 RESTRICTED

Ground & Sky-Wave Ranges of Field Army Radio Stations for use in EUROPE

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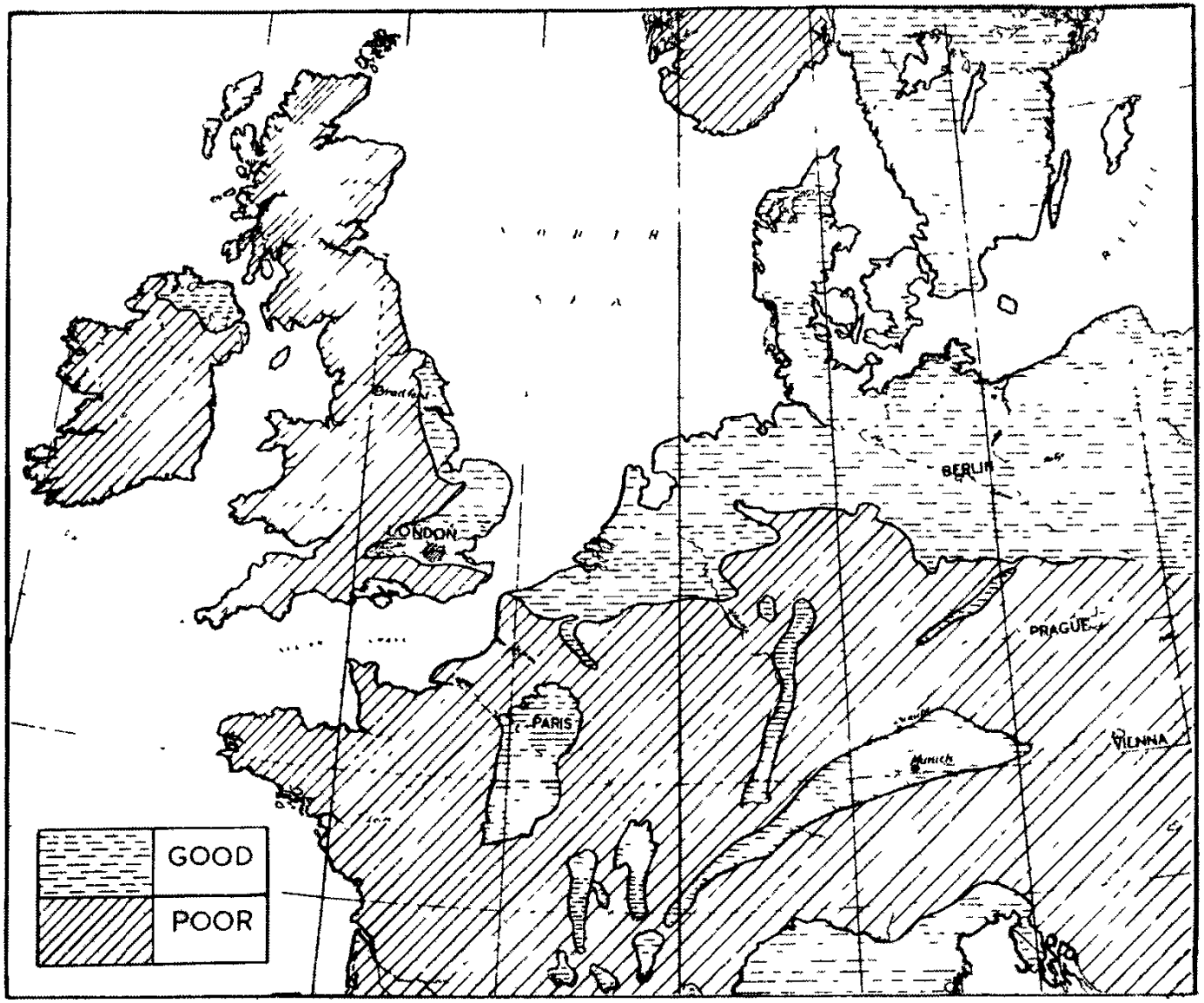
CENTRAL EUROPE



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GROUND AND SKY WAVE RANGES OF FIELD ARMY RADIO STATIONS

1. THE PURPOSE OF THIS PUBLICATION

This publication consists of a series of tables and charts which are designed to assist the user of field army radio stations in estimating the probable range of a set under varying conditions.

The information is presented in two distinct forms:

GROUND WAVE RANGES

These are given in the form of tables where probable ranges for typical day and night conditions are plotted against frequency. Separate tables are given for each radio station and for the different types of antennas with which each station can be used.

SKY WAVE FREQUENCIES Distances up to 200 miles

These are presented by charts showing the expected AVAILABLE BAND in frequencies.

The family of curves on each chart is designed to cater for the year to year variation in propagation (Sun spot cycle).

Radio stations are divided into groups of approximately equal power with one sky wave chart provided for each group.

The first section of this handbook contains the theatre map, index, introduction etc., the remainder of the book is divided into four sections, each containing the tables and charts applicable to a specific three monthly period. The sections are numbered similarly, the pages carrying the ground wave tables for the A.16, for example, have the same number in each section.

Tables and Charts used must be selected from the section covering the current 3-monthly period.

2. HOW TO USE THIS PUBLICATION

In order to make full use of the tables and charts the following information must be available.

(a) Working RANGE required

(b) FREQUENCIES available (assigned)

(c) Type of RADIO STATION available

(d) ANTENNAS available

(e) TIME OF DAY during which communications are required

(f) TYPE OF COUNTRY between terminal stations (Ground Wave only

(g) The IDENTIFYING NUMBER for the Upper Limit Curve of the available band (Sky Wave only).

3. GROUND WAVE OR SKY WAVE?

In order to determine which method of transmission, Ground Wave or Sky Wave, is likely to provide the most efficient radio link in a specific case, select the current ground wave tables for the radio station to be used. From these select the table for the most efficient antenna available and, taking into consideration the time of day and the type of country, look up the expected range for the frequencies allocated to the station. If the required working range is greater than that shown in the table, or it is a marginal case, Sky Wave working should be used provided that suitable frequencies are available.

4. SELECTING THE ANTENNA

Having decided whether ground wave or sky wave working will yield the best signal, and having selected a frequency appropriate to the method of transmission, the next step is to choose an antenna. The tables and charts for a particular set do not refer to identical antennas but are those most favourable to the method of transmission dealt with.

For ground wave working a vertical antenna as near as possible to a quarter wavelength is the most efficient.

For sky wave working the most efficient antennas are a horizontal half-wave dipole erected a quarter wavelength above the ground, and a three-quarter wave inverted "L". If none of these can be used a sloping wire antenna or a rod antenna, tied back, should be used.

5. GROUND WAVE RANGE TABLES

Description For each type of radio set there are a series of tables showing the order of frequency to be used when working at extreme ranges. There is a separate table for each type of antenna.

Each table shows the ranges in miles for:

(a) Day and Night

(b) Voice and CW

(c) Types of ground between stations. These are:

P - Poor ground (Sand, chalk, rock or clay)

G - Good ground (Fairly flat, moist and covered with thick soil other than sand, chalk, rock or clay).

J - Jungle or thick forest.

6. USING THE TABLES

The use of these tables can best be described by means of an example.

Supposing that a SR C11/R210 is being used with a 12 foot rod antenna on a frequency of 5.4 Mc/s and difficulty is being experienced in establishing contact at night on voice with a station six miles away. Communication can, however, be established satisfactorily on CW which suggests a fault in the voice side of the radio set.

In order to establish if it is reasonable to expect a range of six miles under the prevailing conditions, check with the relevant ground wave table as described below:

Consult the theatre map in the front of this publication and ascertain the type of ground over which the radio link is working. It is assumed in this instance that the ground is shown to be P (poor).

The specimen table below gives the estimated ground wave ranges for the C11/R210 when using a 12 foot rod antenna. It will be seen that the night range for voice over poor ground is given as 3 miles on both 5 and 6 Mc/s, hence it can be assumed that a voice range of 3 miles is the maximum that can be expected at 5.4 Mc/s.

The corresponding figures for CW are 7 and 8 miles respectively.

These figures agree with our own efforts in establishing contact on CW and failing on voice. From it we conclude that the radio set is in working order but that a range of 6 miles at that order of frequency is too great for voice communication.

STATION RADIO C11/R210 - 12 FOOT ROD ANTENNA
SPECIMEN TABLE ONLY

FREQ IN MC/S	DAY						NIGHT					
	VOICE			CW			VOICE			CW		
	J	P	G	J	P	G	J	P	G	J	P	G
2	2.0	10	30	2.8	23	64	1.0	3	9	1.7	7	20
3	1.8	10	27	2.5	22	58	0.9	3	8	1.5	7	19
4	1.5	9	23	2.4	20	50	0.8	3	8	1.4	7	19
5	1.4	8	19	2.2	17	42	0.8	3	8	1.4	7	22
6	1.3	8	17	2.1	17	37	0.8	3	8	1.4	8	17
8	1.3	8	16	2.0	18	35	0.8	4	8	1.4	9	18
10	1.2	8	15	1.9	17	31	0.9	5	9	1.4	10	20
12	1.2	9	16	2.0	18	34	0.9	5	9	1.5	12	23
14	1.3	9	16	2.1	20	33	0.9	6	10	1.6	13	22
15	1.4	11	19	2.2	24	40	1.0	2	12	1.7	15	25

7. CHOICE OF FREQUENCIES

In general the tables show that greater ranges can be expected from the lower frequencies during the daytime. At night the range is reduced but varies little with frequency. From these considerations it would appear that a low frequency would give the best results both day and night. Unfortunately interference at night from other stations using frequencies in the region of 2 to 5 Mc/s is very probable. This can have the effect of severely reducing the night ranges at these frequencies from those indicated in the tables.

8. REDUCING INTERFERENCE

By using a higher frequency at night it may be possible to avoid interference without reducing the expected range of the set. In general, the higher the frequency used at night the smaller is the likelihood of interference from other stations.

9. WARNING

Ground wave tables do not take into account Sky Wave radiation which may give very much greater ranges than are shown in the tables. Radiated power should be kept to the minimum needed to maintain reliable communications in order to prevent interference to other stations.

10. LONG RANGE INTERFERENCE GUARD CURVES

(a) The chart on page 21 deals with Long Range interference guard curves. These curves predict the maximum frequency for the time of day at which Sky Wave propagated interference is possible from other points on the Earth. They should be read in conjunction with the identifying number for the Upper Limit of available band.

(b) If a frequency above the Long Range interference guard curve is used for ground wave working it will be virtually impossible to receive interference from a signal propagated by sky wave from another set. In general, the only field army radio sets which can take advantage of this facility are those sets whose frequency range extends above 10 Mc/s.

11. SKY WAVE CHARTS

Description These charts consist of a series of curves numbered from 1 to 9 which show the Upper Limit of available band at different times of the day. The two broken curves show the approximate Lower Limit of available band. All curves are for distances of from 0 to 200 miles. The 9 Upper Limit curves are used to cover all possible conditions of Solar activity. The variation is quite slow and takes

about 11 years to complete one cycle. The particular curve currently in use is notified to all users through CSO's Commands by the Frequency Section, MOD by signal from time to time. A record of the curve number received should be made on the form provided on page iii at the front of this publication. The current number will continue to be used until a new number is signalled.

The two Lower Limit curves vary with the power of the transmitter, but otherwise they remain essentially constant from day to day during the period covered by each chart.

12. THE UPPER LIMIT OF AVAILABLE BAND

(a) Sky Wave communication between two radio sets is dependent on the characteristics of the Ionosphere and depends very little on the power of the transmitters. The main limitation is that between two radio sets there is a maximum frequency which can be used. This is called the Upper Limit of Available Band and is the highest frequency at which the ionosphere will reflect signals between the two sets. If a higher frequency is used each set will lie in the SKIP ZONE of the other, hence on the charts the band of frequencies above the Upper Limit curves are marked SKIP.

(b) Because the Upper Limit of available Band is dependent on the characteristics of tne Ionosphere, it is effected by the following factors:

(i) The Geographical Locality.
(ii) Solar activity.
(iii) The Season.
(iv) The Time of Day.
(v) A random day-to-day fluctuation.

(c) All of these points are catered for in this publication as follows:

(i) There are separate publications for different Theatres.
(ii) The 9 different curves on skywave charts cater for different levels of solar activity.
(iii) There are four separate sets of charts in each publication, one for each three monthly period in a year.
(iv) Each chart shows the variation throughout the 24 hours from noon local time to noon local time.
(v) The actual published curve is about 15% below the calculated curve. This is to allow for the day-to-day fluctuation about the mean. There is in fact a possibility, on about one day in twenty, that the actual upper limit will be below the published curve. Hence the title of these curves is: 'THE PRACTICAL UPPER LIMIT OF AVAILABLE BAND'.

(d) From sub-para (c) (v) it is apparent that on some days it will be possible to use a frequency above the published curve. This practice is not recommended due to uncertainties involved.

13. THE LOWER LIMIT OF AVAILABLE BAND

(a) The two broken lines on each chart show the approximate lower limit of available band for voice and CW for the group of radio sets indicated on the charts. The lower limit is caused by the absorption of the signal in the Ionosphere. As the frequency used is lowered there is an increase in absorption. Hence the lower limit can be decreased by an increase in power.

(b) With these curves it is assumed that a horizontal half wave dipole or a three quarter wave inverted 'L' antenna is used.

14. PERFORMANCE WITHIN THE AVAILABLE BAND

In general the rule is that the higher the operating frequency within the available band, the greater is the signal-to-noise ratio and therefore the better the performance.

15. METHOD OF USE

(a) The Sky Wave charts will normally be used either:

(i) To select a good frequency for Sky Wave working and to assess the performance you can expect from your set;

or

(ii) To assess whether a given frequency is suitable for Sky Wave working at a given time of day, with a certain radio set and a horizontal antenna.

(b) The user will have a number of frequencies to select from and will have to determine which of these will be the most suitable for use during the period in which communications are required. The frequency to be used must be the highest that lies in the available band. It must however be borne in mind that it may be necessary at some time to change frequency in order to fulfil this condition. Suitable night frequencies are always lower than day frequencies.

(c) The expected performance at the chosen frequency may be roughly estimated at different times by the spacing between the Upper and Lower Limits at these times.

NOTE - The Sky Wave charts are calibrated in local sun time i.e. the actual time by the sun at the positions of use. This may be worked out from the longitude and roughly approximates to local zone time.

16. WARNING

When working Sky Wave it is quite possible that the signal will be received at distances in excess of 200 miles from the transmitter. To minimize interference the radiated power should whenever possible, be restricted.

17. GENERAL WARNING

(a) These tables and charts are based on data which cannot always be complete. In addition approximations have been made in order to present the information in a simple form, hence, with any table or chart, the actual performance will vary over wide limits.

(b) These tables and charts should therefore be treated as a guide only.

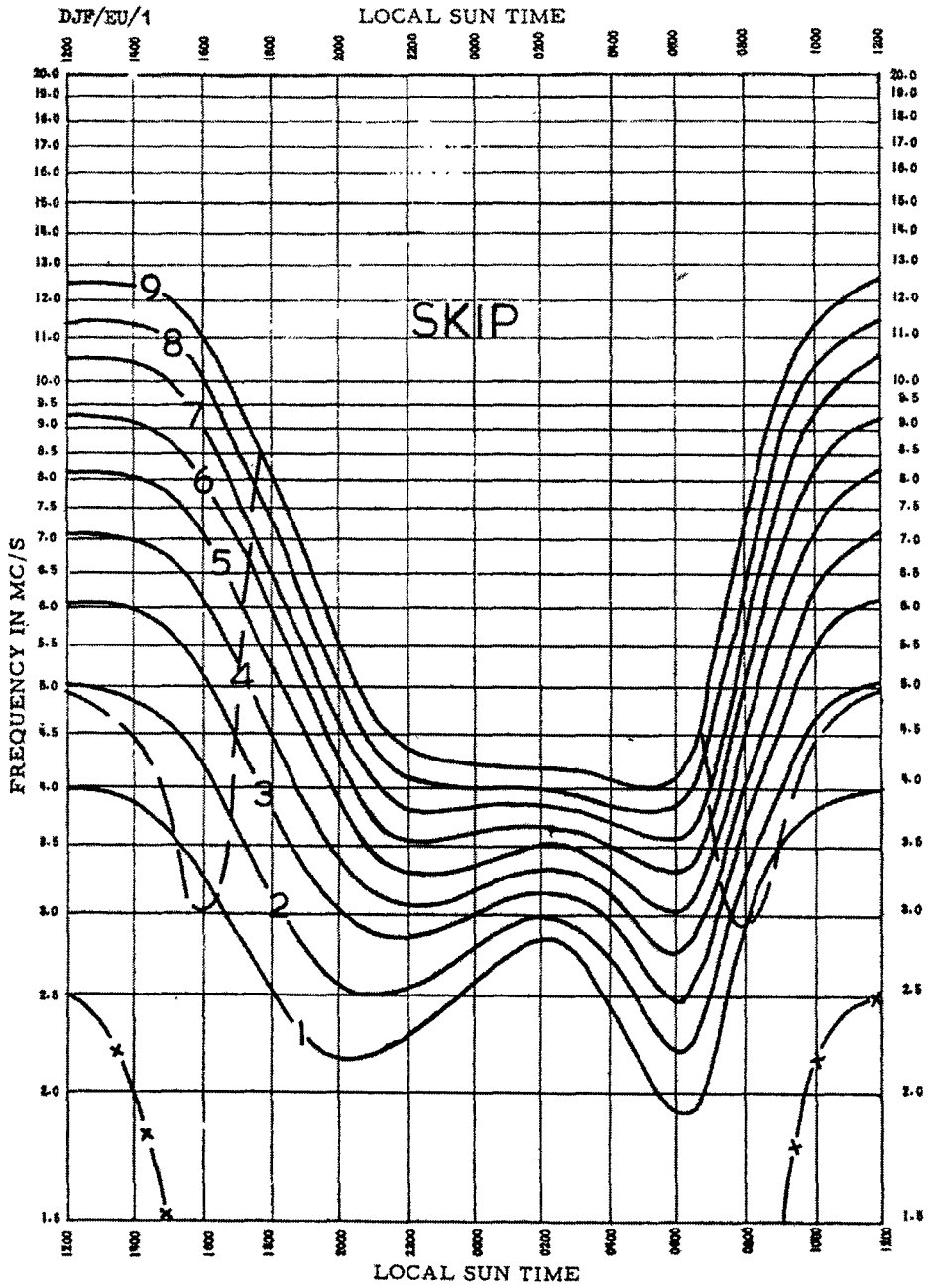
Cases will occur where the experience of the individual will not correspond to tne information given, in much the same way as the weather experienced in particular localities does not always conform to a general regional forecast, even when it is fairly accurate. Do not throw the tables and charts away if they do not always give the right answer.

Ground & Sky-Wave Ranges of Field Army Radio Stations for use in EUROPE

DURING
DECEMBER JANUARY & FEBRUARY

SKY WAVE CHART FOR USE WITH RADIO STATIONS

BCC 156, A14 LP, A16, A13 LP.



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — — —

CW —x—x—x—

A/A14 LP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	3	9	9	27	2	4	8	23
	3	3	9	10	25	2	6	7	18
	4	3	9	10	26	2	6	6	17
	5	3	8	10	24	2	5	6	14
	6	3	8	10	24	2	5	6	13
	8	4	8	10	22	2	5	6	11
	10	4	8	11	22	2	5	7	13
27 FT VERTICAL 2-10 Mc/s	2	8	23	23	60	6	18	19	54
	3	8	21	22	58	5	15	16	43
	4	8	20	24	52	5	13	14	37
	5	7	17	22	47	4	10	12	30
	6	7	15	21	43	5	10	12	28
	8	7	14	21	40	4	9	12	25
	10	7	13	20	36	4	8	12	23

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-6 Mc/s	2	3	9	9	27	2	4	8	23
	3	3	9	10	25	2	6	7	18
	4	3	9	10	26	2	6	6	17
	5	3	8	10	24	2	5	6	14
	6	3	8	10	24	2	5	6	13
26 FT ROD 2-6 Mc/s	2	8	23	23	60	6	18	19	54
	3	8	21	22	58	5	15	16	43
	4	8	20	24	52	5	13	14	37
	5	7	17	22	47	4	10	12	30
	6	7	15	21	43	5	10	12	28

A/A13 LP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-8 Mc/s	2	4	13	12	38	3	10	10	30
	3	4	12	12	33	3	8	9	23
	4	4	12	13	33	3	8	9	21
	5	5	11	13	32	3	6	8	17
	6	4	10	13	30	3	6	8	17
	8	5	10	14	28	3	6	8	16
26 FT ROD 2-8 Mc/s	2	10	30	30	74	8	24	24	64
	3	10	26	30	66	7	20	21	54
	4	10	26	31	64	6	17	20	49
	5	10	23	30	60	6	14	17	40
	6	9	22	28	54	5	12	16	35
	8	9	18	26	50	5	10	15	32

A/C12

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R.T.		C.W.		R.T.		C.W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	4	13	13	37	3	10	10	30
	3	4	12	12	33	3	8	9	23
	4	4	12	13	33	3	8	9	21
	5	5	11	13	32	3	6	8	17
	6	4	10	14	30	3	6	8	17
	8	5	10	14	28	3	6	8	16
	10	6	9	16	27	3	6	9	17
12 FT ROD 1.9-10Mc/s	2	6	17	18	50	4	13	13	40
	3	6	15	16	42	4	11	12	30
	4	6	15	17	42	4	10	11	28
	5	6	15	18	42	4	9	10	25
	6	6	13	17	38	3	8	10	24
	8	6	11	18	36	4	8	10	22
	10	5	11	18	33	4	7	11	22
32 FT VERTICAL 1.6-6.5Mc/s	2	12	35	36	82	9	26	28	70
	3	11	30	35	72	8	23	23	60
	4	11	28	34	70	7	19	22	50
	5	10	25	30	64	6	15	19	42
	6	10	24	35	68	6	13	17	37

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 1.6-12 Mc/s	2	4	13	13	37	3	10	10	30
	3	4	12	12	33	3	8	9	23
	4	4	12	13	33	3	8	9	21
	5	5	11	13	32	3	6	8	17
	6	4	10	13	30	3	6	8	17
	8	5	10	14	28	3	6	8	16
	10	6	9	14	27	3	6	9	17
	12	5	9	16	28	3	7	10	19
16 FT ROD 1.5-12 Mc/s	2	7	21	22	60	5	16	16	46
	3	7	19	20	52	5	14	15	40
	4	7	19	22	50	5	13	14	36
	5	7	17	21	45	4	10	12	28
	6	7	15	21	43	4	9	12	28
	8	8	15	22	41	4	9	13	26
	10	7	13	22	48	4	9	13	25
	12	7	13	21	36	5	9	14	25
27 FT ROD 1.5-8 Mc/s	2	10	30	30	74	8	24	24	64
	3	10	26	30	66	7	20	21	54
	4	10	26	31	64	6	17	20	49
	5	10	23	30	60	6	14	17	40
	6	9	22	28	54	5	12	16	35
	8	9	18	26	50	5	10	15	32

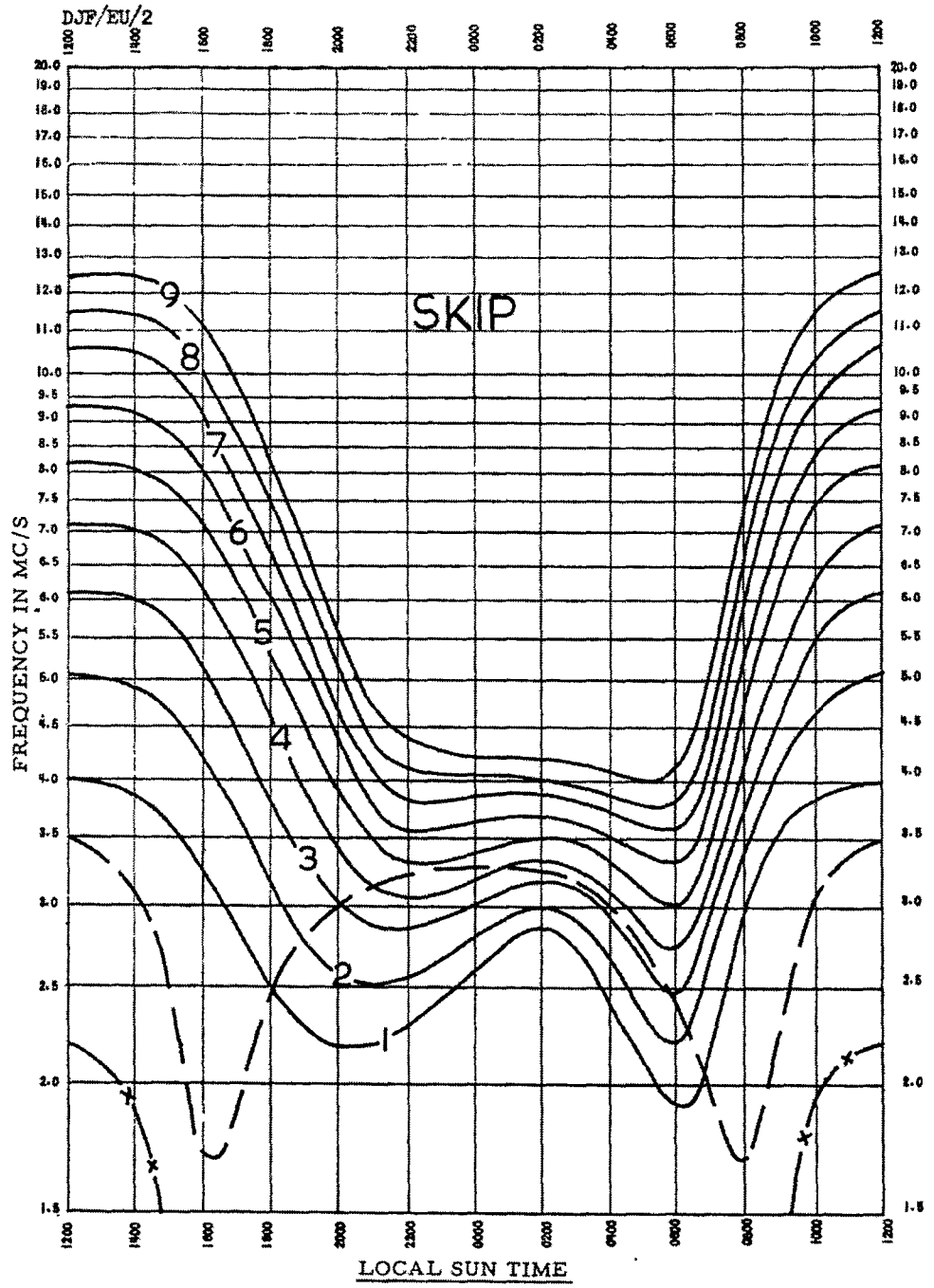
A/62

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	4	13	13	37	3	10	10	30
	3	4	12	12	33	3	8	9	23
	4	4	12	13	33	3	8	9	21
	5	5	11	13	32	3	6	8	17
	6	4	10	13	30	3	6	8	17
	8	5	10	14	28	3	6	8	16
	10	6	9	14	27	3	6	9	17
12 FT ROD 2-10 Mc/s	2	6	17	18	50	4	13	13	40
	3	6	15	16	42	4	11	12	30
	4	6	15	17	42	4	10	11	28
	5	6	15	18	42	4	9	10	25
	6	6	13	17	38	3	8	10	24
	8	6	11	18	36	4	8	10	22
	10	5	11	18	33	4	7	11	22
32 FT VERTICAL 2-6.5 Mc/s	2	12	35	36	82	9	26	28	70
	3	11	30	35	72	8	23	23	60
	4	11	28	34	70	7	19	22	50
	5	10	25	30	65	6	15	19	42
	6	10	24	35	68	6	13	17	37

SKY WAVE CHART FOR USE WITH RADIO STATIONS

C12, C13, 62.

LOCAL SUN TIME



LOCAL SUN TIME

PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — — —

CW —— x —— x —— x

A/A14HP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	5	16	16	46	4	13	13	37
	3	6	15	16	43	4	11	12	30
	4	6	16	17	42	4	10	11	28
	5	6	15	17	40	3	9	10	25
	6	6	13	17	38	3	8	10	22
	8	6	12	18	35	4	8	10	21
	10	6	12	19	34	4	8	12	23
27 FT VERTICAL 2-10 Mc/s	2	13	37	38	86	11	30	32	80
	3	13	36	40	81	10	25	27	64
	4	13	34	40	80	8	21	26	56
	5	12	30	37	72	7	17	22	46
	6	12	28	36	70	7	15	21	43
	8	12	25	34	64	7	14	21	40
	10	12	23	34	57	7	13	20	38

A/19 HP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
12 FT ROD 2-8 Mc/s	2	8	23	23	64	6	17	18	50
	3	7	20	21	54	5	14	16	40
	4	8	21	24	54	5	13	15	37
	5	8	18	24	50	5	11	13	32
	6	8	17	23	45	4	10	13	30
	8	8	16	23	44	5	10	14	28
34 FT VERTICAL 2-6 Mc/s	2	15	44	48	96	12	36	36	84
	3	16	42	45	90	11	28	34	70
	4	14	37	43	88	9	24	30	60
	5	13	32	40	80	8	18	24	50
	6	13	30	43	85	8	17	23	46

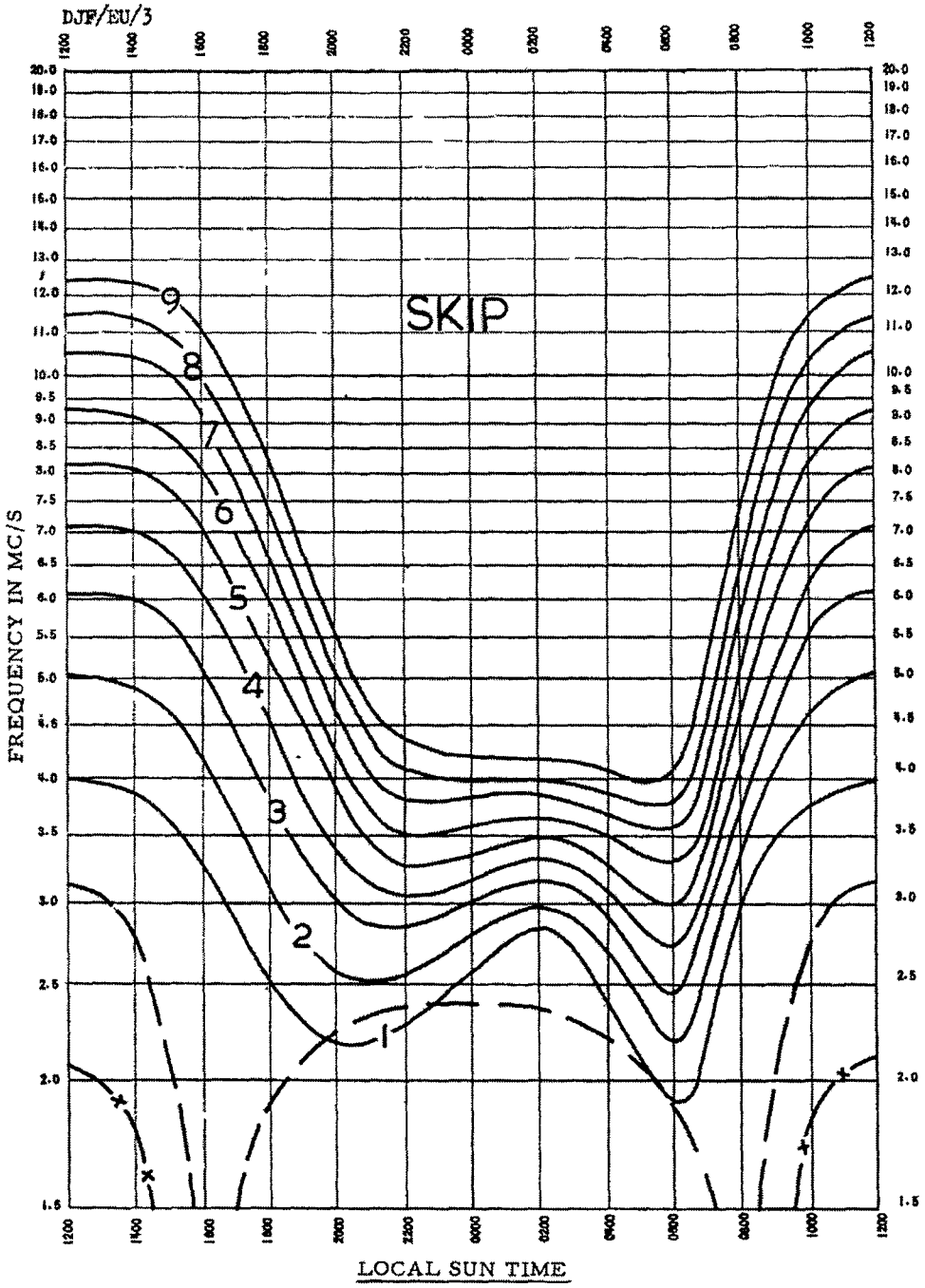
A/A13 HP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-8 Mc/s	2	7	21	22	60	6	17	18	50
	3	7	20	21	54	5	14	16	40
	4	8	20	24	52	5	12	15	37
	5	8	18	24	46	5	11	13	32
	6	8	17	23	45	4	10	13	30
	8	8	16	24	44	5	9	14	27
26 FT ROD 2-8 Mc/s	2	17	49	50	110	14	40	40	90
	3	17	46	50	98	12	33	38	78
	4	17	42	48	100	11	30	36	70
	5	17	40	48	98	10	23	30	60
	6	16	35	47	86	9	22	28	54
	8	16	32	42	72	9	18	27	50

SKY WAVE CHART FOR USE WITH RADIO STATIONS

A14 HP, 19 HP, A13 HP

LOCAL SUN TIME



LOCAL SUN TIME

PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ————————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — — —

CW —x—x—x

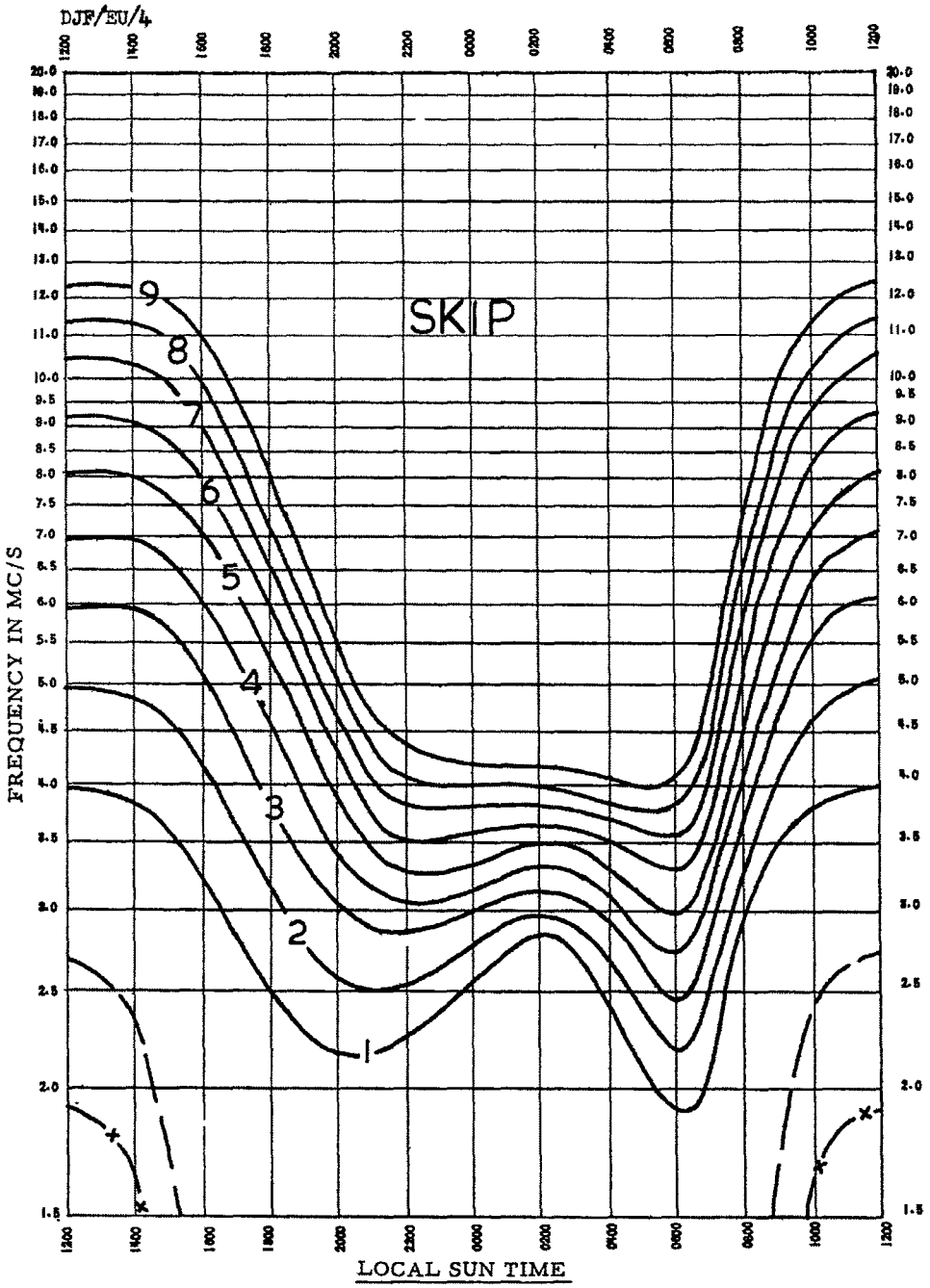
A/C11

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-16 Mc/s	2	8	23	18	50	6	17	13	37
	3	7	20	16	43	5	14	12	30
	4	8	20	17	42	5	12	11	28
	5	8	18	17	40	5	11	10	25
	6	8	17	17	38	4	10	10	22
	8	8	16	18	35	5	9	10	21
	10	8	16	19	34	6	9	12	23
	12	9	17	20	34	6	11	13	24
	14	9	16	20	34	7	12	15	27
	16	9	16	20	34	8	14	18	31
16 FT ROD 2-12 Mc/s	2	12	38	28	71	9	27	22	60
	3	12	30	27	62	9	23	19	50
	4	12	33	30	60	8	21	18	45
	5	12	28	29	58	7	17	16	38
	6	12	28	28	54	8	15	16	35
	8	13	26	26	50	7	15	16	32
	10	12	24	24	46	8	15	17	31
	12	13	23	28	44	8	15	17	33

SKY WAVE CHART FOR USE WITH RADIO STATIONS

C11.

LOCAL SUN TIME



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — — —

CW —— x —— x —— x

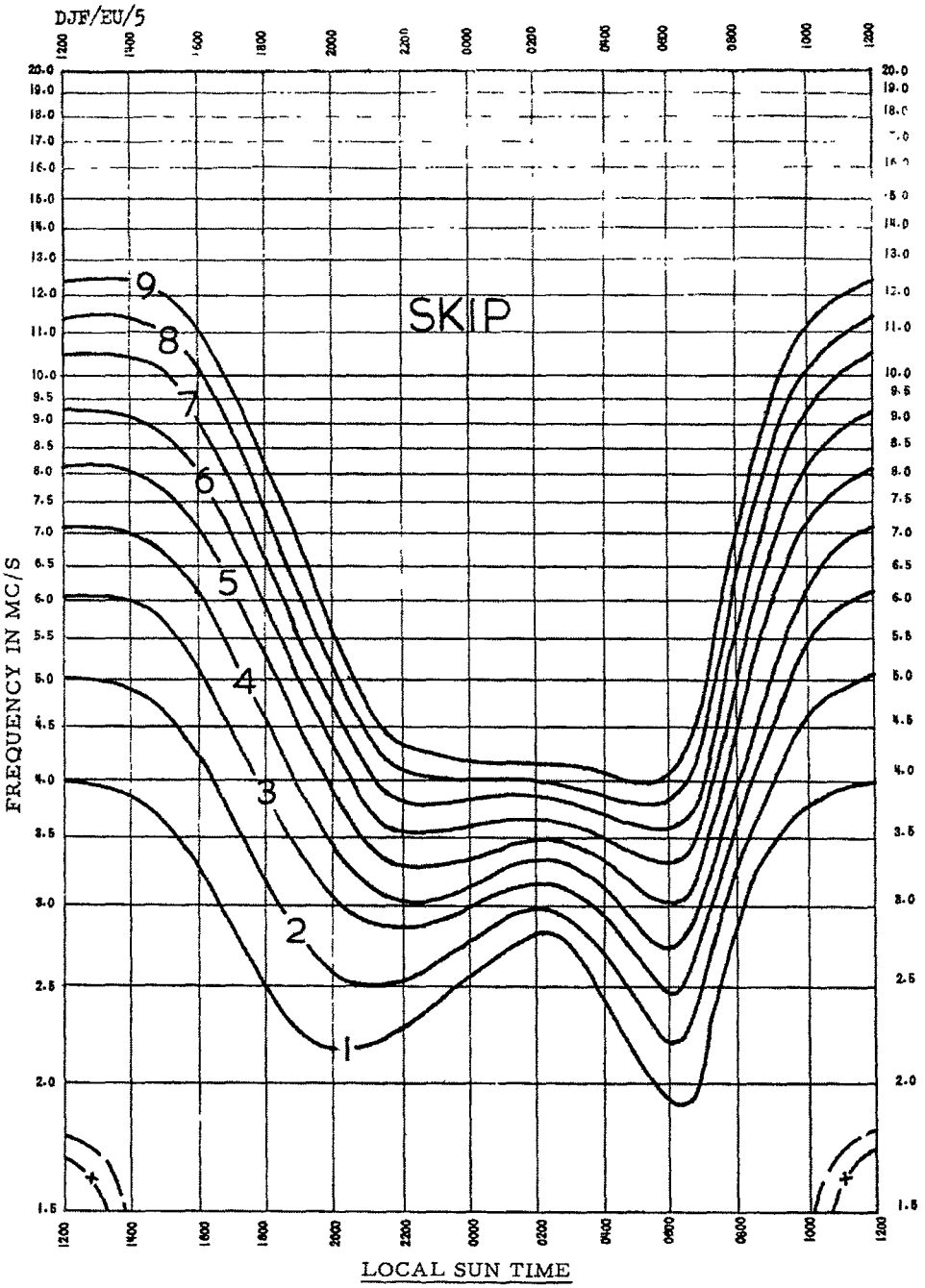
A/C11

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
27 FT VERTICAL 2-10 Mc/s	2	19	54	40	90	14	40	32	80
	3	17	46	40	81	12	33	27	64
	4	17	42	40	80	11	30	26	56
	5	17	40	37	72	10	23	22	46
	6	16	35	36	70	9	22	21	43
	8	16	32	34	64	9	18	21	40
	10	15	28	34	56	9	18	20	38
43 FT VERTICAL 2-5 Mc/s	2	23	61	50	102	19	52	42	92
	3	23	52	50	95	17	44	37	76
	4	23	48	46	89	14	36	33	66
	5	21	43	42	82	12	30	28	56

SKY WAVE CHART FOR USE WITH RADIO STATIONS

D11, C15.

LOCAL SUN TIME



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ————————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — — —

CW —— x —— x —— x

A/D11

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
16 FT ROD 2-22 Mc/s	2	36	82	48	96	28	71	36	88
	3	36	72	45	90	26	62	35	72
	4	37	78	46	95	25	56	33	68
	5	36	70	44	90	21	45	28	58
	6	36	70	47	86	22	42	28	56
	8	36	64	45	74	22	40	27	50
	10	34	58	43	70	24	40	28	48
	12	36	56	44	69	24	40	32	50
	14	35	53	42	64	26	43	34	52
	16	33	50	42	62	30	46	36	56
	18	32	50	40	58	33	50	40	58
	20	33	49	40	58	33	49	40	58
	22	31	47	39	56	31	47	40	56
27 FT ROD 2-22 Mc/s	2	50	110	66	130	40	90	54	110
	3	50	98	62	130	38	78	47	92
	4	48	100	61	120	36	70	43	88
	5	48	98	56	105	30	60	36	74
	6	47	86	56	94	28	54	36	70
	8	42	72	54	90	27	50	36	62
	10	42	64	54	80	27	46	34	58
	12	39	60	48	74	29	46	35	54
	14	36	58	45	68	29	46	37	56
	16	36	54	45	64	32	50	41	62
	18	35	52	43	60	35	52	43	60
	20	35	50	42	60	34	50	42	60
	22	31	47	39	56	31	47	39	56
43 FT ROD 2-22 Mc/s	2	68	130	78	150	52	120	68	130
	3	60	125	78	150	50	100	58	120
	4	60	110	72	130	40	85	50	100
	5	58	100	70	120	36	72	45	88
	6	50	90	64	105	32	62	40	78
	8	47	80	60	90	29	56	38	68
	10	44	70	54	82	28	48	38	60
	12	42	64	52	76	29	46	38	58
	14	37	58	45	68	30	46	37	56
	16	31	48	39	58	29	45	36	55
	18	28	44	34	52	28	43	34	52
	20	21	35	27	42	21	34	27	42
	22	7	11	9	15	7	12	9	15

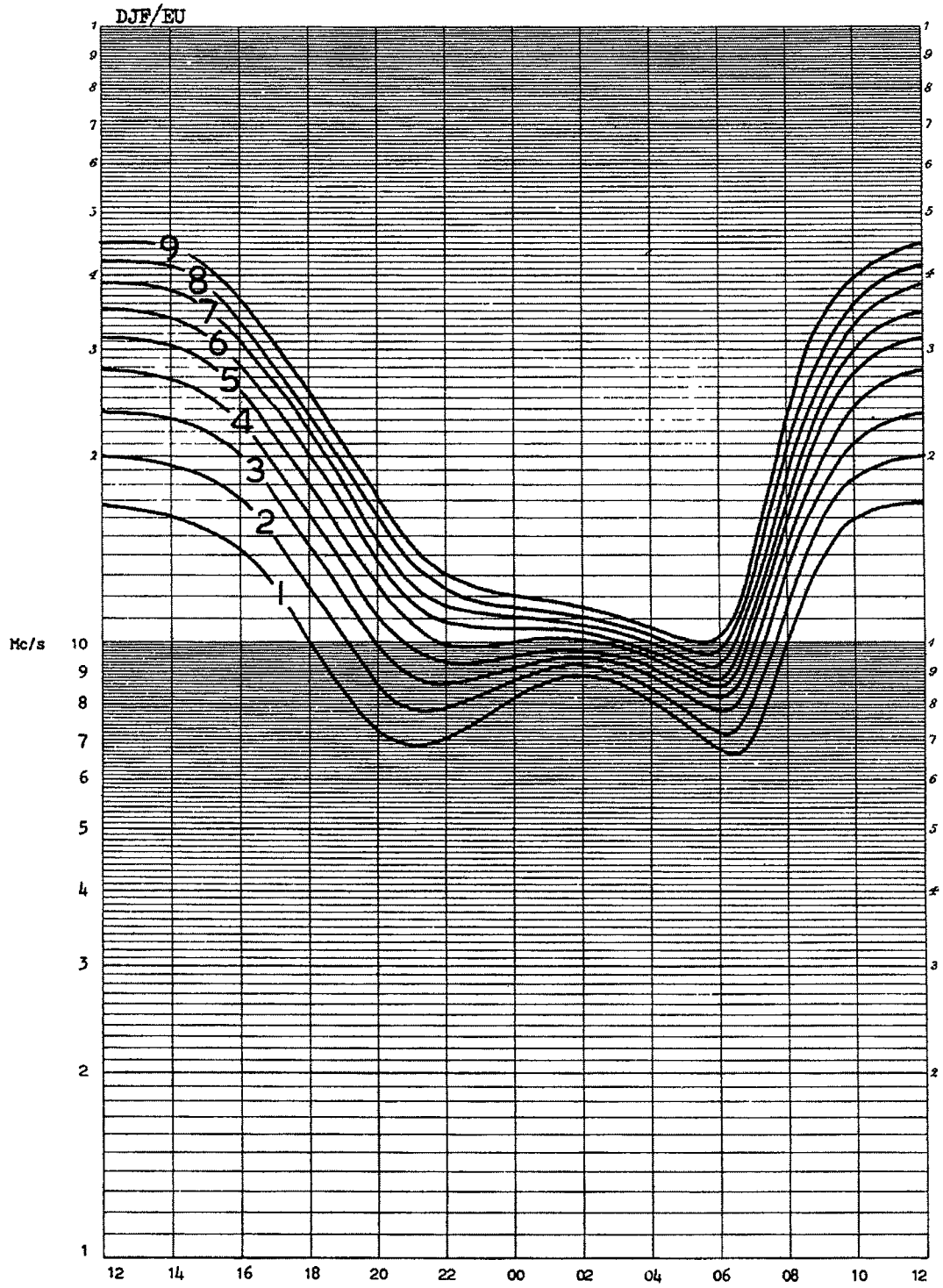
A/C15

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
16 FT ROD 2-30 Mc/s	2	36	82	48	96	28	71	36	88
	3	36	72	45	90	26	62	35	72
	4	37	74	46	92	25	56	33	68
	5	36	70	44	90	21	45	28	58
	6	36	70	47	86	22	42	28	56
	8	36	64	45	74	22	40	27	50
	10	34	58	43	70	24	40	28	48
	12	36	56	44	69	24	40	32	50
	14	35	53	42	64	26	43	34	52
	16	33	50	42	62	30	46	36	56
	18	32	50	40	58	33	50	40	58
	20	33	49	40	58	33	49	40	58
	22	31	47	40	56	31	47	40	56
	24	32	47	40	58	32	47	40	58
	26	31	46	38	54	31	46	36	54
	28	30	44	36	52	30	44	36	52
	30	30	43	35	50	30	43	35	50
24 FT ROD 2-30 Mc/s	2	48	96	60	120	36	88	49	100
	3	45	90	56	110	35	72	45	84
	4	46	92	58	110	33	68	41	80
	5	44	90	58	100	29	58	36	70
	6	44	84	56	95	28	56	34	68
	8	42	70	52	84	27	48	32	60
	10	40	64	50	78	26	45	34	56
	12	39	60	48	70	26	43	34	54
	14	36	58	45	68	30	48	36	58
	16	33	50	43	64	31	48	40	58
	18	35	52	44	62	35	52	44	62
	20	35	51	43	60	36	52	44	60
	22	33	49	41	58	34	49	42	58
	24	31	46	38	55	31	46	38	55
	26	28	42	36	50	28	42	36	50
	28	26	40	33	47	26	40	33	47
	30	25	36	31	44	25	36	31	44

A/C15 Cont'd.

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R.T.		C.W.		R.T.		C.W.	
		P	G	P	G	P	G	P	G
32 FT VERTICAL 2-30 Mc/s	2	56	120	70	140	48	96	60	120
	3	52	110	70	130	40	82	52	100
	4	54	104	68	120	37	78	46	95
	5	50	96	62	110	33	64	40	80
	6	54	88	60	100	30	60	38	74
	8	44	74	56	90	27	50	36	66
	10	42	66	54	80	26	46	34	58
	12	40	60	50	74	28	44	36	56
	14	39	60	49	70	32	48	38	60
	16	36	56	47	65	33	50	43	64
	18	34	50	42	60	33	49	41	58
	20	32	47	41	57	31	47	38	56
	22	29	43	35	50	28	43	35	50
	24	25	38	31	46	25	38	31	46
	26	20	31	25	37	20	31	25	37
	28	11	17	14	22	11	17	14	22
	30	0.6	1.0	0.8	1.3	0.6	1.0	0.8	1.3

LONG RANGE INTERFERENCE GUARD CURVES FOR USE WITH ALL RADIO STATIONS



LOCAL SUN TIME

Ground & Sky-Wave Ranges of Field Army Radio Stations

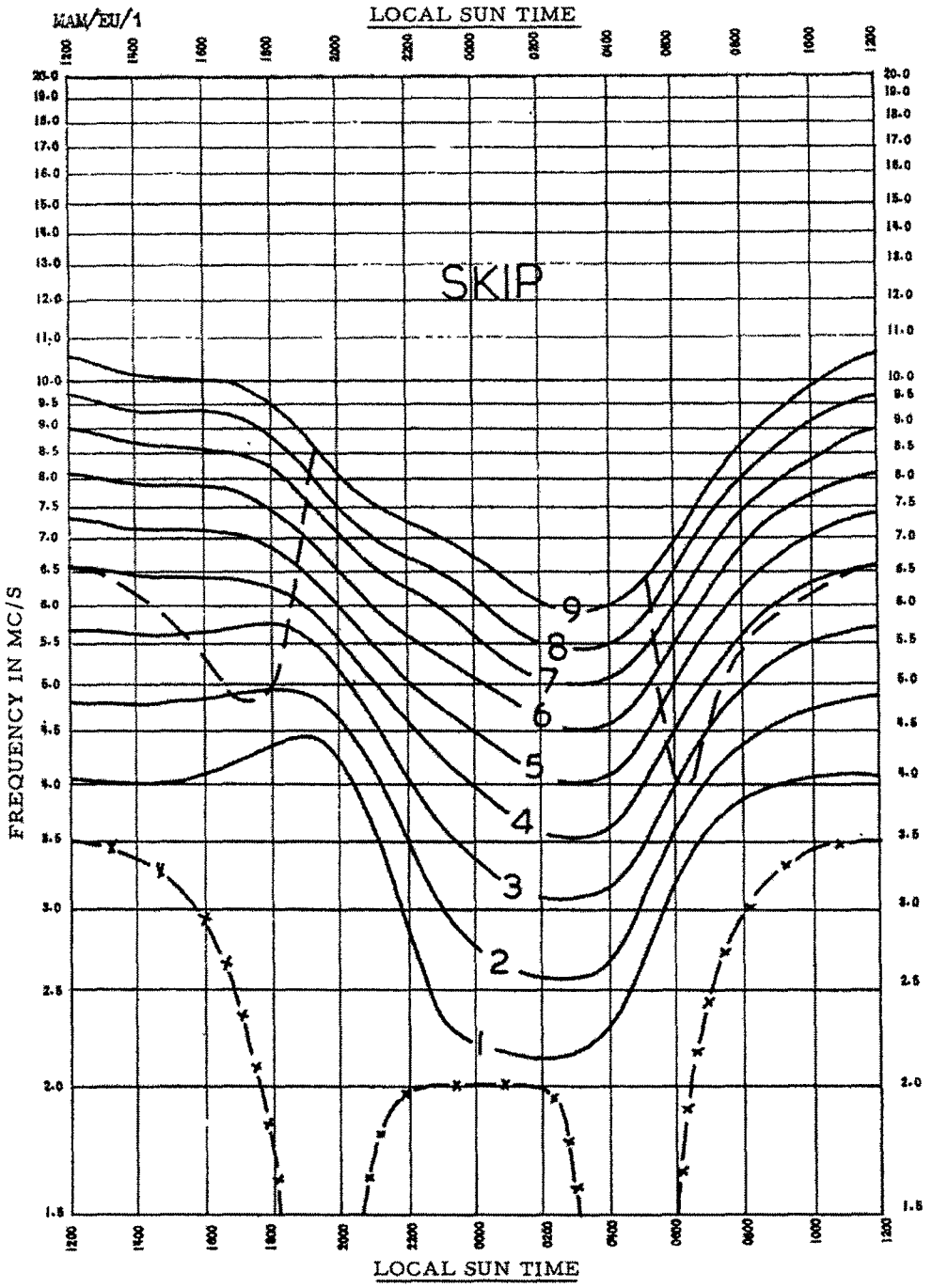
for use in EUROPE

DURING

MARCH APRIL & MAY

SKY WAVE CHART FOR USE WITH RADIO STATIONS

BCC 156, A14 LP, A16, A13 LP



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR

LOWER LIMITS OF AVAILABLE BAND

R/T

CW

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
4 FT ROD 2-8 Mc/s	2	2	5	4	13	1	2	2	6
	3	2	5	4	13	1	3	2	6
	4	2	5	5	13	1	2	2	5
	5	2	5	5	12	1	2	2	5
	6	2	5	5	11	1	2	2	5
	8	2	5	5	10	1	2	2	5
8 FT ROD 2-8 Mc/s	2	3	9	7	21	2	4	3	11
	3	3	9	7	20	1	4	4	10
	4	3	9	8	20	1	4	3	9
	5	3	8	8	18	1	4	3	8
	6	3	8	8	17	1	3	3	8
	8	4	8	8	16	1	3	4	8

C/A14 LP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	3	9	9	27	2	4	5	13
	3	3	9	10	25	1	4	4	13
	4	3	9	10	26	1	4	5	12
	5	3	8	10	24	1	4	5	11
	6	3	8	10	24	1	3	4	10
	8	4	8	10	22	1	3	5	10
	10	4	8	11	22	2	4	5	10
27 FT VERTICAL 2-10 Mc/s	2	8	23	23	60	3	12	12	33
	3	8	21	22	58	3	10	11	28
	4	8	20	24	52	3	9	10	26
	5	7	17	22	47	3	9	10	25
	6	7	15	21	43	3	8	9	22
	8	7	14	21	40	3	7	9	19
	10	7	13	20	36	3	7	10	19

C/A16

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-6 Mc/s	2	3	9	9	27	2	4	5	13
	3	3	9	10	25	1	4	4	13
	4	3	9	10	26	1	4	5	12
	5	3	8	10	24	1	4	5	11
	6	3	8	10	24	1	3	4	10
26 FT ROD 2-6 Mc/s	2	8	23	23	60	3	12	12	33
	3	8	21	22	58	3	10	11	28
	4	8	20	24	52	3	9	10	26
	5	7	17	22	47	3	9	10	25
	6	7	15	21	43	3	8	9	22

C/A13 LP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-8 Mc/s	2	4	13	12	38	2	6	6	18
	3	4	12	12	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	10	13	30	2	5	6	13
	8	5	10	14	28	2	5	7	13
26 FT ROD 2-8 Mc/s	2	10	30	30	74	4	14	14	42
	3	10	26	30	66	5	15	15	37
	4	10	26	31	64	4	12	13	34
	5	10	23	30	60	5	11	13	32
	6	9	22	28	54	4	10	12	28
	8	9	18	26	50	4	9	13	26

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	4	13	13	37	2	6	6	18
	3	4	12	13	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	10	14	30	2	5	6	13
	8	5	10	14	28	2	5	7	13
	10	6	9	16	27	2	5	7	13
12 FT ROD 1.9-10 Mc/s	2	6	17	18	50	3	9	8	24
	3	6	15	16	42	3	8	8	22
	4	6	15	17	42	2	7	8	21
	5	6	15	18	42	3	7	8	19
	6	6	13	17	38	3	6	8	17
	8	6	11	18	36	3	6	9	18
	10	5	11	18	33	3	6	9	17
32 FT VERTICAL 1.6-6.5 Mc/s	2	12	35	36	82	5	16	16	46
	3	11	30	35	72	6	15	16	42
	4	11	28	34	70	5	13	15	37
	5	10	25	30	64	5	13	15	36
	6	10	24	35	68	5	10	13	30

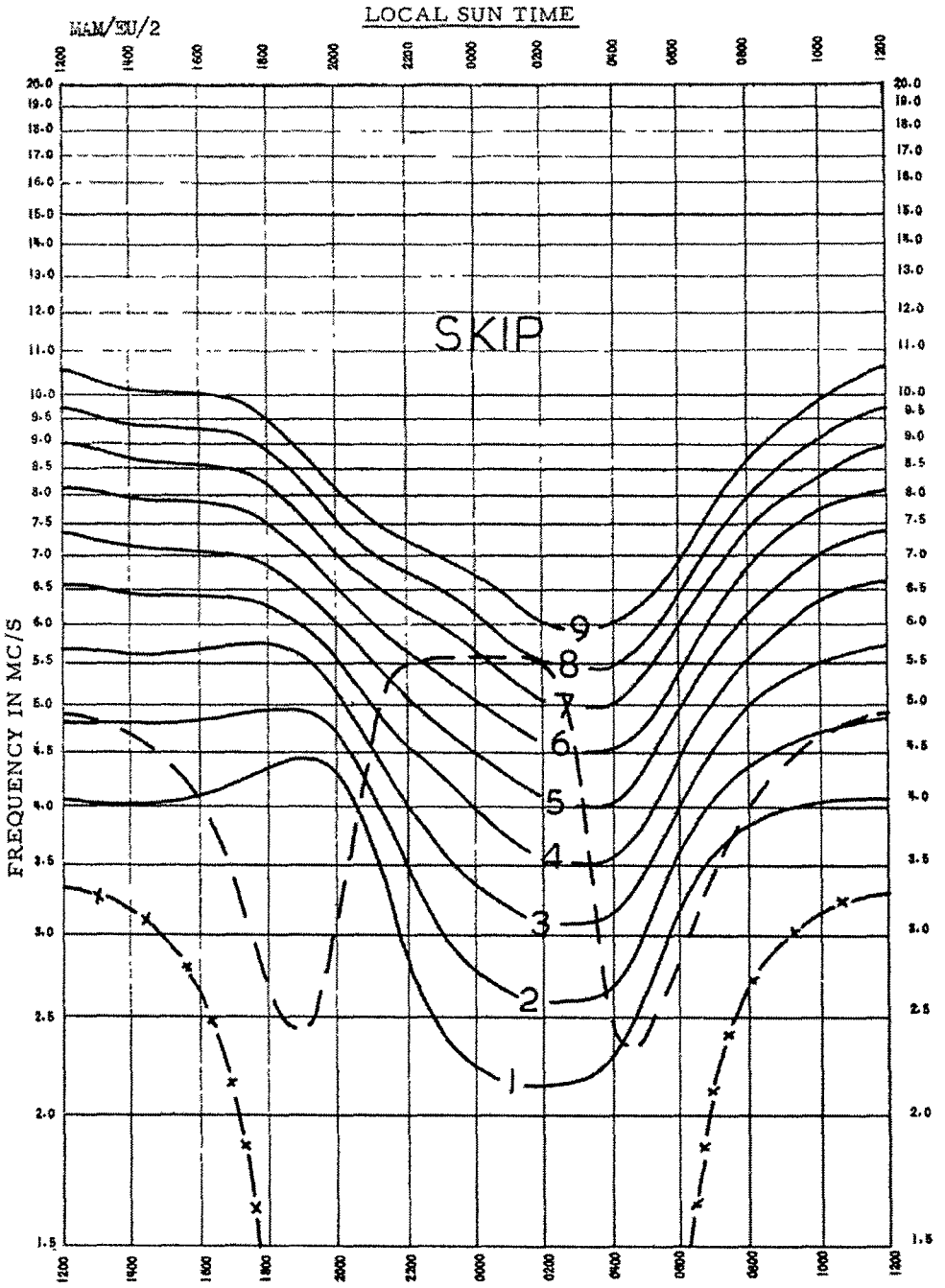
ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 1.6-12 Mc/s	2	4	13	13	37	2	6	6	18
	3	4	12	12	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	10	13	30	2	5	6	13
	8	5	10	14	28	2	5	7	13
	10	6	9	14	27	2	5	7	13
	12	5	9	16	28	3	6	9	16
16 FT ROD 1.5-12 Mc/s	2	7	21	22	60	3	10	10	30
	3	7	19	20	52	3	10	10	27
	4	7	19	22	50	3	8	9	23
	5	7	17	21	45	3	8	10	28
	6	7	15	21	43	3	7	10	21
	8	8	15	22	41	4	7	10	20
	10	7	13	22	48	4	7	10	20
	12	7	13	21	36	4	8	12	23
27 FT ROD 1.5-8 Mc/s	2	10	30	30	74	4	14	14	42
	3	10	26	30	66	5	15	15	37
	4	10	26	31	64	4	12	13	34
	5	10	23	30	60	5	11	13	32
	6	9	22	28	54	4	10	12	28
	8	9	18	26	50	4	9	13	26

C/62

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	4	13	13	37	2	6	6	18
	3	4	12	12	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	10	13	30	2	5	6	13
	8	5	10	14	28	2	5	7	13
	10	6	9	14	27	2	5	7	13
12 FT ROD 2-10 Mc/s	2	6	17	18	50	3	9	8	24
	3	6	15	16	42	3	8	8	22
	4	6	15	17	42	3	7	8	21
	5	6	15	18	42	3	7	8	19
	6	6	13	17	38	3	6	8	17
	8	6	11	18	36	3	6	9	18
	10	5	11	18	33	3	6	9	17
32 FT VERTICAL 2-6.5 Mc/s	2	12	35	36	82	5	16	16	46
	3	11	30	35	72	6	15	16	42
	4	11	28	34	70	5	13	15	37
	5	11	25	30	64	5	13	15	36
	6	10	24	35	68	5	10	13	30

SKY WAVE CHART FOR USE WITH RADIO STATIONS

C12, C13, 62.



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ————————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — —

CW —x—x—x—

C/A14 HP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	5	16	16	46	3	8	8	24
	3	6	15	16	43	3	8	8	22
	4	6	16	17	42	3	7	8	20
	5	6	15	17	40	3	7	8	18
	6	6	13	17	38	3	6	8	17
	8	6	12	18	35	3	6	8	16
	10	6	12	19	34	3	7	9	18
27 FT VERTICAL 2-10 Mc/s	2	13	37	38	86	6	20	20	56
	3	13	36	40	81	7	17	18	50
	4	13	34	40	80	6	15	17	42
	5	12	30	37	72	6	14	18	40
	6	12	28	36	70	5	12	16	35
	8	12	25	34	64	6	11	16	33
	10	12	23	34	57	6	10	18	31

C/19HP

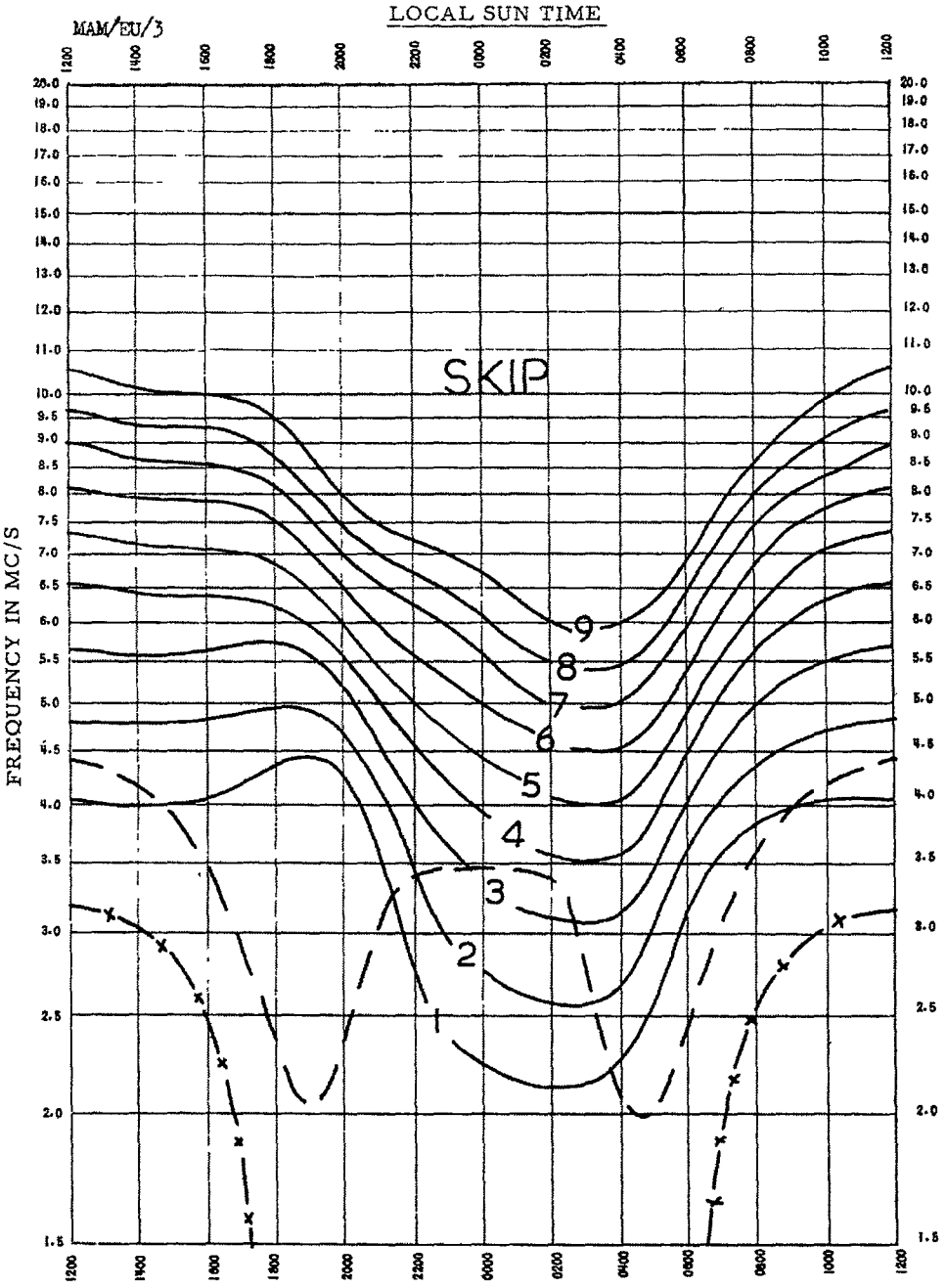
ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
12 FT ROD 2-8 Mc/s	2	8	23	23	64	3	10	11	31
	3	7	20	21	54	4	10	10	27
	4	8	21	24	54	3	9	10	25
	5	8	18	24	50	4	9	11	25
	6	8	17	23	45	3	8	10	24
	8	8	16	23	44	4	8	11	23
34 FT VERTICAL 2-6 Mc/s	2	15	44	48	96	7	22	22	60
	3	16	42	45	90	8	21	22	58
	4	14	37	43	88	7	18	19	48
	5	13	32	40	80	7	16	20	44
	6	13	30	43	85	6	13	17	37

C/A13 HP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-8 Mc/s	2	7	21	22	60	3	11	11	30
	3	7	20	21	54	4	10	10	27
	4	8	20	24	52	3	9	10	26
	5	8	18	24	46	3	8	11	24
	6	8	17	23	45	3	8	10	22
	8	8	16	24	44	4	8	11	23
26 FT ROD 2-8 Mc/s	2	17	49	50	110	9	24	26	66
	3	17	46	50	98	9	23	26	62
	4	17	42	48	100	8	20	24	53
	5	17	40	48	98	8	17	33	48
	6	16	35	47	86	7	15	21	43
	8	16	32	42	72	7	15	22	40

SKY WAVE CHART FOR USE WITH RADIO STATIONS

A14 HP, 19 HP, A13 HP



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ————————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — — —

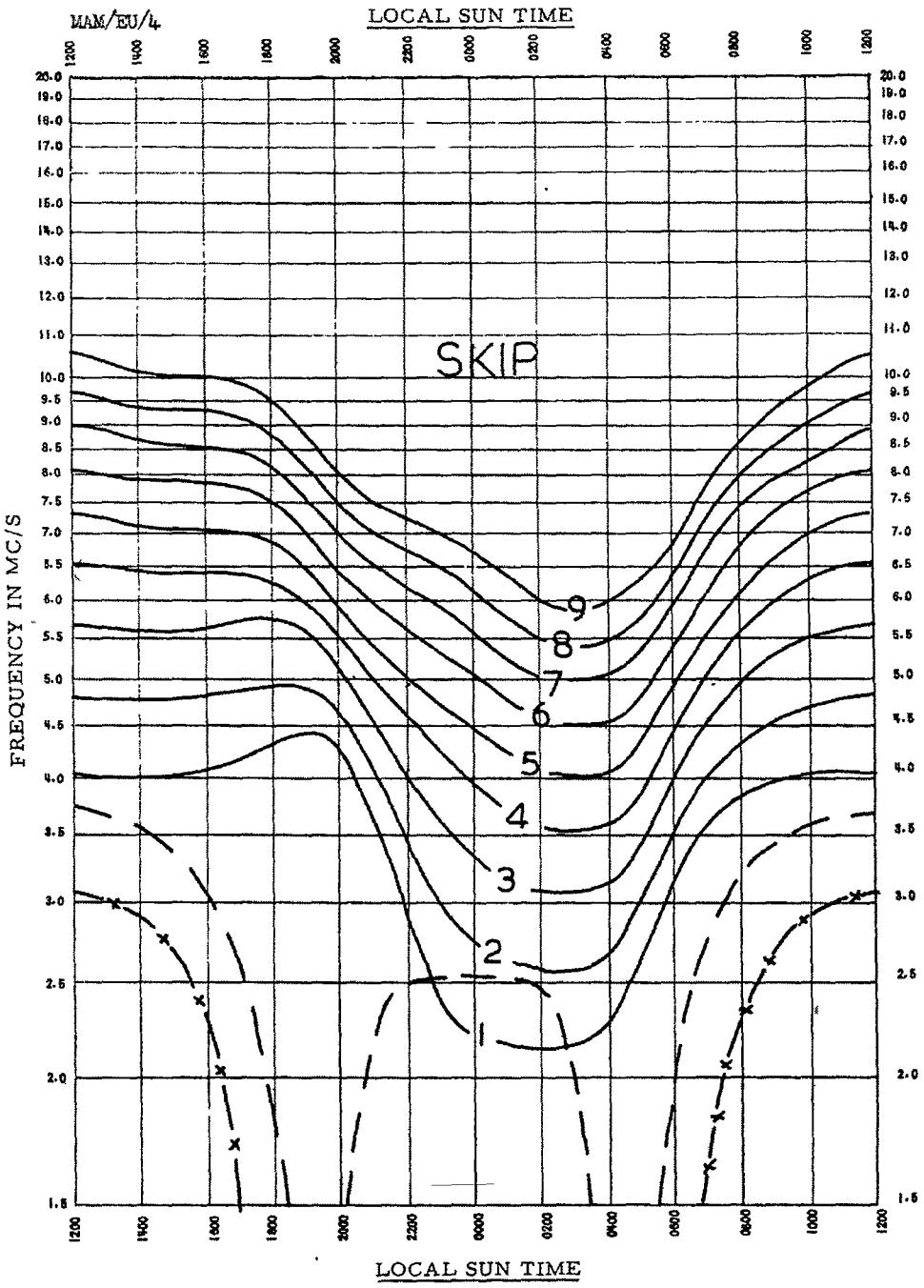
CW —x—x—x—

C/C11

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-16 Mc/s	2	8	23	18	50	3	11	8	24
	3	7	20	16	43	4	10	8	22
	4	8	20	17	42	3	9	8	20
	5	8	18	17	40	3	8	8	18
	6	8	17	17	38	3	8	8	17
	8	8	16	18	35	4	8	8	16
	10	8	16	19	34	4	8	9	18
	12	9	17	20	34	5	9	11	21
	14	9	16	20	34	5	9	12	21
	16	9	16	20	34	7	11	15	26
16 FT ROD 2-12 Mc/s	2	12	38	28	71	6	17	13	40
	3	12	30	27	62	6	17	13	34
	4	12	33	30	60	6	14	12	33
	5	12	28	29	58	5	17	12	37
	6	12	28	28	54	6	13	12	28
	8	13	26	26	50	6	12	14	28
	10	12	24	26	46	5	11	14	26
	12	13	23	28	44	7	13	16	28

SKY WAVE CHART FOR USE WITH RADIO STATIONS

C11



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

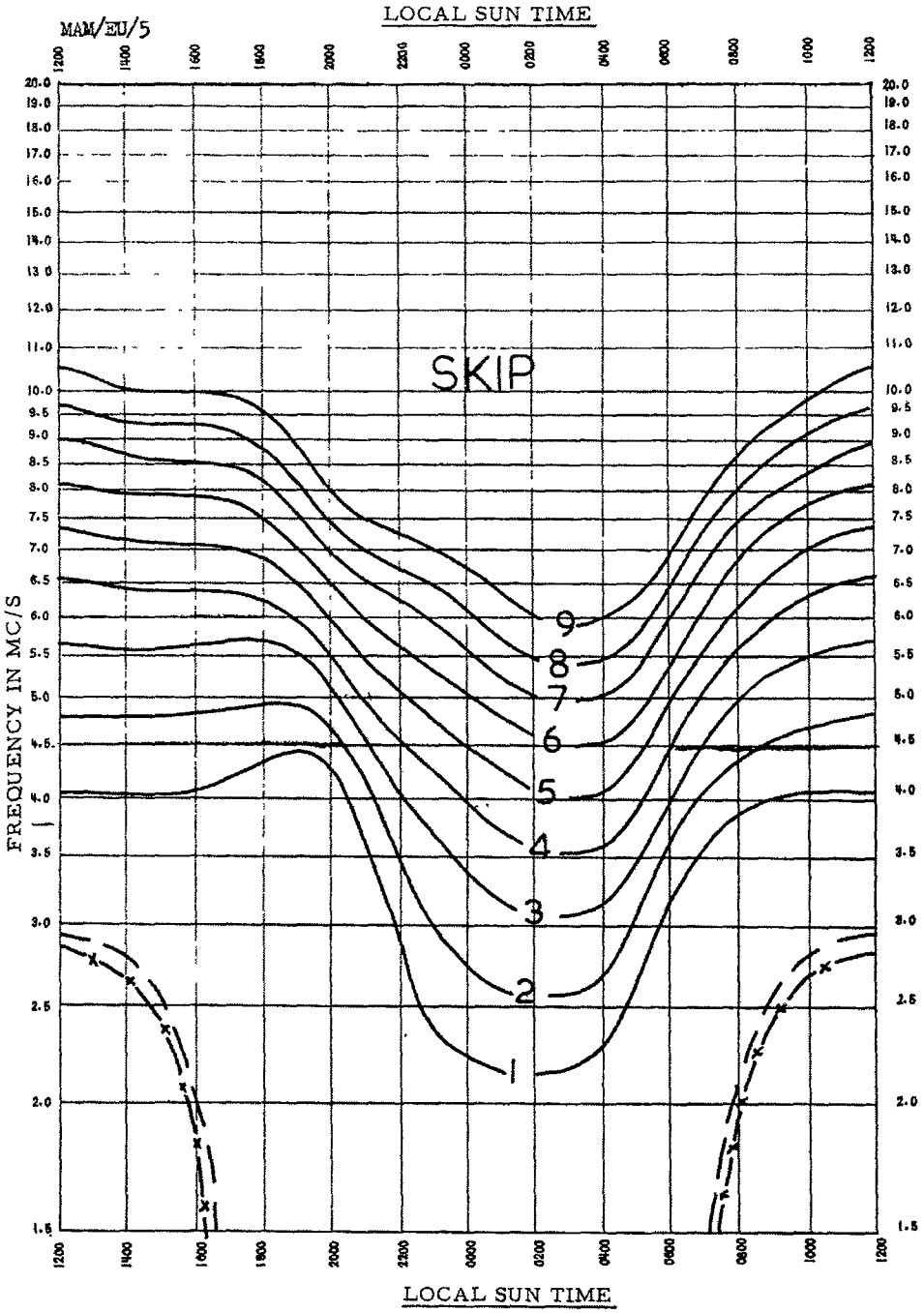
R/T — — — —

CW —x—x—x—

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
27 FT VERTICAL 2-10 Mc/s	2	19	54	40	90	9	24	20	56
	3	17	46	40	81	9	23	18	50
	4	17	42	40	80	8	20	17	42
	5	17	40	37	72	8	17	18	40
	6	16	35	36	70	7	15	16	35
	8	16	32	34	64	7	15	16	33
	10	15	28	34	56	8	14	18	31
43 FT VERTICAL 2-5 Mc/s	2	24	64	53	120	11	32	26	68
	3	23	58	48	94	11	30	25	62
	4	22	50	45	90	10	24	22	50
	5	22	46	45	88	9	23	22	46

SKY WAVE CHART FOR USE WITH RADIO STATIONS

D11, C15.



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — —

CW —x—x—x—

C/D11

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
16 FT ROD 2-22 Mc/s	2	36	82	48	96	18	50	23	64
	3	36	72	45	90	17	46	23	58
	4	37	78	46	95	16	40	22	50
	5	36	70	44	90	16	39	22	46
	6	36	70	47	86	16	35	22	42
	8	36	64	45	74	17	34	23	43
	10	34	58	43	70	18	33	25	40
	12	36	56	44	69	20	35	26	43
	14	35	53	42	64	22	36	28	45
	16	33	50	42	62	25	40	31	48
	18	32	50	40	58	29	45	36	54
	20	33	49	40	58	31	47	40	58
	22	31	47	39	56	30	45	37	54
27 FT ROD 2-22 Mc/s	2	50	110	66	130	26	66	34	82
	3	50	98	62	130	26	62	34	70
	4	48	100	61	120	24	53	31	62
	5	48	98	56	105	23	48	32	62
	6	47	86	56	94	21	43	28	54
	8	42	72	54	90	22	40	27	50
	10	42	64	54	80	22	38	28	49
	12	39	60	48	74	23	40	30	50
	14	36	58	45	68	24	40	31	48
	16	36	54	45	64	27	43	34	50
	18	35	52	43	60	33	49	40	58
	20	35	50	42	60	33	49	41	58
	22	31	47	39	56	30	45	38	54
43 FT ROD 2-22 Mc/s	2	68	130	78	150	33	80	43	94
	3	60	125	78	150	33	72	44	86
	4	60	110	72	130	29	60	37	74
	5	58	100	70	120	29	58	36	74
	6	50	90	64	105	25	49	31	62
	8	47	80	60	90	24	44	30	56
	10	44	70	54	82	26	41	30	50
	12	42	64	52	76	27	41	32	50
	14	37	58	45	68	26	39	31	48
	16	31	48	39	58	24	39	30	47
	18	28	44	34	52	25	40	32	48
	20	21	35	27	42	20	33	24	40
	22	7	11	9	15	7	11	9	15

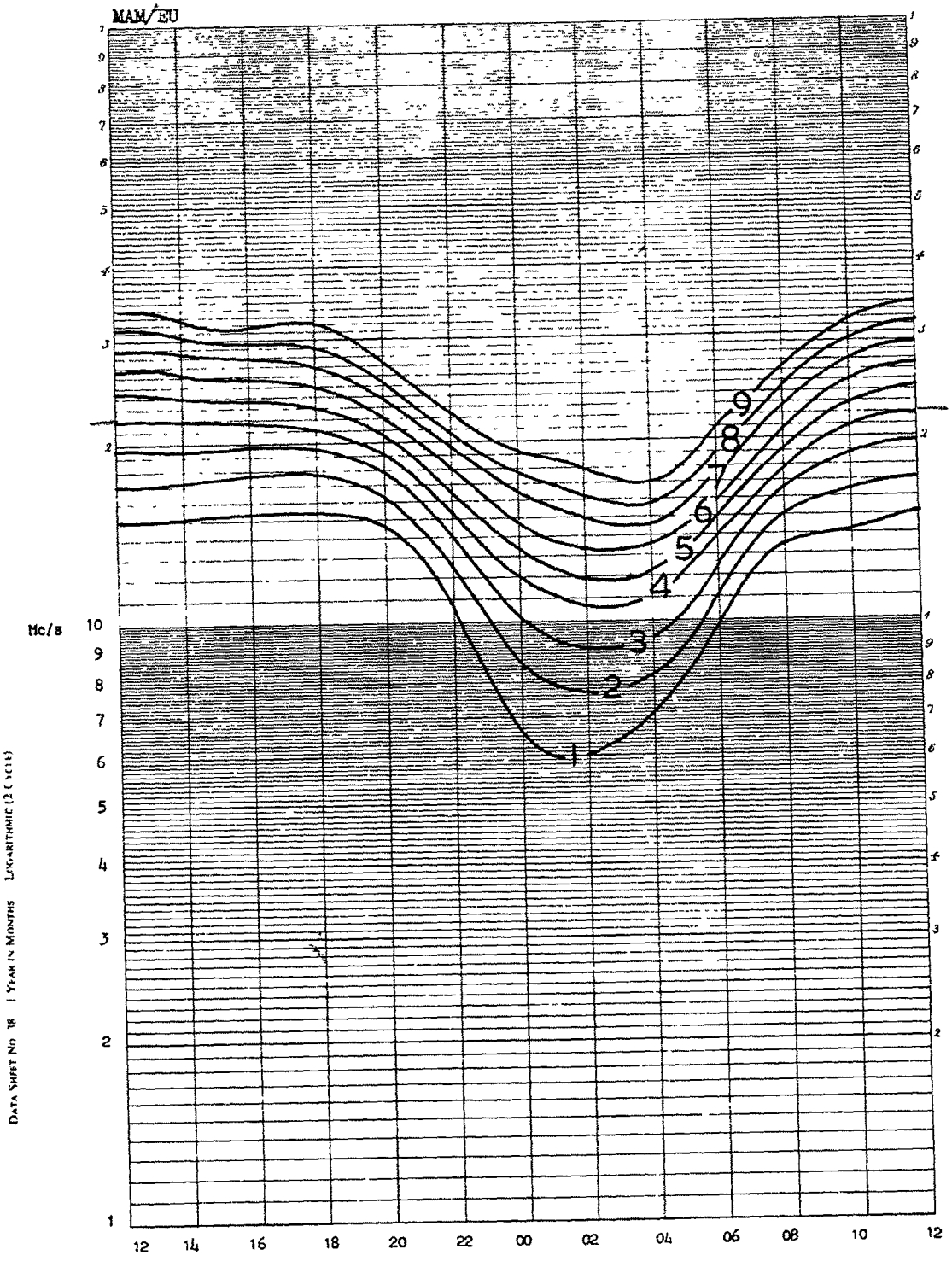
C/C15

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
16 FT ROD 2-30 Mc/s	2	36	82	48	96	18	50	23	64
	3	36	72	45	90	17	46	23	58
	4	37	74	46	92	16	40	22	50
	5	36	70	44	90	16	39	22	46
	6	36	70	47	86	16	35	22	42
	8	36	64	45	74	17	34	23	43
	10	34	58	43	70	18	33	25	40
	12	36	56	44	69	20	35	26	43
	14	35	53	42	64	22	36	28	45
	16	33	50	42	62	25	40	31	48
	18	32	50	40	58	29	45	36	54
	20	33	49	40	58	31	47	40	58
	22	31	47	39	56	30	45	39	54
	24	32	47	40	56	32	47	40	56
	26	31	46	38	54	31	46	38	54
	28	30	44	36	52	30	44	36	52
	30	30	43	35	50	30	43	35	50
24 FT ROD 2-30 Mc/s	2	48	96	60	120	23	64	30	75
	3	45	90	56	110	23	58	30	64
	4	46	92	58	110	22	50	29	60
	5	44	90	58	100	22	46	29	58
	6	44	84	56	95	21	42	28	56
	8	42	70	52	84	21	40	26	50
	10	40	64	50	78	22	38	26	46
	12	39	60	48	70	23	37	29	45
	14	36	58	45	68	25	40	31	48
	16	33	50	43	64	26	42	33	50
	18	35	52	44	62	31	47	37	55
	20	35	51	43	60	33	49	41	59
	22	33	49	41	58	32	47	40	58
	24	31	45	39	55	31	45	39	55
	26	28	42	36	50	28	42	36	50
	28	26	40	33	47	26	40	33	47
	30	25	36	31	44	25	36	31	44

C/C15 Cont'd.

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
32 FT VERTICAL 2-30 Mc/s	2	56	120	70	140	28	71	36	88
	3	52	110	70	130	30	66	38	78
	4	54	104	68	120	25	56	34	70
	5	50	96	62	110	27	54	35	68
	6	54	88	60	100	23	46	30	60
	8	44	74	56	90	23	43	28	54
	10	42	66	54	80	24	40	28	48
	12	40	60	50	74	24	40	31	48
	14	39	60	49	70	25	41	35	50
	16	36	56	47	65	29	46	36	54
	18	34	50	42	60	29	45	36	53
	20	32	47	41	57	31	45	38	55
	22	29	43	35	50	28	41	33	49
	24	25	38	31	45	25	38	31	45
	26	20	31	25	37	20	31	25	37
	28	11	17	14	22	11	17	14	22
	30	0.6	1.0	0.8	1.3	0.6	1.0	0.8	1.3

LONG RANGE INTERFERENCE GUARD CURVES FOR USE WITH ALL RADIO STATIONS



Ground & Sky-Wave Ranges of Field Army Radio Stations

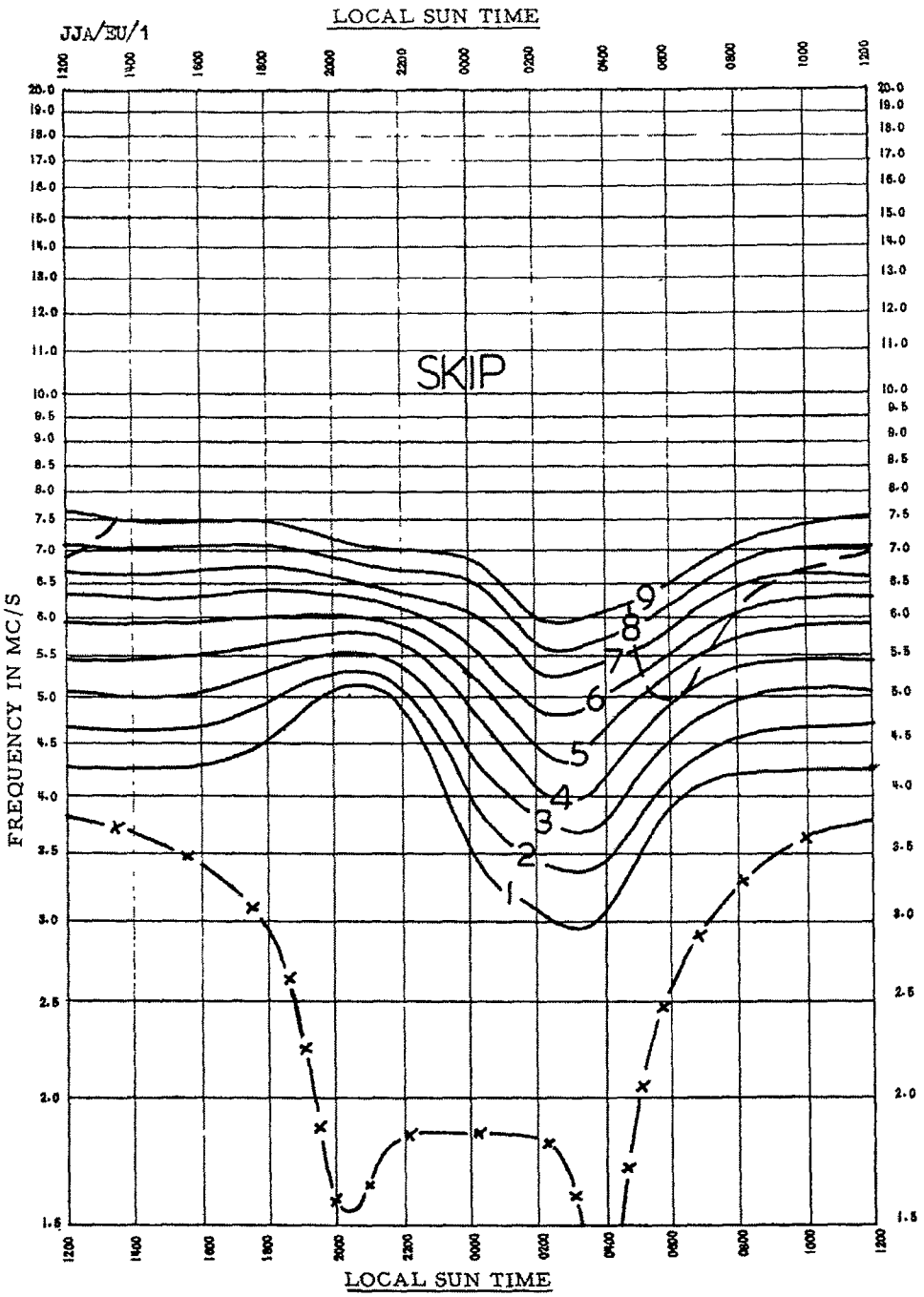
for use in EUROPE

DURING

JUNE JULY & AUGUST

SKY WAVE CHART FOR USE WITH RADIO STATIONS

BCC 156, A14 LP, A16, A13 LP.



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — — —

CW ——x——x——x——

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
4 FT ROD 2-8 Mc/s	2	2	6	4	13	1	2	2	6
	3	2	5	4	13	1	3	2	6
	4	2	5	5	13	1	2	2	5
	5	2	5	5	12	1	2	2	5
	6	2	4	4	10	1	2	2	5
	8	2	4	4	9	1	2	2	5
8 FT ROD 2-8 Mc/s	2	3	10	8	23	2	4	3	11
	3	3	9	7	20	1	4	4	10
	4	3	9	8	20	1	4	3	9
	5	3	8	7	18	1	4	3	8
	6	3	7	7	15	1	3	3	8
	8	3	6	7	13	1	3	4	8

D/A14 LP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	3	10	10	30	2	4	5	13
	3	3	9	10	25	1	4	4	13
	4	3	9	10	26	1	4	5	12
	5	3	8	10	24	1	4	5	11
	6	3	7	9	20	1	3	4	10
	8	3	6	8	16	1	3	5	10
	10	3	7	9	18	2	4	5	10
27 FT VERTICAL 2-10 Mc/s	2	8	24	24	64	3	12	12	33
	3	8	21	22	58	3	10	11	28
	4	8	20	24	52	3	9	10	26
	5	7	17	22	47	3	9	10	25
	6	6	14	19	42	3	8	9	22
	8	6	11	17	33	3	7	9	19
	10	6	10	18	31	3	7	10	19

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-6 Mc/s	2	3	10	10	30	2	4	5	13
	3	3	9	10	25	1	4	4	13
	4	3	9	10	26	1	4	5	12
	5	3	8	10	24	1	4	5	11
	6	3	4	9	20	1	3	4	10
26 FT ROD 2-6 Mc/s	2	8	24	24	64	3	12	12	33
	3	8	21	22	58	3	10	11	28
	4	8	20	24	52	3	9	10	26
	5	7	17	22	47	3	9	10	25
	6	6	14	19	42	3	8	9	22

D/A13 LP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R.T.		C.W.		R.T.		C.W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-8 Mc/s	2	4	13	13	37	2	6	6	18
	3	4	12	12	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	9	12	26	2	5	6	13
	8	4	8	11	23	2	5	7	13
26 FT ROD 2-8 Mc/s	2	11	30	32	80	4	14	14	42
	3	10	26	30	66	5	15	15	37
	4	10	26	31	64	4	12	13	34
	5	10	23	30	60	5	11	13	32
	6	9	19	27	50	4	10	12	28
	8	8	15	22	41	4	9	13	26

D/C12

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	4	13	13	37	2	6	6	18
	3	4	12	12	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	9	12	26	2	5	6	13
	8	4	8	11	23	2	5	7	13
	10	4	8	12	23	2	5	7	13
12 FT ROD 1.9-10 Mc/s	2	6	17	18	50	3	9	8	24
	3	6	15	16	42	3	8	8	22
	4	6	15	17	42	2	7	8	21
	5	6	15	18	42	3	7	8	19
	6	5	12	16	35	3	6	8	17
	8	5	10	15	32	3	6	9	18
	10	5	10	15	28	3	6	9	17
32 FT VERTICAL 1.6-6.5 Mc/s	2	12	35	36	82	5	16	16	46
	3	11	30	35	72	6	15	16	42
	4	11	28	34	70	5	13	15	37
	5	10	25	30	64	5	13	15	36
	6	9	20	28	56	5	10	13	30

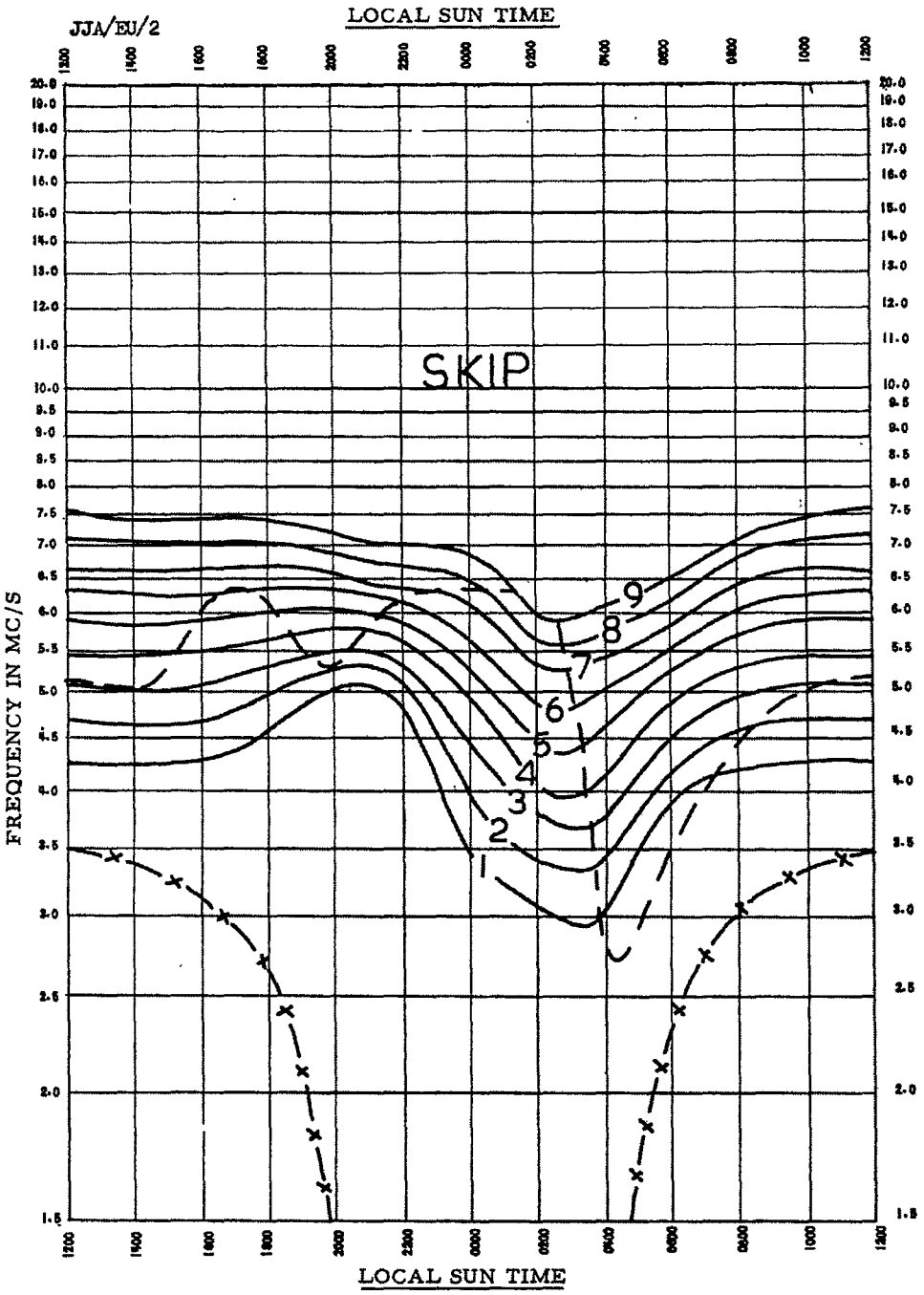
D/C13

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 1.6-12 Mc/s	2	4	13	13	37	2	6	6	18
	3	4	12	12	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	9	12	26	2	5	6	13
	8	4	8	11	23	2	5	7	13
	10	4	8	12	23	2	5	7	13
	12	5	9	13	24	3	6	9	16
16 FT ROD 1.5-12 Mc/s	2	7	21	22	60	3	10	10	30
	3	7	19	20	52	3	10	10	27
	4	7	19	22	50	3	8	9	23
	5	7	17	21	45	3	8	10	28
	6	6	14	19	40	3	7	10	21
	8	6	12	17	34	4	7	10	20
	10	5	11	18	33	4	7	10	20
	12	6	12	17	33	4	8	12	23
27 FT ROD 1.5-8 Mc/s	2	11	30	32	80	4	14	14	42
	3	10	26	30	66	5	15	15	37
	4	10	26	31	64	4	12	13	34
	5	10	23	30	60	5	11	13	32
	6	9	19	27	50	4	10	12	28
	8	8	15	22	41	4	9	13	26

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	4	13	13	37	2	6	6	18
	3	4	12	12	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	9	12	26	2	5	6	13
	8	4	8	11	23	2	5	7	13
	10	4	8	12	23	2	5	7	13
12 FT ROD 2-10 Mc/s	2	6	17	18	50	3	9	8	24
	3	6	15	16	42	3	8	8	22
	4	6	15	17	42	2	7	8	21
	5	6	15	18	42	3	7	8	19
	6	5	12	16	35	3	6	8	17
	8	5	10	15	32	3	6	9	18
	10	5	10	15	28	3	6	9	17
32 FT VERTICAL 2-6.5 Mc/s	2	12	35	36	82	5	16	16	46
	3	11	30	35	72	6	15	16	42
	4	11	28	34	70	5	13	15	37
	5	10	25	30	64	5	13	15	36
	6	9	20	28	56	5	10	13	30

SKY WAVE CHART FOR USE WITH RADIO STATIONS

C12, C13, 62



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — —

CW — x — x — x —

D/A 14 HP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	6	17	18	50	3	8	8	24
	3	6	15	16	43	3	8	8	22
	4	6	16	17	42	3	7	8	20
	5	6	15	17	40	3	7	8	18
	6	5	12	15	34	3	6	8	1[illegible]
	8	5	10	14	29	3	6	8	16
	10	5	10	16	29	3	7	9	18
27 FT ROD 2-10 Mc/s	2	14	40	40	90	6	20	20	56
	3	13	36	40	81	7	17	18	50
	4	13	34	40	80	6	15	1[illegible]	42
	5	12	30	37	72	6	14	18	40
	6	11	26	32	64	5	12	16	35
	8	9	20	26	50	6	11	16	33
	10	10	19	28	48	6	10	18	31

D/19 HP

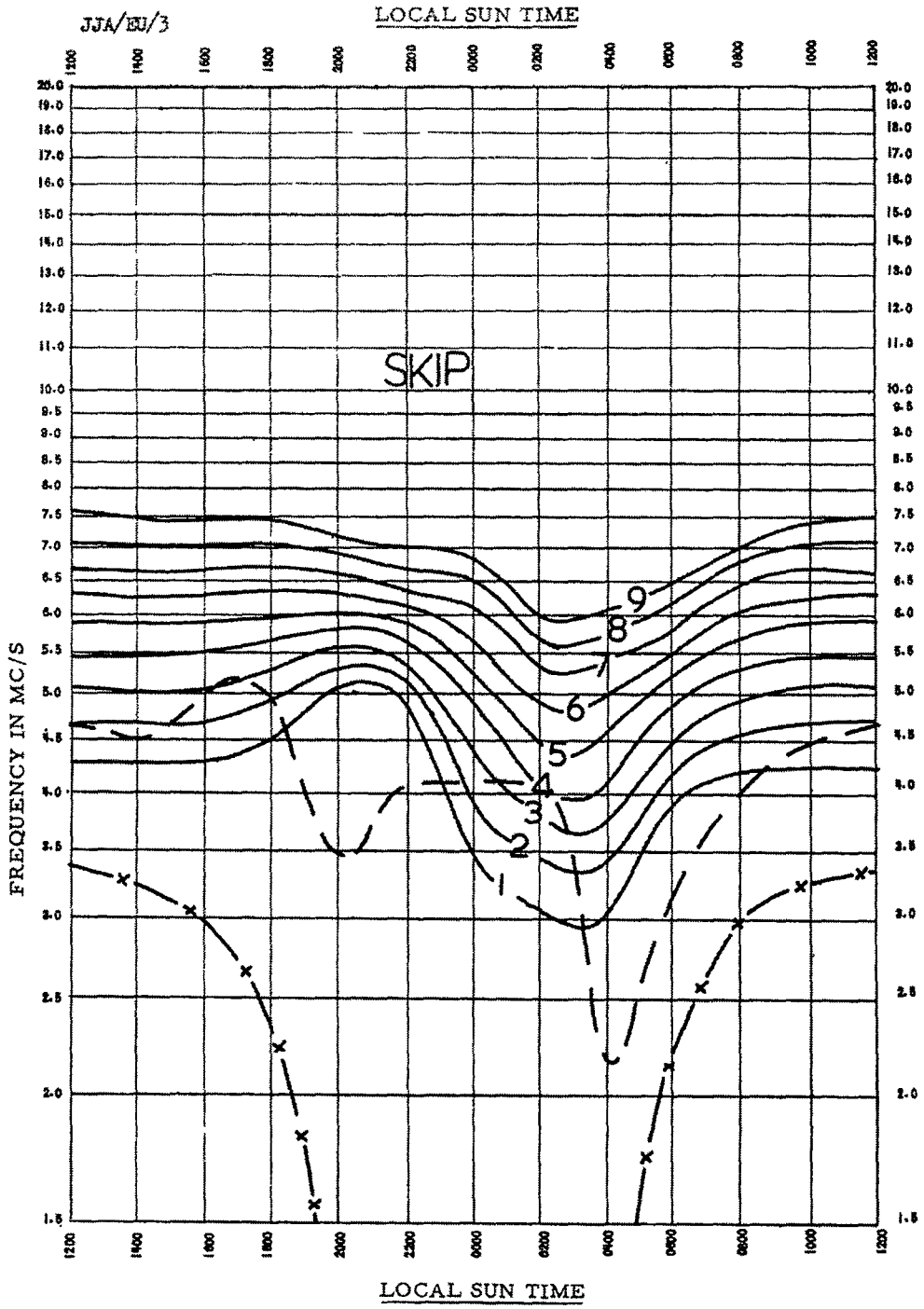
ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
12 FT ROD 2-8 Mc/s	2	8	23	23	64	3	10	11	31
	3	7	20	21	54	4	10	10	27
	4	8	21	24	54	3	9	10	25
	5	8	18	24	50	4	9	11	25
	6	7	15	21	43	3	8	10	24
	8	7	13	19	37	4	8	11	23
34 FT VERTICAL 2-6 Mc/s	2	15	44	48	96	7	22	22	60
	3	16	42	45	90	8	21	22	58
	4	14	37	43	88	7	18	19	48
	5	13	32	40	80	7	16	20	44
	6	11	27	34	66	6	13	17	37

D/A13 HP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-8 Mc/s	2	8	23	23	60	3	11	11	30
	3	7	20	21	54	4	10	10	27
	4	8	20	24	52	3	9	10	26
	5	8	18	24	46	3	8	11	24
	6	7	15	20	46	3	8	10	22
	8	7	13	19	37	4	8	11	23
26 FT ROD 2-8 Mc/s	2	19	54	54	110	9	24	26	66
	3	17	46	50	98	9	23	26	62
	4	17	42	48	100	8	20	24	53
	5	17	40	48	98	8	17	33	48
	6	15	33	43	80	7	15	21	43
	8	13	26	36	64	7	15	22	40

SKY WAVE CHART FOR USE WITH RADIO STATIONS

A14 HP, 19 HP, A13 HP



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ————————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — — —

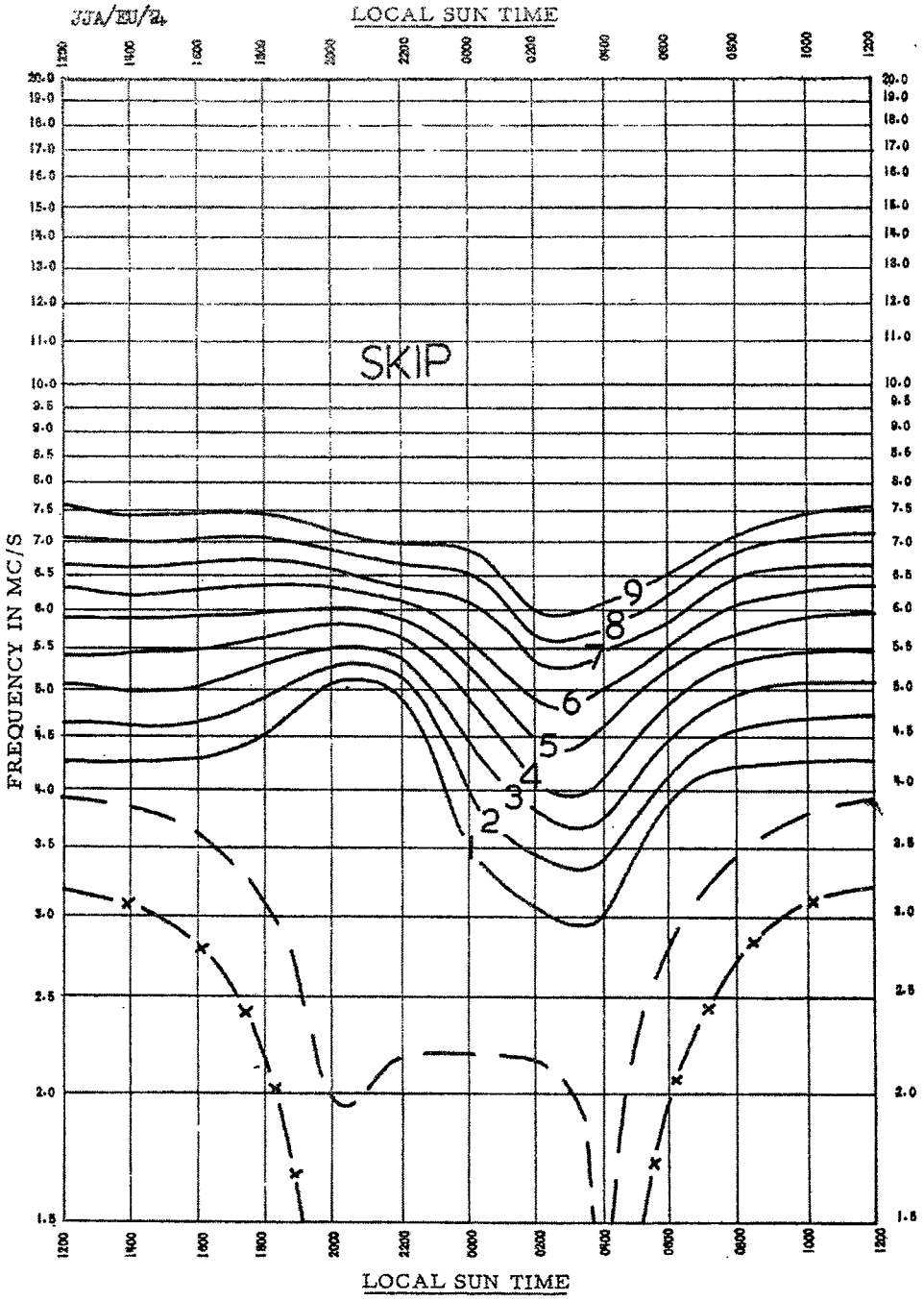
CW —— x —— x —— x ——

D/C11

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-16 Mc/s	2	8	23	18	50	3	11	8	24
	3	7	20	16	43	4	10	8	22
	4	8	20	17	42	3	9	8	20
	5	8	18	17	40	3	8	8	18
	6	7	15	15	34	3	8	8	17
	8	7	13	14	29	4	8	8	16
	10	7	13	16	29	4	8	9	18
	12	8	14	17	31	5	9	11	21
	14	8	15	18	32	5	9	12	21
	16	9	16	20	34	7	11	15	26
16 FT ROD 2-12 Mc/s	2	12	38	28	71	6	17	13	40
	3	12	30	27	62	6	17	13	34
	4	12	33	30	60	6	14	12	33
	5	12	28	29	58	5	17	12	37
	6	11	25	26	50	6	13	12	28
	8	10	20	23	43	6	12	14	28
	10	10	20	24	40	5	11	14	26
	12	11	21	24	40	7	13	16	28

SKY WAVE CHART FOR USE WITH RADIO STATIONS

D11, C15.



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR _____

LOWER LIMITS OF AVAILABLE BAND

R/T — — — —

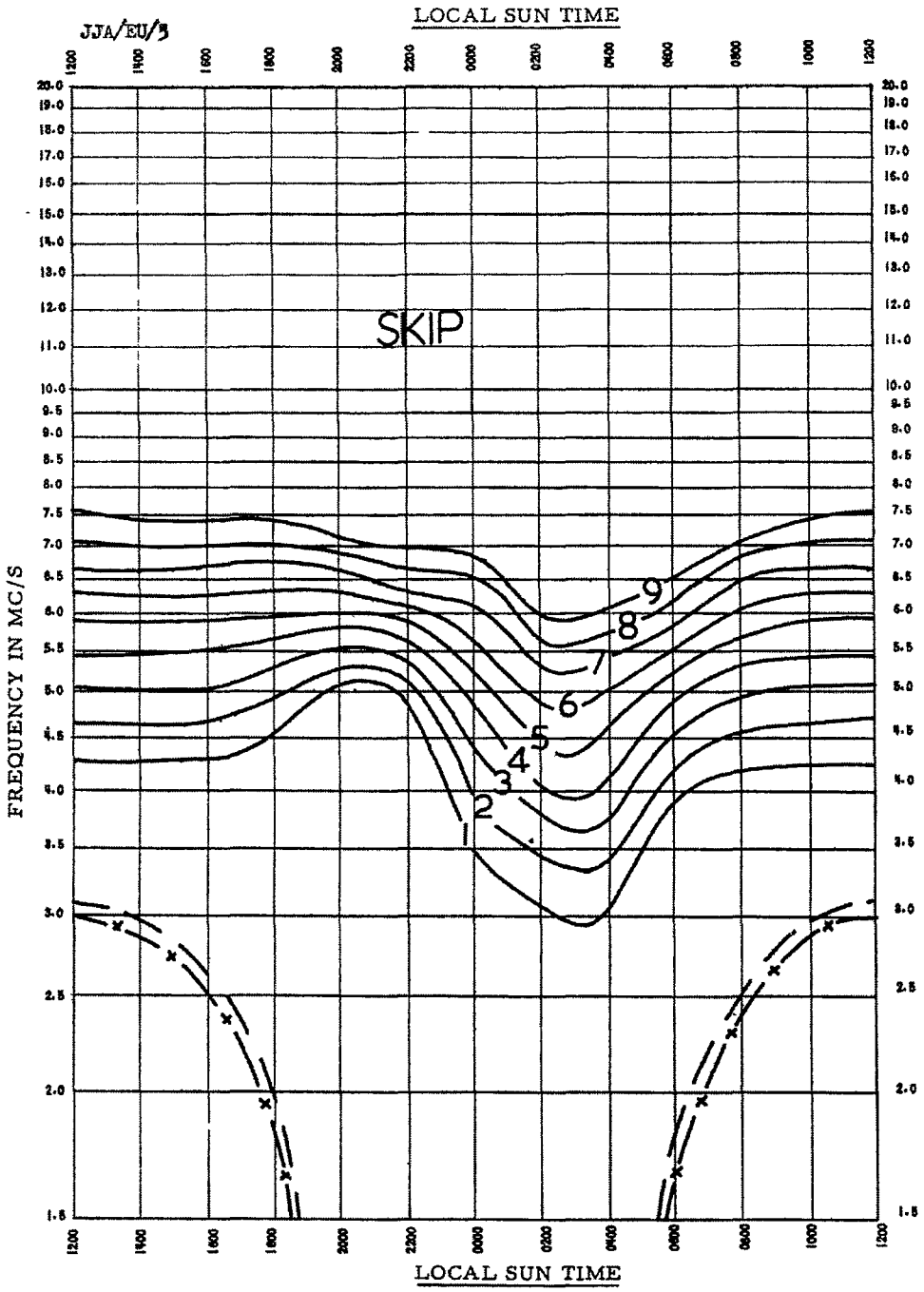
CW —x—x—x—

D/C11

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
27 FT VERTICAL 2-10 Mc/s	2	19	54	40	90	9	24	20	56
	3	17	46	40	81	9	23	18	50
	4	17	42	40	80	8	20	17	42
	5	17	40	37	72	8	17	18	40
	6	15	33	32	64	7	15	16	35
	8	13	26	26	50	7	15	16	33
	10	13	24	28	48	8	14	18	31
43 FT VERTICAL 2-5 Mc/s	2	26	68	53	120	11	32	26	68
	3	24	58	48	90	11	30	25	62
	4	22	50	45	94	10	24	22	50
	5	22	46	45	88	9	23	22	46

SKY WAVE CHART FOR USE WITH RADIO STATIONS

D11, C15



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — —

CW — x — x — x —

D/D11

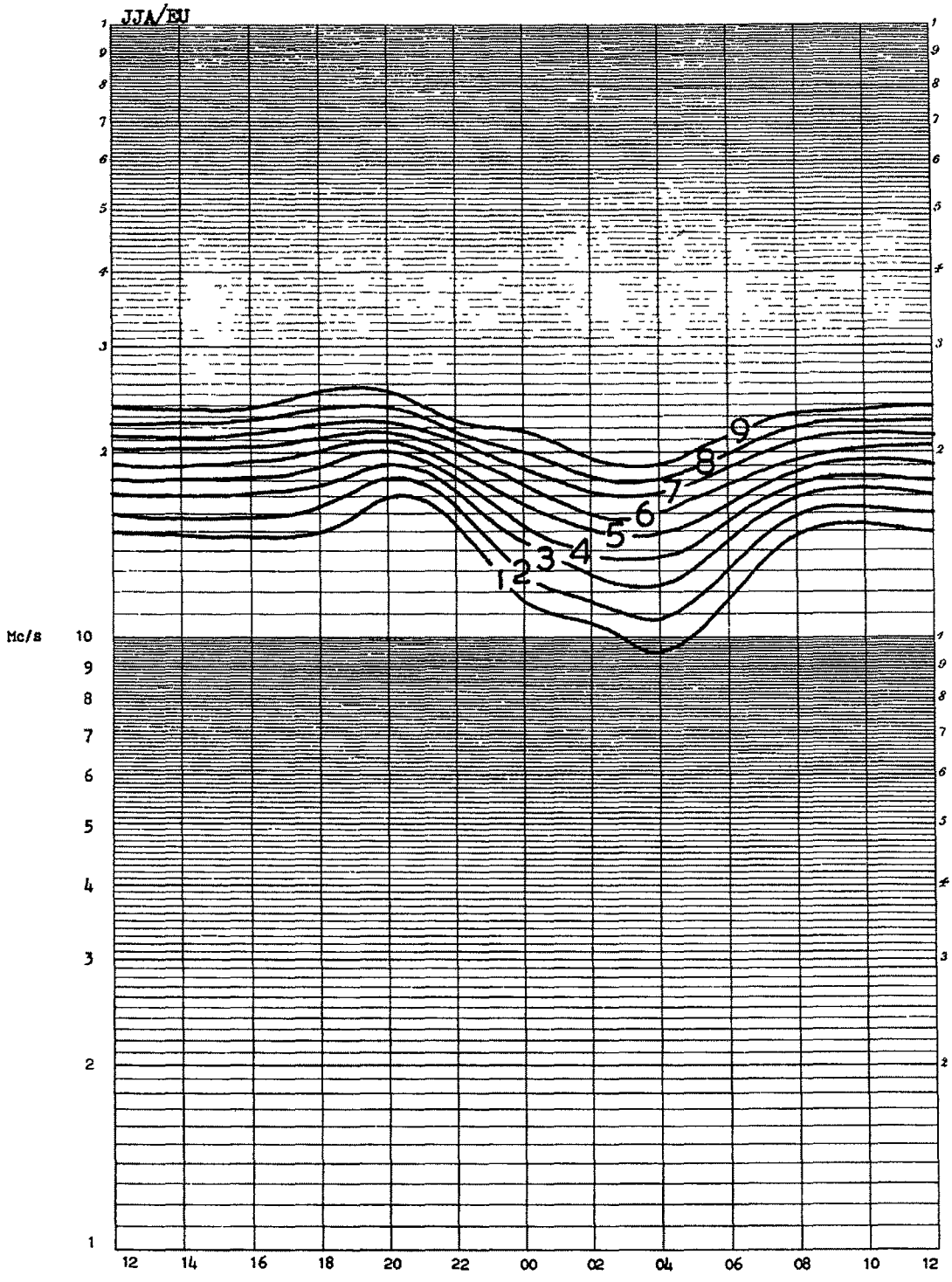
ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
16 FT ROD 2-22 Mc/s	2	36	88	49	100	18	50	23	64
	3	36	72	45	90	17	46	23	58
	4	37	78	46	95	16	40	22	50
	5	36	70	44	90	16	39	22	46
	6	32	72	40	80	16	35	22	42
	8	28	54	38	66	17	34	23	43
	10	30	50	39	62	18	33	25	40
	12	31	48	39	60	20	35	26	43
	14	35	50	40	64	22	36	28	45
	16	33	50	42	62	25	40	31	48
	18	33	50	40	58	29	45	36	54
	20	33	49	40	58	31	47	40	58
	22	31	47	40	56	30	45	37	54
27 FT ROD 2-22 Mc/s	2	54	110	66	130	26	66	34	82
	3	50	98	62	130	26	62	34	70
	4	48	100	61	120	24	53	31	62
	5	48	98	56	105	23	48	32	62
	6	43	80	52	90	21	43	28	54
	8	36	64	45	74	22	40	27	50
	10	36	60	46	72	22	38	28	49
	12	34	54	44	68	23	40	30	50
	14	36	54	43	66	24	40	31	48
	16	36	54	45	64	27	43	34	50
	18	35	52	43	60	33	49	40	58
	20	35	50	42	60	33	49	41	58
	22	31	47	39	56	30	45	38	54
43 FT ROD 2-22 Mc/s	2	66	130	84	160	33	80	43	94
	3	64	108	80	128	33	72	44	86
	4	60	110	72	130	29	60	37	74
	5	58	100	70	120	29	58	36	74
	6	47	88	58	100	25	49	31	62
	8	40	68	49	80	24	44	30	56
	10	40	62	48	76	26	41	30	50
	12	36	56	45	68	27	41	32	50
	14	36	56	45	68	26	39	31	48
	16	31	48	39	58	24	39	30	47
	18	28	44	34	52	25	40	32	48
	20	21	35	27	42	20	33	24	40
	22	7	11	9	15	7	11	9	15

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
16 FT ROD 2-30 Mc/s	2	36	88	49	100	18	50	23	64
	3	36	74	45	90	17	46	23	58
	4	37	76	46	95	16	40	22	50
	5	36	70	44	90	16	39	22	46
	6	32	62	40	80	16	35	22	42
	8	28	54	38	66	17	34	23	43
	10	30	50	39	62	18	33	25	40
	12	31	48	39	60	20	35	26	43
	14	35	50	40	64	22	36	28	45
	16	33	50	32	62	25	40	31	48
	18	33	50	40	58	29	45	36	54
	20	33	49	40	58	31	47	40	58
	22	31	47	40	56	30	45	39	54
	24	32	47	40	56	32	47	40	56
	26	31	46	38	54	31	46	38	54
	28	30	44	36	52	30	44	36	52
	30	30	43	35	50	30	43	35	50
24 FT ROD 2-30 Mc/s	2	49	100	60	120	23	64	30	75
	3	45	90	56	110	23	58	30	64
	4	46	95	58	110	22	50	29	60
	5	44	90	58	100	22	46	29	58
	6	40	78	50	90	21	42	28	59
	8	34	64	42	72	21	40	26	50
	10	34	58	43	70	22	38	26	46
	12	35	54	42	65	22	37	29	45
	14	35	55	45	65	25	40	31	48
	16	33	50	43	64	26	42	33	50
	18	35	52	43	61	31	47	37	55
	20	33	49	41	59	33	49	41	59
	22	32	47	40	58	32	47	40	58
	24	31	45	39	55	31	45	39	55
	26	28	42	36	50	28	42	36	50
	28	26	40	33	47	26	40	33	47
	30	25	36	31	44	25	36	31	44

D/C15 Cont'd.

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
32 FT ROD 2. 30 Mc/s	2	60	120	72	140	28	71	36	88
	3	54	110	66	130	30	66	38	78
	4	54	110	66	120	25	56	34	70
	5	50	95	62	110	27	54	35	68
	6	44	84	56	95	23	46	30	60
	8	38	66	48	85	23	43	28	54
	10	37	60	46	72	24	40	28	48
	12	35	56	44	68	24	40	31	48
	14	36	58	45	68	25	41	35	50
	16	36	56	48	66	29	46	36	54
	18	34	50	42	59	29	45	36	53
	20	31	45	38	55	31	45	38	55
	22	28	41	33	49	28	41	33	49
	24	25	38	31	45	25	38	31	45
	26	20	31	25	37	20	31	25	37
	28	11	17	14	22	11	17	14	22
	30	0.6	1.0	0.8	1.3	0.6	1.0	0.8	1.3

LONG RANGE INTERFERENCE GUARD CURVES FOR USE WITH ALL RADIO STATIONS



LOCAL SUN TIME

Ground & Sky-Wave Ranges of Field Army Radio Stations

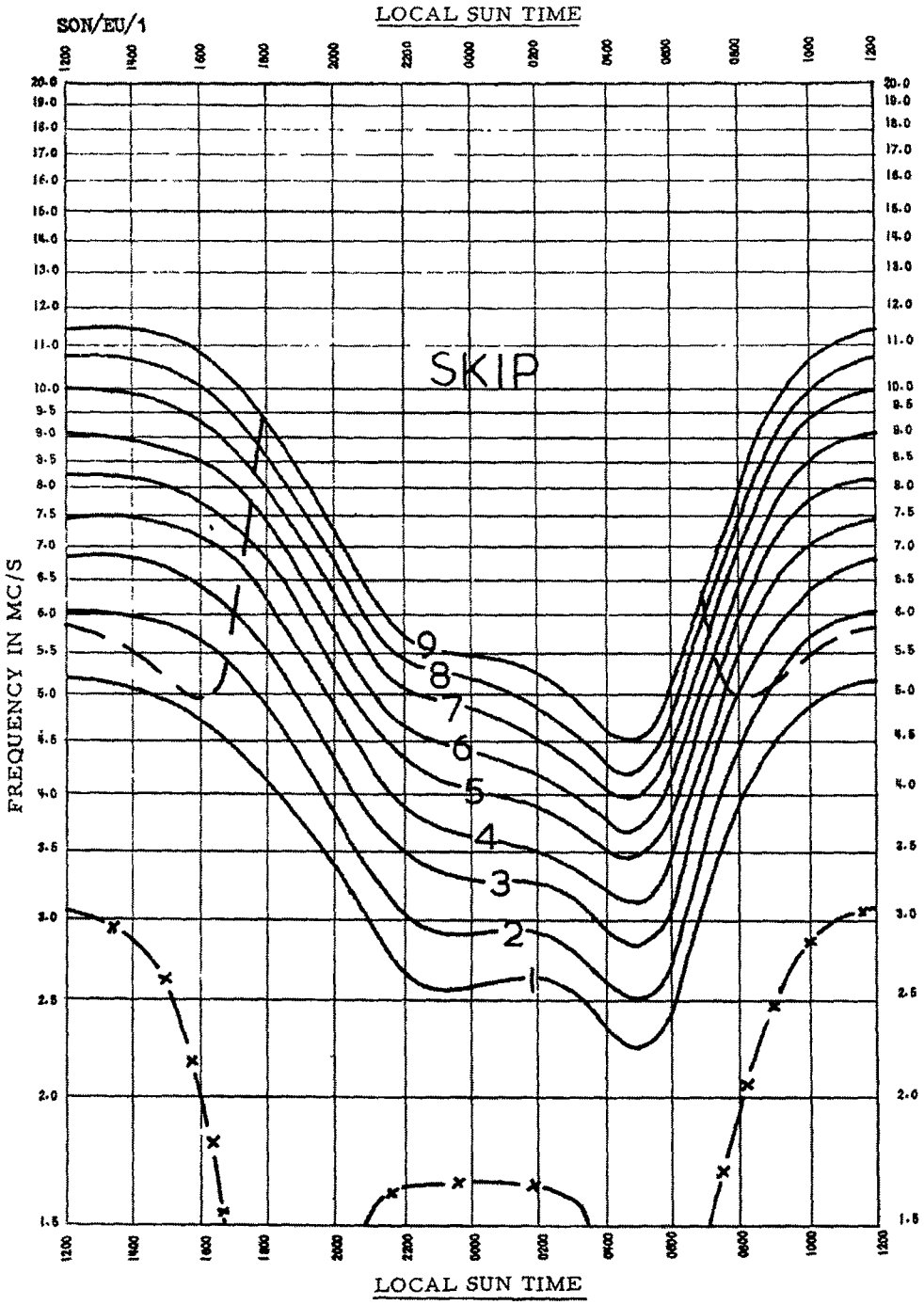
for use in EUROPE

DURING

SEPTEMBER OCTOBER & NOVEMBER

SKY WAVE CHART FOR USE WITH RADIO STATIONS

BCC 156, A14 LP, A16, A13 LP



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR

LOWER LIMITS OF AVAILABLE BAND

R/T

CW

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
4 FT ROD 2-8 Mc/s	2	2	6	4	13	1	2	2	6
	3	2	5	4	13	1	3	2	6
	4	2	5	5	13	1	2	2	5
	5	2	5	5	12	1	2	2	5
	6	2	4	4	10	1	2	2	5
	8	2	4	4	9	1	2	2	5
8 FT ROD 2-8 Mc/s	2	3	10	8	23	2	4	3	11
	3	3	9	7	20	1	4	4	10
	4	3	9	8	20	1	4	3	9
	5	3	8	7	18	1	4	3	8
	6	3	7	7	15	1	3	3	8
	8	3	6	7	13	1	3	4	8

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	3	10	10	30	2	4	5	13
	3	3	9	10	25	1	4	4	13
	4	3	9	10	26	1	4	5	12
	5	3	8	10	24	1	4	5	11
	6	3	7	9	20	1	3	4	10
	8	3	6	8	16	1	3	5	10
	10	3	7	9	18	2	4	5	10
27 FT VERTICAL 2-10 Mc/s	2	8	24	24	64	3	12	12	33
	3	8	21	22	58	3	10	11	28
	4	8	20	24	52	3	9	10	26
	5	7	17	22	47	3	9	10	25
	6	6	14	19	42	3	8	9	22
	8	6	11	17	33	3	7	9	19
	10	6	10	18	31	3	7	10	19

D/A16

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-6 Mc/s	2	3	10	10	30	2	4	5	13
	3	3	9	10	25	1	4	4	13
	4	3	9	10	26	1	4	5	12
	5	3	8	10	24	1	4	5	11
	6	3	4	9	20	1	3	4	10
26 FT ROD 2-6 Mc/s	2	8	24	24	64	3	12	12	33
	3	8	21	22	58	3	10	11	28
	4	8	20	24	52	3	9	10	26
	5	7	17	22	47	3	9	10	25
	6	6	14	19	42	3	8	9	22

D/A13 LP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R.T.		C.W.		R.T.		C.W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-8 Mc/s	2	4	13	13	37	2	6	6	18
	3	4	12	12	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	9	12	26	2	5	6	13
	8	4	8	11	23	2	5	7	13
26 FT ROD 2-8 Mc/s	2	11	30	32	80	4	14	14	42
	3	10	26	30	66	5	15	15	37
	4	10	26	31	64	4	12	13	34
	5	10	23	30	60	5	11	13	32
	6	9	19	27	50	4	10	12	28
	8	8	15	22	41	4	9	13	26

D/C12

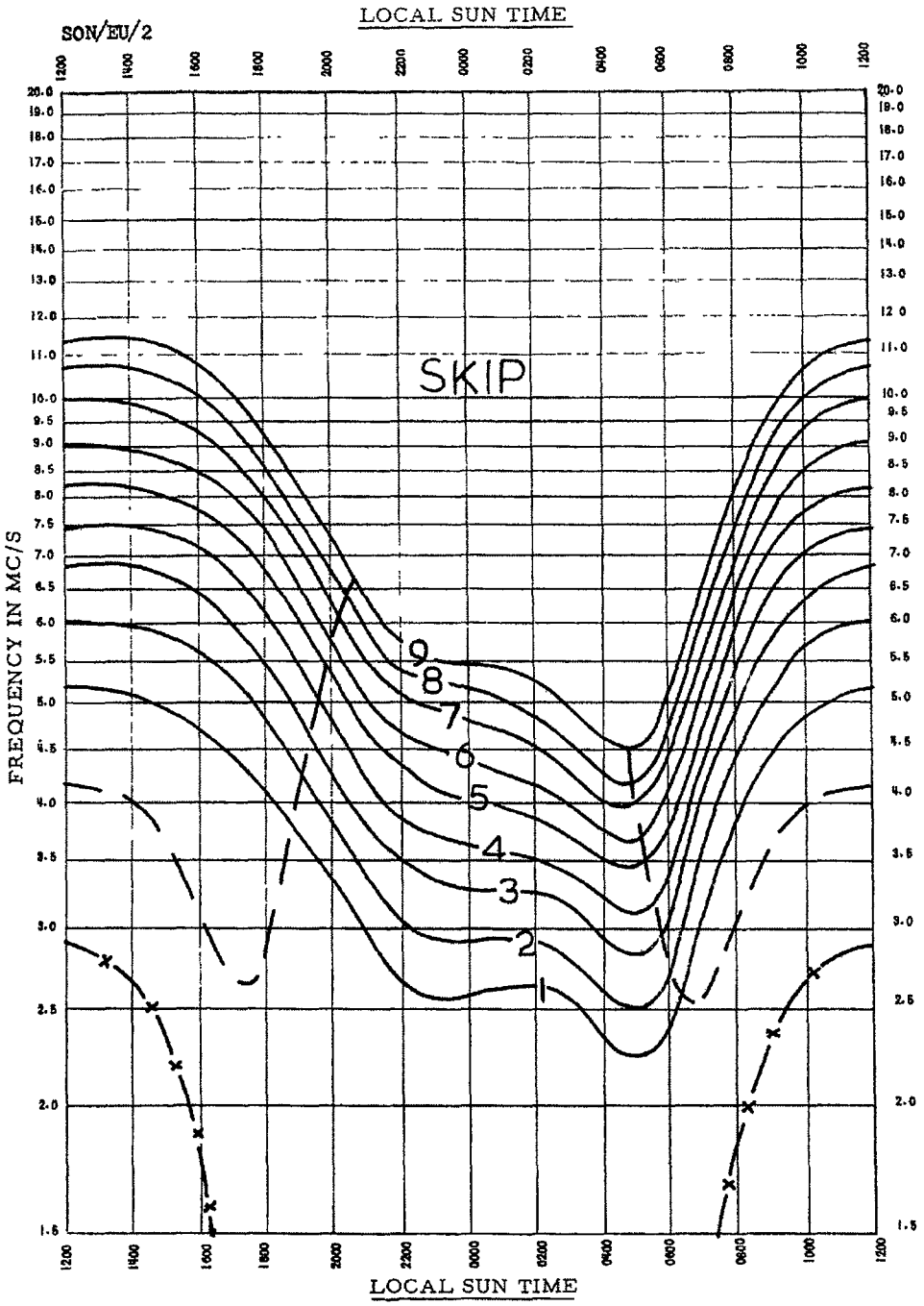
ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	4	13	13	37	2	6	6	18
	3	4	12	12	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	9	12	26	2	5	6	13
	8	4	8	11	23	2	5	7	13
	10	4	8	12	23	2	5	7	13
12 FT ROD 1.9-10 Mc/s	2	6	17	18	50	3	9	8	24
	3	6	15	16	42	3	8	8	22
	4	6	15	17	42	2	7	8	21
	5	6	15	18	42	3	7	8	19
	6	5	12	16	35	3	6	8	17
	8	5	10	15	32	3	6	9	18
	10	5	10	15	28	3	6	9	17
32 FT VERTICAL 1.6-6.5 Mc/s	2	12	35	36	82	5	16	16	46
	3	11	30	35	72	6	15	16	42
	4	11	28	34	70	5	13	15	37
	5	10	25	30	64	5	13	15	36
	6	9	20	28	56	5	10	13	30

D/C13

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 1.6-12 Mc/s	2	4	13	13	37	2	6	6	18
	3	4	12	12	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	9	12	26	2	5	6	13
	8	4	8	11	23	2	5	7	13
	10	4	8	12	23	2	5	7	13
	12	5	9	13	24	3	6	9	16
16 FT ROD 1.5-12 Mc/s	2	7	21	22	60	3	10	10	30
	3	7	19	20	52	3	10	10	27
	4	7	19	22	50	3	8	9	23
	5	7	17	21	45	3	8	10	28
	6	6	14	19	40	3	7	10	21
	8	6	12	17	34	4	7	10	20
	10	5	11	18	33	4	7	10	20
	12	6	12	17	33	4	8	12	23
27 FT ROD 1.5-8 Mc/s	2	11	30	32	80	4	14	14	42
	3	10	26	30	66	5	15	15	37
	4	10	26	31	64	4	12	13	34
	5	10	23	30	60	5	11	13	32
	6	9	19	27	50	4	10	12	28
	8	8	15	22	41	4	9	13	26

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	4	13	13	37	2	6	6	18
	3	4	12	12	33	2	6	6	16
	4	4	12	13	33	2	5	6	16
	5	5	11	13	32	2	5	6	15
	6	4	9	12	26	2	5	6	13
	8	4	8	11	23	2	5	7	13
	10	4	8	12	23	2	5	7	13
12 FT ROD 2-10 Mc/s	2	6	17	18	50	3	9	8	24
	3	6	15	16	42	3	8	8	22
	4	6	15	17	42	2	7	8	21
	5	6	15	18	42	3	7	8	19
	6	5	12	16	35	3	6	8	17
	8	5	10	15	32	3	6	9	18
	10	5	10	15	28	3	6	9	17
32 FT VERTICAL 2-6.5 Mc/s	2	12	35	36	82	5	16	16	46
	3	11	30	35	72	6	15	16	42
	4	11	28	34	70	5	13	15	37
	5	10	25	30	64	5	13	15	36
	6	9	20	28	56	5	10	13	30

SKY WAVE CHART FOR USE WITH RADIO STATIONS
C12, C13, 62



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — — —

CW — x — x — x —

D/A 14 HP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-10 Mc/s	2	6	17	18	50	3	8	8	24
	3	6	15	16	43	3	8	8	22
	4	6	16	17	42	3	7	8	20
	5	6	15	17	40	3	7	8	18
	6	5	12	15	34	3	6	8	11
	8	5	10	14	29	3	6	8	16
	10	5	10	16	29	3	7	9	18
27 FT ROD 2-10 Mc/s	2	14	40	40	90	6	20	20	56
	3	13	36	40	81	7	17	18	50
	4	13	34	40	80	6	15	17	42
	5	12	30	37	72	6	14	18	40
	6	11	26	32	64	5	12	16	35
	8	9	20	26	50	6	11	16	33
	10	10	19	28	48	6	10	18	31

D/19 HP

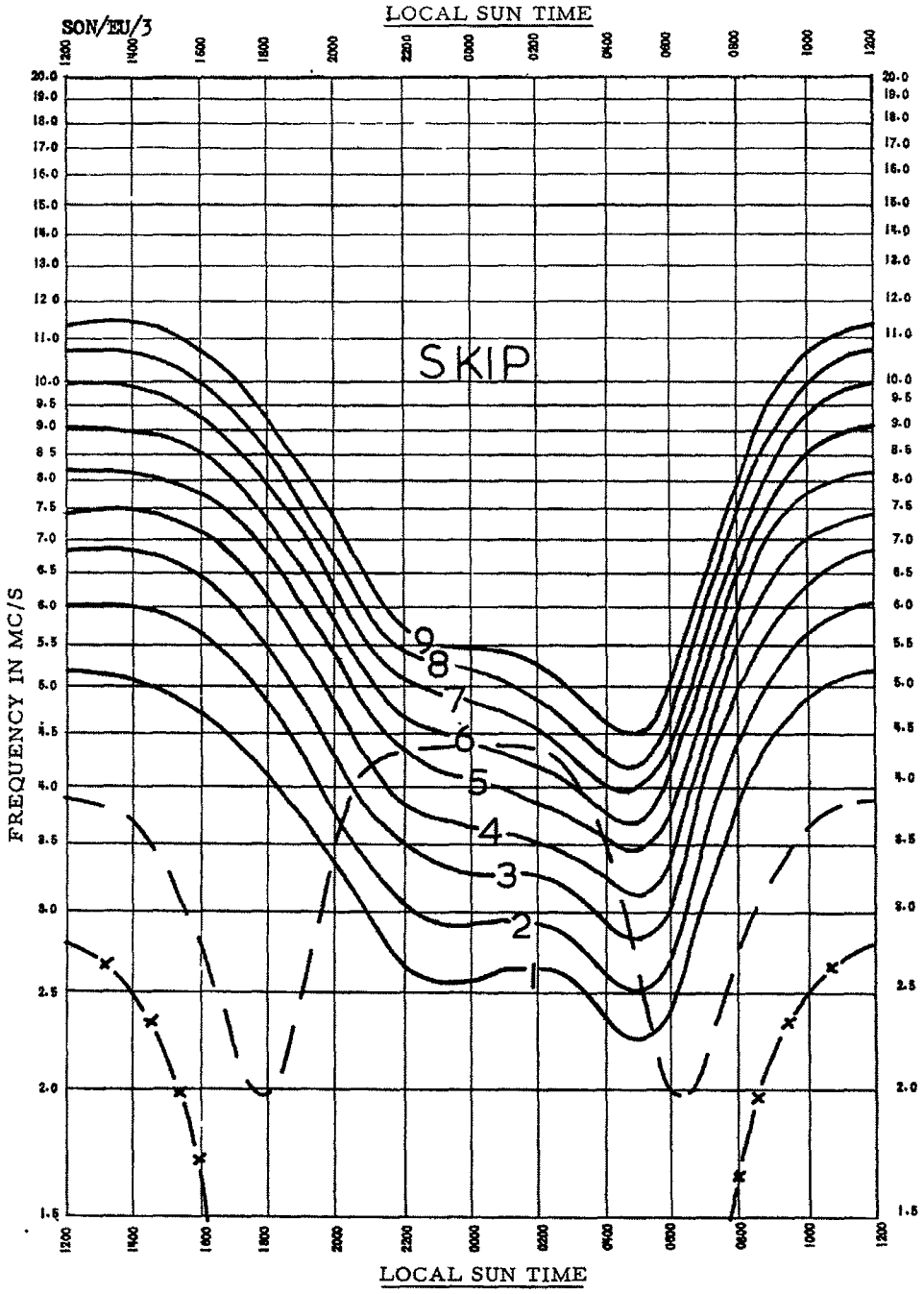
ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
12 FT ROD 2-8 Mc/s	2	8	23	23	64	3	10	11	31
	3	7	20	21	54	4	10	10	27
	4	8	21	24	54	3	9	10	25
	5	8	18	24	50	4	9	11	25
	6	7	15	21	43	3	8	10	24
	8	7	13	19	37	4	8	11	23
34 FT VERTICAL 2-6 Mc/s	2	15	44	48	96	7	22	22	60
	3	16	42	45	90	8	21	22	58
	4	14	37	43	88	7	18	19	48
	5	13	32	40	80	7	16	20	44
	6	11	27	34	66	6	13	17	37

D/A13 HP

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-8 Mc/s	2	8	23	23	60	3	11	11	30
	3	7	20	21	54	4	10	10	27
	4	8	20	24	52	3	9	10	26
	5	8	18	24	46	3	8	11	24
	6	7	15	20	46	3	8	10	22
	8	7	13	19	37	4	8	11	23
26 FT ROD 2-8 Mc/s	2	19	54	54	110	9	24	26	66
	3	17	46	50	98	9	23	26	62
	4	17	42	48	100	8	20	24	53
	5	17	40	48	98	8	17	33	48
	6	15	33	43	80	7	15	21	43
	8	13	26	36	64	7	15	22	40

SKY WAVE CHART FOR USE WITH RADIO STATIONS

A14 HP, 19 HP, A13 HP



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — —

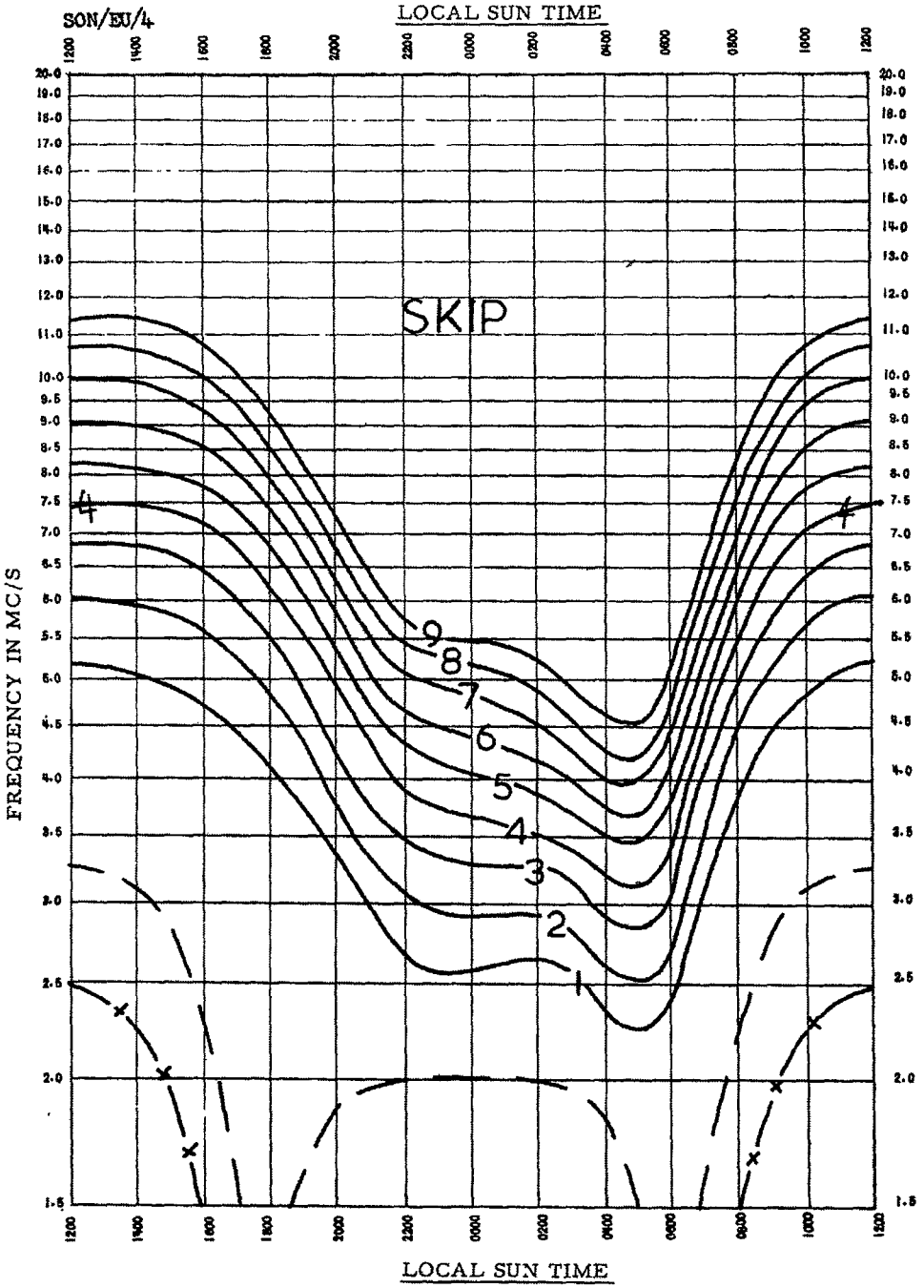
CW — x — x — x —

D/C11

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
8 FT ROD 2-16 Mc/s	2	8	23	18	50	3	11	8	24
	3	7	20	16	43	4	10	8	22
	4	8	20	17	42	3	9	8	20
	5	8	18	17	40	3	8	8	18
	6	7	15	15	34	3	8	8	17
	8	7	13	14	29	4	8	8	16
	10	7	13	16	29	4	8	9	18
	12	8	14	17	31	5	9	11	21
	14	8	15	18	32	5	9	12	21
	16	9	16	20	34	7	11	15	26
16 FT ROD 2-12 Mc/s	2	12	38	28	71	6	17	13	40
	3	12	30	27	62	6	17	13	34
	4	12	33	30	60	6	14	12	33
	5	12	28	29	58	5	17	12	37
	6	11	25	26	50	6	13	12	28
	8	10	20	23	43	6	12	14	28
	10	10	20	24	40	5	11	14	26
	12	11	21	24	40	7	13	16	28

SKY WAVE CHART FOR USE WITH RADIO STATIONS

C11.



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — — —

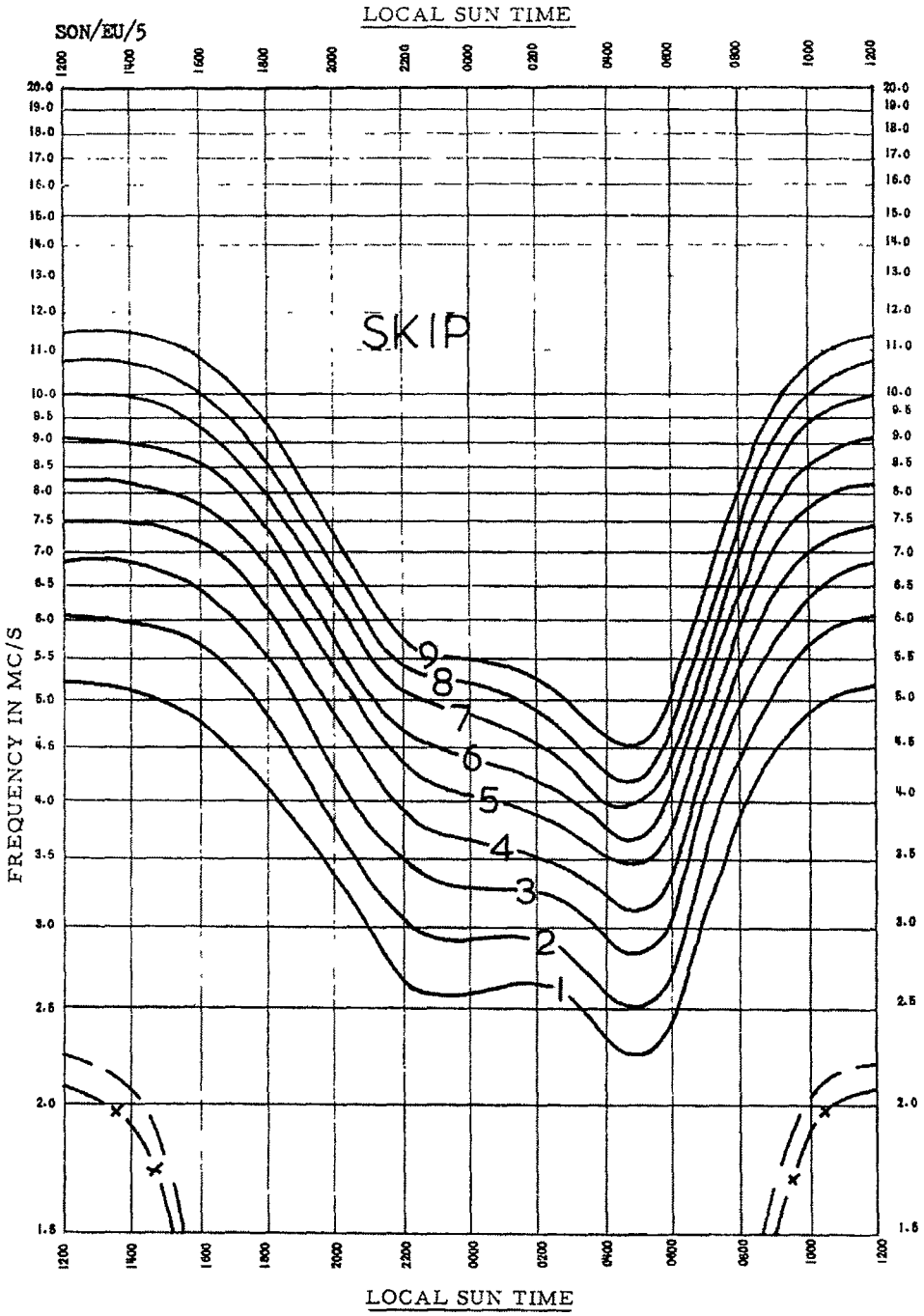
CW —x—x—x—

D/C11

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
27 FT VERTICAL 2-10 Mc/s	2	19	54	40	90	9	24	20	56
	3	17	46	40	81	9	23	18	50
	4	17	42	40	80	8	20	17	42
	5	17	40	37	72	8	17	18	40
	6	15	33	32	64	7	15	16	35
	8	13	26	26	50	7	15	16	33
	10	13	24	28	48	8	14	18	31
43 FT VERTICAL 2-5 Mc/s	2	26	68	53	120	11	32	26	68
	3	24	58	48	90	11	30	25	62
	4	22	50	45	94	10	24	22	50
	5	22	46	45	88	9	23	22	46

SKY WAVE CHART FOR USE WITH RADIO STATIONS

D11, C15.



PRACTICAL UPPER LIMIT OF AVAILABLE BAND IN TERMS OF SOLAR ACTIVITY FACTOR ——————

LOWER LIMITS OF AVAILABLE BAND

R/T — — — —

CW —x—x—x—

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
16 FT ROD 2-22 Mc/s	2	36	88	49	100	18	50	23	64
	3	36	72	45	90	17	46	23	58
	4	37	78	46	95	16	40	22	50
	5	36	70	44	90	16	39	22	46
	6	32	72	40	80	16	35	22	42
	8	28	54	38	66	17	34	23	43
	10	30	50	39	62	18	33	25	40
	12	31	48	39	60	20	35	26	43
	14	35	50	40	64	22	36	28	45
	16	33	50	42	62	25	40	31	48
	18	33	50	40	58	29	45	36	54
	20	33	49	40	58	31	47	40	58
	22	31	47	40	56	30	45	37	54
27 FT ROD 2-22 Mc/s	2	54	110	66	130	26	66	34	82
	3	50	98	62	130	26	62	34	70
	4	48	100	61	120	24	53	31	62
	5	48	98	56	105	23	48	32	62
	6	43	80	52	90	21	43	28	54
	8	36	64	45	74	22	40	27	50
	10	36	60	46	72	22	38	28	49
	12	34	54	44	68	23	40	30	50
	14	36	54	43	66	24	40	31	48
	16	36	54	45	64	27	43	34	50
	18	35	52	43	60	33	49	40	58
	20	35	50	42	60	33	49	41	58
	22	31	47	39	56	30	45	38	54
43 FT ROD 2-22 Mc/s	2	66	130	84	160	33	80	43	94
	3	64	108	80	128	33	72	44	86
	4	60	110	72	130	29	60	37	74
	5	58	100	70	120	29	58	36	74
	6	47	88	58	100	25	49	31	62
	8	40	68	49	80	24	44	30	56
	10	40	62	48	76	26	41	30	50
	12	36	56	45	68	27	41	32	50
	14	36	56	45	68	26	39	31	48
	16	31	48	39	58	24	39	30	47
	18	28	44	34	52	25	40	32	48
	20	21	35	27	42	20	33	24	40
	22	7	11	9	15	7	11	9	15

D/C15

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
16 FT ROD 2-30 Mc/s	2	36	88	49	100	18	50	23	64
	3	36	74	45	90	17	46	23	58
	4	37	76	46	95	16	40	22	50
	5	36	70	44	90	16	39	22	46
	6	32	62	40	80	16	35	22	42
	8	28	54	38	66	17	34	23	43
	10	30	50	39	62	18	33	25	40
	12	31	48	39	60	20	35	26	43
	14	35	50	40	64	22	36	28	45
	16	33	50	32	62	25	40	31	48
	18	33	50	40	58	29	45	36	54
	20	33	49	40	58	31	47	40	58
	22	31	47	40	56	30	45	39	54
	24	32	47	40	56	32	47	40	56
	26	31	46	38	54	31	46	38	54
	28	30	44	36	52	30	44	36	52
	30	30	43	35	50	30	43	35	50
24 FT ROD 2-30 Mc/s	2	49	100	60	120	23	64	30	75
	3	45	90	56	110	23	58	30	64
	4	46	95	58	110	22	50	29	60
	5	44	90	58	100	22	46	29	58
	6	40	78	50	90	21	42	28	59
	8	34	64	42	72	21	40	26	50
	10	34	58	43	70	22	38	26	46
	12	35	54	42	65	22	37	29	45
	14	35	55	45	65	25	40	31	48
	16	33	50	43	64	26	42	33	50
	18	35	52	43	61	31	47	37	55
	20	33	49	41	59	33	49	41	59
	22	32	47	40	58	32	47	40	58
	24	31	45	39	55	31	45	39	55
	26	28	42	36	50	28	42	36	50
	28	26	40	33	47	26	40	33	47
	30	25	36	31	44	25	36	31	44

D/C15 Cont'd.

ANTENNA	FREQ IN MC/S	DAY				NIGHT			
		R. T.		C. W.		R. T.		C. W.	
		P	G	P	G	P	G	P	G
32 FT ROD 2. 30 Mc/s	2	60	120	72	140	28	71	36	88
	3	54	110	66	130	30	66	38	78
	4	54	110	66	120	25	56	34	70
	5	50	95	62	110	27	54	35	68
	6	44	84	56	95	23	46	30	60
	8	38	66	48	85	23	43	28	54
	10	37	60	46	72	24	40	28	48
	12	35	56	44	68	24	40	31	48
	14	36	58	45	68	25	41	35	50
	16	36	56	48	66	29	46	36	54
	18	34	50	42	59	29	45	36	53
	20	31	45	38	55	31	45	38	55
	22	28	41	33	49	28	41	33	49
	24	25	38	31	45	25	38	31	45
	26	20	31	25	37	20	31	25	37
	28	11	17	14	22	11	17	14	22
	30	0.6	1.0	0.8	1.3	0.6	1.0	0.8	1.3

LONG RANGE INTERFERENCE GUARD CURVES FOR USE WITH ALL RADIO STATIONS