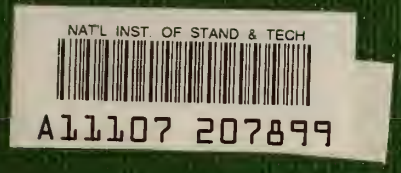


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Technical Note No. 48

Boulder Laboratories

REPORT ON THE IGY OBLIQUE-INCIDENCE SPORADIC-E AND F-SCATTER PROGRAM

J. W. FINNEY AND E. K. SMITH, JR.

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

THE NATIONAL BUREAU OF STANDARDS

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NATIONAL BUREAU OF STANDARDS

Technical Note

48

March, 1960

REPORT ON THE IGY OBLIQUE-INCIDENCE SPORADIC-E AND F-SCATTER PROGRAM

by

J. W. Finney and E. K. Smith, Jr.

Final Report National Science Foundation Grant No. Y/6.14/120

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Final Report USIA Agreement IA-4586 through Amendment No. 1

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Foreward

The basic program described here was sponsored by the National Science Foundation as part of the program in Ionospheric Physics as organized by the U. S. National Committee for the IGY. Additional financial support was supplied by the International Broadcasting Service of the U. S. Information Agency.

This is the final report on NSF Grant No. Y/6.14/120 through Amendment No. 3 and on USIA Agreement IA-4586 through Amendment No. 1. It also constitutes the first technical report on NSF Grant No. Y/22.7/328 under which many of the data were analyzed.

E.K. Smith, Chief
Ionospheric Research Section

R.J. Slutz, Chief
Radio Propagation Physics Division

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REPORT ON THE IGY OBLIQUE-INCIDENCE SPORADIC-E AND F-SCATTER PROGRAM

by

J. W. Finney and E. K. Smith, Jr.

1. INTRODUCTION

In the course of studying sporadic E at the Central Radio Propagation Laboratory, strong indications were found that a large longitude effect existed in the occurrence of sporadic E at middle northern latitudes.

The first of these indications was that sporadic-E field strengths in Japan appeared some 20 to 30 db higher than those observed in the United States. Subsequent examination of data from the worldwide network of ionosondes using long-term averages of sporadic-E occurrence with critical frequencies above 5 megacycles (fEs > 5 Mc/s) showed that almost twice as much was observed in the Philippine-Okinawa region as in the corresponding area of the western hemisphere (Smith, 1957).

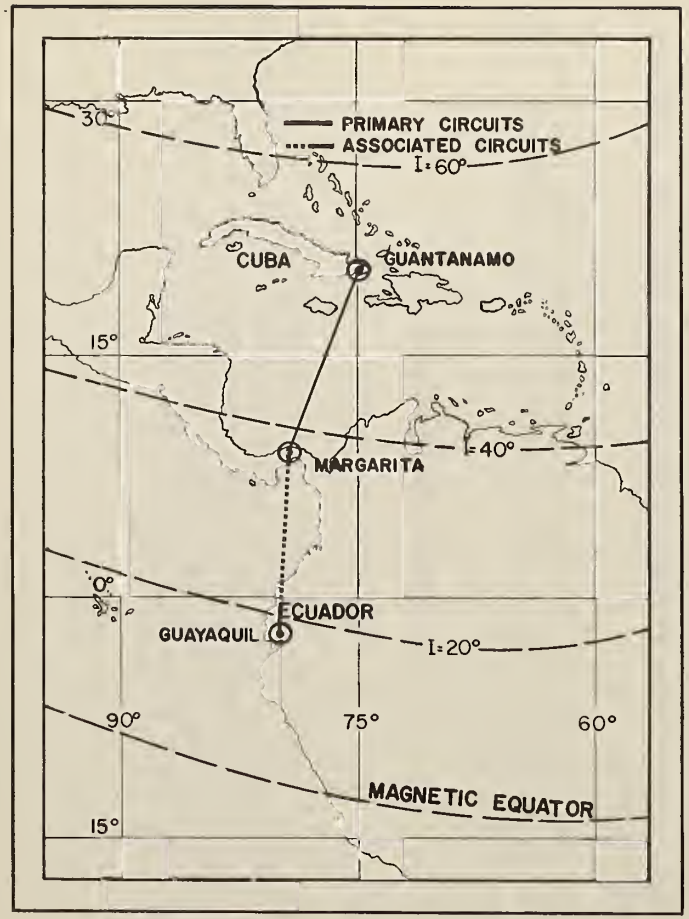
However, vertical-incidence ionosphere sounders are not calibrated for total system loss and therefore the data from these sources cannot be taken as homogenous. Also, the oblique-incidence field strengths compared were for different years and obtained with different types of equipment. Consequently, the effect could only be taken as suggestive rather than established.

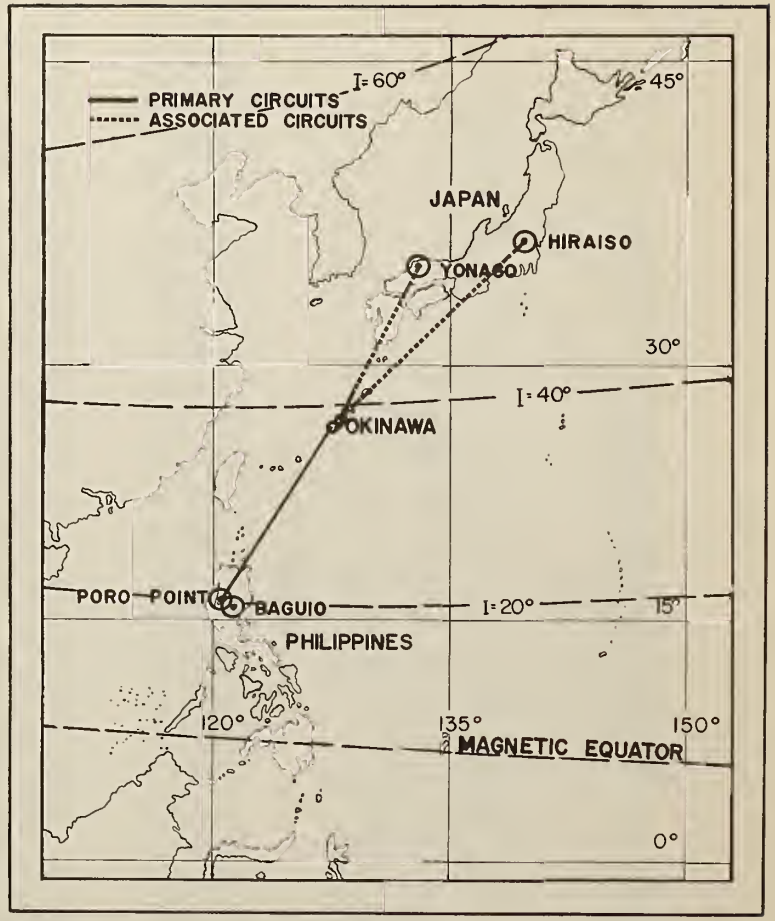
The VHF Oblique-Incidence Sporadic-E Measurements program was therefore undertaken to affirm or deny the existence of the longitude effect in the occurrence of sporadic E.

2. EXPERIMENTAL ARRANGEMENTS

2.1 Circuit locations

Two VHF oblique-incidence circuits were established, one in the Far East from Poro Point, Luzon, Philippine Islands, to Onna, Okinawa, in the Ryukyu Islands and the other in the Caribbean area from Margarita, Panama Canal Zone, to Guantanamo Bay, Cuba. The sites in the Far East were located at existing installations of the United States Information





MAPS SHOWING THE LOCATIONS OF THE CIRCUITS OF THE U.S. IGY VHF OBLIQUE-INCIDENCE SPORADIC-E FIELD-INTENSITIES PROGRAM

FIGURE 1

Agency, in the Canal Zone at the National Bureau of Standards field station, and in Cuba at the United States Naval Base. Operation and maintenance of the equipment was performed by personnel already assigned to these stations.

The path lengths of both circuits were approximately 800 miles and continuous wave transmissions at about 50 Mc/s were beamed in a northerly direction.

2.2 Antennas

All antennas used in the experiment were horizontal five-element Yagis designed for operation at 50 Mc/s. They were erected at a height such that the maximum of the first lobe of the overall polar diagram would illuminate the E-region at the path midpoint. This required a radiation angle of about 7° and to insure adequate clearance for the upgoing and downcoming skywave the maximum elevation of any obstruction on the radio horizon in the direction of interest was set at 3°.

Location of the first fresnel zones of the antennas over sea water insures proper formation of the vertical lobe pattern (if tidal variations are small) and this condition was realized in the Philippines, Panama, and Cuba. In Okinawa, however, other considerations caused erection of the antenna at a location which placed the first fresnel zone over land of doubtful quality. Later, a second antenna overlooking the sea was installed for comparison. However, all data presented here were obtained using the first antenna.

2.3 Transmitting terminals

The transmitters used in this experiment were designed by W. B. Harding and built by personnel of the NBS Central Radio Propagation Laboratory specifically for fixed-frequency 24-hour continuous wave transmissions. They were capable of 3 kw output but an output of only 2 kw was maintained during these tests. Auxiliary control equipment was provided to permit essentially unattended operation. This included provisions for a two-minute break in transmissions every half-hour, continuous recording of forward and back power, and automatic shutoff and alarm devices in case of trouble. The recordings of power were not calibrated but were used to give continuity to the power output and VSWR readings which were taken several times a day.

At all transmitting stations RG-17/U coaxial cable was employed in the transmission lines between transmitter and antenna.

Table 1. Details of the two basic experimental circuits.

	Philippine-Okinawa	Panama-Cuba
Location of transmitter	Poro Point, Luzon, P. I.	Margarita, Panama C. Z.
Geographic coordinates of transmitter	16° 37.5' N ; 120° 17' E	9° 23' N ; 79° 53' W
Location of receiver	Onna, Okinawa	Guantanamo Bay, Cuba
Geographic coordinates of receiver	26° 30' N ; 127° 51' E	19° 53.5' N ; 75° 13' W
Path length	1364 km 837 miles	1270 km 789 miles
Geographic coordinates of midpoint	21° 36' N ; 123° 56' E	14° 39' N ; 77° 36' W
Geomagnetic latitude of midpoint	10° 19' N	26° 1' N
Magnetic inclination at midpoint	30° N	46° N
True azimuth of transmitter from receiver	216° 57'	203° 53'
True azimuth of receiver from transmitter	34° 9'	22° 42'
Frequency	49.84 Mc	49.76 Mc
Date of commencement	September 19, 1957	September 14, 1957
Date of termination	November 1, 1959	December 1, 1958
Reference impedance of circuit	50 ohms	50 ohms
Type of antenna	Horizontal 5-element Yagi	Horizontal 5-element Yagi
Height	42 feet	42 feet
Elevation angle of maximum of main lobe	7°	7°
Plane-wave gain relative to half-wave dipole	9 db	9 db
Horizontal half-power beamwidth	56°	56°
Vertical half-power beamwidth of envelope	Approximately 60°	Approximately 60°
Transmission line loss at transmitter	0.3 db	1.4 db
Transmission line loss at receiver	2.6 db	3.7 db
Transmitter output	2 kw	2 kw and later 1 kw *
Frequency stability of transmitter	One part in 10^9	One part in 10^9
Receiver half-power bandwidth	300 cycles	300 cycles
Frequency stability of receiver	One part in 10^7	One part in 10^7
Recording time constant	12 seconds	12 seconds
Reference for receiver calibration	1 μv open-circuit antenna voltage equals 0 db	1 μv open-circuit antenna voltage equals 0 db
Free-space signal level	69.3 db above 1 μv	69.8 db above 1 μv
Inverse-distance signal level	81.3 db above 1 μv	81.8 db above 1 μv
Transmission loss for reference level	176 db	176 db

* Power output reduced after June 10, 1958

2.4 Receiving terminals

At the receiving stations, recordings of signal and noise levels were made in temperature controlled rooms with graphic recorders, in conjunction with NBS laboratory receivers specifically designed by K. L. Bowles and P. G. Sulzer for this type of measurement at a fixed VHF frequency. These are double-conversion superheterodyne receivers which are crystal controlled for a frequency stability of one part in 10^7. They have a dynamic range of 90 db and a logarithmic output (linear in decibels). Paper tape recordings were made with a time constant of 12 seconds.

Calibration of the receivers using a crystal controlled signal generator together with a stepped attenuator was performed once or twice daily in 10 db steps from -30 db to 60 db using 0 db equals one microvolt open circuit voltage as a reference. Approximately once a week, noise figure and VSWR measurements were made.

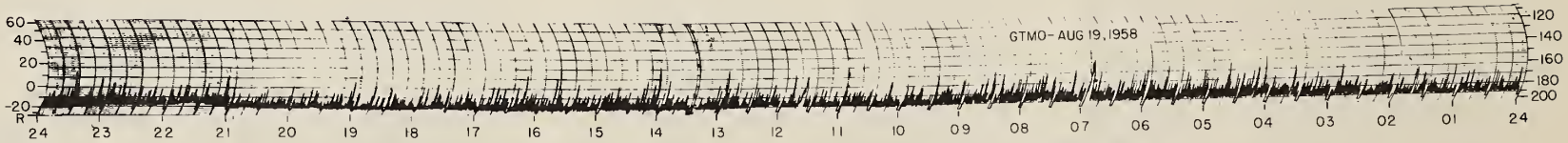
One-half inch coaxial cable with loss of 0.65 db per 100 feet at 50 Mc/s was used for transmission line at the receiving stations except for the second antenna at Onna, which being 1,300 feet in length, was prohibitively long for coaxial cable. In this instance, a four-wire quadrapole line of #14 hard drawn solid copper wire was installed.

2.5 Other circuits

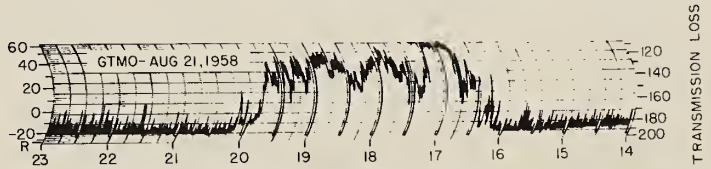
In addition to the two primary circuits, just described, two associated circuits were also established. The first was undertaken as cooperative effort in conjunction with the Radio Research Laboratories of Japan. Our project installed a second transmitting station at Okuma, Okinawa, which was also operated by personnel of the USIA, and the Japanese established receiving sites at Hiraiso and Yonago in Japan for recording the Okumatransmissions.

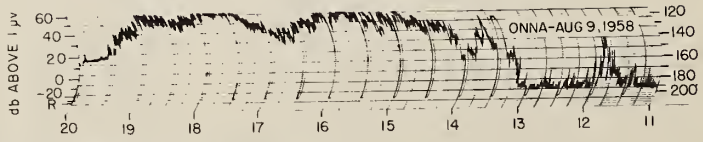
Transmissions for the second associated circuit were provided by erecting a second Yagi antenna at the Canal Zone site and splitting the power output of the transmitter using a hybrid junction. Half of the power continued to be directed toward Cuba and the other half was beamed to Guayaquil, Ecuador. At Guayaquil was located the northernmost station of the Equatorial Scatter Project, which provided the necessary equipment and personnel to complete the circuit.

Table 1 gives a compact presentation of the pertinent statistics for the two primary circuits.

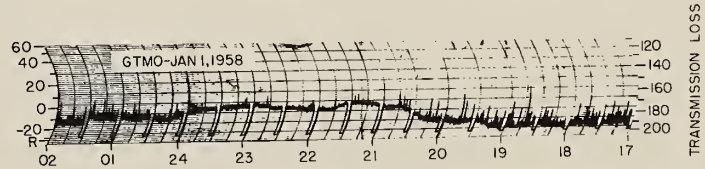


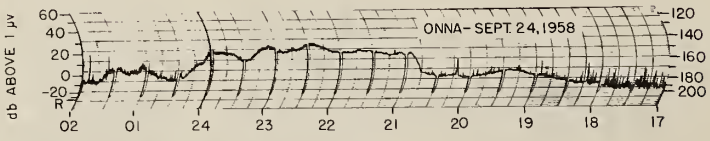
(a) EXAMPLE OF SIGNAL LEVEL DURING A "QUIET" DAY AS RECEIVED AT GUANTANAMO BAY





(b) EXAMPLES OF SPORADIC-E PROPAGATION AS RECEIVED AT ONNA AND GUANTANAMO BAY





(c) EXAMPLES OF THE EVENING SIGNAL ANOMALY AS RECEIVED AT ONNA AND GUANTANAMO BAY

TIMES SHOWN ARE LOCAL STANDARD TIMES AT RECEIVING LOCATIONS

TRANSMISSION LOSS RECORDS MADE WITH 12-SECOND TIME CONSTANT

FIGURE 2

3. PRESENTATION OF DATA

3.1 General appearance of records

From past experience it was expected that the forward-scatter signal would always be present and that the meteoric mode rather than the solar mode would dominate due to the wide beamwidth of the Yagi antennas. The records, therefore, were expected to be very spiky in appearance and to exhibit a maximum signal level at about 0600 hours and a minimum at about 1800 hours local time in the absence of sporadic-E enhancements.

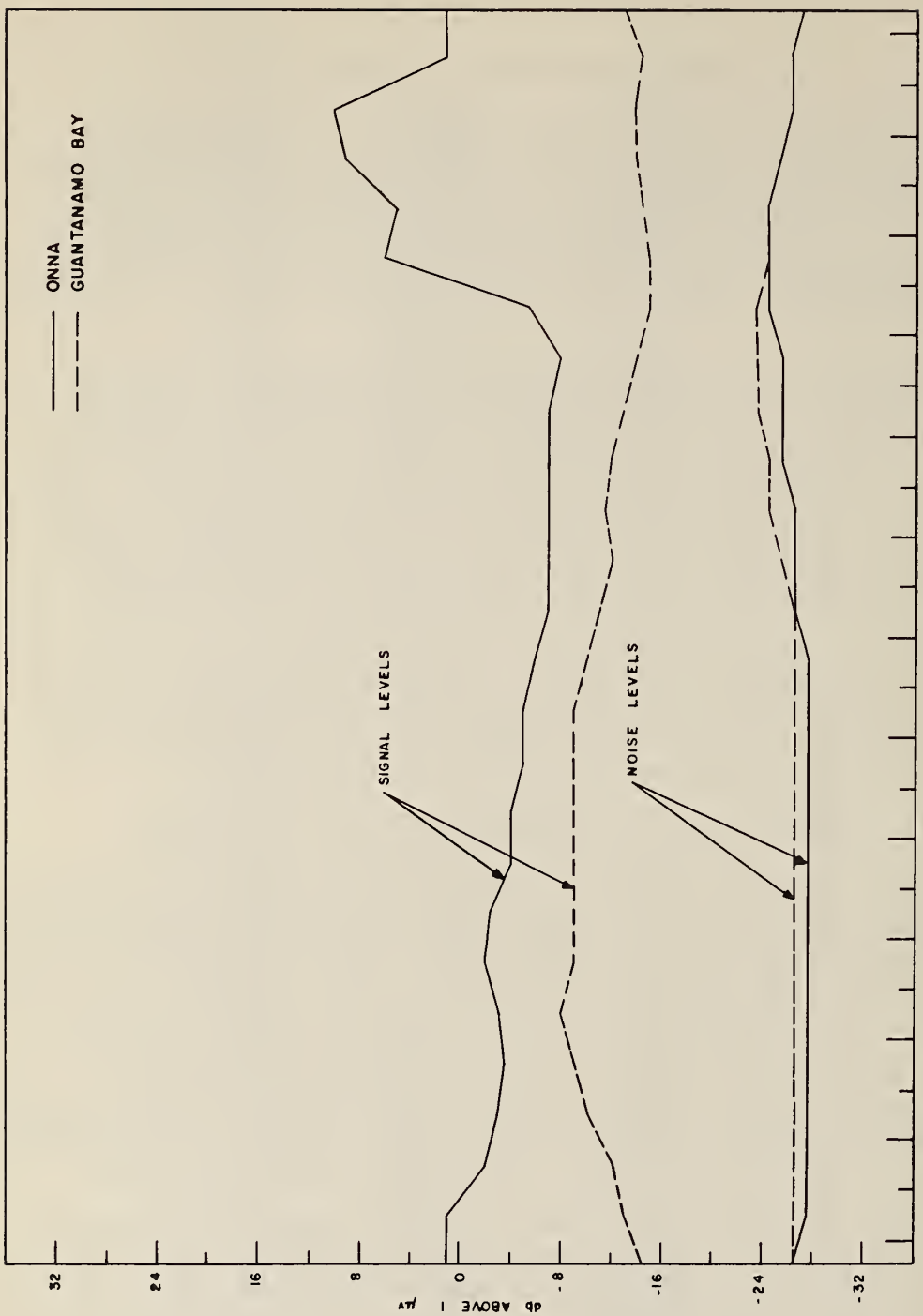
The records from the Panama-to-Cuba circuit did prove to be as expected; however, on the Poro-to-Onna records the signal showed an enhancement in the early evening hours of a type not associated with sporadic E. The general appearance of the signal trace changed from a wide spiky one to a narrow trace more or less devoid of spikes. This type of trace is hereafter referred to as the "evening signal anomaly" (the term "Far Eastern Anomaly" has also been used as the phenomenon, is much more intense over the Poro-to-Onna circuit than elsewhere).

In Figure 2, part (a) is a day's record from Cuba showing the type expected when no sporadic E is present. In part (b) is shown a sample record from each circuit containing a sporadic-E enhancement, and (c) shows the character of the evening signal anomaly in the Far East and what appears to be the same phenomenon in the Caribbean.

3.2 Procedures used in scaling signal and noise levels

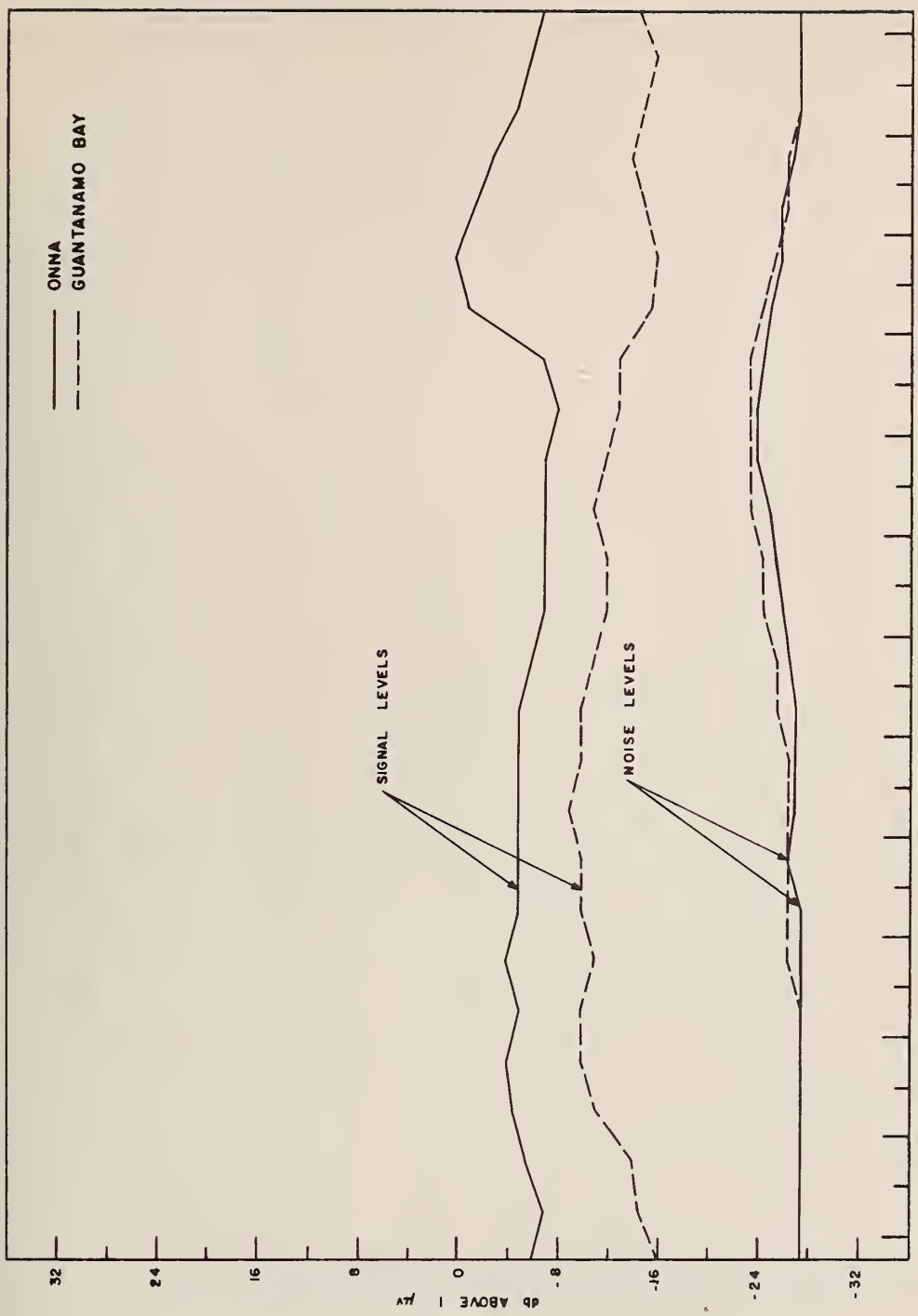
As a first approach to analyzing the records, they were scaled for hourly median signal and hourly sampled noise levels (see Tables 4 and 5) and from these values the monthly medians for each hour of the day were obtained. The latter have been plotted as diurnal curves for each month from October, 1957 through September, 1958, and are shown in Figures 3 through 14. The data have been adjusted to eliminate transmission line losses and include the contributions from all modes of propagation. From these graphs it can readily be seen that the signal levels attained in the Far East were nearly always greater than those in the Caribbean. The influence of the evening signal anomaly is also very apparent.

Both circuits exhibit their lowest signals during the late afternoon hours of the spring equinox. The maximum signal levels on the records from Cuba come in the summer at about 0700 hours, while the maximum at Onna is in the evening hours of the fall equinox due to the influence of the evening signal anomaly.



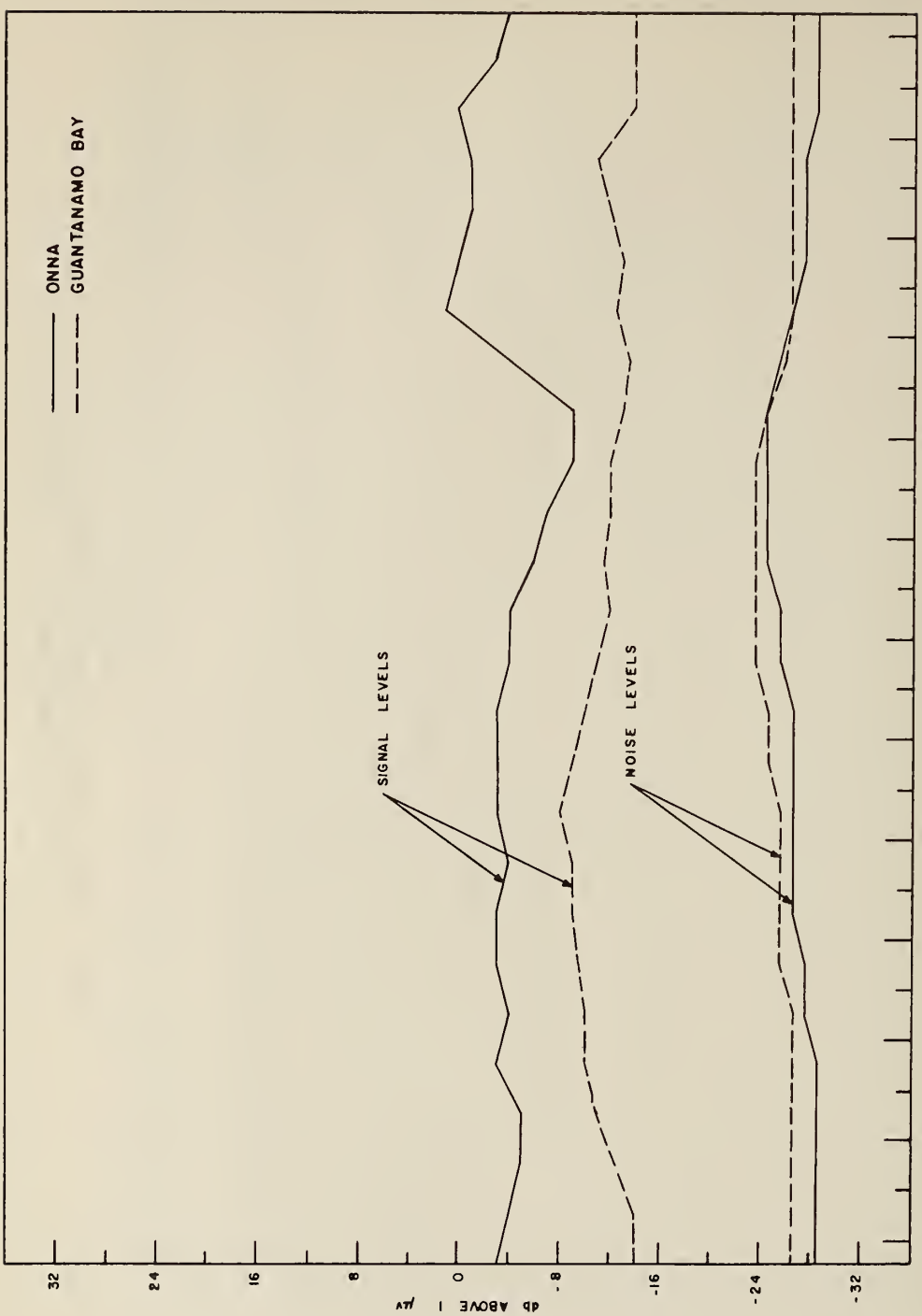
DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT ONNA AND GUANTANAMO BAY OCTOBER 1957

FIGURE 3



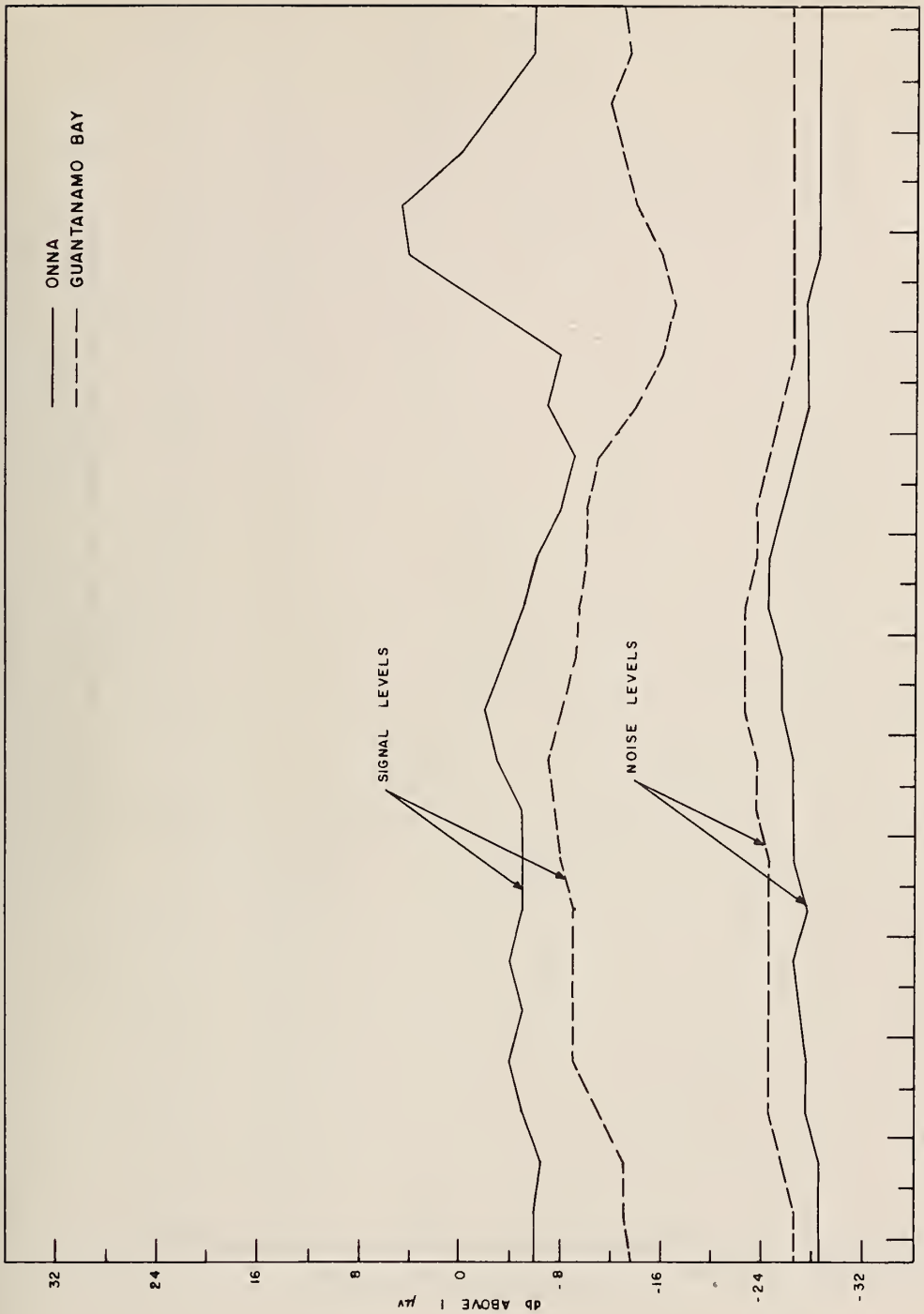
DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT ONNA AND GUANTANAMO BAY NOVEMBER 1957

FIGURE 4



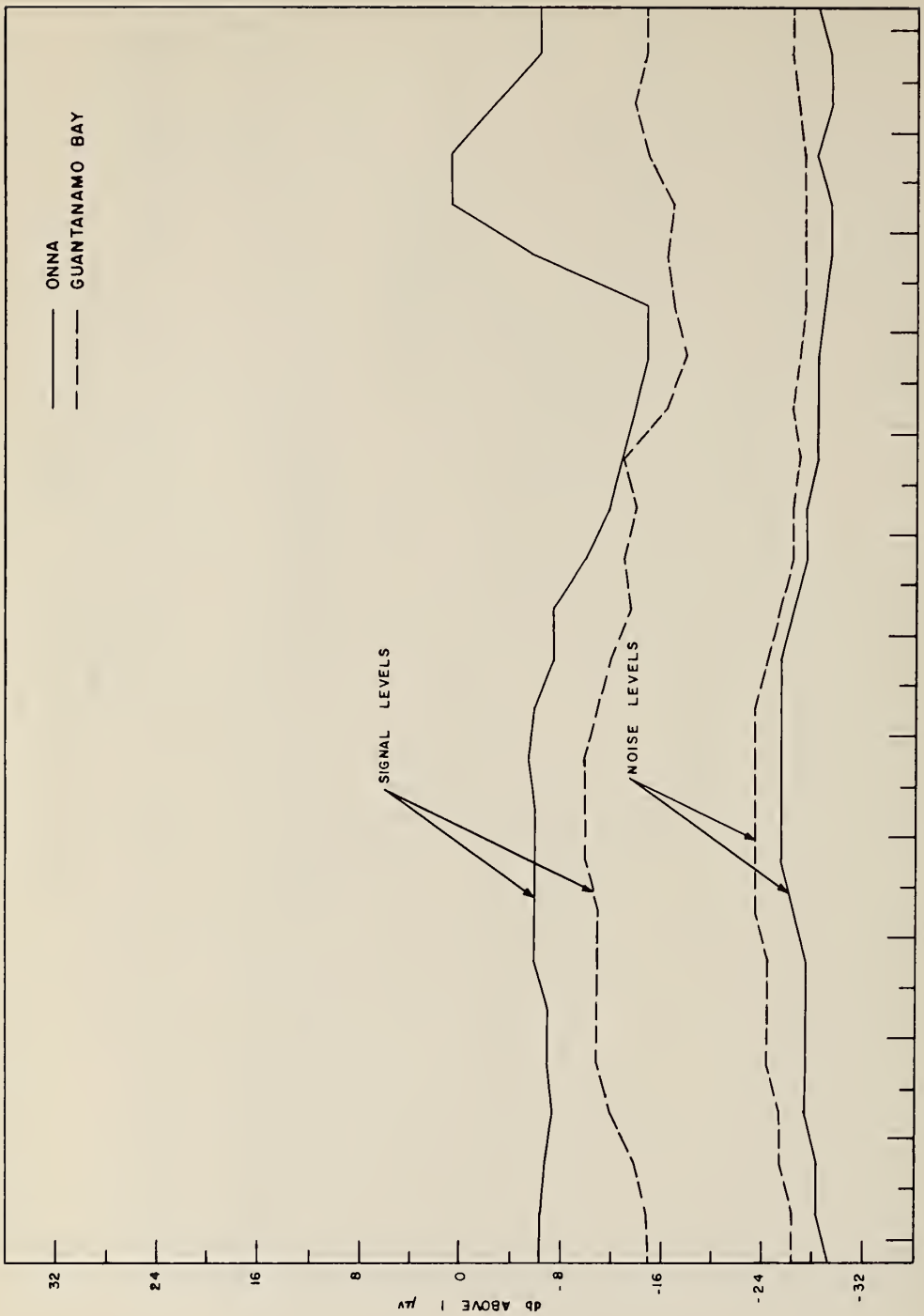
DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT ONNA AND GUANTANAMO BAY DECEMBER 1957

FIGURE 5



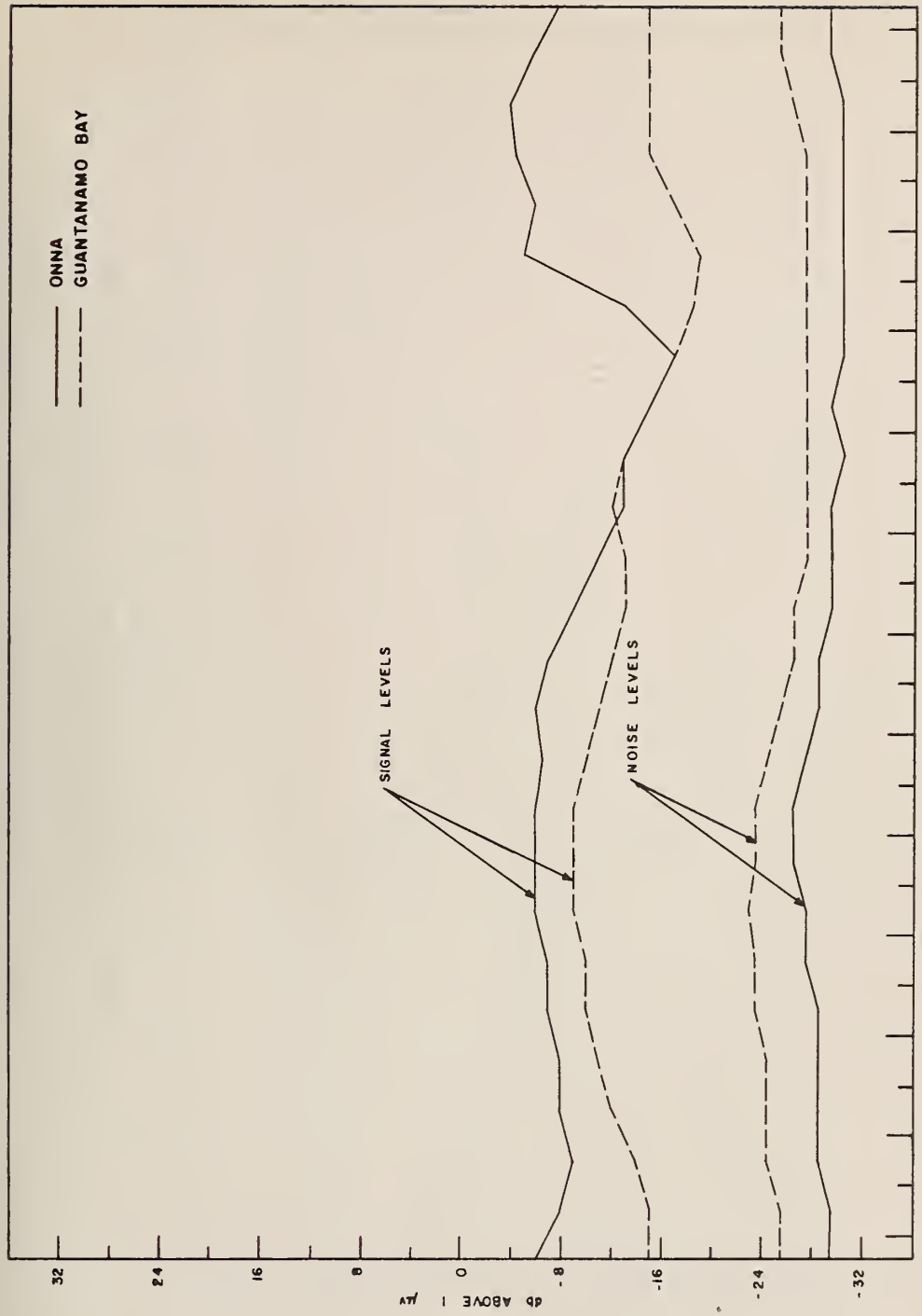
DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT ONNA AND GUANTANAMO BAY JANUARY 1958

FIGURE 6



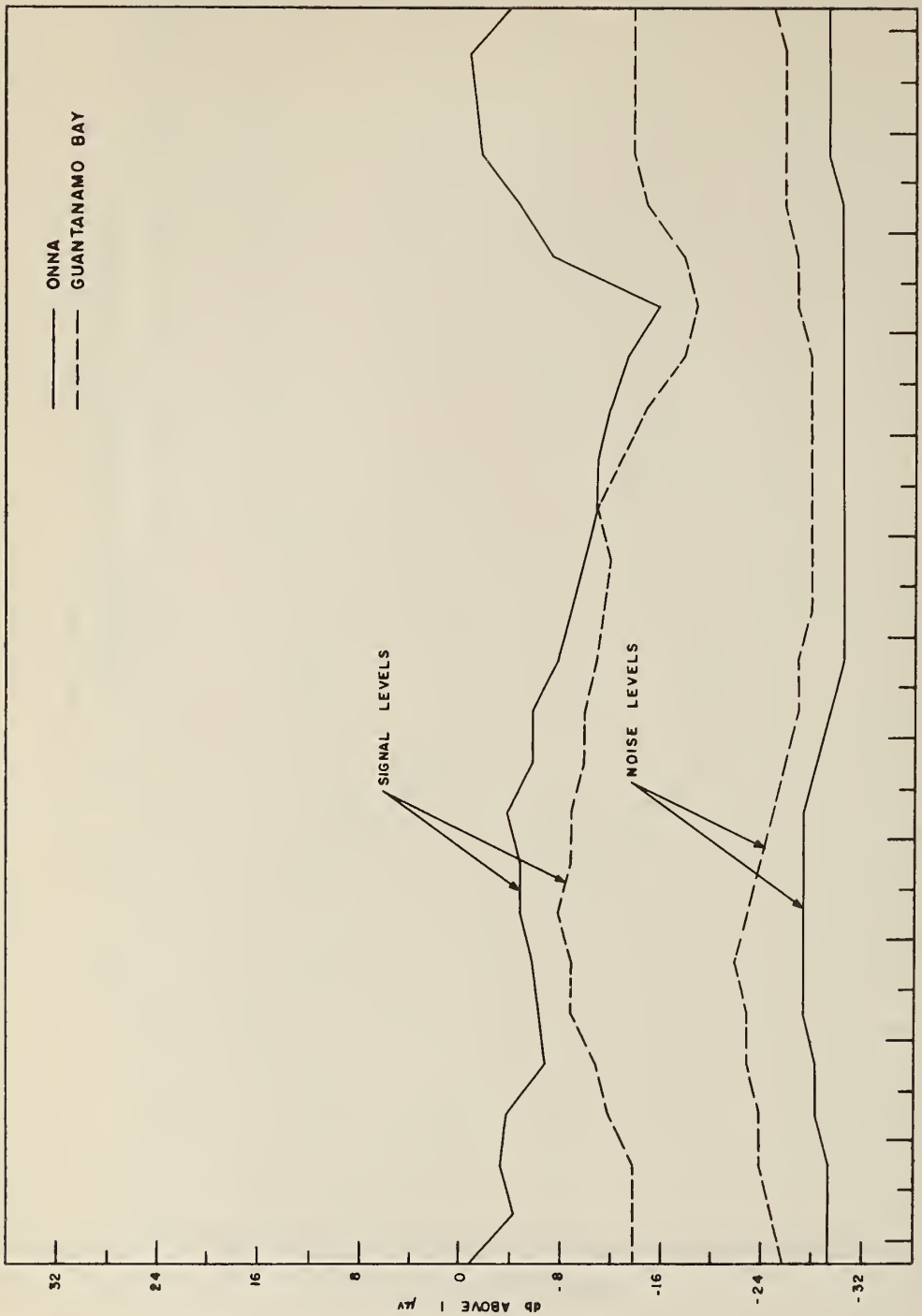
DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT ONNA AND GUANTANAMO BAY FEBRUARY 1958

FIGURE 7



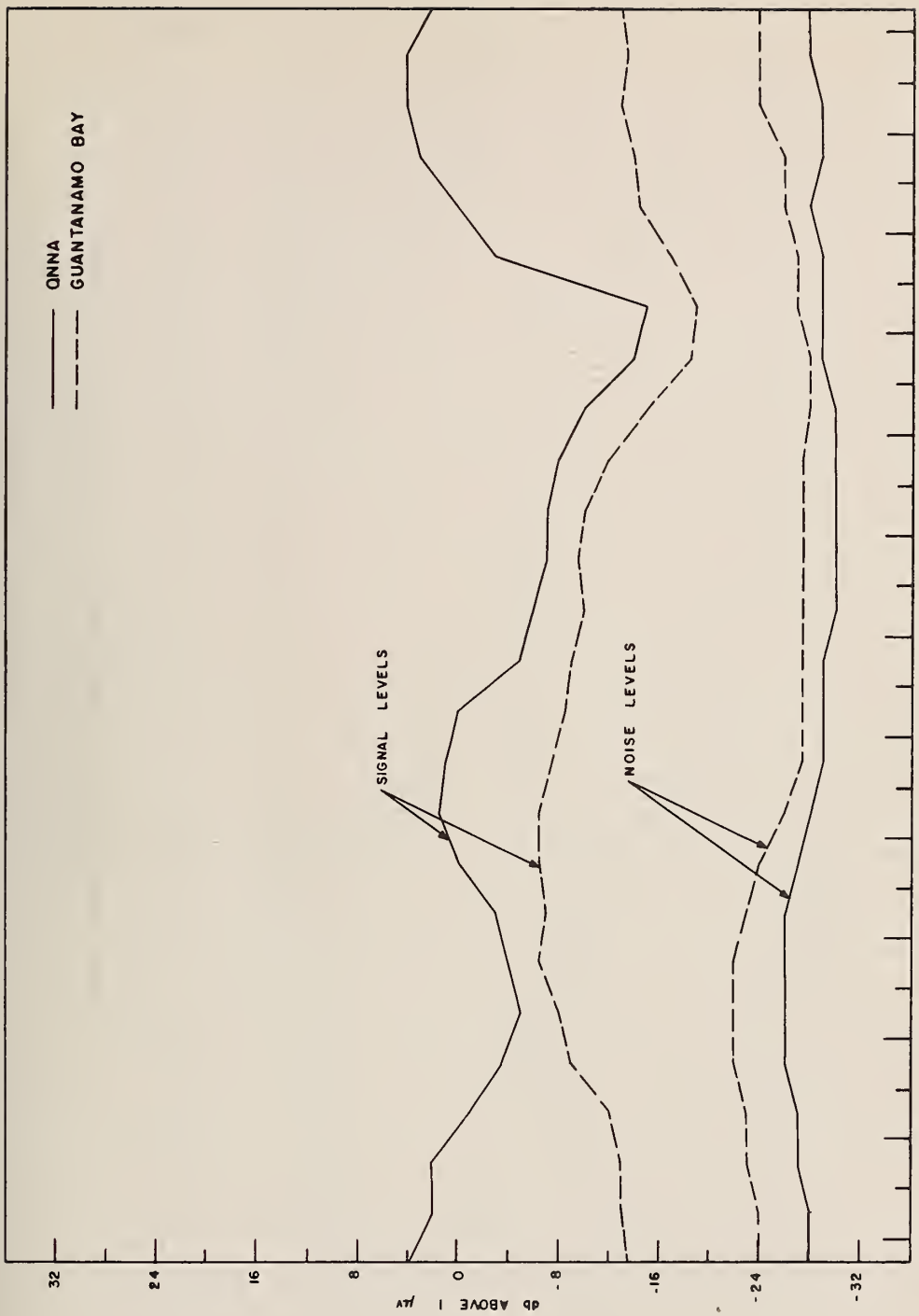
DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT ONNA AND GUANTANAMO BAY MARCH 1958

FIGURE 8



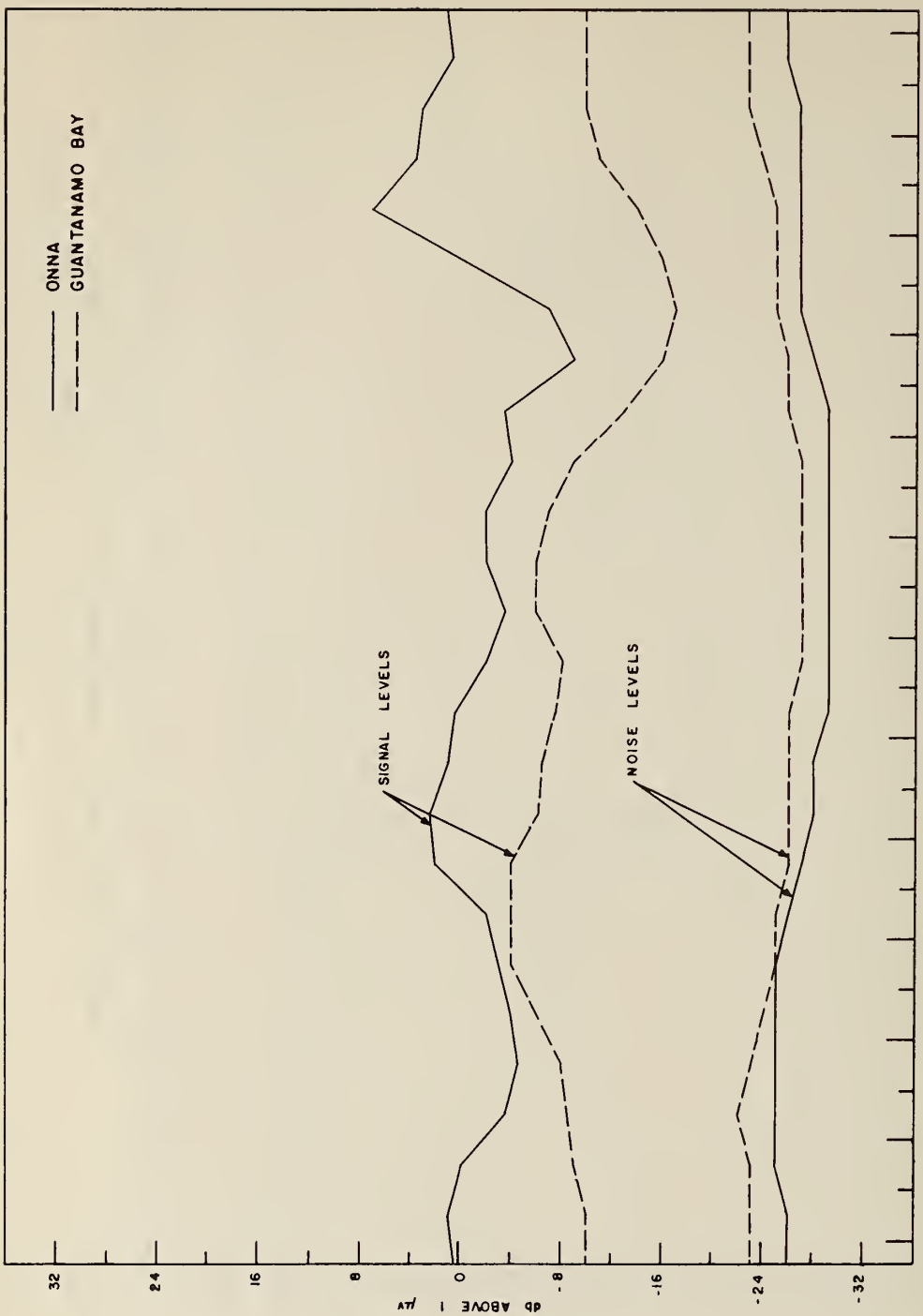
DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT ONNA AND GUANTANAMO BAY APRIL 1958

FIGURE 9



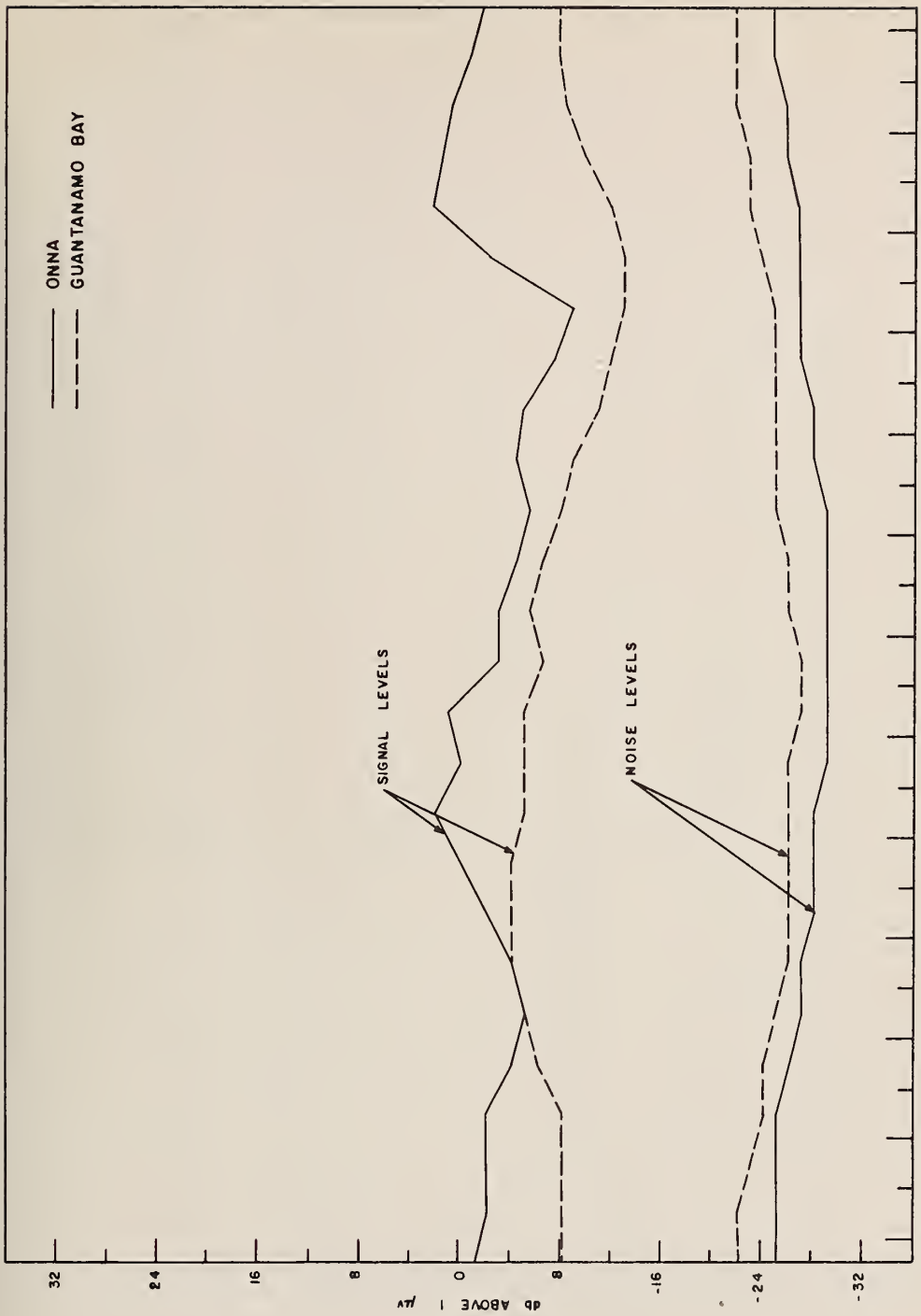
DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT QNNA AND GUANTANAMO BAY MAY 1958

FIGURE 10



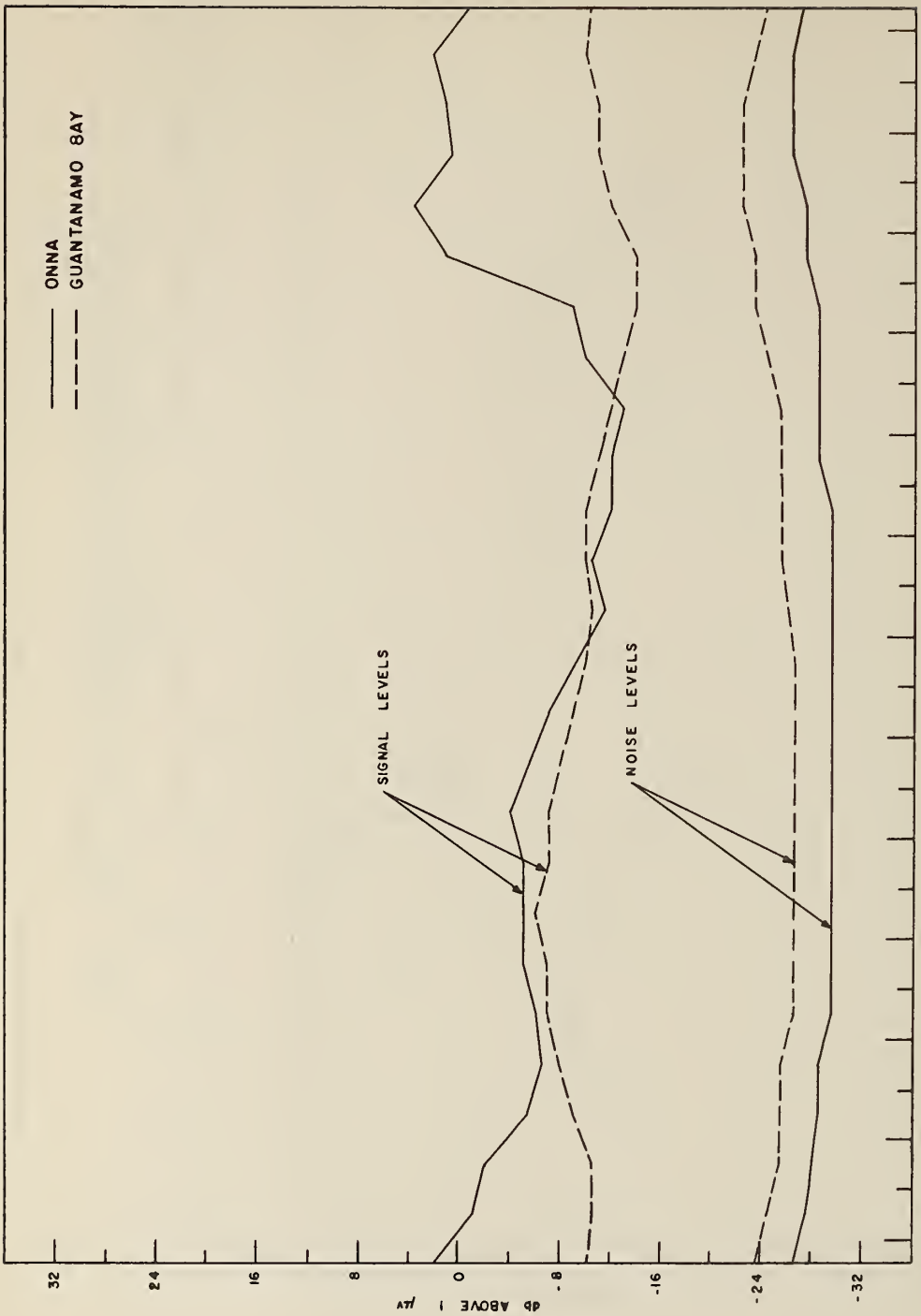
DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT ONNA AND GUANTANAMO BAY JUNE 1958

FIGURE II



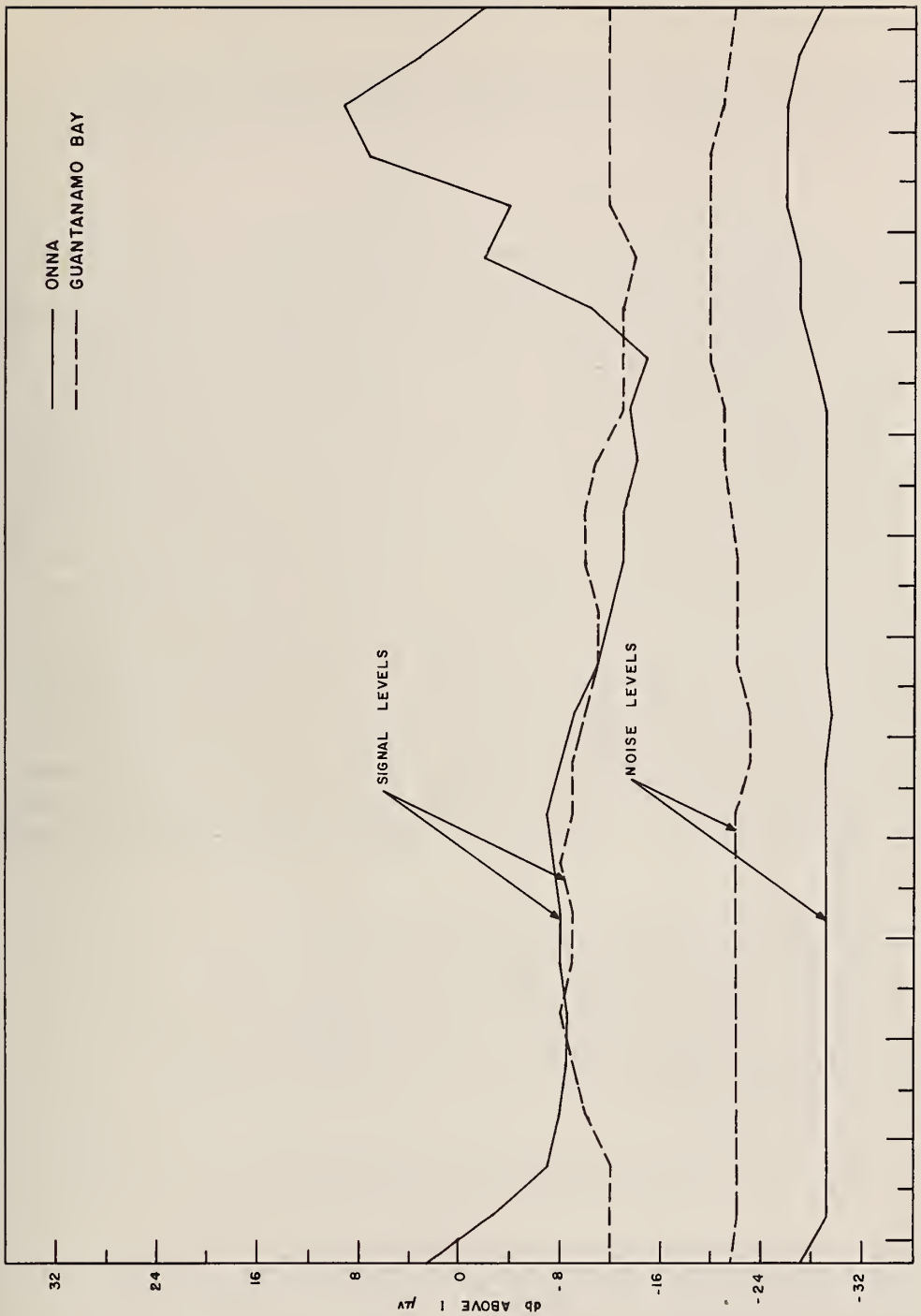
DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT ONNA AND GUANTANAMO BAY JULY 1958

FIGURE 12



DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT ONNA AND GUANTANAMO BAY AUGUST 1958

FIGURE 13



DIURNAL CHART OF MONTHLY MEDIAN SIGNAL AND NOISE LEVELS AS RECEIVED AT ONNA AND GUANTANAMO BAY SEPTEMBER 1958

FIGURE 14

3.3 Noise levels during transmitter breaks

The noise levels are shown in Figure 15 as a mass plot. The abscissa scale has been changed to sidereal time and the peaks indicate when the antennas are looking in the direction of the galactic center.

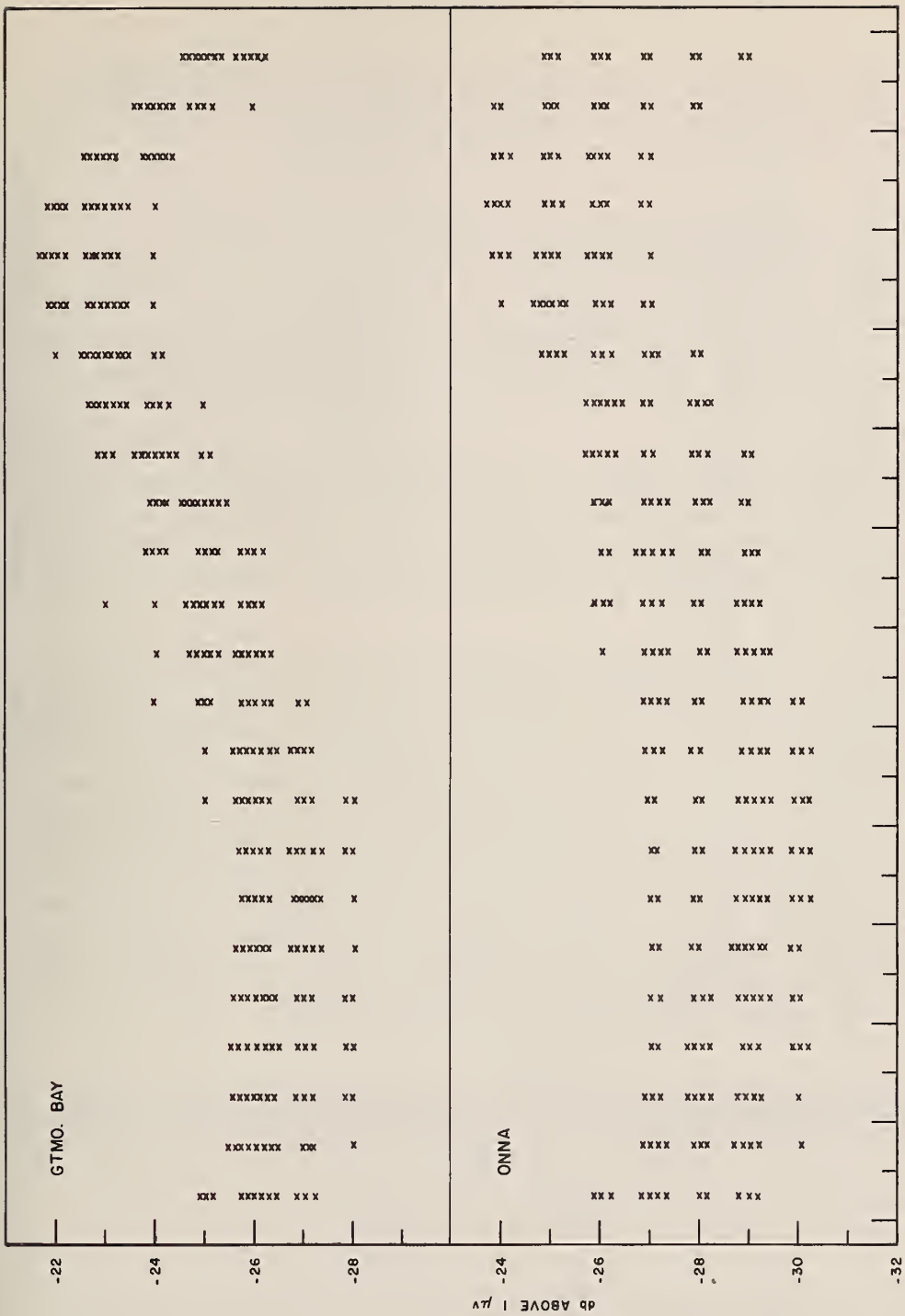
3.4 Consideration of errors

As can be seen in Figure 2 the number of decibels per scale division of the recording tape becomes non-linear and very large as one approaches -30 db relative to 1 μv (which is the region where the noise values occur). The reading error is therefore greater for noise than for signal levels. Ideally the daily mean values of galactic noise recorded at Onna (lat. 26° 30' N, antenna azimuth 216° 57' E of N) and at Guantanamo Bay (lat. 19° 53.5' N, antenna azimuth 203° 53' E of N) should be almost identical and also should not show seasonal variation. Actually the annual median value of noise recorded at Guantanamo Bay was 2 db higher than that for Onna. Also the monthly median values of noise recorded at Onna showed a variation throughout the year characterized by a probable error for an individual month of 1 db and at Guantanamo Bay by a probable error of 4 db. From these values the intercomparison precision between the two circuits is approximately 3 db. The intercomparison precisions can, in principle, be reduced from 3 db to slightly over 1 db by the simple expedient of splitting the systematic error between the two circuits (i.e. adding 1 db to all Onna values and subtracting 1 db from all Guantanamo Bay values). This has not been done because of the possibility that the error may apply to the noise values but not to the signal values. Factors which might affect the noise values but not the signal ones are:

(1) man-made noise levels at the two locations,
(2) precipitation noise on the antennas,
(3) the active sun passing through the antenna lobes,
(4) the increased scaling error for noise values,
(5) temperature drifting in the D.C. amplifiers which has an accentuated effect on the -20 to -30 db relative to 1 μv range.

Factors which would affect both signal and noise levels to the same degree are:

(1) errors in estimating transmission-line losses at transmitting and receiving terminals and deterioration of the transmission lines,
(2) mismatch of the antennas,
(3) gain variations between calibrations within the receivers themselves,
(4) errors in estimating the output power of the transmitters,
(5) errors in the signal generators used for calibration.



MASS PLOT OF MONTHLY-MEDIAN NOISE VALUES FOR EACH HOUR
SIDEREAL TIME FOR ONNA AND GUANTANAMO BAY

FIGURE 15

3.5 Sporadic-E statistics

Periods of sporadic-E enhancements for the year October, 1957 through September, 1958 were more closely examined by scaling median signal levels for each five-minute interval (see Tables 2 and 3). The criterion for determining these events was as follows:

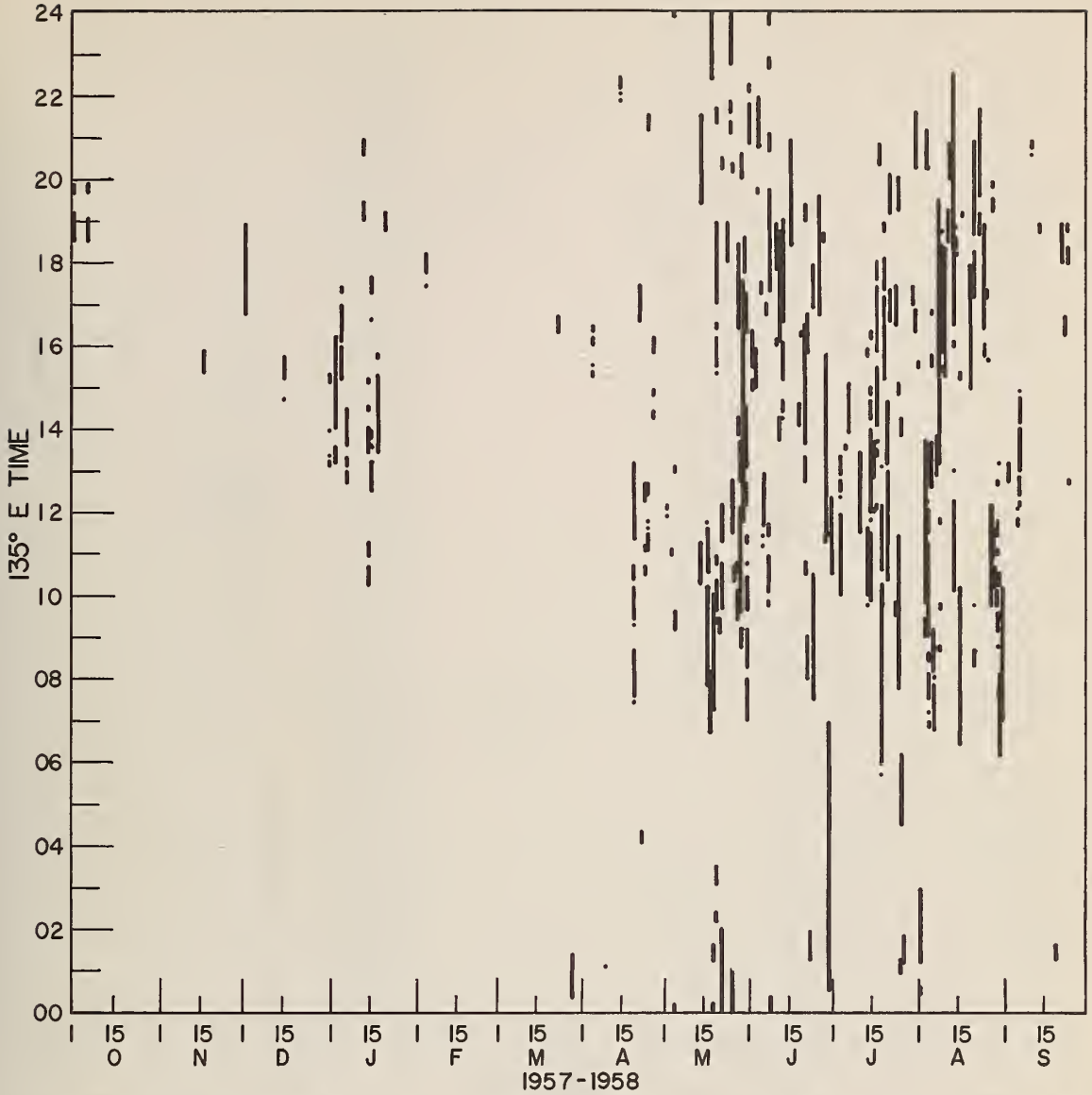
(1) an abrupt rise in signal level clearly distinguishable from the background scatter signal,
(2) a duration of the enhancement of at least twelve minutes, to separate it from strong meteor echoes,
(3) an indication from the appearance of the trace of the slow, deep fading, characteristic of sporadic-E propagation, to distinguish it from the evening signal anomaly.

The sporadic-E data obtained in this manner are shown in Figure 16 (for Onna, Okinawa) and Figure 17 (for Guantanamo Bay, Cuba) to give an overall picture of Es occurrence as a function of time of day and month of the year. Each black square represents a five-minute interval when the median value of the sporadic-E propagated signal equaled or exceeded 5 db above one microvolt.

In Figure 18 a comparison is made between the two paths of the percent of time of Es propagation for each hour of the day for the whole year. Two levels are shown, 5 db above one microvolt representing essentially all occurrences and 50 db above one microvolt for times of "intense" sporadic E. The data from the Far East circuit exhibit two maxima, one at 10 o'clock in the morning and the other at 5 o'clock in the afternoon. These maxima coincide for both levels presented. The Cuban data have only the afternoon peak at about 5 o'clock which shifts to a slightly earlier time for the "intense" Es. However, the statistical sample of Cuban data is small compared to the Okinawan data and also a major outage occurred on the Caribbean circuit during May, 1958, which was a period of strong morning Es in the Far East. Therefore the difference in the diurnal curves may not be significant.

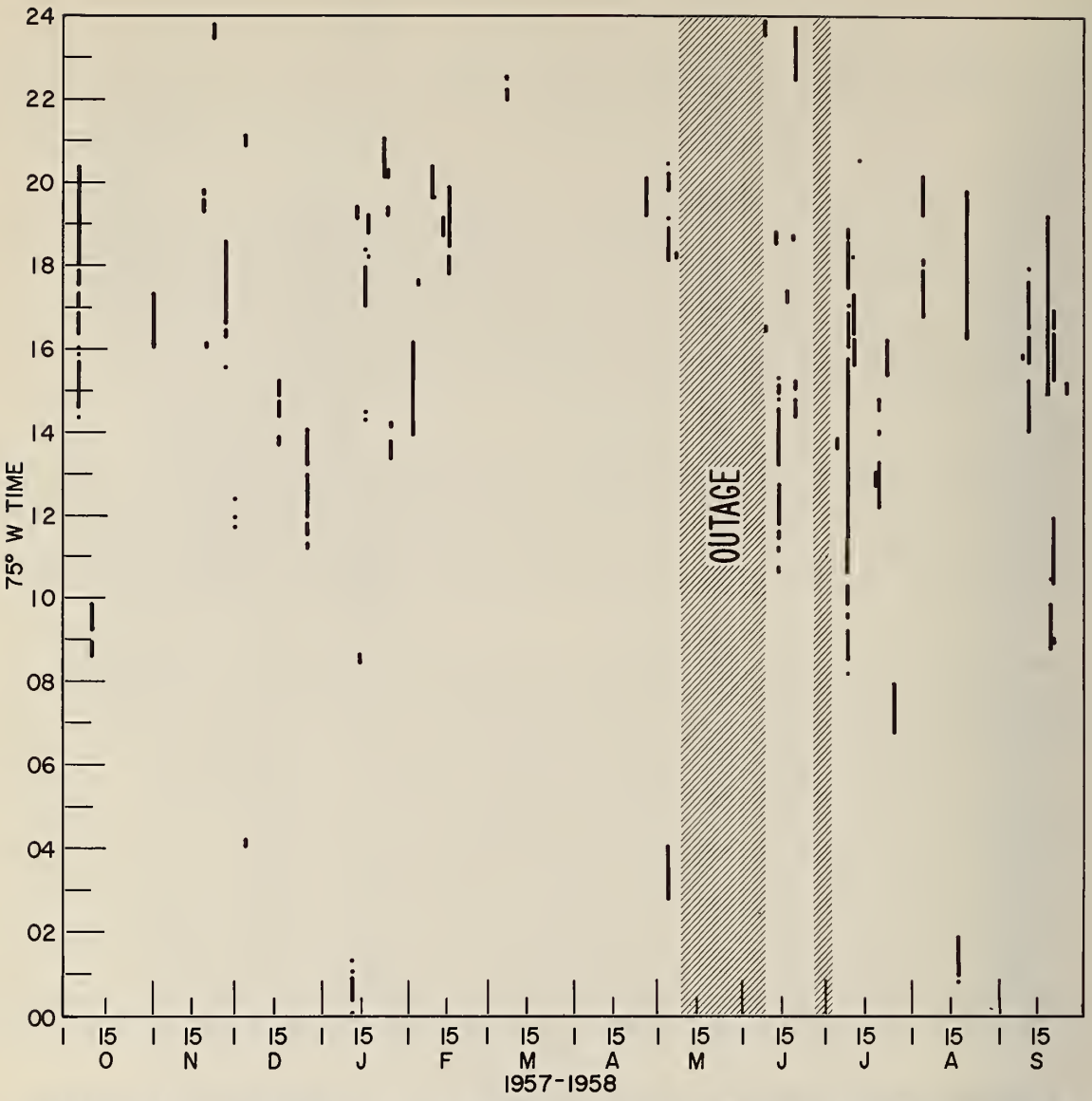
The seasonal variations are compared in Figure 19. The expected summer maximum is evident for both circuits although different in degree. The Onna curves also have a small but well defined winter maximum and show minima occurring during the equinoxes. The data from Cuba indicate that little seasonal variation in Es occurrence exists from October through February, but show a minimum during March and April.

Cumulative distributions showing the percent of time the level of the Es propagated signal equaled or exceeded 0 db and above are given for each month and each circuit in Figures 20 and 21. The curves of the Onna data separate very nicely into three groups of four months each.



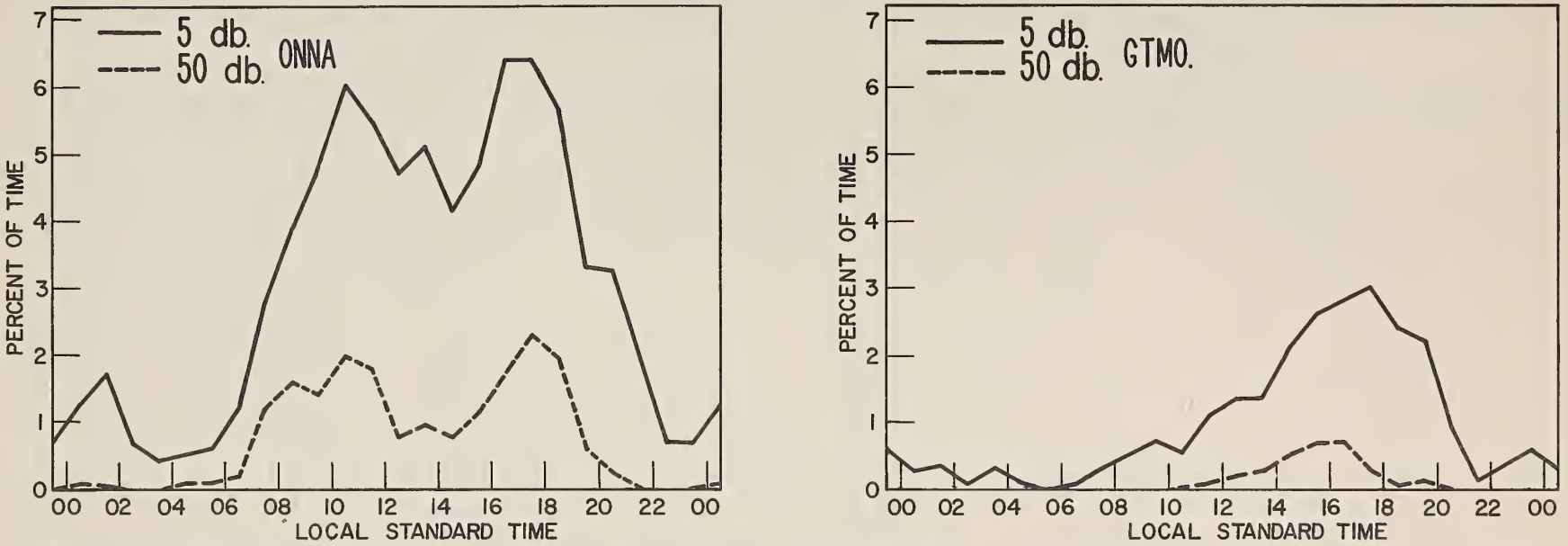
TIMES OF OCCURRENCE OF SPORADIC E EQUAL TO OR GREATER THAN 5db. ABOVE 1 μv (VALUES ADJUSTED FOR NO TRANSMISSION LINE LOSS) AS OBSERVED AT ONNA

FIGURE 16



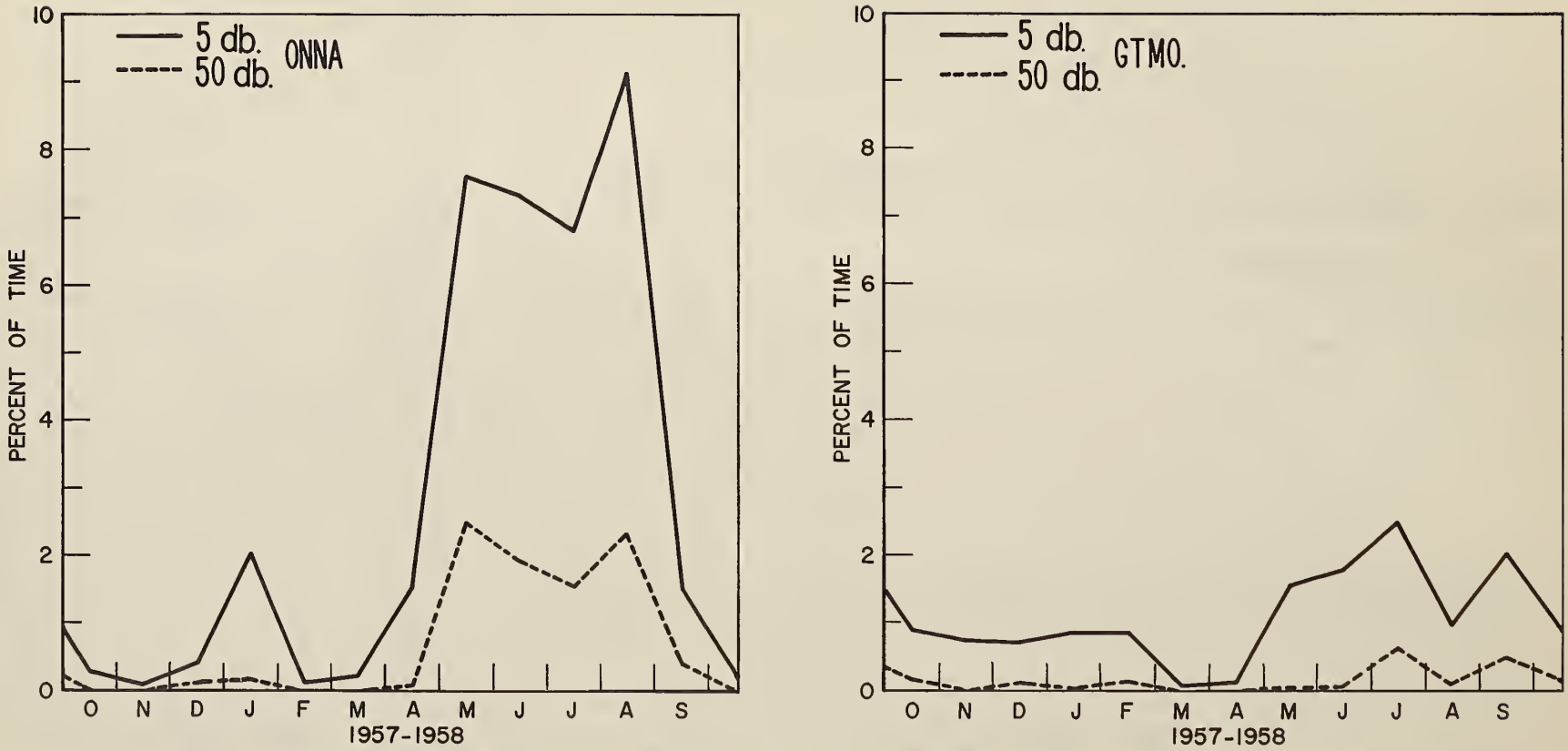
TIMES OF OCCURRENCE OF SPORADIC E EQUAL TO OR GREATER THAN 5db. ABOVE 1 μv (VALUES ADJUSTED FOR NO TRANSMISSION LINE LOSS) AS OBSERVED AT GUANTANAMO BAY

FIGURE 17



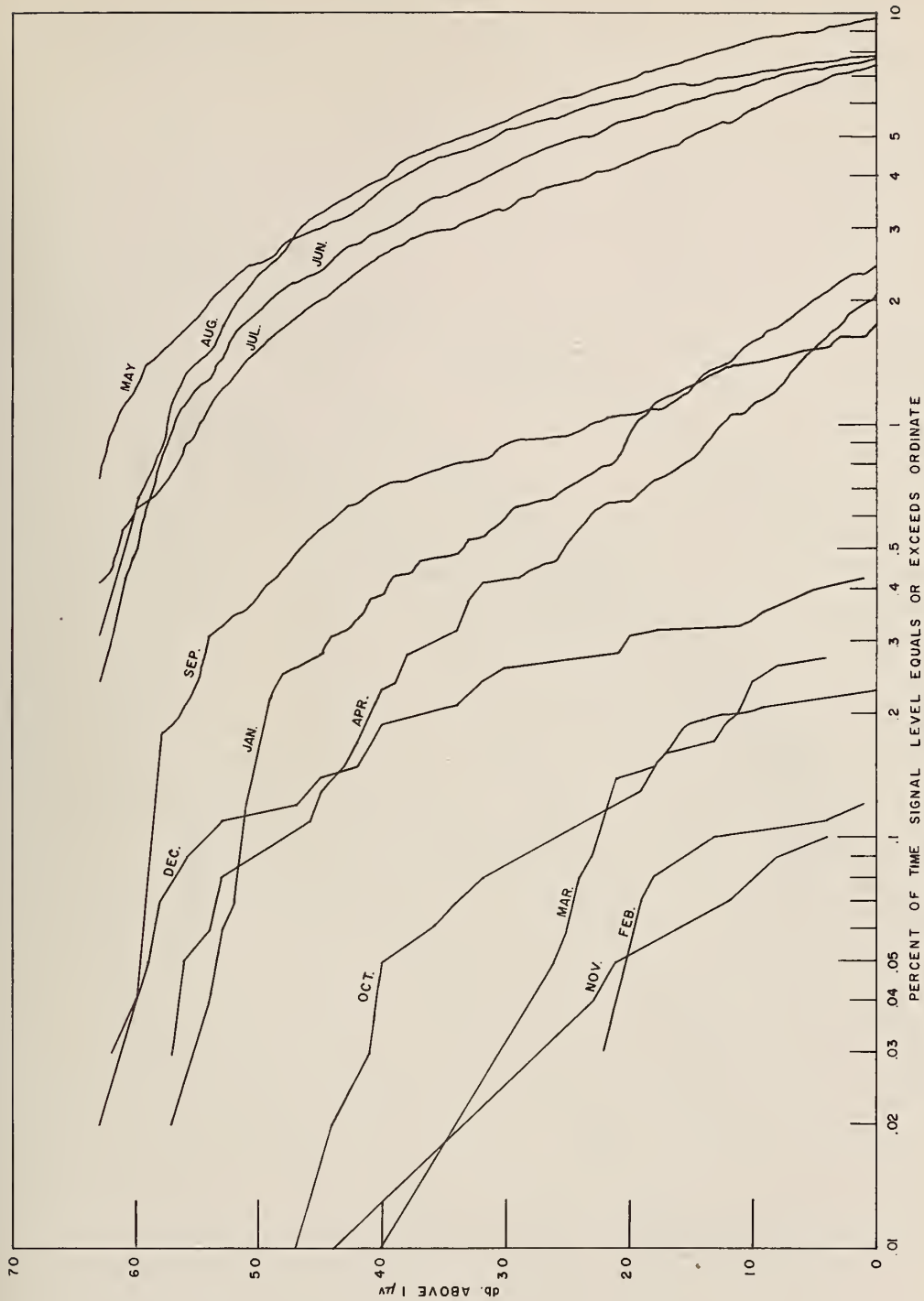
DIURNAL VARIATION OF SPORADIC-E OCCURRENCE FOR REFERENCE LEVELS OF 5 AND 50 db. ABOVE 1 μv FOR ONNA AND GUATANAMO BAY

FIGURE 18



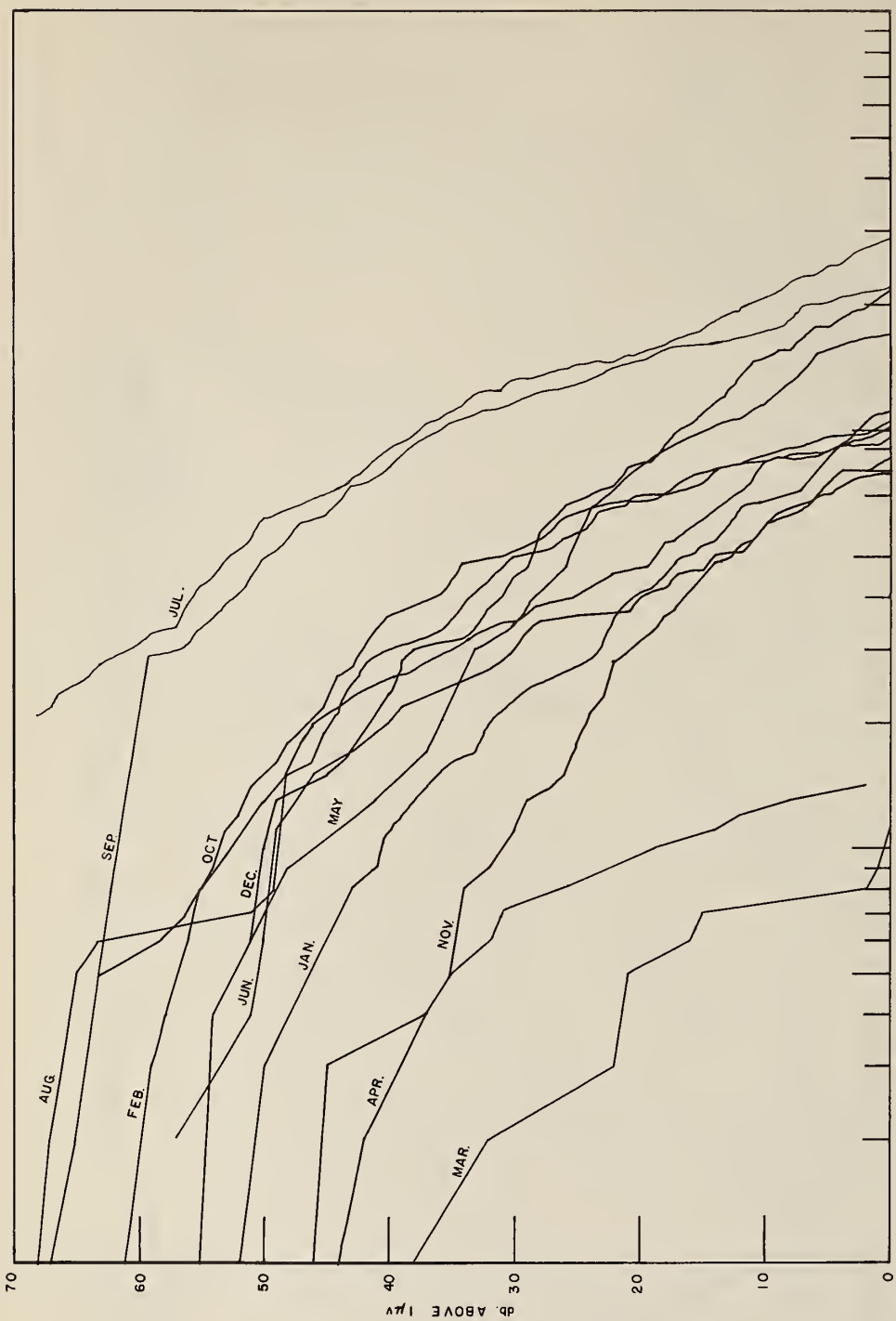
SEASONAL VARIATION OF SPORADIC-E OCCURRENCE FOR REFERENCE LEVELS OF 5 AND 50 db. ABOVE 1 μv FOR ONNA AND GUANTANAMO BAY

FIGURE 19



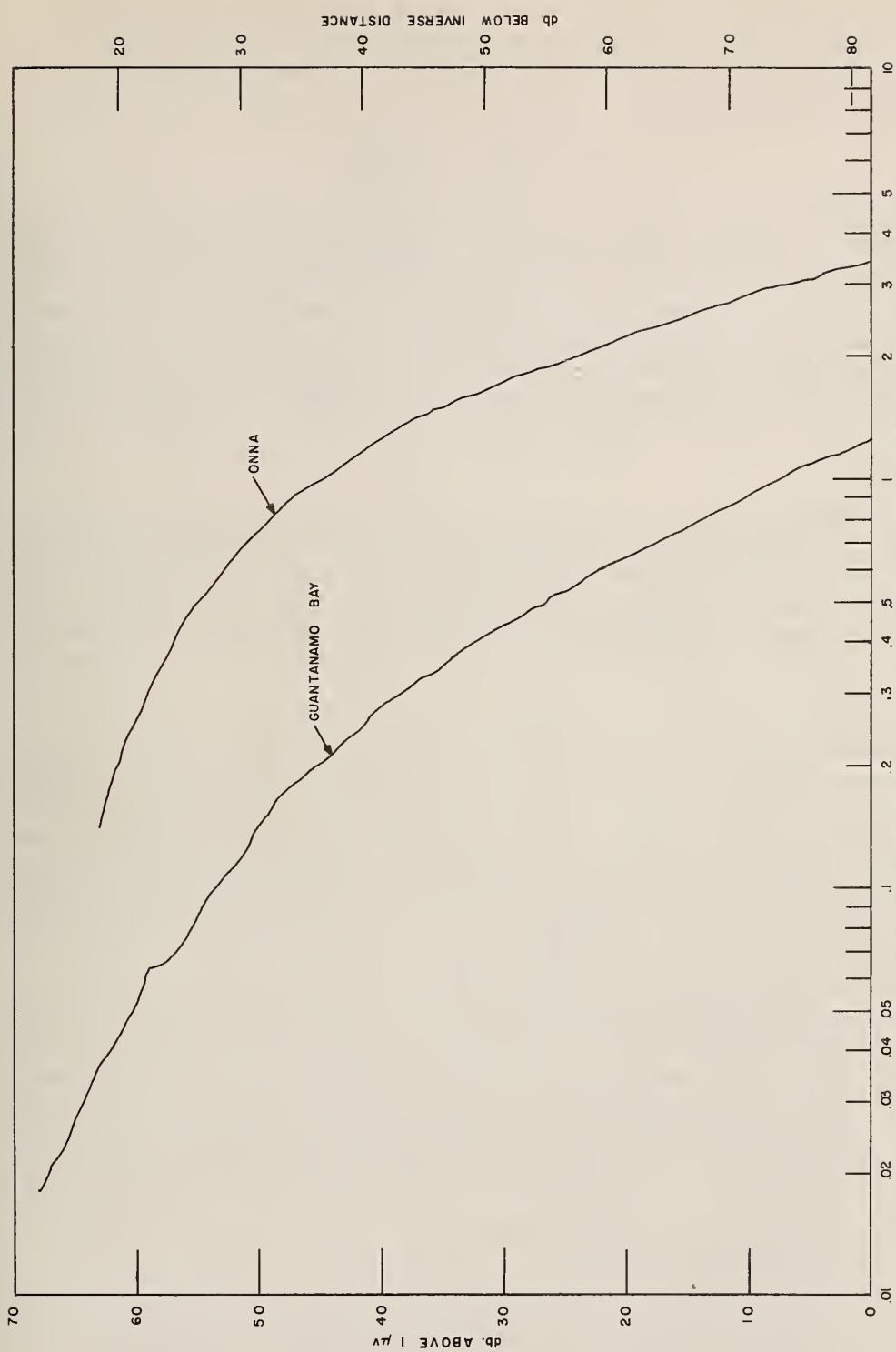
CUMULATIVE DISTRIBUTIONS OF SPORADIC-E SIGNAL LEVEL BY MONTH FOR THE YEAR BEGINNING OCTOBER 1, 1957 AS RECEIVED AT ONNA

FIGURE 20



CUMULATIVE DISTRIBUTIONS OF SPORADIC-E SIGNAL LEVEL BY MONTH FOR THE YEAR BEGINNING OCTOBER 1, 1957 AS RECEIVED AT GUANTANAMO BAY

FIGURE 21



COMPARISON OF THE CUMULATIVE DISTRIBUTIONS OF THE SPORADIC-E SIGNAL LEVEL FOR THE YEAR BEGINNING OCTOBER 1, 1957 AS RECEIVED AT ONNA AND GUANTANAMO BAY

FIGURE 22

Figure 22 compares similar cumulative distribution curves taking the whole year's data for each circuit and clearly shows that sporadic E was three to five times more prevalent over the Poro-to-Onna path than over the Panama-to-Cuba path.

3.6 Evening signal anomaly

The evening signal anomaly was first brought to the attention of members of this project during November, 1956 when E. K. Smith was site surveying in the Far East. He found that an experimental circuit operated by the Page Communications Engineering Company of Washington, D. C., from Poro Point in the Philippines to Sobe, Okinawa, at a frequency of 36.4 Mc/s was producing peculiar evening signals quite consistently during September and October of that year. No information was available as to the reflecting mechanism except that ground scatter could be excluded.

When the IGY circuit was installed between Poro Point and Onna at an operating frequency of 49.84 Mc/s in September of 1957, the anomaly was again observed with signal intensities as high as 45 db above 1 μv. Pulse equipment was hurriedly assembled to take advantage of an inspection trip scheduled for November, 1957. The phenomenon had, in the meantime, become very weak and the November, 1957 pulse tests ended in failure.

A few months later the Page Company initiated tests over their Philippines-to-Okinawa path and were kind enough to invite E. K. Smith to participate in them. Pulse delays pertinent to F-region heights were obtained. Also a comparison of signal levels received on a single lobe versus a split lobe (null along the great-circle path) antenna system indicated that much of the energy was arriving from off the great-circle path. A problem with these measurements was that the F-layer MUF was very close to the operating frequency, particularly for the 36.4 Mc/s circuit used in the pulse delay measurements and it could therefore be argued that the pulse delays were peculiar to the immediate vicinity of the MUF. Another pulse experiment was organized for the IGY circuit for September, 1958. This experiment* was carried out by J. M. Watts and L. H. Tveten and was successful in obtaining the range time records shown in Figure 23 (see also Figure 2 in the Bateman, et al., 1959). A further experiment was scheduled for the fall of 1959 at which time angle of arrival measurements were attempted on the Poro-to-Onna circuit and an effort made to record the evening signal anomaly in adjacent areas to determine its geographical extent.

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*The program of special tests during September, 1958 was supported by the U. S. Information Agency, International Broadcasting Service.

Examples of the appearance of this anomaly on the recordings are shown in Figure 2. Mass plots showing the times when signal levels due to this type of propagation exceeded the threshold values of 5 and 15 db above 1 μv. Actually only four times during the year did the hourly median value of the anomalous signal reach 5 db above 1 μv at Cuba.

It can be seen in Figure 24 that, although the evening signal anomaly occurs during all months of the year, the September-October period appears to be the annual maximum and the November-December period the annual minimum. No pulse measurements were made over the Panama-to-Cuba circuit, so it cannot be claimed for certain that the same phenomenon is being observed. However, it is interesting to note that the data for this later path show a complete seasonal reversal for maximum and minimum periods compared to those observed on the Far East circuit.

4. CONCLUSIONS

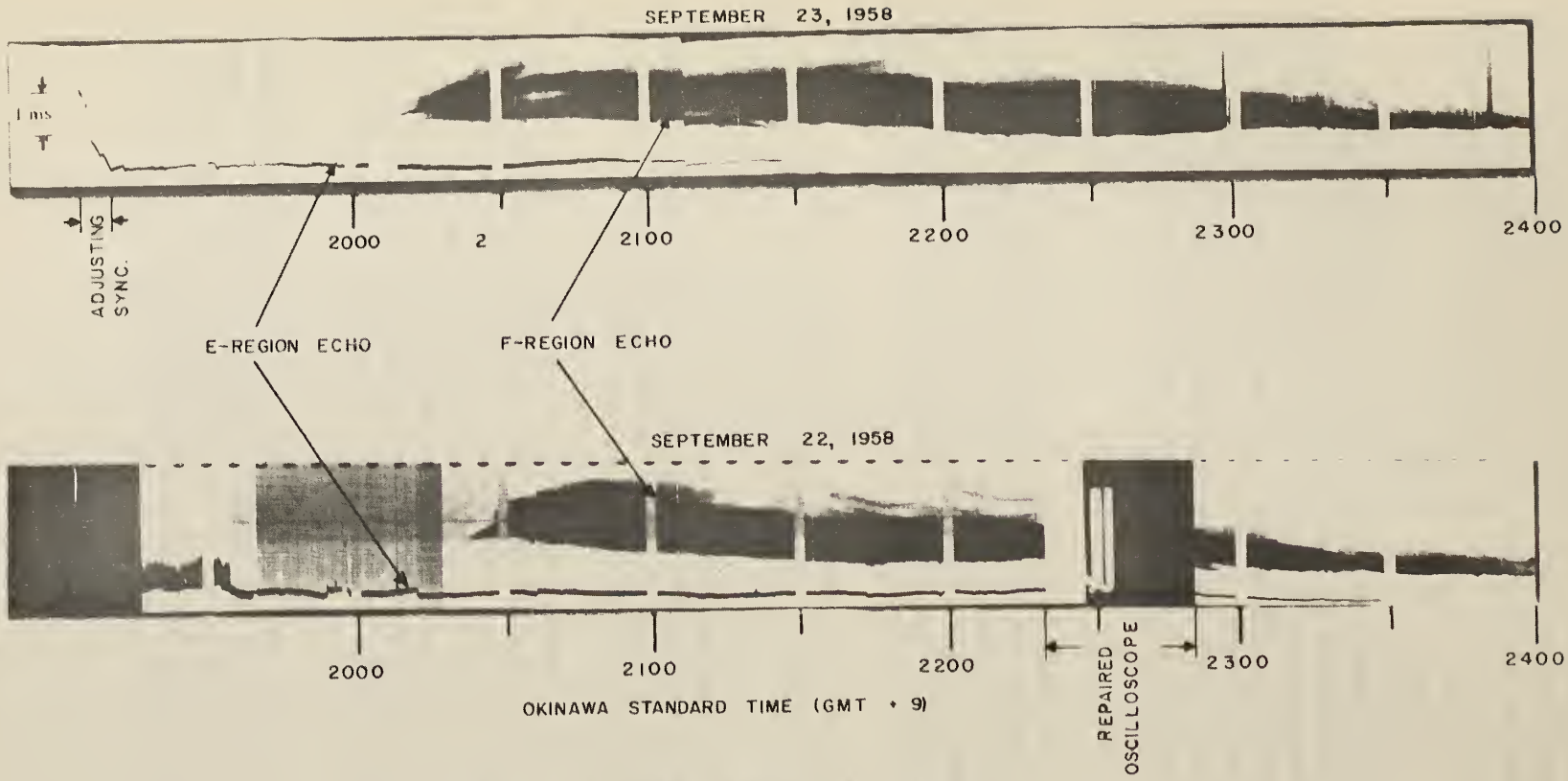
The existence of the longitude effect in the occurrence of sporadic-E propagation suggested by previous data has been affirmed by this experiment, inasmuch as three to five times more sporadic E (depending on the reference level) has been observed on the Poro-to-Onna circuit in the Far East than on the Panama-to-Cuba circuit in the Caribbean.

Seasonal variations of the occurrence of sporadic E showed the summer maximum on both circuits, but only the Far East one had a well defined winter peak.

Diurnally, sporadic E recorded over the Poro-to-Onna circuit exhibited a double-peaked daytime maximum, with the peaks occurring at 1000 and 1700 hours. The Es data from the Panama-to-Cuba circuit also had the daytime maximum but only one peak in the afternoon.

Peculiar evening signal enhancements (referred to as the evening signal anomaly or Far East anomaly) have been observed, particularly around the fall equinox, over the Poro-to-Onna circuit. Pulse measurements during these periods made over this circuit show time delays pertinent to F-region reflections. Pulse broadening points toward a scatter rather than a specular reflection mechanism for these signals. Only faint evidence of a similar phenomenon has been found in the Caribbean area.

In this report an effort has been made to present reductions of as much of the data obtained during the IGY program as possible. A paper has been prepared for publication which will attempt to interpret some of the findings of the experiment (Smith and Finney, 1960).



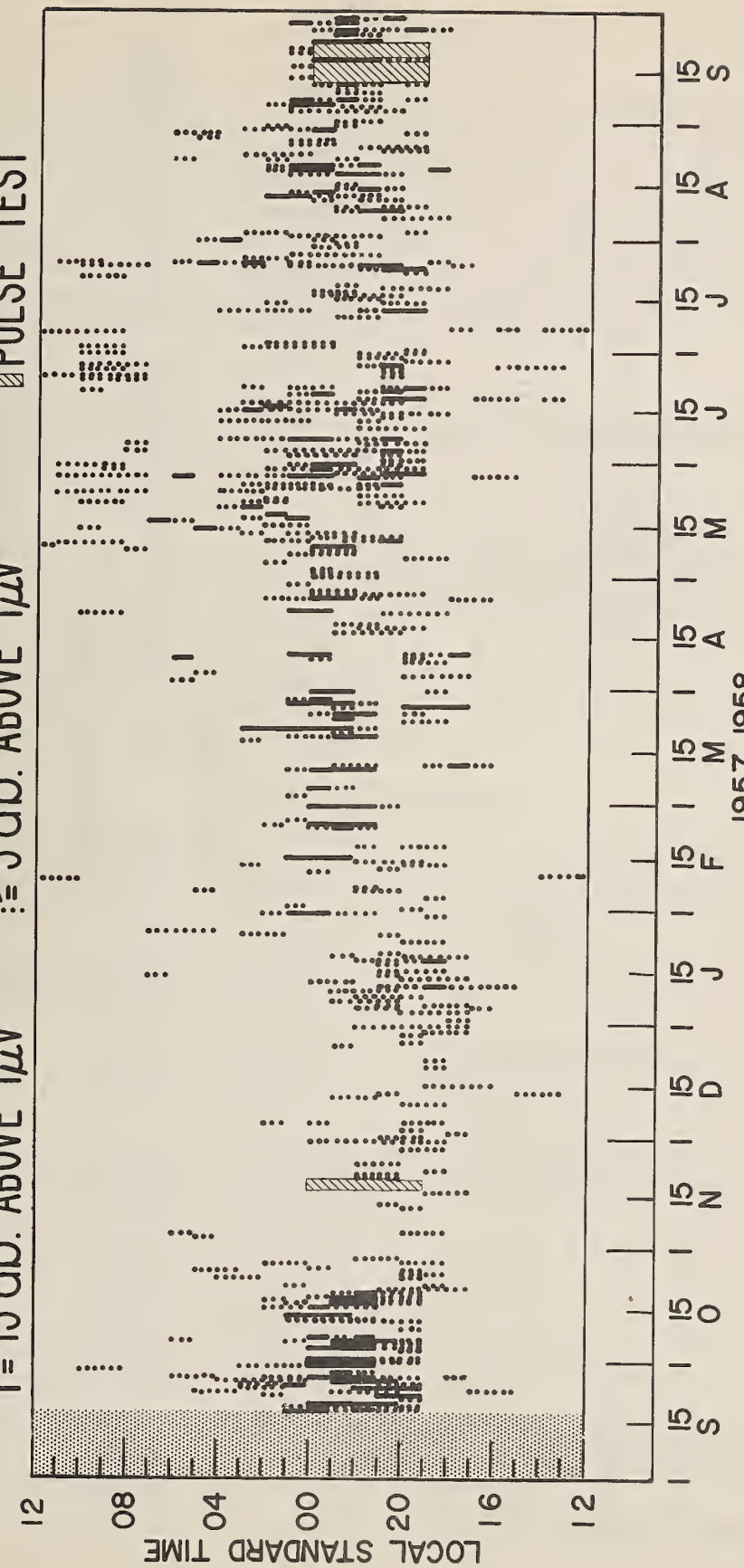
PORO P. I. TO ONNA, OKINAWA (837 MILES)
RANGE MARKERS ARE 100 MICRO-SECONDS

FREQUENCY: 49.84 Mc
POWER: 2 kw
ANTENNAS: 5 ELEMENT H YAGIS

PULSE LENGTH: 50 μs
PULSE REPETITION RATE: 100/sec
RECEIVER BANDWIDTH: 120 kc

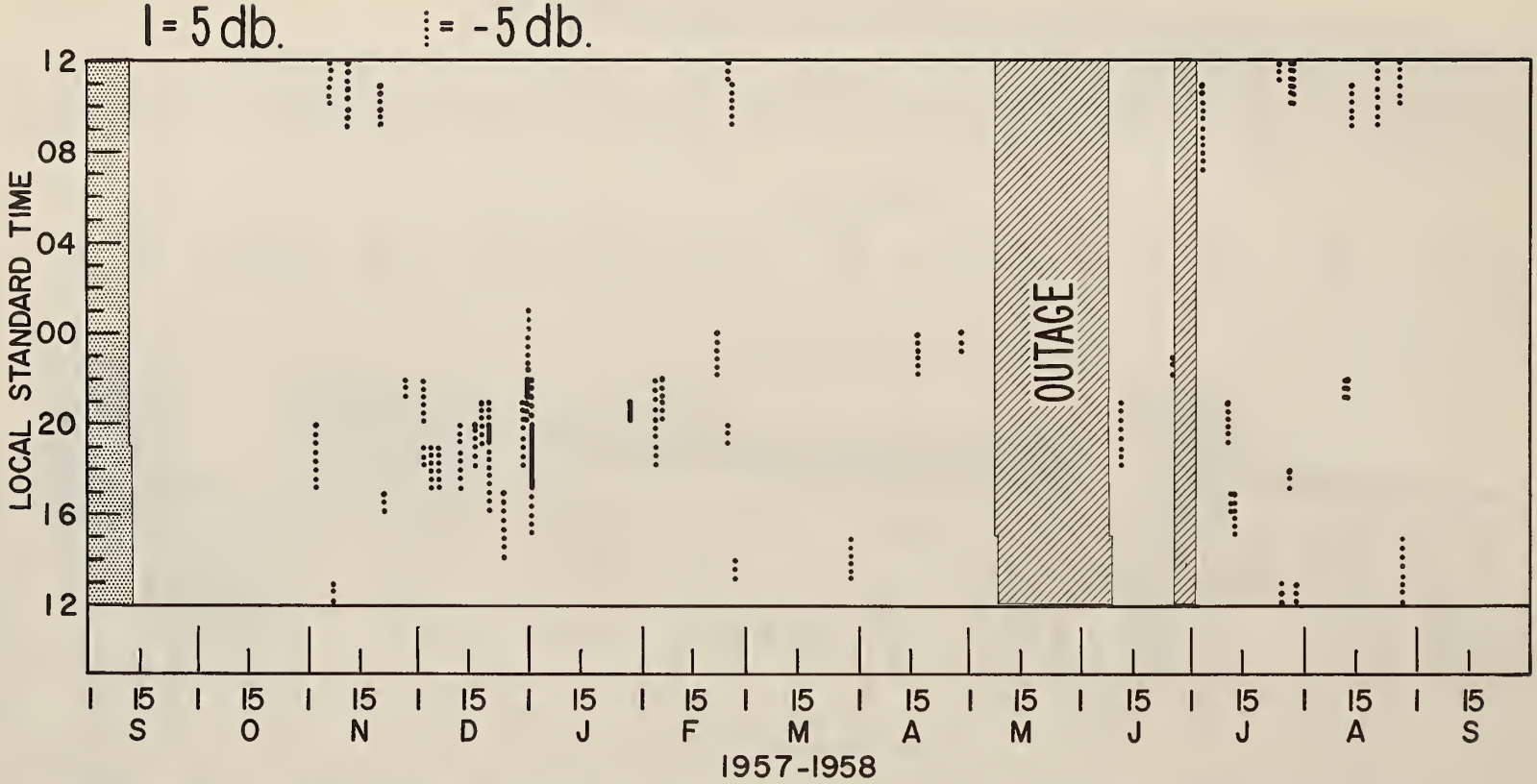
RANGE TIME RECORDS FOR THE PORO-TO-ONNA CIRCUIT ILLUSTRATING THE PULSE DELAY OF THE EVENING SIGNAL ANOMALY RELATIVE TO SPORADIC E

FIGURE 23



TIMES OF OCCURRENCE OF THE EVENING SIGNAL ANOMALY FOR REFERENCE LEVELS OF 5 AND 15 db. ABOVE 1 μv AS OBSERVED AT ONNA

FIGURE 24



TIMES OF OCCURRENCE OF TRACES WITH THE SAME APPEARANCE AS THE EVENING SIGNAL ANOMALY FOR REFERENCE LEVELS OF 5 AND -5 db. ABOVE 1μv AS OBSERVED AT GUANTANAMO BAY

FIGURE 25

5. ACKNOWLEDGMENTS

The authors wish to thank the engineering staff of the Voice of America relay bases in the Far East for their enthusiastic cooperation and diligent operation of the experimental program, in particular William R. Harmon, manager in the Philippines, Fred K. Blackburn, manager in Okinawa, Harold Kenny, Homer Johnson, and Neil Westerdale. Thanks are due for their assistance in the Far East program to E.C. Page, Ross Bateman, Glen Pebbles, Bill Miller and Ray Belford of the Page Communications Engineers; Dr. Casimiro del Rosario, Chairman of the Philippine IGY Committee; and Father Hennessy of the Manila Observatory at Baguio.

We would like to express our gratitude to the personnel of the U.S. Naval Base at Guantanamo Bay, Cuba, for operation of that site under the direction of the Communication Officers, Lt. Douglas I. Smiley and Lt. Fred L. Bradshaw.

Among the staff of the Central Radio Propagation Laboratory of the National Bureau of Standards, we would particularly like to thank, for their contributions to this effort, Alton O. Crawley, Engineer-in-Charge of the Panama NBS Field Station; Dr. K.L. Bowles of the Equatorial Scatter Project; Wesley Harding and Joseph DeGregorio for their part in the installation phase; and J.M. Watts and Lowell Tveten for the excellent results on the pulse tests.

6. REFERENCES

1. R. Bateman, J.W. Finney, E.K. Smith, L.H. Tveten, and J.M. Watts, International Geophysical Year Observations of F-layer scatter in the Far East, J. of Geophys. Res., April, 1959.

2. K.A. Norton, System loss in radio wave propagation, J. of Research NBS, 63D, No. 1, July-August, 1959.

3. E.K. Smith, Jr., Worldwide occurrence of sporadic E, NBS Circular 582, 1957.

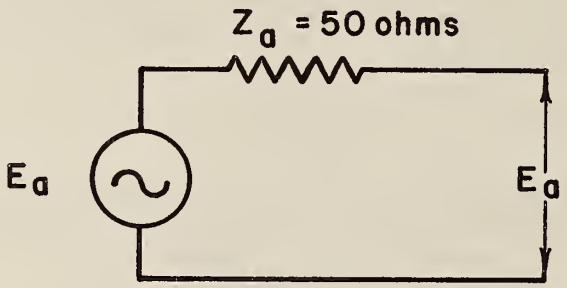
4. E.K. Smith, Jr. and J.W. Finney, Peculiarities of the ionosphere in the Far East: Sporadic E and F-region scatter, J. of Geophys. Res., March, 1960.

7. APPENDIX

RECEIVER CALIBRATION

In the ionospheric forward-scatter program at the Central Radio Propagation Laboratory, it has been the practice to calibrate the receivers in terms of open-circuit antenna voltage. This practice was followed, primarily, because the impedance of the receiving equipment was not matched to the impedance of the antenna system. The receivers used in the VHF Oblique-Incidence Sporadic-E Measurements program also fell into this category, and the same type of calibration was employed. The purpose of this appendix is to describe the calibration method and to show that it does indicate open-circuit antenna voltage. Further, it is shown how this calibration is related to the transmission loss of the circuit.

The antennas used in this experiment were horizontal five-element Yagis with a terminal impedance of 200 ohms. This balanced impedance was transformed to 50 ohms unbalanced by a balun and matching stubs. Neglecting the transmission line loss, the antenna system can be represented by the following circuit:

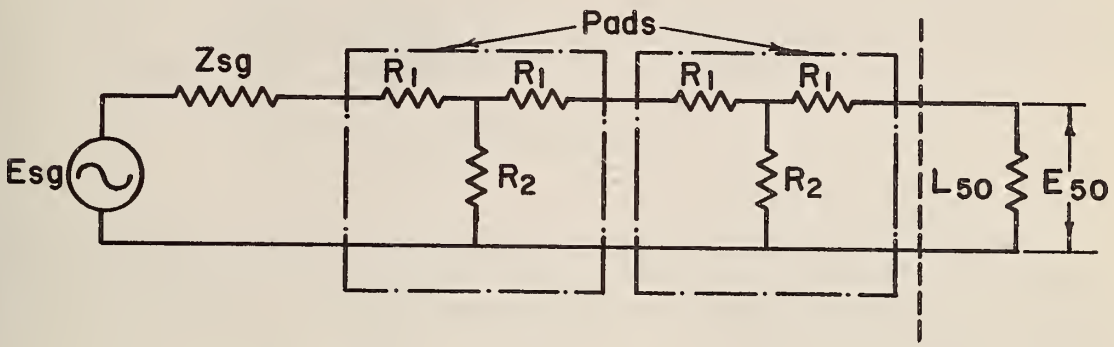


E_a is the open-circuit antenna voltage.

Z_a is the impedance of the antenna system (50 ohms)

The basis of the calibration system is the Measurements Corporation, Model 80, signal generator, modified with a crystal of the desired series-resonant frequency to provide better frequency stability. The generator is so calibrated that the voltage indicated by the long fiducial mark, E_{lf}, is the voltage developed across a 50 ohm load. The pad mark indicates one-half of this voltage, E_{pad}. In conjunction with the signal generator, two Measurements Corporation pads, 80-ZH3, are used to isolate it from the receiver. These pads, when terminated with 50 ohms,

have an input impedance of 50 ohms and each pad provides an insertion loss of 6 db (drop in voltage of one-half). However, regardless of the impedance of the signal generator, the impedance looking back into the two pads when attached to the output of the signal generator is approximately 50 ohms. The signal generator and two pads when ideally loaded with 50 ohms are represented by the following circuit:



E_{sg} is the voltage developed by the signal generator.

Z_{sg} is the internal impedance of the signal generator.

R_1 is a resistance of 16.6 ohms.

R_2 is a resistance of 66.9 ohms.

L_{50} is the ideal load of 50 ohms.

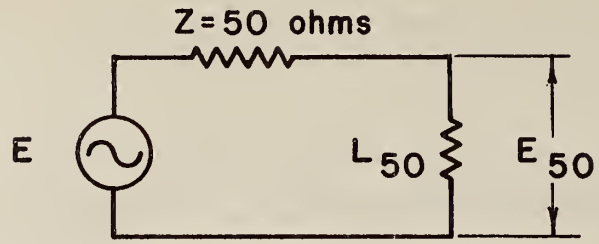
E_{50} is the voltage of the calibration system across 50 ohm load.

Due to the presence of the two pads in the circuit, the voltage developed across the 50 ohm load is equal to one-quarter the voltage indicated by the long fiducial mark and one-half the voltage indicated by the pad mark or:

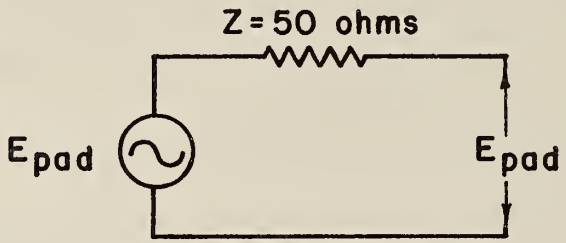
$$E_{50} = 1/4\ E_{lf} = 1/2\ E_{pad}$$

According to Thevenin's theorem, the network to the left of the dashed line, insofar as the load impedance is concerned, behaves as though it were equivalent to a simple generator having an internal impedance Z and a generated voltage E, where E is the open-circuit voltage and Z is the impedance looking into the network when all sources of voltage in the network are short-circuited. The impedance, Z, looking

back into the calibration network is, as previously explained, approximately 50 ohms. The equivalent circuit is therefore:



From this equivalent circuit, it is readily seen that the generated voltage E is equal to twice the voltage across the 50 ohm load, E equals $2(E_{50})$, and therefore equal to the voltage indicated by the pad mark, E equals E_{pad}. The equivalent open-circuit of the calibration system can then be represented by:



Therefore, when the voltage across the terminals of the antenna system is equal to the voltage indicated by the pad mark on the signal generator, the calibration system is the open-circuit equivalent of the antenna system and, no matter what load impedance is placed across the terminals by the receiver, the same amount of power will be delivered to it by both systems.

In the actual calibration of the receivers, the pad mark of the signal generator is set on 1000 microvolts. The output of the receiver, as indicated on an Esterline-Angus recorder chart, produced by this calibration voltage is designated as 60 db above one microvolt open-circuit antenna voltage. Other calibration levels are obtained through the use of a variable attenuator, which is calibrated in decibels. This attenuator was found to perform most accurately when placed between the two pads.

In determining the system loss, L_s, (Norton, 1959) which excludes any transmitting and receiving antenna transmission line losses, it is necessary to know p_t, the radio-frequency signal power input to the terminals of the transmitting antenna, and p_a, the resultant radio-frequency signal power available at the terminals of the receiving antenna. In this experiment, p_t was 2 kw, the power output at which the transmitter was maintained, and p_a was the radio-frequency signal power available to a load having an impedance equal to the antenna impedance of 50 ohms. For the reference level of 0 db (one microvolt open-circuit antenna voltage), the transmission loss is calculated as follows:

$$p_t = 2 \text{ kw} = 2 \times 10^3 \text{ watts}$$

$$P_t = 10 \log p_t = 10 \log (2 \times 10^3) = 33 \text{ dbw}$$

$$p_a = \frac{(E_{50})^2}{Z_a} = \frac{(E_{odb})^2}{4 Z_a} = \frac{(1 \times 10^{-6})^2}{4 (50)} = 5 \times 10^{-15} \text{ watts}$$

$$P_a = 10 \log p_a = 10 \log (5 \times 10^{-15}) = -143 \text{ dbw}$$

$$L_s = P_t - P_a = 33 - (-143) = 176 \text{ db}$$

In the antenna system used in this experiment, the antenna circuit losses other than those associated with its radiation resistance were small and have been ignored. Therefore the transmission loss, L, was considered the same as the system loss.

Table 2. Tabulation of median signal levels for every 5-minute interval during periods of sporadic-E propagation as received at Guantanamo.

Values are in db above 1 μ.v., adjusted for no line losses and 2 kw output of transmitter

75°W Time

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Oct 6	1410	-6	Oct 6	1725	G	Oct 11	0830	0	Nov 20	1905	-14
	15	G		30	18		35	23		10	-7
	20	8		35	29		40	36		15	12
	25	G		40	35		45	37		20	17
	30	4		45	35		50	40		25	9
	35	17		50	33		55	23		30	5
	40	9		55	G		0900	0		35	1
	45	42		1800	44		05	G		40	14
	50	34		05	37		10	1		45	10
	55	42		10	19		15	15		50	4
	1500	45		15	31		20	28		55	-8
	05	52		20	40		25	23			
	10	44		25	45		30	16	Nov 21	1550	-5
	15	50		30	34		35	27		55	-1
	20	53		35	47		40	26		1600	22
	25	56		40	54		45	16		05	16
	30	17		45	42		50	8		10	4
	35	30		50	26					15	-6
	40	16		55	13	Nov 2	1555	0			
	45	G		1900	27		1600	6	Nov 24	2310	-9
	50	11		05	35		05	7		15	10
	55	G		10	49		10	12		20	20
	1600	5		15	48		15	14		25	24
	05	G		20	41		20	26		30	22
	10	4		25	34		25	20		35	15
	15	G		30	41		30	11		40	9
	20	26		35	51		35	9		45	5
	25	23		40	54		40	13		50	-6
	30	26		45	63		45	14		55	-2
	35	63		50	58		50	23			
	40	43		55	51		55	18	Nov 28	1525	0
	45	63		2000	45		1700	16		30	5
	50	63		05	43		05	25		35	-7
	55	G		10	40		10	25		40	-11
	1700	13		15	34		15	15		45	-8
	05	16		20	19		20	4		50	-12
	10	28		25	G		25	-2		55	2
	15	13		30	-10		30	-10		1600	-7
	20	9					35	-13		05	-13
							40	-16		10	1

G Outage

Table 2 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Nov 28	1615	18	Dec 5	0400	17	Dec 27	1135	29	Jan 12	0045	12
	20	6		05	31		40	52		50	16
	25	22		10	18		45	49		55	-12
	30	4					50	4		0100	5
	35	11	Dec 5	2045	-2		55	28		05	-3
	40	19		50	6		1200	30		10	-2
	45	23		55	18		05	41		15	29
	50	16		2100	20		10	41		20	2
	55	24		05	10		15	21		25	-3
	1700	20		10	-4		20	20			
	05	32					25	36	Jan 14	1900	-7
	10	46	Dec 17	1330	-2		30	55		05	13
	15	45		35	12		35	36		10	17
	20	37		40	51		40	30		15	23
	25	34		45	9		45	15		20	11
	30	34		50	6		50	7		25	2
	35	31		55	-2		55	43		30	1
	40	27					1300	3		35	-2
	45	35	Dec 17	1420	9		05	-1		40	1
	50	30		25	39		10	7		45	2
	55	18		30	33		15	54		50	3
	1800	24		35	29		20	54		55	-7
	05	29		40	17		25	50			
	10	8		45	-6		30	45	Jan 15	0820	-4
	15	8		50	14		35	49		25	13
	20	5		55	25		40	50		30	6
	25	10		1500	11		45	50		35	6
	30	12		05	11		50	47			
	35	-5		10	10		55	40	Jan 17	1415	12
	40	-10		15	11		1400	9		20	2
				20	3		05	-7		25	11
Dec 1	1125	0		25	-3					30	-5
	30	4		30	-5	Jan 11	2345	3			
	35	-5		35	-9		50	2	Jan 17	1630	-12
	40	6		40	-5		55	-1		35	2
	45	-3		45	-1	Jan 12	0000	6		40	-5
	50	-1		50	-8		05	4		45	-7
	55	14		55	-10		10	-10		50	-6
	1200	-7					15	4		55	-2
	05	-1	Dec 27	1110	14		20	19		1700	7
	10	2		15	5		25	18		05	31
	15	-5		20	-7		30	24		10	50
	20	10		25	-5		35	14		15	52
	25	-1		30	32		40	17		20	48

Table 2 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jan 17	1725	43	Jan 24	2050	39	Feb 3	1410	36	Feb 10	1950	42
	30	40		55	35		15	36		55	32
	35	44		2100	23		20	42		2000	49
	40	22					25	42		05	47
	45	20	Jan 25	1900	-10		30	53		10	47
	50	20		05	-10		35	53		15	39
	55	17		10	13		40	56		20	29
	1800	2		15	15		45	50		25	4
	05	-1		20	7		50	56			
	10	-3		25	-1		55	50	Feb 14	1825	-14
	15	-3		30	-2		1500	59		30	-10
	20	5		35	-8		05	61		35	-1
	25	-3		40	-11		10	58		40	17
	30	-8		45	1		15	48		45	30
	35	-11		50	-12		20	50		50	22
	40	-13		55	-2		25	25		55	18
				2000	4		30	22		1900	18
Jan 18	1800	-15		05	28		35	12		05	13
	05	-13		10	33		40	9		10	4
	10	5		15	13		45	10		15	0
	15	-6		20	-6		50	15		20	-4
	20	-14					55	12		25	-10
	25	-13	Jan 26	1315	-4		1600	13			
	30	-5		20	22		05	10	Feb 15	1800	-17
	35	-4		25	32		10	2		05	-10
	40	-4		30	32		15	-8		10	-7
	45	6		35	29		20	-14		15	-17
	50	18		40	37		25	-16		20	-16
	55	22		45	22					25	4
	1900	20		50	4	Feb 5	1725	0		30	3
	05	12		55	0		30	16		35	-2
	10	5		1400	-3		35	10			
	15	-15		05	7		40	-2	Feb 16	1730	-19
				10	20		45	-2		35	-14
Jan 24	2000	-2		15	4		50	-2		40	-1
	05	10					55	-5		45	18
	10	5	Feb 3	1330	-13		1800	-4		50	46
	15	6		35	-12		05	4		55	46
	20	12		40	-9		10	0		1800	31
	25	15		45	-8					05	25
	30	24		50	0	Feb 10	1930	-13		10	10
	35	38		55	35		35	32		15	-3
	40	44		1400	23		40	32		20	-3
	45	41		05	23		45	23		25	15

Table 2 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Feb 16	1830	10	Apr 27	1850	-17	May 5	0350	14	Jun 9	1610	-1
	35	10		55	-9		55	18		15	-7
	40	6		1900	2		0400	9		20	1
	45	11		05	-6		05	2		25	11
	50	14		10	8		10	-5		30	7
	55	13		15	12		15	-5			
	1900	11		20	19				Jun 9	2255	-9
	05	11		25	26	May 5	1800	-13		2300	-1
	10	15		30	35		05	20		05	-5
	15	16		35	42		10	41		10	-7
	20	19		40	44		15	48			
	25	18		45	37		20	54	Jun 9	2325	-8
	30	12		50	32		25	6		30	12
	35	14		55	31		30	24		35	14
	40	9		2000	14		35	11		40	28
	45	28		05	-3		40	21		45	7
	50	18		10	-5		45	26		50	7
	55	-3		15	-10		50	23		55	3
				20	-9		55	-1			
Mar 8	2100	-7		25	-8		1900	-1	Jun 13	1830	9
	05	-7		30	-8		05	12		35	18
	10	-5		35	-10		10	-2		40	18
	15	-5		40	-13		15	-10		45	11
	20	-6					20	-5		50	3
	25	0	May 5	0215	-10		25	-7		55	-5
	30	0		20	-8		30	0			
	35	-2		25	-3		35	-1	Jun 14	1035	12
	40	-4		30	-1		40	4		40	14
	45	1		35	-3		45	7		45	-5
	50	-2		40	-3		50	21		50	-5
	55	16		45	6		55	15		55	-5
	2200	38		50	5		2000	33		1100	0
	05	32		55	8		05	33		05	11
	10	22		0300	16		10	26		10	8
	15	2		05	7		15	-1		15	-4
	20	-1		10	8		20	-3		20	-3
	25	15		15	24		25	6		25	33
	30	21		20	24		30	-6		30	40
	35	-2		25	37					35	6
	40	-12		30	30	May 8	1805	-4		40	3
	45	-5		35	29		10	9		45	28
	50	-10		40	24		15	35		50	7
	55	-11		45	19					55	14

Table 2 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jun 14	1200	5	Jun 17	1720	46	Jul 5	1340	16	Jul 9	1125	36
	05	17		25	4		45	16		30	29
	10	9					50	9		35	13
	15	22	Jun 19	1825	0		55	4		40	11
	20	13		30	-1					45	37
	25	26		35	13	Jul 9	0810	8		50	43
	30	26		40	17		15	2		55	44
	35	17		45	1		20	-1		1200	50
	40	14					25	0		05	50
	45	15	Jun 20	1415	-4		30	33		10	43
	50	2		20	6		35	30		15	47
	55	-3		25	6		40	22		20	47
	1300	0		30	11		45	10		25	55
	05	1		35	18		50	6		30	52
	10	9		40	17		55	11		35	54
	15	11		45	16		0900	34		40	52
	20	15		50	-1		05	19		45	57
	25	12		55	-2		10	8		50	55
	30	6		1500	31		15	-2		55	37
	35	12		05	32		20	-2		1300	34
	40	25		10	30		25	-2		05	50
	45	42		15	1		30	16		10	51
	50	49					35	6		15	35
	55	51	Jun 20	2225	19		40	-1		20	55
	1400	57		30	11		45	2		25	50
	05	49		35	16		50	27		30	37
	10	50		40	15		55	30		35	52
	15	26		45	28		1000	56		40	62
	20	26		50	46		05	39		45	63
	25	21		55	24		10	36		50	60
	30	11		2300	32		15	39		55	41
	35	4		05	28		20	3		1400	68
	40	0		10	22		25	1		05	60
	45	6		15	29		30	3		10	68
	50	-3		20	30		35	35		15	>68
	55	38		25	39		40	18		20	>68
	1500	41		30	21		45	45		25	>68
	05	39		35	21		50	49		30	>68
	10	2		40	19		55	34		35	>68
	15	10		45	4		1100	53		40	>68
				50	-4		05	59		45	>68
Jun 17	1705	28					10	40		50	>68
	10	34	Jul 5	1330	1		15	39		55	>68
	15	43		35	15		20	41		1500	>68

Table 2 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jul 9	1505	>68	Jul 9	1845	9	Jul 19	1235	-1	Jul 23	1520	5
	10	>68		50	10		40	6		25	7
	15	67		55	3		45	18		30	12
	20	68		1900	3		50	25		35	13
	25	>68		05	1		55	23		40	13
	30	66		10	4		1300	5		45	19
	35	64		15	-2		05	-4		50	38
	40	65		20	1					55	37
	45	56				Jul 20	1210	15		1600	45
	50	G	Jul 11	1530	0		15	33		05	33
	55	G		35	33		20	39		10	18
	1600	56		40	41		25	43		15	3
	05	50		45	11		30	45		20	0
	10	41		50	18		35	32		25	-4
	15	37		55	8		40	27			
	20	53		1600	14		45	36	Jul 26	0645	13
	25	21		05	35		50	40		50	11
	30	56		10	9		55	51		55	11
	35	53		15	3		1300	33		0700	5
	40	47		20	8		05	11		05	8
	45	41		25	16		10	10		10	13
	50	30		30	42		15	5		15	13
	55	2		35	13					20	28
	1700	5		40	9	Jul 20	1350	-8		25	9
	05	2		45	8		55	10		30	14
	10	-1		50	5		1400	19		35	9
	15	-1		55	7		05	3		40	14
	20	0		1700	7		10	-5		45	9
	25	21		05	8		15	-7		50	16
	30	25		10	6		20	-4		55	7
	35	30		15	5		25	-4			
	40	35		20	2		30	10	Aug 5	1640	0
	45	28		25	-1		35	14		45	14
	50	32					40	14		50	15
	55	40	Jul 11	1810	23		45	14		55	15
	1800	34		15	2		50	1		1700	21
	05	26		20	3		55	1		05	20
	10	31					1500	-4		10	23
	15	43	Jul 13	2030	0		05	-6		15	20
	20	16		35	25					20	23
	25	11		40	16	Jul 23	1500	-4		25	23
	30	5					05	-2		30	23
	35	3	Jul 19	1225	-8		10	-3		35	26
	40	20		30	-2		15	-1		40	20

Table 2 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Aug 5	1745	14	Aug 21	1630	30	Sep 10	1535	-7	Sep 12	1720	22
	50	10		35	37		40	-3		25	23
	55	2		40	24		45	5		30	12
	1800	7		45	48		50	5		35	10
	05	5		50	63		55	-5		40	0
	10	-1		55	68					45	-9
				1700	66	Sep 12	1400	43		50	-7
Aug 5	1910	5		05	67		05	17		55	7
	15	43		10	65		10	11		1800	-8
	20	15		15	38		15	18		05	-6
	25	14		20	23		20	23		10	4
	30	17		25	30		25	21		15	4
	35	15		30	30		30	46		20	-1
	40	5		35	42		35	39			
	45	9		40	35		40	40	Sep 19	1450	-1
	50	12		45	45		45	50		55	15
	55	10		50	48		50	21		1500	29
	2000	12		55	51		55	41		05	43
	05	12		1800	48		1500	63		10	44
	10	1		05	45		05	62		15	24
	15	-1		10	40		10	27		20	44
	20	1		15	34		15	8		25	43
				20	32		20	-2		30	60
Aug 18	0040	-6		25	34					35	62
	45	9		30	42	Sep 12	1540	29		40	56
	50	0		35	46		45	33		45	60
	55	24		40	44		50	25		50	57
	0100	21		45	48		55	35		55	54
	05	31		50	49		1600	51		1600	60
	10	32		55	48		05	51		05	59
	15	32		1900	48		10	62		10	60
	20	24		05	36		15	51		15	61
	25	19		10	43		20	G		20	61
	30	27		15	43		25	G		25	67
	35	26		20	30		30	52		30	63
	40	33		25	42		35	50		35	65
	45	33		30	45		40	48		40	61
	50	35		35	33		45	40		45	61
				40	41		50	23		50	55
Aug 21	1605	-11		45	27		55	10		55	52
	10	-8		50	3		1700	40		1700	55
	15	10		55	-2		05	40		05	53
	20	5		2000	-2		10	47		10	60
	25	7		05	1		15	28		15	59

Table 2 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Sep 19	1720	59	Sep 20	0940	19	Sep 21	1515	48			
	25	49		45	8		20	44			
	30	39		50	18		25	17			
	35	39		55	0		30	10			
	40	39					35	42			
	45	45	Sep 20	1015	-3		40	30			
	50	48		20	4		45	18			
	55	47		25	8		50	13			
	1800	50					55	13			
	05	47	Sep 21	0855	9		1600	19			
	10	34		0900	7		05	31			
	15	37		05	0		10	28			
	20	38		10	-8		15	36			
	25	33					20	20			
	30	33	Sep 21	1010	-6		25	4			
	35	38		15	3		30	12			
	40	29		20	24		35	16			
	45	35		25	37		40	17			
	50	32		30	30		45	20			
	55	31		35	21		50	23			
	1900	27		40	49		55	11			
	05	10		45	22		1700	-4			
	10	7		50	43						
				55	54	Sep 26	1440	-7			
Sep 20	0805	-5		1100	34		45	-2			
	10	2		05	43		50	4			
	15	-5		10	37		55	7			
	20	-2		15	35		1500	8			
	25	2		20	37		05	7			
	30	-4		25	47		10	8			
	35	-6		30	53		15	-1			
	40	-2		35	50		20	-2			
	45	9		40	45		25	-4			
	50	22		45	27						
	55	28		50	20						
	0900	26		55	18						
	05	39		1200	4						
	10	44		05	-2						
	15	38		10	-2						
	20	37		15	-2						
	25	43									
	30	34	Sep 21	1505	-4						
	35	36		10	1						

Table 3. Tabulation of median signal levels for every 5-minute interval during periods of sporadic-E propagation as received at Onna.

Values are in db above 1 μ.v., adjusted for no line losses and 2 kw output of transmitter

135°E Time

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Oct 1	1830	8	Dec 2	1645	18	Dec 16	1535	6	Jan 3	1455	49
	35	13		50	40		40	5		1500	49
	40	19		55	40					05	51
	45	10		1700	45	Jan 1	1300	-2		10	52
	50	17		05	47		05	10		15	51
	55	10		10	60		10	7		20	51
	1900	10		15	56		15	4		25	49
	05	18		20	59		20	7		30	50
	10	29		25	63		25	4		35	50
	15	G		30	>63					40	50
	20	G		35	56	Jan 1	1345	2		45	47
	25	G		40	58		50	4		50	50
	30	G		45	58		55	13		55	49
	35	G		1750	53		1400	4		1600	45
	40	34		55	45		05	0		05	39
	45	18		1800	20					10	31
	50	40		05	40	Jan 1	1515	6			
				10	34		20	27	Jan 5	1500	-6
Oct 6	1825	4		15	34		25	19		05	-1
	30	21		20	42					10	18
	35	36		25	37	Jan 3	1310	21		15	6
	40	47		30	31		15	5		20	10
	45	44		35	25		20	9		25	11
	50	41		40	9		25	39		30	16
	55	29		45	20		30	6		35	16
	1900	32		50	8		35	3		40	26
										45	26
Oct 6	1945	10	Dec 16	1435	-1	Jan 3	1355	-3		50	13
	50	11		40	10		1400	6		55	7
	55	12		45	2		05	5		1600	2
				50	-6		10	20		05	6
Nov 17	1520	23		55	-6		15	19		10	10
	25	44		1500	-3		20	34		15	9
	30	23		05	1		25	46		20	20
	35	21		10	6		30	44		25	30
	40	16		15	11		35	37		30	33
	45	12		20	30		40	31		35	30
	50	8		25	32		45	40		40	23
	55	4		30	21		50	42		45	19

G Outage

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jan 5	1650	15	Jan 13	2055	24	Jan 15	1520	-5	Jan 18	1325	20
	55	21		2100	20		25	-8		30	53
	1700	G								35	53
	05	G	Jan 15	1015	15	Jan 16	1230	5		40	57
	10	G		20	14		35	17		45	57
	15	20		25	12		40	10		50	51
	20	19		30	9		45	11		55	38
				35	7		50	11		1400	20
Jan 7	1230	-2		40	8		55	11		05	14
	35	3		45	4		1300	14		10	16
	40	11		50	3		05	11		15	6
	45	17		55	5		10	11		20	15
	50	14		1100	10		15	2		25	7
	55	9		05	42		20	-3		30	18
	1300	4		10	24		25	-5		35	14
	05	9		15	17		30	0		40	12
	10	8		20	3		35	8		45	25
	15	9		25	-3		40	3		50	32
	20	2					45	23		55	33
	25	3	Jan 15	1315	-6		50	33		1500	20
	30	3		20	-5		55	29		05	11
	35	9		25	5		1400	2		10	10
	40	14		30	43		05	2		15	12
	45	39		35	11		10	0		20	3
	50	54		40	18					25	1
	55	48		45	13	Jan 16	1600	-5		30	-4
	1400	20		50	44		05	-6		35	0
	05	18		55	41		10	-5		40	6
	10	18		1400	18		15	-1		45	6
	15	9		05	-2		20	-2		50	3
	20	5		10	-2		25	1		55	1
	25	6		15	-1		30	3			
				20	4		35	13	Jan 21	1845	14
Jan 13	1900	48		25	5		40	G		50	27
	05	20		30	7		45	G		55	29
	10	18		35	0		50	G		1900	41
	15	22		40	-8		55	G		05	30
	20	19		45	-11		1700	G		10	21
	25	19		50	-10		05	G			
				55	-13		10	G	Feb 5	1700	-10
Jan 13	2035	19		1500	4		15	20		05	-8
	40	23		05	6		20	20		10	-3
	45	41		10	5		25	29		15	1
	50	37		15	-3		30	34		20	4
							35	26		25	13

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Feb 5	1730	G	Apr 5	1545	-8	Apr 20	0750	12	Apr 20	1125	24
	35	G		50	-4		55	8		30	45
	40	G		55	2		0800	12		35	56
	45	21		1600	12		05	41		40	57
	50	22		05	7		10	57		45	38
	55	19		10	9		15	56		50	48
	1800	19		15	3		20	54		55	46
	05	22		20	6		25	48		1200	39
	10	18		25	5		30	43		05	41
				30	4		35	18		10	40
Mar 24	1615	-5		35	3		40	7		15	38
	20	28					45	3		20	34
	25	39	Apr 10	0030	0		50	4		25	33
	30	28		35	2		55	G		30	32
	35	21		40	0		0900	G		35	24
	40	9		45	-2		05	G		40	18
	45	4		50	-2		10	G		45	14
	50	0		55	-1		15	9		50	7
	55	-5		0100	2		20	G		55	6
				05	5		25	20		1300	6
Mar 29	0020	12		10	4		30	22		05	7
	25	18		15	2		35	53		10	5
	30	21		20	1		40	31		15	-6
	35	24		25	3		45	16			
	40	26					50	33	Apr 22	1600	-10
	45	24	Apr 15	2150	10		55	16		05	-9
	50	23		55	2		1000	13		10	-6
	55	17		2200	5		05	10		15	-6
	0100	16		05	-5		10	17		20	-1
	05	21		10	7		15	4		25	3
	10	25		15	10		20	3		30	4
	15	22		20	7		25	33		35	9
	20	15		25	12		30	13		40	19
				30	5		35	33		45	23
Apr 5	1500	-8		35	-7		40	33		50	25
	05	-5					45	-1		55	24
	10	2	Apr 20	0715	-4		50	-4		1700	23
	15	7		20	0		55	-5		05	25
	20	8		25	5		1100	-4		10	25
	25	2		30	2		05	-1		15	27
	30	13		35	7		10	1		20	29
	35	-2		40	5		15	3		25	38
	40	-9		45	23		20	13		30	G
										35	G

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Apr 23	0405	37	Apr 25	2105	2	May 4	2355	31	May 14	2005	45
	10	23		10	14	May 5	0000	28		10	46
	15	41		15	34		05	19		15	48
	20	43		20	22		10	20		20	41
				25	7					25	46
Apr 24	1030	28		30	7	May 5	0905	0		30	44
	35	40		35	0		10	12		35	40
	40	5		40	-8		15	62		40	38
							20	63		45	39
Apr 24	1105	14	Apr 27	1400	-6		25	54		50	34
	10	11		05	-3		30	56		55	23
	15	1		10	3		35	9		2100	16
				15	25		40	G		05	30
Apr 24	1215	12		20	24		45	-3		10	37
	20	19		25	17					15	30
	25	19		30	4	May 5	1300	17		20	19
	30	32		35	-2		05	12		25	28
	35	42		40	-4		10	2		30	12
	40	26		45	1		15	-10			
	45	4		50	5		20	-9	May 17	0750	14
	50	-2		55	8		25	-2		55	21
				1500	1					0800	28
Apr 25	1055	-7		05	-3	May 14	1015	4		05	33
	1100	0		10	-2		20	31		10	33
	05	10		15	-6		25	>63		15	61
	10	15					30	62		20	60
	15	13	Apr 27	1545	0		35	>63		25	57
	20	7		50	12		40	69		30	60
	25	6		55	13		45	65		35	59
	30	4		1600	18		50	60		40	58
	35	6		05	16		55	36		45	62
	40	1		10	8		1100	25		50	61
	45	10					05	62		55	63
	50	1	May 2	1150	-2		10	59		0900	62
	55	2		55	23		15	54		05	57
	1200	3		1200	1					10	62
	05	-5		05	7	May 14	1925	30		15	56
	10	-5		10	26		30	46		20	57
	15	-5		15	-6		35	45		25	59
	20	-4					40	42		30	25
	25	14	May 4	1055	-4		45	32		35	22
	30	15		1100	52		50	31		40	7
	35	14		05	36		55	35		45	8
	40	12		10	-4		2000	38		50	12

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
May 17	0955	11	May 18	2225	16	May 19	0820	59	May 20	0910	G
	1000	23		30	23		25	61		15	G
	05	45		35	17		30	51		20	55
	10	53		40	24		35	48		25	53
	15	G		45	19		40	45		30	G
	20	G		50	27		45	28		35	G
	25	G		55	34		50	22		40	58
	30	G		2300	30		55	59		45	48
	35	57		05	29		0900	63		50	50
	40	36		10	19		05	62		55	48
	45	58		15	19		10	59		1000	42
	50	41		20	19		15	60		05	20
	55	25		25	22		20	52		10	28
	1100	23		30	33		25	57		15	42
	05	54		35	40		30	59		20	41
	10	28		40	39		35	55		25	G
	15	32		45	34		40	47		30	G
	20	23		50	37		45	56		35	G
	25	10		55	35		50	22		40	G
	30	31	May 19	0000	35		55	12		45	10
	35	18		05	20		1000	10		50	20
	40	G		10	17					55	25
	45	8				May 20	0210	30			
			May 19	0115	22		15	31	May 20	1515	-2
May 18	0645	23		20	30		20	26		20	12
	50	55		25	28					25	0
	55	60		30	30	May 20	0305	32		30	7
	0700	57		35	20		10	33		35	22
	05	57					15	30		40	>63
	10	59	May 19	0715	17		20	36		45	63
	15	59		20	15		25	41		50	49
	20	58		25	62		30	29		55	37
	25	59		30	63					1600	25
	30	49		35	>63	May 20	0825	G		05	13
	35	54		40	63		30	G		10	6
	40	57		45	62		35	G		15	2
	45	60		50	62		40	G		20	4
	50	60		55	61		45	G		25	11
	55	60		0800	62		50	G		30	10
	0800	59		05	55		55	G			
	05	54		10	59		0900	G	May 20	1705	62
	10	43		15	61		05	G		10	>63

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
May 20	1715	>63	May 20	2050	G	May 22	0930	-2	May 24	1820	47
	20	>63		55	G		35	4		25	40
	25	>63		2100	G		40	6		30	52
	30	>63		05	G		45	20		35	20
	35	>63		10	G		50	36		40	52
	40	>63		15	G		55	59		45	48
	45	>63		20	31		1000	58		50	55
	50	>63		25	33		05	36		55	19
	55	>63		30	27		10	28			
	1800	>63		35	21		15	25	May 25	2100	3
	05	>63		40	18		20	44		05	8
	10	>63					25	54		10	7
	15	>63	May 21	0905	7		30	52		15	6
	20	>63		10	24		35	37		20	7
	25	>63		15	38		40	6		25	3
	30	61		20	12		45	5		30	2
	35	62		25	5		50	-7		35	9
	40	61								40	5
	45	61	May 22	0000	25	May 22	1105	-3		45	27
	50	59		05	25		10	2		50	10
	55	60		10	32		15	40			
	1900	G		15	37		20	55	May 25	2245	19
	05	G		20	31		25	46		50	9
	10	G		25	38		30	49		55	15
	15	G		30	38		35	50		2300	19
	20	G		35	48		40	53		05	14
	25	G		40	54		45	53		10	14
	30	G		45	52		50	47		15	18
	35	G		50	52		55	41		20	19
	40	G		55	48		1200	25		25	28
	45	G		0100	51		05	15		30	35
	50	G		05	47		10	10		35	39
	55	G		10	43		15	-4		40	44
	2000	G		15	50					45	41
	05	G		20	48	May 22	2015	19		50	32
	10	G		25	43		20	18		55	30
	15	G		30	35		25	27	May 26	0000	37
	20	G		35	33		30	37		05	40
	25	G		40	27					10	41
	30	G		45	23	May 24	1800	41		15	40
	35	G		50	18		05	51		20	37
	40	G		55	16		10	48		25	41
	45	G		0200	23		15	54		30	38

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
May 26	0035	40	May 28	1035	32	May 29	0915	G	May 29	1325	51
	40	38		40	21		20	G		30	17
	45	38		45	13		25	G		35	23
	50	39					30	G		40	23
	55	40	May 28	1355	8		35	57			
	0100	36		1400	13		40	47	May 29	2000	28
				05	18		45	42		05	30
May 26	1130	20		10	18		50	45		10	42
	35	40		15	10		55	47		15	37
	40	23		20	1		1000	46		20	40
	45	28		25	1		05	51		25	34
	50	32					10	50		30	31
	55	36	May 28	1625	16		15	52		35	33
	1200	37		30	26		20	52			
	05	36		35	30		25	55	May 30	1125	G
	10	42		40	31		30	53		30	G
	15	48		45	36		35	54		35	G
	20	48		50	31		40	53		40	G
	25	52		55	31		45	40		45	43
	30	47		1700	21		50	37		50	33
	35	25		05	19		55	63		55	24
	40	22		10	25		1100	60		1200	25
	45	21		15	25		05	62		05	42
				20	21		10	>63		10	48
May 26	2010	28		25	37		15	63		15	62
	15	43		30	51		20	>63		20	>63
	20	29		35	33		25	>63		25	>63
				40	50		30	>63		30	>63
May 27	1020	30		45	31		35	62		35	>63
	25	54		50	48		40	62		40	>63
	30	39		55	44		45	61		45	>63
	35	16		1800	49		50	40		50	>63
	40	7		05	40		50	11		55	>63
				10	8		1200	8		1300	>63
May 28	0920	0		15	18		05	22		05	>63
	25	14		20	10					10	>63
	30	14		25	8	May 29	1245	34		15	>63
	35	30					50	55		20	63
	40	37	May 29	0845	36		55	59		25	60
	45	46		50	49		1300	51		30	56
	50	49		55	28		05	>63		35	45
	55	31		0900	41		10	40		40	36
	1000	36		05	58		15	36		45	38
	05	12		10	63		20	51		50	41

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
May 30	1355	42	May 30	1730	54	May 31	0920	3	May 31	1255	-1
	1400	46		35	G		25	3		1300	-1
	05	61		40	G		30	10		05	8
	10	56		45	>63		35	17		10	29
	15	>63		50	63		40	35		15	23
	20	>63		55	>63		45	5		20	30
	25	46		1800	58		50	8		25	24
	30	38		05	51		55	7		30	26
	35	33		10	41		1000	13		35	31
	40	35		15	40		05	22		40	52
	45	47		20	40		10	38		45	49
	50	>63		25	39		15	24		50	37
	55	>63		30	39		20	43		55	42
	1500	42		35	38		25	18		1400	36
	05	39					30	3		05	42
	10	37	May 31	0700	30		35	2		10	41
	15	35		05	52		40	3		15	42
	20	31		10	54		45	12		20	41
	25	28		15	55		50	3		25	40
	30	27		20	53		55	2		30	12
	35	30		25	26		1100	0			
	40	34		30	23		05	-1	May 31	1615	3
	45	38		35	49		10	-2		20	23
	50	42		40	46		15	5		25	56
	55	45		45	61		20	16		30	>63
	1600	49		50	56		25	14		35	>63
	05	51		55	45		30	G		40	>63
	10	53		0800	G		35	G		45	61
	15	54		05	G		40	G		50	63
	20	54		10	G		45	G		55	>63
	25	55		15	38		50	G		1700	56
	30	53		20	34		55	G		05	>63
	35	47		25	32		1200	0		10	57
	40	56		30	30		05	-1		15	13
	45	53		35	26		10	19		20	2
	50	52		40	17		15	51			
	55	48		45	21		20	21	Jun 1	1200	-2
	1700	42		50	21		25	12		05	8
	05	41		55	14		30	4		10	27
	10	40		0900	14		35	1		15	2
	15	39		05	15		40	24		20	-4
	20	41		10	9		45	8		25	-4
	25	41		15	1		50	3			

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jun 1	1255	8	Jun 2	1540	28	Jun 4	2140	17	Jun 8	0945	17
	1300	19		45	33		45	18		50	18
	05	12		50	25		50	20		55	4
	10	-2		55	29		55	17		1000	1
				1600	34					05	7
Jun 1	1330	10		05	26	Jun 5	1715	14		10	28
	35	21		10	44		20	21		15	>63
	40	14		15	53		25	19		20	57
	45	8		20	53		30	19		25	55
	50	5					35	0		30	55
	55	0	Jun 3	1500	7		40	-7		35	34
	1400	2		05	15					40	48
	05	5		10	36	Jun 6	1100	2		45	53
	10	3		15	38		05	2		50	41
	15	4		20	38		10	8		55	8
	20	-2		25	52		15	2			
				30	53		20	-2	Jun 8	1125	30
Jun 1	2050	25		35	52		25	14		30	43
	55	32		40	38		30	1		35	52
	2100	31		45	52		35	0		40	45
	05	31		50	38		40	33		45	12
	10	34		55	22		45	38			
	15	37					50	28	Jun 8	1720	42
	20	31	Jun 4	1920	2		55	15		25	60
	25	28		25	-5		1200	28		30	45
	30	29		30	-2		05	9		35	52
	35	32		35	2		10	17		40	43
	40	31		40	9		15	37		45	42
	45	30		45	11		20	38		50	51
				50	-1		25	41		55	51
Jun 1	2205	30		55	-5		30	43		1800	56
	10	28					35	34		05	53
	15	29	Jun 4	2045	14		40	38		10	56
				50	22		45	44		15	50
Jun 2	1455	5		55	21		50	48		20	63
	1500	28		2100	14		55	23		25	58
	05	13		05	14					30	60
	10	16		10	17	Jun 7	1645	12		35	59
	15	4		15	16		50	10		40	59
	20	-3		20	17		55	23		45	33
	25	-4		25	16		1700	16		50	44
	30	15		30	14		05	-1		55	30
	35	28		35	19					1900	55

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jun 8	1905	57	Jun 11	1825	43	Jun 12	1810	39	Jun 13	1715	51
	10	57		30	30		15	38		20	57
	15	47		35	9		20	33		25	52
	20	63		40	9		25	27		30	51
	25	59		45	12		30	18		35	52
	30	51		50	10		35	22		40	55
	35	22		55	8		40	31		45	54
	40	17					45	27		50	53
	45	22	Jun 12	1345	8		50	14		55	57
				50	56					1800	56
Jun 8	2040	25		55	46	Jun 13	1405	-2		05	31
	45	27		1400	52		10	2		10	48
	50	22		05	57		15	7		15	61
	55	28		10	54		20	4		20	>63
	2100	28		15	11		25	5		25	59
	05	25		20	3		30	8		30	59
							35	15		35	54
Jun 8	2240	13	Jun 12	1600	-7		40	13		40	51
	45	18		05	15		45	3		45	53
	50	33		10	34					50	56
	55	28		15	38	Jun 13	1505	0		55	44
				20	36		10	16		1900	36
Jun 8	2345	20		25	41		15	18			
	50	21		30	18		20	21	Jun 16	1815	-5
	55	19		35	18		25	49		20	4
Jun 9	0000	21		40	36		30	59		25	10
	05	20		45	48		35	60		30	17
	10	22		50	60		40	58		35	30
	15	29		55	53		45	58		40	58
	20	31		1700	49		50	57		45	>63
				05	46		55	49		50	>63
Jun 11	1600	13		10	44		1600	53		55	>63
	05	21		15	49		05	13		1900	>63
	10	7		20	52		10	2		05	63
				25	50					10	60
Jun 11	1745	2		30	50	Jun 13	1635	33		15	50
	50	17		35	55		40	37		20	54
	55	41		40	48		45	40		25	52
	1800	28		45	45		50	25		30	49
	05	26		50	43		55	41		35	33
	10	42		55	42		1700	43		40	31
	15	52		1800	25		05	47		45	50
	20	43		05	45		10	43		50	48

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jun 16	1955	49	Jun 21	1330	G	Jun 22	0800	12	Jun 24	0800	57
	2000	53		35	G		05	14		05	56
	05	53		40	33		10	12		10	58
	10	50		45	47		15	13		15	32
	15	40		50	>63		20	23		20	61
	20	38		55	>63		25	15		25	59
	25	35		1400	63		30	44		30	56
	30	32		05	62		35	38		35	62
	35	29		10	58		40	43		40	59
	40	21		15	60		45	38		45	63
	45	22		20	58		50	37		50	58
	50	19		25	61		55	39		55	55
	55	16		30	59		0900	20		0900	63
				35	60					05	63
Jun 19	1405	13		40	61	Jun 22	1550	33		10	63
	10	37		45	62		55	30		15	>63
	15	43		50	>63		1600	41		20	61
	20	49		55	59		05	16		25	62
	25	43		1500	50		10	19		30	62
	30	14		05	44		15	24		35	59
	35	11		10	38		20	21		40	63
				15	33		25	24		45	63
Jun 20	1600	-6		20	10		30	24		50	51
	05	-6		25	10		35	21		55	50
	10	2		30	7		40	24		1000	44
	15	11		35	9		45	9		05	21
	20	8		40	26					10	36
	25	3		45	34	Jun 23	0115	31		15	25
				50	26		20	38		20	15
Jun 21	1030	9		55	10		25	36		25	16
	35	45		1600	40		30	32		25	16
	40	28		05	58		35	37		30	7
	45	16		10	61		40	29		35	4
				15	58		45	26		40	2
Jun 21	1245	10		20	44		50	26			
	50	15		25	39		55	22	Jun 24	1645	3
	55	31		30	35					50	2
	1300	47				Jun 24	0730	17		55	26
	05	38	Jun 21	1900	22		35	10		1700	49
	10	42		05	25		40	57		05	36
	15	G		10	23		45	54		10	25
	20	G		15	23		50	51		15	12
	225	G		20	19		55	28		20	11

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jun 24	1725	12	Jun 26	1925	50	Jun 29	1400	55	Jun 30	0200	36
	30	35		30	46		05	49		05	29
	35	36		35	40		10	43		10	33
	40	21					15	48		15	19
	45	20	Jun 28	1830	9		20	52		20	13
	50	11		35	11		25	56		25	11
	55	19		40	14		30	57		30	9
				45	-8		35	61		35	9
Jun 26	1630	-3					40	52		40	20
	35	0	Jun 29	1110	0		45	36		45	27
	40	4		15	10		50	31		50	30
	45	15		20	14		55	27		55	27
	50	17		25	15		1500	37		0300	25
	55	8		30	12		05	31		05	34
	1700	24		35	10		10	27		10	29
	05	31		40	7		15	24		15	33
	10	41		45	2		20	22		20	33
	15	48		50	7		25	19		25	34
	20	51		55	17		30	14		30	34
	25	53		1200	36		35	10		35	39
	30	55		05	39		40	5		40	40
	35	55		10	37		45	5		45	36
	40	57		15	31		50	4		50	36
	45	57		20	30		55	1		55	37
	50	60		25	23					0400	38
	55	58		30	17	Jun 30	0030	6		05	44
	1800	61		35	22		35	7		10	44
	05	59		40	22		40	8		15	40
	10	62		45	23		45	12		20	44
	15	58		50	26		50	18		25	52
	20	58		55	43		55	22		30	52
	25	57		1300	39		0100	25		35	48
	30	56		05	30		05	26		40	48
	35	54		10	27		10	30		45	55
	40	57		15	24		15	41		50	52
	45	58		20	22		20	41		55	49
	50	56		25	20		25	43		0500	50
	55	52		30	27		30	38		05	46
	1900	55		35	19		35	37		10	47
	05	52		40	21		40	41		15	49
	10	47		45	43		45	40		20	45
	15	45		50	50		50	34		25	41
	20	46		55	52		55	34		30	39

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jun 30	0535	38	Jul 4	1000	8	Jul 6	1335	11	Jul 11	1300	32
	40	40		05	54		40	2		05	38
	45	32		10	27		45	3		10	45
	50	31		15	46		50	-2		15	10
	55	26		20	59		55	-4		20	9
	0600	24		25	45					25	8
	05	29		30	59	Jul 7	1350	1		30	3
	10	23		35	56		55	19		35	0
	15	18		40	51		1400	14		40	-1
	20	11		45	33		05	6		45	0
	25	10		50	42		10	10			
	30	11		55	10		15	16	Jul 14	0935	2
	35	11		1100	14		20	29		40	4
	40	10		05	7		25	34		45	12
	45	9		10	43		30	43		50	3
	50	8		15	47		35	19		55	4
	55	5		20	36		40	17		1000	6
				25	48		45	22		05	10
Jul 1	1030	11		30	63		50	25		10	21
	35	15		35	>63		55	21		15	31
	40	20		40	59		1500	13		20	23
	45	28		45	62		05	11		25	23
	50	37		50	44					30	11
	55	51		55	19	Jul 11	1125	0		35	41
	1100	53					30	7		40	27
	05	58	Jul 4	1220	17		35	14		45	18
	10	55		25	1		40	13		50	27
	15	53		30	6		45	10		55	23
	20	54		35	14		50	14		1100	36
	25	48		40	33		55	10		05	31
	30	51		45	16		1200	38		10	44
	35	51		50	1		05	52		15	41
	40	48		55	5		10	55		20	42
	45	43		1300	18		15	47		25	53
	50	38		05	39		20	55		30	51
	55	27		10	28		25	54		35	33
	1200	20		15	7		30	54			
	05	15		20	14		35	17	Jul 14	1545	5
	10	11					40	15		50	39
	15	12	Jul 6	1320	2		45	13		55	5
	20	6		25	-1		50	7			
	25	2		30	10		55	21			

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jul 15	0950	29	Jul 15	1325	22	Jul 16	1320	43	Jul 17	1540	-5
	55	31		30	40		25	43		45	-4
	1000	41		35	43		30	27		50	12
	05	48		40	26		35	12		55	27
	10	49		45	7		40	8		1600	52
	15	54		50	39					05	29
	20	52		55	14	Jul 17	1200	-5		10	35
	25	56		1400	5		05	8		15	62
	30	53		05	4		10	10		20	57
	35	56		10	4		15	2		25	>63
	40	54		15	7					30	54
	45	52		20	16	Jul 17	1300	-5		35	62
	50	46		25	8		05	1		40	57
	55	56		30	16		10	2		45	>63
	1100	44		35	17		15	4		50	57
	05	42		40	5		20	5		55	50
	10	41		45	4		25	5		1700	>63
	15	26		50	9		30	7		05	55
	20	7		55	8		35	4		10	49
	25	11		1500	5		40	6		15	49
	30	10		05	-4		45	4		20	23
	35	4		10	1		50	0		25	7
	40	3					55	3		30	3
	45	4	Jul 15	1600	-1		1400	3		35	10
	50	5		05	-3		05	10		40	14
	55	1		10	18		10	45		45	6
	1200	10		15	13		15	46		50	26
	05	52		20	24		20	19		55	33
	10	28		25	4		25	19		1800	16
	15	14		30	-2		30	19		05	-4
	20	33					35	16		10	-6
	25	9	Jul 16	1200	17		40	13			
	30	38		05	5		45	16	Jul 18	2020	13
	35	10		10	2		50	17		25	10
	40	17		15	3		55	15		30	10
	45	19					1500	17		35	16
	50	12	Jul 16	1245	0		05	40		40	26
	55	23		50	15		10	15		45	29
	1300	15		55	20		15	16		50	15
	05	27		1300	33		20	16			
	10	18		05	42		25	29	Jul 19	0540	16
	15	43		10	51		30	6		45	0
	20	22		15	51		35	-1		50	3

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jul 19	0555	5	Jul 19	0930	27	Jul 20	1545	54	Jul 21	1035	50
	0600	9		35	32		50	55		40	25
	05	18		40	40		55	61		45	31
	10	10		45	48		1600	>63		50	47
	15	5		50	36		05	>63		55	50
	20	22		55	43		10	58		1100	52
	25	22		1000	34		15	47		05	58
	30	27		05	16		20	38		10	32
	35	21		10	10		25	33		15	34
	40	29		15	11		30	28		20	54
	45	45		20	4		35	25		25	36
	50	38		25	-3		40	24		30	28
	55	40		30	3		45	37		35	22
	0700	46		35	15		50	31		40	43
	05	34		40	31		55	5		45	49
	10	45		45	41		1700	24		50	49
	15	45		50	4		05	16		55	53
	20	49		55	41		10	7		1200	48
	25	54		1100	42		15	-4		05	52
	30	55		05	42		20	5		10	42
	35	55		10	47		25	14		15	41
	40	54		15	47		30	14		20	28
	45	57		20	49		35	12		25	24
	50	60		25	50		40	8		30	27
	55	57		30	51		45	7		35	23
	0800	54		35	51		50	10		40	13
	05	48		40	56		55	9		45	14
	10	45		45	52		1800	7		50	15
	15	53		50	38		05	5		55	16
	20	59		55	32		10	4		1300	11
	25	>63		1200	39		15	0		05	3
	30	43		05	15		20	-6		10	5
	35	47		10	8		25	-5		15	25
	40	60		15	-1		30	-2		20	46
	45	61					35	-3		25	52
	50	61	Jul 20	1505	-4		40	0		30	41
	55	42		10	18		45	10		35	42
	0900	29		15	32		50	9		40	23
	05	23		20	39		55	6		45	15
	10	21		25	44					50	9
	15	13		30	47	Jul 21	1020	6		55	8
	20	13		35	46		25	31		1400	9
	25	23		40	54		30	50		05	10

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jul 21	1410	11	Jul 24	0920	0	Jul 25	0910	63	Jul 25	2000	26
	15	13		25	0		15	63			
	20	12		30	8		20	63	Jul 26	0055	11
	25	38		35	44		25	63		0100	20
	30	33		40	37		30	>63		05	23
	35	28		45	17		35	> 63		10	22
	40	6		50	19		40	> 63		15	15
	45	0		55	2		45	> 63			
	50	-1		1000	0		50	> 63	Jul 26	0425	3
	55	0		05	-2		55	> 63		30	6
	1500	-3		10	-5		1000	> 63		35	8
	05	-6					05	>63		40	9
	10	-5	Jul 24	1630	32		10	>63		45	39
	15	0		35	56		15	>63		50	35
	20	-5		40	63		20	>63		55	30
	25	-5		45	63		25	>63		0500	48
	30	-6		50	61		30	>63		05	44
				55	43		35	>63		10	51
Jul 22	1635	11		1700	38		40	>63		15	50
	40	14		05	40		45	>63		20	50
	45	26		10	36		50	>63		25	48
	50	21		15	50		55	>63		30	46
	55	15		20	23		1100	63		35	44
	1700	38		25	15		05	60		40	42
	05	21		30	3		10	61		45	40
	10	16					15	60		50	39
	15	9	Jul 25	0745	12		20	32		55	29
	20	5		50	18		25	23		0600	27
				55	29					05	20
Jul 22	1905	-3		0800	42	Jul 25	1450	11		10	11
	10	21		05	58		55	9			
	15	31		10	54		1500	36	Jul 26	1335	-3
	20	44		15	39		05	8		40	3
	25	44		20	42					45	4
	30	38		25	46	Jul 25	1915	9		50	9
	35	24		30	54		20	7		55	11
	40	27		35	56		25	7		1400	10
	45	29		40	61		30	8		05	9
	50	20		45	61		35	7		10	11
	55	17		50	61		40	13		15	8
	2000	7		55	61		45	28		20	3
	05	5		0900	63		50	35		25	-3
	10	-1		05	63		55	27			

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Jul 27	0110	21	Aug 1	1530	14	Aug 4	0920	25	Aug 4	2025	11
	15	33		35	24		25	33		30	12
	20	38		40	1		30	48		35	10
	25	40					35	23		40	14
	30	40	Aug 2	0025	27		40	17		45	20
	35	34		30	29		45	54		50	20
	40	25		35	35		50	60		55	26
	45	17					55	52		2100	25
			Aug 2	0110	24		1100	53		05	21
Jul 30	1700	57		15	34		05	55		10	7
	05	60		20	38		10	57		15	-2
	10	27		25	35		15	53		20	-4
	15	12		30	40		20	46		25	2
	20	40		35	44		25	47		30	-6
	25	18		40	44		30	47		35	2
				45	44		35	50		40	4
Jul 31	1610	2		50	46		40	47		45	2
	15	4		55	39		45	52		50	-3
	20	14		0200	47		50	47		55	-6
	25	11		05	44		55	46			
	30	40		10	47		1200	54	Aug 5	0650	8
	35	37		15	48		05	54		55	37
	40	33		20	48		10	55		0700	-4
	45	20		25	48		15	57		05	-7
	50	13		30	43		20	58		10	7
	55	1		35	43		25	58		15	-3
				40	43		30	57		20	-6
Jul 31	2015	15		45	33		35	54		25	2
	20	20		50	31		40	55		30	17
	25	47		55	34		45	45		35	34
	30	50					50	46		40	36
	35	53	Aug 4	0900	13		55	55		45	34
	40	55		05	34		1300	51		50	31
	45	49		10	35		05	49		55	24
	50	47		15	26		10	53		0800	24
	55	29		20	28		15	57		05	13
	2100	43		25	20		20	59		10	1
	05	38					25	58		15	-5
	10	32	Aug 4	0950	7		30	63		20	-1
	15	23		55	47		35	59		25	29
	20	20		1000	51		40	33		30	26
	25	20		05	57		45	6		35	19
	30	12		10	38		50	4		40	-3
	35	16		15	35		55	-1		45	-3

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Aug 5	0850	-9	Aug 6	1230	-1	Aug 7	0740	11	Aug 9	0930	19
	55	-6		35	6		45	7		35	6
	0900	26		40	13		50	6		40	-6
	05	30		45	21		55	4			
	10	35		50	22		0800	5	Aug 9	1135	-4
	15	23		55	18		05	4		40	3
	20	31		1300	22		10	6		45	19
	25	37		05	20		15	13		50	19
	30	15		10	14		20	22		55	-7
	35	54		15	9		25	19			
	40	38		20	42		30	23	Aug 9	1310	10
	45	47		25	45		35	22		15	19
	50	29		30	16		40	15		20	48
	55	41					45	11		25	38
	1000	49	Aug 6	1525	-1		50	12		30	28
	05	52		30	20		55	14		35	44
	10	52		35	36		0900	13		40	34
	15	56					05	13		45	36
	20	57	Aug 6	1600	19		10	6		50	21
	25	56		05	43		15	3		55	21
	30	54		10	1		20	-1		1400	19
	35	55					25	-5		05	39
	40	57	Aug 6	1645	8					10	43
	45	60		50	11	Aug 8	1255	7		15	48
	50	57		55	-10		1300	52		20	46
	55	52					05	57		25	48
	1100	52	Aug 7	0620	-4		10	47		30	44
	05	40		25	0		15	58		35	52
	10	49		30	-1		20	57		40	50
	15	11		35	0		25	60		45	51
	20	-6		40	2		30	38		50	63
	25	1		45	13		35	34		55	54
	30	15		50	17		40	16		1500	53
	35	19		55	24		45	14		05	59
	40	23		0700	24		50	7		10	45
	45	10		05	20		55	4		15	53
	50	23		10	13					20	57
	55	30		15	11	Aug 9	0835	2		25	57
	1200	33		20	14		40	22		30	60
	05	18		25	15		45	18		35	59
	10	-11		30	13		50	-2		40	>63
	15	12		35	11					45	60

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Aug 9	1550	60	Aug 10	1515	-4	Aug 11	1500	2	Aug 12	1855	20
	55	52		20	-2		05	4		1900	30
	1600	60		25	39		10	1		05	27
	05	58		30	5		15	36		10	23
	10	50		35	3		20	19		15	19
	15	52		40	-1		25	63			
	20	52		45	2		30	56	Aug 13	2000	9
	25	50		50	47		35	10		05	19
	30	47		55	33		40	29		10	37
	35	38		1600	23		45	52		15	39
	40	43		05	22		50	56		20	30
	45	40		10	20		55	53		25	34
	50	41		15	18		1600	50		30	31
	55	45		20	42		05	43		35	34
	1700	47		25	40		10	39		40	20
	05	49		30	33		15	38		45	22
	10	50		35	14		20	37		50	16
	15	56		40	26		25	38			
	20	62		45	47		30	27	Aug 14	1000	0
	25	>63		50	51		35	27		05	45
	30	>63		55	50		40	16		10	31
	35	>63		1700	50		45	29		15	45
	40	>63		05	40		50	48		20	59
	45	>63		10	32		55	57		25	63
	50	>63		15	33		1700	56		30	58
	55	>63		20	12		05	51		35	56
	1800	59		25	37		10	52		40	52
	05	56		30	29		15	33		45	42
	10	58		35	46		20	49		50	19
	15	52		40	45		25	25		55	37
	20	53		45	29		30	50		1100	38
	25	53		50	12		35	51		05	53
	30	56		55	7		40	53		10	52
	35	57		1800	3		45	39		15	60
	40	58		05	0		50	29		20	59
	45	57		10	-2		55	32		25	56
	50	55		15	4		1800	26		30	54
	55	58		20	5		05	16		35	42
	1900	46		25	6		10	16		40	47
	05	60		30	-1					45	49
	10	44		35	-4	Aug 12	1830	9		50	47
	15	45		40	-1		35	12		55	42
	20	37		45	7		40	21		1200	37
	25	28		50	0		45	18		05	31
	30	24		55	-1		50	28		10	19

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Aug 14	1215	7	Aug 14	1900	56	Aug 15	1805	4	Aug 16	0900	53
				05	58		10	8		05	46
Aug 14	1250	0		10	59		15	14		10	46
	55	3		15	57		20	9		15	48
	1300	5		20	56		25	23		20	47
	05	4		25	56		30	14		25	53
	10	-2		30	52		35	10		30	57
				35	48		40	3		35	49
Aug 14	1600	11		40	47		45	0		40	43
	05	8		45	46		50	12		45	21
	10	1		50	50		55	-4		50	38
	15	-5		55	48					55	14
	20	-8		2000	43	Aug 16	0620	-3		1000	17
	25	-6		05	41		25	29		05	30
	30	11		10	42		30	56		10	7
	35	19		15	51		35	53		15	1
	40	12		20	48		40	43		20	0
	45	14		25	51		45	42		25	0
	50	25		30	48		50	44			
	55	>63		35	42		55	38	Aug 16	1515	17
	1700	57		40	40		0700	27		20	15
	05	>63		45	26		05	39		25	-12
	10	61		50	27		10	47			
	15	61		55	33		15	39	Aug 17	1900	-2
	20	>63		2100	32		20	39		05	12
	25	>63		05	36		25	42		10	20
	30	63		10	40		30	38		15	-7
	35	60		15	37		35	17			
	40	>63		20	39		40	36	Aug 20	1455	4
	45	63		25	43		45	48		1500	29
	50	62		30	36		50	49		05	35
	55	63		35	25		55	38		10	36
	1800	63		40	28		0800	46		15	31
	05	62		45	20		05	42		20	38
	10	>63		50	27		10	45		25	42
	15	>63		55	32		15	49		30	60
	20	61		2200	25		20	42		35	53
	25	>63		05	31		25	51		40	56
	30	63		10	46		30	40		45	58
	35	>63		15	25		35	41		50	59
	40	62		20	16		40	45		55	61
	45	62		25	15		45	49		1600	>63
	50	61					50	50		05	61
	55	40	Aug 15	1800	-10		55	44		10	60

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Aug 20	1615	56	Aug 21	1800	31	Aug 23	1915	-5	Aug 25	1705	11
	20	57		05	41		20	4		10	10
	25	55		10	40		25	-1		15	15
	30	55		15	16		30	0		20	17
	35	57		20	-7		35	10		25	16
	40	52		25	-8		40	7		30	13
	45	57		30	-8		45	9		35	14
	50	53		35	10		50	17		40	31
	55	55		40	23		55	14		45	19
	1700	50		45	41		2000	13		50	21
	05	53		50	26		05	23		55	20
	10	51		55	31		10	21		1800	24
	15	49		1900	34		15	30		05	32
	20	45		05	36		20	21		10	35
	25	39		10	37		25	17		15	41
	30	31		15	41		30	24		20	35
	35	24		20	40		35	22		25	31
	40	21		25	41		40	40		30	24
	45	18		30	39		45	38		35	34
	50	16		35	40		50	38		40	27
	55	17		40	39		55	36		45	24
				45	44		2100	19		50	15
Aug 21	0820	19		50	45		05	29		55	19
	25	16		55	45		10	25			
	30	47		2000	50		15	28	Aug 26	1710	9
	35	45		05	47		20	29		15	10
	40	39		10	48		25	28		20	31
	45	3		15	51		30	34			
				20	46		35	27	Aug 28	0935	-7
Aug 21	0940	2		25	49		40	21		40	3
	45	13		30	47					45	18
	50	0		35	45	Aug 25	1545	39		50	31
	55	-8		40	47		50	35		55	18
				45	36		55	16		1000	30
Aug 21	1705	-4		50	25		1600	17		05	10
	10	22		55	26		05	-2		10	14
	15	21								15	19
	20	25	Aug 23	1835	-16	Aug 25	1625	8		20	25
	25	28		40	12		30	30		25	23
	30	26		45	32		35	30		30	45
	35	22		50	36		40	28		35	24
	40	17		55	13		45	15		40	27
	45	36		1900	30		50	14		45	10
	50	16		05	12		55	12		50	40
	55	37		10	15		1700	10		55	51

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Aug 28	1100	51	Aug 29	1100	28	Aug 30	1240	11	Sep 1	0700	36
	05	47		05	43		45	30		05	52
	10	60		10	48		50	3		10	54
	15	61		15	51		55	-4		15	55
	20	61		20	47		1300	-5		20	62
	25	62		25	39		05	4		25	60
	30	62		30	32		10	7		30	59
	35	59		35	20		15	2		35	58
	40	49		40	2		20	-9		40	58
	45	20		45	-5		25	-4		45	54
	50	12		50	-7		30	-2		50	58
	55	10								55	53
	1200	6	Aug 30	0845	5	Aug 31	0605	4		0800	56
	05	5		50	3		10	11		05	59
	10	5		55	-3		15	50		10	58
	15	2		0900	-1		20	53		15	54
	20	1		05	-3		25	53		20	58
	25	-4		10	27		30	52		25	53
				15	8		35	47		30	55
Aug 28	1910	-5		20	16		40	48		35	59
	15	30		25	18		45	46		40	54
	20	28		30	9		50	42		45	57
	25	19		35	15		55	46		50	48
	30	9		40	4		0700	52		55	43
	35	-6		45	13		05	51		0900	50
	40	-5		50	33		10	50		05	41
	45	-1		55	29		15	49		10	45
	50	12		1000	14		20	36		15	44
	55	21		05	7		25	33		20	43
	2000	-7					30	41		25	37
			Aug 30	1055	-4		35	39		30	42
Aug 29	1000	-6		1100	21		40	34		35	43
	05	-2		05	9		45	39		40	41
	10	8		10	2		50	41		45	43
	15	25		15	-7		55	33		50	40
	20	23		20	-3		0800	29		55	22
	25	23		25	13		05	28		1000	40
	30	27		30	53					05	38
	35	29		35	57	Aug 31	1015	34		10	32
	40	20		40	18		20	38			
	45	4		45	28		25	39	Sep 3	1245	19
	50	4		50	16		30	38		50	24
	55	11		55	-6					55	23

Table 3 (Cont'd)

Date	Time	db	Date	Time	db	Date	Time	db	Date	Time	db
Sep 3	1300	19	Sep 7	1445	8	Sep 23	1615	26			
	05	16		50	3		20	30			
	10	8		55	5		25	31			
							30	24			
Sep 6	1140	14	Sep 11	2035	15		35	12			
	45	18		40	4		40	10			
	50	17		45	22		45	3			
	55	3		50	17		50	-7			
	1200	0		55	14		55	-6			
	05	13		2100	1						
						Sep 24	1755	3			
Sep 7	1205	0	Sep 14	1835	-8		1800	7			
	10	49		40	0		05	8			
	15	13		45	13		10	58			
	20	3		50	23		15	54			
	25	31		55	9		20	38			
	30	48		1900	-6		25	-6			
	35	58					30	-9			
	40	51	Sep 20	0100	-3		35	-7			
	45	55		05	3		40	0			
	50	10		10	2		45	36			
	55	4		15	6		50	50			
	1300	16		20	12		55	45			
	05	12		25	13						
	10	15		30	14	Sep 25	1235	-10			
	15	58		35	15		40	15			
	20	62					45	10			
	25	46	Sep 22	1800	30						
	30	15		05	30						
	35	16		10	41						
	40	35		15	47						
	45	47		20	50						
	50	47		25	47						
	55	31		30	34						
	1400	25		35	24						
	05	-4		40	22						
	10	7		45	17						
	15	46		50	26						
	20	44		55	32						
	25	45									
	30	49	Sep 23	1600	-2						
	35	20		05	1						
	40	16		10	0						

Table 4a. Tabulation of hourly median signal levels as received at Guantanamo - October 1957.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-12	-9	-8	-7	-6	-6	-7	-7	-6	-7	-7	-7	-7	-7	G	-10	-12	-14	-14	-14	-14	-13	-13	-14
2	-13	-11	-9	-6	-7	-7	-5	-3	-5	-5	-7	-6	-8	G	-10	-12	-12	-15	-15	-15	-12	-12	-12	-13
3	-13	-11	-8	-7	-5	-5	-5	-4	-5	-6	-8	-7	-7	-9	-9	G	-15	-15	-17	-17	-15	-15	-14	-14
4	-15	-14	-12	-11	-10	-10	-10	-10	-9	-8	-7	-8	-7	-8	-6	G	-12	-13	-12	-15	-14	-13	-14	-12
5	-10	-10	-7	-6	-6	-8	-7	-7	-8	-9	-10	-11	-12	-12	-11	-11	-13	-15	-15	-14	-13	-12	-12	-15
6	-13	-12	-9	-8	-9	-8	-8	-9	-9	-9	-10	-9	-10	-9	6#	30#	27#	24#	38#	47#	7#	-12	-12	-13
7	-12	-11	-10	-9	-9	-9	-9	-8	-8	-8	-8	-10	-11	-12	-12	-13	-16	-15	-17	-17	-14	-14	-15	-15
8	-15	-12	-12	-10	-9	-10	-10	-9	-10	-10	-9	-10	-13	-12	-13	-14	-15	-17	-17	-18	-15	-15	-15	-17
9	-14	-12	-11	-10	-8	-9	-7	-10	-10	-12	-12	-13	-14	-14	-13	-14	-14	-15	-15	-15	-13	-14	-14	-14
10	-15	-13	-12	-10	-9	-10	-11	-11	-10	-12	-13	-12	-12	-13	-13	-13	-9	-13	-15	-15	-15	-14	-16	-14
11	-15	-13	-11	-9	-10	-9	-10	-9	1#	12#	-9	-10	-12	-13	-14	-14	-16	-15	-16	-14	-11	-11	-12	-9
12	-14	-13	-11	-10	-9	-10	-11	-11	-9	-10	-12	-13	-13	-14	-14	-15	-15	G	G	G	G	G	G	G
13	G	G	G	G	G	G	G	G	G	G	G	G	-9	-7	-8	-9	-14	-14	-16	-16	-16	-16	-16	-18
14	-14	-12	-10	-9	-8	-9	-9	-9	-10	-11	-10	-11	-12	-11	-9	-11	-12	-14	-15	-15	-12	-12	-12	-12
15	-12	-11	-9	-9	-8	-10	-10	-10	-10	-11	-12	-13	-14	-12	-13	-12	-14	-15	-15	-16	-14	-14	-14	-14
16	-13	-12	-10	-9	-8	-9	-9	-8	-9	-10	-9	-8	-10	-11	-8	-9	-11	-13	-15	-15	-14	-9*	-12	-13
17	-11	-8	-8	-9	-9	-8	-9	-8	-8	-8	-7	-7	-9	-10	-12	-14	-12	-11	-13	-12	-8	-9	-12	-14
18	-13	-11	-10	-8	-8	-8	-10	-10	-11	-12	-13	-14	-15	-13	-12	-13	-14	-13	-12	-15	-15	-14	-14	-12
19	-10	-8	-8	-6	-7	-8	-9	-9	-6	-8	-9	-10	-11	-8	-11	-12	-12	-13	-16	-15	-15	-16	-16	-15
20	-13	-12	-9	-9	-7	-7	-8	-10	-8	-8	-9	-10	-16	-12	-12	-12	-13	-13	-16	-16	-16	-16	-17	-16
21	-15	-13	-11	-8	-9	-8	-8	-9	-10	-12	-11	-7	-5	-5	-7	-8	-10	-12	-15	-16	-16	-16	-16	-15
22	-13	G	G	G	G	G	G	G	-9	-8	-7	-8	-10	-10	-10	-11	-13	-14	-15	-15	-13	-12	-14	-15
23	-14	-12	-8	-8	-7	-8	-8	-8	-9	-9	-12	-10	-11	G	G	-10	-13	-15	-16	-15	-15	-15	-16	-16
24	-14	-12	-10	-9	-8	-9	-9	-8	-10	-10	-12	-11	-9	-10	-10	-10	-12	-13	-15	-16	-15	-15	-16	-16
25	-12	-9	-7	-7	-7	-7	-6	-6	-8	-8	-8	-9	-8	-7	-8	-11	-13	-15	-16	-17	-17	-17	-17	-16
26	-15	-13	-12	-10	-9	-9	-9	-8	-9	-11	-11	-13	-14	-14	-14	-14	-14	-14	-16	-16	-16	-16	-15	-16
27	-12	-9	-8	-7	-7	-8	-8	-9	-9	-9	-11	-11	-10	-9	-9	-9	-12	-14	-15	-15	-15	-15	-16	-16
28	-14	-13	-11	-8	-9	-9	-6	-6	-6	-10	-11	-12	-12	-12	-12	-12	-13	-12	-12	-15	-12	-7	-9	-13
29	-14	-12	-11	-9	-8	-10	-9	-9	-9	-8	-9	-9	-12	-13	-13	-12	-13	-13	-14	-16	-16	-17	-14	-15
30	-14	-12	-11	-9	-9	-9	-9	-9	-11	-9	-11	-12	-13	-14	-12	-12	-14	-16	-16	-17	-18	-19	-19	-19
31	-13	-13	-11	-9	-9	-10	-10	-11	-10	-7	-9	-9	-13	-13	G	-11	-12	-14	-14	-14	-13	-14	-14	-14
Med	-13	-12	-10	-9	-8	-9	-9	-9	-9	-9	-9	-10	-11	-12	-12	-12	-13	-14	-15	-15	-15	-14	-14	-15

Sporadic E * Evening signal anomaly G Outage

Table 4b. Tabulation of hourly median signal levels as received at Guantanamo - November 1957.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-14	-12	-10	-10	-9	-9	-9	-10	-10	-10	-11	-12	-13	-13	G	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	-13	-12	14#	-6#	-18	-16	-13	-14	-17	-16
3	-15	-14	-11	-10	-10	-11	-10	-10	-11	-10	-12	-12	-13	-13	-12	-13	-14	-5*	-3*	-5*	-9*	-11*	-11*	-14
4	-14	-14	-12	-10	-9	-9	-9	-8	-6	-6	-6	-6	-12	-12	G	-11	-12	-12	-15	-16	-15	-15	-15	-16
5	-14	-13	-11	-10	-9	-9	-9	-11	-10	-9	-10	-11	G	G	G	-12	-13	-16	-18	-16	-17	-16	-17	-18
6	-17	-14	-11	-10	-10	-11	-10	-9	-10	-9	-9	-12	-13	G	-12	-12	-14	-16	-16	-16	-14	-11	-15	G
7	G	G	G	G	G	G	G	G	-11	-10	-12	-14	-14	-12	-14	-14	-14	G	-8*	-8*	-10*	-8*	-11*	-8*
8	-9*	-12	-11	-10	-11	-13	-14	-11	-8*	-7*	-5*	-4*	-5*	G	G	-10*	-8*	-11*	-11*	-14	-15	-16	-15	-17
9	-15	-14	-11	-10	-10	-9	-9	-7	-8	-10	-11	-9	-11	-9	-10	-12	-14	-13*	-10*	-16	-18	-15	-17	-17
10	-17	-15	-12	-11	-11	-12	-11	-9	-11	-9	-11	-12	-13	-13	-14	-13	-14	-15	-17	-17	-17	-16	-16	-17
11	-14	-14	-11	-10	-10	-11	-10	-10	-11	-11	-9	-12	-15	-15	-15	-14	-17	-17	-19	-19	-18	-14	-17	-18
12	-16	-15	-13	-11	-12	-11	-11	-10	-10	-10	-10	-11	-12	-13	-10	-12	-12	-10*	-14	-16	-16	-13	-13	-16
13	-14	-14	-12	-10	-12	-11	-8	-10	-8	-5*	-4*	-3*	-8*	-7*	G	-14	-17	-20	G	G	G	G	G	G
14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	-11	-10	-14	-16	-16	-14	-12*	-14	-15	-15
15	-14	-14	-18	-11	-11	-11	-9	-9	-7	-8	-10	-10	-8	G	-11	-12	-12	-14	-16	-16	-16	-17	-17	-18
16	-16	-14	-12	-10	-10	-11	-11	-10	-10	-11	-12	-12	-13	-12	-10	-10	-13	-8*	-13	-17	-17	-17	-17	-17
17	-16	-13	-11	-9	-7	-9	-8	-8	-8	-8	-8	-8	-9	-10	-11	-12	-13	-16	-16	-14	-15	-17	G	G
18	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	-9*	-13	-16	-18	-18	-18	-19	-19
19	-17	-16	-13	-11	-12	-12	-11	-11	-12	-12	-14	-14	-15	-14	G	G	-12*	-12*	-11*	-14*	-19	-19	-19	-20
20	-17	-15	-14	-11	-11	-11	-10	-9	-9	-10	-9*	-8*	-10*	-10*	G	-10	-12	-15	-16	1#	-13	-14	-15	-14
21	-14	-12	-11	-11	-10	-10	-10	-10	-10	-10	-10	-12	-12	G	-11	-10	-9#	-12	-6*	-11*	-14	-14	-14	-15
22	-15	-13	-11	-11	-10	-10	-9	-8	-5*	1*	1*	-8*	-12	-12	G	-9*	-5*	-10*	-10*	-12*	-11*	-11	-13	-14
23	-13	-12	-11	-10	-9	-8	-7	-7	-6*	-4*	-9	-11	-12	-9	-8	-8	-9	-11	-15	-16	-14	-14	-13	-14
24	-13	-11	-9	-8	-8	-9	-7	-5	-3	-6	-7	-4	-9	-10	-10	-12	-13	-13	-10	-14	-13	-14	-14	6#
25	-15	-14	-11	-11	-11	-10	-10	-8	-7	-6	-7	-10	-10	-11	-11	-12	-15	-13	-17	-17	-15	-13	-12	-15
26	-15	-13	-11	-11	-11	-10	-10	-10	-9	-11	-12	-13	-14	G	-14	-15	-16	-20	-20	-20	-19	-18	-17	-18
27	-16	-14	-13	-13	-12	-12	-12	-10	-9	-9	-9	-11	-11	-12	G	-12	-14	-13	-8*	-13	-12	-12	-12	-15
28	-14	-13	-12	-10	-10	-10	-11	-11	-9	-10	-11	-11	-11	-12	-12	-11#	9#	34#	5#	-8*	-7*	-4*	-11*	-14
29	-14	-14	-10	-12	-11	-12	-11	-12	-12	-11	-12	-13	-15	-14	G	-15	-16	-19	-20	-19	-15	-11*	-15	-15
30	-14	-12	-11	-11	-12	-11	-11	-10	-11	-11	-13	-13	-13	-12	-11	-14	-17	-17	-17	-20	-19	-16	-16	-15
Med	-15	-14	-11	-10	-10	-11	-10	-10	-9	-10	-10	-11	-12	-12	-11	-12	-13	-13	-16	-16	-15	-14	-15	-16

Sporadic E * Evening signal anomaly G Outage

Table 4c. Tabulation of hourly median signal levels as received at Guantanamo - December 1957.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-15	-13	-11	-10	-10	-9	-8	-9	-9	-9	-9	-5#	-5#	-10	-12	-14	-10	-14	-17	-13	-14	-15	-16	-18
2	-17	-15	-13	-12	-11	-10	-11	-11	-11	G	G	G	G	G	G	G	-19	-21	-20	-17	-16	-15	-21	-20
3	-18	-16	-15	-14	-14	-14	-14	-13	-15	-14	-15	-15	-16	G	-14	G	G	-7*	-5*	-6*	-2*	-1*	-11	-13
4	-11	-11	-9	-8	-8	-7	-8	-8	-9	-10	-10	-11	-13	-10	-11	-12	-14	-16	-16	-15	G	G	G	-12
5	-12	-10	-9	-8	-6#	-8	-7	-7	-8	-8	-9	-8	-7	-8	G	G	-14	0*	-1*	-8*	-6#	-13	-14	-14
6	-14	-11	-9	-9	-7	-6	-5	-5	-6	-9	-7	-5	-4	-4	G	-7	-12	-10	-15	-15	-14	-20	-10	-12
7	-13	-13	-11	-9	-9	-9	-9	-8	-9	-9	-12	-14	-10	-10	-14	-14	-13	-5*	-5*	-6*	-10	-9	-15	-15
8	-14	-12	-11	-11	-10	-10	-10	-10	-9	-8	-7	-8	-12	-13	-14	-16	-16	-13	-12	-8*	-9*	-8	-14	-17
9	-14	-13	-10	-9	-7	-8	-7	-9	-10	-12	-11	-13	-10	-11	-12	-13	-14	-17	-18	-16	-16	-11	-14	-16
10	-14	-12	-11	-7	-5	-4	-1	-3	-7	-6	-9	-11	-12	-12	-10	-11	-11	-14	-17	-17	-16	-14	-15	-14
11	-13	-13	-9	-7	-5	-4	-6	-8	-8	-10	-9	-12	-13	-13	-14	-14	-15	-18	-20	-19	-15	-14	-13	-14
12	-14	-11	-7	-4	-5	-4	-3	-5	-7	-8	-10	-11	-13	-13	-12	-13	-14	-15	-16	-13	-12	-12	-12	-12
13	-12	-8	-6	-2	0	-3	-4	-5	-8	-10	-12	-12	-13	-13	G	-10	-7*	1#	-1*	0*	-8	-5	-5	-7
14	-8	-4	-4	-4	-5	-3	-2	-7	-6	-6	-7	-7	-10	-12	-13	-12	-15	-16	-18	-17	-16	-16	-14	-12
15	-13	-13	-10	-9	-9	-8	-8	-9	-8	-8	-9	-11	-12	-12	-12	-11	-6*	-8*	-10*	-11*	-11*	-16	-15	-14
16	-13	-11	-10	-9	-9	-9	-9	-8	-8	-7	-9	-10	-9	-10	-10	-12	-12	-14	-16	-15	-12	-10	-13	-13
17	-14	-12	-12	-12	-10	-8	-9	-7	-6	-5	-6	-7	-8	-3#	5#	1#	-12	-8*	2*	-4*	-8*	-11	-14	-14
18	-12	-13	-12	-11	-10	-10	-10	-10	-9	-10	-11	-12	-14	-14	-13	-13	-15	-15	-17	-15	-14	-15	-15	-15
19	-14	-13	-13	-11	-9	-10	-10	-10	-9	-10	-10	-10	-12	-12	-13	-15	-16	-15	-10*	-3*	-2*	-6*	-9	-10
20	-12	-12	-11	-9	-10	-10	-10	-9	-8	-8	-10	-11	-11	-10	-10	G	-6*	-14	-9*	-11	-12	-9*	-16	-15
21	-14	-12	-12	-10	-11	-10	-8	-8	-8	-9	-10	-9	-12	-12	-13	-11	-2*	2*	4*	5*	-5*	-12	-13	-15
22	-14	-13	-12	-12	-10	-10	-9	-9	-6	-9	-10	-12	-12	-11	-11	-13	-16	-17	-20	-17	-14	-9*	-11*	-16
23	-13	-14	-12	-11	-12	-14	-12	-12	-11	-11	-10	-5	-4	-9	-9	-12	-14	-11*	-10*	-12*	-9*	-15	-16	-16
24	-14	-13	-11	-11	-11	-10	-10	-10	-9	-10	-11	-11	-12	-13	-11	-14	-12	-13	-9*	-14	-13	-10	-12	-11
25	-12	-12	-12	-10	-10	-10	-9	-7	-7	-5	-4	-9	-8	-5*	-2*	-3*	-8*	-13	-13	-15	-11	-10	-12	-14
26	-14	-12	-10	-10	-10	-10	-9	-10	-10	-12	-12	-13	-13	-13	-14	-12	-12	-12	-11*	-9*	-8*	-7*	-12	-15
27	-14	-14	-13	-11	-11	-11	-10	-10	-8	-8	-8	6#	33#	49#	G	G	G	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
30	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	-12	-12	-2*	-3*	-2*	-9	-12	-15
31	-14	-13	-12	-11	-11	-11	-10	-9	-9	-10	G	-12	-12	-12	-12	-13	-15	-18	-20	-17	-15	-15	-16	-15
Med	-14	-13	-11	-10	-10	-10	-9	-9	-8	-9	-10	-11	-12	-12	-12	-12	-13	-14	-13	-13	-12	-11	-14	-14

Sporadic E * Evening signal anomaly G Outage

Table 4d. Tabulation of hourly median signal levels as received at Guantanamo - January 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-13	-13	-12	-11	-10	-10	-8	-7	-7	-6	-8	-10	-11	-10	-11	-13	-14	-16	-17	-13	-3*	5*	3*	4*
2	-4*	-5	-6	-6	-8	-8	-7	-7	-6	-7	-8	-10	-9	-10	G	-4*	-4*	7*	7*	5*	-4*	-5*	-9	-15
3	-13	-13	-10	-9	-8	-8	-8	-8	-5	2	-6	4	3	-5	G	G	-16	-14	-14	-20	-11	-9	-14	-15
4	-16	-16	-14	-11	-11	-12	-10	-10	-9	-6	-5	-9	-8	-7	-6	-12	-17	-17	-16	-17	-17	-18	-17	-17
5	-17	-16	-14	-12	-12	-12	-10	-8	-9	-10	-11	-11	-12	-12	-13	-13	-15	-18	-9*	-11*	-14	-16	-17	-15
6	-15	-15	-13	-12	-10	-10	-10	-11	-10	-8	-8	-11	-13	-12	G	G	-16	-18	-19	-14	-13	-11	-12	-11
7	-12	-11	-12	-11	-9	-9	-9	-6	-6	-6	-6	-10	-12	-12	-13	G	-16	-19	-19	-17	-15	-14	-14	-15
8	-15	-14	-11	-9	-7	-8	-9	G	G	G	G	G	G	G	G	G	G	G	-18	-16	-14	-15	-16	
9	-12	-13	-11	-9	-9	-9	-9	-8	-7	-7	-9	-10	-11	-11	-11	G	-15	-9	-18	-17	-16	-13	-14	-12
10	-11	-11	-10	-9	-9	-10	-10	-9	-8	-8	-7	-10	-10	-11	-12	G	-15	-17	-19	-18	-16	-14	-14	-15
11	-14	-13	-11	-9	-9	-9	-9	-7	-6	-7	-10	-11	-12	-13	-13	-13	-14	-19	-19	-19	-15	-12	-14	-14
12	13*	-6*	-11	-9	-8	-9	-9	-8	-7	-6	-7	-8	-8	-6	-4	-5	G	-9	-18	-17	-15	-14	-13	-13
13	-12	-12	-11	-10	-10	-9	-8	-8	-8	-8	-9	-10	-10	-10	-10	-11	-12	G	-13	-6*	-8*	-11	-11	-9
14	-13	-10	-9	-9	-9	-8	-10	-8	-8	-8	-9	-9	-11	-11	-12	-11	-11	G	G	2#	-9	-11	-10	-12
15	-9	-8	-8	-8	-8	-8	-8	-7	-4#	-5	-8	-9	-9	-7	G	G	-10	-14	-18	-15	-15	-14	-15	-14
16	-12	-13	-11	-10	-11	-10	-11	-9	-8	-8	-9	-9	-12	G	-10	G	G	G	G	G	G	G	G	-15
17	-14	-14	-9	-6	-6	-10	-9	-9	-8	-8	-8	-9	-8	G	G	-13	-12#	35#	-7#	-19	-17	-13	-12	-14
18	-16	-14	-13	-12	-11	-11	-11	-11	-8	-9	-9	-10	-11	-13	-14	-16	-17	-8	-3#	-18#	-19	-18	-17	-17
19	-17	-15	-13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
20	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
22	G	G	G	G	G	G	G	G	G	G	-9	G	G	G	G	G	-17	-19	-20	-18	-17	-15	-12	-13
23	-10	-7	-5	-4	-4	-4	-3	-3	0	-1	-2	-3	-6	-8	-7	G	-12	-14	-15	-14	-10	-11	-9	-10
24	-9	-8	-6	-5	-4	-5	-3	-3	-3	-1	-2	-4	-4	-7	-8	-7	G	-12	-14	-11	21#	-9	-6	-8
25	-6	-4	-1	-1	-2	-2	-2	-3	-3	-3	-5	-5	-4	-6	-7	-8	-12	-12	-12	-6#	-8#	-9	-10	-8
26	-8	-7	-5	-4	-3	-3	-3	-3	-2	-4	-4	-3	-4	14#	-1#	-4	-9	-12	-14	-14	-12	-10	-9	-10
27	-11	-9	-6	-4	-4	-3	-4	-4	-5	-6	-6	-8	-9	-8	-7	-8	-11	-13	-14	-13	-12	-10	-9	-9
28	G	G	G	-9	-8	-8	-8	-9	-8	-8	-8	-8	-10	-10	G	G	G	-18	-19	-18	-14	-6*	-9*	-11
29	-14	-12	-11	-10	-9	-9	-10	-8	-9	-9	-7	-7	-7	-6	-8	-11	-13	-16	-17	-13*	5*	-14	-14	-16
30	-14	-13	-12	-10	-9	-8	-8	-8	-9	-7	-8	-11	-12	-11	-11	-12	-13	-16	-18	-17	-15	-13	-12	-13
31	-14	-13	-10	-10	-9	-10	-10	-10	-9	-9	-8	-6	-8	-9	-10	G	-15	-16	-17	-16	-15	-13	-14	-14
Med	-13	-13	-11	-9	-9	-9	-9	-8	-8	-7	-8	-9	-10	-10	-10	-11	-14	-16	-17	-16	-14	-13	-12	-14

Sporadic E * Evening signal anomaly G Outage

Table 4e. Tabulation of hourly median signal levels as received at Guantanamo - February 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-15	-14	-12	-11	-10	-11	-10	-10	-10	-11	-13	-13	-15	-14	-14	-15	-18	-19	-12	-20	-19	-18	-18	-17
2	-17	-14	-13	-12	-11	-11	-12	-12	-12	-12	-13	-13	-16	-15	-14	-15	-17	-15*	-14*	-18	-19	-16	-16	-16
3	-15	-14	-13	-12	-11	-11	-11	-10	-10	-10	-12	-13	-14	-13#	47#	24#	-15#	-19	-14*	-3*	-18	-17	-18	-17
4	-17	-15	-13	-12	-11	-11	-11	-11	-10	-10	-12	-14	-15	-15	-14	-15	-18	-20	-21	-20	-19	-17	-17	-17
5	-16	-14	-12	-12	-12	-12	-11	-11	-11	-12	-12	-14	-14	-14	-15	G	-18	-3#	-2*	-4*	-2*	-4*	-14	-14
6	-15	-14	-13	-13	-12	-12	-12	-13	-12	-11	-11	-13	-16	-16	-16	-17	-17	-20	-20	-20	-19	-19	-18	-17
7	-17	-15	-13	-13	-12	-13	-12	-12	-12	-12	-13	-14	-13	-11	G	-15	-18	-17	-18	-15*	-4*	-3*	-12	-17
8	-18	-17	-15	-14	-13	-14	-14	-12	-13	-12	-13	-14	-16	-17	-16	-16	-19	-22	-23	-20	-19	-18	-16	-16
9	-17	-14	-12	-11	-11	-12	-12	-11	-6	-10	-9	-9	-13	-12	-14	-13	-14	-18	-15*	-12*	-13	-11	-13	-12
10	-12	-14	-12	-11	-10	-10	-11	-9	-9	-8	-11	-12	-13	-13	-13	-13	-16	-19	-17	-13#	-7#	-11*	-14	-15
11	-14	-14	-13	-11	-11	-11	-11	-10	-10	-11	-11	-12	-14	-14	-14	-13	-18	-16	-19	-19	-18	-17	-17	-15
12	-18	-15	-14	-13	-11	-11	-12	-12	-12	-10	-9	-12	-11	-11	-14	-15	-17	-19	-21	-20	-19	-19	-18	-18
13	-18	-15	-14	-12	-12	-11	-10	-11	-10	-11	-11	-15	-17	-16	-15	-17	-17	-17	-19	-19	-18	-16	-14	-13
14	-15	-14	-13	-12	-12	-12	-12	-11	-8	-8	-11	-13	-15	-17	-16	-15	-18	-20	-12#	-10#	-14	-14	G	-13
15	-14	-14	-13	-12	-12	-12	-13	-12	-12	-12	-12	-12	-14	-17	-17	-16	-19	-19	-13#	-12*	-19	-19	-16	-11
16	-17	-15	-14	-12	-12	-12	-12	-12	-11	-11	-13	-13	-14	-13	-8	-14	-15	-14#	11#	13#	-14	-15	-12	-16
17	-13	-14	-13	-12	-12	-11	-11	-11	-7	-7	-7	-6	-9	-12	-11	-13	-14	-16	-15	-17	-15	-14	-14	-15
18	-14	-13	-11	-11	-10	-10	-9	-7	-7	-6	-6	-10	-11	-12	-11	-12	-15	-19	-19	-19	-19	-17	-17	-16
19	-15	-14	-12	-10	-9	-9	-9	-8	-9	-9	-9	-10	-14	-14	-11	-12	-16	-18	-19	-19	-18	-16	-16	-16
20	-15	-14	-12	-10	-10	-10	-9	-10	-9	-10	-10	-12	-13	-13	-13	-13	-17	-18	-18	-19	-17	-13	-13	-6*
21	-9*	-12	-11	-9	-9	-9	-9	-9	-7	-8	-10	-11	-13	-13	G	-12	-14	-16	-17	-16	-15	-13	-12	-13
22	-12	-8	-7	-8	-7	-7	-6	-6	-6	-6	-8	-8	-9	-10	-11	-12	-12	-10*	-15	-16	-14	-12	-4*	-1*
23	-7*	-10	-9	-7	-7	-7	-7	-6	-7	-8	-8	-7	-8	-9	-12	-11	-14	-15	-17	-16	-15	-13	-12	-13
24	-14	-13	-12	-11	-10	-10	-9	-10	-10	G	-12	-12	-13	-12	-12	-13	-17	-18	-14	-14	-17	-17	-14	-15
25	-14	-14	-12	-10	-9	-10	-10	-10	G	G	-10	-12	-14	-14	-14	-13	-15	-17	-12*	-4*	-8*	-9*	-12	-13
26	-12	-13	-12	-10	-9	-10	-9	-8	-9	-9	-6*	-3*	-8*	-7*	-8	-10	-16	-19	-20	-19	-18	-15	-16	-15
27	-13	-13	-11	-10	-9	-9	-9	-7	-7	-4*	-5*	-8	-7	-5*	-6*	-6*	-8*	-11	-19	-17	-8	-8	-8	G
28	-11	-11	-10	-10	-10	-9	-9	-8	-5	-5	-7	-6	-7	-8	G	G	-9	-14	-17	-14	-11	-12	-12	-13
Med	-15	-14	-12	-11	-11	-11	-11	-10	-10	-10	-11	-12	-14	-13	-14	-13	-17	-18	-17	-17	-17	-15	-14	-15

Sporadic E * Evening signal anomaly G Outage

Table 4f. Tabulation of hourly median signal levels as received at Guantanamo - March 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-15	-14	-12	-11	-10	-10	-9	-8	-7	-9	-10	-9	-3	-5	-9	-12	-15	-17	-11	-13	-14	-15	-14	-13
2	-14	-14	-13	-10	-10	-10	-10	-10	-10	-9	-11	-13	-13	-14	-14	-14	-15	-18	-20	-19	-17	-16	-15	-15
3	-14	-14	-12	-11	-10	-10	-10	-9	-8	-6	-9	-13	-14	-13	-12	-14	-17	-19	-20	-19	-16	-15	-14	-15
4	-15	-14	-12	-10	-10	-10	-9	-10	-9	-4	-7	-8	-7	G	G	G	G	G	G	G	G	G	G	-14
5	-15	-14	-12	-10	-10	-10	-8	-9	-10	-10	-11	-14	G	-14	-14	-14	-16	-19	-19	-18	-11*	-9*	-13	-16
6	-15	-13	-11	-10	-10	-10	-9	-8	-7	-9	-8	-9	-10	-12	-13	-15	-17	-20	-21	-20	-18	-18	-17	-16
7	-16	-15	-14	-12	-10	-10	-10	-10	-9	-8	-8	-12	-13	G	-12	-14	-16	-20	-20	-20	-17	-15	-15	-15
8	-14	-14	-12	-11	-10	-10	-8	-8	-9	-10	-10	-12	-14	-14	-14	-13	-16	-17	-20	-20	-11*	-2#	1#	-8*
9	-12	-12	-12	-11	-11	-11	-10	-8	-10	-12	-13	-14	-13	-11	-14	-15	-17	-19	-19	-19	-17	-15	-15	-14
10	-14	-14	-13	-11	-9	-10	-9	-10	-11	-11	-11	-10	-13	-12	-13	-14	-14	-15	-17	-18	-15	-13	-13	-12
11	-15	-11	-11	-9	-9	-10	-9	-10	-8	-10	-10	-8	-11	-8	-9	G	-12	-15	-17	-17	-15	-14	-14	-13
12	-12	-12	-11	-10	-9	-10	-10	-10	-10	-12	-11	-12	-12	-15	-11	-14	-14	-16	-17	-18	-18	-16	-15	-14
13	-14	-14	-13	-10	-10	-9	-9	-8	-8	-9	-9	-8	-6	-5	-11	-9	-12	-16	-17	-17	-17	-16	-12	-8
14	-10	-11	-12	-11	-9	-9	-9	-10	-9	-10	-12	-12	-10	-9	-7	-7	-13	-16	-18	-19	-17	-14	-16	-16
15	-15	-15	-12	-11	-10	-9	-7	-4	-6	-6	-5	-2	-8	-10	-11	-11	-16	-18	-19	-19	-18	-15	-15	-16
16	-15	-14	-11	-10	-9	-9	-8	-9	-7	-6	-9	-12	-11	-12	-13	-11	-12	-11*	-10*	-10*	-10*	-7*	-10*	-6*
17	-10	-12	-12	-11	-9	-10	-8	-9	-9	-10	-13	-13	-12	-13	-12	-13	-15	-19	-21	-19	-18	-15	-16	-16
18	-14	-14	-12	-13	-10	-10	-10	-10	-10	-11	-11	-15	-14	-13	-15	-13	-15	-19	-16	-18	-17	-17	-16	-17
19	-16	-14	-11	-11	-10	-10	-9	-9	-8	-10	-13	-15	-15	-15	-14	-15	-17	-18	-19	-19	-17	-15	-14	-13
20	-11	-13	-11	-10	-9	-9	-9	-10	-10	-10	-12	-14	-14	-13	-13	-15	-17	-20	-21	-20	-18	-16	-15	-15
21	-16	-15	-12	-11	-10	-10	-10	-10	-10	-11	-12	-12	-14	-13	-12	G	-13	-9*	-14	-17	-18	-17	-15	-15
22	-16	-14	-14	-12	-11	-9	-9	-9	-9	-10	-11	-13	-14	-14	-13	-12	-14	-16	-17	-16	-16	-14	-13	-14
23	-15	-14	-13	-11	-10	-9	-10	-10	-11	-11	-13	-14	-13	-11	-12	-14	-17	-19	-18	-16	-15	-15	-14	-15
24	-14	-13	-12	-11	-11	G	G	G	-10	-11	-13	-14	-14	-11	-10	-12	-15	-16	-21	-20	-19	-16	-17	-17
25	-16	-14	-14	-13	-11	-11	-10	-11	-10	-10	-13	-13	-13	-13	-13	-14	-14	-17	-19	-20	-16	-14	-14	-15
26	-13	-9	-10	-10	-10	-9	-10	-9	-8	-10	-11	-12	-12	-13	-10	-13	-13	-15	-18	-20	-18	-16	-17	-17
27	-16	-16	-12	-11	-9	-9	-9	-9	-9	-9	-9	-12	-11	-9	-9	-7	-7	-12	-17	-19	-19	-16	-15	-14
28	-15	-15	-12	-10	-9	-9	-9	-9	-9	-9	-11	-12	-14	-14	-10	G	-13	-15	-17	-19	-15	-15	-15	-16
29	-15	-13	-13	-11	-9	-9	-9	-9	-9	-10	-12	-13	-13	-13	-13	-14	-15	-16	-16	-17	-16	-14	-13	-14
30	-15	-14	-13	-11	-10	-10	-9	-10	-9	-9	-9	-11	-7	-4*	-4*	-7*	-10	-13	-19	-19	-17	-15	-15	-15
31	-15	-15	-13	-10	-10	-9	-8	-9	-7	-9	-7	-9	-7	-7	-5	-12	-14	-17	-19	-17	-16	-17	-15	-15
Med	-15	-14	-12	-11	-10	-10	-9	-9	-9	-10	-11	-12	-13	-13	-12	-13	-15	-17	-19	-19	-17	-15	-15	-15

Sporadic E * Evening signal anomaly G Outage

Table 4g. Tabulation of hourly median signal levels as received at Guantanamo - April 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-16	-14	-12	-11	-10	-10	-10	-8	-10	-8	-8	-11	-11	G	-11	-10	-11	-12	-16	-17	-16	-13	-14	-13
2	-15	-15	-13	-11	-11	-10	-10	-9	-10	-10	-11	-11	-8	G	-12	-14	-17	-19	-19	-17	-15	-15	-15	-15
3	-14	-13	-13	-10	-9	-9	-9	-8	-9	-11	-13	-13	-14	-14	-12	G	-15	-16	-18	-18	-15	-15	-13	-15
4	-15	-15	-14	-12	-10	-9	-9	-9	-10	-11	-12	-14	-15	-13	-14	G	-17	-18	-20	-20	-18	-15	-15	-15
5	-13	-14	-12	-11	-9	-9	-9	-10	-9	-10	-12	-13	-13	-12	-11	-11	-15	-18	-19	-20	-18	-15	-15	-15
6	-14	-15	-13	-11	-10	-10	-10	-10	-11	-12	-12	-13	-14	-13	-11	-12	-13	-17	-20	-18	-15	-14	-14	-13
7	-15	-14	-13	-12	-9	-9	-8	-9	-9	-10	-11	-12	-11	-9	-8	-11	-15	-18	-20	-18	-14	-14	G	G
8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	-14	-17	-20	-21	-21	-17	-15	-15	-16
9	-15	-13	-11	-9	-8	-8	-7	-8	-8	-8	-10	-11	-12	-10	-10	G	-15	-17	-19	-19	-16	-15	-15	-15
10	-15	-14	-12	-11	-10	-9	-10	-10	-11	-11	-10	-14	-14	-13	-14	-14	-17	-18	-21	-17	-16	-14	G	-13
11	-13	-13	-12	-10	-9	-9	-8	-9	-8	-8	-9	-12	-11	-13	-12	G	G	-20	-19	-20	-13	-11	-8	-11
12	-14	-14	-12	-11	-10	-9	-8	-9	-9	-11	-13	-13	-13	-12	-12	-12	-14	-15	-15	-14	-20	-13	-11	-13
13	-14	-12	-11	-9	-9	-9	-9	-9	-9	-10	-12	-18	-12	-12	-11	-13	-16	-18	-19	-17	-14	-13	-13	-13
14	-16	-14	-14	-12	-10	-10	-10	-10	-10	-11	-9	-10	G	-14	-13	-14	-15	-20	-20	-18	-14	-9	-10	-13
15	-14	-14	-12	-10	-10	-9	-10	-10	-10	-12	G	-11	-12	-12	-10	-12	-14	-18	-21	-20	-17	-15	-14	-15
16	-16	-13	-12	-11	-10	-10	-9	-10	-10	-11	-10	-11	-12	-12	-13	-14	G	G	G	G	G	G	G	-14
17	-14	-14	-11	-10	-10	-8	-8	-7	-8	-9	-11	-12	-13	-13	-12	G	-15	-18	-16	-17	-14	-6*	-4*	-4*
18	-6*	-10	-10	-9	-9	-7	-7	-8	-9	-9	-9	-11	-11	-11	-12	-13	G	-19	-20	-20	-16	-14	G	-14
19	-13	-14	-12	-11	-10	-8	-8	-8	-9	-9	-10	-10	-10	-8	-9	-13	-14	-18	-19	-18	-15	-15	-13	-12
20	-14	-13	-12	-10	-9	-8	-8	-7	-9	-9	-9	-8	-8	-9	-9	-10	-13	-17	-19	-17	-14	-14	-14	-14
21	-15	-14	-12	-11	-8	-7	-7	-7	-7	-9	-10	-10	-10	-9	-11	-13	-16	-17	-19	-19	-15	-14	-14	-14
22	-12	-10	-8	-8	-7	-7	-5	-6	-6	-7	-9	-11	-8	-7	-7	G	-16	-19	-19	-18	-14	-12	-12	-13
23	-15	-14	-13	-11	-9	-9	-8	-9	-9	-11	-13	-15	-15	-13	-12	G	-17	-21	-21	-19	-14	-14	-13	-14
24	-13	-13	-12	-11	-8	-8	-7	-9	-8	-7	-9	-9	-10	-13	G	-14	-15	-18	-13	-17	-17	-15	-14	-15
25	-14	-14	-13	-10	-9	-8	-8	-8	-7	-7	-7	-9	-10	-11	-11	-9	G	-15	-18	-18	-15	-15	-14	-14
26	-14	-13	-12	-10	-8	-7	-9	-9	-9	-8	-9	-11	-13	-11	-8	-13	-16	-17	-18	-19	-16	-6*	-13	-13
27	-15	-15	-13	-11	-9	-9	-8	-8	-8	-11	-11	-10	-11	-12	-11	-13	-15	-17	-18	27#	-9#	-14	-14	-13
28	-15	-14	-13	-11	-9	-8	-9	-9	-9	-8	-10	-9	-10	-8	-9	-13	-15	-14	-16	-18	-15	-14	-14	-14
29	-14	-13	-12	-11	-9	-8	-8	-9	-9	-9	-10	-10	-10	-7	-9	G	-12	-17	-19	-16	-16	-15	-13	0*
30	-13	-13	-12	-11	-10	-9	-9	-10	-10	-10	-10	-8	-10	-10	-12	G	-10	-13	-20	-19	-16	-15	-14	-13
Med	-14	-14	-12	-11	-9	-9	-8	-9	-9	-10	-10	-11	-12	-12	-11	-13	-15	-18	-19	-18	-15	-14	-14	-14

Sporadic E * Evening signal anomaly G Outage

Table 4h. Tabulation of hourly median signal levels as received at Guantanamo - May 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	-1	-13	-12	-10	-8	-8	-8	-8	-8	-8	-9	-11	-10	-11	-13	-13	-17	-19	-19	-12	-10	-8	-8	-6
2	-12	-13	-12	-9	G	G	G	G	G	G	G	G	G	G	G	G	G	-21	-21	-21	-18	-17	-14	-15
3	-14	-14	-12	-10	-8	-6	-7	-6	-6	-9	-9	-11	-11	-13	-10	-14	-17	-20	-22	-21	-18	-15	-15	-16
4	-15	-13	-12	-8	-9	-8	-7	-5	-4	-6	-8	-8	-10	-9	-9	-12	-15	-18	-20	-20	-18	-16	-15	-14
5	-13	-13	-4#	21#	-4#	-5	-4	-3	-6	-7	-7	-7	-6	-6	-10	-11	-14	-13	25#	3#	-5#	-13	-13	-15
6	-15	-13	-12	-9	-8	-8	-7	-9	-9	-5	-8	-9	-6	-8	-11	-12	-13	-15	-15	-16	-13	-13	-12	-11
7	-11	-10	-9	-6	-5	-4	-5	-5	-5	-6	-7	-8	-9	-8	-8	-10	-12	-12	-14	-14	-9	-10	-12	-13
8	-14	-14	-12	-10	-8	-7	-7	-8	-10	-12	-9	-9#	-11	-10	-10	-13	-15	-20	-19	-18	-16	-15	-13	-13
9	-11	-10	-10	-8	-6	-5	-7	-7	-7	-8	-9	-10	-10	-10	-11	-12	G	G	G	G	G	G	G	G
10	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
11	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
15	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
18	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
19	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
20	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
22	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
23	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
30	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
31	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
Med	-13	-13	-12	-9	-8	-7	-7	-7	-7	-8	-9	-9	-10	-10	-10	-12	-15	-19	-19	-17	-15	-14	-13	-14

Sporadic E

G Outage

Table 4i. Tabulation of hourly median signal levels as received at Guantanamo - June 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	-6	-7	-15	-16	-15	-12	-9	-8	3#
10	-5	-5	-7	-6	-5	-2	-1	-2	-1	-1	1	-2	-1	-1	G	G	-11	-15	-16	-15	-14	-11	-10	-11
11	-11	-10	-10	-8	-6	-4	-3	-3	-2	-1	-2	-2	-3	-4	-5	-7	-10	-14	-17	-16	-13	-11	-10	-10
12	-8	-8	-8	-8	-5	-2	0	0	-2	-2	-4	-2	-4	-3	G	-9	-12	-8	2*	-2*	-3*	-6	-8	-8
13	-10	-11	-11	-8	-6	-5	-2	-3	-3	-4	-4	-3	-2	G	-4	-5	-7	-7	-2#	-11	-11	-8	-8	-4
14	-2	-8	-7	-6	-5	-3	-2	-3	-4	-5	-3#	7#	10#	12#	25#	-7#	-12	-16	-17	-16	-15	-11	-10	-9
15	-7	-8	-8	-7	-5	-4	-5	-5	-7	-9	-8	-6	-6	-6	-7	-10	-13	-17	-18	-17	-11	-10	-8	G
16	G	G	G	G	G	G	G	G	-10	-9	-9	-8	-8	-3	-9	-13	-19	-22	-22	-22	-14	-12	-12	-12
17	-12	-11	-11	-9	-7	-4	-4	-5	-5	-7	-8	-7	-6	-7	-8	G	-16	-15#	-22	-21	-14	-13	-12	-10
18	-10	-9	-10	-8	-6	-4	-5	-8	-9	-10	-9	-9	-7	-6	-9	G	-18	-22	-22	-11	-13	-12	-12	-12
19	-11	-11	-10	-8	-5	-3	-3	-3	-6	G	G	G	G	G	G	-10	-14	-20	-9#	-20	-15	-15	-13	-10
20	-11	-10	-8	-9	-8	-5	-4	-5	-7	-6	-7	-7	-7	G	6#	-9#	-14	-17	-18	-17	-16	-12	6#	22#
21	-8	-9	-10	-7	-6	-5	-5	-8	-8	-9	-9	-11	-9	-8	-8	-10	-13	-14	-16	-15	-14	-12	-12	-11
22	-10	-11	-8	-4	-5	-5	-7	-2	-6	-9	-9	-9	-8	-9	-10	-11	-12	-16	-17	-12	-12	-7	-9	-8
23	-10	-9	-9	-8	-6	-4	-5	-7	-6	-6	-7	-7	-6	-5	-5	G	-12	-6*	-11*	-9*	-14	-13	-12	-10
24	-11	G	G	G	G	G	G	G	G	-11	-10	-10	-9	-7	-7	G	-13	-17	-17	-17	-14	-12	-11	-10
25	-5	-6	-5	-5	-4	-3	-3	-4	-4	-4	-4	-6	-6	-7	-7	G	G	G	G	G	G	G	-10	-9
26	G	-8	-9	-9	-8	-6	-6	-8	-8	-9	-9	-9	-6	-9	-10	G	-15	-17	-18	-17	-14	-9*	-5*	-8
27	-9	-9	-8	-7	-7	-6	G	-4	-6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
30	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
Med	-10	-9	-9	-8	-6	-4	-4	-4	-6	-7	-8	-7	-6	-6	-7	-9	-13	-16	-17	-16	-14	-11	-10	-10

Sporadic E * Evening signal anomaly G Outage

Table 4j. Tabulation of hourly median signal levels as received at Guantanamo - July 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
3	G	G	G	G	G	G	G	G	G	G	G	-5	-5	-5	-7	-9	-11	-15	-17	-16	-13	-11	-11	-10
4	-10	-11	-10	-10	-8	-6	-7	-8	-8	-9	-11	-11	-11	-9	-10	-10	-11	-11	-10	-13	-12	-11	-9	-9
5	-10	-9	-9	-8	-7	-6	-3	-1*	1*	2*	0*	-5	-5	1#	-9	-10	-12	-12	-11	-14	-14	G	G	G
6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	-13	-14	-12	-11	-10	-9	-9
8	-10	-10	-9	-8	-6	-4	-5	-6	-7	-8	-8	-9	-9	-10	-10	G	-13	-16	-17	-16	-14	-12	-10	-10
9	-11	-11	-10	-7	-5	-5	-3	-1	8#	8#	33#	40#	51#	51#	>68#	67#	46#	23#	18#	-11#	-12	-9	-8	-8
10	-9	-10	-9	-8	-6	-4	-4	-5	-5	-8	-10	-10	-10	-11	G	-13	-14	-14	-17	-15	-13	-11	-10	-8
11	-9	-9	-10	-8	-7	-6	-6	-5	-3	-1	-5	-3	-6	-6	-5	-1#	7#	-1#	-5#	-1*	0*	-6	-9	-7
12	-8	-9	-7	-8	-5	-5	-5	-4	-5	-7	-8	-10	-9	-6	-9	-6	-4*	-13	-14	-16	-12	-11	-11	-10
13	-10	-10	-9	-7	-5	-4	-2	-3	-1	-2	-5	-2	-3	-1	-3	-1*	0*	-6	-12	-13	-11#	-11	-10	-8
14	-10	-10	-9	-7	-6	-5	-5	-5	-5	-5	-8	-7	-7	-9	-8	-8	-11	-14	-11*	-7*	-7*	-9	-8	-8
15	-9	-8	-8	-6	-5	-4	-5	-5	-4	-3	-5	-5	-5	G	-6	-7	-9	-12	-15	-14	-11	-9	-8	-7
16	-9	-9	-8	-5	-6	-4	-5	-5	-6	-5	0	-2	-3	-7	-9	-11	-12	-14	-8*	-9*	-10	-10	-9	-8
17	-8	-7	-6	-6	-6	-5	-5	-6	-5	-6	-7	-9	-8	-6	-7	G	-13	-14	-14	-14	-12	-10	-9	-9
18	-9	-8	-7	-5	-6	-5	-5	-6	-7	-8	-7	-9	-9	-10	G	G	-11	-14	-15	-13	-11	-10	-9	-9
19	-8	-6	-5	-5	-5	-5	-5	-5	-7	-7	-5	-9	-2#	-9	-10	-5	-9	-12	-12	-14	-12	-10	-9	-8
20	-7	-7	-7	-6	-5	-5	-4	-4	-5	-7	-8	-8	34#	-5#	5#	-9	-12	-14	-16	-14	-12	-10	-9	-9
21	-8	-7	-7	-6	-5	-4	-5	-4	-5	-5	-7	-9	-9	-8	-9	-9	G	G	G	G	G	G	G	G
22	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	-11	-11	-11	-11	-13	-11	-9	-7	-6
23	-6	-6	-7	-5	-4	-3	-3	-5	-4	-7	-5	-5	-5	-6	-8	9#	-5#	-14	-14	-13	-11	-9	-7	-7
24	-8	-8	-7	-5	-3	-2	-1	-3	-7	-8	-5	-7	-9	G	G	G	-9	-12	-14	-13	-11	-7	-5	-6
25	-7	-11	-10	-9	-7	-3	-4	-6	-7	-9	-8	-8	-5	-9	-4	G	-10	-8	-10	-12	-12	-10	-6	-6
26	-6	-8	-8	-5	-2	-1	2	11#	-2	-2	-4	-1*	-1*	-5	-7	-10	-13	-14	-15	-13	-13	-9	-7	-7
27	-7	-8	-6	-3	-2	-1	-2	-4	-3	-3	-3	-8	-7	-7	-8	-6	-3	-9	-12	-13	-10	-4	-4	-5
28	-4	-2	0	0	0	1	0	-1	-1	-3	-1	-5	-5	-5	-7	-9	-11	2*	-8	-7	-9	-8	-6	-4
29	-3	-7	-8	-5	-2	0	0	-3	-4	-5	-4*	-2*	-6*	-7	G	-12	-14	-16	-17	-16	-14	-10	-8	-6
30	-5	-6	-7	-3	-1	-1	-4	-2	-7	-7	-5*	-3*	-2*	-6*	-10	G	-10	-10	-10	-14	-11	-8	-8	-7
31	-8	-8	-6	-2	-1	0	-2	-4	-4	-2	-5	-6	-9	-9	G	-6	-10	-12	-13	-14	-12	-9	-6	-6
Med	-8	-8	-8	-6	-5	-4	-4	-4	-5	-5	-5	-7	-6	-7	-8	-9	-11	-12	-13	-13	-12	-10	-9	-8

Sporadic E * Evening signal anomaly G Outage

Table 4k. Tabulation of hourly median signal levels as received at Guantanamo - August 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-7	-8	-8	-7	-6	-2	-4	-6	-6	-6	-4	-5	-4	-3	-7	-7	-11	-14	-14	-14	-11	-6	-6	-6
2	-5	-5	-5	-6	-5	-4	-4	-6	-7	-7	-8	-8	G	G	-7	-12	-13	-13	-12	-7*	-12	-11	-10	-10
3	-7	-9	-9	-8	-7	-4	-5	-6	-7	-9	-11	-13	-12	-6	G	-11	-14	-16	-15	-13	-13	-9	-8	-8
4	-6	-7	-7	-6	-3	-4	-4	-6	-7	-8	-7	-8	-7	-10	-11	-12	-12	-14	-14	-14	-12	-10	-10	-9
5	-9	-9	-7	-5	-3	-4	-3	-5	-6	-6	-5	-7	-9	-10	G	-10	-8#	20#	-10#	11#	-3#	G	-8	-2
6	G	G	-6	-4	-4	-5	-4	-7	-9	-9	-11	-13	-12	-12	-11	G	-12	-15	-15	-15	-13	-10	-9	-8
7	-7	-8	-6	-5	-4	-4	-4	-7	-9	-10	-10	-12	-11	-9	G	-3	-3	-9	-9	-9	-8	-5	-3	-3
8	-6	-5	-5	-2	-1	-1	-1	-3	-5	-7	-7	-8	-7	G	-10	-13	-11	-12	-15	-15	-12	-11	-11	-10
9	-10	-10	-9	-7	-7	-6	-5	-7	-7	-7	G	-11	-12	-13	-13	-13	-15	-17	-16	-15	-12	-11	-11	-11
10	-11	-11	-8	-7	-6	-4	-4	-4	-4	-5	-4	-6	-7	-10	-12	-14	-15	-11	-14	-15	-13	-10	-9	-10
11	-9	-10	-9	-8	-5	-5	-6	-8	-8	-9	-12	-14	-14	-12	-9	-9	-13	-15	-16	-16	-13	-11	-11	-10
12	-10	-6	-5	-6	-5	-3	-3	-5	-3	-4	-7	-8	-9	G	-10	-11	-12	-13	-13	-12	-8*	4*	-7	-8
13	-8	-7	-5	-4	-1	-3	-3	-3	-3	-4	-7	-9	-9	G	-10	-10	-13	-13	-8*	-10	-11	-5*	-10	-11
14	-12	-11	-10	-8	-7	-5	-5	-3	-5	-5	-7	-8	-8	-9	G	-8	-14	-15	-16	-14	-13	-12	-13	-13
15	-15	-13	-10	-7	-9	-10	-8	-11	-9	-3*	-2*	-6	-10	G	G	-13	-15	-14	-17	17	-16	-15	-13	-12
16	-12	-12	-10	-10	-8	-8	-10	-10	-11	-11	-14	G	-11	-10	-11	-13	-14	-16	-15	-16	-15	-14	-13	-12
17	-12	-12	-12	-9	-9	-8	-8	-8	-7	-9	-11	-13	-13	-11	-12	-14	G	-15	-15	-15	-13	-11	-11	-9
18	-5#	29#	-10	-8	-8	-8	-6	-7	-9	-10	-11	-11	-11	-12	-11	-12	-13	-15	-15	-14	-13	-12	-12	-11
19	-11	-11	-11	-10	-8	-9	-9	-9	-10	-11	-12	-12	-12	-13	-13	-15	-15	-15	-16	-15	-14	-10	-10	-11
20	-13	-12	-11	-10	-9	-9	-9	-9	-9	-9	-10	-11	-12	G	-11	-12	-14	-13	-14	-14	-12	-11	-9	-9
21	-11	-11	-9	-9	-8	-8	-4	-2	-3	-5	-5	-8	-7	-6	-9	-11	22#	43#	44#	35#	-12	-13	-11	-12
22	-10	-8	-10	-8	-7	-7	-7	-5	-4	-5*	G	-1*	-4	-5	-9	-8	-10	-12	-13	-13	-12	-11	-11	-12
23	-12	-11	-11	-9	-8	-8	-9	-9	-10	-10	-12	-13	-13	-11	-9	-10	-10	-7	-9	-12	-12	-12	-12	-12
24	-12	-12	-10	-6	-6	-6	-5	-3	-5	-5	-7	-8	-6	-5	-5	-4	-7	-10	-13	-12	-8	-3	-5	-9
25	-12	-12	-10	-8	-7	-8	-10	-10	-11	-10	-9	-10	-12	-11	-9	-11	-12	-11	-14	-13	-12	-11	-11	-11
26	-12	-12	-11	-9	-8	-7	-7	-8	-8	-9	-9	-12	-12	-10	G	-10	-12	-14	-14	-14	-13	-12	-11	-9
27	-11	-11	-9	-10	-8	-9	-8	-7	-6	-10	-12	-12	-11	-10	-8	G	-9	-11	-13	-12	-12	-11	-11	-10
28	-9	-8	-9	-7	-7	-7	-7	-7	-8	-4	1*	0*	-2*	-2*	0*	G	-11	-12	-13	-13	-12	-10	-9	-11
29	-12	-11	-10	-9	-8	-8	-8	-9	-9	-10	-10	-10	-9	-6	-6	G	-7	-10	-14	-14	-13	-11	-11	-10
30	-10	-9	-8	-8	-7	-7	-7	-8	-9	-10	-10	-10	-10	-11	-11	-11	-12	-13	-14	-13	-12	-11	-11	-11
31	-12	-11	-9	-8	-7	-9	-8	-7	-8	-7	-8	-10	-12	-12	-12	-12	-12	-13	-14	-14	-12	-12	-12	-12
Med	-11	-11	-9	-8	-7	-7	-6	-7	-7	-8	-9	-10	-11	-10	-10	-11	-12	-13	-14	-14	-12	-11	-11	-10

Sporadic E * Evening signal anomaly G Outage

Table 4ℓ. Tabulation of hourly median signal levels as received at Guantanamo - September 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-13	-13	-11	-9	-9	-9	-9	-9	-11	-10	-12	-13	-11	-10	-8	-10	-13	-14	-13	-13	-11	-11	G	G
2	G	G	G	G	G	G	G	G	G	-9	-13	-14	-13	-12	-13	-15	-13	-14	-16	-15	-15	-14	-14	-13
3	-13	-11	-10	-9	-10	-9	-9	-8	-10	-9	-8	-11	-12	-9	-10	-10	-12	-12	-15	-14	-13	-13	-12	-13
4	-14	-12	-11	-10	-9	-10	-7	-7	-8	-9	-9	-10	-12	-7	-3	-10	-13	-13	-14	-14	-12	-11	-10	-11
5	-11	-10	-10	-8	-8	-8	-10	-7	-7	-6	-8	-9	-9	-9	-12	-12	-14	-14	-15	-16	-8	-7	-9	-11
6	-10	-9	-8	-6	-2	-5	-5	-5	-7	-7	-9	-7	-6	-8	-8	-10	-11	-12	-11	-7*	-5*	-8	-6	-2*
7	-10	-10	-9	-7	-7	-7	-7	-6	-7	-9	-6	-6	-6	-6	-6	-5	-10	-12	-11	-11	-11	-11	-11	-12
8	-12	-12	-11	-8	-9	-9	-8	-8	-8	-8	-9	-12	-12	-10	-10	-11	-9	-12	-13	-12	-12	-12	-11	-11
9	-12	-10	-9	-8	-7	-8	-8	-9	-9	-9	-10	-7	-11	-11	-12	-12	-14	-12	-13	-14	-12	-12	-12	-14
10	-12	-13	-12	-10	-9	-9	-9	-9	-9	-10	-11	-10	-10	-9	-8	-7	-10	-12	-14	-14	-14	-13	-12	-14
11	-13	-12	-10	-9	-8	-9	-10	-9	-9	-9	-10	-12	-14	-13	-13	-12	-14	-14	-15	-14	-10	-8	-7	-12
12	-12	-12	-10	-8	-7	-8	-8	-9	-8	-10	-12	-12	-12	G	32#	23#	48#	19#	-7	-11	-11	-11	-10	-11
13	-12	-11	-9	-8	-8	-8	-7	-7	-8	-9	-11	-9	-11	-10	-10	G	G	G	G	G	G	G	G	G
14	G	G	G	G	G	-6	-5	-7	-7	-8	-8	-10	-9	-11	-10	-10	-11	-12	-13	-12	-12	-11	-7	-10
15	-12	-11	-9	-8	-8	-9	-8	-6	-5	-7	-9	-12	-11	-12	-13	-13	-14	-14	-13	-14	-13	-12	-9	-11
16	-12	-12	-11	-9	-8	-8	-9	-8	-7	-8	-8	-12	-12	-12	-12	-12	-14	-15	-15	-15	-12	-11	-12	-13
17	-12	-12	-10	-8	-7	-5	-9	-10	-10	-11	-12	-14	-12	-12	-13	-14	-13	-14	-13	-15	-13	-12	-12	-9
18	-11	-11	-10	-9	-8	-8	-10	-9	-9	-11	-11	-10	-11	-11	-11	-12	-12	-13	-16	-14	-15	-14	-10	-14
19	-12	-13	-10	-9	-8	-10	-9	-8	G	G	G	G	G	-12	-10	47#	61#	46#	34#	-8	-12	-10	-12	-12
20	-13	-11	-10	-9	-9	-8	-9	-7	3#	28#	-9	-12	-11	-12	-11	-12	-13	-13	-15	-15	-15	-11	-15	-14
21	-11	-12	-10	-10	-10	-10	-10	-11	-10	-9	29#	36#	-11	-11	-10	21#	20#	-12	-14	-16	-13	-13	-11	-8
22	-14	-12	-11	-9	-7	-9	-8	-9	-9	-10	-9	-11	-9	-8	-9	-9	-6	-5*	-7	-14	-12	-12	-11	-12
23	-14	-13	-11	-9	-8	-10	-10	-10	-10	-11	-9	-7	-9	-7	-11	-13	-14	-16	-14	-14	-12	-13	-16	-16
24	-15	-12	-10	-9	-9	-9	-9	-10	-11	-12	-12	-11	-11	-12	-11	-11	-13	-14	-11	-12	-12	-13	-13	-14
25	-14	-12	-11	-11	-9	-10	-10	-10	-10	-10	-10	-12	-14	-12	-13	-13	-13	-14	-14	-13	-13	-12	-14	-15
26	-13	-11	-10	-9	-9	-9	-10	-7	-9	-12	-12	-11	-10	-11	-5#	-6#	-2*	-4*	-6*	-9	-12	-11	-12	-12
27	-15	-14	-11	-9	-9	-9	-9	-8	-10	-11	-12	1*	1*	0*	-2*	-3*	-5*	-9	-2*	-10	-11	-12	-13	-15
28	-13	-11	-10	-9	-8	-6	-8	-8	-9	-10	-11	-12	-11	-9	-10	-10	-10	-11	-9	-10	-11	-10	-13	-13
29	-12	-12	-10	-8	-8	-8	-8	-9	-11	-11	-12	-12	-10	-10	-12	-13	-15	-15	-15	-12	-6*	-9	-11	-11
30	-10	-12	-11	-9	-8	-9	-8	-9	-9	-13	-12	-13	-13	-9	-9	-12	-15	-15	-14	-14	-14	-13	-12	-14
Med	-12	-12	-10	-9	-8	-9	-9	-8	-9	-9	-10	-11	-11	-10	-10	-11	-13	-13	-13	-14	-12	-12	-12	-12

Sporadic E * Evening signal anomaly G Outage

Table 5a. Tabulation of hourly median signal levels as received at Onna - October 1957.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	-1*	-2*	-2*	-4	-4	-4	-3	0	5*	7*	-2	-3	-5	-6	-4	-7	-9	-6	7#	G	-1*	28*	37*	36*
2	6*	8*	12*	-4	-3	-2	-1	-2	-2	-2	-3	-5	-6	-6	-4	-7	-7	-6	-5*	6*	12*	20*	34*	41*
3	4*	-5	-6	-4	-1	-2	-1	-1	-5	-4	-6	-6	-7	-6	-6	-7	-7	-7	-6*	7*	11*	27*	33*	34*
4	-4	-4	-2	-2	-1	-2	-2	-3	-3	-5	-3	-6	-4	-7	-8	-8	-8	-8	-8	4*	17*	29*	25*	35*
5	-8	4*	-4	-6	-5	-4	-4	-4	-3	-4	G	G	-9	-8	-4*	-2*	G	-9	-7	9*	-1*	-4	-5	-3
6	-5	-6	-5	-4	-4	-3	-3	-4	-5	-4	-3	-2	-6	-7	-6	-2*	-2*	-9	13#	13*	8*	28*	35*	22*
7	-1*	-3	-5	-4	-3	0	G	-4	-4	-4	-5	-6	-6	G	-5	-7	-2*	0*	-1*	9*	11*	29*	27*	-2*
8	-6	-5	-5	-2	-3	-3	-3	-4	-3	-4	-4	-6	-8	-7	-9	-9	-9	-6*	4*	9*	28*	27*	26*	-1*
9	5*	-5	-3	G	-1	5*	-2	-3	-4	-5	-7	-8	-10	-10	-9	-9	-6*	-1*	3*	4*	-3	26*	7*	20*
10	-3*	-6	-6	-5	-3	-3	-2	-2	-4	-6	-7	-9	-10	-9	-9	-7	-7	-9	-8	-9	-3*	-3*	1*	4*
11	4*	2*	1*	-2	-3	-3	-2	-3	-5	-6	-6	-7	-8	-9	-9	-9	-7	-9	-6*	7*	-1*	-1*	1*	1*
12	1*	0*	2*	2*	1*	-3	-1	-4	-6	-7	-8	-9	-10	-10	-10	-10	-6	-9	-10	-5*	-2*	-4	-5	-5
13	-1	4*	3*	0	-3	-4	-3	-3	-3	-4	-4	-6	-8	-9	-7	-10	G	-9	-7	10*	9*	6*	12*	13*
14	9*	1*	-3	-4	-4	-4	-4	-5	-1	-1	-3	-6	-3*	-10	-10	-5	-9	-9	-9	-8	1*	9*	8*	10*
15	5*	-3	-4	-4	-3	-2	-3	-3	-5	-6	-5	-8	-9	-9	-2*	-8	-10	-10	-11	4*	2*	-2*	23*	27*
16	25*	1*	-2	-1	-3	-1	-3	-3	-5	-6	-7	-7	-6	-7	-7	-5	-4	-6	-6	0*	-3	-5	-6	-2
17	-6	-6	-5	-5	-4	-4	-4	-5	-6	-6	-7	-6	-7	-6	0*	G	G	G	G	-1*	7*	12*	14*	15*
18	12*	6*	-2	-4	-3	-3	-5	-5	-6	-8	G	G	G	G	G	G	G	G	4*	6*	9*	25*	15*	-1*
19	10*	0*	0*	-1	-3	-3	-4	-5	-5	-7	-8	-9	-10	-11	G	G	-10	-8	2*	9*	7*	17*	22*	-5
20	1*	6*	4*	-1	-2	-2	0	-4	-5	-5	-4	-5	-9	-10	-8	-9	G	-5	-7	12*	5*	22*	32*	5*
21	4*	-1*	-4	-3	-4	-2	-2	-4	-4	-4	-4	-8	-7	-7	-8	-6	-10	-10	-5*	9*	10*	21*	14*	3*
22	-4	-5	-1	1	0	L	-1	-3	-4	-5	-5	-7	-8	-5	-7	-8	-8	7*	12*	10*	8*	2*	-5	-8
23	-9	-8	-6	-4	-3	-1	-2	-3	-4	-5	G	G	-8	-11	-11	-11	-5*	-5*	6*	2*	0*	-4	-6	1*
24	10*	2*	-3	-3	-3	-2	-1	-3	-5	-6	-6	-7	-8	-9	-10	-9	-10	-9	-8	0*	-1*	3*	-3*	-2*
25	1*	2*	3*	1	0	-2	-4	-4	-5	-6	-6	-6	-5	-7	-7	-7	-7	-8	2*	7*	2*	3*	-1	-6
26	-8	-2*	10*	6*	4*	0	-2	-4	-4	-4	-4	-5	-5	-5	0	-2	G	G	G	G	G	G	G	G
27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	-4	-4
30	G	G	G	G	G	G	G	G	G	-5	-5	-6	-7	-7	-6	-9	-8	-8	-5	4*	8*	6*	4*	-2
31	-4	-7	-6	-4	-3	-3	-3	-5	-5	-6	-5	-5	-4	-4	-3	1*	1*	0*	4*	1*	-1	1*	-4	-6
Med	1	-2	-3	-4	-3	-2	-3	-4	-4	-5	-5	-6	-7	-7	-7	-7	-7	-8	-5	6	5	9	10	1

Sporadic E * Evening signal anomaly G Outage

Table 5b. Tabulation of hourly median signal levels as received at Onna - November 1957.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-5	-5	-4	-1	-1	-3	-2	-3	-2	-1	-2	-6	-4	-7	-7	-8	-8	-3*	-1*	2*	2*	0*	-1*	-6
2	-4	-4	-2	1*	2*	1*	-3	-1	-3	-4	-4	-4	-4	-5	-7	-7	-8	-7	-8	-4*	-4*	-4*	-7	-8
3	-7	-5	-3	0	-1	-4	-5	-6	G	-5	-5	-4	-7	-2	-5	-5	-4*	1*	2*	2*	-4*	1*	-3*	-7
4	-8	-7	-3	-3	-3	-3	-4	-5	-5	-6	-7	-6	-9	-8	-8	-7	-9	-5*	-1*	0*	-3*	0*	3*	0*
5	-5	-3	-5	-2	-1	-2	-4	-5	-5	-6	-5	-7	-6	-5	-8	-6	-7	-8	-6	-2*	-6	-2*	-5	-7
6	-9	-5	-3	0*	5*	4*	-2	-2	-4	-2	-3	-3	-2	-4	-4	-5	-7	-4*	7*	7*	3*	0*	-1*	-9
7	-10	-7	-5	-2	4*	5*	-1	-5	-6	-6	-4	-4	-4	-7	-8	-7	G	-5*	-4*	-4*	-7	-7	-6	-5
8	-7	-7	-6	-6	-5	-4	-4	-3	-3	-4	-4	-6	-8	-9	-9	-8	-7	-10	-6*	-1*	-4*	-5	-7	-6
9	-6	-5	-3	-5	-5	-4	-4	-5	G	G	G	G	-3	-2	-3	-5	-6	-6	-5*	-4*	-1*	-3*	-5	-6
10	-8	-8	-6	-6	-6	-6	-4	-7	-5	-5	-4	-4	-9	-8	-8	-10	-9	-7*	-6*	-4*	-4*	-5	-5	-5
11	0*	0*	2*	0*	-2*	-4	-5	-5	-5	-8	-7	-9	-9	-10	-10	-9	-10	G	G	0*	0*	-2*	-5	-5
12	-5	-7	-6	-6	-5	-7	-6	-7	-7	-6	-9	-10	-9	-9	-8	-10	-10	-9	-6	-2*	-2*	-4*	-5	-5
13	0*	2*	1*	-3*	-2	-6	-6	-6	-6	-6	-7	-8	-7	-8	-5	-7	-9	-9	4*	6*	2*	-2*	-4	-6
14	-7	0*	3*	1*	1*	-4	-5	-5	-3	-4	-5	-8	-9	-7	-7	-10	G	-8	-2*	0*	7*	4*	4*	-1*
15	1*	-4*	-6	-7	-6	-6	-5	-5	-6	-6	-7	-7	-7	-8	-10	-11	-11	-11	-8*	-1*	G	-4*	-7	-6
16	-6	-8	-8	-5	-6	-6	-6	-6	-6	-7	-8	-8	-7	-7	-8	-5	-8	-10	-9	-8	-9	-11	-12	-12
17	-10	-10	-8	-6	-6	-7	-6	-8	G	-5	-5	-6	-6	-6	-7	9#	0*	10*	11*	0*	-6	-4	-7	-9
18	-8	-6	-3	-4	-4	-6	-5	-6	-6	-5	-7	-9	-7	-8	-6	G	-10	G	G	P	P	P	P	P
19	G	-6	-4	-4	-4	-5	-5	-6	-5	-4	-6	0	0	G	G	G	G	1*	2*	P	P	P	P	P
20	-10	-5	-4	-3	-5	-6	-5	-6	-7	-8	-4	-4	-4	-5	1	-10	-7	-3*	-3*	P	P	P	P	P
21	-2*	-5*	-3*	-3	-5	-5	-6	-7	-8	-7	-8	-8	-10	G	G	-6	-8	-1*	G	2*	7*	6*	3*	-1*
22	-3*	-1*	-3	G	G	G	G	G	-7	-6	-7	-7	-5	-8	-6	-6	-8	0*	4*	2*	7*	6*	-1*	-8
23	-9	-7	-5	-5	-5	-4	-5	-4	-5	-4	-5	-7	-7	-6	-5	-10	-12	-7*	11*	2*	-4*	-7	-10	-6
24	-8	-9	-7	-6	-5	-4	-4	-3	-2	-1	-2	-5	-5	-6	-6	-6	-9	-8	-6*	-1*	1*	1*	-2*	-9
25	-8	-7	-6	-6	-4	-4	-5	-4	-2	-2	-2	2	-1	G	G	-5	-10	-11	-12	-7	5*	5*	-7	-7
26	-7	-8	-5	-3	1	-3	-5	-4	-5	-4	-4	-5	-5	-5	-5	-8	-10	-7	2*	1*	-2*	-5*	-4*	-2*
27	-5*	-7	-6	-4	-5	-3	-4	-4	-4	-5	-6	-5	-7	-8	-9	-9	-7	-4*	0*	1*	-1*	3*	-5	-9
28	-11	-10	-7	-6	-6	-5	-5	-5	-5	-5	-5	-6	-3	-3	-6	-10	-11	-11	0*	4*	-1*	-7	-10	-11
29	-5*	-5	-5	-5	-5	-4	-4	-5	-4	-5	-6	-7	-7	-7	-2	-4	4*	4*	12*	5*	-5	-8	-8	-1*
30	-4*	-5*	1*	-4	-5	-5	-6	-5	-5	-5	-6	-8	-10	-11	-12	-12	-13	-11	1*	3*	-1*	-5	-6	-7
Med	-7	-6	-5	-4	-5	-4	-5	-5	-5	-5	-5	-6	-7	-7	-7	-7	-8	-7	-1	0	-2	-3	-5	-6

Sporadic E * Evening signal anomaly G Outage P Pulse test

Table 5c. Tabulation of hourly median signal levels as received at Onna - December 1957.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-8	-7	-2	-2	-3	-3	-3	G	G	-4	-4	-6	-4	-2	-3	G	-3	3*	6*	7*	5*	7*	12*	8*
2	-3	-3	1	1	1	-2	-2	G	-4	-4	-3	G	-7	-6	-4	-5	G	56#	32#	6*	6*	1*	-6	-9
3	-8	-6	-6	-4	-2	-3	-2	G	-6	-5	-3	-4	-6	-6	-6	G	-1*	5*	3*	4*	-1*	3*	-4*	-9
4	-9	-6	-3	-1	1	-1	-2	G	-3	-5	-3	-4	-5	-7	-2	-9	G	-1*	4*	5*	0*	-2*	2*	-1*
5	-3	-4	-3	-2	-2	-3	-3	G	-2	-2	-2	-3	-6	-6	-8	-10	-9	0*	3*	-2*	-2*	4*	-2	-3
6	-2	-3	-2	-3	-4	-3	-4	G	-2	-2	-2	-3	-4	-5	-6	-7	G	-3	7*	8*	4*	1*	4*	5*
7	0*	8*	1*	-2	-2	-2	-2	1	-1	-2	G	-4	-5	-8	-8	-8	G	G	G	G	G	G	G	G
8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	0*	-1*	-2*	0*	-6	-10
10	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
11	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	-5	5*	6*	-1*	-5	-2	-3
12	-3	-3	-3	-3	G	0	0	-2	-4	-5	-6	-6	-8	-8	-9	-9	-9	-6*	-5*	-10	-7	-7	-6	-5
13	-5*	-4	-2*	2*	1	3	3	3	0	-2	-2	-7	-7	-10	-10	-10	-12	-12	-6*	-4*	-2*	8*	8*	4*
14	1	2	0	1	4	6	4	4	1	3	4*	2*	-3	5*	12*	1*	-7*	-4*	-8*	-4*	7*	0*	0*	-3
15	-6	-5	-2	-4	-4	-4	-4	-2	G	-4	-5	-6	-7	-5	-7	-8	-11	-11	-3*	-4*	-1*	0*	1*	-3*
16	-6	-8	-5	-3	-3	-3	-3	-4	-2	-2	-1	0	-1	-6	-6	7#	12*	5*	7*	0*	-2*	-4	-5	-5
17	-4	-7	-5	-4	-4	-3	-2	-3	-3	-2	-4	-5	-5	-6	-7	-8	-7	-4*	-3*	-7	-8	-9	-10	-9
18	-10	-10	-7	-5	-5	-3	-3	-2	-1	-1	-2	-1	-3	-3	-5	-7	-7	-7	-1*	-1*	G	1*	0*	-3*
19	-2*	-3*	G	-3	-6	-4	-4	-3	-3	-4	-2	-1	-5	-5	-7	-10	G	-6	-1*	1*	-3*	-1*	2*	1*
20	-4*	-6	-6	G	G	-4	-5	-4	-5	-5	G	G	-8	-8	G	-10	-9	G	-6*	-10	-12	-11	-11	-9
21	-9	-8	-7	-5	-6	-5	-3	-4	-6	-4	-3	1*	3*	-1*	-7	-6	G	3*	6*	2*	-3*	-5*	-4*	-4*
22	2*	-5	-6	-6	-4	-4	-3	-4	-5	-5	-5	-5	-4	-4	-8	-9	G	-10	1*	1*	-1*	-2*	0*	-4*
23	-6	-5	-5	-5	-4	-4	-4	-4	-4	-3	-3	1*	3*	0*	-6	-9	-10	-1*	6*	2*	-2*	1*	3*	4*
24	4*	-1*	-5	-4	-4	-5	-5	-4	-2	-2	-5	-5	-4	-6	-8	-10	-10	-3*	-3*	0*	-2*	-3*	0*	3*
25	0*	-2*	-6	-7	-6	-6	-4	-4	-2	-4	-6	-8	-6	-9	-4	-7	-6	-6	2*	G	G	G	G	-2*
26	-6	-6	-1*	-1*	2*	-3	-5	-4	-3	0	2	2	-1	-4	-5	-12	-13	-14	-4*	0*	-1*	1*	1*	-3*
27	-2*	3*	1*	-3	-4	-4	-4	-4	G	-1	2	1	2	-4	-7	-5*	-2*	-9	-2*	-4*	-7	-1*	6*	4*
28	-1*	-5	-6	-5	-5	-4	-4	-4	-3	-5	-4	-4	-4	-7	-8	-10	-9	2*	4*	7*	4*	1*	-1*	-2*
29	-7	-8	-7	-7	-6	-6	-6	-6	G	-2	0	-2*	-1*	-6	-9	-11	-14	-13	-5*	0*	-1*	-4*	1*	-6
30	-5	-5	-5	-3	-3	-5	-5	-6	-5	-3	-5	-4	G	2*	-6	-8	-9	-2*	2*	5*	0*	-5*	-7	-4*
31	1*	-2*	-4	-6	-4	-4	-5	-4	-4	-2	-1	-2	-2	-7	-9	-10	G	8*	7*	4*	2*	-1*	-5*	G
Med	-4	-5	-5	-3	-4	-3	-3	-4	-3	-3	-3	-4	-4	-6	-7	-9	-9	-4	1	0	-1	-1	0	-3

Sporadic E * Evening signal anomaly G Outage

Table 5d. Tabulation of hourly median signal levels as received at Onna - January 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	G	G	G	-5	-5	-4	-3	-3	-2	-4	-5	-7	-7	5#	-8	5#	-5*	5*	7*	8*	5*	5*	0*	-4
2	-6	-6	-6	-6	-5	-5	-5	-4	-4	-3	-3	1	-3	-5	-6	-9	-6	-7	-8	2*	-3*	-7	-8	-8
3	-7	-6	-5	-4	-1	-2	-3	-3	-3	-3	3	1	-2	0	36#	50#	23#	9*	-9	-10	-9	-8	-7	-4*
4	1*	3*	3	1	6	6	5	6	4	4	5	2	-2	-5	G	-7	-10	-10	-5	-10	-8	-4	-3	-6
5	-6	-4	-4	-6	-4	-4	-4	-3	-4	-5	-4	-5	-4	-5	-7	11#	18#	14*	15*	8*	-3*	-7	-10	-11
6	-11	-9	-7	-6	-6	-4	-4	-4	-4	-2	-1	2	1	1	-1	1	5*	4*	3*	1*	6*	6*	1*	-2
7	-3	-4	-3	-3	-4	-4	-5	-5	-5	-5	-4	-3	-1#	9#	3#	-1	-1	12*	8*	4*	6*	3*	3*	1*
8	0*	-7	-8	-8	-6	-6	-5	-5	G	-1	0	3	4	0	-1	-10	-13	-12	-3*	4*	11*	13*	6*	-5
9	-3	-4	-5	-5	-5	-5	-5	-3	-4	-3	-1	-2	-5	-7	-8	-12	1*	1*	3*	8*	9*	8*	-3*	-7
10	-9	G	G	G	G	G	G	G	-6	-5	-5	-4	-5	-9	-11	-12	-14	-15	-2*	-3*	-5*	-4*	-7	-6
11	-2*	-1*	0*	-3	-2	-1	-6	-5	-5	-1	0	-2	-7	-10	-12	-13	-15	-15	-16	-4*	14*	11*	5*	2*
12	1*	0	-3	-2	-3	-4	-2	-4	-4	2	6	1	-1	-6	-1	14*	12*	14*	15*	14*	7*	-1	-7	-3
13	-1	-1	0	-2	-4	-5	-6	-5	-5	-4	-1	-4	-4	-5	-9	-8	-13	-14	-8	15#	14#	11#	11*	6*
14	2	0	L	0	-1	-4	-5	-5	-5	-3	-2	-4	-4	-6	-7	-8	-1*	8*	10*	9*	3*	-1*	-4	-7
15	-8	-8	-7	-6	-6	3*	7*	-4	-2	4	6#	2#	-6	8#	-2#	-8	-7	G	-6	3*	5*	1*	-7	-9
16	-8	-8	-6	-4	-4	-4	-4	-5	1	5	1	-4	6#	10#	-4	-10	G	G	13*	10*	7*	1*	-5	-8
17	-8	-7	-5	-4	-4	-5	-5	-4	1	6	4	1	-1	-3	-10	-8	-6	-8	-7	-2*	-3*	-6	-11	-11
18	-11	-10	-8	-7	-5	-5	-4	-4	-3	-1	-3	-1	0	34#	16#	7#	G	G	G	G	5*	0*	-4*	-8
19	-10	-10	-9	-9	-8	-8	-7	-6	-6	-4	-2	-3	-6	-7	-10	-12	G	G	21*	14*	6*	5*	0*	0*
20	-4*	-9	-10	-9	-8	-7	-8	-7	-7	-7	-5	-4	-5	-8	-8	-9	0*	9*	11*	11*	2*	2*	5*	1*
21	-5*	-7	-9	1*	-5	-6	-7	-7	-6	-7	-6	-6	-7	-9	-8	-10	-11	-8	0#	13#	8*	3*	-1*	-6
22	-7	-4	0*	-3*	-5	-6	-6	-6	-6	-4	-2	-5	-7	-2	-1	-4	G	-11	-9	-3*	-1*	-5*	0*	4*
23	-4	-5	-5	-7	-7	-6	-6	-6	-6	-8	-6	G	G	G	G	G	-8	G	G	G	G	G	G	G
24	G	G	-4	-3	-5	-3	-5	-6	-6	-6	-6	-7	-7	-9	-10	-13	-15	-16	5*	6*	3*	-5	-3	-9
25	-11	-10	-3*	1*	-1*	-3	-5	G	-4	4	9	9	G	G	G	G	G	G	-9	-3*	-6*	-11	-11	-7
26	-9	-7	G	-8	-7	-4	-8	-6	G	1	-1	-6	-9	-10	-12	-10	G	-16	-17	-1*	9*	-1*	-3*	-4
27	3*	9*	9*	4*	-1	-3	-5	-5	-5	-5	-3	-5	-8	-12	-13	-15	-14	G	G	G	G	G	G	G
28	G	G	G	G	6*	10*	9*	-4	-1	4	-2	-6	-8	-9	-10	-10	-10	-12	-13	-14	-3*	0*	1*	-3
29	-6	-7	-8	-7	-6	-6	-6	-6	-5	-4	-4	-5	-6	-10	-10	G	G	-9	G	G	G	G	G	G
30	G	G	G	-3	-7	-8	-6	-6	-5	-3	G	G	-9	-12	-12	G	G	-13	-9	1*	3*	1*	-9	-11
31	-9	-9	-6	-3	1*	-5	-7	-7	-7	-7	G	G	G	-13	-15	-15	-14	-8	5*	4*	4*	-12	-9	-9
Med	-6	-7	-5	-4	-5	-4	-5	-5	-5	-3	-2	-4	-5	-6	-8	-9	-7	-8	-2	4	4	0	-3	-6

Sporadic E * Evening signal anomaly G Outage

Table 5e. Tabulation of hourly median signal levels as received at Onna - February 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-5	-6	-7	-8	-8	-9	-8	-8	-7	-3	-1*	G	2*	-5	-9	-9	-6	-17	-20	1*	2*	11*	8*	33*
2	30*	5*	3*	-2*	-5	-6	-6	-7	-7	-9	-8	-9	-12	-14	-16	-16	-16	-17	-11	8*	3*	3*	2*	-2*
3	-5	-9	-8	-8	-8	-7	-7	-7	-8	-4*	-1*	0*	1*	-4*	-12	-11	-10	-17	-19	-9*	1*	2*	1*	0*
4	9*	-3	-4	-7	-8	-8	-8	-7	-7	-2	0*	-1*	-1*	-1*	2*	-5*	-14	-18	-20	-14	-3*	1*	-3*	-5
5	-4	-1*	1*	-7	-6	-7	-4	-6	-7	-4	-7	-7	-2*	-3*	-13	-13	-12	15#	8*	-3*	2*	-10	-13	-12
6	-11	-10	-9	-7	-3	-4	-6	-5	-6	-5	-7	-8	-10	-12	-15	-16	-15	-16	-8*	-10	-5*	-9	-4*	0*
7	0*	-1*	-4*	-7	-7	-7	-7	-4	-4	-6	-6	-9	-9	-3*	-6*	1*	G	-7*	-19	-7*	5*	7*	0*	-4*
8	-5*	-5*	-7	-3*	5*	4*	-5	-4	-6	-6	-8	-9	-10	-12	-14	-15	-15	-17	-18	-10*	4*	5*	-5*	-9
9	-7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	3*	G	G	G
10	G	G	G	G	G	-6	G	G	G	G	G	-8	-11	-12	-11	-15	-14	G	G	2*	1*	1*	1*	-11
11	-7*	-7*	-8	-8	-3*	-2*	-6	-8	-8	-4	9*	13*	5*	6*	-12	-13	-15	-16	-19	-6*	-7*	-10	-10	-12
12	-13	-12	-10	-10	-8	-5	-3	3*	4*	1*	1*	-6	-7	-11	-14	-12	-7*	-12	-17	-17	-2*	-6*	-6*	7*
13	1*	-2*	-6	-5	-7	-6	-6	-6	-7	-7	-7	-8	-7	-6	-1*	-11	-15	-7*	-4*	1*	10*	4*	-3*	-5*
14	-5*	-7	-7	-7	2*	0*	-6	-6	-5	-4	-6	-5	-7	-10	-11	-11	G	-4*	8*	8*	1*	-4*	-3*	-5*
15	-7	-4*	5*	0*	0*	-1*	-4	-6	-6	-7	-7	G	G	G	G	G	-4*	-6*	3*	9*	10*	5*	-4*	-8
16	-9	-5*	-3*	-1*	-5	G	G	G	G	G	-7	-8	-9	-11	-14	-15	-13	1*	2*	1*	-4*	-4*	22*	31*
17	19*	-7	-9	-7	-6	-7	-7	-6	-6	-3	-6	-7	-4	-11	-13	-13	-15	-17	-19	-4*	1*	0*	-8	-9
18	-6	-3	-8	-7	-8	-8	-8	-7	-7	-6	-7	-9	-11	-9	-11	-3*	-14	-15	-20	-12*	-6*	-7*	-7	-8
19	-9	-10	-9	-8	-7	-3*	-5	-7	-7	-8	-7	-8	-11	-11	-13	-14	-14	-16	8*	12*	0*	6*	-3*	G
20	G	G	-8	-8	-7	-6	-5	-2	-5	-7	-8	-9	-10	-10	G	G	G	-19	-1*	G	G	G	G	-8
21	-11	-11	-8	-7	-6	-6	-6	-7	-6	-6	-8	-7	-7	-11	-13	-14	G	G	G	2*	G	-2*	-5	-9
22	-10	-12	-10	-10	-8	-6	-5	-1	1*	-1	-3	-5	-8	-12	-12	-13	-16	-17	-17	-7*	-10	-12	-12	-12
23	-12	-12	-10	-9	-7	-7	-7	-7	-6	-6	-5	-5	-5	-4*	-1*	-6	G	-10	-16	-4*	4*	3*	-2*	-8
24	-7	-7	-7	-7	-7	-5	-4	-6	-7	-6	-7	-9	-10	-12	-12	-10	-4*	-6*	-12	-8*	-8*	5*	28*	10*
25	-9	-11	-8	-7	-7	-6	G	-4	-4	G	G	G	-11	-13	-13	-14	-16	-15	-11*	-11*	-14	16*	20*	17*
26	3*	6*	0*	-3*	-6	-6	-7	-3	-1	-1	-3	-4	-6	-8	-9	-13	-16	-15	-17	-15	-13	-13	3*	3*
27	6*	1*	-5*	-8	-8	-8	-5	-6	-4	-6	-6	-9	-9	-9	-13	-13	-14	-14	-15	-6*	-7*	-3*	-8	-11
28	-11	-11	-10	-6	-4	-3	-5	-4	-4	-4	-6	-6	-3	-7	-10	-11	-13	-18	-7*	-8*	-13	-13	-12	-11
Med	-7	-7	-8	-7	-7	-6	-6	-6	-6	-6	-6	-8	-8	-10	-12	-13	-14	-15	-15	-6	0	0	-3	-7

Sporadic E * Evening signal anomaly G Outage

Table 5f. Tabulation of hourly median signal levels as received at Onna - March 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-9	-7	-9	-8	-7	-8	-7	-7	-7	-7	G	-11	-13	-18	G	G	-15	-16	-20	-7*	12*	26*	22*	24*
2	-6*	-8	-5	-4	-5	-5	-6	-6	-6	-5	-6	-9	-9	-11	-12	-12	-13	-16	-16	-6*	-9*	-5*	0*	-5
3	-8	-7	-7	-8	-6	-6	-5	-5	-6	-7	-6	-10	-10	-11	-12	-13	-12	-15	-12*	4*	-1*	-1*	-2*	0*
4	-1*	-4	-7	-7	-7	-6	-6	-5	-5	G	G	G	G	G	-16	-18	-18	-19	-18	-7*	-4*	-6*	-3*	2*
5	10*	-6*	-7	-10	-7	-7	-7	-7	-7	-7	-6	-7	-7	-11	-13	-13	-13	G	G	G	G	G	G	G
6	-8	-9	-8	-4*	-9	-8	-7	-7	-3	-6	G	-11	-15	-16	-17	-16	-18	G	G	G	-9*	0*	11*	17*
7	-9	-11	-10	-8	-7	-7	-7	-6	G	-7	-6	-2*	-12	-13	-14	-14	-16	-17	-20	-17	3*	-2*	-4*	-8
8	-11	-10	-5	-9	-8	-7	-6	-3	-5	-7	-7	-2*	-9	-13	-13	-13	-15	-14	-7*	-6*	-11	-14	-14	-14
9	-13	-13	-7	-7	-8	-7	-4	-7	-7	G	-7	-9	-10	-11	-13	-13	-12	-14	-10*	-6*	-11	-13	-13	-9
10	-5*	-2*	-8	-8	-9	-7	-7	-3	-8	G	G	G	G	G	-15	-16	-15	-18	-8*	-5*	-10*	-11	-12	-13
11	-13	-13	-12	-8	-1*	-4	-4	-6	-6	-6	-8	-8	-8	-6	-13	-13	-14	-19	-18	-6*	-6*	22*	26*	30*
12	13*	-9	-10	-3*	-5	-7	-7	-8	-6	-8	G	-11	-11	-13	-7	G	G	16*	7*	3*	4*	9*	7*	-10
13	-8	-11	-10	-9	-7	-7	-6	-4	-6	-5	-6	-6	-5	-13	-13	-11	-12	-14	-2*	-3*	-7*	-12	-13	-13
14	-9	-10	-10	-9	-9	-1	-5	-1*	0*	-3	-4	-2*	-3*	-12	-13	-14	-16	-16	-13	-9*	-13	-9	-12	-12
15	-14	-12	-9	3*	-4	-6	-7	-8	-6	G	3*	0*	-3*	-1*	-2*	-9	-16	-16	-17	-12	-13	-13	-6*	-7
16	-10	-8	-7	-3*	-7	-6	-6	-5	-5	1*	-4	-6	-7	G	G	G	G	G	-21	-4*	-7*	-10	-10	-12
17	-13	-13	-12	-9	-6*	-3*	-5	-7	-8	-8	-8	-9	-5*	-8*	-16	-16	-19	-20	-21	-5*	-6*	-9*	-12	-13
18	-12	-14	-13	-11	-9	-9	-8	-5	-7	-5	-6	-7	-4*	-8*	-13	-14	-15	-18	-20	1*	3*	0*	-5*	-8
19	-11	-12	-12	-11	-12	-7	-6	-6	-6	-3	-6	-7	-11	-7	-9	-11	-6*	-17	-19	-15	-12	-5*	-7*	-8
20	-10	-11	5*	-4	-5	-5	-6	-7	-7	-3	-3	-3	0*	-6	-5	-7	-6	-9	-13	-11*	-11*	28*	35*	8*
21	11*	1*	-3*	-6	-7	-5	-5	-6	-4	-3	-5	-5	-8	-11	-12	-12	-4*	-17	-17	-5*	-7*	-4*	5*	0*
22	-4	-4	-8	-7	3*	0*	1*	-3	-2	-5	-1*	-5	-4*	-5*	-9	-13	-15	G	-6*	-3*	-9*	12*	33*	23*
23	29*	23*	15*	-6	-7	-7	-5	-5	G	-7	-8	-8	-9	-7	-7	-11	-11	-17	-14	-2*	-3*	-2*	-4*	-7
24	-10	-10	-8	-8	-3	-4	-1	-6	-9	-9	-10	-12	G	G	-13	-11	1#	1*	5*	5*	-1*	-1*	-6	-5
25	-9	-12	-11	-8	-6	-6	-7	-7	-7	-7	-8	-11	-13	-14	-15	-15	-17	-17	-5*	0*	-4*	-7*	29*	1*
26	-1*	-8	-8	0*	0	-5	-4	-6	-3	-4	-4	-5	-7	-6	-12	-14	-16	-17	2*	5*	2*	29*	28*	9*
27	2*	-4*	-8	-6	-7	-7	-7	-5	1*	-6	-10	-11	-15	-15	-14	-15	G	-17	-7*	3*	-3*	-10	-10	-11
28	-14	-13	-12	-11	-10	-8	-7	-9	-8	-8	-8	-9	-9	-8	-12	-9	G	15*	21*	15*	-5*	1*	9*	3*
29	19#	-3#	-5	-3	-4	-6	-6	-6	-2	G	-6	-7	-10	-13	-12	-15	-15	-17	-4*	2*	0*	12*	31*	15*
30	33*	-7	-10	-10	-9	-8	2*	-8	G	-11	-12	-13	-13	-14	-14	-13	-17	-16	-5*	3*	-1*	-8	-8	16*
31	14*	3*	-1*	-8	-10	-7	-7	-6	-2	-11	-11	-2*	0*	-4*	-6*	-12	-16	-20	-21	-14	-15	-13	-13	-13
Med	-8	-9	-8	-8	-7	-7	-6	-6	-6	-7	-6	-7	-9	-11	-13	-13	-15	-17	-13	-5	-6	-5	-4	-6

Sporadic E * Evening signal anomaly G Outage

Table 5g. Tabulation of hourly median signal levels as received at Onna - April 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	-15	-14	-13	-11	-10	-9	-9	-8	-6	-8	-8	-6	-8	-7	-13	-15	-16	-1*	6*	4*	-4*	-7*	27*	20*
2	-12	-2*	-1*	-7	-6	-8	-6	-9	-7	-11	-10	-13	-14	-15	-18	-19	-10	-18	-19	-19	-12*	-7*	-8*	-9
3	-13	-13	2*	-2*	-3*	0*	-5	-5	-6	-7	-10	-11	-14	-16	-15	-15	-16	-18	-17	-6*	-13	-11	-8	-8
4	-5*	-9	-4*	-7	-8	-5	-5	-7	-6	-6	-6	-6	-6	-9	-11	-9	-11	G	-18	-15*	-13*	-11*	-12	-14
5	-13	-12	-10	-9	0*	7*	-3*	-6	-7	-7	-8	-8	-9	-11	-1#	-1#	3#	6*	7*	9*	-3*	-10	-9	3*
6	2*	-2*	-3*	-4*	-7	-7	-5	-4	G	-6	-6	-8	-9	-8	-11	-11	-13	-17	-21	-7*	-6*	-5*	-4*	-8
7	-5*	4*	-4*	2*	10*	3*	-6	-1*	-2*	G	-8	-10	-12	G	G	G	G	G	G	G	G	G	G	G
8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
9	G	G	G	G	G	G	G	G	G	G	G	-13	-15	-14	-15	-15	-17	4*	6*	6*	1*	-1*	-2*	-7
10	-3#	-3#	-7	-9	-10	-8	-5	-3	-7	-6	-10	-11	-11	-14	-13	-15	-16	-13*	1*	11*	3*	-1*	-5*	13*
11	-10	-13	-12	-10	-6*	18*	3*	-5	-4	-9	-6	-11	-6*	-13	-15	-16	-5*	17*	6*	6*	-4*	-10*	3*	29*
12	29*	-2*	-3*	-6*	-7	-4	-6	-9	-5	-3	-3	-11	-14	-13	-3*	-7*	G	G	-20	-13*	-8*	0*	1*	-2*
13	-7*	-11	-10	-11	-10	-8	-4	-5	-3	-8	-10	-12	-10	-14	-14	-14	-14	G	-21	-16*	2*	3*	3*	1*
14	-6*	-10	-11	-5*	-3*	-6	-7	G	-2*	-6	-6	-8	-13	-14	-13	-13	-15	-19	-11*	-6*	1*	-1*	-5*	-8
15	-5*	-3*	-3*	-7	-8	-7	-6	-6	-5	-8	-11	-12	-10	-10	-13	-15	-17	-17	-19	-4*	-7*	-10	-4*	-3*
16	2*	2*	-5	-7	-7	-7	-5	-5	-2	-2	-8	-12	-7	G	G	-15	-17	-15	-22	-17	-9*	2*	3*	-3*
17	0*	2*	-6*	-9	-8	-8	-7	-4	-5	-6	-5	-8	-10	-12	-11	-11	-10	-9	-15	-15	7*	9*	6*	0*
18	-1*	0*	0*	-4*	-7	-7	-5	-3*	4*	-3*	-6	-5	-5	-12	-11	-13	-15	G	G	13*	10*	6*	1*	3*
19	4*	0*	-2*	-2*	-5*	-7	-5	-5	-3	-2	-5	-4	-6	-9	-10	-11	-12	-16	-17	-17	-1*	7*	6*	4*
20	4*	4*	0*	-6	-7	-5	-5	3#	31#	15#	13#	36#	30#	-8	-10	-10	-13	-15	-16	-8*	-7*	-8	-10	-3
21	-4	-7	-9	-8	-6	-6	-4	-1	-4	G	-6	G	-8	-9	-7	-8	G	G	-17	-17	-5*	-2*	-5*	-6
22	-6	-7	-8	-8	-8	-6	-5	-6	-5	-5	-6	-6	-7	-10	-10	-9	4#	26#	8*	10*	6*	-4*	-9	-10
23	-7	-5	-4	-7	-2#	-6	-5	1*	6*	7*	-2*	-7	-9	-8	-5	-6	-8	-2*	-15	-16	-14	-7	14*	25*
24	19*	-6	-5	-8	-6	-4	-3	-5	G	0*	-2#	-1#	7#	-7	-9	-9	-12	-14	-2*	3*	-4*	-12	-13	-11
25	-11	-10	-9	-8	-3	-5	-3	-2	-3	-4	-7	6#	-2#	-9	-8	-9	-8	-2*	-13	-15	-6	1#	-9	-7
26	-7	-7	-6	-4	-3	-5	-2	-2	4*	2*	-5	G	-10	-6	2*	-1*	5*	6*	-11	-17	-12	11*	23*	22*
27	8*	6*	2*	-5	-6	-6	-4	-2	G	0*	-3	-6	-6	-8	1#	-2#	0#	3*	3*	9*	12*	8*	10*	8*
28	2*	0*	-2*	-1*	1*	-3	-1	-1	1	-1	-5	-8	-11	-13	-13	-14	G	-17	-17	-7*	-6*	-9	6*	10*
29	6*	0*	-2*	-6	-7	-5	-5	-6	-7	-6	-8	-10	-10	-10	-10	-11	-14	G	-20	-16	-5*	4*	4*	4*
30	1*	-4*	-4*	-7	-7	-7	-5	-3	-2	G	0*	-5	-10	-10	-10	-11	-11	-16	-20	-10*	-6*	-2*	-1*	0*
Med	-5	-4	-4	-7	-7	-6	-5	-5	-4	-6	-6	-8	-9	-10	-11	-11	-12	-14	-16	-8	-5	-2	-1	-1

Sporadic E * Evening signal anomaly G Outage

Table 5h. Tabulation of hourly median signal levels as received at Onna - May 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	5*	1*	-6*	-9	-7	-6	-4	-1*	1*	G	G	G	G	G	G	-15	-17	-21	-23	-21	-8*	-12*	-15	-17
2	-14	-14	-13	-12	-10	-8	-6	-5	-6	-7	-7	-10#	-10#	-15	-13	-15	-15	G	G	G	-11*	6*	8*	6*
3	1*	-2*	-5*	-9*	-9	-9	-7	-1*	3*	0*	G	G	-5*	-11	-10	-12	-14	-14	-18	-19	-2*	10*	5*	10*
4	2*	-1*	2*	-3*	-7	-6	-3	G	-2	0	-3	-8#	-6	-10	-8	-5*	-4*	-7*	-18	-12*	-8*	-9*	-3*	8*
5	8#	2*	-1*	-5*	-6	-7	-3	-6	-6	7#	-5	-8	-8	-8#	-10*	-9*	-12*	-18	-22	-7*	-9*	-9*	-9	-10
6	-9	-10	-9	-6	-3	-4	-6	-5	-7	-5	-7	-10	-12	-12	-12	-14	-17	-17	-4*	2*	-3*	-11	-13	-11
7	1*	5*	-6*	-10	-10	-7	-6	-8	-6	-8	-8	-10	-11	-12	-10	-14	-14	-4*	8*	5*	-1*	-8*	-10*	-8*
8	-6*	-8*	-10	-10	-10	-8	-6	-5	-3	-4	-4	-6	-6	-7	-9	-12	-14	-15	-16	-6*	-5*	-5*	6*	9*
9	10*	2*	-5	-6	-6	-3	-2	-1	-3	-2	-5	-4	-5	-4	-2	-6	-8	-15	-17	-11*	-4*	-4*	12*	8*
10	4*	-2*	0*	3*	-6	-1	2*	5*	0*	-4	-4	-5	-7	G	-8	-7	-8	G	-18	-15*	-2*	-1*	15*	23*
11	-6	-6	-7	-8	-4	-4	-3	0*	G	1*	3*	5*	-3	-6	-7	-7	-10	G	-17	-3*	0*	-1*	-6	-7
12	-4	-5	-6	-6	-5	-3	-1	4*	8*	7*	5*	-4	-5	-7	-8	-9	-14	-16	-19	-6*	19*	13*	8*	4*
13	8*	5*	-6	-6	-6	-5	-2	G	-5	-6	-6	-8	-8	-9	-7	-8	-10	-15	-9*	2*	7*	8*	7*	7*
14	4*	4*	2*	0*	-4	-4	-2	0*	4*	2*	60#	G	-6	-7	-7	-8	-9	-12	-10	28#	41#	16#	7*	13*
15	9*	4*	5*	0*	0*	-2	-3	-2	1	-2	-5	-6	-6	-6	-7	-6	-10	-13	-14	-15	-11	-11	-9	-6
16	-7	-7	-6	9*	16*	0*	-1	2*	4*	5*	-5	G	2*	1*	2*	-3*	-12	-15	-18	-17	-5*	-1*	3*	0*
17	12*	11*	-2*	-4	-4	-5	-2	4#	58#	49#	G	22#	-2*	-2*	-7	-9	G	G	-23	-15*	-6*	-10	-10	-10
18	-8	-3*	1*	-6	-8	13*	23*	58#	11#	6*	G	-3*	-8	-7	-7	-11	-13	-15	-17	-14*	0*	10#	16#	30#
19	15*	17#	10*	2*	-5	-5	-4	58#	56#	56#	2#	G	-9	-8	-7	-6	-9	-13	-17	-3*	3*	1*	-4	-4
20	-1*	17*	24#	24#	G	G	G	G	G	G	G	-6*	-12	-13	-4	7#	5#	16#	>63#	63#	G	G	-5	G
21	G	G	-9	G	-7	-6	G	G	G	G	1*	G	G	G	-3	-10	-12	-12	-6*	-2*	5*	3*	1*	-1*
22	40#	39#	15*	10*	4*	-3	-6	1*	4*	2#	28#	46#	-7	-11	-11	-7	-6	-16	-12*	10*	7*	8*	12#	2*
23	1*	12*	12*	2*	-4	-6	-5	0*	5*	5*	2*	-4	-5	-7	-8	-8	-9	-7	-14	G	G	G	G	0*
24	-1*	7*	0*	0*	-2*	-3	-4	2	-2	0	-1	-7	-7	-4	-7	-6	-11	-12	50#	10#	7*	9*	4*	0*
25	-4	-6	-6	-6	-7	-6	-5	-2	-3	-3	-4	-8	-9	-9	-10	-11	G	-16	-17	-11*	3*	6#	4*	29#
26	39#	24#	13*	8*	2*	-2	-3	6*	8*	8*	14*	14#	38#	G	G	G	G	-14	-21	-1*	15#	10*	5*	6*
27	8*	9*	3*	-6	-6	-5	-2	-1	2	-2	3#	3*	-7	-8	G	G	G	G	-13	4*	15*	12*	4*	5*
28	9*	12*	9*	-1*	-5	-5	-4	-2	-2	16#	6#	-4	-6	-7	-2#	-7	24#	31#	6#	1*	4*	1*	0*	0*
29	2*	1	-1	-3	-1	0	2	7	10#	G	51#	62#	7#	27#	2	5*	5*	0*	-2*	-8	10*	21*	29#	18*
30	17*	13*	13*	10*	3*	18*	4*	10*	10*	6*	7*	G	56#	58#	53#	36#	51#	46#	39#	32*	18*	13*	5*	G
31	G	G	-3	-3	-2	0	4*	50#	30#	7#	13#	G	8#	26#	33#	-10	57#	4#	4*	5*	7*	6*	5*	15*
Med	2	2	-1	-4	-5	-4	-3	0	1	1	0	-5	-6	-7	-7	-8	-10	-14	-15	-3	0	3	4	4

Sporadic E * Evening signal anomaly G Outage

Table 5i. Tabulation of hourly median signal levels as received at Onna - June 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	14*	10*	2*	-1	-4	-5	-2	4*	7*	3*	1*	G	-5#	2#	-4	G	G	G	-12	-14	7*	31#	23*	19*
2	8*	1*	-4	-6	-6	-3	3*	4*	9*	9*	7*	-2*	-4	-7	-9	9#	9#	G	1*	11*	1*	-4*	-8	-10
3	-3*	-4*	-6	-9	-10	0*	-8	-8	-9	-9	-9	-7	-7	-5	-6	39#	-3	-10	-14	-4*	5*	4*	1*	-5
4	-2*	-6	-6	-6	-3	-4	-4	-1	-4	-4	-7	-9	-9	-8	-7	-9	-12	-14	-14	-4#	7*	17#	13*	14*
5	10*	3*	-2*	-4	-6	-6	-3	-2	G	-5	-1	-3	-5	-6	-5	-4	3*	9#	-7*	12*	17*	7*	9*	5*
6	7*	6*	3*	-2	-4	-4	-2	6*	4*	1*	0*	4#	35#	-2#	-7	-10	-11	-15	-16	-4*	4*	1*	-3*	-2*
7	-4	-3	-6	-7	-7	-5	-2	-1	3	G	G	-6	-6	-7	-7	-9	G	-11	-15	10*	10*	5*	-3*	-7
8	-4	-6	-8	-7	-6	-3	2	6*	G	1#	44#	4#	-2	-3	-2	-1	-3	43#	55#	51#	20*	13*	12*	16*
9	15*	13*	13*	12*	-3	-3	-1	-2	-4	-4	-6	-6	-4	1	-1	-1	4*	-7*	G	-4*	-1*	3*	4*	-1*
10	-4	-2*	-5	-6	-3	-3	0	2	3	0	0	-1	-3	-1	-1	-6	-11	-14	-7*	-1*	-2*	-4*	-8	-7
11	-7	-7	-7	-5	-4	-4	-3	-2	-1	-5	G	G	-8	-7	G	G	-7	-9	28#	8*	9*	5*	4*	0*
12	-2	-6	-6	-6	-5	-3	-2	-1	-2	-3	0	-2	-5	-3	-1#	-4	35#	46#	28#	-9	1*	1*	3*	1*
13	-2	-4	-2	0	-3	G	-2	2*	4*	4*	2*	-4	-5	-1	4#	48#	20#	50#	54#	-8*	3*	10*	4*	3*
14	8*	9*	9*	7*	-1	-1	3	2	2	2	3*	4*	0	-2	-2	-4	-5	-9	-12	3*	5*	1*	3*	0
15	0	-2	-5	-5	-4	1	2	2	-1	G	-5	-7	-7	-7	-5	-7	-10	-12	7*	8*	5*	8*	8*	4*
16	1	-1	-4	-10	-12	-12	-11	G	G	G	G	3*	-2	-5	-4	-6	-10	-12	13#	50#	34#	12*	18*	12*
17	12*	11*	15*	10*	2*	-1	5	2	-2	1	4*	4*	0*	-2	-5	-8	-12	-14	-16	-3*	2*	-1*	-2*	-4
18	13*	20*	8*	-5	-6	-4	-3	-3	-4	-6	-6	-5	-5	-1	-2	-6	-8	-12	-15	-5*	11*	10*	11*	8*
19	13*	14*	5*	-4	-5	-3	-2	1	-1	G	-5	-4	-3	9*	23#	11*	8*	-7	-8	15*	15*	6*	1*	3
20	1	-2	-4	-6	-6	-4	-2	G	-2	-6	-7	-8	-8	-7	-8	-7	4#	-12	-16	-15	-4*	2*	-1*	15*
21	12*	3*	-4*	-5	-6	-7	-5	-3	-1	G	G	0	0#	G	61#	26#	36#	28#	19#	18#	15*	8*	4*	-3
22	-5	-5	-7	-6	-6	-2	-2	2	25#	6*	4*	-4	-3	-3	-6	-3#	21#	3*	9*	15*	8*	3*	3*	12*
23	9*	29#	7*	2*	-3	-3	-2	3	G	-7	-8	-8	-2	-2	-4	-5	-11	-13	-14	-9	-2*	0*	1*	1*
24	4*	3*	0*	-4	-4	-2	-2	7#	56#	62#	11#	-1	-3	-6	-5	-7	-6	20#	-1*	-4*	-3*	-3*	-6	-3
25	-1	-3	-3	0	-3	-3	-1	5*	9*	9*	3*	4*	1*	-2	3*	4*	4*	1*	-3*	3*	9*	-2*	-1*	-5
26	-4	4*	1*	-4	-4	-3	-1	7*	11*	9*	10*	9*	-5	-2	-1	-6	-4#	55#	58#	46#	14*	3*	4*	1*
27	-2	2*	3*	-2	-3	-3	-2	1	1	6*	2*	-1*	-4	4*	-1	-5	-2	-7	-6*	1*	13*	2*	3*	4*
28	1	-3	-5	-4	-4	-1	-2	0	7*	8*	4*	4*	3*	9*	11*	8*	1*	-7	-9#	-12	16*	8*	-1*	-4
29	-3	-5	-6	-6	-2	1	-1	5*	9*	9*	2*	10#	26#	29#	54#	18#	-7	-9	11*	11*	G	3*	3*	-4
30	3#	37#	25#	34#	47#	41#	11#	4	4	1	-2	-4	0	0	1	-4	-6	-12	-8*	-2*	8*	11*	3*	0
Med	1	0	-4	-5	-4	-3	-2	2	2	1	0	-2	-4	-2	-2	-4	-4	-9	-7	0	7	3	3	0

Sporadic E * Evening signal anomaly G Outage

Table 5j. Tabulation of hourly median signal levels as received at Onna - July 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	1*	2*	-2*	-6	-3*	1*	-8	-12	-6	-3*	10#	51#	0#	-6	-6	-6	-6	-6	1*	7*	9*	6*	-2*	-8
2	-11	-12	-13	-13	-9	-6	-10	0*	6*	8*	1*	-2*	-5	-8	-6	-3	-6	-14	-6*	5*	2*	-1*	-2*	-1*
3	-2	-3	-7	-6	-6	-5	-2	-3	-2	-3	-4	-4	-2	-6	-7	-8	-12	-13	-14	-16	-10	-10	-4*	11*
4	10*	12*	6*	3*	-4	-3	-2	4*	6*	6*	44#	46#	3#	1#	-2	-2	-7	-10	-13	-14	-2*	-3*	3*	11*
5	10*	7*	4*	-4	-5	-5	-4	-2	2	0	G	G	G	0*	0*	-3	-4	-9	-12	-4*	-8	-7	-6	-7
6	-6	-7	-5	-4	-5	-4	-3	-2	3	G	-6	-3	-4	-6	-7	-1#	-3	G	G	G	G	G	G	G
7	0*	-2	-4	-5	-5	-5	-3	4*	6*	-2	-9	-8	-10	-10	22#	-4	-7	-12	-14	-3*	2*	3*	2*	2*
8	2*	0*	-2	-4	-5	-3	-1	2*	6*	8*	7*	8*	9*	6*	-1*	5*	4*	6*	-2*	6*	3*	3*	-1	-3
9	-4	-4	-2	-4	-5	-3	0	3*	2*	3*	3*	-6	-6	-8	-4	-7	-12	-12	-14	1*	-1*	0*	-4	-5
10	-8	-10	-7	-5	-5	-5	0	-1	2*	0	-1	-1*	-2*	-5	-8	-6	-3*	-8	-14	-15	1*	-9	-9	-7
11	-7	-7	-7	-7	-6	-4	-3	G	G	G	-1*	2#	36#	6#	G	-7	-11	-11	-15	-15	-4*	7*	7*	3*
12	-3	-5	-1	-3	-2	-1	-1	G	G	G	G	G	-1*	-1*	-3*	-5*	-7*	-17	-18	-19	0*	-9	-15	-10
13	-8	0*	-7	-6	-10	-11	-10	-10	G	-8	-14	-15	-9	-3*	-12	-13	-16	-15	-7*	17*	17*	7*	4*	-3
14	5*	11*	11*	6*	-1	-5	-5	0	0	-1#	25#	35#	-2#	-2	-3	-3#	-6	-10	-13	-2*	3*	-3	-4	-3
15	-3	-5	-6	-6	-6	-4	-4	-4	0	-1#	53#	9#	15#	26#	7#	-8#	11#	-7	-7	7*	13	2*	-4	-5
16	-3	7*	3*	-5	-6	-5	-4	0	2	-2	-7	-8	0#	29#	-1*	-2*	1*	1*	-6*	-13	1*	14*	9*	-1
17	-1	-5	-4	-6	-5	-4	-2	2	2	2	2	-2	-4#	4#	17#	14#	57#	26#	-10	-11	8*	14*	12*	13*
18	4*	0	-2	-4	-6	-5	-5	-3	0	-2	-5	-6	-10	-9	-6*	-4*	-3*	-6*	-12	-15	11#	4*	7*	5*
19	3*	1*	3*	-1	-3	-3#	21#	52#	52#	27#	13#	48#	-6#	-9	-5*	-2*	-2*	-1*	11*	11*	6*	1*	3*	0
20	-3	-6	-6	-5	-5	-4	-5	-3	G	1	2	-6	-12	-13	-13	45#	36#	10#	-2#	-7	4*	3*	6*	0
21	-4	-3	-4	-4	-5	-5	-5	-4	-3	-1	24#	46#	27#	18#	11#	-7	-12	-11	-12	-6*	-4*	2*	2	0
22	-2	-3	-2	-2	-3	-4	-2	3*	4*	7*	4*	-3*	-2*	-7	-3	0*	5#	0#	-14	21#	-6	-1*	-5	-5
23	-6	-5	-6	-4	-5	-4	-1	3*	8*	6*	3*	-1*	-3	-3	-8	-12	-12	-14	-1*	5*	3*	0*	-2	-1
24	-3	-2	-4	-5	-4	-4	-4	-4	-5	2#	-7	-8	-9	-3	-7	-4	20#	7#	-3*	21*	19*	8*	1*	-1
25	-3	-5	-4	-4	-2	-4	-2	2#	56#	>63#	>63#	21#	1*	-6	-6#	-5#	-1*	6*	1*	7#	18*	16*	13*	8*
26	6*	8#	5*	1*	6#	45#	4#	9*	7*	5*	1*	-7	-10	-4#	-4#	-8	-6	3*	6*	2*	7*	-3	-6	-3
27	7*	23#	19*	11*	18*	9*	-1	2	4*	5*	5*	2*	-5	G	-12	-14	-12	-7*	0*	2*	1*	1*	0	-1
28	1	5*	5*	3*	-1	-2	-1	1	2*	0*	-7	-9	-10	-10	-11	G	G	-12	-8	-4*	-2*	5*	8*	7*
29	8*	2	0	-3	-4	-4	0	-1	0	-6	-6	-7	G	-6*	-7	-12	-12	-14	-14	-5*	-4*	-2*	-2	3
30	-2	-1	2	-2	-5	-4	-2	-2	-4	-3	-4	-3	0*	1*	0*	-4*	-4*	7#	-13	-14	-9	-6	8*	5*
31	3	5	0	-3	-4	-3	-1	-2	3*	-2	-7	-11	-12	-8	-6*	-6*	11#	-5	-7	0*	35#	18#	8*	4
Med	-2	-2	-2	-4	-5	-4	-2	0	2	0	1	-3	-3	-5	-6	-5	-5	-8	-9	-3	2	1	0	-1

Sporadic E * Evening signal anomaly G Outage

Table 5k. Tabulation of hourly median signal levels as received at Onna - August 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	-1	-2	-3	-4	-5	-3	-1	-3	-3	-5	-10	-11	-12	-11	-12	-11#	-14	-15	-16	-14	3*	-1*	-4	0*
2	22#	38#	44#	16*	9*	3*	-1	-2	0	G	-3	-4	2*	4*	-2	-2	0	-6	-12	-5*	-1*	6*	14*	13*
3	8*	4*	-1	-4	-6	-6	-5	-5	G	-8	-10	-14	-15	-9	-10	-11	-11	-4*	4*	5*	3*	-5	-3	-3
4	-3	5*	5*	-4	-5	-4	-4	-5	G	13#	47#	49#	55#	53#	-9	-12	-13	-13	-9*	-10*	9#	3#	-2*	-2*
5	-4*	-7	-4*	-6	-11	-10	-10	14#	1#	36#	56#	23#	-13	-14	-15	-16	-17	-15	-9*	3*	4*	0*	-9	-7
6	-8	-7	-9	-11	-11	-12	-10	-13	-13	-13	-12	-10	1#	9#	-14	-6#	-6#	-15	-18	-20	-6*	-7*	-7*	-8
7	-12	-13	-14	-15	-15	-15	-1#	11#	13#	-5#	-19	-23	-24	-14	-14	-13	-14	-5*	7*	7*	7*	-6	-2*	3*
8	2*	-5	-5	-6	-7	-5	-3	2*	-6	-8	G	-10	-14	40#	-11	-14	-15	-15	-16	-9*	-4*	-4*	-5	-7
9	-8	13*	-6	-6	-6	-5	-4	-1	-2	-5	-12	-9	-12	23#	48#	56#	48#	>63#	57#	28#	17*	15*	8*	1*
10	-1*	-6	-4	-7	-6	-4	-4	-4	-2	-4	-7	-7	-11	-11	-6#	0#	24#	33#	1#	9*	G	2*	5*	-2*
11	-4	-4	-7	-7	-4	-4	-3	-4	1*	-3	-8	-10	-12	-8	-8	37#	38#	43#	6#	-1*	-2*	1*	1*	0*
12	-5	-6	-7	-5	-2	0	2	-1	-4	-6	-6	-8	-9	-10	-8	-11	-15	-6	10#	17#	7*	7*	4*	6*
13	G	G	G	-4	-4	-3	-3	-5	-4	-1	-7	-9	-6	-10	-13	-9	-11	-11	-14	-9*	27#	6*	7*	14*
14	16*	18*	4*	0	2	0	-1	-2	-2	-3	48#	50#	1#	-9#	G	-9	11#	>63#	>63#	53#	43#	35#	16#	16*
15	8*	-6	-7	-7	-5	-3	-3	-5	-5	-1	2*	3*	3*	-1*	-3*	-9	-9	-12	9#	1*	5*	19*	5*	3*
16	-3	-6	-6	-5	-6	-3	26#	39#	46#	46#	0#	-11	-13	G	G	-15	-16	-10	-8*	-3*	1*	-8	10*	-8
17	-5	-1	-1	-7	-6	-5	-6	-6	-8	G	-9	-11	-12	-9	-8	-12	-13	-11	-12	3#	3*	G	G	G
18	G	G	G	G	G	G	G	G	G	G	G	G	-16	-16	-16	-16	-15	-16	-15	-2*	-1*	-4*	-7	-9
19	-8	-7	-7	-9	-8	-8	-8	-4	-5	-9	-11	-13	-14	-16	-16	-15	-13	-12	-15	-11*	6*	18*	16*	8*
20	6*	3*	-4	-3	-5	-6	-6	-8	-8	-9	-10	-11	-10	-10	-10	47#	56#	35#	16*	3*	-2*	-1*	1*	15*
21	15*	13*	-4*	-10	-7	-7	-7	-9	-2#	-6#	-9	-10	-11	-11	-11	-12	-13	23#	25#	40#	46#	17*	13*	17*
22	15*	13*	-10	-9	-8	-8	-6	-6	-4	-4	-6	-6	-13	-15	-14	-13	-12	-6*	-13	-4*	-2*	-9	-6	-7
23	-9	-11	-10	-10	-8	-7	-6	-7	-5	-6	-6	-8	-9	-11	-13	-13	-15	-10*	-10#	10#	26#	27#	11*	3*
24	2*	5*	-13	-13	-7*	5*	-8	G	G	G	G	-15	G	-13	-14	-14	-15	-11	-16	-17	-2*	-7	-6	-4
25	9*	12*	12*	2*	-2	-4	-5	-6	G	-7	G	-8	-10	-13	-14	G	13#	16#	31#	17*	10*	-5*	-9	-6
26	-8	-11	-11	-11	-5	-6	-9	-10	-10	-8	-5	-9	-11	-9	-13	-15	-16	-13#	4*	12*	11*	7*	4*	3*
27	-1*	-9	-10	-11	-9	-9	-7	-9	-11	-11	-14	-15	-15	-16	-12	-14	-16	-16	-17	-11*	-7*	-6*	3*	9*
28	6*	2*	4*	0*	-5	-7	-10	-7	-7	-6#	22#	55#	-7#	-15	-15	-16	-15	-12	-17	3#	-3*	3*	1*	6*
29	6*	3*	-2*	-6	-8	-8	-7	-4*	-4*	-8	16#	32#	-13	-14	-14	-14	-10	-10	-15	-15	-8*	-4*	-2*	0*
30	3*	-1*	-5	-8	8*	0*	-7	-6	-2	14#	-8	13#	-9#	-9#	G	-11	-7*	-2*	-7*	8*	4*	-4	-10	-5
31	2*	-4*	-4*	-8	10*	14*	45#	41*	-6	G	-6#	-7	-14	-14	-11	-11	-13	-15	-15	-15	4*	3*	3*	17*
Med	-1	-2	-5	-7	-6	-5	-5	-5	-4	-6	-7	-9	-12	-11	-12	-12	-13	-10	-9	1	3	0	1	2

Sporadic E * Evening signal anomaly G Outage

Table 5ℓ. Tabulation of hourly median signal levels as received at Onna - September 1958.
Values are in db above 1 μv, adjusted for no line losses and 2 kw output of transmitter.

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	14*	9*	6*	-3*	-7	-6	0#	43#	55#	42#	-5#	-6	-6	-10	-9	-10	-7	-11	-13	-11	-11	-6	8*	2*
2	1*	7*	0*	-5	-8	-9	-7	-8	-8	-9	-12	-11	-12	-13	-14	-14	-14	-16	-18	-16	-5*	7*	5*	-4*
3	-9	-11	-6	-7	-6	-6	-7	-8	-3	-6	-7	-8	11#	-7#	-9	-10	-4*	-1*	-2*	-2*	-7*	1*	-4*	-8
4	-12	-11	-10	-10	-9	-8	-8	-7	-8	-7	-9	-12	-12	-11	-13	-15	-16	-14	-15	-3*	-5*	-2*	-5*	-8
5	-10	-11	-6	0*	-5	-6	-1*	4*	4*	-1*	-8	-10	-12	-14	-13	-14	-15	-16	-15	1*	5*	9*	8*	6*
6	7*	4*	0*	-4	-6	-8	-8	-8	-9	-11	-11	G	-8	-8	-16	-15	-15	-16	-16	-8*	0*	10*	10*	7*
7	5*	-1*	-4	-6	-8	-6	-8	-6	-4	-6	-10	G	43#	39#	15#	-14	-13	-15	-6*	2*	4*	-2*	0*	20*
8	17*	7*	-10	-10	-9	-9	-9	-7	1*	-4	-7	-10	-13	-15	-16	-16	-17	-16	1*	10*	0*	12*	15*	6*
9	19*	-5*	-8	-11	-10	-9	-9	-8	-7	-10	-12	-12	-12	-15	G	G	G	G	-7*	-6*	-8*	4*	-6*	-2*
10	-5	-8	-11	-11	-10	-8	-7	-7	-5	-9	-6	G	G	-13	-14	-13	-15	-7	1*	0*	-6*	13*	13*	-6
11	-8	-10	-10	-9	-7	-8	-7	-8	-9	-10	-11	-12	-15	-15	-10	-13	-13	-14	-13	2*	11#	-4*	5*	3*
12	-6	-7	-6	-7	-7	-7	-7	-7	-6	-8	-8	-9	-10	-10	-10	-11	-11	-12	-4	7*	G	11*	21*	9*
13	-6	-7	-4	-3	-6	-6	-7	-7	-7	-8	G	-9	-10	-9	-11	-12	-14	-15	-15	P	P	P	P	P
14	-4*	-4*	-3*	-7	-8	-6	-6	-3	G	G	-9	-12	-15	-14	-13	-14	-14	G	-12#	P	P	P	P	P
15	9*	-8	-8	-8	-8	-7	-7	-7	-7	-8	-10	-11	-12	-13	-13	-14	-13	G	G	P	P	P	P	P
16	-6*	-12	-10	-10	-10	-9	-9	-8	-6	-4	-6	-10	-12	-12	-12	-12	-8	-9	G	P	P	P	P	P
17	1*	-4*	-7	-8	-9	-8	-9	-7	-3	-3	-6	G	-13	-13	-13	-13	-13	-11	-14	P	P	P	P	P
18	12*	-5*	-11	-12	-10	-10	-9	-6	-7	-9	-12	-14	-15	-14	-13	-13	-15	-16	-11	P	P	P	P	P
19	-14	-15	-13	-12	-11	-10	-9	-9	-9	-6	-10	-14	-14	-15	-13	G	-7	-5	-16	G	9*	26*	25*	21*
20	-4*	2#	-9	-11	-8	-8	-9	-9	-10	-10	-13	-14	-13	-12	-13	-6	-2*	-4*	G	P	P	P	P	P
21	-4	-8	-10	-11	-10	-6	-4	-9	G	-8	-9	-11	-13	-13	-13	-14	-13	-8	G	P	P	P	P	P
22	7*	-8*	-11	-14	-13	-11	-10	-10	-12	-10	-14	-15	-17	-17	-16	-18	-19	-19	34#	P	P	P	P	P
23	7*	-5*	-7	-5	-11	-10	-10	-9	-9	-5	-11	-12	-11	-10	-13#	-14	7#	-16	26#	P	P	P	P	P
24	9*	-13	-13	-11	-8	-5	-5	-7	-9	-9	-10	-11	-13#	-15	-15	-15	-12	-16	-7*	1*	-1*	21*	24*	21*
25	1*	4*	-8	-11	-10	-10	-10	-8	-9	-9	-8	-11	-12	-13	-14	-13	-14	-17	-14	-5*	-4*	-4*	-5*	-7
26	-7	-3*	-1*	2*	-7	-8	-7	-6	-3	-6	-7	-7	-13	-14	-14	-16	-16	-15	-14	-7*	-7*	7*	30*	1*
27	-1*	1*	2*	-5	-3*	-4	-1*	3*	-8	-9	-8	-11	-13	-14	-14	-15	-14	-17	11*	15*	9*	14*	17*	6*
28	-6	-8	-9	-10	-10	-8	-9	-10	G	-10	-10	-10	-12	-15	-16	-16	-16	-15	-10*	-9*	-4*	0*	-7	-11
29	-11	-12	-12	-8	-9	-10	-8	-8	-10	-10	-8	-13	-14	-15	-18	-18	G	-3*	2*	4*	-4*	2*	16*	13*
30	15*	-11	-12	-12	-10	-10	-10	-10	-8	-9	-10	-13	-10	-12	-13	-13	-12	-8*	-7*	-4*	19*	12*	20*	3*
Med	-3	-7	-8	-9	-9	-8	-8	-8	-7	-8	-9	-11	-12	-13	-13	-14	-14	-15	-11	-2	-4	7	9	3

Sporadic E * Evening signal anomaly G Outage P Pulse Test

U.S. DEPARTMENT OF COMMERCE
Frederick H. Mueller, *Secretary*

NATIONAL BUREAU OF STANDARDS
A. V. Astin, *Director*

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