NTIA Report 85-173

Atmospheric Radio Noise: Worldwide Levels and Other Characteristics

Arthur D. Spaulding
James S. Washburn

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary
David J. Markey, Assistant Secretary
for Communications and Information

April 1985

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ATMOSPHERIC RADIO NOISE: WORLDWIDE LEVELS AND OTHER CHARACTERISTICS

A. D. Spaulding and J. S. Washburn*

The determination of radio communication system performance is a matter of proper statistical treatment of both the desired signal and the real-world noise (or interference) processes. System performance is highly dependent on the detailed statistical characteristics of both the signal and the noise as well as the single parameter: signal-to-noise ratio (which is sometimes the only parameter considered). Generally, the computation of the desired signal characteristics over a given path can be made reasonably accurately. This is not the case when it comes to estimating the noise level and other required noise characteristics. Existing noise models consist primarily of the worldwide atmospheric noise maps contained in CCIR Report 322 and estimated man-made noise levels given in CCIR Report 258. In addition, there are numerous other special purpose models.

There is a need for an overall, comprehensive usable noise model for application to telecommunication problems. One needed task that has been accomplished toward the goal of obtaining such an overall model is the development of an improved atmospheric noise model. The existing worldwide atmospheric noise model (CCIR Report 322) was developed from approximately 4 years of measurements from a worldwide network of 16 measurement stations. This network made measurements for 5 years (longer in a few cases) past the completion of CCIR Report 322 in 1963. Also, additional data are now available from other locations, primarily many years of data from 10 Soviet measurement stations. All these additional data have been analyzed and an updated worldwide atmospheric noise model has been prepared in both graphical and numerical forms. Results of this analysis show substantial "corrections" (on the order of 20 dB for some locations) to the 1 MHz noise level values given by CCIR Report 322. It is the purpose of this report to present and discuss this new model for atmospheric noise levels and other characteristics.

Key words: amplitude probability distributions; atmospheric noise characteristics; atmospheric radio noise; diurnal and seasonal noise variations; worldwide noise levels

1. INTRODUCTION AND DEFINITIONS

Atmospherics are electromagnetic "signals," impulsive in nature, which means they are spectrally broadband processes. The lightning that radiates these atmospherics radiates most of its energy at frequencies at and below HF (3-30 MHz). It is also frequencies at and below HF that are used for long-range communications, since propagation is supported by the Earth-ionosphere waveguide. While this means

*The authors are with the Institute for Telecommunication Sciences, National Telecommunications and Information Administration, U. S. Department of Commerce, Boulder, Colorado 80303.

that atmospherics can be used to study this propagation medium, the density and location of thunderstorms and other geophysical phenomena, it also means that long-range communications systems can receive interference from these atmospherics. At any receiving location, atmospherics can be received from the entire Earth's surface (at low enough frequencies). Therefore, the satisfactory design of a radio communications system must take into account the level and other characteristics of this atmospheric noise. It should also be noted that in spite of satellite systems, the use of the ionosphere to achieve long-range communications is continually increasing.

The satisfactory design of a radio communications system depends on consideration of all the parameters affecting operation. This requires not only the proper choice of terminal facilities and an understanding of propagation of the desired signal between the terminals, but also a knowledge of the interference environment. This environment may consist of signals that are intentionally radiated, or of noise, either of natural origin or unintentionally radiated from man-made sources, or various combinations of these. It has long been recognized that the ultimate limitation to a properly designed communication link will usually be the radio noise.

There are a number of types of radio noise that must be considered in any design; though, in general, one type will be the predominant noise and will be the deciding design factor. In broad categories, the noise can be divided into two types--noise internal to the receiving system and noise external to the receiving antenna. Noise power is generally the most significant parameter (but seldom sufficient) in relating the interference potential of the noise to system performance. Since the noise level often results from a combination of external and internal noise, it is convenient to express the resultant noise by means of an overall operating noise factor that characterizes the performance of the entire receiving system. In so doing, it is then possible to make decisions concerning required receiving system sensitivity; that is, a receiver need have no more sensitivity than that dictated by the external noise. Indeed, worldwide minimum noise levels have been estimated for this purpose (CCIR Report 670, 1978). Also, the noise levels can then be compared to the desired signal level to determine the predetection signal-to-noise ratio. The predetection signal-to-noise ratio is an important system design parameter and is always required knowledge (required but seldom sufficient) when determining the effects of the external noise on system performance. It is useful to refer (or translate) the noise from all sources to one point in the system for comparison with the signal power (desired signal). A unique system reference point exists: the terminals of an equivalent lossless antenna having the same characteristics (except efficiency) as the actual antenna (see CCIR Report 413).

Consider the receiving system shown in Figure 1. The output of block (a) is this unique reference point. The output of block (c) represents the actual (available) antenna terminals to which one could attach a meter or a transmission line. Let s represent the signal power and n the average noise power in watts that would be observed at the output of block (a) in an actual system (if the terminals were accessible). We can define a receiving system overall operating noise factor, f, such that $n = fkT_o b$, where k = Boltzmann's constant = 1.38×10^{-23} J/K, T_o = the reference temperature in K taken as 288K, and b = the noise power bandwidth of the receiving system in Hertz.

We can also define a system overall operating noise figure $F = 10 \log_{10} f$ in decibels. The ratio s/n can be expressed in decibels:

$$(s/n)_{dB} = S - N \tag{1}$$

where

S = the desired average signal power in dB (1W)
  $= 10 \log_{10} s$, and
N = the average system noise power in dB (1W)
  $= 10 \log_{10} n$.

Let us now explore the components of n in greater detail with emphasis on environmental noise external to the system components.

For receivers free from spurious responses, the system noise factor is given by

$$f = f_a + (\ell_c - 1) \frac{T_c}{T_o} + \ell_c(\ell_t - 1) \frac{T_t}{T_o} + \ell_c \ell_t (f_r - 1) \quad , \tag{2}$$

where

f_a = the external (i.e., antenna) noise factor defined as

$$f_a = \frac{p_n}{kT_o b} \quad ; \tag{3}$$

F_a = the external noise figure defined as $F_a = 10 \log f_a$;
p_n = the available noise power from a lossless antenna [the output of block (a) in Figure 1];
ℓ_c = the antenna circuit loss (available input power/available output power);
T_c = the actual temperature, in K, of the antenna and nearby ground;

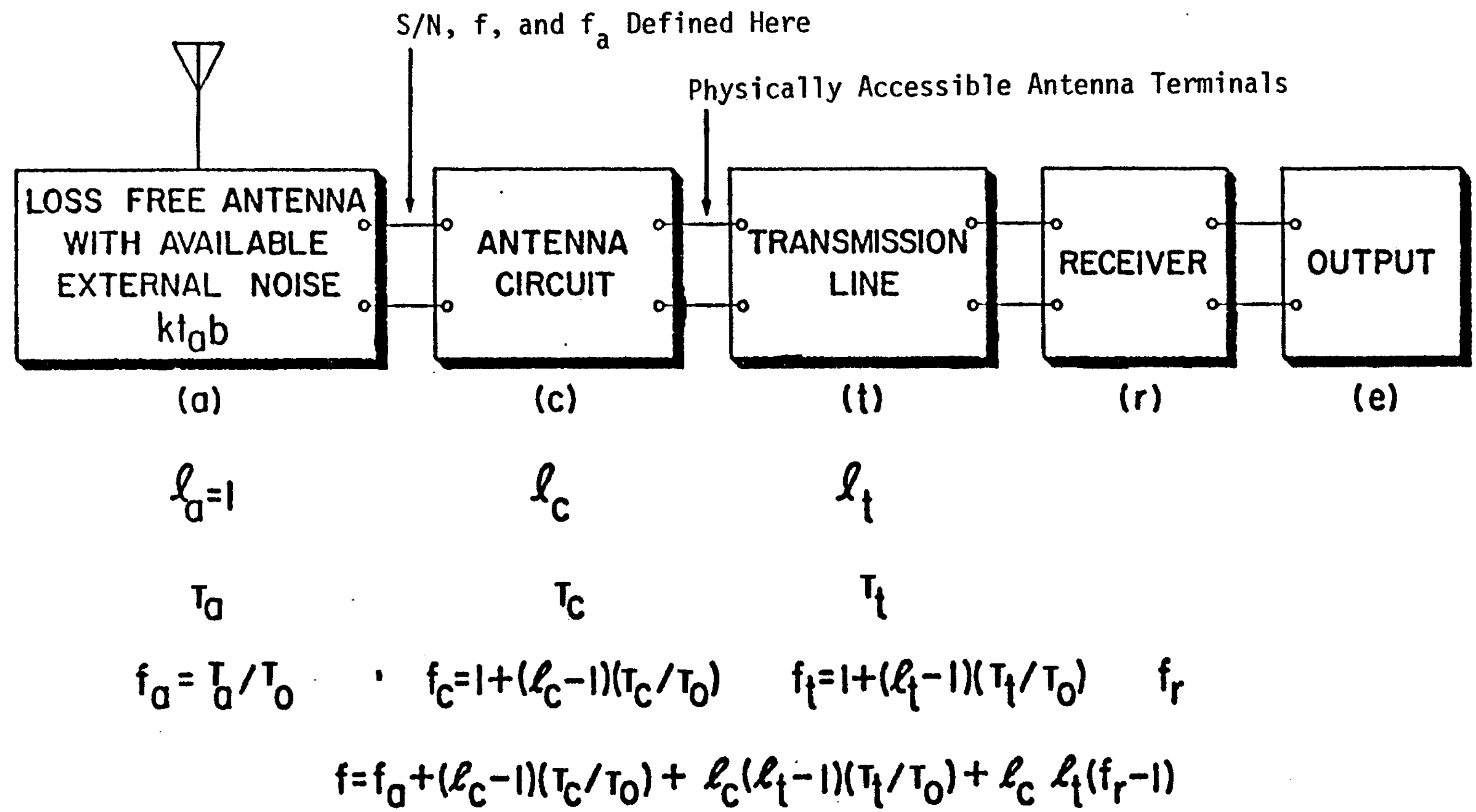

Figure 1. The receiving system and its operating noise factor, f.

ℓ_t = the transmission line loss (available input power/available output power);

T_t = the actual temperature, in K, of the transmission line; and

f_r = the noise factor of the receiver ($F_r = 10 \log f_r$ = noise figure in dB).

Let us now define noise factors f_c and f_t, where f_c is the noise factor associated with the antenna circuit losses,

$$f_c = 1 + (\ell_c - 1)\frac{T_c}{T_o} \quad , \tag{4}$$

and f_t is the noise factor associated with the transmission line losses,

$$f_t = 1 + (\ell_t - 1)\frac{T_t}{T_o} \quad . \tag{5}$$

If $T_c = T_t = T_o$, (2) becomes

$$f = f_a - 1 + f_c f_t f_r \quad . \tag{6}$$

Note specifically that even when $f_c = f_t = 1$ (lossless antenna and transmission line), then $F \neq F_a + F_r$.

Relation (3) can be written

$$P_n = F_a + B - 204 \text{ dB(1W)} \ , \tag{7}$$

where $P_n = 10 \log p_n$ (p_n = available power at the output of block (a) in Figure 1, in watts); $B = 10 \log b$; and $-204 = 10 \log kT_o$. For a short ($h \ll \lambda$) grounded vertical monopole, the vertical component of the rms field strength is given by

$$E_n = F_a + 20 \log f_{MHz} + B - 95.5 \text{ dB}(1\ \mu\text{V/m}) \quad . \tag{8}$$

where E_n is the field strength [dB(1 μV/m)] in bandwidth b (Hz) and f_{MHz} is the center frequency in MHz. Similar expressions for E_n can be derived for other antennas (Lauber and Bertrand, 1977). For example, for a halfwave dipole in free space,

$$E_n = F_a + 20 \log f_{MHz} + B - 98.9 \text{ dB}(1\ \mu\text{V/m}) \ . \tag{9}$$

The external noise factor is also commonly expressed as a temperature, T_a, where by definition of f_a

$$f_a = \frac{T_a}{T_o} , \qquad (10)$$

and T_o is the reference temperature in K and T_a is the antenna temperature due to external noise (in K).

More detailed definitions and discussions (including the case with spurious responses) are contained in CCIR Report 413 (1966).

Note that f_a is a dimensionless quantity, being the ratio of two powers (or, equivalently, two temperatures). The quantity f_a, however, gives, numerically, the available power spectral density in terms of kT_o and the available power in terms of kT_ob. The relationships between the noise power, P_n, the noise power spectral density, P_{sd}, and noise power bandwidth, b, are summarized in Figure 2. When F_a is known, then P_n or P_{sd} can be determined by following the steps indicated in the figure. For example, if value of F_a = 40 dB and b = 10 kHz, then the value of noise power available from the equivalent lossless antenna is P_n = -124 dB(1W).

If ℓ_c = 3, then the noise power available from the actual receiving antenna is -128.8 dB(1W).

Above, we have f_a (and T_a), the most useful and common way of specifying the external noise level. When one is concerned with determining the effects of the external noise (e.g., atmospheric noise) on system performance, more information about the received noise process than just its energy content (level) is almost always required. An exception would be if the external noise were a white Gaussian noise process, but this is almost never the case. Other parameters useful in determining the degradation effects of noise or interference are defined below.

Atmospheric noise (and man-made noise) is a random process. The fact that we are dealing with a random process means that the noise can be described only in probabilistic or statistical terms and cannot be represented by a deterministic waveform or by any collection of deterministic waveforms. Of course, deterministic waveforms can be treated as "random" and described in probabilistic terms also. But the opposite is not true; that is, random processes, such as atmospheric noise, must be described probabilistically.

The basic description of any random process is its probability density function (pdf) or distribution function. The first-order pdf of the received interference process is almost always required in order to determine system performance (i.e., it is always necessary but sometimes not sufficient). The received atmospheric noise

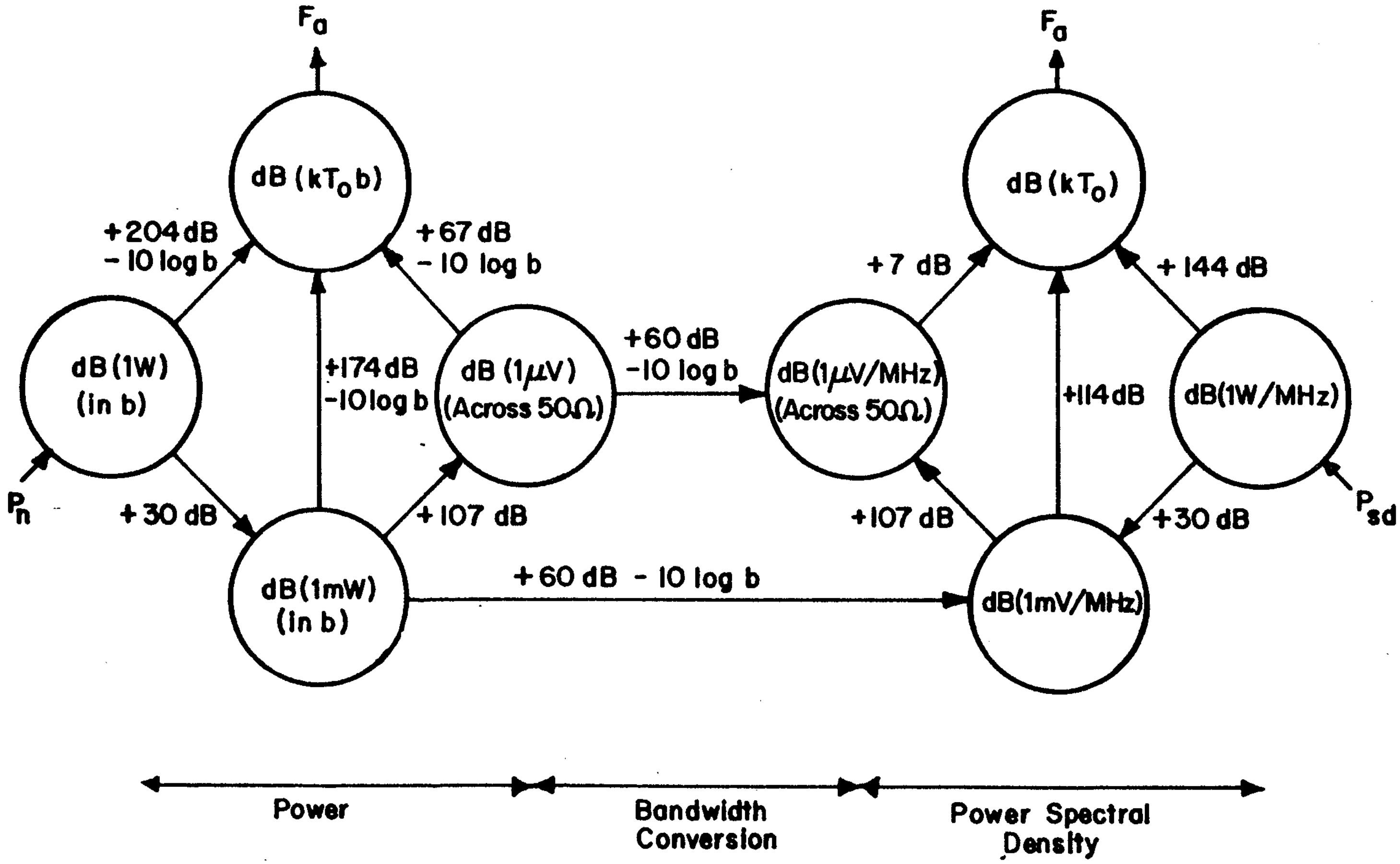

Figure 2. Relationships between power, power spectral density, and noise bandwidth (rms detector). (Presentation developed by G. H. Hagn.)

process under consideration here is a bandpass process in that it is describable by an envelope process and a phase process. Since the phase process is known (phase uniformly distributed), the required pdf of the instantaneous amplitude can be obtained from the envelope amplitude pdf. Usually, also, the envelope pdf can be used directly in system performance analyses. The atmospheric noise envelope statistic is usually given as (and measured as) a cumulative exceedance distribution, termed the "amplitude probability distribution" or APD. For some envelope level, E_i, the APD is the fraction of the total measurement time, T, for which the envelope was above level E_i;

$$D(E) = \text{Prob}[E \geq E_i] = 1 - P(E) \quad , \tag{11}$$

where P(E) is the cumulative distribution function. The pdf of E is given by the derivative of P(E).

Over many years, various statistical moments of the received atmospheric noise envelope were measured and, on occasion, continue to be measured. These statistical moments are defined as follows:

The average envelope voltage is termed the expected value of E or E[E];

$$E_{av} = E[E] = \frac{1}{T} \int_0^T E(t)dt = -\int_0^\infty EdD(E) \quad , \tag{12}$$

where $-dD(E) = p(E)dE$; the rms voltage squared (proportional to energy or power), $E[E^2]$, is

$$E_{rms}^2 = E[E^2] = \frac{1}{T} \int_0^T E^2(t)dt = -\int_0^\infty E^2dD(E) \; ; \tag{13}$$

and the average logarithm of the envelope voltage, E[logE], is

$$E_{log} = E[\log E] = \frac{1}{T} \int_0^T \log E(t)dt = -\int_0^\infty \log EdD(E) \quad . \tag{14}$$

Because the rms voltage level can be given in absolute terms (i.e., rms field strength or available power), it is common to refer the other envelope voltage levels to it. The dB difference between the average voltage and the rms voltage is termed V_d,

$$V_d = -20 \log \frac{E_{av}}{E_{rms}} \quad . \tag{15}$$

The dB difference between the antilog of the average log of the envelope voltage and the rms voltage is termed L_d,

$$L_d = -20 \log \frac{10^{E_{\log}}}{E_{rms}} \quad . \tag{16}$$

Of course, many other statistical descriptors (e.g., average crossing rate characteristic, autocorrelation function, pulse spacing distributions, pulse width distributions, etc.) have been measured and/or modeled. The ones defined above are the main ones of concern here. How these parameters (e.g., f_a) vary with time and location is also required knowledge.

Research pertaining to atmospheric noise dates back to at least 1896 (A. C. Popoff); however, the research leading to the first publication of predictions of radio noise levels was carried out in 1942 by a group in the United Kingdom at the Interservices Ionosphere Bureau and in the United States at the Interservice Radio Propagation Laboratory (I.R.P.L., 1943). Predictions of worldwide radio noise were published subsequently in RPU Technical Report No. 5 (1945) and in NBS Circular 462 (1948), NBS Circular 557 (1955), and CCIR Report 65 (1957). All these predictions for atmospheric noise were based mainly on weather patterns and measurements at very few locations and over rather short periods of time.

Starting in 1957, average power levels (f_a) of atmospheric noise were measured on a worldwide basis starting with a network of 16 identical recording stations. Figure 3 shows the locations of these recording stations. The frequency range 13 kHz to 20 MHz was covered, and measurements of F_a, V_d, and L_d were made using a bandwidth of 200 Hz. In addition, APD measurements were made at some of the stations.

The data from this worldwide network were analyzed by the Central Radio Propagation Laboratory (CRPL) of NBS and the results published in the NBS Technical Note Series 18. The first in this series was published in July 1959 and covered July 1957-December 1958. After this, one in the series was published every quarter until No. 18-32 for September, October, and November 1966. These Technical Notes gave, for each frequency and location, the month-hour median value of F_a along with D_μ and D_ℓ, the upper and lower decile values; i.e., the values exceeded 10 percent and 90 percent of the time. The median values of V_d and L_d were also given. In addition, the corresponding season-time block values were given for the four seasons, winter (December, January, and February; June, July, and August in the southern hemisphere), spring (March, April, May), summer (June, July, August), and

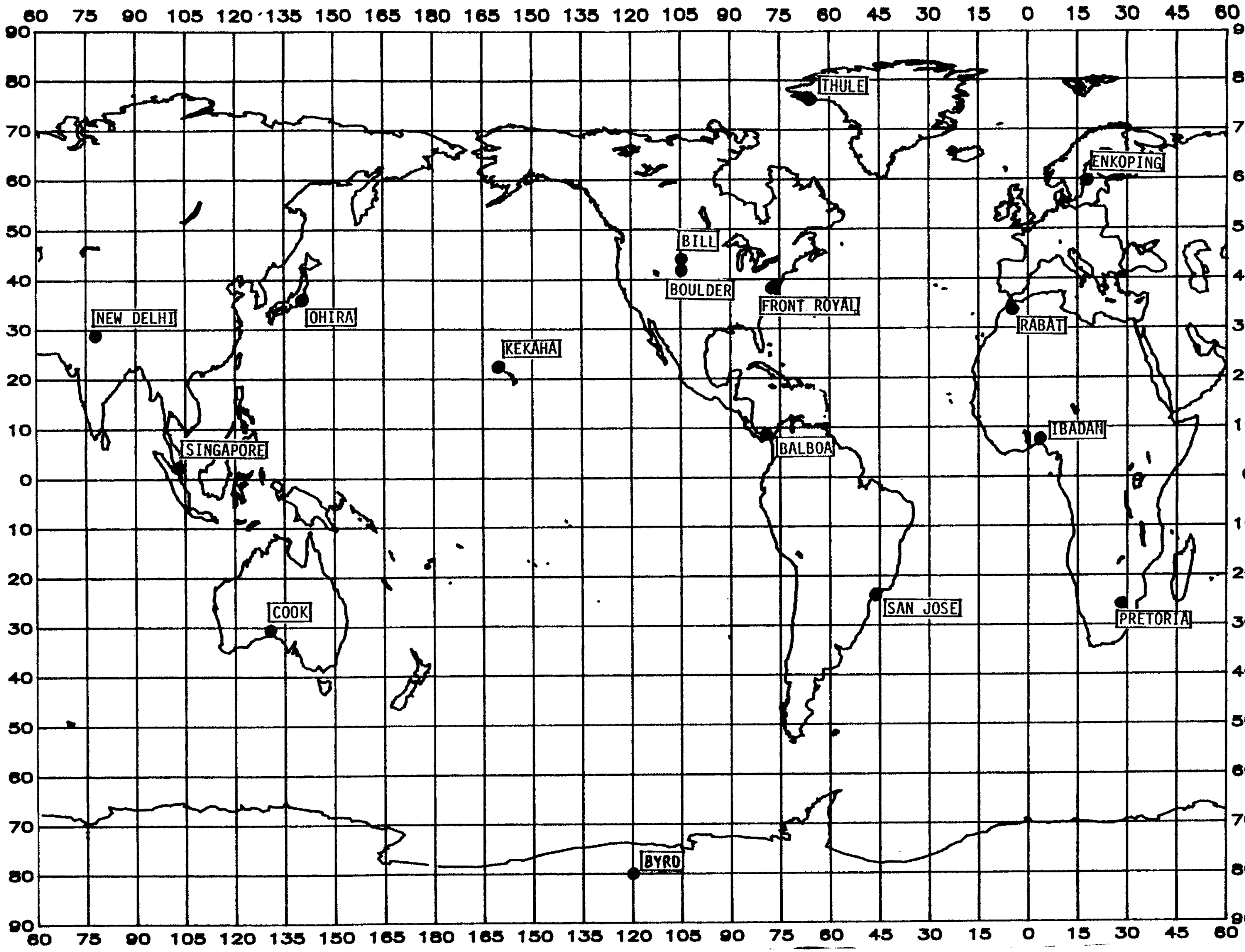

Figure 3. Radio noise recording stations used to obtain most of the data used for CCIR Report 322.

fall (September, October, November) and six four-hour time blocks (0000-0400, etc.).

In 1964, CCIR Report 322, World Distribution and Characteristics of Atmospheric Radio Noise, was published by the International Telecommunication Union (ITU) in Geneva. This report (small book, actually) presents the worldwide predictions of F_a, V_d, and their statistical variations for each season-time block and is based on all the available measurements to that date, primarily the recording network shown in Figure 3. In 1983, CCIR Report 322 was reprinted as CCIR Report 322-2 with a revised text and title, but with the same atmospheric noise estimates.

Figure 4 shows Figure 19A of CCIR Report 322. This figure gives F_{am} at 1 MHz as a function of latitude and longitude for the summer season and the time block 2000-2400. Since this map is for local time, there is a discontinuity at the equator (corresponding to summer being 6 months apart in the northern and southern hemispheres). World maps of atmospheric radio noise in universal time are also available (Zacharisen and Jones, 1970). To obtain F_{am}, Figure 19B (given as Figure 5 here) is used to convert the 1 MHz value to any frequency between 10 kHz and 30 MHz. Finally, the median value of V_d, V_{dm}, and the statistical variations of F_a about its median value F_{am}, are given via Figure 19C (Figure 5 here). Also, numerical representation of CCIR Report 322 is available (Lucas and Harper, 1965). While the title of Lucas and Harper says that only HF (3-30 MHz) is covered, the results there will cover the frequency range 10 kHz to 30 MHz. This numerical representation is also contained in the ITU HF propagation prediction programs. The numerical representation of Lucas and Harper was obtained by the numerical mapping of values obtained from the CCIR 322 1-MHz maps, rather than by numerically mapping of the original data points (84 longitude, 100 latitude grid points), which produced the CCIR 322 maps. This procedure gave an rms error of approximately 2 dB (typically for each of the 24 maps) with maximum errors up to approximately 10 dB being noted between the CCIR 322 maps and the Lucas and Harper numerical representation. The numerical representation of the frequency variation of F_{am} (e.g., Figure 19B of Figure 5) and the D_μ and D_ℓ variation (e.g., Figure 19C of Figure 5) given by Lucas and Harper are "precise," being the same numerical routines used to produce these parts of CCIR 322. The universal time "maps" of Zacharisen and Jones (1970) were obtained by numerical mapping using the "original" Report 322 data. Also, using the original data to plot the contour maps in Report 322, Sailors and Brown (1982,1983) developed a simplified atmospheric noise numerical model suitable for use on minicomputers.

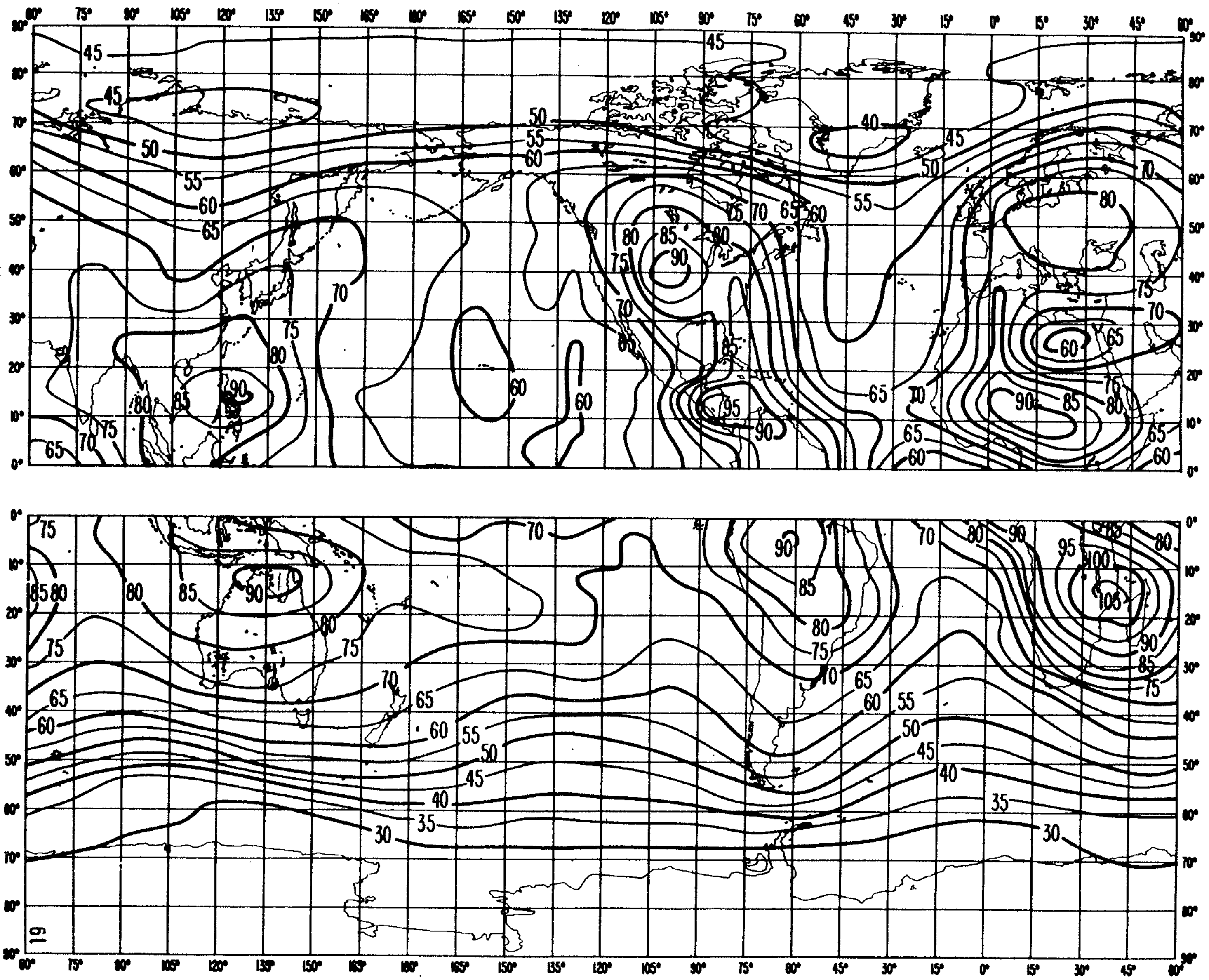

FIGURE 19a – *Expected values of atmospheric radio noise, F_{am} (dB above kT_0b at 1 MHz)*
(Summer; 2000-2400 h)

Figure 4. Figure 19A from CCIR Report 322.

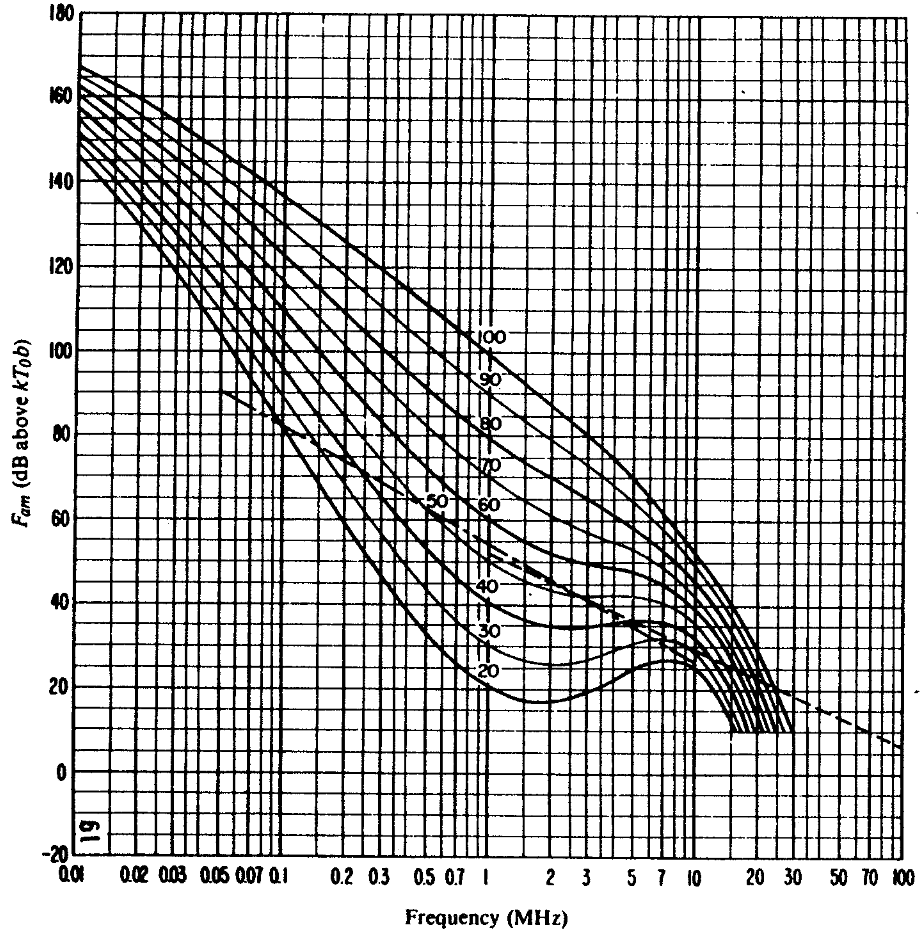

FIGURE 19b – *Variation of radio noise with frequency (Summer; 2000-2400 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

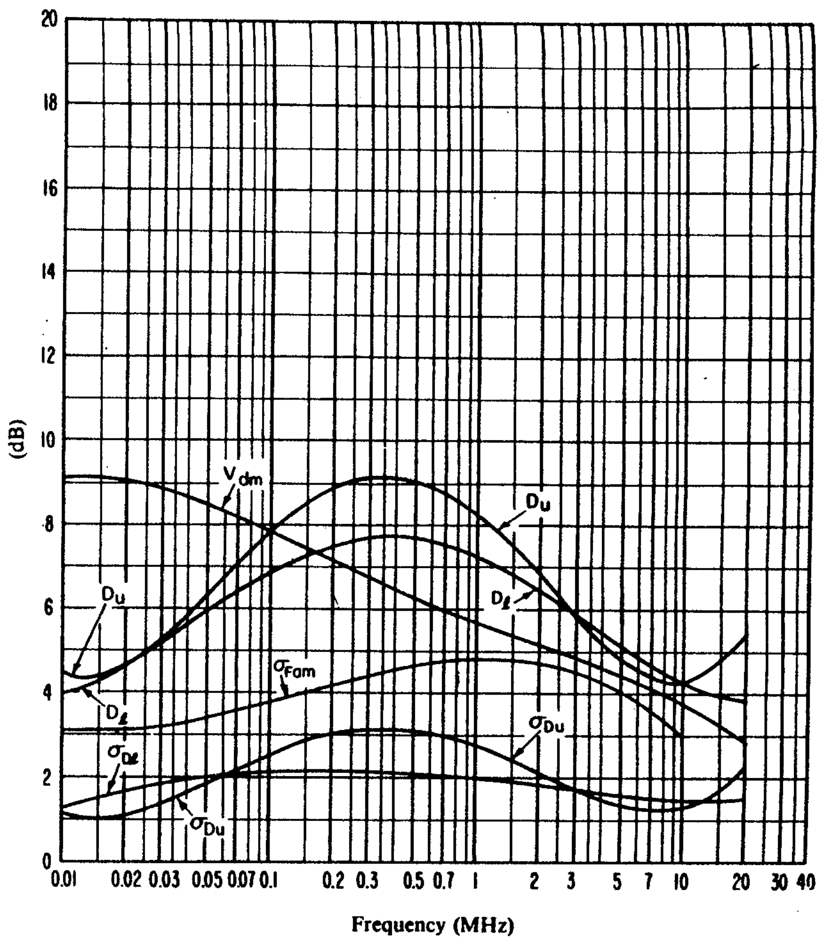

FIGURE 19c – *Data on noise variability and character (Summer; 2000-2400 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 5. Figure 19B and 19C from CCIR Report 322.

It has been shown that the variation of f_a for a given season and time block can be adequately represented by two log-normal distributions (i.e., dB values normally distributed), one above the median value and one below. Therefore, the variation is given by F_{am}, D_μ, and D_ℓ. This is best explained with an example. Suppose we want F_a and its variation for the summer season, 2000-2400 time block for Boulder, Colorado, at 500 kHz. From Figure 4, the 1 MHz F_{am} value is 90 dB. From Figure 5 then, the 500 kHz F_{am} is 102 dB with D_u = 9.0 dB, D_L = 7.7 dB, σ_{Du} = 3.1 dB, and $\sigma_{D\ell}$ = 2.0 dB. A value for $\sigma_{F_{am}}$ is also given (4.7 dB) and is designed to account for the difference between observations and the results obtained by the numerical mapping routines that produced CCIR Report 322, to account for year-to-year variations, and also to account for the expected variation in the median value when extrapolations were made to geographic areas where measurements did not exist. Figure 6 shows the distribution of F_a values estimated via the data above (F_{am}, D_u, D_ℓ, σ_{Du}, and σ_{D_ℓ}). On Figure 6, all the measured values of F_a measured at Boulder at 500 kHz will essentially lie between the two dotted lines with the solid line being the estimate of the distribution of F_a for this season and time block. The σ_{D_ℓ} and σ_{D_u} values account for the year-to-year variation in D_ℓ and D_μ and also the geographic variation, since only one value of D_u is given for the entire Earth's surface. Now the value of F_a exceeded any percent of time for this season-time block can be determined.

CCIR Report 322 was originally published in 1964 and was an output document of the CCIR Xth Plenary Assembly held in Geneva in 1963. The atmospheric noise data used were the data from the worldwide network of recording stations (Figure 3) through 1961; that is, the data were from July 1957 through October 1961. Since then, much additional data have become available. Data from the worldwide network through November of 1966 and many years of data from 10 Soviet measurement locations are now available along with data from Thailand from March 1966 to February 1968 (Chindahporn and Younker, 1968). All these data have been analyzed and an updated set of atmospheric radio noise estimates produced, essentially in the CCIR Report 322 format. Section 2 of this report covers this analysis and presents, both in graphical and numerical forms, these updated estimates. These estimates are new 1 MHz contour maps (corresponding to Figure 4, for example).

Section 3 reproduces the 24 sets of characteristics from Report 322, of which Figure 5 here is an example, and gives the coefficients for the mathematical version of these characteristics. This is done for completeness, to make this report self-contained, and also, some of these sets of coefficients (e.g., for σ_{Du}) were not available before. Analysis of the totality of data from the worldwide network of recording stations obtained no significant changes in these characteristics, so this portion of the "new" model is the same as the current CCIR Report 322 model.

Crichlow et al. (1960a) developed a "model" or method for obtaining the APD of the received atmospheric noise envelope from the measured statistical moments V_d and L_d, defined previously. A "most likely" subset of this model became the "CCIR 322" model. Section 4 reviews this model and presents a numerical representation, including bandwidth relationships, since the received APD is a function of receiver bandwidth.

Section 5 then gives a brief summary and Section 6 contains the references. Various computer algorithms (programs) are given throughout the report, where appropriate, that will reproduce all the atmospheric noise characteristics. These programs are given in FORTRAN.

2. THE NEW 1 MHz ATMOSPHERIC RADIO NOISE F_{am} ESTIMATES

As noted in the last section, the existing estimates of atmospheric noise levels and characteristics are contained in CCIR Report 322. These estimates were obtained from measurements made by a worldwide network of 16 recording stations (Figure 3). The measurements were made in a 200 Hz bandwidth on frequencies of essentially .013, .051, .160, .495, 2.5, 5, 10, and 20 MHz. There were some small variations in these frequencies between stations and not all stations had all frequencies for the entire period of measurement. The measurements made from July 1957 through October 1961 were used to produce Report 322. The network continued to operate through November 1966 and longer still for some locations. All these data are contained in the series of NBS Technical Notes No. 18 (July 27, 1959) through 18-32 (October, 1967). This means that there is a great deal of additional analyzed data available from this network to use in producing an updated "322." Data from portions of the network exist past November 1966, but only the analyzed data contained in the NBS Technical Note Series (July 1957-November 1966) are used here. Also, after the publication of Report 322, it was shown that the data from Thule, Greenland, and Byrd Station, Antarctica, were generally contaminated by high levels of local man-made noise. Therefore, data from Thule and Byrd Station were not used in this present analysis.

For a number of years the Soviet Union operated a network of ten noise measurement stations. Data from these measurement locations within the Soviet Union are available from the World Data Center (National Oceanic and Atmospheric Administration, Boulder, Colorado 80303). Raw data are available on microfilm for periods

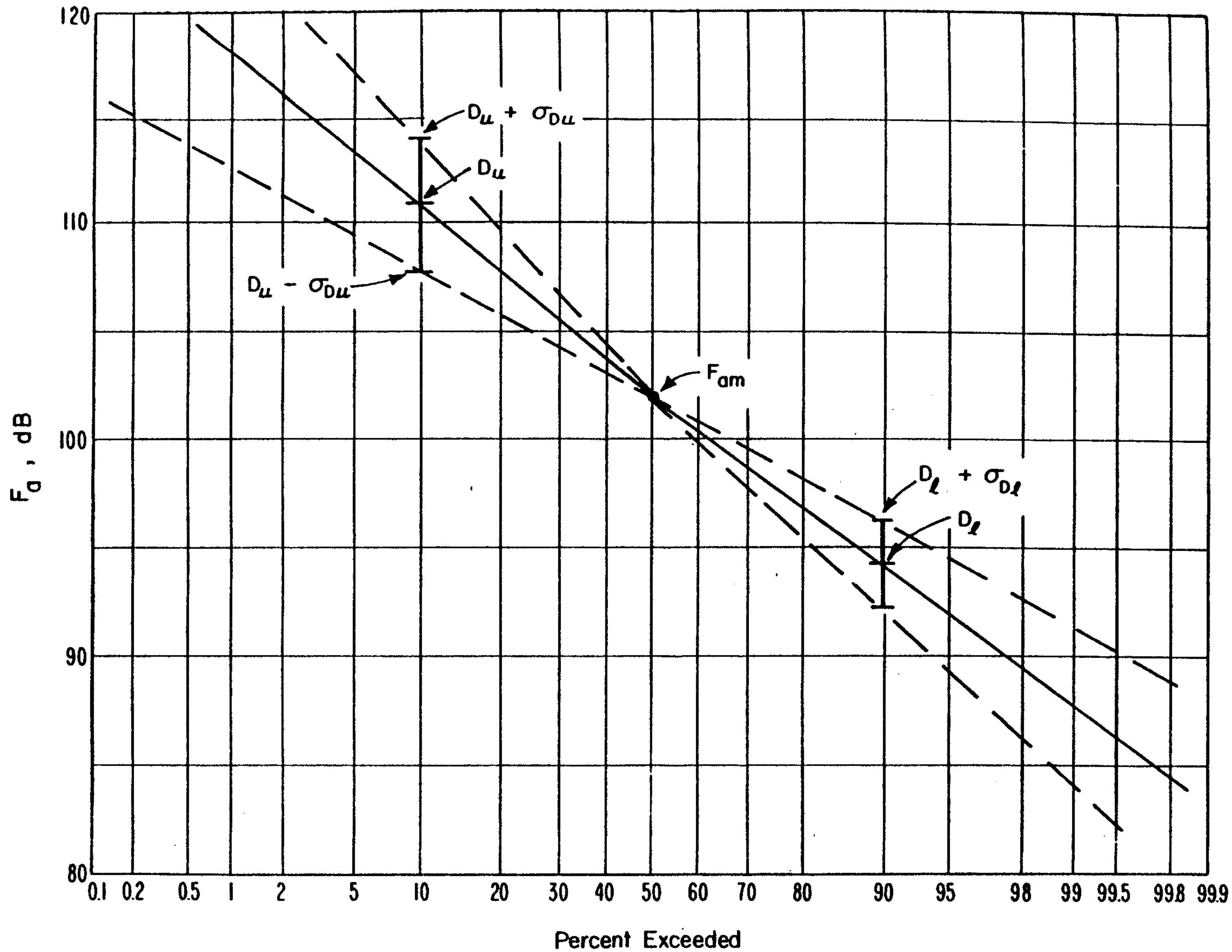

Figure 6. The distribution of F_a values expected at Boulder, Colorado, 500 kHz, for the summer season, 2000-2400 hrs.

of time from mid-1958 through 1965. The parameters that were measured were different from those discussed above and the analysis and use of the Soviet data are discussed next. The worldwide network locations and the new locations are given in Table 1. Figure 7 is a repeat of Figure 3, but with the new locations added.

2.1 Analysis of the Soviet Data

The Soviet atmospheric noise measurement program was organized and controlled by Dr. Ja. I. Likhter (Izmiran, P. O. Akademgorodok, Moscow Region, USSR). Dr. Likhter kindly supplied detailed information on the measurement equipment used and the definitions of the various parameters measured. On each measurement frequency (specified later) a measurement lasted approximately 2 minutes and measurements were taken 3 hours apart each day. There were often many days in any given month when no measurements were taken. The voltage levels (given in field strength, μV/m) that were exceeded 2, 10, 20, 30, 40, 50, 60, 70, 80, and 90 percent of the time were recorded. These levels are noted by $E_{0.02}$ to $E_{0.9}$. Because of averaging in the receiving and, perhaps, the short measurement time, this set of measurements, unfortunately, does not appear to be an APD measurement (as defined earlier) and they do not correspond to other Soviet APD results (e.g., Remizov, 1981, the references therein, and Likhter and Terina, 1960). Also, most of the energy in the atmospheric noise process is contained at levels that occur less than two percent of the time. The peak value was also recorded. The data also give a parameter, noted E_{on}. This parameter has no physical meaning in itself but is a level set by the equipment operator, below which the other levels ($E_{0.02}$, etc.) were recorded. As detailed below, it turns out the E_{on} serves as a good approximation to the rms level (f_a) and the parameter E_{on} is the parameter used in the analysis here. This is based on the following analysis and observations:

a) In 1960, Likhter and Terina developed a model for the APD of atmospheric noise based on measurements. Using this model, they developed a technique to determine the rms level from the measured median level $E_{0.5}$. This was done for 12, 25, 36, and 60 kHz. These authors used this technique to compare some Soviet measurements at Moscow to the CCIR estimates contained in CCIR Report 65 (the predecessor to Report 322), that is, to F_{am}. Using this technique, we always obtained, for the sample case studies, a value that was always within 4 dB of E_{on}, and usually much closer. It was assumed that this would perhaps be true, therefore, at all frequencies.

Table 1. Atmospheric noise measurement locations.

WORLDWIDE NETWORK LOCATIONS (CCIR 322)

Balboa, Canal Zone	79.5W, 9.0N
Bill, Wyoming	105.2W, 43.2N
Boulder, Colorado	105.1W, 40.1N
Byrd, Antarctia	120.0W, 80.0S
Cook, Australia	130.4E, 30.6S
Enkoping, Sweden	17.3E, 59.5N
Front Royal, Virginia	78.2W, 38.8N
Ibadan, Nigeria	3.9E, 7.4N
Kekaha, Hawaii	159.7W, 22.0N
New Delhi, India	77.3E, 28.8N
Ohira, Japan	140.5E, 35.6N
Pretoria, South Africa	28.3E, 25.8S
Rabat, Morocco	6.8W, 33.9N
San Jose, Brazil	45.8W, 23.3S
Singapore	103.8E, 1.3N
Thule, Greenland	68.7W, 76.6N

NEW LOCATIONS

Laem Chabang, Thailand	100.9E, 13.05N
Alma Ata, USSR	76.92E, 43.25N
Ashkhabad, USSR	58.3E, 37.92N
Irkutsk, USSR	104.5E, 52.0N
Khabarovsk, USSR	135.0E, 50.0N
Kiev, USSR	30.3E, 50.72N
Moscow, USSR	37.32E, 55.47N
Murmansk, USSR	35.0E, 69.0N
Simferopol, USSR	34.03E, 45.02N
Sverdlovsk, USSR	61.07E, 56.73N
Tbilisi, USSR	40.0E, 41.72N

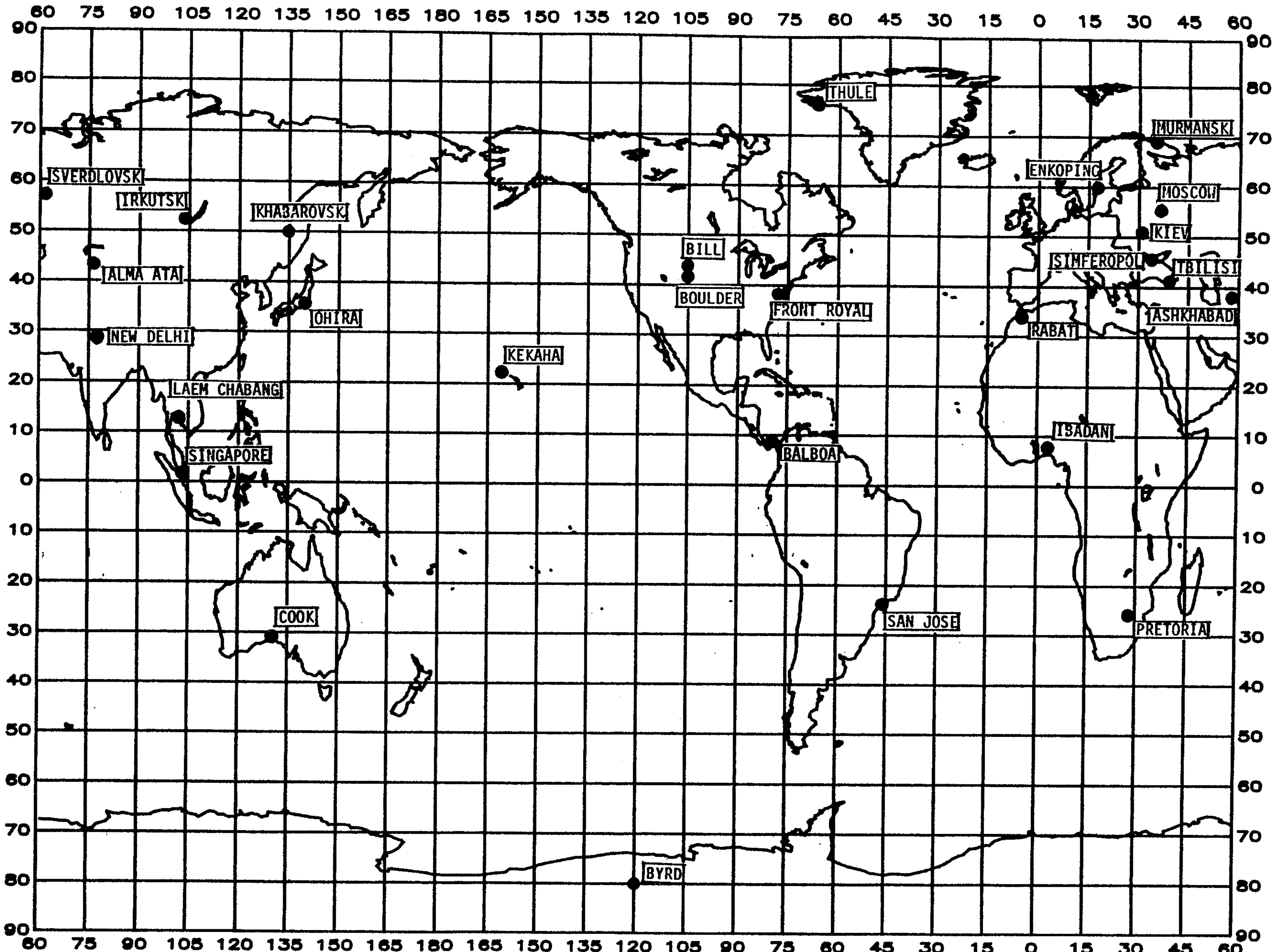

Figure 7. Radio noise recording station locations used in the present analysis.

b) The atmospheric noise is low within the USSR, especially the eastern part, and the measurements appear to be of mostly man-made noise for a good portion of the time at the higher frequencies. The parameter E_{on} leads to levels and variation with frequency that correspond quite closely to levels measured at quiet receiving sites in the worldwide network; that is, comparison of man-made noise levels check.

c) Finally, the analysis to obtain new estimates is based on determining correction factors at each measurement location (corrections to CCIR 322). Correction factors developed using E_{on} at Murmansk and at the close F_a measurement location, Enkoping, Sweden, were always quite similar, both in magnitude and direction.

Based on the above, the median value of E_{on} was determined for all measurements at a given location and for a given measurement frequency for the hours and months within each of the twenty-four 3-month/4-hour time blocks. This median value of E_{on} is in μV/m. The antennas used at the Soviet measurement locations were 5 meter vertical rods over a ground plane. Equation (3), therefore, is used to go from field strength to F_{am}. The bandwidths used were approximately 250 Hz at frequencies below 1.5 MHz, and 1000 Hz at frequencies at or above 1.5 MHz, with some variation at some of the measurement stations; for example, a 1000 Hz bandwidth was sometimes used at .750 and 1 MHz. The measurement frequencies and other information are summarized below for each of the measurement locations.

Alma Ata: Data are available from September 1958 through December 1965. The measurement frequencies at the start were .75, 1, 2.5, 5, 7.5, and 10 MHz. In May 1962 the measurement frequencies were changed to 12, 25, 35, 60, 350, 750, 1000, 2500, 5000 kHz.

Ashkhabad: Data are available from November 1958 through December 1965. The measurement frequencies were 12.5, 50, 100, 350, 750, 1000, 2500, 5000, 7500, and 10000 kHz. In March 1962, they were changed to 12, 25, 35, 60, 100, 750, 2500, 5000 kHz.

Irkutsk: Data are available from November 1958 through December 1965. The measurement frequencies were initially 12.5, 50, 100, 350, 750, 1000, 2500, 5000, 7500, 10000 kHz. In February 1963 they were changed to 12.5, 25, 35, 60, 100, 350, 750, 1000, 7500, 5000, 7500, 10000 khz. In 1964 and 1965 only the lower frequencies were used, essentially up to 60 kHz, with a few measurements at higher frequencies.

Khabarovsk: Data are available from December 1958 through December 1965. The measurement frequencies were initially 12.5, 50, 100, 350, 750, 1000, 2500, 5000, 7500, 10000 kHz. In February 1961, they were changed to 12.5, 25, 35, 50, 100, 350, 750, 1000, 2500, 7500, 10000 kHz. As with Irkutsk, the lower frequencies were then emphasized.

Kiev: Data are available from August 1960 through December 1965. The initial frequencies were 2500, 5000, 7500, and 10000 kHz, but were changed to 12, 25, 35, 50, 750, 1000, 2500, 5000, 7500, and 10000 kHz in December 1960. The frequency 350 kHz was also occasionally used.

Moscow: Data are available from March 1958 through December 1964. The frequencies were 12, 25, 35, 60, 100, 350, 750, 1000, 2500, 5000, 7500, and 10000 kHz. In October 1962 the frequencies 3, 5, and 8 kHz were added. Starting in February 1964, there are also data at the additional frequencies of 15, 20, 30, 40, 50, and 70 kHz.

Murmansk: Data are available from May 1959 through November 1965. The frequencies were 12.5, 25, 35, 50, 100, 350, 750, 1000, 2500, 5000, 7500, and 10000 kHz throughout.

Simferopol: Data are available from August 1958 through December 1965. The initial frequencies were 750, 1000, 2500, 5000, 7500, and 10000 kHz. In August 1963, 12, 25, 35, 60, 100, and 350 kHz were added.

Sverdlovsk: Data are available from March 1959 through December 1965. The initial frequencies were 750, 1000, 2500, 5000, 7500, and 10000 kHz. In April 1964, 12, 25, 35, 60, 100, and 350 kHz were added.

Tbilisi: Data are available from November 1959 through December 1965. The frequencies were 12.5, 25, 35, 50, 100, 350, 750, 1000, 2500, 5000, 7500, and 10000 kHz. In January 1963, 50 kHz was changed to 60 kHz.

The above summarizes the Soviet data. Throughout these data, there are missing months, times, frequencies, some months with only a few days of measurements, etc. All in all, however, there is a large body of usable data. Some of the data were analyzed by the Institute for Telecommunication Sciences (ITS) in Boulder, Colorado, but most of the data were analyzed by David Sailors and his colleagues at the Naval Ocean Systems Center (NOSC) in San Diego, California. This analysis represents a very large and time consuming effort.

The analysis involved determining, at each frequency, for each 3-month period and 4-hour time block, the median value of all the data. (A large number of other statistical parameters were also determined, since the analysis employed standard computer statistical analysis algorithms.) These median values at the various frequencies were then used to determine the appropriate 1 MHz F_{am} value and this value was then used to obtain a correction value to the current CCIR Report 322 value. Figure 8 shows an example for Moscow for June, July, August (Northern Hemisphere Summer) and 1600-2000 hours. A computer algorithm was developed that determined the frequency variation curve that "best" fit the data. However, since the median value at some frequencies was based on much more data than the value of other frequencies (due to missing data and some frequencies being stressed at some locations), this "fitting" process was generally done by hand (visually). On Figure 8, the "best" frequency law curve was determined to be 72 dB. The current CCIR 322 value is 65 dB, resulting in a correction of +7 dB. As mentioned earlier, most of the data at higher frequencies were measurements of man-made noise, rather than atmospheric noise. Figure 9 shows an example for Moscow for the period November, December, January, 0800-1200 hours. Atmospheric noise would be expected to be low during this period (winter morning). Note that the higher frequencies, 350 kHz and above, give a typical man-made noise curve at a level expected for quiet receiving sites. Using the data at the lower frequencies, the frequency law curve for 31 dB was determined. The CCIR value is 29 dB, resulting in a required correction of +2 dB.

2.2 Corrections to CCIR Report 322 1 MHz F_{am} Values

The above procedure (Figures 8 and 9) was followed for all the data available worldwide (noted above) and corrections were obtained for each location and for each 3-month/4-hour time block.

Tables 2 through 5 give the corrections determined by the above procedure used in the analysis. The "correction" is the difference between the current CCIR Report 322 1 MHz F_{am} value and the corresponding value determined from the above data. Note there are no correction values for Thule, Greenland, or Byrd Station, Antarctica, as explained earlier. There are also no corrections for Ibadan, Nigeria, since there are no data from Ibadan past the publication date of Report 322. The corrections for Bill and Boulder were essentially identical, so only Boulder is used. Corrections are also given for only 6 Soviet locations (rather than 10) since Simferopol, Svendlovsk, Tbilisi, and Kiev had only small amounts of usable low frequency data (needed to determine the proper 1 MHz F_{am} value, as explained

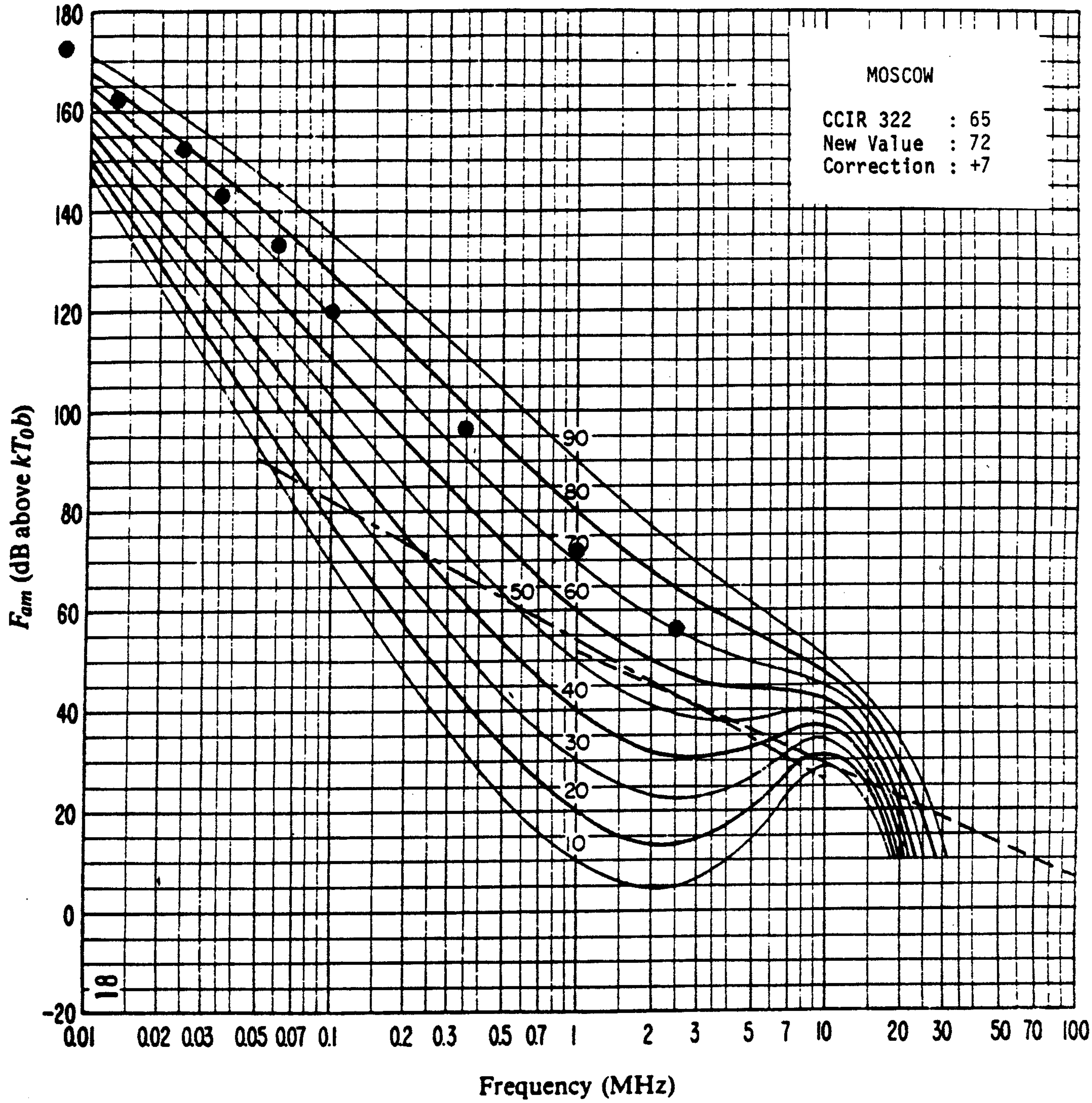

Figure 8. Determination of 1 MHz F_{am} value for Moscow, June, July, August, 1600-2000 hours.

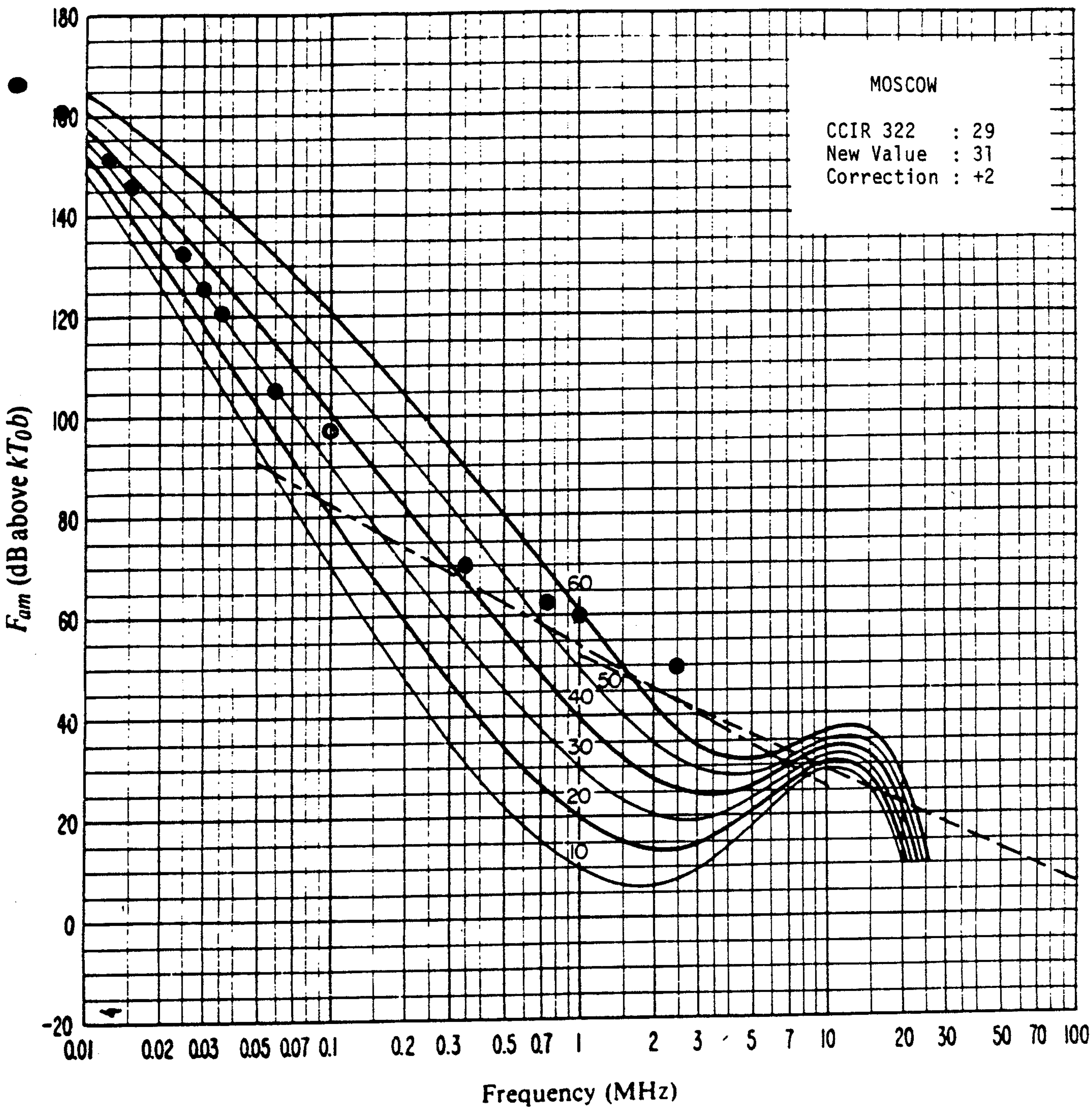

Figure 9. Determination of 1 MHz F_{am} value for Moscow, December, January, February, 1000-1200 hrs.

Table 2. Corrections (dB) to CCIR Report 322 1 MHz F_{am} values for December, January, and February.

PLACE	LOCATION	00-04	04-08	08-12	12-16	16-20	20-24
Alma Ata	76.9E,43.2N	+7	-6	+6	+5	-3	-6
Irkutsk	104.5E,52.0N	-21	-25	-7	-15	-25	-25
Khabarovsk	135.0E,50.0N	-19	-15	-8	-7	-20	-20
New Delhi	77.3E,28.8N	-13	+7	+17	+17	+8	+11
Ohira	140.5E,35.6N	+7	+7	+8	+12	+11	+11
Thailand	100.9E,13.0N	+14	+15	+24	+18	+17	+15
Singapore	103.8E, 1.3N	0	+6	+12	+9	+5	+1
Kekaha	159.7W,22.0N	+5	+10	+8	+15	+5	+6
Boulder	105.1W,40.1N	+5	+4	+7	+14	+7	+8
Front Royal	78.2W,38.8N	-1	+2	+3	+8	0	0
Balboa	79.5W, 9.0N	+3	+6	+7	+9	+7	+2
Rabat	6.8W,33.9N	+2	+4	+3	+8	+2	+4
Enkoping	17.3E,59.5N	+12	+10	-1	+8	+7	+7
Murmansk	35.0E,69.0N	+8	+5	+7	+9	+7	+7
Moscow	37.3E,55.5N	+4	+3	+2	+4	0	-1
Ashkhabad	58.3E,37.9N	-9	-1	-5	-5	-6	-12
Cook	130.4E,30.6S	+2	-3	+6	+1	+6	+3
San Jose	45.8W,23.3S	+2	0	+2	+2	+4	+3
Pretoria	28.3E,25.8S	-4	+8	-4	+1	+5	-8

Table 3. Corrections (dB) to CCIR Report 322 1 MHz F_{am} values for March, April, and May.

PLACE	LOCATION	00-04	04-08	08-12	12-16	16-20	20-24
Alma Ata	76.9E,43.2N	-7	-4	-5	-8	-2	-5
Irkutsk	104.5E,52.0N	-12	-7	-5	+5	+4	-14
Khabarovsk	135.0E,50.0N	-15	-6	-7	+1	-1	-21
New Delhi	77.3E,28.8N	+6	+10	+15	+9	+12	+7
Ohira	140.5E,35.6N	+2	+4	+15	+12	+7	+2
Thailand	100.9E,13.0N	+6	+9	+14	+17	+10	+8
Singapore	103.8E, 1.3N	+3	+5	+16	+13	+10	+5
Kekaha	159.7W,22.0N	+6	+8	+11	+13	+5	+6
Boulder	105.1W,40.1N	+3	+5	+7	+2	+8	+3
Front Royal	78.2W,38.8N	-3	-1	-5	-5	-3	+1
Balboa	79.5W, 9.0N	+4	+5	+9	+5	+6	+4
Rabat	6.8W,33.9N	+1	+4	+3	-5	0	0
Enkoping	17.3E,59.5N	0	0	+3	-1	-5	+2
Murmansk	35.0E,69.0N	+3					+4
Moscow	37.3E,55.5N	+4	0	0	-2	+0	-4
Ashkhabad	58.3E,37.9N	+2	+1	-3	+2	-4	+2
Cook	130.4E,30.6S	+3	+9	+5	+8	+4	+5
San Jose	45.8W,23.3S	+2	+3	+5	+7	+3	+7
Pretoria	28.3E,25.8S	+3	+2	+11	+9	+11	-1

Table 4. Corrections (dB) to CCIR Report 322 1 MHz F_{am} values for June, July, and August.

PLACE	LOCATION	00-04	04-08	08-12	12-16	16-20	20-24
Alma Ata	76.9E,43.2N	-4	0	-8	-6	-2	-3
Irkutsk	104.5E,52.0N	-20	-6	-11	0	-4	-15
Khabarovsk	135.0E,50.0N	-10	-4	-8	+1	+2	-12
New Delhi	77.3E,28.8N	+8	+17	+11	+4	+10	+8
Ohira	140.5E,35.6N	+2	+5	+11	+10	+9	+3
Thailand	100.9E,13.0N	+11	+15	+15	+18	+13	+8
Singapore	103.8E, 1.3N	+4	+11	+15	+15	+10	+2
Kekaha	159.7W,22.0N	+9	+6	+2	+2	-6	+4
Boulder	105.1W,40.1N	+2	+8	+7	+10	+12	+6
Front Royal	78.2W,38.8N	-8	-4	+4	-11	-10	-1
Balboa	79.5W, 9.0N	-10	+9	+12	+1	+3	+4
Rabat	6.8W,33.9N	0	+3	+2	-16	-4	0
Enkoping	17.3E,59.5N	+5	+6	-4	-7	-4	-7
Murmansk	35.0E,69.0N	-2	+8	-1	+5	+10	-2
Moscow	37.3E,55.5N	-2	0	-2	+2	+7	-6
Ashkhabad	58.3E,37.9N	+2	-4	-7	-8	-3	-3
Cook	130.4E,30.6S	+5	+7	+12	+11	+10	+6
San Jose	45.8W,23.3S	-4	+5	+11	+10	+9	0
Pretoria	28.3E,25.8S	+12	+11	+20	+22	+16	+17

Table 5. Corrections (dB) to CCIR Report 322 1 MHz F_{am} values for September, October, and November.

PLACE	LOCATION	00-04	04-08	08-12	12-16	16-20	20-24
Alma Ata	76.9E,43.2N	-4	-3	-2	-8	-7	-9
Irkutsk	104.5E,52.0N	-22	-20	-15	-15	-20	-20
Khabarovsk	135.0E,50.0N	-19	-10	-8	-9	-12	-18
New Delhi	77.3E,28.8N	+5	+8	+9	-4	+6	+5
Ohira	140.5E,35.6N	+6	+4	+12	+9	+9	+7
Thailand	100.9E,13.0N	+5	+11	+20	+12	+9	+7
Singapore	103.8E, 1.3N	+7	+11	+20	+14	+7	+7
Kekaha	159.7W,22.0N	+1	+5	0	+2	0	+2
Boulder	105.1W,40.1N	+2	+7	+12	+10	+9	+3
Front Royal	78.2W,38.8N	-2	+3	+4	-1	-2	-1
Balboa	79.5W, 9.0N	0	+4	+14	+12	+5	0
Rabat	6.8W,33.9N	+5	+9	+11	+3	+6	+5
Enkoping	17.3E,59.5N	+2	+4	0	+4	0	+3
Murmansk	35.0E,69.0N	-5	+2	-2	+3	+1	-2
Moscow	37.3E,55.5N	0	+3	+3	-2	-2	+2
Ashkhabad	58.3E,37.9N	+3	+5	-6	-4	-2	0
Cook	130.4E,30.6S	-1	+2	+11	+10	+4	+4
San Jose	45.8W,23.3S	+4	+6	+12	+6	+3	+2
Pretoria	28.3E,25.8S	+3	+9	+9	+6	+8	+4

earlier) and/or were close to other measurement locations. The data at these four locations were analyzed to ascertain that the corrections agreed with those used at nearby locations, especially Moscow and Ashkhabad. For Murmansk, March, April, and May, for the four time blocks 0400-0800, 0800-1200, 1200-1600, and 1600-2000 hours, the data were highly irregular and confusing, so it was decided not to attempt to obtain any correction values for Murmansk for those four periods (Table 3).

As noted previously, the CCIR Report 322 1 MHz F_{am} contour maps were obtained directly from a grid of equally spaced 84 longitude and 100 latitude points. The next step in the analysis was to obtain a corresponding grid of 84 x 100 correction values to add point by point to the grid of original data. To do this, we used a method of C^1 (continuous first partial derivatives) interpolation to scattered data over a sphere developed by Dr. Charles L. Lawson (1982) of the Jet Propulsion Laboratory (JPL). The method first constructs a triangular grid over the surface of a sphere (the Earth, here) using a given set of points as vertices (the 19 data points, Tables 2 through 5). First partial derivatives are estimated at each vertex using local quadratic least squares approximates to given data values at nearby vertices. The derived method for C^1 interpolation then uses six Hermite cubic interpolations along arcs of great circles. This approach has been implemented using the JPL structured FORTRAN preprocessor, SFTRAN3, and was used by JPL in the analysis of the gravity field of Venus. Dr. Lawson supplied SFTRAN3 and all the algorithms (programs) for the interpolation, along with complete documentation. The structured FORTRAN preprocessor was installed on the Department of Commerce Boulder Laboratories' computer (CYBER 170/750) and grids (84 x 100) of correction values were generated. Figures 10 through 33 are contour maps of these 24 (four 3-month periods, six 4-hour time blocks) correction grids. These maps show, at a glance, the changes from the current model (CCIR Report 322). Note that substantial corrections (on the order of 20 dB in some cases) are indicated for some areas, especially around the "new" measurement locations. This is also shown, of course, on Tables 2 through 5. Also note that the correction maps are presented in terms of 3-month periods rather than in terms of seasons (which results in a discontinuity at the equator) as in Report 322.

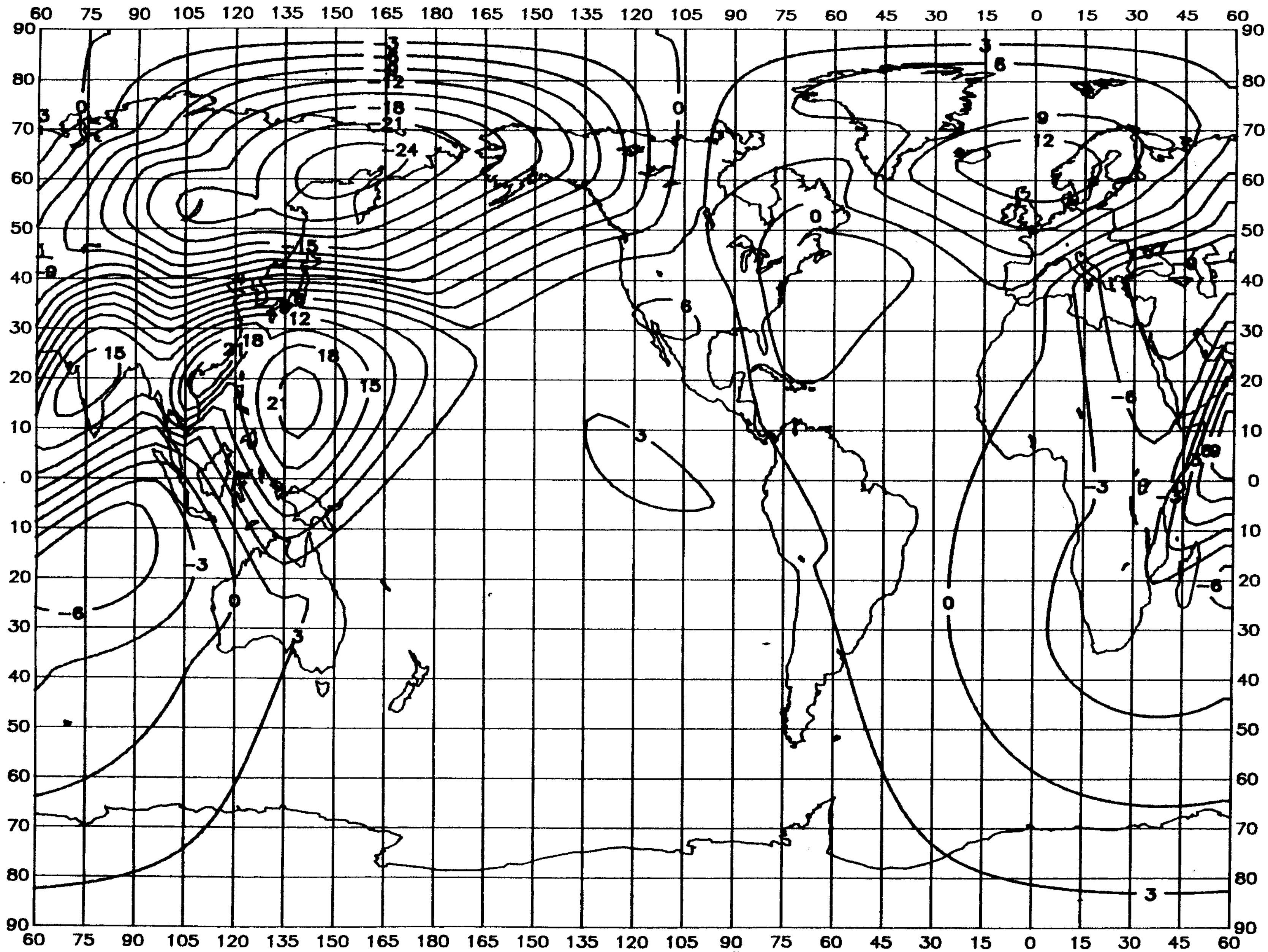

Figure 10. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, December, January, February, 0000-0400 hours.

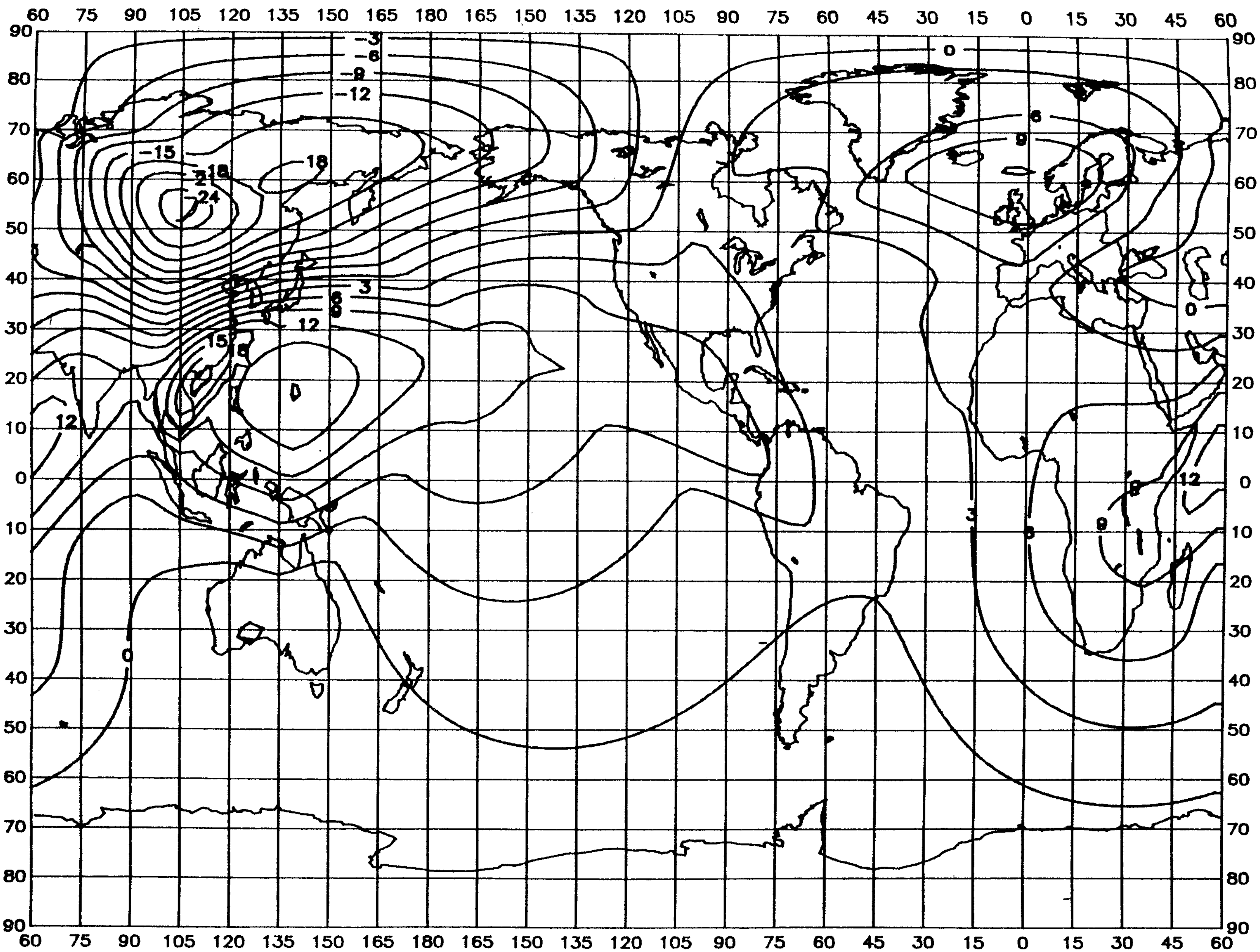

Figure 11. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, December, January, February, 0400-0800 hours.

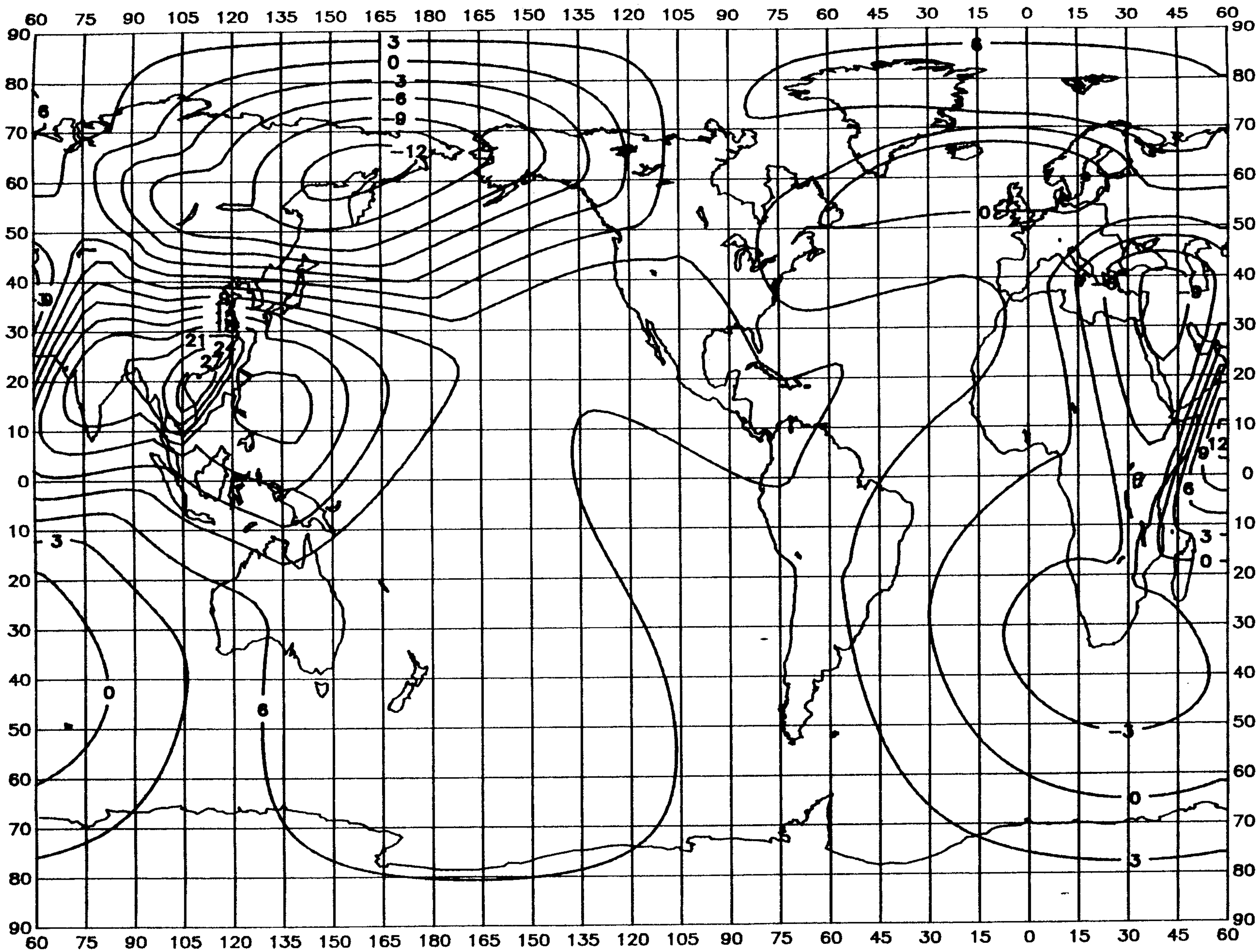

Figure 12. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, December, January, February, 0800-1200 hours.

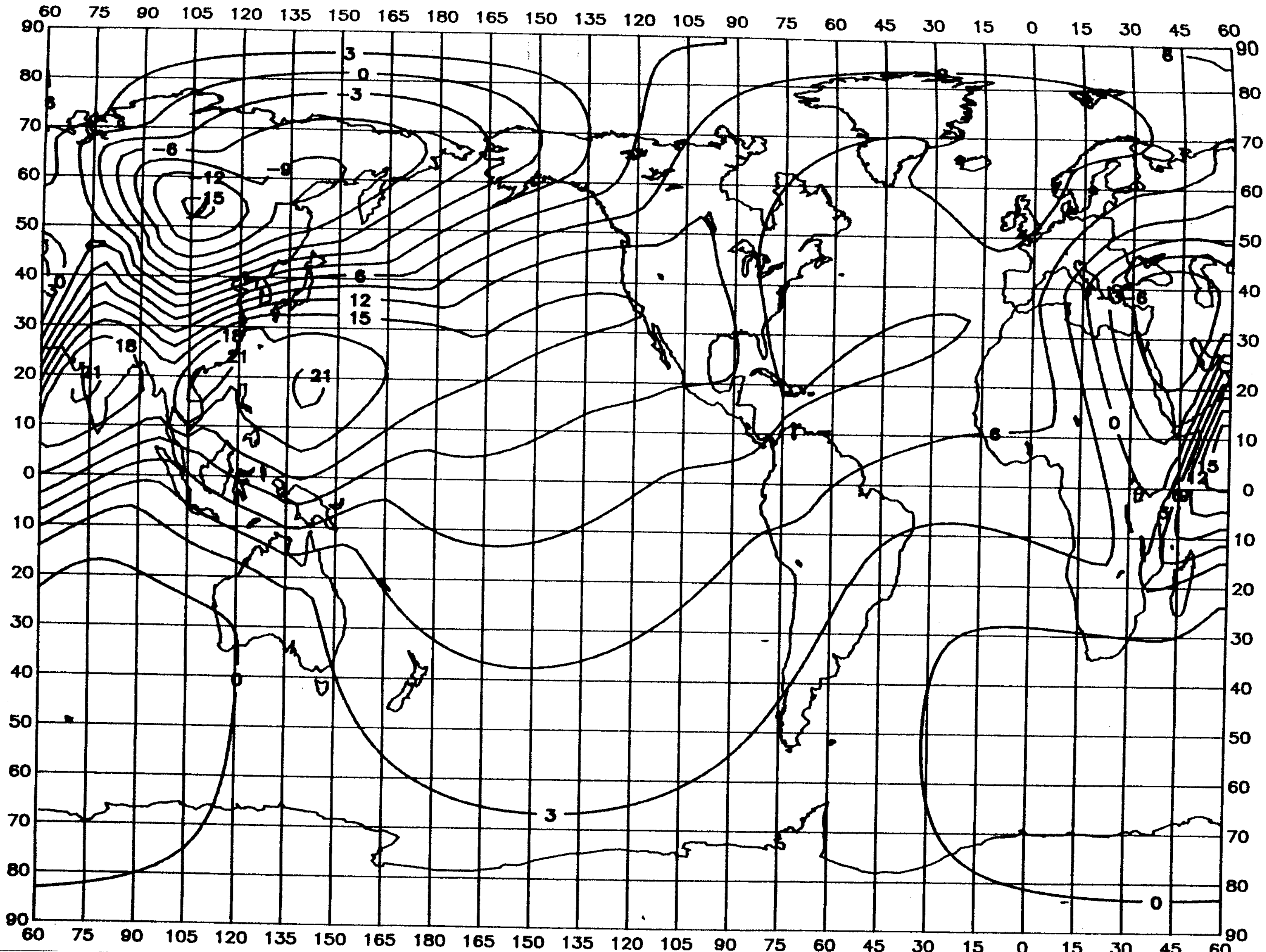

Figure 13. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, December, January, February, 1200-1600 hours.

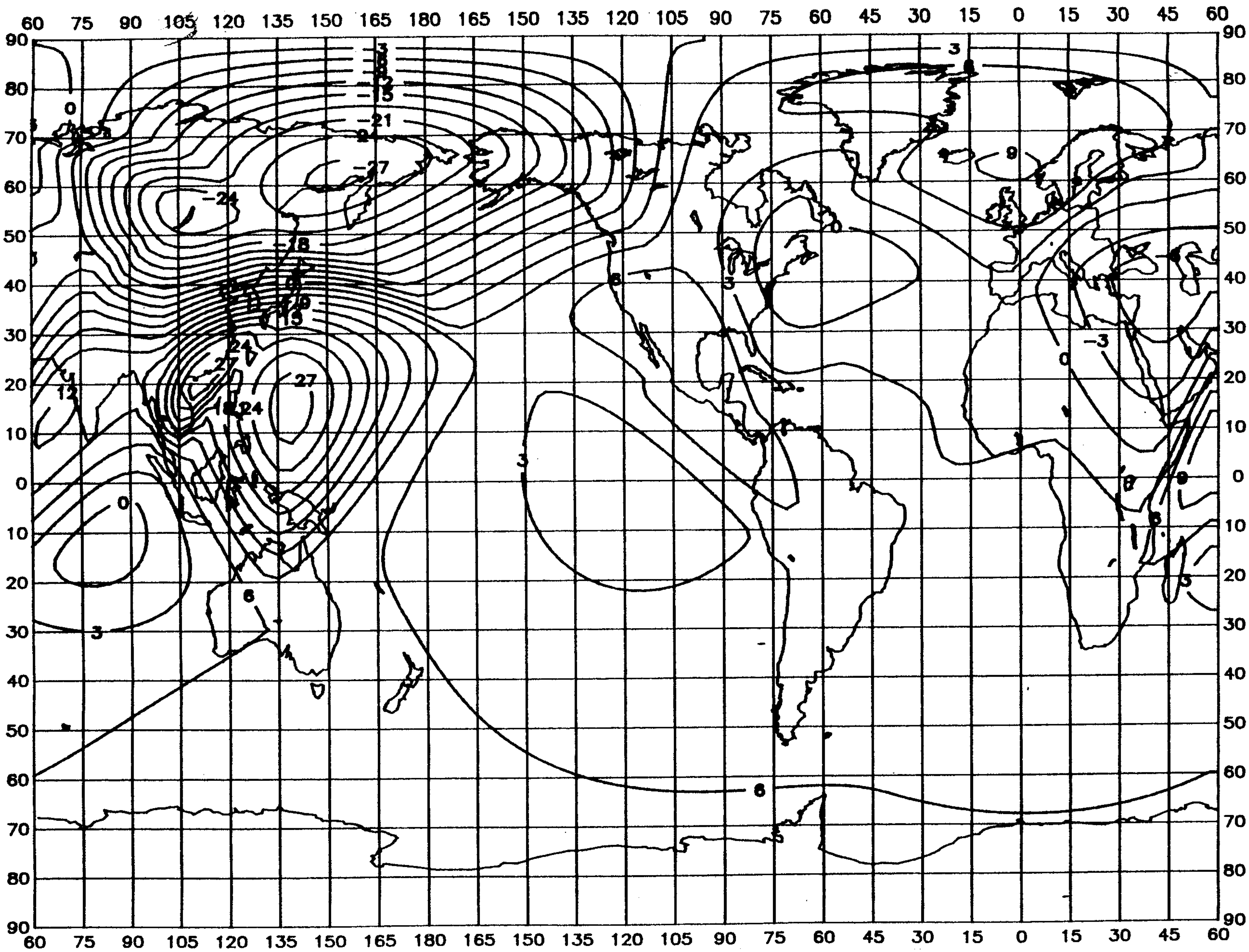

Figure 14. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, December, January, February, 1600-2000 hours.

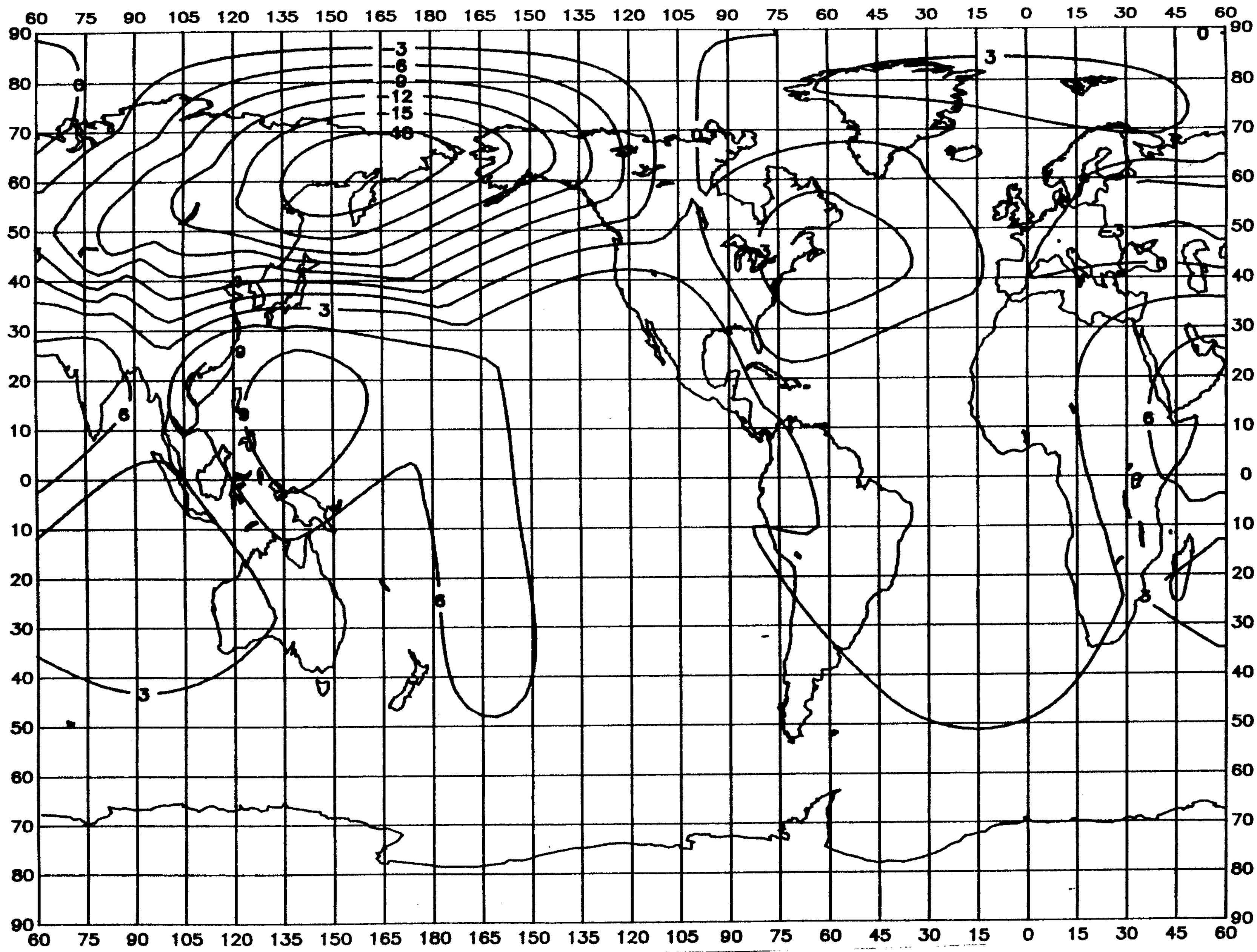

Figure 16. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, March, April, May, 0000-0400 hours.

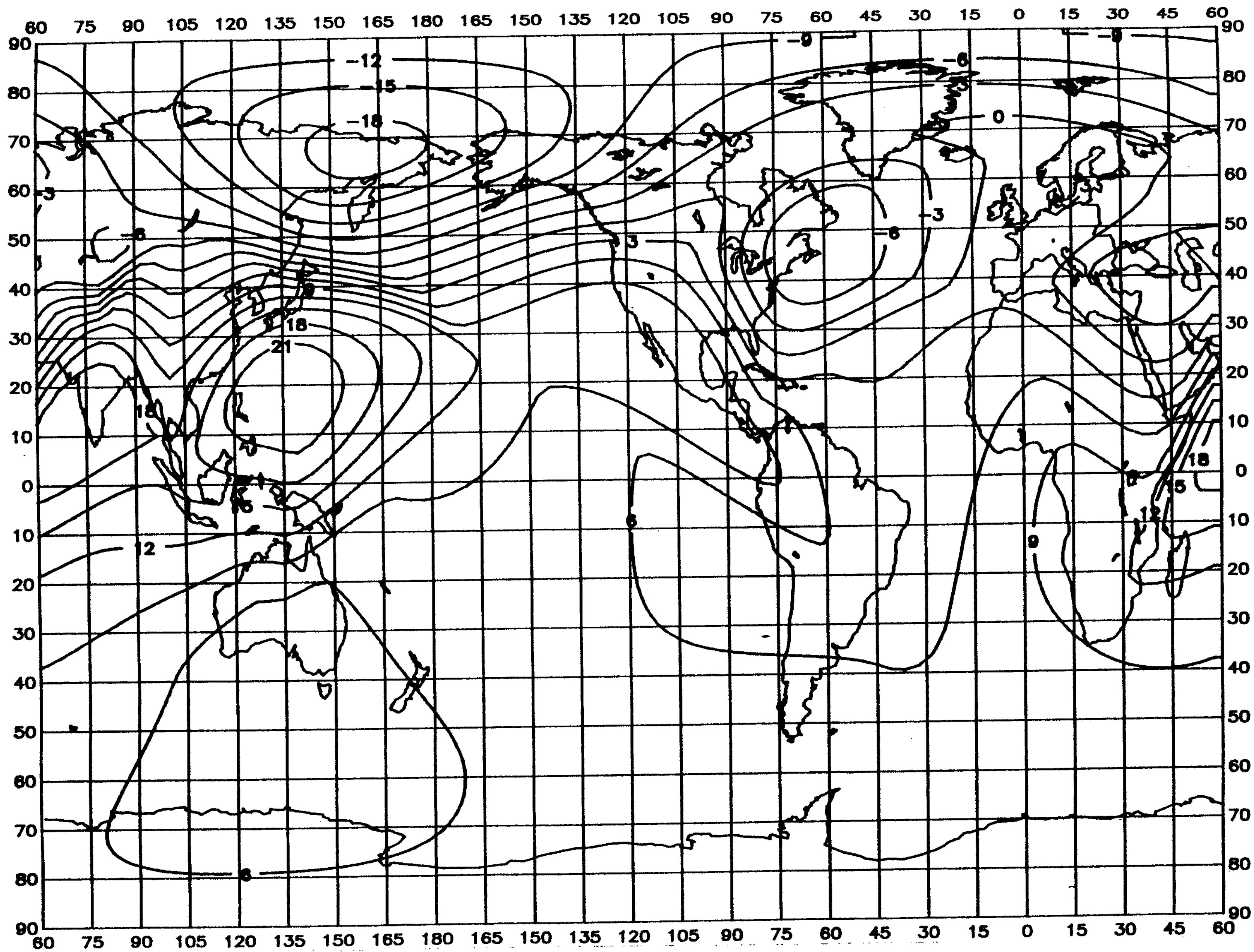

Figure 18. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, March, April, May, 0800-1200 hours.

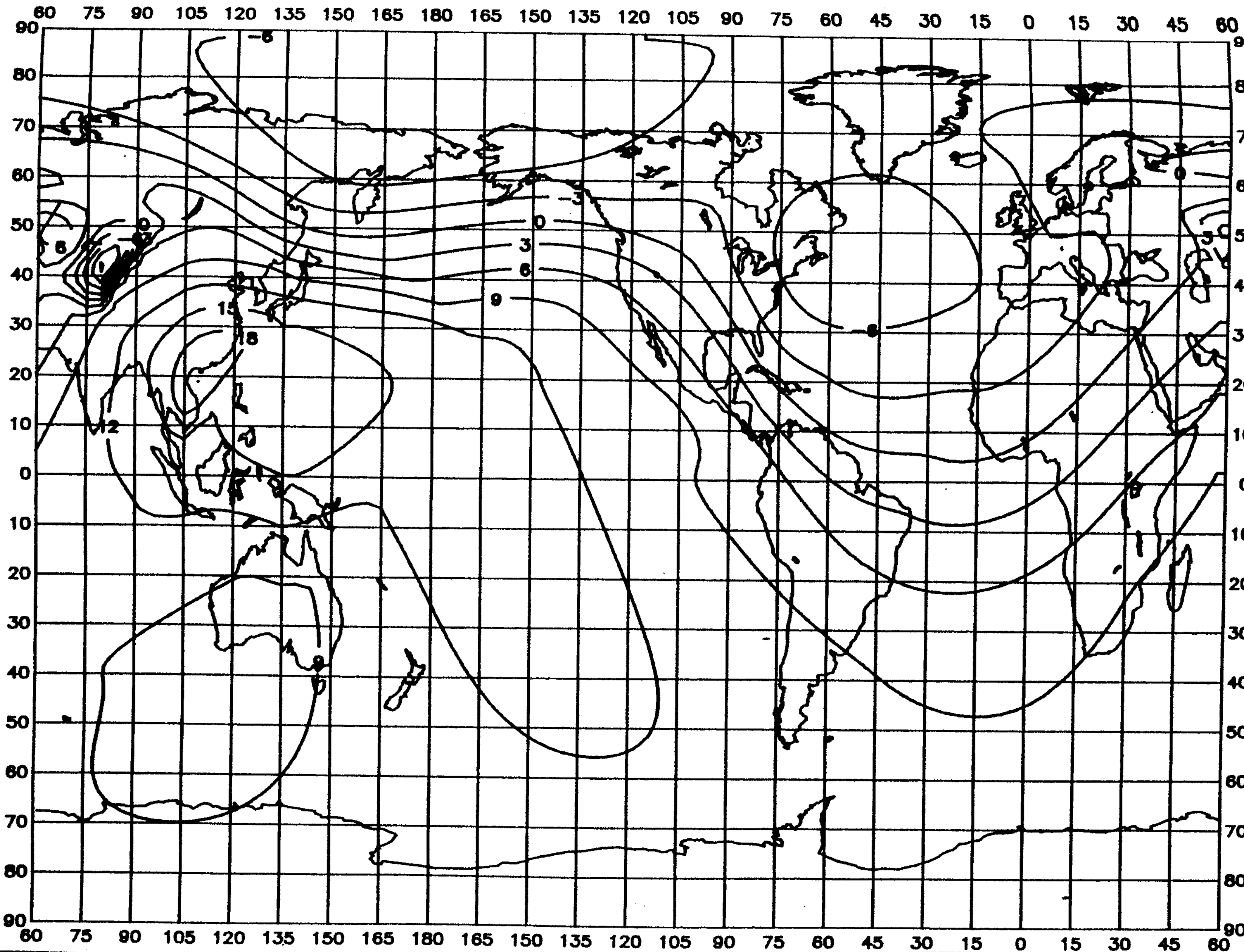

Figure 19. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, March, April, May, 1200-1600 hours.

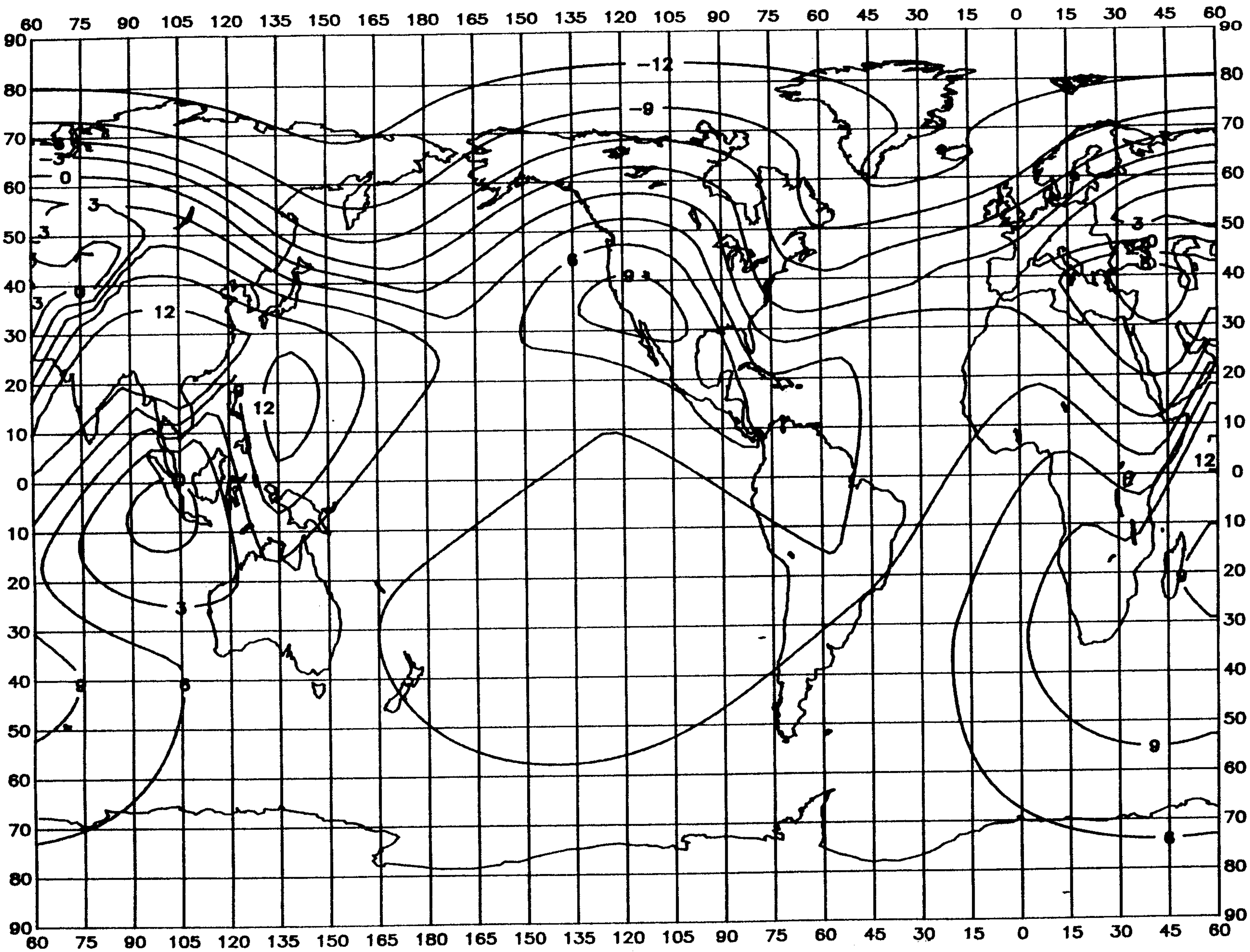

Figure 20. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, March, April, May, 1600-2000 hours.

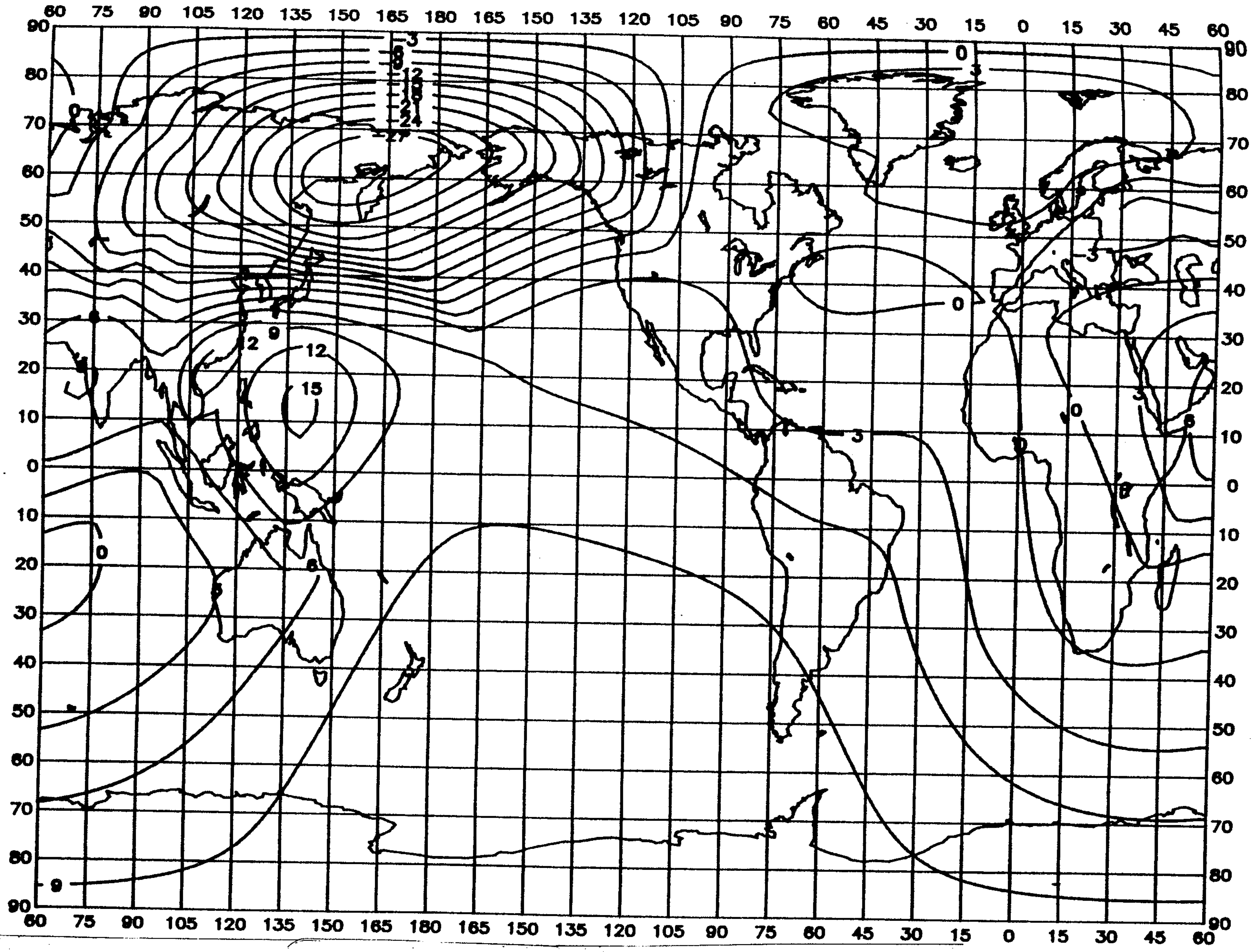

Figure 21. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, March, April, May, 2000-2400 hours.

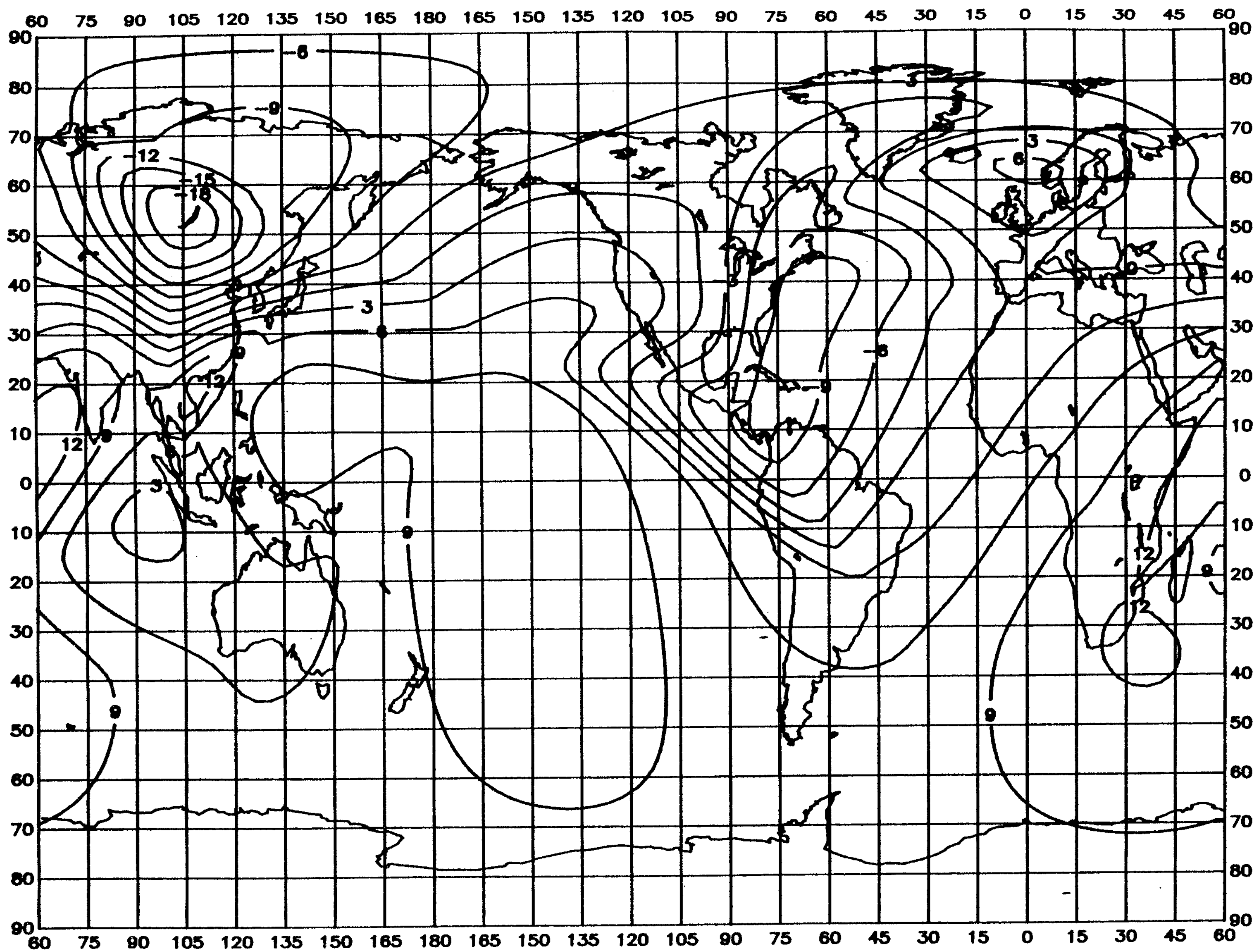

Figure 22. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, June, July, August, 0000-0400 hours.

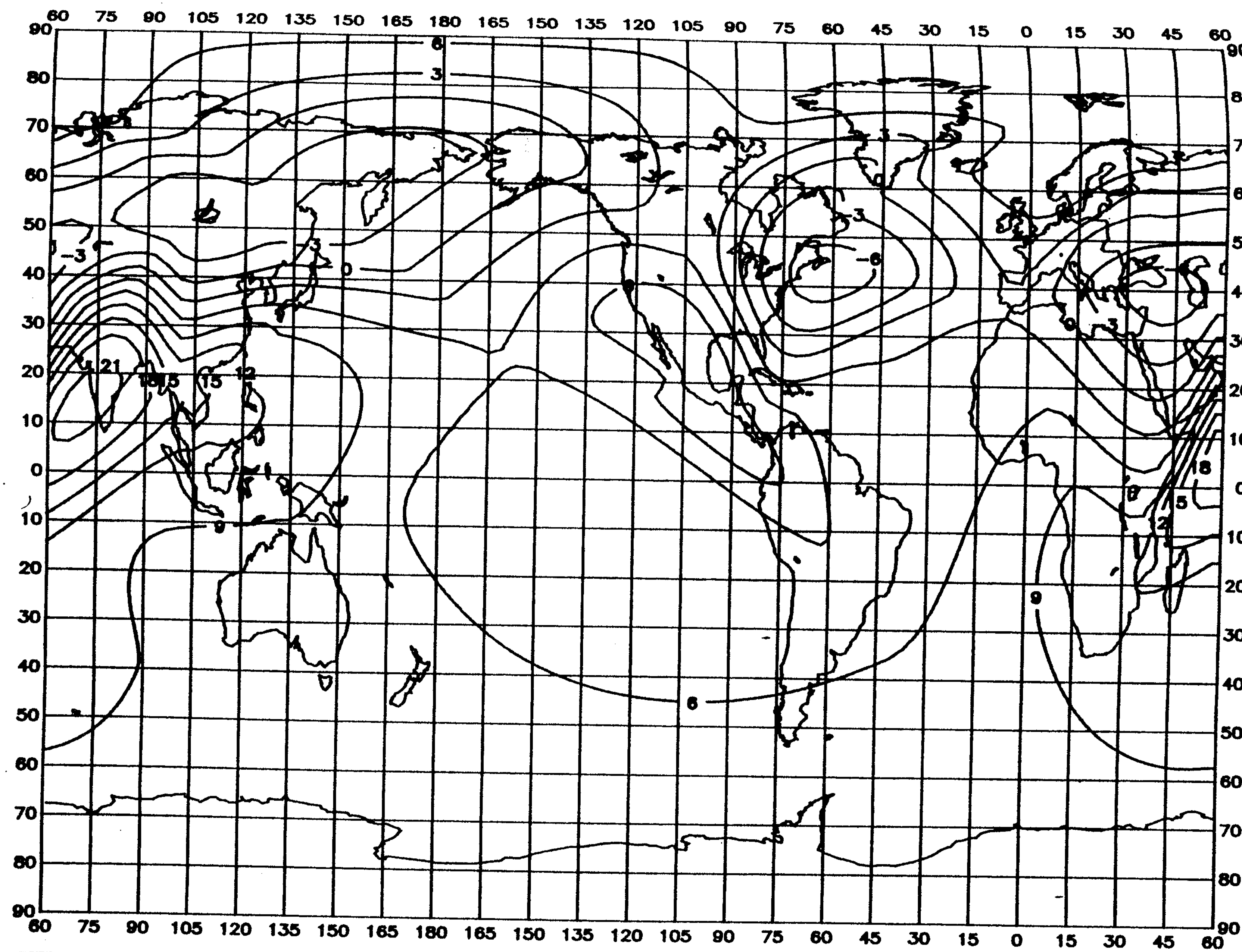

Figure 23. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, June, July, August, 0400-0800 hours.

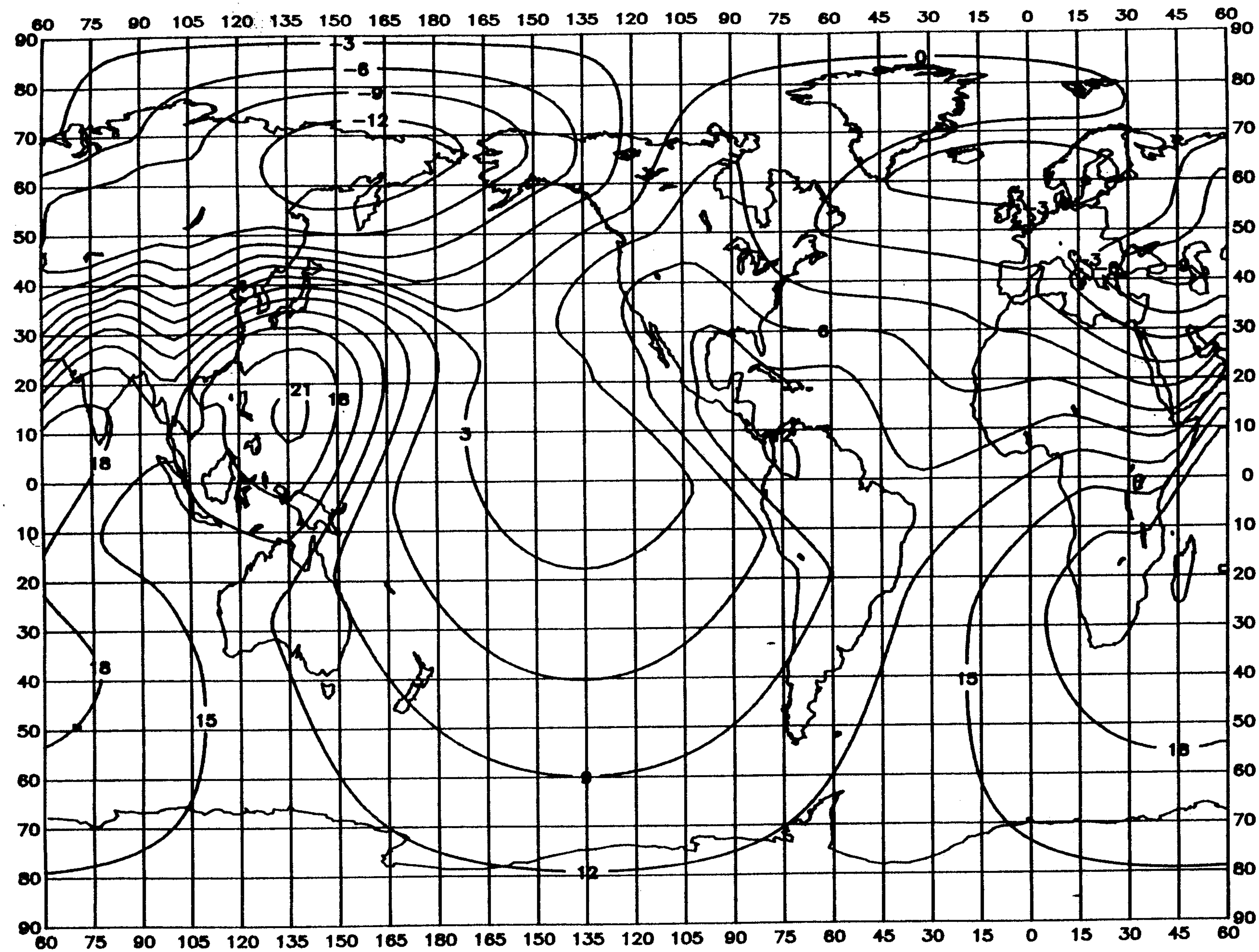

Figure 24. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, June, July, August, 0800-1200 hours.

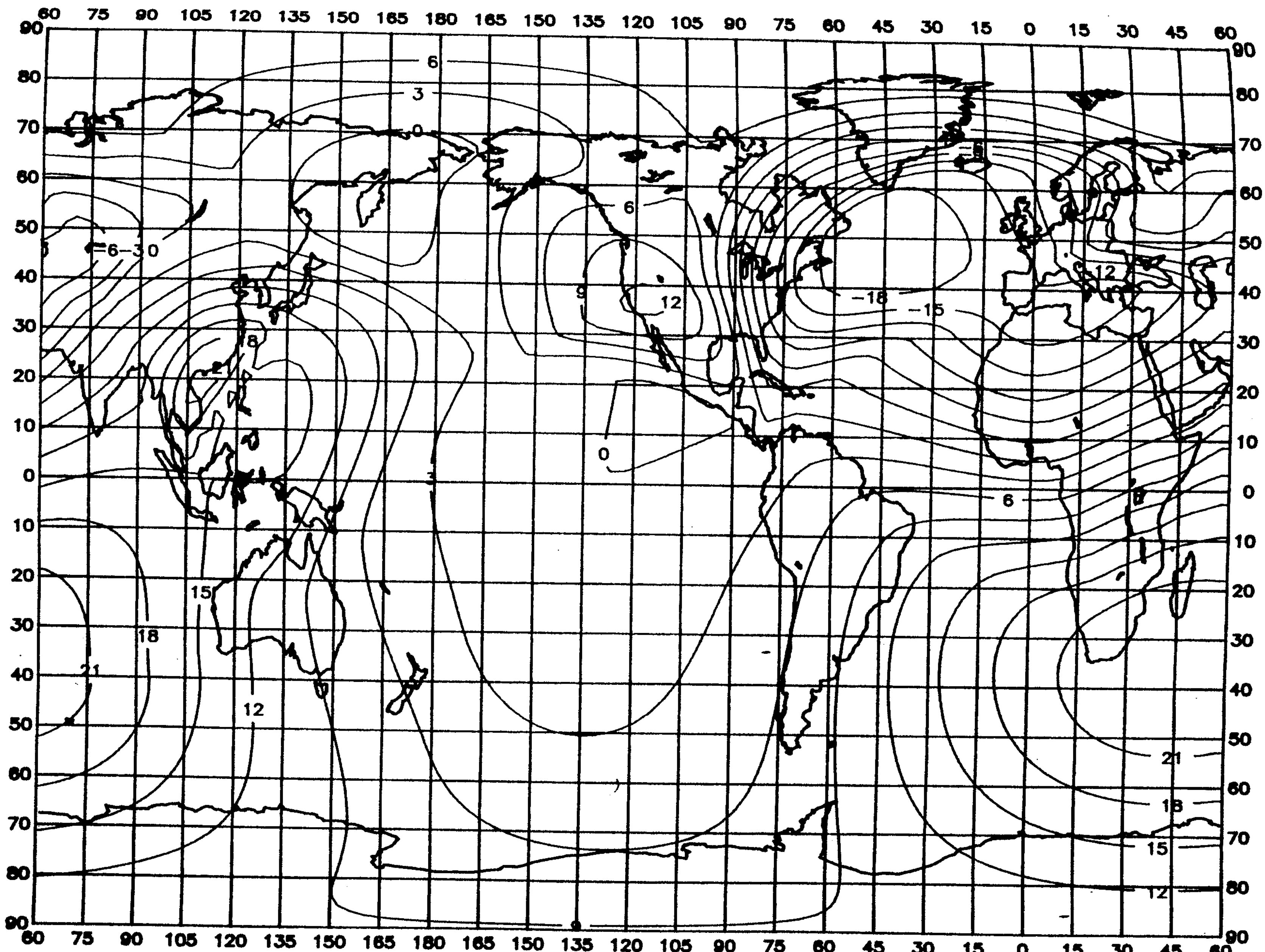

Figure 25. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, June, July, August, 1200-1600 hours.

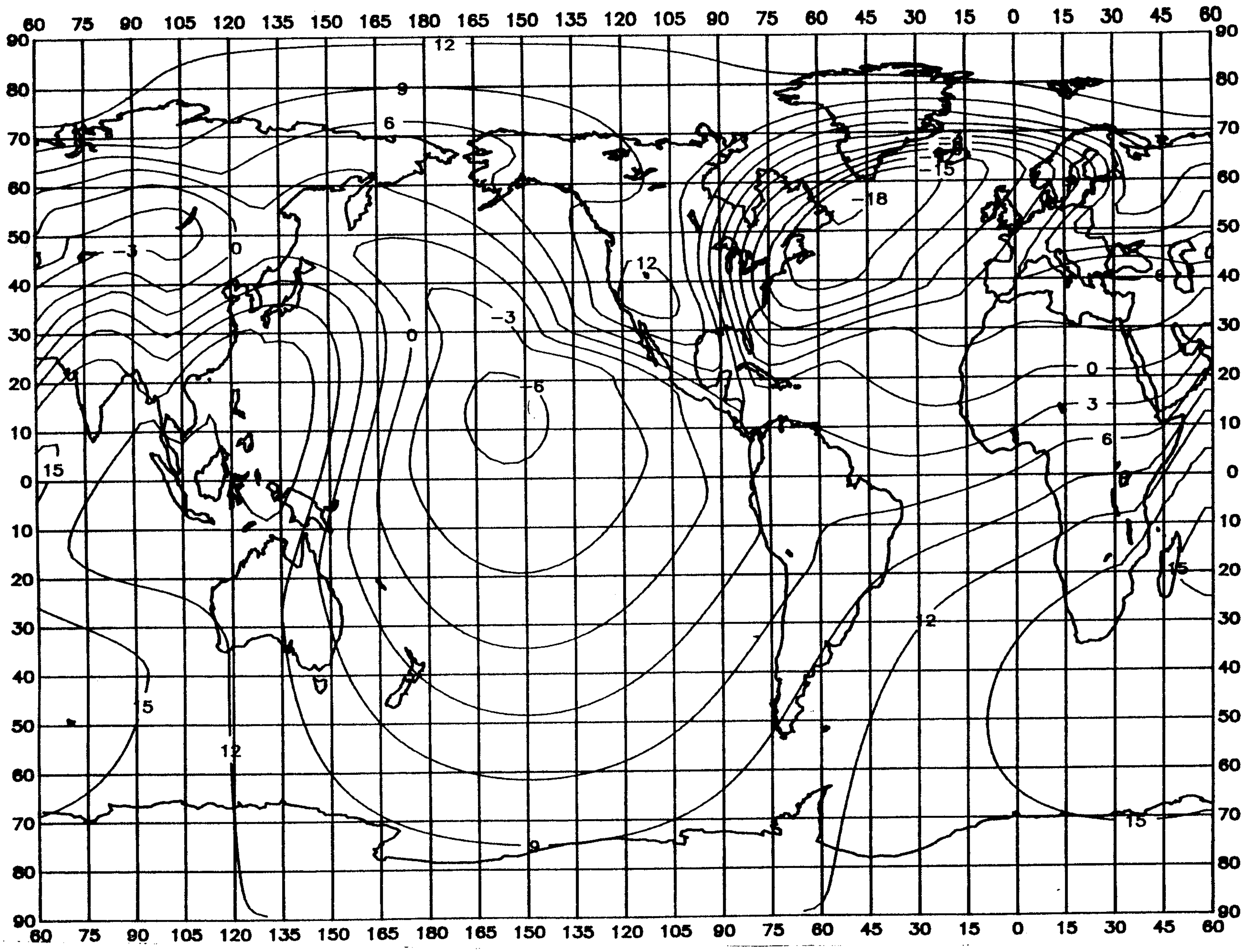

Figure 26. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, June, July, August, 1600-2000 hours.

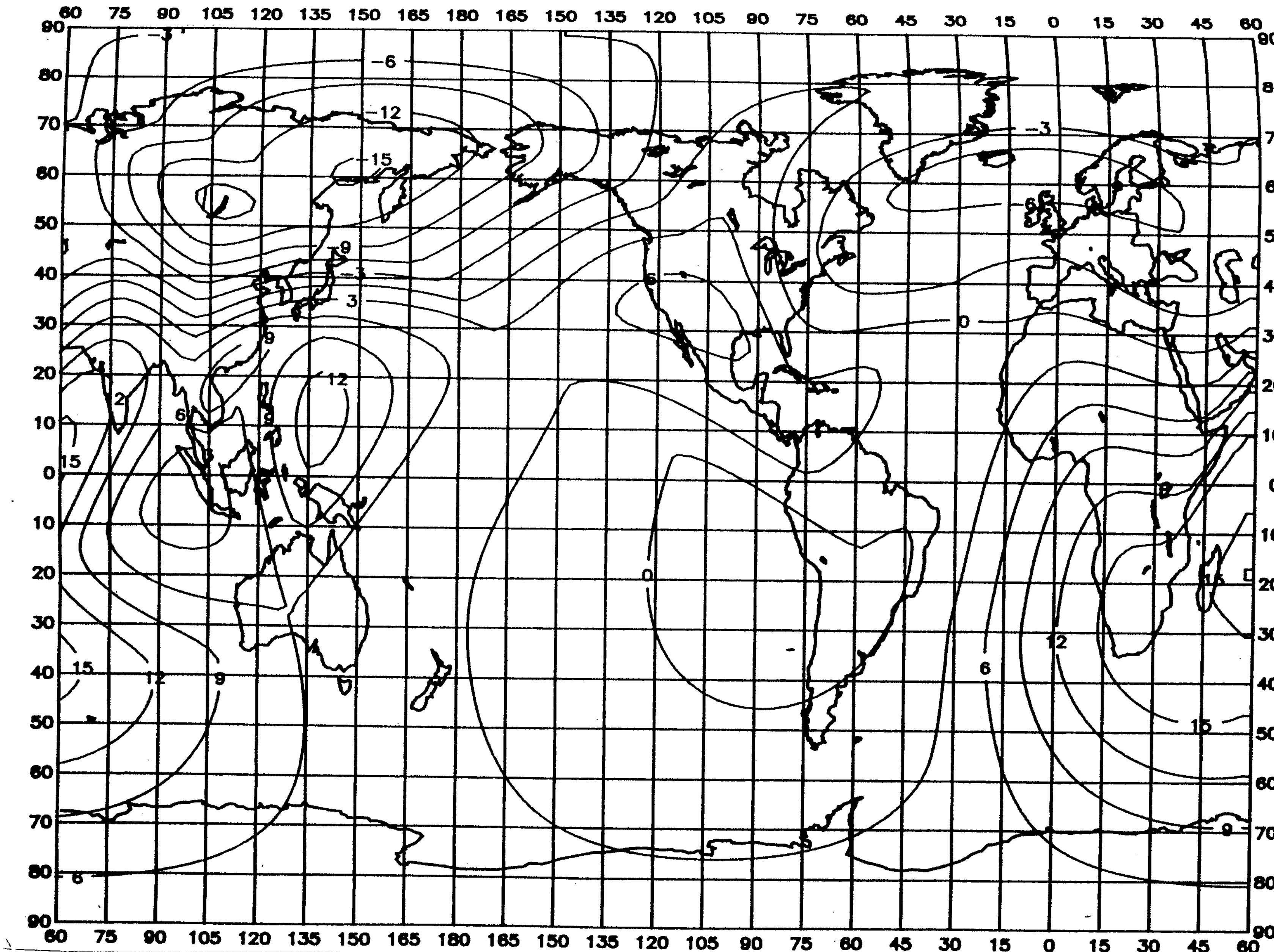

Figure 27. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, June, July, August, 2000-2400 hours.

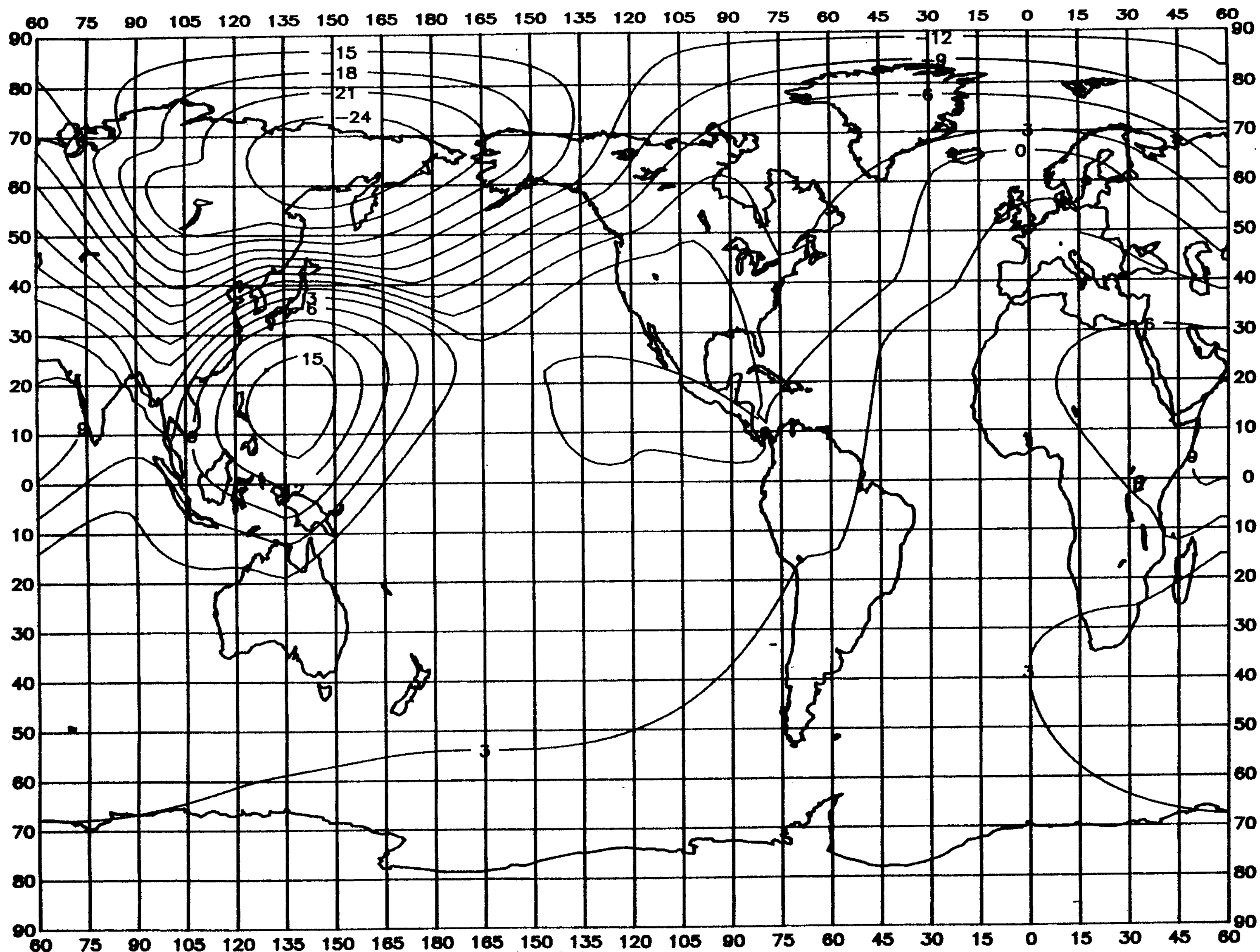

Figure 28. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, September, October, November, 0000-0400 hours.

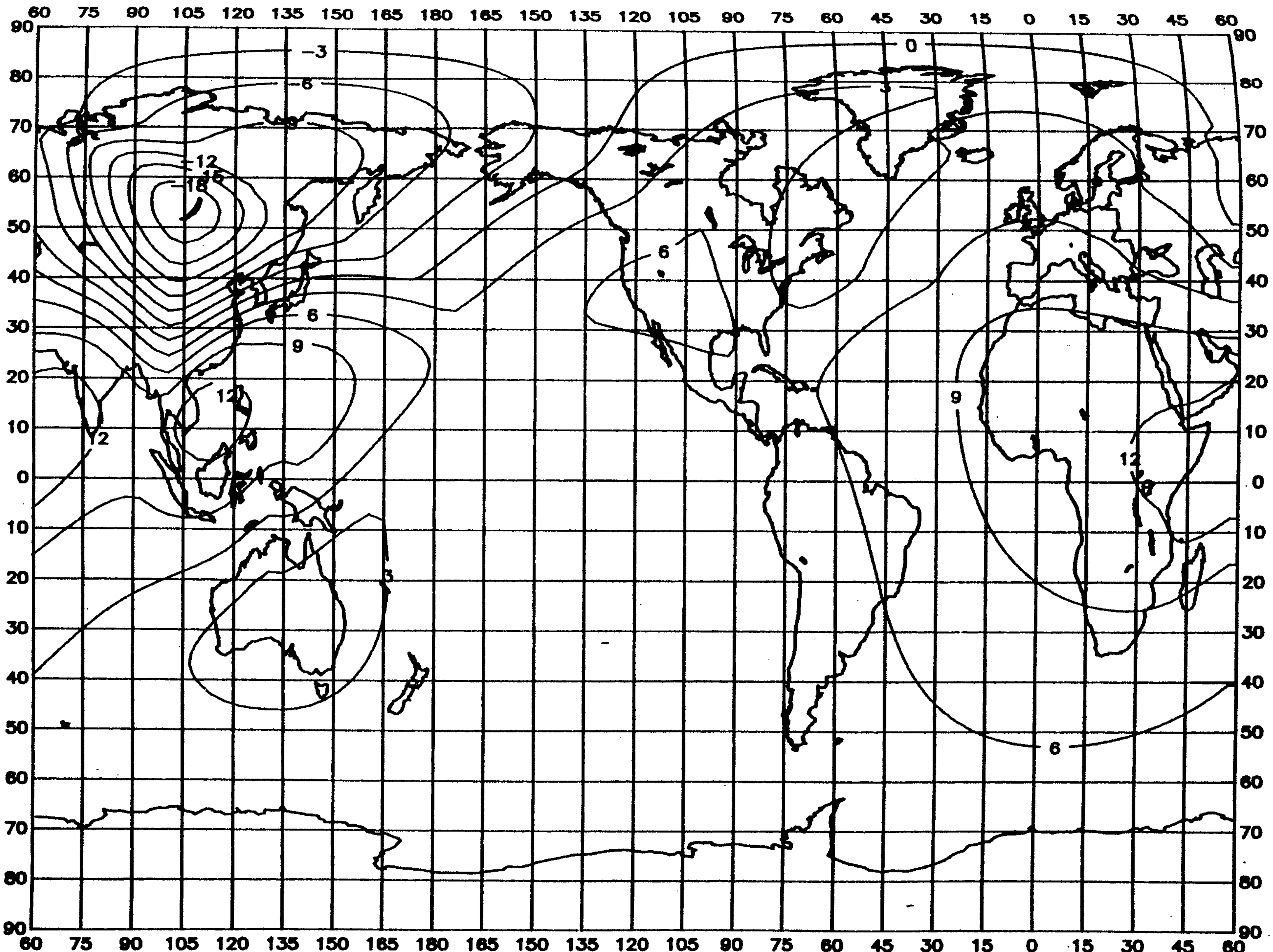

Figure 29. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, September, October, November, 0400-0800 hours.

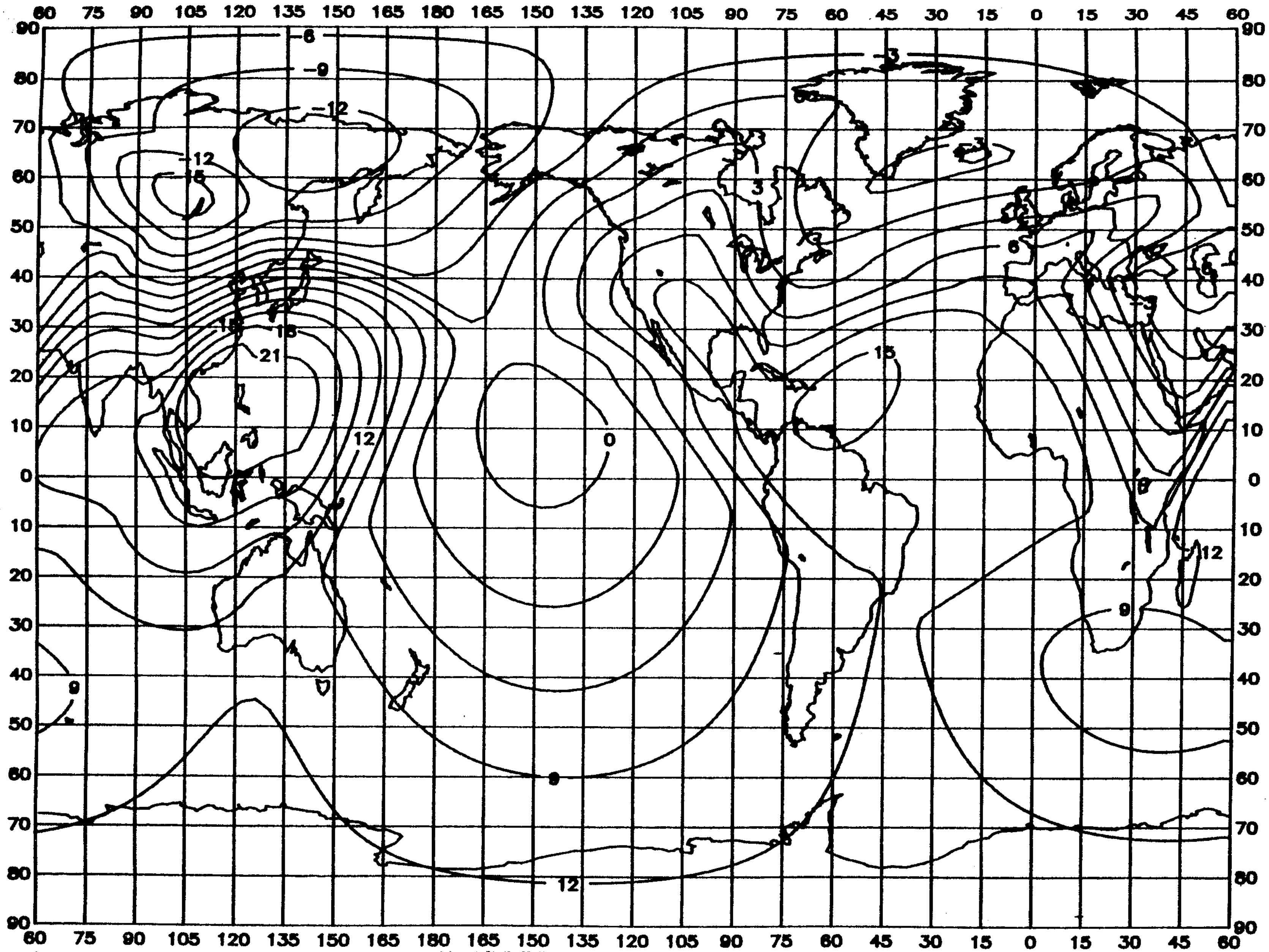

Figure 30. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, September, October, November, 0800-1200 hours.

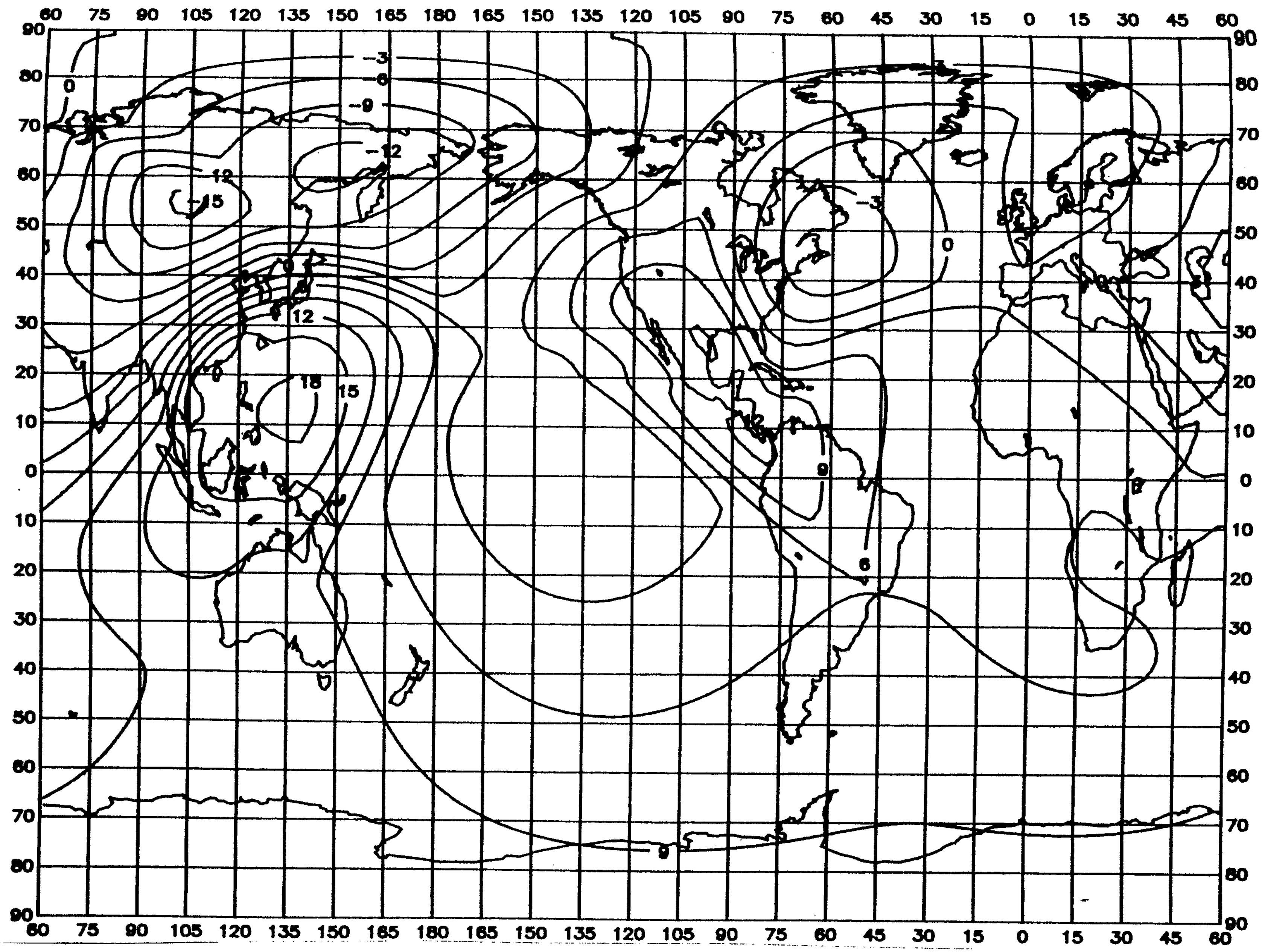

Figure 31. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, September, October, November, 1200-1600 hours.

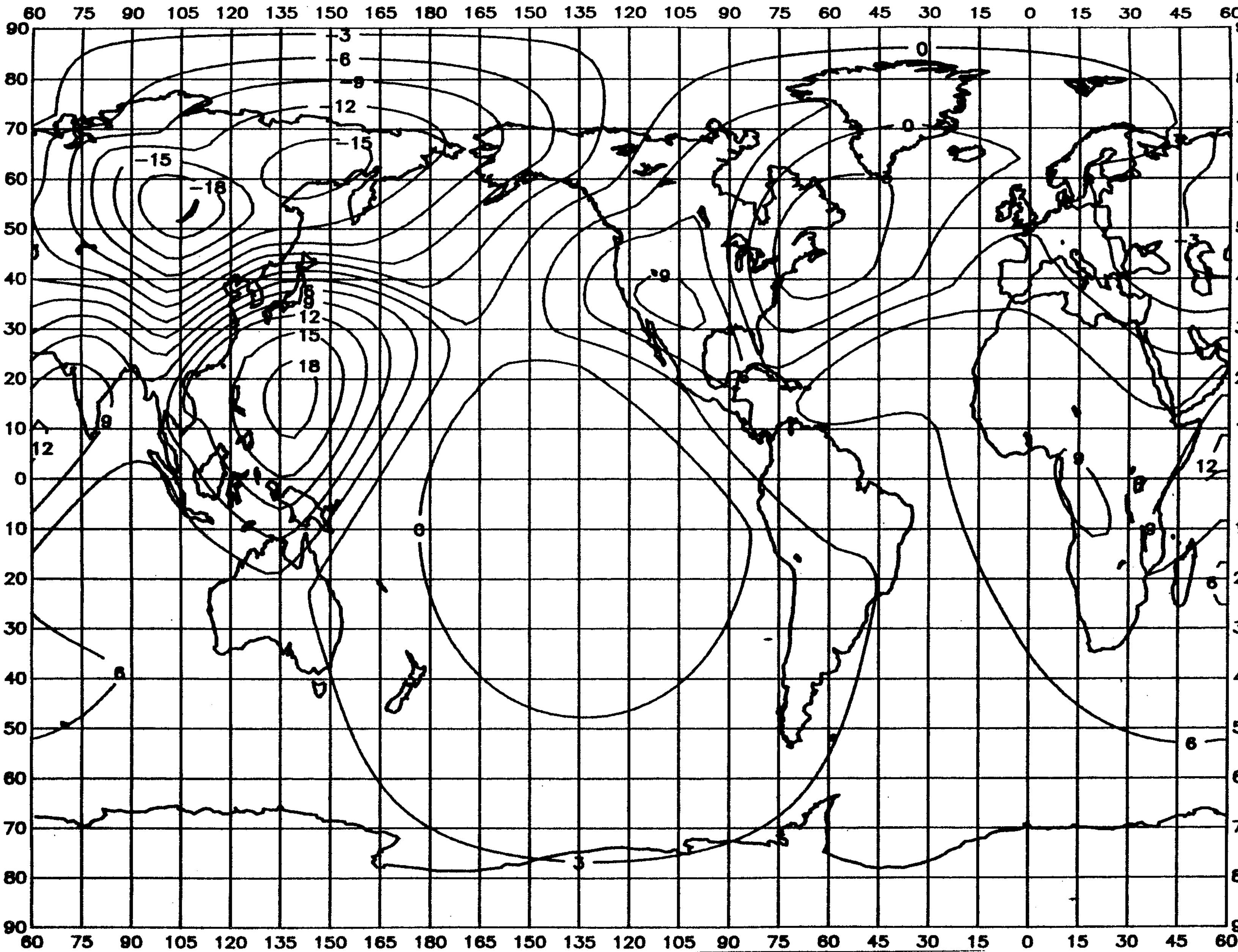

Figure 32. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, September, October, November, 1600-2000 hours.

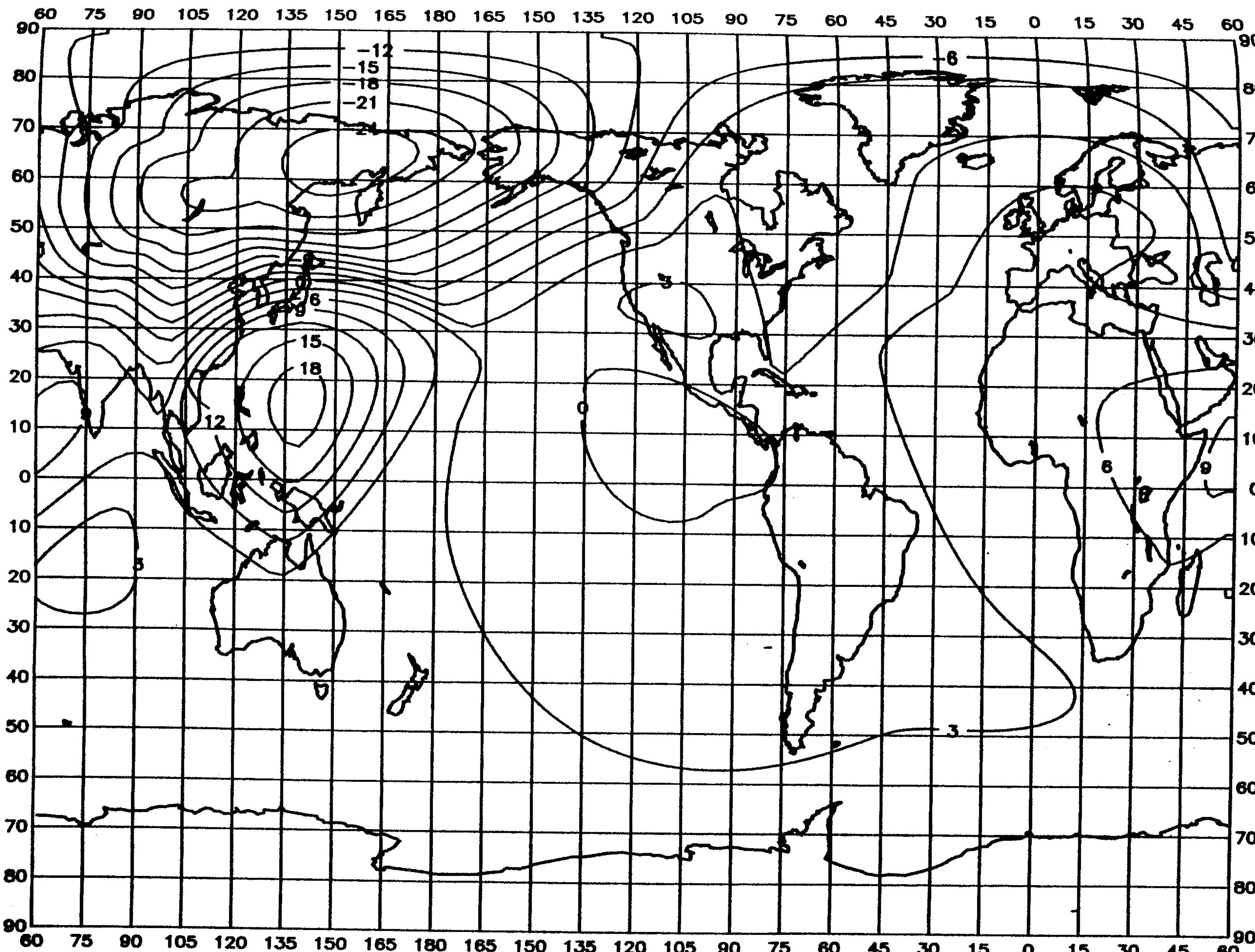

Figure 33. Corrections (dB) to current CCIR Report 322 1 MHz F_{am} estimates, September, October, November, 2000-2400 hours.

2.3 The New 1 MHz F_{am} Values

As described earlier, the new 1 MHz F_{am} values are given by 24 grids of 84 (longitude) by 100 (latitude) points, these data points being obtained by adding the 84 x 100 grids of correction values to the original 84 x 100 grids from which CCIR Report 322 was drafted.

In developing a numerical representation for the new 1 MHz F_{am} maps, the method used by Lucas and Harper (1965) was essentially used. The resulting sets of coefficients, then, can be used with existing computer programs developed to obtain the 1 MHz F_{am} noise value from the Lucas and Harper representation of the current CCIR Report 322.

For each of the 84 longitude points, the latitude variation was fit using a Fourier sine series of 29 terms. The 100 latitude data points were used with second order polynomial interpolation [using the process of Aitken and Neville (Kopal, 1961)] to generate $n + 1 = 361$ data points at equal intervals $x = 0, h, 2h, \ldots,$ $nh = \pi$ from each of the desired latitude functions $f_j(x)$, $j = 1,84$. The latitude scale has been transformed from $-90° \leq x \leq 90°$ to $0 \leq x \leq \pi$. Define

$$g_j(x) = f_j(x) - (\alpha + \beta x) \quad , \quad 0 \leq x \leq \pi, \tag{17}$$

where α and β are chosen so that $g_j(0) = g_j(\pi) = 0$, all j, so that there is only one value at the North and South Poles. This was accomplished simply by making

$$\alpha = \overline{f_j(0)} ,$$

and (18)

$$\beta = \frac{\overline{f_j(\pi)} - \alpha}{\pi} , \quad \text{where}$$

the bar denotes the average of the 84 interpolated values at $x = 0$ and π. Now $g_j(x)$ is given by

$$g_j(x) = b_{1,j} \sin x + b_{2,j} \sin 2x + \ldots + b_{29,j} \sin 29x , \tag{19}$$

where

$$b_{k,j} = \frac{2}{n} \sum_{\ell=1}^{n-1} g_j(\ell h) \sin(k \ell \frac{\pi}{n}) , \tag{20}$$

$k = 1,29, \; j = 1,84.$

The above now gives a Fourier representation of the latitude variation at each of the 84 longitude points.

The next step in the generation of coefficients to represent the geographic distribution was to do a harmonic analysis of the longitudinal variation of the 29 b coefficients generated above.

The same procedure used above was followed. We have 84 sample values of each of the 29 coefficients. The same interpolation procedure was used to generate $n + 1 = 361$ values. The longitude scale was transformed into $0 \leq y \leq \pi$ by going Eastward from 0° longitude. As in Lucas and Harper (1965), the resulting sine series for each coefficient is terminated after 15 terms. Since $b_k(0) = b_k(\pi)$, a single constant $\chi_k = b_k(0)$ is subtracted, i.e.,

$$b_k'(y) = b_k(y) - \chi_k \quad , \tag{21}$$

and

$$b_k'(y) = c_1 \sin y + c_2 \sin 2y + \ldots + c_{15} \sin 15y \ . \tag{22}$$

The result then is a set of 16 coefficients (15 c's and a χ) for each of the 29 latitude coefficients. Table 6 shows the arrangement of the Fourier coefficients that are given in the next 24 tables (7 to 30) , one for each of the 24 1-MHz F_{am} maps.

Comparing the numerical representation above for each of the 8400 original data points (84 X 100 grids) for each of the 24 maps gave an rms variation that ranged from 0.88 dB to 2.37 dB over the 24 maps with an average rms variation of 1.52 dB, with the maximum deviation (all maps considered, i.e., 24 X 8400 points) of 6.7 dB.

The numerical maps represent a "smoothed" version of the original data and are, then, the new 1-MHz F_{am} worldwide atmospheric noise estimates. Figures 34-57 are contour plots of these new estimates. Note that the graphical version given in these figures and the numerical version are "identical."

Following these figures is a computer subroutine, quite similar to that one in current use for the Lucas and Harper coefficients, which will compute from the new coefficients the 1 MHz F_{am} value for any latitude and longitude. The coefficients given here are available on tape.

Table 6. Arrangement of Fourier Coefficients for Tables 7 through 30

		ALPHA ABP (1,k)		BETA ABP(2,k)	
CHI	MIXED LATITUDE AND LONGITUDE COEFFICIENTS				
P(1,16,k)	P(1,1,k) P(1,6,k) P(1,11,k)	P(1,2,k) P(1,7,k) P(1,12,k)	P(1,3,k) P(1,8,k) P(1,13,k)	P(1,4,k) P(1,9,k) P(1,14,k)	P(1,5,k) P(1,10,k) P(1,15,k)
P(2,16,k)	... ...	... ...	... ...	... ...	... ...
. . .	. . .	. . .	. . .	. . .	. . .
P(29,16,k)	P(29,1,k) P(29,6,k) P(29,11,k)	P(29,2,k) P(29,7,k) P(29,12,k)	P(29,3,k) P(29,8,k) P(29,13,k)	P(29,4,k) P(29,9,k) P(29,14,k)	P(29,5,k) P(29,10,k) P(29,15,k)

NOTE: k = 1,6 (for the six 4-hour time blocks for each 3-month period). The coefficients, as arranged here, are for use in subroutine NOISE, and can be easily arranged in any other convenient fashion as required.

Table 7. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, DECEMBER-JANUARY-FEBRUARY (0000-0400 LOCAL MEAN TIME)

ALPHA	BETA
2.7210816E+01	5.6744471E+00

CHI	MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS				
3.1573446E+01	8.4990566E+00	1.3425676E+00	3.9552379E-01	-1.8342578E+00	1.9709765E+00
	3.2939866E+00	4.0135199E-01	2.8715991E-01	-2.2153481E+00	3.1577377E-01
	4.1010438E-01	6.9115304E-01	-2.3177678E-01	2.7326834E-02	4.8979548E-02
-1.1214259E+01	2.0480766E+01	2.8639838E-01	3.3805164E-01	-6.2530390E-01	4.0013126E+00
	8.0291470E-01	8.2386699E-01	9.0811677E-01	-1.0004911E+00	-1.3733350E-01
	-2.1237515E+00	-4.6103594E-01	-4.2480097E-01	-3.2190408E-01	7.3492130E-02
-3.8225815E+00	-8.2654745E+00	-4.3817968E+00	1.3323443E+00	2.5468791E+00	-2.1457946E-02
	-7.7155918E-01	-9.1769428E-01	-3.5631408E-01	8.0823325E-01	-1.9275787E-01
	2.3252241E-01	-5.4882566E-02	1.3843474E-01	-9.2017427E-02	-3.9805637E-01
-4.2038465E+00	4.8668772E+00	5.6165279E-02	-3.4569954E+00	-3.0751250E+00	-2.7264533E+00
	-2.0811565E+00	-2.0226243E+00	-1.2586602E+00	4.3430254E-01	1.5715211E-01
	1.1286077E+00	2.5710111E-01	4.0874029E-01	2.6937944E-01	2.7768476E-01
1.9726579E+00	-7.1264091E+00	5.4463304E-01	1.9690881E+00	1.0952524E+00	-1.2123360E-02
	9.3297254E-01	1.7493027E-01	7.7507162E-01	-3.4645172E-01	2.3668618E-01
	-1.0486615E-01	2.0531682E-01	3.1742012E-01	2.1712280E-01	3.7246736E-01
-2.6150725E-01	-5.2146943E-01	-8.3769456E-01	-1.0291891E+00	1.4395903E+00	9.0244383E-01
	8.9440092E-01	1.1731574E+00	8.1320987E-01	-4.9936100E-02	-1.6579474E-01
	4.0114896E-03	-1.4278946E-01	-5.7027709E-01	-4.7417417E-01	-2.8910857E-01
-3.0647120E+00	4.6994090E+00	1.6374791E+00	1.5083980E+00	4.3721031E-02	1.8201774E-02
	-7.2977749E-01	7.8283225E-01	-3.0664418E-01	2.7237149E-01	-4.1851098E-01
	-3.2398999E-01	-3.0290084E-01	-4.7270686E-01	4.3654718E-02	-2.6905266E-01
8.5581892E-01	-2.1389515E+00	7.1859252E-01	-7.1407001E-01	2.1484198E-01	-1.0216067E+00
	-7.5595949E-01	1.5429076E-02	-5.0923357E-01	2.6680966E-01	-6.5570123E-02
	1.7609851E-02	6.7850856E-02	4.2630163E-01	4.8869796E-01	1.9160674E-01
1.6417899E+00	-1.8248600E+00	-3.2910325E-01	-5.2530661E-01	-5.7326858E-01	-8.4415539E-01
	3.9055844E-01	-5.1821824E-01	1.2810796E-01	-2.7840909E-02	5.0990014E-01
	4.6638351E-01	1.6819681E-01	2.2511804E-01	-1.5695892E-01	3.9125082E-02
-6.2219397E-02	1.1997985E+00	1.2350688E+00	2.2412600E-01	-3.4191201E-01	2.7364671E-01
	4.3037413E-01	8.5519812E-02	2.0169622E-01	-1.9569990E-01	-2.9607097E-01
	-2.4759721E-01	-4.4915378E-02	1.7933043E-02	-1.1978267E-01	-4.1974225E-02
-1.1092845E+00	1.7502980E+00	-4.0546009E-01	-6.7638699E-02	-1.4647312E-01	7.5672203E-01
	-2.7681093E-02	5.8193186E-02	-2.6666695E-01	-4.6353446E-02	-2.7589214E-01
	-7.5201643E-02	-2.9198322E-02	-1.9894964E-01	1.1863211E-03	-8.2685969E-03
5.2801453E-01	-1.0098349E+00	4.1458033E-02	5.8556028E-02	1.5403856E-01	2.2973820E-02
	2.1527378E-01	-1.0708097E-01	-1.3194737E-01	-7.2907988E-02	1.8232657E-01
	3.0793037E-01	-5.7805087E-02	-1.6436390E-01	-1.0921817E-02	-1.5437043E-02
9.3927339E-01	-1.0114058E+00	-2.5632921E-01	-2.4889627E-01	-7.9025203E-02	2.0761876E-01
	-7.3748293E-02	5.1087731E-04	1.1974855E-01	1.0589947E-02	2.5741482E-01
	-9.4631830E-02	1.3335575E-01	1.9266926E-01	1.0059537E-01	-2.0859632E-02
-2.6036441E-01	4.2773501E-02	-3.3009263E-01	2.7713735E-01	1.3554528E-01	-5.7665131E-02
	1.8459860E-01	-2.8317790E-01	1.2687426E-01	1.5175583E-02	8.5111059E-02
	-1.3495355E-01	-8.0669333E-02	1.1549256E-01	-4.0230778E-02	1.1390341E-01
-3.1628955E-01	5.7190169E-01	-9.1881948E-02	-1.1013110E-02	-9.1311552E-02	1.5796128E-01
	-4.1878788E-02	8.1874692E-02	-2.0881459E-01	-4.7555481E-02	-1.5028205E-01
	-2.8037334E-02	-1.8118707E-01	-1.1501553E-01	-1.4041825E-01	-5.9318385E-02
-1.1510906E-01	1.6124189E-01	-1.3097199E-01	-2.2495205E-02	1.1338317E-01	1.0167262E-01
	-1.3392946E-01	-9.9386011E-03	-2.0031397E-02	-1.7952074E-02	-1.3539942E-02
	-9.7556134E-03	2.1530688E-01	-1.9993819E-02	1.0080276E-01	8.9281177E-03
6.3153780E-01	-8.8852685E-01	-1.3490940E-01	-1.8783317E-01	-1.6354091E-02	-4.2698894E-01
	-3.2115445E-01	9.7019903E-02	2.6766844E-01	8.7325023E-02	3.4824335E-02
	1.9757818E-02	1.6123720E-02	3.1546458E-03	1.3084579E-01	1.0295610E-01
-5.1609619E-01	6.0013535E-01	-3.7581666E-02	2.1493660E-01	1.0171576E-02	1.0609239E-01
	-8.6689490E-02	1.3672921E-03	-1.8448116E-02	4.5613932E-02	4.5324503E-02
	-8.4538433E-02	-1.0121276E-01	-1.9535850E-02	-2.8483269E-02	-3.7825135E-02
-3.5669254E-01	3.6515286E-01	9.3135648E-05	1.5224327E-01	-1.2145366E-02	-3.1974835E-02
	2.8918239E-02	-4.6395400E-02	-6.9625394E-02	5.1619379E-02	-1.4731139E-01
	-1.0871200E-03	-9.7577398E-03	8.5241087E-02	-1.5490985E-02	-6.9876307E-02
2.6216560E-01	-1.3961616E-01	2.3522583E-01	-1.7546536E-01	-6.0013924E-02	-4.8987225E-02
	6.5915300E-02	1.4690424E-01	1.0970243E-01	7.7685810E-03	-1.1459534E-01
	4.2720901E-02	3.8242493E-02	-3.6380803E-02	-7.6412315E-02	-4.8187890E-02
2.3566273E-01	-2.9616105E-01	1.2868944E-01	-7.6557135E-02	7.1489949E-02	2.3822342E-02
	8.2502374E-02	2.6886290E-03	-1.4722706E-02	-9.1512730E-02	8.3278008E-02
	6.5611525E-02	7.3280210E-02	-4.4036166E-02	-5.4817805E-03	6.0567577E-02
-3.5682048E-01	4.3814905E-01	-3.1614840E-02	1.3517833E-01	-7.4675863E-02	-1.8098171E-02
	-8.1307705E-02	9.6168832E-02	4.5715532E-02	2.2460269E-02	1.1196473E-02
	1.2530259E-01	4.9084751E-02	1.6195242E-02	-2.4941286E-02	-9.7349593E-02
-1.5655358E-01	1.8949698E-01	1.8748106E-02	5.5674624E-02	-3.1470732E-02	6.0116683E-02
	3.1808169E-02	-6.4281540E-02	-1.0098415E-01	-9.3025460E-02	-5.3512529E-02
	-6.7345340E-02	-8.2899755E-02	-5.1006132E-02	6.3345300E-03	2.8337390E-02
1.3928158E-01	-2.3116993E-01	1.7143275E-02	-1.0705171E-01	-6.6146101E-02	-2.7110172E-02
	1.3870443E-02	-6.2413891E-02	-1.7784391E-01	-6.3140056E-02	6.8300123E-02
	2.3508077E-02	-4.0090331E-02	4.7193472E-02	8.4925032E-03	4.6764794E-02
9.0175678E-02	-7.5864402E-02	4.2276991E-03	-6.5802387E-02	4.7588752E-02	1.6268859E-02
	1.4391761E-01	-3.3130838E-02	4.4032860E-02	1.9229050E-02	4.3264165E-02
	9.6779931E-03	2.2820280E-02	-3.6918933E-02	6.9776897E-03	3.8748910E-03
-6.6091494E-02	4.9747300E-02	2.4605864E-02	6.1075086E-02	7.7249083E-02	5.0056628E-02
	7.6676775E-03	-7.1401628E-04	3.9784325E-02	-1.1531553E-03	8.1831899E-02
	-8.2888650E-03	-3.3107251E-02	-6.0458255E-02	9.4421849E-05	4.0687445E-02
-1.3516797E-01	1.6809731E-01	-2.2475923E-02	2.2948315E-02	4.8137067E-02	9.2788429E-02
	-5.4962496E-02	6.9447116E-02	1.9877127E-02	7.1818925E-02	2.2733476E-02
	-3.5171018E-03	1.8189787E-02	2.5389037E-02	3.7046356E-02	-4.0466775E-02
1.6269315E-01	-2.0991237E-01	-1.6536676E-02	-9.1458944E-02	-3.5562053E-02	-6.9424669E-02
	-1.4042004E-02	-3.0465597E-02	5.2684180E-05	3.3530692E-04	-3.4984546E-02
	-1.9663445E-02	8.3354186E-03	1.2281863E-02	9.8423856E-03	1.6371513E-02
-8.4818337E-02	1.2728638E-01	1.3477382E-02	5.4247449E-02	6.8080297E-03	1.3290924E-02
	-1.4698861E-03	7.4849552E-03	6.9832546E-04	-3.8471059E-03	-1.2362332E-02
	-2.8228414E-03	-9.6639529E-03	-2.1888450E-03	-8.3383880E-03	-2.1315587E-03

Table 8. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, DECEMBER-JANUARY-FEBRUARY (0400-0800 LOCAL MEAN TIME)

ALPHA	BETA
8.1797818E+00	1.0860265E+01

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
3.1416875E+01	9.8266426E+00	-9.2143993E-04	-6.9604508E-02	5.1020104E-01	3.4929655E+00
	1.8731541E+00	-5.9471415E-01	1.3099044E+00	-1.6920416E+00	2.4016974E-01
	-2.7777242E-01	4.5426360E-01	9.9184764E-02	2.5003752E-02	1.3435150E-02
-1.4433519E+01	1.9685832E+01	-9.8540657E-01	3.0261307E-01	6.7536142E-02	2.7738645E+00
	-5.6332491E-01	6.4780998E-01	1.2237968E+00	-7.6412813E-01	7.4289207E-01
	-1.2372581E+00	-2.2656519E-01	-4.2222375E-01	-1.8548187E-01	-6.6190648E-02
-7.0094352E+00	-3.9910656E+00	-4.8472066E+00	2.0898179E-01	1.2644665E+00	1.7793483E+00
	3.4858558E-01	2.0383322E-01	-8.6635325E-01	3.1567931E-01	1.0351617E-01
	-2.1865601E-01	2.0599463E-01	-1.7354581E-01	1.9326587E-02	-2.9446037E-01
-2.2905875E+00	3.6149827E+00	-5.4621614E-01	-2.6157888E+00	-2.5900219E+00	-2.4473642E+00
	-4.5220704E-01	-8.4857711E-01	-9.6736802E-01	6.7727241E-01	-3.5396713E-02
	7.8446380E-01	2.5353700E-01	3.8297944E-01	1.4530950E-01	-3.0271108E-03
2.4211822E+00	-7.5619466E+00	-2.8221559E-01	6.3395158E-01	-5.7858584E-01	-1.1000802E+00
	-7.2476569E-02	-4.7129562E-01	3.3094348E-01	6.3254500E-02	5.1705887E-02
	7.0265708E-02	9.7955110E-02	2.8846193E-01	3.2194452E-01	4.5305094E-01
1.0011859E+00	-2.4170096E+00	-6.9294979E-01	-5.8554701E-01	1.0178079E+00	6.6467048E-01
	-7.9791829E-02	-8.1248306E-02	3.0800961E-01	-3.4020937E-01	2.4117361E-01
	-7.3786605E-02	2.3064228E-01	-5.3401981E-02	-7.3108237E-02	7.0120260E-02
-2.1712279E+00	4.1858791E+00	3.8772016E-01	1.2582943E+00	-1.3432607E-01	6.4562472E-01
	1.4348011E-01	7.3750754E-01	2.6292580E-01	9.0409788E-02	-1.1477251E-01
	-2.1557692E-01	-1.8727476E-01	-4.5562311E-01	-2.0427301E-02	-1.7094406E-01
-1.7517529E+00	1.4732179E+00	2.2518842E-01	9.8324912E-01	9.1904608E-01	9.4326960E-01
	-1.9492080E-01	5.6088235E-01	-2.2716256E-01	4.7745841E-02	-1.3776119E-01
	-7.1652679E-02	1.2575393E-01	-3.1100208E-01	2.1429214E-01	-1.3665286E-01
1.0269143E-01	-5.1398295E-01	-1.3794204E-01	-1.0286621E-01	-2.7204001E-01	-6.4168477E-01
	-7.9708954E-01	8.0663027E-02	-1.5950546E-01	-4.0601789E-02	2.1216211E-01
	1.0090408E-01	1.6988833E-01	-1.2920770E-02	-4.2640077E-02	2.2565733E-02
8.3275286E-01	-1.0137709E+00	7.5209943E-02	2.4531679E-02	-3.8708227E-01	-3.4723799E-01
	2.7598496E-01	4.7462745E-02	2.3016947E-01	7.5195190E-02	-2.7126993E-02
	-1.1327401E-01	-1.7634697E-02	1.3238778E-01	2.9655489E-02	5.6941091E-02
1.3825207E-01	4.3721192E-02	3.0799499E-01	2.4394981E-02	-6.2825354E-02	-1.6181855E-01
	2.1652568E-02	-2.7697291E-01	9.6790446E-02	8.4684037E-02	7.8782708E-02
	-1.2366906E-01	-6.7360799E-02	3.8089713E-02	-1.6925829E-02	6.6739396E-02
-5.6566131E-01	1.0215854E+00	1.9333353E-01	-4.7694808E-02	-1.4701366E-01	-4.6028263E-02
	2.6736314E-01	1.0719982E-02	-1.1471788E-01	-8.6684961E-02	-2.7445196E-01
	-4.3620567E-02	-1.4072521E-01	-1.0908530E-02	-1.0587363E-01	-2.5712378E-02
1.7613417E-01	3.6583022E-02	1.8782737E-01	-2.6076598E-01	1.2877577E-01	2.9581471E-01
	7.2487994E-02	-3.4556594E-02	-9.3096765E-02	-7.7991652E-02	-9.5611448E-02
	1.7672528E-01	1.4447556E-01	1.1368438E-01	-3.5596540E-02	-1.2950013E-01
4.8525924E-01	-4.9811167E-01	1.3011719E-01	-4.6272552E-01	1.7269332E-01	-4.9148322E-01
	-9.3961341E-02	-3.3333923E-02	1.8435192E-01	1.2072994E-01	2.6122671E-02
	5.0850546E-02	-1.2203820E-01	8.2601377E-02	-4.4188996E-02	7.1740674E-02
8.5099721E-01	-1.0381367E+00	-1.7249561E-02	-4.1310136E-01	2.2316525E-01	-1.6042585E-01
	2.5361097E-01	-5.2633308E-02	4.6339215E-03	2.1365845E-02	-6.7738912E-02
	1.2659637E-01	-9.1671705E-02	8.4488675E-02	2.3233934E-02	-2.6330414E-04
-1.5846856E-02	4.7942578E-02	1.6077346E-01	-8.9938880E-02	1.4745827E-01	-1.5810498E-01
	6.1204931E-02	-3.4846731E-01	-8.2930652E-02	-5.1081666E-02	-4.0612396E-02
	1.2168078E-01	-2.1522210E-01	1.0500915E-01	-1.1962088E-01	-7.2505976E-02
4.9498948E-02	-8.1264666E-02	7.8449479E-02	-2.4431439E-01	1.0393332E-01	-1.7057432E-01
	2.3843300E-01	9.6587966E-03	-4.6834457E-02	1.6643107E-03	-1.5032867E-01
	2.0301738E-02	-2.2928035E-01	8.6947727E-02	-1.3612264E-01	-1.0603865E-02
2.1952500E-01	-3.4453220E-01	7.0839244E-02	-3.0944934E-01	1.6013474E-01	-1.0183762E-01
	1.3625926E-01	-1.4935382E-01	-8.8129196E-02	1.7483764E-02	1.3058030E-01
	1.9069199E-01	5.5437100E-02	4.1182433E-03	-8.7021447E-02	1.5061953E-02
5.7843024E-01	-7.6478407E-01	-6.2659178E-03	-3.9541169E-01	1.0013982E-01	-2.3924731E-01
	7.8136744E-02	-6.8242369E-02	5.8405098E-02	1.4683654E-02	-6.8566969E-02
	6.0697474E-02	-1.0032560E-01	2.3109276E-02	-6.2331091E-02	3.7040689E-02
1.5064911E-01	-2.0293802E-01	-2.1899355E-01	-8.8105386E-02	7.3320795E-02	-7.4416530E-02
	2.6384631E-02	-5.8040525E-02	-1.1784339E-02	-9.1947455E-02	-9.0312850E-02
	4.0386911E-02	-3.1606563E-02	6.7512731E-02	3.7050259E-03	-2.1030021E-02
-3.3641487E-01	4.1402984E-01	-3.0047527E-02	1.5029638E-01	5.1588111E-02	5.9829293E-02
	-8.8059903E-02	-7.9389467E-02	-5.8833122E-02	-3.8532271E-02	-3.1069640E-02
	-7.3012763E-02	-1.2335818E-01	-1.2022573E-02	-2.8912411E-02	3.0945612E-02
-6.3426685E-02	5.6243416E-02	-9.4745935E-02	1.4909240E-02	2.3131623E-03	1.0025394E-01
	4.1614292E-02	8.9292062E-02	3.1496767E-02	2.3359408E-02	-5.5730102E-02
	-4.5622662E-02	1.1031661E-02	2.9050396E-02	2.1710983E-02	-2.8777121E-02
1.8262273E-01	-2.0041293E-01	-4.1635285E-02	-5.1154292E-02	-4.2220591E-02	-1.1449963E-02
	-2.6281515E-02	-3.4457108E-02	4.8351695E-02	2.2692148E-02	1.1313247E-01
	3.9175203E-02	1.1196504E-01	-1.7324688E-02	7.0170060E-02	1.3365257E-02
2.3438923E-02	1.8051896E-02	-2.8972894E-02	1.1042480E-01	-3.3089135E-02	1.0789571E-01
	-4.3410855E-02	1.1508080E-01	5.0379637E-02	6.0333762E-02	2.7668672E-02
	-8.0842322E-02	8.7861598E-03	-5.8160233E-02	3.8299748E-02	3.1355476E-02
-4.1591382E-01	5.9994386E-01	-9.7113661E-02	3.0249409E-01	-1.0200865E-01	1.3020582E-01
	-1.3005975E-01	4.8133168E-02	1.4744297E-02	4.8004763E-03	2.4692355E-02
	-7.0538063E-02	8.5348546E-02	-7.0534650E-02	2.6338938E-02	-2.2778298E-02
-3.4298732E-01	5.0549970E-01	-1.2711943E-01	2.2504893E-01	-1.4416834E-01	1.0281975E-01
	-1.3866815E-01	6.1856579E-02	9.2149823E-03	9.5257825E-03	6.9384205E-03
	-8.9633881E-02	-3.1278828E-03	-6.1046395E-02	3.7845207E-02	1.4071808E-02
-2.1872343E-01	3.2347298E-01	-8.4421157E-02	1.2313192E-01	-1.1805258E-01	1.2165210E-01
	-1.1048434E-01	7.2199437E-02	-5.1261681E-03	8.1511374E-03	5.3880274E-02
	-6.5377643E-02	1.0285150E-01	-6.9689364E-03	8.0123541E-02	-4.7753871E-03
8.8340655E-02	-1.2418078E-01	-1.2860091E-02	-6.8815585E-02	-2.0854064E-02	-3.5701849E-02
	1.0795649E-02	-1.5386025E-02	-1.3181427E-03	-8.4647034E-03	1.8015434E-02
	8.0996293E-03	2.3327608E-02	-6.4748768E-03	-6.6866705E-03	9.6874295E-03
-3.1297308E-02	4.0387454E-02	2.0485913E-02	9.2426069E-03	2.0128031E-02	1.9254312E-02
	2.9081870E-02	4.1523540E-03	-9.6537611E-03	-6.1530547E-03	-1.3617994E-02
	1.7240241E-02	-1.2362010E-02	5.7316354E-03	-3.4190013E-03	-9.9384285E-04

Table 9. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, DECEMBER-JANUARY-FEBRUARY (0800-1200 LOCAL MEAN TIME)

ALPHA	BETA
1.2846994E+01	4.3739358E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
5.4058597E+00	1.5325148E+01	1.1043571E+00	3.0740093E+00	-2.3413542E+00	1.7256269E+00
	2.3931340E+00	2.7718585E-01	1.6275846E+00	-1.6360469E+00	9.3867296E-01
	-6.1300503E-01	2.4425421E-01	-3.1027462E-01	-8.7403942E-02	6.8645973E-02
-1.1943496E+01	1.6066317E+01	3.2654455E-01	-8.4259862E-02	1.2166777E+00	3.7060295E+00
	2.0477270E+00	1.5180320E+00	6.4433982E-01	-1.2055413E+00	-3.9374554E-01
	-1.4066879E+00	-6.6919755E-01	-7.1547009E-01	-3.7593493E-01	-7.2188974E-02
-1.0746009E+01	3.4697271E+00	-4.5178412E+00	1.1085307E+00	9.1290675E-01	-9.0652578E-01
	-8.9170967E-01	-1.0548428E+00	-1.2579586E+00	7.3050802E-01	-3.3735144E-01
	1.4893024E-01	1.3696269E-01	-2.5505797E-02	2.0369029E-03	-3.5889207E-01
4.2568897E+00	-6.8646152E+00	-3.2591874E-01	-5.5001425E+00	-2.9970011E+00	-4.1893443E+00
	-2.8818149E+00	-1.4445522E+00	-9.6095067E-01	1.2972224E+00	4.3942939E-01
	1.2923848E+00	5.3195200E-01	9.3539076E-01	5.0611704E-01	3.6420509E-01
4.6557465E+00	-4.8574068E+00	7.3658742E-01	7.4568184E-01	1.3664502E+00	-5.3005515E-01
	2.1675250E+00	-1.2545874E-01	1.0284598E+00	-4.0837679E-01	2.2993877E-01
	2.2102019E-01	1.1618654E-01	3.5495578E-01	1.1565638E-01	3.6686047E-01
-1.3353309E-01	1.3503877E+00	4.6869441E-01	1.0148973E+00	1.2658316E+00	2.2132367E+00
	1.3509239E+00	1.2643733E+00	5.7836478E-01	-5.0423079E-01	-2.9689107E-01
	-4.1665283E-01	-3.6322653E-01	-5.9741264E-01	-5.5021469E-01	-3.7877531E-01
-2.3338757E+00	4.6763814E+00	6.3771483E-01	1.3575528E+00	6.5578356E-03	1.1203939E+00
	-5.1334517E-01	1.0350721E+00	-3.6524604E-01	-6.4046105E-02	-5.4519975E-01
	-6.1199456E-01	-3.8769775E-01	-5.5059197E-01	-9.0450550E-02	-3.0743115E-01
-5.7155288E-01	-5.2365147E-01	-1.8554957E-01	-1.3426762E-01	-6.0131499E-02	-9.2698379E-01
	-9.3956385E-01	-9.5315214E-01	-5.9669504E-01	1.5311677E-01	-1.0078297E-02
	1.4978638E-01	2.6031765E-01	3.4874307E-01	4.4731616E-01	2.7937950E-01
2.1815404E+00	-3.2507536E+00	-1.3527065E+00	-1.5989531E+00	-6.5293445E-01	-8.4958811E-01
	-4.4302388E-01	-5.0275615E-01	1.4181537E-01	2.8656405E-01	5.8485027E-01
	3.9392911E-01	2.2556091E-01	3.1868329E-01	1.0973125E-02	1.2724714E-01
1.5792892E-01	4.6210776E-01	5.1967854E-01	2.2311789E-01	-2.5585582E-01	-5.7169920E-03
	6.4239260E-01	-2.2650985E-02	4.4617617E-01	-7.2339216E-02	2.0896302E-01
	6.4229771E-02	1.1889529E-01	7.8130492E-02	-1.2154103E-01	-8.0484531E-02
-1.0385999E+00	1.9296157E+00	1.2057901E-01	2.7493755E-01	9.2114423E-02	6.9033365E-01
	1.5537471E-01	4.0077381E-01	-1.6183854E-01	-1.2598432E-01	-3.7919125E-01
	-9.3842669E-02	-2.8022151E-01	-2.5076017E-01	-1.6339655E-01	-8.8585147E-02
-5.6223857E-01	5.6406030E-01	1.8730160E-01	5.0739467E-01	5.4093090E-01	3.4645261E-01
	-3.1780104E-02	1.8268238E-01	-2.9029728E-01	-1.4997531E-01	-2.1288146E-01
	-1.3906531E-01	4.4984480E-05	-1.6014878E-01	8.1320294E-02	-4.0787561E-02
7.8492991E-01	-1.3644942E+00	-4.1676238E-01	-3.3347109E-01	-1.5599167E-02	-2.5299654E-01
	-3.1974679E-01	-2.6647383E-01	1.6470966E-01	3.4564334E-02	9.1749698E-02
	-1.1772289E-01	9.6205585E-03	1.3153189E-01	8.8263955E-02	1.0749353E-01
3.4051759E-01	-5.5179881E-01	2.4396309E-02	1.9862005E-01	-1.2728654E-01	-1.1492549E-01
	-1.7691233E-02	-1.0238746E-01	2.8387152E-01	1.5675736E-01	2.9484644E-01
	1.4492491E-02	-4.0350506E-02	7.6578535E-02	-1.8222590E-02	6.3867274E-02
-7.2908305E-01	9.9349303E-01	-9.7898632E-02	-2.3291498E-01	-3.6139943E-01	-1.5207644E-01
	1.0425685E-01	-4.9058708E-02	-1.7854771E-01	-4.0584337E-02	-3.8197049E-02
	1.9384740E-01	6.8020842E-02	3.4699157E-03	-7.1959659E-02	-6.8408644E-02
-8.6332111E-02	3.0116204E-01	3.5630352E-01	-4.7427703E-03	1.5740209E-01	1.5000280E-01
	1.0016135E-01	2.1994055E-01	-1.5487790E-01	1.8782140E-02	-2.1112369E-01
	6.3687021E-02	6.1027620E-02	-6.0779505E-02	9.0862132E-03	-1.1783298E-01
4.1702977E-01	-5.3705908E-01	-1.2120272E-01	-1.3507396E-01	7.5787014E-02	-1.9133441E-01
	-1.9511699E-01	-4.8049974E-02	1.3189024E-01	-3.8110489E-02	9.4754279E-02
	-1.0229893E-01	1.1319006E-01	4.0137638E-02	9.6889454E-02	1.3314416E-01
1.8340613E-01	-2.9575317E-01	-1.6192556E-01	1.5198921E-01	1.2124996E-01	9.3211035E-02
	4.1844988E-02	-2.9044928E-02	1.0255971E-01	-3.8895736E-02	3.0618653E-02
	-1.0852580E-01	-1.7866439E-01	-1.4362445E-02	-7.8487451E-02	4.4637340E-02
-5.7192655E-01	8.0995692E-01	-1.3004598E-02	2.2411104E-01	-2.7732059E-02	1.0256054E-01
	5.3179189E-02	5.4645590E-04	-8.6607920E-02	1.1395748E-02	-4.1041162E-02
	3.4540155E-02	-4.4895830E-02	1.1911709E-02	1.7307544E-02	-9.1999391E-02
3.7080777E-02	-4.6230481E-02	1.4890947E-01	-2.2145142E-01	-4.5944787E-02	-2.3315213E-02
	1.1417832E-01	4.2810870E-02	-1.2909582E-01	1.6343171E-02	-8.3120423E-02
	6.4385552E-02	-1.8742569E-02	-4.9339562E-02	-2.9450594E-02	-1.4450029E-02
4.4318245E-01	-4.9267614E-01	2.9528768E-02	-2.0303185E-01	4.7973787E-02	-6.9777618E-03
	2.2037121E-02	6.0276445E-03	1.3044519E-02	3.3107394E-02	9.6771877E-02
	5.2459331E-02	1.2732296E-01	5.0558470E-03	4.3507940E-02	2.6392698E-02
-1.4405728E-01	1.0131113E-01	-1.4643029E-01	9.8951335E-02	-8.2551636E-02	-2.5519372E-02
	-1.2176314E-01	-4.5514704E-02	1.5628727E-01	-1.2791645E-02	4.6711925E-02
	-4.8580537E-02	5.0672546E-02	4.6247860E-02	-3.0345018E-02	1.1127927E-02
-3.0052501E-01	3.9487703E-01	-1.2874814E-01	1.3882673E-01	8.5976395E-03	3.7013644E-02
	-7.4628843E-02	-2.9410630E-02	-3.4679250E-04	-2.9632946E-03	-4.6377751E-02
	-7.2215195E-03	-9.1953383E-02	2.0626808E-02	1.2593864E-02	-2.2311616E-02
-9.6215809E-02	1.1727122E-01	7.4775012E-02	1.0004135E-02	7.3388697E-03	-3.2720380E-03
	2.3796664E-02	-1.1355875E-02	-9.9815096E-02	-2.0160461E-02	-5.2668656E-02
	-9.4483250E-02	-6.6481127E-02	-4.2719898E-02	1.8163960E-02	2.8860101E-03
2.8221709E-01	-2.7504273E-01	7.8217272E-02	-1.2769054E-01	1.7331623E-02	-9.0682859E-03
	5.1390978E-02	3.6800722E-02	-1.5293353E-02	1.3991633E-02	1.9115123E-02
	8.2270080E-03	4.4454652E-02	-1.7831403E-02	-8.2449663E-03	2.3076387E-02
-3.6704388E-02	-1.8144313E-04	-2.1004789E-02	4.5152348E-02	-4.3472907E-02	1.2046031E-02
	1.3102211E-02	1.3396838E-02	6.8405926E-02	5.0259262E-03	6.8192339E-02
	-1.1107755E-03	5.1565779E-02	1.9393085E-03	-2.9141835E-02	3.7816756E-04
-8.9831345E-02	8.8796549E-02	-8.3954820E-02	4.5969533E-02	4.1141951E-02	3.9441521E-03
	1.2105993E-02	-1.0720770E-02	7.1981848E-02	1.4640546E-02	-1.6144355E-03
	3.4054367E-02	3.9789337E-02	7.9429893E-02	5.1925745E-03	-3.9344106E-02
-5.5445384E-03	1.5217431E-03	8.3524240E-03	2.1674748E-03	-1.6448402E-02	-1.3468985E-02
	-2.1949641E-02	1.6896009E-03	-1.8992188E-02	3.6570642E-03	-7.6638192E-03
	6.4399648E-03	-7.3700764E-04	-1.4278077E-03	2.0647405E-02	1.7851340E-03
-2.5744681E-02	6.4215687E-02	-1.2826321E-02	-2.6939073E-02	1.3865526E-02	9.4157068E-04
	1.3625252E-02	-6.3334477E-03	-1.3843582E-02	-1.8083130E-02	-8.8481418E-03
	-2.1771488E-02	-2.5746348E-02	-2.4388001E-02	-9.8674597E-03	1.4533369E-02

Table 10. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, DECEMBER-JANUARY-FEBRUARY (1200-1600 LOCAL MEAN TIME)

ALPHA	BETA
1.1451596E+01	7.8154165E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
2.1524467E+01	2.8809406E+00	-3.8000358E+00	2.2710054E+00	-1.3992076E+00	2.6047328E+00
	7.2116876E-01	1.7906101E-03	5.9299890E-01	-1.7238756E+00	1.0867978E+00
	-1.1040857E-02	1.2139194E+00	1.5785968E-01	2.6547222E-02	-3.5762458E-02
-3.2021775E-01	8.1051849E+00	-1.0313285E+00	7.6033892E-01	1.4047047E+00	5.5736864E+00
	1.9512299E+00	1.0833250E+00	1.0387742E+00	-1.0826608E+00	-3.1044586E-01
	-1.8606688E+00	-6.5571700E-01	-5.8367213E-01	-2.3011172E-01	8.7833233E-02
-8.1844718E+00	-2.6437979E+00	-6.3689326E+00	-8.4284980E-01	1.3320859E+00	4.7949593E-01
	2.5250851E-03	-2.1133407E-01	-8.4570936E-01	7.4352077E-01	-5.0256049E-01
	9.1220568E-02	-4.4271242E-01	-2.7450466E-01	-1.7048427E-01	-4.2955442E-01
-1.3282952E+00	-4.1121377E+00	-8.0965333E-01	-3.6305414E+00	-3.6993406E+00	-5.2889097E+00
	-2.4838507E+00	-1.7991863E+00	-1.2918343E+00	1.1140591E+00	5.4500042E-01
	1.6824240E+00	5.8774961E-01	8.9379534E-01	4.1617508E-01	2.4481928E-01
1.3462024E+00	-2.5893537E+00	1.7948098E+00	2.5136635E+00	1.0909970E+00	-5.0302568E-01
	1.1981717E+00	-1.8354757E-01	1.3679225E+00	-3.5183640E-01	1.9072868E-01
	-1.1285535E-01	1.2901091E-01	3.2830266E-01	3.1567098E-01	4.6530529E-01
-2.4580400E+00	2.6423903E+00	-4.8419250E-01	4.4219103E-01	1.2239117E+00	2.0271801E+00
	4.4927831E-01	7.6743289E-01	3.3621808E-01	-5.5247415E-01	-3.3104817E-01
	-3.3070647E-01	-1.2060347E-01	-5.8523623E-01	-4.8196313E-01	-3.1562486E-01
-2.0599807E-01	2.6168035E+00	1.2409129E+00	2.9596591E-01	3.5725238E-01	3.8872354E-01
	-2.3371921E-01	1.3599380E+00	-1.9744412E-01	3.0140048E-01	-2.8263443E-01
	-2.9789928E-01	-3.1432950E-01	-4.8105739E-01	-1.8687682E-01	-3.9773392E-01
3.0364886E-01	-8.2302910E-01	-8.4708075E-02	-2.4659205E-01	1.9434250E-02	-8.6556582E-01
	-8.7295016E-01	-2.4161821E-01	-6.1487306E-01	1.1490379E-01	-1.3344312E-01
	1.6835717E-02	7.7229371E-02	3.7034483E-01	3.8967475E-01	2.0743829E-01
2.3688363E+00	-3.0582608E+00	-4.7808143E-01	-1.0322429E+00	-1.6116639E-01	-7.2284841E-01
	2.1656866E-01	-6.5901976E-01	4.4665247E-02	1.6362957E-01	6.5860493E-01
	2.4236411E-01	1.2412868E-01	2.2448840E-01	-4.6063214E-02	2.2557424E-01
4.8814537E-02	9.8715925E-01	5.9779400E-01	2.4380054E-01	-5.5460566E-01	1.9960091E-01
	8.1259498E-01	-4.8566392E-02	4.7981738E-01	-2.6658997E-02	-1.0248620E-01
	-1.3300438E-01	3.2303857E-02	-1.5936881E-02	-8.0965346E-02	-3.5646193E-02
-1.6862403E+00	2.4050399E+00	-4.2021367E-01	2.5604879E-01	-1.5759300E-01	6.5444279E-01
	-2.1656933E-01	-8.1679598E-02	-1.5794867E-01	-1.8285273E-01	-3.4513132E-01
	4.0066464E-02	2.4269307E-02	-1.2939621E-01	-6.3700183E-02	-1.0254095E-01
5.1778014E-01	-6.9112822E-01	-1.5251748E-01	-1.7121287E-02	3.8471679E-01	2.9531691E-02
	-1.5671668E-01	9.5594254E-02	-1.4971165E-01	-1.0810404E-01	-3.9638138E-02
	1.0578501E-01	-8.5147591E-02	-1.1075511E-01	5.0247109E-02	2.5112320E-02
7.6781961E-01	-9.6738085E-01	-3.3824693E-01	-2.1492752E-01	-1.3959715E-01	-2.0939867E-01
	-1.3609237E-01	6.2552027E-02	2.4782124E-02	3.8192499E-02	1.4453514E-01
	-1.0258840E-02	5.8800847E-02	1.9782924E-01	1.2856447E-01	-1.4375769E-02
1.0640105E-01	-3.7244732E-01	-8.8330793E-02	2.0151535E-01	2.0568731E-01	8.3686984E-02
	1.8776617E-01	-7.3618530E-02	1.2961662E-01	1.2330146E-01	2.2597884E-01
	-5.4694267E-02	-6.7739790E-02	4.2170097E-02	-1.0081254E-01	-1.0128118E-02
-8.5649130E-01	1.0597435E+00	-1.2597437E-01	7.3045730E-02	-1.7364397E-01	2.2185643E-01
	1.1392281E-01	4.4294159E-02	-1.0175303E-01	-1.7756592E-02	-1.8725409E-01
	-5.5874628E-03	-2.2491795E-02	-1.1460466E-01	-1.3215290E-01	-5.5837109E-02
9.5108115E-02	-9.1630605E-02	-3.6599334E-02	1.9819354E-02	-2.1617611E-02	5.5957251E-02
	-1.5553664E-01	-1.0179644E-02	6.4983940E-02	-3.4190405E-02	-1.1484003E-01
	-4.2248354E-02	6.9062510E-02	-7.6407264E-02	5.2054666E-02	2.6816227E-02
4.6889255E-01	-6.9726776E-01	-7.6108536E-02	-1.4780778E-01	5.8502047E-02	-2.0207431E-01
	-2.3358912E-01	-6.8992602E-02	6.2666095E-02	1.8923761E-02	1.1421442E-01
	3.5128042E-03	7.6161863E-02	4.5510761E-02	1.6313717E-01	1.0706322E-01
-3.2060327E-01	2.9816278E-01	-1.4624077E-03	1.5890354E-01	1.7112494E-02	-3.0143714E-02
	-5.9189916E-03	2.1492587E-02	-5.6292948E-02	4.4208338E-02	1.0006575E-01
	-7.9704308E-03	-3.8214045E-02	5.6487593E-02	3.1656079E-02	-3.3447476E-02
-2.5207057E-01	3.2298915E-01	9.7969348E-02	1.0462386E-01	-4.4114793E-02	-7.2163831E-02
	7.6175046E-02	6.7087469E-02	-2.4840453E-02	2.9238174E-02	-7.6125237E-02
	-4.6211215E-02	-8.0400581E-02	3.3519699E-02	-8.1031370E-02	-6.0322276E-02
1.7643667E-01	-1.5279208E-01	1.3943218E-01	-2.3364124E-02	-8.3266442E-02	-4.0904595E-02
	1.4303099E-01	3.8267691E-02	4.0561713E-03	-6.1173639E-02	-3.4533053E-02
	7.0729234E-02	2.1520152E-03	-7.0978719E-02	-9.7720812E-02	-3.7975875E-03
2.1488263E-01	-2.0331040E-01	6.2298791E-02	-1.5698893E-01	-2.4449451E-02	-1.0040793E-01
	1.5918155E-02	-3.5457203E-02	6.2705614E-02	-4.6924781E-02	4.4332530E-02
	6.3632688E-02	3.9164575E-02	-2.6339914E-02	1.9727938E-02	6.3752394E-02
-2.4761838E-01	2.4371798E-01	-3.0062213E-02	1.2305419E-01	1.2934785E-01	1.6985823E-01
	1.1069498E-02	7.0960610E-02	3.1293658E-02	-2.7591992E-02	-7.0560309E-02
	-2.5752277E-02	5.1710911E-02	3.4078029E-02	1.3800847E-02	-4.6094579E-02
-5.9383946E-02	4.6321818E-03	-1.4853685E-01	-8.3399496E-02	1.6006317E-02	2.2994158E-04
	-8.8497797E-02	-1.1225996E-01	-8.8362533E-02	-2.2392871E-02	6.5763921E-03
	-1.0656627E-02	-3.6441063E-02	1.7435548E-02	1.6924933E-02	1.6117275E-02
3.3212176E-01	-3.6559827E-01	1.9049227E-02	-3.5068738E-02	2.6670061E-02	4.8644099E-02
	9.4003137E-02	4.1906395E-02	9.9336592E-03	5.2896872E-02	5.0889226E-03
	-3.0852731E-02	-7.2105620E-02	1.4593213E-02	8.6011381E-03	7.3654206E-04
1.0075256E-01	-5.8664977E-02	-4.3461423E-02	-1.3421719E-01	-1.5305423E-02	-2.5936448E-02
	2.2207845E-02	-3.5994354E-02	-6.5747463E-02	2.1789456E-02	3.4135087E-02
	6.0362010E-02	6.6284920E-02	1.3031127E-02	-1.0159413E-02	-2.5293456E-02
-1.3630107E-01	1.6673245E-01	-7.3877453E-02	6.3605210E-03	7.1513874E-02	6.6925752E-02
	-1.1377095E-02	-3.2768436E-02	-4.0727506E-02	2.6366478E-02	-4.8192049E-02
	-3.9522598E-02	-1.9379673E-02	-3.3731122E-02	-1.3670970E-02	1.4569556E-02
-6.9090420E-02	1.5663633E-01	-3.6587212E-02	2.7923037E-02	2.0402014E-02	3.2182919E-02
	-5.1782408E-02	5.6298730E-03	4.2175522E-02	-5.7358053E-04	-4.8661987E-02
	-6.5914969E-02	8.3203706E-03	2.5383727E-02	5.9655975E-03	3.6443961E-03
9.3444401E-02	-1.4927971E-01	-3.5244011E-02	-3.0110440E-02	-6.4555784E-02	-6.2354720E-02
	-2.6275235E-02	7.4352712E-03	2.0273832E-02	-3.3474193E-03	2.6832043E-02
	1.3196944E-02	5.9092816E-03	-4.0649088E-03	3.0347126E-03	8.6000468E-03
-5.9983883E-02	7.7993928E-02	5.4873807E-03	4.8159839E-02	1.9799905E-02	1.7048445E-02
	2.2499300E-02	1.1512221E-02	-3.5012573E-03	-9.0210424E-03	2.9652257E-03
	4.8499727E-03	-7.0061805E-03	-5.1148193E-03	9.0457403E-03	1.6482692E-03

Table 11. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, DECEMBER-JANUARY-FEBRUARY (1600-2000 LOCAL MEAN TIME)

ALPHA	BETA
2.4767385E+01	6.1455250E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
3.2360174E+01	-1.2535799E+00	1.0822558E+00	8.5428966E-01	-4.6335334E+00	2.2051415E+00
	3.1953570E+00	1.2074884E+00	2.7810554E-01	-2.1967085E+00	4.2299062E-02
	-2.1147101E-01	1.2035122E+00	2.2311682E-01	1.5156522E-01	9.6803454E-02
-3.9140226E+00	1.3066014E+01	-1.8797905E+00	-2.0501475E+00	1.7688293E-01	6.3495577E+00
	7.9830036E-01	1.1005833E+00	1.2584326E+00	-1.0554532E+00	3.0278406E-01
	-1.9491778E+00	-3.5499218E-01	-4.0798130E-01	-1.5446002E-01	6.9713511E-02
-7.5810963E+00	-5.2461867E+00	-5.2474503E+00	1.8902900E+00	2.6125807E+00	-3.3846676E-01
	-1.0049844E+00	-1.2660327E+00	-8.9634363E-01	1.1328518E+00	-4.2659972E-01
	3.8130039E-03	-2.3426819E-01	-5.2497319E-02	1.6772019E-02	-3.3004820E-01
-5.5627125E+00	3.6326282E+00	3.6345710E-01	-2.6233298E+00	-3.3222849E+00	-4.0032857E+00
	-1.5325535E+00	-1.5592444E+00	-8.7554872E-01	7.1608016E-01	1.0555532E-01
	1.2718738E+00	2.8573092E-01	3.4315632E-01	1.5754565E-01	2.3661764E-01
1.6898787E+00	-6.7135439E+00	5.6373079E-01	1.8627856E+00	-2.0762898E-02	-4.7759544E-01
	2.3877727E-01	-2.9476100E-01	1.0056229E+00	-5.9241732E-01	4.0131878E-01
	2.5541910E-01	1.5773274E-01	2.2654646E-01	1.0853067E-01	5.0138994E-01
-1.0208958E+00	2.9441457E-01	-2.0862010E-02	-7.3165727E-01	1.4997600E+00	9.2312875E-01
	6.7664756E-01	1.0967177E+00	3.5270269E-01	-2.4264025E-01	-1.6455731E-01
	-1.0421318E-02	-9.6385593E-02	-3.6946732E-01	-4.6013989E-01	-3.9426560E-01
-2.4142273E+00	4.6169175E+00	1.5846526E+00	5.8359360E-01	1.6086105E-01	1.4366281E-01
	1.3049644E-01	1.3137749E+00	-1.9975919E-01	3.9230465E-01	-4.7406290E-01
	-4.7719698E-01	-3.3978473E-01	-3.4029398E-01	2.9411990E-02	-3.2146797E-01
9.1970765E-01	-1.9541834E+00	5.2915048E-01	-1.4050629E-01	4.2720492E-01	-1.0354529E+00
	-8.0550190E-01	-3.3525244E-01	-5.9294147E-01	3.3754938E-01	5.5284600E-02
	6.9286484E-02	4.4917531E-02	3.0362766E-01	3.9780851E-01	1.9444427E-01
2.2258930E+00	-1.5668558E+00	-4.2675382E-01	-5.3043085E-01	-5.3334712E-01	-4.9270858E-01
	4.8171904E-01	-2.8617541E-01	9.6242548E-02	-1.8350689E-01	4.8010923E-01
	3.3406868E-01	-3.2268950E-02	1.1974959E-01	-2.0148683E-01	1.5396955E-02
3.9900526E-01	9.7921592E-01	5.8125553E-01	2.9874062E-01	-4.1123540E-01	5.8730686E-01
	5.7602437E-01	4.4900854E-02	1.9205248E-01	-2.3482544E-01	-2.5055030E-01
	-1.8950016E-01	1.6269903E-01	1.0726053E-01	-3.0142979E-02	-4.9649383E-02
-6.5484443E-01	1.5362172E+00	-7.6839702E-01	-4.3516409E-02	-6.6165542E-03	5.3446311E-01
	-3.9328081E-01	-1.4319462E-01	-2.4163088E-01	8.5424216E-02	-1.7861680E-01
	-1.1875100E-02	-7.1967480E-04	-1.7949220E-01	-7.7877393E-02	-5.2207638E-02
2.9004514E-01	-2.6085863E-01	-3.6411585E-01	2.3034055E-01	2.5138114E-01	1.6809987E-01
	1.5080180E-01	-7.2352636E-02	1.9271497E-02	-1.0748410E-01	7.5470566E-02
	1.4920639E-01	-6.1707893E-02	-1.2081985E-01	6.0249594E-02	1.2269598E-02
9.1291988E-01	-1.0901712E+00	-5.0157962E-01	-1.1472266E-01	-6.9474906E-02	1.7166331E-01
	-1.6783233E-01	-1.0321231E-01	2.0631124E-01	-3.2161801E-03	1.7179205E-01
	-1.9759379E-01	6.8559100E-02	1.7925761E-01	1.0929648E-01	4.5994643E-02
-6.9655429E-01	5.6809952E-01	-2.4300380E-01	4.2744103E-01	4.3969320E-02	-5.1471611E-02
	-7.0373539E-03	-1.5164402E-01	1.5000354E-01	-1.1283858E-02	3.3351059E-02
	-2.1711947E-01	-1.0227103E-01	-3.4461805E-02	-1.0405244E-01	1.1979236E-01
-3.1733941E-01	2.0670849E-01	-5.6352203E-02	-2.6563908E-01	-2.7071809E-01	4.1852356E-02
	-1.3910099E-02	4.3120531E-02	-2.1591462E-01	-2.6945891E-02	-9.9041688E-02
	1.2445557E-01	1.0856436E-01	-5.4714639E-02	-2.5794619E-02	3.0860155E-03
7.5991257E-03	-2.4702847E-01	7.3624539E-02	-1.5615673E-01	1.8041583E-03	-1.9418724E-01
	-1.1565023E-01	8.6056661E-02	7.2696466E-02	6.9417815E-02	-3.7550961E-02
	7.3289976E-02	7.9663737E-02	1.5385503E-02	1.5544871E-02	-8.9445824E-02
2.6915369E-01	-6.4773588E-01	1.1979690E-01	-7.1624421E-02	1.6424222E-01	-2.3427696E-01
	-8.2772293E-02	8.8046680E-02	1.3924343E-01	2.0414957E-02	1.0920073E-02
	9.3346425E-03	-6.5750858E-02	4.7450493E-02	7.7268442E-02	4.6731090E-02
-5.4192327E-01	5.6082626E-01	8.1392146E-02	1.7022432E-01	1.0653903E-01	1.2227068E-01
	3.6876926E-02	7.5155315E-03	-8.0817717E-02	3.8791288E-02	1.0321027E-01
	2.6959778E-02	-8.9672810E-02	-5.2581068E-02	-1.7943157E-02	-1.3846205E-02
-1.2091052E-01	3.1456779E-01	2.4405765E-01	3.9281809E-02	3.5022204E-03	-9.7203363E-02
	7.0174231E-02	3.3347526E-03	-3.6638503E-02	1.6544123E-02	-1.2680263E-01
	-2.1855085E-03	7.3756426E-03	-1.4684375E-03	-2.3666177E-04	-3.4693389E-02
7.1885383E-02	1.0825926E-02	2.2387849E-01	-7.7911752E-02	-9.8508029E-02	-4.4766416E-02
	7.9820740E-02	8.8906502E-02	-5.3939007E-02	-5.2914071E-02	-3.9621194E-02
	4.6908075E-02	6.1438386E-02	-3.0004176E-02	-3.0729035E-02	-2.3581167E-02
1.3993237E-01	-5.4931969E-02	7.3560755E-02	1.4083432E-04	9.5562912E-02	-1.2366958E-03
	1.0174143E-01	-2.8290638E-02	-3.9206676E-02	2.6471789E-02	1.0181795E-01
	1.6540187E-02	-3.3264839E-02	2.5476871E-02	2.6443147E-03	6.2672964E-03
-1.0859327E-01	1.0444293E-01	-1.4510439E-01	1.0503445E-01	1.9995047E-02	5.0749009E-02
	-3.5669751E-02	-2.5601206E-02	3.9536851E-02	7.5093678E-03	-3.5106525E-02
	-4.3879947E-02	1.4595911E-02	8.6442861E-02	-1.4327470E-02	-5.3520612E-02
1.3282437E-01	-7.8098033E-02	-7.6273267E-02	-5.8689516E-02	2.0176234E-02	7.9494754E-02
	-1.2002103E-02	-2.6086936E-02	9.9647691E-03	-5.6094880E-02	1.5347696E-02
	-5.5136597E-02	-5.5123005E-02	-3.9959732E-02	-5.9551137E-03	4.1859222E-02
3.3918073E-01	-3.7315502E-01	-1.2787552E-01	-1.3910567E-01	-7.3155297E-02	4.3963974E-02
	1.9480878E-02	-2.5239328E-03	-5.4183459E-02	-1.9301554E-02	-2.6944935E-02
	7.2018629E-03	-2.2180093E-02	2.3717240E-03	1.0895226E-02	4.6523849E-02
9.0437820E-02	-1.0734733E-01	-9.4309689E-02	-7.0458451E-02	-1.6506391E-02	4.6865952E-02
	-3.9671934E-03	-4.5469677E-03	-2.2907273E-02	-2.0901619E-02	2.7538173E-03
	2.7072672E-02	1.0143756E-01	-1.6035382E-03	-1.8113169E-02	-2.3288182E-02
-9.4243445E-02	1.2245051E-01	-1.2052370E-01	7.9156811E-02	-6.1155060E-02	7.0194031E-03
	-3.3306503E-02	1.0456078E-03	6.4351724E-02	5.1282128E-02	3.6164775E-04
	-4.7954630E-02	-3.4816569E-02	-2.1873486E-02	2.9490344E-03	1.7421004E-02
-9.5264493E-02	1.5875754E-01	-1.0120865E-01	7.4729862E-02	5.7584992E-02	5.4713299E-02
	-4.9538631E-02	-2.0718012E-02	3.1120140E-02	3.7257570E-02	-1.7445028E-02
	-3.1809937E-02	-8.3494134E-03	2.1275588E-02	2.3174460E-02	-1.2834676E-02
1.1484274E-01	-1.6968709E-01	1.9806893E-02	-5.2469683E-02	2.6059624E-03	-5.8310257E-02
	-4.6179840E-03	-5.8469374E-03	-2.6538196E-03	-1.4274387E-02	1.5450297E-02
	9.0095514E-03	9.9140750E-03	-1.5489133E-02	-5.2086580E-03	1.0870773E-02
-1.2231904E-01	1.6238216E-01	2.1692814E-02	3.1311465E-02	-7.5423170E-03	4.5077005E-03
	1.6435716E-02	9.8171882E-03	-7.7691713E-03	-5.0431095E-03	-6.4679426E-03
	9.0077366E-03	-6.9980649E-03	-2.6185859E-04	9.1067586E-03	8.7366156E-03

Table 12. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, DECEMBER-JANUARY-FEBRUARY (2000-2400 LOCAL MEAN TIME)

ALPHA	BETA
3.0203258E+01	4.6708028E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
3.1494614E+01	7.3473813E+00	1.5416254E-01	9.0423517E-01	-4.1268037E+00	9.9965547E-01
	2.6957515E+00	6.9854075E-01	-3.1160419E-02	-2.3394958E+00	3.6356178E-01
	5.8228038E-01	9.2160728E-01	-1.5052897E-01	9.3996297E-02	6.1013889E-02
-9.3700638E+00	1.8776958E+01	-7.2907496E-02	1.2552127E+00	-4.8833112E-01	4.3343110E+00
	6.1947135E-01	7.8228006E-01	1.1832930E+00	-9.0507947E-01	-1.9589777E-01
	-2.2905044E+00	-6.2573872E-01	-5.0375535E-01	-3.5401242E-01	9.8918468E-02
-4.1594002E+00	-8.0957034E+00	-4.7121098E+00	1.8482575E+00	2.9532967E+00	2.5907588E-01
	-3.0050287E-01	-1.2571224E+00	-4.5001543E-01	7.8546573E-01	-2.5491371E-01
	2.5418161E-01	-7.5209663E-02	1.4781563E-01	-1.1773473E-01	-4.7125033E-01
-2.4865202E+00	3.0522983E+00	6.3158767E-02	-4.3607706E+00	-3.1977699E+00	-2.9396600E+00
	-1.9341868E+00	-1.6472873E+00	-1.2701120E+00	4.6976286E-01	2.9365953E-01
	1.2104219E+00	3.1484969E-01	4.4193739E-01	2.9321053E-01	3.0206170E-01
1.4939661E+00	-6.7697383E+00	4.3212434E-01	2.1656504E+00	1.1290793E+00	2.3039235E-01
	5.9041123E-01	1.1499155E-01	8.3989015E-01	-4.1136126E-01	1.8321186E-01
	-1.9501139E-01	1.9834020E-01	3.1637869E-01	2.3286591E-01	4.3968929E-01
-4.5509709E-01	-3.1261564E-01	-1.0403393E+00	-8.4575091E-01	1.6614306E+00	8.8802088E-01
	8.4938701E-01	9.9947467E-01	6.7015932E-01	-2.1933951E-03	-2.2577729E-01
	7.8564265E-02	-1.0870015E-01	-5.8811044E-01	-5.0219023E-01	-3.5321005E-01
-2.5621624E+00	4.2094710E+00	1.6684023E+00	1.4150767E+00	-1.2713259E-01	-3.0281956E-04
	-5.3326161E-01	9.1770319E-01	-1.3088964E-01	3.1550152E-01	-3.8457160E-01
	-3.7094141E-01	-3.9482453E-01	-4.9308135E-01	5.7688824E-02	-2.7785921E-01
3.8713690E-01	-1.7520261E+00	7.1149825E-01	-6.3972863E-01	2.2803174E-01	-9.9990682E-01
	-8.8073736E-01	-9.2367495E-02	-5.5407195E-01	1.5991274E-01	-3.2521762E-02
	2.4755387E-02	1.0490559E-01	4.9216371E-01	4.8785517E-01	2.3131251E-01
2.1094105E+00	-2.3247487E+00	-2.8711247E-01	-5.7734557E-01	-4.6684663E-01	-9.1945003E-01
	3.9030994E-01	-4.1050654E-01	4.0971854E-02	4.7119573E-02	5.3675919E-01
	4.8513192E-01	2.1182137E-01	1.7450949E-01	-1.8399404E-01	3.8532251E-02
-3.2153029E-01	1.4973470E+00	1.1347673E+00	2.6723340E-01	-3.9970133E-01	3.0406815E-01
	5.4980049E-01	7.7383028E-02	2.5743426E-01	-1.9618604E-01	-3.8781599E-01
	-2.8410688E-01	-7.5014025E-02	2.6615776E-03	-6.9066978E-02	-5.5265945E-02
-8.9159031E-01	1.4748187E+00	-3.6930823E-01	-7.8763157E-02	-1.5850826E-01	7.5230370E-01
	-1.3857247E-01	-2.8081802E-02	-2.5836718E-01	-6.3172674E-02	-2.3384296E-01
	-3.2640201E-03	-3.0755119E-02	-1.5348934E-01	-2.3029180E-02	-3.1889565E-02
7.7300130E-01	-9.4408481E-01	3.3267883E-02	1.0153749E-01	1.9326677E-01	4.6051574E-02
	2.7419289E-01	-5.6562118E-03	-1.1521162E-01	-8.5077551E-02	2.1106196E-01
	2.4268346E-01	-7.9711076E-02	-1.7829864E-01	-3.7106794E-02	1.6361260E-02
9.6769128E-01	-1.0910072E+00	-2.9019152E-01	-3.0079459E-01	-8.2605066E-02	1.7923447E-01
	-8.4207090E-02	-4.1962217E-02	6.6391766E-02	2.6277556E-02	2.3226329E-01
	-8.8156573E-02	1.7581853E-01	1.9071024E-01	1.3052837E-01	-1.2727717E-02
-2.1275437E-01	-2.7363834E-02	-3.0925138E-01	3.4938661E-01	1.2021827E-01	-4.8534000E-02
	1.6108602E-01	-2.9336514E-01	1.6522004E-01	3.6159004E-02	8.3277816E-02
	-1.1040984E-01	-9.2471123E-02	8.9459718E-02	-4.1549911E-02	8.3683772E-02
-3.5791263E-01	6.0867107E-01	-9.8661966E-02	-3.0836466E-02	-6.5471894E-02	1.7630925E-01
	5.3758127E-03	9.9262244E-02	-2.1171367E-01	-9.4656967E-02	-1.5566028E-01
	-3.7458803E-02	-2.0387947E-01	-7.9418312E-02	-1.3926748E-01	-4.4904060E-02
-1.1496865E-02	4.0585855E-02	-1.5859924E-01	-3.1555277E-02	9.8384326E-02	7.2692878E-02
	-1.8406077E-01	-1.8113223E-02	-4.0283850E-02	1.7733266E-02	1.2876915E-02
	-5.9565502E-03	2.3184350E-01	-2.5309791E-02	8.4999114E-02	7.4983814E-03
5.5661683E-01	-8.1741387E-01	-1.2299431E-01	-1.4195266E-01	-1.2811837E-02	-3.9947591E-01
	-2.8981678E-01	1.0539419E-01	2.9060273E-01	7.4805620E-02	7.6825824E-03
	-3.3791946E-04	2.3538721E-02	-1.5739883E-02	1.3624715E-01	1.0787181E-01
-4.1388700E-01	4.6728653E-01	-5.1080177E-02	1.7798661E-01	1.6354959E-02	9.5104870E-02
	-8.8928167E-02	-1.1302554E-02	-3.1462994E-02	4.5574540E-02	5.9649398E-02
	-5.2858889E-02	-1.0865594E-01	-2.7352097E-03	-1.6585756E-02	-4.0119311E-02
-4.1261062E-01	4.3254696E-01	-9.5403424E-03	1.8067812E-01	-2.1147020E-02	-3.2591174E-02
	1.3223007E-02	-2.9442589E-02	-6.4314888E-02	5.8116014E-02	-1.4790205E-01
	-2.6369355E-02	-1.9634230E-02	7.5145117E-02	-2.4248420E-02	-8.1693101E-02
3.1920062E-01	-2.2072979E-01	2.3403418E-01	-1.7469157E-01	-4.4618368E-02	-4.2116724E-02
	8.4833143E-02	1.3425559E-01	1.0436423E-01	-4.4083991E-03	-1.2411991E-01
	5.2524019E-02	5.7533858E-02	-2.5580731E-02	-7.9101762E-02	-3.3572403E-02
2.2875571E-01	-2.9235883E-01	1.2917655E-01	-7.3522882E-02	5.7310351E-02	2.1657524E-02
	7.6368456E-02	8.1781222E-03	-7.3746886E-03	-7.5637614E-02	9.4034317E-02
	6.8797633E-02	5.8125429E-02	-5.5525458E-02	2.3947793E-04	5.9370979E-02
-3.4461407E-01	4.1746211E-01	-5.1176870E-02	1.4195860E-01	-6.8500128E-02	-1.8018962E-02
	-8.9307977E-02	9.4863536E-02	3.9762908E-02	5.1110708E-03	2.7858000E-03
	1.1482684E-01	5.3154137E-02	2.4607887E-02	-2.6139909E-02	-1.0546187E-01
-1.2564705E-01	1.4897764E-01	3.1898817E-02	5.8849543E-02	-2.6120801E-02	6.2632160E-02
	4.1446102E-02	-6.1466935E-02	-9.8993885E-02	-7.9454265E-02	-4.4392336E-02
	-5.4431828E-02	-7.6962827E-02	-3.3592467E-02	1.8850166E-03	3.2760388E-02
1.1933702E-01	-2.2066353E-01	-3.4759776E-03	-1.0266618E-01	-7.6460149E-02	-2.8384386E-02
	1.2020594E-02	-6.5587870E-02	-1.7740754E-01	-6.6780904E-02	5.9831012E-02
	1.1656460E-02	-4.6793808E-02	4.3532144E-02	1.6325144E-02	5.0714022E-02
1.3506058E-01	-1.2832454E-01	1.0721069E-02	-6.5632636E-02	5.5879460E-02	1.6943200E-02
	1.3799405E-01	-3.3797072E-02	4.1826226E-02	1.6108783E-02	4.6839569E-02
	2.0846648E-02	2.5490722E-02	-2.9712353E-02	3.9116670E-04	-5.8384604E-03
-8.5761342E-02	6.4768592E-02	1.1989737E-02	7.1361892E-02	7.6445948E-02	5.4083935E-02
	1.8142031E-02	7.7540415E-03	4.4978370E-02	2.1097785E-03	8.3428723E-02
	-1.6899730E-02	-3.5594152E-02	-6.7106545E-02	2.2642449E-03	4.8661434E-02
-1.0539375E-01	1.2707640E-01	-1.9526206E-02	1.9783724E-02	4.3768225E-02	8.8110995E-02
	-6.3511441E-02	5.7601114E-02	1.2448618E-02	7.0084012E-02	1.8768362E-02
	-8.6322363E-04	2.3069775E-02	3.0948111E-02	3.7774129E-02	-3.9683237E-02
1.6203411E-01	-2.1359237E-01	-2.7737492E-02	-8.2418601E-02	-3.2158178E-02	-6.2626556E-02
	-1.0068440E-02	-1.8869390E-02	6.9613846E-03	2.5613979E-03	-3.2736139E-02
	-1.8321805E-02	3.4254135E-03	6.2597606E-03	8.1884096E-03	8.2149743E-03
-6.8697294E-02	1.0447956E-01	1.8102748E-02	5.3069921E-02	8.8770890E-03	8.5165848E-03
	-1.6436574E-03	5.3515740E-04	-3.2962679E-03	-8.2186741E-03	-1.2411393E-02
	-4.3454118E-03	-6.9598869E-03	3.9203892E-03	-4.4796852E-03	6.6845382E-03

Table 13. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, MARCH-APRIL-MAY (0000-0400 LOCAL MEAN TIME)

ALPHA	BETA
3.9283844E+01	1.9973017E+00

CHI	MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS				
3.4386761E+01	-1.3218215E+00	3.0679137E+00	3.2515537E+00	-9.0895984E-01	-2.1429146E-01
	2.1040746E+00	3.2244495E-01	1.6629696E+00	-7.6578216E-01	2.1258107E-02
	-7.2747985E-01	-2.3510286E-03	-8.8101442E-02	2.7909743E-01	3.4036673E-01
-2.3298714E+00	4.3832758E+00	2.3382229E+00	-1.9697490E+00	-3.9600111E-01	1.6002852E+00
	-8.7277494E-01	8.3825721E-01	3.0725435E-01	-1.2172242E-01	6.8224050E-01
	-9.5711641E-01	-1.9355439E-01	-1.0426610E-01	-2.5003508E-01	1.5087975E-01
-2.4684630E+00	-5.2706588E+00	-2.8594444E+00	8.1876727E-01	2.0595982E+00	-3.2182892E-01
	-1.1654757E+00	-4.6654046E-01	-1.2472565E+00	5.1256567E-01	-4.6942691E-01
	5.6551833E-01	3.5482203E-02	2.4458523E-02	-5.3280460E-03	-2.5288145E-01
-8.8684702E-01	4.4011846E+00	5.9244602E-01	-6.3871084E-01	-1.8251753E+00	-1.3319318E+00
	4.6678856E-01	-1.2821383E+00	-1.6273035E-01	8.8655381E-03	-4.9443615E-01
	7.8148309E-01	-4.3510989E-02	3.5398186E-01	5.5629202E-03	-1.9282885E-01
1.6710598E+00	-5.9346237E+00	8.3548479E-01	1.0567369E+00	3.3098282E-01	2.8887235E-01
	3.5864536E-01	3.7226194E-01	1.1058115E+00	-4.0385189E-01	5.5143957E-01
	-1.3661324E-01	1.0517452E-01	1.2048166E-01	-1.1354945E-02	2.2801647E-01
1.0301198E-01	-1.7693424E-01	-1.3970811E+00	-8.1170225E-01	7.3082669E-01	4.4499308E-01
	-7.1834011E-02	5.3147387E-01	-3.9026029E-03	6.0499763E-02	-1.4136561E-02
	-2.1772751E-01	1.3785912E-01	-2.8288629E-01	1.9731925E-02	1.1018130E-01
-3.1314399E+00	3.8427456E+00	8.2972924E-01	1.1983086E+00	-3.1164960E-01	7.4799861E-02
	-1.1178872E-01	-7.6836879E-03	-4.9534915E-01	1.7450625E-02	-3.1627373E-01
	-1.2423535E-01	-4.0892542E-01	-1.4857413E-01	-1.6376163E-01	-2.4486779E-01
1.7545511E-01	-4.2838578E-01	6.6735978E-01	-2.0827620E-01	4.2120886E-02	-4.5537316E-01
	-4.1736893E-01	1.1182943E-01	3.6320944E-02	5.4903240E-02	4.3398693E-02
	-3.2343485E-02	-1.6461145E-02	-9.7607939E-03	9.4488082E-02	9.3059301E-02
1.1333872E+00	-1.0960214E+00	-1.2819632E-01	-2.7148742E-01	-1.4276403E-01	-6.8394307E-02
	6.5564658E-01	4.4704176E-02	2.3067210E-01	-2.8569456E-02	2.4108487E-01
	1.1604820E-01	2.3529933E-01	9.8870204E-03	1.0547313E-01	9.0133921E-02
-2.0472813E-01	1.5783089E-01	5.2416539E-01	7.0205189E-02	-7.2957664E-02	1.0929939E-01
	-1.8185087E-01	-1.1318181E-02	-2.5744096E-01	-1.6373431E-01	2.1741802E-01
	6.3201808E-02	1.5928564E-01	1.2079878E-01	-1.1773034E-02	-1.3148141E-02
-7.2193764E-01	1.2070563E+00	-2.1054125E-01	-1.3261038E-01	-2.8354139E-01	6.3352337E-02
	-1.9303467E-01	-1.4661629E-02	-5.1435955E-02	9.2225661E-02	-1.1022540E-01
	-1.7869495E-01	-4.7599627E-02	-8.4412492E-02	2.0501305E-02	3.1008033E-02
-3.4670107E-02	-4.9658784E-03	3.5213792E-01	1.8987398E-01	4.5903777E-01	-4.6279350E-02
	3.7003817E-01	-3.5320547E-02	-3.7477201E-02	6.1896035E-02	-1.5725785E-01
	8.1340556E-02	-1.6819907E-01	-3.9442196E-02	1.1605126E-02	-6.5904929E-02
6.8758709E-01	-7.1489645E-01	-3.3796763E-01	-3.1909409E-01	-5.2399376E-02	2.5950294E-01
	-1.3473555E-01	-5.7196211E-02	-2.2299553E-02	2.2742743E-02	5.0520451E-02
	1.9423676E-02	1.5989397E-01	5.9311998E-02	9.5089711E-03	-9.3510205E-03
-1.3396657E-01	-1.0305137E-01	-5.5890111E-02	1.0599522E-01	1.4578022E-01	1.1544361E-01
	5.7899018E-02	-2.0677521E-02	1.2770028E-01	-7.2694069E-02	-5.1309536E-03
	-1.5106908E-01	-3.3477669E-02	1.0978283E-02	-1.9076163E-02	6.4397863E-02
1.7611127E-01	-1.1663059E-01	-2.0596422E-01	-1.1487561E-01	-4.4904470E-02	-1.2627755E-01
	-1.6336570E-01	-6.0063524E-02	-2.2786938E-02	1.2076451E-01	-2.1973460E-02
	1.0382815E-01	-1.0354925E-01	-1.1326899E-02	7.5390274E-03	-1.6818879E-02
-2.4962875E-01	2.1708554E-01	-3.8781541E-02	1.1207762E-01	-4.9326981E-03	9.0624731E-02
	9.4844685E-03	-5.6909315E-02	9.8622209E-02	9.2173746E-02	-5.4265383E-02
	-2.5081981E-02	-1.3557858E-02	5.0533772E-03	-2.4135670E-02	-8.7215955E-02
4.9825746E-01	-6.9533829E-01	1.0133438E-01	-1.9414787E-01	1.3370080E-01	-1.8281055E-01
	-6.1761401E-02	1.3329177E-01	-3.7350845E-03	-6.1015435E-02	-2.7397663E-02
	2.5277241E-02	6.5513048E-02	3.2105914E-02	-5.9695688E-02	3.0998870E-02
-2.1614302E-02	2.2742635E-01	-8.8087600E-02	2.2006687E-01	-2.2508526E-01	8.9907494E-03
	8.2841224E-02	-2.7182814E-02	8.0643718E-02	-1.5529812E-03	4.8794675E-02
	2.8876953E-02	2.3023533E-02	-2.9286681E-02	2.3465263E-03	1.4697570E-02
-1.0694772E-01	9.8242455E-02	1.7707699E-01	1.1115329E-01	1.0043649E-02	-7.3531729E-02
	-5.4093069E-02	4.5103590E-02	-9.6511581E-03	-1.1838529E-01	-5.1966856E-02
	-4.1365891E-02	-8.7385426E-02	2.1554329E-02	-1.7374633E-02	-8.1621790E-03
-7.3823164E-02	1.3612793E-01	4.7088588E-02	-7.9708496E-02	-7.1692286E-02	-1.6140068E-02
	-2.0579881E-02	8.3472672E-02	-1.0322771E-01	-7.4260672E-03	2.7934238E-03
	5.0451704E-02	5.1294854E-02	-5.7193726E-02	-1.7305338E-02	5.9497937E-03
1.6531145E-01	-2.7071623E-01	3.3789971E-02	-2.4351601E-02	2.3678929E-03	2.9271887E-02
	1.2202546E-01	-8.2284175E-02	2.7743614E-03	-2.8948338E-02	7.7235863E-02
	6.4856476E-02	1.3813246E-03	5.4603397E-02	8.7510186E-02	3.8692183E-03
1.8868568E-01	-2.3816694E-01	-1.9569749E-02	-1.2009623E-01	1.6616325E-02	-6.6792080E-02
	-7.7557854E-02	5.5234068E-02	-9.2536334E-03	1.4781735E-02	2.0977818E-02
	-1.1350116E-02	4.6744121E-03	-1.3770069E-02	-1.2133461E-02	1.6514000E-02
-3.3050489E-01	3.9503730E-01	-5.7116579E-02	2.0393271E-01	-3.3139102E-02	1.6447191E-01
	5.6311879E-02	-8.6799822E-02	-2.1014038E-02	-1.8478433E-02	3.4810298E-02
	-4.8308563E-02	-7.9460794E-03	-3.8910442E-02	2.2668917E-02	2.0614809E-02
3.4899930E-03	-1.3268975E-01	1.5170167E-02	-9.1486343E-02	8.9440993E-02	-1.5061815E-02
	-8.5676445E-02	1.2210262E-02	-7.0275074E-02	-1.0438233E-02	-1.9409449E-02
	-1.8263142E-02	-6.8096523E-02	2.8935857E-02	1.6317128E-04	6.7528939E-03
1.2379392E-01	-9.5563485E-02	1.6085865E-02	3.0750027E-02	5.5379995E-02	4.7186882E-02
	6.8231154E-02	-3.0365036E-03	3.7954382E-02	9.1327282E-02	-1.4228810E-02
	-3.9479498E-02	4.4188766E-02	-4.0955964E-02	2.2899096E-02	-7.7081065E-03
1.0069635E-01	-1.7196445E-01	1.7809209E-02	-3.0395445E-02	4.1510131E-03	-2.6541458E-02
	-2.0584506E-02	-3.5669206E-02	6.7142160E-02	-4.6196075E-03	2.3097370E-02
	1.5297605E-02	-3.3515551E-02	1.9482720E-02	-1.5181146E-03	5.9202691E-03
-2.8504599E-01	3.9005790E-01	-3.9178590E-03	7.1521276E-02	-2.3255082E-02	7.1925111E-02
	-6.5021046E-02	5.4192226E-02	-1.6071027E-02	-1.4142062E-03	-4.6960292E-02
	-4.6422016E-02	2.1311264E-02	4.0366215E-03	-3.8996758E-02	-2.0966394E-02
6.4368456E-03	-1.0706980E-03	2.0816909E-02	2.5784488E-02	-2.5276049E-02	-5.0715227E-03
	2.0723707E-02	-5.3613931E-03	-5.9589942E-04	-4.3426777E-03	3.4344609E-03
	-2.5120277E-03	2.2107075E-02	-1.0741046E-02	-3.9284018E-03	-3.9197872E-03
5.9442580E-02	-8.3277461E-02	1.1191448E-02	-3.9766414E-02	1.3630943E-02	-2.5045670E-02
	6.1464839E-03	4.4147970E-03	1.7547075E-03	-5.3072178E-03	2.8575760E-03
	1.9352080E-02	-1.2506880E-02	4.5902902E-03	3.8271557E-03	1.2329422E-02

Table 14. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, MARCH-APRIL-MAY (0400-0800 LOCAL MEAN TIME)

ALPHA	BETA
3.5537703E+01	-2.1485351E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
2.7607003E+01	6.4220684E+00	-7.7021073E-01	1.8110165E+00	-1.5745863E+00	-5.5886854E-01
	1.5104364E+00	4.5216182E-01	1.8881306E+00	-3.5031704E-01	2.9554509E-01
	-3.0962829E-01	-3.4339579E-01	-3.3595773E-01	-9.2139930E-03	2.6085204E-02
-2.3975438E+00	5.4987727E+00	1.6696638E+00	-1.3502316E+00	-4.2657738E-01	1.1925997E+00
	-8.9745073E-01	8.9000969E-01	1.9329740E-01	-4.3191649E-01	2.6813178E-01
	-1.0044334E+00	-9.8238094E-02	-5.4416216E-02	-1.0000459E-01	1.8559934E-01
-6.7772537E+00	-1.6656425E+00	-2.2973566E+00	-1.4481566E-01	1.2611257E+00	6.7284921E-01
	-4.1095091E-01	-8.2504641E-01	-1.2958705E+00	2.7476906E-01	-3.4226754E-01
	4.5366422E-01	7.9797087E-02	1.0380853E-01	4.3459754E-02	-2.3451134E-01
2.3123208E+00	-9.4072371E-01	6.2013202E-01	2.8541867E-01	-1.4057422E+00	-2.0750484E+00
	1.0272413E-01	-1.1483572E+00	3.2086527E-02	4.3021873E-01	-5.2421586E-02
	9.5026205E-01	5.2182990E-02	3.0136862E-01	4.4457484E-02	-1.3644835E-01
-9.6587858E-02	-2.0518863E+00	-1.0997506E-01	4.4159163E-01	2.6693017E-01	-1.1139817E-01
	3.4099598E-01	5.3826521E-01	9.5068349E-01	-4.6229722E-01	3.4110427E-01
	-4.6166240E-01	6.6724013E-02	1.2836962E-01	-7.5493808E-03	3.3449697E-01
-1.8252958E-01	2.9914170E-02	-4.8468340E-01	1.5712860E-01	1.0377253E+00	9.5174420E-01
	5.5898026E-01	6.5035791E-01	-2.3371721E-01	-2.1366741E-01	-2.0811946E-01
	-2.9565217E-01	1.3389691E-02	-3.6213302E-01	-3.7297729E-02	4.2911581E-02
-2.1447943E+00	3.4724484E+00	3.2796953E-01	4.4119459E-01	-4.8240190E-01	-2.0694785E-01
	-7.5199944E-01	-1.4009830E-01	-2.8035993E-01	1.5891799E-01	-2.7040903E-01
	9.0931889E-02	-2.6242551E-01	-9.9956569E-02	-8.1215768E-02	-2.7738737E-01
1.2746069E-01	-5.8169565E-01	9.6202975E-01	-1.9188214E-01	2.1346882E-01	-3.5061305E-01
	-2.0244933E-01	1.2557371E-01	8.5431624E-02	1.0309600E-02	8.1773899E-02
	-5.8271158E-02	-2.1522742E-02	1.7945781E-01	1.3252139E-01	5.6679554E-02
1.3006004E+00	-1.2485846E+00	-3.8100027E-01	-3.9683815E-01	-3.5553081E-01	-2.5317862E-01
	4.2019586E-01	-3.1529999E-04	-8.4004278E-02	-1.6173325E-02	1.9863831E-01
	1.4924743E-01	2.7360526E-01	3.8693915E-02	8.8105115E-02	1.3569839E-01
-3.1396462E-01	3.1344361E-01	2.4319963E-01	1.3362593E-01	-7.7077040E-02	3.7839324E-01
	-4.4026127E-02	-1.3044076E-01	2.6012109E-02	-4.3117433E-02	1.7670670E-01
	2.4103921E-02	9.9218361E-02	-1.9309377E-02	-1.2596330E-01	-7.5897979E-02
-5.2346026E-01	8.7085278E-01	-7.9355997E-02	3.3524449E-03	1.5466035E-01	1.7509656E-01
	-5.2085043E-02	-5.0934818E-03	-1.0959565E-01	9.0045519E-02	-2.3179520E-01
	-1.3177645E-01	-1.8746840E-01	-1.1867460E-01	2.3816459E-02	1.7163101E-02
-6.3859697E-02	-1.0054015E-02	-4.8747866E-02	-6.4528344E-02	1.3077175E-01	-1.7340928E-03
	1.3957979E-01	-6.8979618E-02	-1.9756461E-02	8.2734378E-02	-1.5444443E-01
	2.1815865E-02	-1.4562740E-01	-2.7187442E-02	9.5786978E-02	-4.0085700E-03
6.6640975E-01	-8.4232413E-01	-5.0538091E-02	-2.0522947E-01	1.9008348E-01	7.3090081E-02
	2.8910983E-02	-5.1188401E-03	6.7848829E-02	-7.2684332E-03	1.4206407E-01
	3.8233781E-02	9.7099412E-02	1.0478954E-01	-2.6172202E-02	-6.1236964E-02
-1.0470074E-01	6.9728396E-02	-3.3154485E-01	1.0522810E-01	-2.8295645E-01	-1.5473554E-02
	-8.2354428E-02	-7.6000084E-03	9.1303373E-02	1.2408236E-02	6.8883199E-02
	-2.8274077E-02	7.4615980E-02	-2.2632363E-02	-5.9233884E-02	6.0689564E-02
-2.7083319E-01	2.7749076E-01	4.1862753E-02	6.4499014E-02	3.1648111E-02	-9.3091480E-02
	-6.3027614E-02	1.5349090E-02	8.1205556E-02	5.9224413E-03	-1.9653966E-02
	3.5480206E-02	-5.3285021E-02	3.1865437E-02	9.7594546E-03	-2.8119296E-02
9.9761210E-02	2.0709282E-03	1.5856980E-01	3.9679147E-02	-2.1301111E-03	-1.0539387E-01
	-3.9302476E-02	3.3082916E-02	-2.5425175E-02	2.9136599E-02	-1.0693908E-01
	1.2818034E-02	-6.6817739E-03	1.5879207E-02	3.8465216E-02	-6.1376515E-02
1.0479936E-01	-2.3757975E-01	1.0995443E-01	2.4897461E-02	1.0588332E-01	2.3897463E-02
	7.9912342E-02	3.4163145E-02	1.0110649E-02	-9.2484118E-02	-2.3440766E-02
	-1.4867092E-02	3.5537251E-02	-3.4302966E-02	-2.9605666E-02	5.6613744E-02
7.5510127E-02	-1.0883009E-02	-7.8342154E-03	6.7365385E-02	-6.9756753E-02	-1.7374085E-02
	-5.1220001E-02	-2.7533219E-02	-4.4695052E-02	-8.4225026E-02	5.4871941E-02
	4.7608135E-02	-1.1331122E-02	1.1928002E-02	-5.1690020E-02	-3.4677937E-03
-2.7141095E-01	3.9561748E-01	-1.1938936E-01	4.7838231E-02	-1.9580179E-01	-1.0522583E-02
	1.3247604E-03	2.9160393E-02	6.1834410E-02	4.0178328E-02	2.1410153E-02
	-4.9566935E-03	4.1672823E-03	3.4453308E-03	3.2695740E-02	-1.6215436E-02
1.8357172E-01	-3.4436903E-01	6.3458127E-02	-1.8931658E-01	1.1741110E-01	-2.0343259E-02
	2.1195688E-02	1.1873691E-02	-8.6136300E-02	1.1635092E-02	2.5673690E-02
	1.5887384E-02	3.1601588E-02	2.8741202E-04	4.3604261E-02	2.7219860E-02
1.9419820E-02	1.3674434E-02	-5.8296679E-02	-2.9602720E-02	1.8972716E-02	7.0229536E-02
	4.7546870E-02	-4.7940951E-02	-9.5193051E-02	2.0291538E-02	-2.0282323E-02
	1.1638960E-02	-5.7855671E-02	-3.6209071E-02	7.4680681E-03	-1.1833910E-02
-1.2686027E-02	2.7237833E-02	6.2721273E-02	9.7137671E-02	4.7128713E-02	8.5622581E-02
	3.9149021E-02	-5.2103948E-03	7.5075621E-02	-3.4229970E-03	-2.0959946E-02
	-7.3970553E-02	-3.9712876E-02	1.3096934E-02	-4.2783224E-03	1.1730204E-02
-9.3217877E-02	1.6867684E-01	-5.4566369E-02	3.2226189E-02	-7.6041497E-02	-4.7023981E-03
	-7.1315940E-02	-2.9746998E-02	-4.5037520E-03	-2.0005076E-02	4.4187034E-03
	-4.2029923E-02	5.6919086E-03	1.8207618E-02	-1.6692323E-02	7.1081991E-03
-8.8315913E-03	-8.2541546E-02	8.5198751E-03	-3.5297374E-02	1.8729030E-02	2.1053475E-02
	1.3049046E-02	5.4637641E-03	2.2818240E-02	4.1899530E-02	1.6492378E-02
	3.7217575E-02	1.3623824E-02	6.3776421E-03	2.9766386E-02	-2.1003988E-02
8.6532087E-02	-8.3574824E-02	3.8530622E-02	-7.0252854E-02	2.1012738E-02	-7.2833770E-02
	-2.5885786E-02	1.8803941E-02	1.0575779E-03	4.1390946E-02	-6.1620459E-04
	2.3738431E-02	1.1073272E-02	1.1141626E-02	-1.6168305E-02	-1.5416644E-02
-7.6221815E-02	1.2306114E-01	7.0525978E-03	8.8355070E-02	-6.0844185E-02	2.6057343E-02
	2.1753582E-02	2.0704406E-02	4.8718992E-02	-3.5537150E-02	-1.3811052E-02
	-3.1211906E-02	-1.5123240E-02	-1.1063896E-02	-2.8472208E-02	-2.5342068E-03
-3.7114934E-02	3.7415643E-02	-8.7954014E-03	3.4010493E-02	4.7232836E-02	2.4704463E-02
	-2.3546035E-02	-1.1165125E-03	-8.4245694E-03	-5.4744397E-02	-1.4488352E-02
	-1.8968381E-02	2.9305043E-02	1.3997941E-02	-6.3553059E-03	1.5068765E-02
3.0538317E-02	-4.0410514E-02	8.1607318E-03	-1.3413380E-02	-6.5221707E-03	-2.2746753E-02
	-1.8507158E-02	-3.7180926E-03	-1.7604273E-02	8.6540765E-03	5.4913752E-03
	9.0196462E-03	4.0909479E-03	-6.8357472E-03	-3.5597410E-03	2.8606167E-03
-1.1898952E-02	1.2240639E-02	-1.2556507E-02	-1.3980121E-02	5.2121197E-03	2.2054664E-03
	2.5352401E-02	3.2175204E-03	1.1553329E-02	6.6867793E-03	3.0948694E-03
	3.8286423E-03	-8.2415284E-03	-4.4050301E-03	1.0832345E-02	3.3837726E-04

Table 15. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTICN OF ATMOSPHERIC RADIO NOISE, MARCH-APRIL-MAY (0800-1200 LOCAL MEAN TIME)

ALPHA	BETA
1.9735899E+01	-2.2975368E+00

CHI	MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS				
2.0753902E+01	2.3035486E+00	-1.0525549E+00	5.8336824E+00	-3.7371859E-01	-3.2307716E+00
	2.1149405E+00	3.1520569E-01	3.5716764E+00	7.5465407E-01	2.2706605E+00
	4.9943416E-01	7.5338218E-01	-3.1859549E-01	-2.1800196E-01	-1.3289351E-01
-5.7363385E+00	5.4578279E+00	-1.5230570E+00	-1.6790419E+00	5.7456166E-01	4.5085764E+00
	-4.1626540E-01	1.6475423E-01	4.7373648E-01	-8.5960546E-01	3.2644488E-01
	-1.2021795E+00	-3.0892904E-01	-3.6162396E-01	-1.3022229E-01	2.5506305E-01
-4.7801024E+00	-4.5625336E+00	-4.8076575E+00	3.6533216E-02	7.0768502E-01	7.4883921E-01
	-2.1222559E+00	-4.4505860E-01	-2.2452886E+00	1.2402400E-01	-1.3270067E+00
	3.2445374E-01	-3.2384199E-01	5.9121450E-02	-1.4209707E-01	-3.6325608E-01
-3.3038438E-01	5.0192299E+00	1.1098807E+00	-2.7143711E+00	-2.7849534E+00	-3.4637211E+00
	4.8780941E-01	-7.7683297E-01	-5.3297281E-01	5.0583928E-01	-1.0636998E-01
	1.1300128E+00	3.9415698E-01	5.2148428E-01	3.7594775E-01	-2.0250290E-01
3.5684111E+00	-4.5421396E+00	7.4181660E-01	2.4579005E+00	4.9215127E-01	2.0719357E-01
	1.4075759E+00	3.0787889E-01	1.9641085E+00	-3.9242166E-01	9.3801463E-01
	-5.4894824E-01	2.2030509E-01	2.5013979E-01	2.0105272E-01	4.9377285E-01
-1.0348857E+00	1.6427817E+00	-1.0694589E+00	-7.7850412E-02	1.3031402E+00	9.6298712E-01
	2.1536994E-01	4.5848212E-01	4.5222550E-02	-3.7717436E-02	3.1194204E-02
	-3.3302405E-01	-1.3954083E-01	-4.8636428E-01	-3.9085633E-01	1.4524073E-02
-3.4888149E+00	4.3931486E+00	-4.2197156E-01	2.7592761E-01	-7.6319564E-01	3.3848846E-01
	-1.1650543E+00	-4.0631953E-01	-1.3887001E+00	2.0023272E-02	-7.4444091E-01
	7.6863433E-02	-3.0012206E-01	-1.9864783E-01	-8.9474482E-02	-3.9432789E-01
7.7655298E-01	-1.2175860E+00	8.2915259E-01	-1.3505528E-01	1.9651005E-01	-1.0947153E+00
	-2.6258695E-01	7.1247425E-02	4.5596502E-01	3.6144302E-01	-1.2554389E-01
	1.5760492E-01	-5.1847258E-02	2.8852695E-01	2.2666496E-01	-4.6810259E-03
3.0280813E+00	-3.3999674E+00	-6.0909352E-01	-9.2522963E-01	-9.1692104E-02	-1.1709551E-01
	8.7256372E-01	1.1712489E-01	5.7287705E-01	-1.9518532E-01	4.7977346E-01
	1.9614108E-01	2.3121294E-01	1.0539893E-01	1.7058862E-01	2.3300348E-01
-7.2304601E-01	8.4684661E-01	-1.6186741E-01	2.7610951E-01	-8.4657211E-02	8.2209540E-01
	-7.3064749E-02	-8.3208569E-02	-2.2712111E-01	-2.5387537E-01	4.7149992E-01
	-7.0121357E-02	1.7327932E-01	-2.8401149E-02	-3.0924401E-01	-5.0880189E-02
-1.7161994E+00	2.1178013E+00	-9.4759643E-02	2.7823852E-01	-2.8845257E-02	-1.4972636E-01
	-4.4109195E-01	1.0816432E-01	-2.9666925E-01	1.4618178E-01	-4.9871945E-01
	-2.5301170E-01	-2.0760644E-01	-5.3197502E-02	8.9823772E-02	-2.1820117E-02
1.1014660E-02	-2.0603837E-02	2.0928167E-01	1.1865732E-01	4.9947709E-04	-3.3836333E-01
	8.7399243E-02	-6.3257236E-02	1.6116661E-01	2.0743073E-01	-2.9525348E-01
	1.7839560E-01	-2.5780687E-01	-8.6349639E-02	1.3228163E-01	-9.2154931E-02
1.2777486E+00	-1.6454728E+00	-5.1800113E-02	-3.6590349E-01	3.1267521E-01	1.4448838E-01
	2.1282192E-01	-4.6359527E-04	6.7992847E-02	-1.2364214E-01	2.6535990E-01
	7.3510100E-02	2.8762473E-01	8.1460580E-02	-4.3410639E-02	2.3443193E-02
4.7734377E-02	-1.0765052E-01	-1.3270915E-01	-4.9855488E-02	-2.8392569E-01	1.4640354E-01
	-7.1331876E-02	6.7422376E-02	6.3243074E-02	-1.7548581E-01	2.9809824E-01
	-1.3461127E-01	2.1042114E-01	4.0808471E-03	-7.8998053E-02	1.5443736E-01
-1.1348827E+00	1.6680817E+00	-1.2283616E-01	3.7866658E-01	-2.4216666E-01	-1.4621260E-01
	-4.2537097E-02	-1.6887097E-01	-4.3059959E-02	1.6865598E-01	-1.0494225E-01
	3.3810386E-02	-2.6383856E-01	-5.7672893E-03	2.6289013E-02	-7.4672456E-02
-1.7385778E-01	1.4588237E-01	5.1183134E-02	-3.1463296E-02	1.3104196E-01	3.2400039E-02
	-7.9001908E-02	1.8829510E-02	-1.0461825E-01	8.9422392E-02	-2.5701383E-01
	2.3332659E-02	-6.1499678E-02	1.5388827E-02	1.2032826E-01	-1.2618845E-01
8.4838800E-01	-1.3111921E+00	1.6361504E-01	-3.3015117E-01	3.5925654E-01	5.7633147E-02
	1.5390856E-01	2.4098631E-01	6.1629051E-02	-9.7387773E-02	9.4772676E-02
	-4.3597667E-02	1.8731691E-01	-6.7130454E-02	-9.5593248E-02	8.3374319E-02
7.0785806E-02	1.8643559E-01	-2.0356795E-01	1.1505127E-01	-1.8740349E-01	-1.1493829E-01
	7.4404326E-02	-1.3534165E-01	5.3844144E-02	-3.1403884E-02	1.1126728E-01
	7.3516339E-02	-3.6844220E-02	3.2911176E-02	-2.8464965E-02	2.6997018E-02
-5.1718522E-01	6.7522483E-01	-1.5377097E-01	2.0247200E-01	-2.6640354E-01	7.0576956E-02
	-1.4518611E-01	-1.2208649E-01	6.4120705E-02	-4.0617129E-02	-3.3046025E-03
	-3.7189885E-02	-1.3222511E-01	7.4251351E-02	1.6533295E-02	-2.1033076E-02
-7.3185148E-02	-8.6502890E-03	1.1244914E-01	-2.0380255E-01	1.9362795E-01	-1.4135136E-02
	-2.4031359E-02	1.2028494E-01	-1.6258167E-01	7.3605685E-02	-3.8216504E-02
	-4.6920358E-02	5.8815855E-02	-6.7821624E-02	9.9350625E-03	1.9350610E-02
3.1332172E-01	-4.0000404E-01	-2.5551636E-02	-3.5641563E-02	1.2644681E-01	3.7851279E-02
	9.2952545E-02	6.4892448E-03	3.8961085E-03	4.3521457E-02	-4.2263654E-02
	8.4990270E-02	4.8732075E-02	-1.3348825E-02	4.7778066E-02	-5.5289120E-02
8.8584725E-02	-6.2538964E-02	-5.0249902E-02	2.9257921E-02	-1.1722768E-01	-1.0586964E-01
	-3.4332178E-02	-3.9428054E-02	1.4851661E-01	-5.2577373E-02	3.9695073E-02
	-1.3949471E-02	9.8605850E-03	6.4469823E-02	-5.5773880E-02	1.9792588E-02
-2.7279205E-01	3.9775242E-01	-9.8187662E-02	8.6233690E-02	-1.1175093E-01	2.1910027E-02
	-3.7183451E-02	-1.6215637E-02	-3.8678776E-02	-2.7545981E-02	3.4172058E-02
	-4.6713955E-02	-3.0109894E-02	-6.1034583E-02	-1.3937223E-02	5.2086749E-02
-1.6135372E-01	1.5725692E-01	4.9177741E-02	4.6674193E-03	8.9204610E-02	1.1629274E-01
	2.3047537E-02	2.5962675E-02	-6.9409438E-02	1.2609096E-03	-4.0038685E-03
	-1.2323554E-02	-2.0261577E-02	1.5007020E-02	1.1054080E-02	-2.6360758E-02
2.3812363E-01	-2.8566244E-01	-3.7538200E-02	-9.4313289E-02	6.5323539E-02	-8.2156352E-02
	3.2007618E-02	2.3136383E-02	2.0136691E-02	4.7963796E-02	-3.3674807E-02
	2.4341858E-02	4.9705498E-02	2.6467595E-02	2.7001217E-02	-2.5041123E-02
4.2716486E-02	-3.3008877E-02	-9.2430051E-03	3.5675973E-03	-6.8509656E-02	-5.7379314E-02
	-3.5361607E-02	-4.3406249E-02	4.1410644E-02	-1.0608903E-02	-3.2710225E-02
	2.2073539E-02	-3.7408747E-02	-5.2821633E-02	6.7405728E-03	2.0189087E-02
-1.9808738E-01	2.5528116E-01	-7.8755877E-02	6.8841052E-02	-3.2757808E-02	6.9494303E-02
	-3.7025626E-02	3.7356736E-02	-5.2650060E-02	-3.9050188E-02	3.9181073E-02
	-5.9432169E-02	1.6068721E-02	1.7285193E-02	-7.1488055E-02	2.1101586E-02
2.7026788E-02	-2.5631427E-02	-1.2986897E-02	-2.4827603E-02	-7.3020695E-03	-4.5967022E-03
	4.6135797E-03	5.0700053E-03	1.0430712E-03	1.6861900E-03	2.0727094E-02
	2.5612563E-03	2.0571390E-02	-2.0258940E-03	-8.2822067E-03	-2.4863754E-03
-3.5875872E-04	-6.5869646E-03	-2.2822238E-02	-8.2838242E-03	1.5780803E-02	-6.0602812E-03
	1.9321347E-02	-1.7941978E-02	1.3002402E-02	2.3126343E-03	-1.1517064E-02
	1.1878662E-02	-1.8343471E-02	-5.0202706E-03	2.3290633E-02	1.6033953E-03

Table 16. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, MARCH-APRIL-MAY (1200-1600 LOCAL MEAN TIME)

ALPHA	BETA
3.0738336E+01	-3.5411375E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
2.6523496E+01	-5.0639703E+00	2.5890754E+00	7.4139052E+00	2.1456936E+00	-1.3800989E+00
	1.1165705E+00	4.3278172E-01	3.0302813E+00	-4.7468016E-01	9.9652379E-01
	-9.9839330E-01	-2.5234489E-01	-4.2767507E-01	3.1684411E-01	7.2553967E-01
-1.6733467E-01	5.2235519E-01	-2.9132096E+00	-4.3222274E+00	-2.4723436E-01	4.2281476E+00
	-1.3109426E+00	4.5365314E-01	5.7448825E-02	-6.5285834E-01	7.6482273E-01
	-6.2515824E-01	-5.3171573E-02	-2.7033663E-01	-1.6663155E-01	1.0398558E-01
-5.0165711E+00	-2.7757383E+00	-3.8960097E+00	-4.1906852E-01	2.8168500E+00	8.3555475E-01
	-1.3003345E-01	-5.0792995E-01	-2.3955327E+00	1.8779161E-01	-1.0213617E+00
	4.2742618E-01	1.2140073E-01	2.0158525E-01	-5.3291395E-02	-3.1207777E-01
-1.6659878E+00	3.9952049E+00	1.1137507E+00	1.1201152E-01	-2.9854317E+00	-3.3675909E+00
	6.2090195E-01	-9.3597565E-01	2.8259233E-02	6.1848924E-01	-5.4684109E-01
	6.6495979E-01	-1.2391473E-01	3.6662044E-01	1.3711897E-01	-9.9649248E-02
3.6493749E+00	-6.0308976E+00	4.8630351E-01	1.6218322E+00	-2.7746817E-01	-1.6818029E-01
	1.0502990E-01	4.2655444E-01	2.0169187E+00	-1.3737948E-01	1.0738002E+00
	-4.7195049E-02	6.8681442E-02	5.3493545E-03	-2.8599320E-02	9.4257960E-02
3.4179126E-01	7.8186304E-01	-6.3117304E-01	-1.0632764E-01	1.2030016E+00	8.6624772E-01
	9.1907768E-02	4.5711938E-01	-1.9468332E-01	-2.6746969E-01	3.5307428E-02
	-3.1955176E-01	3.7265341E-01	-9.7341826E-02	-2.5647256E-02	1.5610424E-01
-3.7095633E+00	4.2999216E+00	5.2566579E-03	6.4003169E-01	-3.7426338E-01	1.6826860E-01
	-5.1393547E-01	-1.3598578E-01	-9.5922813E-01	-2.0269227E-01	-8.4128137E-01
	2.8066118E-02	-5.2083852E-01	-2.9681963E-01	-7.4441179E-02	-1.9100981E-01
1.0822764E-01	-1.9490830E-01	9.2066451E-01	3.0800191E-02	9.0306964E-02	-4.6073484E-01
	-3.1181065E-01	-1.0811384E-02	4.5975540E-02	2.4119385E-02	-1.0683350E-01
	1.2633945E-01	-2.4610404E-01	1.8382024E-01	3.0500781E-01	-4.8479377E-02
2.5104133E+00	-2.7276635E+00	-7.1126049E-01	-5.5382182E-01	-2.3420346E-01	1.2652978E-02
	1.0324938E+00	1.1416299E-01	3.7646553E-01	2.3267945E-01	4.7784858E-01
	1.3998378E-02	3.6916292E-01	1.4125480E-01	3.5818368E-02	7.6254894E-02
-5.0455192E-01	3.7053639E-01	2.5066193E-01	2.8792014E-02	1.2419467E-02	5.7115557E-01
	-1.3922648E-01	-9.5525252E-02	3.2075242E-02	-5.6645005E-02	3.6791791E-01
	9.7192778E-03	1.3341231E-01	-1.1796129E-01	-3.1353371E-01	-5.3232269E-02
-1.2520662E+00	1.7648113E+00	-2.7364800E-01	1.9459520E-01	-7.3838657E-02	4.6248326E-02
	-4.6069414E-01	-1.0417318E-01	-2.3744135E-01	-5.4627673E-02	-3.5358233E-01
	-2.0285405E-01	-2.0383011E-01	-2.4105536E-03	3.0185101E-02	7.3793300E-02
1.1774104E-01	-3.3969628E-01	3.4985347E-02	2.4639152E-02	2.4101436E-01	-2.9941448E-01
	2.9256284E-01	1.0757656E-02	5.8493345E-02	4.1119243E-02	-2.2715656E-01
	1.0722205E-01	-2.4808150E-01	-4.9768600E-02	8.3422892E-02	-6.9729839E-02
1.2741056E+00	-1.6036690E+00	1.3359283E-01	-2.9844775E-01	1.2340816E-01	-2.7881473E-02
	-1.2642878E-02	6.2257225E-02	1.2113419E-01	1.8107074E-02	2.3107105E-01
	1.7207117E-01	2.3453106E-01	9.9751697E-02	6.8621941E-02	-4.8255567E-02
-2.6853341E-01	2.2757172E-01	-6.2858401E-02	5.7727517E-02	-2.1548362E-01	3.5051087E-02
	3.5352699E-02	1.7062493E-02	2.4965042E-02	-9.7851576E-02	5.3122501E-02
	-2.0759762E-01	1.5118612E-01	7.6387155E-02	-3.7196332E-02	1.4242773E-01
-4.7508341E-01	6.0606000E-01	-1.0156720E-01	1.7203894E-01	-1.1336965E-01	-1.2870942E-01
	-1.6182424E-01	-7.9394430E-02	3.5983907E-02	2.2274712E-02	-6.0255093E-02
	9.6085245E-02	-1.9036046E-01	-9.4411226E-02	-1.0929376E-01	-5.9122090E-02
-3.4038069E-03	1.4291786E-01	8.8092482E-02	3.9115896E-02	1.9192180E-02	5.9185741E-02
	2.1280021E-02	-6.3006491E-02	-2.9811367E-02	2.4730057E-02	-1.2477620E-01
	7.3861347E-02	7.7029604E-02	6.4919572E-02	1.0305090E-01	-7.8675179E-02
5.7212408E-01	-9.7799378E-01	6.8876156E-02	-2.7732324E-01	2.3258871E-01	-6.3824230E-03
	1.2728662E-01	2.1706977E-01	-2.9846619E-02	-6.8800495E-02	4.3967506E-02
	-1.0889470E-01	7.7960298E-03	-2.3506609E-02	2.8870913E-02	1.0145276E-01
-1.1735163E-01	3.3836545E-01	-7.2916896E-02	9.0314771E-02	-1.0605560E-01	5.6124921E-02
	-5.3518048E-02	-8.8067563E-02	-4.5769287E-02	2.6225321E-02	8.7769178E-02
	2.2709734E-02	-9.1806448E-02	-6.1902506E-02	-6.6586335E-02	-7.4645793E-03
-4.1459555E-01	5.2933487E-01	-7.4504315E-02	2.8581816E-01	-8.4438635E-02	1.1420776E-01
	7.0968263E-02	-1.5711688E-01	1.9687597E-02	-9.9779978E-03	-3.9581227E-02
	-3.1052992E-03	-6.8607276E-03	5.4113600E-02	1.9685431E-02	-3.7847563E-02
8.4937823E-02	-1.8253826E-01	1.1490983E-02	-2.3994372E-01	6.6359813E-03	-7.3946764E-02
	-7.9538140E-02	1.7165267E-01	3.1640188E-02	6.9012954E-02	1.6655802E-02
	-3.8735503E-02	-2.9831053E-03	-5.5877506E-02	-2.5150501E-02	2.5651257E-02
2.1427786E-01	-2.8340614E-01	4.3182230E-03	4.3596023E-02	3.6448782E-02	4.1855895E-02
	5.2602813E-02	-6.8773057E-02	-3.2892776E-02	-1.0303410E-03	1.1009139E-02
	7.8261633E-02	1.0667141E-01	5.0667344E-02	5.1987773E-02	-2.8203428E-02
-3.6515433E-02	1.8812497E-02	2.0969593E-02	1.7570150E-02	7.5466904E-02	-8.4650139E-02
	6.3857766E-03	3.9863769E-02	3.2625085E-02	-1.8382716E-03	-2.3684725E-02
	3.5035549E-02	-5.4584813E-02	5.5074314E-03	-1.7645885E-02	-2.3620217E-02
-2.2230294E-01	3.6800368E-01	-8.1726328E-02	1.2940871E-01	-1.0846377E-01	3.6646406E-02
	-5.1306050E-02	2.4684781E-02	3.1231279E-02	6.4846930E-03	-2.7407325E-02
	-9.4569745E-02	-7.8999469E-02	-5.9463558E-02	-4.6185738E-02	2.6693917E-02
3.0016441E-02	-8.7840829E-02	8.1497434E-02	-9.8630378E-03	3.9176123E-02	3.3343757E-02
	-8.8362303E-04	-7.3892261E-02	-3.8709743E-02	-7.9728661E-02	1.0013711E-02
	2.7003679E-02	7.7505149E-02	7.6700493E-02	3.4368672E-02	-1.6637167E-03
3.9023773E-01	-5.3066834E-01	-1.0172928E-01	-1.7040480E-01	4.2195042E-02	-8.2716960E-02
	6.4204511E-03	8.1723890E-02	3.6301300E-03	6.5004031E-02	1.3989132E-03
	3.3034896E-03	3.7699815E-02	-1.3659337E-02	-8.6364818E-03	4.2881188E-03
-1.3037180E-01	2.0937116E-01	5.1331597E-02	8.9225264E-02	-3.5556580E-02	-3.8022384E-03
	1.3905867E-02	-5.3983181E-02	1.7583651E-02	2.6962133E-02	-8.5083225E-03
	1.2856024E-02	-3.2642011E-02	-2.3408008E-02	1.1933565E-02	-1.1735320E-03
-1.4561963E-01	1.5854829E-01	-5.0653775E-02	7.7721346E-03	-9.4007864E-03	3.0502297E-02
	-4.1794188E-02	2.3898260E-02	-3.4097568E-02	-4.3800870E-02	3.3991267E-03
	2.7065359E-02	-2.6528541E-02	9.3307480E-03	-1.3641639E-02	-1.6695509E-02
3.4705628E-02	-2.9487632E-02	-6.2747147E-04	-2.7883513E-02	-7.8090739E-03	5.7504968E-03
	5.2973783E-03	1.1695193E-02	-7.5384881E-04	-9.5199007E-03	-4.2779020E-03
	-2.5992107E-02	-3.3795115E-03	-1.3527572E-02	-8.5583430E-03	1.4440640E-02
5.8295220E-02	-9.0154874E-02	-1.0223228E-02	3.7191237E-02	1.9978886E-02	3.6567152E-03
	1.1195674E-02	-1.9235453E-02	6.6027761E-03	8.5391020E-04	6.9190396E-03
	8.4187784E-03	3.5704136E-03	3.1478243E-03	9.8631507E-03	6.2565802E-04

Table 17. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, MARCH-APRIL-MAY (1600-2000 LOCAL MEAN TIME)

ALPHA	BETA
3.6086648E+01	-2.7836954E+00

CHI	MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS				
4.2041852E+01	-1.2789485E+01	4.5477533E+00	5.4618170E+00	7.0668792E-01	-3.9675309E+00
	1.6333689E+00	1.3537035E+00	1.1108534E+00	3.9844054E-02	4.3721261E-01
	-1.8825837E-02	3.3333560E-01	-2.8814449E-01	3.6170263E-01	5.6988446E-01
7.9268600E-02	-4.6204471E-01	-1.2167353E+00	-2.5564386E+00	-1.7085247E+00	5.0891346E+00
	-1.5086606E+00	3.5619205E-01	1.9719379E-02	-8.8354782E-01	1.3175880E-01
	-1.2315749E+00	-2.7909097E-01	-2.7347065E-01	-2.2339376E-01	2.1617628E-01
-8.9358868E+00	2.5721296E+00	-1.3694632E+00	-3.3051358E-02	3.8537375E+00	-4.2171971E-01
	-1.8951633E-01	-1.2051852E-01	-8.0837092E-01	6.1769259E-01	-3.7089475E-01
	1.6301046E-02	-3.7544854E-02	1.6893642E-01	-1.5449106E-01	-3.4910589E-01
2.5647903E-01	1.5425301E+00	1.3963812E-01	-2.8344486E-02	-3.6159503E+00	-2.7637325E+00
	-6.0196876E-01	-1.2335717E+00	5.4069555E-02	3.2773465E-01	-7.5167907E-02
	1.2372404E+00	1.0291915E-02	4.6202111E-01	1.0748991E-01	-2.4551389E-01
8.8988128E-01	-4.6866283E+00	-5.1599564E-01	5.5013077E-01	1.8700388E-01	1.0965818E+00
	-1.6634896E-01	-9.9148427E-02	6.8722888E-01	-7.6760412E-01	3.9987643E-01
	1.6649777E-02	6.5314830E-02	9.1862422E-02	3.7984124E-02	2.8018023E-01
1.0780684E+00	-1.4293475E+00	-5.8903747E-01	-1.4835896E-01	1.4467004E+00	3.4084502E-02
	1.0453539E+00	1.1010493E+00	-8.6526628E-02	1.6426372E-01	-1.9706960E-01
	-4.1811266E-01	8.1304383E-02	-4.1773392E-01	-3.9634517E-02	1.7149132E-01
-2.5522651E+00	3.5054415E+00	1.0038438E-01	3.9996440E-01	-1.0038608E+00	-5.7926513E-02
	-5.3350655E-01	-2.0997990E-01	-2.9153505E-01	1.1005006E-01	-2.7873805E-01
	-3.7824793E-02	-2.8689351E-01	-2.0673860E-01	-9.5067695E-02	-2.3945601E-01
1.1128470E-01	4.5522638E-02	1.2362292E+00	4.5869155E-01	8.5467167E-01	-2.2972389E-01
	4.6073953E-04	1.9079568E-02	8.7946055E-02	-3.9775530E-03	3.4121526E-03
	-2.7349732E-02	3.5784925E-02	1.7249319E-01	1.4990442E-01	3.6853229E-02
1.3447647E+00	-1.1756865E+00	-5.4102256E-01	-5.8783128E-01	-6.5155549E-01	-8.2308221E-02
	3.3915971E-01	8.4905570E-02	-2.1953436E-02	-5.4257320E-02	1.9560573E-01
	1.0548834E-01	1.3304669E-01	6.3271996E-02	1.2078757E-01	1.4668228E-01
-6.0091428E-01	8.6266800E-01	3.0204390E-01	2.1800183E-02	-1.2240676E-01	2.9538949E-01
	-2.0511471E-01	-2.8197773E-01	-1.1248387E-01	-7.2518480E-02	3.4264760E-01
	-3.3911907E-03	6.0863696E-02	1.5405235E-02	-1.2846086E-01	-9.5967385E-02
-2.1099802E-01	3.6400334E-01	2.6693880E-02	1.0602353E-01	8.9051566E-02	5.9135893E-02
	1.4396566E-01	1.2016054E-01	7.0206570E-03	9.9996684E-02	-2.1132749E-01
	-1.3497272E-01	-6.0675656E-02	-1.8995399E-02	3.8795260E-02	2.7988205E-02
-3.6832135E-01	2.7070832E-01	-1.7563005E-01	-5.7149947E-02	1.5578142E-02	-2.0763862E-02
	4.0076627E-02	-1.0021942E-01	1.0252746E-02	6.7777484E-03	-1.5240797E-01
	9.0995740E-02	-1.0712245E-01	-5.0201573E-02	2.2014763E-02	-2.9586466E-02
6.3026182E-01	-8.8154662E-01	5.9051847E-04	-5.3091581E-02	3.5510909E-01	1.0129817E-01
	3.0453647E-02	-2.4198528E-04	1.6515983E-02	3.7162991E-02	2.8650733E-02
	3.0100132E-02	9.7752771E-02	2.9178676E-02	-4.0283803E-02	-8.1632546E-02
-7.8736857E-02	7.4692970E-03	-2.4044698E-01	-9.1509940E-04	-2.0135099E-01	1.9075382E-02
	-6.4033985E-02	4.8936955E-02	8.5185229E-02	-5.7131606E-02	1.0759987E-02
	-4.6739467E-02	3.7311644E-02	4.6407132E-02	2.1609120E-02	1.1489711E-01
-9.6873361E-03	-1.2265237E-01	-4.9348051E-02	4.8265068E-02	7.0533704E-02	-1.8134526E-01
	-4.2458466E-02	-1.0024327E-01	4.2956726E-02	1.9653445E-02	7.6904313E-02
	2.5171372E-02	-8.7592074E-02	4.3474166E-03	-3.6344664E-02	6.1229604E-04
6.9173241E-02	4.3232847E-05	-2.2491420E-02	3.1677352E-02	1.0977892E-01	5.8632329E-02
	2.6731369E-02	8.8284907E-02	2.8503402E-02	5.3835998E-02	-1.1812678E-01
	-5.3229328E-03	1.3500012E-02	-1.1418961E-02	1.5167422E-02	-9.6918536E-02
-2.0896403E-02	-3.3552795E-02	5.5320043E-02	-8.1625755E-03	-4.5964472E-02	-5.1234223E-03
	-9.6087708E-02	2.5432389E-02	3.4570937E-02	-4.5535491E-02	-6.5535497E-03
	2.6615682E-03	1.0613837E-02	-1.0586342E-02	-2.3784107E-02	5.7971936E-02
2.1629224E-01	-8.2627374E-02	1.1786303E-02	-5.6755692E-02	-7.1380575E-02	-1.0356840E-01
	2.8699434E-02	-1.2985026E-02	-2.1196737E-02	-8.2278732E-03	5.3414826E-02
	1.5311098E-02	-3.3049020E-02	-1.4400209E-02	-2.2252566E-02	9.3057420E-03
-1.0750087E-01	1.8187099E-01	9.3420833F-03	8.2265473E-02	-1.1976135E-01	1.0977935E-01
	6.3480505E-02	5.2746191E-02	1.0860135E-02	-3.0405605E-02	2.8253345E-02
	2.3561856E-02	5.5729074E-02	1.2759611E-02	7.2734428E-02	-2.0516842E-02
-1.3540150E+01	1.1092161E-01	5.2885570E-02	-4.7375292E-02	-5.8895514E-02	-1.3410250E-01
	-7.3782448E-02	-3.9847699E-02	-6.9268178E-02	8.3209506E-04	1.5453636E-02
	3.5278557E-02	-1.9363045E-02	-1.9181532E-02	-3.2722027E-02	2.2898632E-02
1.2903946E-01	-1.4326891E-01	5.4973055E-04	-1.3018907E-02	5.1188453E-03	3.8105452E-02
	3.3859037E-02	-8.2967373E-03	-6.1077896E-02	-2.4119053E-02	-3.4970604E-02
	-4.0573358E-03	-1.3433415E-02	8.9574157E-03	5.3746118E-03	-2.0397206E-02
6.3069051E-02	-7.2665728E-02	-2.3006611E-02	1.9352627E-02	1.0761979E-01	5.5862338E-02
	4.3739743E-02	-5.4434413E-03	5.8440472E-03	-2.3507888E-02	1.8573182E-02
	-1.9789111E-02	3.4286989E-02	2.5012455E-02	3.2453217E-02	3.0725511E-02
-1.7401193E-02	1.5553863E-02	-8.3062047E-02	2.7075143E-02	-2.6736875E-02	2.1510512E-02
	-1.2671258E-02	-5.6783437E-02	3.4782790E-02	1.4009036E-02	-1.9186098E-03
	-1.5302577E-02	-8.3906456E-02	-4.0331797E-02	-3.0304375E-02	5.9251174E-03
-1.0212697E-01	3.2108292E-02	1.2616259E-02	-4.2208963E-03	7.9648556E-02	7.8563475E-02
	-3.6169277E-02	-5.9407675E-03	-2.3161019E-02	7.8817330E-03	9.3072401E-03
	-4.9546236E-02	-1.9664463E-03	2.5758553E-02	8.0744565E-03	-1.6683618E-02
5.1711154E-02	-1.2261481E-01	-4.7421066E-02	3.4798379E-03	3.2659284E-02	-5.0683343E-02
	-2.0848488E-02	1.4392865E-02	7.4606096E-03	6.9939134E-02	-3.3527338E-02
	1.0839554E-02	3.7038487E-02	2.3660124E-02	-7.4375492E-05	-7.9541843E-03
4.9431400E-02	-5.8597571E-02	2.0110889E-02	2.0355242E-04	-6.1821978E-02	9.8637173E-03
	1.2313226E-02	6.9448107E-03	9.1923862E-02	9.8584709E-03	1.5072677E-02
	-1.2158500E-02	-2.2046515E-03	-3.6076969E-03	-3.4825666E-03	-9.9591772E-03
-3.2358141E-02	6.3257934E-02	1.3957247E-02	4.4651004E-02	5.7388070E-03	-2.0641301E-02
	-2.0446591E-02	-2.8051485E-03	-3.8111253E-02	-2.8407909E-02	-1.2811745E-03
	-2.1312443E-02	5.4517724E-03	4.9845809E-03	-1.5196493E-02	6.7215136E-03
-5.2463545E-02	8.8754981E-02	-1.4195062E-02	-7.5102754E-03	-2.6236927E-02	-2.5228039E-02
	-1.1868412E-02	4.4914531E-03	-1.5444853E-02	5.1064625E-04	-9.6670822E-03
	1.7937104E-02	-2.0084120E-03	-6.8091227E-03	-1.0072303E-02	6.7606902E-03
6.7804976E-02	-1.0543676E-01	3.5821584E-03	-1.2342439E-02	2.0215828E-02	9.1067149E-03
	2.3559079E-02	5.9848735E-05	1.0788504E-02	-9.1127847E-03	7.5932962E-03
	-2.0869557E-03	-3.3707010E-04	-9.3432149E-03	9.2720720E-03	2.5983950E-03

Table 18. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, MARCH-APRIL-MAY (2000-2400 LOCAL MEAN TIME)

ALPHA	BETA
4.3059827E+01	1.0837549E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
3.4497494E+01	-3.3349854E+00	2.3514780E+00	4.9553044E+00	-5.6987848E-01	-1.0665678E+00
	2.1284453E+00	5.5638879E-01	1.4631544E+00	-8.5157781E-01	-2.4978505E-02
	-6.5809145E-01	2.2076029E-02	-5.1070987E-02	2.9111229E-01	3.4563839E-01
-1.5813010E+00	6.7208246E+00	9.9927404E-02	-3.6149334E+00	-7.7182417E-01	2.4319358E+00
	-1.0630454E+00	7.4547361E-01	2.2700012E-01	-8.5280133E-03	6.2084703E-01
	-1.0214350E+00	-2.0780574E-01	-1.8843448E-01	-2.5009710E-01	1.2321784E-01
-2.3611163E+00	-6.1652570E+00	-3.1043229E+00	1.7553711E+00	2.8662939E+00	-4.6755396E-01
	-8.5439903E-01	-6.9826665E-01	-1.0751251E+00	4.7172146E-01	-4.0781751E-01
	5.5514496E-01	3.4549108E-02	6.4563048E-02	-4.5198610E-04	-2.4905154E-01
-1.4387962E+00	5.3783632E+00	1.1545063E+00	-1.6467860E+00	-2.8630487E+00	-1.2124248E+00
	3.4098452E-01	-1.0960507E+00	-1.2619169E-01	-7.3928854E-02	-4.5913648E-01
	8.3242089E-01	-7.7648163E-02	4.1004041E-01	-1.5538542E-02	-1.7778304E-01
3.2959436E+00	-8.5322457E+00	9.3644147E-01	9.1010631E-01	7.6174401E-01	3.8919245E-01
	3.3561521E-01	5.7461899E-01	9.3507028E-01	-2.6478784E-01	4.7344441E-01
	-1.5217983E-01	1.7220511E-01	7.2448983E-02	7.7259794E-03	2.4180178E-01
-5.6126497E-02	1.4146162E-01	-1.6517592E+00	-4.1012752E-01	9.2315811E-01	2.7141161E-01
	2.7263482E-02	4.0518980E-01	1.0175310E-01	4.2647513E-02	-1.1070260E-03
	-2.1905773E-01	1.2533657E-01	-2.9400732E-01	2.3651191E-02	8.5584628E-02
-3.2267565E+00	4.0361844E+00	9.6303185E-01	1.1141385E+00	-4.6696173E-01	1.8492959E-01
	-1.0450486E-01	-5.9343353E-02	-4.3490986E-01	-7.0364323E-03	-2.9223493E-01
	-1.1308079E-01	-4.8967914E-01	-1.1692936E-01	-1.8013903E-01	-2.4039734E-01
2.8387192E-01	-7.6592553E-01	6.7295792E-01	-1.5036766E-01	1.3685506E-01	-4.6785000E-01
	-5.4047673E-01	1.3173877E-01	-4.8945662E-02	6.8191438E-02	6.1746824E-02
	-3.9368893E-02	4.9837319E-02	4.1212761E-03	1.0091616E-01	1.1786122E-01
9.7505713E-01	-7.9331957E-01	-1.4562255E-01	-2.3019156E-01	-1.7065367E-01	-8.7386988E-02
	6.9568544E-01	7.8781260E-02	2.2348360E-01	-6.2762490E-02	2.3947692E-01
	1.0999421E-01	2.4597708E-01	-3.5723805E-02	9.7731004E-02	7.3515333E-02
-9.1387189E-02	-3.2859638E-02	4.9822552E-01	5.6013301E-02	-6.7639695E-02	1.0912487E-01
	-1.1641563E-01	-2.8645870E-02	-2.3892356E-01	-1.2378528E-01	1.7790863E-01
	6.8648655E-02	1.3754560E-01	1.2934527E-01	6.4007298E-03	-1.0143793E-02
-7.3857858E-01	1.2327870E+00	-1.7532792E-01	-9.6688058E-02	-2.9663470E-01	6.6678260E-02
	-2.6494574E-01	-4.6763875E-02	-1.8075875E-02	7.7494896E-02	-1.0242771E-01
	-1.6499341E-01	-5.3973546E-02	-5.7773564E-02	1.1793405E-02	1.2421776E-02
-6.9980969E-03	-5.6642585E-02	3.3449405E-01	2.0431659E-01	4.7234067E-01	-5.0696119E-02
	3.9072047E-01	8.1833363E-03	-6.9650767E-02	3.9980516E-02	-1.2446389E-01
	6.6004704E-02	-1.6802979E-01	-5.4562613E-02	-3.6571126E-03	-5.1327725E-02
7.3409452E-01	-7.5348370E-01	-3.2054200E-01	-3.3635970E-01	-5.5610979E-02	2.7419222E-01
	-1.4097560E-01	-8.1919995E-02	-1.9775500E-02	4.9912523E-02	4.6725768E-02
	7.2408124E-03	1.8120534E-01	6.2953180E-02	2.6222329E-02	1.1052227E-02
-1.8906326E-01	-6.8442742E-02	-6.1850430E-02	1.3559531E-01	1.6721670E-01	8.1170213E-02
	6.3942096E-02	-2.4961980E-02	1.3297178E-01	-7.4610299E-02	-3.8963595E-02
	-1.3259604E-01	-4.4025273E-02	-3.7791985E-04	-1.8069617E-02	3.7169625E-02
2.4939819E-01	-1.9741913E-01	-2.0403582E-01	-1.2125322E-01	-6.8040959E-02	-8.9489162E-02
	-1.5871759E-01	-4.3543271E-02	-2.9355837E-02	1.0890536E-01	1.4253441E-03
	1.1161274E-01	-1.1394543E-01	-7.5916706E-03	1.0158484E-02	-1.6362001E-02
-3.1761500E-01	2.8999600E-01	-5.5177202E-02	1.2474097E-01	1.0414236E-02	8.0297430E-02
	4.2997534E-03	-7.4062962E-02	1.1049593E-01	9.3227653E-02	-4.5076695E-02
	-4.4180130E-02	-7.8655225E-03	1.7797781E-02	-4.1216637E-02	-7.8202457E-02
5.8074269E-01	-8.0044021E-01	1.2131520E-01	-1.9741410E-01	1.2964408E-01	-1.9270910E-01
	-6.2027740E-02	1.4877635E-01	-1.1670507E-02	-5.6110147E-02	-4.8174466E-02
	2.9967738E-02	7.5731905E-02	2.2399234E-02	-5.8498339E-02	3.3149837E-02
-5.8921648E-02	2.6865302E-01	-1.0820365E-01	2.3372135E-01	-2.2732844E-01	2.9691192E-02
	8.6339594E-02	-3.2922117E-02	7.7692402E-02	-2.3197739E-03	6.1563211E-02
	3.5734887E-02	1.5902314E-02	-3.6082892E-02	2.7070541E-02	9.3465129E-03
-5.9759949E-02	4.9519569E-02	1.9673720E-01	9.9136037E-02	1.8703278E-02	-9.0162444E-02
	-5.9010901E-02	3.9576293E-02	-2.8188172E-03	-1.2096496E-01	-5.5148322E-02
	-4.8791172E-02	-9.3765475E-02	3.4897025E-02	-3.6839268E-02	-1.0554813E-02
-7.6599729E-02	1.3368384E-01	3.0931023E-02	-6.4122390E-02	-7.2295253E-02	-1.2361871E-02
	-1.5590731E-02	9.2600771E-02	-1.0747574E-01	-5.6159577E-03	-2.8263903E-03
	5.5688800E-02	6.0081370E-02	-6.1593386E-02	-1.8202845E-02	1.0108673E-02
1.6257869E-01	-2.6770744E-01	4.2919363E-02	-2.4784459E-02	-4.1760219E-03	3.7262557E-02
	1.2012520E-01	-8.9406609E-02	3.0538728E-03	-2.8533963E-02	8.8513657E-02
	6.2603238E-02	-4.2418950E-03	4.8451435E-02	9.6425921E-02	7.3323465E-03
2.0445765E-01	-2.6700057E-01	-2.9783016E-02	-1.1840496E-01	2.4127142E-02	-7.2938149E-02
	-7.8240731E-02	5.7724788E-02	-4.7490536E-03	1.3273971E-02	1.2752067E-02
	-1.1730515E-02	6.8316068E-03	-5.6077262E-03	-2.0123654E-02	7.7096093E-03
-3.2709951E-01	3.9292982E-01	-4.9789265E-02	2.0664690E-01	-3.5073629E-02	1.6935433E-01
	5.6797832E-02	-8.2665910E-02	-2.7528208E-02	-1.9662238E-02	3.8197049E-02
	-4.7127726E-02	-3.0493835E-03	-4.4516280E-02	2.6975874E-02	2.4321131E-02
1.2670205E-02	-1.5193937E-01	5.3571249E-03	-8.9032687E-02	8.8148008E-02	-1.5121720E-02
	-8.3983117E-02	8.2222691E-03	-6.8049082E-02	-5.4901654E-03	-2.0951656E-02
	-1.9082509E-02	-7.7578749E-02	3.2046621E-02	1.4207871E-03	1.1492610E-02
1.2913294E-01	-1.0243652E-01	2.7624341E-02	3.0006226E-02	6.0182807E-02	4.5864353E-02
	6.6429955E-02	-2.1056588E-03	4.0524029E-02	8.7001749E-02	-1.6885133E-02
	-3.9600959E-02	5.1672412E-02	-4.1518206E-02	2.0922877E-02	-1.6508954E-02
1.1419230E-01	-1.9285188E-01	3.8028572E-03	-2.7710051E-02	1.4074957E-03	-2.6645969E-02
	-1.9095752E-02	-3.5474743E-02	6.4377532E-02	-5.5206360E-03	2.8588318E-02
	1.6742373E-02	-3.7668910E-02	1.9102957E-02	-3.3261757E-03	1.3884814E-02
-2.9896303E-01	4.0594468E-01	6.9205986E-03	7.8118089E-02	-2.3408872E-02	7.7155217E-02
	-6.7477716E-02	5.5635636E-02	-1.6165077E-02	4.0367735E-03	-5.0565372E-02
	-4.8327828E-02	2.2317929E-02	5.2350306E-03	-3.5466295E-02	-2.4181964E-02
3.0742412E-02	-3.6842156E-02	1.0393915E-02	2.1044628E-02	-2.3315724E-02	-1.0154987E-02
	2.3624779E-02	-8.2476898E-03	2.5995742E-03	-1.0347883E-02	5.3632449E-03
	-2.3218579E-03	2.6038557E-02	-1.3639205E-02	-6.4396531E-03	-5.9750214E-03
5.6591428E-02	-7.9309046E-02	1.8483522E-02	-3.5062007E-02	1.3095971E-02	-2.0671529E-02
	3.0378998E-03	8.4819727E-03	-3.3129437E-03	-1.0509319E-03	7.8417657E-04
	2.2032356E-02	-1.9027864E-02	5.8554540E-03	5.5660880E-03	1.5824558E-02

Table 19. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTICN OF ATMOSPHERIC RADIO NOISE, JUNE-JULY-AUGUST (0000-0400 LOCAL MEAN TIME)

ALPHA	BETA
3.8625978E+01	-3.9037372E-01

CHI	MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS				
3.5921426E+01	4.6535248E+00	2.0189580E-02	3.3091053E+00	3.2153321E-01	3.2455134E-01
	5.5061782E+00	-1.4703889E+00	2.1508041E+00	-8.3486317E-01	2.4720456E-01
	-2.9789667E-02	5.6366660E-01	4.0392313E-01	1.3163434E-01	-2.2640513E-02
-1.6160630E+00	8.2311683E-01	-2.3129321E+00	-2.6498523E-01	-1.0416058E+00	6.3828580E-01
	-3.4639024E+00	1.7739297E+00	3.8511196E-01	-5.1788075E-02	2.5842091E-01
	-1.4104433E+00	-2.9525274E-01	-1.6616518E-01	-1.3661803E-01	1.3546251E-01
3.5116863E+00	-6.9344537E+00	-3.8677779E+00	-9.5076845E-01	2.6499733E+00	-3.0915792E-03
	9.7833108E-01	-9.3033393E-01	-1.5527503E+00	5.9830845E-01	-5.8238123E-01
	6.8755953E-01	-4.3101858E-02	4.8570047E-02	-1.4683569E-01	-1.3789246E-01
4.2521262E+00	-4.1259074E+00	3.5097634E+00	-9.5062662E-01	-3.0691377E+00	-1.7818061E+00
	-4.6844229E-01	-3.8278345E-01	4.7707671E-01	-3.7775096E-01	-3.0420026E-01
	1.1076440E+00	-3.3103408E-01	6.9872087E-01	-1.1871460E-01	-1.2967394E-01
-3.0946934E+00	3.3355946E-01	-5.2351559E-01	1.5470984E+00	5.6328242E-01	1.0778647E+00
	7.5615277E-01	6.5738563E-01	1.0681990E+00	-2.5950721E-01	7.2395713E-01
	-6.0712850E-01	3.1242217E-02	-4.2304064E-01	9.9710610E-02	3.0731670E-01
-3.8645371E+00	4.7505692E+00	-3.2130005E+00	1.2758354E+00	6.3764820E-01	6.9313589E-01
	3.1571954E-01	-1.0214336E+00	-7.7258585E-01	2.6723459E-01	2.1858676E-01
	-1.8561495E-01	5.0410746E-01	-6.6435635E-01	2.0708451E-01	1.0732880E-01
-3.3954698E+00	2.0657898E+00	1.2980068E+00	-7.8666424E-02	-2.6013260E-01	-7.3900143E-01
	-1.6269868E+00	1.5440899E-01	1.5474458E-02	-1.7859790E-01	-3.9847260E-01
	-2.5082289E-02	-5.4293454E-01	4.1471253E-01	2.8472068E-02	-1.7333022E-01
4.9883370E+00	-4.2650464E+00	1.1479427E+00	-3.8550449E-01	6.3964410E-01	2.2682731E-01
	1.0659899E+00	9.5892051E-01	2.7187435E-01	4.6367503E-02	-2.5968650E-02
	6.2974177E-02	1.2864174E-01	1.1224440E-01	-2.7014161E-02	-6.7069724E-02
-2.1446727E+00	2.3238679E+00	-3.1700551E-02	5.7537148E-01	-5.1951032E-01	-5.3173826E-02
	3.0844385E-01	4.0464565E-01	-2.2250344E-01	-4.1771159E-02	6.1749080E-02
	-1.7581690E-01	2.9999338E-01	-3.7040096E-01	-2.3869396E-01	2.1391742E-03
-3.4448241E-01	4.1019103E-01	1.2069190E-01	-7.9703504E-01	-5.4148770E-01	-4.2941844E-01
	-5.1463484E-01	-4.8122531E-01	-1.6897811E-01	-1.6905089E-01	-8.9372914E-03
	1.0796650E-02	-9.9591105E-02	3.4737018E-01	1.6259153E-01	1.0317176E-01
7.8165448E-01	-1.1175877E+00	-3.0499473E-01	-3.4646537E-02	-2.0031416E-01	-1.3140256E-02
	4.0810982E-02	-5.2577156E-01	4.5689010E-02	-2.0253626E-02	-1.5993444E-02
	2.5345314E-01	-1.7348005E-01	7.4585170E-02	3.6867677E-02	-2.1077452E-02
4.2671563E-01	-6.4508690E-01	1.5324071E-01	5.5855977E-02	9.4279194E-01	2.4706855E-01
	4.4574955E-01	3.6209004E-01	6.8490906E-02	3.6218432E-01	4.4645260E-02
	7.0859116E-02	-8.8564143E-02	-1.8218705E-01	-4.0285138E-02	-9.5582483E-02
-8.3033803E-01	1.1756680E+00	-3.2121329E-01	1.8763342E-01	-3.9157850E-01	3.0458610E-01
	-3.2121519E-01	1.2621352E-01	-1.7250627E-01	-1.6039244E-02	1.2635232E-01
	-3.1876326E-01	1.4756373E-01	-1.6028526E-01	7.0122115E-02	1.0259944E-01
-7.2117055E-01	5.1496696E-01	2.2940182E-01	6.8249187E-02	2.1975808E-01	2.0675299E-03
	5.1754552E-02	-2.5950266E-01	1.3658224E-01	-1.3271858E-01	-9.1036493E-02
	5.5578881E-03	-1.1888295E-01	3.0273251E-02	-5.5896655E-02	2.1209497E-02
1.5804626E+00	-1.4852762E+00	-4.9579936E-01	-2.8359453E-01	-5.1099259E-02	-6.5505901E-02
	2.4968756E-01	-5.6327302E-02	1.1402662E-01	8.9042349E-02	-5.2591456E-02
	3.0961389E-01	7.6100967E-02	2.6330469E-01	1.4389982E-01	-1.5041020E-01
-5.4495129E-01	2.1207883E-01	1.4319517E-01	1.5889934E-01	-1.0923460E-01	9.8542853E-02
	-3.7566107E-01	6.0031793E-02	-2.1401455E-02	2.6150726E-02	7.7309065E-02
	-2.2458908E-01	3.4949294E-02	-9.8930814E-02	-1.0153375E-01	4.4998929E-02
2.5515565E-01	-4.8613294E-03	1.3919138E-01	-2.5296461E-01	7.1195331E-02	-2.0809967E-01
	-5.5349335E-02	1.5501744E-01	-1.2276304E-02	1.0528783E-01	-2.0572845E-01
	-6.6581183E-02	-8.8400326E-03	-6.7911752E-02	-7.5118591E-02	5.3703136E-02
1.4499939E-01	-1.9129008E-01	-9.0980850E-03	1.7444508E-01	-2.5705165E-01	7.9823670E-03
	1.8176820E-01	5.2301943E-03	5.6420525E-02	-2.2757551E-01	-5.3530236E-03
	1.3119513E-01	1.1045062E-01	9.4054075E-02	-9.3587037E-03	-4.7620880E-02
4.4877500E-01	-4.2927973E-01	-1.2922197E-01	-1.8571695E-01	-6.5238052E-03	-1.8493965E-01
	-7.9513706E-02	-1.2786906E-01	-2.0649317E-02	-4.5589119E-02	7.2605734E-02
	5.4760849E-02	-8.7629229E-02	5.9482542E-02	-1.3360328E-02	3.7894114E-02
-5.3614376E-01	3.6931628E-01	-5.5496255E-02	4.0272541E-01	3.1018807E-02	3.0592964E-01
	-6.5349563E-02	8.1631668E-02	-3.2866437E-02	7.4526498E-02	9.3415512E-02
	-1.3964851E-01	-3.8303869E-02	-1.5226049E-01	6.6867519E-02	1.2418748E-02
-1.7917593E-01	1.3322463E-01	2.2228410E-01	-1.9000483E-01	1.8846504E-01	-7.6915410E-02
	1.5054671E-02	2.4803532E-02	2.4233169E-02	4.0108659E-02	6.5581308E-02
	5.2327671E-02	1.0200771E-02	-1.3766091E-02	-9.1871319E-03	1.9565776E-02
2.3602328E-01	-1.0792090E-01	-2.5248896E-01	7.8564761E-02	-2.6169166E-01	-6.2569377E-02
	1.2448989E-01	-5.0031180E-02	-1.0896144E-02	-5.2400414E-02	-1.3344731E-01
	1.2659144E-01	-5.5487100E-02	3.1552518E-02	2.9950050E-03	-8.2846143E-02
-4.7471697E-02	5.4680400E-03	3.4206191E-02	1.8889910E-02	5.3124567E-02	1.0229968E-01
	2.8018088E-02	-5.4501349E-02	-7.8431885E-02	-1.1641252E-01	1.5891372E-01
	-7.8331557E-02	5.9217093E-02	-1.8150701E-02	-2.9468150E-02	8.5021714E-02
2.3754419E-01	-3.3233656E-01	2.8980095E-02	-1.2666059E-01	1.9583544E-02	-3.1195217E-02
	-4.9267724E-02	7.6037643E-02	-2.3999287E-02	6.5934709E-02	-7.7636881E-02
	-8.2314837E-02	-1.9419305E-02	4.3876863E-02	8.4749982E-03	5.7004949E-02
-1.6127020E-01	1.6312378E-01	1.1894776E-02	6.1374794E-02	7.3212006E-03	-3.9836816E-02
	-2.0923430E-03	-6.4647765E-02	5.5240319E-02	1.2553550E-02	-1.7810969E-02
	5.8864860E-02	-4.0384469E-03	3.1168430E-02	5.9391502E-02	-8.9364040E-02
7.5271989E-02	-4.2153602E-04	-1.8219097E-02	-1.2717482E-02	8.1349081E-03	6.2197343E-03
	3.5665822E-02	1.9446107E-02	3.0358376E-02	5.0996662E-02	-3.9660468E-02
	2.0462715E-02	-4.4880984E-02	-1.7332527E-02	-3.7397618E-02	-2.2671610E-02
-1.8671060E-01	1.0501041E-01	-2.3222392E-02	1.0123273E-01	1.0106714E-04	2.1411952E-01
	-4.7567518E-02	5.9651997E-02	-2.0446164E-02	-4.8419775E-02	9.6346636E-02
	-7.2088175E-02	9.6490946E-02	-2.0920442E-02	-1.4888371E-02	2.7617867E-02
1.5029228E-01	-1.6707881E-01	-3.3590590E-02	-8.6905183E-02	2.6799359E-02	-1.1389445E-01
	1.1067997E-02	-3.4483089E-02	-2.4871488E-02	1.9034817E-02	2.2535736E-02
	-2.9717491E-03	3.0194683E-02	-1.4280680E-02	9.8099414E-03	2.8940840E-02
-7.9035369E-02	1.3759292E-01	-4.4119355E-02	7.2962092E-02	-1.3841931E-02	1.1997180E-03
	2.9977422E-02	2.8320199E-03	1.4898157E-02	1.8642163E-02	-6.6546132E-02
	1.7761286E-02	-4.1259570E-02	6.6652106E-03	1.2288769E-02	-2.5500706E-02

Table 20. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, JUNE-JULY-AUGUST (0400-0800 LOCAL MEAN TIME)

ALPHA	BETA
3.7506250E+01	-1.7266959E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
2.8306012E+01	2.6314284E+00	-2.0957898E+00	2.5328748E+00	2.9327868E-01	-1.7611294E+00
	3.0880385E+00	-1.8279970E+00	2.7240775E+00	-8.0688675E-01	8.3115760E-01
	2.7714805E-01	6.3889422E-01	4.2730087E-01	-4.3188747E-02	3.7963774E-01
5.0512653E+00	6.6119714E-01	-1.3436951E+00	-1.9840905E+00	-2.8596782E+00	4.3063431E+00
	-2.8422277E+00	2.0578749E+00	-1.1428610E-01	-1.0481749E+00	4.2629258E-01
	-1.6439980E+00	-3.2318721E-01	-3.6727004E-02	-4.0219939E-01	2.4207759E-01
3.8113144E-01	-9.7189033E+00	-1.8214906E+00	-1.7260178E+00	2.8280975E+00	5.3571983E-01
	6.9144195E-01	2.5859319E-01	-1.6319947E+00	1.1263776E+00	-4.1292151E-01
	3.6681284E-01	-1.0089531E-01	-3.5296030E-01	-1.4000048E-02	-3.9341240E-01
3.0456290E+00	5.9670010E-01	1.6655607E+00	1.2511578E-01	-2.6016262E+00	-2.1695608E+00
	8.0290066E-02	-1.2347180E+00	6.1654581E-01	2.8608019E-01	1.0987446E-03
	1.0448618E+00	1.6022912E-01	3.4278427E-01	1.5189402E-01	-1.9329643E-01
-2.1144226E+00	-3.9328169E-01	-7.6059867E-02	3.1930211E+00	-1.4033631E-01	8.4476805E-01
	6.0927537E-01	6.3763348E-02	1.0878783E+00	-8.3561160E-01	1.9060473E-01
	-4.1037863E-01	-2.7094456E-02	2.7412619E-01	9.8182427E-02	3.2377584E-01
-2.5600626E+00	2.5240642E+00	-1.8519174E+00	-3.3448500E-01	1.0672178E+00	-5.0494030E-02
	7.1029743E-02	-1.8737704E-01	-7.1849590E-01	6.9818271E-02	-7.3311594E-02
	-2.4411229E-01	-8.5914344E-02	-4.2948046E-01	-1.4283356E-01	1.1670949E-01
-1.1196976E+00	7.8985356E-01	6.3386672E-01	-1.2441711E-01	-7.3557077E-01	-9.6163546E-01
	-1.3642327E+00	1.9979864E-02	-2.6683664E-01	1.9516930E-01	-1.0151057E-01
	1.2846766E-01	-5.8379269E-02	4.6645451E-02	-6.1219752E-02	-1.9723829E-01
1.9694552E+00	-2.4553560E+00	7.8729127E-01	-1.0308982E-01	7.5088300E-01	8.6375620E-02
	1.1634041E+00	4.1370128E-01	4.7086532E-01	1.7773768E-01	-7.4125328E-02
	1.9403113E-01	2.3295402E-01	8.2630428E-02	3.1324956E-01	2.6865882E-03
-1.0361072E+00	1.8087036E+00	-2.1354209E-01	4.6790579E-01	-4.5444097E-01	3.5505888E-01
	1.5583273E-01	1.9233203E-01	-2.0912314E-01	-2.3636598E-01	6.7213104E-02
	-1.7879647E-01	-8.6371580E-02	-2.3283007E-01	-1.3649446E-01	7.4868688E-02
-1.8222062E+00	1.6615134E+C0	1.7144345E-01	-2.3026721E-01	-1.7910636E-01	-1.5190360E-01
	-7.0819744E-01	-1.2763969E-01	-4.0067048E-01	-8.3153237E-02	-3.1636113E-02
	-4.9642600E-02	-1.1467755E-01	1.2235601E-01	-3.5457634E-02	-5.2410847E-02
1.9070409E+00	-1.9051894E+00	-2.5871860E-01	-3.5440852E-01	3.1507703E-01	-2.1307193E-01
	6.8436912E-01	-4.1913400E-02	2.0774442E-01	1.5629218E-01	8.7118705E-02
	1.3680270E-01	7.4591137E-02	2.0350618E-02	1.0509762E-01	4.1644604E-02
-5.2726595E-02	-2.0296808E-01	4.3326129E-01	4.6213628E-02	3.0842059E-01	2.2762939E-01
	1.6113074E-01	1.7426255E-01	1.0615191E-01	1.8379385E-01	-1.5817226E-03
	2.6681272E-02	-2.8015465E-02	-1.1148769E-01	-4.2888450E-02	-8.3967318E-02
-4.7025930E-01	8.2151467E-01	-3.8886005E-01	-8.7732994E-02	-9.0918776E-02	1.9660566E-01
	-5.7796199E-01	-1.4958920E-01	-2.1262220E-01	2.3525759E-02	-3.4248145E-02
	-1.0068639E-01	2.1740221E-02	-9.8016947E-03	4.4315373E-02	1.8482329E-02
-2.2589889E-02	-2.0239668E-01	-9.5484767E-02	-9.1273730E-02	4.7194478E-02	-9.9561676E-02
	8.3868204E-02	-1.6264115E-01	1.0999976E-01	-1.1619912E-01	4.5725119E-02
	-1.0307688E-01	-3.6680242E-02	1.0532969E-01	-3.6996724E-02	1.2266843E-01
1.1882368E+00	-1.1845069E+00	-7.1545776E-02	-2.4200994E-01	5.5377030E-02	-7.2660357E-02
	6.3237438E-02	-2.2819982E-02	1.6063191E-01	9.4412143E-02	-1.8764462E-02
	1.8699570E-01	4.3635242E-02	1.2206494E-01	2.4861345E-02	-9.1377940E-02
-4.8076058E-01	5.1926198E-01	-1.2026307E-01	3.4964086E-01	-6.9199191E-02	1.2822392E-01
	-1.2397930E-01	2.9102876E-02	-2.3610636E-02	-4.9764564E-03	2.3075421E-02
	-9.1375440E-02	1.0533557E-02	-1.3476735E-01	-5.5800455E-03	-2.0301930E-03
-3.2203471E-01	2.4757584E-01	1.4936594E-01	-4.9374096E-02	5.7055157E-02	7.3041996E-02
	-8.9325199E-02	1.9035155E-01	-9.8576787E-02	-1.8889037E-03	-1.1757399E-01
	-1.0423318E-01	1.5566170E-02	-5.1253291E-02	-7.0114590E-02	-3.8711312E-03
4.3520946E-01	-2.8440824E-01	-1.3642153E-01	-9.1993373E-02	-1.7739933E-01	-2.2150184E-01
	3.1663005E-02	-7.6562065E-02	7.5944584E-02	-5.6043776E-02	-2.8737351E-02
	1.4522593E-01	4.7296265E-02	1.1784148E-01	5.8192102E-03	-1.4467559E-02
2.5380589E-01	-5.0572152E-01	-1.2170367E-01	1.2007345E-01	-2.9618676E-02	-1.9260404E-03
	5.6596377E-02	-2.3802310E-02	9.2306922E-02	-8.3990623E-02	8.7966062E-02
	-1.4423089E-03	-4.0670569E-02	2.2229571E-03	-1.3897465E-02	4.7630573E-02
-2.9386024E-01	4.6132717E-01	3.9180467E-02	7.8637165E-02	-1.7722874E-02	6.8175537E-02
	-5.2420080E-02	5.7114444E-02	-9.2495150E-02	-1.8986301E-02	1.6747329E-02
	-1.1601908E-02	1.4756996E-02	-7.2916907E-02	-3.4790007E-03	-2.3379489E-02
-1.2486027E-01	-2.0348403E-02	4.4961584E-02	2.8122905E-03	4.2347493E-02	1.5873858E-02
	6.6830538E-02	7.8325703E-02	-4.2764401E-02	-1.5690823E-02	6.6067309E-03
	6.7037244E-03	-3.4925923E-02	-1.0359048E-02	1.2949753E-02	2.9885249E-03
2.3416018E-01	-1.7326322E-01	-2.8023387E-02	-3.3362726E-02	-1.0142842E-03	-7.4868784E-02
	4.5326020E-05	-7.7424353E-02	-2.9305972E-02	3.9857254E-02	-1.8772667E-02
	2.2354050E-02	-6.4295798E-02	5.5548355E-04	4.1272247E-02	1.5069142E-02
-1.3118933E-02	-6.2485508E-02	-1.1032521E-01	-9.2487973E-04	-9.4384014E-02	-1.1827003E-02
	-1.9620535E-02	-7.2493088E-02	3.9581206E-02	-9.8488274E-03	9.3986011E-02
	-1.5047417E-02	1.8385655E-02	2.2206558E-03	3.6617049E-02	3.8304185E-02
-5.7600120E-02	3.1101842E-02	1.0873712E-01	1.7049066E-02	1.5400787E-01	1.3687809E-01
	2.0266155E-02	9.0460408E-02	-3.5712058E-03	-2.9908693E-03	4.5179944E-02
	-4.2635365E-02	4.1334877E-02	7.1442402E-03	-1.8760868E-02	-3.0247548E-04
-1.3550367E-01	2.8756155E-01	-4.9374410E-02	5.6125752E-02	-6.0271120E-02	-7.1939491E-02
	-3.8382208E-03	-6.6802302E-02	-1.8261781E-02	2.5845344E-02	-1.2348841E-01
	1.8125217E-02	-5.7244514E-02	-1.4642197E-02	-1.2041611E-02	-4.5490354E-02
1.3591468E-01	-2.9073772E-01	2.1920042E-03	-9.9620748E-02	1.0210543E-02	2.2667810E-02
	-1.0675650E-02	8.7021876E-03	9.8204449E-03	2.8094477E-02	-1.3898670E-03
	-1.4143094E-02	2.7356002E-02	-1.2141675E-04	1.9607638E-02	2.2293222E-02
-3.2020219E-02	1.3921567E-01	2.0273392E-02	4.8501424E-02	4.7946626E-02	3.4999500E-02
	-2.5413328E-02	5.0102840E-02	1.0292834E-02	3.3858976E-02	4.3101371E-02
	-2.7593249E-02	8.1903015E-02	-1.2033583E-02	-3.5674318E-04	7.2490287E-03
4.3990780E-02	-6.4931205E-02	-9.6212642E-03	-2.2535953E-02	-3.4904638E-02	-4.7380997E-02
	2.4707841E-03	-1.2411286E-02	6.9505609E-03	-1.2133804E-02	-3.8503950E-03
	-7.6882778E-04	-1.5015433E-02	-2.9923593E-03	-9.9856018E-03	-9.9773388E-05
-1.2080490E-02	-4.5642495E-03	-3.0619788E-02	1.6689123E-02	1.2641401E-02	2.4041104E-02
	7.8907612E-03	-3.0646544E-03	-4.7022427E-03	-8.7028296E-03	-8.1670291E-03
	7.1127509E-03	-5.6473213E-03	5.2811763E-03	7.5571457E-04	1.2692202E-03

Table 21. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, JUNE-JULY-AUGUST (0800-1200 LOCAL MEAN TIME)

ALPHA	BETA
3.2145553E+01	-1.9890683E+00

CHI	MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS				
5.3177962E+00	-1.1764918E+00	2.1417388E+00	1.1279477E+01	-2.4790953E+00	-3.1497132E+00
	5.5340308E+00	-1.8533799E+00	3.9587625E+00	-1.4098011E+00	4.1715897E-01
	2.9220283E-01	3.7266835E-01	4.5162496E-01	7.1107194E-02	2.1072664E-01
-1.2328386E+00	7.6207429E-01	-2.3096528E+00	-1.9940007E+00	1.9618904E-01	4.7003209E+00
	-3.4289539E+00	1.3946058E+00	-7.7649520E-01	-4.5853337E-01	5.2521945E-01
	-1.2637431E+00	5.0406033E-02	-8.6647762E-02	-1.3187998E-01	-7.9855198E-02
4.1449084E+00	-1.0900896E+01	-3.6115276E+00	-7.7872318E-01	2.6387699E+00	5.3591691E-01
	-8.1652945E-01	4.5159759E-01	-2.2788237E+00	1.3853702E+00	-1.0447292E+00
	3.9078650E-01	6.2102418E-02	-5.6039620E-01	-1.6451593E-01	-3.9751570E-01
4.4707797E+00	1.7843343E+00	1.5745446E+00	-1.1903416E+00	-2.5220895E+00	-3.3247793E+00
	1.9248232E+00	-1.2002088E+00	1.3899920E+00	6.6013771E-02	-1.5186091E-01
	1.4140956E+00	-1.6906549E-01	7.7288084E-01	1.2378598E-01	-2.4471562E-01
1.6510422E+00	-2.8115172E+00	4.5223418E-02	2.2464993E+00	5.9367011E-01	8.3474619E-01
	1.6682313E-01	5.7578958E-01	1.3800820E+00	-3.5073709E-01	7.9462975E-01
	-7.2831940E-01	-1.8115323E-01	5.7276376E-02	5.5421070E-02	3.1818143E-01
-3.9749590E+00	3.2016224E+00	-2.8492440E+00	-1.9194530E-01	1.4417199E+00	3.2446007E-01
	-7.8727611E-01	2.8655736E-01	-1.4318708E+00	3.9859076E-01	-2.0216922E-01
	-4.6005340E-01	2.2074445E-01	-9.2210115E-01	-2.5593387E-01	3.0579796E-01
7.5712688E-01	-8.9586666E-01	1.8817235E-01	-9.6517249E-01	-9.0529422E-01	-8.8896002E-01
	-9.3403497E-01	-4.1795692E-01	-5.8194218E-01	-2.3201587E-01	-1.8745732E-01
	4.9776440E-01	1.0232983E-01	4.1681278E-01	-2.9916933E-02	-2.6302903E-01
3.1263177E+00	-3.4794990E+00	8.0776871E-01	-3.1157701E-01	5.8612386E-01	-9.9476543E-02
	1.1355182E+00	4.5352973E-01	1.0641490E+00	1.2496435E-01	9.3946192E-02
	1.3417413E-01	1.4516344E-01	2.4821471E-01	3.2447079E-01	1.5435622E-02
-7.5975790E-01	1.6134547E+00	-7.1798705E-01	1.0160089E+00	-2.5491382E-01	3.3538192E-01
	2.1054549E-01	2.8019874E-01	-6.3426921E-02	1.2748921E-01	1.8279681E-01
	-2.3287949E-01	1.4323554E-02	-4.4349667E-01	-3.0288140E-02	1.9053948E-01
-3.7360573E+00	3.8722963E+00	1.0141415E-01	4.6529218E-01	-6.1079328E-01	3.4857913E-01
	-9.5946641E-01	-2.8424206E-01	-4.4124263E-01	-5.3424200E-01	9.2867814E-02
	-2.7928897E-01	-1.3410403E-01	9.2268663E-02	-3.4913483E-01	-1.3190374E-01
2.5212702E+00	-3.1354188E+00	-4.3308971E-01	-7.1794265E-01	2.4839029E-01	-5.6243157E-01
	4.5516388E-01	-2.4201339E-01	1.5900927E-01	8.4539653E-02	-2.1186979E-01
	2.5353530E-01	1.1239990E-01	2.2038076E-01	8.0971532E-02	5.8543220E-02
9.2000705E-01	-9.9297553E-01	8.6649568E-02	5.8815379E-02	3.2358666E-01	-4.9651509E-02
	4.7257596E-01	1.1990843E-01	2.2760421E-01	4.0380638E-01	4.6358270E-02
	1.9323309E-01	-3.8123577E-03	-1.4520391E-01	2.0642488E-01	-4.2855926E-02
-1.6604932E+00	1.7332508E+00	4.0357648E-01	2.6567832E-01	1.1066554E-02	7.3677785E-01
	-4.4746509E-01	2.6890635E-01	-1.3619508E-01	-1.6215675E-03	1.1239241E-01
	-2.6940976E-01	-1.3263804E-01	-1.1327885E-01	-1.0043302E-01	-1.0779488E-01
-3.3691130E-01	3.5753505E-01	-2.1894017E-01	-1.6097394E-01	-2.7944467E-01	-3.5618167E-01
	-2.5113852E-01	-1.7316784E-01	-2.4366935E-01	-1.0942487E-01	-1.5233819E-01
	-4.8263963E-02	6.9762020E-02	9.2361466E-02	-4.9032611E-02	1.2545238E-01
1.8892228E+00	-2.2228952E+00	-1.9507720E-01	-4.3380563E-01	-8.5077377E-02	-2.8769454E-01
	3.2180504E-01	-3.1539874E-01	2.5404634E-01	-9.7356108E-02	2.2755545E-02
	2.2111186E-01	-1.4645635E-04	1.5665372E-01	-8.0010773E-03	3.4727082E-02
-1.6351823E-01	1.5482862E-01	1.0700981E-01	1.7709848E-01	9.2536562E-02	4.2671962E-01
	-4.3065260E-02	1.6037408E-01	1.5785806E-01	-8.6300208E-03	8.4514817E-02
	-5.2243131E-02	-2.8332863E-02	-4.1849766E-02	-1.0229580E-02	-6.5761682E-02
-1.4224513E+00	1.5857138E+00	1.1533578E-01	2.6856897E-01	4.1004703E-02	4.6248337E-02
	-1.6703488E-01	2.6977653E-01	-1.5901368E-01	1.0782775E-01	-9.0589614E-02
	-1.3972209E-01	8.8199627E-02	-1.4016641E-01	5.4290076E-02	-8.6337442E-03
5.4427277E-01	-5.8994780E-01	-7.0498117E-02	-2.4360360E-01	-3.9596455E-02	-1.9992685E-01
	1.3116930E-01	-1.8866854E-01	5.4654047E-02	-5.0154028E-02	-7.2234810E-02
	2.0599345E-01	-1.3380027E-01	1.0413286E-01	3.9647537E-04	-5.1483340E-02
5.2743540E-01	-6.8603796E-01	-2.3199411E-01	6.7582687E-02	-4.8904578E-02	9.9206510E-02
	-6.5705393E-03	-1.5670760E-01	1.2612342E-01	-9.3267049E-02	8.8451674E-02
	1.0239688E-01	-1.5871044E-02	7.5751815E-02	-8.8818528E-03	-8.8401933E-03
-4.4820522E-01	5.2094003E-01	-3.7234854E-02	7.5582546E-02	2.3774088E-02	6.0778758E-02
	-1.2989287E-01	1.5912063E-01	-9.0055819E-02	3.0017746E-02	9.7621392E-02
	-1.6038706E-01	1.1845676E-01	-1.2560650E-01	4.0741125E-02	8.8039749E-02
-1.6536365E-01	2.1177599E-01	2.4467739E-01	1.5956642E-02	4.9127892E-02	4.5933332E-02
	-5.3648849E-03	1.8085712E-01	-1.3493685E-02	6.9250407E-02	-7.3018130E-02
	-2.0567364E-02	-8.0333209E-02	-3.6995045E-02	7.0601307E-02	-6.8004555E-02
3.2937652E-01	-3.7307837E-01	-2.1804408E-01	-7.1650738E-02	2.2092993E-02	-9.9799103E-02
	1.3667054E-01	-1.2439695E-01	5.9704943E-02	-2.1869274E-03	-7.8101215E-02
	1.7201642E-01	-5.0031642E-02	9.5796552E-02	-6.2625000E-02	-7.8951630E-02
2.2098956E-01	-2.5760627E-01	-2.2956635E-01	1.1673249E-02	-1.3025831E-01	-2.7963666E-02
	-1.1147273E-01	-9.6541240E-02	-5.3991328E-02	-9.6734713E-02	9.3587332E-02
	-6.2719102E-02	5.0916336E-02	-1.1169971E-02	-5.1061986E-02	1.0669194E-01
-2.2136805E-01	2.6301276E-01	7.1830576E-02	4.6671838E-02	-1.3192942E-02	8.3224131E-02
	-7.9024090E-02	8.7786720E-02	2.1396995E-02	-1.7552514E-03	6.7899455E-02
	-1.3797242E-01	5.2796231E-02	-2.5419780E-02	7.8165237E-02	4.1375187E-02
2.0387433E-01	-2.0827076E-01	-3.3043163E-02	-2.0813169E-02	1.0482733E-01	-5.6138810E-02
	1.3786419E-01	7.4639395E-03	6.8887681E-03	7.8757511E-02	-7.9775733E-02
	1.0322472E-01	-5.3822204E-02	3.3663379E-02	-4.6770658E-02	-7.7943692E-02
-1.9481617E-02	1.9678682E-03	-7.1398970E-02	-1.2662923E-02	-9.9003567E-05	-1.8452467E-02
	-1.1269439E-04	-1.2388001E-02	-3.3486153E-02	5.4421085E-03	-4.1166880E-02
	7.4907367E-03	-4.2864706E-02	-2.4187753E-02	-4.1607146E-02	-1.1456900E-02
-1.7853906E-02	-4.2293847E-02	-8.4282999E-02	3.0610254E-02	-5.0477372E-02	1.4883705E-02
	-1.1717106E-01	-8.2575463E-03	-1.6933136E-02	-6.9516587E-03	7.7216841E-02
	-7.6878956E-02	1.0151757E-01	-2.2790295E-02	5.4162152E-02	6.7524131E-02
-6.0283630E-02	8.2906463E-02	-4.4551112E-02	1.0141363E-02	-1.5823706E-02	-5.6439475E-03
	-6.7122831E-03	1.1513093E-02	-2.3228088E-03	2.4550352E-03	8.3676516E-03
	6.5691638E-03	1.5451474E-02	-3.7380821E-03	-6.7001282E-04	6.4100083E-03
8.3874948E-02	-1.2108190E-01	8.5819997E-03	-7.6650375E-03	3.0682029E-02	-5.5660711E-03
	4.0750529E-02	-5.8898700E-03	1.3790784E-02	-1.5013426E-03	-1.6524990E-02
	8.8746267E-03	-2.0951666E-02	-1.7124029E-04	-1.0282583E-02	-1.1543923E-02

Table 22. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, JUNE-JULY-AUGUST (1200-1600 LOCAL MEAN TIME)

ALPHA	BETA
2.9050894E+01	2.3416826E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
7.2701666E+00	5.5308077E+00	1.4943315E+00	1.5294904E+01	1.8025783E+00	-4.3927234E+00
	3.3702626E+00	-1.2147647E+00	2.8685050E+00	-6.2985490E-01	3.1267417E-01
	-8.1618982E-02	-4.0351233E-01	2.8964857E-01	-3.2409062E-02	-4.7889206E-01
4.3077604E+00	-7.8762704E+00	-5.1702005E+00	-5.6914631E+00	-3.2837302E+00	6.5484320E+00
	-5.3581380E+00	1.9737638E-01	-3.1944747E-01	-8.8921449E-01	8.9844908E-01
	-3.0740296E-01	-1.6879570E-01	1.4495470E-01	-2.3829578E-01	-6.7352307E-02
4.6953564E+00	-1.0793675E+01	-3.6952897E+00	-3.4815435E+00	4.7170532E+00	3.9005320E-01
	2.2973225E+00	7.7669085E-01	-1.1758011E+00	9.3678334E-01	-1.0482046E+00
	3.5665872E-01	2.7411533E-01	-1.1896816E-02	2.9385354E-01	-9.4353311E-02
4.6127762E+00	3.2532419E+00	1.7677327E+00	1.7623140E-02	-2.7403542E+00	-2.6667732E+00
	9.5130358E-01	-2.2062421E-01	6.4098769E-01	-1.1318596E-01	9.1595273E-03
	7.3732912E-01	-3.0723194E-01	3.0881673E-01	-6.2293524E-02	-9.4428641E-02
2.6440343E+00	-5.6626588E+00	-1.6188382E+00	1.9982475E+00	-1.0946170E-01	1.2308039E+00
	-1.0284612E+00	7.5334842E-01	1.3321840E+00	-4.3189766E-01	7.7390342E-01
	-6.4065894E-01	1.9017130E-01	-2.3830042E-02	-1.2821101E-02	2.2556020E-01
-2.8332664E+00	2.7420400E+00	-2.5130383E+00	1.0266020E-01	1.5360857E+00	-4.4024415E-01
	3.1292622E-01	-1.2470364E-01	-1.1175197E+00	4.1745179E-01	-9.2569085E-02
	3.2946986E-02	4.0310561E-01	-4.1788499E-01	-1.3099516E-01	4.4992806E-02
1.1790989E+00	-1.2473663E+00	-5.7068588E-01	-3.7078333E-01	-1.4669238E+00	-8.4090365E-01
	-1.2361107E+00	-5.0979502E-01	-4.1678901E-01	-1.2766180E-01	-2.2881054E-01
	2.6935893E-01	-3.1149677E-01	3.1425907E-01	1.7192410E-01	-4.1501755E-02
2.8259547E+00	-3.2319456E+00	8.7701898E-01	-3.0360750E-01	6.0563450E-01	6.1497892E-01
	9.7671085E-01	6.3083456E-01	1.1102459E+00	-1.5064819E-01	2.6313492E-01
	2.2901728E-01	-2.9217732E-01	1.6709867E-01	1.1909636E-02	-1.5364327E-01
6.2612427E-01	-3.6719724E-01	-7.2893190E-01	3.1813155E-01	-9.7576611E-01	-3.7855268E-02
	3.3227536E-02	4.0766990E-01	-4.0299285E-01	1.2689327E-01	1.3399994E-01
	-2.2675920E-01	1.4882849E-01	-2.8209196E-01	-4.6802998E-02	1.8359066E-01
-2.7545316E+00	2.7102571E+00	1.9171794E-01	1.4389069E-01	-6.8416412E-01	-1.1369284E-01
	-7.8313876E-01	-2.1701424E-01	-4.5981387E-01	-2.7835999E-01	-8.9975768E-02
	-2.1604121E-01	9.4719735E-02	3.7562398E-02	3.6067236E-02	-4.0495256E-02
2.7765822E+00	-3.4247505E+00	-4.7730826E-01	-2.1556457E-01	-4.6050646E-02	5.2128841E-02
	3.1688331E-01	-3.1807134E-01	1.0915065E-01	2.3386459E-02	-1.0195549E-01
	2.5805444E-01	-1.3693943E-01	1.1051857E-01	1.6561973E-01	1.2081820E-01
1.9861913E-01	-6.1830954E-01	2.3304716E-01	-3.2334150E-02	-5.8630762E-02	5.9516354E-02
	9.2696882E-02	-7.6200344E-02	-7.3703481E-02	5.7971394E-02	8.1764294E-02
	8.5541911E-02	-6.5661894E-02	-4.0009116E-02	-9.2038410E-02	-2.5459434E-02
-1.9173036E-01	1.5161894E-01	2.7389505E-01	8.0674087E-02	-2.5232385E-01	4.9226736E-01
	-3.9758785E-01	2.3797892E-01	-1.3194158E-01	-1.1230911E-01	-1.6225681E-02
	-3.1352026E-01	-4.4110911E-04	-4.2033993E-02	-4.8066649E-02	-4.7534479E-02
-5.4557505E-01	3.9053463E-01	-1.1826623E-01	1.4102773E-01	-3.3750741E-01	9.3142482E-02
	-1.9970684E-01	-2.5942662E-01	-7.3355735E-02	-9.7813519E-02	-4.2240791E-02
	-9.9908879E-02	2.0292959E-02	3.0833078E-02	3.7633743E-02	1.6490350E-01
6.3038262E-01	-8.6143138E-01	-2.5352211E-01	-1.4399814E-01	-3.3170431E-02	-5.9148797E-02
	1.9365445E-02	-2.2037690E-01	1.4315190E-02	1.1181693E-01	-1.8607287E-02
	1.1066964E-01	-1.0076237E-02	8.0266582E-02	-5.8534981E-04	-1.0645994E-01
9.2545301E-02	-1.2560589E-01	1.3090310E-01	5.6972130E-02	-1.7578964E-03	2.2811208E-01
	-7.2522148E-02	1.6503121E-01	-9.1345571E-02	1.2386215E-01	-7.0911779E-02
	-7.3077308E-02	5.0813742E-02	-5.7721714E-02	-3.9925861E-02	-5.9870204E-02
-4.4488981E-01	3.7764040E-01	2.1227806E-01	-9.6359601E-02	-1.4403966E-01	9.0674263E-02
	-1.2811997E-01	1.0990542E-01	5.3116928E-02	-1.0741085E-01	-6.1195614E-02
	-1.8142915E-01	4.0875977E-03	-2.6381248E-02	-9.4071712E-02	1.0875376E-01
1.9324623E-01	-1.6912373E-01	-1.0671570E-01	-1.1003978E-01	-3.0482585E-02	9.3458864E-02
	-9.6942566E-02	-4.0588736E-02	5.9203304E-02	7.0465580E-03	6.9490784E-03
	8.9617927E-02	-3.6508282E-02	3.1864718E-02	-5.6937980E-02	-9.0515611E-02
-1.7038692E-01	1.6508381E-01	-1.7632614E-01	1.6803459E-01	-1.0553746E-01	6.7917672E-02
	-4.9409363E-02	3.0090769E-03	4.0288786E-02	1.4348319E-02	3.7939344E-03
	3.2946893E-03	9.1604535E-02	2.5053732E-02	7.9912530E-02	-3.7835522E-02
-1.7083085E-03	-2.6592792E-02	6.8818060E-02	-2.5705492E-01	-7.5918701E-03	2.7419619E-02
	-1.8018105E-01	2.0119636E-02	-1.0462368E-01	4.7150320E-03	3.4257255E-02
	-5.1664900E-02	-7.5710496E-03	-9.5318389E-02	-9.5538184E-02	9.3573310E-02
-6.4199039E-02	1.1012416E-01	9.7921981E-04	1.4543241E-01	2.8125225E-01	7.3879544E-02
	5.6516180E-02	1.6837586E-01	-2.3607819E-02	1.0139175E-01	-8.2659452E-02
	-4.2586296E-02	-3.6125864E-02	-8.5858953E-02	4.3237496E-03	-3.2210484E-02
-1.3932965E-01	3.3127813E-01	-1.7079990E-01	-3.0105763E-02	-8.1095199E-02	-3.0818677E-02
	7.1208713E-02	-8.6388524E-03	5.9132170E-02	-8.7120186E-02	-6.4987388E-03
	1.1333527E-01	3.3112992E-03	1.7189565E-02	9.0858683E-03	-4.9490686E-02
-8.4051557E-02	-3.8457500E-02	-1.8997238E-02	-1.5961559E-02	-3.7652106E-02	-1.3587616E-02
	-1.8608769E-01	4.3210595E-02	-5.9925712E-02	-5.4112229E-02	2.2136609E-02
	-8.6984470E-03	5.8952790E-02	-2.0241360E-02	3.0856669E-02	5.8080192E-02
-1.3914370E-01	2.2563744E-01	3.6832927E-02	4.8843912E-02	1.8302059E-01	7.5143132E-02
	-2.8028875E-02	8.8628202E-02	2.0323937E-02	-3.6832822E-02	6.0047365E-02
	-4.7827035E-02	-3.4432923E-02	-5.1592330E-02	-1.6733643E-02	1.3154566E-02
4.5487751E-02	-4.2579534E-03	-1.8003214E-01	5.6293551E-02	5.5180482E-02	-4.8719770E-02
	3.8337846E-02	8.4235082E-02	-4.6354783E-02	4.2996330E-02	-5.7973359E-02
	4.0269522E-02	-8.1762170E-02	-6.2078000E-02	1.4254948E-02	-6.2539171E-03
-3.6289090E-01	5.0743445E-01	-5.5113138E-02	8.2916883E-02	5.9638268E-02	-9.1992477E-02
	7.9222003E-02	1.4855089E-02	-6.1331737E-02	9.7407129E-03	-4.1446882E-02
	2.7597671E-02	5.8821642E-02	-3.5830024E-02	2.1513836E-02	-2.1689686E-02
2.1149781E-01	-2.6835285E-01	-9.9462489E-02	-7.9492116E-02	3.1932700E-02	-2.5307667E-02
	-1.4176551E-02	8.5922899E-03	1.3967444E-02	-5.9805561E-02	8.7953618E-02
	3.1801591E-02	1.7542403E-03	2.9029454E-02	-7.0832353E-03	2.6333724E-02
-1.4558709E-01	1.6249671E-01	-8.1482812E-03	1.1772689E-03	-7.0275218E-03	2.4979031E-02
	-1.7414061E-02	1.0069380E-02	-2.1844470E-03	7.1672728E-04	2.5607468E-02
	1.2375561E-02	-1.4348944E-02	1.8133956E-02	2.6040517E-03	-1.5621785E-02
4.1722434E-02	-7.7734020E-02	-3.4158060E-02	3.0722136E-02	1.7272560E-02	-2.1663072E-02
	6.6023641E-02	-4.2210641E-02	5.3740414E-02	6.4979848E-03	-1.5131471E-02
	-1.8927007E-02	-1.0034629E-02	1.7961384E-02	6.7142779E-03	-1.7496413E-02

Table 23. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, JUNE-JULY-AUGUST (1600-2000 LOCAL MEAN TIME)

ALPHA	BETA
4.3310318E+01	3.5997150E-01

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
1.6267552E+01	-2.0437212E-01	2.9389348E+00	1.1541576E+01	-9.1256755E-01	-4.2231151E+00
	4.2772547E+00	-5.9434222E-01	2.5844031E+00	-7.5631364E-01	6.5940305E-01
	-2.6148900E-02	2.2907521E-01	-7.3152098E-02	-2.1532872E-02	7.3845992E-02
1.9881128E+00	-2.6758307E+00	-2.4219673E+00	-2.3983064E+00	-5.0513122E+00	5.2184054E+00
	-5.1078020E+00	8.1120776E-01	2.9406418E-01	-7.6470775E-01	1.4469384E-01
	-1.0457418E+00	-4.0011968E-01	-9.8223831E-02	-1.6506911E-01	6.6475012E-02
-2.1682756E+00	-3.7710720E-01	-3.0543864E+00	-6.5701796E-01	5.8988680E+00	-3.3597360E-01
	2.1410173E+00	-3.7105270E-01	-1.8299831E+00	7.9660939E-01	-9.4170249E-01
	2.6485227E-01	-2.1646736E-01	-2.2013819E-01	2.9603078E-02	-2.4468648E-01
8.2183926E+00	-5.1516708E+00	2.9818974E+00	-6.1808492E-01	-2.9906102E+00	-2.9086930E+00
	8.3285159E-01	-5.8615524E-01	2.2710569E-01	-2.2239403E-01	-3.2241312E-01
	1.1381558E+00	8.5586227E-02	5.5450980E-01	1.3296698E-01	3.7799250E-02
-1.8221153E+00	-2.1070928E+00	-3.6711586E-01	1.7097553E+00	-7.6829453E-01	1.7945029E+00
	-1.1465169E+00	2.9418505E-01	1.5292725E+00	-8.1446764E-01	6.4687925E-01
	-6.2847999E-01	-2.6344444E-02	1.3172465E-01	-3.9269753E-02	2.7498418E-01
-2.8775843E+00	3.8543285E+00	-1.7781194E+00	-5.0642399E-02	2.1179237E+00	-2.8201833E-01
	1.5601422E-01	-8.7075169E-02	-1.1197282E+00	6.3050889E-01	1.0120828E-01
	-6.2212882E-01	5.7279570E-02	-4.8617879E-01	7.9953407E-02	2.6527674E-01
-1.0961496E+00	6.8216434E-02	-6.6809479E-02	1.3601521E-01	-1.2689635E+00	-6.8982760E-01
	-1.0779427E+00	-3.5435865E-01	-3.0343855E-01	-1.7119469E-02	-3.4225073E-01
	1.5752045E-01	-4.0833990E-02	9.2732093E-02	1.4427912E-01	-1.5847857E-01
2.4565953E+00	-2.0599132E+00	1.3508281E+00	2.1726212E-01	9.5961777E-01	7.4730787E-01
	1.5532385E+00	4.4308090E-01	7.4247892E-01	-2.7773807E-01	1.7106326E-02
	1.6242947E-01	1.2970619E-02	1.1104509E-01	-2.1700517E-01	-1.4111761E-01
1.3662862E+00	-8.4129441E-01	-2.0804522E-01	-3.7959791E-01	-7.8284571E-01	-2.4793190E-01
	-2.9291485E-01	7.6380367E-01	-5.2205602E-01	2.0372781E-01	3.9077352E-02
	3.6220407E-02	6.8827315E-02	-2.4514088E-01	-8.2719131E-02	1.0111008E-01
-3.6989482E+00	3.4210432E+00	2.1991328E-01	2.8538048E-02	-1.2587791E-01	-6.8668487E-02
	-3.5782850E-01	-3.5102214E-01	-2.5841537E-01	-1.4797603E-01	-6.6572703E-02
	1.6048550E-02	9.2312247E-02	7.7547633E-02	1.9303411E-01	-1.6559757E-01
2.8122016E+00	-2.7775462E+00	-6.2658979E-01	-6.2801920E-01	1.8352467E-01	-7.2908666E-02
	2.3561808E-01	-3.8653880E-01	1.1171733E-01	1.5858410E-01	1.5045604E-01
	1.9282504E-01	4.1190535E-02	1.9808340E-01	5.4071187E-02	9.8802974E-02
-7.5500645E-01	1.7101271E-01	1.0011974E-01	2.0465099E-01	1.4183638E-01	6.3716557E-02
	-6.8149176E-02	2.0050183E-01	1.8914148E-01	1.6203831E-01	-3.8948332E-02
	-1.1711514E-01	-1.9493178E-01	-1.4767621E-01	-3.1299947E-02	2.0302025E-02
1.0311995E-01	7.9827774E-01	-1.4171068E-01	2.9493960E-01	1.4207734E-01	3.4330559E-01
	1.5297588E-01	-2.5418947E-02	-1.4894838E-01	-5.1143938E-02	-9.6307791E-02
	-1.2177890E-01	-6.8397086E-02	-7.7437365E-02	-3.1760784E-02	-1.2762380E-01
-4.4909942E-01	5.4460240E-03	1.5866284E-01	-8.7680325E-02	-2.1931328E-02	-3.1456431E-02
	-2.1128732E-01	-8.1844478E-02	6.9878870E-02	3.0144066E-02	2.8511901E-02
	-2.2067876E-02	4.8921909E-02	7.2715718E-02	5.0522549E-02	1.1228004E-01
5.6152085E-01	-5.4010651E-01	-1.8908703E-01	-1.8571826E-01	1.1869442E-01	-7.6436675E-02
	1.5163511E-01	-1.3021283E-01	6.1906385E-02	-7.2266794E-02	4.4412276E-02
	5.6343522E-02	7.7497300E-02	1.0361498E-01	-3.2400448E-02	7.2499343E-03
-2.9026480E-02	2.2890552E-01	-2.3633894E-01	2.3457633E-01	-2.9893741E-01	5.3448430E-02
	-2.5719184E-01	6.4440405E-02	-7.7599714E-02	1.6414455E-02	3.1053944E-02
	-6.3124799E-02	4.9595529E-04	-6.8466120E-02	-5.0627127E-02	-3.9467784E-02
-6.7049716E-01	4.0080221E-01	3.0259508E-01	5.6247281E-02	1.5140488E-01	3.2221337E-02
	1.4750098E-02	5.9286510E-02	1.4477674E-01	-4.9338864E-02	-1.0320760E-01
	-8.3225588E-02	-1.9250562E-02	-5.7007078E-02	5.4201427E-02	6.2652042E-02
1.0189139E+00	-7.9924464E-01	-3.4103068E-02	-2.0905451E-01	-2.5759322E-02	-2.1725720E-01
	2.3482721E-01	2.4944978E-03	-6.3105338E-02	-8.8514944E-02	-5.4561771E-02
	1.7372391E-01	-1.1282093E-03	9.8055912E-02	-9.6021472E-02	-3.6218117E-02
-5.1760921E-01	3.4152730E-01	-1.3938847E-01	2.3996332E-01	-2.8493181E-02	1.6439440E-01
	-6.3569326E-02	1.0722490E-01	2.7381895E-02	-2.2801370E-02	4.3531120E-02
	-2.9807686E-02	2.1765527E-02	-1.8358759E-02	1.8638349E-02	-4.2866254E-02
8.9782173E-02	2.4123993E-02	-6.4763675E-02	-6.9626294E-02	-3.3685541E-02	-8.1593487E-02
	-8.9459059E-02	-1.6633338E-01	-4.4321811E-02	7.5099863E-03	3.0054073E-02
	2.1767980E-02	2.0810444E-02	-1.6734335E-02	6.3288470E-02	6.9128974E-02
-3.9132677E-03	-1.8750485E-01	3.6664112E-02	-3.4867667E-02	1.0897665E-01	-1.1717474E-02
	4.0631396E-02	1.4645183E-01	-6.6008979E-03	7.5286820E-02	1.4460125E-02
	-4.6981494E-02	-7.9058819E-02	-6.2611111E-02	-9.0487391E-03	-1.2538174E-02
6.5016229E-02	4.8209603E-02	3.8878237E-02	-9.6932462E-03	-2.6842097E-03	3.2166423E-02
	7.5140384E-02	-6.3399091E-02	5.1085604E-02	-5.2375903E-02	1.5744318E-02
	4.2130606E-02	-1.2187946E-02	4.5140299E-02	-1.9692461E-02	-1.2160089E-02
-5.4953615E-02	1.1353205E-01	-1.7141781E-01	9.7710359E-02	-1.6905740E-01	7.0051542E-03
	-6.5013646E-02	-2.4592633E-02	-8.3536697E-02	2.0744292E-02	-1.7094924E-03
	4.8450964E-02	6.1296097E-02	-1.3189216E-02	2.1882606E-02	-5.9678989E-03
-4.0709748E-02	-1.0029083E-01	1.5531252E-01	-6.1896656E-02	1.7805496E-01	6.8956461E-02
	1.2021180E-02	3.8354166E-02	5.7517085E-03	6.2831291E-03	3.0858570E-03
	-1.2341913E-01	-4.3930241E-03	-1.0758898E-02	4.2169519E-02	2.6156569E-02
2.5869972E-01	-1.8586938E-01	-1.7734869E-01	-3.0272487E-02	-6.0292635E-02	-8.2928648E-02
	-5.9766202E-02	-1.0391410E-01	-4.4446639E-03	1.9623118E-02	-1.8026570E-02
	5.2434890E-02	-7.8965988E-02	4.6769318E-02	-3.5030998E-02	1.1405989E-02
-2.6379611E-01	2.3439847E-01	6.7952441E-02	4.2562751E-02	-4.9639850E-03	5.0891737E-02
	8.1454655E-02	6.6807886E-02	4.6856502E-02	-3.4389950E-03	-2.3708251E-02
	-2.4176802E-02	4.2373300E-02	-4.8314873E-02	-7.4877936E-03	-3.0044771E-02
3.0177763E-01	-2.1999706E-01	-3.9213401E-02	-6.5224768E-02	-6.5893358E-02	-2.8939632E-02
	3.2672955E-03	-2.1644226E-02	1.8629178E-02	-2.5304142E-02	3.9101640E-02
	4.6112212E-02	4.8124486E-02	4.5143777E-02	-1.8355031E-02	1.3314385E-03
-1.2731238E-01	1.6393817E-01	-2.9055025E-02	5.2918926E-02	-4.2562079E-02	1.0299996E-02
	-5.5386289E-02	3.2263629E-02	-2.7013662E-02	1.4384744E-02	4.6016764E-03
	7.5635601E-03	-1.7968955E-02	-5.1664456E-03	1.2287842E-02	-2.5417805E-03
5.1425273E-02	-1.1853608E-01	-5.1193366E-03	-1.6212369E-02	6.6870975E-02	-6.2688728E-03
	4.2840757E-02	-2.9094995E-02	1.3958564E-02	-2.1240810E-02	-1.2087257E-02
	-3.5225965E-02	9.3705288E-03	-1.2883147E-02	-1.6989807E-03	1.1598892E-02

Table 24. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, JUNE-JULY-AUGUST (2000-2400 LOCAL MEAN TIME)

ALPHA	BETA
3.4360078E+01	2.5750355E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
3.5836154E+01	-1.3019225E-01	2.7019314E+00	4.1548325E+00	-1.4343202E+00	-3.4509786E-01
	4.1730804E+00	-1.5948328E+00	2.6419012E+00	-1.1114949E+00	5.9429467E-01
	3.0471668E-01	7.7473797E-01	5.9458579E-01	2.9994382E-02	5.8459603E-02
8.0640359E-02	-2.0491859E+00	8.8778261E-01	-9.2199496E-01	-3.3018978E+00	3.5122571E+00
	-3.9992366E+00	1.1630570E+00	1.4985013E-01	-3.7717432E-01	1.2134736E-01
	-1.5465783E+00	-3.4877701E-01	-1.7710837E-01	-1.3229432E-01	1.3817022E-01
2.0860566E+00	-5.8677946E+00	-2.6109872E+00	-2.3547192E-01	4.3223924E+00	-7.3870638E-01
	4.9773520E-01	-3.4745857E-01	-1.6167299E+00	1.0635747E+00	-7.1705515E-01
	4.0261998E-01	-2.1469146E-01	-1.5836635E-01	-1.2273000E-01	-1.9235390E-01
4.8449699E+00	-2.9323328E+00	1.7682683E+00	-8.9752347E-01	-3.7898110E+00	-2.4511070E+00
	7.8376238E-02	-7.6866798E-01	4.6607916E-01	-2.8043031E-01	-1.7341354E-01
	1.3551539E+00	-1.6262438E-01	7.5422809E-01	-3.2997847E-02	-1.6126106E-01
-3.3985779E+00	-1.2044110E-01	-2.5204866E-01	1.7352321E+00	9.4276578E-01	1.6671340E+00
	4.5063853E-01	3.2932457E-01	1.1575533E+00	-7.0032702E-01	6.9278472E-01
	-5.3417067E-01	1.5088873E-02	-3.2310003E-01	2.0903441E-02	3.4217073E-01
-3.8481083E+00	4.3753487E+00	-2.6373813E+00	2.6868520E-01	1.0377468E+00	3.8310926E-01
	-7.2437948E-02	-2.9905849E-01	-6.6726606E-01	3.9287017E-01	2.4952337E-01
	-2.9929531E-01	3.8378672E-01	-6.3056811E-01	1.4999434E-01	1.7846095E-01
-2.5635863E+00	1.3732135E+00	9.5011659E-01	-1.6399983E-01	-3.9886234E-01	-6.6534428E-01
	-1.1181664E+00	2.0081024E-01	-2.9730165E-01	1.7084407E-02	-3.7498233E-01
	-9.3823939E-02	-3.7655977E-01	2.7851180E-01	9.7538212E-02	-2.3384079E-01
3.5297876E+00	-2.5440104E+00	1.0682581E+00	2.6685488E-01	7.1287608E-01	1.4208918E-02
	1.2753797E+00	5.8800632E-01	4.0788669E-01	1.4399476E-02	-1.7013797E-01
	1.4758410E-01	8.9206559E-02	1.0833373E-01	-4.2416960E-03	-1.1509181E-01
-7.8735272E-01	7.9265426E-01	1.0903412E-01	2.1988937E-01	-7.4570759E-01	9.4060765E-02
	2.3185730E-01	5.1593051E-01	-7.0366729E-02	-1.0010911E-01	1.1287009E-01
	-5.5802190E-02	1.9503419E-01	-2.3407837E-01	-2.1974693E-01	3.3873222E-02
-1.3988391E+00	1.5391134E+00	1.2892883E-01	-6.2060685E-01	-4.3091507E-01	-3.8114809E-01
	-6.1073137E-01	-4.8292367E-01	-2.8042033E-01	-2.9238696E-01	1.1552636E-01
	-1.8919956E-01	-6.6931307E-02	2.9436196E-01	5.0637280E-02	1.5256500E-01
1.3946469E+00	-1.7644142E+00	-3.3444513E-01	-1.9121741E-01	-1.0904905E-01	-1.3298014E-01
	1.2219489E-01	-4.3894296E-01	-1.1841432E-02	1.5523535E-01	-9.7922643E-02
	2.8522570E-01	-7.6235111E-02	5.5092471E-02	8.3241483E-02	-2.2525234E-02
1.3353727E-01	-3.3344424E-01	1.1032716E-01	1.9057504E-01	8.3265600E-01	2.9199608E-01
	4.9064892E-01	3.0521981E-01	8.7048764E-02	3.5124995E-01	-2.0517130E-03
	1.4594716E-01	-1.0865192E-01	-2.4534636E-01	3.8951573E-02	-1.5967290E-01
-8.2165571E-01	1.1479668E+00	-2.5935975E-01	9.5383961E-02	-3.5766389E-01	2.9212799E-01
	-3.3841779E-01	3.3734252E-02	-8.0144749E-02	-8.6457280E-02	1.4027920E-01
	-3.1269064E-01	8.7783723E-03	-7.4650097E-02	4.9832979E-03	1.0612095E-01
-5.3711058E-01	3.3349255E-01	1.6159549E-01	1.0160451E-01	2.0712801E-01	4.2356043E-02
	2.7476110E-03	-8.8539252E-02	6.8665666E-02	-1.1016710E-01	-2.6346984E-02
	-4.1238370E-02	-6.9204605E-04	6.1003043E-02	-6.9660555E-02	5.5440112E-02
1.2757101E+00	-1.1268259E+00	-4.5256703E-01	-2.3268262E-01	-4.5727035E-02	-1.1921471E-01
	3.0374061E-01	-1.7617475E-01	1.0604371E-01	6.6144107E-02	-7.2625419E-02
	2.7088338E-01	8.5801857E-02	1.8282963E-01	1.3239488E-01	-1.0646746E-01
-1.5830197E-01	-2.7682888E-01	1.5514477E-01	3.1263413E-02	-1.0291870E-01	1.1426866E-01
	-3.8896252E-01	9.6882758E-02	-3.3938751E-03	1.0339342E-01	1.0045511E-02
	-1.4254536E-01	-1.3591487E-02	-8.6164123E-02	-2.5651783E-02	-2.9701682E-02
-1.4229002E-01	5.0763249E-01	1.2347612E-01	-9.3013141E-02	6.0818214E-02	-1.8273685E-01
	-7.7219543E-02	1.6763220E-01	-5.0902101E-03	2.7742080E-02	-1.3734895E-01
	-1.0317844E-01	1.1386880E-02	-4.8831546E-02	-1.1300949E-01	5.1583899E-02
4.7013055E-01	-6.0884130E-01	-1.2287055E-02	1.8484931E-02	-2.3441521E-01	-5.9371735E-02
	2.1834138E-01	-2.4334126E-02	3.9500432E-02	-1.9440251E-01	-2.5702431E-02
	1.3832565E-01	7.7546801E-02	1.1777209E-01	-5.2350086E-02	4.8376159E-03
2.4337483E-01	-1.7153807E-01	-1.2588211E-01	-6.6245270E-02	-4.2229185E-02	-9.9669286E-02
	-1.0124812E-01	-1.0341825E-01	-1.1852607E-02	-3.7252252E-02	7.2910661E-02
	4.1521870E-02	-3.0349112E-02	1.3116750E-02	3.6753384E-02	8.6713123E-03
-4.6229771E-01	2.7471074E-01	-5.5485186E-02	3.4015471E-01	5.1137302E-02	2.4229561E-01
	-6.2771679E-02	6.1246175E-02	-2.0112758E-02	4.3169735E-02	9.3007857E-02
	-1.2595185E-01	-7.6604781E-02	-1.2987326E-01	4.7400189E-02	2.6664579E-02
-1.3263865E-01	8.6453734E-02	2.2637185E-01	-1.8760500E-01	1.9150470E-01	-4.2843191E-02
	1.6869698E-02	6.0371011E-02	-7.2152548E-03	7.1497557E-02	6.6182260E-02
	4.8081978E-02	1.2244859E-02	-1.4216185E-02	6.7664217E-03	-8.1071734E-03
1.2656064E-01	1.4501089E-02	-2.5027201E-01	1.0664485E-01	-2.6777125E-01	-8.4688540E-02
	1.3328845E-01	-9.4994096E-02	1.6910251E-02	-7.0058867E-02	-1.3430335E-01
	1.1457557E-01	-3.7601689E-02	2.6731145E-02	-1.6080027E-02	-5.7394871E-02
9.4483243E-02	-1.6225941E-01	3.6129193E-02	-1.9903898E-02	5.1418186E-02	1.1548682E-01
	1.5164451E-02	-2.1664219E-02	-9.1465491E-02	-1.0139363E-01	1.4544020E-01
	-4.5906029E-02	3.5512617E-02	-8.5347148E-03	-2.2694449E-02	8.1593722E-02
8.3698038E-02	-1.4003014E-01	2.5718403E-02	-8.3288140E-02	2.6987755E-02	-3.4503890E-02
	-4.2473498E-02	5.8467688E-02	-1.5931309E-02	4.2654042E-02	-4.3330220E-02
	-1.1792900E-01	-4.4986445E-03	3.0114187E-02	1.5220227E-02	4.4376346E-02
1.3516630E-03	-4.4304523E-02	1.4762973E-02	1.0646742E-02	-2.5265632E-03	-4.9630679E-02
	-6.3556988E-03	-5.9432795E-02	4.7424358E-02	3.7109147E-02	-4.8021236E-02
	7.6593236E-02	-7.0324453E-03	4.8125836E-02	4.3859309E-02	-6.8934435E-02
-8.8770921E-02	2.0538861E-01	-1.9659688E-02	4.7811881E-02	1.1809039E-02	3.4663129E-02
	4.0371667E-02	2.6732022E-02	3.2590848E-02	4.0061769E-02	-2.8204404E-02
	2.0078462E-02	-3.8016418E-02	-4.0237925E-02	-2.0369230E-02	-4.3896277E-02
-2.4109950E-02	-9.7941319E-02	-1.5206508E-02	2.8392275E-02	7.7477994E-03	1.7430436E-01
	-4.7597316E-02	4.2898234E-02	-1.5652239E-02	-5.4051603E-02	9.5528873E-02
	-7.5558636E-02	7.9257033E-02	-1.9610026E-03	-2.2220263E-02	3.9299321E-02
2.4477725E-02	-6.7675469E-03	-4.4503482E-02	-2.2806234E-02	1.4797621E-02	-7.7008098E-02
	6.4569355E-03	-1.1457542E-02	-3.3888595E-02	3.3148479E-02	1.8014613E-02
	-4.4514203E-04	4.3313526E-02	-1.6287883E-02	7.0477011E-03	2.4297531E-02
-1.1103944E-02	4.6704848E-02	-2.7779053E-02	3.6100837E-02	-3.8959526E-03	-2.3091320E-02
	3.9817621E-02	-2.0999837E-02	2.6003557E-02	5.5655867E-03	-5.8921460E-02
	1.3781950E-02	-4.2260409E-02	-2.4816345E-03	1.2106268E-02	-1.6750596E-02

Table 25. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, SEPTEMBER-OCTOBER-NOVEMBER (0000-0400 LOCAL MEAN TIME).

ALPHA	BETA
3.4926720E+01	-2.0414080E-01

CHI	MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS				
4.7157350E+01	-6.0446209E+00	3.6083490E-01	2.9303179E+00	-2.3556473E+00	1.1730730E+00
	4.2492319E+00	2.8399560E-01	2.2761084E+00	-1.4941561E+00	1.3322384E-01
	2.7816840E-01	-1.1153128E-01	-2.8528379E-01	-4.2558117E-01	1.9125674E-01
-6.5765285E+00	7.0189958E+00	-7.3100604E-01	-6.6235560E-01	-2.0348645E+00	2.4241317E+00
	-1.2775562E+00	8.1000103E-01	5.9793218E-01	2.5923443E-01	4.5072733E-01
	-1.3088280E+00	-2.2645539E-01	-1.9159000E-01	-1.3008877E-01	-4.9986652E-02
-1.5893142E+00	-4.9420408E+00	-3.9976863E+00	7.5614568E-01	2.5923931E+00	5.0960832E-01
	-1.1250293E+00	-4.8144228E-01	-1.8105853E+00	5.8875711E-01	8.9518050E-02
	5.3051785E-01	6.0457045E-01	-1.3300280E-01	3.6004730E-01	-3.1676944E-01
1.3468953E+00	8.5127504E-01	1.8544337E+00	-1.4267967E+00	-1.7572717E+00	-1.4342708E+00
	3.3283872E-01	-9.5438208E-01	-8.4491329E-01	-2.7769235E-01	-4.6420769E-01
	5.9621692E-01	-1.6246875E-01	3.9254083E-01	6.1314447E-02	8.9404935E-02
1.9649639E+00	-6.3240810E+00	1.0863155E+00	1.6448297E+00	9.7784792E-02	-5.8073394E-01
	-4.2310121E-02	2.9310783E-01	1.3953579E+00	1.6741158E-01	-3.7997038E-02
	-3.2044961E-01	-6.0321186E-01	2.2076440E-01	-3.0137793E-01	1.2904910E-01
-1.6115456E+00	2.1460683E+00	-1.4540681E+00	9.0336634E-01	1.0637858E+00	5.7563969E-01
	-5.1924715E-02	4.7543802E-01	2.2703507E-01	5.8026975E-02	2.3573772E-01
	-1.6929806E-01	4.9572692E-01	-1.4047756E-01	8.7199398E-02	-2.0656922E-01
-3.1985821E+00	3.0319627E+C0	8.0407035E-01	1.5954483E-01	-7.3489585E-02	8.4046249E-02
	-2.9311914E-01	1.7277676E-01	-2.3414639E-01	-1.0441642E-01	-1.0003029E-02
	-7.7113597E-02	2.2869891E-01	-2.7291930E-01	1.4356948E-01	9.3244418E-04
2.7981249E+00	-2.9958500E+00	8.2142468E-01	-9.0975635E-01	-2.0654625E-03	-9.0694051E-01
	-1.0235122E-01	1.6752473E-02	-2.3887411E-01	1.3818455E-01	-3.1796854E-01
	1.5836532E-01	-2.9024678E-01	9.8708856E-02	2.0918637E-02	1.5502813E-01
6.6605937E-01	-8.3659952E-01	1.5134965E-01	-3.6670286E-01	-6.5241261E-02	4.5928506E-02
	5.7117931E-01	2.3281431E-02	-1.0972632E-01	-8.0993583E-02	1.4258457E-01
	7.2234735E-02	-1.6411152E-01	1.0142600E-01	-2.8148973E-01	-5.8490769E-04
-8.3756134E-01	1.5009357E+00	-1.3278880E-01	8.9141727E-02	-1.2423933E-01	5.5122195E-01
	1.5267937E-01	-2.1948091E-01	1.8505572E-01	-2.3433182E-01	1.5392425E-01
	-3.3231927E-03	1.8486768E-01	-2.9929697E-02	3.7276389E-02	-3.1341357E-02
-9.4271775E-01	1.2652540E+00	-3.2965775E-01	2.4739663E-01	-2.8112599E-01	2.2387730E-02
	-1.7478155E-01	-1.0969216E-01	7.8620497E-02	-5.3578035E-02	6.6873126E-02
	-1.4469687E-01	1.4225127E-01	-1.9232450E-02	1.3557505E-01	5.7078485E-02
1.1833524E+00	-1.8560040E+00	5.0076545E-01	-4.9199823E-01	3.3877987E-01	-3.3841782E-01
	-1.7690722E-01	2.4012626E-01	-2.4299883E-01	1.5350530E-01	-1.3673174E-02
	8.1101270E-02	-2.3252883E-01	-7.0505150E-02	-1.1084680E-01	8.2505884E-02
6.1148184E-01	-5.6293400E-01	-3.3517114E-01	-2.4100871E-01	1.1099388E-01	2.4530268E-01
	1.3213750E-01	-1.4481129E-01	-1.3122457E-01	2.0088018E-01	-2.0460898E-01
	5.0113918E-02	1.4526063E-02	7.3280278E-02	8.4322190E-02	-9.4849447E-02
-9.8729814E-01	8.3758604E-01	1.4278220E-02	5.1124276E-01	1.6984697E-01	4.4318976E-02
	2.2850405E-02	-1.6518321E-01	2.8579444E-01	-8.5579921E-02	5.9178677E-02
	-8.5963694E-02	6.2998323E-03	1.3277707E-02	-3.7494392E-02	-2.1539753E-02
5.0276278E-02	1.9897440E-01	-1.5304592E-01	1.0619864E-01	-1.8683072E-01	7.8225129E-03
	-8.5424752E-02	6.1756252E-02	3.2099177E-02	-7.7084460E-02	8.4541088E-02
	-9.5290629E-02	3.8708152E-03	2.6970209E-02	4.0188667E-02	4.2392319E-02
2.5164689E-01	-5.2230098E-01	5.7421526E-03	1.2496518E-01	1.0812257E-01	4.0789343E-02
	3.5302335E-03	6.0170916E-02	6.3219571E-02	1.7215938E-01	9.2364894E-04
	7.9621267E-03	2.2194668E-02	-5.1133784E-04	-5.2855281E-02	-7.2487942E-02
4.6657481E-01	-6.3527090E-01	9.1353209E-02	-3.1059035E-01	4.7730801E-03	-1.8557788E-01
	-1.6461180E-C1	1.0442356E-01	-8.9395660E-02	-2.4303042E-02	-1.5401256E-01
	8.9719676E-02	-1.6138940E-02	-1.9539947E-02	-2.2977840E-02	2.8893557E-02
-6.9733650E-01	9.4609698E-01	-8.7623674E-02	2.9152708E-01	-1.4696880E-01	2.7467793E-02
	2.1551781E-01	-4.4197450E-02	-3.0616579E-02	-4.7403921E-02	6.0072652E-02
	-6.5646858E-03	7.5225788E-02	8.1634517E-03	6.1527635E-02	-3.9373159E-02
2.4170759E-01	-3.7328807E-01	1.4185623E-01	-3.8318914E-02	-1.4865403E-02	-8.8416011E-02
	-7.3306703E-02	1.1589907E-02	9.9962852E-02	-1.4082173E-01	8.1125281E-02
	2.6733560E-02	-6.7217628E-03	1.0722060E-02	-7.0856461E-02	3.8541906E-02
2.3105335E-01	-6.2134190E-02	-1.7143113E-01	8.5027481E-03	-1.5229249E-01	6.7476945E-02
	3.0204306E-02	8.9064040E-02	-4.7112400E-02	-6.4961905E-03	-5.5750991E-02
	-2.2310178E-02	2.5003322E-02	-2.8696080E-02	6.7865089E-04	2.4715558E-02
-4.5270188E-02	-1.1691873E-01	1.3910958E-01	-3.4698536E-02	1.0794472E-01	2.2290103E-02
	-2.8251547E-02	-3.0955486E-02	-7.9424856E-02	4.9527631E-02	2.2174573E-02
	7.9037073E-02	-5.5136038E-02	-6.1838034E-02	2.7334575E-02	-1.4028107E-02
-1.4765686E-01	2.7787631E-01	-7.3967605E-02	-4.7692436E-02	-1.0354051E-02	7.1023173E-02
	-7.0291367E-03	1.9806873E-02	-7.4265463E-02	3.9174251E-03	-2.5039928E-02
	-5.2075847E-02	-1.0334088E-02	4.2982020E-02	4.1931161E-02	-3.6971172E-02
9.2563666E-02	-1.8701957E-01	6.8961973E-02	5.5574045E-02	7.7521533E-02	-2.0708449E-02
	6.8948090E-02	-1.2632555E-01	1.0156362E-01	6.1951216E-02	9.1277691E-02
	-2.4224742E-02	1.5291204E-02	-3.3194689E-03	2.2013935E-03	4.2008409E-02
2.6294296E-01	-3.1035498E-01	-5.5279061E-02	-1.3131657E-01	-2.9385557E-02	4.4448441E-02
	-1.0905784E-01	8.0425048E-03	-6.6897203E-03	-1.4149002E-02	-1.3290571E-02
	-3.1818919E-02	-9.1779109E-02	3.0752056E-02	-3.0802516E-03	2.6558251E-02
-3.0548564E-01	3.5499007E-01	-6.3041304E-02	1.8033886E-01	1.3172291E-02	7.6901892E-02
	4.5679878E-02	-2.1481678E-02	-2.2078676E-02	4.3697590E-02	-2.2912600E-02
	-4.5745873E-02	8.3324169E-02	2.4747622E-02	-4.0056375E-03	-6.2714433E-02
1.1967111E-01	-2.1518608E-01	8.3313783E-02	-1.0793774E-01	2.8986689E-02	-1.1267661E-01
	-5.8937273E-02	2.3268717E-02	1.2174754E-02	-1.5498783E-02	-2.2260208E-02
	5.3336419E-02	-4.4716047E-02	-2.2847833E-02	2.8794623E-02	3.4217759E-02
2.2013035E-02	5.5356412E-02	-7.9369879E-03	4.8907919E-02	-3.7592398E-02	3.0369471E-03
	5.2396560E-02	2.1117169E-02	2.8743377E-02	3.4612122E-02	1.1781405E-02
	-5.6840425E-02	8.9265819E-03	3.2774162E-02	1.0683750E-02	-1.4883753E-02
5.8748246E-02	-1.0573069E-01	-2.8067819E-03	2.0389388E-02	-1.1652993E-03	-2.1085240E-02
	1.0530367E-02	-1.3378392E-02	6.4028117E-03	-7.4719604E-04	1.2500581E-02
	7.5979910E-03	2.5106904E-02	-7.2350224E-03	-2.6829814E-02	2.7202199E-03
-3.3337425E-02	3.6790552E-02	5.4031124E-03	-1.3052214E-02	4.2607838E-03	2.3453740E-02
	-6.2946620E-03	2.0000106E-02	-1.4859649E-02	-2.2318266E-02	-1.2112135E-02
	1.2447518E-02	-1.4203063E-02	-1.0414381E-02	6.1226170E-03	8.7757514E-03

Table 26. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, SEPTEMBER-OCTOBER-NOVEMBER (0400-0800 LOCAL MEAN TIME)

ALPHA	BETA
2.1197135E+01	2.6782914E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
3.6466097E+01	5.4118086E+00	-2.4154382E+00	2.2099564E+00	3.0401466E-01	2.7418657E+00
	3.0963414E+00	-1.1909426E+00	2.0799556E+00	-1.5448209E+00	2.2421162E-01
	-1.3270032E-01	-3.3498995E-03	1.4978471E-01	-3.6677109E-01	-3.6727515E-02
-1.0179407E+01	9.9966611E+00	-4.5908116E-01	-1.0344922E+00	-4.8944608E-01	1.6989000E+00
	-1.6039821E+00	8.7373552E-01	7.2712094E-01	2.9403475E-02	4.9675426E-01
	-1.2412383E+00	-1.1741706E-01	-3.2067273E-01	-1.4376564E-01	1.3897678E-01
-4.8192491E+00	-4.8297305E+00	-6.3644864E+00	-1.2060856E+00	1.8052820E+00	1.1135602E+00
	-2.9435788E-01	-2.2490531E-01	-1.4520116E+00	3.2879863E-01	-1.0525868E-03
	5.4305268E-01	4.7734504E-01	-1.8197685E-01	3.4252072E-01	-1.6628119E-01
1.5304106E+00	-7.8314330E-01	1.5969881E+00	-1.4418422E+00	-1.6453196E+00	-1.6552555E+00
	-4.2158795E-01	-1.0362681E+00	-6.4890616E-01	1.1403553E-02	-4.7895464E-01
	6.8129950E-01	-2.0863270E-01	3.6373076E-01	2.0360965E-02	2.9748879E-02
2.1600125E-01	-2.2525654E+00	2.5856215E-01	1.5494596E+00	1.3509603E-01	-8.8078087E-01
	5.3967165E-01	3.0484380E-01	1.3417363E+00	1.1722710E-01	2.8871993E-02
	-2.2726907E-01	-3.6709513E-01	2.9073407E-01	-6.9337728E-02	7.9118115E-02
-1.7136099E+00	2.3333575E+00	-1.3256219E+00	8.2138450E-01	1.0585651E+00	6.3987084E-01
	1.0035944E-01	2.8168448E-01	-1.3637377E-01	-1.2471010E-01	1.3907967E-01
	-1.0196671E-01	3.4838277E-01	-2.5470613E-01	-7.9294390E-03	-1.2845490E-01
-2.6051170E+00	2.4850350E+00	1.0588479E+00	3.8788718E-01	-3.0646396E-01	-1.6564430E-01
	-6.8020025E-01	3.6880345E-01	-2.5133860E-01	-5.4546117E-02	-3.7330655E-02
	-2.4315740E-01	1.5886086E-01	-1.8238361E-01	8.9624657E-02	-9.4485617E-03
1.5599984E+00	-1.6572936E+00	5.9334213E-01	-8.1042147E-01	-6.6337089E-03	-5.8642141E-01
	3.3600332E-01	1.3113896E-01	-5.8246810E-02	5.7501953E-02	-2.3357664E-01
	1.5283899E-01	-1.1682280E-01	1.1408898E-01	3.5839646E-02	8.8955507E-02
5.8729045E-01	-3.1133786E-01	1.0842911E-01	-3.3484872E-01	-3.0342790E-01	-8.3179183E-02
	2.2105486E-01	-1.1797752E-03	-1.1256991E-01	2.7874009E-02	1.9069059E-01
	1.1685509E-01	-9.1628342E-02	-4.9278915E-02	-2.0560335E-01	3.5329799E-02
-1.0548720E+00	1.6731883E+00	1.4692816E-01	3.3296108E-02	-2.6902139E-01	3.3984154E-01
	1.8363520E-01	-7.4573299E-02	1.6273469E-01	-2.0993198E-01	2.0384910E-01
	-1.1097325E-01	4.7019645E-02	1.8630019E-02	7.3199102E-02	-1.4888258E-02
-4.9641081E-01	1.0672325E+00	-2.7014797E-01	-1.0690927E-02	-1.6441579E-01	1.5354075E-04
	-1.6079824E-01	-2.7052081E-01	-1.4163738E-01	1.6357879E-02	-3.7982473E-02
	1.6014987E-02	-3.9671535E-03	-2.6569320E-02	3.8912133E-02	9.2085238E-03
8.3935527E-01	-1.1646184E+00	4.7767469E-01	-3.8050290E-01	3.6161873E-01	-1.8352096E-01
	-1.5047302E-02	1.3063771E-01	-1.1909989E-01	1.7369700E-01	-7.3220729E-02
	7.2380403E-02	-1.0605122E-01	4.3037815E-02	5.4443398E-03	1.1181410E-02
2.4992971E-01	-4.8717702E-02	-3.7888181E-01	6.0396794E-02	2.4680208E-01	2.5057746E-01
	1.5462811E-01	-1.1676331E-01	-8.3900766E-02	9.2813680E-02	-1.4554595E-01
	2.3379136E-02	1.9128390E-02	1.7429943E-02	7.1793596E-02	-9.3484505E-02
-6.9701573E-01	6.6403914E-01	-1.3200576E-01	3.9891391E-01	1.7400161E-01	3.0114486E-01
	-4.0191636E-02	-1.1577251E-01	1.8042917E-01	-5.4583910E-02	9.2444205E-02
	-1.5567066E-01	-1.5203448E-03	-2.9497253E-02	-4.6347981E-02	1.9355861E-02
4.3221484E-01	-4.6648972E-01	-3.4159235E-01	-2.1218709E-01	-1.0689591E-02	-7.3341783E-02
	-3.4442064E-02	-4.2723493E-02	8.8715164E-02	-1.2049377E-01	-3.1302442E-02
	-3.5930489E-02	-8.8358228E-03	6.9822159E-02	-3.2901962E-02	7.2638944E-02
3.4658792E-01	-4.5802012E-01	-9.1337829E-02	-3.5136065E-02	-1.9236278E-02	-2.6982396E-02
	-6.8610159E-02	3.3170618E-02	6.3587606E-02	1.8405001E-01	-1.9560216E-02
	6.9112413E-02	4.2433605E-02	-2.7053981E-02	-1.7748332E-02	-5.8505529E-02
-3.6811385E-02	-1.5894013E-01	-2.4615245E-02	-1.2496023E-01	3.1914051E-02	-1.0509176E-01
	-3.1694018E-02	1.7298299E-01	-1.4593154E-02	-1.2922226E-02	-3.7548241E-02
	2.4769549E-02	9.9339124E-03	7.9919842E-03	9.1696648E-03	-1.0776544E-02
-3.8968845E-01	6.9718998E-01	-9.7545831E-02	1.7320947E-01	-1.8077800E-01	-5.6746752E-02
	5.2973627E-03	-6.5948106E-02	-1.4616563E-02	-4.1648573E-02	6.4307123E-03
	6.8631079E-02	4.9482339E-02	1.1990493E-03	4.1005878E-02	-2.8065404E-02
2.3903307E-01	-3.3097982E-01	7.6565569E-02	-4.9993317E-02	-1.0241080E-[illegible]	-1.0687911E-01
	-8.9213226E-02	2.6691854E-02	5.8885863E-02	-8.4660120E-02	1.5628927E-02
	-5.6826258E-02	-2.2013566E-02	1.0096955E-02	-4.0800815E-02	6.2415151E-02
1.8224209E-01	-5.1626561E-02	-5.0782581E-02	1.0370094E-02	-6.8003849E-02	-2.0792836E-02
	3.8841718E-02	4.6812609E-02	1.1113429E-02	-6.9152677E-02	-6.6712592E-03
	2.5755196E-02	-3.4951220E-03	-1.9019119E-02	-3.7801607E-02	1.6581688E-02
-2.7106593E-01	2.4854933E-01	9.5649022E-02	7.8201332E-02	-1.5258744E-02	1.0287761E-01
	4.1093812E-03	5.0497020E-02	-2.1186342E-02	6.7006283E-02	3.6091185E-02
	1.3288099E-02	-2.3695751E-02	-6.8411764E-02	4.8048477E-02	-3.0693241E-02
-1.5380777E-01	2.0967526E-01	1.1004682E-02	-4.8706414E-02	-3.2072425E-02	-1.3592059E-02
	-4.6979862E-03	3.6296852E-02	-1.0785193E-01	-2.8478460E-02	1.9234234E-02
	-1.0954873E-02	-5.6181026E-03	1.6440243E-02	1.4673550E-02	-1.3692402E-02
4.9797833E-02	-2.2831125E-02	-3.2944901E-02	-7.0805124E-03	-3.3243106E-02	4.7232489E-02
	5.8402760E-02	-9.2952059E-02	1.1945358E-02	3.6977655E-02	8.3523757E-02
	2.8134007E-02	2.3592339E-02	-4.8362395E-03	1.8962636E-02	1.3759592E-02
8.5367812E-02	-1.7331256E-01	-2.5754212E-02	-7.4430949E-02	3.8201094E-02	5.2688129E-02
	-2.9757704E-02	-3.7778490E-02	-5.5249206E-02	-4.4005758E-02	2.2081316E-02
	-4.8160662E-02	-4.3123489E-02	2.5863611E-02	-2.6411141E-02	3.2564928E-02
-1.2879752E-01	1.9203358E-01	-1.0724396E-01	6.2050771E-02	6.8410740E-02	5.7793956E-02
	3.9417856E-02	-5.4836606E-02	-2.7746009E-02	-3.8648717E-03	-4.5325952E-03
	1.0515187E-02	1.9584212E-03	1.4576540E-03	1.0584547E-02	-1.8490415E-02
-9.2076323E-02	2.1304658E-02	6.9152758E-02	-5.2168239E-02	5.0410474E-02	9.4497794E-03
	-3.8873491E-02	-3.9996564E-03	-3.9755741E-02	2.4419270E-02	-5.3855764E-02
	-3.1180686E-02	-3.2272774E-02	-1.6905030E-02	4.2080586E-02	1.2863433E-02
3.4219512E-02	-1.8595602E-02	-3.7887693E-02	-9.8348767E-03	5.4423926E-02	-1.3608675E-02
	1.5599120E-02	1.9053205E-02	2.0525460E-02	3.4527896E-02	-1.9020914E-02
	-1.3292570E-02	2.7447059E-02	3.0869709E-02	-6.2843310E-04	-1.7877773E-02
7.9310644E-03	1.7095734E-02	-1.9352645E-02	-2.8996505E-03	-2.7471338E-02	-1.8122714E-02
	8.1714637E-04	1.2245628E-02	3.6453215E-02	1.1493480E-02	5.8492973E-03
	8.9070589E-03	5.6999536E-03	-8.4453999E-03	-9.0765250E-03	-9.7887454E-04
-3.7937143E-02	5.8843871E-02	-1.6645059E-02	-5.5152882E-03	1.5540160E-03	-3.7547023E-03
	1.2212623E-04	4.5832944E-03	4.1044916E-04	-2.1006961E-02	-7.3278420E-03
	-4.4337488E-03	8.5647081E-04	2.6614693E-03	-2.8822968E-03	5.1293906E-03

Table 27. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, SEPTEMBER-OCTOBER-NOVEMBER (0800-1200 LOCAL MEAN TIME)

ALPHA	BETA
2.2300793E+01	-2.5533825E+00

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
2.2950836E+01	-3.4002946E+00	-1.9257417E+00	7.2037245E+00	-3.8366361E+00	-2.9668267E+00
	3.1643618E+00	-2.1209732E-02	3.1134871E+00	-9.0799082E-01	9.4691864E-01
	-1.5211835E-02	-1.1921470E-01	3.0388362E-01	-3.3816202E-01	3.0695734E-01
-9.1392735E+00	8.9015712E+00	-9.6625241E-01	7.5853762E-01	-4.7882617E-02	4.0109252E+00
	-3.4059864E-01	1.8683047E-02	4.7055829E-01	-5.4035857E-01	5.1395089E-01
	-1.4323029E+00	-9.1410459E-02	-4.4717173E-01	-1.9955098E-01	2.1567753E-01
-7.1079927E+00	-6.0789762E-01	-5.4403368E+00	-2.4956105E+00	1.9363929E+00	1.1704691E+00
	-1.4831882E+00	3.6242999E-01	-2.8685970E+00	8.9317123E-01	-8.1676959E-01
	3.2340847E-01	6.6972929E-01	-5.9876513E-01	4.1172884E-01	-4.5299605E-01
4.2235205E+00	-2.3310527E+00	1.4124275E+00	-2.4976267E+00	-2.0090221E+00	-3.9045362E+00
	1.0352293E-01	-7.1434088E-01	-4.4950417E-01	4.6958195E-01	-4.2846385E-01
	1.1398392E+00	-2.7828448E-01	6.4280930E-01	3.0287608E-01	3.8532056E-02
3.2297715E+00	-3.1859030E+00	1.0441447E+00	2.4495013E+00	6.4440614E-01	-5.6181571E-01
	6.7681265E-01	-5.5298009E-01	2.2136212E+00	-5.7105515E-01	3.0344413E-01
	-1.9594718E-01	-6.6566684E-01	6.7301806E-01	-4.3095218E-01	3.2004296E-01
-2.9225399E+00	3.7006464E+00	-8.4001440E-01	1.3138999E+00	1.5570472E+00	1.7396221E+00
	-1.4474071E-01	8.0185301E-01	5.0894843E-02	-2.3181270E-01	4.4328459E-01
	-3.9526478E-01	5.9842211E-01	-5.0472590E-01	-2.9992671E-01	-2.3650231E-01
-4.0845485E+00	4.8705713E+00	4.2824908E-01	4.0983563E-01	-7.6176083E-01	2.8464081E-01
	-7.3750800E-01	2.7739019E-01	-8.8122275E-01	-5.6452831E-02	-7.7670738E-02
	-3.7779260E-01	2.0037806E-01	-4.7253052E-01	3.5970631E-01	-7.8291007E-02
3.0178260E+00	-3.9798952E+00	9.4645755E-01	-1.5132766E+00	2.7834565E-01	-1.0537033E+00
	7.8525836E-04	-1.9316355E-01	-1.1928374E-01	2.5860872E-01	-5.8337266E-01
	2.6722227E-01	-4.5829763E-01	2.9993162E-01	1.6071952E-01	1.7476452E-01
3.2197184E+00	-3.4606934E+00	-2.5875382E-01	-1.0491603E+00	-2.5250994E-01	-3.8758461E-01
	5.6347331E-01	1.2841095E-02	1.8296211E-01	1.1622674E-01	1.9482273E-01
	5.5532974E-01	-1.5690982E-01	2.8015141E-01	-2.7077961E-01	-4.6819314E-02
-3.4804259E+00	4.6715128E+00	-4.2093451E-01	1.2339068E+00	-3.1596567E-01	1.0339656E+00
	2.8998910E-01	-1.9315851E-01	2.4358742E-01	-4.2199761E-01	3.9720284E-01
	-2.6999422E-01	2.4681577E-01	-1.1030591E-01	-3.9254105E-02	-1.6134401E-01
-6.0089014E-01	8.5743017E-01	-2.6084243E-01	2.9803978E-01	2.8774431E-02	6.3432760E-02
	-3.9121017E-01	-1.9326856E-01	-1.0062364E-01	1.9593851E-02	-5.3947223E-02
	-2.9775407E-01	2.4615455E-01	-1.6917299E-01	1.5375083E-01	2.2474146E-01
2.0100120E+00	-2.5112497E+00	3.4487880E-01	-9.2604993E-01	1.1215001E-01	-6.3228951E-01
	-1.0802616E-01	2.2485605E-01	-2.8063103E-01	3.8405418E-01	-3.7782255E-01
	1.1371817E-01	-1.7622770E-01	-3.2125769E-02	1.1472364E-01	1.0654514E-01
4.2334462E-01	-6.2682309E-01	7.6415959E-02	-1.9243282E-01	4.9018268E-01	3.9215269E-01
	3.5553874E-01	1.9646986E-01	-4.2828571E-02	1.4725750E-01	-6.1299772E-02
	2.0672273E-01	-1.3849188E-01	2.3924645E-02	-7.1546061E-02	-2.9556774E-01
-1.6253647E+00	1.9907573E+00	-3.3515275E-01	7.6231618E-01	-9.8343188E-02	1.0202716E-01
	-1.7176497E-02	-3.0955696E-01	3.0522238E-01	-1.7537319E-01	3.0184419E-01
	-4.8410374E-02	3.9514203E-02	6.8436303E-02	-7.2656568E-02	2.1178056E-03
-5.4218323E-03	2.0106399E-02	-2.1544057E-01	-2.0830048E-02	-3.7460671E-01	-2.2367705E-01
	-2.0206060E-01	-1.3599341E-01	1.4125859E-01	-2.7311877E-01	7.1158152E-02
	-2.0753329E-01	4.4071570E-02	9.8321447E-02	-2.2291593E-02	1.7608311E-01
1.3305853E+00	-1.6406624E+00	8.0532887E-02	-3.4681896E-01	1.1923666E-01	-4.3198271E-02
	-1.9621330E-01	2.4341772E-01	-1.2068712E-01	1.5051435E-01	-7.8837926E-02
	2.8192412E-02	7.8996346E-02	-2.6731632E-02	-2.5801767E-02	-4.8259050E-03
-4.3687064E-01	3.8819712E-01	1.0828979E-01	4.5533824E-02	1.6444169E-01	3.7468838E-02
	5.9846669E-02	1.9660840E-01	-1.4799385E-01	1.3512132E-01	-1.2415581E-01
	9.9058425E-02	2.3696932E-02	-1.3705330E-01	8.1704560E-02	-6.4932969E-02
-8.9154362E-01	1.2372379E+00	3.0595270E-02	2.5302724E-01	-4.2426063E-03	-1.0508626E-02
	1.8023683E-01	-1.2049773E-01	7.2704847E-03	-1.1149256E-01	-1.7247069E-02
	1.7408246E-02	-9.5763842E-02	-1.4990563E-03	1.3683302E-02	-5.0103371E-02
4.5893032E-01	-4.2095238E-01	-1.3143370E-01	-5.7960139E-02	-1.8842049E-01	-6.0448902E-02
	2.0608605E-02	-1.3251858E-01	1.9298931E-01	-9.1978979E-02	7.2571334E-02
	-3.9164790E-02	1.8286570E-03	1.5148454E-01	-5.6150612E-02	5.3434406E-02
6.2346331E-01	-8.0082976E-01	-8.2841234E-02	-2.2694313E-01	-7.8718771E-02	3.2019978E-02
	-3.9770369E-02	-8.1800553E-03	-3.7816287E-02	-3.0231092E-02	6.9991814E-02
	3.1470863E-02	5.1351534E-02	-2.1798551E-02	-5.9740113E-02	6.5437441E-02
-5.1032821E-01	6.2409660E-01	1.0971721E-01	8.6903587E-02	9.3771199E-02	1.0431606E-01
	-4.7965495E-02	1.2834976E-01	-1.8482276E-01	1.1487465E-01	-1.0776687E-03
	-2.2229133E-03	-3.8314528E-02	-1.4280670E-01	5.3765661E-02	-4.9932043E-02
-4.2297503E-01	4.9769562E-01	5.5034688E-02	2.0411808E-02	8.0491004E-02	7.1906962E-03
	3.5907255E-02	7.1346566E-03	-2.4884900E-02	2.4664905E-02	-6.3351069E-02
	-1.9594874E-02	1.7335009E-02	2.7077368E-02	9.5221585E-02	-3.7018020E-02
4.1909126E-01	-4.9158484E-01	-7.3807266E-02	-8.5515776E-02	2.2215825E-02	-6.9699207E-02
	7.8993642E-02	-1.4995336E-01	1.0284060E-01	-1.0739358E-02	-4.8142780E-03
	2.4724351E-02	-7.5780859E-02	7.1766140E-02	-3.5610991E-02	3.0977390E-02
1.6443392E-01	-1.9821873E-01	-1.1104785E-01	4.9844064E-02	-3.6011775E-02	5.8492706E-02
	-5.3910603E-02	1.2445299E-02	8.2897476E-02	-1.0934376E-02	3.9890124E-02
	-6.0941916E-02	-1.7060278E-02	3.5636060E-02	-5.0794112E-02	8.9277297E-05
-2.6794420E-01	2.9726924E-01	-3.1723433E-02	6.2263917E-02	-1.6717534E-02	9.9597651E-06
	-8.9061377E-02	5.4464663E-02	-4.5790113E-02	-1.6952588E-02	-3.4432365E-03
	-4.1528293E-03	9.2226435E-02	-2.7812626E-02	2.0839458E-03	-5.1555562E-03
-1.5305537E-01	1.4881675E-01	7.6613747E-02	-5.6536117E-02	5.5943853E-02	-6.2698019E-02
	1.4952970E-02	4.2089352E-02	-4.2607237E-02	5.5964583E-02	-3.2681327E-02
	1.6774334E-02	2.5026937E-02	-5.3464765E-02	6.2876258E-02	8.2047233E-03
1.9272050E-01	-2.0253436E-01	5.1275147E-02	-5.9003271E-02	6.3132963E-02	-2.3232978E-02
	4.8586906E-02	1.0452950E-02	4.4245154E-02	4.8063517E-02	-1.1241816E-02
	3.6398497E-02	-3.5100803E-02	3.8647235E-02	-1.8570209E-02	-3.8975928E-02
-6.9959331E-03	2.8499173E-02	-4.5716623E-02	1.2919879E-02	-3.5802532E-02	1.3317463E-03
	-1.1309107E-02	-6.3640941E-04	-1.5571141E-03	-1.1320695E-02	3.8621945E-04
	6.5891716E-03	-1.3799662E-02	3.0336787E-03	-1.8223533E-02	8.1932947E-03
-3.2764999E-02	3.9875707E-02	-2.4070849E-02	4.7008943E-03	-1.5082368E-03	9.2091355E-03
	1.1829309E-02	-1.8405807E-02	-3.1809635E-03	-2.7649729E-02	7.0996992E-03
	-1.8431385E-02	1.2232995E-02	-1.1964854E-02	8.2835901E-03	1.2051660E-02

Table 28. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, SEPTEMBER-OCTOBER-NOVEMBER (1200-1600 LOCAL MEAN TIME)

ALPHA	BETA
2.6960355E+01	-5.4558973E-01

CHI	MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS				
3.1660528E+01	-1.6568551E+01	1.2822688E+00	8.7841620E+00	-3.3521263E+00	-2.4464930E+00
	5.3302462E+00	7.1213044E-01	3.1499430E+00	-9.3296152E-01	4.2041691E-01
	-2.1931310E-01	-5.1112875E-01	1.3628828E-01	-8.7497675E-04	4.2875179E-01
-4.4674246E-01	1.5032706E+00	-1.4243749E+00	-3.2853873E-01	-1.5982815E+00	4.1521796E+00
	-1.5038329E+00	-5.0846216E-01	1.0381451E-01	-1.0745557E+00	7.4660666E-01
	-6.9366584E-01	2.1879342E-01	-1.5055552E-01	-1.6119553E-01	3.0955961E-01
-6.6648506E+00	-2.0745845E+00	-5.4663866E+00	-1.8931599E+00	2.2763190E+00	1.2457877E+00
	-1.7605505E+00	1.1950224E-01	-2.7397089E+00	6.7368191E-01	-4.8872091E-01
	2.9978026E-01	5.7361667E-01	-4.6184906E-01	3.1149547E-01	-3.3854485E-01
1.2638935E+00	1.0655592E+00	1.7295372E+00	-1.5753371E+00	-1.5835065E+00	-2.7350060E+00
	7.3686397E-01	-7.4983432E-02	1.0941446E-01	9.4884064E-01	-5.4232363E-01
	4.1984178E-01	-3.2967954E-01	3.4804285E-01	4.0318086E-02	-1.7993637E-01
3.4154751E+00	-4.3303341E+00	8.6009722E-01	2.4844767E+00	-5.5324141E-01	-7.3756099E-01
	-2.3728883E-01	-6.8435523E-01	2.0226034E+00	-2.9278969E-01	4.4338178E-01
	7.7569613E-02	-3.9376911E-01	6.5938337E-01	-3.3376285E-01	1.2073435E-01
-3.4980451E+00	4.1425907E+00	-3.1378167E-01	6.4522224E-01	1.4335263E+00	8.0142795E-01
	-3.5599806E-01	1.6196020E-01	-5.0395114E-01	-5.4747987E-01	4.7978941E-01
	-2.5602930E-01	4.2188471E-01	-2.2444105E-01	4.1029023E-02	6.8544026E-02
-3.1835627E+00	3.9833424E+00	7.3169413E-01	7.3772580E-01	1.7184995E-01	2.9847298E-01
	1.1282589E-01	5.1120184E-01	-6.2989708E-01	9.0014078E-02	-3.4193467E-01
	-4.0123694E-01	-1.1864238E-03	-6.4383570E-01	1.5818394E-01	1.9775558E-02
2.7566109E+00	-3.6982245E+00	4.8085714E-01	-1.3342442E+00	1.0844852E-01	-9.5105423E-01
	2.4960971E-01	-1.8274711E-01	-1.8670361E-01	2.5187871E-01	-7.0665395E-01
	4.5382274E-01	-2.7301049E-01	1.8048524E-01	1.4376825E-01	2.4671402E-03
2.4811690E+00	-2.5068844E+00	-3.6915346E-01	-7.0047724E-01	-2.6015440E-01	-2.0491789E-01
	1.9508536E-C1	-4.9032967E-02	1.3854809E-01	2.8694613E-02	2.5456111E-01
	3.5023123E-01	-6.0617522E-02	2.9631062E-01	-2.3470592E-01	-6.4479003E-02
-2.3164187E+00	2.9602289E+C0	-1.2374168E-01	7.4471494E-01	-2.8661382E-01	8.7370251E-01
	-3.1347539E-02	6.5825770E-02	3.6004194E-01	-1.8239491E-01	6.5123516E-01
	-2.9148001E-01	3.0071727E-01	-9.2257626E-02	-6.1528986E-02	-2.0812160E-02
-6.9050175E-01	1.0560840E+00	-3.7005179E-01	2.2686445E-01	-1.5743134E-01	3.1041708E-02
	-1.4241091E-01	-2.6023124E-01	-1.5570405E-01	-1.7316566E-01	2.8409384E-02
	-1.9403065E-01	9.6186583E-02	-3.5190596E-02	1.6299472E-01	1.3233682E-01
1.5129502E+00	-2.0032376E+00	3.7516392E-01	-4.9575301E-01	3.0672296E-01	-4.5502263E-01
	9.6570132E-03	4.8492055E-02	-2.5083060E-01	2.1867986E-01	-5.3861601E-01
	1.5379050E-01	-2.4845022E-01	5.8037977E-02	1.1036055E-01	1.6643879E-03
7.2934553E-01	-9.6212354E-01	-1.7395620E-02	-2.3177526E-01	3.0861459E-01	3.6305592E-01
	1.3570119E-01	1.8856936E-01	-5.1386287E-02	2.0433942E-01	-3.4156920E-02
	9.9691445E-02	-7.8846248E-02	-4.4814914E-02	-6.3289502E-02	-1.7078633E-01
-1.5166962E+00	1.7723770E+00	-2.5299096E-01	6.7110599E-01	-8.4307309E-02	1.3722644E-01
	-1.0847735E-01	-1.8000706E-01	2.9637849E-01	-2.0429095E-01	2.8631568E-01
	-1.9931464E-01	5.0647752E-02	3.6725316E-03	-1.3480152E-01	6.0010395E-02
3.1877066E-01	-3.8135663E-01	-2.5013714E-01	-2.2588468E-02	-3.1473479E-01	-2.1388066E-01
	-5.7884080E-02	-1.1624506E-01	8.3931357E-02	-1.7882604E-01	1.9924149E-02
	-1.3885430E-02	9.0223360E-02	6.2487306E-02	3.8122145E-02	1.1569990E-01
9.0258706E-01	-1.0966493E+00	8.8638643E-02	-2.3518976E-01	4.2174638E-02	-1.3983371E-01
	-4.8824078E-02	1.5187994E-01	-3.0436216E-02	1.6566887E-01	-5.0811168E-02
	1.0927678E-01	-3.6214761E-03	1.4771763E-02	9.1111984E-03	-7.1551065E-02
-3.7134049E-01	1.5557548E-01	1.5481030E-01	4.1419662E-02	2.3317758E-01	7.6716839E-02
	9.0040411E-03	1.9939818E-01	-6.1377436E-02	1.1188821E-01	-1.1382666E-01
	2.3455731E-02	1.1762608E-02	-5.9203249E-02	2.2515393E-02	-5.6750923E-02
-6.9815279E-01	9.8406675E-01	1.7059503E-02	1.8758054E-01	-6.4930752E-02	1.3896535E-02
	1.0125784E-01	-1.2140002E-01	-1.0681408E-01	-9.9611319E-02	4.1700074E-02
	-2.0602318E-02	2.5098890E-02	-4.9220356E-02	1.4741921E-03	3.0934553E-02
5.7204818E-01	-6.2206413E-01	-3.2087865E-03	-7.5892270E-02	-1.2040711E-01	-8.2458218E-02
	-1.8543263E-02	-8.1444379E-02	1.4632558E-01	-9.3561253E-02	1.2205148E-02
	-6.9514614E-02	-6.5670940E-02	6.9686730E-02	-5.3382667E-02	5.9337099E-02
3.9704932E-01	-4.6826608E-01	-4.8016633E-02	-1.2725549E-01	-4.9046995E-02	1.9954919E-03
	3.8928090E-02	-2.3517641E-02	-1.9083382E-02	-2.0113754E-02	2.5755534E-02
	1.0156321E-C1	-6.5714795E-03	8.3308514E-03	-2.9021665E-03	-1.3133963E-03
-5.4805361E-01	6.5157666E-01	1.1889404E-02	8.3034018E-02	6.3866455E-02	1.0746838E-01
	-6.6026930E-03	7.7742123E-02	-1.2372421E-01	1.2329858E-01	5.1050788E-02
	8.2834107E-03	5.5297695E-03	-5.8817698E-02	4.6308689E-02	-4.9428440E-02
-2.2394118E-01	2.0565005E-01	7.7572786E-02	-1.4876258E-02	4.9586976E-02	4.4978706E-02
	-5.9284436E-02	4.5930516E-02	-1.0532203E-02	2.2664718E-02	-4.9912185E-02
	-6.8090863E-02	5.1450015E-02	-5.6614850E-03	4.5349530E-02	-1.1994229E-02
5.1575453E-01	-5.4486662E-01	-7.1157340E-02	-7.9572660E-02	1.3109365E-02	-9.3232946E-02
	9.8542993E-02	-1.3727402E-01	4.7250204E-02	-3.3950998E-02	5.4683889E-03
	3.8856425E-02	-6.3500940E-02	2.0095266E-02	-4.0062370E-02	4.5884116E-02
1.9087851E-01	-3.0179973E-01	-6.7117404E-02	-7.6426447E-03	2.5102638E-02	3.3102600E-02
	-4.5038737E-02	-1.2400204E-02	3.7185909E-02	-2.2647063E-02	4.0514569E-03
	-3.3048209E-02	-4.2328151E-02	6.7605611E-02	-1.9038488E-02	1.0276281E-02
-3.8373033E-01	4.6255694E-01	-2.0404707E-02	1.5729942E-01	2.1382654E-02	3.6227776E-02
	-4.1905897E-02	5.4235645E-02	-1.5306902E-02	4.8121028E-03	-2.2318468E-02
	-1.1818343E-02	6.5280682E-02	-2.9310395E-02	5.4527053E-03	-4.4712272E-02
-6.1477182E-02	4.4476514E-02	1.6826144E-02	-1.5593728E-02	-1.0585024E-02	-5.3625580E-02
	-2.1738253E-02	3.3246682E-02	2.8186572E-03	4.5698849E-02	-1.6301876E-02
	-6.6869368E-03	2.2977768E-02	-3.1809587E-02	6.2098665E-02	1.4132074E-02
3.5964987E-01	-4.5518870E-01	-1.7864898E-02	-1.0641030E-01	1.2495386E-02	-3.2454960E-02
	3.6400182E-03	2.7310012E-03	2.3491000E-02	4.6861499E-03	2.4484715E-02
	3.7514350E-02	1.5322394E-03	3.6850130E-02	-3.7480884E-02	5.1251013E-03
4.9642956E-02	-4.7179288E-02	-7.7016576E-03	-9.0565085E-03	-1.8811011E-02	-1.0919827E-02
	9.8329219E-03	-3.0439447E-03	-7.9121796E-03	-8.0316277E-03	6.9356194E-03
	7.9641400E-03	-8.4888286E-03	-9.1218469E-03	-2.7972920E-02	4.1427883E-03
-7.7281132E-02	8.3416524E-02	-1.4571639E-02	4.6716127E-02	7.2535894E-04	2.6448819E-02
	1.0043403E-02	-1.0686190E-02	-2.4084230E-03	-1.1381113E-02	-5.8354800E-03
	-1.4354176E-02	1.8584034E-03	-7.9706093E-03	2.1013494E-02	6.4268553E-03

Table 29. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLD•IDE DISTRIBUTION OF ATMOSPHERIC RADIO NOISE, SEPTEMBER-OCTOBER-NOVEMBER (1600-2000 LOCAL MEAN TIME)

ALPHA	BETA
2.8189296E+01	4.0539214E+00

CHI	MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS				
4.4441006E+01	-1.8943956E+01	5.9416724E-01	4.7874041E+00	-2.7964796E+00	-3.5155526E-01
	4.4301469E+00	7.9935189E-01	1.8583571E+00	-1.0854528E+00	1.7388747E-01
	8.8710671E-01	-1.1608839E-01	-4.0558179E-03	3.1848953E-02	-5.8387452E-03
-2.3198441E+00	1.9901361E+00	-9.1019043E-01	2.1411791E-01	-2.2519515E+00	4.0777703E+00
	-1.6565317E+00	4.2297638E-02	9.1311696E-01	-2.1500948E-01	2.8056079E-01
	-8.6108610E-01	-5.3185602E-01	-2.9765009E-01	-1.5319792E-01	-1.9487999E-02
-8.2396274E+00	-4.9131605E-01	-5.6729630E+00	-5.1377554E-01	3.5398557E+00	5.7748137E-01
	-4.7102986E-01	-1.6579265E-01	-1.4662698E+00	4.4425355E-01	5.5147369E-04
	2.8877610E-02	4.5272159E-01	-1.8217523E-01	5.4709434E-02	-2.1615975E-01
1.9215127E+00	-1.3119798E+00	1.6497053E+00	-1.3315028E+00	-2.2404315E+00	-2.1927538E+00
	-1.5427697E-01	-7.6685912E-01	-8.4754586E-01	2.6905999E-01	-2.5854818E-01
	4.3641822E-01	1.6236363E-01	3.7882307E-01	2.0213413E-01	1.4979667E-01
1.6647489E+00	-5.0289237E+00	3.0380360E-01	2.3960636E+00	-1.0794981E-01	-2.4981643E-02
	-7.3231070E-01	-2.9436889E-01	1.3415179E+00	-8.9048017E-02	-1.4610407E-01
	7.2287217E-03	-6.1041189E-01	2.7446879E-01	4.7478686E-02	9.8007734E-02
-2.0527857E+00	1.9258526E+00	-1.3213263E+00	4.7633251E-02	1.5887766E+00	3.8279198E-01
	2.3655989E-01	5.4041306E-01	7.8641412E-02	-1.5415964E-01	2.9665029E-01
	1.1055162E-01	3.2856800E-01	-1.3877028E-01	-8.5350955E-02	-2.3329192E-01
-1.6767645E+00	1.7427453E+00	9.9212309E-01	4.9571722E-01	-4.3768172E-01	-4.3607937E-01
	-1.2056648E-01	4.9337805E-01	-7.3661454E-02	9.3881016E-02	8.6826166E-02
	-2.9389308E-01	2.4796151E-01	-1.2888572E-01	6.0414722E-02	-4.1870127E-02
1.8415646E+00	-1.9053806E+00	7.9817119E-01	-4.1519729E-01	-5.3729068E-02	-5.6700416E-01
	-4.2163926E-02	5.3220001E-02	-1.7512658E-01	-7.1053642E-02	-3.7012688E-01
	-1.5845862E-02	-2.4695605E-01	2.5158395E-02	-2.0023462E-02	2.0246048E-01
8.6634810E-01	-3.9690307E-01	1.9947321E-01	-2.5333205E-01	-1.9758295E-01	1.5490983E-01
	3.9036622E-01	-4.0516296E-02	-2.9937166E-01	-1.1926919E-01	1.5905671E-01
	1.7935985E-01	-1.2621611E-01	4.8190204E-02	-1.4721944E-01	-1.0369149E-02
-1.2414726E+00	1.8786580E+00	9.4863285E-02	1.1535257E-01	-3.0164284E-01	5.1167519E-01
	3.6823652E-01	-1.2844815E-01	2.6179485E-01	-3.8506109E-02	9.2621819E-02
	1.1611413E-02	1.0460986E-01	2.7791908E-02	1.7195785E-01	-1.3585789E-01
-7.2168532E-01	1.1455597E+00	-2.6227333E-01	5.2788304E-02	-3.4402127E-01	1.0332355E-01
	-1.6836465E-01	-1.7608879E-01	-7.8836277E-03	4.6961777E-02	-3.8278539E-02
	-5.2353080E-02	7.3068095E-02	-8.6284495E-02	-2.3594660E-03	1.8773070E-03
4.8354770E-01	-1.0976426E+00	4.9934936E-01	-2.4439068E-01	4.4686919E-01	-1.0095404E-01
	-6.0852406E-02	1.8534781E-01	-1.9126986E-01	8.1746190E-02	6.1054327E-02
	-8.7362344E-03	-1.6703561E-01	4.5190516E-02	-1.3275689E-01	8.2158528E-03
9.5958559E-01	-9.7166080E-01	-2.7449288E-01	-3.2536156E-01	8.6165270E-02	1.7377851E-01
	2.6846896E-02	-2.5282415E-01	-1.9795500E-01	4.1342031E-02	-1.3986432E-02
	4.6877129E-02	-1.4672588E-04	9.0506322E-02	8.3495596E-02	-1.6476817E-02
-5.5161075E-01	4.1472670E-01	-7.6933203E-02	3.7821805E-01	1.8934363E-01	1.0627341E-01
	1.4427198E-01	-1.4821495E-01	2.4122550E-01	7.7360411E-02	9.9402848E-02
	-1.2977829E-01	-6.3934202E-02	-2.0771077E-02	9.9136697E-02	5.4664703E-02
2.3056200E-01	-1.3010759E-01	-3.6747480E-01	1.1881091E-02	3.8538861E-02	3.0380041E-02
	-7.3975421E-02	1.1317427E-02	9.0255022E-03	-3.1075021E-02	-8.1958334E-02
	-2.4772538E-02	3.2327216E-02	-1.4714294E-02	3.8849221E-02	2.6521747E-02
5.3390546E-01	-7.9747546E-01	-1.1786494E-01	1.2778688E-01	8.4158794E-02	-8.0315170E-02
	-1.2506625E-01	7.9404435E-02	1.2768147E-01	6.5215589E-02	-5.4550843E-02
	5.0544038E-02	9.9294308E-02	6.0769614E-03	-1.0261416E-01	-6.8221473E-02
3.6896325E-01	-6.9677672E-01	3.5850031E-02	-2.0381372E-01	4.9308490E-02	-2.0883051E-01
	-1.3227158E-01	1.9425143E-01	1.0751909E-01	-2.3381003E-02	-9.1878346E-02
	-3.0835425E-03	-2.9447233E-02	6.5356420E-02	-5.3938035E-02	1.1542880E-02
-5.2078267E-01	9.1278704E-01	-1.7225622E-01	1.9129626E-01	-2.2218361E-01	5.8983492E-02
	6.6797000E-02	-2.5201168E-02	-6.1909133E-02	-1.5927566E-02	1.8492927E-02
	8.2385293E-02	6.3290661E-02	-3.4680384E-02	3.9116920E-02	-5.1460545E-02
-1.3455877E-02	5.5154981E-02	6.8010888E-02	7.7822117E-02	-8.5385925E-02	-4.8248913E-03
	5.0466802E-02	3.9144945E-02	2.7895029E-02	-5.5511556E-02	-3.9987120E-02
	2.1439103E-02	-3.4199932E-02	-3.6686503E-02	1.2682351E-02	-1.1250573E-02
3.5866291E-01	-2.4270067E-01	-7.6864208E-02	-4.1652975E-02	-1.5369044E-01	-7.3910622E-02
	-3.9481021E-02	-1.2123461E-02	-3.9894723E-02	-9.9468884E-02	-2.3310940E-04
	1.8002597E-03	2.3084635E-03	-3.0639844E-02	-4.2524233E-02	6.6944890E-02
-2.5868556E-02	-9.4179077E-02	9.3179514E-02	3.2303686E-02	9.4948873E-02	-1.3350162E-02
	9.9065696E-02	5.1595642E-02	-4.3819191E-02	-3.9202159E-03	7.7803035E-02
	1.1062666E-02	-2.0144241E-02	-1.7177498E-02	-1.9774758E-02	1.3191551E-02
-3.6300380E-02	8.8875065E-02	-8.4879795E-02	-1.0660085E-01	-1.3950207E-03	1.5049578E-02
	-7.7218108E-02	1.5679959E-02	-1.0698432E-01	1.1326995E-02	4.5173640E-03
	-2.5937452E-02	7.0129644E-04	2.8971776E-02	5.8122485E-02	-1.7592093E-02
7.7133877E-02	-5.9688707E-03	-3.4412863E-02	2.4351962E-02	3.4112390E-02	5.3569639E-02
	8.2485895E-02	-1.0896268E-01	5.6721041E-02	1.0494579E-01	1.0393041E-01
	2.7315172E-02	-1.2919021E-02	-4.4282124E-02	6.1385814E-02	2.3158306E-02
1.8366373E-01	-3.1159563E-01	-4.2856644E-02	-7.9705654E-02	4.4488246E-03	4.8804349E-02
	-5.8704266E-02	-6.3010452E-02	-4.9257102E-02	-3.9996721E-02	-1.9858969E-03
	2.7515881E-03	-6.0974981E-02	2.5971388E-02	-1.8723458E-03	2.6666566E-02
-2.4033463E-01	2.6949342E-01	-1.1202242E-01	1.7643684E-01	4.1225921E-02	1.0721462E-01
	-2.8834219E-02	-2.7762672E-02	1.3914280E-02	-4.2192989E-03	1.8853310E-02
	-4.9974599E-02	5.2651514E-02	1.5370949E-02	-3.1391021E-02	-3.2786603E-02
-8.9184623E-02	-2.5784407E-02	1.0133282E-01	-1.5096875E-02	2.8554590E-02	-4.8701365E-02
	-4.3024709E-02	1.2505942E-02	-7.4759813E-03	3.2190348E-02	-4.3458749E-02
	-3.9133324E-02	-4.6329859E-02	-1.4404910E-02	9.2085143E-03	1.2859157E-02
7.6292177E-02	-3.1215385E-02	-4.1486021E-02	1.7916858E-02	2.3870573E-02	4.3277552E-02
	3.6015965E-04	-1.3269238E-02	-8.9882311E-03	4.6666272E-02	-3.7114377E-02
	-9.6062791E-03	7.8128086E-03	3.8593658E-02	1.5042105E-02	-3.3362974E-02
5.3945394E-02	-6.9977698E-02	-2.1014967E-02	8.4910389E-03	-1.2759798E-02	-9.5421755E-03
	3.2308006E-02	2.2971673E-02	2.9116360E-02	1.3190550E-03	7.8095355E-03
	8.6173962E-03	1.1927347E-02	-3.7368830E-03	-1.0048046E-02	-2.5570310E-03
7.7567852E-03	-2.6587513E-02	1.2122052E-02	-6.9886383E-04	-1.1186286E-02	-1.4139573E-02
	-3.3346652E-03	2.2012294E-03	-5.4870425E-03	-2.9878650E-02	-4.2684390E-03
	4.2595576E-03	4.1005204E-03	-5.9681758E-03	1.8661832E-03	1.3883057E-02

Table 30. FOURIER COEFFICIENTS REPRESENTING THE 1 MHZ WORLDWIDE DISTRIBUTICN OF ATMOSPHERIC RADIO NOISE, SEPTEMBER-OCTOBER-NOVEMBER (2000-2400 LOCAL MEAN TIME)

ALPHA	BETA
3.6375289E+01	9.1055690E-01

MIXED LATITUDINAL AND LONGITUDINAL COEFFICIENTS

CHI					
4.6623578E+01	-1.1220527E+01	2.7255765E+00	4.1676803E+00	-3.2138059E+00	5.9727242E-02
	4.7519825E+00	8.5440877E-01	2.5247027E+00	-1.3457560E+00	1.5836370E-01
	2.8041886E-01	-1.6453436E-01	-3.0455993E-01	-4.4500492E-01	2.2837695E-01
-5.1148686E+00	5.6479201E+00	9.3812575E-01	3.9338109E-01	-2.4692222E+00	2.6197186E+00
	-1.4068140E+00	5.2010240E-01	3.2792268E-01	7.2352713E-02	4.6390655E-01
	-1.2148393E+00	-1.0502782E-01	-1.2951898E-01	-1.3478482E-01	-9.4609455E-02
-2.1658035E+00	-4.8466249E+00	-3.5196868E+00	1.0244509E+00	2.4346682E+00	1.3244230E-01
	-1.1682012E+00	-2.7361442E-01	-1.6450782E+00	7.0504859E-01	4.3765848E-02
	4.2365958E-01	5.0274676E-01	-1.8299240E-01	3.6619214E-01	-2.9094967E-01
1.4737504E+00	9.5119284E-01	1.9419554E+00	-2.2640378E+00	-2.0385520E+00	-1.7203118E+00
	-4.4615041E-02	-8.1398903E-01	-8.4424714E-01	-1.6665738E-01	-4.3933662E-01
	6.3209852E-01	-1.6128638E-01	4.1895178E-01	9.5840931E-02	1.2054067E-01
2.0562439E+00	-6.1757040E+00	9.3191822E-01	1.7847832E+00	4.5503680E-01	-5.2427915E-02
	-1.8897559E-01	5.2487855E-02	1.2856955E+00	4.0364630E-02	-5.8926906E-03
	-2.6580299E-01	-5.4933722E-01	2.1074049E-01	-3.4609611E-01	7.8960784E-02
-2.0014398E+00	2.4171165E+00	-1.5854490E+00	7.3060854E-01	1.1227630E+00	6.9938557E-01
	1.8860072E-01	5.6916681E-01	3.2080832E-01	4.7485205E-02	1.8796256E-01
	-2.3411888E-01	4.5157302E-01	-1.4427138E-01	9.0902058E-02	-1.8641516E-01
-2.8612852E+00	2.8557391E+00	9.2253141E-01	2.5974596E-01	-1.3947053E-01	-5.3716238E-02
	-3.3540568E-C1	1.0992106E-01	-3.0768788E-01	-7.9408175E-02	1.1487140E-02
	-4.8791877E-02	2.7[?]98032E-01	-2.4986107E-01	1.6906888E-01	-1.5417119E-04
2.5376973E+00	-2.7405373E+00	8.5995848E-01	-8.3917147E-01	6.5386330E-02	-8.6297244E-01
	4.3491406E-03	2.9717702E-02	-1.6776910E-01	1.6015303E-01	-3.2685775E-01
	1.2909140E-01	-3.4529307E-01	5.2242110E-02	1.7625694E-03	1.5602561E-01
9.4758345E-01	-1.1773675E+00	7.6868545E-02	-4.7517011E-01	-1.0375364E-01	7.0935991E-02
	5.5936419E-01	3.3647262E-02	-1.4187167E-01	-1.0942863E-01	1.3614573E-01
	9.9283174E-02	-1.3910746E-01	1.4187494E-01	-2.6564525E-01	1.1105775E-03
-1.0333513E+00	1.7656026E+00	-1.6057989E-02	2.1516318E-01	-1.0837090E-01	5.0617170E-01
	9.6926083E-02	-2.7578368E-01	1.6707329E-01	-2.4170541E-01	1.8417764E-01
	2.2921344E-03	2.0509591E-01	-3.5832217E-02	1.2456558E-02	-5.3346521E-02
-7.8537238E-01	1.0630186E+00	-3.6693553E-01	1.6641555E-01	-2.5859238E-01	6.6472130E-02
	-9.5601733E-02	-3.0098287E-02	1.2153094E-01	-2.3870893E-02	3.3392219E-02
	-1.8462650E-01	9.9184690E-02	-3.2823581E-02	1.6145827E-01	9.6942933E-02
1.1122669E+00	-1.7967341E+00	4.9187159E-01	-4.5882221E-01	3.0899610E-01	-3.5774617E-01
	-2.2529380E-01	1.8167225E-01	-2.9062463E-01	1.3546725E-01	7.2436911E-03
	1.2029811E-01	-1.9300178E-01	-6.7795461E-02	-1.1678434E-01	6.0173385E-02
6.5247078E-01	-5.8911760E-C1	-2.9163219E-01	-2.3752426E-01	1.3519371E-01	2.5101926E-01
	1.5964111E-01	-1.3143879E-01	-9.8769052E-02	1.9925032E-01	-2.1533510E-01
	4.3124678E-02	-8.9322455E-03	7.5514287E-02	6.4013131E-02	-1.1279485E-01
-9.5223659E-01	7.7911799E-01	5.7631938E-03	5.0279240E-01	1.5841043E-01	6.0007819E-02
	2.4438406E-02	-1.3468522E-01	2.7987374E-01	-8.0385676E-02	5.6273196E-02
	-1.0150707E-01	1.2532813E-02	2.6003186E-02	-4.9387765E-03	9.3771537E-03
9.7441128E-03	2.5431304E-01	-1.3457546E-01	1.2715896E-01	-1.9391107E-01	-2.6480053E-02
	-1.1624033E-01	1.4703105E-02	2.5513614E-02	-7.5679135E-02	1.0327858E-01
	-8.6137174E-02	5.8636302E-03	5.6205041E-03	1.2815965E-02	3.4130400E-02
3.3384676E-01	-6.2759469E-01	2.3215954E-02	1.1302493E-01	1.3195285E-01	7.5823350E-02
	4.1888157E-02	9.4577892E-02	6.4955980E-02	1.6774964E-01	-2.6144508E-02
	1.0046555E-02	2.0111152E-02	1.3776769E-02	-3.7716133E-02	-8.3300729E-02
4.0154830E-01	-5.6070300E-01	8.6460089E-02	-2.9117854E-01	-1.6765028E-02	-2.0040470E-01
	-1.8856441E-01	8.9569920E-02	-8.7471149E-02	-2.2688188E-02	-1.3242278E-01
	8.8170386E-02	-1.0415543E-02	-2.1640214E-02	-2.1408404E-02	3.8241107E-02
-6.3004876E-01	8.6003150E-01	-7.3032647E-02	2.7169583E-01	-1.4011846E-01	1.8400259E-02
	2.1891171E-01	-4.5845129E-02	-2.9095421E-02	-4.1803086E-02	5.1953529E-02
	-8.4909813E-03	5.8318892E-02	1.7141670E-03	4.6190873E-02	-3.9773594E-02
2.1745075E-01	-3.4300010E-01	1.4984577E-01	-9.5212438E-03	-8.1462126E-03	-6.1081964E-02
	-6.0712038E-02	2.3138547E-02	9.4651938E-02	-1.4942238E-01	8.1371648E-02
	3.0129996E-02	1.5895369E-02	1.8354904E-02	-5.5895482E-02	3.3079540E-02
2.4751853E-01	-9.2748465E-02	-1.7115096E-01	-1.3914336E-02	-1.6762548E-01	4.0926183E-02
	1.6798468E-02	7.7922437E-02	-3.9129771E-02	8.8900649E-05	-5.3065254E-02
	-2.4316265E-02	9.6363538E-03	-3.3036008E-02	-7.5217172E-03	3.2479333E-02
-2.3563853E-02	-1.3853874E-01	1.5396977E-01	-1.6505163E-02	1.2204545E-01	4.0769923E-02
	-2.1524586E-02	-2.2963153E-02	-8.9636253E-02	4.4790225E-02	1.4878182E-02
	7.7862196E-02	-5.1423836E-02	-6.0011976E-02	3.2388966E-02	-2.2489433E-02
-1.6200010E-01	2.9072571E-01	-6.5162387E-02	-4.6680024E-02	-1.5235137E-02	6.3072770E-02
	-5.4187305E-03	1.4925698E-02	-6.4542776E-02	6.2401374E-03	-1.5643871E-02
	-5.0462150E-02	-6.2219461E-03	4.2759606E-02	3.9217475E-02	-2.9850765E-02
1.2215697E-01	-2.2765968E-01	6.7723673E-02	4.9232865E-02	7.1297650E-02	-2.2290459E-02
	6.1006085E-02	-1.2412551E-01	9.5710083E-02	6.4741896E-02	8.2362361E-02
	-2.4452027E-02	6.3225746E-03	-3.3283582E-03	2.8587766E-03	4.1550465E-02
2.4745008E-01	-2.9164165E-01	-4.0714371E-02	-1.1515315E-01	-1.8913945E-02	5.2252367E-02
	-1.0119358E-01	5.4764262E-03	-5.4094083E-03	-2.0613715E-02	-4.6935979E-03
	-3.1537394E-02	-8.1387915E-02	2.9459022E-02	-3.6382333E-03	1.8776014E-02
-2.7412454E-01	3.1218702E-01	-6.3094241E-02	1.6767714E-01	4.4273776E-03	6.9686970E-02
	4.2271018E-02	-1.7874208E-02	-2.0026952E-02	5.1080252E-02	-2.7588573E-02
	-4.5060790E-02	7.5912350E-02	2.7267334E-02	-4.2735187E-03	-5.1702863E-02
9.6064697E-02	-1.8856997E-01	9.0644110E-02	-9.2770859E-02	2.9847215E-02	-1.0676007E-01
	-6.0649322E-02	2.1280800E-02	8.0857281E-03	-2.1043790E-02	-2.2139482E-02
	5.1877403E-02	-4.0770948E-02	-2.5721772E-02	3.0549170E-02	2.5700406E-02
6.3703334E-02	2.0092701E-03	-4.0194016E-04	3.9004491E-02	-3.2169272E-02	-3.0599457E-04
	5.9058839E-02	2.1401016E-02	3.3998056E-02	3.4928213E-02	1.2755417E-02
	-5.6490758E-02	6.3380192E-03	3.4109083E-02	7.9613583E-03	-1.1825198E-02
3.3194010E-02	-7.6175629E-02	2.3323281E-04	3.2109840E-02	-8.7680559E-03	-1.7554797E-02
	3.5343844E-03	-1.1274526E-02	9.2860371E-04	7.5034774E-04	1.0649051E-02
	8.5933269E-03	2.6793084E-02	-5.1161732E-03	-2.3069002E-02	4.7650134E-03
-1.0688149E-02	5.4647485E-03	1.2839078E-02	-1.6488393E-02	8.3699588E-03	1.9733837E-02
	-2.4566250E-03	1.6322491E-02	-1.0351058E-02	-2.3398192E-02	-9.2276450E-03
	1.0857284E-02	-1.4766227E-02	-1.4422392E-02	1.4396943E-03	4.7989861E-03

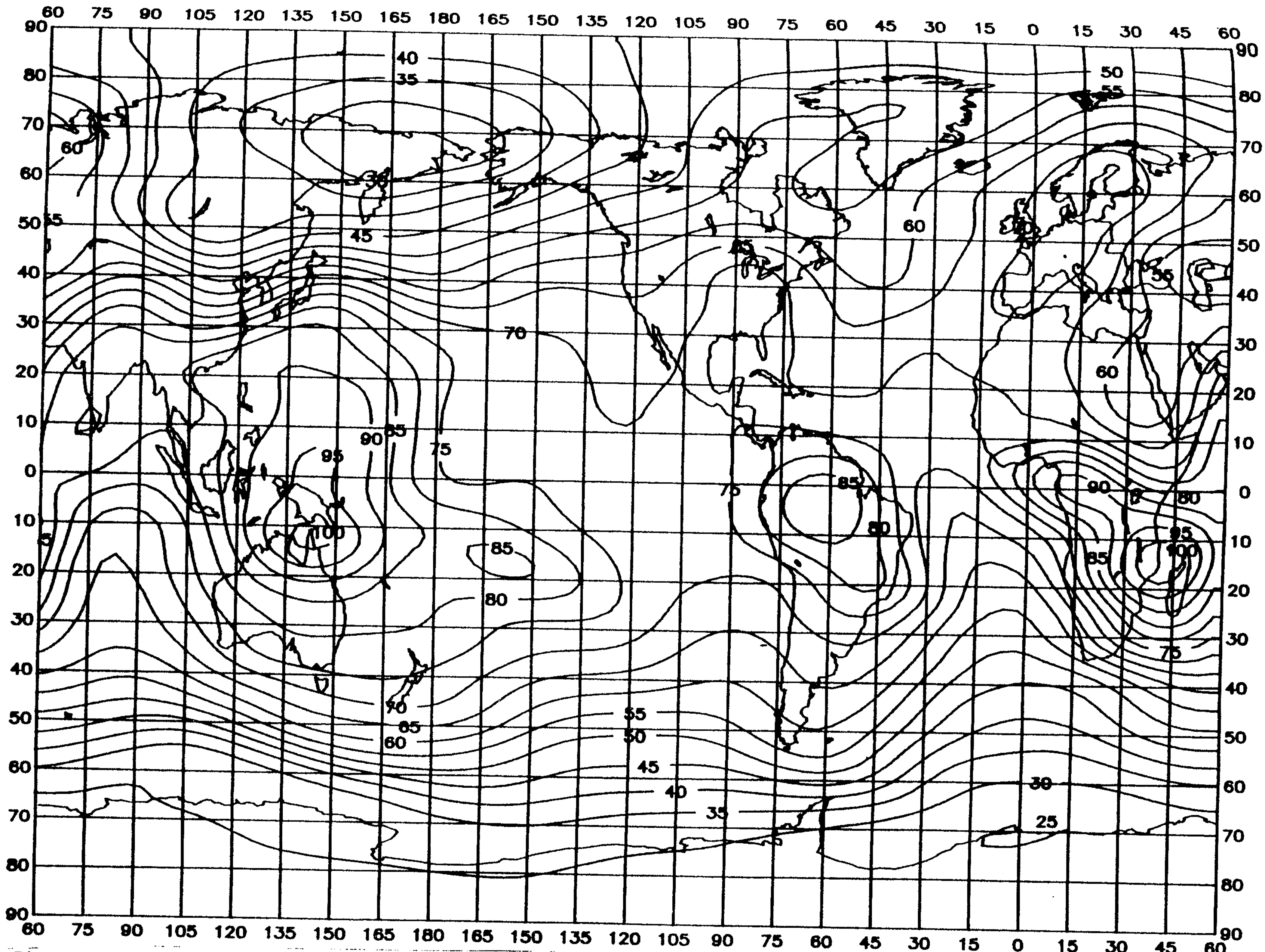

Figure 34. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for December, January, February, 0000-0400 hours.

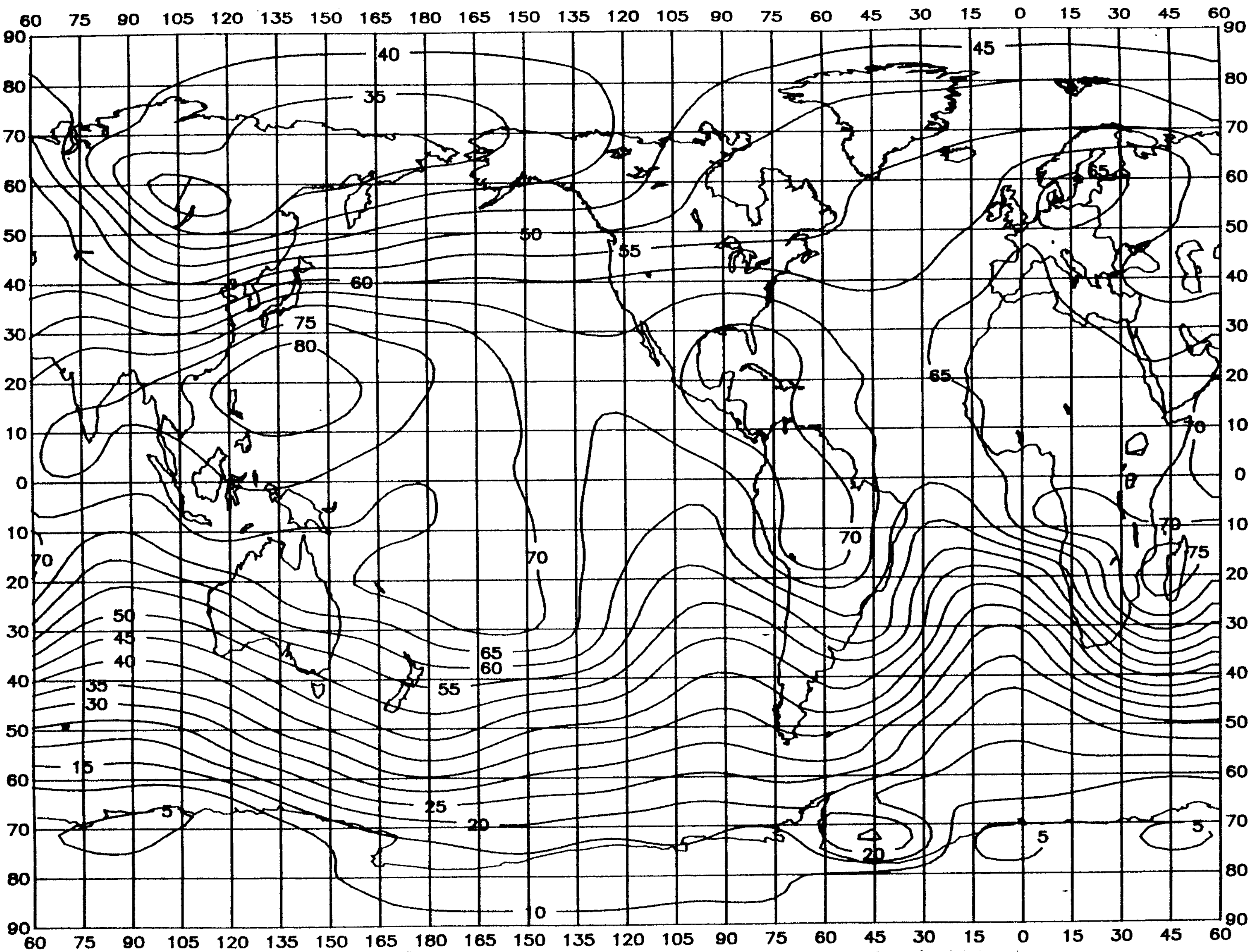

Figure 35. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for December, January, February, 0400-0300 hours.

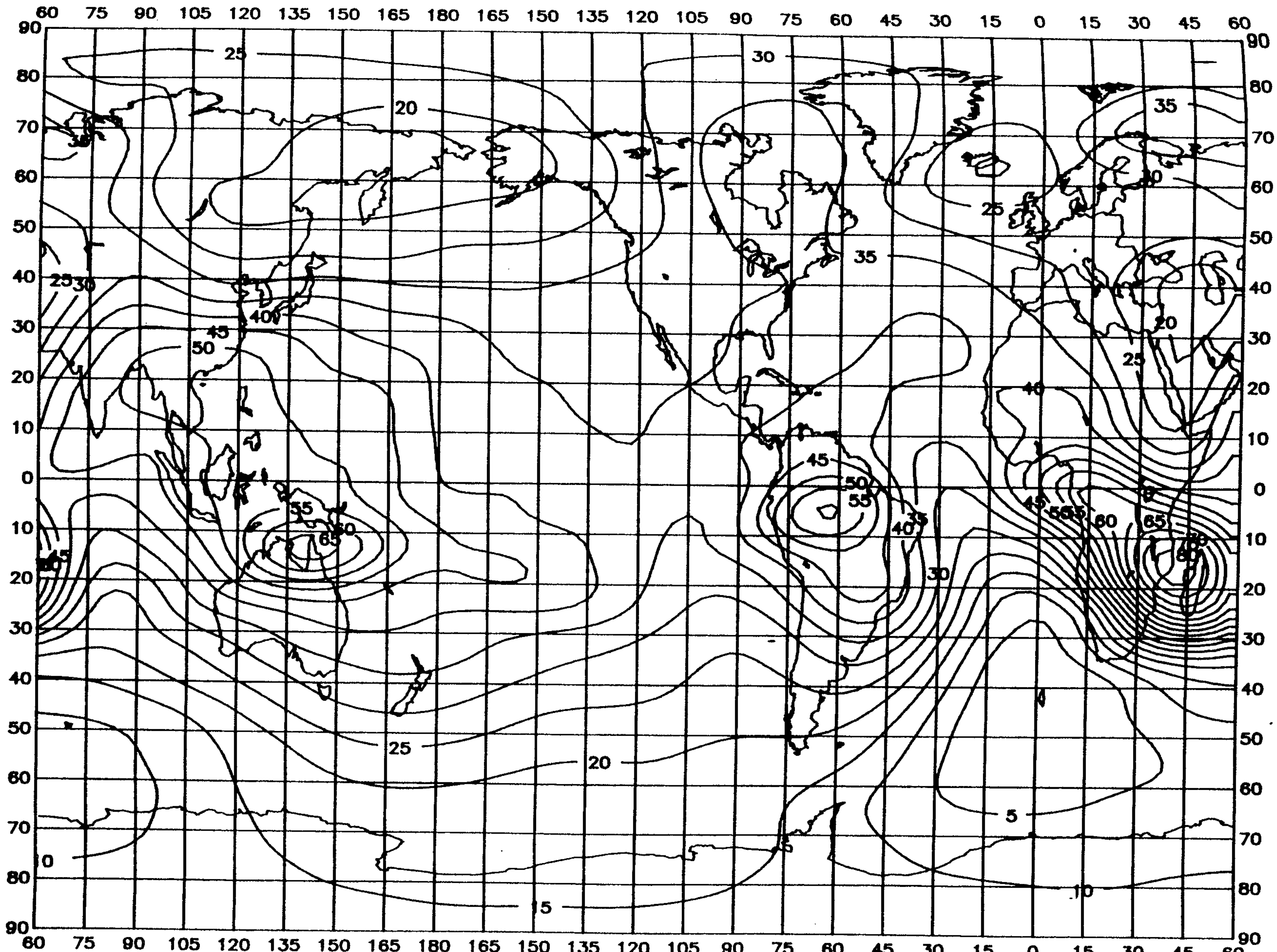

Figure 35. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for December, January, February, 0800-1200 hours.

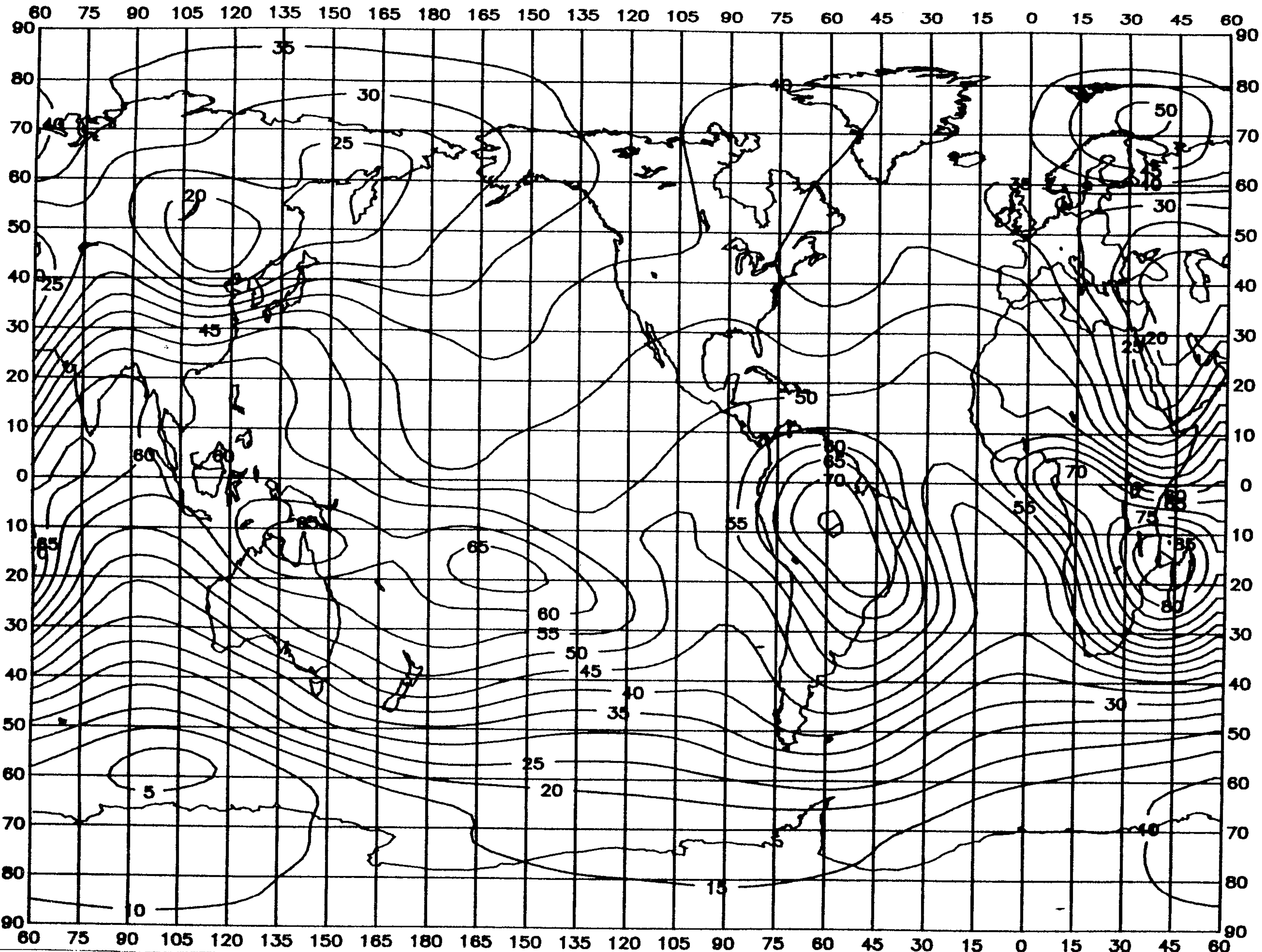

Figure 37. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for December, January, February, 1200-1600 hours.

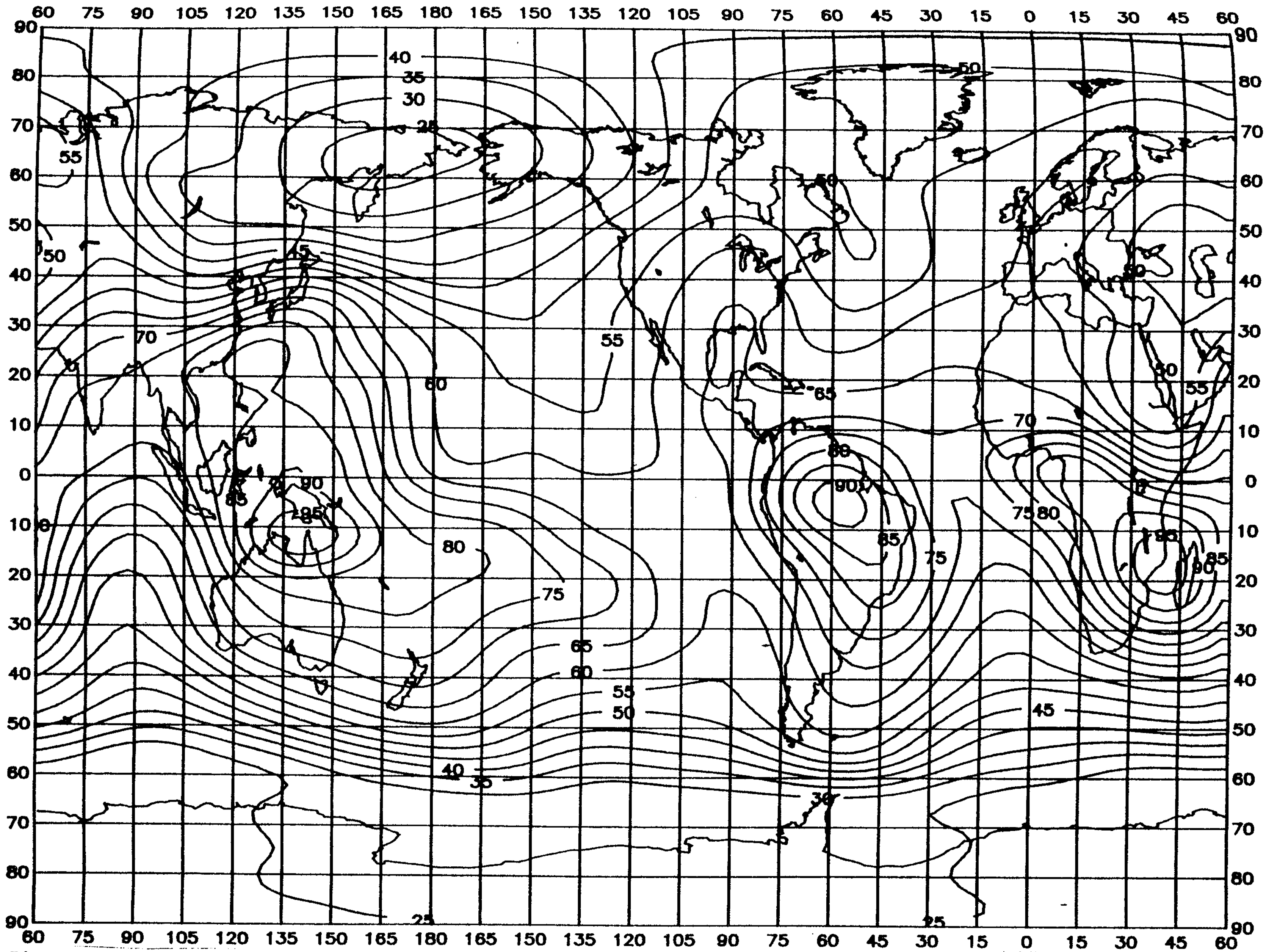

Figure 38. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for December, January, February, 1600-2000 hours.

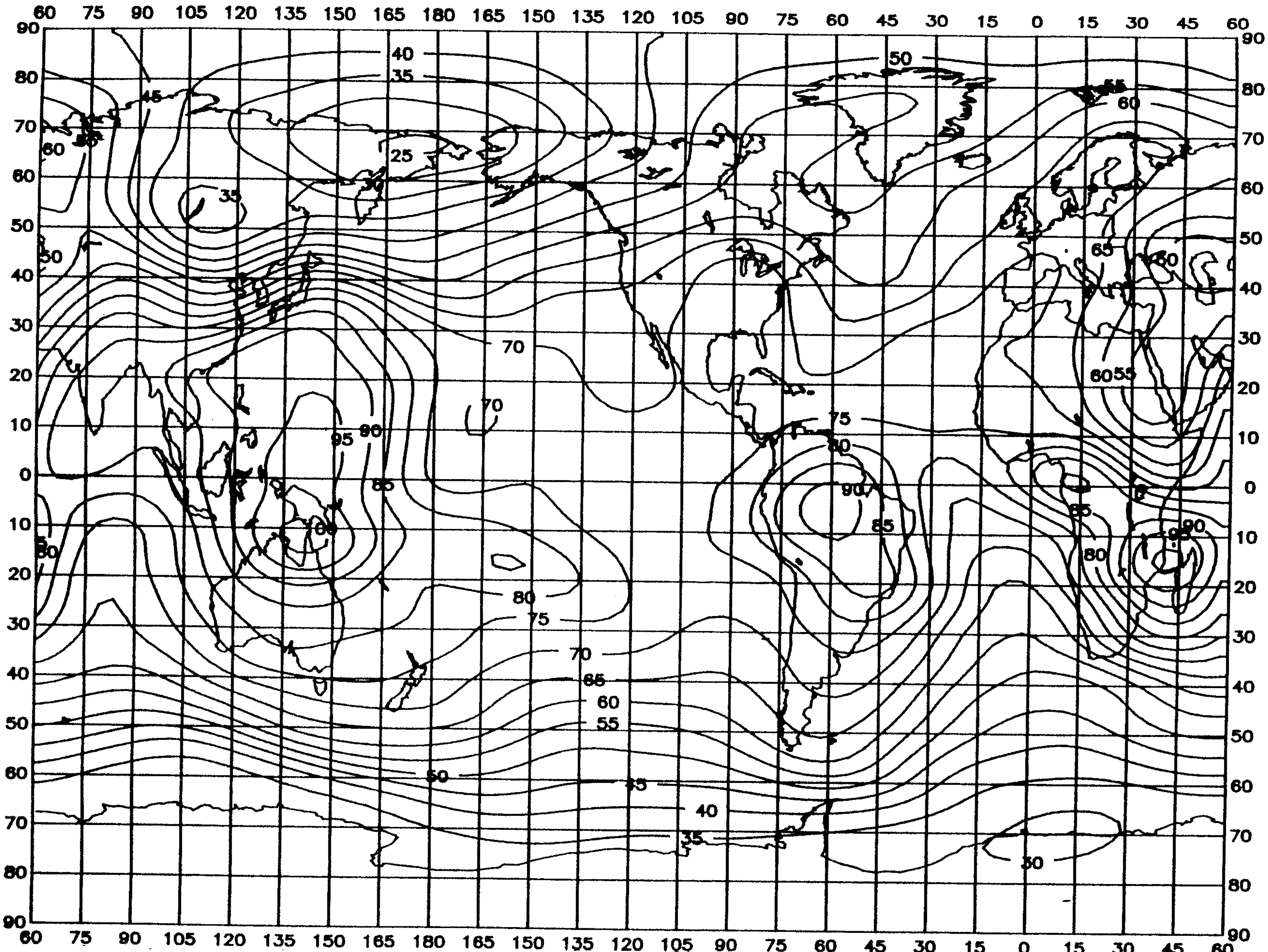

Figure 39. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for December, January, February, 2000-2400 hours.

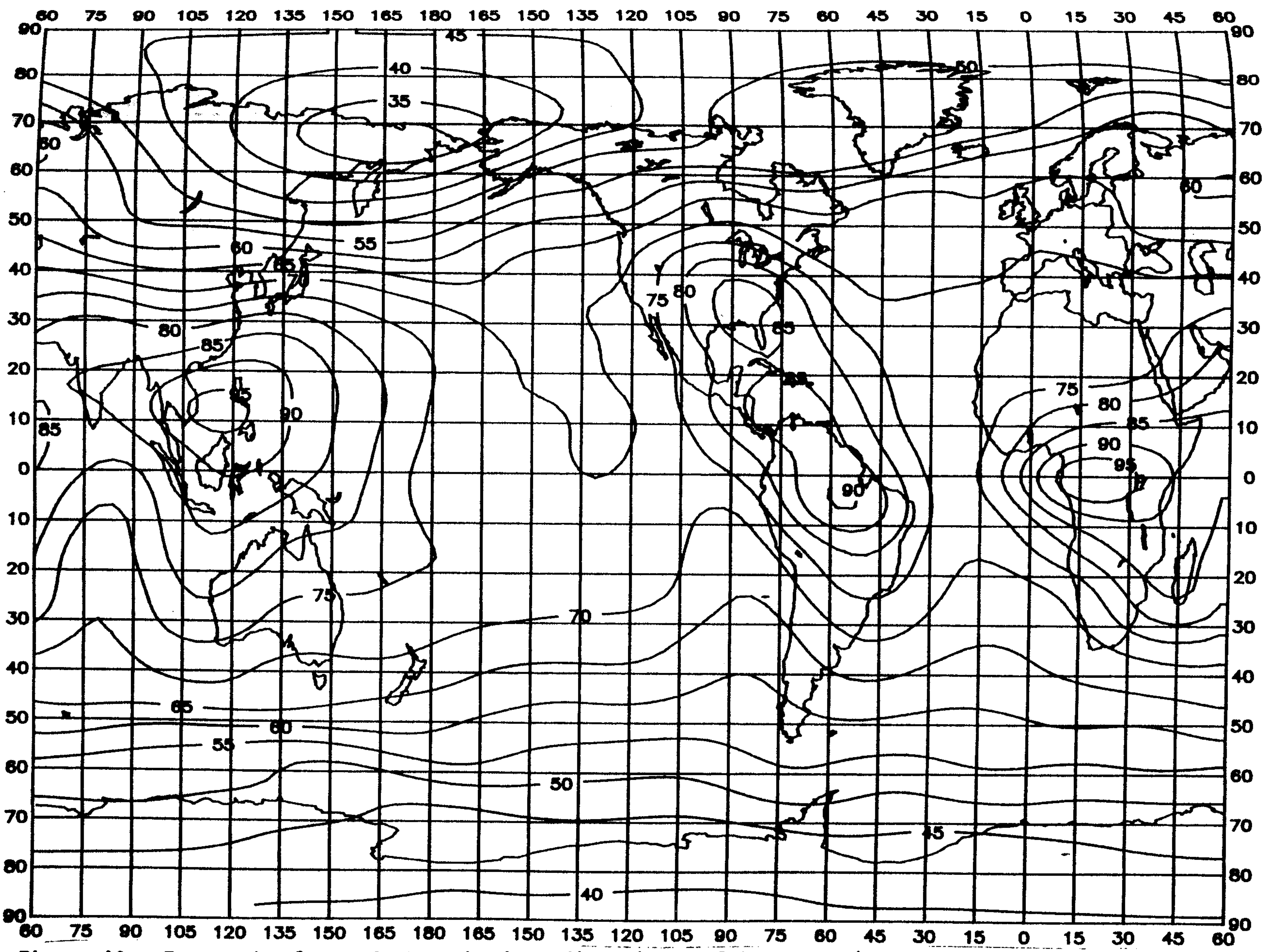

Figure 40. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for March, April, May, 0000-0400 hours.

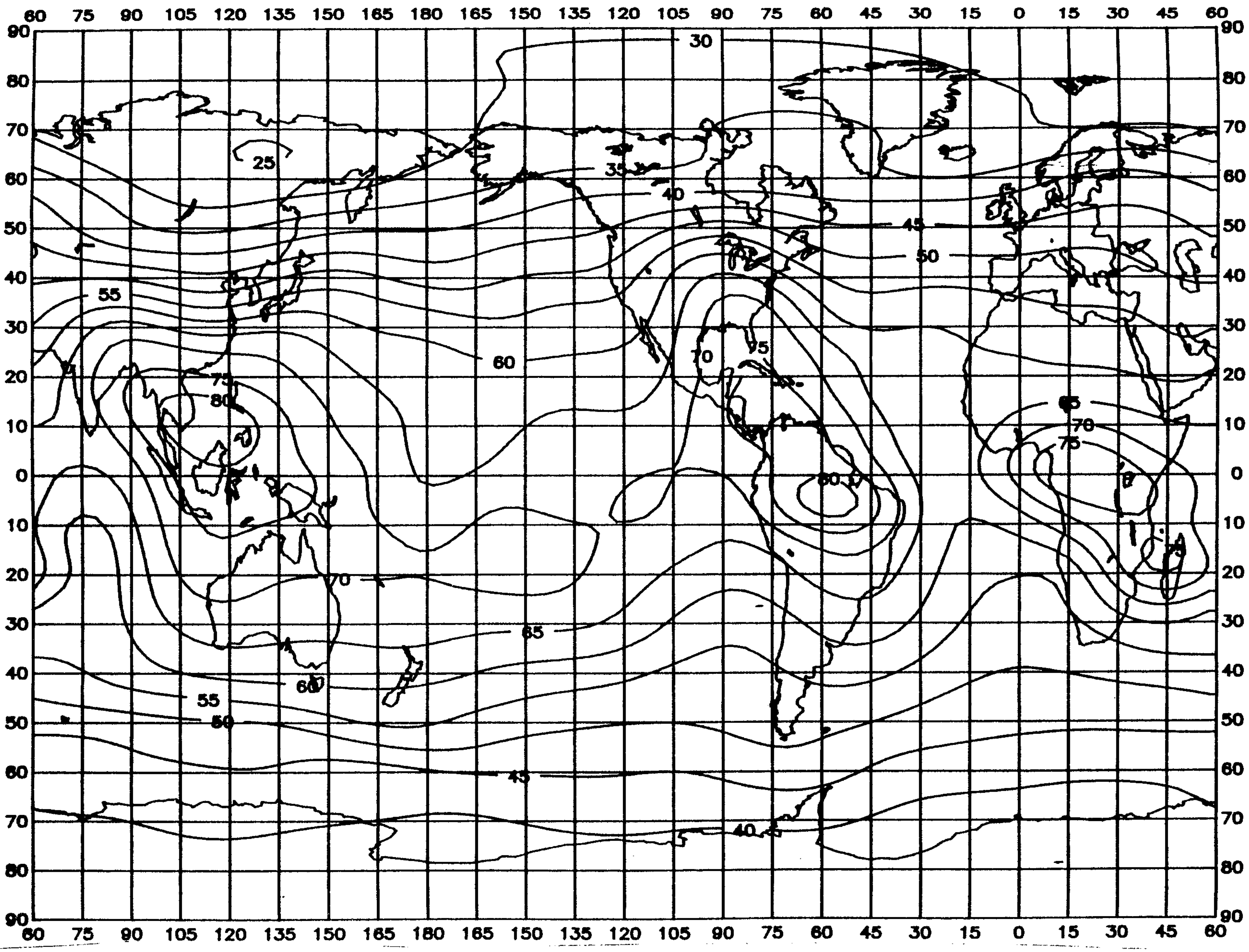

Figure 41. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for March, April, May, 0400-0300 hours.

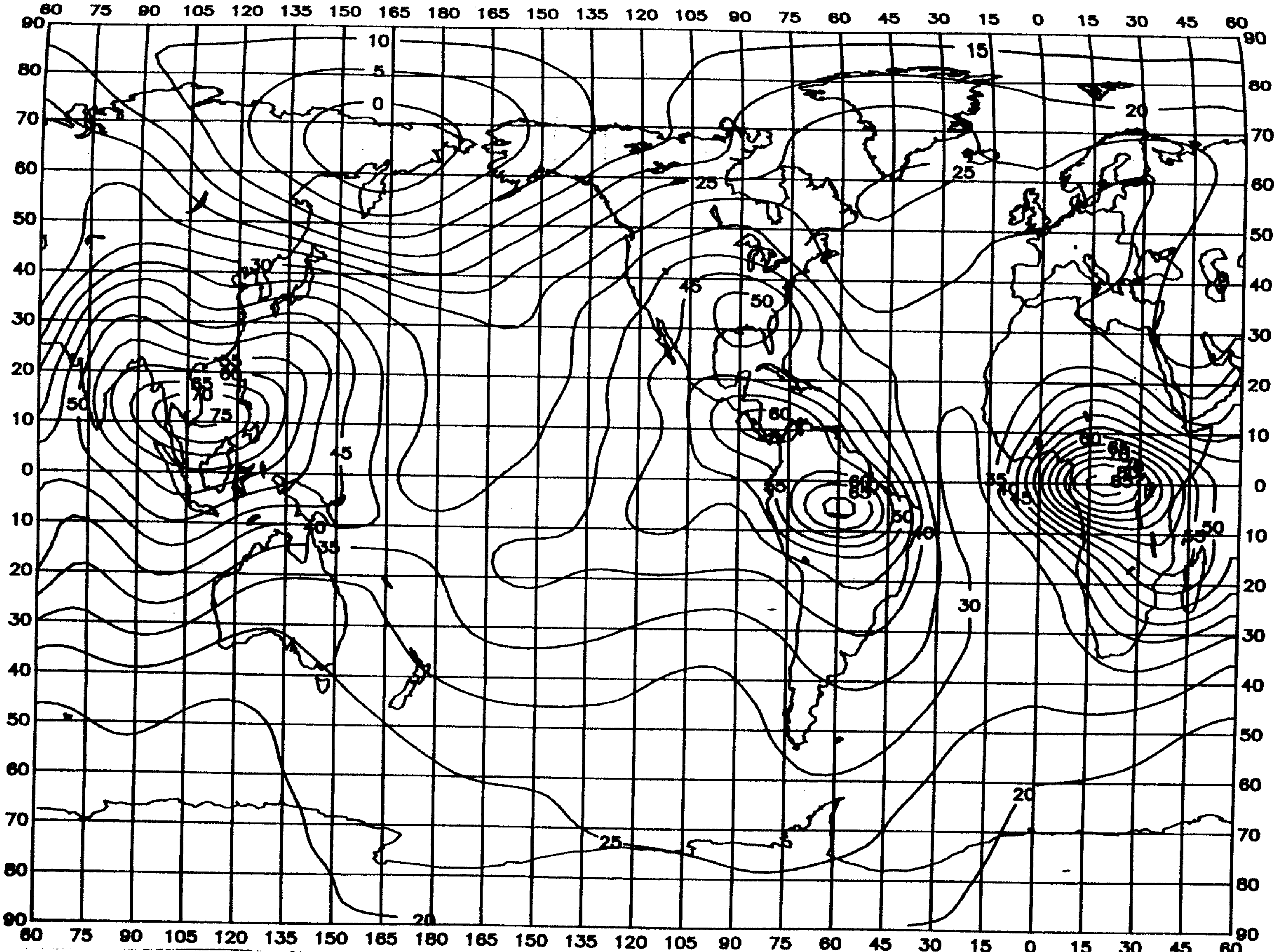

Figure 42. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for March, April, May, 0800-1200 hours.

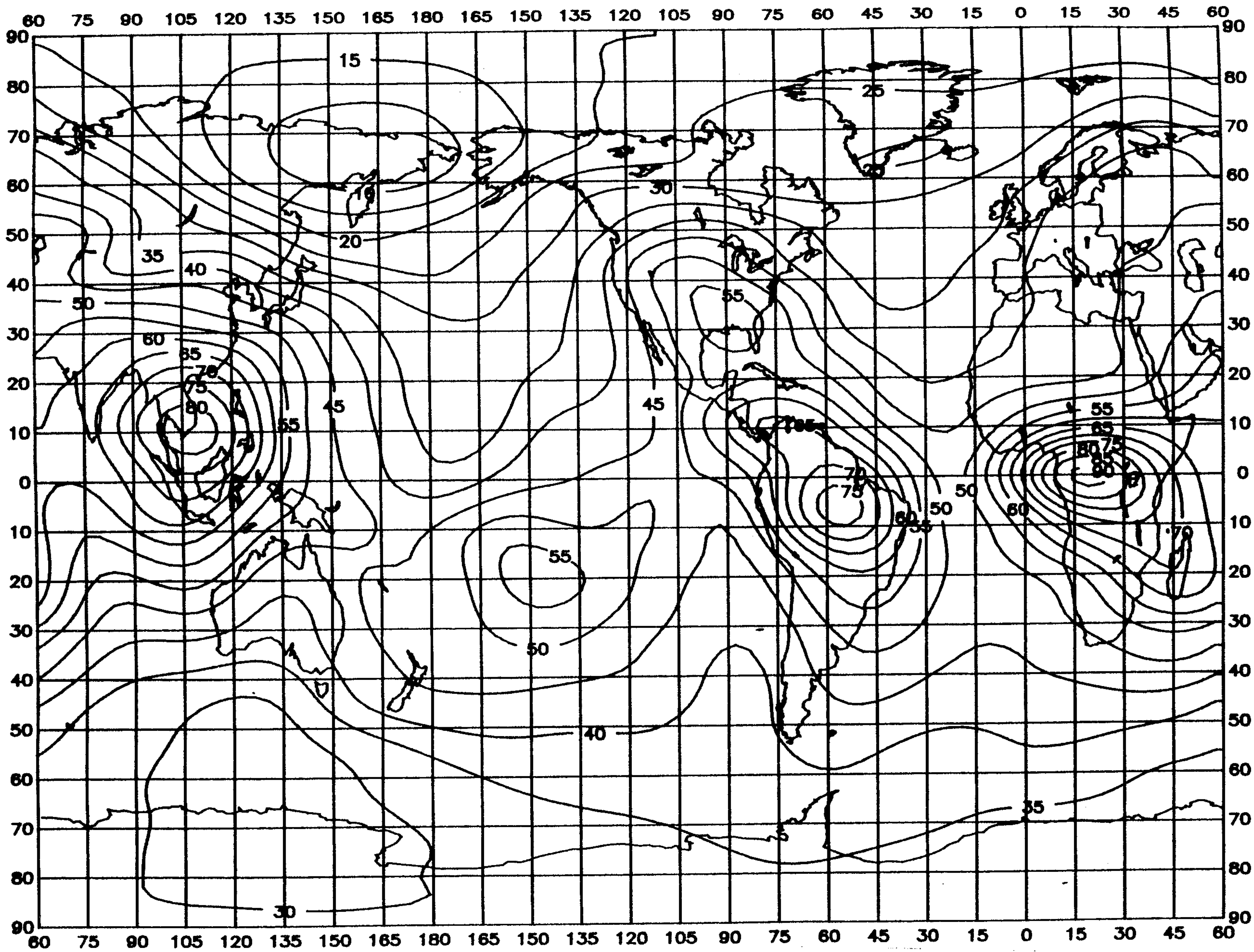

Figure 43. Expected values of atmospheric radio noise at 1 MHz, F_{am} (d3 above kT_0b), for March, April, May, 1200-1600 hours.

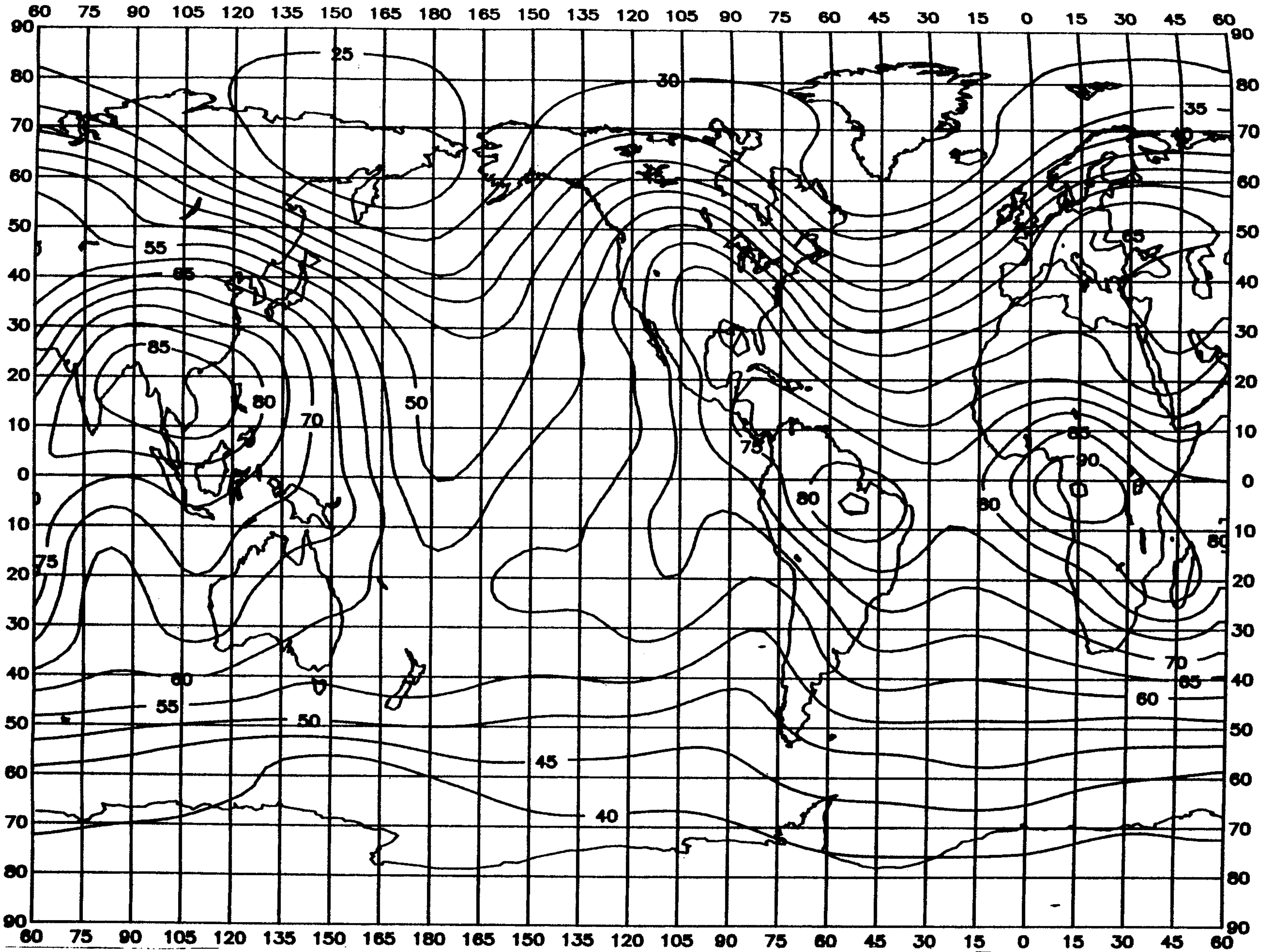

Figure 44. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for March, April, May, 1600-2000 hours.

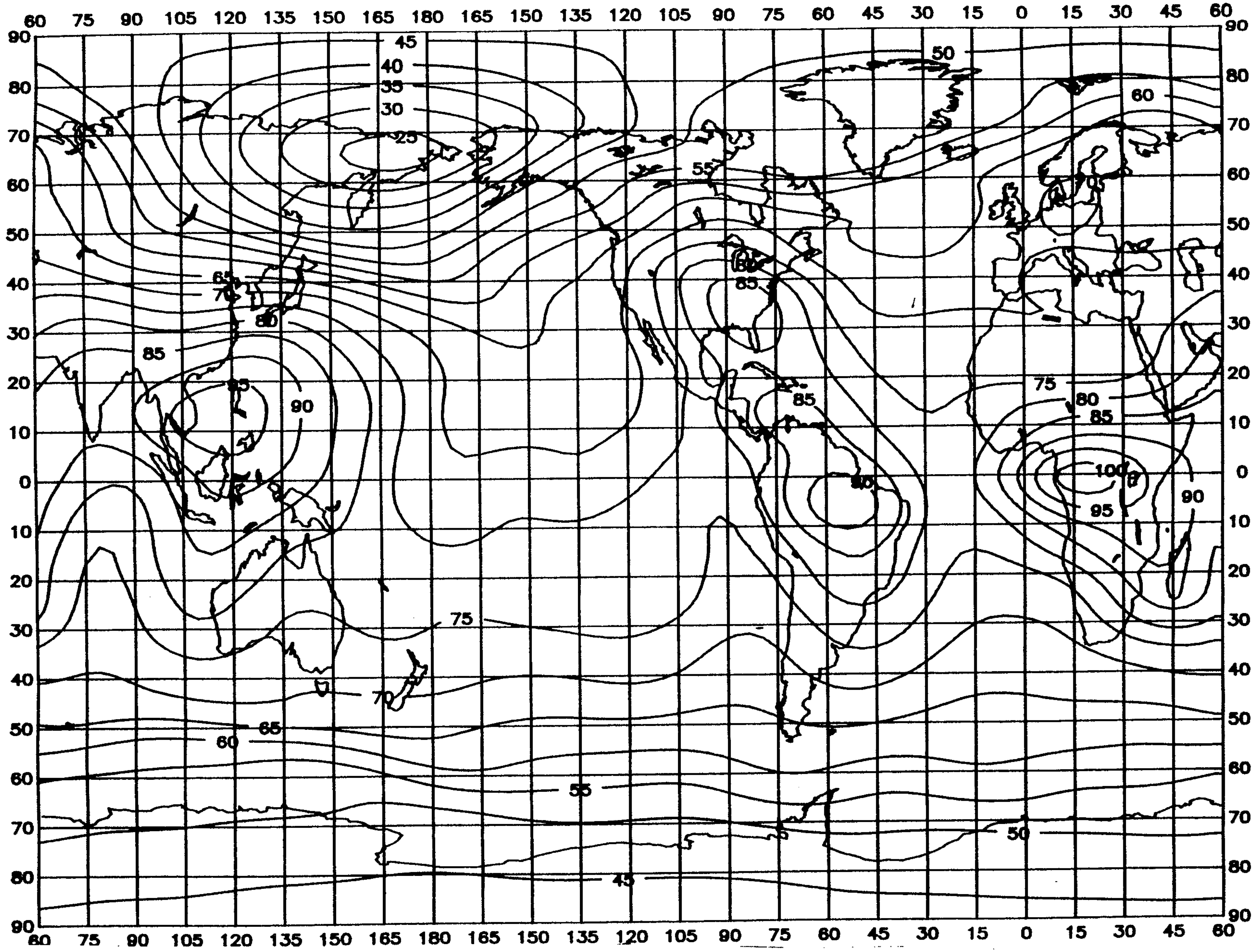

Figure 45. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for March, April, May, 2000-2400 hours.

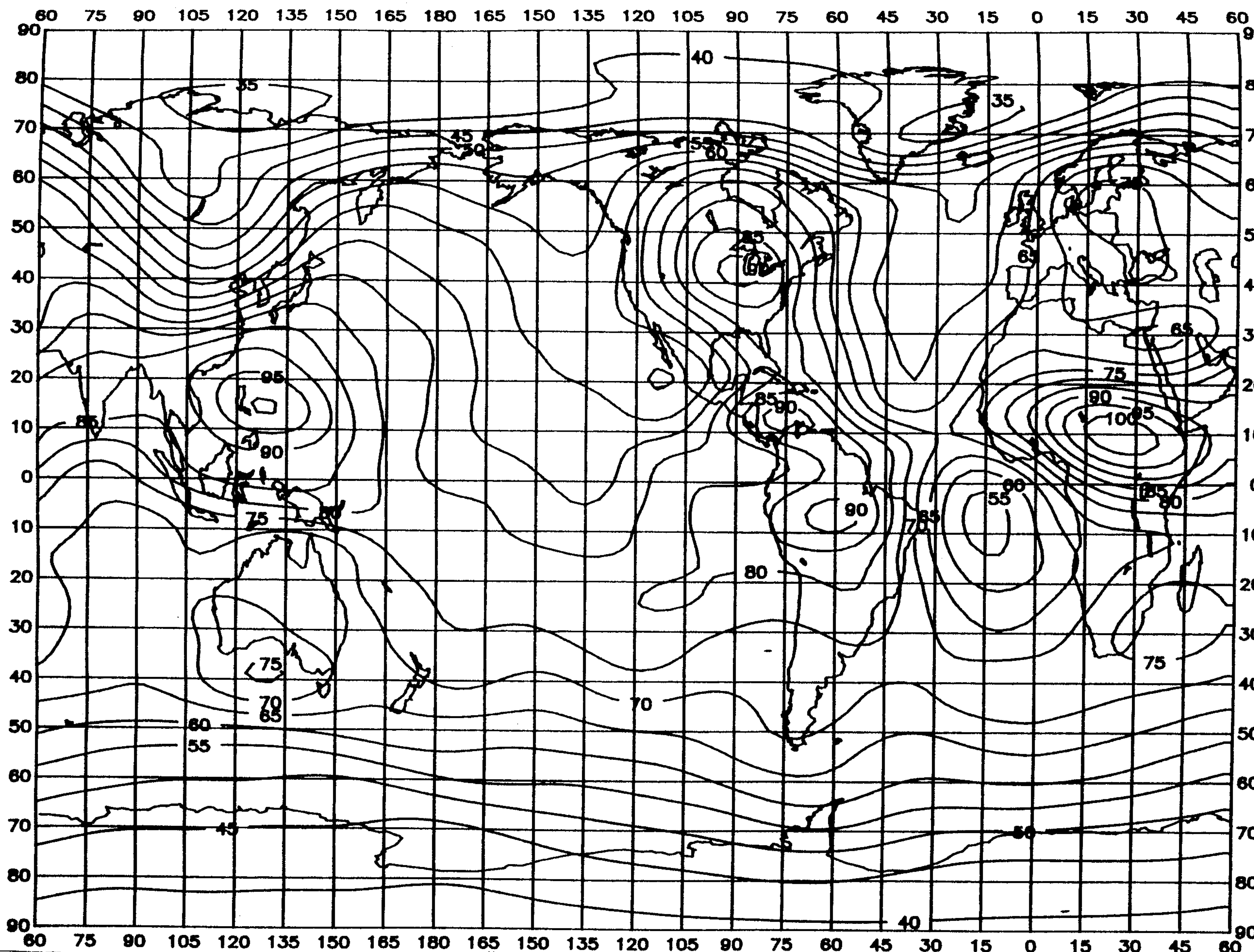

Figure 46. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for June, July, August, 0000-0400 hours.

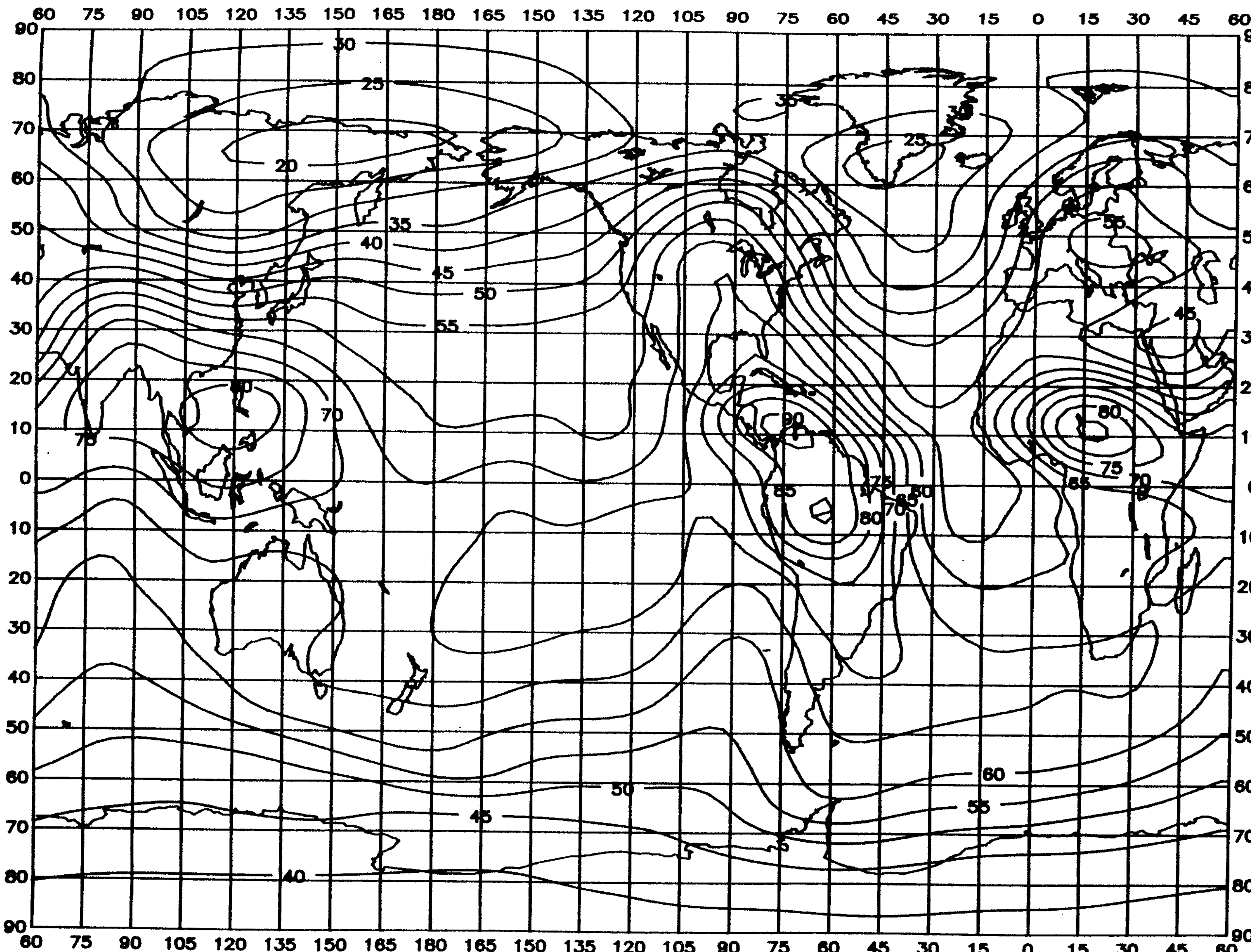

Figure 47. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for June, July, August, 0400-0800 hours.

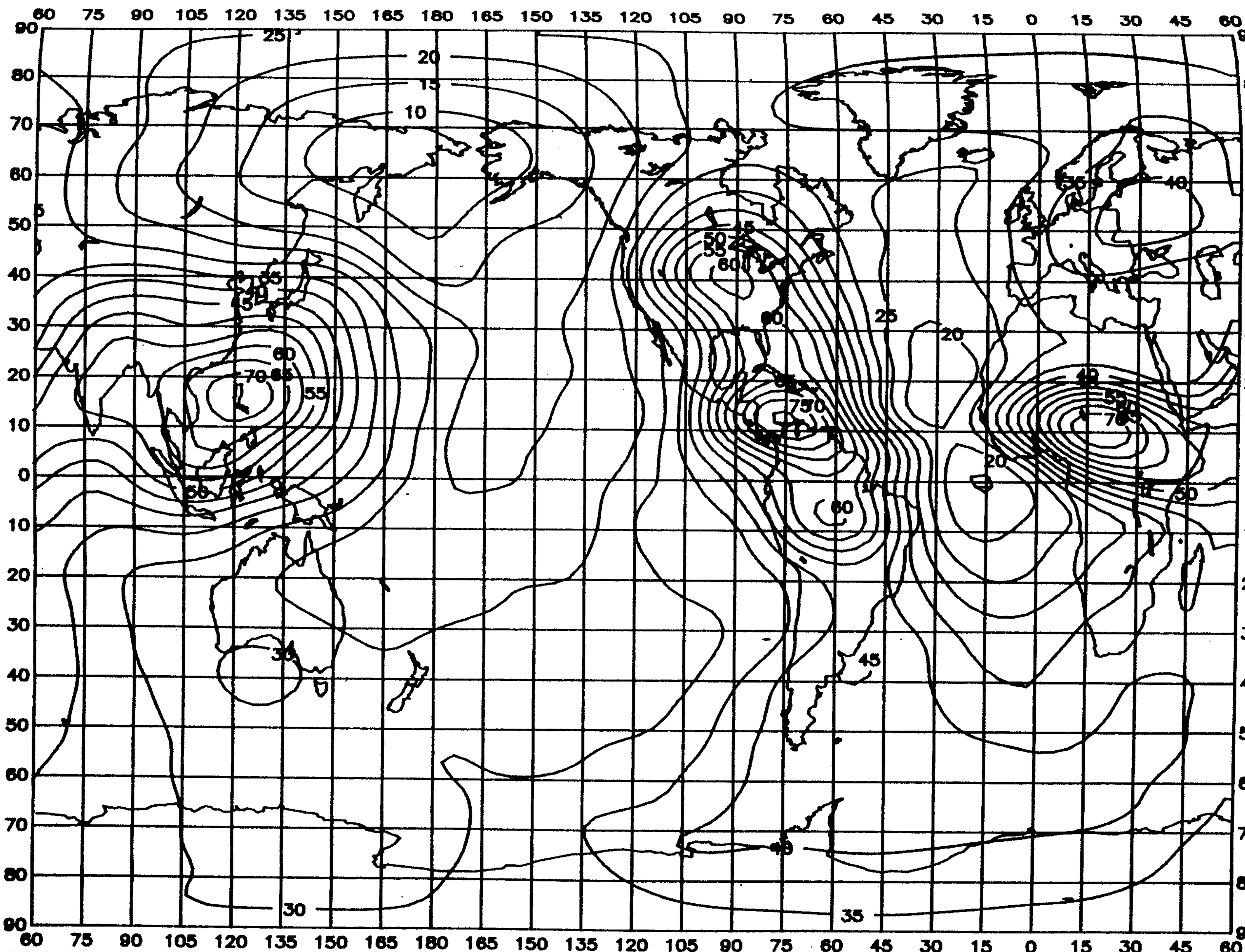

Figure 48. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_ob), for June, July, August, 0800-1200 hours.

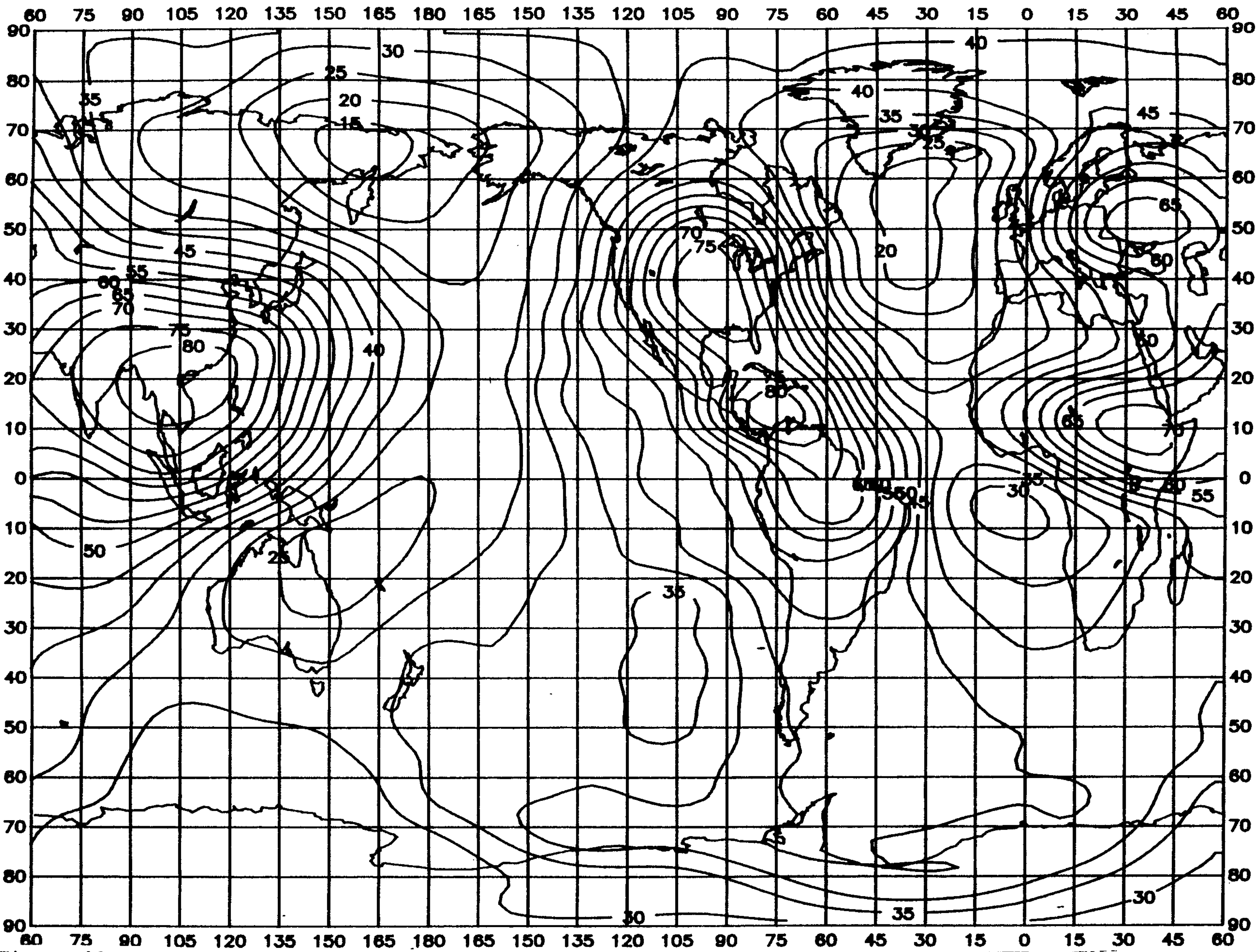

Figure 49. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for June, July, August, 1200-1600 hours.

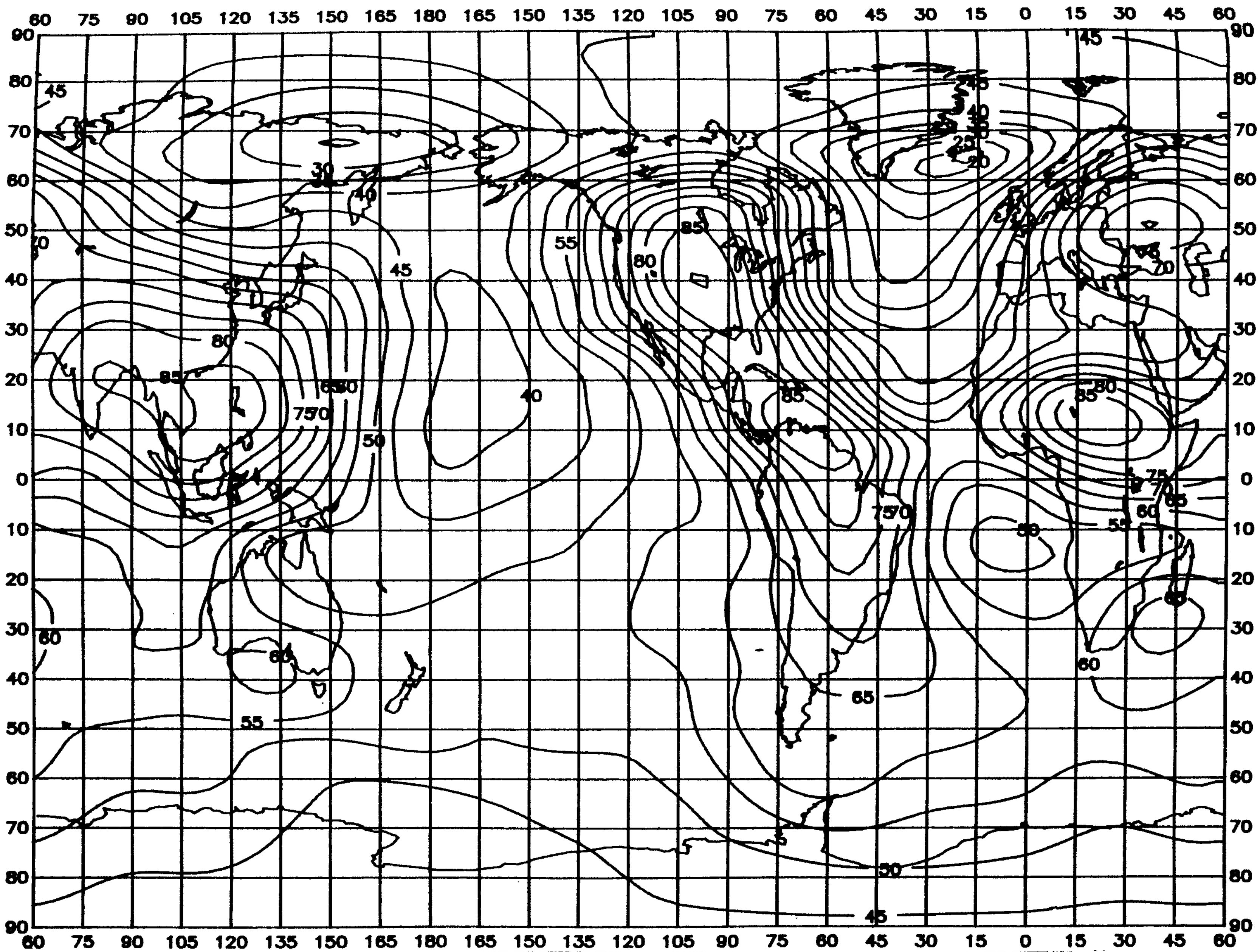

Figure 50. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for June, July, August, 1600-2000 hours.

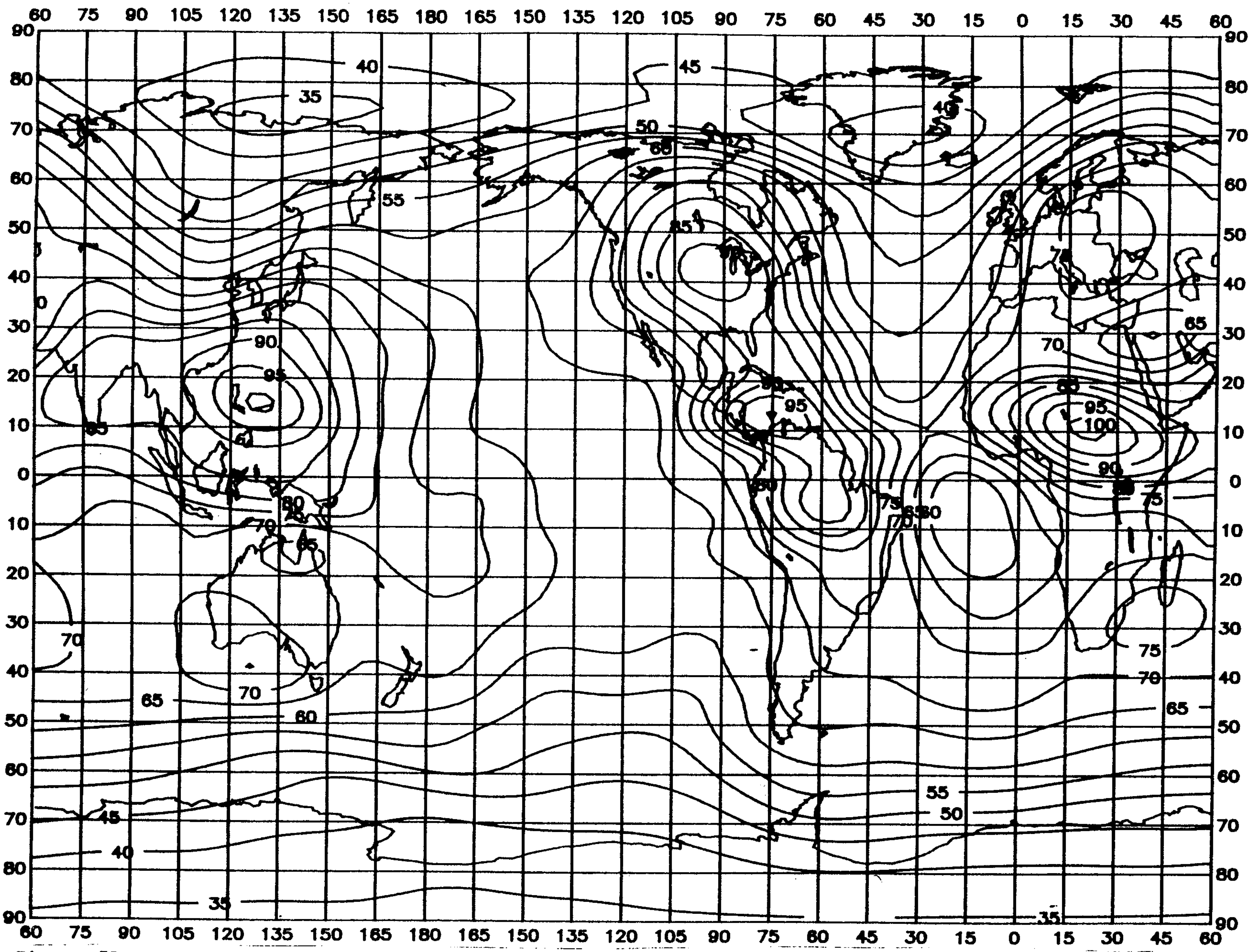

Figure 51. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for June, July, August, 2000-2400 hours.

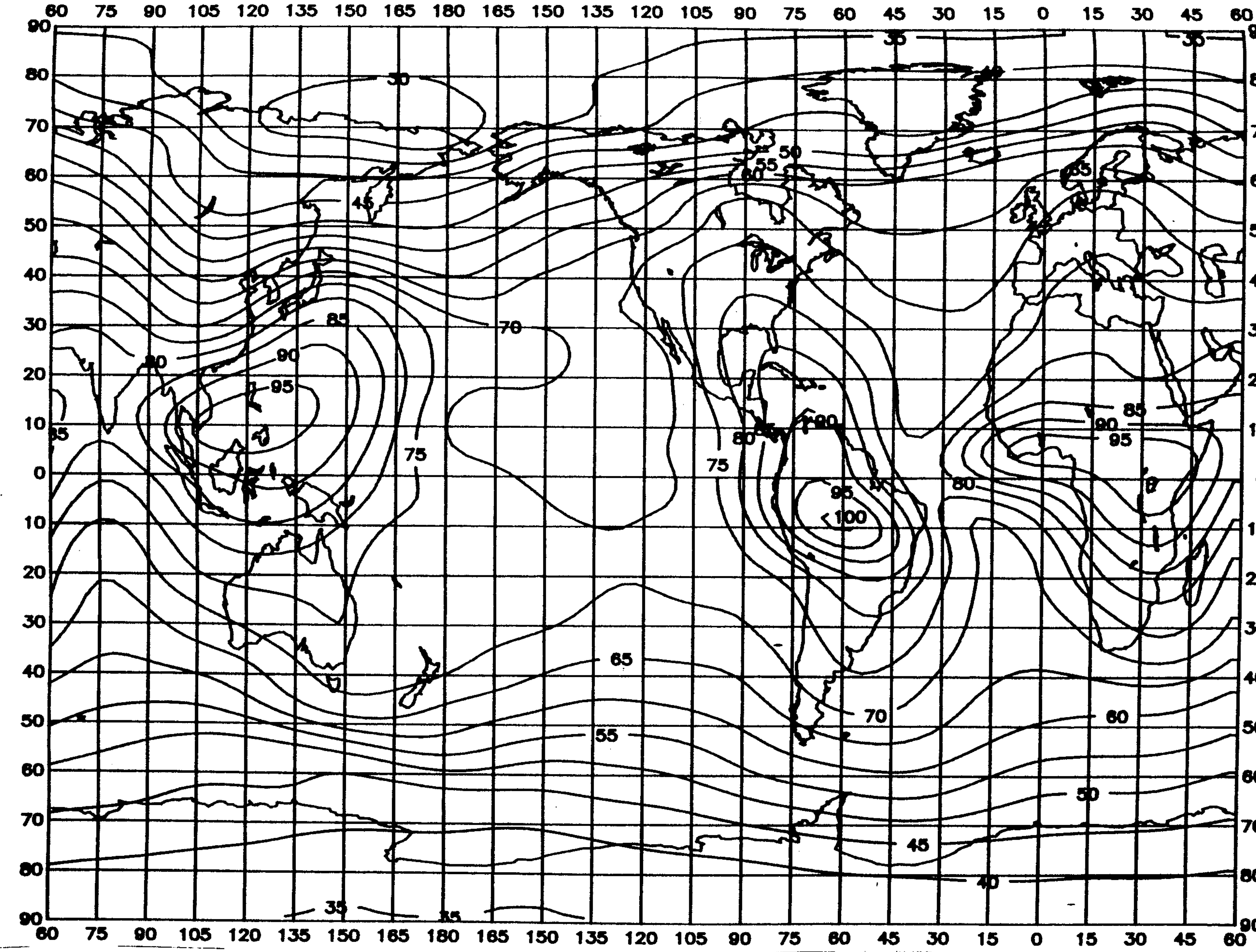

Figure 52. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for September, October, November, 0000-0400 hours.

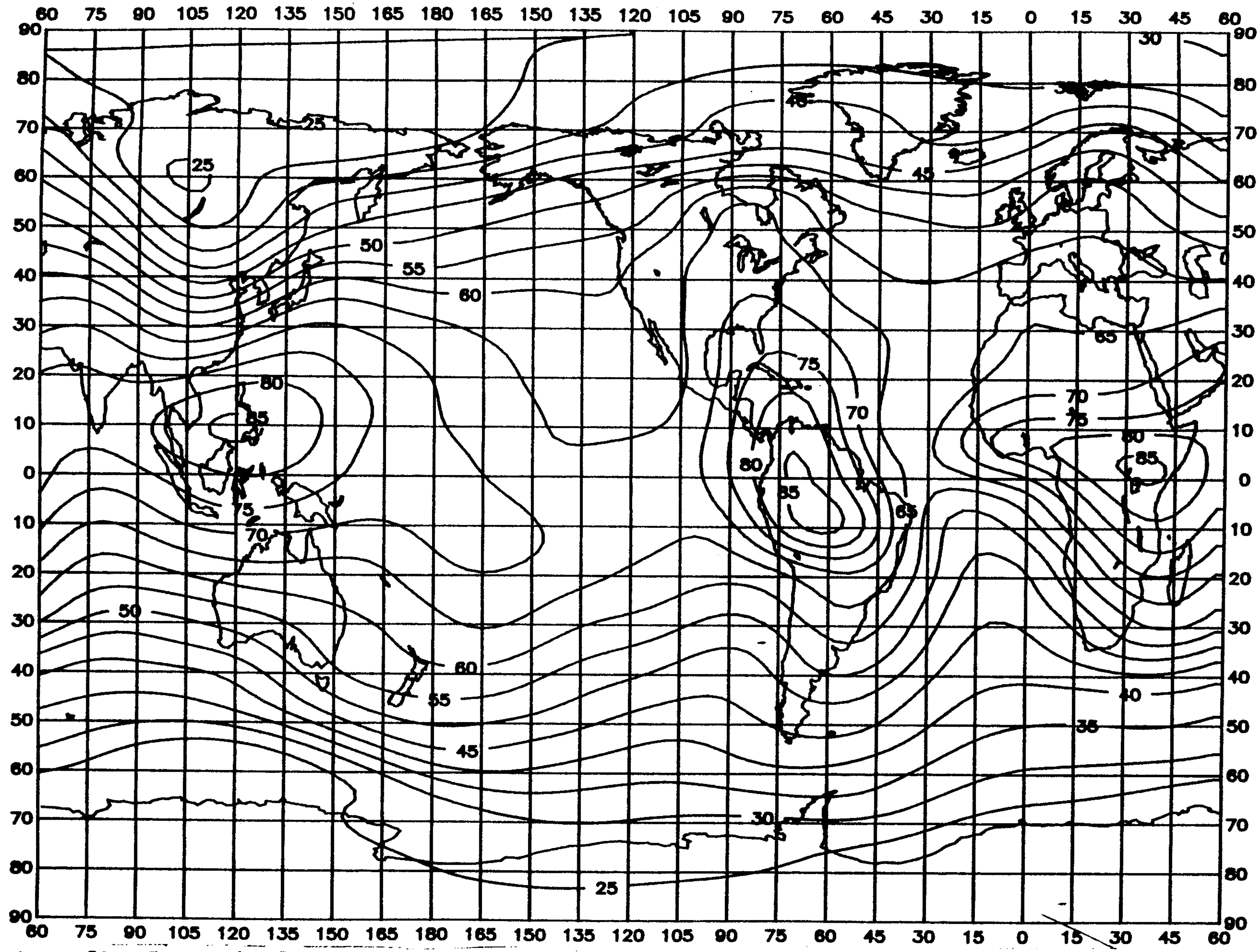

Figure 53. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for September, October, November, 0400-0800 hours.

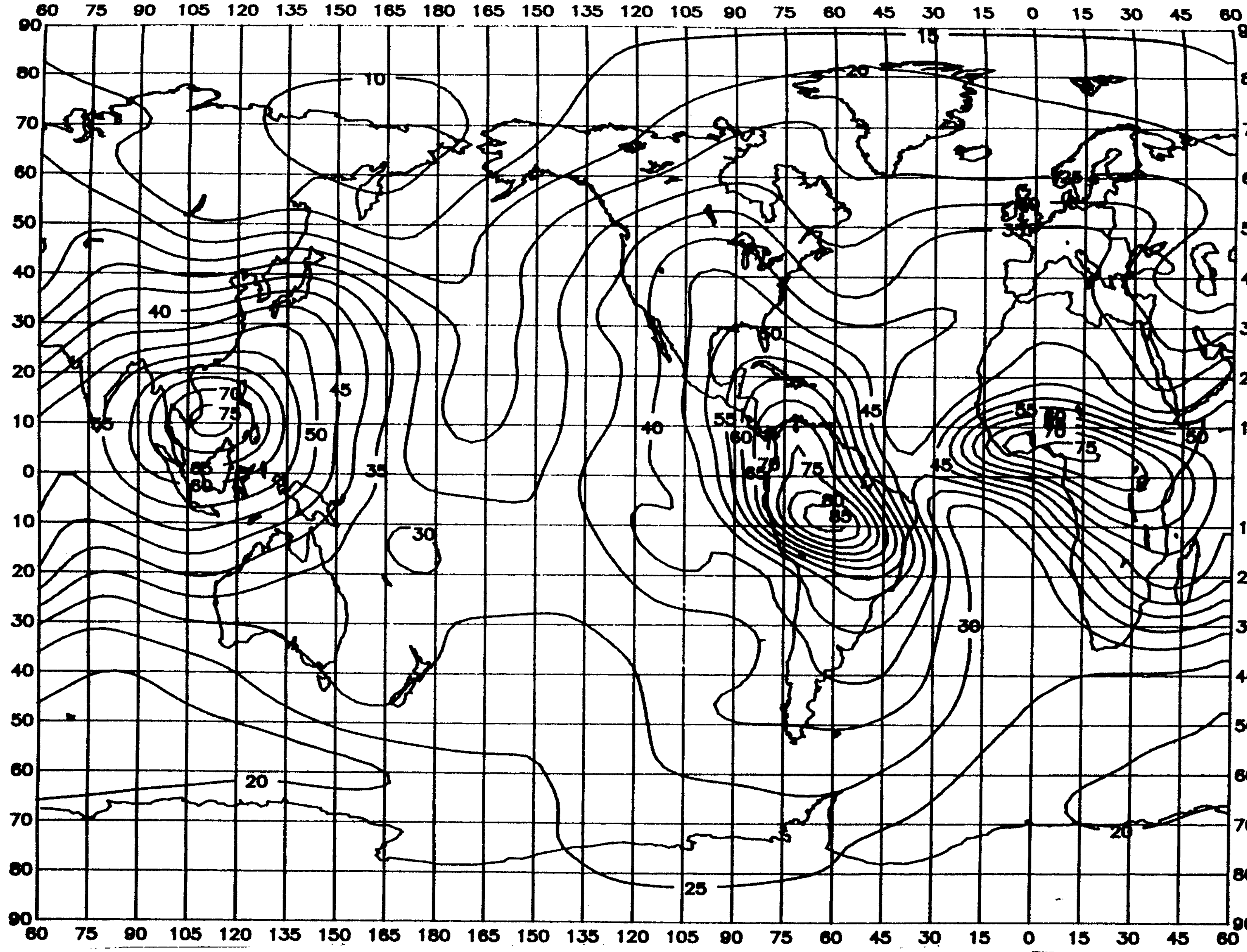

Figure 54. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for September, October, November, 0800-1200 hours.

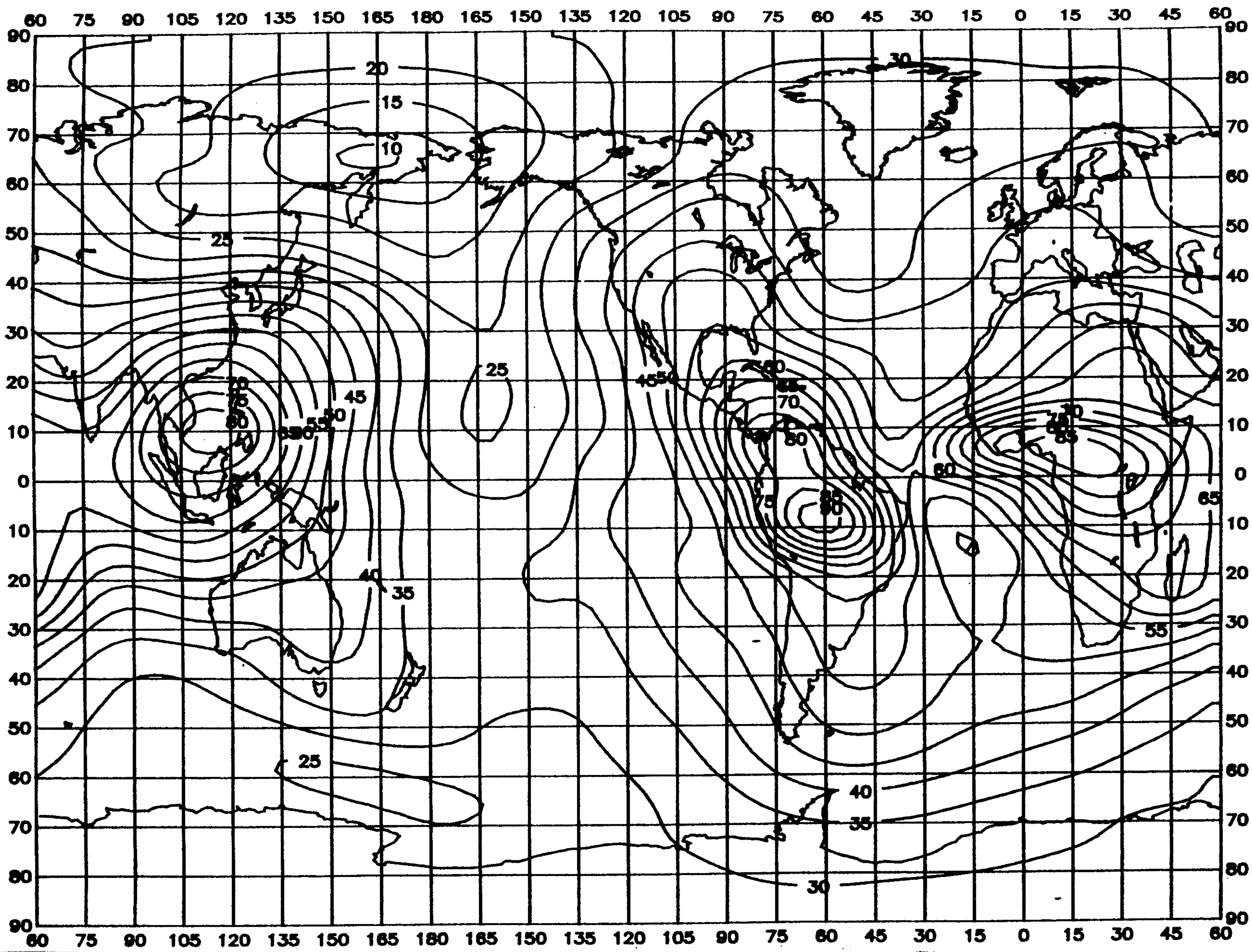

Figure 55. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for September, October, November, 1200-1600 hours.

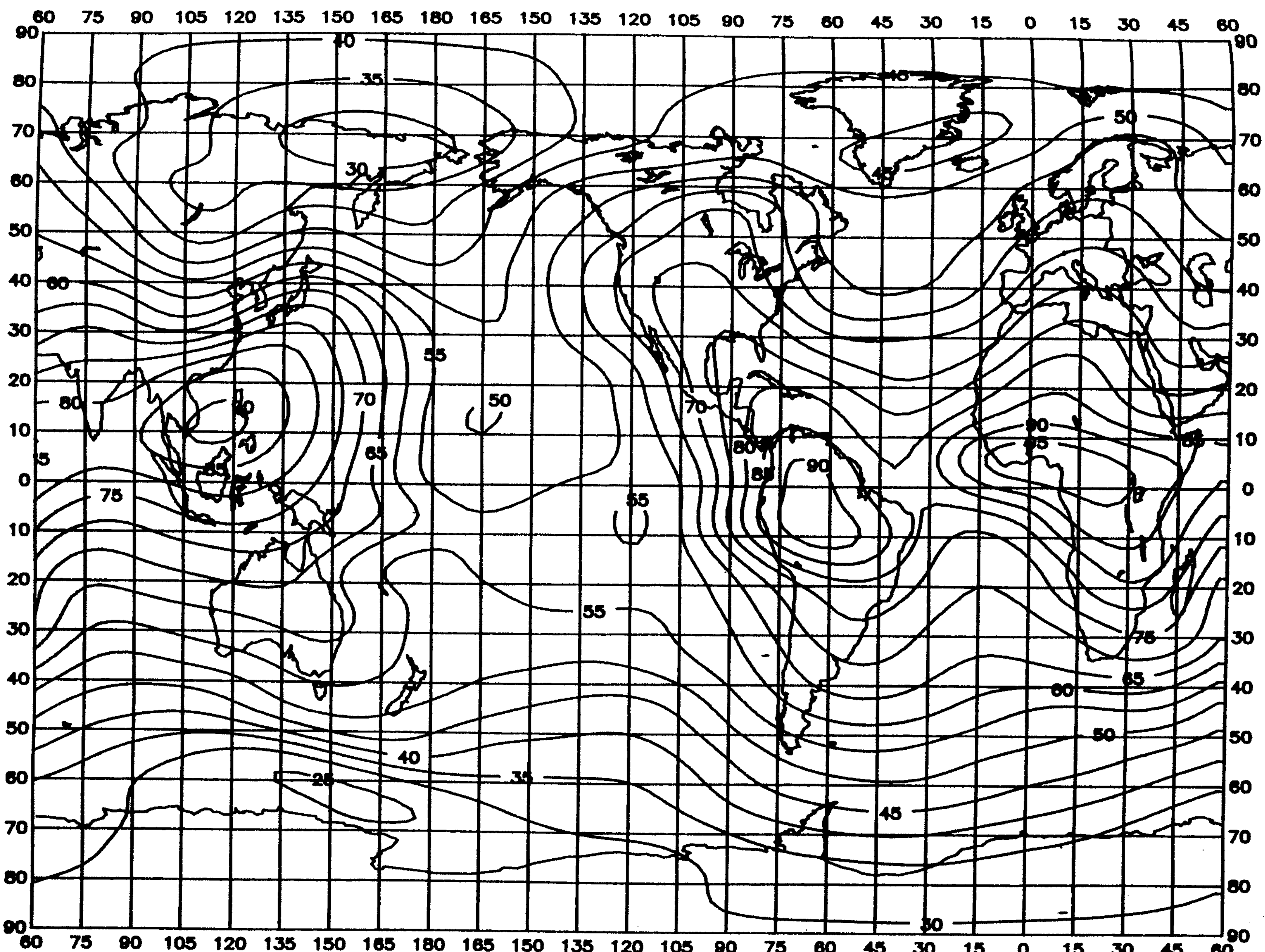

Figure 56. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for September October, November, 1600-2000 hours.

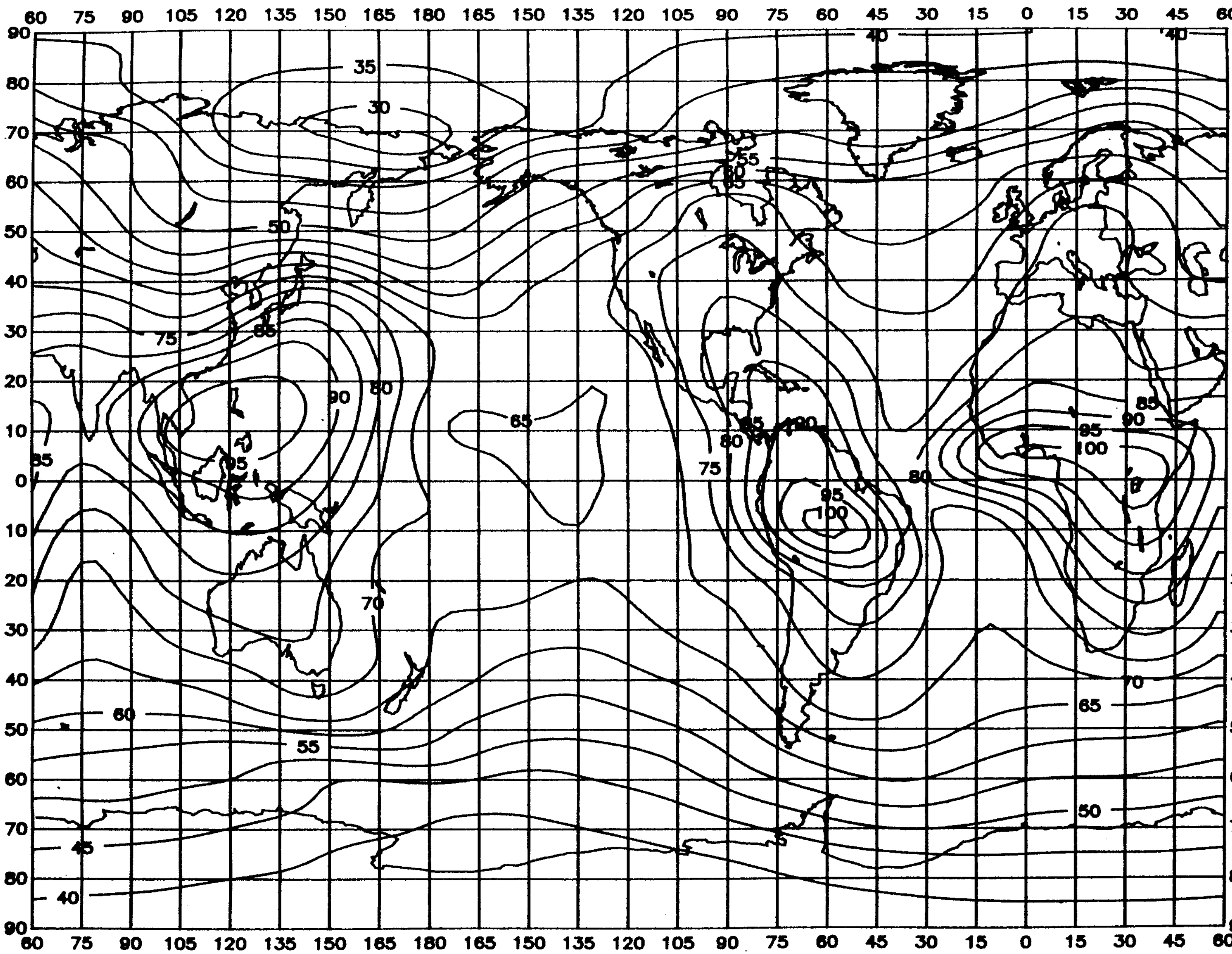

Figure 57. Expected values of atmospheric radio noise at 1 MHz, F_{am} (dB above kT_0b), for September, October, November, 2000-2400 hours.

```
      SUBROUTINE NOISE(KJ,ALAT,ALONG,FAM)
C     THIS SUBROUTINE EVALUATES THE 1MHZ FAM ATMOSPHERIC NOISE
C     VALUE AT THE LATITUDE ALAT AND THE LONGITUDE ALONG USING
C     THE FOURIER COEFFICIENTS IN THE ARRAYS ABP AND P.
C     ALAT IS THE LATITUDE IN DEGREES, + = NORTH AND - = SOUTH.
C     ALONG IS THE LONGITUDE IN DEGREES EAST OF GREENWICH.
C     KJ IS FOR THE 4 HOUR TIME BLOCKS, 1=00-04, 2=04-08,
C     ETC,  KJ=1,6.
      DIMENSION SX(15),ZZ(29),P(29,16,6),ABP(2,6)
      COMMON ABP,P
      PI = 3.141592654
      ALPHA = ABP(1,KJ)
      BETA = ABP(2,KJ)
      Q = ALONG*PI/360.
      S1 = SIN(Q)
      C1 = COS(Q)
      SX(1) = S1
      CX = C1
      DO 20  I=2,15
      TX = SX(I-1)
      SX(I) = TX*C1+CX*S1
      CX = CX*C1-TX*S1
   20 CONTINUE
      DO 40  J=1,29
      R = 0.
      DO 30  K=1,15
      R = R+SX(K)*P(J,K,KJ)
   30 CONTINUE
      ZZ(J) = R+P(J,16,KJ)
   40 CONTINUE
C     THE ZZ ARRAY IS THE 29 B COEFFICIENTS.
      Q = (ALAT+90.)*PI/180.
      S1 = SIN(Q)
      C1 = COS(Q)
      SX = S1
      CX = C1
      SUM = 0.
      DO 50  L=1,29
      SUM = SUM+SX*ZZ(L)
      SS = SX*C1+CX*S1
      CX = CX*C1-SX*S1
      SX = SS
   50 CONTINUE
      FAM = SUM+ALPHA+BETA*Q
      RETURN
      END
```

3. FREQUENCY VARIATION AND DATA ON NOISE VARIABILITY

In the last section we presented the updated contour maps of 1 MHz F_{am} expected values along with these maps in numerical form. In this section we present the variation with frequency of F_{am} and the variation of F_a about its median value, F_{am}. Preliminary analysis of the totality of data from the network of recording stations (Figure 3) indicated that no significant change would result for the variation of F_{am} with frequency from that currently given by CCIR Report 322. Similar findings hold for D_u, D_ℓ, σ_{D_u}, σ_{D_ℓ}, and V_{dm}. Figures 58-81, therefore, are the Figures 2b and 2c through 25b and 25c of CCIR Report 322. These are repeated here for completeness, but mainly, we want to give the numerical forms of these statistics. The numerical forms for some of the parameters were not available previously.

The frequency variation of F_{am} was obtained by a least squares mapping of the data by the function

$$F_{am}(x,z) = A_1(z) + A_2(z)x^2 + A_3(z)x^3 + \ldots + A_7(z)x^6, \qquad (23)$$

where

$$A_i(z) = B_{i,1} + B_{i,2}z \text{ , } i = 1,7.$$

z = the 1 MHz F_{am} value (from the contour maps), and

$$x = \frac{8 \times 2^{\log_{10} f} - 11}{4} \text{ ,} \qquad (24)$$

where f is the desired frequency in MHz.

The mapping was subject to the constraint $F_{am}(-0.75,z) = z$ (i.e., the 1 MHz value must equal z). From the above, 14 coefficients represent each of the 24 frequency variations (each season and 4-hour time period). Note that the frequency variation (as well as D_u, etc.) is a function of <u>season</u>, whereas the contour maps are given for <u>3-month periods</u>. For example, December, January, and February are <u>Winter</u> in the Northern Hemisphere and <u>Summer</u> in the Southern Hemisphere. Tables 31-34 give coefficients for each season/4-hour time period and the program FREQL demonstrates how the coefficients are used to produce the frequency variation curves. Table 35 gives the output of FREQL. The example shown gives F_{am} values for 27 frequencies and 9 1-MHz F_{am} values (20-100 dB). That is, this example "covers" CCIR Report 322 Figure 2b (Figure 58, here). For any particular 1 MHz F_{am} value and frequency, program FREQL is easily modified.

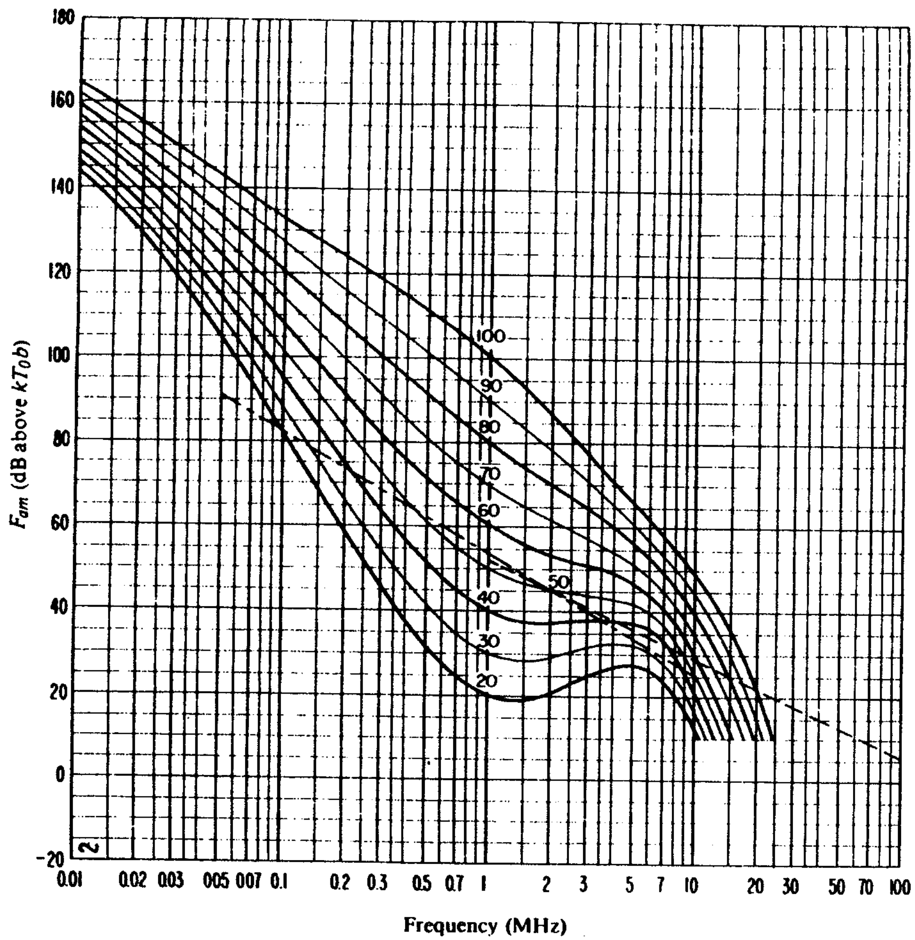

FIGURE 2b – *Variation of radio noise with frequency (Winter; 0000-0400 h)*

——————— Expected values of atmospheric noise

— · — · — · — Expected values of man-made noise at a quiet receiving location

— — — — — Expected values of galactic noise

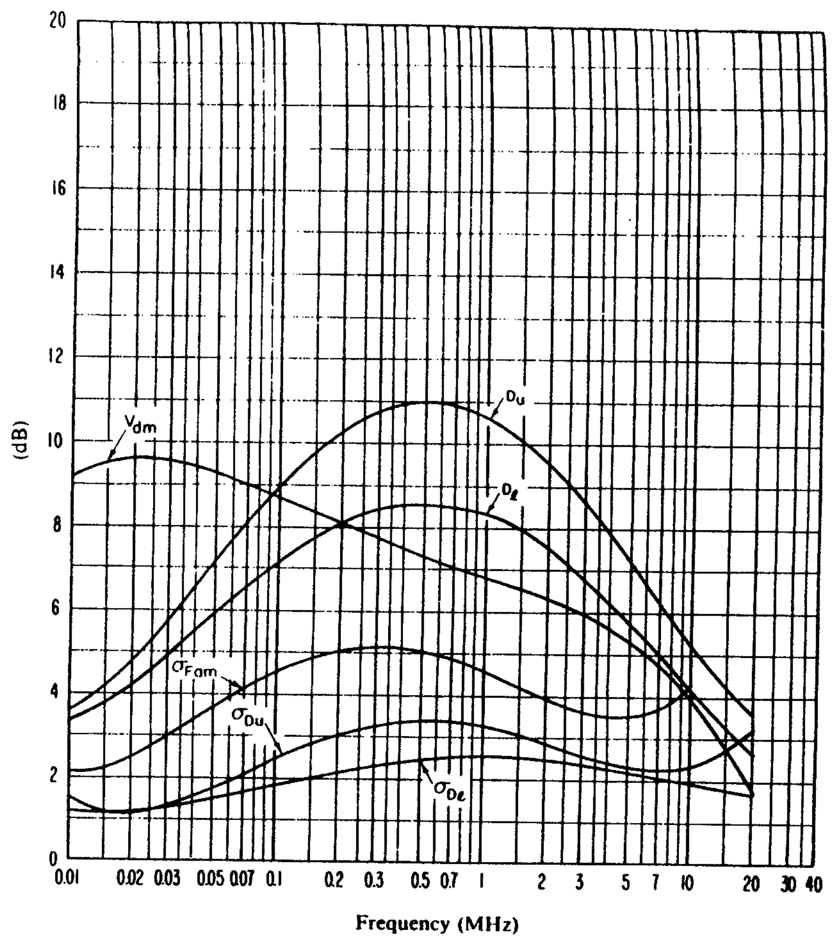

FIGURE 2c – *Data on noise variability and character (Winter; 0000-0400 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 58. Figures 2b and 2c from CCIR Report 322.

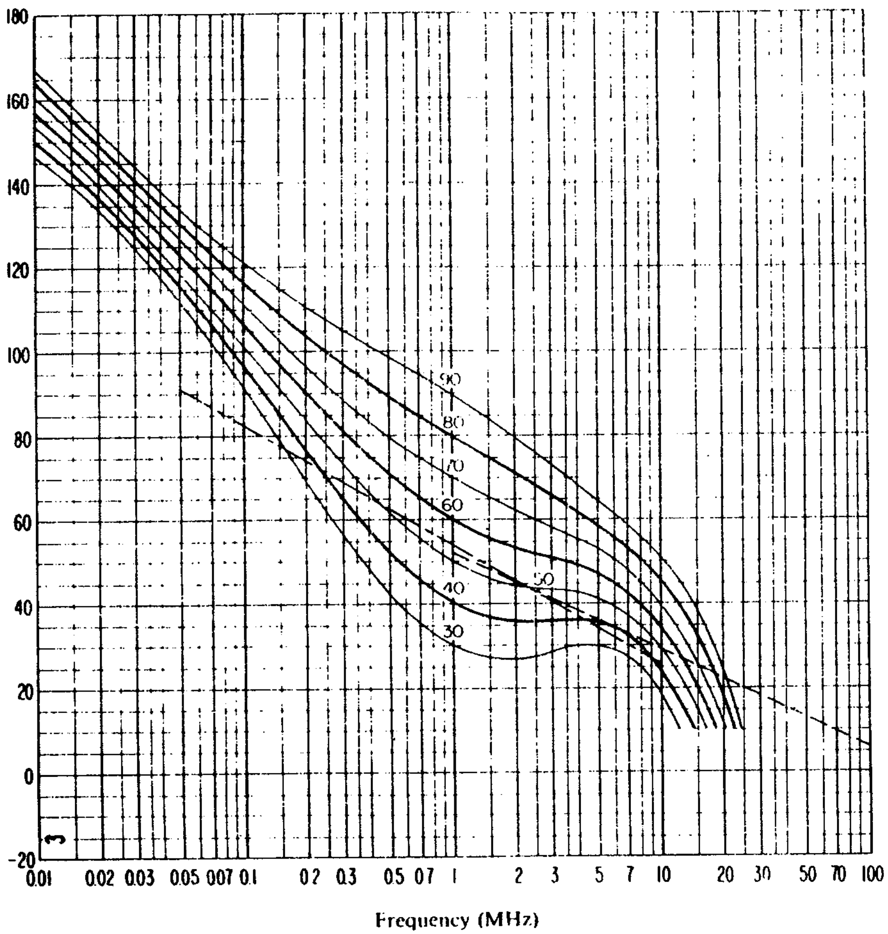

FIGURE 3b – *Variation of radio noise with frequency (Winter; 0400-0800 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

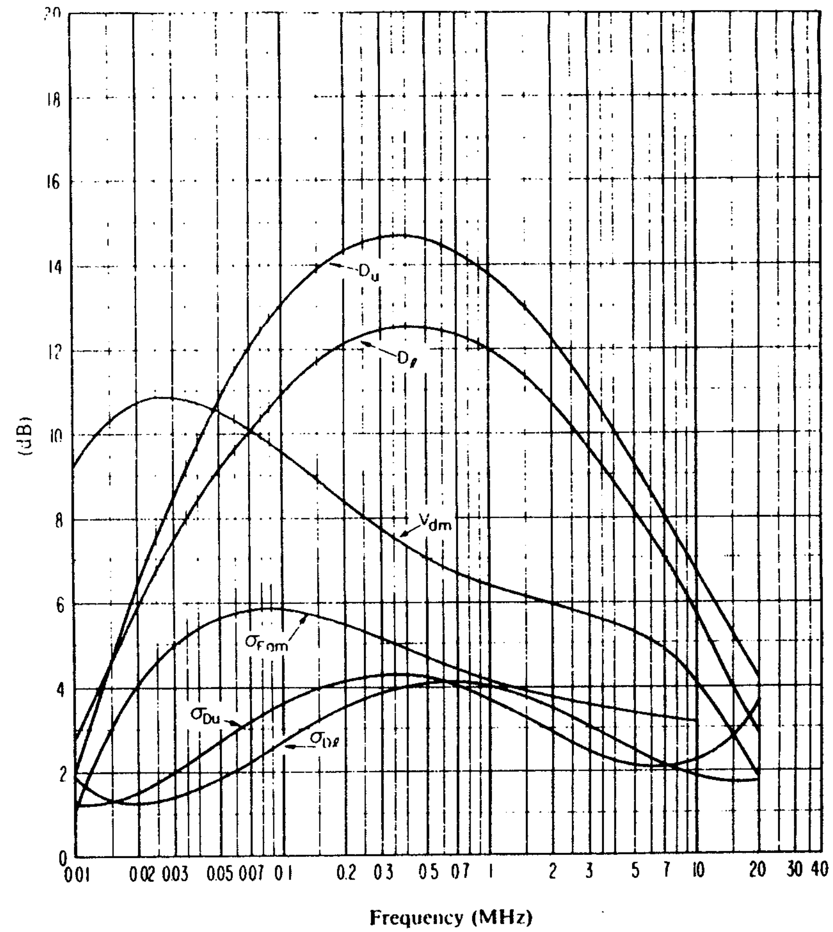

FIGURE 3c – *Data on noise variability and character (Winter; 0400-0800 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 59. Figures 3b and 3c from CCIR Report 322.

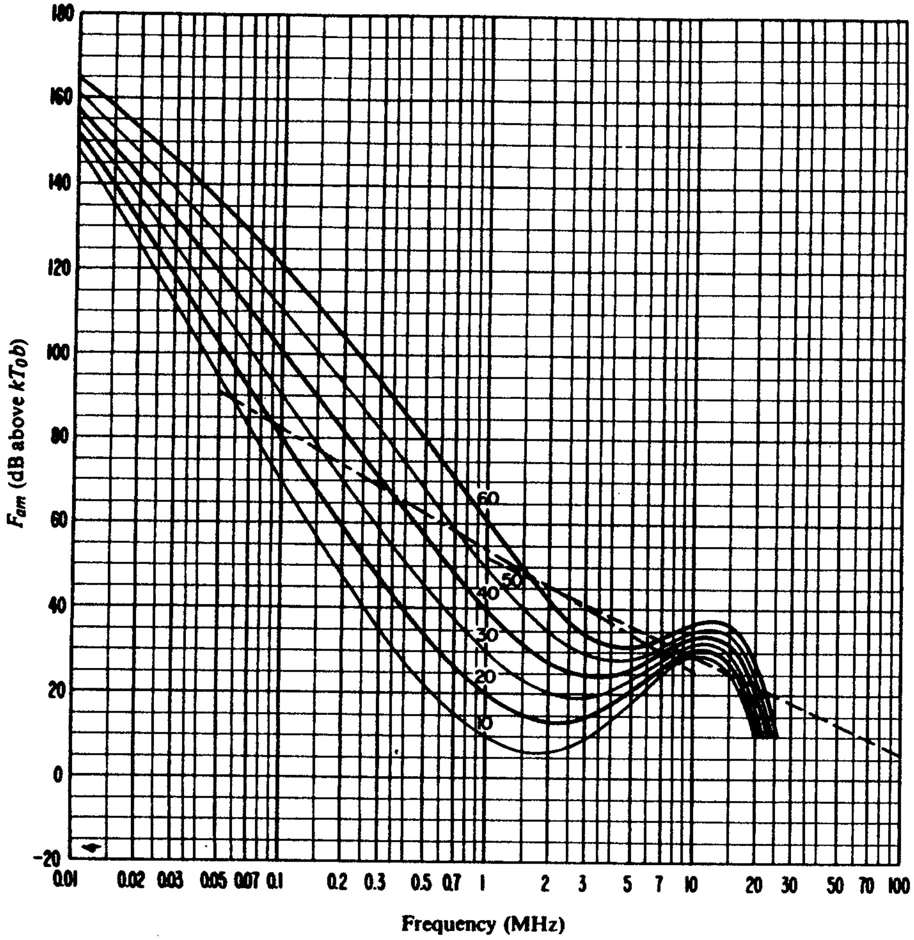

FIGURE 4b – *Variation of radio noise with frequency (Winter; 0800-1200 h)*

——————— Expected values of atmospheric noise

— · — · — · — Expected values of man-made noise at a quiet receiving location

— — — — — — Expected values of galactic noise

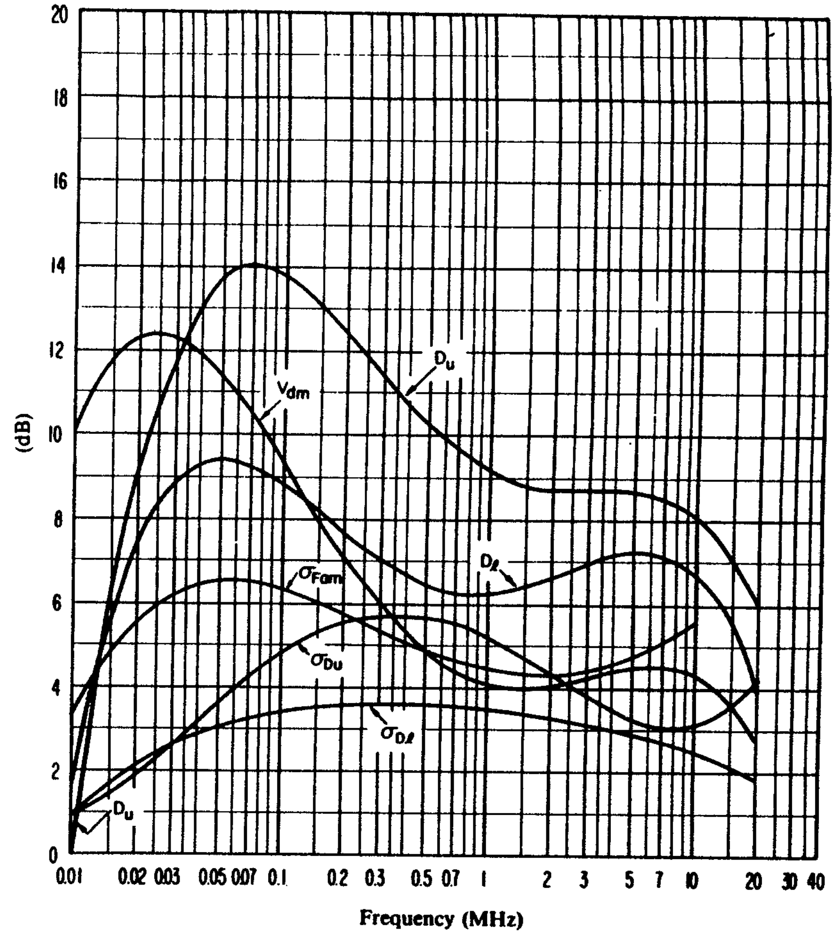

FIGURE 4c – *Data on noise variability and character (Winter; 0800-1200 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 60. Figures 4b and 4c from CCIR Report 322.

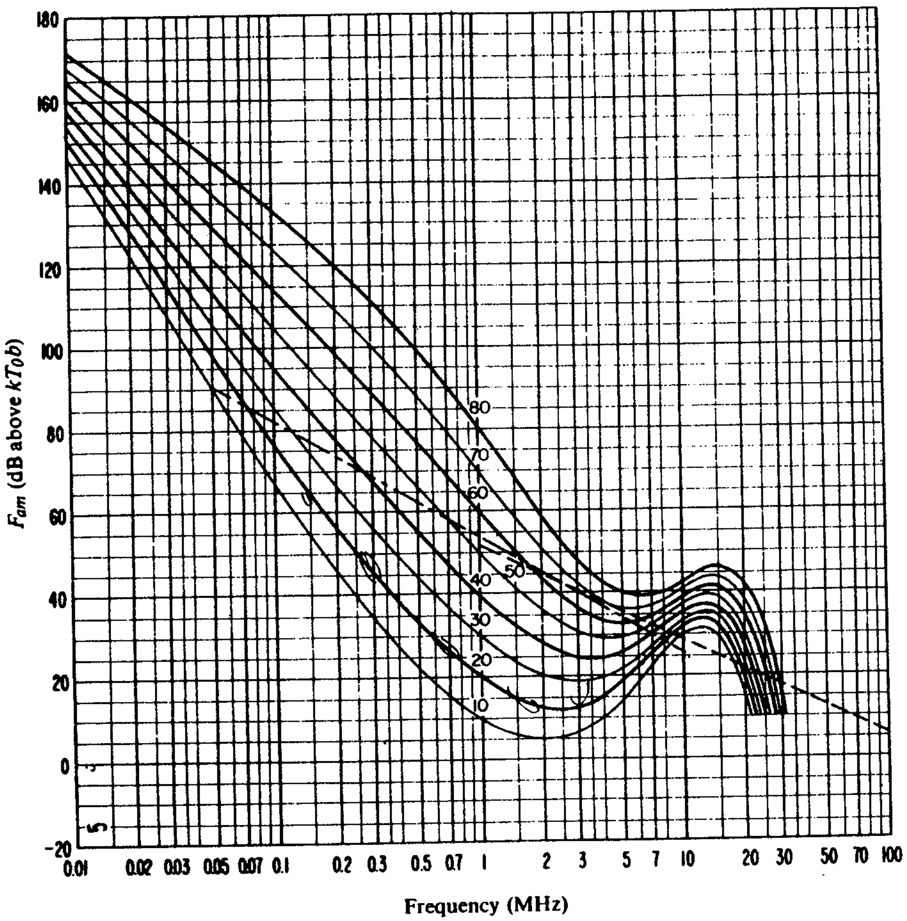

FIGURE 5b – *Variation of radio noise with frequency (Winter; 1200-1600 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

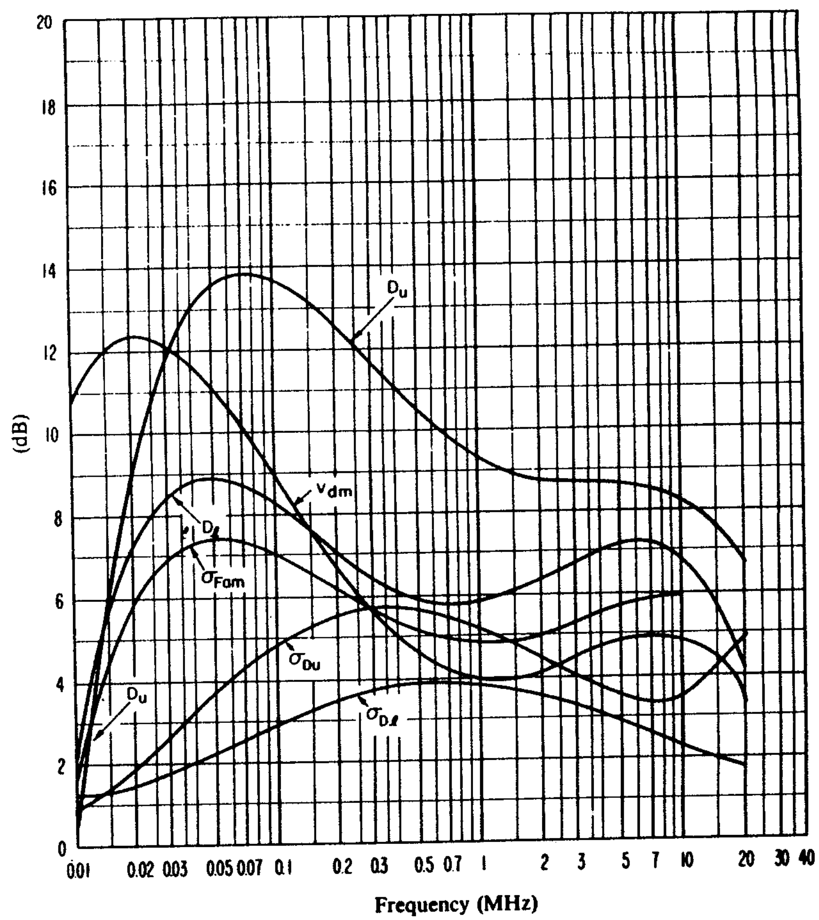

FIGURE 5c – *Data on noise variability and character (Winter; 1200-1600 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 61. Figures 5b and 5c from CCIR Report 322.

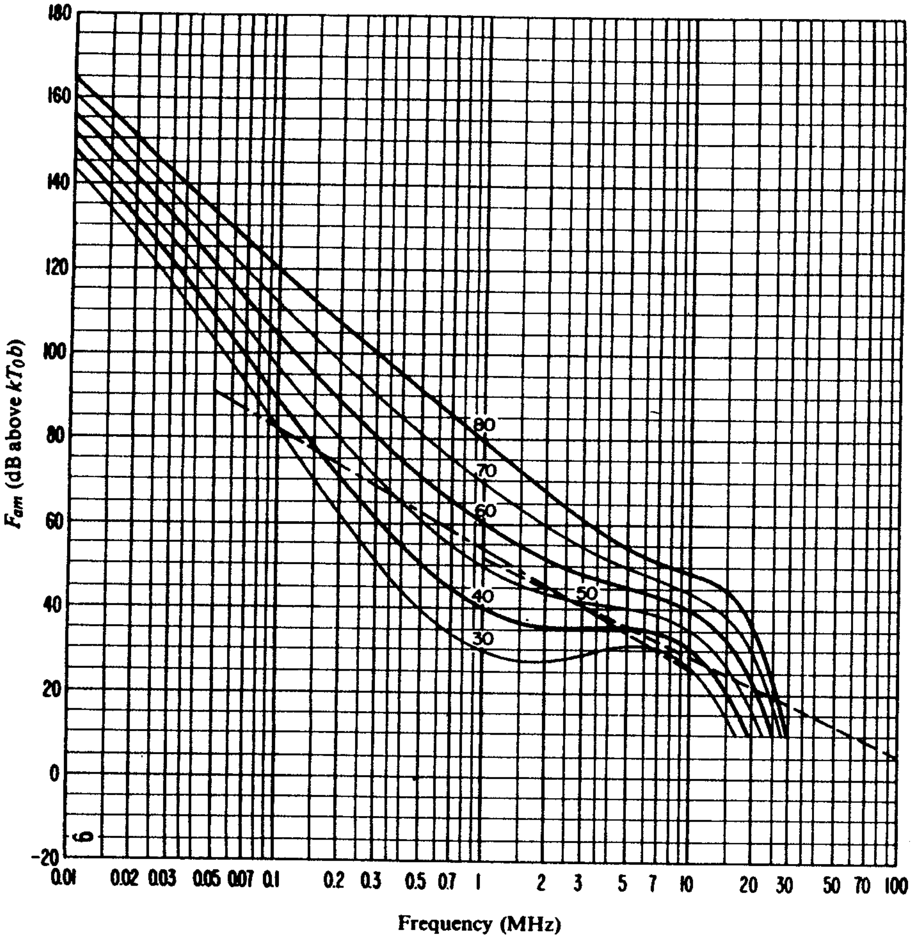

FIGURE 6b – *Variation of radio noise with frequency (Winter; 1600-2000 h)*

- ———— Expected values of atmospheric noise
- — · — · — Expected values of man-made noise at a quiet receiving location
- — — — — Expected values of galactic noise

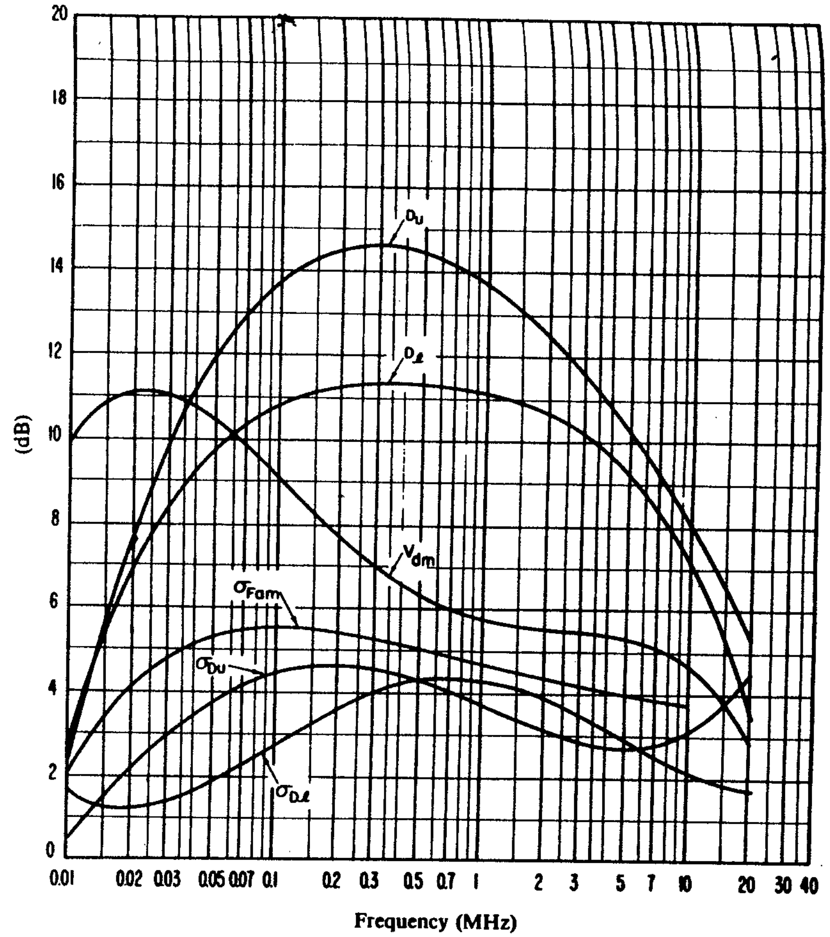

FIGURE 6c – *Data on noise variability and character (Winter; 1600-2000 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 62. Figures 6b and 6c from CCIR Report 322.

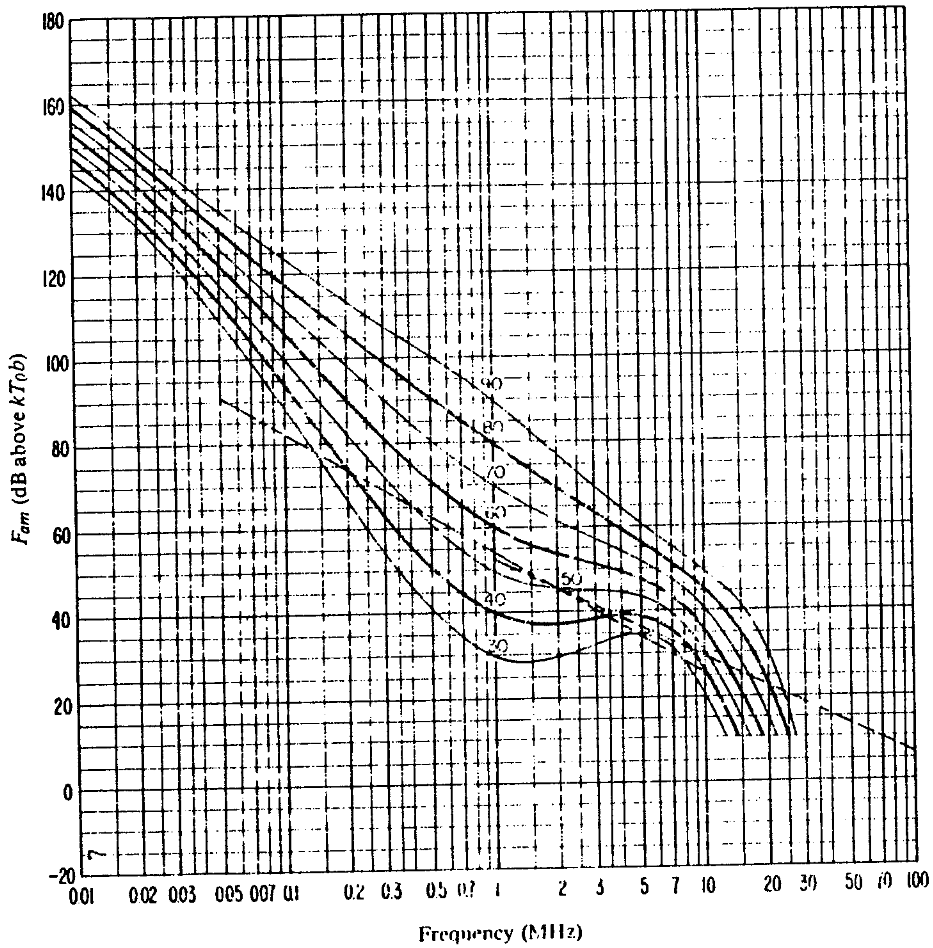

FIGURE 7b – *Variation of radio noise with frequency (Winter; 2000-2400 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

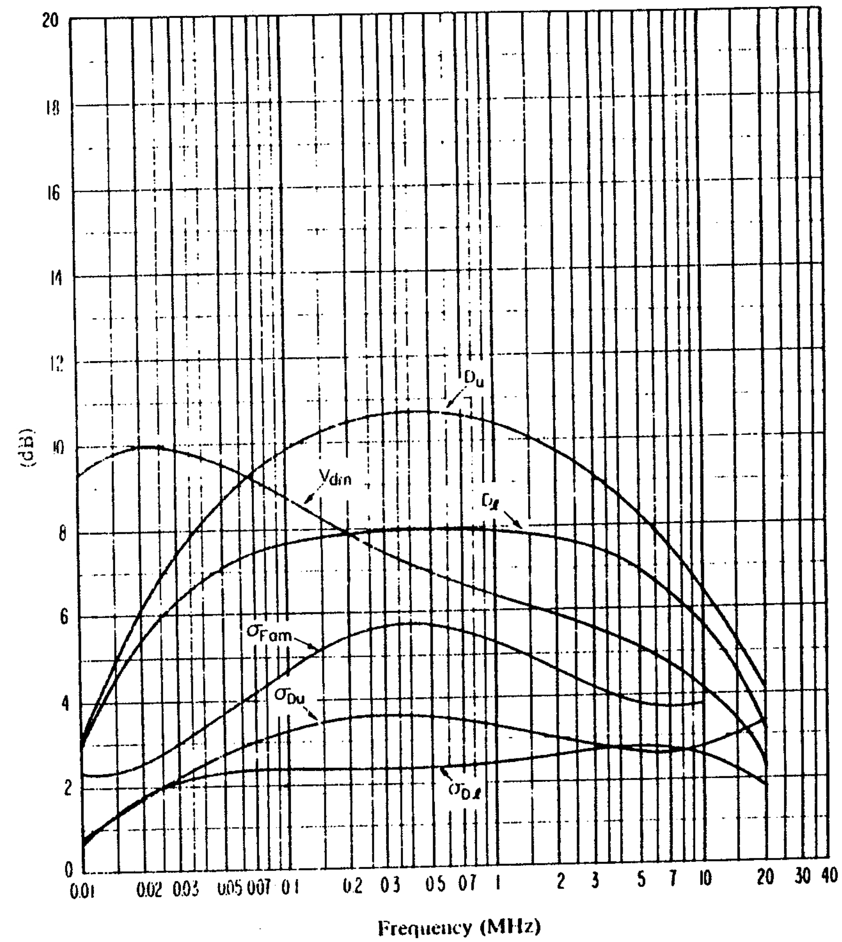

FIGURE 7c – *Data on noise variability and character (Winter; 2000-2400 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 63. Figures 7b and 7c from CCIR Report 322.

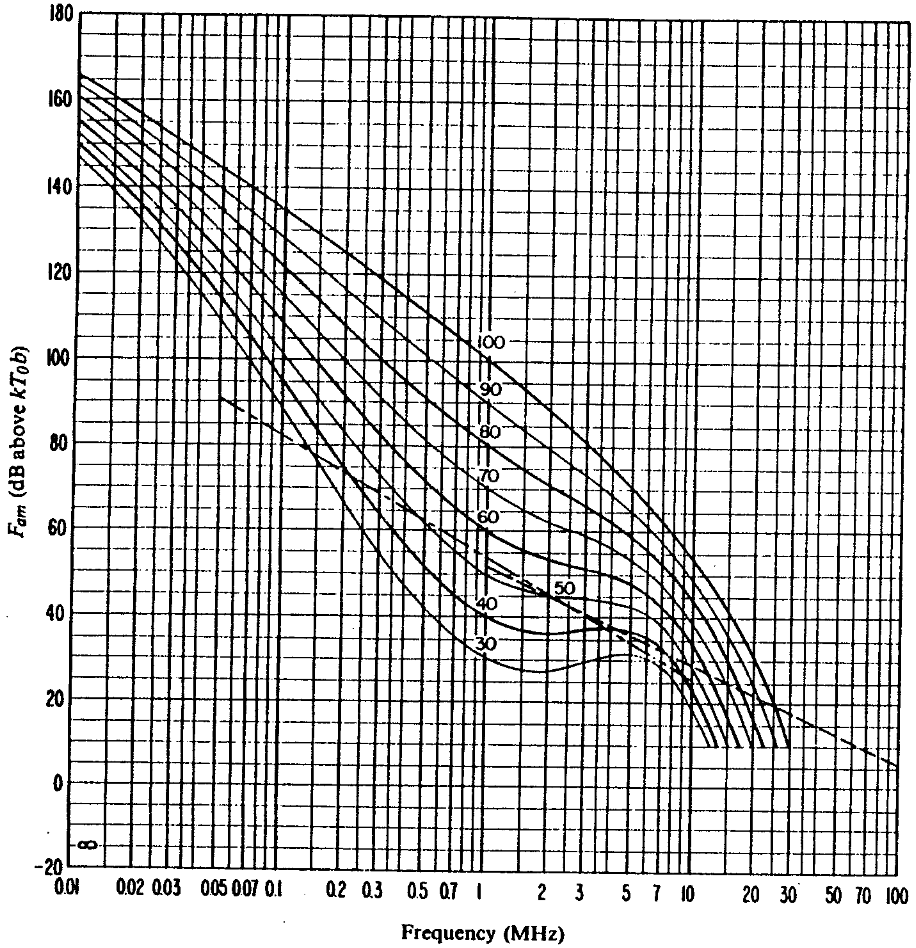

FIGURE 8b – *Variation of radio noise with frequency (Spring; 0000-0400 h)*

——————— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — — Expected values of galactic noise

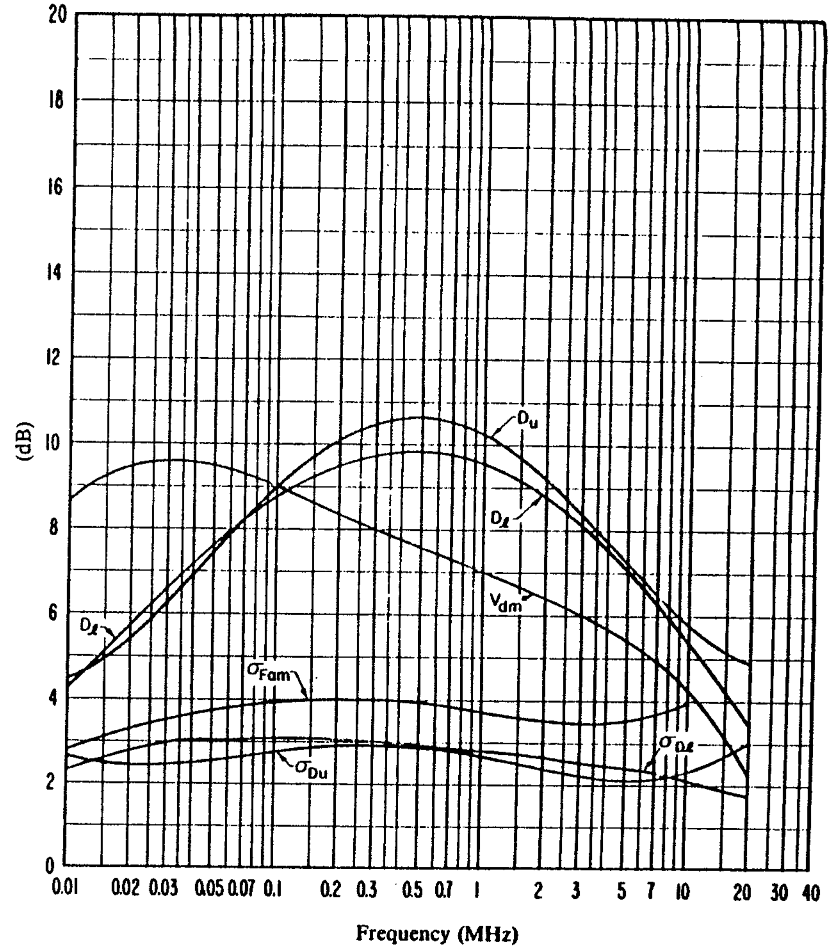

FIGURE 8c – *Data on noise variability and character (Spring; 0000-0400 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 64. Figures 8b and 8c from CCIR Report 322.

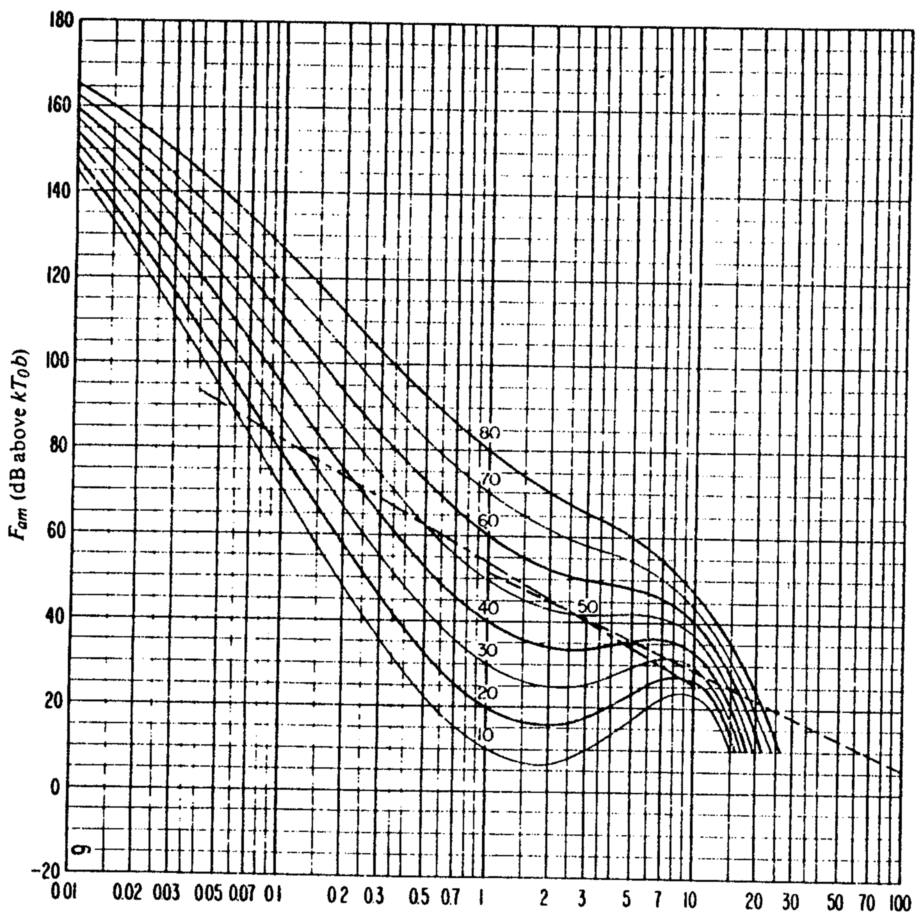

FIGURE 9b – *Variation of radio noise with frequency (Spring; 0400-0800 h)*

———— Expected values of atmospheric noise

— · — · — · — Expected values of man-made noise at a quiet receiving location

— — — — — Expected values of galactic noise

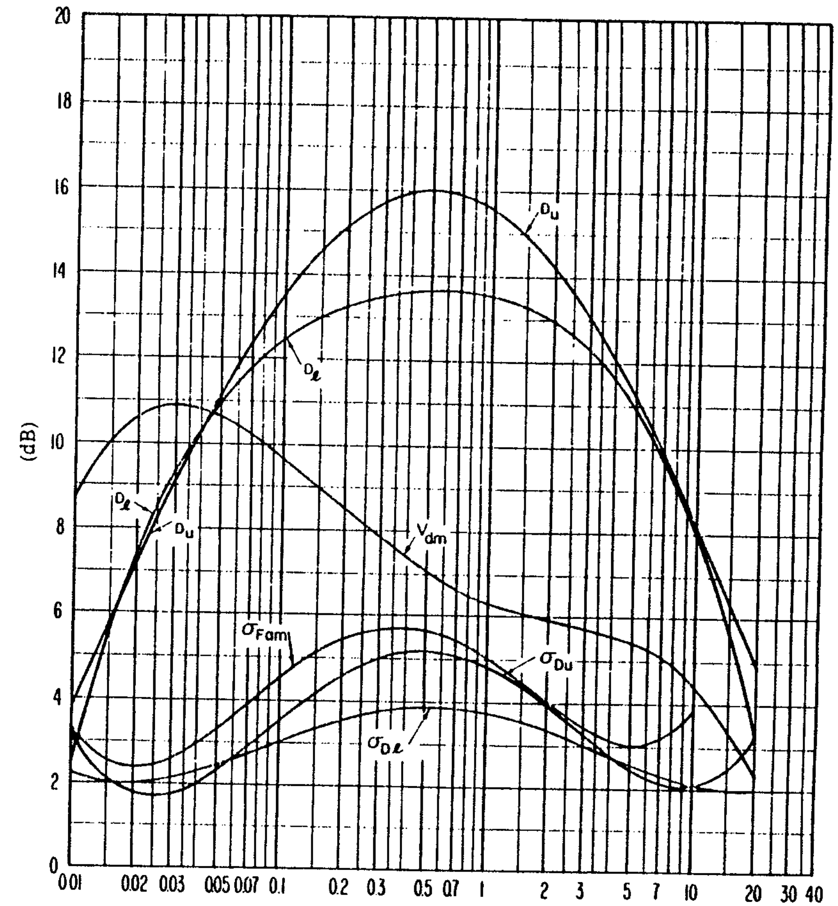

FIGURE 9c – *Data on noise variability and character (Spring; 0400-0800 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 65.. Figures 9b and 9c from CCIR Report 322.

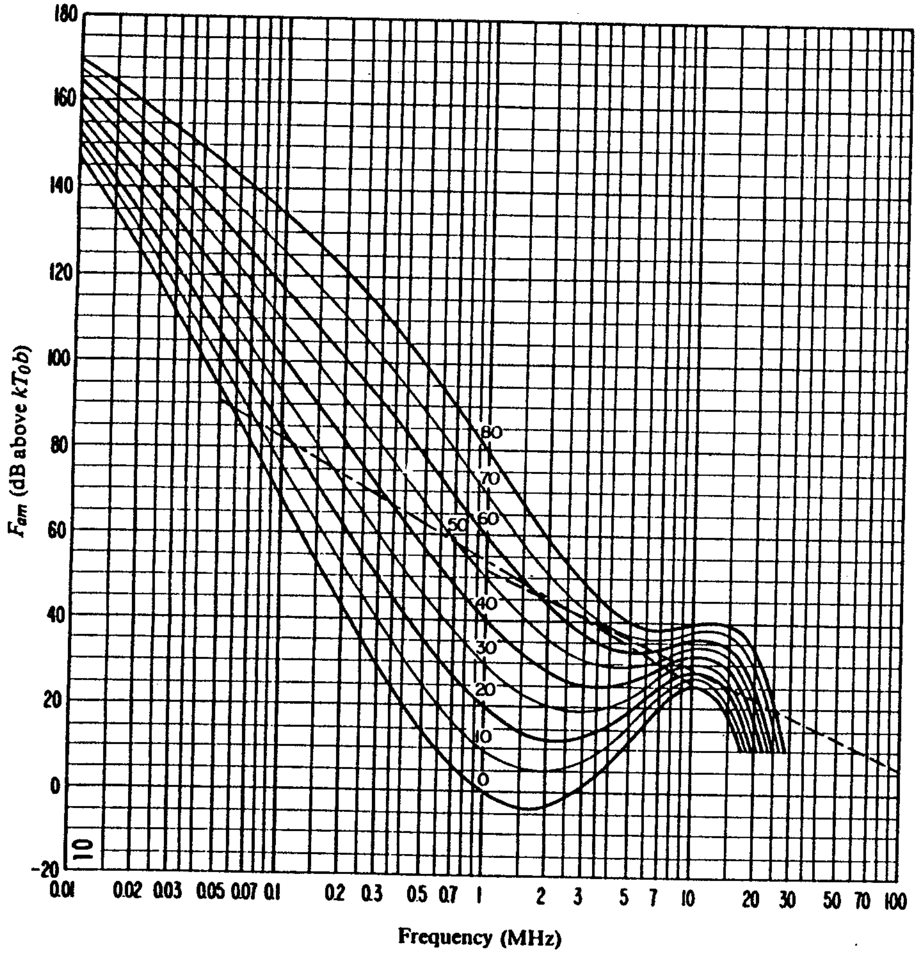

FIGURE 10b – *Variation of radio noise with frequency (Spring; 0800-1200 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

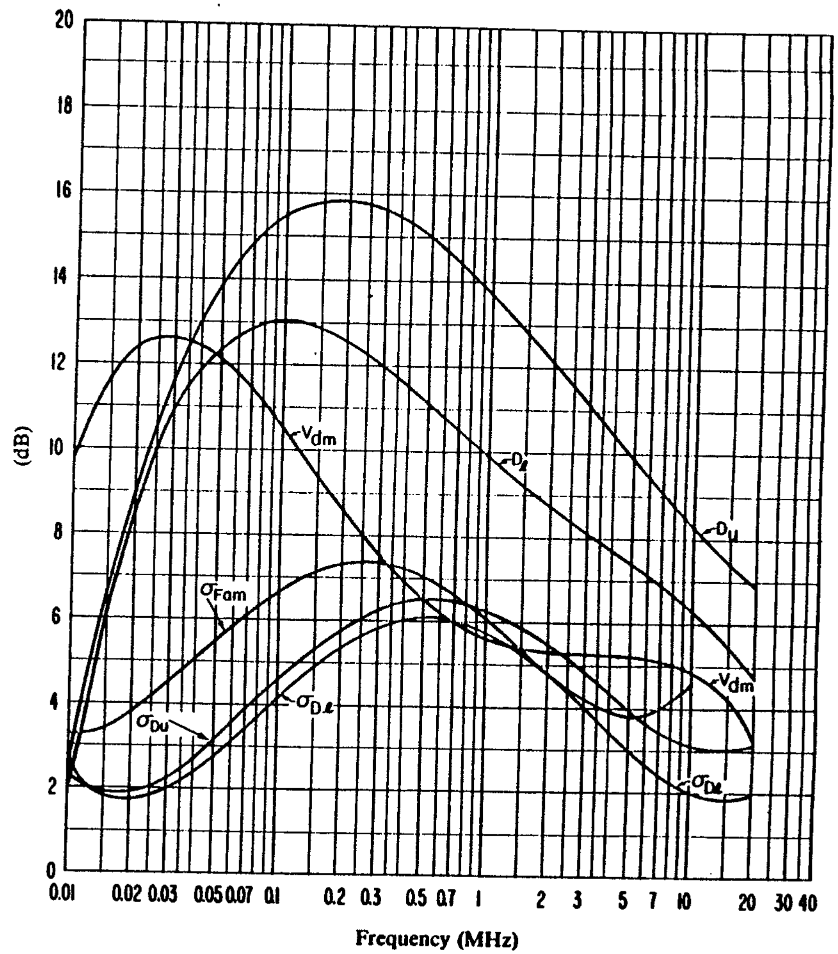

FIGURE 10c – *Data on noise variability and character (Spring; 0800-1200 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 66. Figures 10b and 10c from CCIR Report 322.

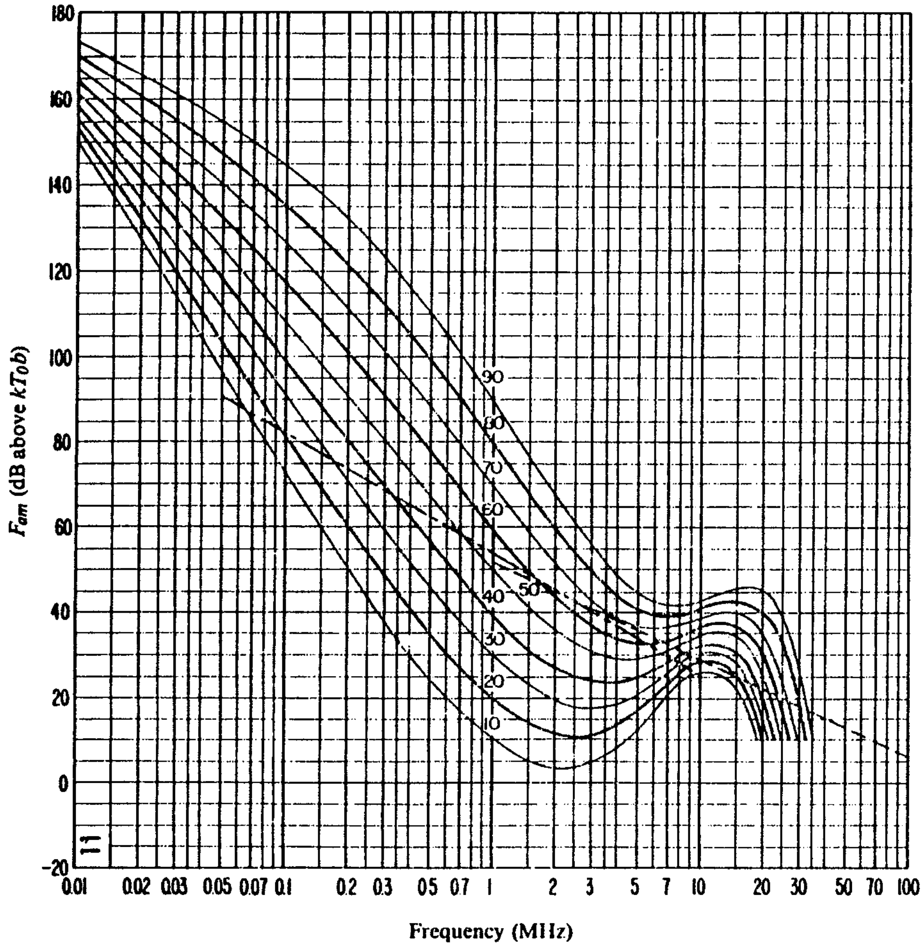

FIGURE 11b – *Variation of radio noise with frequency (Spring; 1200-1600 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

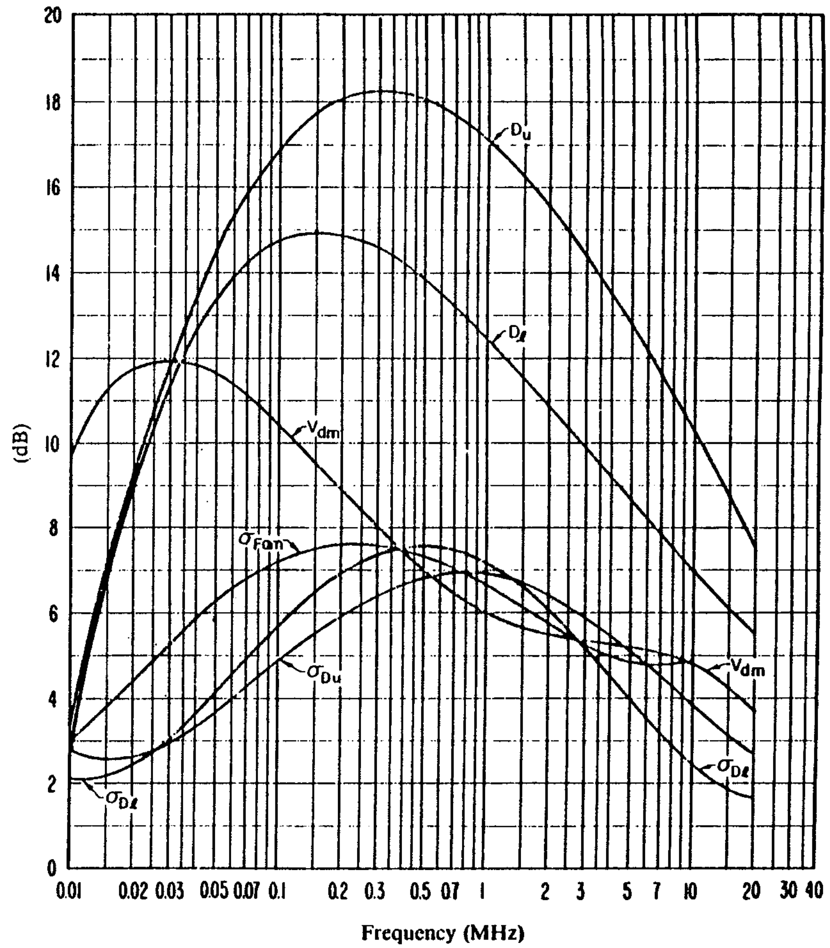

FIGURE 11c – *Data on noise variability and character (Spring; 1200-1600 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 67. Figures 11b and 11c from CCIR Report 322.

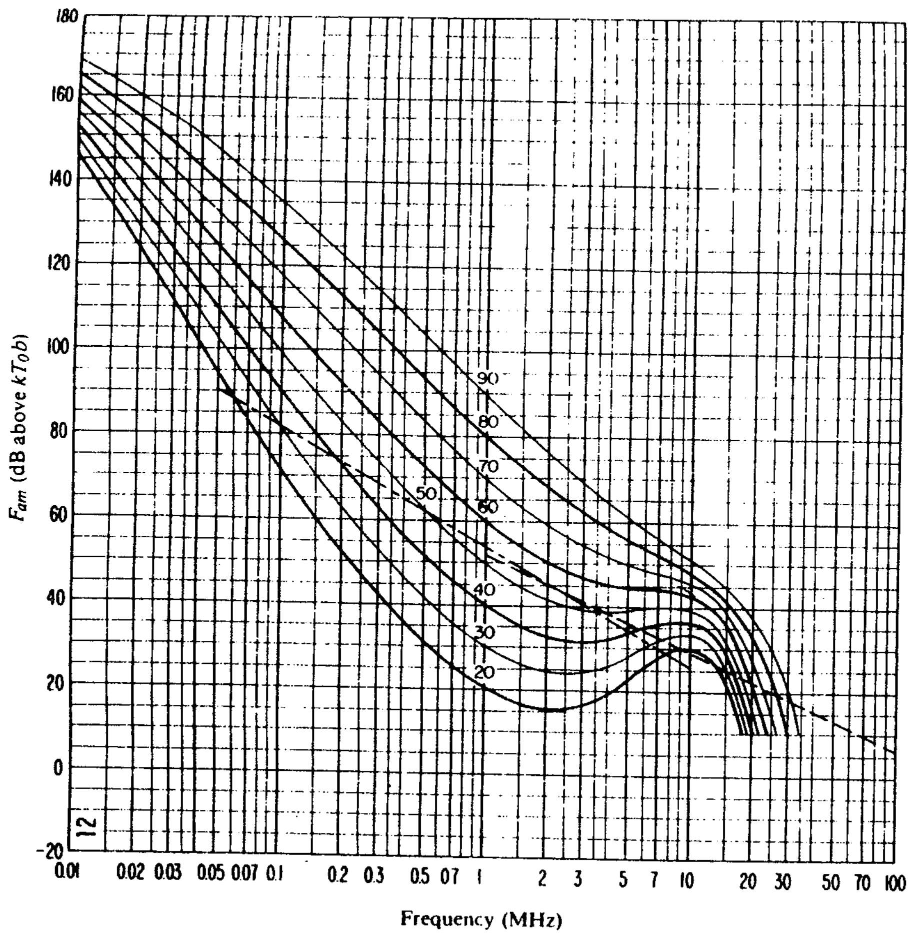

FIGURE 12b – *Variation of radio noise with frequency (Spring; 1600-2000 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

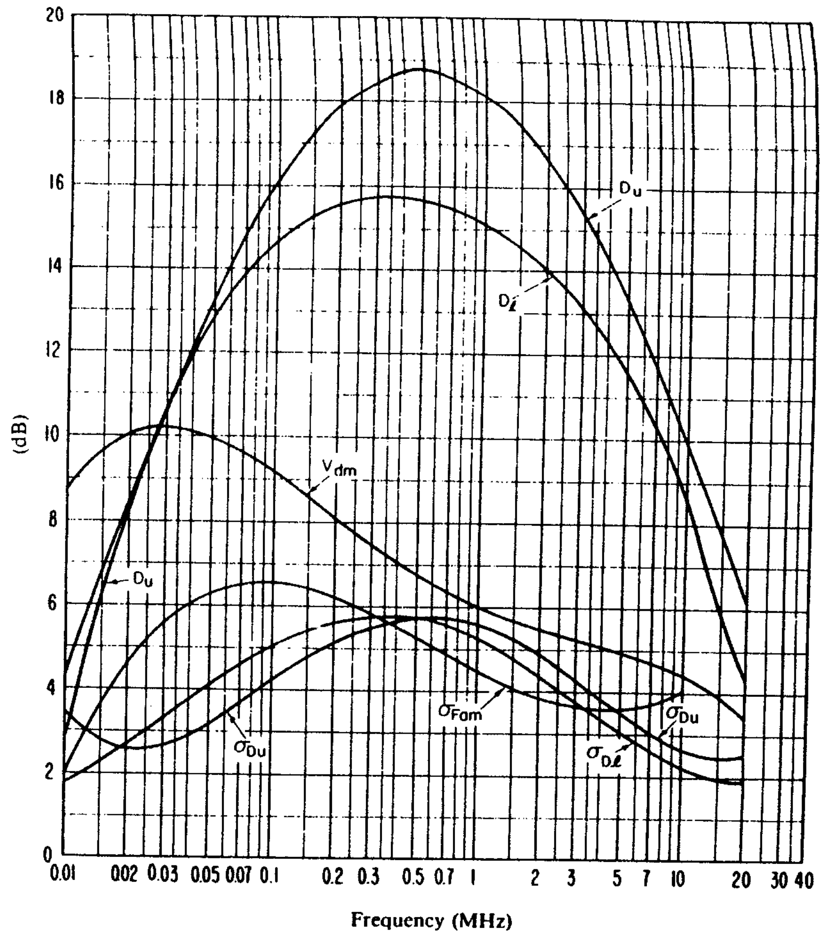

FIGURE 12c – *Data on noise variability and character (Spring; 1600-2000 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 68. Figures 12b and 12c from CCIR Report 322.

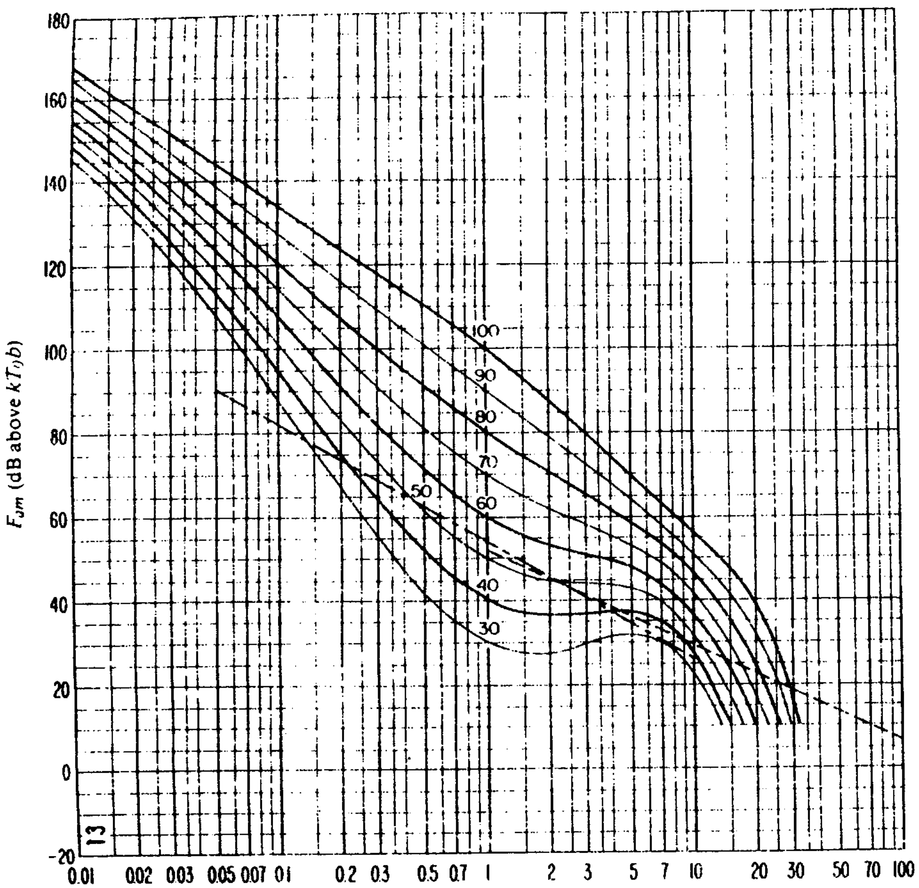

FIGURE 13b – *Variation of radio noise with frequency (Spring; 2000-2400 h)*

——————— Expected values of atmospheric noise

— · — · — · — Expected values of man-made noise at a quiet receiving location

— — — — — Expected values of galactic noise

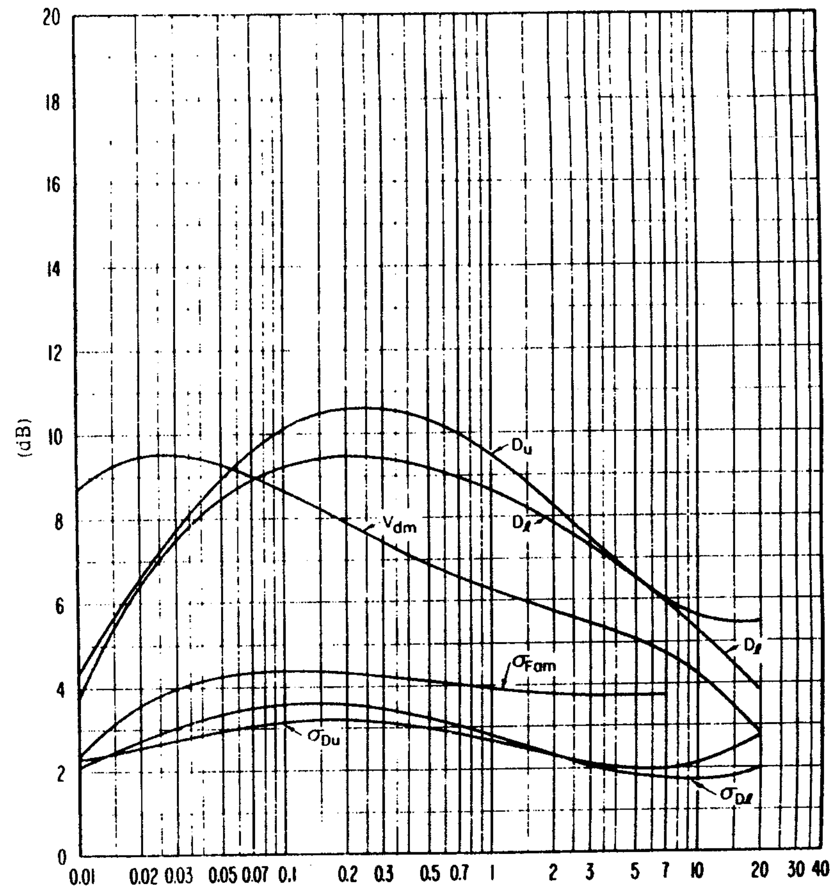

FIGURE 13c – *Data on noise variability and character (Spring; 2000-2400 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 69. Figures 13b and 13c from CCIR Report 322.

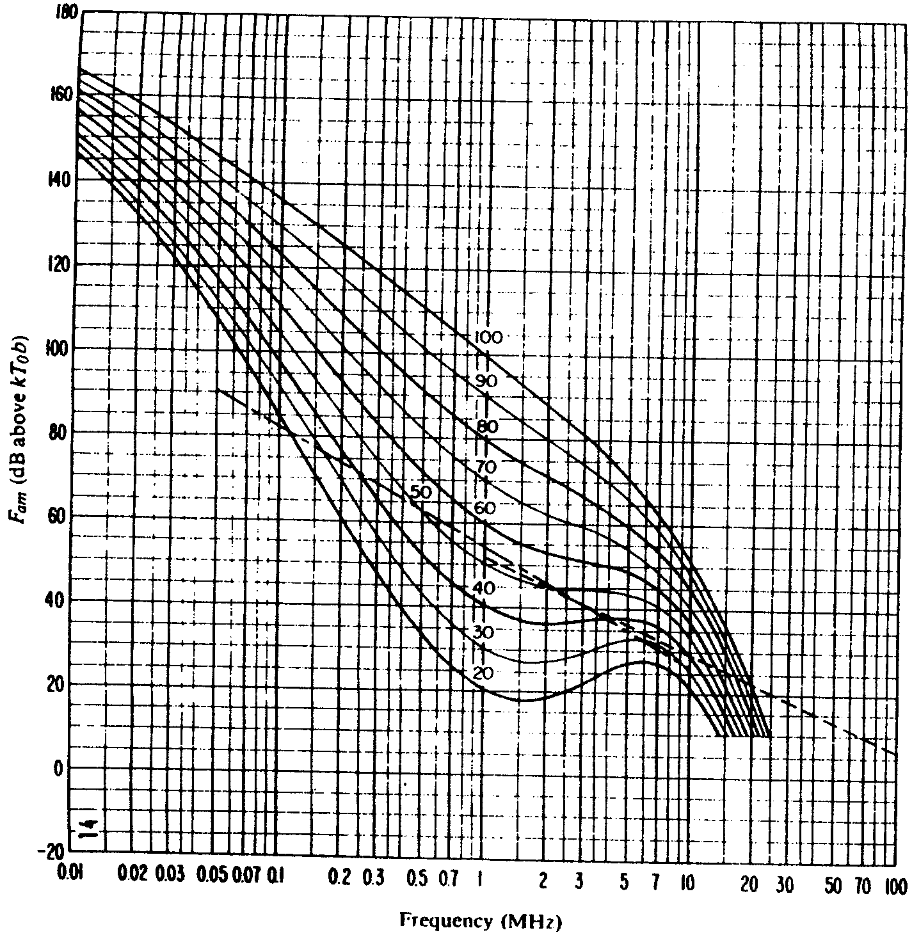

FIGURE 14b – *Variation of radio noise with frequency (Summer; 0000-0400 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

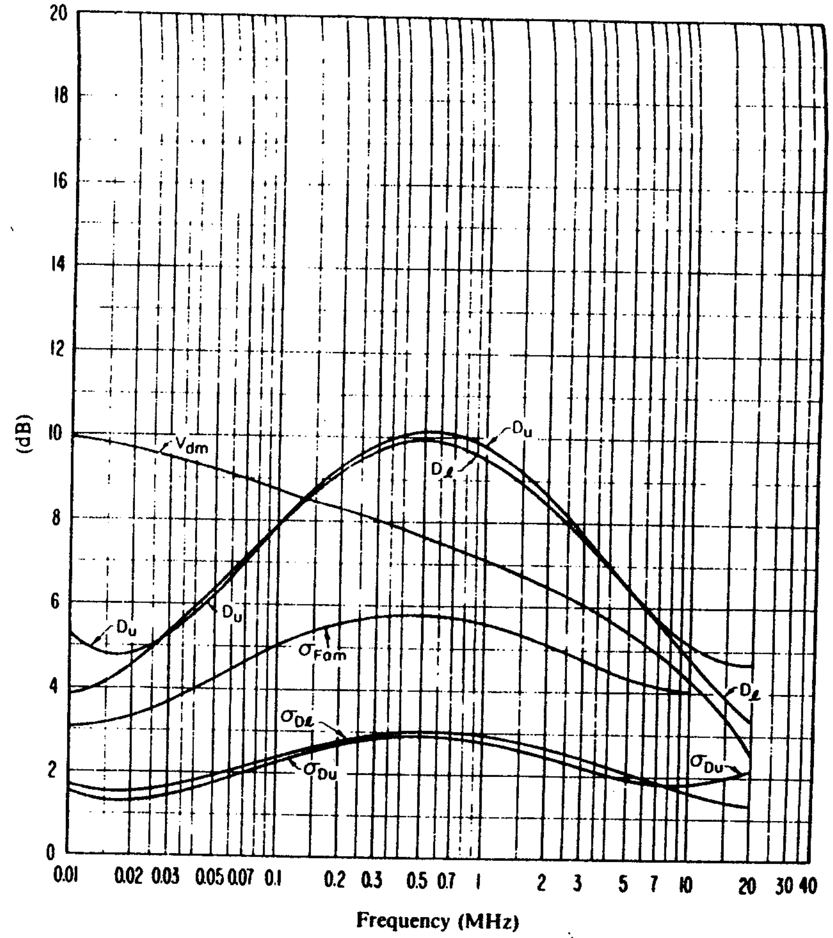

FIGURE 14c – *Data on noise variability and character (Summer; 0000-0400 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 70. Figures 14b and 14c from CCIR Report 322.

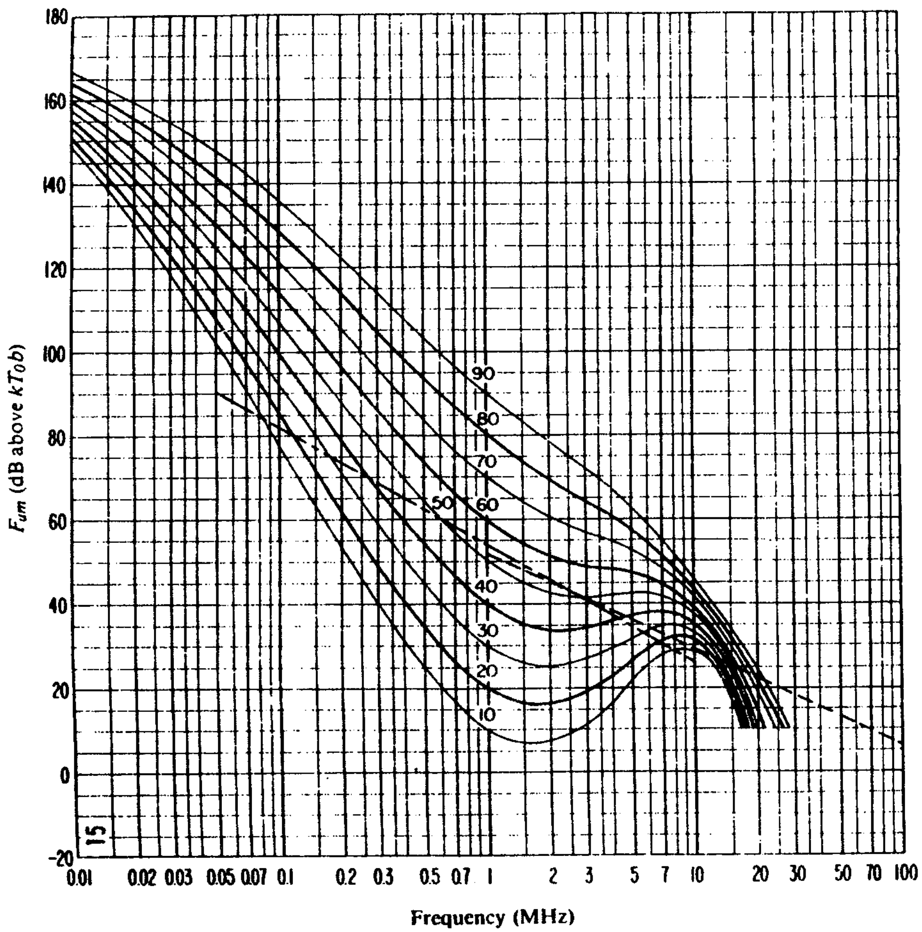

FIGURE 15b – *Variation of radio noise with frequency (Summer; 0400-0800 h)*

———— Expected values of atmospheric noise

– · – · – Expected values of man-made noise at a quiet receiving location

– – – – Expected values of galactic noise

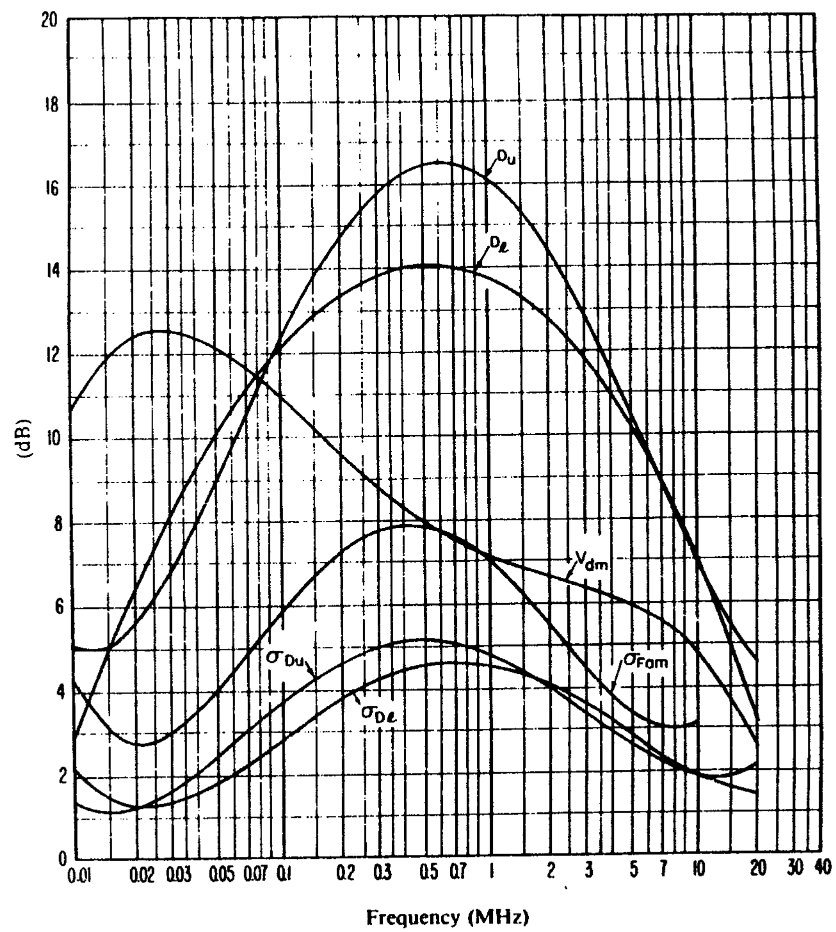

FIGURE 15c – *Data on noise variability and character (Summer; 0400-0800 h)*

σ_{Fam} : Standard deviation of values of F_{am}

D_u : Ratio of upper decile to median value, F_{am}

σ_{Du} : Standard deviation of values of D_u

D_l : Ratio of median value, F_{am}, to lower decile

σ_{Dl} : Standard deviation of value of D_l

V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 71. Figures 15b and 15c from CCIR Report 322.

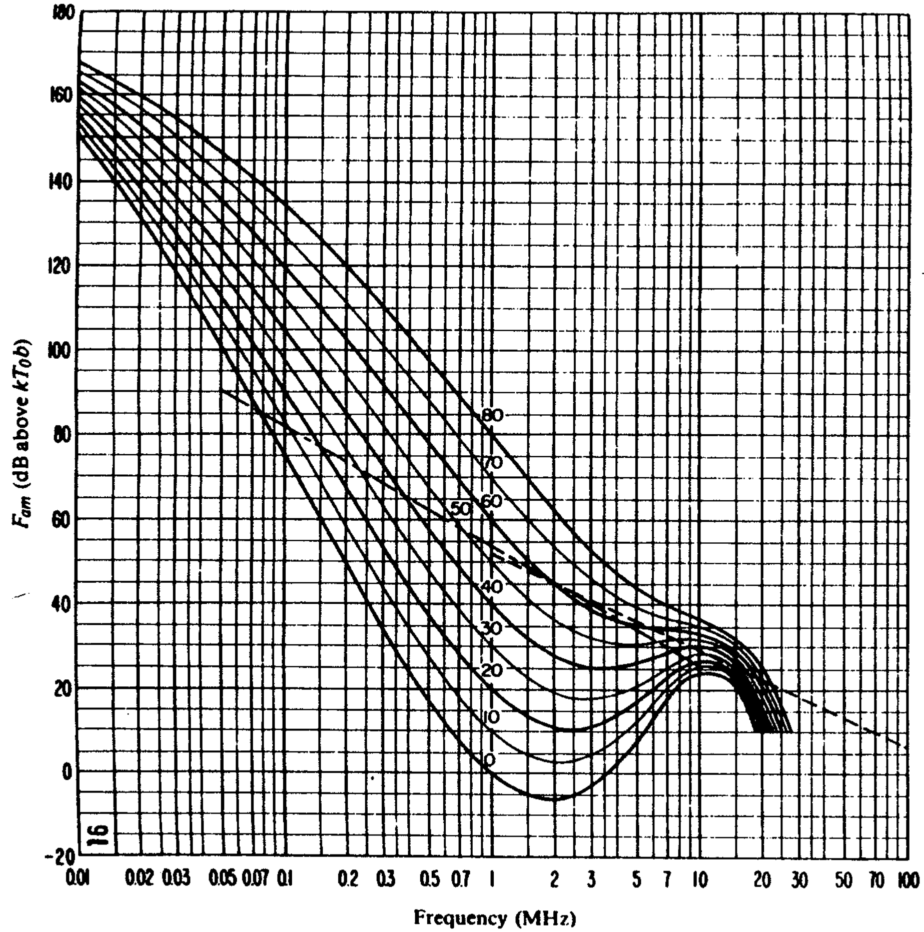

FIGURE 16b – *Variation of radio noise with frequency (Summer; 0800-1200 h)*

——————— Expected values of atmospheric noise

— · — · — · — Expected values of man-made noise at a quiet receiving location

— — — — — Expected values of galactic noise

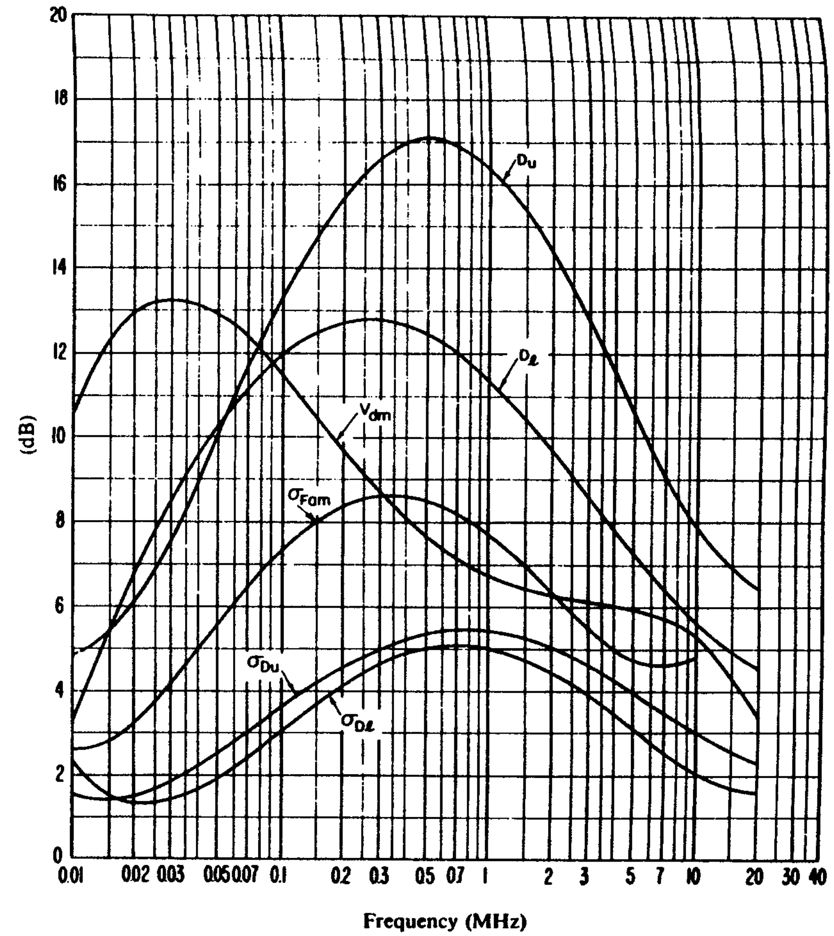

FIGURE 16c – *Data on noise variability and character (Summer; 0800-1200 h)*

σ_{Fam} : Standard deviation of values of F_{am}

D_u : Ratio of upper decile to median value, F_{am}

σ_{Du} : Standard deviation of values of D_u

D_l : Ratio of median value, F_{am}, to lower decile

σ_{Dl} : Standard deviation of value of D_l

V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 72. Figures 16b and 16c from CCIR Report 322.

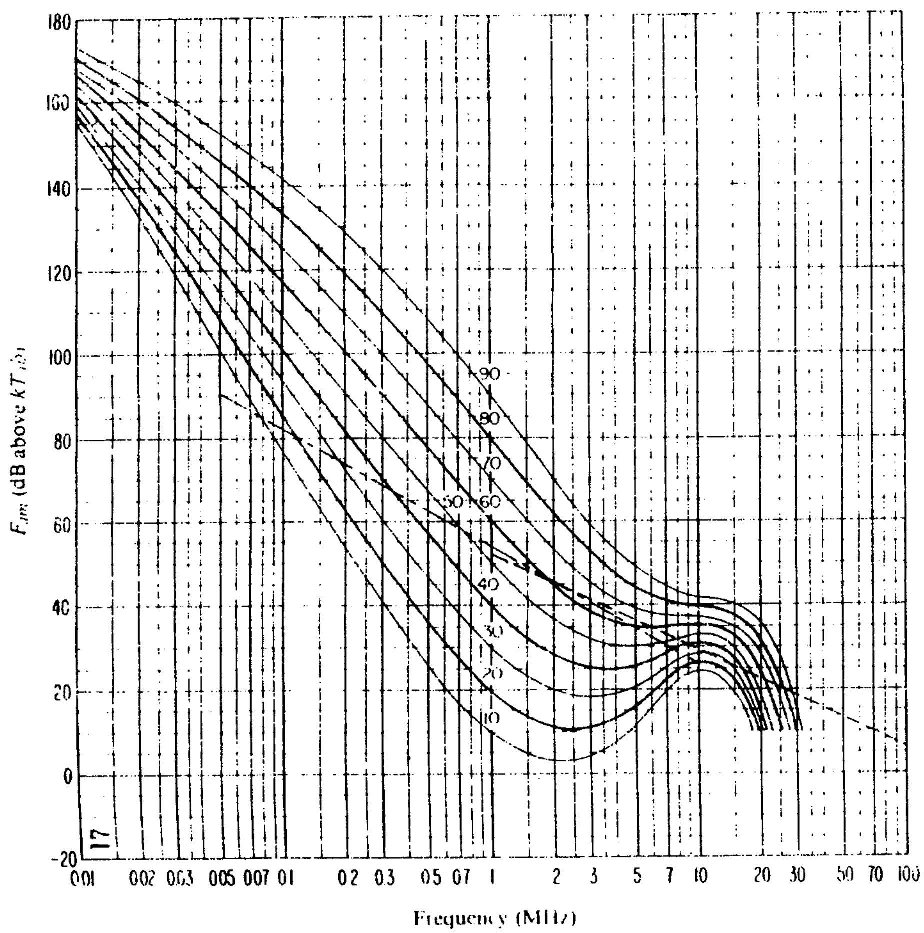

FIGURE 17b *Variation of radio noise with frequency (Summer; 1200-1600 h)*

- ———— Expected values of atmospheric noise
- —·—·— Expected values of man-made noise at a quiet receiving location
- — — — Expected values of galactic noise

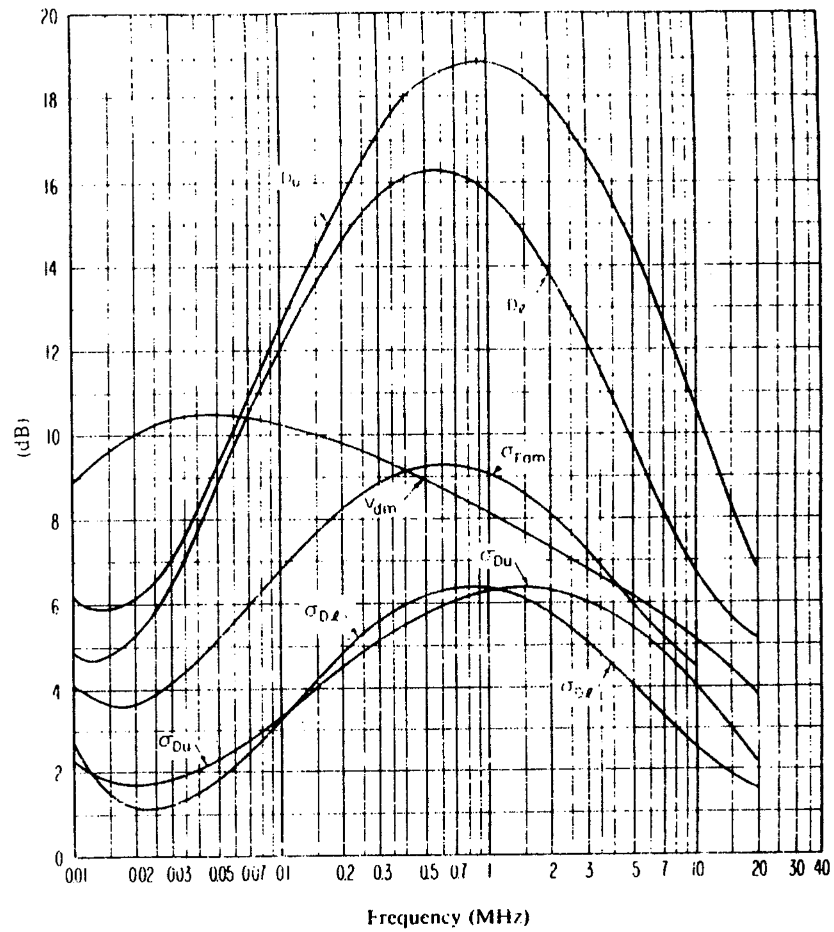

FIGURE 17c *Data on noise variability and character (Summer; 1200-1600 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz

Figure 73. Figures 17b and 17c from CCIR Report 322.

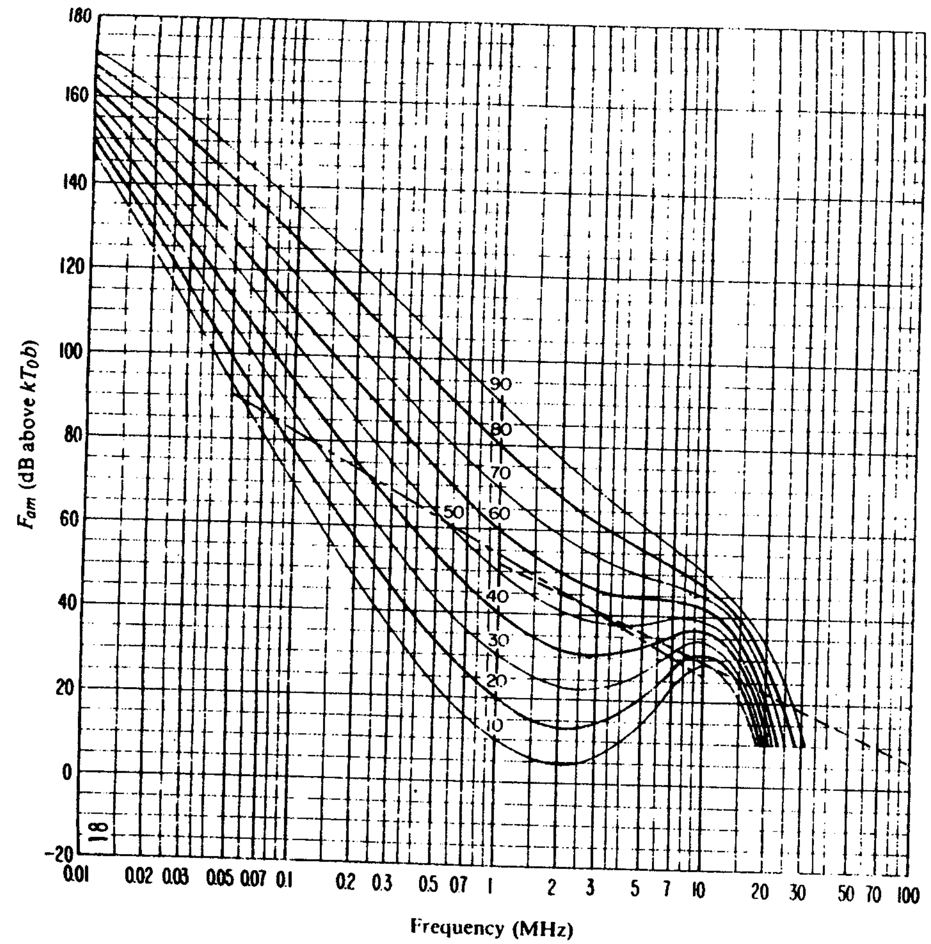

FIGURE 18b – *Variation of radio noise with frequency (Summer; 1600-2000 h)*

——————— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

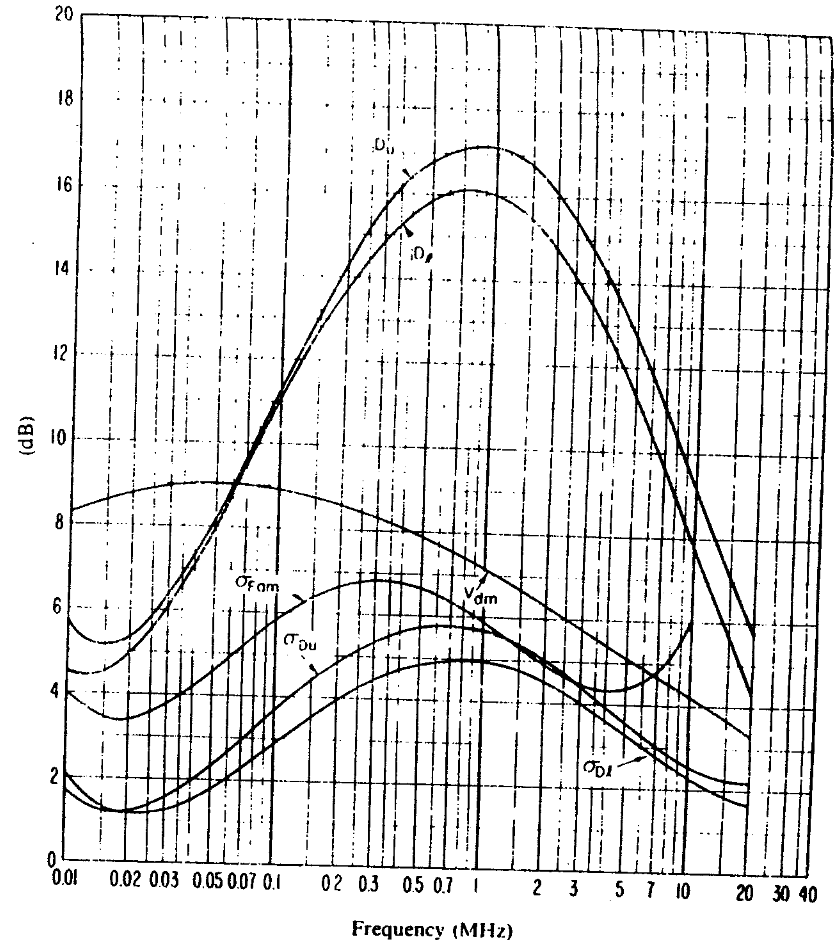

FIGURE 18c *Data on noise variability and character (Summer; 1600-2000 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 74. Figures 18b and 18c from CCIR Report 322.

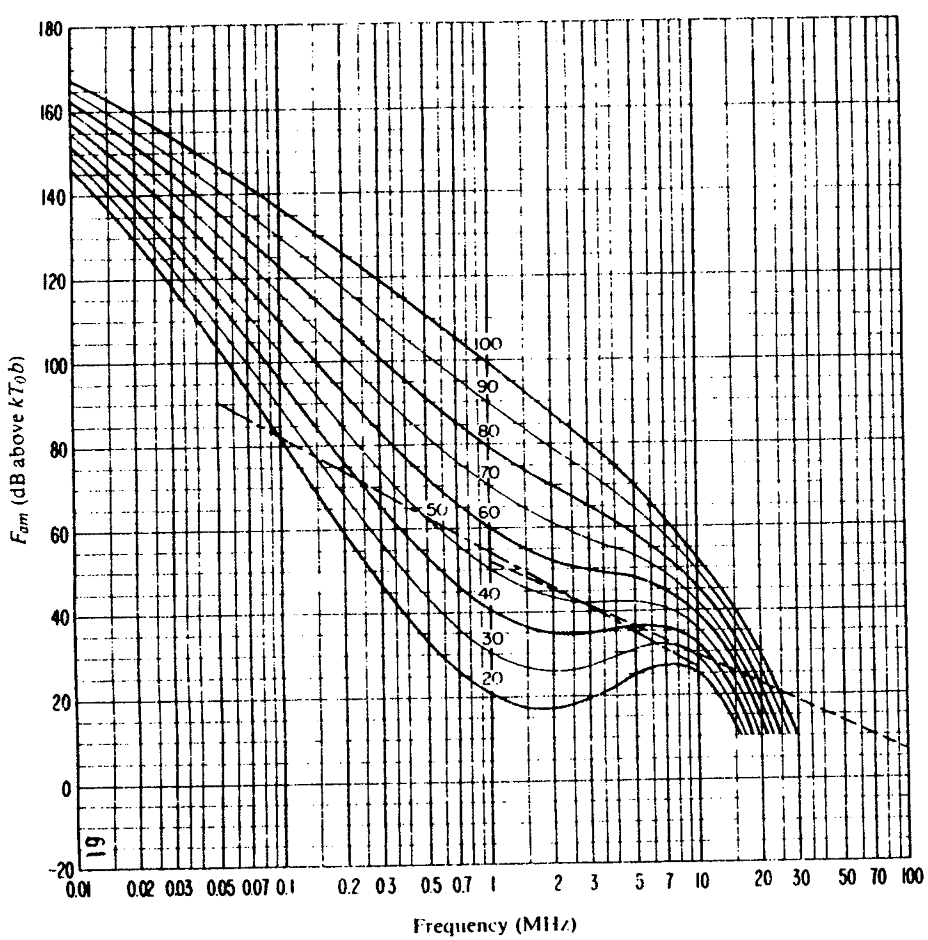

FIGURE 19b – *Variation of radio noise with frequency (Summer; 2000-2400 h)*

——— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — Expected values of galactic noise

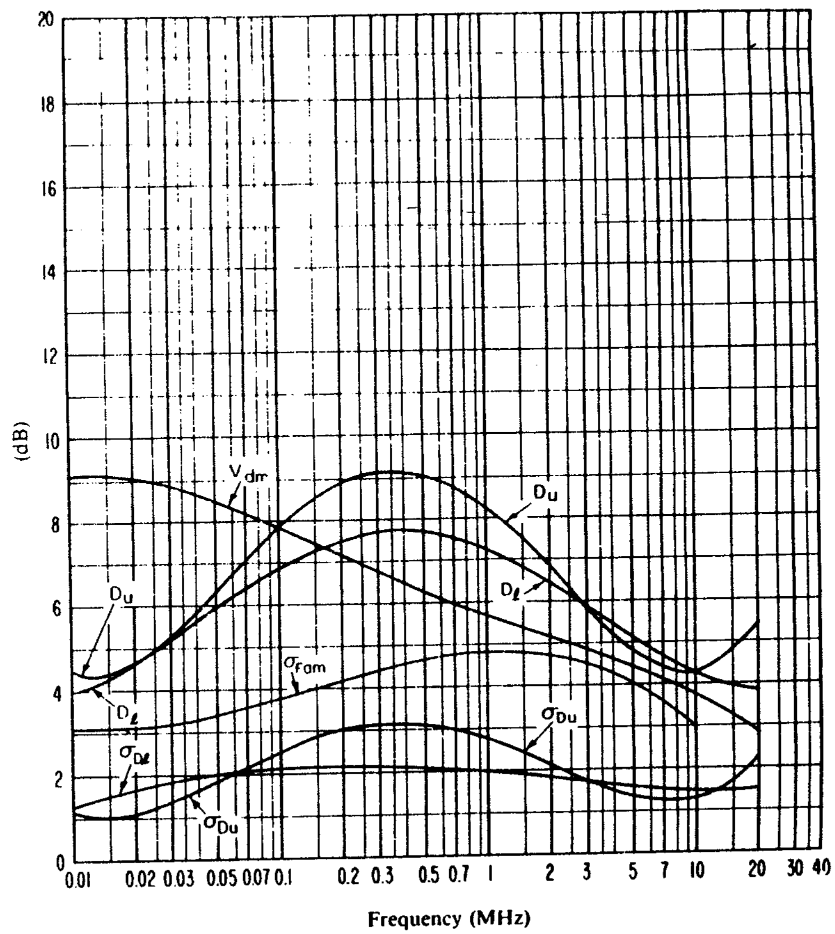

FIGURE 19c – *Data on noise variability and character (Summer; 2000-2400 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 75. Figures 19b and 19c from CCIR Report 322.

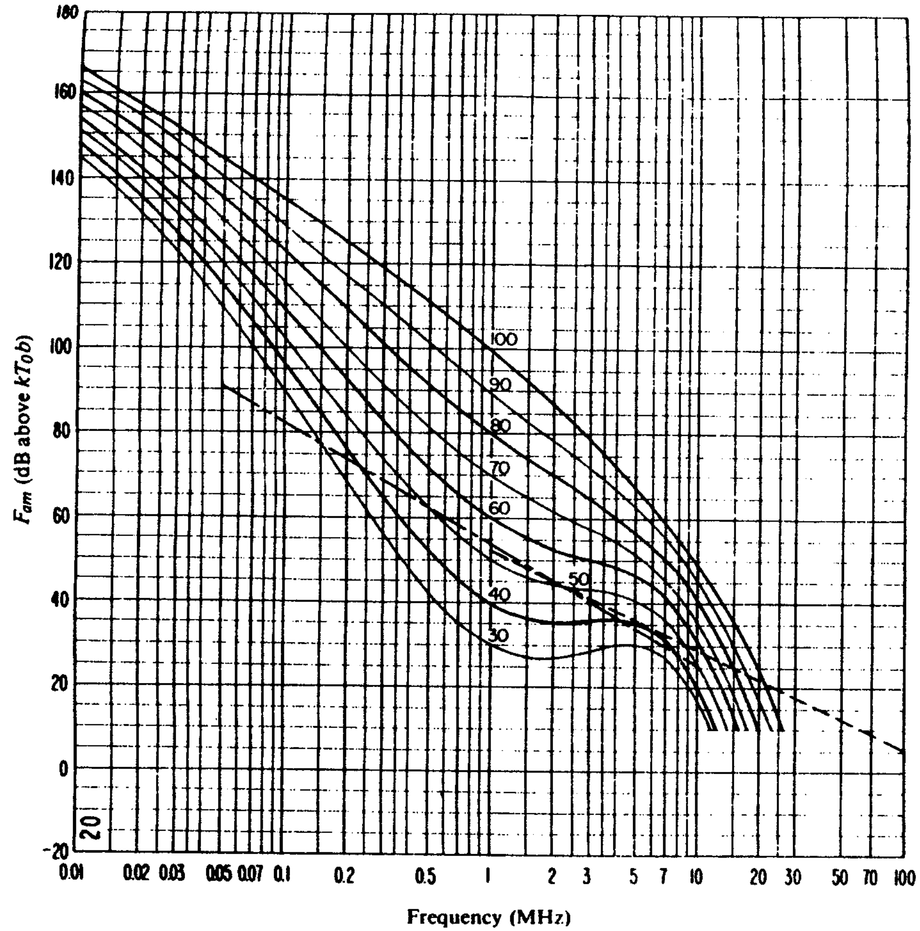

FIGURE 20b – *Variation of radio noise with frequency (Autumn; 0000-0400 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

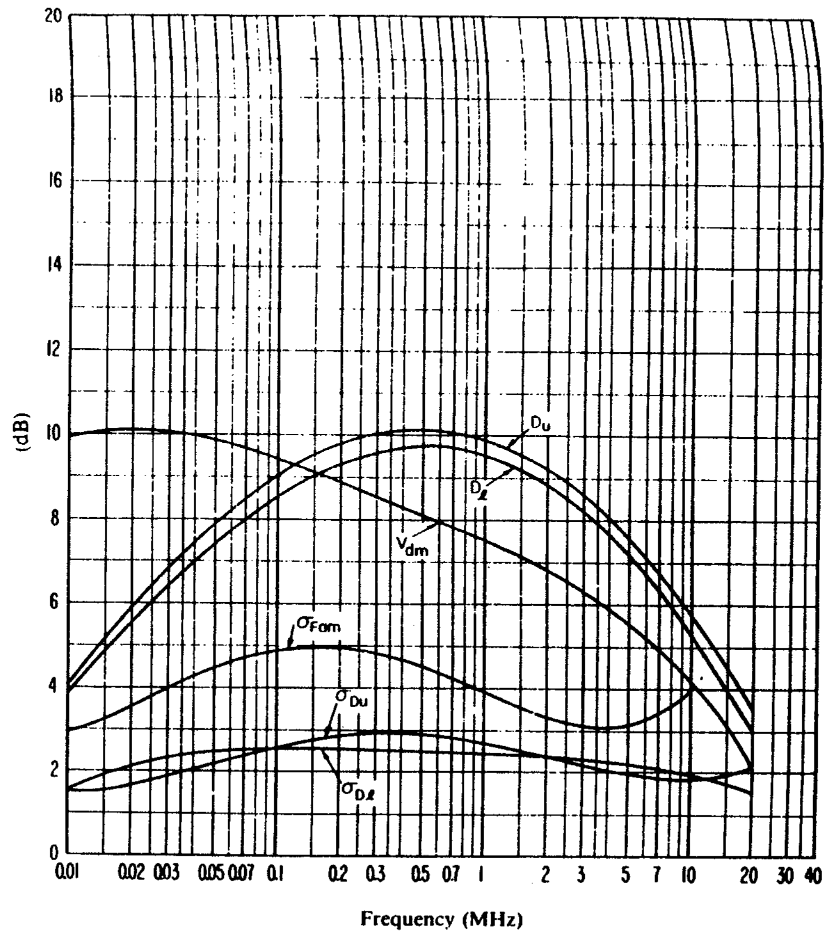

FIGURE 20c – *Data on noise variability and character (Autumn; 0000-0400 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 76. Figures 20b and 20c from CCIR Report 322.

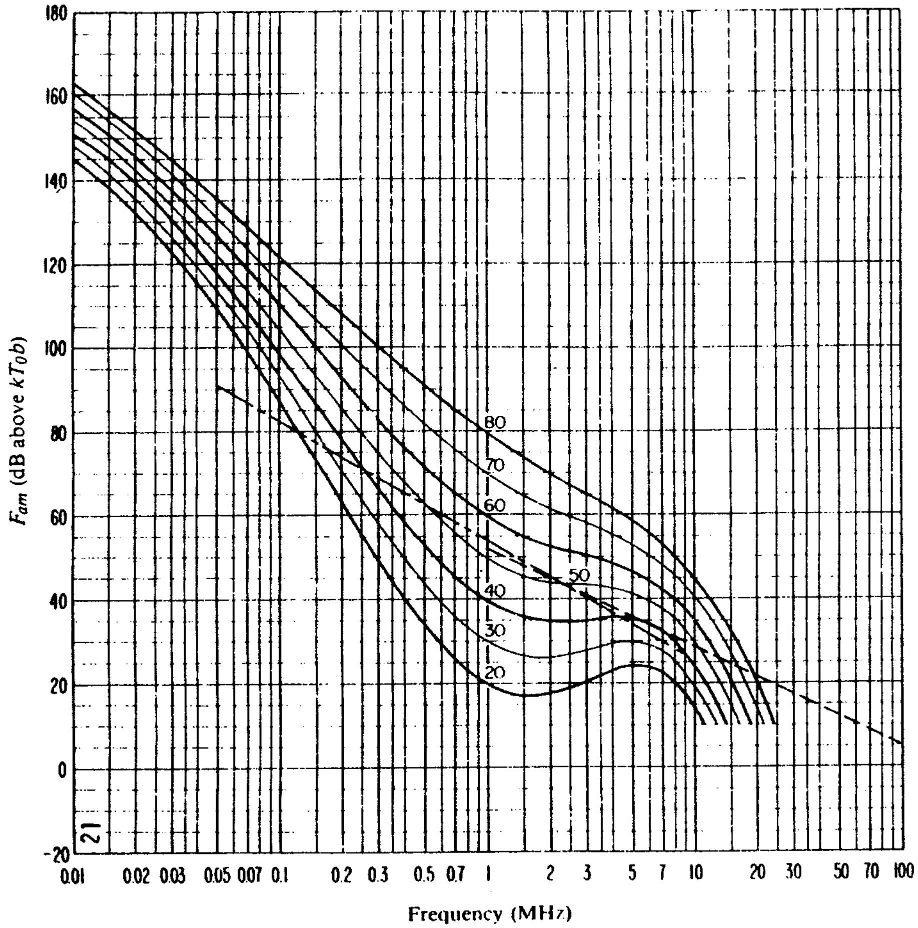

FIGURE 21b – *Variation of radio noise with frequency (Autumn; 0400-0800 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

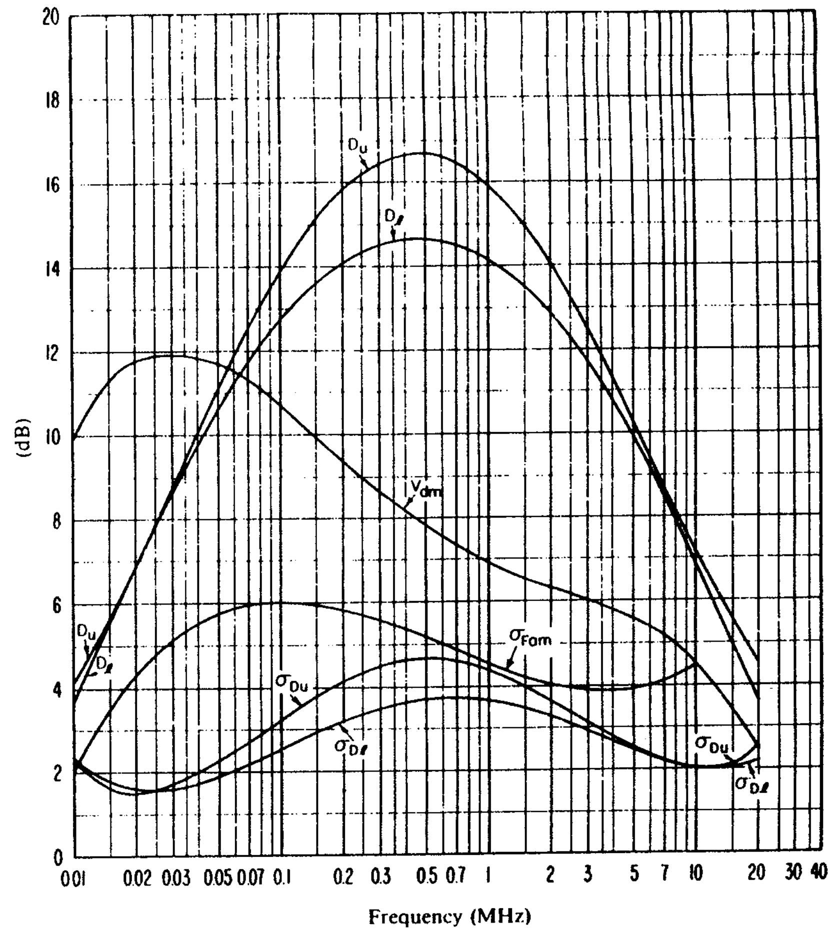

FIGURE 21c – *Data on noise variability and character (Autumn; 0400-0800 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage.
The values shown are for a bandwidth of 200 Hz.

Figure 77. Figures 21b and 21c from CCIR Report 322.

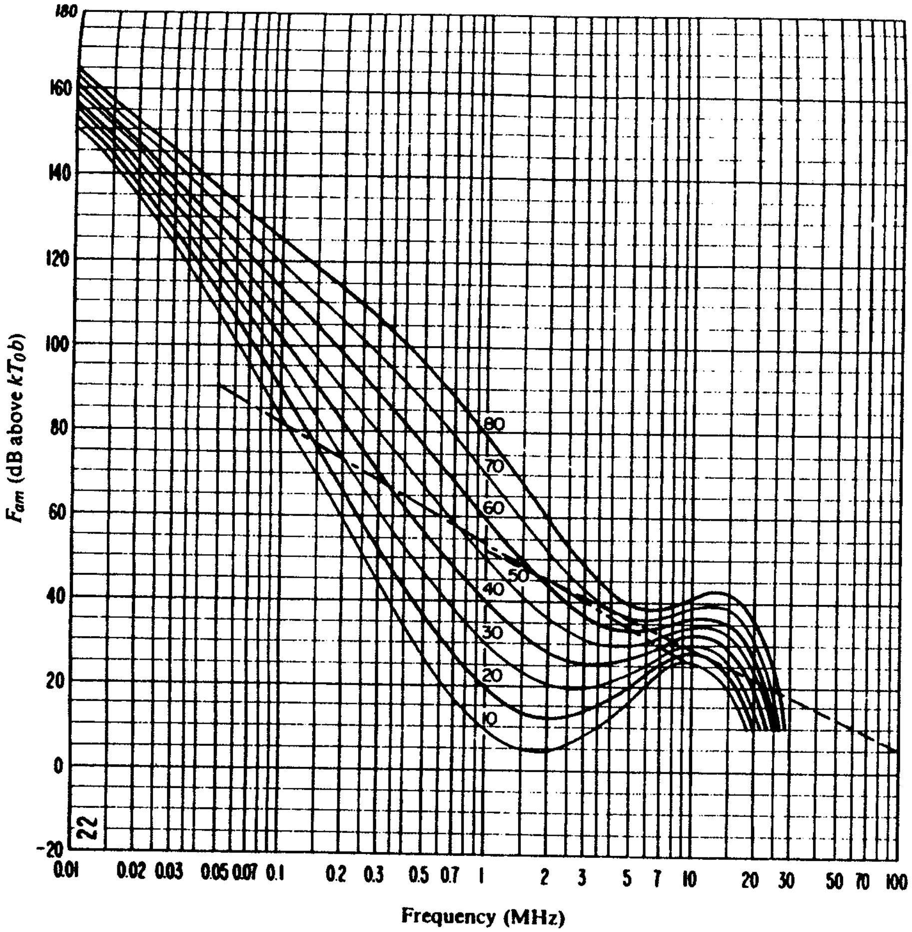

FIGURE 22b – *Variation of radio noise with frequency (Autumn; 0800-1200 h)*

——— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

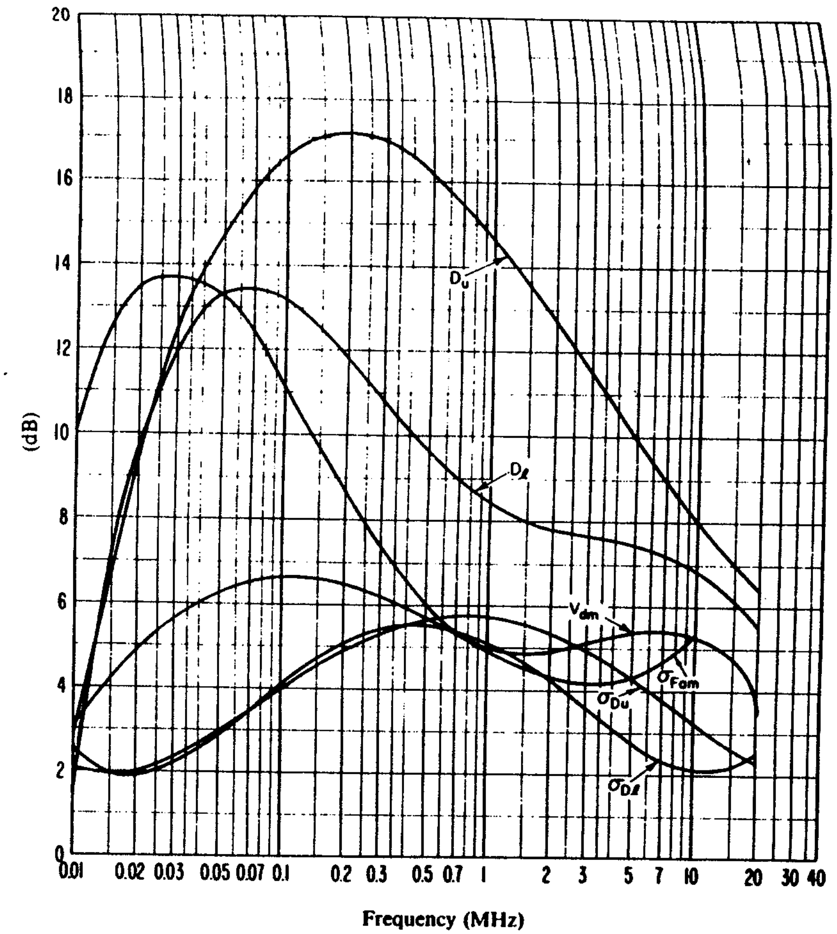

FIGURE 22c – *Data on noise variability and character (Autumn; 0800-1200 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 78. Figures 22b and 22c from CCIR Report 322.

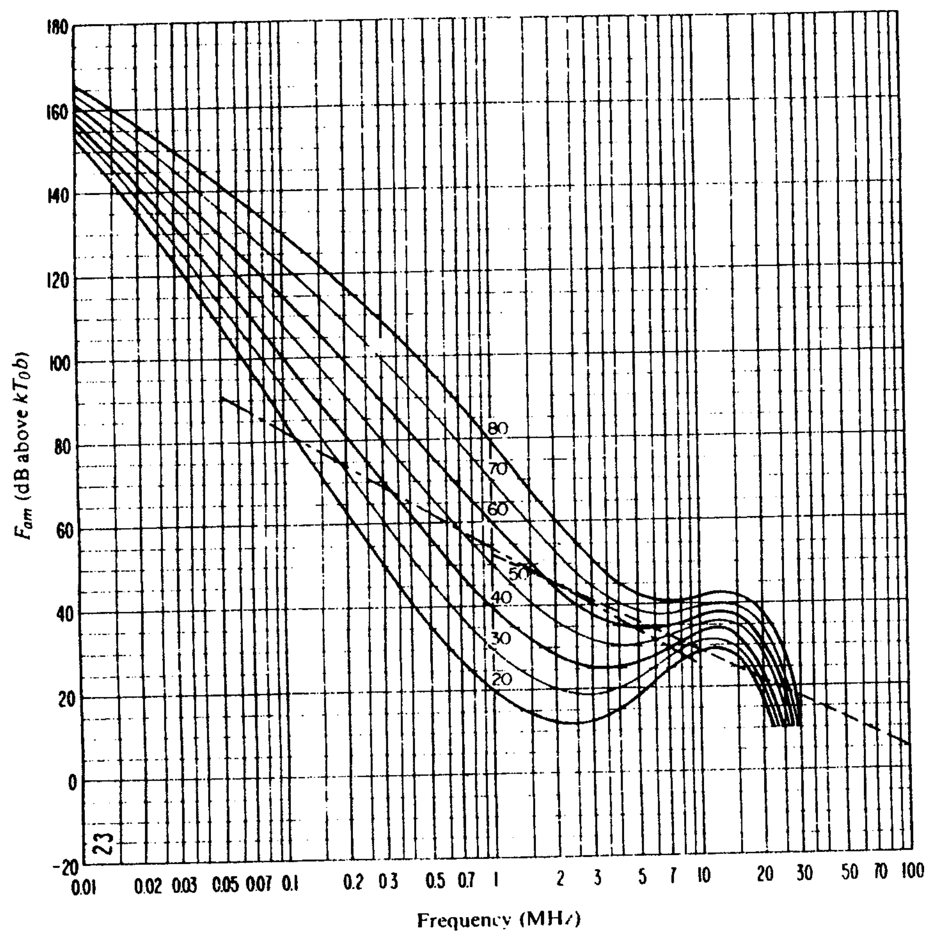

FIGURE 23b – *Variation of radio noise with frequency (Autumn; 1200-1600 h)*

——— Expected values of atmospheric noise

– · – · – Expected values of man-made noise at a quiet receiving location

— — — · – Expected values of galactic noise

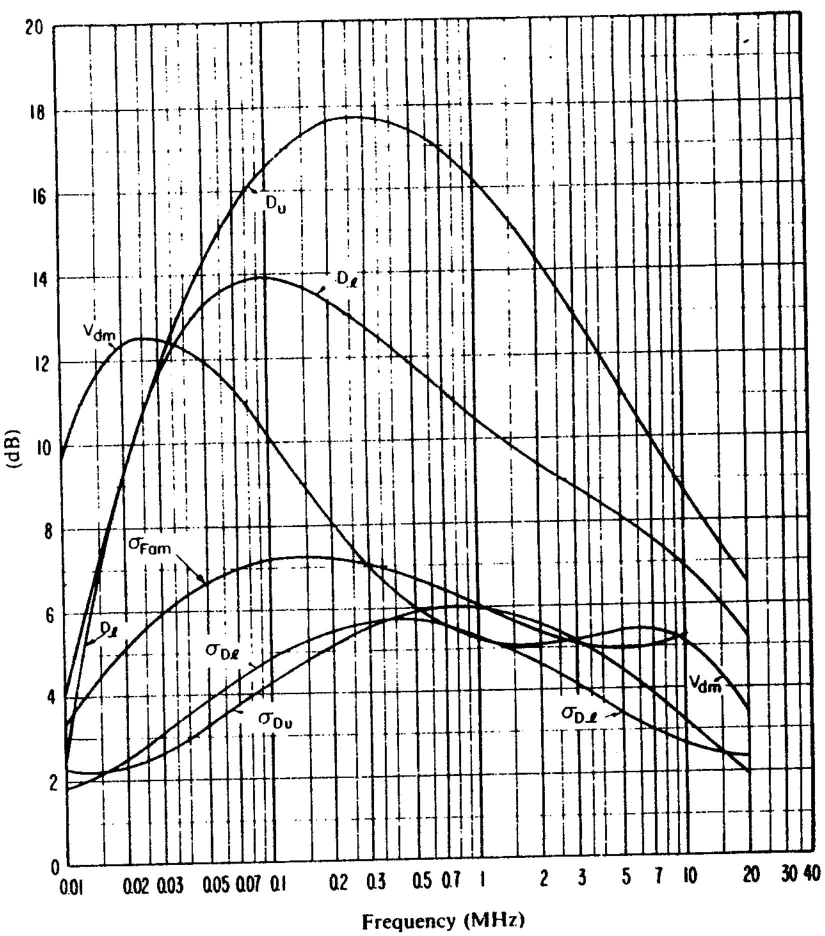

FIGURE 23c – *Data on noise variability and character (Autumn; 1200-1600 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 79. Figures 23b and 23c from CCIR Report 322.

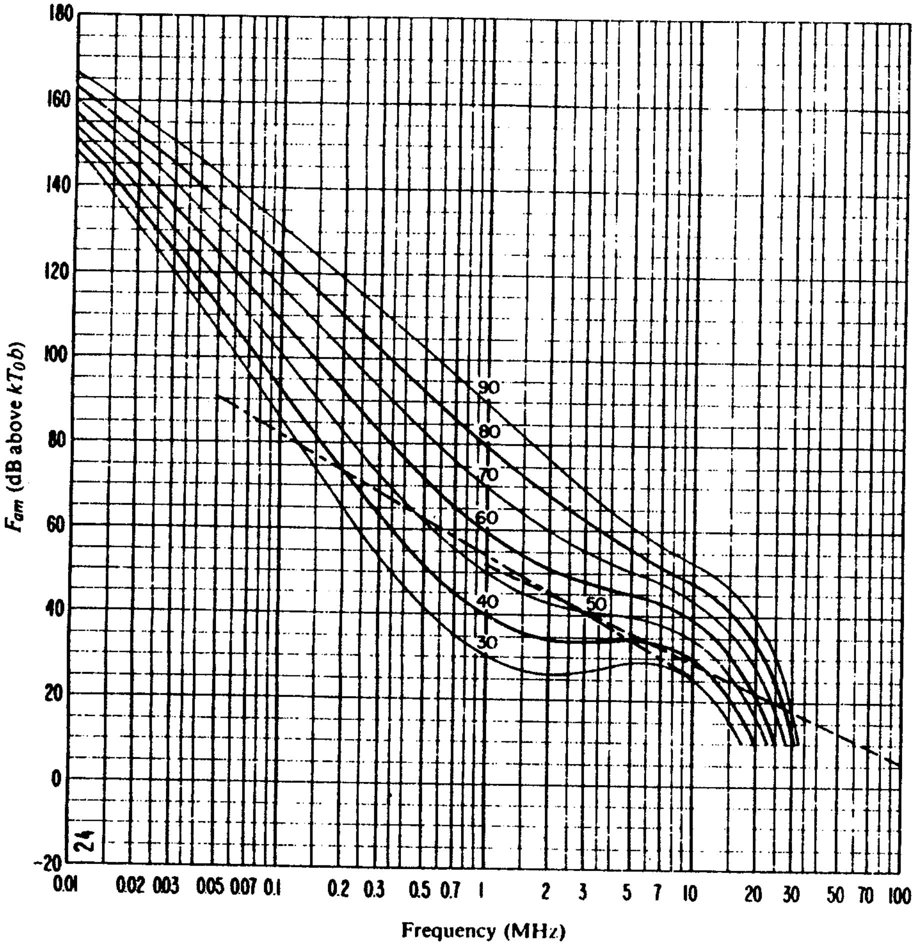

FIGURE 24b – *Variation of radio noise with frequency (Autumn; 1600-2000 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

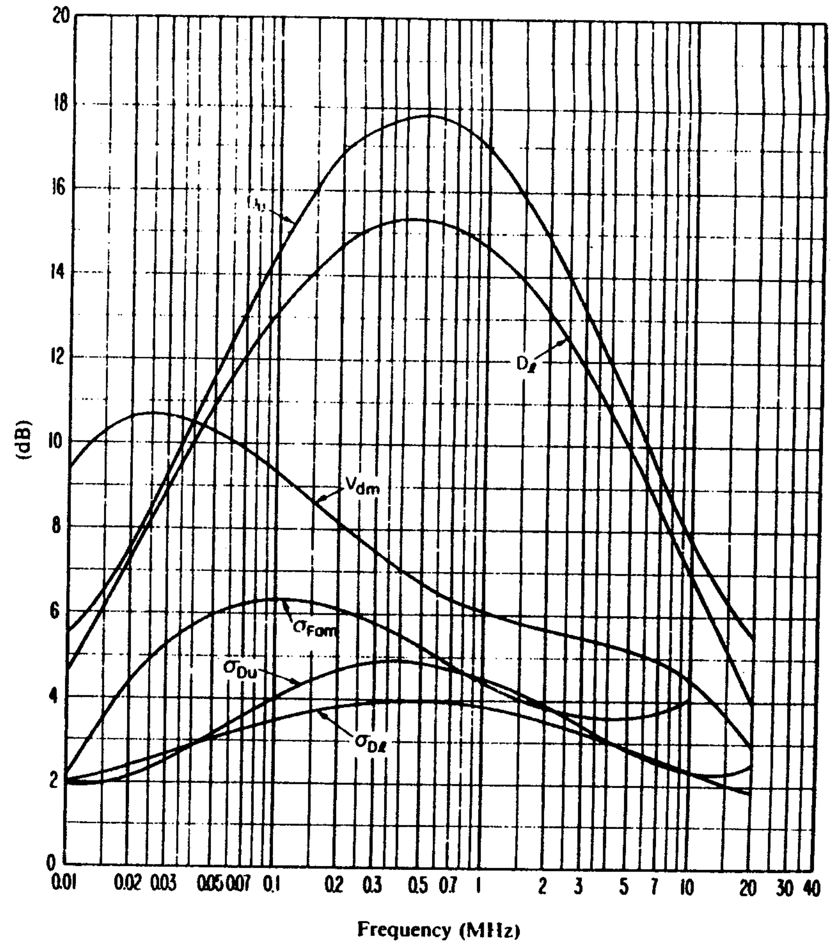

FIGURE 24c – *Data on noise variability and character (Autumn; 1600-2000 h)*

$\sigma_{F_{am}}$: Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{D_u} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{D_l} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage. The values shown are for a bandwidth of 200 Hz.

Figure 80. Figures 24b and 24c from CCIR Report 322.

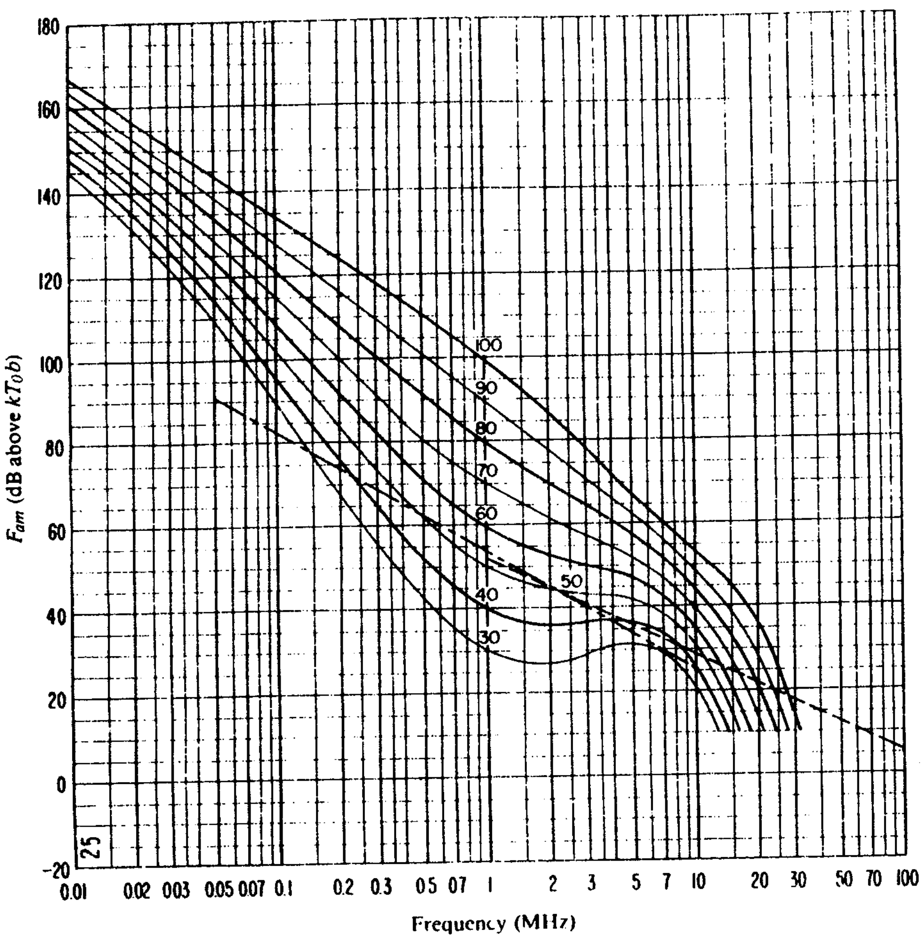

FIGURE 25b – *Variation of radio noise with frequency (Autumn; 2000-2400 h)*

———— Expected values of atmospheric noise

— · — · — Expected values of man-made noise at a quiet receiving location

— — — — Expected values of galactic noise

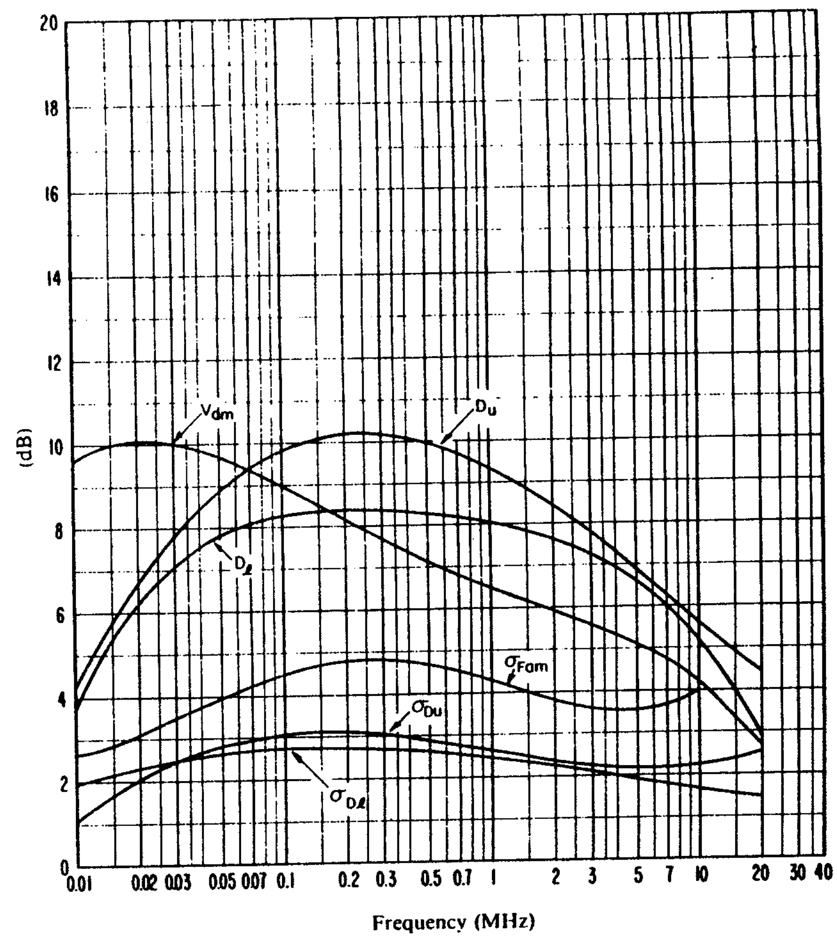

FIGURE 25c – *Data on noise variability and character (Autumn; 2000-2400 h)*

σ_{Fam} : Standard deviation of values of F_{am}
D_u : Ratio of upper decile to median value, F_{am}
σ_{Du} : Standard deviation of values of D_u
D_l : Ratio of median value, F_{am}, to lower decile
σ_{Dl} : Standard deviation of value of D_l
V_{dm} : Expected value of median deviation of average voltage.
The values shown are for a bandwidth of 200 Hz.

Figure 81. Figures 25b and 25c from CCIR Report 322.

Table 31. Coefficients for Frequency Variation of F_{am} for Winter Season

Time Block

00-04	04-08	08-12	12-16	16-20	20-24
5.1464396E-03	7.5598661E-03	6.4431812E-04	-7.7356835E-04	4.7935808E-03	7.5132148E-03
-2.1874073E-02	-3.1284123E-02	-2.1885861E-03	-1.2374851E-03	-2.0086448E-02	-3.1190486E-02
-5.3265774E-02	-5.7129856E-02	-3.8541876E-02	-1.0759584E-02	-5.2335115E-02	-7.0445139E-02
2.3485862E-01	2.6515074E-01	1.3823060E-01	1.1765277E-01	2.1836369E-01	2.9776482E-01
9.3090396E-02	3.4857854E-02	1.4159342E-01	3.0344274E-02	1.1949617E-01	1.4221385E-01
-5.2714667E-01	-4.8079920E-01	-6.3263597E-01	-5.4932964E-01	-5.2892510E-01	-5.9214756E-01
7.2661293E-01	8.1514313E-01	5.3708674E-01	6.1035067E-01	7.0258744E-01	6.9095528E-01
-4.0462420E-01	-4.8874490E-01	1.3336874E-01	2.5867958E-01	-2.4503308E-01	-5.1815356E-01
1.7321095E+00	2.0165651E+00	-1.5656420E-01	-5.6593070E-01	9.7256898E-01	2.1326680E+00
4.6754704E+00	4.5076702E+00	-4.5337248E-01	-1.7218062E+00	3.4270667E+00	5.4322478E+00
-2.1917779E+01	-2.1965428E+01	-9.0273744E+00	-5.8219453E+00	-1.5965903E+01	-2.4450892E+01
-6.2582144E+00	-9.8616028E-01	1.2710892E+01	1.6671449E+01	-1.8885631E+00	-7.4510769E+00
2.4616179E+01	2.1699456E+01	1.8181485E+01	1.3845789E+01	2.2249658E+01	2.9032140E+01
7.3174758E+00	2.1794727E+00	4.5146703E+00	2.2940871E+00	7.0567941E+00	9.7249165E+00

Table 32. Coefficients for Frequency Variation of F_{am} for Spring Season.

Time-Block

00-04	04-08	08-12	12-16	16-20	20-24
2.6227150E-03	-3.0928853E-03	9.2504994E-04	-1.8928761E-03	-4.0659133E-03	3.2872957E-03
-1.5435276E-02	3.3566042E-03	-8.1007290E-03	1.1748273E-04	6.6289030E-03	-1.8200176E-02
-2.6706372E-02	2.5763444E-02	-2.1237181E-02	3.1218262E-03	2.8338014E-02	-3.0299053E-02
1.9057717E-01	6.2825124E-02	1.6661943E-01	1.1442644E-01	5.4493614E-02	2.0779780E-01
1.8883627E-02	-1.2774835E-01	3.3203508E-02	-1.3008267E-02	-9.9406906E-02	2.8095663E-02
-4.5043527E-01	-3.4887758E-01	-5.9817472E-01	-5.2247759E-01	-3.8805703E-01	-4.7896571E-01
7.9810921E-01	7.8960690E-01	6.2563424E-01	6.4463009E-01	7.3731906E-01	7.8167334E-01
-2.5529960E-01	1.5706237E-01	9.7660960E-02	2.4834855E-01	3.2389405E-01	-2.7009737E-01
1.3464320E+00	2.0586997E-02	1.5103476E-01	-3.4669304E-01	-5.7892625E-01	1.3902068E+00
3.0176706E+00	-1.0421569E+00	-8.1605343E-01	-2.0406075E+00	-2.2557144E+00	2.9772045E+00
-1.9309806E+01	-1.0353239E+01	-1.0792174E+01	-7.4774508E+00	-6.6829098E+00	-1.9347779E+01
-7.3266268E-01	1.2813055E+01	1.5728586E+01	1.8250356E+01	1.5031157E+01	1.4394426E-01
2.1423349E+01	1.5530053E+01	1.7272884E+01	1.3019752E+01	1.4323193E+01	2.2882956E+01
3.1892639E+00	2.7632983E+00	1.5702502E+00	-3.1375289E-02	3.5976484E+00	3.9221281E+00

Table 33. Coefficients for Frequency Variation of F_{am} for Summer Season

Time Block					
00-04	04-08	08-12	12-16	16-20	20-24
3.0143955E-03	-2.2845696E-03	-7.5274411E-04	-1.3997095E-03	-3.6364795E-03	3.3167374E-04
-1.3958785E-02	-1.1765908E-03	-3.7619833E-03	-2.5487753E-03	4.5869794E-03	-8.3206859E-03
-2.7567580E-02	2.4051259E-02	5.2770951E-03	4.8204224E-03	3.2040968E-02	-4.5952060E-04
1.6856721E-01	1.0463027E-01	1.2206943E-01	1.1480539E-01	6.0028845E-02	1.4311093E-01
-3.6890309E-02	-1.5088457E-01	-1.0070603E-01	-5.9997109E-02	-1.4929356E-01	-9.4815058E-02
-4.7263805E-01	-4.5339737E-01	-5.0750125E-01	-4.9003121E-01	-3.8420528E-01	-4.6252675E-01
8.2445444E-01	7.5110295E-01	7.0779588E-01	6.9604462E-01	7.7892180E-01	8.4676390E-01
-3.0476368E-01	5.2502189E-02	7.8407382E-02	1.9581196E-01	3.0842602E-01	-5.7306319E-02
1.3392726E+00	5.0137264E-01	2.8305843E-01	-1.5927426E-01	-4.4212906E-01	7.2664566E-01
3.1315548E+00	-6.8688268E-01	-1.2244095E+00	-1.6802038E+00	-2.6451535E+00	6.7443838E-01
-1.8412520E+01	-1.3906543E+01	-1.0959831E+01	-8.6921585E+00	-7.2818758E+00	-1.5076057E+01
3.8431763E+00	1.4617926E+01	1.9799508E+01	1.8380329E+01	1.8911183E+01	1.0063312E+01
2.4079279E+01	2.1927978E+01	1.4974221E+01	1.2803221E+01	1.4034052E+01	2.2037366E+01
1.0766247E+00	4.1730763E+00	-1.9565070E+00	-1.3030351E+00	2.0163780E-01	-1.5549285E+00

Table 34. Coefficients for Frequency Variation of F_{am} for Fall Season.

Time-Block					
00-04	04-08	08-12	12-16	16-20	20-24
2.6060968E-03	4.7218759E-03	5.7919370E-03	1.2819985E-03	1.9544206E-03	3.7517258E-03
-1.6966518E-02	-2.2817850E-02	-2.5804536E-02	-9.2396140E-03	-9.6202585E-03	-2.0696537E-02
-2.2286011E-02	-3.6320554E-02	-5.1842800E-02	-2.0020832E-02	-2.9889922E-02	-3.2482501E-02
2.0199396E-01	2.2382304E-01	2.7412141E-01	1.6583351E-01	1.4879695E-01	2.2678871E-01
3.9072967E-03	4.5731775E-03	5.2010863E-02	-3.8523823E-03	4.5721579E-02	3.4854501E-02
-4.7280531E-01	-4.5875562E-01	-6.7573414E-01	-5.6597695E-01	-4.3862613E-01	-5.0311006E-01
7.9619034E-01	8.2435732E-01	6.3235173E-01	6.6906922E-01	7.5903333E-01	7.6697643E-01
-2.5430293E-01	-3.8882837E-01	-1.3797437E-01	6.0975115E-02	-1.3779156E-01	-3.0288481E-01
1.5137575E+00	1.7861163E+00	9.7379231E-01	1.8205184E-01	6.0554971E-01	1.5897481E+00
2.6202258E+00	3.5648251E+00	7.6400372E-01	-5.3942311E-01	2.3795970E+00	3.0684651E+00
-2.0458629E+01	-2.1037028E+01	-1.5721352E+01	-1.0469860E+01	-1.3357272E+01	-2.0733835E+01
1.6717672E-01	1.3975506E+00	1.4068001E+01	1.6559177E+01	2.7394866E+00	-2.3981661E-01
2.1683289E+01	2.1358209E+01	2.1297837E+01	1.6481370E+01	1.7625039E+01	2.3773712E+01
2.1682355E+00	9.6474147E-01	1.6616210E+00	-1.8865955E-01	3.0657970E+00	4.2926189E+00

```
      PROGRAM FREQL(INPUT,OUTPUT)
      DIMENSION COF(14),Z(9),FREQ(27),X(27),CZ(9),P(9,27)
      DATA COF/5.1464396E-3,-2.1874073E-2,-5.3265774E-2,2.3485862E-1,
     19.3090396E-2,-5.2714667E-1,7.2661293E-1,-4.0462420E-1,1.7321095,
     24.6754704,-2.1917779E1,-6.2582144,2.4616179E1,7.3174758/
      DATA Z/20.,30.,40.,50.,60.,70.,80.,90.,100./
      DATA FREQ/.01,.015,.02,.03,.04,.05,.07,.1,.15,.2,.3,.4,.5,
     1.7,1.,1.5,2.,3.,4.,5.,7.,10.,15.,20.,30.,40.,50./
C     Z IS THE NOISE GRADE (INPUT 1MHZ FAM VALUE).
C     FREQ IS THE FREQUENCY IN MHZ FOR WHICH FAM IS DESIRED FOR
C     A GIVEN Z.
C     THE 14 COEFFICIENTS IN THIS EXAMPLE ARE FOR WINTER SEASON,
C     00-04 HOURS.
      PRINT 6
      PZ=-.75*COF(1)+COF(2)
      PX=-.75*COF(8)+COF(9)
      DO 10 I=3,7
      PZ=-.75*PZ+COF(I)
      PX=-.75*PX+COF(I+7)
   10 CONTINUE
      DO 20 J=1,9
      P1=Z(J)*PZ+PX
      CZ(J)=Z(J)-(P1-Z(J))
   20 CONTINUE
      DO 40 K=1,27
      X(K)=(8.*2.**(ALOG10(FREQ(K)))-11.)/4.
      PZ=COF(1)*X(K)+COF(2)
      PX=COF(8)*X(K)+COF(9)
      DO 30 I=3,7
      PZ=PZ*X(K)+COF(I)
      PX=PX*X(K)+COF(I+7)
   30 CONTINUE
      DO 40 J=1,9
      P(J,K)=CZ(J)*PZ+PX
   40 CONTINUE
      PRINT 7, (FREQ(K),(P(J,K),J=1,9),K=1,27)
    6 FORMAT(1H1)
    7 FORMAT(2X,F10.3,F10.1,8F8.1)
      END
```

Table 35. Output of Program FREQL, F_{am} Values for Winter Season, 0000-0400 hours

Frequency in MHz	1 MHz F_{am} Value 20	30	40	50	60	70	80	90	100
.010	143.7	146.2	148.8	151.3	153.9	156.4	159.0	161.5	164.1
.015	135.7	138.6	141.5	144.4	147.2	150.1	153.0	155.9	158.8
.020	129.3	132.5	135.7	138.9	142.1	145.3	148.5	151.7	154.9
.030	119.2	123.0	126.7	130.5	134.3	138.1	141.9	145.7	149.5
.040	111.2	115.5	119.8	124.1	128.4	132.7	137.0	141.3	145.6
.050	104.6	109.3	114.1	118.8	123.6	128.3	133.1	137.8	142.6
.070	94.0	99.5	105.0	110.5	116.0	121.5	127.0	132.5	138.0
.100	82.1	88.5	94.9	101.3	107.7	114.1	120.5	126.8	133.2
.150	68.2	75.7	83.1	90.6	98.0	105.5	112.9	120.4	127.8
.200	58.4	66.6	74.8	83.0	91.2	99.4	107.6	115.8	124.0
.300	45.2	54.4	63.5	72.7	81.8	91.0	100.1	109.3	118.4
.400	36.9	46.6	56.3	65.9	75.6	85.3	95.0	104.7	114.4
.500	31.2	41.2	51.2	61.2	71.2	81.2	91.1	101.1	111.1
.700	24.5	34.7	44.9	55.0	65.2	75.4	85.5	95.7	105.9
1.000	20.2	30.2	40.1	50.1	60.0	70.0	80.0	89.9	99.9
1.500	19.2	28.3	37.4	46.6	55.7	64.9	74.0	83.2	92.3
2.000	20.6	28.9	37.1	45.3	53.5	61.8	70.0	78.2	86.4
3.000	24.5	31.2	37.8	44.4	51.1	57.7	64.3	71.0	77.6
4.000	27.0	32.5	38.0	43.5	49.0	54.5	60.0	65.5	71.0
5.000	27.5	32.3	37.1	41.9	46.7	51.5	56.3	61.1	65.9
7.000	24.0	28.2	32.5	36.7	41.0	45.2	49.5	53.7	58.0
10.000	12.1	16.7	21.4	26.0	30.6	35.2	39.9	44.5	49.1
15.000	-11.8	-5.8	.2	6.2	12.2	18.3	24.3	30.3	36.3
20.000	-31.5	-24.7	-18.0	-11.2	-4.4	2.4	9.2	16.0	22.8
30.000	-50.3	-45.0	-39.7	-34.4	-29.1	-23.8	-18.5	-13.2	-7.9
40.000	-52.7	-50.9	-49.0	-47.2	-45.4	-43.6	-41.8	-40.0	-38.2
50.000	-60.0	-60.0	-60.0	-60.0	-60.0	-60.0	-60.0	-60.0	-60.0

The other parameters, D_u, D_ℓ, σ_{D_u}, σ_{D_ℓ}, $\sigma_{F_{am}}$, and V_{d_m} (CCIR Report 322, Figure 2c, for example) are all given by the function

$$P(x) = a_0 + a_1 x + a_2 x^2 + a_3 x^3 + a_4 x^4 , \tag{25}$$

where $x = \log_{10}(f_{MHz})$,

and f_{MHz} is the frequency in MHz.

The parameters D_u, D_ℓ, σ_{D_u}, σ_{D_ℓ}, and V_{d_m} were defined previously.

CCIR Report 322 states that "The values of $\sigma_{F_{am}}$ have been derived by comparing actual observations with predictions for the same locations, and include such uncertainties as those due to the unpredictable variations from year to year and the errors introduced by the necessity of presenting a large volume of data in summarized and homogeneous form." As mentioned at the beginning of this section (23), the variation with frequency of F_{am} is given by a least squares numerical mapping of the totality of data for all the measurement frequencies. The parameter $\sigma_{F_{am}}$ represents, as a function of frequency, the variation of the F_{am} data about the "mapped" (or estimated) values (Figures 58-81). Also, the parameter V_{d_m} and other parameters associated with the APD are covered in the next section. Tables 36-40 give the a (25) coefficients for D_u, σ_{D_u}, D_ℓ, σ_{D_ℓ}, and $\sigma_{F_{am}}$.

Table 36. Coefficients for the CCIR Report 322 D_μ Estimates, S = Season (1 = Winter, etc.), TB = Time block (1 = 0000-0400 Hours, etc.)

S	TB	a_4	a_3	a_2	a_1	a_0
1	1	6.00692328E-01	6.56960918E-01	-4.10245631E+00	-2.51700673E+00	1.06003617E+01
1	2	2.13276390E-01	8.52802328E-01	-4.06908294E+00	-3.96891703E+00	1.37919489E+01
1	3	-1.95472178E+00	-2.09296371E-01	3.73129703E+00	-2.62048511E+00	9.19466303E+00
1	4	-1.66350158E+00	1.22944116E-01	3.26883880E+00	-2.84347866E+00	9.34307460E+00
1	5	-2.87120111E-01	4.45009607E-01	-2.45814032E+00	-3.29490920E+00	1.36788105E+01
1	6	-1.87770920E-01	-8.17502666E-02	-2.03652073E+00	-1.62093728E+00	1.03446264E+01
2	1	6.18674390E-01	8.20599306E-01	-3.46732308E+00	-2.38538553E+00	1.02728040E+01
2	2	3.34112625E-01	3.69580294E-01	-5.05748159E+00	-3.00054536E+00	1.55734402E+01
2	3	-2.66208854E-01	1.30900712E+00	-1.54087371E+00	-4.87094024E+00	1.37265001E+01
2	4	-5.29136231E-02	9.10697127E-01	-3.50653422E+00	-4.26338965E+00	1.71683940E+01
2	5	2.98848395E-01	4.46575341E-01	-5.52759061E+00	-3.54169831E+00	1.82207816E+01
2	6	3.78008073E-01	1.29007328E+00	-1.97377642E+00	-3.51621167E+00	9.48159604E+00
3	1	1.06232859E+00	1.15881737E+00	-4.32820997E+00	-2.56569951E+00	9.76968454E+00
3	2	1.39607390E+00	1.14981068E+00	-7.87923925E+00	-3.66903417E+00	1.61267736E+01
3	3	1.46563738E+00	1.92703384E+00	-7.23805025E+00	-4.69724192E+00	1.63707552E+01
3	4	1.20286856E+00	-2.25543038E-02	-8.49459349E+00	-9.26168862E-01	1.89779414E+01
3	5	1.20579759E+00	1.13000763E-01	-8.06379684E+00	-1.17700782E+00	1.71655248E+01
3	6	1.13956525E+00	2.07384212E+00	-3.26395658E+00	-3.84406733E+00	8.20398344E+00
4	1	4.32754349E-02	-7.80041037E-02	-2.55179747E+00	-1.55263045E+00	9.92781725E+00
4	2	8.69263171E-01	1.21394341E+00	-6.27987340E+00	-4.57176206E+00	1.59520737E+01
4	3	-1.19096693E-01	1.60331698E+00	-2.19368375E+00	-5.91634192E+00	1.46092051E+01
4	4	1.86980239E-01	1.32862617E+00	-3.74523357E+00	-5.25667239E+00	1.62165396E+01
4	5	1.18747834E+00	1.56471486E+00	-6.97775207E+00	-4.97688658E+00	1.69966481E+01
4	6	5.41620521E-02	5.41617173E-01	-1.70229138E+00	-2.61085981E+00	9.36940160E+00

Table 37. Coefficients for the CCIR Report 322 σ_{D_μ} Estimates, S = Season (1 = Winter, etc.), TB = Time block (1 = 0000-0400 Hours, etc.)

S	TB	a_4	a_3	a_2	a_1	a_0
1	1	5.84988902E-01	9.08411417E-01	-1.44193636E+00	-9.77948436E-01	3.20666477E+00
1	2	6.87790597E-01	1.49680586E+00	-1.47127374E+00	-2.17754495E+00	3.71580333E+00
1	3	6.68277267E-01	1.50024199E+00	-1.88099825E+00	-2.31393412E+00	5.18590172E+00
1	4	6.36256371E-01	1.54440718E+00	-1.59233567E+00	-2.16955237E+00	5.13319057E+00
1	5	2.72640576E-01	1.34449765E+00	-2.34686954E-01	-2.02360313E+00	3.72861058E+00
1	6	2.02102563E-01	7.11963677E-01	-4.91857596E-01	-9.67332776E-01	3.27446847E+00
2	1	2.93029947E-01	5.89826398E-01	-3.99569479E-01	-8.29667422E-01	2.61660898E+00
2	2	1.21679141E+00	1.55251333E+00	-3.27879393E+00	-2.27418994E+00	4.83328744E+00
2	3	8.89553504E-01	1.04478992E+00	-3.34413791E+00	-1.76264438E+00	6.27406813E+00
2	4	5.11150776E-01	1.66104307E-01	-3.06957423E+00	-6.46193770E-01	6.90657263E+00
2	5	7.85209211E-01	7.69996769E-01	-2.90611683E+00	-1.55795087E+00	5.53987865E+00
2	6	2.39790781E-01	6.81280716E-01	-3.08606965E-01	-1.22300530E+00	2.69737731E+00
3	1	3.98093243E-01	5.68995476E-01	-1.16672068E+00	-7.95759725E-01	2.78905289E+00
3	2	7.86136988E-01	1.07513083E+00	-2.81168499E+00	-1.92580089E+00	4.80514347E+00
3	3	4.76566531E-01	3.00696383E-01	-2.57554704E+00	-6.13671796E-01	5.41091278E+00
3	4	2.94452858E-01	-6.09592300E-01	-2.90712879E+00	9.83296891E-01	6.32001618E+00
3	5	7.87444045E-01	7.08388391E-01	-3.33333857E+00	-1.24265857E+00	5.63240400E+00
3	6	5.76908645E-01	1.10865643E+00	-1.34561722E+00	-1.71046200E+00	2.69892803E+00
4	1	2.48431128E-01	4.84654286E-01	-7.44197615E-01	-8.42676450E-01	2.71611807E+00
4	2	8.45612652E-01	1.08136951E+00	-2.60406093E+00	-1.70503895E+00	4.39208019E+00
4	3	4.26833386E-01	1.60727815E-01	-2.55549142E+00	-5.23502830E-01	5.76011429E+00
4	4	3.52316085E-01	5.08512351E-03	-2.58666430E+00	-5.33095218E-01	5.98158342E+00
4	5	5.36375551E-01	8.76975835E-01	-1.89205000E+00	-1.72566744E+00	4.52137141E+00
4	6	1.81982176E-02	4.39310400E-01	-1.15919839E-02	-8.59438382E-01	2.62724283E+00

Table 38. Coefficients for the CCIR Report 322 D_ℓ Estimates, S = Season (1 = Winter, etc.), TB = Time block (1 = 0000-0400 Hours, etc.)

S	TB	a_4	a_3	a_2	a_1	a_0
1	1	3.75273933E-01	3.15764566E-01	-3.00008669E+00	-1.80534960E+00	8.27623751E+00
1	2	1.79274064E-01	3.22455577E-01	-3.85280465E+00	-2.96261376E+00	1.20024817E+01
1	3	-1.81377559E+00	-1.49409231E+00	3.33695571E+00	4.14694355E-01	6.24869231E+00
1	4	-1.79134825E+00	-1.61777787E+00	3.44133463E+00	9.03138793E-01	5.83517474E+00
1	5	-7.14187544E-01	-8.52356730E-01	-1.43198294E+00	-9.86330720E-01	1.11117595E+01
1	6	-5.41074950E-01	-7.36251929E-01	-6.85219303E-01	-3.18125204E-01	7.80435541E+00
2	1	1.45088070E-01	8.28309686E-02	-2.62786539E+00	-1.75942070E+00	9.57929487E+00
2	2	-7.24822510E-01	-1.05959881E+00	-2.53112977E+00	-1.16771156E+00	1.34940043E+01
2	3	-8.12157738E-01	6.41436686E-01	5.82971474E-01	-3.99424719E+00	9.90341876E+00
2	4	-3.43341946E-01	1.17402871E+00	-1.20298699E+00	-5.01926677E+00	1.24540346E+01
2	5	-5.48853477E-01	-3.51728959E-01	-2.93009098E+00	-2.65133600E+00	1.51177933E+01
2	6	-1.47178270E-01	2.59003605E-01	-1.24027986E+00	-2.22174482E+00	8.65136150E+00
3	1	5.67012363E-01	5.27723785E-01	-3.65976131E+00	-2.07890949E+00	9.46329785E+00
3	2	-9.62458959E-02	-3.18153397E-01	-4.04548463E+00	-2.11482996E+00	1.37553749E+01
3	3	3.35468408E-01	1.39596592E+00	-2.85213740E+00	-4.57599158E+00	1.13260090E+01
3	4	1.60995363E+00	1.69437206E+00	-7.92087387E+00	-4.27003295E+00	1.57883984E+01
3	5	1.04238368E+00	1.93220024E-01	-7.54433886E+00	-1.77457401E+00	1.60362094E+01
3	6	4.35403208E-01	7.50398873E-01	-2.09431367E+00	-2.05797551E+00	7.28345730E+00
4	1	6.17574527E-02	-1.39219358E-01	-2.65072397E+00	-1.44924358E+00	9.54061679E+00
4	2	2.15062012E-01	2.39095546E-01	-4.52844367E+00	-3.08359545E+00	1.41353646E+01
4	3	-1.73888002E+00	-2.04298114E-01	3.32500962E+00	-2.97805357E+00	8.42810564E+00
4	4	-9.61300068E-01	5.29546307E-01	9.00353880E-01	-4.03760336E+00	1.04980712E+01
4	5	4.89627123E-01	5.89646048E-01	-5.14365459E+00	-3.67487714E+00	1.47067935E+01
4	6	-4.46081839E-01	-5.27024032E-01	-8.30183630E-01	-9.77980736E-01	8.03757106E+00

Table 39. Coefficients for the CCIR Report 322 σ_{D_ℓ} Estimates, S = Season (1 = Winter, etc.), TB = Time block (1 = 0000-0400 Hours, etc.)

S	TB	a_4	a_3	a_2	a_1	a_0
1	1	1.30437115E-01	2.92449732E-02	-7.80967695E-01	1.91653721E-02	2.48965606E+00
1	2	6.12076040E-01	5.70926163E-01	-2.34850915E+00	-1.00282530E+00	4.03858606E+00
1	3	-1.17973740E-01	-1.19367503E-02	-4.09223631E-01	-4.43103234E-01	3.47297489E+00
1	4	2.47335195E-01	2.02799579E-01	-1.49123436E+00	-5.38877202E-01	3.79966225E+00
1	5	5.09629563E-01	3.44171822E-01	-2.32419840E+00	-6.28446395E-01	4.29254259E+00
1	6	-3.43275521E-01	-4.12285103E-01	3.42984172E-01	4.90663826E-01	2.41246483E+00
2	1	-8.00980309E-02	-4.29523925E-02	-1.07398044E-01	-4.49211944E-01	2.76012890E+00
2	2	4.00214933E-01	4.20341759E-01	-1.56008779E+00	-8.74790097E-01	3.69572528E+00
2	3	9.96197401E-01	1.12168790E+00	-3.68444135E+00	-2.20709540E+00	5.77351546E+00
2	4	7.97893647E-01	9.14078756E-01	-3.88794046E+00	-2.51824755E+00	7.19704818E+00
2	5	4.15565799E-01	8.20364930E-01	-1.99851271E+00	-2.23342901E+00	5.21231204E+00
2	6	1.36202347E-01	5.72826611E-01	-3.42747637E-01	-1.51238883E+00	2.84617486E+00
3	1	2.33195213E-01	1.84606216E-01	-1.16619911E+00	-5.50767566E-01	2.94686877E+00
3	2	6.86802519E-01	4.35718215E-01	-2.90772675E+00	-8.79148867E-01	4.55759217E+00
3	3	7.59343105E-01	4.92747509E-01	-3.18687913E+00	-9.66270653E-01	4.99102887E+00
3	4	9.57959045E-01	3.77518599E-01	-4.36475076E+00	-7.33028917E-01	6.36491880E+00
3	5	6.83113311E-01	3.31657433E-01	-3.09066157E+00	-6.09136476E-01	4.96627829E+00
3	6	3.02665169E-02	2.00262806E-01	-1.65657869E-01	-5.20579102E-01	1.97863649E+00
4	1	-1.05498513E-01	-8.17923262E-02	-6.51691841E-02	-2.17622267E-01	2.44715672E+00
4	2	5.47182359E-01	5.05282528E-01	-1.87150899E+00	-7.49003105E-01	3.65098321E+00
4	3	9.26979200E-01	1.23474152E+00	-2.99706064E+00	-2.21742218E+00	5.14279228E+00
4	4	4.04915676E-01	6.96150479E-01	-1.98993323E+00	-1.77919148E+00	5.32953282E+00
4	5	1.47807715E-01	1.69049614E-01	-1.08214496E+00	-7.45422601E-01	3.83718770E+00
4	6	1.92606974E-02	1.25315421E-01	-2.87496093E-01	-6.63707027E-01	2.44816012E+00

Table 40. Coefficients for the CCIR Report 322 $\sigma_{F_{am}}$ Estimates, S = Season (1 = Winter, etc.), TB = Time block (1 = 0000 = 0400 Hours, etc.)

S	TB	a_4	a_3	a_2	a_1	a_0
1	1	7.17336617E-01	1.79245221E+00	-8.88626588E-01	-1.95974968E+00	4.53002186E+00
1	2	-4.22887166E-01	3.25697605E-01	7.59928734E-01	-1.62587013E+00	4.16430566E+00
1	3	-3.20276980E-01	6.52254504E-01	1.79156164E+00	-1.04669452E+00	4.42172693E+00
1	4	-1.09756941E+00	-4.06295072E-01	2.72023661E+00	-1.90731382E-01	4.68145256E+00
1	5	-2.07377666E-01	2.92324993E-01	1.88162988E-01	-1.17932103E+00	4.69851568E+00
1	6	7.06038885E-01	1.37884395E+00	-1.73106217E+00	-1.83011388E+00	5.27880997E+00
2	1	1.94488047E-01	6.82539873E-01	6.74389258E-02	-6.50437620E-01	3.68970619E+00
2	2	1.40830918E+00	2.65366393E+00	-2.23928914E+00	-3.01265005E+00	4.98043446E+00
2	3	1.28643085E+00	2.97997161E+00	-1.79339834E+00	-3.93238039E+00	6.07332343E+00
2	4	5.53030171E-01	1.71239269E+00	-1.12558086E+00	-2.85251039E+00	6.61554348E+00
2	5	-6.44060031E-02	1.22138733E+00	8.22469283E-01	-2.46490773E+00	4.49169945E+00
2	6	-1.22838279E-01	2.16799883E-01	2.65464343E-01	-5.44928241E-01	3.89097848E+00
3	1	4.40357155E-01	7.54016066E-01	-1.49919021E+00	-1.23007793E+00	5.53331406E+00
3	2	1.83572743E+00	2.89477337E+00	-4.33304111E+00	-4.23750422E+00	7.03859826E+00
3	3	1.24681707E+00	2.69054302E+00	-2.86212335E+00	-3.93897679E+00	7.65787395E+00
3	4	9.70717435E-01	9.70230627E-01	-4.21771963E+00	-2.12820968E+00	8.86990363E+00
3	5	1.47357413E+00	3.19778514E+00	-1.53173895E+00	-3.12032032E+00	5.88662991E+00
3	6	2.93959753E-02	-4.94949663E-01	-1.46844250E+00	9.39509890E-02	4.83292651E+00
4	1	4.87844676E-01	1.65333771E+00	6.26904318E-02	-2.07342517E+00	3.86029719E+00
4	2	1.95492398E-03	1.14851414E+00	7.47208548E-01	-1.90246027E+00	4.49712082E+00
4	3	2.55156131E-01	1.73723372E+00	7.83954782E-01	-2.39545160E+00	4.92860187E+00
4	4	2.19842795E-01	1.31666900E+00	-4.22021756E-02	-2.25733980E+00	6.06891727E+00
4	5	8.09133835E-02	1.41602511E+00	6.62046021E-01	-2.49567651E+00	4.43678475E+00
4	6	4.41095697E-01	1.22893160E+00	-4.65968105E-01	-1.47217426E+00	4.25615147E+00

4. THE AMPLITUDE PROBABILITY DISTRIBUTION

As noted in the introduction, atmospheric noise (and most forms of man-made noise) is a random process. This means that the noise can be described only in probabilistic terms. The basic distribution of any random process is its first order probability density function (pdf) or distribution function, and a random process is said to be completely described by its hierarchy of density functions (first order, second order, and so on, ad infinitum).

The received atmospheric noise process under consideration here is a bandpass process in that it is describable by an envelope process and a phase process. That is, the received noise process is given by

$$N(t) = E(t) \cos [\omega_c t + \phi(t)], \tag{26}$$

where E(t) is the envelope process and $\phi(t)$ is the phase process and ω_c is the band-pass filter center frequency. Since the phase process is known (phase uniformly distributed), the required pdf of the instantaneous amplitude can be obtained from the envelope amplitude pdf. Usually, also, the envelope pdf can be used directly in system performance analyses. The atmospheric noise envelope statistic is usually given as (and measured as) a cumulative exceedance distribution, termed the "amplitude probability distribution" or APD. The APD was described earlier (11) and is given by the probability of the envelope level E (26) being above the level E_i;

$$D(E) = \text{Prob}[E \geq E_i] = 1 - P(E) \tag{27}$$

where P(E) is the cumulative distribution function of the envelope. The pdf of E is given by the derivative of P(E).

Various statistical moments of the received noise envelope were defined earlier. Of concern here are the parameters V_d (15) and L_d (16). Crichlow et al. (1960a) developed a "model" or method of obtaining the APD from these two measured statistical moments. A "most likely" subset of this model became the "CCIR Report 322" model (1964). CCIR Report 322 also gives estimates of V_d(for a 200-Hz bandwidth). One of the purposes here is to review this model and present a numerical representation, including bandwidth relationships, since the received APD is a function of the receiver bandwidth. There have been many models for atmospheric (and other) noise developed over the years, with the CCIR ad hoc model for the APD being one of the many models. A historical summary of the various main models and their interrelationships has been given by Spaulding (1977, 1982) and by Shaver et al. (1972).

4.1 The CCIR 322 APD Model

Using all the measured distributions (APD) of the received atmospheric radio noise envelope available at the time (a small number compared to what is available today), Crichlow et al. (1960a) developed an APD model, where the APD is represented by two straight lines connected by the arc of a circle on a particular coordinate system. The coordinate system used is given by the ordinate being the envelope voltage level (in dB) and the abscissa being the percentage of time the ordinate is exceeded. The coordinates are such that the Rayleigh distribution (envelope of Gaussian noise) plots as a straight line of slope -1/2. These coordinates are log of voltage versus $-1/2 \log_{10}$ (-ln of probability). Figure 82 shows these coordinates, an APD composed of the two straight lines and the circular arc, and the parameters that were used to define this idealized APD. The low envelope level-high probability straight line is a Rayleigh distribution, since the noise process must approach Rayleigh at the lower voltage levels. The parameters used (Figure 82) are defined as follows:

- A = dB difference between Rayleigh at 0.5 probability and the E_{rms} level.
- B = dB difference between the point of intersection of the Rayleigh and high-voltage, low probability line and the tangent to the circular arc (the tangent being drawn perpendicular to the bisector of the angle formed by the Rayleigh and high-voltage, low probability line).
- C = dB difference between the high-voltage, low probability line and Rayleigh line at 0.01 probability coordinate.
- X = absolute value of slope of high-voltage, low probability line relative to Rayleigh, that is $X = -2\ m_2$, where m_2 is the slope of the high-voltage, low probability line.

Next, it was shown that B could be given, approximately, as

$$B = 1.5(X - 1). \tag{28}$$

Figure 83 shows the correlation of B with X for the measured distributions available at the time. A number of APD's were drawn for a range of values of X, C, and A (the remaining unknowns). These distributions were numerically integrated (essentially by hand) and V_d and L_d determined for each APD. From these integrations, X and C were obtained as functions of V_d and L_d, and A was obtained as a function of X and C.

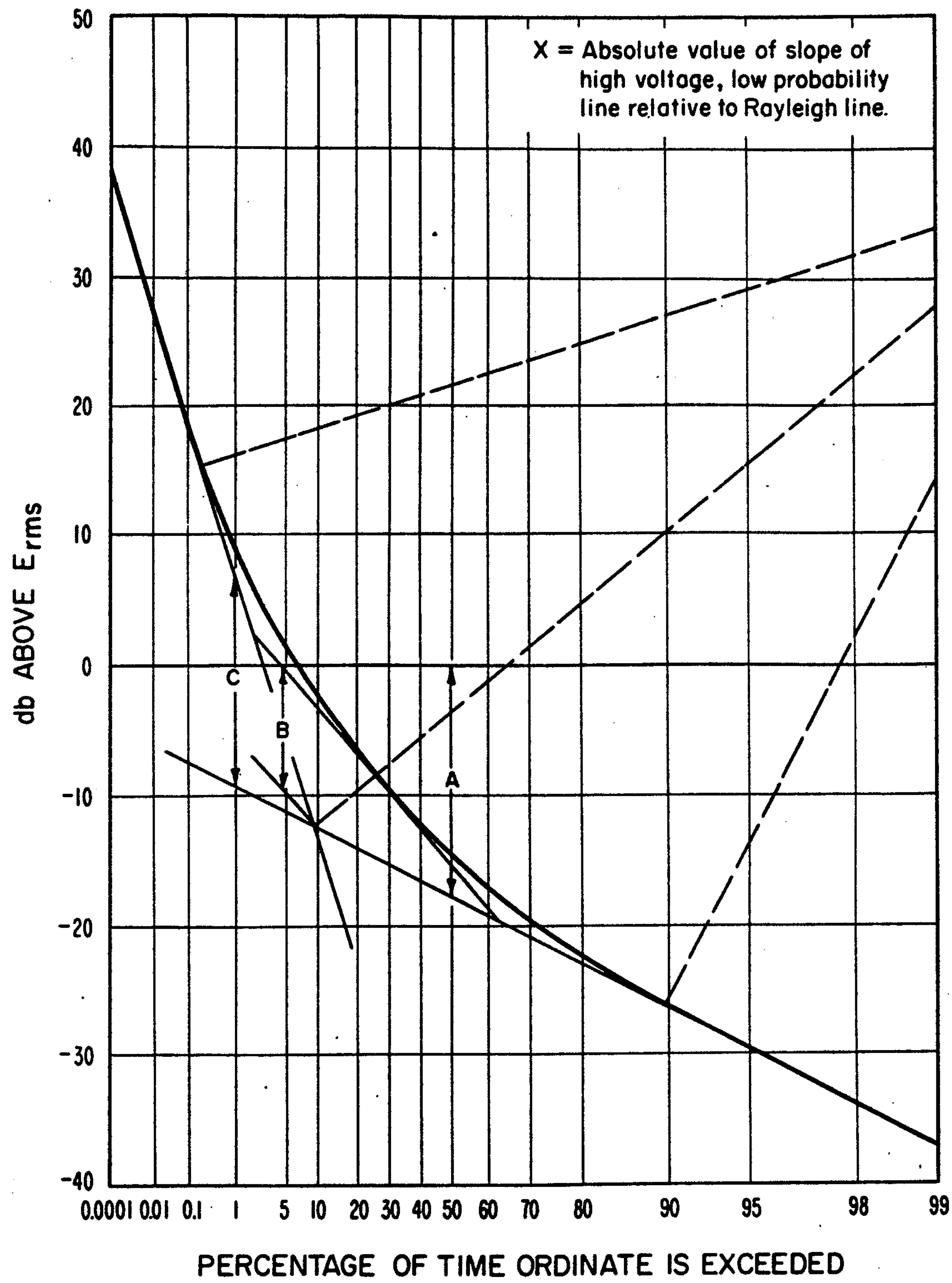

Figure 82. Definition of parameters for the amplitude probability distribution of atmospheric radio noise.

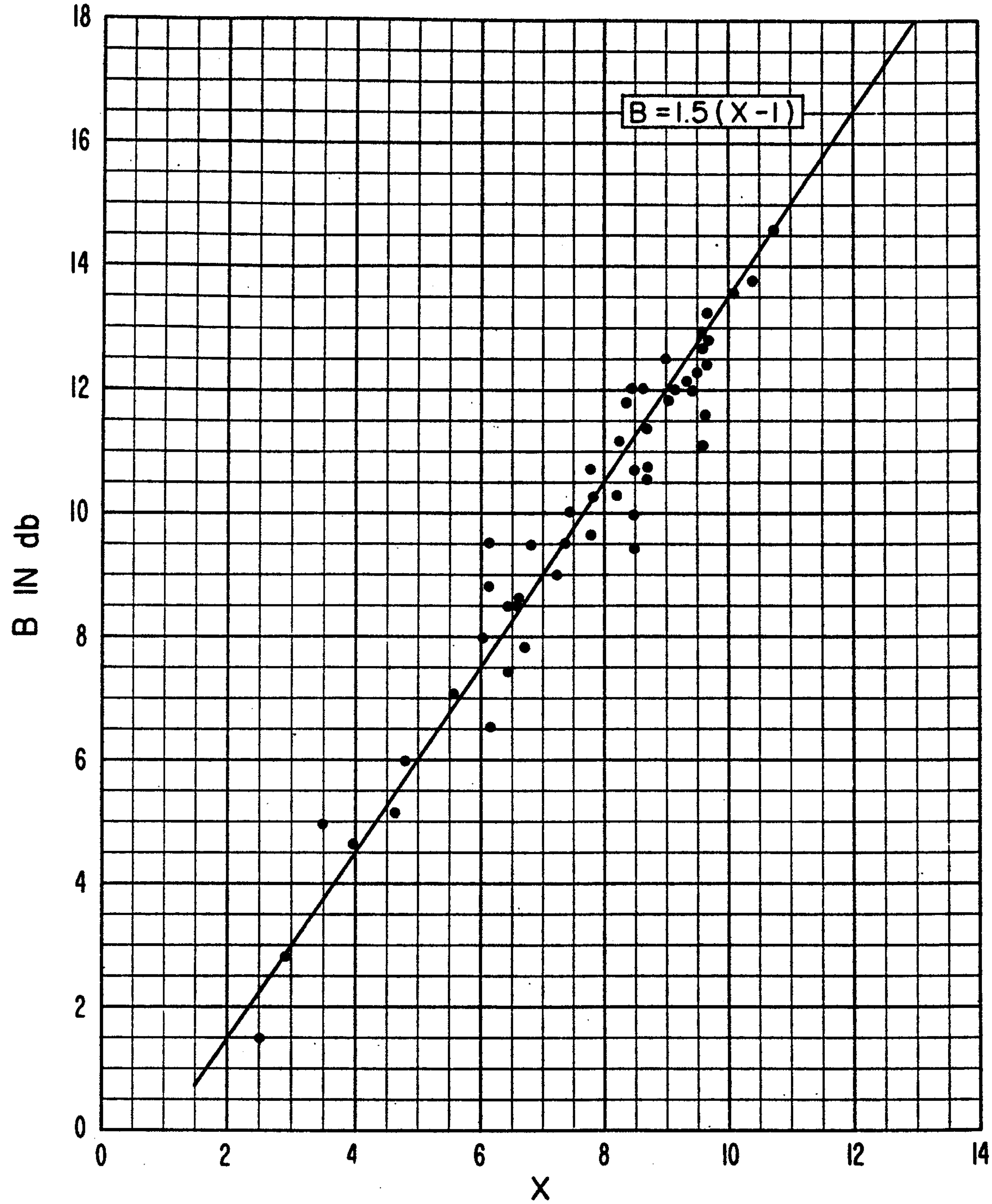

Figure 83. Experimental correlation of B and X.

Figures 84, 85, and 86 show these functional relationships. Use of these results allowed construction of an APD for any measured V_d-L_d combination, and these constructions did represent the measured APD's rather well. Crichlow et al. (1960b) presented sets of APD's, a set for each V_d along with the allowed range of L_d's for that particular V_d.

The APD is a function of receiver bandwidth, and when developing a method to convert the APD appropriate in one bandwidth to that which would be observed in another bandwidth, Spaulding et al. (1962) noted that V_d and L_d were highly correlated. Using approximately 95 measured distributions, the majority measured in a 200 Hz bandwidth and various frequencies between 13 kHz and 20 MHz, it was shown that the linear correlation of L_d with V_d is given by

$$L_d = 1.697\ V_d + 0.7265 \quad . \tag{29}$$

A few of the above distributions were measured in other than a 200 Hz bandwidth. These bandwidths were 0.64 Hz, 6 Hz, 10 Hz, 170 Hz, 950 Hz, and 1170 Hz. APD's measured since in wider bandwidths appear to be still representable by the above model. For example, Figure 87 shows an APD of atmospheric noise measured at 4.75 MHz in a 50 kHz bandwidth along with the "CCIR APD" for a V_d of 8.6 dB. The relationship (29) was used to develop the "standard" set of APD's given in CCIR Report 322. The linear correlation (29) gives results for small V_d that are not mathematically valid. For example, for a V_d of 2 dB, say, the resulting value of 4.12 dB for L_d is not mathematically possible. Therefore, the relationship (29) has to be relaxed slightly in order to obtain APD's for the smaller value of $V_d (\leq 5$ dB), and this modification is arbitrary. The dashed curves on Figures 84 and 85 show the relationship (29) and, therefore, the particular APD's that compose the CCIR 322 model. This set of APD's is given on Figure 88.

A mathematical representation of the APD using the above model was developed some time ago for computer use. This development was never documented, but was used by various authors in system performance studies. See, for example, Conda (1965), Halton and Spaulding (1966), and Spaulding (1966). The input parameters to these computer algorithms are X, C, and A, obtained graphically from figures such as 84, 85, and 86.

In the next section, we present the geometry of the APD model and a computer algorithm for the "standard" set of APD's where the input is V_d directly. This is based on earlier results by Akima (1972). The "standard" set of APD's obtained from this algorithm will be seen to be slightly different from the earlier CCIR 322

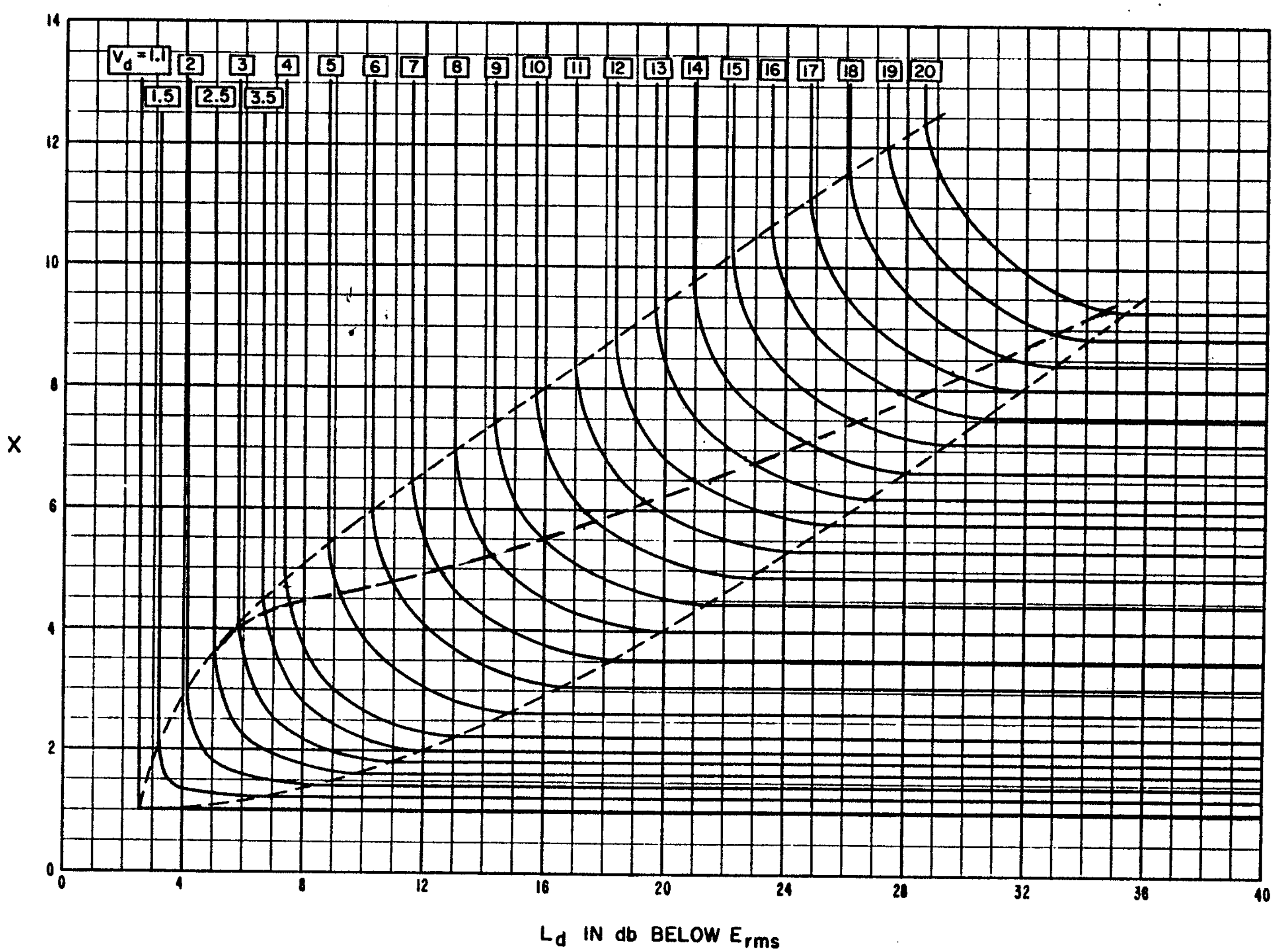

Figure 84. X versus L_d and V_d.

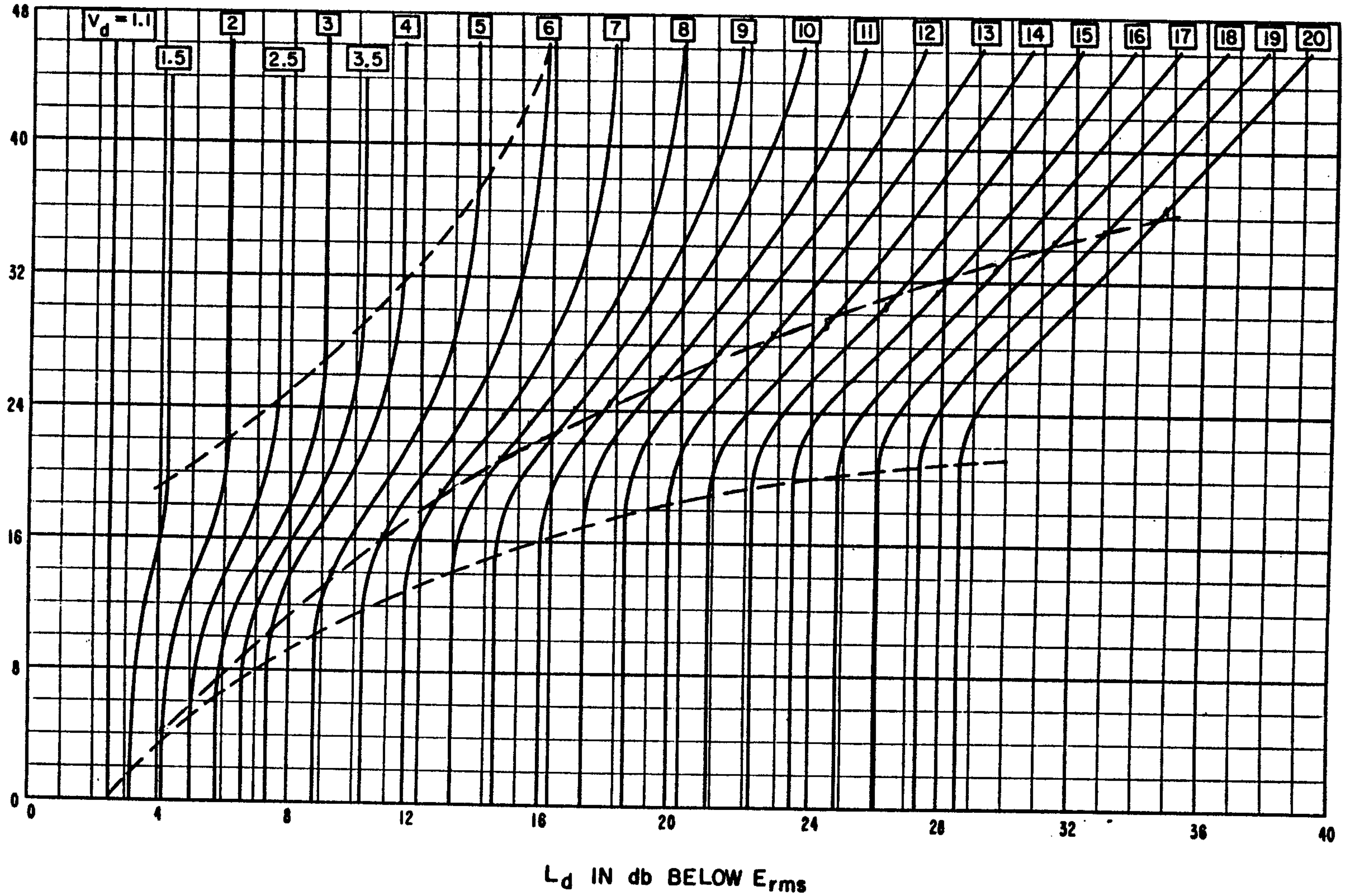

Figure 85. C versus L_d and V_d.

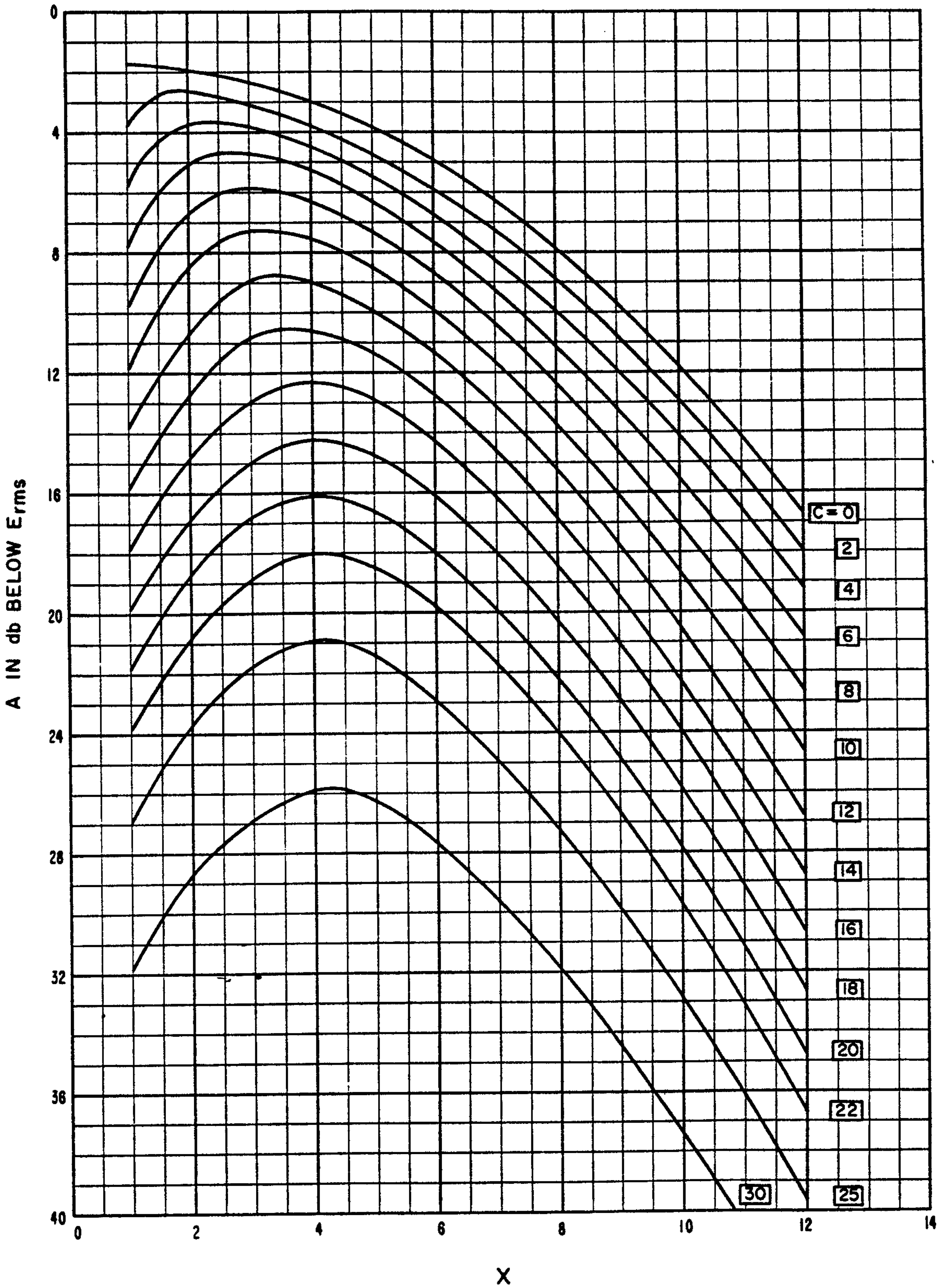

Figure 86. A versus X and C.

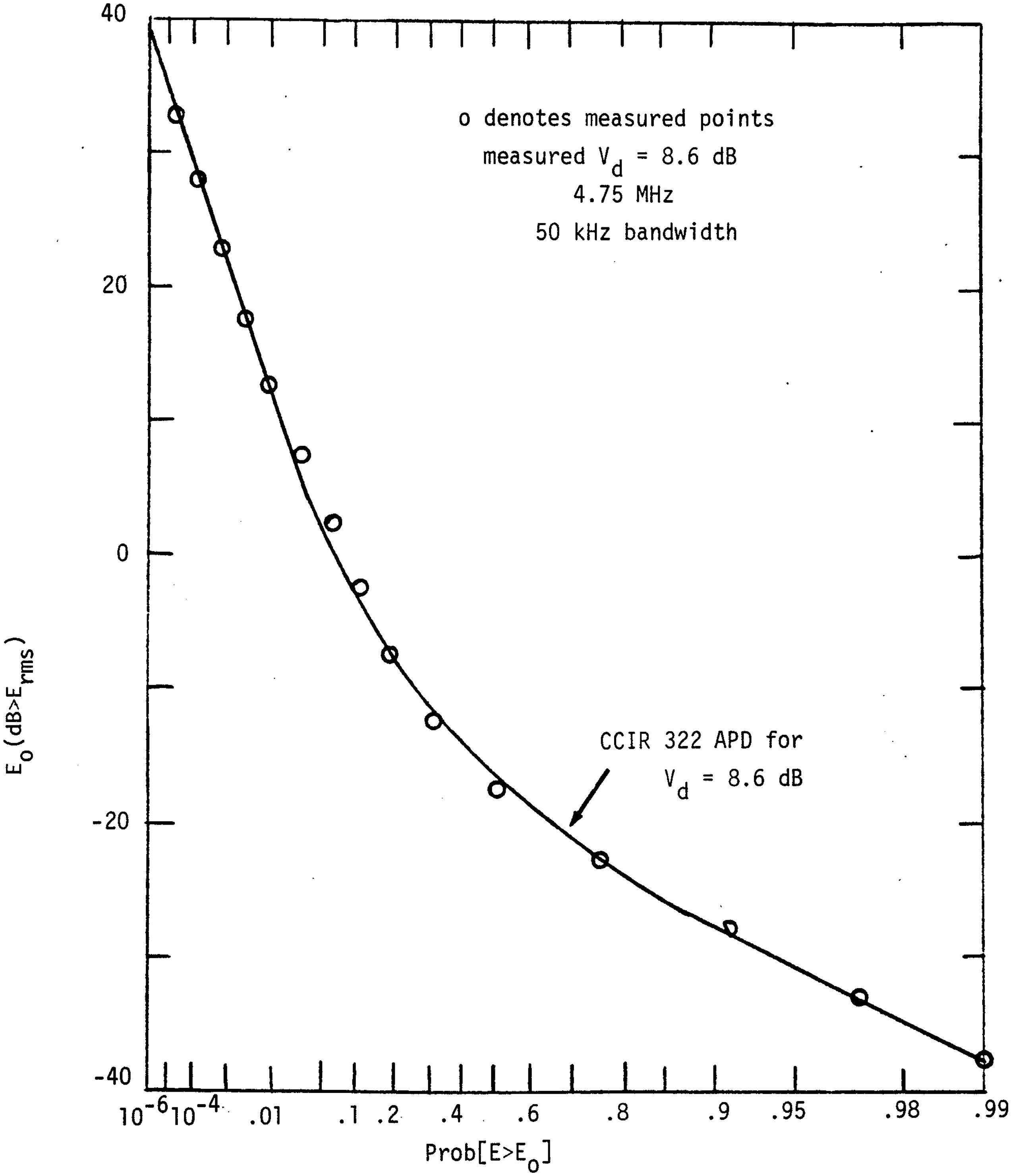

Figure 87. An APD of atmospheric radio noise measured at 4.75 MHz in a 50 kHz bandwidth (15 seconds of data) compared with the CCIR Report 322 APD for a V_d of 8.6 dB.

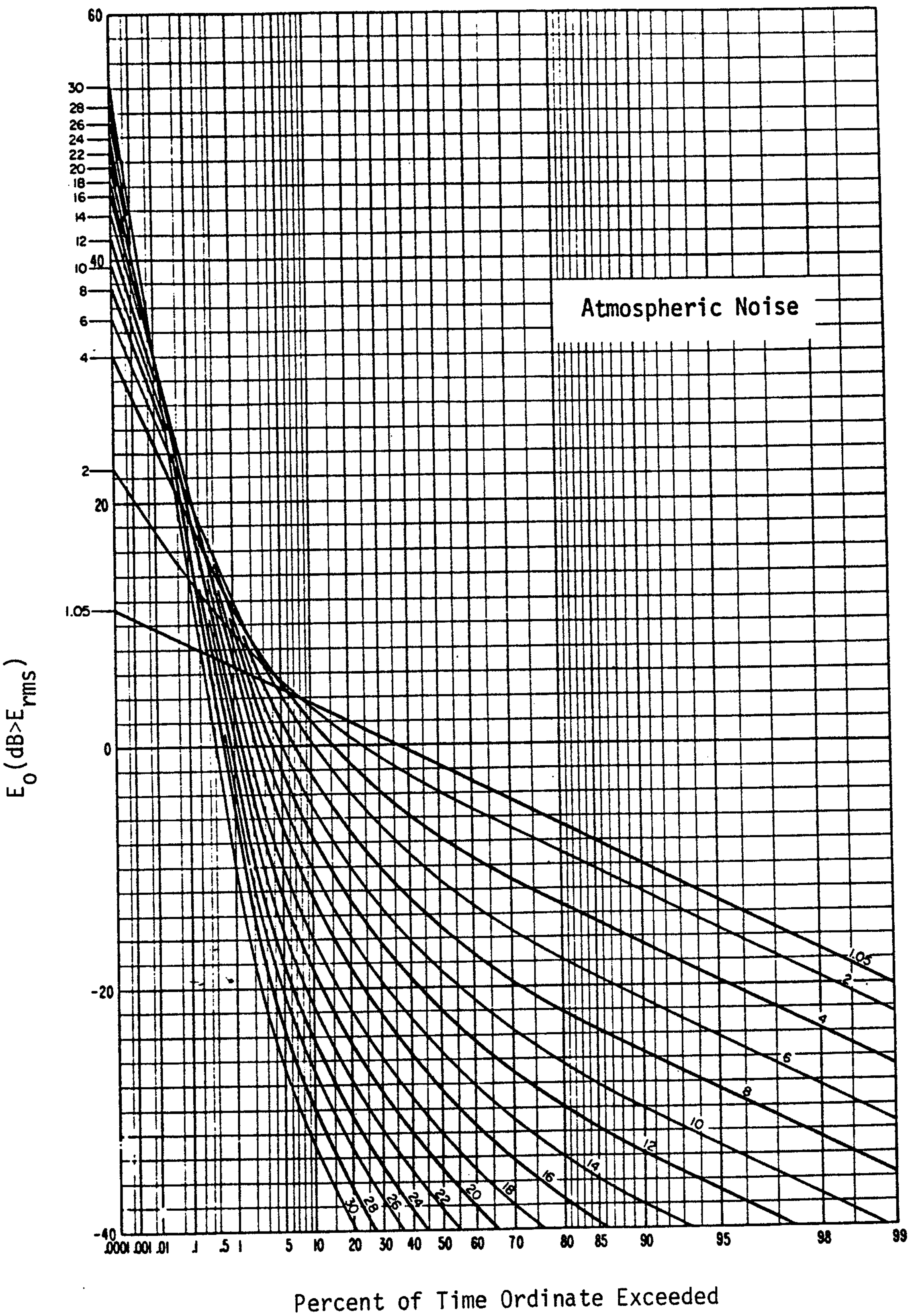

Figure 88. CCIR Report 322 set of amplitude probability distributions of atmospheric radio noise for various V_d values.

standard set (Figure 88) for the smaller values of V_d. This is due to much more precise numerical integration of the APD's and determination of the relationship between the parameters defining the APD's and the corresponding V_d's and L_d's. Also, a more physically meaningful modification of the linear regression (29) was used (See Akima, 1972).

In order to use the computer algorithm or the corresponding set of graphical APD's (Figure 88), the appropriate V_d for the required bandwidth must be determined. CCIR Report 322 gives estimates of V_d for each season and time block for frequencies between 10 kHz and 20 MHz. These values of V_d are for a 200 Hz bandwidth. The bandwidth conversion of V_d will be treated in a later section. The CCIR 322 V_d estimates were obtained by fitting the function

$$V_d(x) = c_0 + c_1 x + c_2 x^2 + c_3 x^3 + c_4 x^4 \quad , \qquad (30)$$

where $x = \log_{10}(f_{MHz})$,

and f_{MHz} is the frequency in MHz.

Table 41 gives the sets of c coefficients for each season and time block to be used with (30) to obtain the CCIR Report 322 V_d estimates. It is interesting to note that these coefficients have not been presented previously.

The observed variation of V_d, σ_{V_d}, is also an important statistic for system performance analysis. Table 42 gives sets of d coefficients for each season and time-block for σ_{V_d}, using the relationship (30). That is

$$\sigma_{V_d}(x) = d_0 + d_1 x + d_2 x^2 + d_3 x^3 + d_4 x^4 \quad . \qquad (31)$$

CCIR Report does not give σ_{V_d}, but handles the variation of the APD differently. Using (31) is much more appropriate, however, especially for numerical work.

The network of recording stations that made the measurements that produced CCIR Report 322 measured the parameter L_d as well as V_d. Table 41 and 42 give the coefficients for the season time-block estimates of V_d and σ_{V_d}. A similar set of estimates for L_d and σ_{L_d} is now also available, based on all the previous measurements. Tables 43 and 44 give the coefficients [corresponding to (30) and (31) above] for L_d and σ_{L_d} for each season-time block. That is

Table 41. Coefficients for the CCIR Report 322 V_d Estimates, S = Season (1 = Winter, etc.) and TB = Time block (1 = 0000-0400 Hours, etc.).

S	TB	c_4	c_3	c_2	c_1	c_0
1	1	-4.15586022E-01	-7.50869801E-01	-6.26841762E-02	-1.61673242E+00	6.78459487E+00
1	2	-8.19124731E-01	-9.09585597E-01	1.24573700E+00	-1.80429429E+00	6.43835525E+00
1	3	-1.42224362E+00	-1.18235587E+00	4.15636528E+00	-1.31952622E+00	4.14994576E+00
1	4	-1.43530592E+00	-1.40729681E+00	4.30851317E+00	-6.13432992E-01	3.97698107E+00
1	5	-9.13614531E-01	-1.02085307E+00	2.05263792E+00	-1.20481693E+00	5.76797550E+00
1	6	-5.00808267E-01	-6.40179441E-01	6.00336702E-01	-1.72489385E+00	6.28328251E+00
2	1	-4.10306784E-01	-5.59607899E-01	8.41784321E-03	-1.82745777E+00	7.01077413E+00
2	2	-9.17965965E-01	-8.57576457E-01	1.65778832E+00	-1.74210229E+00	6.31934305E+00
2	3	-1.25456604E+00	-8.33540325E-01	3.35449427E+00	-2.02941542E+00	5.61265781E+00
2	4	-8.64337002E-01	-3.66203002E-01	2.43257460E+00	-2.43853742E+00	6.02758044E+00
2	5	-5.30065572E-01	-2.18096252E-01	1.28866179E+00	-2.14385922E+00	6.00629093E+00
2	6	-4.17496112E-01	-3.94890710E-01	5.65160173E-01	-1.81148452E+00	6.28661034E+00
3	1	-1.68487571E-01	-4.83367793E-01	-4.73701322E-01	-1.72666100E+00	7.16722078E+00
3	2	-9.15337559E-01	-8.83815317E-01	1.66817783E+00	-2.18486442E+00	7.16769077E+00
3	3	-1.13551135E+00	-7.83533518E-01	2.75493715E+00	-2.32068743E+00	6.72491255E+00
3	4	-1.98417811E-01	3.01961060E-02	-2.64713855E-01	-2.60622295E+00	8.18005102E+00
3	5	1.02759914E-02	2.09493861E-01	-6.30085802E-01	-2.55700412E+00	7.18374974E+00
3	6	-1.80634032E-01	-2.06153419E-01	2.48345237E-01	-1.81286248E+00	5.73012908E+00
4	1	-2.39386843E-01	-4.96995642E-01	-5.10797542E-01	-2.14213999E+00	7.56139657E+00
4	2	-8.38309477E-01	-7.03483344E-01	1.51059375E+00	-2.36513950E+00	6.94308817E+00
4	3	-1.70706706E+00	-1.17987406E+00	4.82706183E+00	-1.76485628E+00	5.06494256E+00
4	4	-1.41821434E+00	-1.11527452E+00	3.86485170E+00	-1.40866619E+00	5.21901993E+00
4	5	-7.11876529E-01	-6.18844507E-01	1.52472219E+00	-1.78588700E+00	6.06417207E+00
4	6	-3.99560349E-01	-4.70927657E-01	4.68497339E-01	-1.92315743E+00	6.52222929E+00

Table 42. Coefficients for σ_{V_d} Estimates, S = Season (1 = Winter, etc.) and TB = Time-block (1 = 0000-0400 Hours, etc.)

S	TB	d_4	d_3	d_2	d_1	d_0
1	1	5.74559281E-01	4.62707699E-01	-1.72173781E+00	-9.95140894E-01	2.20240447E+00
1	2	4.35458757E-01	4.25522378E-01	-1.60117703E+00	-1.08102724E+00	2.58152223E+00
1	3	-6.49233466E-03	4.74253633E-02	-4.03212846E-01	-6.23938149E-01	2.24785228E+00
1	4	4.81514268E-02	3.88000518E-02	-4.79816376E-01	-7.53047623E-01	2.36761696E+00
1	5	2.20951179E-01	1.04067232E-01	-1.00765279E+00	-7.66812705E-01	2.49052997E+00
1	6	3.06314630E-01	1.51288358E-01	-1.05397392E+00	-5.54183344E-01	1.99341144E+00
2	1	3.86616314E-01	8.01623166E-01	-8.87032696E-01	-1.52905085E+00	1.92759641E+00
2	2	4.40050440E-01	7.18383335E-01	-1.35584006E+00	-1.64482072E+00	2.45213428E+00
2	3	3.67170246E-02	-5.61537089E-02	-1.01505114E+00	-3.83501537E-01	3.09611594E+00
2	4	1.65289800E-01	1.70060547E-02	-1.15989586E+00	-3.09043606E-01	2.85528452E+00
2	5	3.07936037E-01	3.85654734E-01	-1.00679367E+00	-1.02253224E+00	1.98359891E+00
2	6	1.31439752E-01	4.02605087E-01	-4.03779860E-01	-9.92782318E-01	1.70204048E+00
3	1	3.58940314E-01	4.95409368E-01	-8.27121405E-01	-7.63286332E-01	1.55427990E+00
3	2	2.09965713E-01	3.24844698E-01	-8.07822126E-01	-8.80559875E-01	2.08557260E+00
3	3	-9.08564453E-02	-1.75290010E-01	-4.90665403E-01	-1.91890309E-01	2.80704666E+00
3	4	-2.94892431E-04	-2.05446289E-01	-7.68224281E-01	1.17367277E-01	2.75988679E+00
3	5	1.91096116E-01	1.87522643E-01	-9.11250293E-01	-5.71111677E-01	1.98460093E+00
3	6	2.47570773E-01	3.91438655E-01	-6.43926655E-01	-7.67813443E-01	1.49625461E+00
4	1	5.01750036E-01	5.77129399E-01	-1.35720266E+00	-1.04622956E+00	1.99818623E+00
4	2	3.55927079E-01	4.23490372E-01	-1.29001962E+00	-9.61774515E-01	2.30245072E+00
4	3	-5.57814073E-02	-1.21842205E-01	-5.62937765E-01	-3.16487314E-01	2.94384763E+00
4	4	1.07676095E-01	-1.21212315E-01	-9.15292141E-01	-2.77208541E-01	2.97756952E+00
4	5	1.40565912E-01	6.61535051E-02	-6.51440190E-01	-4.10729136E-01	1.86781589E+00
4	6	1.14401727E-01	2.07595064E-01	-3.50865144E-01	-5.22015309E-01	1.52884872E+00

Table 43. Coefficients for L_d Estimates, S = Season (1 = Winter, etc.) and TB = Time block (1 = 0000-0400 Hours, etc.)

S	TB	e_4	e_3	e_2	e_1	e_0
1	1	-4.01080390E-01	-8.06871222E-01	-9.16065607E-01	-3.12341181E+00	1.17796511E+01
1	2	-1.14612417E+00	-1.16044131E+00	1.48801759E+00	-3.11963345E+00	1.08095069E+01
1	3	-2.01268851E+00	-1.58446010E+00	5.76959544E+00	-2.19798985E+00	7.15846402E+00
1	4	-2.01284126E+00	-1.69581923E+00	6.20222659E+00	-1.68630451E+00	6.54887850E+00
1	5	-1.22376561E+00	-1.14145192E+00	2.70535893E+00	-2.57991235E+00	9.57765195E+00
1	6	-4.77566043E-01	-6.80647279E-01	-1.38313271E-01	-3.08912539E+00	1.11620472E+01
2	1	-7.56387723E-01	-9.41795283E-01	1.48878601E-02	-3.01658687E+00	1.19305855E+01
2	2	-1.47380509E+00	-1.13857531E+00	2.70265503E+00	-3.39495783E+00	1.06030690E+01
2	3	-1.64465533E+00	-5.20826651E-01	4.66848576E+00	-4.41871597E+00	9.24596259E+00
2	4	-1.07577532E+00	-6.58190899E-02	3.10458703E+00	-4.52877044E+00	1.00850456E+01
2	5	-6.94420166E-01	-1.16143553E-01	1.54082549E+00	-3.84614111E+00	1.03725134E+01
2	6	-5.44782695E-01	-3.70339547E-01	4.18740539E-01	-3.36683216E+00	1.08592467E+01
3	1	-5.72573485E-02	-6.31460722E-01	-1.67851932E+00	-3.02538520E+00	1.27623885E+01
3	2	-1.21972222E+00	-9.01790378E-01	1.92007436E+00	-4.29975019E+00	1.22139152E+01
3	3	-1.46183941E+00	-6.21479919E-01	3.46372974E+00	-4.72257846E+00	1.12195165E+01
3	4	8.89864683E-02	4.55733588E-01	-1.51999568E+00	-4.74217115E+00	1.37346270E+01
3	5	2.07351893E-01	5.81000648E-01	-1.57227661E+00	-4.50545603E+00	1.23294894E+01
3	6	-1.89484675E-01	-2.32209905E-01	-1.63480903E-01	-3.20050499E+00	1.03548994E+01
4	1	-5.66360041E-02	-4.83281183E-01	-1.97564001E+00	-3.79144519E+00	1.32416806E+01
4	2	-1.12491420E+00	-9.11485568E-01	1.55307102E+00	-3.95085955E+00	1.18725334E+01
4	3	-2.48390336E+00	-1.51620101E+00	6.93839891E+00	-3.15527018E+00	8.45645981E+00
4	4	-1.75758814E+00	-1.19889517E+00	4.88840291E+00	-2.78488101E+00	8.95452079E+00
4	5	-9.24933064E-01	-6.82560000E-01	1.78149730E+00	-3.32249985E+00	1.05203855E+01
4	6	-5.81223504E-01	-5.66027834E-01	3.01275165E-01	-3.53727004E+00	1.13939994E+01

Table 44. Coefficients for σ_{L_d} Estimates, S = Season (1 = Winter, etc.), TB = Time block (1 = 0000-0400 Hours, etc.)

S	TB	f_4	f_3	f_2	f_1	f_0
1	1	9.01312767E-01	7.88067963E-01	-3.00905494E+00	-1.70696299E+00	3.82658841E+00
1	2	8.40212504E-01	8.47490696E-01	-2.98248275E+00	-2.02966382E+00	4.31515747E+00
1	3	-1.15010729E-01	1.14301151E-01	-4.59078531E-01	-1.16383964E+00	3.74010391E+00
1	4	2.38301427E-02	3.19603082E-01	-6.61835101E-01	-1.54605599E+00	3.52091972E+00
1	5	4.18614469E-01	4.50300762E-01	-1.60948778E+00	-1.64255799E+00	3.59113521E+00
1	6	3.48991796E-01	1.98604395E-01	-1.44513230E+00	-9.52923306E-01	3.31937922E+00
2	1	7.48772662E-01	1.35688170E+00	-1.62281902E+00	-2.23630853E+00	2.91318837E+00
2	2	7.71793817E-01	1.18185259E+00	-2.68206137E+00	-2.55304851E+00	4.33849834E+00
2	3	3.32902164E-01	4.53383515E-01	-2.35643875E+00	-1.62755279E+00	5.31224117E+00
2	4	8.49533890E-01	7.58362650E-01	-3.23297819E+00	-1.54336524E+00	5.06695298E+00
2	5	7.49445008E-01	6.62196232E-01	-2.57325195E+00	-1.66050741E+00	3.66111294E+00
2	6	2.04405264E-01	5.28586058E-01	-6.24392010E-01	-1.42954452E+00	2.47515282E+00
3	1	6.88900456E-01	8.03747629E-01	-1.81006419E+00	-1.11791608E+00	2.52498491E+00
3	2	6.16625068E-01	8.19429853E-01	-2.30453767E+00	-1.83898053E+00	3.97380417E+00
3	3	-9.78848747E-02	-2.34615748E-01	-1.12402853E+00	-5.03506352E-01	4.74347300E+00
3	4	3.66977790E-01	-1.42718306E-01	-2.41897240E+00	-2.04556660E-02	4.89462488E+00
3	5	5.48989406E-01	3.22359358E-01	-2.21794175E+00	-6.69402823E-01	3.27316437E+00
3	6	1.56926584E-01	2.18540144E-01	-4.23639121E-01	-4.33381686E-01	1.67025525E+00
4	1	8.22378639E-01	6.85277683E-01	-2.56770690E+00	-1.25328720E+00	3.33183215E+00
4	2	7.37138510E-01	7.90719147E-01	-2.60914502E+00	-1.77202522E+00	4.01696572E+00
4	3	3.29307237E-02	2.61046502E-01	-1.31346784E+00	-1.41271059E+00	4.99214530E+00
4	4	1.36887095E-01	-8.21977668E-02	-1.74000982E+00	-7.00101431E-01	4.87512720E+00
4	5	3.24876972E-01	1.05665674E-01	-1.51298491E+00	-6.94697920E-01	3.21008663E+00
4	6	3.01877516E-01	3.38148064E-01	-1.03299281E+00	-8.80198176E-01	2.63363314E+00

$$L_d(x) = e_0 + e_1x + e_2x^2 + e_3x^3 + e_4x^4 , \quad (32)$$

and

$$\sigma_{L_d}(x) = f_0 + f_1x + f_2x^2 + f_3x^3 + f_4x^4 , \quad (33)$$

and, as before

$$x = \log_{10}(f_{MHz}).$$

Figure 89 shows the relationship between the V_d's from (30) and L_d's from (32) using each of the 24 season-time blocks and the 11 measurement frequencies, .013, .051, .120, .160, .246, .495, .545, 2.5, 5, 10, and 20 MHz. These estimates for V_d and L_d are for average values, averaged over the entire Earth's surface and over each season-time block. Note that these average V_d's and L_d's are highly correlated (Figure 89), but that this correlation is somewhat different from that given in (29), which was obtained from a set of actual measured distributions. The relation (29) is also shown on Figure 89 for comparison.

A monograph by V. F. Osinin (1982) presents the results of experimental studies of natural radio noise on frequencies from VLF to HF within auroral, subauroral, and middle-latitude areas of the USSR. Osinin (1982) shows L_d versus V_d relationships obtained from APD measurements for four locations, three in the far eastern USSR and one in Japan. The three USSR locations are M. Schmidt, Magadan, and Khaborovsk. The Soviet measurements are in the frequency range 12 to 10,000 kHz and the measurements from Japan are at 50 kHz with a 1 kHz bandwidth. The bandwidth used for the Soviet measurements is not specified. In all four cases the results are similar to Figure 89 in that V_d and L_d are highly linearly correlated with the individual V_d-L_d points clustering slightly below the $L_d = 1.697V_d + 0.7265$ line (which Osinin also displays).

The APD for man-made noise can also be modeled by the Crichlow et al. (1960a) model. See, for example, Disney and Spaulding (1970), Spaulding et al. (1971), Spaulding and Disney (1974), Spaulding (1976), and Hagn (1982). Figure 90 shows the correlation of L_d with V_d for man-made noise, using 637 measured V_d and corresponding L_d median values for numerous locations throughout the United States and for various frequencies covering the range 250 kHz to 250 MHz and in a 4-kHz bandwidth. Note that the relationship is somewhat different from that for atmospheric radio noise (29). The computer algorithm for the APD presented in the next section has

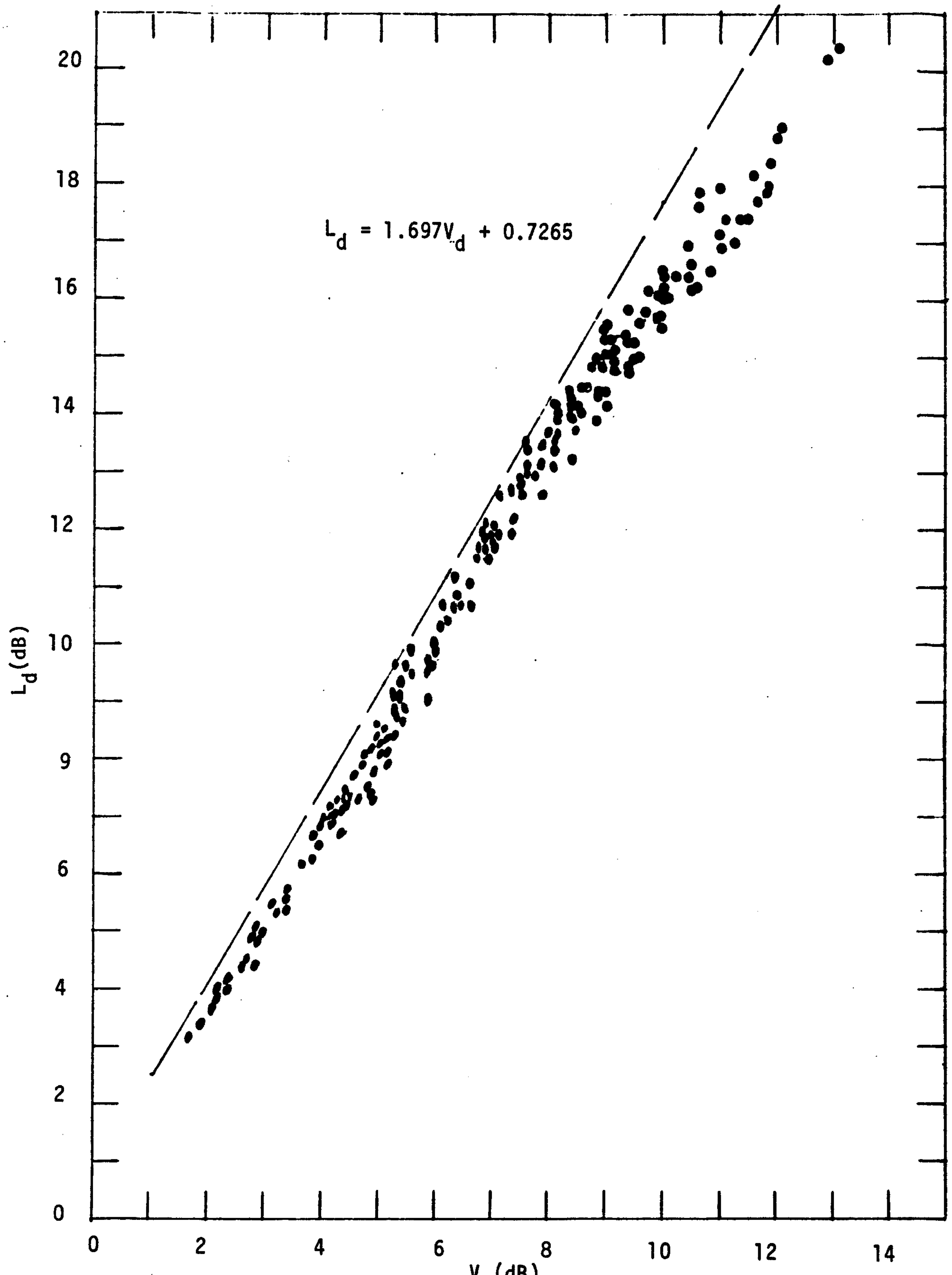

Figure 89. Season- 4 hour time block worldwide average L_d versus V_d, 200 Hz bandwidth, frequency range 13 kHz to 20 MHz.

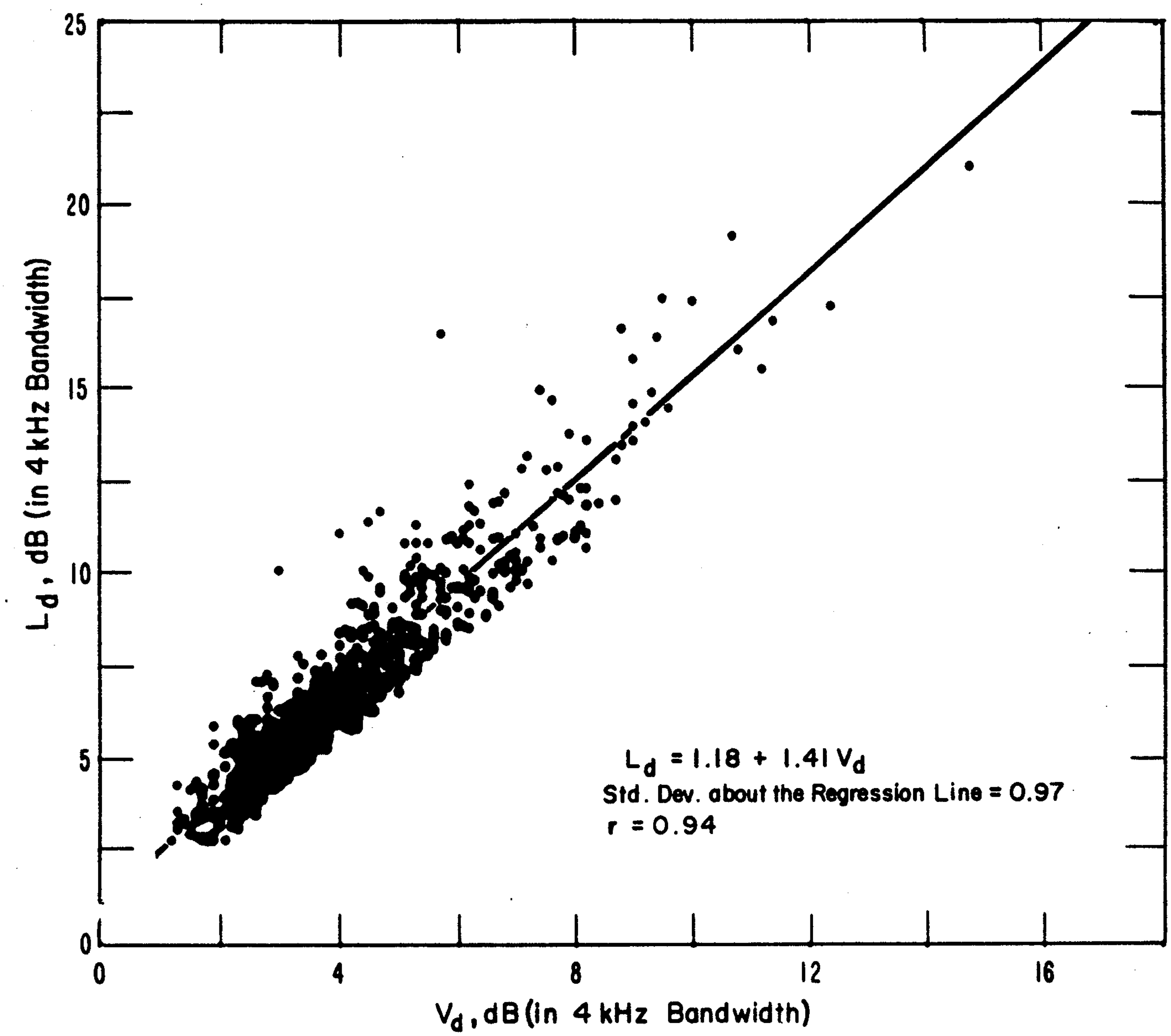

Figure 90. Correlation of V_d and L_d for man-made noise in the frequency range 250 kHz-250 MHz.

V_d as its input and is for the "standard" set of APD's using, basically, the relationship (29) for atmospheric radio noise. For other V_d, L_d combinations, the corresponding X, C, and A parameters can be obtained from Figures 84, 85, and 86. We will show how these "nonstandard" sets of parameters can be used in conjunction with the algorithms presented next.

4.2 Geometry of the Three-Section APD Curve

The APD model of Crichlow et al. (1960a) is shown on Figure 91 (and Figure 82). For small y values the curve coincides with a straight line, L_1, having the same slope as the Rayleigh distribution, i.e., -0.5. For large y values the curve coincides with another straight line L_2, having a steeper (negative) slope. These two straight lines are connected by the circular arc C.

We denote the points where the circular arc is tangent to straight lines L_1 and L_2 by (x_1, y_1) and (x_2, y_2), respectively, as shown in Figure 91. We also denote the center of the circle by (x_c, y_c) and its radius by r. Then, the three-section curve can be expressed by

$$L_1: \quad y = m_1 x + b_1 \tag{34}$$

for $x \geq x_1$ and $y \leq y_1$;

$$C: \quad (x - x_c)^2 + (y - y_c)^2 = r^2 \tag{35}$$

for $x_1 \geq x \geq x_2$ and $y_1 \leq y \leq y_2$;

$$L_2: \quad y = m_2 x + b_2 \tag{36}$$

for $x \leq x_2$ and $y \geq y_2$.

We denote the third straight line that is tangent to the arc at its midpoint by

$$L_3: \quad y = m_3 x + b_3 \quad . \tag{37}$$

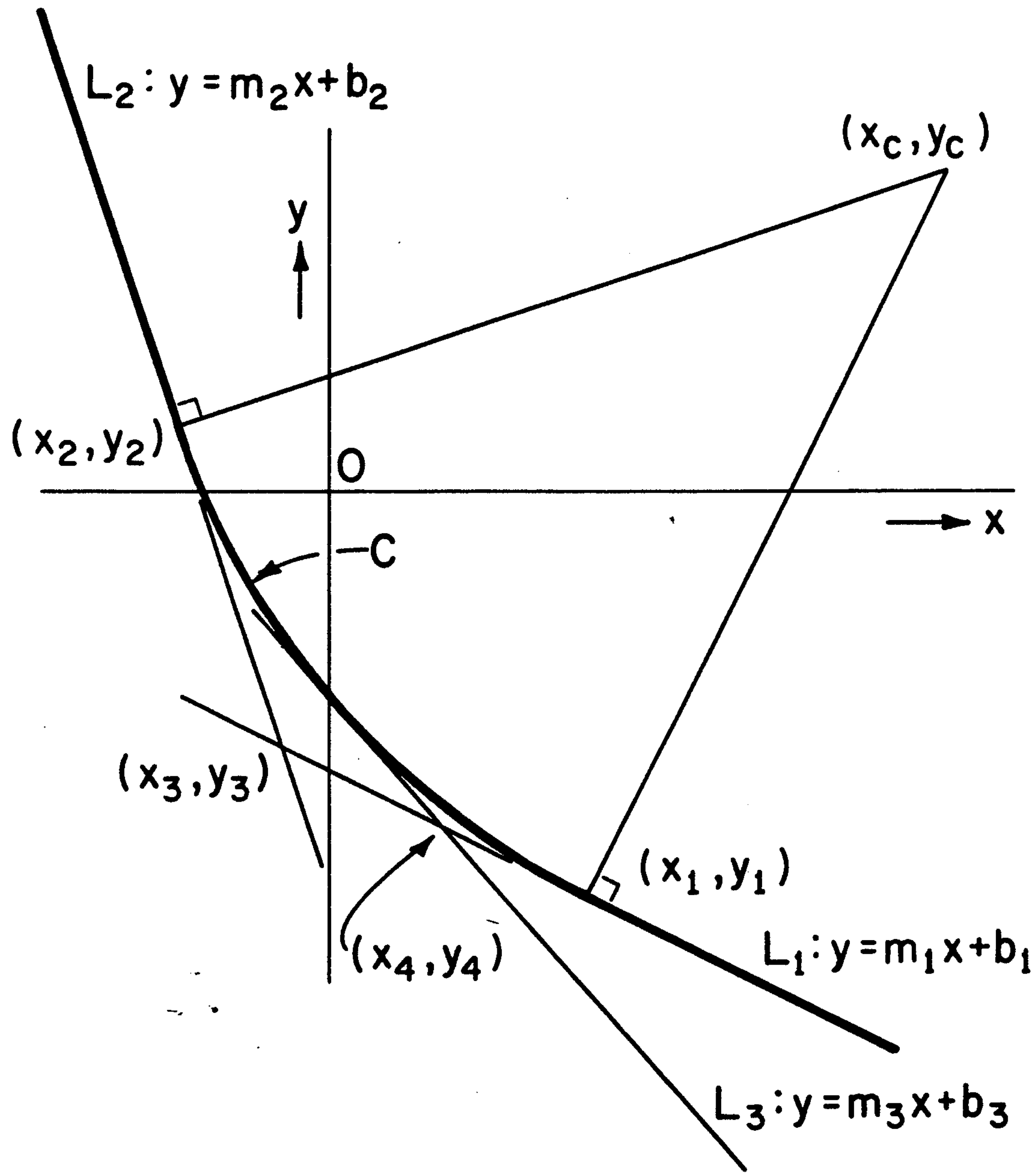

Figure 91. Three-section curve for the APD function.

Since L_3 is parallel to the bisector of the angle between L_1 and L_2, m_3 is related to m_1 and m_2 by

$$m_3 = \tan\left(\frac{\mathrm{Tan}^{-1}m_1 + \mathrm{Tan}^{-1}m_2}{2}\right) . \tag{38}$$

If we denote the direction tangent of a bisector of the angle between L_1 and L_3 by m_4, it is given by

$$m_4 = \tan\left(\frac{\mathrm{Tan}^{-1}m_1 + \mathrm{Tan}^{-1}m_3}{2}\right) . \tag{39}$$

We further denote the point of intersection between L_1 and L_2 by (x_3,y_3), and between L_1 and L_3 by (x_4,y_4), as shown in Figure 91. Then, these coordinates are given as

$$x_3 = \frac{b_2 - b_1}{m_1 - m_2} , \tag{40}$$

$$y_3 = \frac{m_1 b_2 - m_2 b_1}{m_1 - m_2} , \tag{41}$$

$$x_4 = \frac{b_3 - b_1}{m_1 - m_3} , \tag{42}$$

$$y_4 = \frac{m_1 b_3 - m_3 b_1}{m_1 - m_3} . \tag{43}$$

With these values, the coordinates x_c and y_c are given by

$$x_c = \frac{m_3(x_4 + m_4 y_4) - m_4(x_3 + m_3 y_3)}{m_3 - m_4} , \tag{44}$$

$$y_c = \frac{(x_3 + m_3 y_3) - (x_4 + m_4 y_4)}{m_3 - m_4} . \tag{45}$$

The coordinates x_1, y_1, and y_2 are given by

$$x_1 = \frac{x_c + m_1(y_c - b_1)}{1 + m_1^2} \quad , \tag{46}$$

$$y_1 = \frac{b_1 + m_1 x_c + m_1^2 y_c}{1 + m_1^2} \quad , \tag{47}$$

$$x_2 = \frac{x_c + m_2(y_c - b_2)}{1 + m_2^2} \quad , \tag{48}$$

$$y_2 = \frac{b_2 + m_2 x_c + m_2^2 y_c}{1 + m_2^2} \quad . \tag{49}$$

Finally, the radius of the circular arc is expressed by

$$r = \sqrt{(x_c - x_1)^2 + (y_c - y_1)^2} \quad . \tag{50}$$

It follows from this geometry that if five constants, m_1, m_2, b_1, b_2, and b_3, are specified, all the necessary values for determining the curve can be uniquely determined by following steps from (34) to (50). It was noted earlier in (28) that $B = 1.5\ (X - 1)$ where $X = m_2/m_1$. This means that the line L_3 can be expressed by

$$y-y_3 = m_3(x - x_3) + 1.5\ (m_2/m_1 - 1) \quad . \tag{51}$$

From this we have

$$b_3 = y_3 - m_3 x_3 + 1.5\ (m_2/m_1 - 1) \quad . \tag{52}$$

Also L_1 is a Rayleigh distribution so that

$$m_1 = -0.5. \tag{53}$$

Because of these two conditions, we have only three parameters, m_2, b_1, and b_2, that we need to specify to construct the desired curve. Later (Section 4.4), a computer algorithm to do this is specified. This algorithm used an interpolation procedure to obtain m_2, b_1, and b_2 from the input V_d. The resulting APD is the CCIR 322 "standard" APD for this value of V_d (slightly modified for small values of V_d, as noted earlier). This set of APD's is shown on Figure 92. For other "nonstandard" APD's, the following relationships can be used to specify m_2, b_1, and b_2 in terms of X, C, and A:

$$m_2 = -X/2 \quad ,$$

$$b_1 = -A + 1.598, \text{ and} \tag{54}$$

$$b_2 = 8.23 + C - A - 6.63X \quad .$$

The algorithms given in Section 4.4 also can be used to compute the pdf of the envelope, i.e., the derivative of P(E), (27), as well as the APD, or D(E) (27). All levels are given relative to the rms level of the envelope.

4.3 Bandwidth Conversion of the APD

As noted earlier, the parameters V_d and L_d (and the APD) are a function of receiver bandwidth and the worldwide V_d estimates given by CCIR Report 322 are for a 200-Hz bandwidth. Spaulding et al. (1962) developed a method to convert the APD to other bandwidths. These results gave a "new" V_d value as a function of the "old" V_d value and the bandwidth ratio. The analysis that led to these results was based on earlier results of Fulton (1961) and used various idealized assumptions. These bandwidth conversion results became the "standard" and are given in CCIR Report 322. Numerous measurements since the publication of CCIR Report 322 in 1964 have shown that these bandwidth conversion relationships can give quite wrong results, especially if the bandwidth ratio is at all large. The bandwidth conversion relationship given by CCIR Report 322 is one of the main deficiencies of Report 322.

Recently Herman and DeAngelis (1983) conducted an extensive study in order to develop a better V_d-bandwidth relationship. A large data base of wideband (100 kHz), high dynamic range (120 dB) digital recordings was used. This data base was for MF and was recorded in a remote location in Nevada during Autumn 1980, Winter 1981, and Summer 1981. Digital filtering and analysis allowed determination of the noise characteristics in bandwidths from 100 kHz down to 6 Hz. Figure 93 shows the

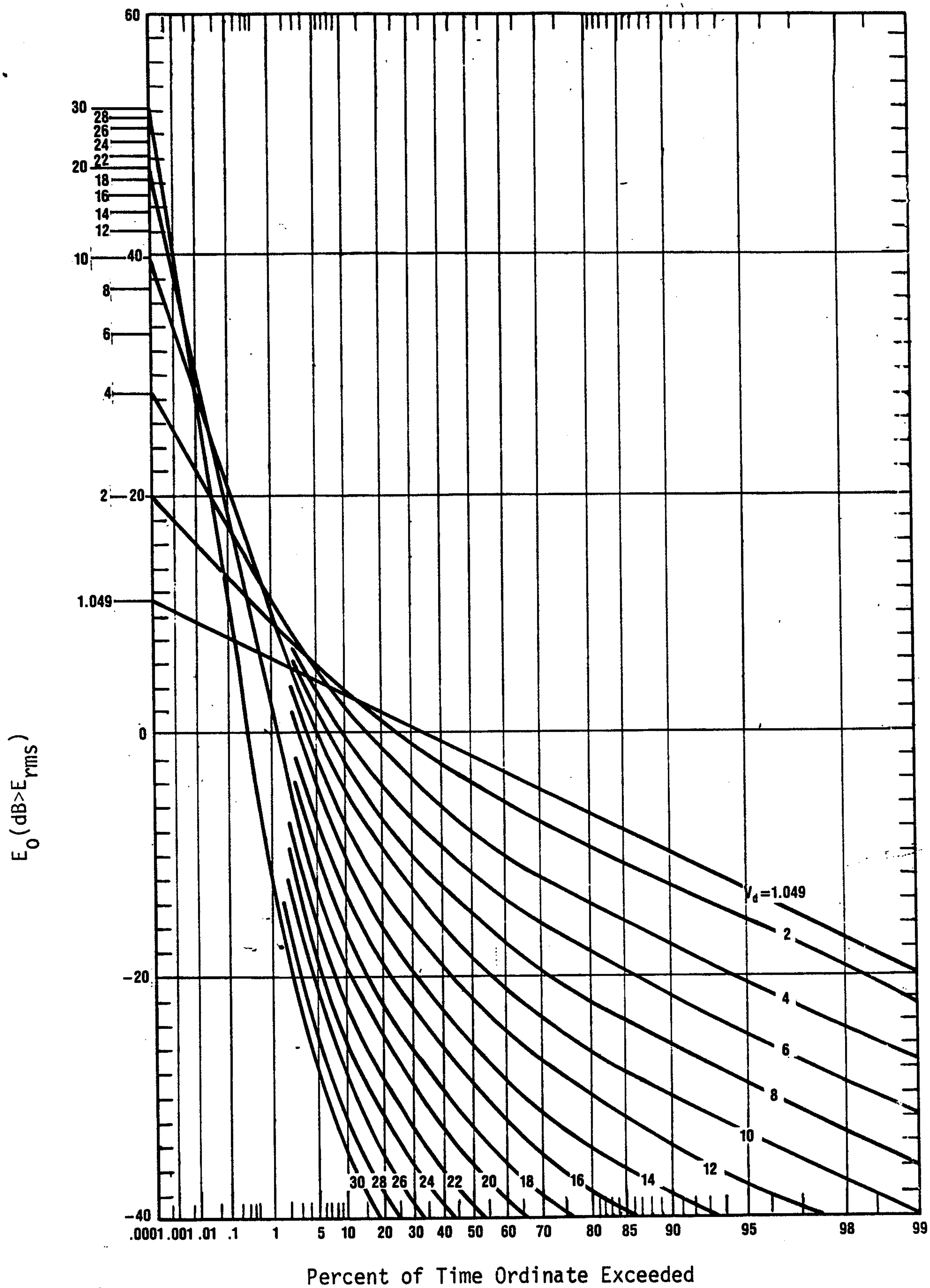

Figure 92. "New" set of amplitude probability distributions for atmospheric radio noise for various values of V_d.

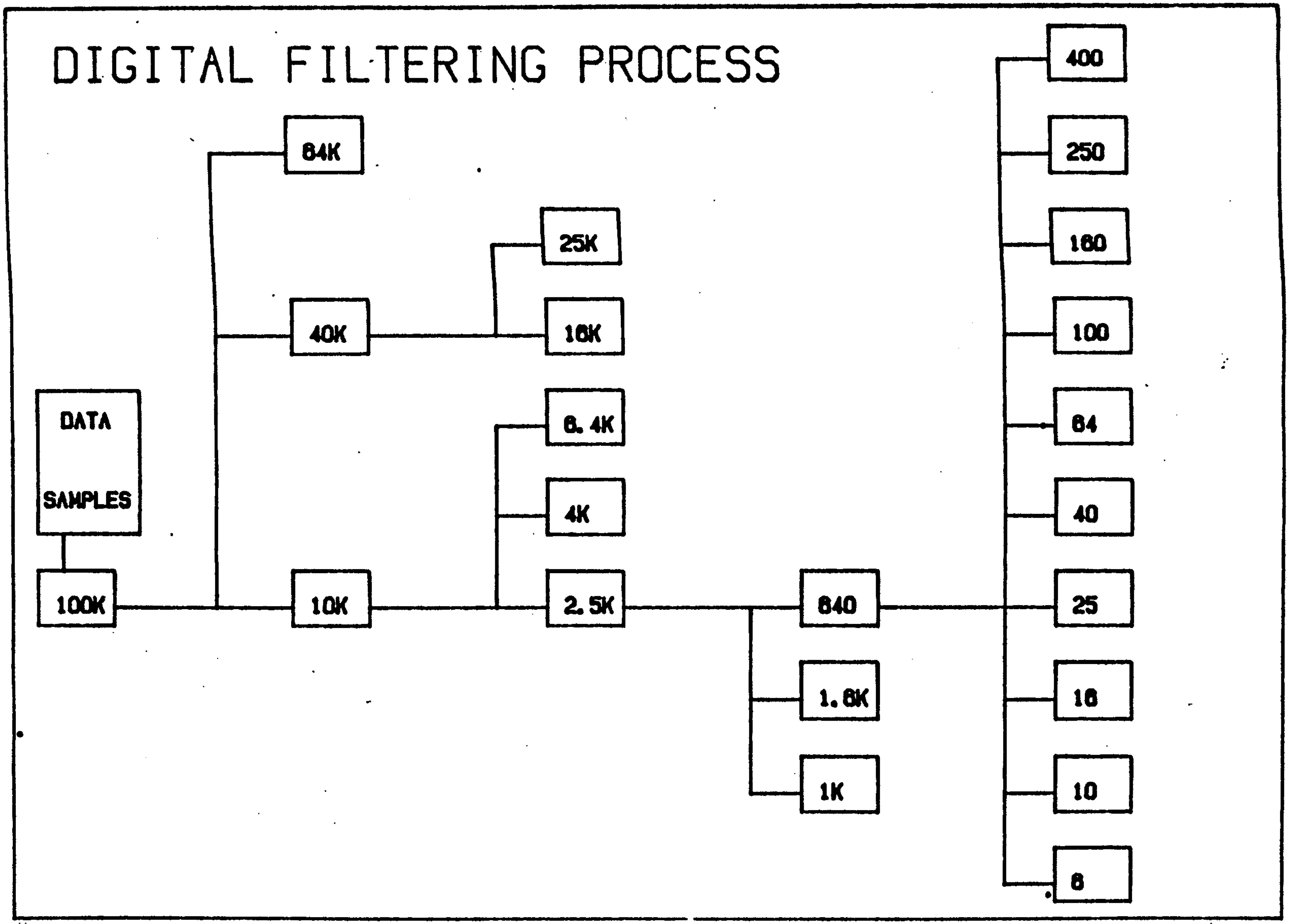

Figure 93. The digital filtering process illustrating the bandwidths used in the V_d versus bandwidth atmospheric noise analysis (Herman and DeAngelis, 1983).

digital filtering process and the resulting bandwidths. In all cases, the resulting APD's could be represented by the model given here by Figure 92 (or the CCIR 322 model). That is, the APD-V_d relationship is valid. Figure 94 gives some of the results of this study, giving means to convert the 200 Hz V_d to other bandwidths. The results of Herman and DeAngelis (1983) depend on the starting bandwidth, whereas the CCIR 322 bandwidth conversion results do not depend on the starting bandwidth, but only on the bandwidth ratio. Herman and DeAngelis's results indicate the proper bandwidth conversion relationships depend on starting bandwidth. The results of Figure 94 are strictly valid only for MF, even though the APD's obtained were equivalent to those obtained at other frequencies. The results of Figure 94 need to be verified at other frequencies (e.g., HF), but should represent a substantial improvement over the idealized results given by CCIR Report 322. The results of Figure 94 are given mathematically as

$$V_{dn} = V_{de} + (0.4679 + 0.2111\ V_{de}) \log BWR \quad , \tag{55}$$

where V_{dn} is the desired value of V_d and V_{de} is the starting V_d value in a 200-Hz bandwidth, and BWR is the bandwidth ratio, i.e., desired bandwidth/200 Hz.

4.4 Computer Software

In this section we simply present computer software (FORTRAN) to use with the results above. The first program (PROGRAM APD) is an example program. It takes a 200-Hz V_d (VD200) of 7.0 dB and a bandwidth ratio (BWR) of 100, and produces the corresponding APD. The bandwidth conversion of V_d is accomplished via (55), which is given by FUNCTION VDC(VD200,BWR) called by PROGRAM APD. The main software given here is FUNCTION APDAN(VD,K,DB) which actually produces the APD value (or the corresponding envelope pdf value) for a given V_d(VD) at a specified level (DB) relative to the rms level. Other details are well covered by the comment statements in the programs and FUNCTION statements below. The standard set of APD's given on Figure 92 was obtained from FUNCTION APDAN(VD,K,DB) using a program similar to the PROGRAM APD given below. Table 45 is a sample of the output for a V_d of 20 dB.

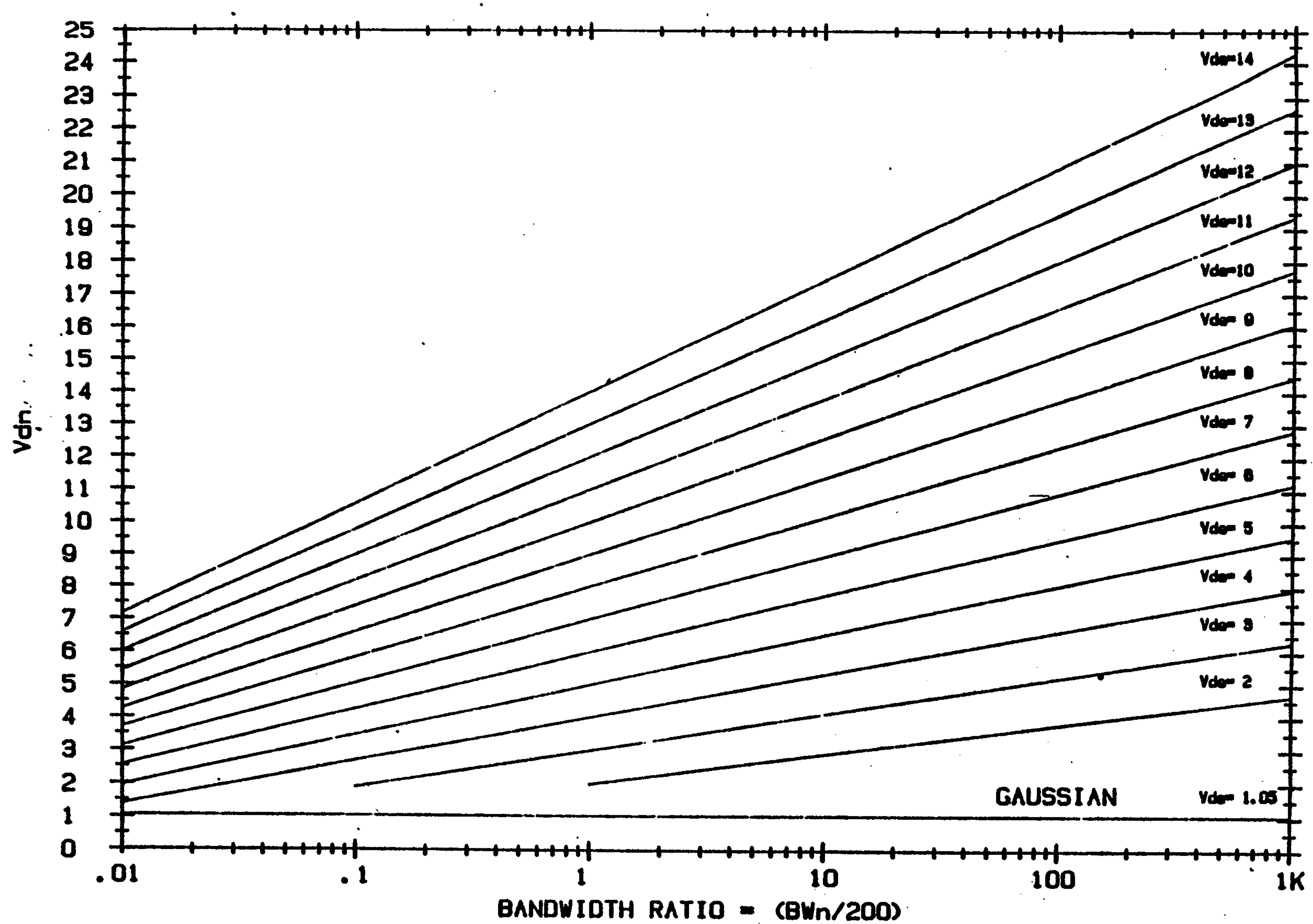

Figure 94. Translation of a 200-Hz bandwidth V_d, V_{de}, to other bandwidths, BWn.

```
1       PROGRAM APD (INPUT,OUTPUT)
C       RADIO NOISE FOR THE PARAMETER  VD.  VD200 IS THE CCIR 322 (OR OTHER)
C       EXTIMATED VALUE FOR A 200 HZ BANDWIDTH.
        PRINT 3
        VD200 = 7.0
        BWR = 100.
C       OBTAIN VD FOR THE PROPER BANDWIDTH  (BWR * 200.).
        VD = VDC (VD200,BWR)
        PRINT 4, VD
C       COMPUTE EXCEEDENCE PROBABILITY (K=1) OR PROBABILITY DENSITY (K=2) OF
C       NOISE ENVELOPE.
C       LEVELS ARE RELATIVE TO RMS LEVEL AND IN DB.
     10 I = 0      $       $K = 1
     20 I = I + 1
        DB = -(I-1) * 2.
        P = APDAN (VD,K,DB)
        PRINT 5, DB, P
        IF (P.LE.0.99)  GO TO 20
     30 J = 0       $ DB = 0.
     40 J = J + 1
        DB =   J * 2
        P = APDAN (VD,K,DB)
        PRINT 5, DB,P
        IF (P.GE.1.0E-6)  GO TO 40
C       FORMAT STATEMENTS
      3 FORMAT(1H1)
      4 FORMAT(10X,*  VD = *,F5.2,/)
      5 FORMAT(10X,F10.1,2X,1PE10.3)
        CALL EXIT
        END


        FUNCTION VDC(VD200,BWR)
C       OBTAINS THE NOISE PARAMETER -VD-,FOR THE SPECIFIED BANDWIDTH
C       FROM THE CCIR REPORT 322 (OR OTHER) 200HZ BANDWITH -VD- (VD200).
C      -BWR- IS THE BANDWITH RATIO (REQUIRED BANDWIDTH/200 HZ BANDWIDTH).
        IF(VD200.LE.1.049)  GO TO 50
        VDO = VD200 + (0.4679 + 0.2111 * VD200) * ALOG10(BWR)
        IF(VDO.LE.1.049)  GO TO 50
        VDC = VDO
        RETURN
     50 VDC = 1.049
        RETURN
        END
```

```
C
      FUNCTION APDAN(VD,K,DB)
C      AMPLITUDE PROBABILITY DISTRIBUTION (APD) OF THE ENVELOPE OF ATMOSPHERIC
C      NOISE
C      VD = CCIR REPORT 322 NOISE PARAMETER
C         = RATIO OF RMS TO AVERAGE OF NONE ENVELOPE IN DB, FOR THE APPROPRIATE
C      RECEIVER BANDWITH.
C      NOTE: FUNCTION VDC CONVERTS CCIR 200HZ VD(VD200) TO OTHER BANDWIDTHS.
C      K = 1 FOR APD (EXCEEDENCE PROBABILITY)
C        = 2 FOR PROBABILITY DENSITY FUNCTION OF ENVELOPE.
C      DB = LEVEL RELATIVE TO RMS IN DB.
      DIMENSION VVD(24), BB1(24), BB2(24), MM2(24)
      REAL MM2, M1, M2, M3, M4, M1SQP1,M2SQP1
      DATA VVD/ 1.0491,  1.1779,  1.3215,  1.4803,  1.6549,  1.8466,
     1          2.2831,  2.7973,  3.3941,  4.0796,  4.8567,  5.7218,
     2          6.6744,  7.7069,  8.8107,  9.9740, 12.9794, 16.0528,
     3         22.1551, 28.2294, 34.2720, 40.2839, 46.2711, 52.2264/
      DATA BB1/0.0000,  -0.4329,  -0.8909,  -1.3751,  -1.8867,  -2.4269,
     1       -3.5913,  -4.8927,  -6.3195,  -7.8868,  -9.5991, -11.4490,
     2      -13.4448, -15.5800, -17.8472, -20.2380, -26.3694, -32.6321,
     3      -44.9001, -57.0708, -69.2146, -81.3777, -93.6426,-105.8298/
      DATA BB2/ 0.0000, -0.7529,  -1.5309,  -2.3305,  -3.1667,  -4.0269,
     1         -5.8383, -7.7827,  -9.8695, -12.1068, -14.4991, -17.0495,
     2        -19.7548,-22.6100, -25.6072, -28.7380, -37.0919, -46.0824,
     3        -65.6023,-86.8042,-109.4042,-133.2062,-158.0634,-183.8612/
      DATA MM2/  -0.5,  -0.6,  -0.7,  -0.8,  -0.9, -1.0,
     1           -1.2,  -1.4,  -1.6,  -1.8,  -2.0, -2.2,
     2           -2.4,  -2.6,  -2.8,  -3.0,  -3.5,  -4.0,
     3           -5.0,  -6.0,  -7.0,  -8.0,  -9.0, -10./
      DATA VDPV/ 0.0/
      DBO =  DB
      M1 = -0.5
      M1SQP1 = 1.25
      C1 = 0.2302585093
      C2 = C1/2.
   10 VDO = VD
      KO = K
      IF (VDO.LT.1.049)   GO TO 90
   20 IF (VDO.GE.1.05)    GO TO 22
   21 L = 1
      PP = EXP(C1 * DBO)
      GO TO 65
   22 IF (VD.EQ.VDPV)  GO TO 60
C     LOCATE VDO AND INTERPOLATE FOR B1,B2, AND M2.
   30 VDPV = VDO
      IF (VDO.LT.VVD(3))      GO TO 35
      IF (VDO.GE.VVD(22))     GO TO 36
      IMN = 4
```

```
      IMX = 22
   31 I = (IMN+IMX)/2
      IF (VDO.GE.VVD(I))      GO TO 33
   32 IMX = I
      GO TO 34
   33 IMN = I + 1
   34 IF (IMX.GT.IMN)         GO TO 31
      I = IMX
      GO TO 40
   35 I = 3
      GO TO 40
   36 I = 23
   40 CONTINUE
      V1 = VVD(I-2) - VDO
      V2 = VVD(I-1) - VDO
      V3 = VVD(I) - VDO
      V4 = VVD(I+1) - VDO
      V43 = V4 - V3
      V42 = V4 - V2
      V41 = V4-V1
      V21 = V2 - V1
      V32 = V3 - V2
      V31 = V3 - V1
      A1 = V41 * V31 * V21
      A1 = V4 * V3 * V2 / A1
      A2 = V42 * V32 * V21
      A2 = -V4 * V3 * V1 / A2
      A3 = V43 * V32 * V31
      A3 = V4 * V2 * V1 / A3
      A4 = V43 * V42 * V41
      A4 = -V3 * V2 * V1 / A4
      B1 = A1*BB1(I-2) + A2*BB1(I-1) + A3*BB1(I) + A4*BB1(I+1)
      B2 = A1*BB2(I-2) + A2*BB2(I-1) + A3*BB2(I) + A4*BB2(I+1)
      M2 = A1*MM2(I-2) + A2*MM2(I-1) + A3*MM2(I) + A4*MM2(I+1)
C     GEOMETRY
   50 SF = M2/M1
      M2SOP1 = M2 * M2 + 1.0
      DM = M1 - M2
      SM = M1 + M2
      X3 = (B2-B1) / DM
      Y3 = (M1*B2 - M2*B1) / DM
      T = (1.0-M1*M2)/SM
      M3 = -T - SQRT(T*T+1.0)
      B3 = Y3 - M3 * X3 + 1.5 * (SF-1.0)
      DM = M1 - M3
      SM = M1 + M3
      X4 = (B3-B1) / DM
      Y4 = (M1*B3 - M3*B1) / DM
```

```
      T = (1.0 - M1*M3)  / SM
      M4 = -T - SQRT(T*T+1.0)
      DM = M3 - M4
      X3 = X3 + M3 * Y3
      X4 = X4 + M4 * Y4
      XC = (M3*X4-M4*X3) / DM
      YC = (X3-X4) / DM
      DBMN = (B1+M1*(XC+M1*YC)) / M1SQP1
      DBMX = (B2+M2*(XC+M2*YC)) / M2SQP1
      RSQ = (YC-DBMN)**2 * M1SQP1
      PRINT 99, B1,B2,M2,DBMN,DBMX,YC
   99 FORMAT (6(F10.0))
C     COMPUTATION OF THE FUNCTION
   60 IF (DBO.GE.DBMX)         GO TO 63
      IF (DBO.GT.DBMN)         GO TO 62
   61 L = 1
      PP = EXP(C1*(DBO-B1))
      GO TO 65
   62 L = 2
      DY = YC - DBO
      DX = SQRT(RSQ-DY*DY)
      PP = EXP(C2*(DX-XC))
      GO TO 65
   63 L = 3
      PP = EXP(C1*(DBO-B2)/SF)
   65 APDAN = EXP(-PP)
      IF (KO.EQ.1)                     RETURN
      GO TO (69,67,68), L
   67 APDAN = 0.5 * DY * APDAN / DX
      GO TO 69
   68 APDAN = APDAN / SF
   69 APDAN = APDAN * PP * C1
      RETURN
C     ERROR EXIT
   90 PRINT 2090
      GO TO 95
   95 PRINT 2095, VDO,KO,DBO
      RETURN
C     FORMAT STATEMENTS
 2090 FORMAT(1X/21H  888   VD TOO SMALL./)
 2095 FORMAT(*   VD =   *,E12.3,8X,* K =*,I3,8X,*DB =* E12.3/
     1*  ERROR DETECTED IN ROUTINE  -APDAN-*)
      END
```

Table 45. Sample Output of PROGRAM APD for V_d = 20 dB. E_o is Envelope Voltage (dB>E_{rms}) and P is Probability of Level E_o Being Exceeded

E_o	P	E_o	P
0.0	1.413E-02	2.0	1.138E-02
-2.0	1.736E-02	4.0	9.067E-03
-4.0	2.112E-02	6.0	7.140E-03
-6.0	2.546E-02	8.0	5.554E-03
-8.0	3.091E-02	10.0	4.266E-03
-10.0	3.803E-02	12.0	3.233E-03
-12.0	4.727E-02	14.0	2.416E-03
-14.0	5.919E-02	16.0	1.779E-03
-16.0	7.439E-02	18.0	1.289E-03
-18.0	9.358E-02	20.0	9.196E-04
-20.0	1.175E-01	22.0	6.446E-04
-22.0	1.467E-01	24.0	4.438E-04
-24.0	1.819E-01	26.0	2.998E-04
-26.0	2.234E-01	28.0	1.985E-04
-28.0	2.713E-01	30.0	1.287E-04
-30.0	3.252E-01	32.0	8.167E-05
-32.0	3.844E-01	34.0	5.063E-05
-34.0	4.477E-01	36.0	3.063E-05
-36.0	5.135E-01	38.0	1.806E-05
-38.0	5.801E-01	40.0	1.037E-05
-40.0	6.455E-01	42.0	5.788E-06
-42.0	7.079E-01	44.0	3.136E-06
-44.0	7.656E-01	46.0	1.647E-06
-46.0	8.175E-01	48.0	8.374E-07
-48.0	8.626E-01		
-50.0	9.006E-01		
-52.0	9.315E-01		
-54.0	9.555E-01		
-56.0	9.717E-01		
-58.0	9.820E-01		
-60.0	9.886E-01		
-62.0	9.928E-01		

5. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The current information on worldwide atmospheric noise levels and other characteristics is contained in CCIR Report 322 (1964). Since the publication of this report, additional measurements and other investigations have identified some main areas where the current atmospheric noise estimates could be improved. These areas are summarized below.

A great deal of additional measurements have become available and more locations on the earth's surface, making it possible to improve the estimates of atmospheric noise levels (field strength) worldwide. In this report, the analysis of this additional data (as well as the original data) has been presented and new improved estimates obtained, both in graphical and numerical form. These two forms are "identical," which is not the situation currently. Also, the new results are substantially different (on the order of 20 dB in some cases) from the current CCIR estimates for some areas, especially around the "new" measurement locations.

In order to determine the effects of the non-Gaussian atmospheric noise on system performance, the APD (cumulative exceedance distribution of the received noise envelope) is always required information (but sometimes not sufficient). The APD is a function of the receiver bandwidth and the present method of converting from the CCIR Report 322 bandwidth (200 Hz) to the required bandwidth has been shown since the publication of CCIR Report 322 to be greatly in need of modification. This report presents a new bandwidth conversion procedure based on a very extensive analysis (Herman and De Angelis, 1983). While this procedure is strictly valid only at MF, its use in place of the current method should be a substantial improvement. Also, preliminary analysis of wideband noise measurements at HF tend to indicate that the MF results will also be valid at HF. This report also presents numerical algorithms for the bandwidth conversion and for the APD itself. Care should be exercised when applying this new procedure to lower frequencies (i.e., LF, VLF, and ELF) as the pulse time structure of the atmospheric noise is different at these lower frequencies and, therefore, perhaps affected differently by the receiver bandpass. Also, the original analysis that led to the current CCIR Report 322 bandwidth conversion relationships assumed Gaussian-shaped receiver filters (i.e., no ringing), whereas the study by Herman and De Angelis (1983) used essentially rectangular shaped bandpasses (thus better representing modern communications receivers). The bandwidth conversion of the APD, is, therefore, in need of further study and refinement, both with measurements (especially at the lower frequencies) and with analytical investigations.

Previously, numerical representation (coefficients) were available for only a few of the noise parameters given by CCIR Report 322. Here, we have given the numerical representation of all these parameters. We have also done this for parameters that were not explicitly included before in Report 322 (i.e., σ_{V_d}, L_d, and σ_{L_d}).

The CCIR Report 322 presents estimates for average background atmospheric radio noise, with any effects caused by local thunderstorm activity removed from the data. In various areas of the world, local thunderstorm activity is present enough of the time to be an important factor. Also, noise from this local activity can be important at frequencies above HF. Information concerning the effects of local thunderstorm activity is given in the report by Hagn and Shepherd (1985). However, additional information on the effects of local thunderstorm activity is required and should be obtained by measurements, perhaps coupled with satellite observations (Kotaki, 1984). The report by Hagn and Shepherd (1985) also gives the relationships between F_a and rms field strength for antennas other than a short vertical monopole (the only antenna treated by CCIR Report 322), along with recommendations for additional needed efforts in this area.

The above should remove the main drawbacks present in the current atmospheric radio noise estimates. There are, however, other areas that still have not been treated in any systematic way. These include noise directionality and polarization. Also, measurements exist at only a very few locations in the Southern Hemisphere, so additional information is needed here to further improve the estimates there. It is possible that data from satellites can supplement ground-based observations to improve the estimates for these regions (Kotaki and Katoh, 1983 and Kotaki, 1984). The results of Kotaki (1984) (and any similar results) should be compared with the new estimates obtained here to define areas where additional measurements would be fruitful. In addition to measurements (e.g., Hagn et al., 1968), the procedures developed for obtaining atmospheric noise directionality and polarization results from thunderstorm distributions (Maxwell et al., 1970, Kelly et al., 1981, and Ortenburger et al., 1971) can be used to develop worldwide "directivity factors" to use in conjunction with the current omnidirectional estimates. These techniques can also be used, of course, to generate omnidirectional noise "data" for areas of the world where measurements do not exist.

6. ACKNOWLEDGMENTS

The authors would like to express their appreciation to John Herman of GTE Sylvania, David Sailors of NOSC, George Hagn of SRI International, Steve Matsuura of USACEEIA, and Lenora Cahoon of ITS for their invaluable discussions, comments, and suggestions after reviewing the draft of this report. The efforts of these colleagues have resulted in an improved and clearer presentation of the new atmospheric radio noise model.

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FORM **NTIA-29**
(4-80)

U.S. DEPARTMENT OF COMMERCE
NAT'L. TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION

BIBLIOGRAPHIC DATA SHEET

	1. PUBLICATION NO.	2. Gov't Accession No.	3. Recipient's Accession No.
	NTIA Report 85-173		

4. TITLE AND SUBTITLE
Atmospheric Radio Noise: Worldwide Levels and Other Characteristics

5. Publication Date
April 1985

6. Performing Organization Code

7. AUTHOR(S)
A. D. Spaulding and J. S. Washburn

9. Project/Task/Work Unit No.

8. PERFORMING ORGANIZATION NAME AND ADDRESS
Institute for Telecommunication Sciences
National Telecommunications & Information Administration
U.S. Department of Commerce
Boulder, CO 80303

10. Contract/Grant No.

11. Sponsoring Organization Name and Address
NTIA/CSA/USACEEIA
Herbert C. Hoover Building
14th & Constitution Ave., N.W.
Washington, D.C. 20230

12. Type of Report and Period Covered

13.

14. SUPPLEMENTARY NOTES

15. ABSTRACT *(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)*

The determination of radio communication system performance is a matter of proper statistical treatment of both the desired signal and the real-world noise (or interference) processes. System performance is highly dependent on the detailed statistical characteristics of both the signal and the noise as well as the single parameter: signal-to-noise ratio (which is sometimes the only parameter considered). Generally, the computation of the desired signal characteristics over a given path can be made reasonably accurately. This is not the case when it comes to estimating the noise level and other required noise characteristics. Existing noise models consist primarily of the worldwide atmospheric noise maps contained in CCIR Report 322 and estimated man-made noise levels given in CCIR Report 258. In addition, there are numerous other special purpose models.

There is a need for an overall, comprehensive usable noise model for application to telecommunication problems. One needed task that has been accomplished toward
(next page)

16. Key Words *(Alphabetical order, separated by semicolons)*
amplitude probability distributions; atmospheric noise characteristics; atmospheric radio noise; diurnal and seasonal noise variations; worldwide noise levels

17. AVAILABILITY STATEMENT	18. Security Class. *(This report)*	20. Number of pages
☒ UNLIMITED.	UNCLASSIFIED	192
☐ FOR OFFICIAL DISTRIBUTION.	19. Security Class. *(This page)* UNCLASSIFIED	21. Price:

★U.S. Government Printing Office: 1980—678-495/529

the goal of obtaining such an overall model is the development of an improved atmospheric noise model. The existing worldwide atmospheric noise model (CCIR Report 322) was developed from approximately four years of measurements from a worldwide network of 16 measurement stations. This network made measurements for 5 years (longer in a few cases) past the completion of CCIR Report 322 in 1963. Also, additional data are now available from other locations, primarily many years of data from 10 Soviet measurement stations. All these additional data have been analyzed and an updated worldwide atmospheric noise model has been prepared in both graphical and numerical forms. Results of this analysis show substantial "corrections" (on the order of 20 dB for some locations) to the 1 MHz noise level values given by CCIR Report 322. It is the purpose of this report to present and discuss this new model for atmospheric noise levels and other characteristics.