013	013	014	014	014	015	015	016	016	016	016	016	015	015	014	014	014	014	014	014	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

K 6

IONOSPHERIC DATA

Dec. 1966 | 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	265	260	J275F	J280F	305Z	295	305	340	340	330	330	355	340R	U335R	345	340	320	365	335	320	345	350	260	280
2	275	305	290	315	355	280	295	355	350	360	335	335	U350R	355	345	345	350	320	325	320	310	305	305	290
3	290	U305R	U280F	320	U320R	280	325	350	355	325	335	J340R	J325R	345R	355	350	J350R	350	A	350	335	J285F	F	285F
4	290	280F	270	285V	295F	280	305	355	355	U350R	C	C	U360R	350	345R	U360R	350	330	295	U330R	335	320	280	280
5	280	265	275	320	290	325	285	350	350	325	340R	345	335R	340	340	355R	360	320	320	320	315	305	270F	260
6	275	285	275	290	335	305	320	365	355	315R	J330R	350	330	U345R	335	340	340R	315	330	350	315	280	275	280
7	275	270	270	295	305	300	305	340	U345R	335	335	335	335	325R	335R	335R	345R	280	315	335	325	295	280	275
8	280	270	275	275	325	280	310	345R	350	350R	320	345	345	345	350	380R	330	335	340	I325C	C	265	280	275
9	270	270	270	C	C	C	C	C	I350R	310R	345	335	325	330	C	C	C	300	300	345	300	295	305	270
10	265	275	255	285	315	335	295	330	355	360	350	340	320H	345	350	340	370	340	285	315	305	310	270	280
11	280	285	275	300	350	265H	285	345	350	325R	335	320	330	U345R	335	U350R	345	315	325	310	305	330	270	250
12	265	280	265	275	305	320	295	345	360	335	335	350	335	345	R	350	355	330	295	345	350	275	260	270
13	260	275	270	310	310	C	C	C	C	345	335	345	335	330	340	340	340	320	300	360	290	290	255	235
14	265	270	295	310	345	255	260	320	U350R	330	320	325	330	335	325	340	300	305	A	J300R	280	295	C	C
15	C	C	C	C	C	C	C	C	C	330	330	325R	320	330R	320	335	325	315	310	315R	305	300	300	280
16	285	295	300	275	245	285	345	320	360R	350	340	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	345R	350	345	335	330	345R	330	345	350	310	315	315	300	315	260
18	300	315	275	285	290	270	305	340	U340R	345	350	320	320	350	340	320	315	335	295R	330	295	280	275	265
19	255	290	275	290	300	295	290	330	330	355	340	355	315	335	350	330	350	300	315	335	335	350	280	275
20	310	285	275	295	305	270	320	350	345	345R	U330R	360R	335	325	330	350R	355	330	310R	315	325	325	360	260
21	280	260	290	275	305	315	300	330R	355	345	340	345	325	320	350R	370	340	340	325	315	370	270	275	265
22	295	290	275	265	300	320	320	340	345	340R	340	340	325	340	320	365	355	335	335	365	310	280	300	270
23	270	270	280	290	320	300	295	365	350	350	335	335	345	325	330	325	335	340	325	345	325	340	270	275
24	285	280	280	290	270	270	315	355	355H	340	305	355	345	345	360R	335	355	330	310	320	305	320	255	275
25	285	275	285	285	U315R	265	310	U335R	350	345	330	345	345	340	315	355R	350	330	320	310	330	340	265	305
26	285	290	265	295	280	280	290	340	330	U345R	310	335	U355R	340	340R	335	345	315	J325R	310	325	330	295	295
27	275	275R	255Z	280	290	290	270	335	335	J330R	J335R	J340R	355	J355R	J350R	J325R	325	A	315	315	305	315	255	C
28	C	C	C	C	C	C	C	C	C	340	330	340	335	345	J340R	330	345	A	A	335	340	320	260	270
29	270	270F	275	305	335	270	290	330	380	355	J350R	320	315	360	365	295R	A	J345R	335	I285A	280	A	I270A	270
30	275	285	290	305	320	280	280	345	365	355	330	340	335	J345R	335R	335	325	350R	335	360	300	295	270	260
31	265	270	285	275	280	285	290	345	360R	345	345	335	335	320	345	U330R	350	355	325	310	335	U330R	265	265
Count	28	28	28	27	27	26	26	26	27	31	30	29	30	30	28	29	28	28	27	30	29	29	28	28
Median	275	280	275	290	305	280	300	340	350	345	335	340	335	340	340	340	345	330	320	320	315	305	270	270
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

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IONOSPHERIC DATA

Dec. 1966 | 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	L	L	L	L									
2										390L	L	L	L	L		400L								
3											L	L	L	L	L									
4										L	C	C	L	L	L									
5											L	380L	L	L	L									
6										L	L	S	L	395L	L	L								
7											L	L	L	A	A									
8									L	L	L	L	L	380L										
9										L	L	L	L	L	C	C	C							
10										L	L	L	L											
11										L	L	L	370L	L	L									
12												L	L	L										
13									C	395L	400L	L	L	L	L									
14									L	L	L	L		L										
15									C	380L	L	L	L	L										
16										L	L	C	C	C	C	C	C							
17									C	L	400L	L	380L		L									
18											L	395L	L	L	L	L								
19											L	L	380L	L		L								
20										L	L	L	L	410L	L									
21												L	L	L	L									
22										L	L	A	L	L	L									
23									L	L	L	L	U370L	L	L	L								
24										L	L	L	L	L										
25											L	L	L	L	L									
26										370L	L	L	L	L	A	L								
27										L	L	L	L	L		L								
28									C		L	L	L	L	L									
29										L	L	L	L	L	L		A							
30										L	L	L	L	L	385L	L								
31										L	L	375L	L	380L	L									
Count										4	2	3	4	4	1	1								
Median										385L	400L	380L	375L	390L	385L	400L								
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

Dec. 1966 | 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										245	250	225	230	245	250									
2										235	240	245	245	230		230								
3											250	250	250	240	220									
4										230	I235C	I230C	230	230	230									
5											245	240	240	250	245									
6										255	255	230	240	235	260	230								
7											235	235	245	245	230									
8									210	230	265	250	240	245										
9										235	255	250	255	275	C	C	C							
10										230	250	250	250											
11										250	260	245	250	240	245									
12												250	260	245										
13									C	230	245	240	275	250	240									
14									230	250	250	255		250										
15									C	230	255	235	255	245										
16										230	235	C	C	C	C	C	C							
17									C	220	230	235	245		230									
18											235	245	260	245	235	230								
19											250	230	245	255		225								
20										250	250	220	260	255	230									
21												245	260	270	250									
22										255	260	260	245	245	255									
23									225	230	240	260	250	240	250	250								
24										215	260	245	235	245										
25											235	250	235	235	220									
26										235	265	245	240	245	230	250								
27										255	270	250	250	250		250								
28									C		250	250	240	240	250									
29										240	225	255	240	240	240		I255A							
30										230	235	230	255	245	235	230								
31										230	250	250	245	235	245									
Count									3	22	29	30	29	28	20	8	1							
Median									225	230	250	245	245	245	240	230	I255A							
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

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IONOSPHERIC DATA

Dec. 1966 | 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	345	340	340	300	245	270	255	245	230	230	230	225	225	230	230	225	220	205	220	250	230	230	330	300
2	310	260	285	235	215	300	280	230	215	215H	210	245	230	225	220	210	215	205	230	225	250	230	265	295
3	310	330	330	260	245	250	230	220	215	220	220	205	240	220	220	225	225	205	A	240	220	290	320	300
4	290	300	300	295	280	300	255	220	230	210	I210C	I200C	225	215	230	225	210	205	255	240	230	230	300	275
5	330	355	330	280	265	240	255	220	215	230	225	220	230	230	215	225	215	200	235	240	230	250	315	325
6	320	290	315	280	225	275	250	210	210	230	230	230	225	210	220	225	215	215	215	210	250	270	310	300
7	290	350	330	275	250	265	260	220	225	230	230	230	230	I240A	I230A	255A	220	260	225	245	230	280	300	325
8	310	305	305	300	230	270	255	225	230	225	230	240	240	225	225	220	215	215	240	I240C	C	340	310	325
9	350	315	305	C	C	C	C	C	220	220	250	245	230	235	C	C	C	235	255	230	255	260	325	335
10	330	315	370A	295	250	225	275	235	230	230	230	225	225	240	230	240	205	200	255	245	250	250	290	300
11	325	300	290	275	225	200H	260	240	225	235	240	225	225	240	230	225	220	210	235	255	230	240	330	355
12	315	305	310	300	250	250	260	230	220	230	235	245	210	245	245	230	220	200	220	240	225	250	325	325
13	320	330	300	255	255	C	C	C	C	215	200	230	250	250	235	230	215	210	255	210	255	320	350	415A
14	325	340	280	235	210	350	350	250	230	230	205	210	245	240	245	240	250A	250A	A	250	260	265	C	C
15	C	C	C	C	C	C	C	C	C	225	235	225	220	235	230	230	225	220	245	250	250	260	265	325A
16	285	275	265	305	350	285	230	215	220	225	220	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	215	205	225	210	245	220	230	225	215	240	250	230	260	250	305
18	270	240	290	300	275	315	265	230	230	230	210	205	240	240	220	230	220	215	210	230	210	305	285	315
19	315	300	280	265	250	230	270	250	220	230	230	230	215	220	230	215	215	200	230	250	210	215	265	305
20	300	300	310	275	250	300	250	225	225	240	230	225	215	215	230	230	205	215	215	230	230	230	230	300
21	335	330	305	310	250	220	265	245	230	230	230	240	225	210	240	220	225	230	210	255	220	300	320	310
22	275	285	315	320	270	240	255	230	215	230	225H	I240A	235	245	215	225	215	205	235	215	255	275	265	325
23	320	330	305	280	230	300	275	225	210	205H	195H	245	210	225	230	245	210	200	225	210	240	230	310	310
24	300	295	295	275	290	300	250	225	210H	200	220H	250	240	245	215	230	215	230	230	230	250	230	350	305
25	295	290	300	280	245	290	250	230	215	220	200H	230	240	235	205	220	215	225	230	240	235	210	360	285
26	280	300	305	270	300	350	305	220	225	220	250	245	250	230	I220A	225	225	260A	250	230	225	240	280	280
27	315	310	310	280	260	250	300	230	230	250	250	245	225	205	220	210	225	A	250	220	245	240	290	C
28	C	C	C	C	C	C	C	C	C	230	210	240	240	225	205	240	225	A	A	260A	250	260	350	370
29	305	340	305	260	220	290	275	245	225	205	205	225	210	245	225	250	A	220	250	A	330A	A	A	360A
30	350	300	295	255	250	300	300	240	225	230	210	205	205	230	210	225	210	215	230	205	245	275	330	330
31	360	330	300	310	285	270	275	235	230	220	210	225	230	205	220	230	225	215	225	265	230	225	310	350
Count	28	28	28	27	27	26	26	26	27	31	31	30	30	30	29	29	28	28	27	29	29	29	28	28
Median	315	305	305	280	250	270	260	230	225	230	225	230	230	230	225	225	220	215	230	240	235	250	310	310
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

K 10

IONOSPHERIC DATA

Dec. 1966 | 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	B	B	B	110	B	B	B	B	G	G	G	G	130	130	105	100	105	105	105	115	B	120	105	S
2	B	110	110	105	110	B	B	B	G	170	115	115	115	115	110	G	165	110	115	110	105	S	B	S
3	S	B	B	B	125	115	B	G	G	180	110	G	155	G	110	G	G	150	115	110	115	110	110	105
4	105	105	105	110	140	B	B	G	105	115	C	C	G	160	130	175	G	B	110	S	B	S	B	B
5	115	110	B	B	B	B	B	155	170	165	G	110	110	G	130	105	105	S	B	B	B	S	125	B
6	B	B	B	B	B	B	B	G	G	165	165	G	G	105	G	105	G	S	S	B	B	105	S	S
7	S	115	110	B	110	110	110	170	G	G	150	150	130	120	120	115	115	110	115	110	115	115	130	B
8	110	B	115	B	B	B	B	155	G	105	175	150	130	125	120	100	110	110	130	C	C	125	130	105
9	115	115	B	C	C	C	C	C	115	110	G	105	130	160	C	C	C	110	110	110	110	115	105	105
10	105	105	S	S	B	B	B	140	110	G	G	150	140	120	G	G	G	B	B	B	B	B	B	B
11	B	B	B	B	B	B	B	B	B	G	G	B	G	G	G	B	G	B	B	B	B	B	B	S
12	S	B	B	B	B	B	B	150	160	G	150	140	150	G	150	150	175	B	150	150	140	B	100	S
13	100	B	B	B	B	C	C	C	C	150	G	G	B	B	G	145	165	150	110	105	105	S	115	110
14	115	115	115	B	B	B	B	105	G	115	G	G	G	G	140	150	125	115	110	105	105	115	C	C
15	C	C	C	C	C	C	C	C	C	G	115	110	G	105	105	G	160	150	B	115	110	110	110	110
16	110	110	110	110	B	115	B	G	G	175	125	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	120	115	G	G	175	G	110	G	110	110	S	B	B	S	S
18	115	110	115	135	B	B	B	120	115	115	125	G	115	115	G	G	G	S	B	B	B	S	S	B
19	B	B	105	B	B	115	B	160	160	170	130	G	115	115	G	G	G	B	S	B	B	B	S	B
20	S	105	B	B	110	110	B	155	G	130	175	130	G	120	175	105	G	110	105	150	130	105	125	S
21	S	S	B	B	B	110	110	110	105	125	140	120	G	120	115	160	110	110	110	125	B	B	120	125
22	B	125	115	110	110	B	B	G	G	185	160	125	115	G	G	G	110	105	105	105	105	B	B	B
23	B	B	B	B	B	B	B	160	115	G	G	175	105	105	150	G	B	B	S	100	B	S	B	B
24	B	B	B	B	115	B	B	G	G	G	175	130	G	125	115	G	160	S	B	110	S	B	B	S
25	B	B	B	115	B	B	B	115	160	G	120	175	115	115	115	110	G	B	105	135	130	B	B	125
26	B	B	115	115	115	110	110	155	G	G	170	125	120	110	110	110	115	115	115	110	105	B	B	B
27	B	B	B	B	110	B	160	155	G	145	115	115	145	115	115	110	105	105	105	B	B	B	105	C
28	C	C	C	C	C	C	C	C	C	105	105	150	125	120	110	105	G	105	100	100	100	100	105	105
29	B	B	105	105	105	105	B	B	100	G	G	150	115	G	150	125	115	100	100	105	105	100	100	100
30	100	100	105	105	100	100	100	G	G	150	G	G	110	110	140	155	105	110	110	S	110	105	S	105
31	100	100	105	110	105	B	105	B	G	115	110	G	110	110	110	105	105	105	105	105	B	B	B	B
Count	11	13	13	11	12	9	6	14	11	20	20	18	20	22	21	19	17	19	21	19	15	12	14	10
Median	110	110	110	110	110	110	110	155	115	140	130	130	120	120	115	110	115	110	110	110	110	110	110	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

K 11

IONOSPHERIC DATA

Dec. 1966 | 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				f			f						h	h12	12	12	12	f	f	f2		f	f	
2		f	f2	f2	f					h	12	12	1	12	1		h	f	f	f	f			
3					f	f2				h	1		h		1			f	f3	f2	f2	f2	f2	f2
4	f2	f2	f2	f	f				1	1				h	h	h			f					
5	f2	f2						h2	h	h		12	12		h2	12	1						f	
6										hh	h			1		1						f		
7		f2	f		f	f2	f	h			h	h	h	c	c2	12	12	f	f	f	f	f2	f2	
8	f		f					h		1	h	h1	h	h1	c	1	1h	ff	f2f			f	f	f
9	f2	f							12	1		1	h	h				f2	ff	ff	f2	f	f2	f2
10	f	f						h	1h			h	h	c										
11																								
12								h2	h2		h	h	h		h2	h	h		ff	f2f	f		f	
13	f									h						h	h	ff	f3	f	f2		f2	f
14	f	f2	f					1		1					h	h2	c3	f3	f3	f3	f	f		
15											12	1		1	1		h1	f		f2	f	f2	f2	f3
16	f	f	f	f		f				h	h													
17										c	c			h		1		f	f2					
18	f3	f2	f2	f				1	1	c2	h		1	1										
19			f			f		h3	h	h	h		1	1										
20		f			f	f		h		h	h	h		c	h1	12		f	f	f	f	f	f	
21						f	f2	1h	1	h2	h	c		c	1	h1	12	f2	f	f			f	f
22		f	f	f	f					h	h	h	1				1h	f	f2	f	f			
23								h	1			h	1	1	h					f				
24					f						h	h		h	1		h212			f				
25				f				1h2	h		c	h	c2	c	1	12			f	ff	f			f2
26			f	f	f2	f3	f	h			h	h2	c	1	13	1	12	f3	f3	f	f			
27					f3		f	h2		h	c	c	h	c	c2	1	1	f3	f2				f2	
28										1	1	h	h2	h	12	1		f2	f3	f3	f2	f2	f	f
29			f	f	f	f2			1			h	1		h	c2	c313	f3	f3	f3	f4	f3	f2	f3
30	f2	f	f	f	f2	f	f			h1			1	1h	h	h	1	f	f		f	f		f
31	f2	f2	f	f2	f2		f			1	1		12	1	1	12	1	f	f	f				
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

Dec. 1966 | 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	390	410	J390F	J355F	300Z	310	300	260	265	280	265	245	255R	U270R	260	255	305	235	260	285	265	255	385	345
2	335	310	325	270	245	345	330	255	250	255	275	280	U250R	245	R	255	250	285	270	260	290	295	320	330
3	345	U375R	U370F	285	U280R	330	275	245	230	280	280	J275R	J280R	250R	245	250	J250R	250	A	250	250	J340F	F	355F
4	340	350F	360	350V	340F	350	305	250	250	U255R	C	C	U245R	250	250R	U235R	230	265	315	U280R	275	295	340	330
5	365	390	375	320	320	280	330	250	240	295	265R	255	265R	270	265	245R	250	285	235	285	285	285	360F	385
6	370	335	365	335	255	280	280	235	225	300R	J280R	245	265	U260R	280	255	255R	300	265	235	285	340	355	335
7	335	385	385	330	285	310	305	255	U255R	265	260	265	280	290R	270R	290R	255R	335	275	270	275	325	330	355
8	370	340	345	335	275	330	305	250R	250	250R	280	265	260	260	250	235R	270	265	260	I270C	C	360	345	360
9	385	375	350	C	C	C	C	C	I250R	270R	265	270	290	295	C	C	C	295	320	265	300	300	325	360
10	365	355	405	330	280	270	325	275	255	250	260	270	300H	250	250	250	230	250	330	290	310	305	350	355
11	360	340	350	320	250	390H	330	270	250	275R	285	295	270	U265R	270	U245R	250	280	280	300	280	275	370	380
12	365	345	360	330	285	300	315	255	240	255	280	255	280	250	R	250	250	280	305	250	250	320	380	380
13	380	380	355	300	310	C	C	C	C	255	265	255	280	280	265	265	265	275	305	235	330	330	395	470
14	380	390	320	285	235	400	385	280	U260R	270	290	290	255	280	300	260	305	300	A	J310R	320	305	C	C
15	C	C	C	C	C	C	C	C	C	265	270	275R	300	270R	275	265	270	270	305	295R	300	310	310	350
16	335	320	315	350	400	330	265	270	245R	260	260	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	245R	245	250	260	275	255R	270	255	245	295	285	285	310	285	360
18	310	280	350	330	330	380	310	260	U260R	255	255	290	285	265	270	260	280	260	300R	270	280	335	340	360
19	385	335	335	335	305	285	310	280	265	255	265	245	275	275	240	270	250	280	285	275	245	245	310	340
20	330	340	345	315	290	350	295	255	255	260R	U280R	230R	285	290	275	245R	230	270	290R	235	280	275	230	385
21	365	375	340	350	285	250	320	285R	250	260	265	260	285	285	260R	230	255	245	255	290	250	345	330	355
22	325	340	370	370	320	290	295	260	240	265R	285	270	270	260	285	245	245	265	285	270	300	335	310	360
23	370	365	340	325	275	330	310	240	245	250	275	290	270	290	290	290	250	250	270	245	280	255	370	360
24	350	350	345	330	350	350	300	250	240H	235	325	255	250	255	230R	260	245	280	290	275	295	275	395	345
25	345	340	330	330	U270R	365	295	U270R	245	235	270	260	260	255	270	245R	230	260	285	300	285	245	385	320
26	320	330	355	315	335	350	335	255	255	U250R	300	270	U250R	260	265R	280	250	300	J295R	280	270	275	320	315
27	370	360R	380Z	340	305	300	345	260	260	J255R	J270R	J260R	250	J260R	J260R	J290R	280	A	305	290	305	290	400	C
28	C	C	C	C	C	C	C	C	C	255	285	270	260	255	J260R	260	250	A	A	290	260	290	390	395
29	360	390F	360	300	260	360	335	290	235	250	J250R	300	300	250	250	310R	A	J260R	250	I335A	350	A	I390A	370
30	380	350	340	300	290	350	350	260	250	235	275	255	270	J260R	260R	275	245	245R	265	230	280	300	365	375
31	395	385	335	350	335	325	325	265	250R	260	255	265	275	280	260	U275R	255	235	255	315	270	U245R	360	380
Count	28	28	28	27	27	26	26	26	27	31	30	29	30	30	27	29	28	28	27	30	29	29	28	28
Median	365	350	350	330	290	330	310	260	250	255	270	265	270	260	260	260	250	270	285	280	280	300	350	360
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

K 13

IONOSPHERIC DATA

Dec. 1966 | 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	060	090	J065F	J075F	055Z	085	060	060	055	055	050	055	050R	U040R	055	055	045	050	050	045	045	045	065	055
2	065	055	050	055	050	055	050	045	050	050	055	035	U050R	050	R	045	050	045	055	055	065	045	055	045
3	060	U060R	U045F	065	U055R	055	055	055	055	065	045	J045R	J050R	060R	050	050	J050R	045	A	055	095	J070F	F	070F
4	060	060F	090	050V	060F	100	055	045	045	U045R	C	C	U050R	045	045R	U050R	050	055	055	U055R	040	055	040	045
5	040	065	055	055	055	050	040	045	055	040	050R	050	045R	045	045	050R	040	045	050	050	045	065	060F	055
6	055	060	060	050	050	070	065	050	055	055R	J070R	060	055	U055R	045	050	045R	045	055	050	045	055	055	065
7	065	055	045	055	060	055	055	045	U040R	045	055	045	040	040R	040R	045R	045R	050	050	050	045	060	065	050
8	045	060	060	070	050	065	045	050R	050	050R	040	040	050	040	050	040R	050	050	045	I050C	C	065	055	065
9	040	050	070	C	C	C	C	C	I050R	095R	040	045	050	040	C	C	C	055	055	045	050	045	060	055
10	055	050	050	055	060	065	035	045	040	045	045	050	090H	060	055	060	060	100	080	065	090	080	100	085
11	080	070	095	080	050	110H	075	050	050	060R	045	050	060	U045R	045	U055R	055	050	045	050	065	060	050	055
12	065	060	060	070	045	050	060	050	050	085	050	050	040	055	R	050	050	070	095	060	050	090	070	075
13	085	070	095	055	085	C	C	C	C	050	045	045	055	045	040	050	040	050	045	050	070	055	060	045
14	065	065	065	065	065	050	060	065	U040R	080	065	035	090	040	045	085	090	095	A	J085R	100	050	C	C
15	C	C	C	C	C	C	C	C	C	060	055	055R	050	060R	055	055	060	055	045	040R	050	050	050	065
16	060	060	055	070	065	065	040	045	050R	040	055	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	055R	050	050	055	045	050R	050	045	050	055	050	055	050	055	070
18	065	050	055	065	065	050	050	045	U040R	045	045	060	045	040	045	055	060	055	070R	055	065	055	055	075
19	060	065	065	055	045	065	065	050	045	040	045	050	055	050	055	045	045	065	060	050	055	055	085	065
20	060	075	065	055	055	060	060	050	045	050R	U045R	050R	045	050	045	050R	055	055	055R	045	040	045	055	065
21	045	055	060	055	060	065	040	045R	050	050	045	040	045	045	040R	055	055	055	055	055	050	070	050	055
22	060	055	055	060	045	065	050	055	055	050R	035	050	065	055	050	040	050	055	065	055	050	035	055	075
23	060	050	060	050	050	065	050	045	060	050	045	030	040	060	040	055	085	070	080	055	070	090	080	090
24	070	095	065	070	095	095	055	050	055H	065	060	055	060	050	055R	045	040	050	055	050	050	065	065	065
25	055	065	065	065	U070R	050	055	U055R	040	065	050	045	050	045	070	040R	065	055	045	050	045	055	050	055
26	075	055	065	060	065	055	060	045	050	U055R	045	060	U055R	055	045R	045	050	045	J050R	050	055	055	065	055
27	060	055R	075Z	055	070	065	060	060	045	J055R	J085R	J080R	050	J060R	J055R	J055R	045	A	085	060	065	060	090	C
28	C	C	C	C	C	C	C	C	C	055	045	035	060	050	J060R	085	060	A	A	060	080	060	110	065
29	090	060F	080	050	075	090	075	055	035	050	J045R	055	090	050	040	090R	A	J055R	070	I085A	060	A	I070A	080
30	065	060	060	065	060	100	095	050	040	060	060	060	050	J055R	055R	050	080	055R	045	055	055	050	060	055
31	050	045	065	050	065	060	050	065	045R	045	050	055	050	065	055	U045R	045	060	050	045	055	U060R	065	055
Count	28	28	28	27	27	26	26	26	27	31	30	29	30	30	27	29	28	28	27	30	29	29	28	28
Median	060	060	060	055	060	065	055	050	050	050	050	050	050	050	050	050	050	055	055	050	055	055	060	065
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

K 14

IONOSPHERIC DATA

Dec. 1966 | foF2 | 0.1 Mc | 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	035	032	034S	035	044S	I026C	024	044	081S	094S	100	108	104	090	096S	094	083	066	046	035	033	035	027	032
2	033	033	I034S	034	039	I022S	023	047	079	086	081	096	118	099	103	077S	088S	054	036	036	034	034	031	028
3	030	029	029F	F	S	J032S	021H	043	I073S	071	070S	084	090	096S	092	074	080	080	044	042	047	032	029	029
4	029	030	029	030	031	030	029	049	081	076S	080	083	081	080	084	085	079	067	056H	056	063	045	035H	026
5	029	030	030	034	036	026	029	046	I066S	077	085	091	094S	094	083	079	069	060	052	040	048S	037	029H	030
6	031	032	032	032	034	029F	I032S	I061S	058S	062	091	109	109	102	096	095S	081	067	058	050	036	029	028F	029
7	031	032	031	032F	031F	028	028S	048	J073S	082	086	093	095	096	095S	089	087	078	061	066S	051H	033	030	028
8	027	028	029	028	030	026	025	045	065S	068	072	108	097	J094S	079	097H	079	072S	063	043	034	034H	029	028
9	029	029	031	035S	039	026	023	042	074S	J077H	075S	094	089	094	J105H	093S	078	064	051	070	059	040	034	031
10	027	028	029	030	033	030	022	J041S	088	077	079	088	096	104	104	090	087	058	051	048	054	051	045	038
11	030	031	031	034	035	021	022	041	079	088	091	086	095	094	111	098	077	070	060	050	046	048S	033	029
12	029	031	033	032	034	030	021	041	073	087	082	094H	093	094	091	086	J090S	073S	057	053	056	050	030	031
13	030	031	034	037	036	029	032	046	081	088	084	091	099	106	086	083H	086	I070S	045	050	J038S	043S	034	031
14	034	035	041	050	034S	024	026	046	093S	087	082	104H	110	111H	J099S	086	082	069	058	J064S	J042S	038	031	030
15	029	029	032	030	038	047S	052S	I051S	086	J107S	114	111S	095	097S	088	J075H	074	083	I077S	062S	063S	051	048	041
16	033	035	035	030	029	030	035S	040S	069	087	094S	093	095	094	094	088H	089	085H	058	046	059	055	030	023
17	025	027	028	028	029	028	024	040S	076S	092	092S	088	078	082	095	088	J077S	069	048	045	045S	047	040	033
18	029	029	028	028	030	027	028	045	I076S	J072S	082	083	095	109	095H	086	090S	074S	046	051	052	040	026	030
19	028	030	030	030S	030	029	025	040	I069S	082	089	073	094	093	096	079	073	057	049	050	I046S	032	033	024H
20	025	027	028	028	029	031	026	038S	074S	082S	077	092	083	085	085	086	072S	065	058	056	048S	035	030H	026
21	026	028	030	030	033	033	024	037	067	074S	070	072	074	099	102	087	082	072	055	054	044	032	030	030
22	032	030	031	030	036	033	024	040S	068	084S	080	099	100S	104	117	124	094S	068	055	056S	044	038	033	026
23	030	031	033	036	036	028H	028	041	064	074S	073	076	098	104S	098	084	076	077	052	048	033S	047S	038S	030S
24	029S	030	030	029	030	029	028	040S	J064S	067	I069C	088	091V	097	083	078	J077S	J070S	062	048	047	I044S	032	030
25	030S	032	033	035	040	023	025	044	067	J082S	077	089	095S	109	107	108	080H	J065S	075S	058	068	J051S	029	027
26	029	029	030	030	029	025	025	040	067	086	088	093	109	086	079	074	069	076S	052	051	045	038	031	031
27	032	031	030	030F	031F	032S	030	040	062	J075S	090	115	088	I073A	080	085	071	072S	051	047	049	043	028	027
28	029F	037	J041S	024	020	019	020	038	079	077	086	097	098	087	083	079	089	068	052	048	060S	033	I025A	020
29	022	025	026	030	028	027	026S	039	I070S	J085S	100S	084	102	101	080	I077H	073S	081	076	050	042	046	031	023
30	024	025	028	027	034	019	022	035	063	084	075	081H	085	089	070	086	071S	074	059	040	039	041	041	030
31	030	029	031	030	030	029	027	038	071S	083	087	084	088	091H	097	100S	111H	099S	060	043	057	060	031	025
Count	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Median	029	030	031	030	033	028	025	041	073	082	082	091	095	094	095	086	080	070	055	050	047	040	031	029
U.Q.	031	032	033	034	036	030	028	046	079	087	090	097	099	102	099	093	087	076	060	056	056	047	034	031
L.Q.	028	029	029	030	030	026	023	040	067	075	077	084	089	090	083	079	074	066	051	045	042	034	029	026
Q.R.	003	003	004	004	006	004	005	006	012	012	013	013	010	012	016	014	013	010	009	011	014	013	005	005

foF2

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

The Radio Research Laboratories, Japan

Y 1

IONOSPHERIC DATA

Dec. 1966 | foF1 | 0.01 Mc | 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	L	L	L	L	L								
2											L	410	L	L	L	L								
3											L	450L	L	L	L	L								
4											L	430L	450L	L										
5												L	L	L	L									
6											L	L	L	L	L	L								
7											L	L	450	480	L	L	L							
8												460L	L	L	L	L								
9												L	L	L	L	L								
10										L	L	L	490L	L	L									
11											L	L	L	L	L									
12											L	L	L	450L	L	L								
13										L	L	L	LH	L	L									
14											L	LH	520H	L	L									
15										L	L	L	L	L										
16											L	L	L	460L	L									
17										L	L	460L	L	L	L									
18											L	L	L	L	L	L								
19											L	L	L	L	L	L								
20											L	450L	L	470	L	L								
21												L	L	L	L	L								
22											L	L	L	L	L	L								
23											L	L	L	L	L	L								
24											C	L	L	L	L	L								
25												410	460	L	L	L								
26											L	L	L	450	L									
27											L	L	A	A	A	L								
28											L	L	L	L	L									
29										L	440L	L	L	L	L	L								
30										C	L	L	L	LH	L	L								
31											L	L	L	LH	L	L								
Count											1	7	5	5										
Median											440L	450L	460	460										
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

Y 2

IONOSPHERIC DATA

Dec. 1966 | foE | 0.01 Mc | 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								S	220	A	A	A	A	310	I295A	280	I235A	S						
2								S	220	270	300	320	310	320	310	A	A	S						
3								S	215	270	305	310	320	315	305	280	240	S						
4								S	220	290	300	320	325	320	310	295	230	S						
5								S	220	I275A	I315A	330	330	325	315	280	I240A	S						
6								S	210	280	310	320	330	320	310	280	210	S						
7								S	220	270	310	325	330	330	315	I275A	I230A	A						
8								S	220	280	305	325	335	325	I305A	280	220	A						
9								S	240	290	315	340	340	I340A	I325A	290	235	S						
10								S	240	290	315	330	330	330	330	300	250	S						
11								S	230H	305	I315A	330	340	335	320	305	240	A						
12								S	230H	290	315	330	335	330	320	300	240H	S						
13								S	240	280H	295	330	340	340	330	300	230	S						
14								S	220	280	320	325	330H	335	320	300	250	S						
15								S	205	290	310	320	325	330	320	290H	250	S						
16								S	220	280	305	320	320	320	310	290	240	S						
17								S	230H	275	295	320	330	330	315	I295A	245	S						
18								S	230	270	290	310	I325A	325	310	280	230H	S						
19								S	230H	280	305	320	330	A	A	290	240	S						
20								S	210	280H	300	320	I320A	I320A	I305A	280	I225A	S						
21								S	220	280	305	320	330	325	I305A	290H	250H	S						
22								S	210H	270H	305	320	A	A	I305A	280	240	A						
23								S	200H	265	295	310	I320A	I325A	315	I290A	I240A	S						
24								S	200	260	I300C	320	325	320	315	290	230	S						
25								S	200	270	300	320	330	A	A	A	230	S						
26								S	190	260	295	315	320	A	A	A	I220A	S						
27								S	205	270	300	A	A	A	A	280	240	S						
28								S	A	260	295	310	320	I320A	300	280	240	S						
29								S	A	260	300	I305R	320	320	315	I280A	I240A	S						
30								S	200	C	A	320	320	I315A	310	300	260	S						
31								S	200	270	A	A	A	330	320	I295A	260	A						
Count									29	29	28	28	27	26	27	28	30							
Median									220	275	305	320	330	325	315	290	240							
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

Dec. 1966 | foEs | 0.1 Mc | 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	020	J026	E012B	E	E	C	E015S	021	015G	030	033	038	J041	035	J044	027G	J033	021	021	E014S	E015S	E015S	022	017
2	024	017	E015S	021	020	E	020	020	021G	030	035	036	J035	J036	J046	J032	J031	023	E015S	019	021	018	E015S	020
3	018	E012B	E013B	E	E	E015S	E015S	E015S	G	G	033	036	039	038	039	032	J024G	J024	020	E013S	E011B	E015S	E012B	021
4	J024	J026	E	E011B	020	021	020	021	023	G	G	035	037	041	J042	023G	020G	020	021	J018	022	020	E015S	E015S
5	019	E014S	E011B	E	E	E011B	E015S	018	025	031	J043	J040	J036	J028G	023G	J028G	J031	J020	022	019	E015S	E014S	E014S	E015S
6	E014S	E015S	E012B	020	E	E014S	E014S	E015S	G	G	022G	034	024G	037	025G	023G	030	020	E016S	E014S	E015S	022	E014S	E014S
7	E015S	E014S	020	021	020	J024	J020	021	G	J023G	G	039	039	038	J047	J040	027	J025	020	E015S	E015S	E012B	E015S	E015S
8	E015S	E014S	E013B	E	E	E014S	E014S	020	G	G	G	036	J053	040	033	J034	027	J030	021	E015S	E014S	E015S	E015S	J025
9	E014S	020	E	020	020	020	020	020	G	031	036	G	G	036	037	035	033	020	E014S	J025	J020	J022	E014S	E015S
10	E014S	E015S	E015S	E	E	E	E014S	E015S	G	031	036	038	036	034	031G	J026G	020G	020	E015S	E015S	E011B	E015S	E011B	E015S
11	E015S	E014S	E012B	E	E	E	E012B	E015S	G	G	033	039	037	038	J034	G	G	020	J021	020	E013B	E015S	E015S	E014S
12	E015S	E014S	E	E	E	E011B	E015S	E014S	G	G	035	G	041	035	035	032	029	E015S	J023	020	022	E015S	E014S	E014S
13	E015S	E011B	E015B	E	E	E013B	E015S	E014S	016G	031	034	034	G	034G	036	035	017G	018	020	J027	J025	J034	J026	J022
14	J024	E014B	E	E	022	E014S	E012B	J018	J030	J041	G	G	G	G	039	J053	J088	J097	J061	021	E015S	E015S	E013S	E015S
15	E015S	E014S	E	E	E	E012B	E014S	021	028	039	J044	044	042	037	G	G	G	027	J015S	020	J044	J038	J022	E015S
16	E014S	021	021	J021	E	020	E012B	J022	G	G	G	G	G	035	G	G	030	022	E015S	J018	E015S	E015S	E015S	E014S
17	E014S	E014S	E	J030	J028	021	023	021	J030	031	040	042	031G	J041	J035	J040	029	J033	J026	021	J021	021	020	E017S
18	E014S	E015S	E012B	E	E	E	E015S	E015S	G	030	033	034	034	030G	024G	020G	020G	E015S	E015S	E015S	E014S	E014S	E014S	E014S
19	E015S	E	E	E	E	E014S	E015S	E014S	G	020G	035	035	035	036	J045	024G	G	E015S	E015S	E015S	E015S	E015S	E015S	E013S
20	E014S	E014S	E014S	E	E	E015S	E	E015S	G	031	G	G	036	036	033	J030	J028	E014S	J015S	E015S	E015S	E015S	E014S	E015S
21	E015S	E012B	E014S	E	E011B	E015S	019	021	G	G	034	039	042	J056	039	024G	020G	J030	J043	E015S	020	E015S	J023	E014S
22	E015S	020	E014S	E	E	E	020	E014S	G	G	G	G	035	J051	J041	J030	J031	021	E015S	E015S	020	017	019	E014S
23	E015S	E014S	E	E	E	E	E015S	E014S	G	G	G	019G	044	038	032	J031	J029	E015S	023	019	018	E015S	E015S	E015S
24	E015S	E014S	E012B	E	E	E014B	E015S	E015S	G	G	C	038	042	041	036	030	J027	E015S	E016S	J028	020	J020	J021	021
25	J022	E014S	J033	E014S	E	E014S	E015S	E015S	024	030	J042	G	G	038	036	J053	J029	E015S	E015S	E015S	021	E014S	J022	E014S
26	E015S	E013S	E014S	E	J024	E	E015S	E015S	G	G	G	020G	041	035	J042	040M	028	023	022	E015S	E014S	E014S	E015S	021
27	E015S	E014S	E	E014B	E	E011B	E011B	J016S	030	G	G	034	J085	146M	176M	050M	030	020	021	E015S	E015S	020	E015S	E015S
28	E014S	E011B	021	022	020	E013S	E014S	E015S	J032	G	025G	036	G	036	028G	028	J053	028	J022	J030	J026	J027	J033	E015S
29	E013S	E013S	E014S	E014B	022	J022	021	J028	J033	J026	J028G	030G	038	037	036	040	028	J024	021	E015S	E012B	E015S	020	020
30	021	E014S	E011B	019	021	E013S	E015S	020	023	E050C	030	032G	039	J054	J038	J025G	030	J038	J024	J021	J024	J023	022	021
31	021	020	019	E011B	E	E015S	021	J022	G	G	J041	033	J040	032G	J033	J030	J034	025	J021	J030	021	022	022	021
Count	31	31	31	31	31	30	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31
Median	E015S	E014S	E012	E	E	E014	E015S	016S	G	G	033	034	037	037	036	030	029	021	021	018	E015	E015S	E015S	E015S
U.Q.	019	E015	E015	019	020	E015	020	021	024	031	035	038	041	040	041	035	031	025	022	021	021	021	022	020
L.Q.	E014	E014	E	E	E	E011	E014	E015	G	G	G	G	G	035	032	G	G	018	E015	E015	E015	E015	E014	E014
Q.R.	D005						D006	D006						005	009			007	D007	D006	D006	D006	D008	D006

foEs

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

IONOSPHERIC DATA

Dec. 1966 | **f_bEs** | 0.1 Mc | **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	025	B			C	S	S	015G	028	031	036	032	033	033	025G	025	S	E	S	S	S	E	E
2	E	E	S	011	E	E	S	S	G	G	G	G	030	029	026	028	022	S	S	E	E	E	S	E
3	E	B	B			S	S	S			G	035	038	038	038	031	G	017	E	S	B	S	B	017
4	016	014		B	E	017	S	S	014			G	G	039	024	019G	020G	S	E	015	E	E	S	S
5	E	S	B			B	S	S	G	029	032	030	030	025G	021G	024G	025	S	015	E	S	S	S	S
6	S	S	B	E		S	S	S			022G	G	024G	035	024G	023G	029	S	S	S	S	E	S	S
7	S	S	E	E	E	E	020	S		016G		G	G	G	034	036	026	021	E	S	S	B	S	S
8	S	S	B			S	S	S				035	044	038	032	023	G	019	016	S	S	S	S	E
9	S	E		E	015	E	S	S		G	034			036	036	034	031	G	S	E	015	017	S	S
10	S	S	S				S	S		G	G	G	G	032	030G	021G	016G	S	S	S	B	S	B	S
11	S	S	B				B	S			033	G	G	G	025			E020R	016	018	B	S	S	S
12	S	S				B	S	S			G		038	G	G	G	028	S	E	018	E	S	S	S
13	S	B	B			B	S	S	016G	G	G	032		032G	G	027	017G	G	E	021	E	018	017	014
14	017	B			014	S	B	G	G	G					038	041	046	041	040	016	S	S	S	S
15	S	S				B	S	S	G	035	040	043	041	G				G	S	019	028	025	E	S
16	S	E	E	011		E	B	S						G			G	G	S	E	S	S	S	S
17	S	S	E	E	018	E	S	S	016	G	036	G	029G	030	026	035	G	021	021	E	E	E	E	S
18	S	S	B				S	S		G	G	G	033	029G	024G	020G	020G	S	S	S	S	S	S	S
19	S					S	S	S		020G	G	G	G	034	040	022G		S	S	S	S	S	S	S
20	S	S	S			S		S		G			034	034	032	025	026	S	S	S	S	S	S	S
21	S	B	S		B	S	S	S			033	037	039	040	035	024G	020G	024	020	S	E	S	E	S
22	S	E	S				S	S					034	033	031	025	020	018	S	S	E	E	E	S
23	S	S					S	S				019G	034	033	030	030	025	S	E	E	E	S	S	S
24	S	S	B			B	S	S			C	G	G	G	G	027	022	S	S	E	E	018	E	E
25	019	S	013	S		S	S	S	G	G	G			036	034	030	021	S	S	S	E	S	017	S
26	S	S	S		015		S	S				020G	036	033	037	032	G	021	E	S	S	S	S	015
27	S	S		B		B	B	S	029			034	074	A	049	022	015	G	E	S	S	E	S	S
28	S	B	E	011	014	S	S	S	022		024G	G		034	028G	025	021	021	019	028	023	017	A	S
29	S	S	S	B	013	016	E	025	023	020	018G	E030R	035	G	G	031	028	020	E	S	B	S	E	E
30	E	S	B	E	014	S	S	S	G	C	030	030G	G	036	025	021G	G	017	016	016	018	017	017	E
31	E	E	E	B		S	S	017			035	032	032	031G	029	030	020	022	017	022	E	022	022	021
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

Y 5

IONOSPHERIC DATA

Dec. 1966 | f-min | 0.1 Mc | 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	E014S	E014S	012	E	E	C	E015S	E015S	012	012	012	015	015	014	012	011	015	E015S	E017C	E014S	E015S	E015S	E015S	E015S
2	E015S	012	E015S	E	E	E	E014S	E015S	015	015	014	015	014	015	014	011	012	E014S	E015S	E015S	E015S	E015S	E015S	E015S
3	E015S	012	013	E	E	E015S	E015S	E015S	012	012	015	012	015	015	012	015	014	E015S	E015S	E013S	011	E015S	012	E015S
4	E015S	E	E	011	E	E015S	E015S	E015S	011	012	012	013	012	014	012	011	014	E015S	E015S	E014S	E015S	E015S	E015S	E015S
5	E013S	E014S	011	E	E	011	E015S	E015S	012	012	012	012	015	014	011	012	011	E014S	E014S	E015S	E015S	E014S	E014S	E015S
6	E014S	E015S	012	E	E	E014S	E014S	E015S	014	012	012	012	015	015	017	014	015	E015S	E016S	E014S	E015S	E015S	E014S	E014S
7	E015S	E014S	011	E	E	011	E015S	E015S	014	012	014	016	016	016	016	014	011	012	E015S	E015S	E015S	012	E015S	E015S
8	E015S	E014S	013	E	E	E014S	E014S	E015S	012	012	014	015	017	017	014	014	011	012	E015S	E015S	E014S	E015S	E015S	E015S
9	E014S	E014S	E	011	E	E	E015S	E015S	014	015	017	015	019	017	018	015	017	E015S	E014S	E015S	E014S	E015S	E014S	E015S
10	E014S	E015S	E015S	E	E	E	E014S	E015S	012	012	015	021	017	016	015	015	014	E014S	E015S	E015S	011	E015S	011	E015S
11	E015S	E014S	012	E	E	E	012	E015S	014	015	015	015	019	017	015	024	017	012	E015S	E014S	013	E015S	E015S	E014S
12	E015S	E014S	E	E	E	011	E015S	E014S	012	014	014	018	015	016	017	014	012	E015S	E015S	012	E015S	E015S	E014S	E014S
13	E015S	011	015	E	E	013	E015S	E014S	014	016	017	022	022	022	018	016	015	E014S	016	E014S	E015S	E015S	E015S	E013S
14	E014S	014	E	E	E	E014S	012	E014S	014	014	015	016	018	015	015	011	013	E014S	E015S	E014S	E015S	E015S	E013S	E015S
15	E015S	E014S	E	E	E	012	E014S	E015S	015	013	012	017	016	016	014	015	015	E014S	E014S	012	E015S	E014S	E015S	E015S
16	E014S	014	012	E	E	011	012	E014S	014	014	014	014	015	016	015	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E014S
17	E014S	E014S	E	E	E	E	E015S	E015S	014	014	014	016	015	018	015	015	014	E015S	E015S	012	E015S	E015S	E015S	E017S
18	E014S	E015S	012	E	E	E	E015S	E015S	015	012	014	016	018	016	016	015	014	E015S	E015S	E015S	E014S	E014S	E014S	E014S
19	E015S	E	E	E	E	E014S	E015S	E014S	014	015	018	015	017	015	016	015	015	E015S	E015S	E015S	E015S	E015S	E015S	E013S
20	E014S	E014S	E014S	E	E	E015S	E	E015S	015	014	015	017	015	022	017	015	015	E014S	E015S	E015S	E015S	E015S	E014S	E015S
21	E015S	012	E014S	E	011	E015S	E015S	E015S	015	014	018	016	019	017	015	015	015	E015S	E015S	E015S	E015S	E015S	E014S	E014S
22	E015S	E014S	E014S	E	E	E	E015S	E014S	014	013	015	022	017	016	016	015	012	012	E015S	E015S	E015S	E015S	E015S	E014S
23	E015S	E014S	E	E	E	E	E015S	E014S	014	014	017	015	022	022	022	017	014	E015S	E015S	E014S	E015S	E015S	E015S	E015S
24	E015S	E014S	012	E	E	014	E015S	E015S	015	015	C	021	016	022	026	017	012	E015S	E016S	E015S	E015S	E013S	E015S	E015S
25	E014S	E014S	E	E014S	E	E014S	E015S	E015S	014	013	015	015	016	015	018	013	013	E015S	E015S	E015S	E015S	E014S	E015S	E014S
26	E015S	E013S	E014S	E	E	E	E015S	E015S	012	013	015	016	015	015	015	015	014	E015S	E015S	E015S	E014S	E014S	E015S	E014S
27	E015S	E014S	E	014	E	011	011	E014S	013	012	014	015	015	012	014	012	012	E015S	E015S	E015S	E015S	E015S	E015S	E015S
28	E014S	011	E	E	E	E013S	E014S	E015S	012	012	014	014	014	015	015	015	014	E015S	012	011	E015S	E015S	E014S	E015S
29	E013S	E013S	E014S	014	011	011	E014S	E015S	015	012	012	015	021	015	015	015	015	E015S	E015S	E015S	012	E015S	E014S	E014S
30	E015S	E014S	011	011	E	E013S	E015S	E015S	014	E050C	013	014	015	015	015	015	014	E014S	E015S	E014S	E015S	E015S	E015S	E015S
31	E015S	011	011	011	E	E015S	E014S	E015S	014	014	012	015	017	016	015	015	012	E014S	E015S	E015S	E015S	E015S	E015S	E015S
Count	31	31	31	31	31	30	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31
Median	E015S	E014S	E012	E	E	E012	E015S	E015S	014	013	014	015	016	016	015	015	014	E015S	E015S	E015S	E015S	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

IONOSPHERIC DATA

Dec. 1966 | 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	255	260	260S	285	325S	I260C	270	305	335S	320S	330	345	325	320	335S	340	335	355	325	315	305	290	260	270
2	290	285	I310S	305	350	I295S	270	320	355	360	345	335	330	325	325	325S	335S	390	305	325	295	325	305	285
3	295	305	255F	F	S	J370S	270H	320	I360S	350	355S	335	335	345S	350	340	350	365	345	310	345	250	290	285
4	310	300	290	295	290	300	305	325	370	370S	355	350	345	345	345	330	340	360	300H	305	325	315	285H	275
5	275	260	270	295	320	275	300	325	I350S	345	340	345	330S	330	335	330	335	320	340	280	335S	325	245H	270
6	270	280	275	290	325	275F	I280S	I345S	360S	325	310	320	330	325	325	340S	345	335	330	340	310	315	290F	275
7	290	315	295	290F	305F	285	290S	320	J355S	355	330	345	340	335	330S	350	345	335	345	310S	315H	305	305	285
8	265	285	290	295	310	285	285	335	345S	340	345	335	350	J350S	335	330H	345	345S	350	300	325	280H	285	285
9	270	285	295	300S	345	250	265	310	355S	J330H	345S	340	335	320	J305H	325S	345	345	290	315	355	305	305	305
10	265	270	270	295	310	365	275	J305S	355	350	335	335	325	325	340	335	355	335	315	280	295	295	320	290
11	265	265	265	295	335	305	275	305	340	350	340	335	315	310	335	340	340	335	320	300	295	325S	305	265
12	270	285	275	290	340	365	260	300	335	355	340	330H	325	315	290	335	J340S	345S	325	320	305	320	320	260
13	275	270	270	295	310	280	295	315	335	340	340	330	325	320	325	310H	340	I350S	340	320	J295S	285S	270	260
14	255	255	275	310	310S	250	270	325	355S	335	305	310H	320	305H	J315S	335	310	335	315	J330S	J290S	265	260	260
15	270	240	250	235	250	265S	290S	I295S	325	J320S	340	325S	325	310S	340	J335H	325	320	I325S	300S	315S	275	315	295
16	275	285	290	300	250	285	330S	315S	335	345	340S	365	340	330	320	295H	325	340H	330	260	290	320	285	265
17	270	270	285	295	310	325	275	300S	330S	360	350S	350	335	305	325	330	J340S	340	315	300	320S	320	300	310
18	295	295	285	285	300	265	285	335	I350S	J340S	365	325	315	320	305H	315	335S	325S	345	300	345	325	295	300
19	255	290	300	300S	305	305	290	305	I330S	335	350	315	330	345	345	355	330	325	310	320	I330S	305	320	250H
20	280	290	285	285	285	325	290	295S	340S	355S	315	315	330	340	330	350	335S	340	330	325	315S	315	305H	270
21	270	260	295	275	305	365	290	305	345	340S	335	375	300	345	335	325	355	340	345	335	340	285	275	300
22	315	300	270	265	285	365	290	280S	325	345S	325	315	320S	315	315	335	320S	340	345	325S	320	315	335	270
23	265	290	290	305	310	270H	290	300	345	340S	320	320	315	325S	325	320	315	350	290	315	320S	295S	340S	250S
24	270S	275	300	285	285	305	295	325S	J360S	335	I315C	330	310V	340	350	335	J355S	J315S	330	315	320	I300S	280	275
25	265S	280	285	290	325	315	275	305	360	J340S	390	335	325S	330	310	330	325H	J355S	335S	295	340	J315S	380	270
26	285	280	300	275	315	260	280	310	345	345	350	325	340	325	345	325	335	325S	325	320	335	305	295	290
27	290	285	260	265F	300F	260S	275	305	340	J345S	320	350	350	I350A	325	340	315	335S	315	305	325	305	295	260
28	240F	285	J340S	310	250	265	255	300	345	340	340	340	340	320	315	310	335	340	330	290	350S	335	I275A	250
29	265	280	270	305	280	295	275S	290	I340S	J340S	360S	335	335	340	350	I315H	360S	345	355	320	300	325	305	245
30	250	260	295	305	325	265	275	305	350	335	350	320H	330	310	360	350	350S	350	360	310	270	300	245	275
31	265	275	295	300	300	310	295	295	340S	360	340	355	330	320H	310	340S	315H	355S	350	265	320	345	300	270
Count	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Median	270	280	285	295	310	285	280	305	345	340	340	335	330	325	330	335	335	340	330	310	320	305	295	270
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

Y 7

IONOSPHERIC DATA

Dec. 1966 | 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	L	L	L	L	L								
2											L	390	L	L	L	L								
3											L	385L	L	L	L	L								
4											L	375L	385L	L										
5												L	L	L	L									
6											L	L	L	L	L	L								
7											L	L	380	355	L	L	L							
8												350L	L	L	L	L								
9												L	L	L	L	L								
10										L	L	L	365L	L	L									
11											L	L	L	L	L									
12											L	L	L	395L	L	L								
13										L	L	L	LH	L	L									
14											L	LH	360H	L	L									
15										L	L	L	L	L										
16											L	L	L	370L	L									
17										L	L	370L	L	L	L									
18											L	L	L	L	L	L								
19											L	L	L	L	L	L								
20											L	380L	L	360	L	L								
21												L	L	L	L	L								
22											L	L	L	L	L	L								
23											L	L	L	L	L	L								
24											C	L	L	L	L	L								
25												390	380	L	L	L								
26											L	L	L	375	L									
27											L	L	A	A	A	L								
28											L	L	L	L	L									
29										L	365L	L	L	L	L	L								
30										C	L	L	L	LH	L	L								
31											L	L	L	LH	L	L								
Count											1	7	5	5										
Median											365L	380L	380	370										
U.Q.																								
L.Q.																								
Q.R.																								

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

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Dec. 1966 | h'F2 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										245	255	250	250	250	255	240								
2											250	245	260	245H	240	225								
3											230	240	250	255	240	230								
4											240	230	230	240										
5												245	270	250	250									
6											250	250	240	250	255	245								
7											240	235	245	270	245	230	240							
8												275	240	245	250	240								
9												255	240	265	250	240								
10										230	230	250	260	270	240									
11											235	245	260	250	250									
12											250	245	250	250	230H	240								
13										230	240	255	280	265	250									
14											230	250	280	255	250H									
15										240	240	240	275	235H										
16											225	230	250	245	260									
17										235	235	245	230	250H	245									
18											225	230	275	235	250	230H								
19											240	240	270	245	240	235								
20											230H	235	240H	250	245	230								
21												225	290	290	250	230								
22											240	270	265	265	275	240								
23											225	250	245	240	270	240								
24											C	250	250	240	230	240								
25												250	280	260	255	245								
26											240	245	250	240H	225									
27											265	240	250	I250A	250	260								
28											240	240	245	240	245									
29										250	240	250	255	245	240	240								
30										C	230	240H	250	280	230	250								
31											240	240	270	245	245	245								
Count										6	25	31	31	31	29	20	1							
Median										240	240	245	250	250	250	240	240							
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

Dec. 1966 | 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	320	E380A	325	300	225	C	E320S	270	205H	230	230	225	205H	200H	225	225	230	205	225	220	230	245	E320S	325
2	290	300	250	250	205	200	E300S	250	220	215	240	200	200H	205H	215	205	225	200	195	240	245	245	270	290
3	295	250	320	300	270	200	SH	250	225	230	225	210	235	225	I230A	225	230	225	195	245	205	E280S	275	300
4	250	280	260	290	275	300	250	240	225	225	210	210	200	230	245	240	225	210	200	245	230	200	240	E305S
5	E305S	345	330	275	230	250	280	220	225	230	230	220	205	200	220H	230H	225	210	210	250H	230	215	250	305
6	305	300	300	260	245	E300S	285	220	205H	200H	230	230	225	225	225	230	225H	220	215	215	230	245	295	330
7	300	255	275	290	255	250	E330A	240	225	240	225	230	210	200	200H	I230A	230	205	210	240	200	225	250	295
8	325	305	300	290	250	235	250	240	225	200H	225H	210	I230A	240	200	240	230	220	200	200	200	230	255	E300S
9	E315S	300	270	255	240	200	E350S	255	225	225H	235H	235	225H	185H	240	250	225	210	205H	240	200	235	250	250
10	E300S	325	345	290	250	205	E300S	270	230	230	225	220	210	195H	245	220H	230	205	200	250	250	245	230	250
11	E320S	320	300	260	225	200	275	255	245	235	240	240	225	220H	225	235H	230H	220	220	210	225	230	250	315
12	345	315	300	260	225	200	E350S	260	230	230H	235	230	225	210	200H	235	220	220	205	230	225	205	240	325
13	320	300	300	245	245	250	275	260	230	220	220	200H	190H	240	230	215H	230	220	200	230	255	255	300	370
14	350	350	275	240	210	E355S	325	275	235	230	210	200H	210H	240	230	245	E250H	225H	275	230	240	E240S	305	350
15	340	385	355	395	330	280	250	270	250	235	E240A	230	230H	220	225H	205H	230	235	230	240	240	275	250	245
16	300	300	255	280	320	315	220	220	235	200H	225	185H	190H	210	200H	200H	225	205	195	225H	245	225	250	E310S
17	340	320	290	250	280	240	E270S	250	230	240	230	210	200	195H	200H	235H	225	225	200	225	215	230	215	245
18	275	250	270	280	250	275	E300S	250	230	230H	225	195	180H	185H	240	200	240	210	200	250	205	225	250	290
19	E320S	270	275	250	245	275	E260S	255	235	230	235	220	210	195H	I220A	230	210H	205H	205	225	210	250	230	E300S
20	305	300	300	270	270	250	275	255	230	230	225	210	200	220	215	215H	220	220	205	220	205	210	225	280
21	E335S	320	290	270	250	200	E310S	240	230	230	230H	235	235H	250	245	220	230	225	200	225	205	245	255	250
22	260	285	305	325	270	205	300	275	230	230	235	220H	210	210	230	220H	200H	215	200	220	205	250	230	E320S
23	E350S	305	275	250	245	200	300	240	215H	225H	220	195H	230	230	210	225	225	210	205	215	205	240	225	E325S
24	E320S	300	285	270	280H	270	E270S	240	225	225H	I200C	220H	225	240	230	225	230	230	225	225	250	240	250	300
25	340	315	300	280	240	205	E325S	240	230	225	215H	205	205	220	230	230	220H	200H	225	215	205	205	205	305
26	290	300	275	250	250	300	320	250	225H	200H	230	220H	220	200	I205A	200H	220	230	200	225	215	220	280	290
27	280	275	295	350	265	300	340	240	230	230	220H	240	A	A	A	200H	220H	U225C	U200C	U245C	U225C	U225C	U275C	E345S
28	E390S	U280C	U210C	U245C	E395A	E400S	E350S	U250C	U240C	U225C	U225C	U215C	U215C	U220C	U195H	U200H	U240C	215	220	E295A	210	225	A	E400S
29	E355S	320	315	255	250	E280A	E270S	280	240	200H	225	180H	225	245	230	200	215H	220	205	205	245	235	240	E300S
30	E370S	E345S	280	230	240	E310S	E300S	245	220	I230C	205H	195	240	205	225	200	225	230	205	220	220	250	245	E300S
31	E320S	310	275	280	275	250	270	260	225	225H	210	215	190	200	195H	200H	230	215	200	220H	240	235	E270A	E375A
Count	31	31	31	31	31	30	30	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	30	31
Median	U300	300	290	270	250	U235	E300	250	230	230	225	215	210	215	225	225	225	220	205	225	225	230	250	U275
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

Dec. 1966 | 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	105	100	B	E	E	C	S	105	100	125	120	135	110	115	110	110	100	100	100	S	S	S	105	100
2	100	100	S	100	100	E	100	100	100	105	105	105	105	105	105	100	100	100	S	100	100	095	S	095
3	095	B	B	E	E	S	S	S	G	G	E165G	145	140	130	125	120	100	100	100	S	B	S	B	100
4	105	100	E	B	100	110	100	100	100	G	G	145	145	130	095	095	110	100	095	100	100	095	S	S
5	100	S	B	E	E	B	S	110	E170G	150	105	100	100	100	095	095	095	095	095	095	S	S	S	S
6	S	S	B	105	E	S	S	S	G	G	100	150	100	125	100	105	115	100	S	S	S	100	S	S
7	S	S	100	100	105	105	100	100	G	100	G	135	125	125	120	110	145	100	100	S	S	B	S	S
8	S	S	B	E	E	S	S	100	G	G	G	155	120	115	110	100	E175G	100	095	S	S	S	S	100
9	S	100	E	100	100	100	100	100	G	125	125	G	G	105	150	150	130	150	S	105	100	100	S	S
10	S	S	S	E	E	E	S	S	G	150	130	125	120	110	100	100	100	100	S	S	B	S	B	S
11	S	S	B	E	E	E	B	S	G	G	115	150	160	145	100	G	G	095	095	115	B	S	S	S
12	S	S	E	E	E	B	S	S	G	G	E175G	G	125	120	120	120	160	S	110	140	105	S	S	S
13	S	B	B	E	E	B	S	S	105	130	120	115	G	110	150	100	105	100	100	120	105	105	105	105
14	100	B	E	E	105	S	B	100	100	100	G	G	G	G	145	120	115	105	110	110	S	S	S	S
15	S	S	E	E	E	B	S	100	155	125	120	120	115	125	G	G	G	155	S	130	105	105	100	S
16	S	105	100	100	E	100	B	100	G	G	G	G	G	E160G	G	G	150	145	S	120	S	S	S	S
17	S	S	E	100	100	100	110	100	100	155	135	125	105	105	100	100	135	100	100	100	095	095	095	S
18	S	S	B	E	E	E	S	S	G	125	120	115	115	105	105	105	110	S	S	S	S	S	S	S
19	S	E	E	E	E	S	S	S	G	105	125	120	120	110	105	100	G	S	S	S	S	S	S	S
20	S	S	S	E	E	S	E	S	G	155	G	G	110	105	105	100	100	S	S	S	S	S	S	S
21	S	B	S	E	B	S	100	100	G	G	150	130	120	110	110	105	100	100	100	S	100	S	115	S
22	S	110	S	E	E	E	100	S	G	G	G	G	105	105	100	100	100	100	S	S	100	095	095	S
23	S	S	E	E	E	E	S	S	G	G	G	100	110	105	105	100	100	S	100	100	100	S	S	S
24	S	S	B	E	E	B	S	S	G	G	C	125	120	115	120	100	100	S	S	100	120	110	110	110
25	105	S	100	S	E	S	S	S	125	150	115	G	G	115	105	100	105	S	S	S	120	S	095	S
26	S	S	S	E	100	E	S	S	G	G	G	100	110	110	110	100	150	145	095	S	S	S	S	100
27	S	S	E	B	E	B	B	S	120	G	G	110	105	100	100	100	100	U150C	U095C	S	S	U100C	S	S
28	S	B	U100C	U100C	U100C	S	S	S	U105C	G	U100C	U135G	G	U105C	U100C	U100C	U100C	100	100	100	095	100	095	S
29	S	S	S	B	100	100	100	095	095	095	095	100	170	160	150	110	E170G	105	095	S	B	S	130	125
30	125	S	B	095	095	S	S	115	150	C	105	105	E175G	100	100	100	130	105	100	100	100	100	095	095
31	095	095	095	B	E	S	100	095	G	G	105	105	105	105	100	100	100	150	100	095	095	095	095	095
Count	9	7	5	8	10	6	9	15	13	15	20	24	25	30	29	28	28	24	19	16	15	13	12	10
Median	100	100	100	100	100	100	100	100	100	125	120	120	115	110	105	100	100	100	100	100	100	100	100	100
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

Dec. 1966 | 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	f2	f4						1	1	c212	c21	h2c21	c 1	c21	c31	1213	13	1	f				f	f
2	f	f		f	f		f2	1	12	12	12	1	12	13	12	12	1	1		f	f	f2		f2
3	f										h 1	h 1	h 14	h21	h212	c2	12	1	f					f
4	f2	f			f	f	f	1	1			h21	h213	h212	12h	13	1	1	f2	f	f	f		
5	f							1 h	h 1	h212	12	12	13	1	12	13	12	1	f2	f				
6				f2							12	h 12	1	h 1	1	1	c4	1				f		
7			f	f	f	f	f4	1		1		h	h	h	c2	c3	h212	15	f					
8								12				h	c3	c2	c212	1	h 1	12	f					f
9		f		f	f	f	f	1		h3	h2			12	h 12	h	h2	h2		f	f	f		
10										h	h2	h	c	c212	1	1	1	1						
11											c	h 1	h	h 1	1			1	f	f				
12											h 1		h2	c	c2	c2	h 1		f	f2	f			
13									1	h 1	c	1		1	h	12	1	1	f	f3f	f	f2	f2	f2
14	f2				f			13	1	1					h21	c31	c41	13	f3	f2				
15								1 h	h	h2	c3	c3	c2	c2				h31	f	f f2	f3f	f2	f	
16		f	f	f		f		1						h			h2	h		f				
17				f	f2	f	f	1	1	h 1	h212	h21	1	12	12	13	h21	12	f2	f	f2	f2	f	
18										h21	c21	c 1	c	1	1	1	1							
19										1	h21	c 1	c	c2	13	12								
20										h			c2	12	12	12	12		f					
21							f	12			h2	h3	c4	c3	c2	1	1	13	f2		f		f	
22		f					f						12	12	12	1	12	12			f	f	f	
23												1	c2	12	12	13	13		f	f	f			
24												h	c	c	c	13	12			f2	f	f2	f2	f2
25	f		f2f						h2	h 1	c			c2	13	12	12				f		f	
26					f							1	c2	c2	13	13	h 1 1	h212	f2					f
27								c	c2			c2	13	14	13	12	1	h 1	f			f		
28			f	f	f				1		12	h31		12	12	1	13	12h2	f4	f2	f2	f2	f2	
29					f	f	f	14	12	13	1	12	h 1	h2h	h c	c3	h 13	1 1	f				f	f
30	f3			f	f			1	h 1		12	1	h212	12h	12h	1	h21	1	f	f	f2	f4	f2	f
31	f	f	f				f	1			13	12	12	12	12	13	12	h 12	f2	f3	f2	f3	f	f2
Count																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

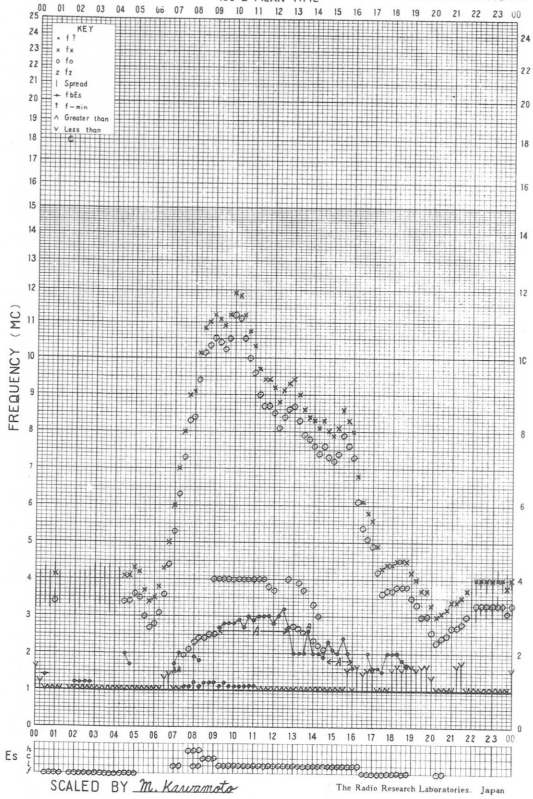
Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation

The Radio Research Laboratories, Japan

Y 12

f-PLOT OF IONOSPHERIC DATA

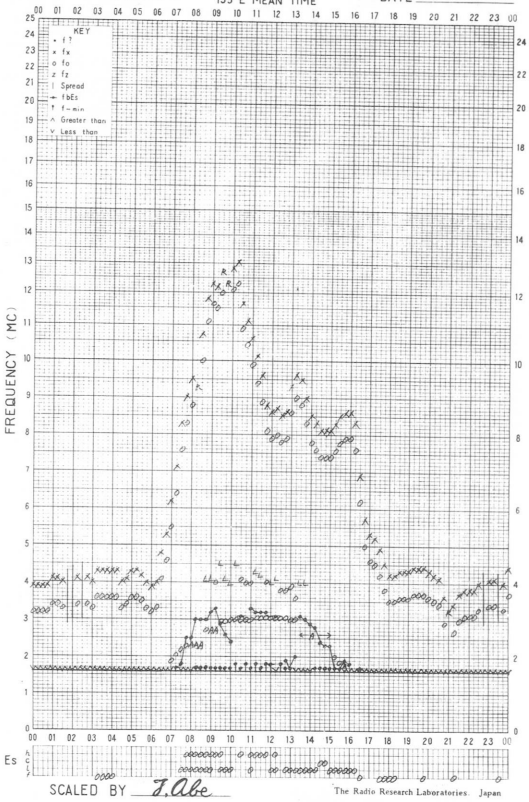
STATION WAKKANAI 135° E MEAN TIME DATE DEC. 1, 1966



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

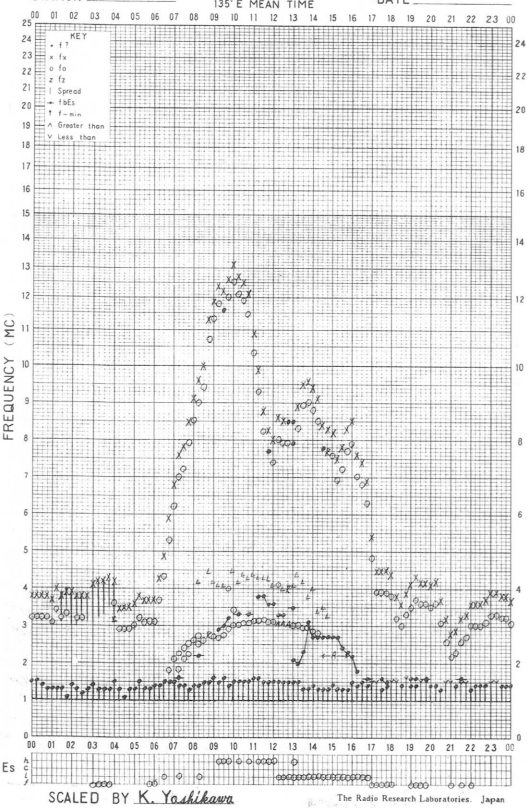
STATION AKITA 135° E MEAN TIME DATE Dec. 1. 1966



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

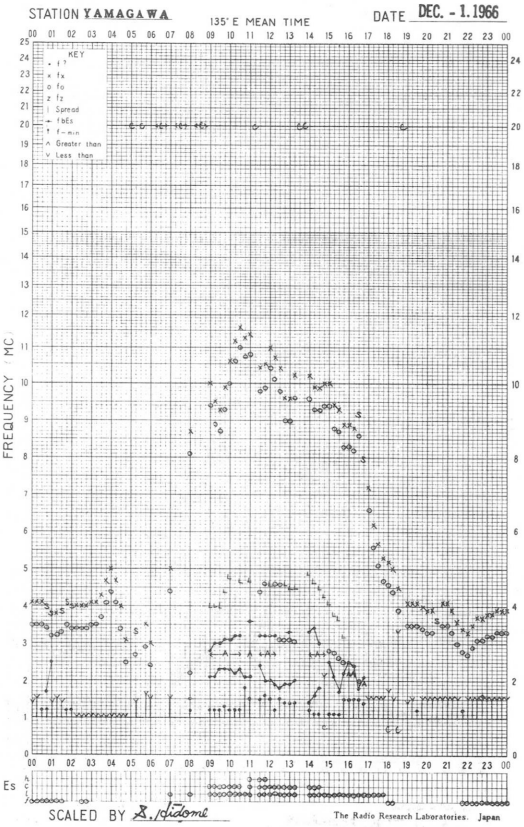
STATION KOKUBUNJI 135° E MEAN TIME DATE DEC. 1, 1966



SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

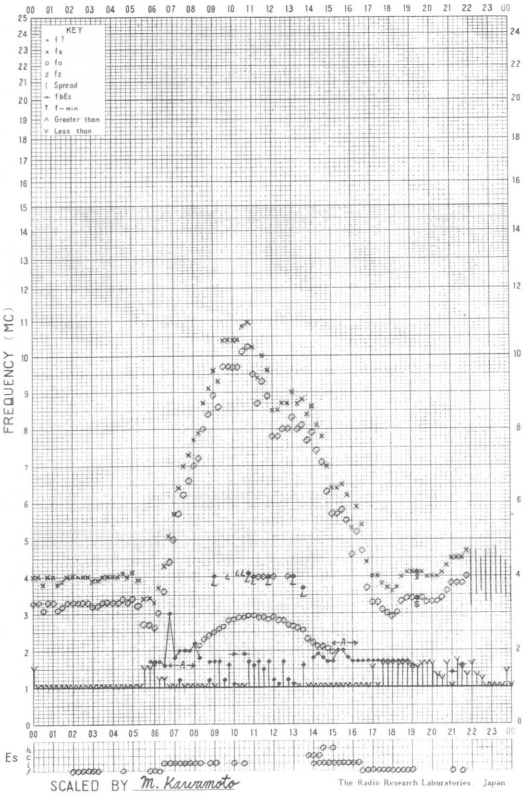
STATION YAMAGAWA 135° E MEAN TIME DATE DEC. - 1. 1966



SCALED BY S. Ichiome The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE DEC. 2 1966

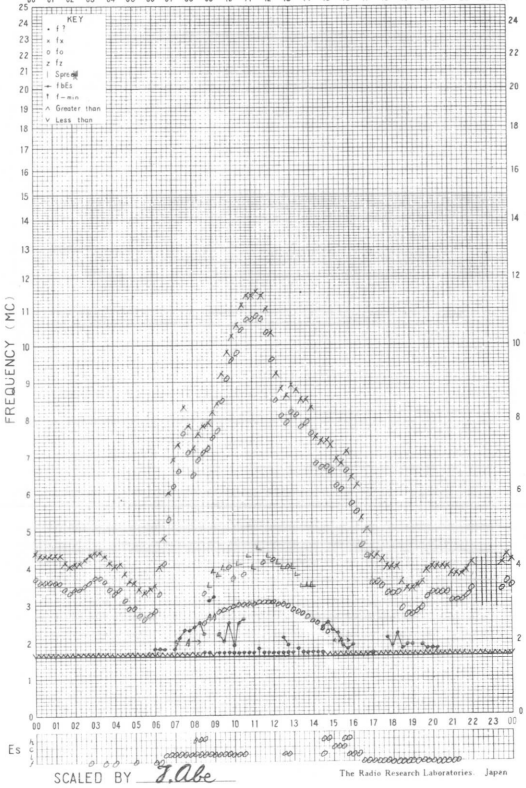


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Dec. 2 1966

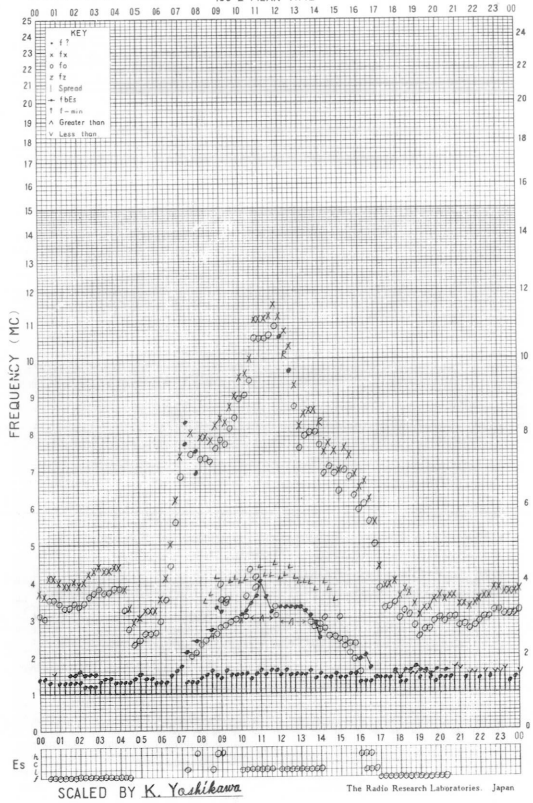


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135°E MEAN TIME DATE DEC. 2 1966

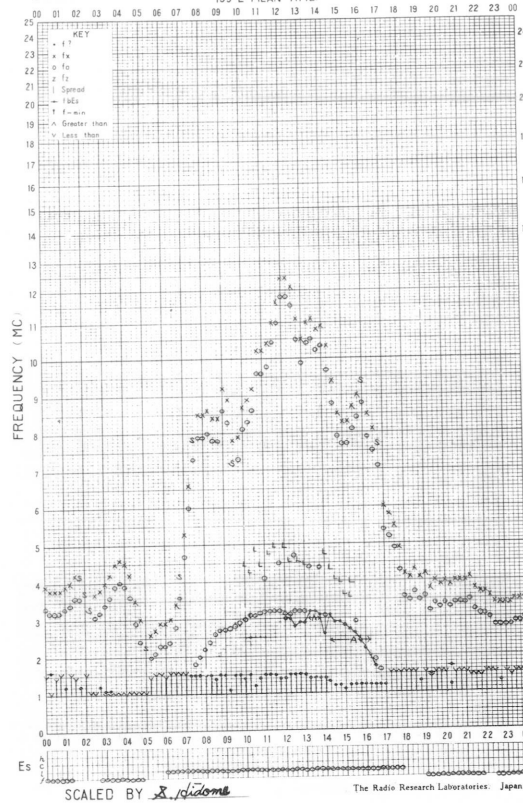


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE DEC. 2 1966



SCALED BY S. Uchome

The Radio Research Laboratories. Japan

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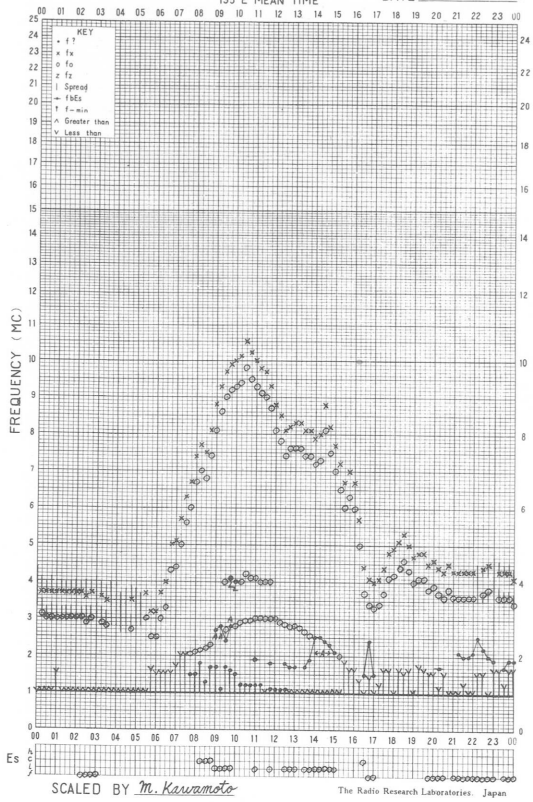

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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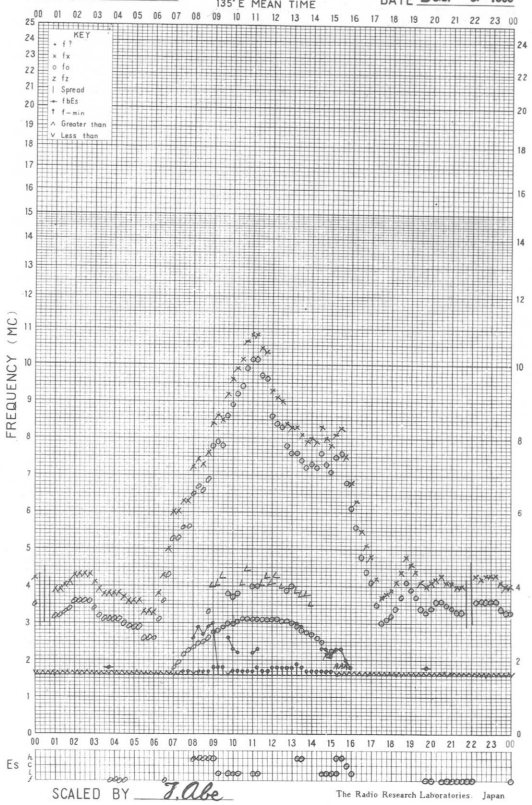

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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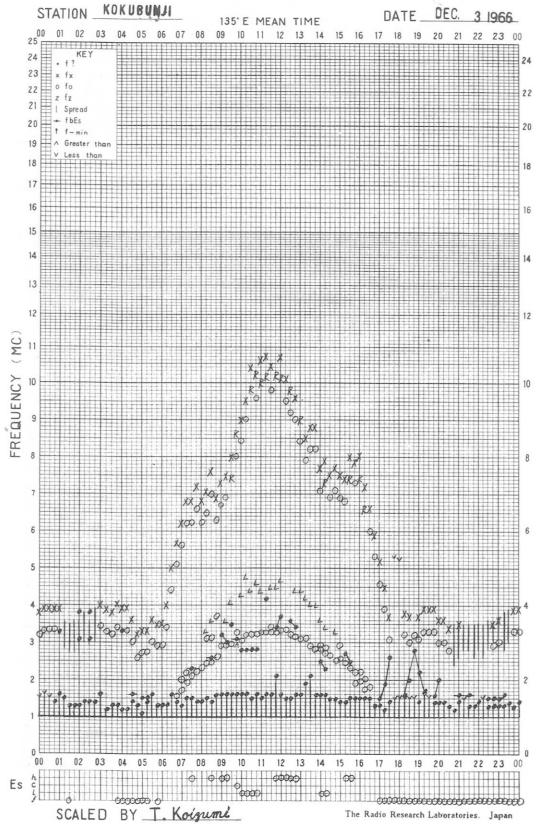

SCALED BY T. Koizumi

The Radio Research Laboratories. Japan

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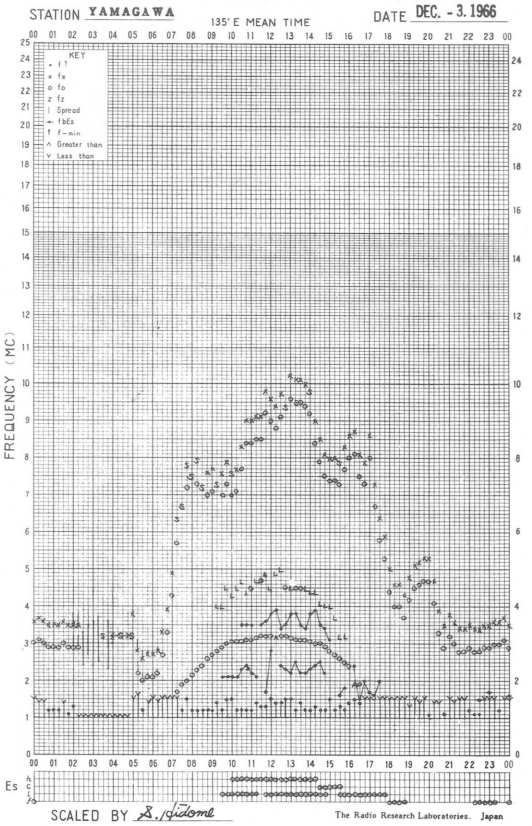

SCALED BY S. Shidome

The Radio Research Laboratories. Japan

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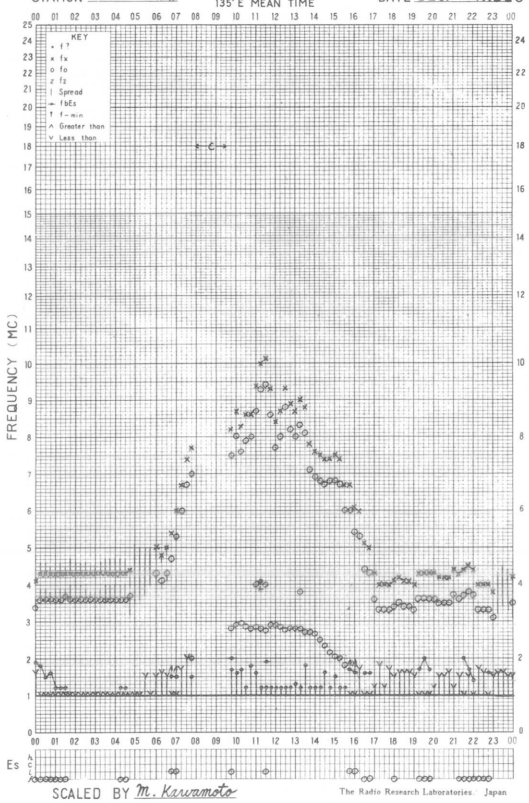

SCALED BY M. Kawamoto

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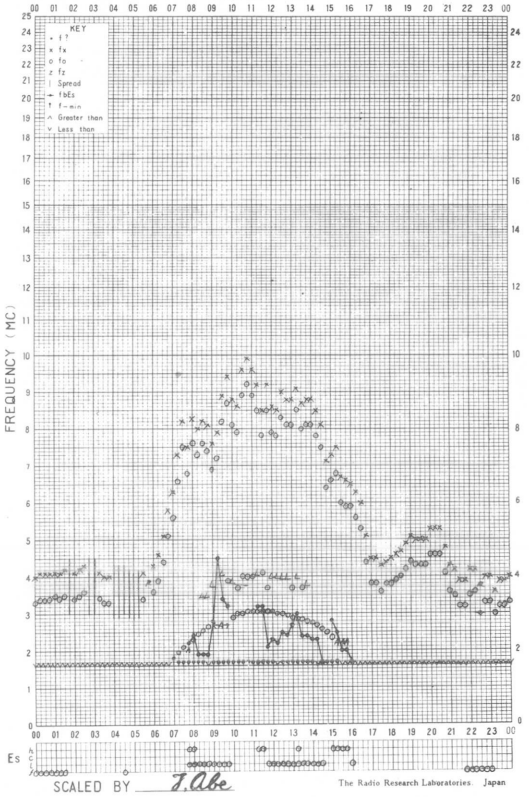

SCALED BY T. Abe

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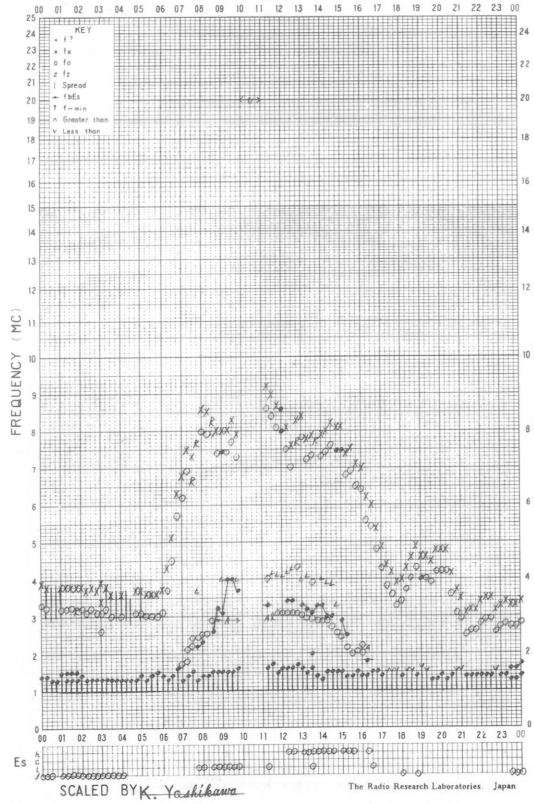

SCALED BY K. Yoshikawa

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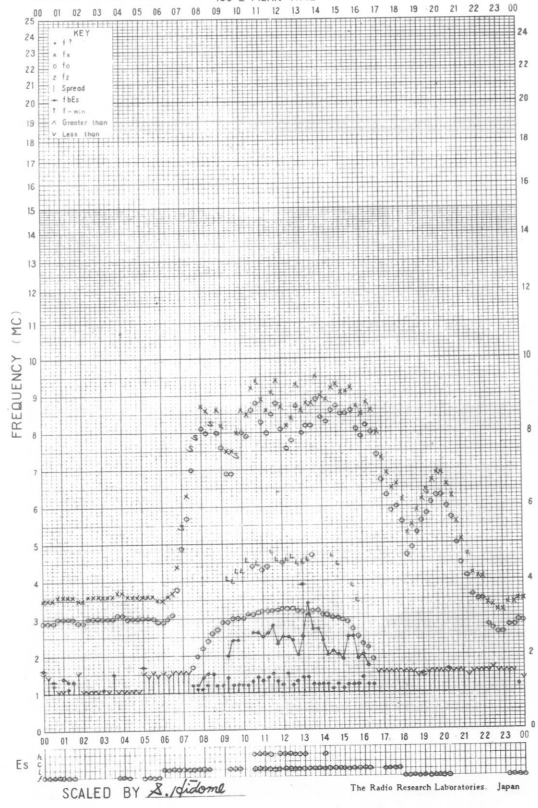

SCALED BY S. Tidome

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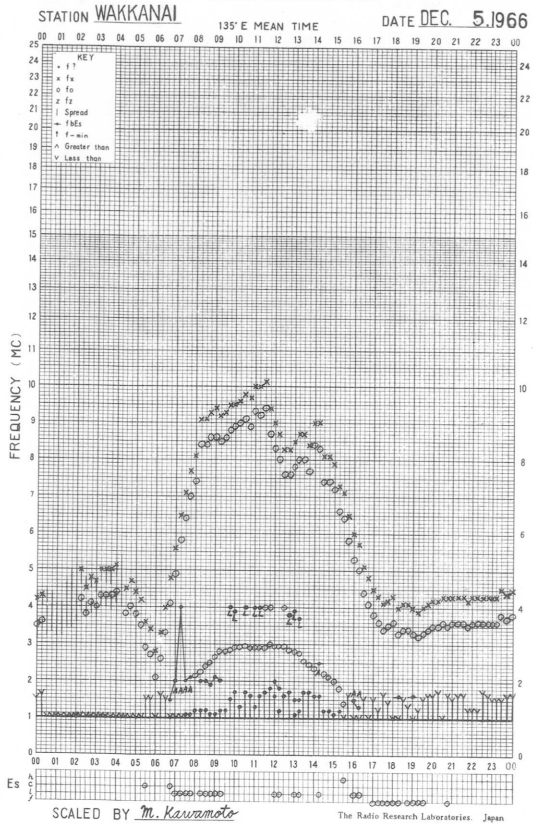

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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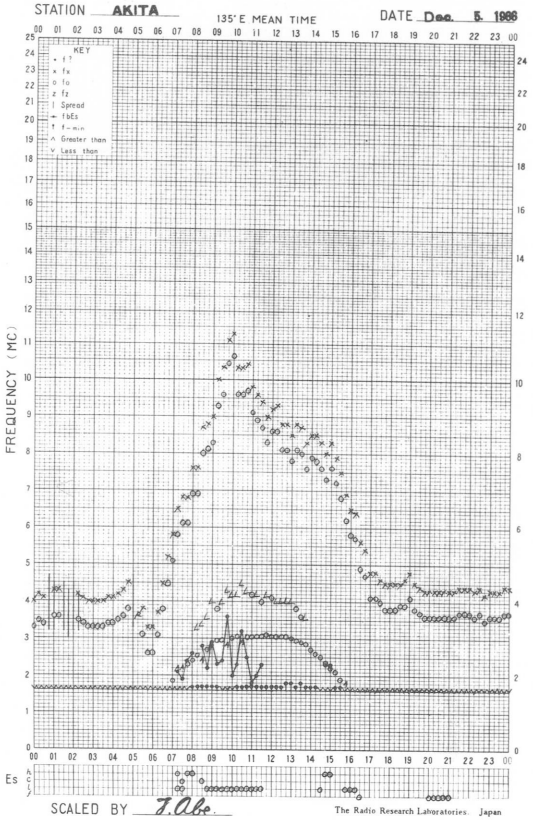

SCALED BY T. Abe The Radio Research Laboratories. Japan

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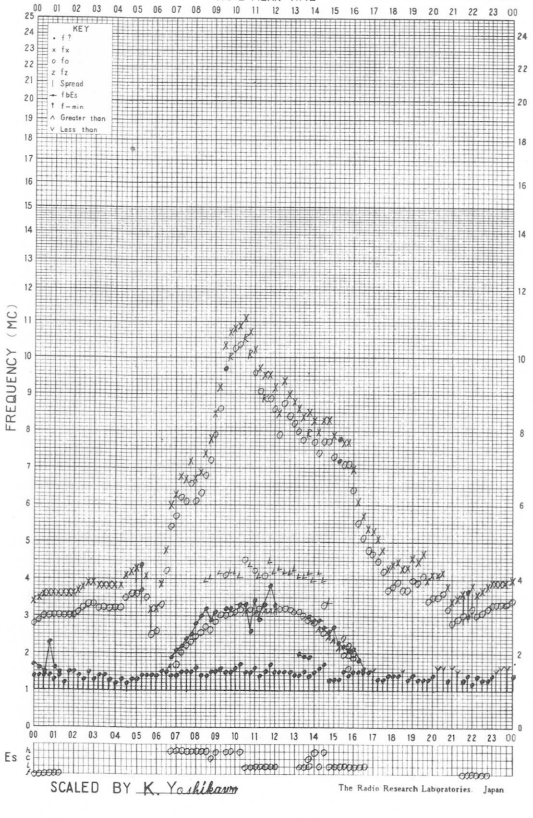

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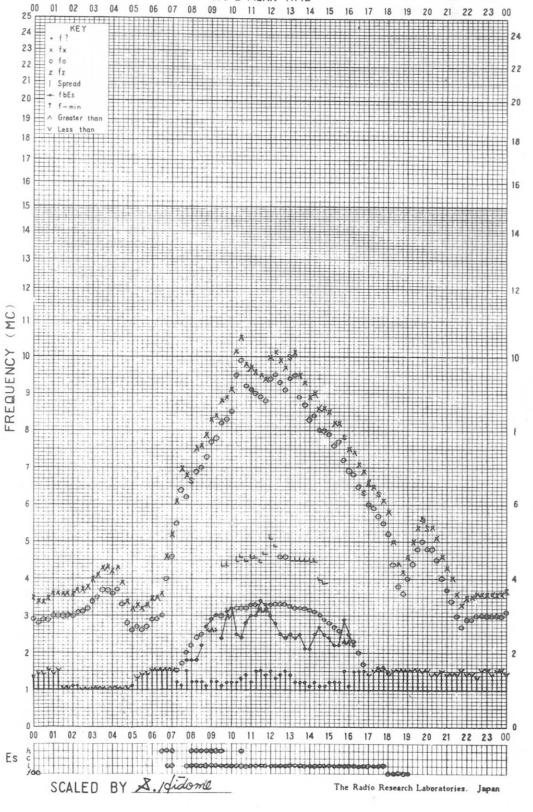

SCALED BY R. Hidoma The Radio Research Laboratories. Japan

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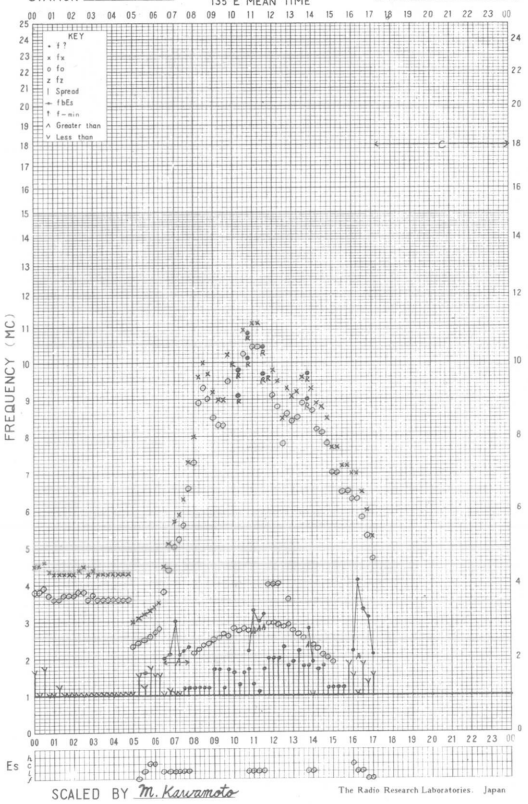

SCALED BY M. Kawamoto

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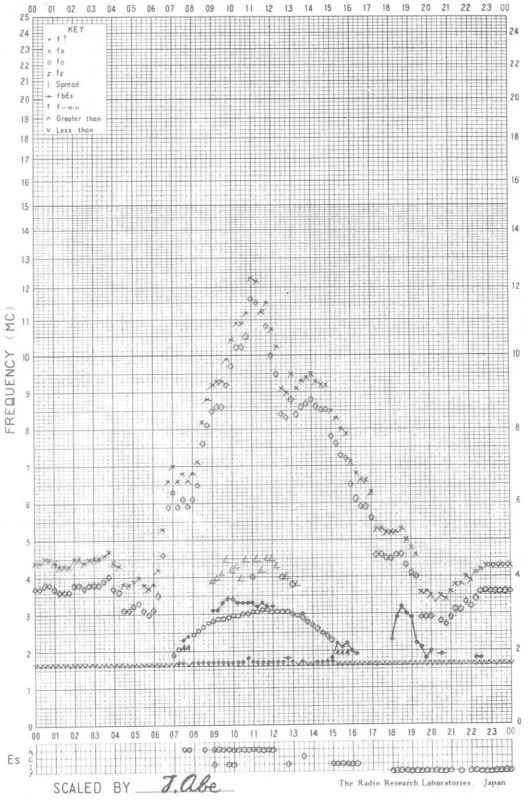

SCALED BY J. Abe

The Radio Research Laboratories. Japan

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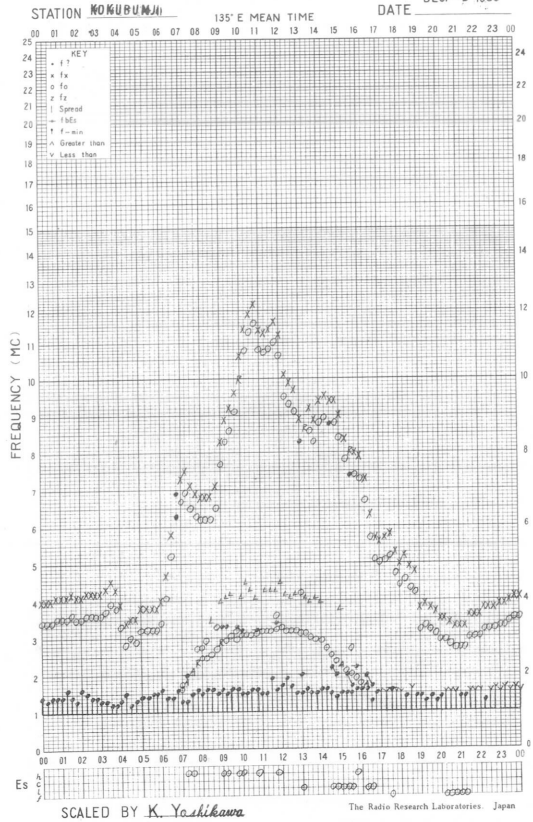

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The Radio Research Laboratories. Japan

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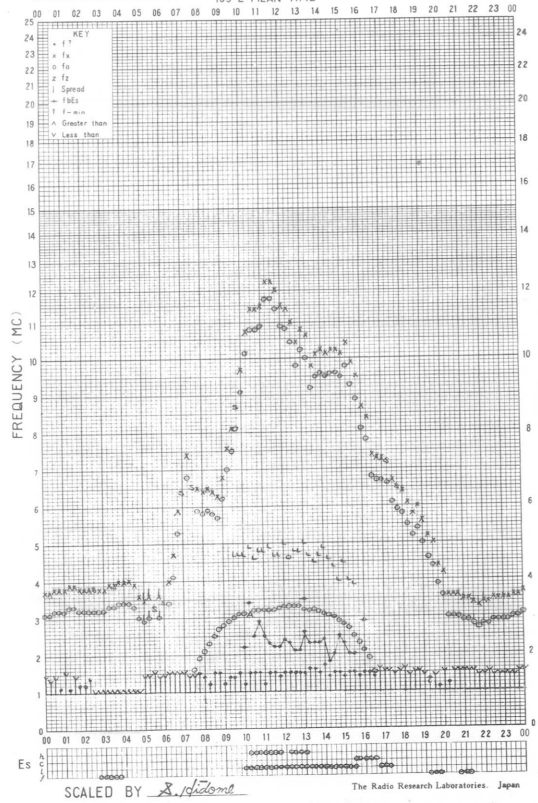

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The Radio Research Laboratories. Japan

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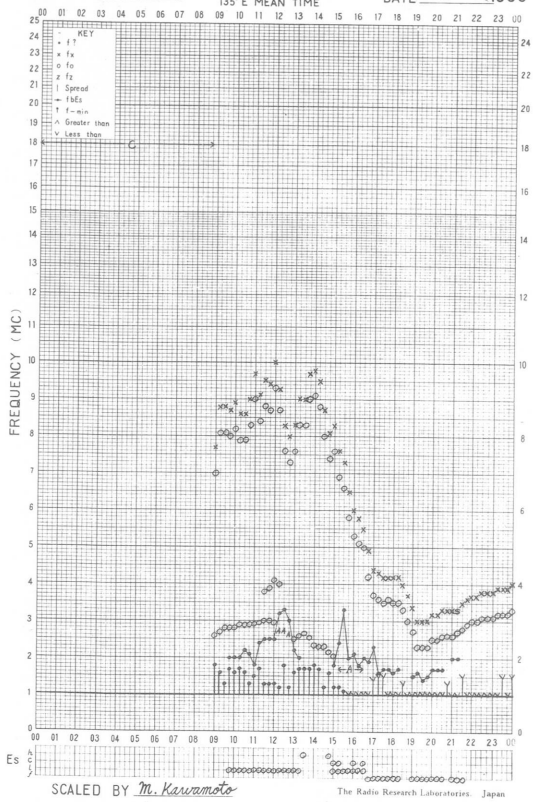

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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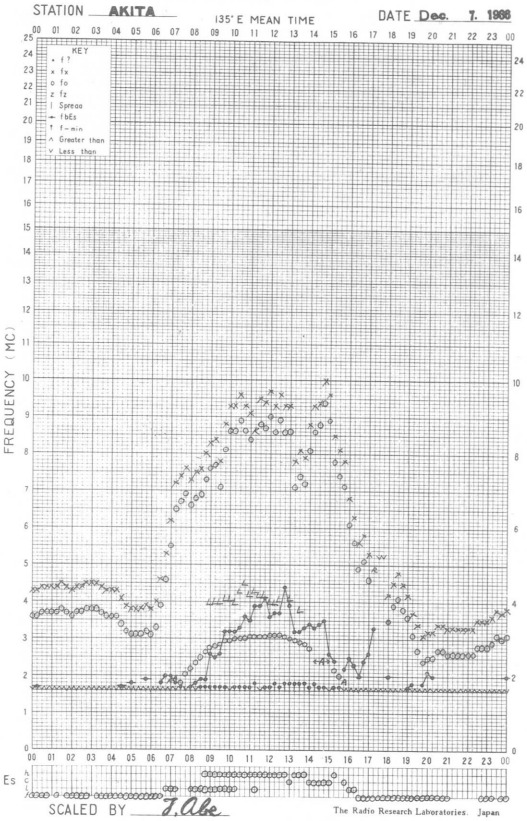

SCALED BY T. Abe The Radio Research Laboratories. Japan

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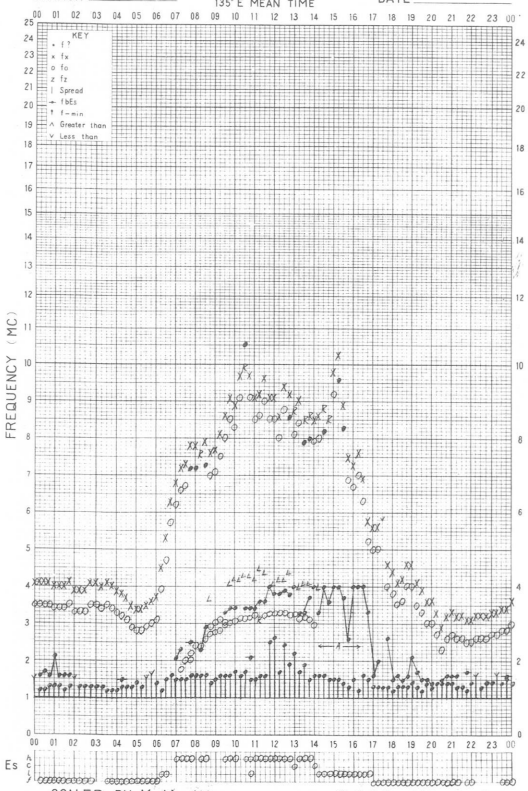

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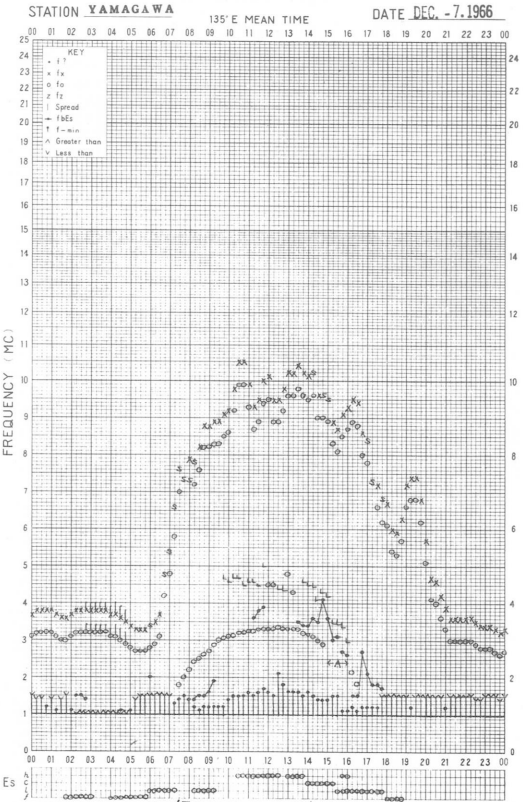

SCALED BY S. Shitomi The Radio Research Laboratories. Japan

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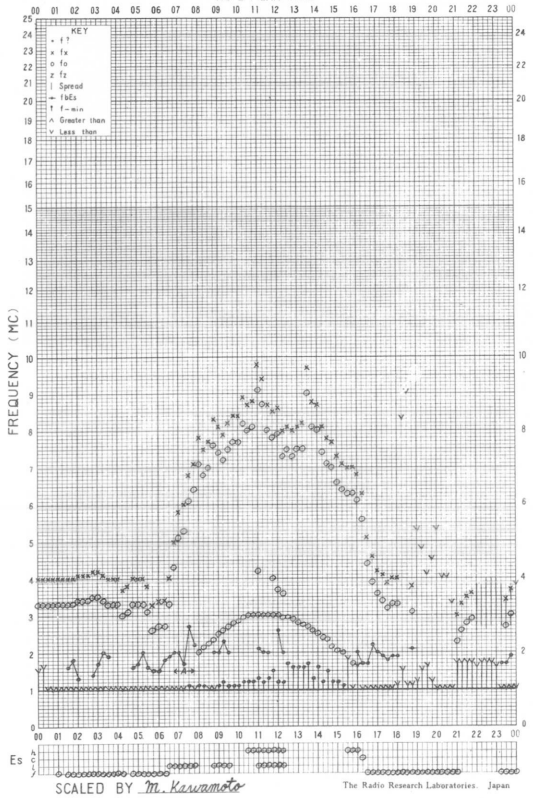

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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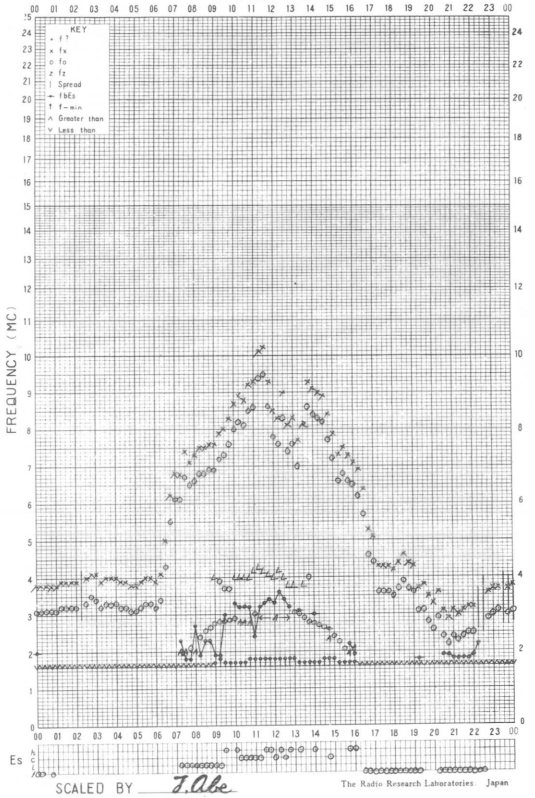

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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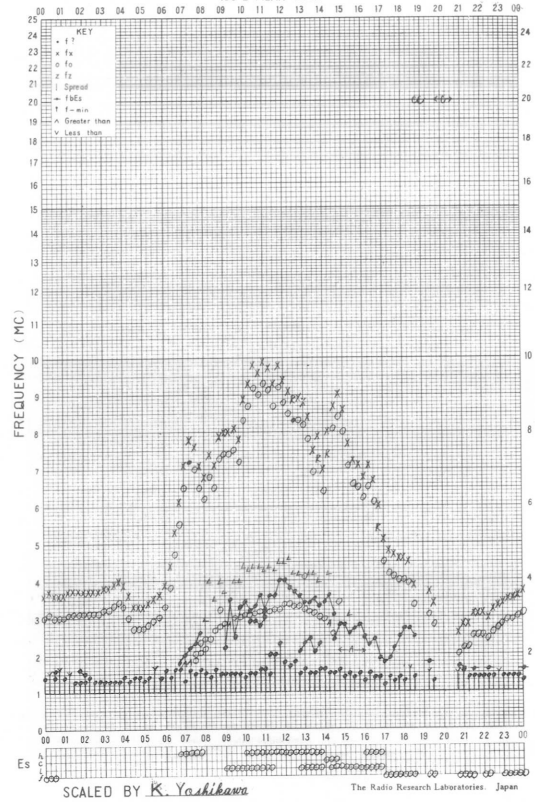

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The Radio Research Laboratories. Japan

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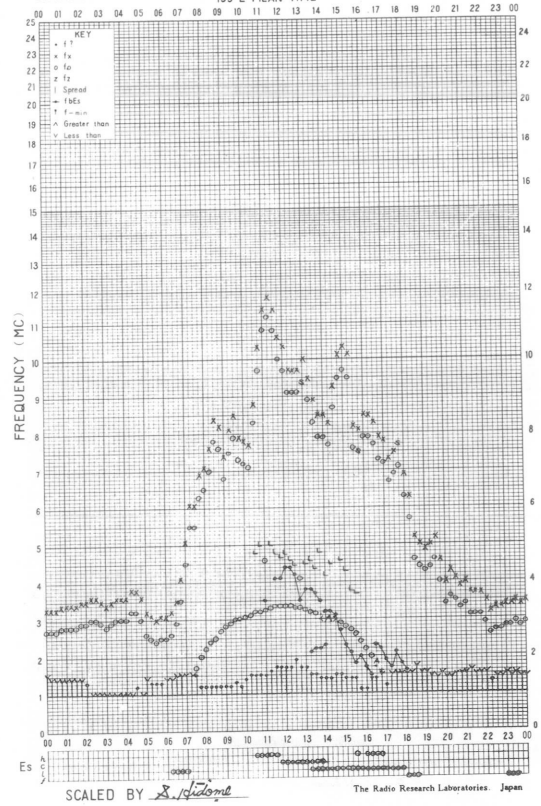

SCALED BY S. Shirono

The Radio Research Laboratories. Japan

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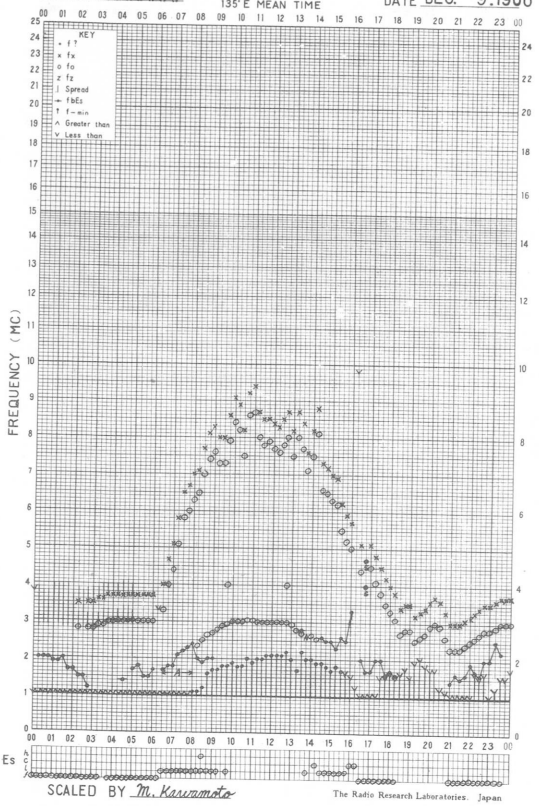

SCALED BY M. Kasuamoto

The Radio Research Laboratories. Japan

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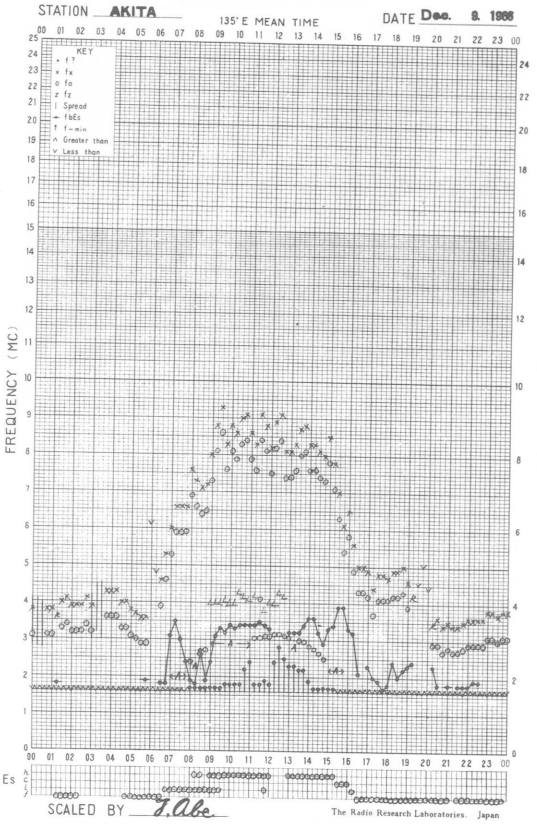

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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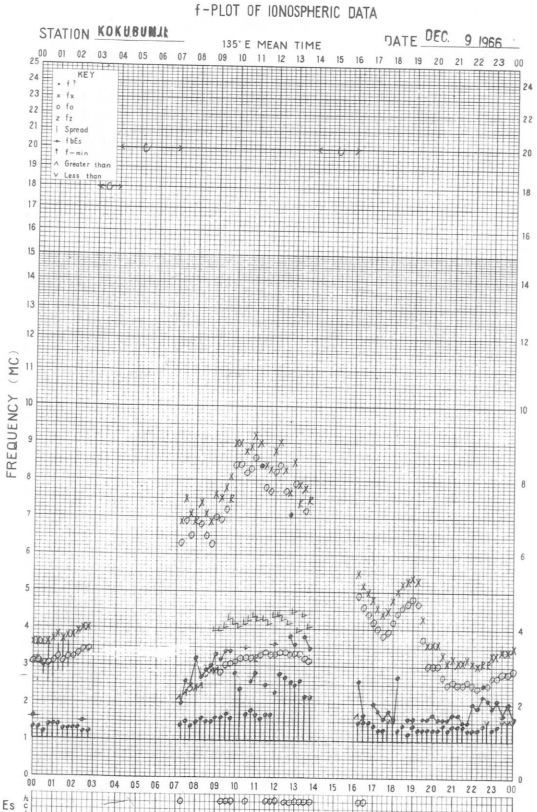

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The Radio Research Laboratories. Japan

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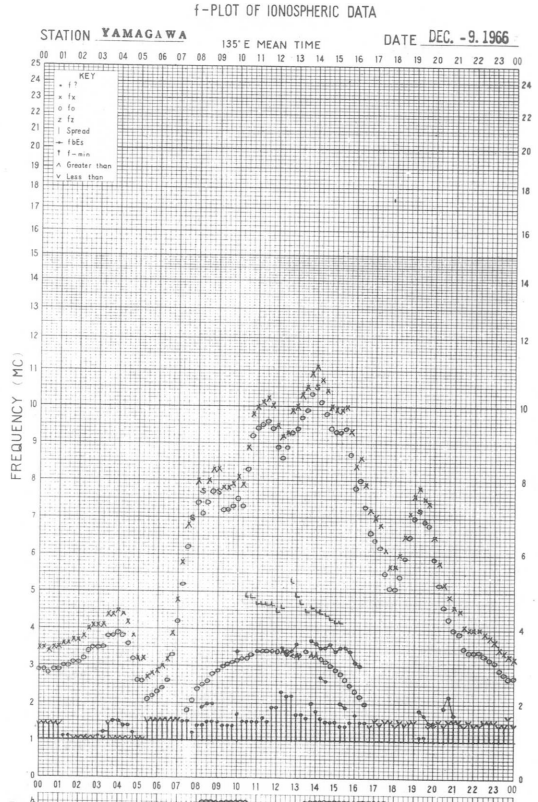

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The Radio Research Laboratories. Japan

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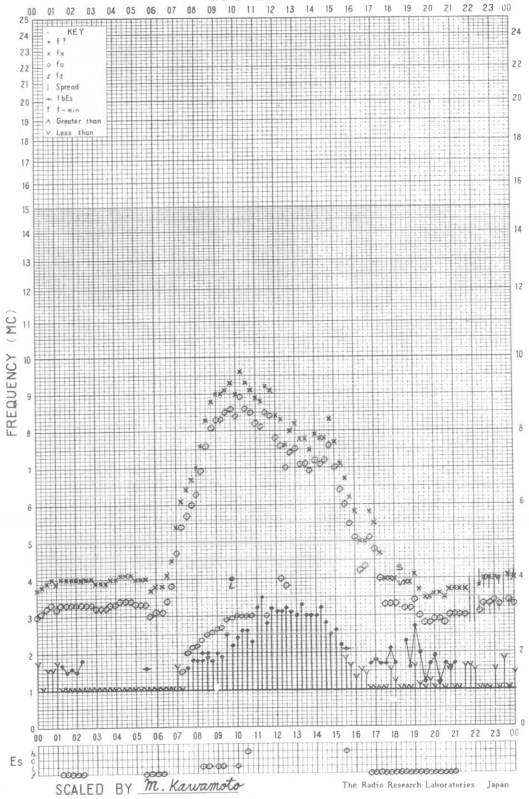

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The Radio Research Laboratories. Japan

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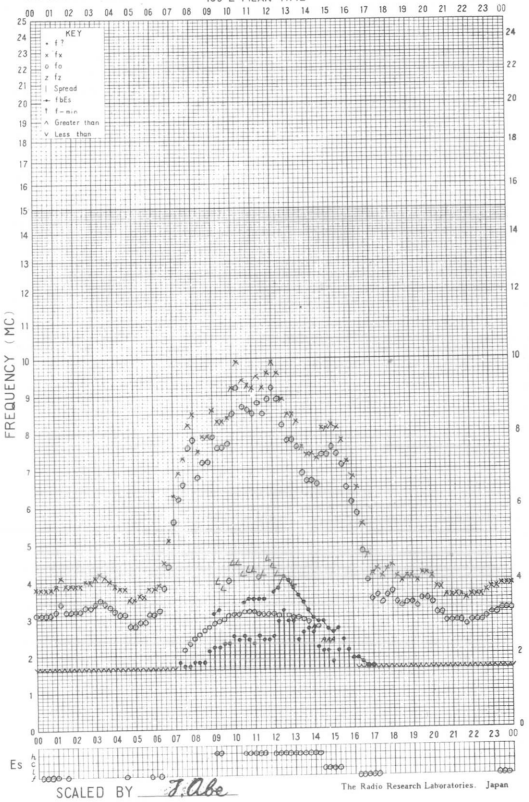

SCALED BY I. Abe

The Radio Research Laboratories. Japan

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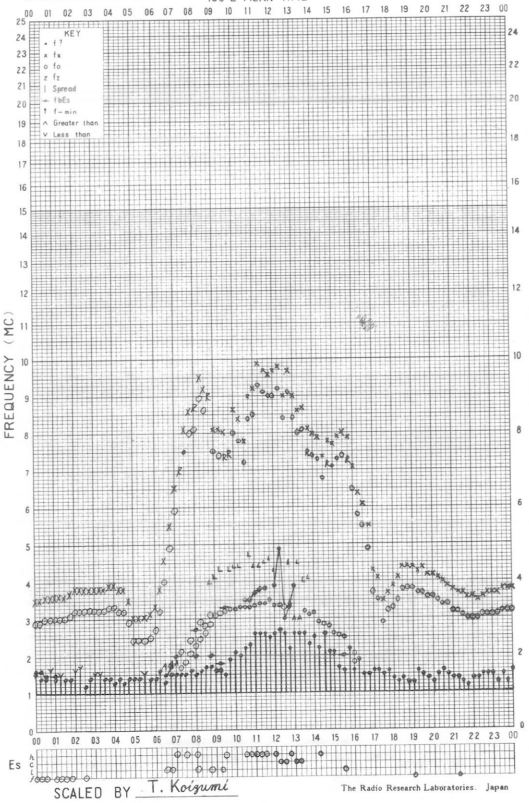

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The Radio Research Laboratories. Japan

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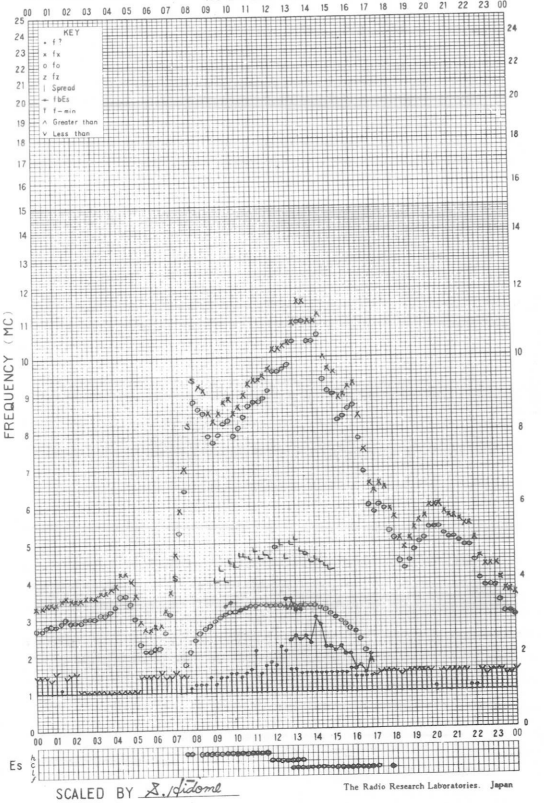

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The Radio Research Laboratories. Japan

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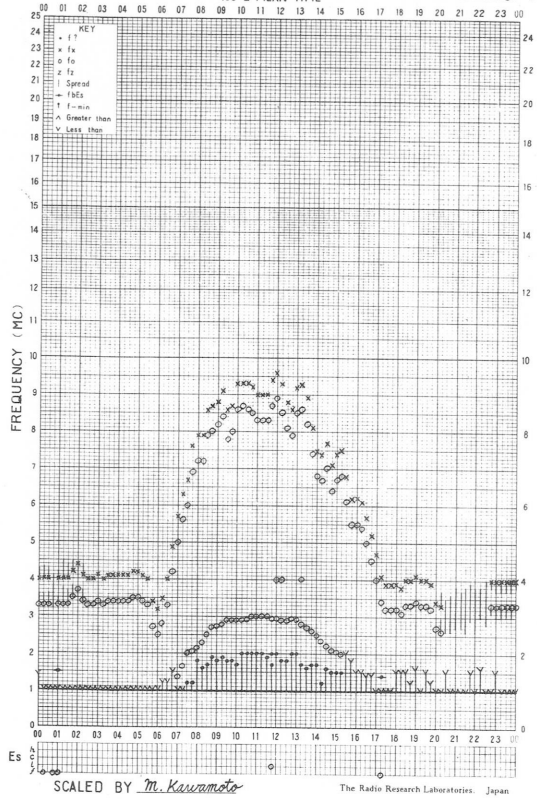

SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

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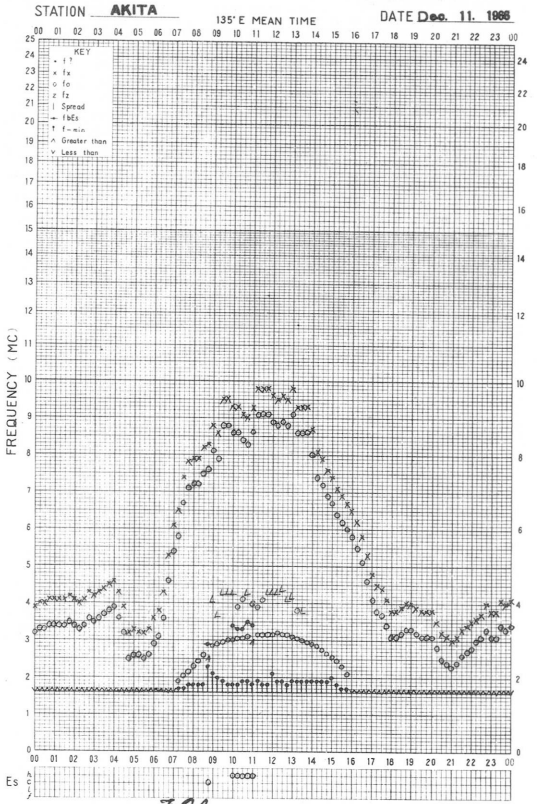

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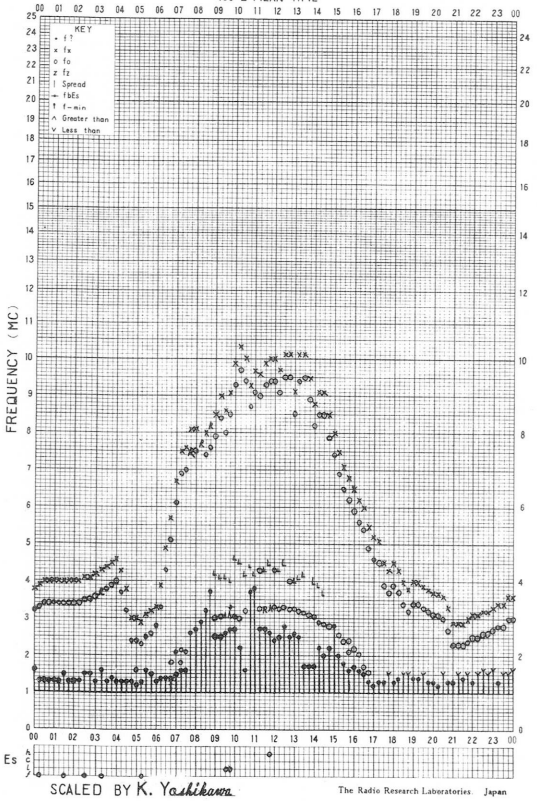

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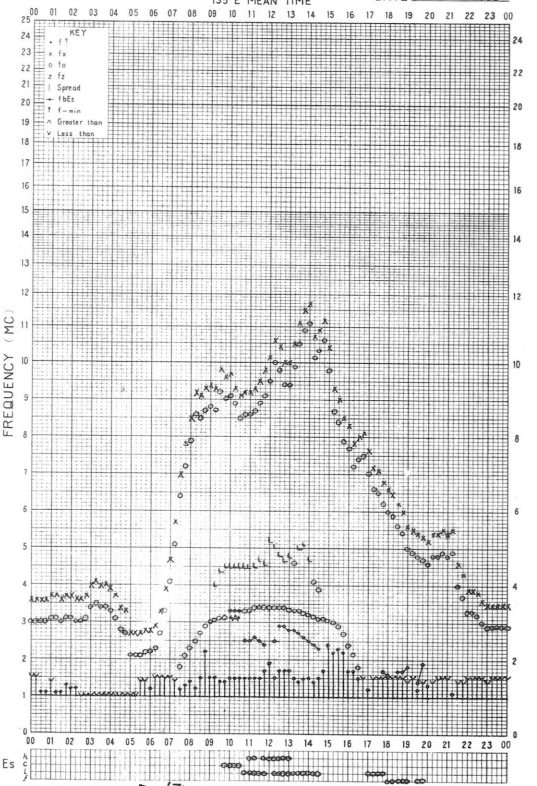

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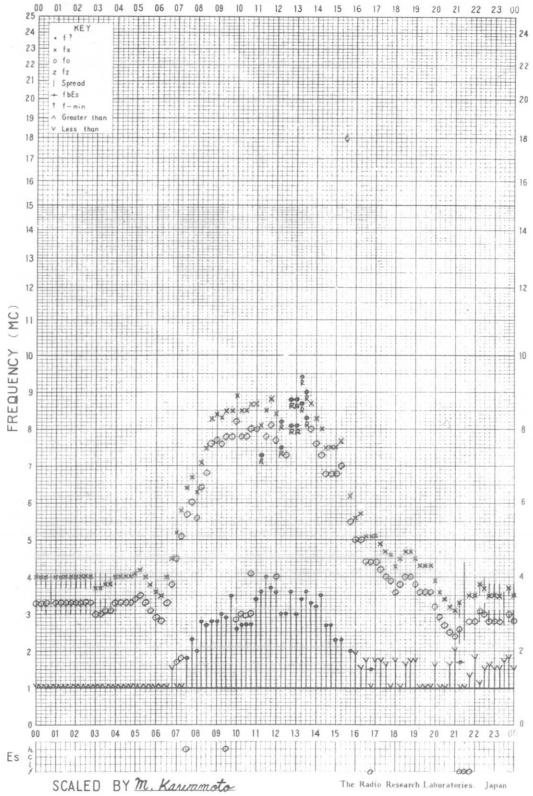

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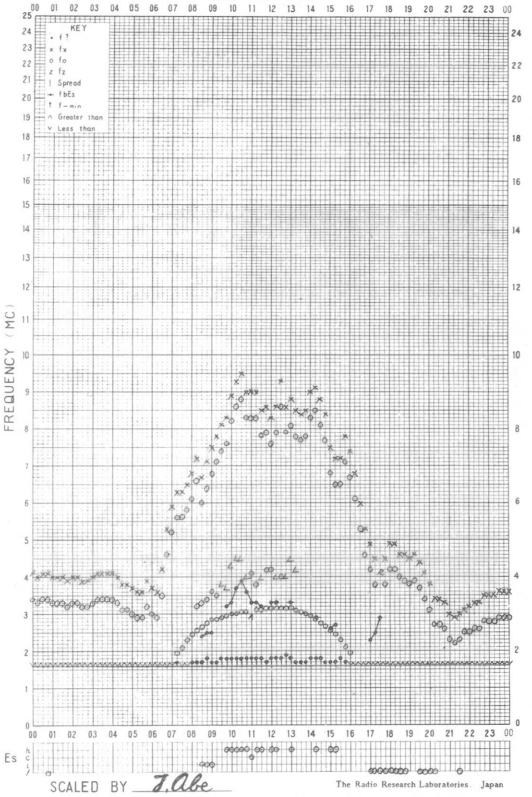

SCALED BY T. Abe

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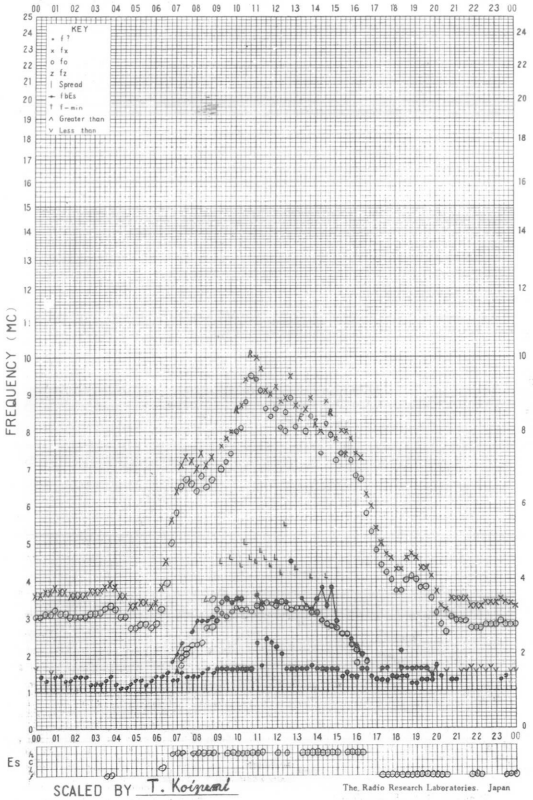

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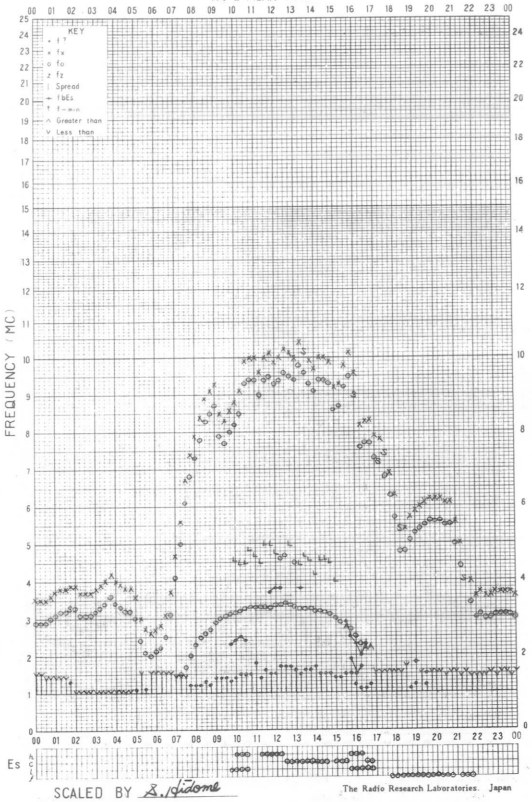

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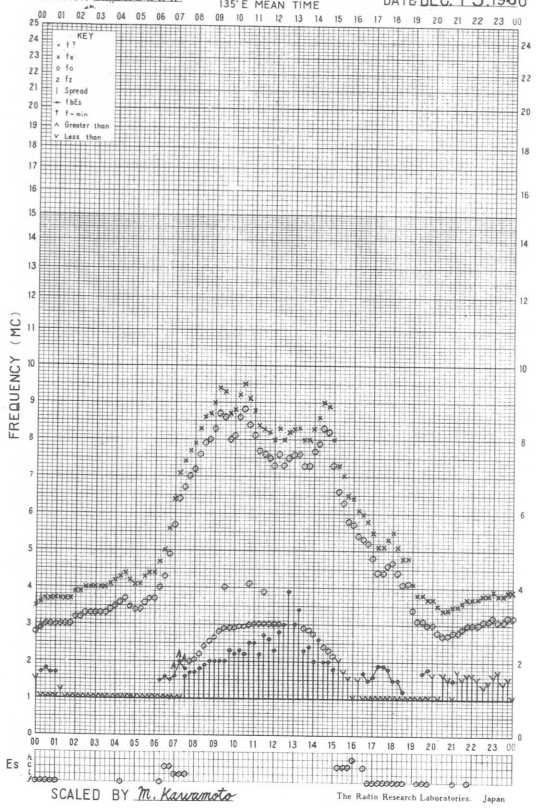

SCALED BY M. Kawamoto

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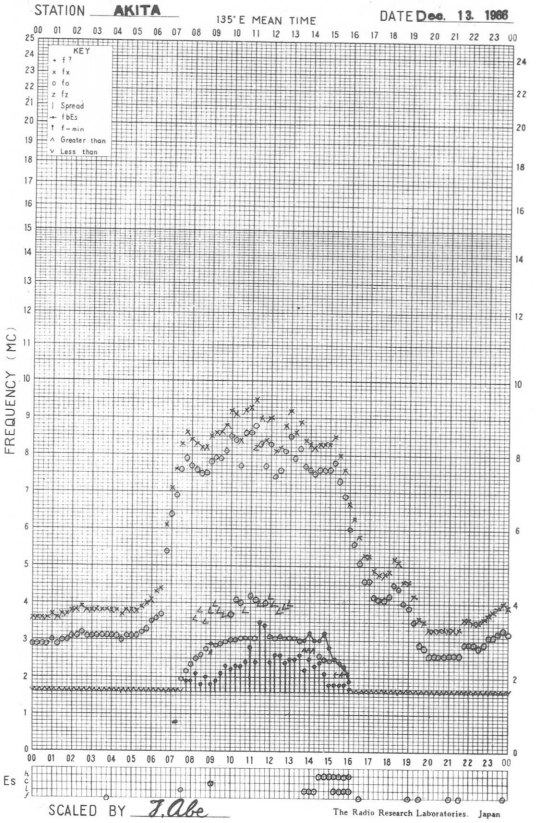

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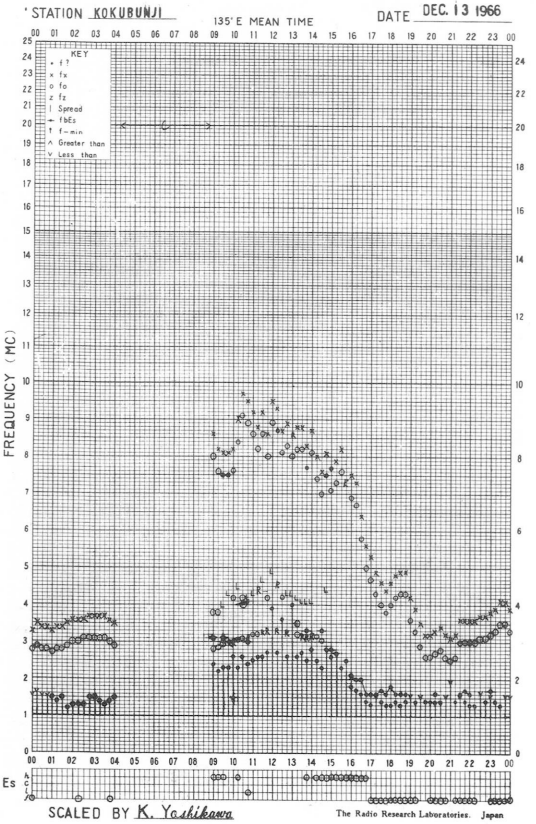

SCALED BY K. Yoshikawa

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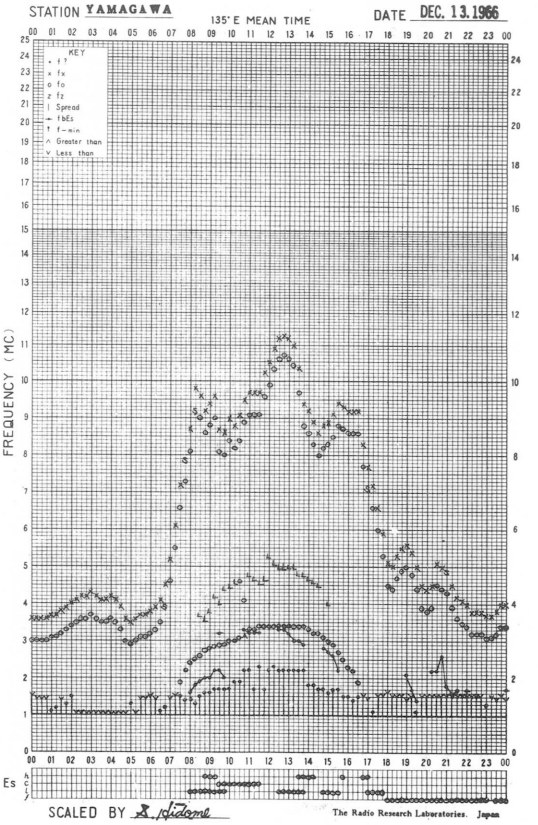

SCALED BY S. Shirono

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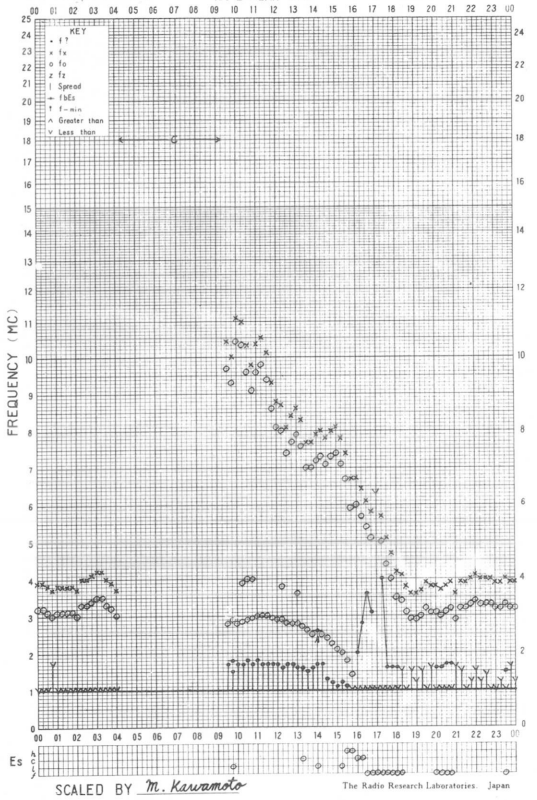

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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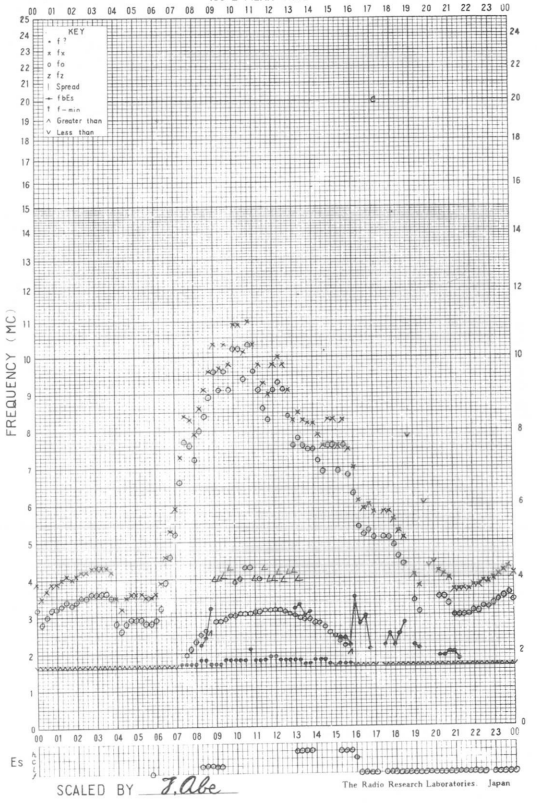

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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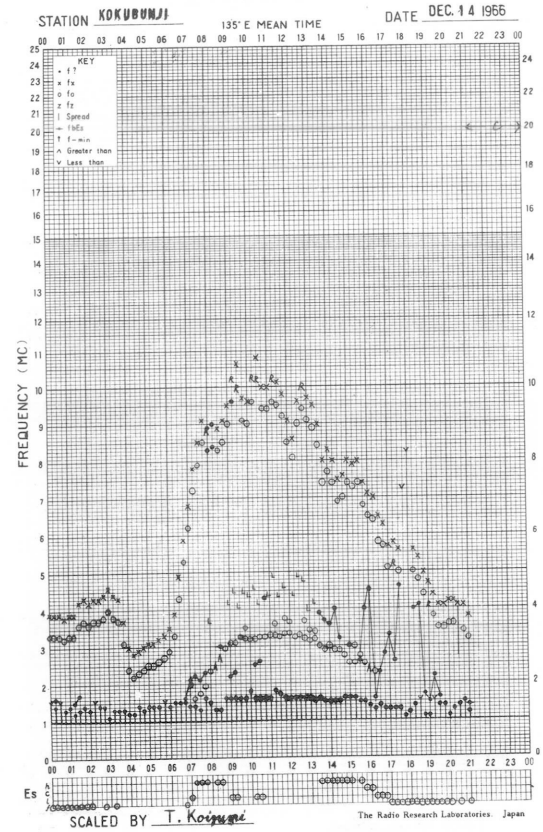

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The Radio Research Laboratories. Japan

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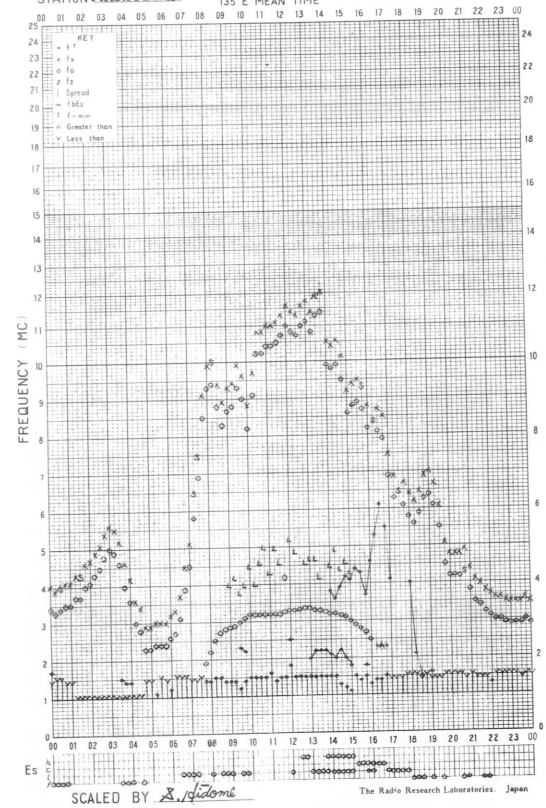

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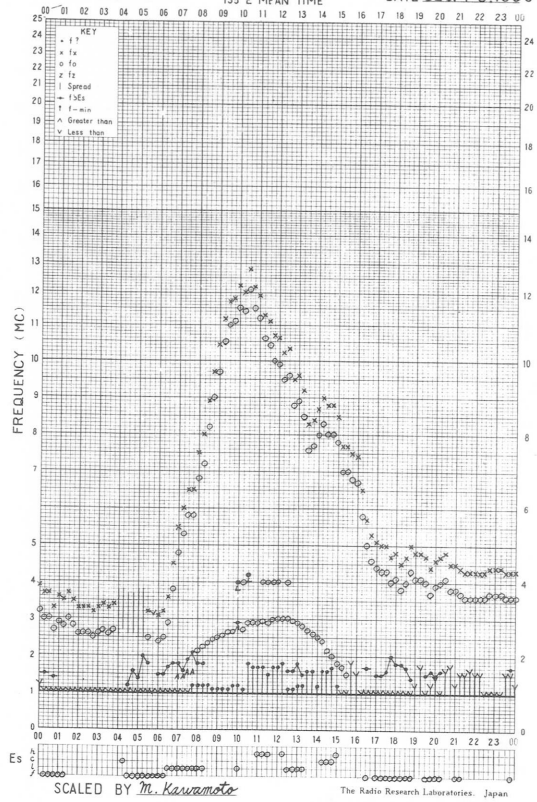

SCALED BY M. Kawamoto

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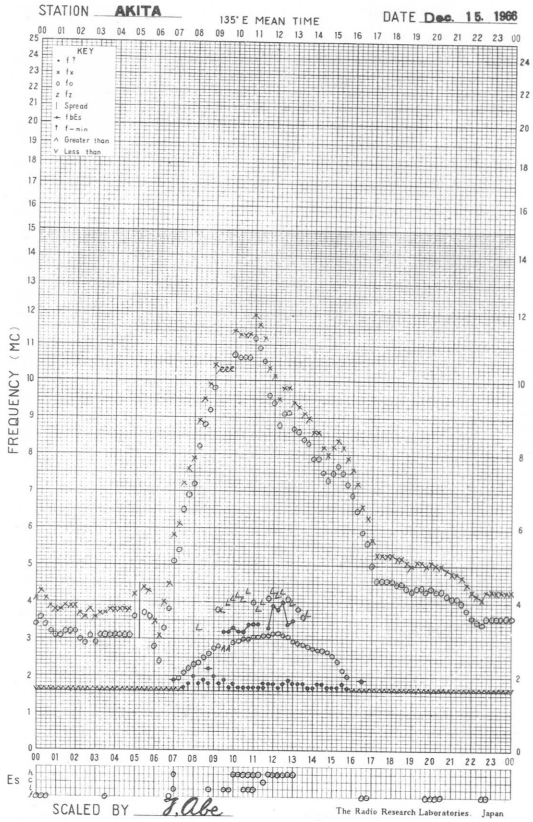

SCALED BY T. Abe

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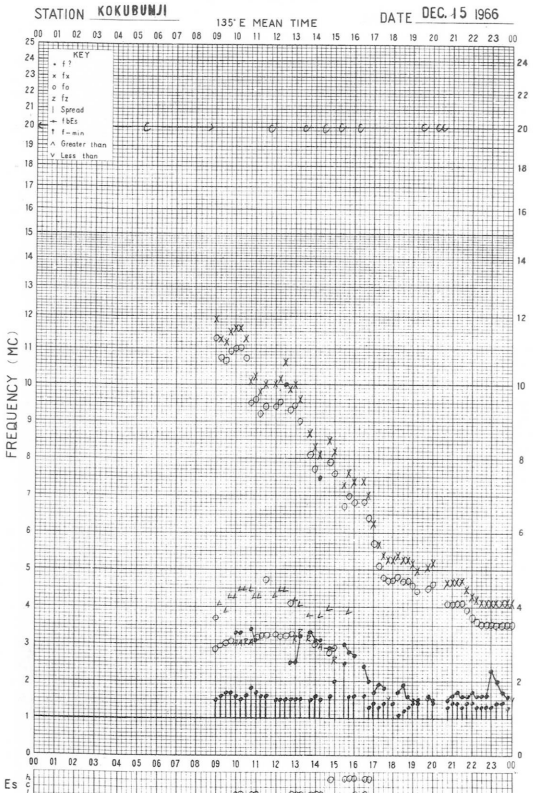

SCALED BY K. Yoshikawa

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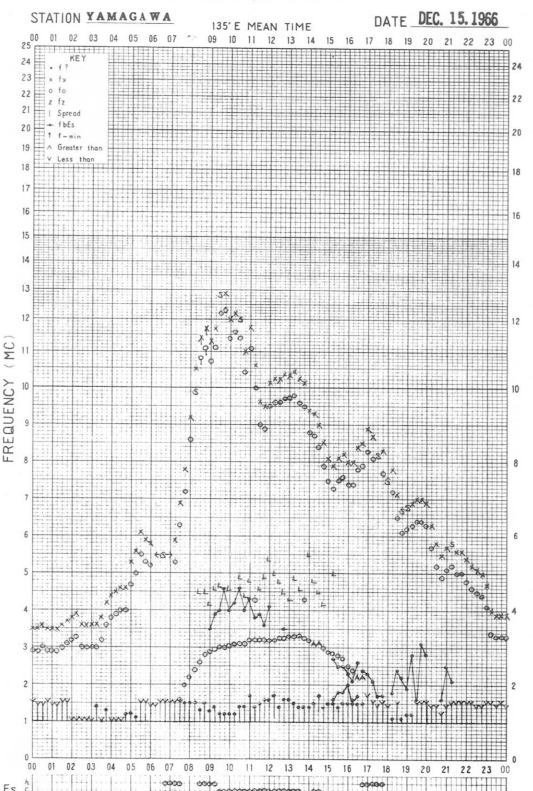

SCALED BY A. Sidomi

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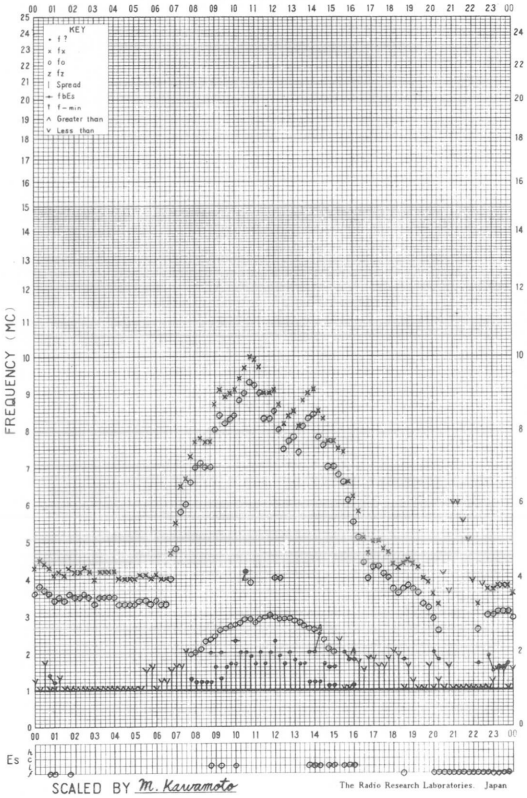

SCALED BY M. Kawamoto

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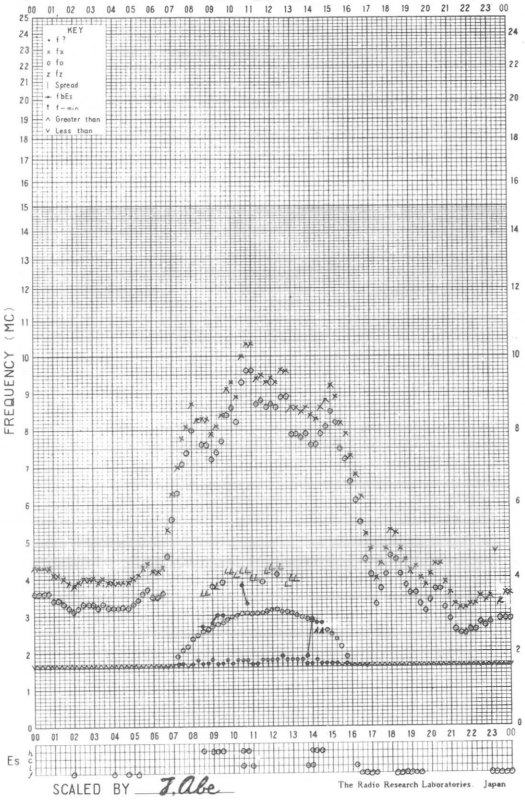

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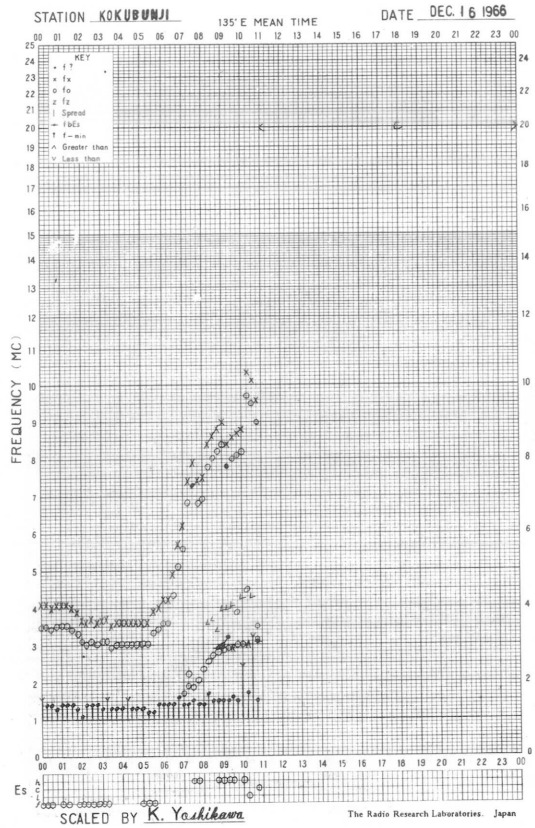

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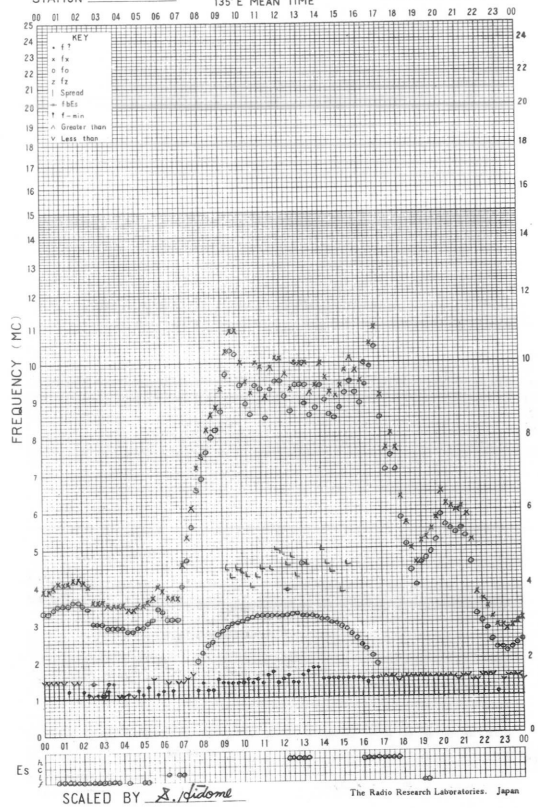

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The Radio Research Laboratories. Japan

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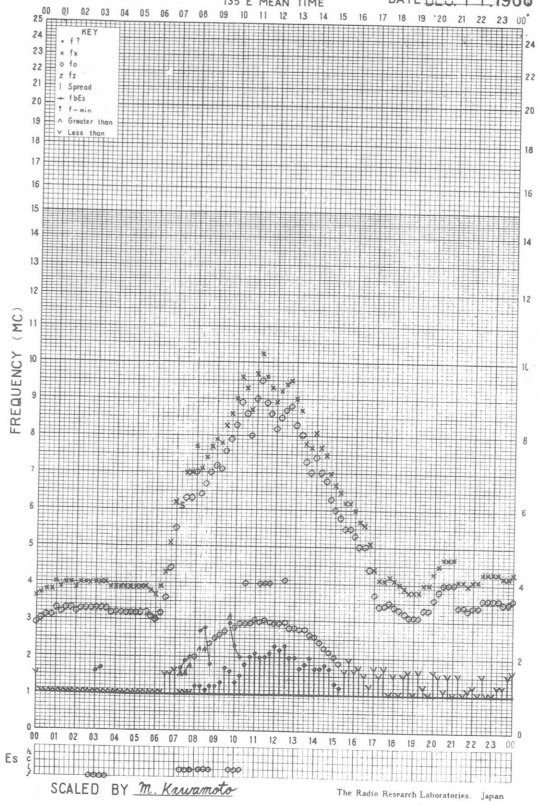

SCALED BY M. Kawamoto

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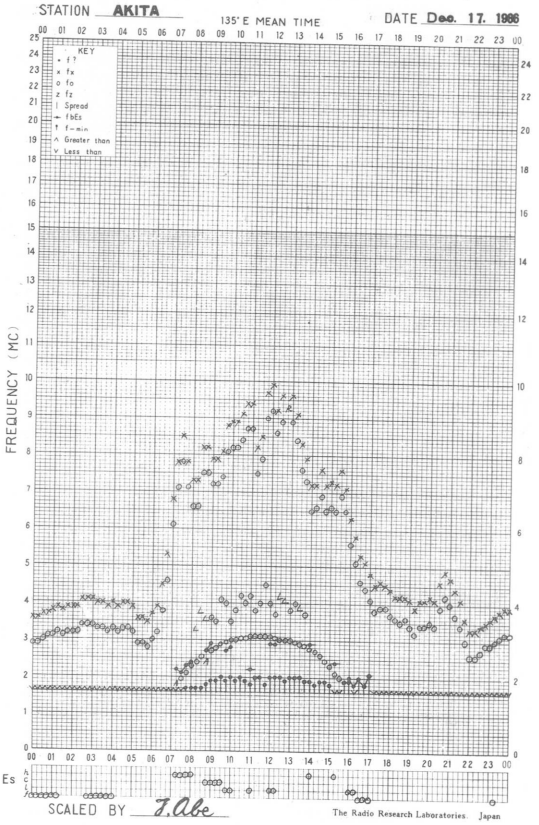

SCALED BY T. Abe

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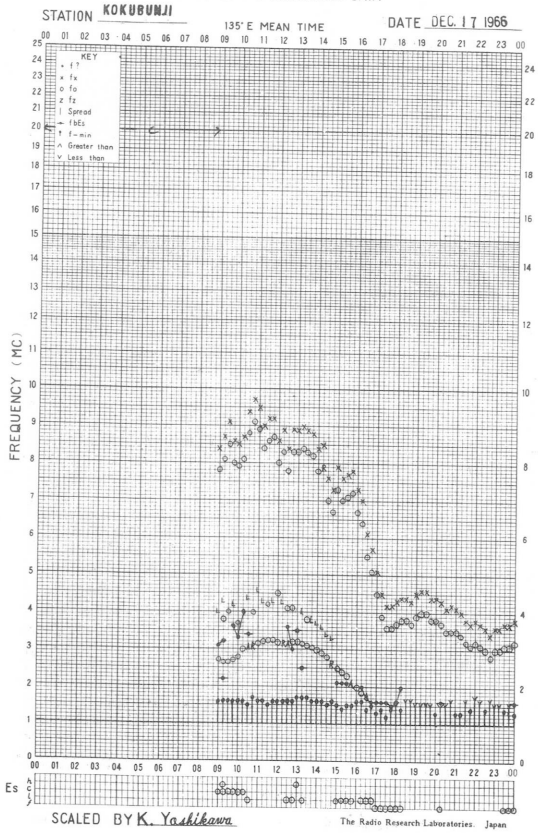

SCALED BY K. Yashikawa

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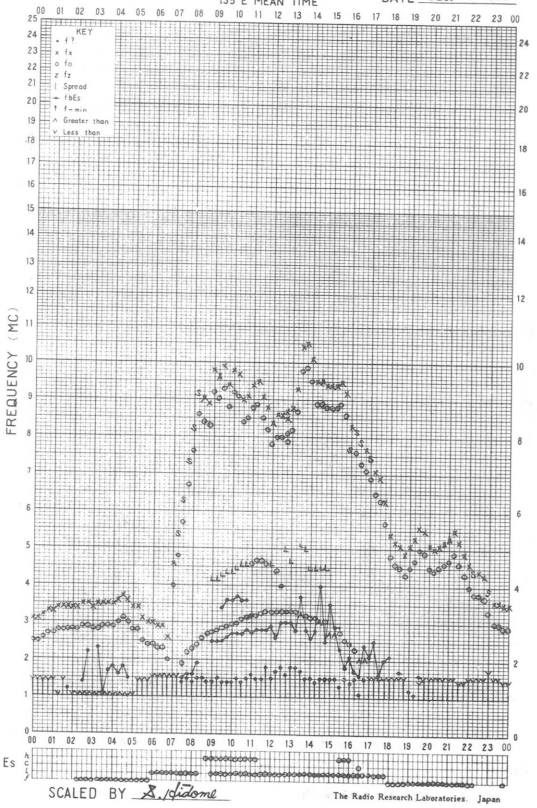

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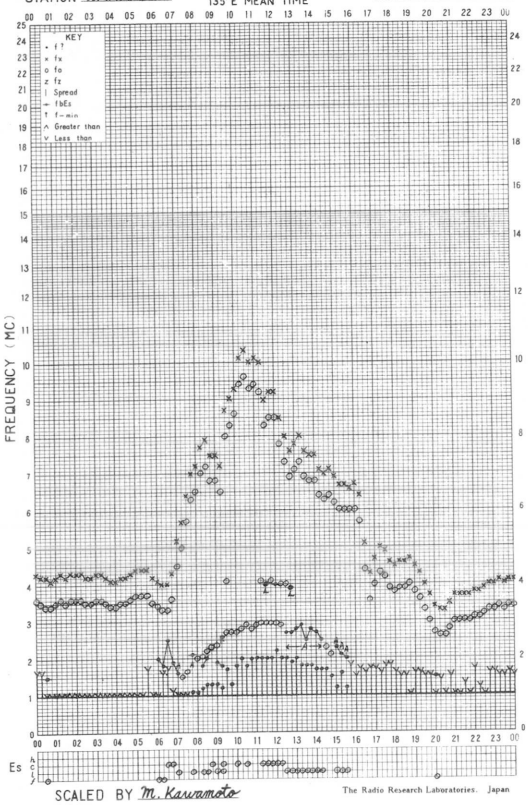

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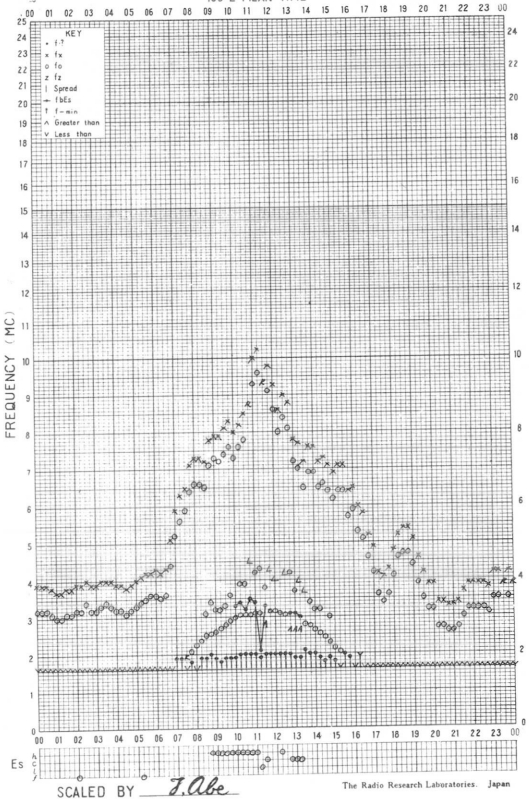

SCALED BY I. Abe

The Radio Research Laboratories. Japan

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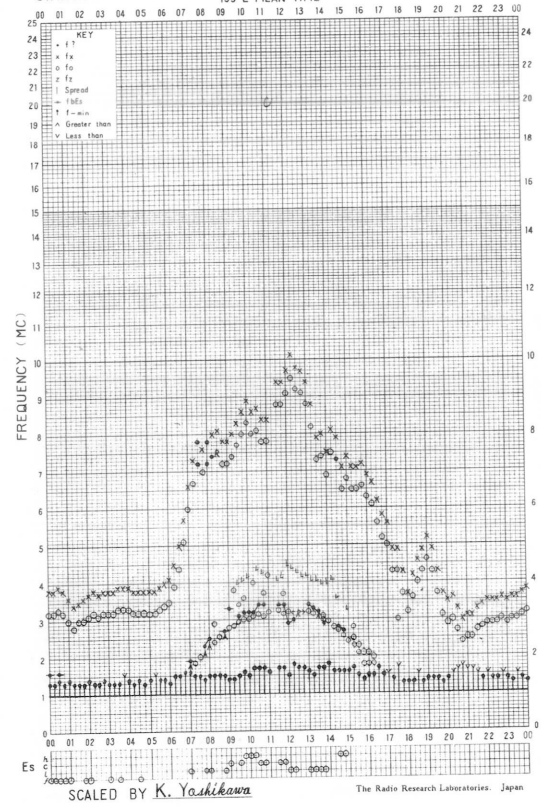

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The Radio Research Laboratories. Japan

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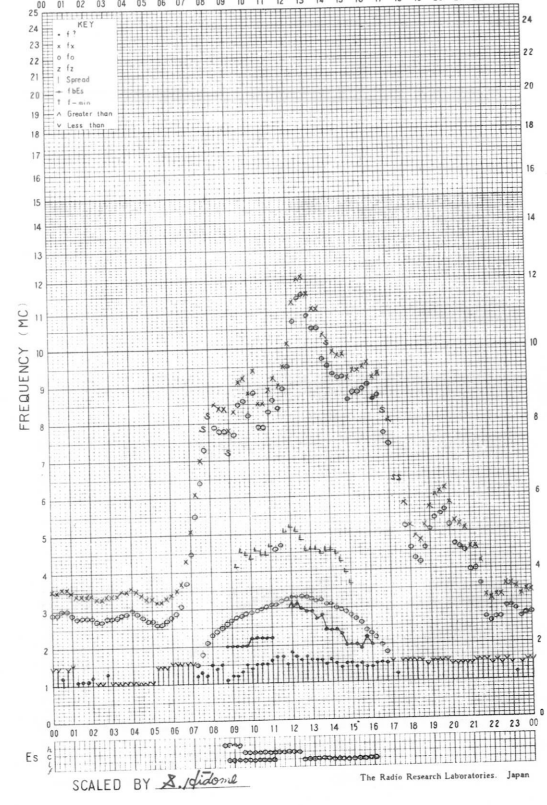

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The Radio Research Laboratories. Japan

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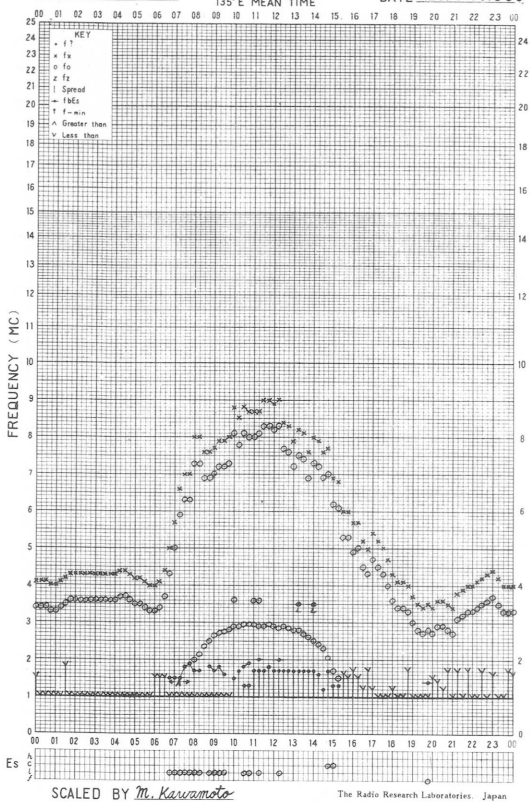

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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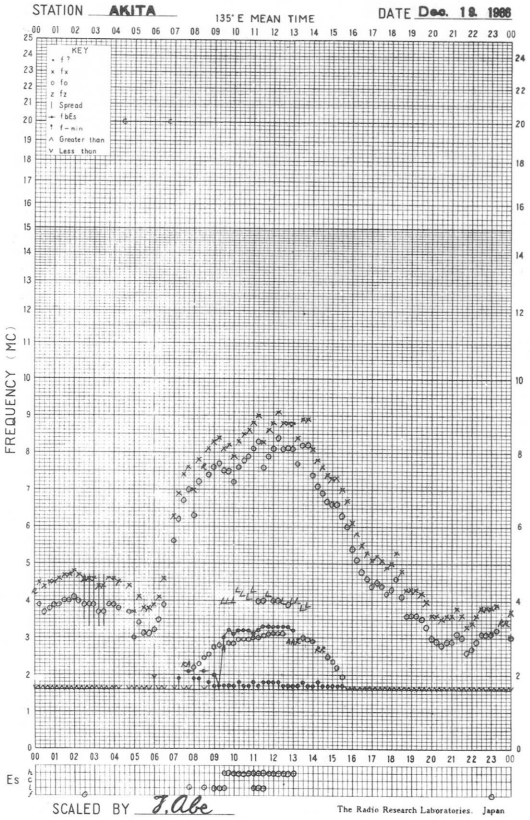

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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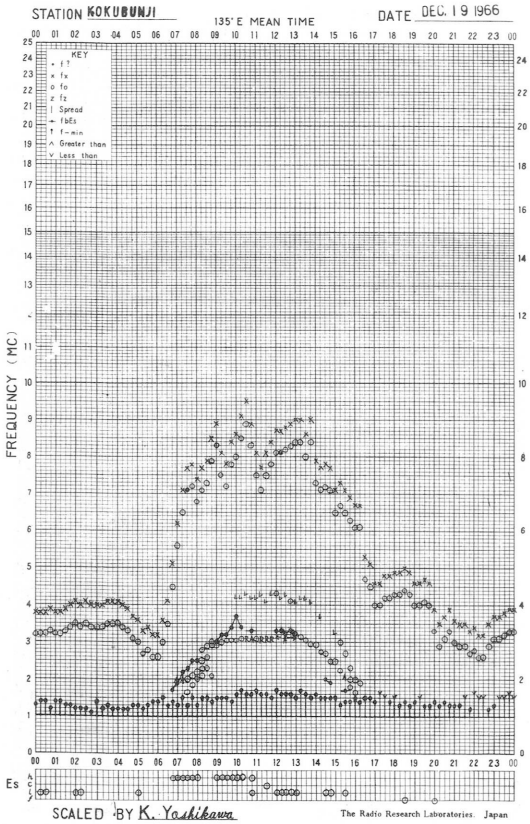

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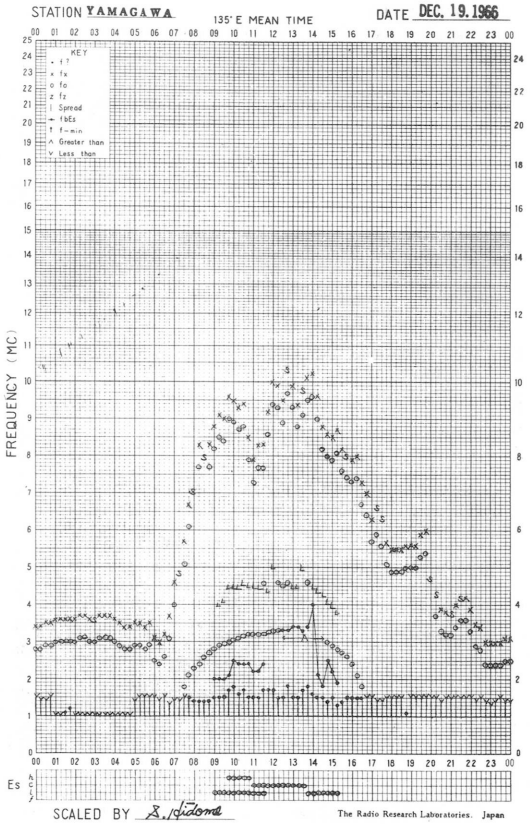

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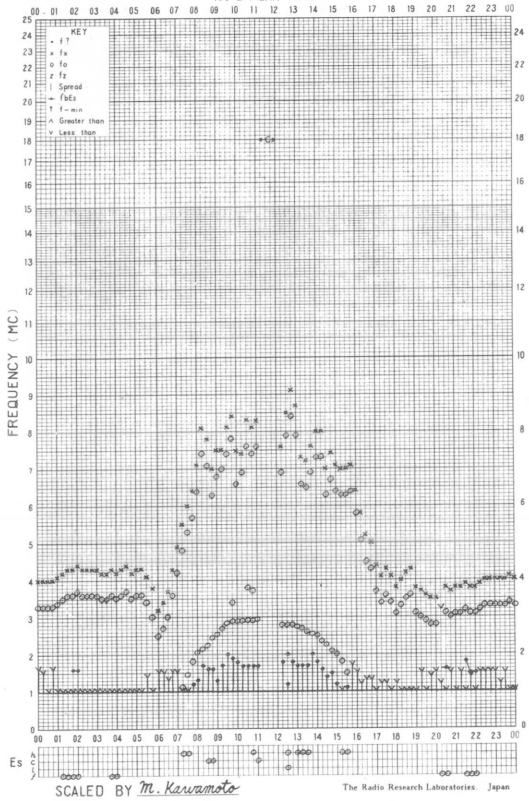

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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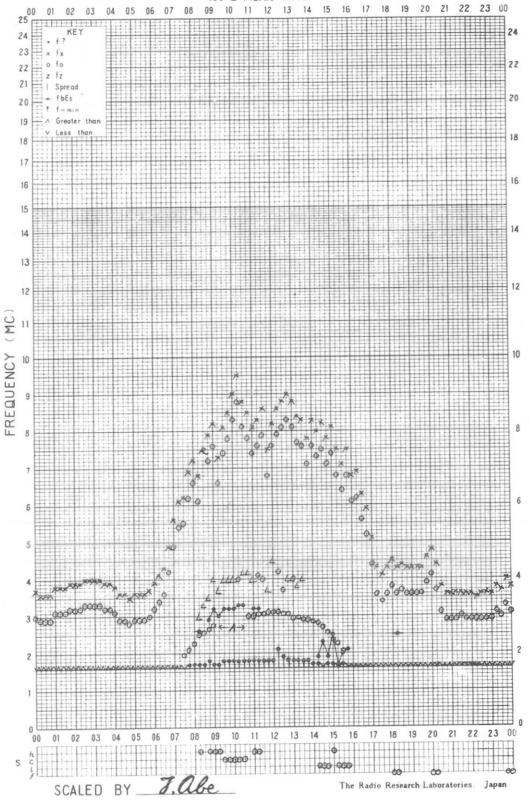

SCALED BY T. Abe

The Radio Research Laboratories. Japan

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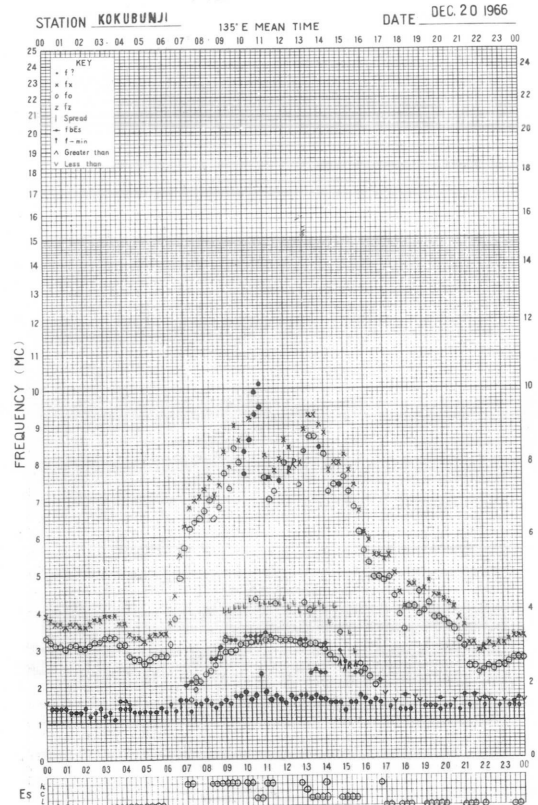

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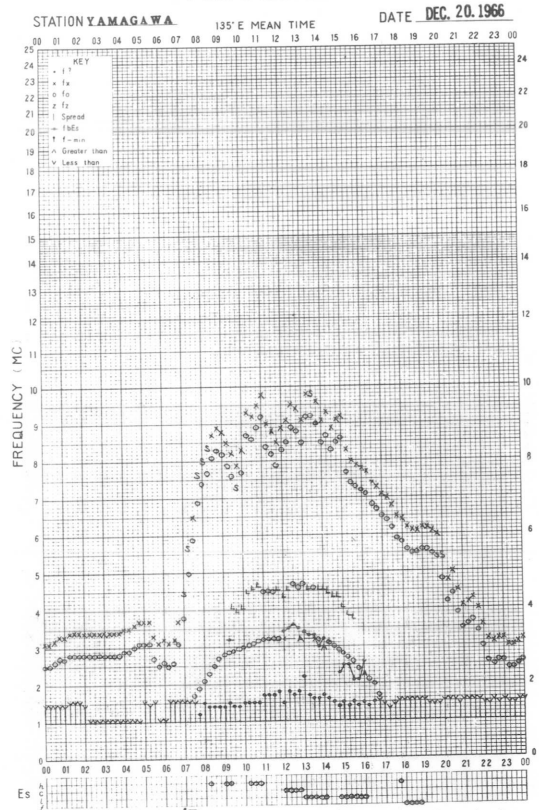

SCALED BY S. Ichidome

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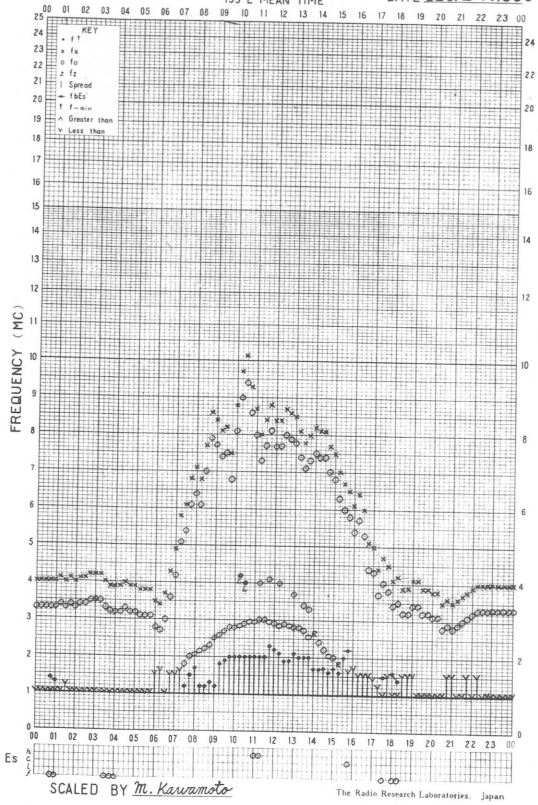

SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

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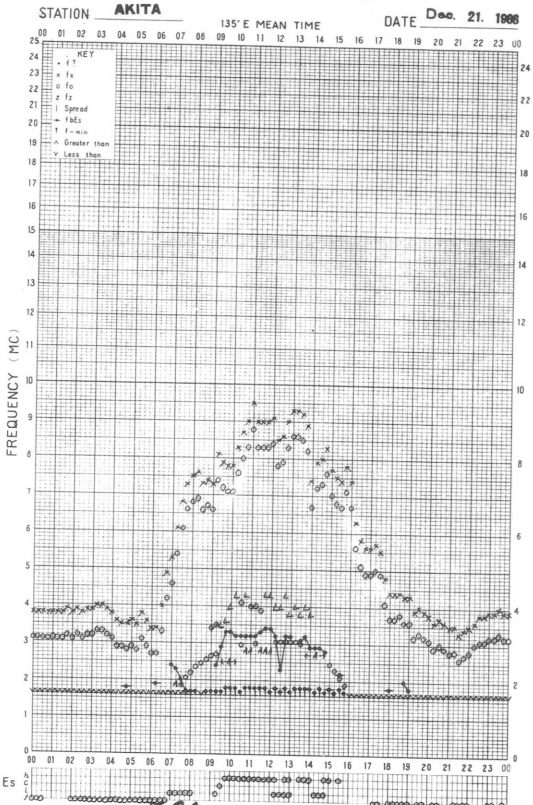

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The Radio Research Laboratories. Japan

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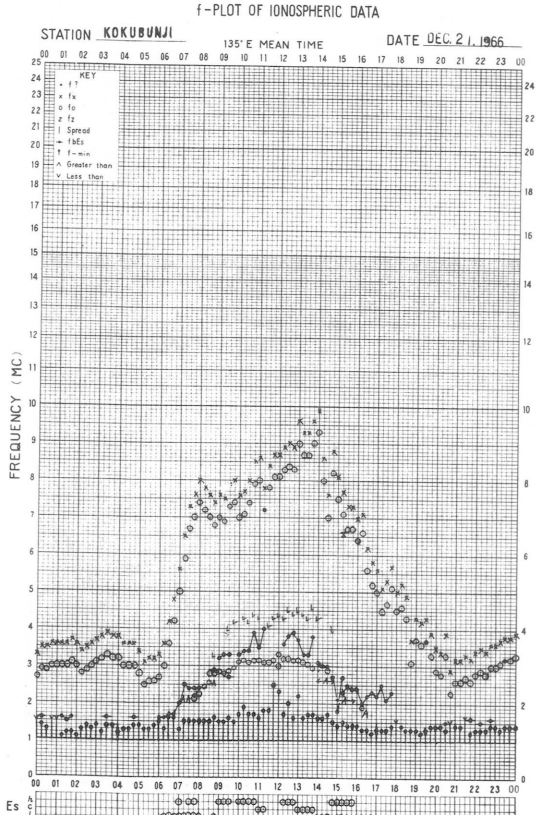

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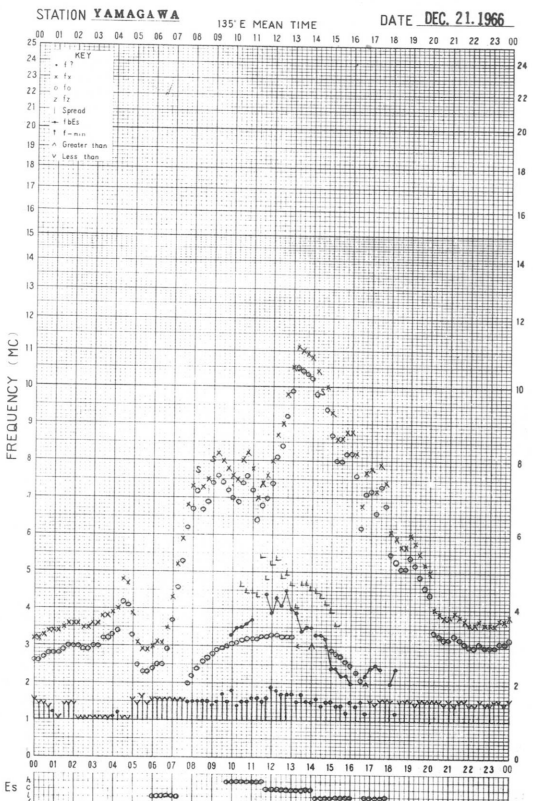

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The Radio Research Laboratories. Japan

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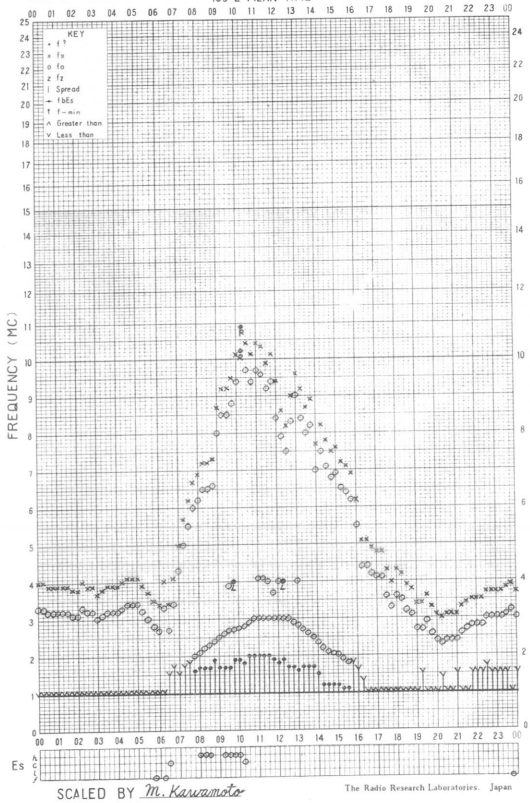

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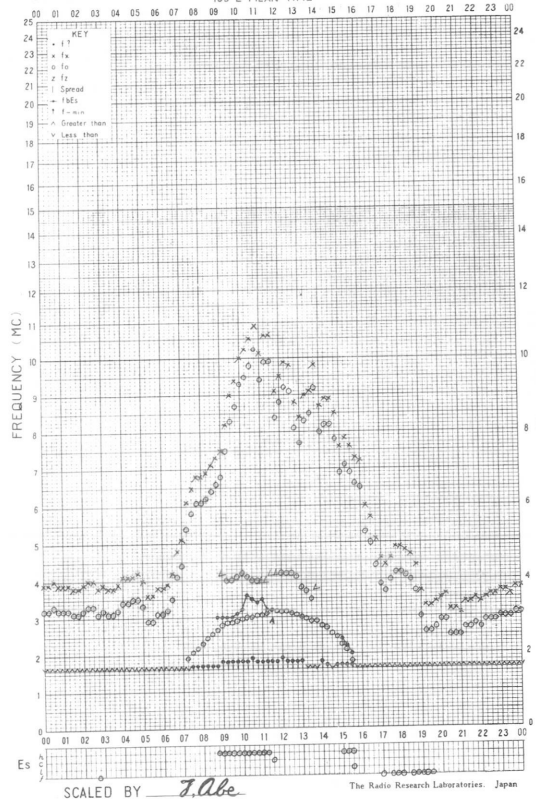

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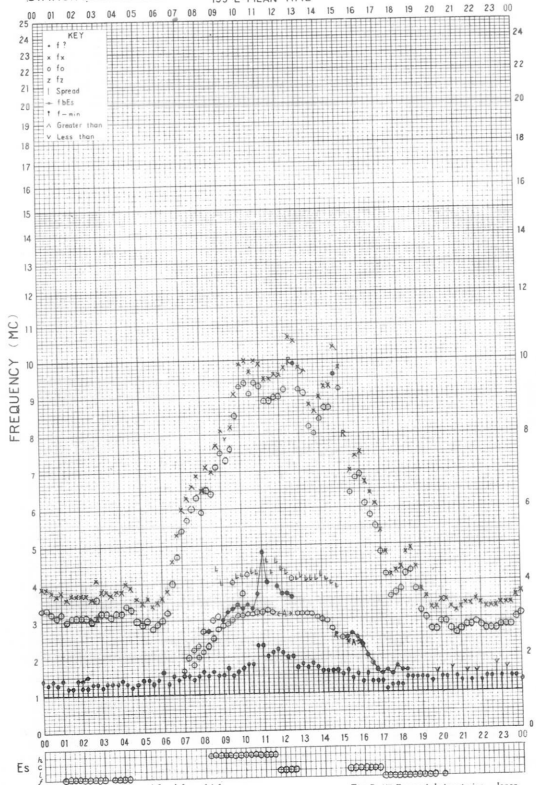

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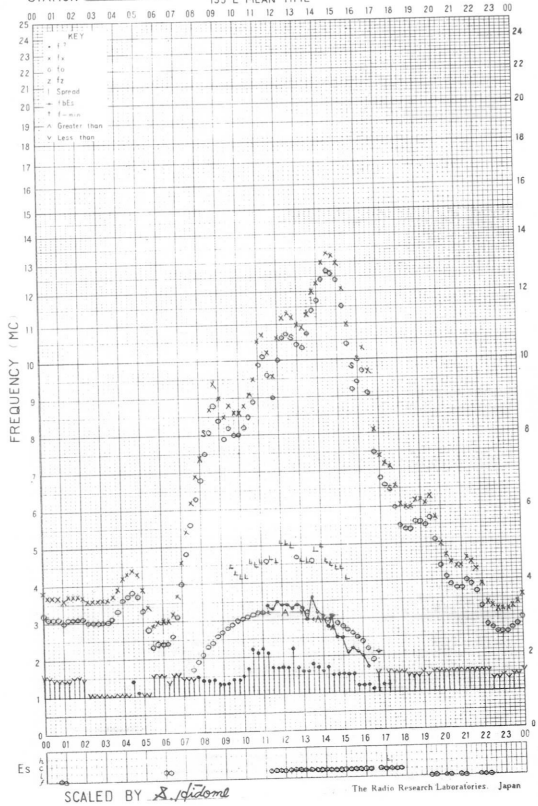

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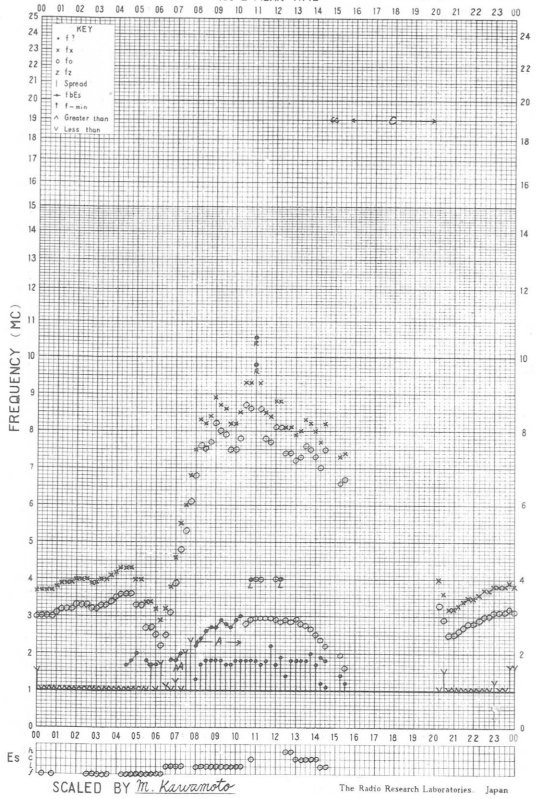

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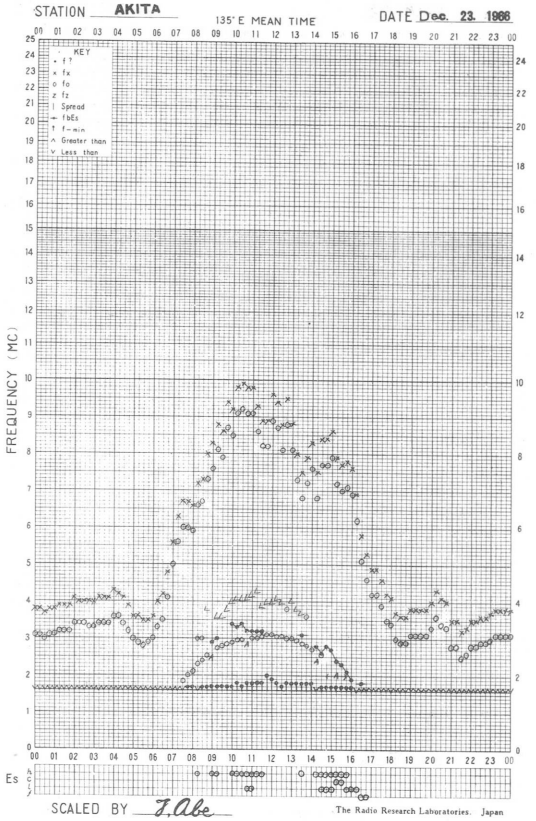

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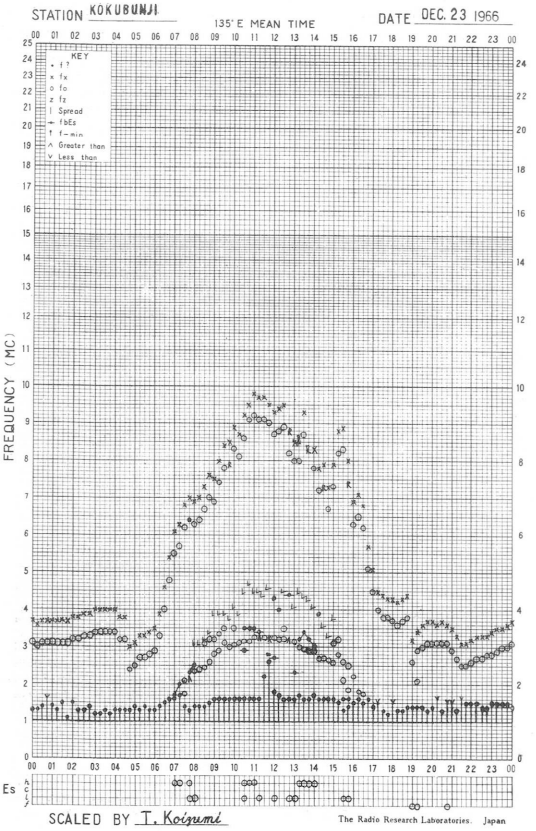

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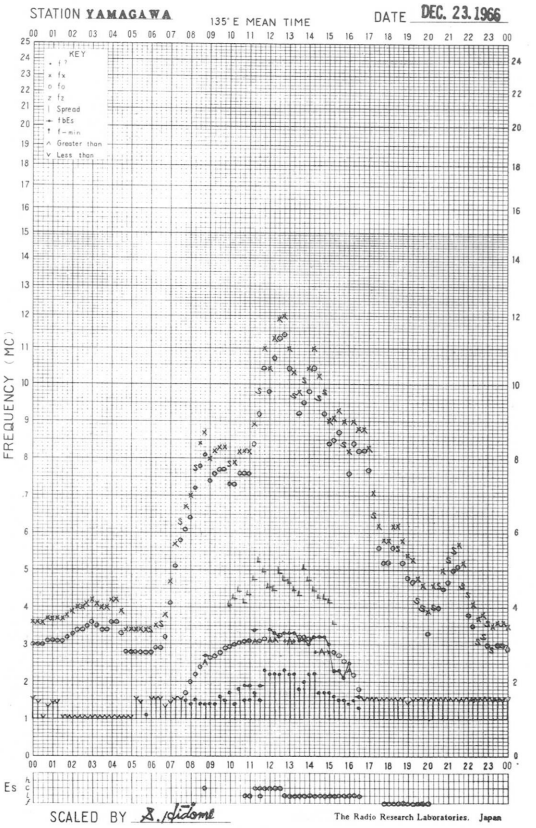

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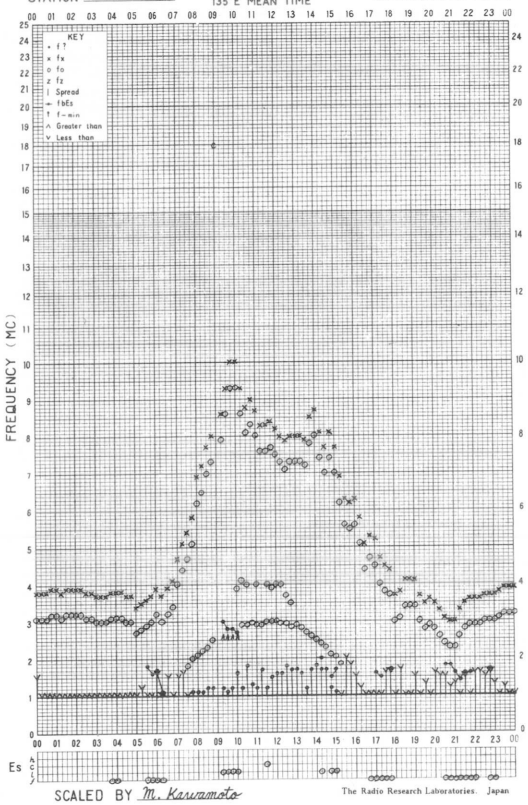

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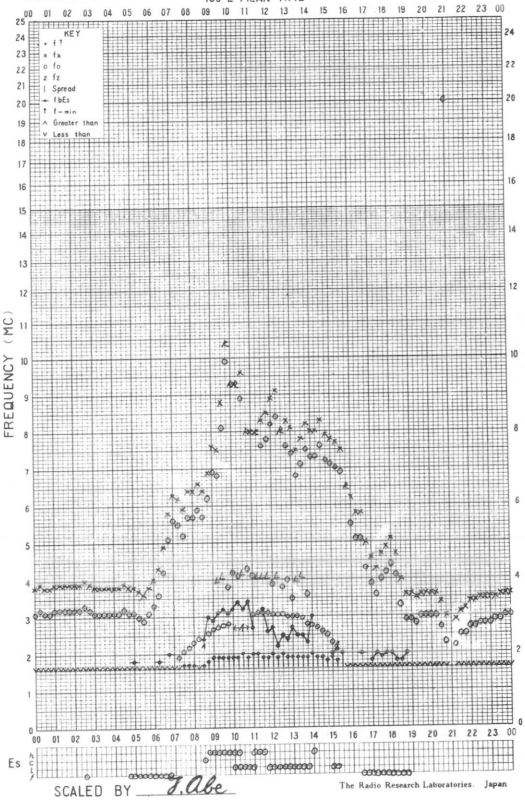

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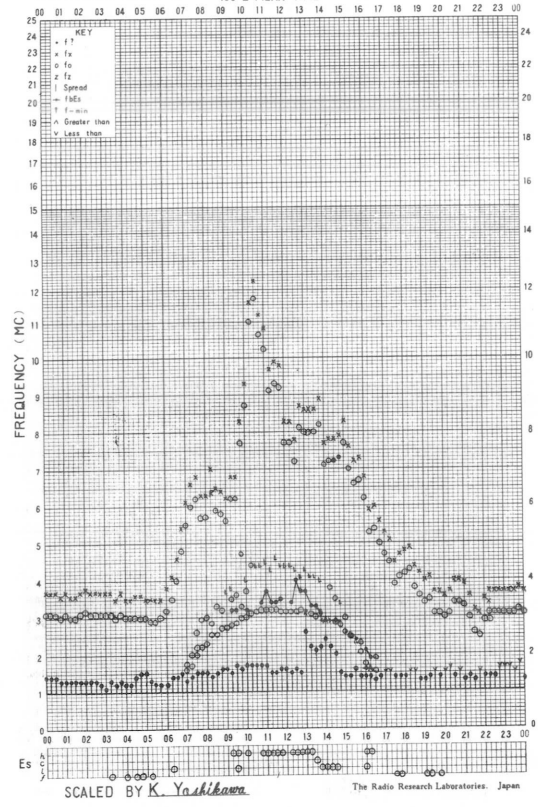

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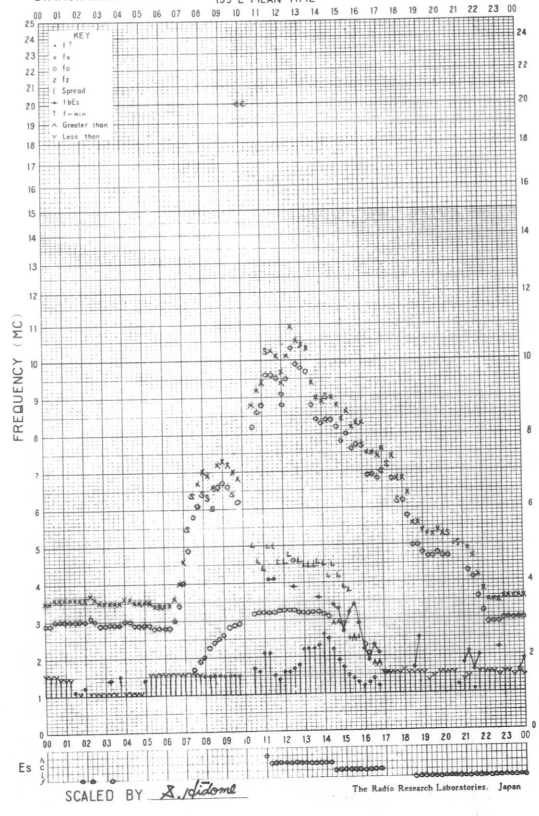

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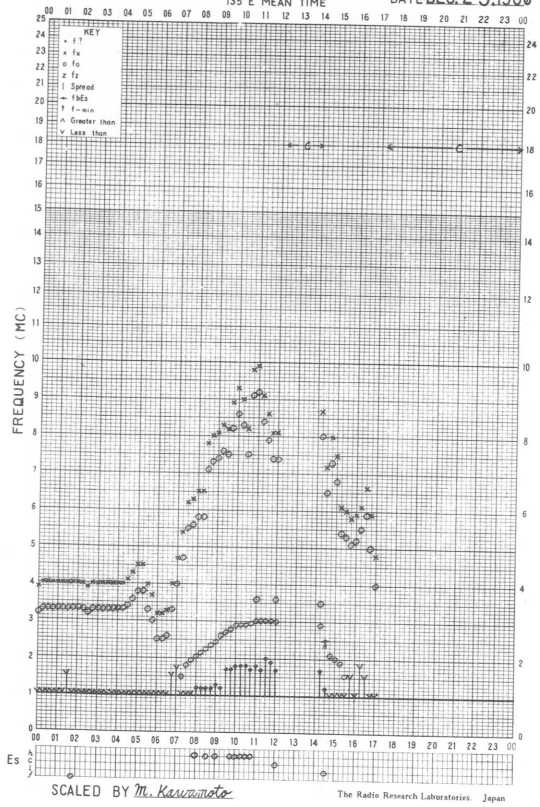

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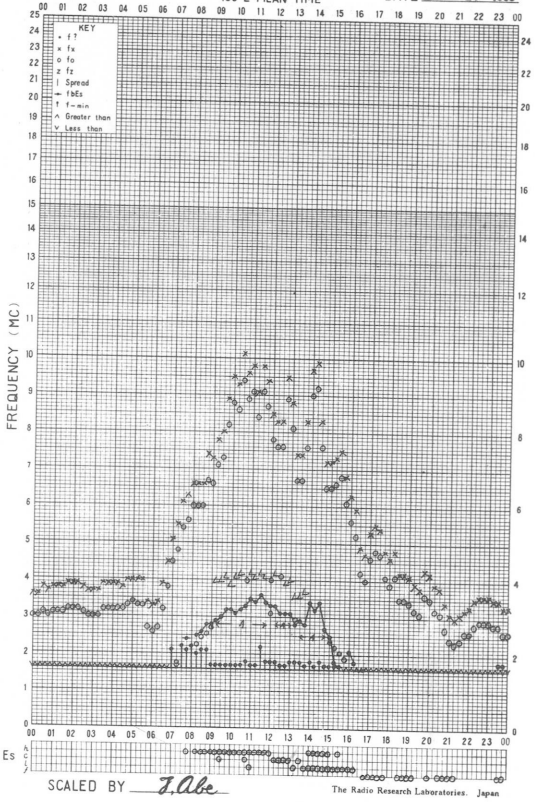
f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Dec. 25. 1966

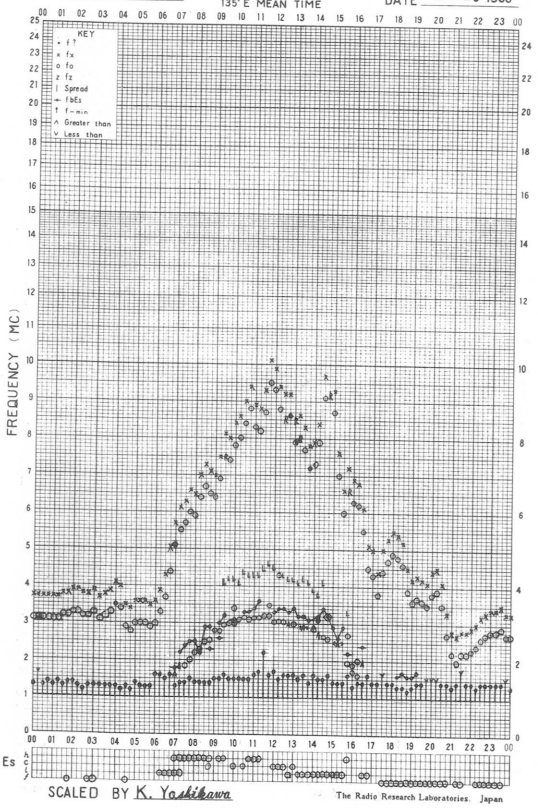


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE DEC. 25 1966

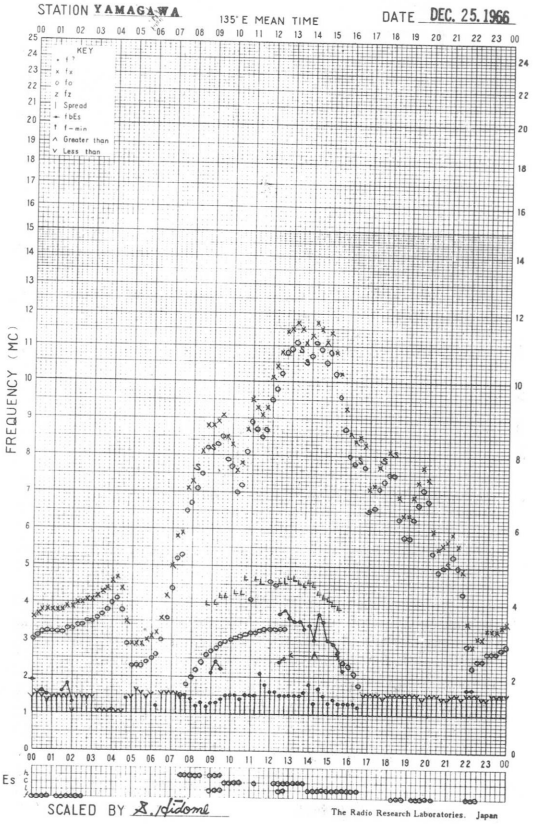


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE DEC. 25. 1966

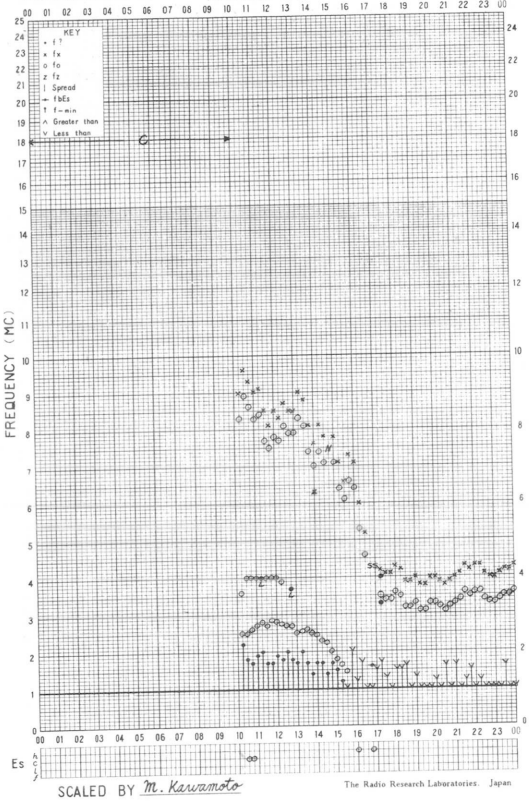


SCALED BY S. Tidomi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE DEC. 26. 1966

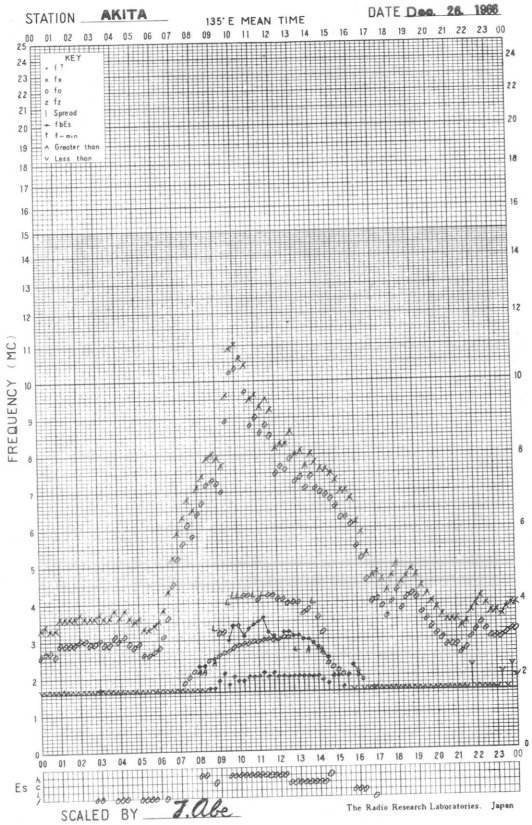


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Dec. 26. 1966

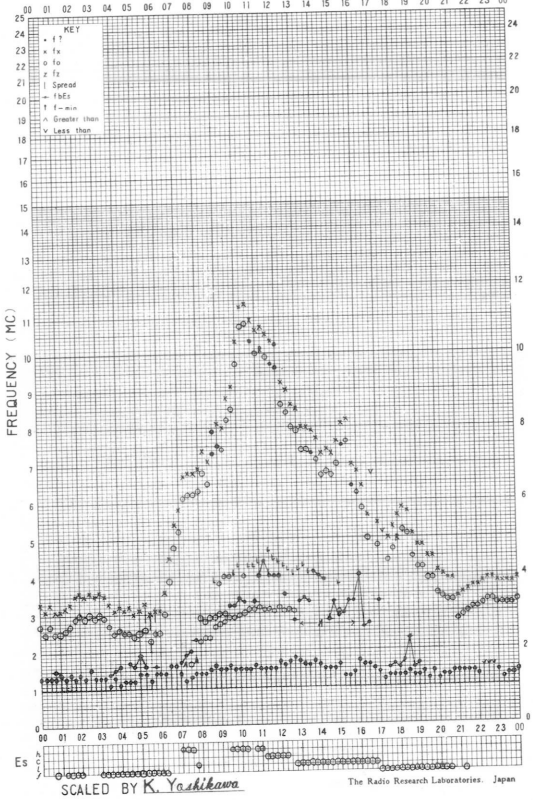


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE DEC. 26 1966

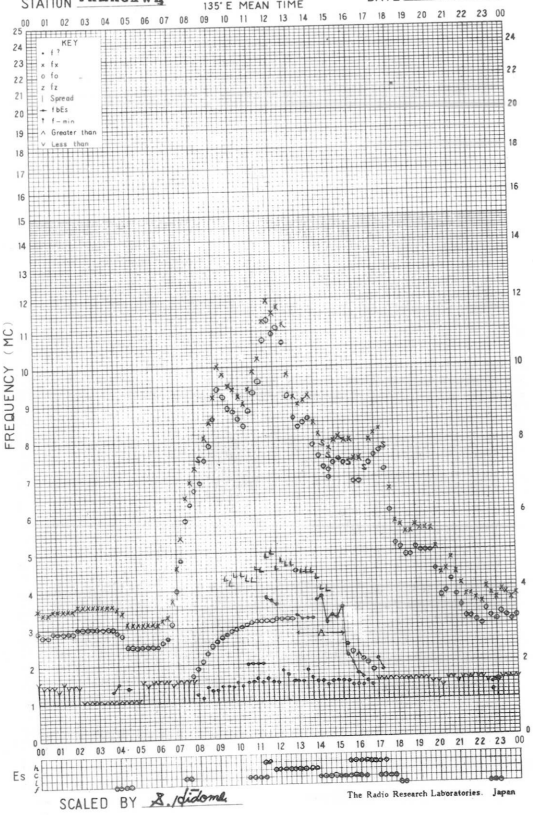


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE DEC. 26. 1966

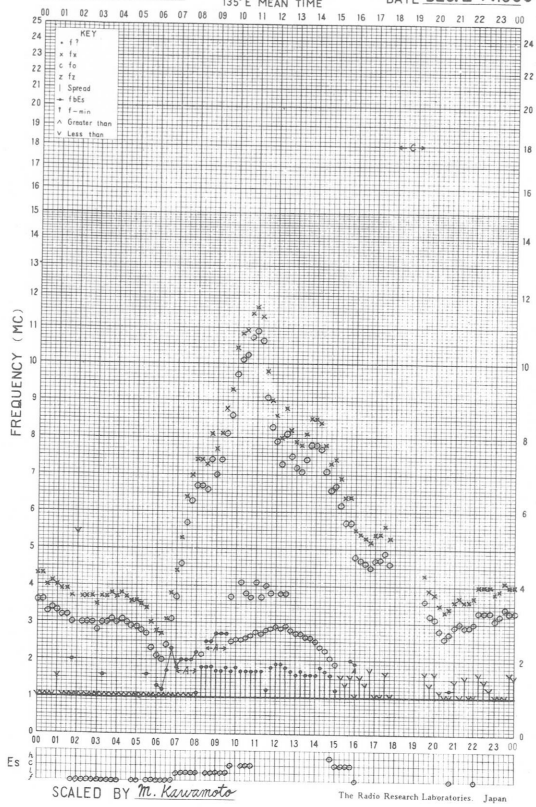


SCALED BY S. Shidomi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135° E MEAN TIME DATE DEC. 2 7. 1966

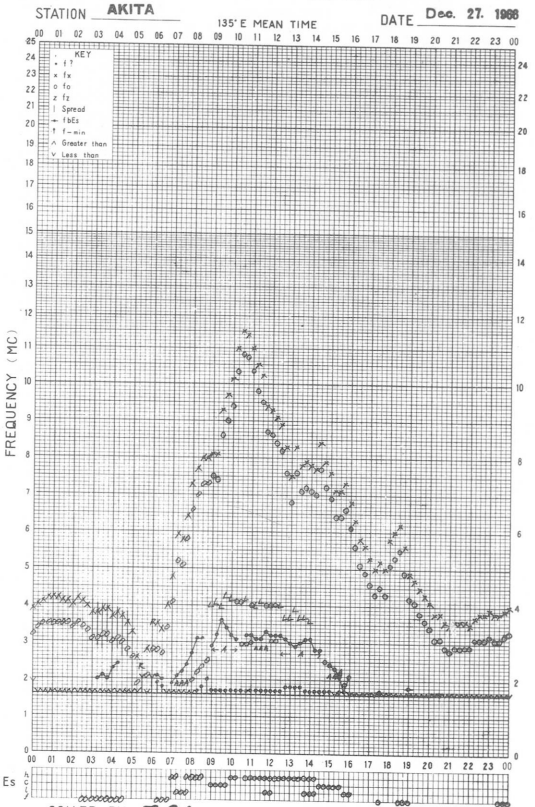


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135° E MEAN TIME DATE Dec. 27. 1966

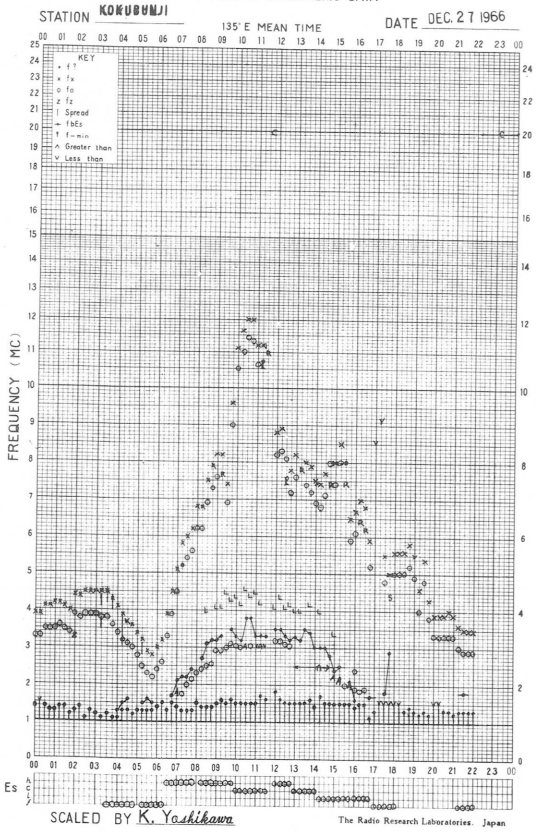


SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION KOKUBUNJI 135° E MEAN TIME DATE DEC. 2 7 1966

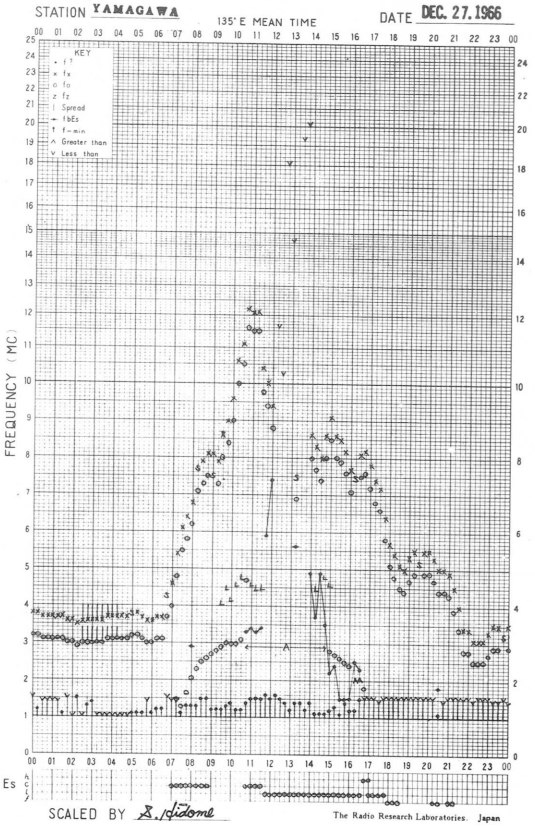


SCALED BY K. Yashikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE DEC. 27. 1966

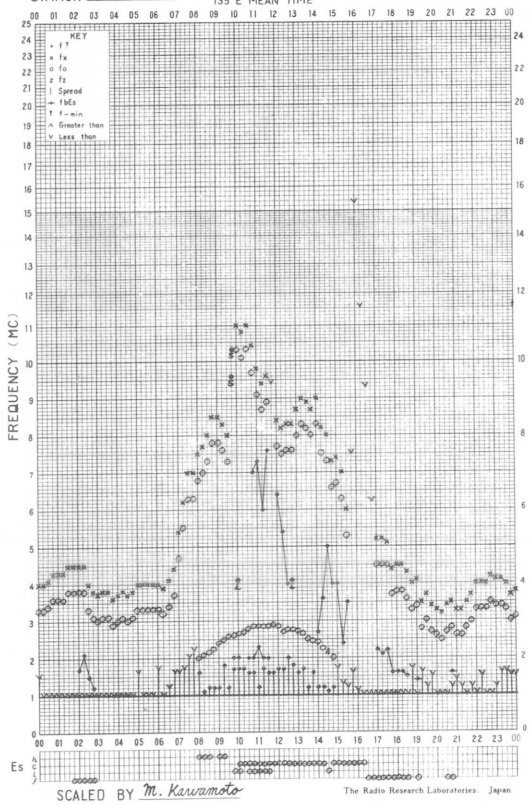


SCALED BY S. Ichidome

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

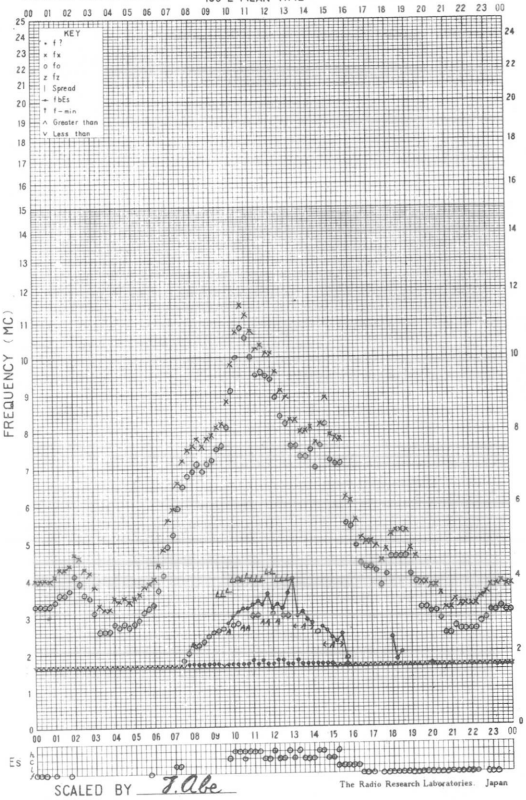
STATION WAKKANAI 135° E MEAN TIME DATE DEC. 28. 1966



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

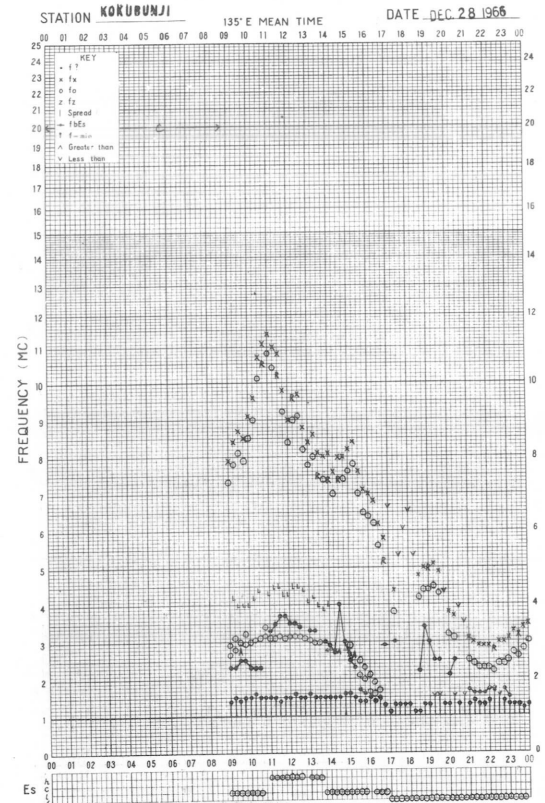
STATION AKITA 135° E MEAN TIME DATE Dec. 28. 1966



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

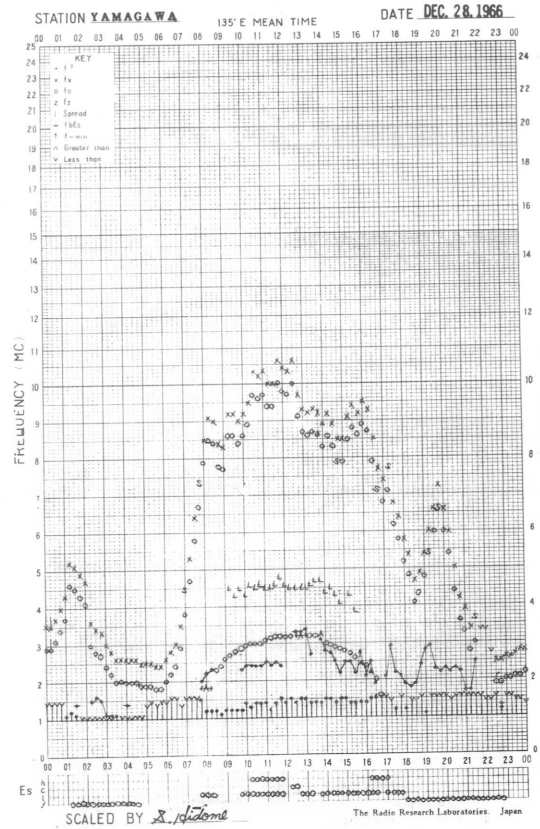
STATION KOKUBUNJI 135° E MEAN TIME DATE DEC. 28 1966



SCALED BY T. Koizumi The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

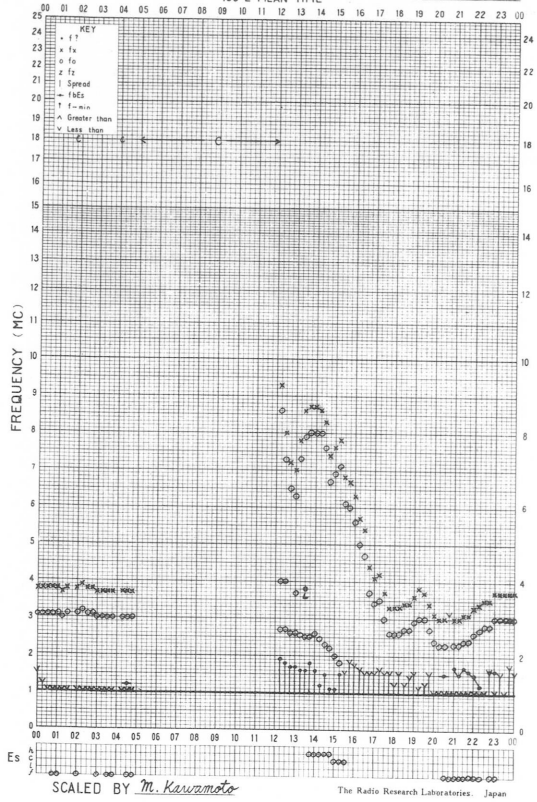
STATION YAMAGAWA 135° E MEAN TIME DATE DEC. 28. 1966



SCALED BY S. Fidome The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION WAKKANAI 135°E MEAN TIME DATE DEC. 29. 1966



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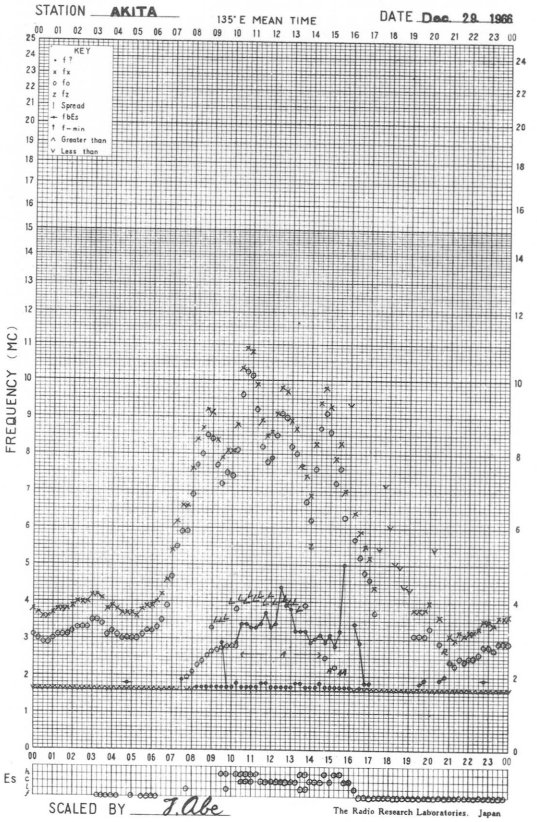

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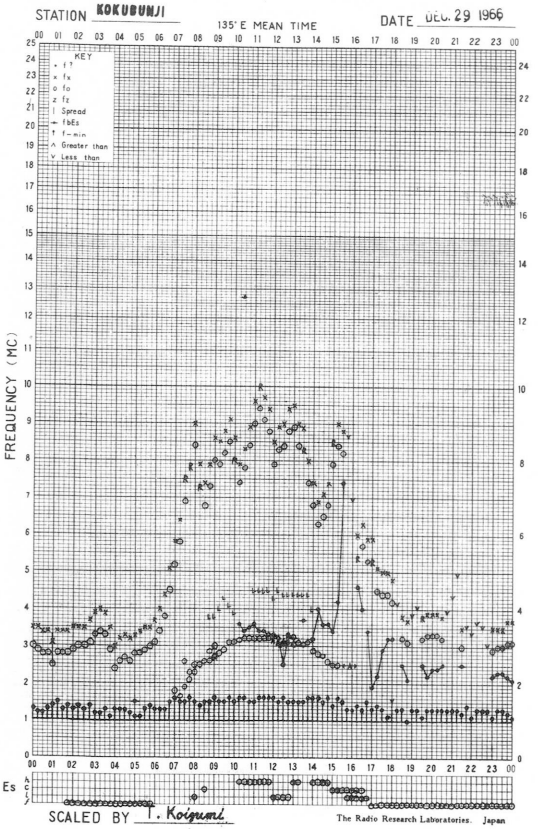

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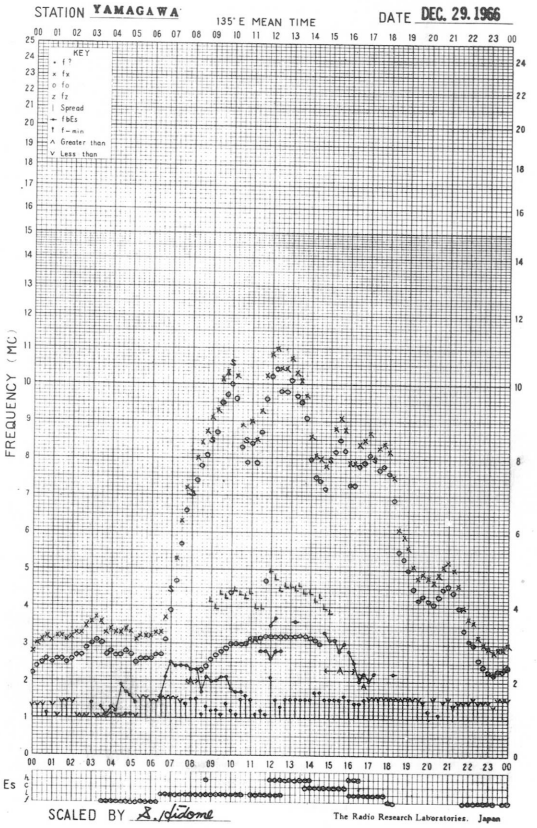

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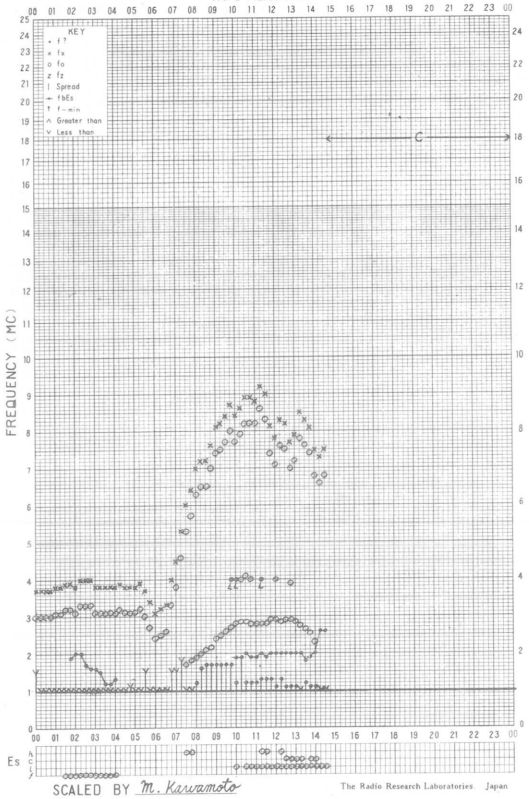
STATION WAKKANAI 135°E MEAN TIME DATE DEC. 30. 1966

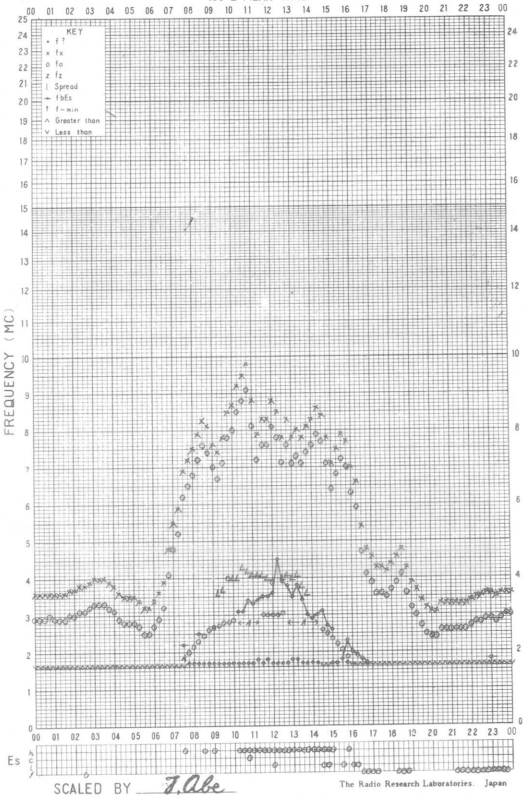


SCALED BY M. Kawamoto

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION AKITA 135°E MEAN TIME DATE Dec. 30. 1966



SCALED BY T. Abe

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

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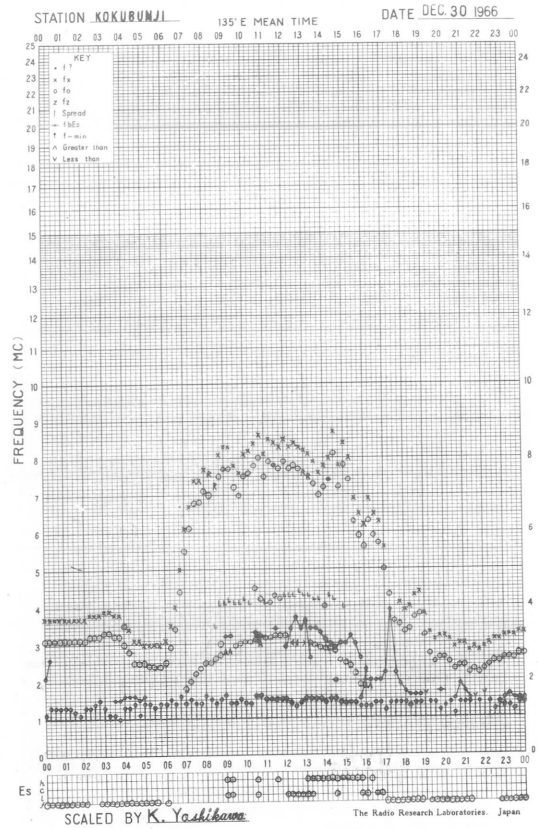
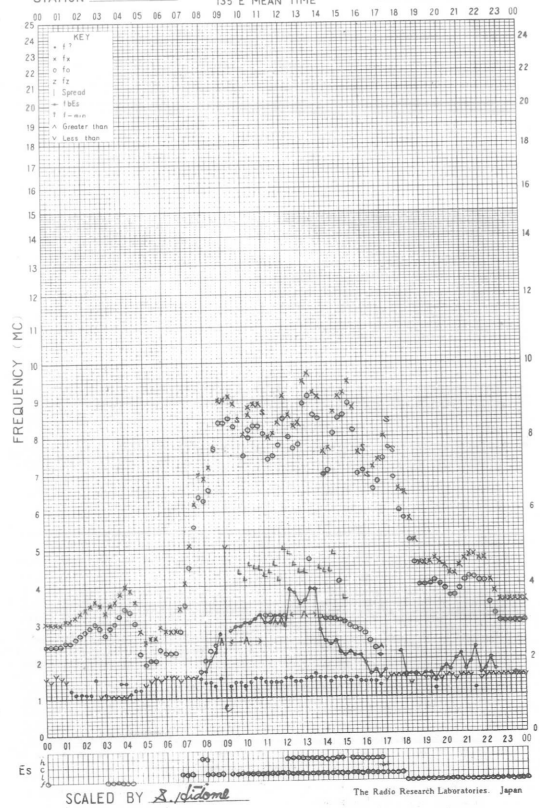


SCALED BY K. Yoshikawa

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135°E MEAN TIME DATE DEC. 30. 1966

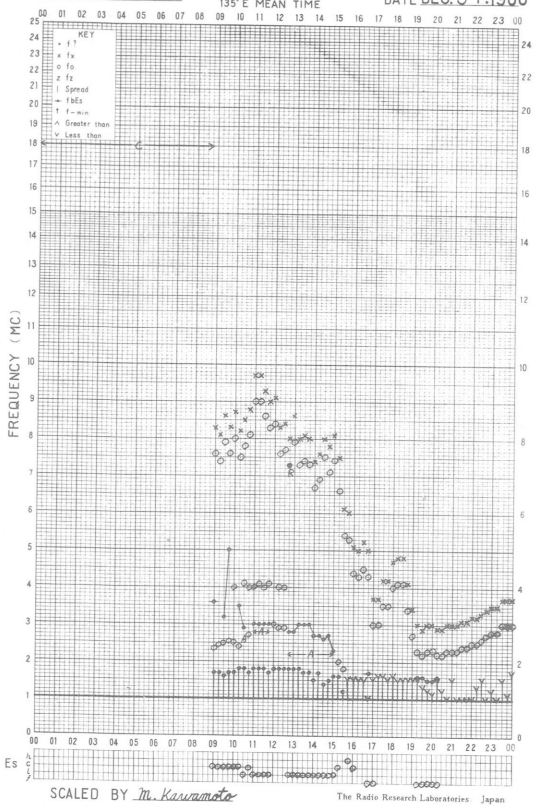


SCALED BY S. Sidomi

The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

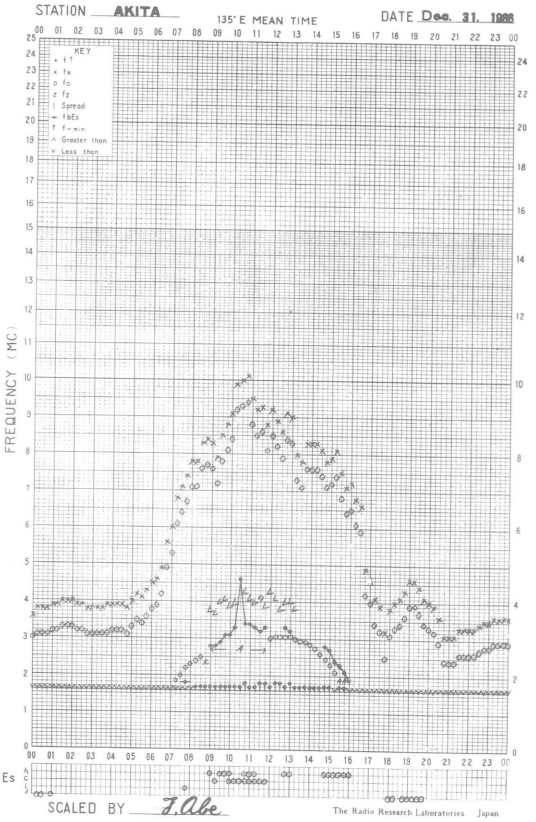
STATION WAKKANAI 135° E MEAN TIME DATE DEC. 3 1. 1966



SCALED BY M. Kawamoto The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

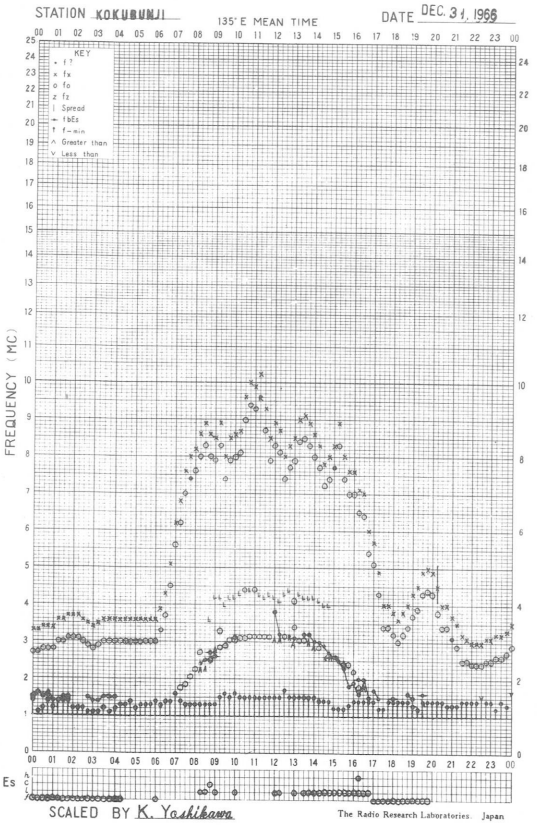
STATION AKITA 135° E MEAN TIME DATE Dec. 31. 1966



SCALED BY T. Abe The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

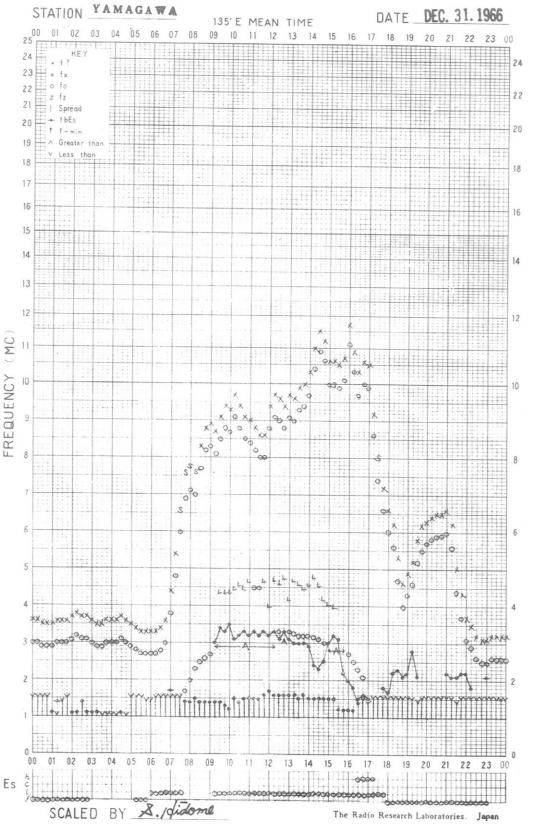
STATION KOKUBUNJI 135° E MEAN TIME DATE DEC. 31. 1966



SCALED BY K. Yoshikawa The Radio Research Laboratories. Japan

f-PLOT OF IONOSPHERIC DATA

STATION YAMAGAWA 135° E MEAN TIME DATE DEC. 31. 1966



SCALED BY S. Ajisawa The Radio Research Laboratories. Japan

SOLAR RADIO EMISSION

Flux Density and Variability

Month: December 1966
Observing station: Hiraiso
Frequency: 200 Mc/s

	Flux density 10^{-22} Wm^{-2}(c/s)$^{-1}$					Variability 0 to 3				
UT	00-03	03-06	06-09	21-24	Day	00-03	03-06	06-09	21-24	Day
Date										
1	9	8	(7)	(7)	8	0	0	(0)	(0)	0
2	8	8	(7)	(7)	8	0	0	(0)	(0)	0
3	8	7	(7)	(7)	7	0	0	(0)	(0)	0
4	8	9	(7)	(7)	8	0	0	(0)	(0)	0
5	9	7	(7)	(7)	8	0	0	(0)	(0)	0
6	7	8	(7)	(7)	7	0	0	(0)	(0)	0
7	7	8	(7)	-	7	0	0	(0)	-	0
8	8	8	(7)	-	8	0	0	(0)	-	0
9	14	12	(9)	-	12	1	0	(0)	-	1
10	19	33	(43)	(20)	28	2	2	(2)	(1)	2
11	20	22	(18)	-	20	1	1	(0)	-	1
12	22	23	(21)	(52)	22	1	1	(0)	(2)	1
13	33	20	(21)	-	29	2	2	(1)	(1)	2
14	16	21	(14)	-	18	0	0	(0)	-	0
15	-	-	-	-	-	-	-	-	-	-
16	9	11	(15)	-	11	0	0	(0)	-	0
17	(9)	10	(9)	(7)	9	(0)	0	(0)	(0)	0
18	9	9	(9)	(9)	9	0	0	(0)	(0)	0
19	9	8	(9)	(12)	9	0	0	(0)	(0)	0
20	10	10	(10)	(15)	10	0	0	(0)	(0)	0
21	13	12	(10)	(12)	13	1	0	(0)	(0)	0
22	12	12	(12)	(10)	12	0	0	(0)	(0)	0
23	11	10	(10)	(12)	10	0	1	(0)	(0)	0
24	11	12	(9)	(8)	11	0	0	(0)	(0)	0
25	12	10	(10)	(9)	10	0	0	(0)	(0)	0
26	9	8	(9)	(10)	9	0	0	(0)	(0)	0
27	11	12	(12)	(10)	11	0	0	(0)	(0)	0
28	11	12	(11)	(10)	11	0	0	(0)	(0)	0
29	10	12	(12)	(10)	11	0	0	(0)	(0)	0
30	(12)	14	(13)	(10)	13	(0)	0	(0)	(1)	0
31	10	(8)	-	14	9	0	(0)	-	1	0

Note No observations during the following periods:

7th	2140-		2400	16th	0500-		0600
8th	2140-	9th	0030	16th	2140-	17th	0200
9th	2140-		2400	29th	2300-	30th	0200
11th	2140-		2400	31st	0120-		0140
13th	2140-		2400	31st	0300-		0400
14th	2140-	16th	0100	31st	0600-		0730

SOLAR RADIO EMISSION

Flux Density

Month: December 1966
Observing station: Hiraiso Frequency: 500 Mc/s

Flux density 10^{-22} $Wm^{-2}(c/s)^{-1}$

UT	00-03	03-06	06-09	21-24	Day
Date					
1	29	29	(27)	28	28
2	29	29	(28)	-	29
3	28	28	(28)	28	28
4	29	30	(28)	29	29
5	30	31	(29)	(31)	30
6	29	29	(29)	(29)	29
7	31	30	(28)	(30)	30
8	31	30	(29)	-	30
9	-	-	-	(39)	-
10	46	52	(40)	(38)	47
11	39	38	(37)	(37)	38
12	37	38	(34)	(37)	37
13	39	38	(35)	(40)	38
14	42	39	(38)	(40)	40
15	-	-	-	-	(40)
16	-	-	-	(38)	-
17	36	35	(34)	(34)	35
18	33	32	(31)	(34)	33
19	34	33	-	-	33
20	33	32	(32)	(32)	32
21	33	32	(32)	(32)	33
22	32	32	(32)	(32)	32
23	34	31	-	(32)	32
24	32	31	(30)	(32)	31
25	33	32	(31)	(34)	32
26	33	32	(30)	(30)	33
27	32	31	(29)	(32)	31
28	31	32	-	(30)	32
29	29	30	(31)	(31)	30
30	31	30	(30)	(31)	31
31	31	32	(31)	(30)	31

Note No observations during the following periods:

8th 2140- 9th 0730
15th 0000- 16th 0730
19th 0600- 20th 0100
23rd 0600- 0730
28th 0600- 0730

Distinctive Events

(single-frequency observations)

Month: December 1966
Observing station: Hiraiso
Normal observing period: 2140 - 0730 (sunrise to sunset)

Date	Frequency	Starting time	Time of maximum	Duration	Type	Flux density $10^{-22}Wm^{-2}(c/s)^{-1}$		Remarks
	Mc/s	UT	UT	minutes		peak	mean	
10	200	0510 ~ 0725 (ss)			storm			
12-13	200	sunrise to sunset						*
13	500	2303	2309	12	S	36	10	
13-14	200	sunrise to sunset						**
21	500	0355	0356.5	2	C	27	5	
	200	0354.5	-	4.5	C	1530	320	
23	500	0404	0404	1	C	50	3	
	200	0403.5	0403.5	1	C	490	85	
30	500	2232.8	2235.3	5	C	330	47	
	200	2233	2235.4	7	C	1200	90	

* moderate noise storm

** slightly stormy

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

Dec. 1966 Frequency: 15 Mc/s, Bandwidth: ±40 c/s, 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	12	10	14	-21	<- 3s	<- 1s	< 0s	< 4s	< 1s	<-15s	<-35s	<-15s	<-36s	<-36s	<-36s	<-36s	(-36)s	-23	<-36s	-21	<-35s	3	8	7
2	6	10	< 0s	< 1s	<- 4s	< 1s	<- 4s	<- 1s	<- 2s	<-10s	<-27s	<-25s	<-37s	<-37s	<-37s	<-37s	<-37s	<-37s	<-36s	<-36s	<-10s	- 1	9	12
3	17	- 1	- 9	4	< 1s	<- 2s	<- 3s	<- 2s	<-17s	<-31s	<-19s	<-19s	<-36s	<-37s	<-37s	-12	<-36s	0	- 1	-26	-35	2	9	11
4	9	- 5	<-22s	<-16s	<- 8s	<- 3s	<- 3s	<- 9s	<-12s	<-22s	<-25s	<- 7s	<-28s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	- 2	3
5	9	11	7	C	<-16s	<- 4s	<- 9s	<- 9s	<-23s	<-30s	<-34s	<- 8s	<-37s	<-37s	<-37s	-36	<-37s	<-37s	<-37s	<-36s	<-36s	<-36s	- 1	6	8
6	8	12	10	- 7	< 5s	<- 4s	<-22s	<-23s	<-27s	<-25s	<-29s	<-25s	<-34s	<-34s	<-34s	S	C	S	S	C	-11	7	9	12
7	(2)s	10	1	< 0s	- 9	<- 2s	-27	-27	<-21s	<-34s	<-26s	<-21s	<-35s	<-35s	<-35s	<-36s	<-36s	<-36s	<-36s	<-36s	-25	5	13	12
8	14	11	<-15s	<-25s	< 2s	<-13s	<-21s	<-17s	<-26s	<-28s	<-34s	<-33s	<-36s	<-36s	<-36s	<-36s	<-36s	<-35s	-18	-23	- 7	12	15	13
9	18	6	-17	<- 4s	-16	<- 4s	-12	<-12s	<-15s	<-22s	<-10s	<-12s	<-32s	C	C	<-37s	<-37s	<-37s	<-37s	<-37s	<-37s	5	10	8
10	6	11	(- 7)s	<-18s	<- 3s	<-11s	<-12s	<- 9s	<-24s	<-34s	<-28s	<-12s	<-27s	<-30s	<-35s	<-36s	<-36s	<-36s	<-36s	<-37s	<-31s	6	6	5
11	< 5s	< 1s	-12	<-10s	<- 4s	<- 1s	<-14s	<-13s	<-12s	<-33s	<-33s	<-16s	<-34s	<-34s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	-27	7	6	3
12	9	6	-27	<-18s	< 9s	<-13s	<- 9s	<-12s	<-15s	<-13s	<-17s	<-19s	<-25s	<-32s	<-36s	<-36s	<-36s	<-36s	<-36s	<-35s	(-23)s	4	7	6
13	11	7	2	-11	- 4	<- 5s	<- 5s	<- 5s	<-10s	<- 5s	-21	<-23s	<-35s	<-35s	<-35s	<-34s	<-34s	<-34s	-30	<-34s	-33	- 1	9	7
14	8	8	10	-10	<- 5s	<-11s	<- 7s	<- 7s	<- 5s	< 7s	< 7s	<-15s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	-31	2	15	11
15	16	21	12	-11	< 1s	<-15s	<-13s	<- 6s	<- 9s	<- 9s	<-16s	<- 6s	<-33s	<-33s	<-36s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	- 7	5	11
16	10	8	0	-19	<- 2s	<- 7s	<-10s	<-10s	<-29s	<-14s	<-14s	<-14s	<-26s	<-33s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	2	5	15
17	7	12	5	< 2s	<-13s	- 8	<- 9s	<-14s	<-14s	<-34s	<-29s	<-12s	<-33s	<-33s	<-32s	<-36s	<-36s	<-36s	<-36s	<-36s	-30	1	4	- 2
18	4	C	1	< 3s	-17	<- 4s	<- 9s	< 0s	<-11s	<-10s	<-10s	<-10s	<-33s	<-33s	<-33s	<-33s	<-33s	<-33s	<-33s	<-33s	<-33s	2	8	14
19	9	15	12	<-20s	<-12s	<- 8s	<- 9s	-11	-13	-21	<-28s	<-14s	<-31s	<-31s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	- 1	10	9
20	12	8	9	<-14s	<-11s	<-16s	<-25s	<-19s	<-23s	<-23s	<-25s	<-13s	<-35s	<-34s	<-34s	<-34s	<-33s	<-33s	-17	-33	-11	- 4	1	5
21	6	6	1	-13	<- 3s	<-17s	<-30s	-24	-29	<-27s	<-23s	<-16s	<-35s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	-34	- 8	8	2
22	5	12	6	-17	<- 4s	<- 6s	<- 5s	<- 5s	<-13s	<-28s	<-25s	<-17s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	-11	7	7
23	8	(8)c	(<12)s	(<-25)s	(<-18)s	(<-11)c	<-12s	<- 7s	<-11s	<-31s	-30	-15	<-31s	<-31s	<-32s	<-32s	<-32s	<-32s	<-32s	<-32s	<-32s	- 4	7	14
24	C	4	13	C	<-13s	-13	- 6	<- 2s	<-17s	<-22s	<-31s	<-11s	<-32s	<-32s	<-32s	<-33s	<-33s	<-33s	<-33s	<-33s	<-33s	2	9	9
25	12	13	- 2	- 4	- 6	<- 6s	- 4	<- 7s	<-13s	<-16s	<-21s	<-24s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	-16	-19	-13	- 1	7	9
26	C	14	7	6	C	<-13s	<- 8s	<- 6s	<-18s	<-16s	<-30s	<-13s	<-36s	<-36s	<-36s	<-36s	<-36s	-27	<-37s	<-37s	<-37s	-18	- 3	- 3
27	2	9	8	-12	-11	-12	<-15s	<-10s	<-14s	<-10s	<-10s	<-27s	<-34s	<-35s	<-35s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	- 8	6	5
28	10	10	10	-16	< 7s	<-12s	<-13s	<-14s	<-17s	<-10s	<-14s	<-21s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	-14	- 5	5	1
29	10	14	3	<-16s	< 10s	<- 7s	<-12s	<- 6s	< 4s	<-10s	<- 5s	<-19s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	-12	7	10
30	13	7	<-14s	<-18s	<- 3s	<- 4s	<-13s	<-13s	<-27s	<-34s	<-35s	<-35s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	-15	-18	<-36s	9	14	12
31	C	2	<-18s	<- 3s	<-14s	< 5s	-17	-13	-28	<-34s	<-34s	<-12s	<-25s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	4	8	10
Median	9	10	2	<-12s	<- 4s	<- 7s	<-10s	<- 9s	<-15s	<-22s	<-25s	<-15s	<-34s	<-35s	<-35s	<-35s	<-36s	<-35s	<-35s	<-35s	<-33s	1	7	9
Median Count	28	30	31	29	30	31	31	31	31	31	31	31	31	30	30	30	30	30	30	30	31	31	31	31
Upper decile	16	14	12	< 3s	< 7s	<- 1s	<- 3s	<- 1s	<- 2s	<- 9s	<-10s	<- 8s	<-26s	<-31s	<-32s	<-33s	<-33s	-27	-16	-21	<-11s	7	14	14
Lower decile	< 4s	< 1s	<-18s	<-21s	<-16s	<-15)c	<-25s	<-23s	<-28s	<-34s	<-34s	<-27s	<-36s	<-37s	<-37s	<-36s	<-37s	<-37s	<-37s	<-37s	<-36s	-11	3	1

* WWV was transferred from Washington D.C. to Fort Collins (40°41' N, 105°02' W) on Dec. 1, 1966.

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

Dec. 1966 Frequency: 15 Mc/s, Bandwidth: ±40 c/s, 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	9	10	11	14	18	6	< 6s	9	<- 7s	<-23s	<-27s	<-18s	<-36s	<-36s	<-36s	<-36s	<-36s	-30	-19	<-30s	10	14	10	10
2	< 7s	10	10	4	12	<-15s	< 0s	<-17s	C	<-30s	<-23s	<-36s	<-37s	<-37s	<-37s	<-37s	<-37s	<-37s	<-36s	<-24s	10	11	8	5
3	7	12	14	15	9	<-10s	<- 1s	<- 3s	C	<-29s	<-29s	<-35s	<-36s	<-37s	<-37s	<-36s	<-36s	<-14s	<-32s	<-35s	5	6	6	7
4	5	5	8	16	12	<- 5s	<- 2s	<-21s	<-19s	<-22s	<-17s	<-16s	<-34s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	1	7	6	5
5	C	8	11	13	20	<- 8s	(- 2c	<-19s	<-28s	<-22s	<-21s	<-16s	<-37s	<-37s	<-37s	<-37s	<-37s	<-37s	<-36s	<-36s	4	9	7	8
6	5	9	9	17	19	6	-13	<-23s	<- 6s	<-22s	<-19s	<-33s	<-34s	<-34s	C	S	S	S	S	-28	4	10	9	7
7	8	10	10	15	16	- 2	- 1	-14	-23	<-13s	<-11s	<-24s	<-35s	<-35s	<-35s	<-36s	<-36s	<-36s	<-36s	<-36s	2	8	7	6
8	4	C	10	17	15	- 4	- 4	<-16s	<-17s	<- 7s	<-34s	<-34s	<-36s	<-36s	<-36s	<-36s	<-36s	<-29s	<-35s	-26	- 3	7	5	- 2
9	3	4	4	8	10	8	(- 1c	<-19s	<-12s	<-18s	<- 9s	<-33s	C	C	<-37s	<-37s	<-37s	<-37s	<-37s	<-37s	- 5	3	- 1	- 1
10	- 2	3	6	12	14	<- 8s	<- 9s	<-17s	<-28s	-24	-18	<-15s	<-25s	<-32s	<-35s	<-36s	<-36s	<-36s	<-36s	-27	1	2	1	<- 7s
11	< 2s	< 7s	4	7	12	-13	<- 5s	<-16s	<-29s	-16	-25	<-22s	<-34s	<-34s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	- 4	3	- 1	- 3
12	C	5	6	15	17	7	<- 9s	<- 8s	<- 9s	S	<-17s	<-27s	<-25s	<-32s	<-36s	<-36s	<-36s	<-36s	<-35s	<-23s	0	6	1	1
13	4	5	8	14	9	<- 7s	<- 3s	<- 8s	<- 9s	<-12s	<-21s	<-21s	<-35s	<-35s	<-35s	<-34s	<-34s	-27	<-33s	<-34s	9	11	3	- 4
14	3	6	10	10	15	- 2	<- 3s	4	< 1s	<-16s	<- 4s	<-21s	-28	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	- 1	10	6	- 1
15	5	9	8	10	18	7	2	<-29s	<- 5s	<-17s	<-13s	<-19s	<-33s	<-33s	<-36s	<-35s	<-35s	<-35s	<-35s	<-35s	3	3	4	4
16	4	10	12	14	17	8	13	-11	-13	<-16s	<-16s	<-20s	-26	<-33s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	- 2	11	5	4
17	C	7	10	11	17	<- 2s	<- 9s	<-14s	-14	-15	-18	<-17s	-25	<-33s	<-32s	<-36s	<-36s	<-36s	<-36s	-32	2	8	4	7
18	4	4	C	10	12	(- 3c	< 3s	S	<- 3s	<-18s	<-17s	<-21s	<-33s	<-33s	<-33s	<-33s	<-33s	<-33s	<-33s	<-33s	4	11	10	4
19	5	10	8	16	18	- 2	<-12s	C	-17	-20	-24	<-19s	<-31s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	-26	0	4	7	- 1
20	1	6	13	12	14	-13	<- 4s	<-19s	<-18s	-22	C	<-18s	<-35s	<-34s	<-34s	<-34s	<-33s	<-33s	<-33s	-15	- 3	1	6	6
21	3	9	11	9	10	- 5	- 8	-15	- 3	-17	-23	<-23s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	<-3C	- 7	10	5	9
22	(1c	8	12	9	19	<- 6s	<- 6s	<-14s	<-15s	-16	<-14s	<-22s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	<-34s	-10	8	6	3
23	(5c	(3c	(- 1c	(2c	(5c	9	C	<-13s	<- 9s	<-30s	<-31s	-16	<-31s	<-31s	<-32s	<-32s	<-32s	<-32s	<-32s	<-32s	- 3	5	1	5
24	C	5	10	15	17	- 3	< 0s	<-18s	<- 2s	-17	<- 8s	<-11s	<-32s	<-32s	<-32s	<-33s	<-33s	<-33s	<-33s	<-33s	- 1	3	3	5
25	7	4	3	13	13	7	- 2	C	<-15s	<-15s	<-18s	<-31s	<-35s	<-35s	<-35s	<-35s	<-35s	<-35s	C	- 5	- 3	6	9	1
26	3	10	11	15	C	<-10s	<-12s	<- 5s	<-12s	<-14s	<-11s	<-14s	<-36s	<-36s	<-36s	<-36s	<-36s	<-37s	-30	<-37s	- 6	2	5	3
27	6	8	9	14	12	- 3	<-10s	<-18s	<-14s	<-21s	<-18s	<-22s	<-34s	<-35s	<-35s	<-34s	<-34s	<-34s	<-34s	<-34s	- 4	6	4	2
28	0	6	6	13	12	- 8	<-11s	<-17s	<-15s	<- 5s	<-14s	<-23s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	-21	-18	-12	6	2	9
29	7	4	10	10	14	5	- 5	<- 3s	<- 1s	<-25s	<-12s	<-27s	-31	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	-21	- 5	6	- 3	3
30	7	6	11	11	9	1	- 5	<-14s	-17	<-35s	<-35s	<-35s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	-36	4	4	- 2	5
31	4	4	9	14	14	6	- 2	6	-21	-30	-26	<-15s	<-32s	<-36s	<-36s	<-36s	<-36s	<-36s	<-36s	-36	- 6	2	3	2
Median	(4s	(7s	10	13	14	(- 3s	<- 4s	<-15s	<-14s	<-18s	<-18s	<-21s	<-34s	<-35s	<-35s	<-36s	<-36s	<-35s	<-35s	<-34s	- 1	6	5	4
Median Count	27	30	30	31	30	31	30	28	29	30	30	31	30	30	30	30	30	30	29	30	31	31	31	31
Upper decile	7	10	12	16	19	8	< 3s	4	<- 2s	<-12s	<- 9s	<-15s	<-25s	<-32s	<-32s	<-33s	<-33s	<-29s	-30	-18	9	11	9	9
Lower decile	< 1s	< 4s	4	7	9	<-13s	<-12s	<-21s	<-28s	<-30s	<-31s	<-35s	<-36s	<-37s	<-37s	<-37s	<-37s	<-37s	<-36s	<-36s	- 7	2	- 1	- 3

RADIO PROPAGATION QUALITY FIGURES

HIRAISO

Time in U.T.

Dec. 1966	Whole Day Index	H B 06 12 18 / 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	4o	4 4 4	5 4 4 4	4 4 4 (4)	4 3 - 4	N N N N			
2	4o	4 4 4	3 4 4 4	4 4 4 4	4 3 - 4	N N N N			
3	4o	4 4 4	3 4 5 5	(3) 4 4 5	4 4 - 4	N N N N			
4	4o	5 4 4	3 4 5 4	4 4 4 4	4 5 - 4	N N N N	0609	---	147^{γ}
5	4o	3 4 (3)	5 5 5 4	4 4 4 3	4 4 - 3	N N N N	---	11xx	
6	4+	4 4 (5)	4 4 4 4	5 4 (4 4)	4 3 - 4	N N N N			
7	4o	(4) 4 (4)	4 4 3 4	5 4 5 4	4 3 - 4	N N N N			
8	4o	(4 3 3)	4 4 5 (4)	4 4 5 5	4 4 - (4)	N N N N			
9	4+	4 4 5	3 4 5 4	4 4 5 4	4 4 - 4	N N N N			
10	4o	(4) 4 (4)	3 5 4 4	(3) 4 (4) 4	4 4 - 4	N N N N			
11	4-	4 4 (5)	3 3 4 (4)	4 (3 3) 4	4 4 - 4	N N N N			
12	4o	4 4 4	3 4 5 4	(4) 4 4 4	4 4 - 4	N N N N			
(13)	4-	4 (3) 4	4 5 4 (4)	4 4 (3) 3	4 4 - 4	N N N N	01.1	19xx	112^{γ}
(14)	4-	5 5 (5)	5 5 1 3	(3) 4 3 3	4 4 - 3	N N N N	09.0	---	94^{γ}
(15*)	4o	4 4 (4)	5 4 4 4	(4) 4 4 3	4 5 - 3	N N N N	---	19xx	
16	4-	4 4 (4)	(4) 4 3 4	4 (4) 3 3	5 5 - 4	N N N N			
17	4o	4 5 (4)	4 4 5 4	3 (4) 4 4	4 5 - 4	N N N N			
18	4-	4 5 4	3 4 3 4	3 4 4 4	4 4 - 4	N N N N			
19	4-	4 (3) 4	4 3 4 4	4 4 4 3	5 4 - 4	N N N N			
20	4+	C 4 4	5 3 4 4	4 5 (4) 5	4 4 - 4	N N N N			
21	4o	C 4 (4)	4 4 3 4	5 4 C 4	4 4 - 4	N N N N			
22	4o	C 4 (4)	4 3 4 4	5 4 4 (4)	4 4 - 4	N N N N			
23	4-	4 4 (4)	4 (2) 3 4	5 4 4 3	4 3 - 3	N N N N			
24	4+	(4) 4 4	4 5 5 4	4 4 4 4	4 5 - 4	N N N N			
25	4o	4 4 (4)	4 (4) 3 4	4 4 4 5	4 4 - 4	N N N N			
26	4o	(4 4) 4	4 (4) 4 4	5 4 4 3	4 5 - 4	N N N N			
27	4o	C 4 C	4 (5) 4 4	(4) 4 4 3	4 5 - 3	N N N N			
28	4-	C 4 (3)	4 - 3 4	4 4 (4) 4	4 3 - 4	N N N N			
29	4-	C 4 (3)	4 - 3 (4)	4 4 (4) 4	4 4 - (4)	N N N N			
30	4o	(4) 4 4	(3) - (3) 4	5 4 (4) 4	(4) 4 - 4	N N N N			
31	4-	4 (4 4)	4 - (2) 4	4 4 (4) 3	4 4 - 4	N N N N			

IQSY GEOALERT and ADALERT (Western Pacific Region)

* = MAGSTORM

o = 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.

Dec. 1966	S W F									Correspondence		
	Drop-out Intensities (db)						Start-time	Duration	Type	Imp.	Flare	Solar Noise	Mag.
	WS*	SF	HA	TO	HB	SH							
9		30					17.59	20	S	2	x		
10		13			-		23.28	25	S	1			
13	10	21	-				23.07	38	Slow	1+	x	x	

*WWV was transferred from Washington D.C. to Fort Collins (40°41' N, 105°02' W) on Dec. 1, 1966.

IONOSPHERIC DATA IN JAPAN FOR DECEMBER 1966

第１８巻　第１２号

1967年３月20日　印　刷
1967年３月25日　発　行　　（不許複製非売品）

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