Central Radio Propagation Laboratory

IONOSPHERIC PREDICTIONS

for August 1965

IMPORTANT NOTICE

SEE INTRODUCTION PAGE

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U.S. DEPARTMENT of COMMERCE
National Bureau of Standards
Number 29/Issued May 1965

U.S. DEPARTMENT OF COMMERCE
John T. Connor, Secretary

NATIONAL BUREAU OF STANDARDS
A. V. Astin, Director

Central Radio Propagation Laboratory

Ionospheric Predictions

for August 1965

[Formerly "Basic Radio Propagation Predictions," CRPL Series D.]

Number 29

Issued

May 1965

The CRPL Ionospheric Predictions are issued monthly as an aid in determining the best sky-wave frequencies over any transmission path, at any time of day, for average conditions for the month. Issued three months in advance, each issue provides tables of numerical coefficients that define the functions describing the predicted worldwide distribution of foF2 and M(3000)F2 and maps for each even hour of universal time of MUF(Zero)F2 and MUF(4000)F2.

NOTE: Department of Defense personnel see back cover.

Use of funds for printing this publication approved by the Director of the Bureau of the Budget (June 19, 1961).

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National Bureau of Standards

The National Bureau of Standards serves as a principal focal point within the Federal Government for assuring maximum application of the physical and engineering sciences to the advancement of technology in industry and commerce. The Bureau is organized into four institutes as follows: The Institute for Basic Standards provides the central basis within the United States for a complete and consistent system of physical measurement; its responsibilities include administration of the National Standard Reference Data System. The Institute for Materials Research conducts a broad range of programs to provide a better understanding of the basic properties and behavior of materials and to make available reliable quantitative data on their performance; it distributes a wide variety of carefully characterized reference materials to science and industry. The Institute for Applied Technology develops criteria for the evaluation of the performance of technological products and services, provides specialized information services to meet the needs of industry, and studies problems of technological innovation. The fourth institute, the Central Radio Propagation Laboratory, is described below.

The Central Radio Propagation Laboratory

The Central Radio Propagation Laboratory is the central agency of the Federal Government for obtaining and disseminating information on the propagation of electromagnetic waves, on the electromagnetic properties of man's environment, on the nature of electromagnetic noise and interference, and on methods for the more efficient use of the electromagnetic spectrum for telecommunication purposes. In carrying out these responsibilities, the Central Radio Propagation Laboratory:

1. Acts as the primary agency of the Federal Government for the conduct of *basic and applied research* in these fields;

2. *Acts as the central repository* for data, reports, and information in these fields;

3. *Furnishes advisory and consultative services* in these fields to industry and to other government and non-government organizations;

4. *Performs scientific liaison* with other countries to advance knowledge in these fields, including that liaison required by international responsibilities and agreements;

5. *Prepares and issues predictions* of electromagnetic wave propagation conditions, and warnings of disturbances in those conditions.

NOTICE

Beginning with the December issue, No. 24 of this series, polar plots of the prediction maps will be included for every even hour universal time. These are plotted on the same scale as the former polar plots, but extend only to 40° latitude. The contours of the rectangular world maps are now cut off at 80° latitude. Occasional slight discrepancies between the contours of the rectangular maps and those of the polar maps are due to the different computer programs used to derive the two sets of contours from the table of numerical coefficients. These discrepancies are well within the accuracy of the predictions.

These polar maps are being published on a trial basis for six months. They will be discontinued after six months unless there is a positive indication of their usefulness from a substantial proportion of users of these predictions. Therefore, if you wish these to continue, it is necessary to send us your comments in writing as soon as possible.

Introduction

The "Central Radio Propagation Laboratory Ionospheric Predictions" is the successor to the former "Basic Radio Propagation Predictions," CRPL Series D. To make effective use of these predictions, National Bureau of Standards Handbook 90, "Handbook for CRPL Ionospheric Predictions Based on Numerical Methods of Mapping," should be obtained from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402, price 40 cents. This Handbook includes required additional data, nomographs and graphical aids, as well as methods for use of the predictions. The Handbook supersedes the obsolete NBS Circular 465.

The basic prediction appears in tables 1 and 2, presenting predicted coefficients for foF2 and M(3000)F2 defining the numerical map functions describing the predicted worldwide variation of these characteristics. With additional auxiliary information, these coefficients may be used as input data for electronic computer programs solving specific high-frequency propagation problems. Basic equations, their interpretation, and methods of using numerical maps are described in papers by W. B. Jones and R. M. Gallet, "The Representation of Diurnal and Geographic Variations of Ionospheric Data by Numerical Methods," Vol. 66D, No. 4, July–Aug. 1962, pages 419–438, and "Methods for Applying Numerical Maps of Ionospheric Characteristics," Vol. 66D, No. 6, Nov.–Dec. 1962, pages 649–662, both in the Journal of Research of the National Bureau of Standards, Section D. Radio Propagation. The predicted numerical map coefficients of tables 1 and 2 may be purchased in the form of a tested set of punched cards. Write to Prediction Services Section, Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colo., to arrange for purchase of a set of punched cards, and for information and assistance in the application of computer methods and numerical prediction maps to specific propagation problems.

The graphical prediction maps, derived from the basic prediction, are provided for those unable to make use of an electronic computer. Figures 1 to 12 present world maps of MUF (Zero) F2 and MUF(4000)F2 for each even hour of universal time. Figures 13 to 24 present the same predictions for even hours 00 through 22 universal time for the North and South Polar areas. Handbook 90 describes methods for including regular E–F1 propagation. Figure A is a graph of predicted and observed Zürich sunspot numbers which shows the recent trend of solar activity. Table A lists observed and predicted Zürich smoothed relative sunspot numbers and includes the sunspot number used for the current prediction.

Members of U.S. Army, Navy, or Air Force desiring the Handbook and the Ionospheric Predictions should send requests to the proper service address; for Navy: The Director, Naval Communications, Department of the Navy, Washington, D.C., 20350; for Air Force: Directorate of Command Control and Communications, Headquarters, United States Air Force, Washington, D.C., 20330. Attention: AFOCCAA. Army personnel should refer to the Handbook as TM 11–499 and to monthly predictions as TB 11–499–( ), predictions for the month of August 1965 being distributed in May 1965 and designated TB 11–499–(29), and should requisition these through normal publication channels.

Information concerning the theory of radio wave propagation and such important problems as absorption, field intensity, lowest useful high frequencies, etc., is given in National Bureau of Standards Circular 462, "Ionospheric Radio Propagation." A revised work is in preparation which will be announced in the Ionospheric Prediction series when available. Additional information about radio noise may be found in C.C.I.R. Report Number 322, "Revision of Atmospheric Noise Data," International Telecommunication Union, Geneva, 1964.

Reports to this Laboratory of experience with these predictions would be appreciated. Correspondence should be addressed to the Prediction Services Section, Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colorado.

NOTE: The MUF(ZERO)F2 values of figures 1A through 12A were derived by adding one-half the gyrofrequency to the foF2 calculated by use of the predicted coefficients in table 1. The error introduced by this approximation is generally not important compared to other uncertainties in the predictions, and is significant only when the foF2 is near or below the gyrofrequency. If more precise values of predicted fxF2 are desired, the theoretical relationships should be applied to the foF2 values calculated by the coefficients in table 1.

Table A

Observed and Predicted Zurich Smoothed Relative Sunspot Numbers

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1954	6	6	4	3	4	4	5	7	8	8	10	12
	(14)	(12)	(11)	(10)	(10)	(9)	(8)	(8)	(8)	(10)	(10)	(11)
1955	14	16	20	23	29	35	40	46	55	64	73	81
	(12)	(14)	(14)	(13)	(16)	(18)	(22)	(27)	(30)	(31)	(35)	(42)
1956	89	98	109	119	127	137	146	150	151	156	160	164
	(48)	(53)	(60)	(68)	(77)	(89)	(95)	(105)	(119)	(135)	(147)	(150)
1957	170	172	174	181	186	188	191	194	197	200	201	200
	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)
1958	199	201	201	197	191	187	185	185	184	182	181	180
	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)
1959	179	177	174	169	165	161	156	151	146	141	137	132
	(150)	(150)	(150)	(150)	(146)	(143)	(141)	(142)	(141)	(139)	(137)	(137)
1960	129	125	122	120	117	114	109	102	98	93	88	84
	(136)	(135)	(133)	(130)	(125)	(120)	(118)	(115)	(110)	(108)	(105)	(100)
1961	80	75	69	64	60	56	53	52	52	51	50	49
	(100)	(90)	(90)	(90)	(85)	(85)	(80)	(75)	(70)	(70)	(65)	(60)
1962	45	42	40	39	39	38	37	35	33	31	30	30
	(60)	(50)	(48)	(45)	(42)	(37)	(34)	(31)	(29)	(28)	(27)	(34)
1963	29	30	30	29	29	28	28	27	27	26	24	21
	(31)	(28)	(26)	(25)	(25)	(25)	(23)	(21)	(20)	(18)	(18)	(17)
1964	20	18	15	13	11	10	10	10				
	(17)	(17)	(17)	(17)	(17)	(17)	(17)	(17)	(17.5)	(17.3)	(17.0)	(17.0)
1965												
	(15.0)	(16.0)	(16.0)	(16.0)	(15.0)	(17.0)	(21.0)	(28.9)*				
1966												

Note: Final numbers are listed through June 1964, the succeding values being based on provisional data. The predicted numbers are in parentheses.

* Number used for predictions in this issue.

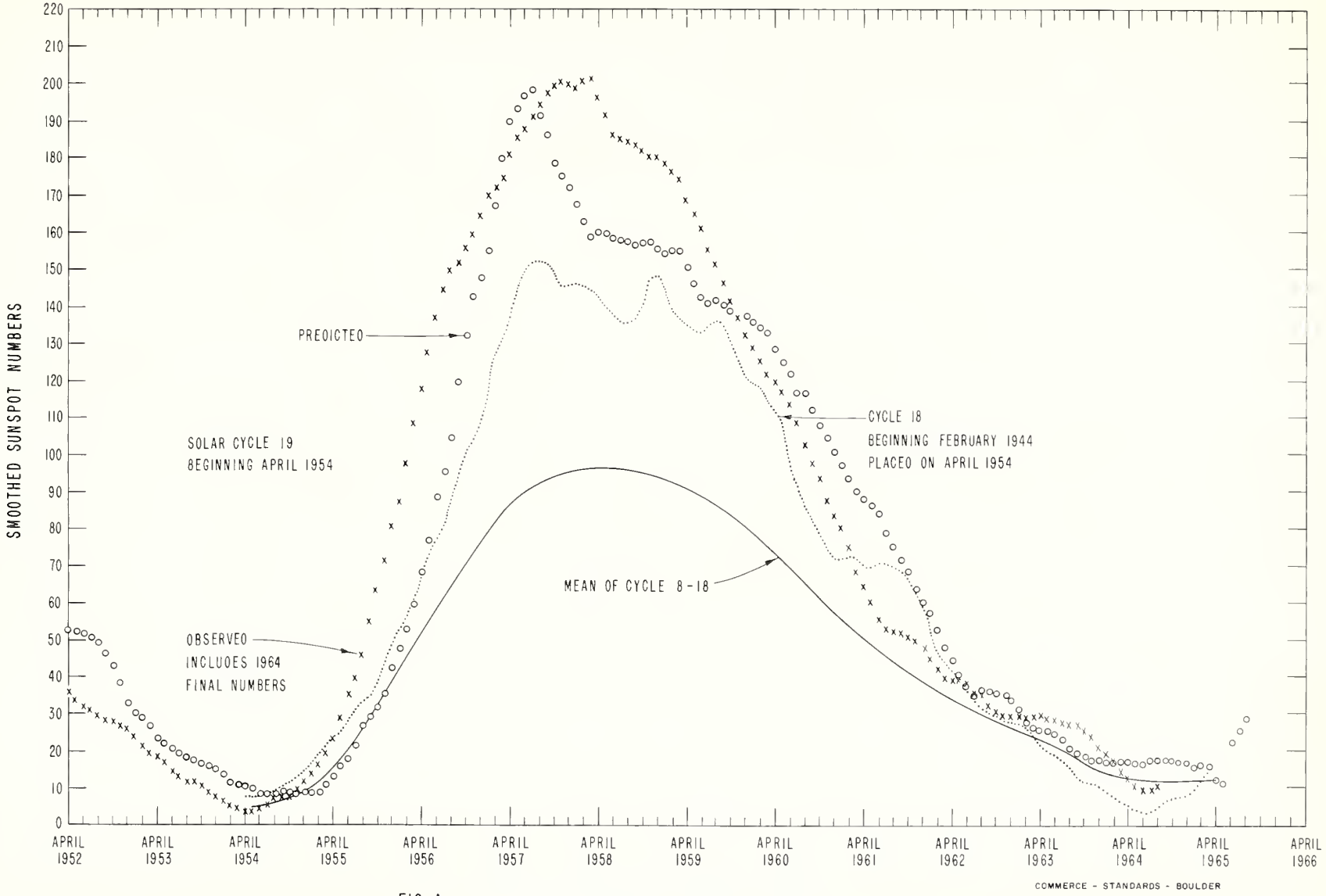


FIG. A. PREDICTED AND OBSERVED SUNSPOT NUMBERS

TABLE I

TIME VARIATION

GEOGRAPHICAL VARIATION

Harmonic		0	1		2		3		4	
	K \ S	0	1	2	3	4	5	6	7	8
I	0	6.6953371E 00	1.8738508E 00	1.9223708E 00	-6.4846731E-01	2.1142327E-01	-3.4576801E-01	-4.7489506E-01	2.7291085E-01	-1.3325802E-01
	1	1.4685001E 00	1.2295800E 00	-1.6223021E 00	1.4131621E 00	-1.2869942E 00	1.7426609E-01	-2.6514696E-01	8.1445600E-02	5.3801581E-01
	2	-9.9961824E 00	1.8966190E 00	1.1026616E 01	8.4841994E 00	-4.0791123E 00	-2.092370CE 00	5.9796664E-01	-1.1742820E 00	3.2893572E 00
	3	6.9921056E 00	1.2298950E 01	2.6367465E 01	-3.8881069E 00	1.7350737E 00	2.2176401E-01	3.6127498E 00	2.3111727E 00	2.1066135E-02
	4	4.3376864E 01	-5.0874458E 01	-1.1592520E 02	-3.2388669E 01	4.0986396E 01	3.0794629E 01	-1.6546627E 00	4.6224642E 00	-2.6849157E 01
	5	-5.2809049E 01	-1.0486424E 02	-1.5071840E 02	-2.4209467E 01	1.4455286E 01	-6.5031693E 00	-1.5500667E 01	-1.0762611E 01	-1.3327509E 01
	6	-1.6006571E 02	1.7592152E 02	4.1343709E 02	3.5083746E 01	-1.6057695E 02	-1.2335350E 02	2.2295680E 01	-6.5954994E 00	8.6349785E 01
	7	1.1452305E 02	2.5880590E 02	3.3779641E 02	8.9131743E 01	-5.3037972E 01	2.4031496E 01	3.5292735E 01	1.8833191E 01	4.0227261E 01
	8	2.9109915E 02	-2.6411669E 02	-7.0305235E 02	1.5074556E 01	2.9266421E 02	2.2365051E 02	-6.6182457E 01	-3.8404196E 00	-1.3510800E 02
	9	-1.0571486E 02	-2.6271904E 02	-3.2752065E 02	-1.0040646E 02	6.2542754E 01	-3.1084655E 01	-3.8162066E 01	-1.5028553E 01	-4.3704814E 01
	10	-2.4410785E 02	1.8662046E 02	5.7575200E 02	-4.3934848E 01	-2.4981526E 02	-1.8934078E 02	7.3046324E 01	1.3771844E 01	1.0376430E 02
	11	3.6064406E 01	9.5231273E 01	1.1545943E 02	3.7931317E 01	-2.4503973E 01	1.3201861E 01	1.5039013E 01	4.5737273E 00	1.6281373E 01
	12	7.6707503E 01	-5.1153008E 01	-1.8284671E 02	1.8428157E 01	8.0732167E 01	6.0668896E 01	-2.7691219E 01	-7.0821288E 00	-3.1359394E 01
II	13	-1.1830270E-02	4.0182525E-02	1.7986568E-01	4.3756954E-02	-2.7903476E-02	5.6346813E-04	3.5166566E-02	1.5269404E-02	-4.0468847E-03
	14	1.4273695E-01	-1.3501008E-01	2.8074677E-01	-3.9938826E-01	2.1961096E-01	-1.7596622E-02	-2.5655113E-02	1.0321991E-01	-1.4008646E-01
	15	9.4583563E-01	1.8753284E-01	1.5041260E 00	-7.3530551E-01	3.8229311E-01	-2.1317437E-01	-3.3855713E-01	5.4688351E-02	-7.3948251E-02
	16	-7.7544252E-01	-1.5955784E 00	-4.7774227E 00	-4.7577088E 00	-1.4163083E 00	-1.0173705E 00	-5.4666412E-01	6.9031716E-01	-5.9534279E-01
	17	-8.2829891E 00	-3.7958946E 00	-2.7633101E 00	6.5362127E-01	-1.2159543E 00	1.4011180E 00	-7.1053514E-01	2.3056001E-01	1.6216529E 00
	18	-1.4616493E 01	-4.0731145E 00	-1.4928858E 00	4.7160564E 00	-9.0511056E 00	-1.2860251E 00	5.7074110E-01	-2.2438812E 00	4.2517691E 00
	19	-6.3025783E 00	-2.6585444E 00	-2.9218436E 01	4.9043571E 00	-3.8183728E 00	2.1314346E 00	4.0139700E 00	-2.8789499E-01	-4.1979855E-01
	20	5.2879702E 01	5.0980535E 01	7.7441468E 01	6.2131335E 01	2.3368370E 01	1.0707661E 01	8.2740173E 00	-7.3715470E 00	7.3771312E 00
	21	1.2157014E 02	6.6198127E 01	1.6774274E 01	-7.4022201E 00	3.1688805E 01	-1.0095566E 01	5.8713395E 00	-3.3493819E 00	-1.7146640E 01
	22	1.3455341E 02	5.2691195E 01	7.7662088E 00	-1.7151054E 01	7.4701965E 01	1.9166712E 01	5.1928152E-01	1.6436201E 01	-3.3371881E 01
	23	2.0030481E 01	-3.3191438E 00	1.5791049E 02	-1.7942183E 01	2.0606439E 01	-6.5839133E 00	-1.4102711E 01	-6.3356586E-01	5.7437096E 00
	24	-3.0038808E 02	-2.7058261E 02	-3.5533741E 02	-2.8495736E 02	-1.1463155E 02	-4.5595025E 01	-5.0385947E 01	3.3324340E 01	-3.5682628E 01
	25	-6.0556819E 02	-3.3595325E 02	-4.4403498E 01	3.4895099E 01	-1.7690581E 02	2.8635660E 01	-2.4253909E 01	8.1471522E 00	7.1162681E 01
	26	-4.7774591E 02	-2.2776302E 02	-5.8452235E 01	5.0925226E 01	-2.5939837E 02	-7.7874742E 01	-1.6783657E 01	-5.6190796E 01	1.1640959E 02
	27	-2.8026635E 01	5.4209937E 01	-3.6532603E 02	3.1999070E 01	-5.5282771E 01	4.4170078E 00	2.2743052E 01	6.8932046E 00	-1.6353313E 01
	28	6.8019323E 02	5.5814150E 02	6.8898613E 02	5.8524192E 02	2.4642099E 02	9.3808575E 01	1.2580594E 02	-7.0627396E 01	7.7715031E 01
	29	1.3432466E 03	7.2807914E 02	6.7913441E 01	-8.2760439E 01	3.9567498E 02	-4.0557085E 01	5.3042372E 01	1.6321706E 00	-1.3704575E 02
	30	8.0528135E 02	4.3602075E 02	1.6925510E 02	-1.1417627E 02	4.4660411E 02	1.3387338E 02	4.9706452E 01	9.2751874E 01	-2.0628439E 02
	31	7.2044238E 00	-1.0116220E 02	3.8122436E 02	-2.1774189E 01	6.5681530E 01	5.6006887E 00	-1.7635949E 01	-1.2431576E 01	1.8753518E 01
	32	-6.8076231E 02	-5.0499858E 02	-6.0158877E 02	-5.6605372E 02	-2.4026632E 02	-9.0258611E 01	-1.3532428E 02	6.8664210E 01	-7.7772615E 01
	33	-1.3505205E 03	-7.1045936E 02	-6.2775738E 01	8.7022629E 01	-3.8040230E 02	2.7878825E 01	-5.7356867E 01	-1.7543489E 01	1.2299666E 02
	34	-6.4377388E 02	-3.7769757E 02	-2.0282162E 02	1.2594511E 02	-3.7546789E 02	-9.9886652E 01	-5.3621284E 01	-7.1405979E 01	1.8008081E 02
	35	7.6623334E 00	5.4763924E 01	-1.4797708E 02	1.8634863E 00	-2.7831386E 01	-5.5109522E 00	5.5036610E 00	-7.7677939E 00	-7.7677939E 00
	36	2.4933578E 02	1.6819573E 02	1.9535072E 02	2.0548191E 02	8.6716126E 01	3.2263978E 01	5.2425129E 01	-2.4668977E 01	2.9091783E 01
	37	5.0123851E 02	2.5580240E 02	2.7427650E 01	-3.1917271E 01	1.4104394E 02	-7.1668256E 00	2.3304366E 01	1.0882564E 01	-4.1642474E 01
	38	1.9622137E 02	1.2106328E 02	8.7016628E 01	-5.0184845E 01	1.2269639E 02	2.5712915E 01	1.9526093E 01	2.0458364E 01	-6.1135197E 01
III	39	1.6153079E-02	-1.0004169E-01	2.2695443E-02	-1.3196149E-01	5.9244108E-02	-5.2712291E-02	2.3527569E-02	1.0085215E-02	-3.0674021E-02
	40	3.4276972E-02	6.1032915E-03	-5.5908357E-02	-9.2733114E-02	-5.3762268E-02	1.3741303E-04	2.1061547E-02	1.6235724E-02	-8.8662870E-03
	41	2.2580592E-01	2.1682291E-01	-1.1929427E-01	3.0007341E-01	1.5303590E-01	1.3317171E-02	-1.0123018E-01	-2.2684384E-03	1.6728655E-02
	42	4.9268723E-01	4.1657344E-01	6.9083788E-02	4.4919403E-01	2.9796846E-01	-2.3653246E-02	-5.9800726E-02	-4.2919612E-03	1.7278453E-02
	43	3.0503601E-01	3.2109227E 00	-1.7131773E-01	1.1792256E 00	-2.3517093E 00	8.1395667E-02	-7.9009296E-01	7.1627998E-03	1.2061403E 00
	44	-8.1950027E-01	-3.5832353E-01	5.6137990E-01	7.6440591E-01	4.0983415E-01	-1.7288699E-01	-1.7286699E-01	-8.1970541E-02	8.6158501E-02
	45	1.7276656E 00	1.5351984E 00	1.2647465E-02	-3.9886253E-01	-1.0041531E 00	-5.5304223E-02	3.5083571E-01		2.0359103E-01
	46	-1.8779479E-01	-2.2828456E-01	-6.6341410E-03	-7.8968511E-01	-3.8826733E-01	7.1262097E-02	2.1685196E-01		-2.0755040E-01
	47	-1.1795661E-01	-1.1592941E 01	-1.1362005E-01	-2.1978301E 00	8.8206252E 00	-1.4909651E-01	2.3654915E 00		-4.2859872E 00
	48	1.3460339E 00	1.6924348E-02	-1.1127375E-01	-1.1417272E 00	-5.5314587E-01	1.4540614E-02	5.8430225E-02		5.7349503E-02
	49	-3.7854621E 00	-2.7951585E 00	9.4884689E-02	-4.9612656E-01	1.0639152E 00	6.9627001E-02	-1.5301594E-02		-5.0732885E-01
	50	-5.2079744E-01	-6.4508922E-01		-3.1547303E-01	9.4856176E-02		-3.3323193E-02		2.9862474E-01
	51		1.0431146E 01		5.1695196E-01	-8.2541884E 00		-1.5288844E 00		3.4995025E 00
	52				9.2968003E-01	5.8916982E-01				-1.9871597E-01

GEOGRAPHICAL VARIATION

Harmonic		5		6		7		8	
	K \ S	9	10	11	12	13	14	15	16
I	0	1.2616222E-01	1.6972602E-01	-1.1975983E-01	4.2675416E-02	-4.5406780E-02	-8.6289197E-02	7.5381687E-02	-1.2520532E-02
	1	-1.6491206E-01	-2.2452718E-02	-8.5351595E-02	-1.3371282E-01	1.1763284E-01	7.6519432E-03	3.0285825E-02	8.0420932E-02
	2	-3.4400666E-01	-3.8727059E-01	2.7955547E-01	1.7924723E-02	9.0493411E-02	2.1542582E-01	-2.4469763E-01	-6.0275516E-02
	3	1.4623175E-01	1.3487713E-02	1.0344922E-01	1.3262092E-01	-1.2252238E-01	-5.6166710E-03	-3.3308623E-02	-8.3531213E-02
	4	2.2689821E-01	2.2749971E-01	-1.5107115E-01	-5.6942773E-02	-4.8236466E-02	-1.2891463E-01	1.7107535E-01	7.4534492E-02

I - Main latitudinal variation. Mixed latitudinal and longitudinal variation: II - First order in longitude, III - Second order in longitude

Notation: For each entry the number given by the first eight digits and sign is multiplied by the power of ten defined by the last two digits and sign.

PREDICTED COEFFICIENTS D_{SK} DEFINING THE FUNCTION $\Gamma(\lambda,\theta,t)$ FOR MONTHLY MEDIAN f_o F2 (Mc/s)

AUGUST 1965

TABLE 2

TIME VARIATION

GEOGRAPHICAL VARIATION

Harmonic		0	1		2		3	
	K \ S	0	1	2	3	4	5	6
I	0	3.0194309E 00	-1.3310435E-01	-2.3875142E-01	-1.6935240E-02	-1.0948894E-01	1.3129850E-02	-4.0200611E-03
	1	-5.7067998E-01	-1.4867880E-01	-4.0529871E-01	1.8234257E-01	-5.7500656E-01	1.1931273E-01	7.0657252E-02
	2	1.4454447E 00	9.0369297E-01	2.3914545E 00	4.5854425E-02	-3.4174339E-01	-3.9310406E-01	-2.9159982E-01
	3	2.4832798E 00	5.6165350E-01	1.6105970E 00	-1.2361158E 00	2.8029929E 00	-4.6848276E-01	-3.6363678E-01
	4	-4.2176813E 00	-2.2267801E 00	-6.1825756E 00	-7.8439994E-01	2.0204706E 00	1.5530124E 00	7.1456293E-01
	5	-4.2434495E 00	-5.8873171E-01	-2.7145016E 00	2.1933168E 00	-4.3670138E 00	6.9477073E-01	7.7323453E-01
	6	4.3496979E 00	2.6004598E 00	6.6275150E 00	1.5928505E 00	-2.8915834E 00	-2.1797883E 00	-5.1496671E-01
	7	2.2930828E 00	2.0525194E-01	1.3896236E 00	-1.1444700E 00	2.1292070E 00	-3.4301366E-01	-4.6595878E-01
	8	-1.5211768E 00	-1.1311065E 00	-2.6412238E 00	-8.4234581E-01	1.3178745E 00	1.0129708E 00	8.7896155E-02
II	9	1.8853417E-02	9.3800539E-03	4.8723841E-02	-3.7696767E-02	1.2035420E-02	7.9061472E-03	-9.8983359E-03
	10	8.8626510E-02	4.5632244E-02	6.4324827E-02	-5.7863429E-02	8.1192195E-02	-9.5477630E-03	9.1199807E-03
	11	1.9910624E-01	-8.9181772E-02	1.0299105E-01	3.0523261E-02	4.0202568E-02	-1.4287969E-02	-3.0816969E-02
	12	-4.3767685E-01	-3.2534156E-01	-9.7332211E-01	-4.2348484E-02	-8.4663312E-02	9.5067109E-02	1.6155270E-01
	13	-3.3086748E-02	-3.6754206E-01	-7.8974790E-01	4.8050224E-01	-4.4013860E-01	5.3300491E-02	-6.1750174E-02
	14	-1.2314482E 00	-6.6332537E-01	-6.2130534E-02	8.7889383E-01	-1.5488601E 00	1.9921839E-01	-1.3759868E-02
	15	-1.6753481E 00	6.2270810E-01	-1.4025964E-01	-2.0028647E-01	3.5171676E-02	-1.1917504E-01	1.6427203E-01
	16	3.2599517E 00	1.8039996E 00	5.9405816E 00	-5.8658961E-02	3.6763979E-01	-7.3753906E-01	-8.1561998E-01
	17	2.1843658E-01	2.3497580E 00	2.6953322E 00	-2.0869634E 00	2.1988869E 00	-5.5349142E-01	5.5979422E-01
	18	4.1165820E 00	2.8724281E 00	-1.6655944E 00	-3.8105167E 00	6.8944461E 00	-9.0845836E-01	-6.3674755E-01
	19	3.5878545E 00	-1.5061755E 00	-1.8745400E-01	2.6058052E-01	-3.8802405E-01	7.0371817E-01	-2.8156278E-01
	20	-5.9265991E 00	-3.2176779E 00	-9.9287838E 00	5.9772928E-01	-6.2214200E-01	1.4320683E 00	1.1763491E 00
	21	-1.4209865E-01	-4.8041629E 00	-3.0267996E 00	3.0684447E 00	-3.7603959E 00	1.4217291E 00	-8.9618367E-01
	22	-4.7109004E 00	-4.7266159E 00	4.3096508E 00	6.0165464E 00	-1.0453462E 01	1.3958764E 00	1.5635089E 00
	23	-2.2224132E 00	9.2399663E-01	3.3002912E-01	-1.0575945E-01	4.3824697E-01	-5.9493077E-01	1.9025298E-01
	24	3.1267079E 00	1.9093079E 00	5.3232344E 00	-5.4853749E-01	3.5505962E-01	-8.4085181E-01	-5.3078687E-01
	25	1.7159516E-01	3.0159861E 00	1.3116424E 00	-1.4498820E 00	1.9945013E 00	-1.0243740E 00	3.3531094E-01
	26	1.5973571E 00	2.5637539E 00	-2.7854345E 00	-3.0760323E 00	5.1633597E 00	-6.7481166E-01	-9.4647899E-01
III	27	7.5191060E-03	-1.7036338E-02	1.4243778E-02	-2.0691024E-02		-4.3820599E-03	-8.2120004E-03
	28	-1.7620756E-02	-7.7093894E-03	8.2523661E-03	-1.1233013E-02		7.2241331E-03	6.1346248E-03
	29	-1.5290415E-01	-1.3898033E-01	-1.2610746E-01	2.0031074E-02			-2.6588390E-02
	30	-1.2019779E-02	-3.6449176E-02	-1.0917504E-01	3.4463844E-02			1.2188698E-02
	31	-6.9007494E-02	3.2378210E-02	5.7144739E-02	1.4478085E-01			7.4305607E-03
	32	1.5809203E-02	1.2114463E-01	-1.2689081E-01	4.8351939E-02			-2.4919289E-02
	33	3.5703919E-01	2.9181237E-01	2.6912103E-01	-8.9993882E-02			8.9439329E-02
	34		1.7874055E-01	2.5713139E-01	-8.1545181E-03			
	35				-2.3527546E-01			
	36							

GEOGRAPHICAL VARIATION

Harmonic		4		5		6	
	K \ S	7	8	9	10	11	12
I	0	3.2953815E-02	4.9377699E-03	8.2642545E-03	2.3377928E-02	-1.0910963E-02	3.8944058E-03
	1	1.8863966E-02	3.5152692E-02	-3.3539475E-02	-7.7831596E-03	1.4199110E-03	-2.6280465E-02
	2	-4.3171604E-02	-1.2406166E-02	-4.6138307E-03	-2.7265633E-02	1.5700270E-02	-2.9241891E-03
	3	-2.5471618E-02	-2.4966996E-02	2.8738131E-02		2.1567101E-03	2.2077260E-02

I - Main latitudinal variation. Mixed latitudinal and longitudinal variation: II - First order in longitude, III - Second order in longitude.

Notation: For each entry the number given by the first eight digits and sign is multiplied by the power of ten defined by the last two digits and sign.

PREDICTED COEFFICIENTS D_{SK} DEFINING THE FUNCTION $\Gamma(\lambda,\theta,t)$ FOR MONTHLY MEDIAN M(3000)F2

AUGUST 1965

AUGUST 1965 UT = 00

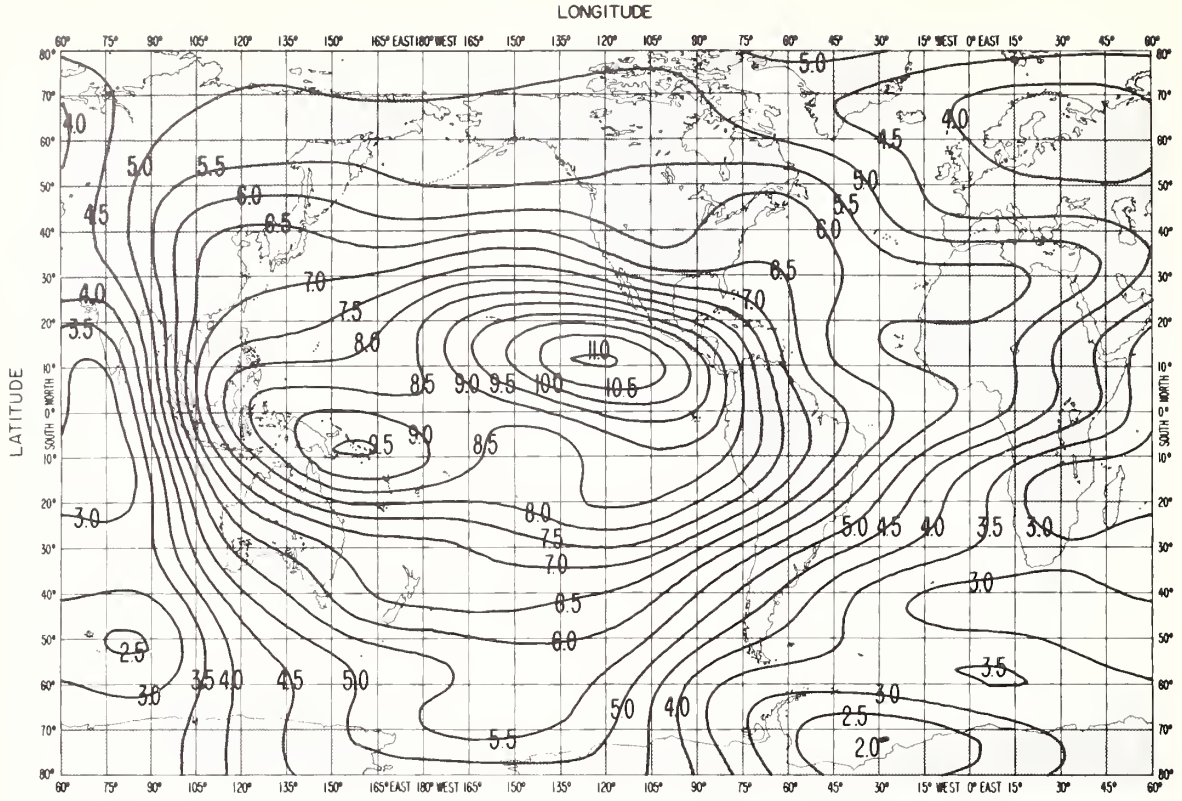


FIG. 1 A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

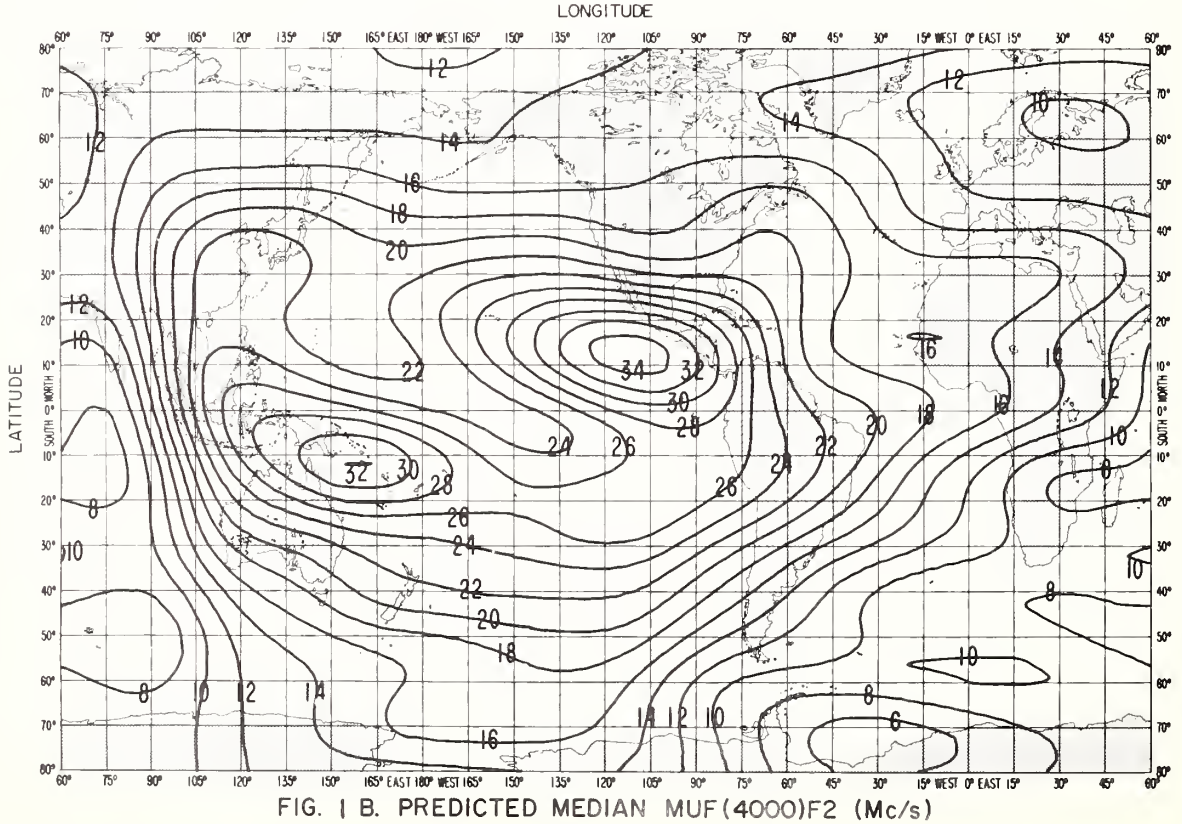


FIG. 1 B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

AUGUST 1965 UT = 02

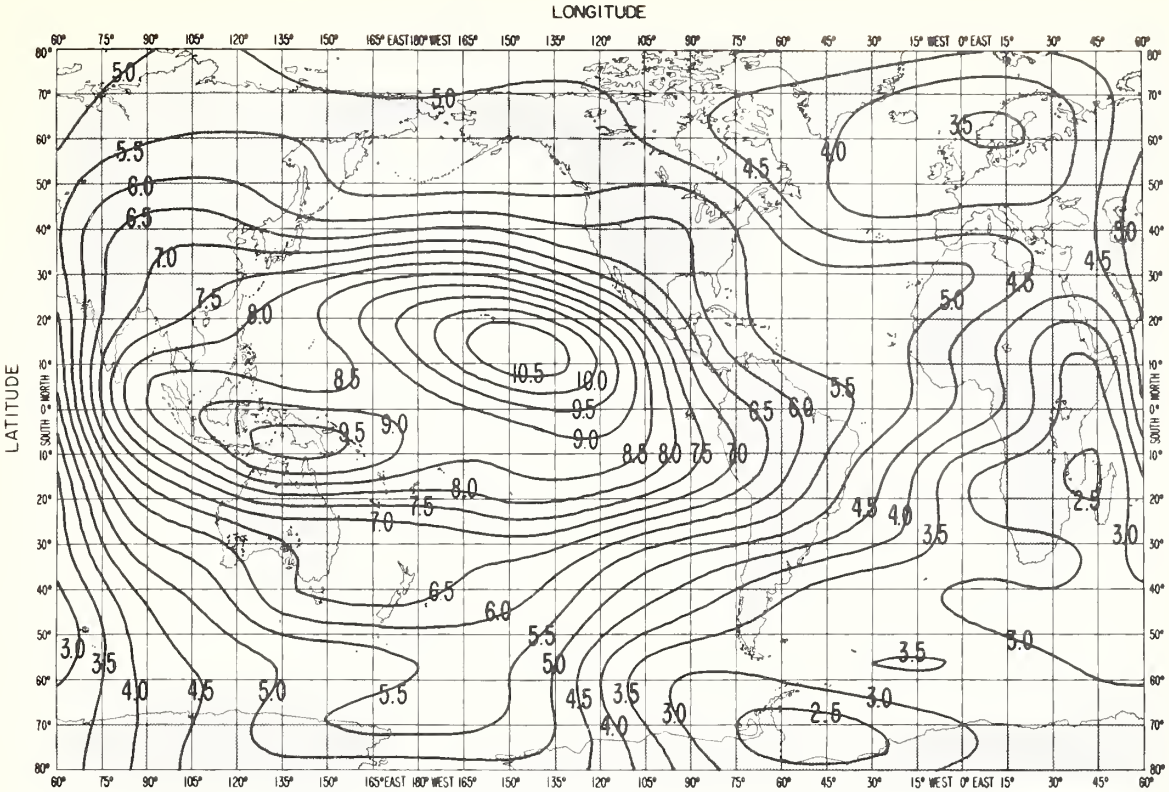


FIG. 2 A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

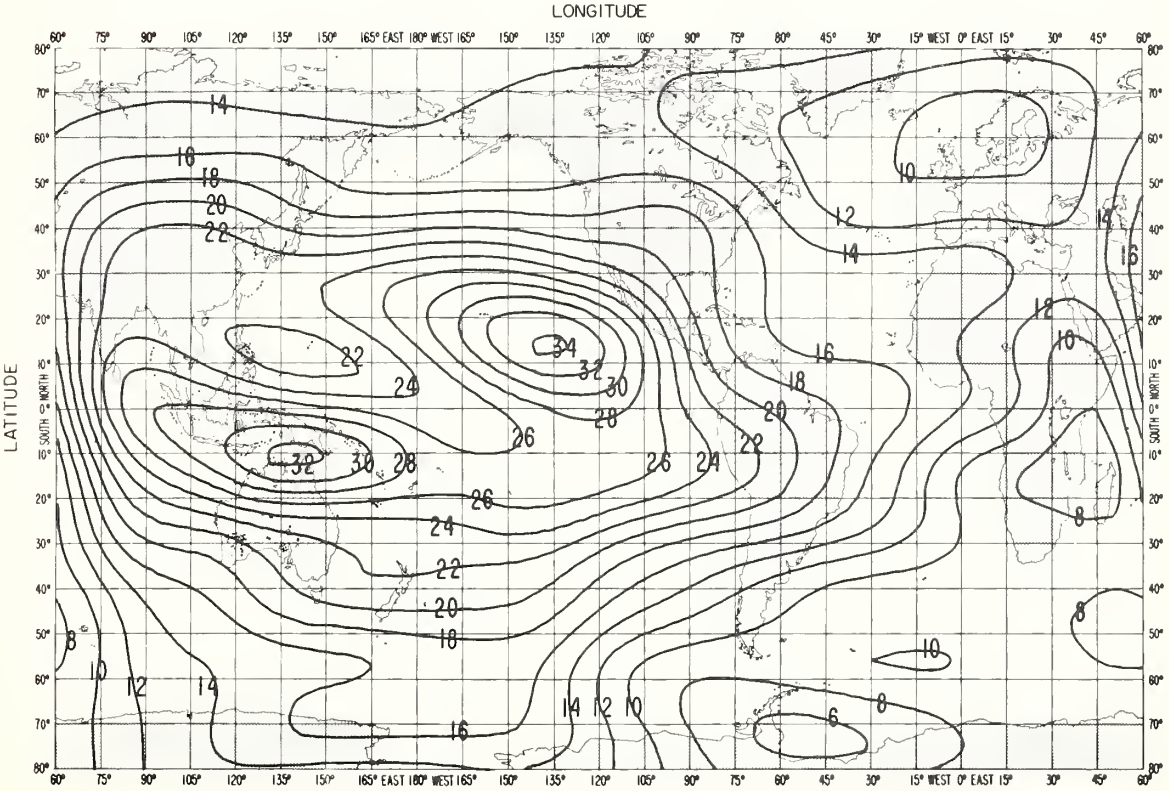


FIG. 2 B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

AUGUST 1965 UT = 04

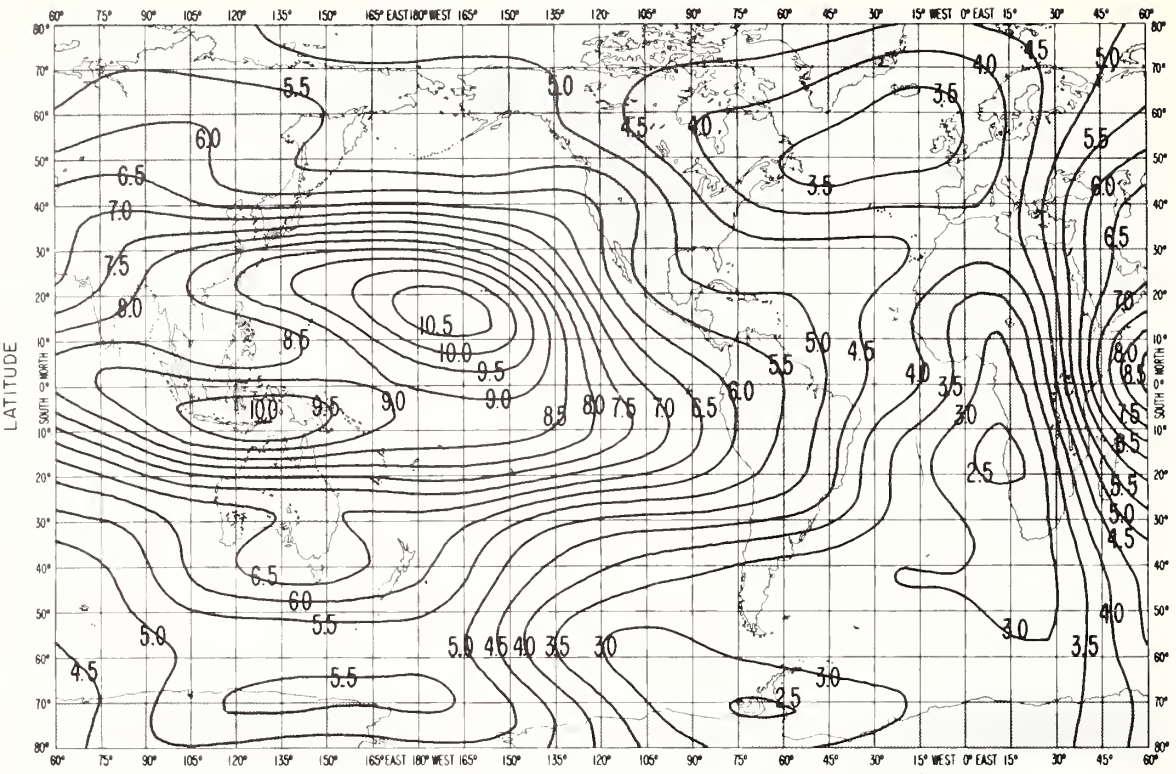


FIG. 3 A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

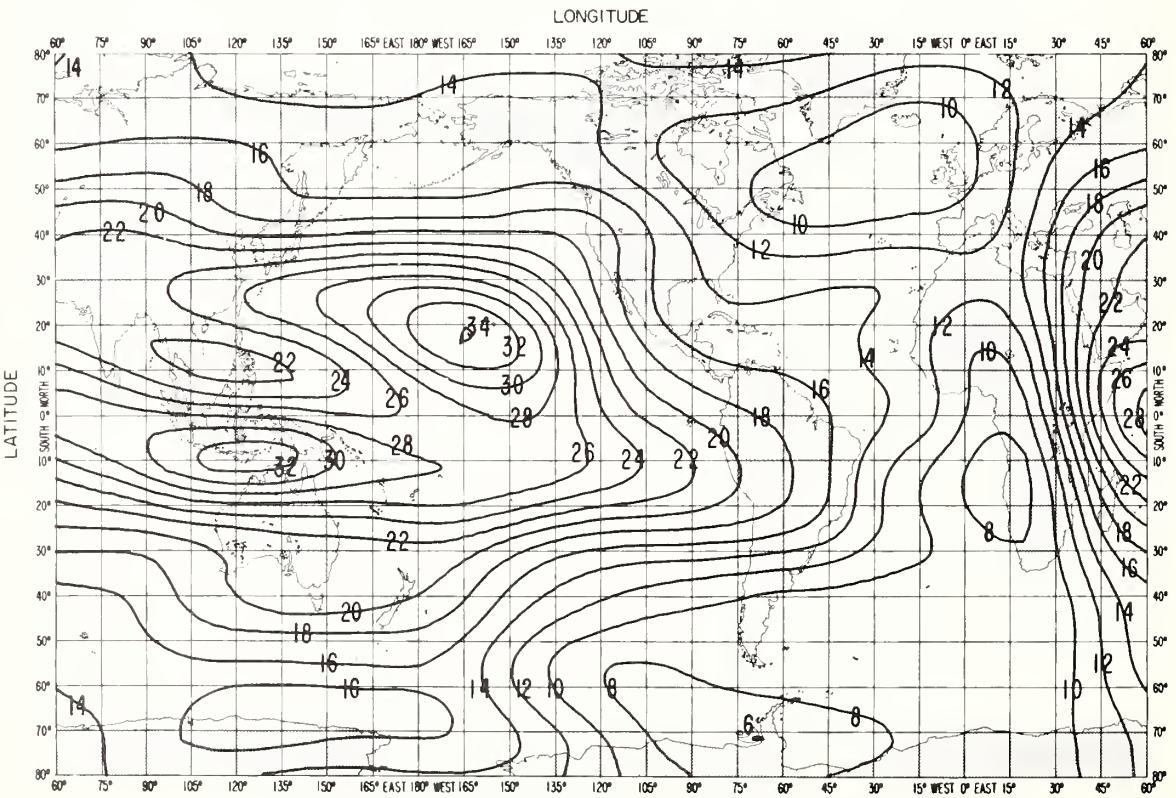


FIG. 3 B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

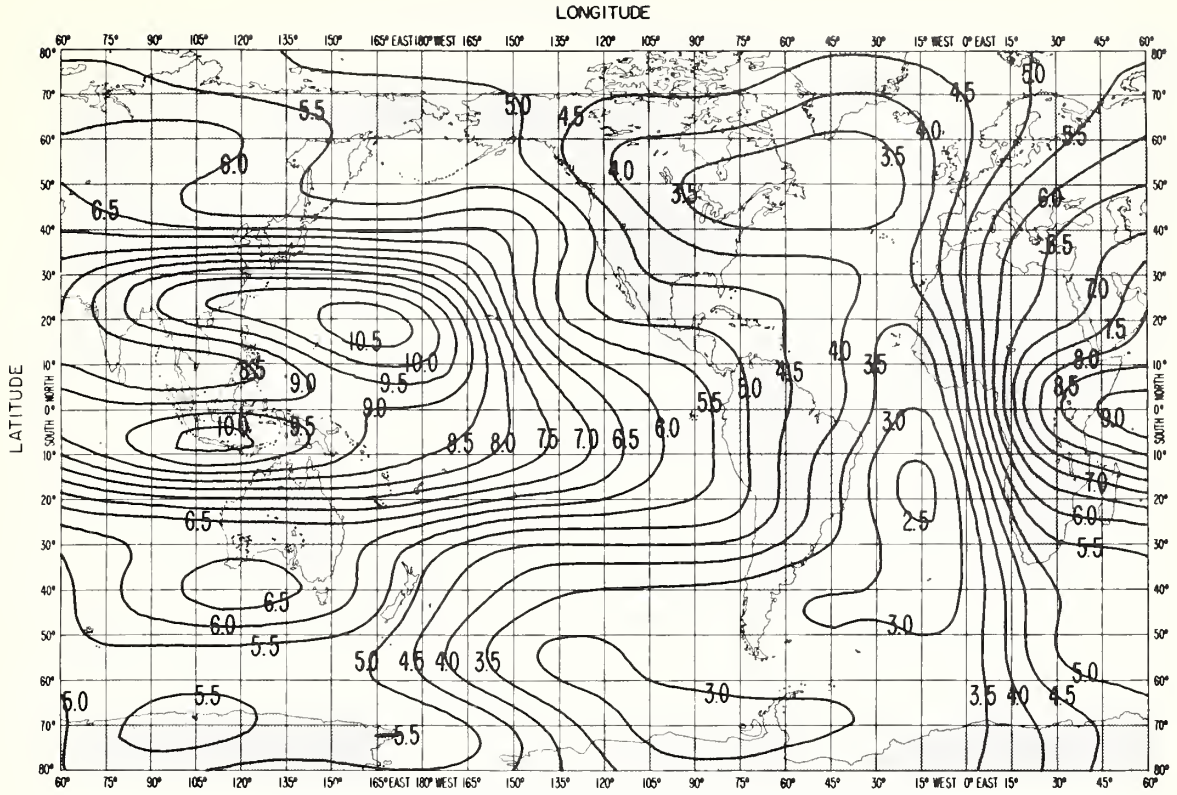


FIG. 4 A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

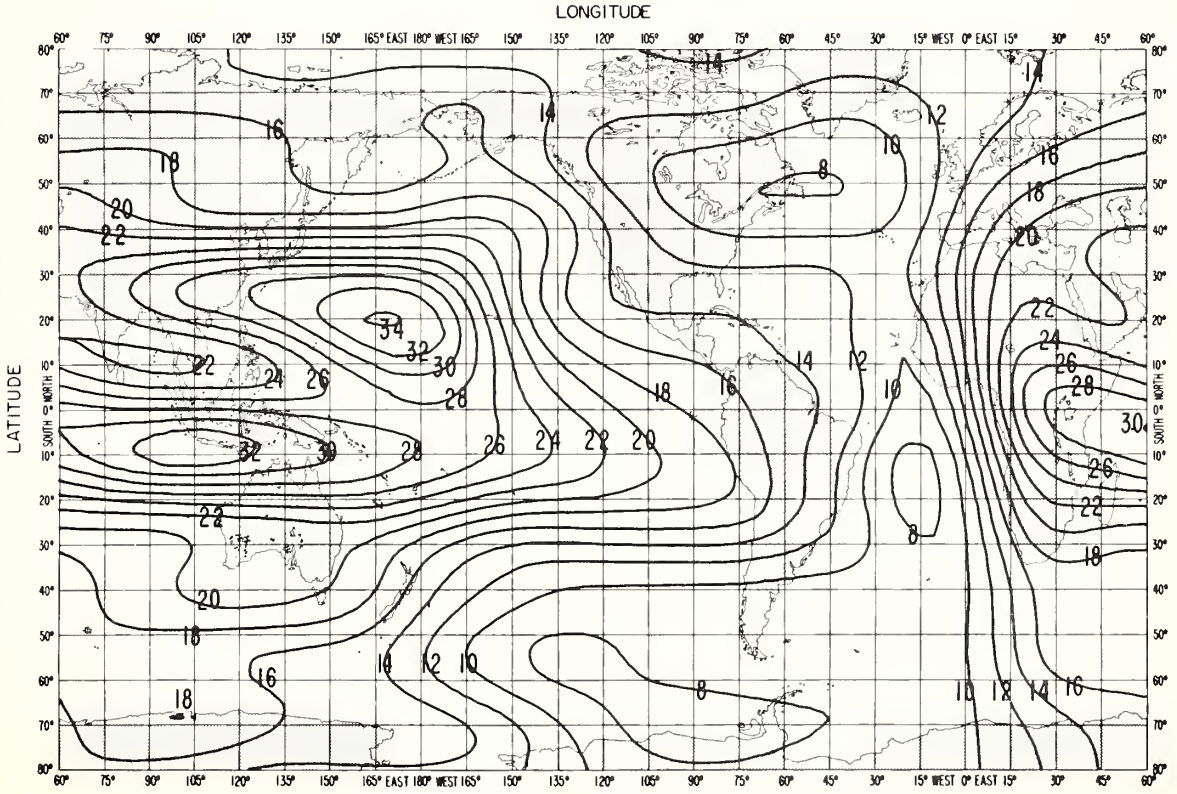


FIG. 4 B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

AUGUST 1965 UT = 08

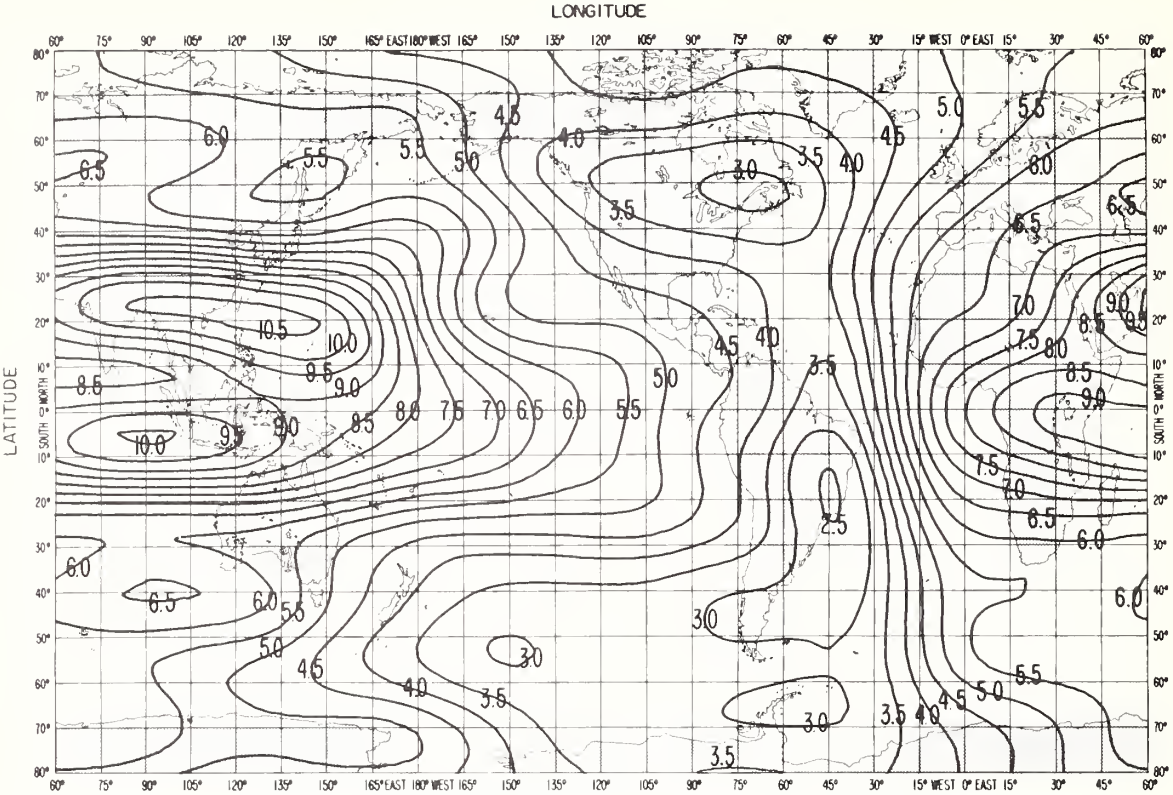


FIG. 5 A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

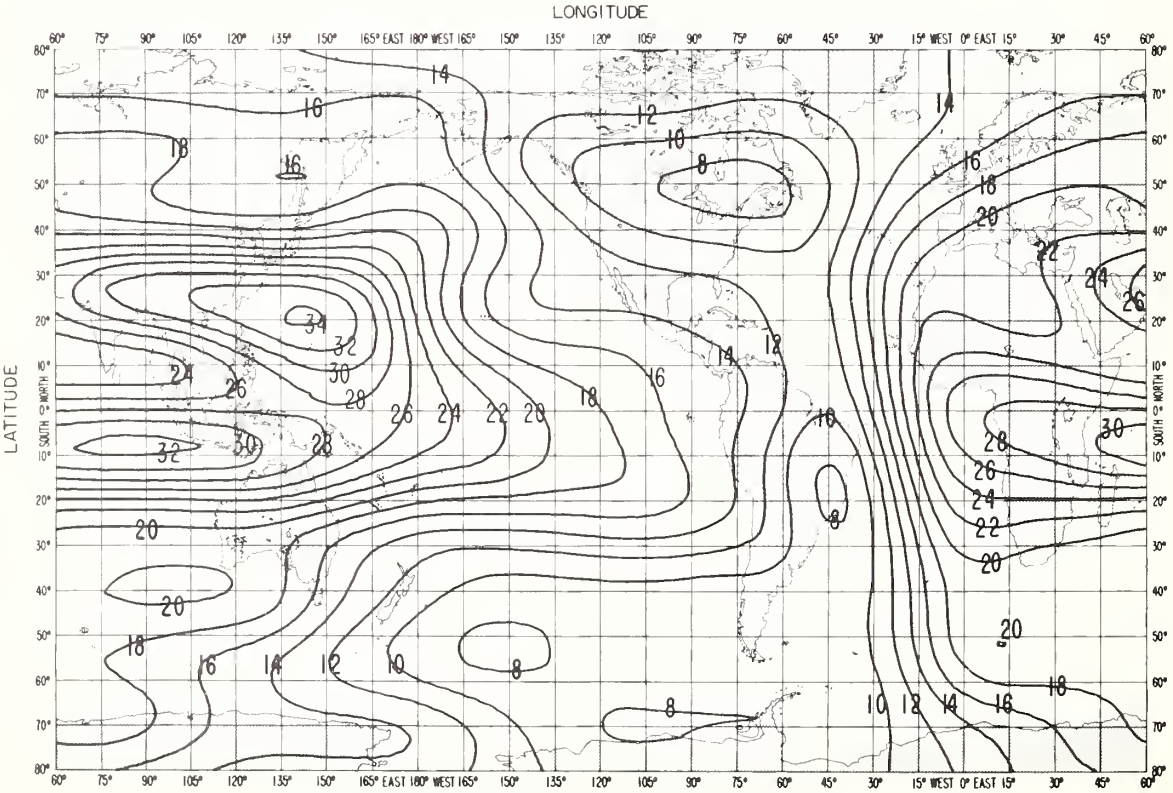


FIG. 5 B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

AUGUST 1965 UT = 10

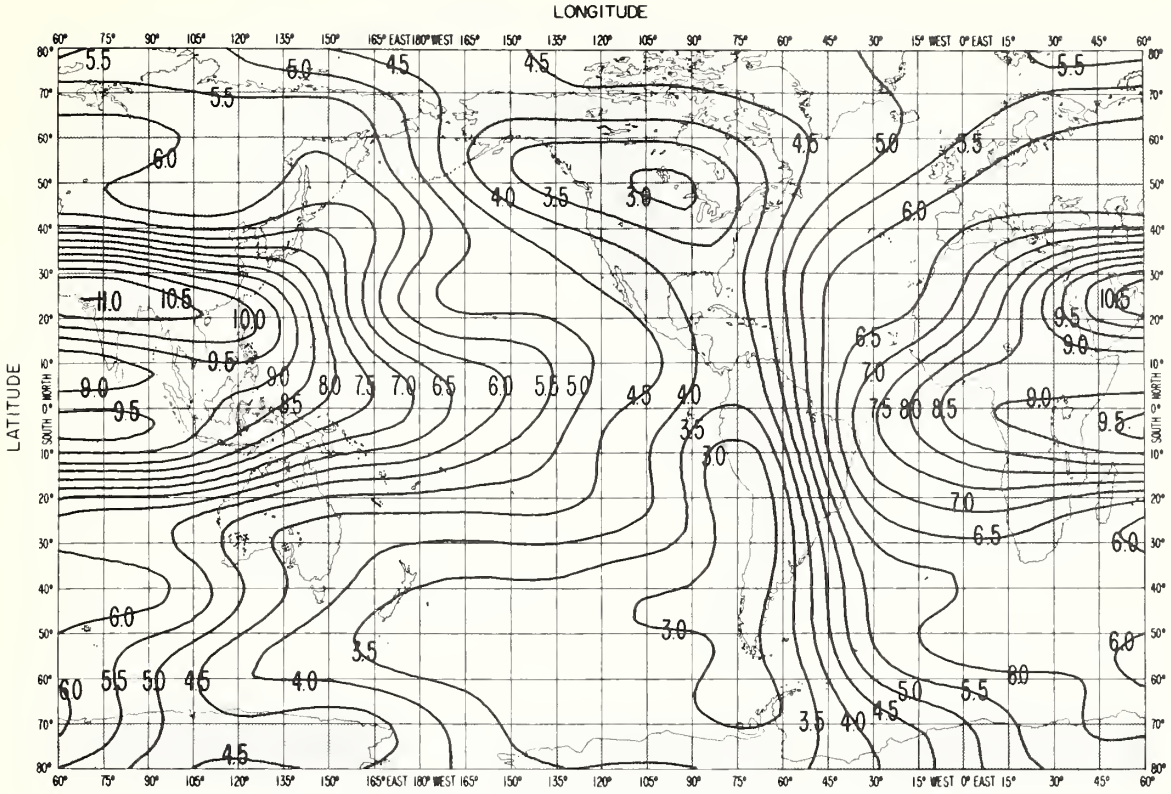


FIG. 6 A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

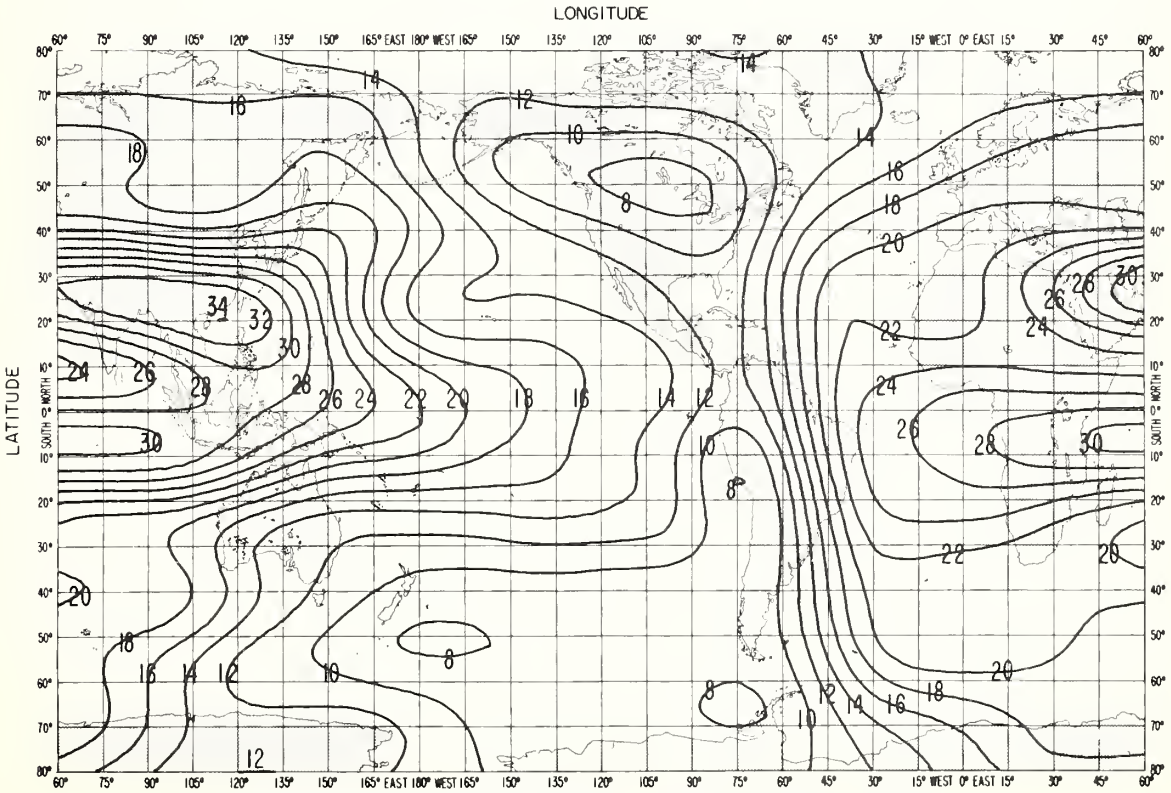


FIG. 6 B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

AUGUST 1965 UT = 12

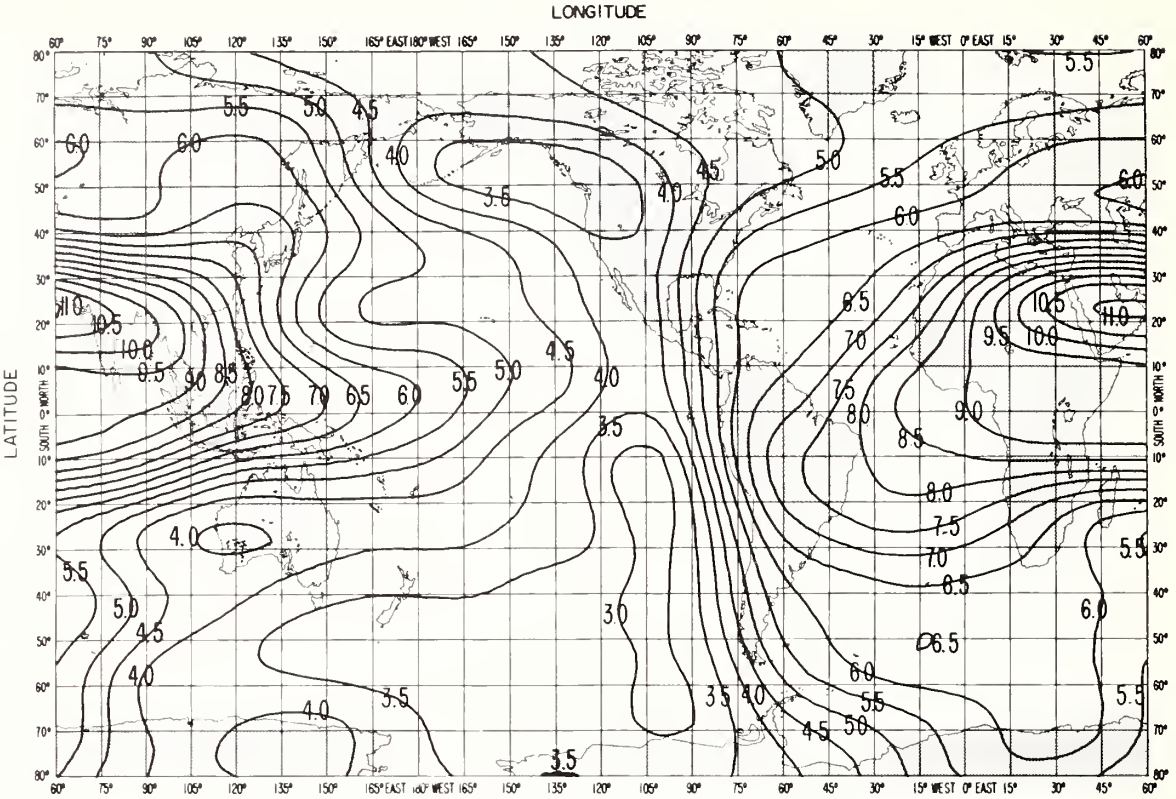


FIG. 7 A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

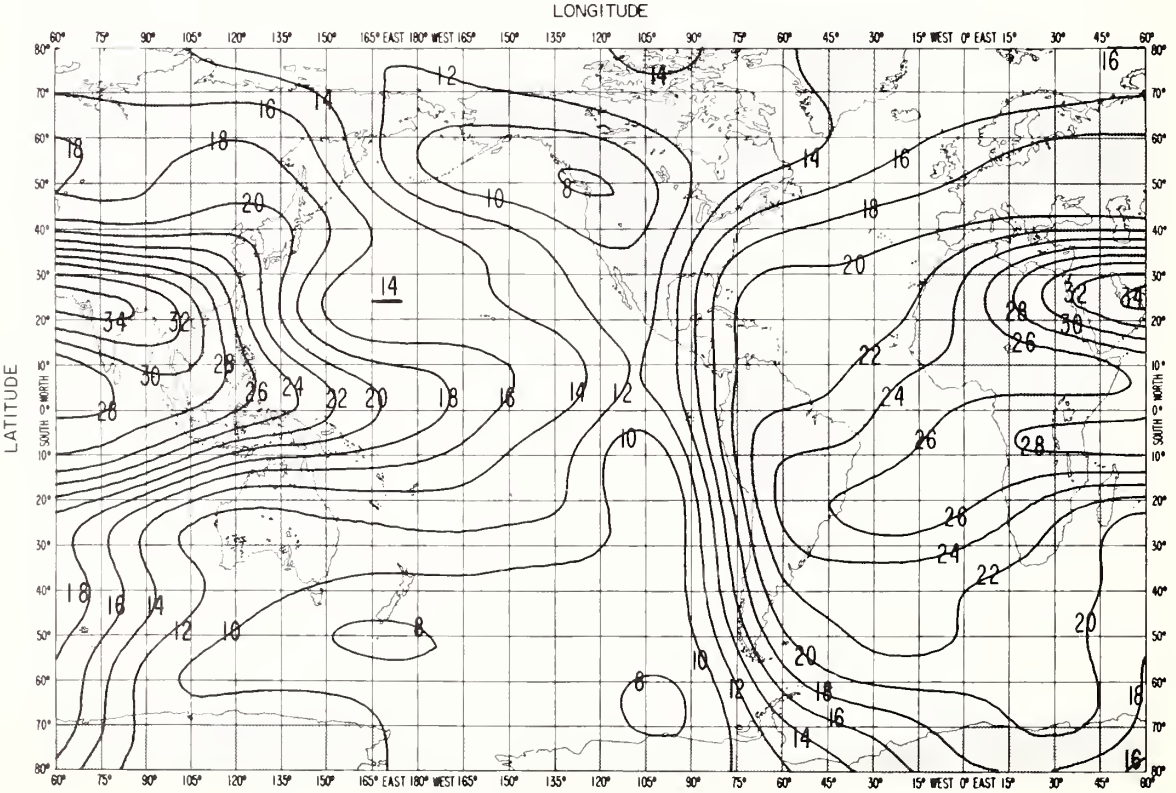


FIG. 7 B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

AUGUST 1965 UT = 14

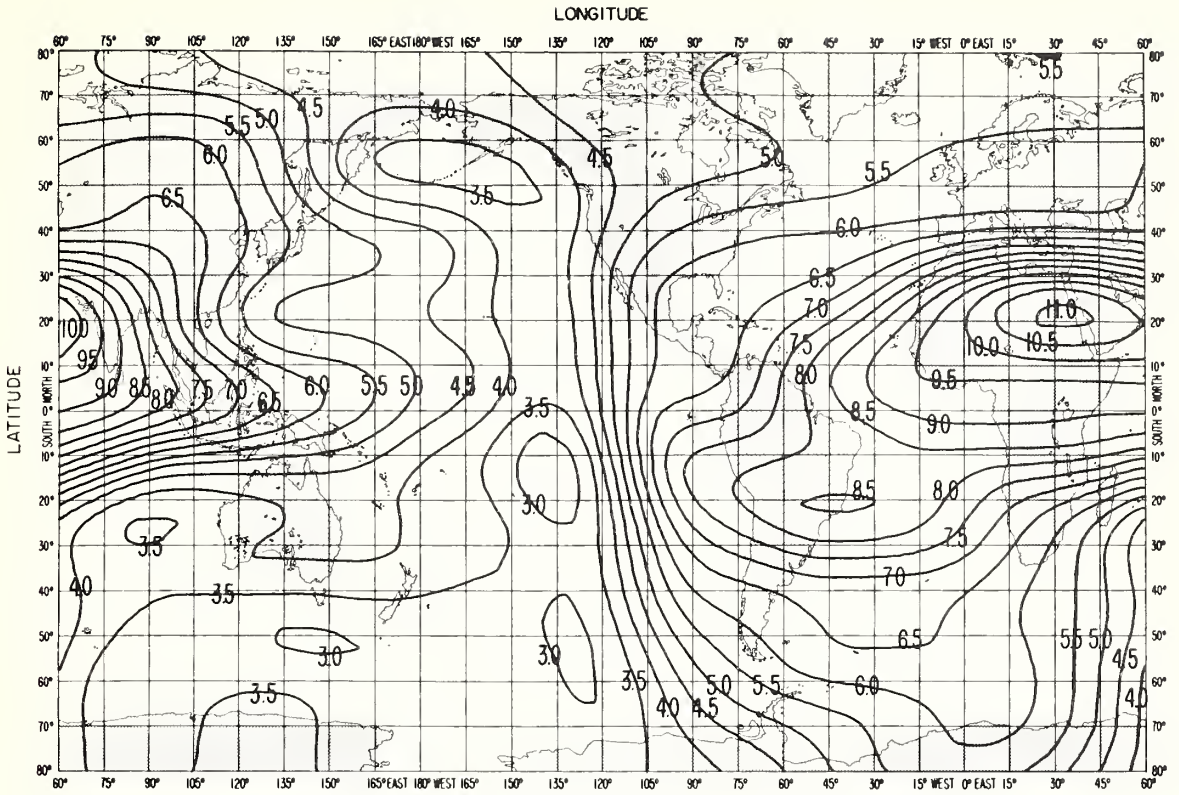


FIG. 8 A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

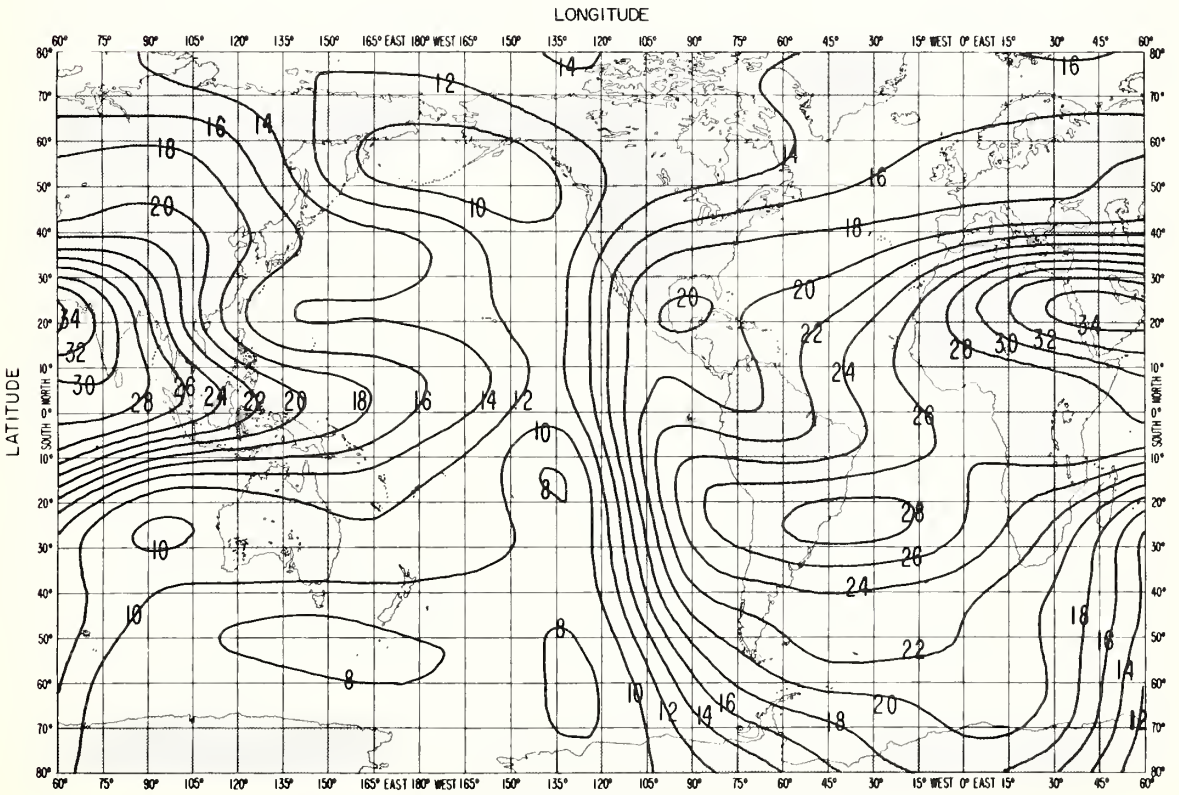


FIG. 8 B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

AUGUST 1965 UT = 16

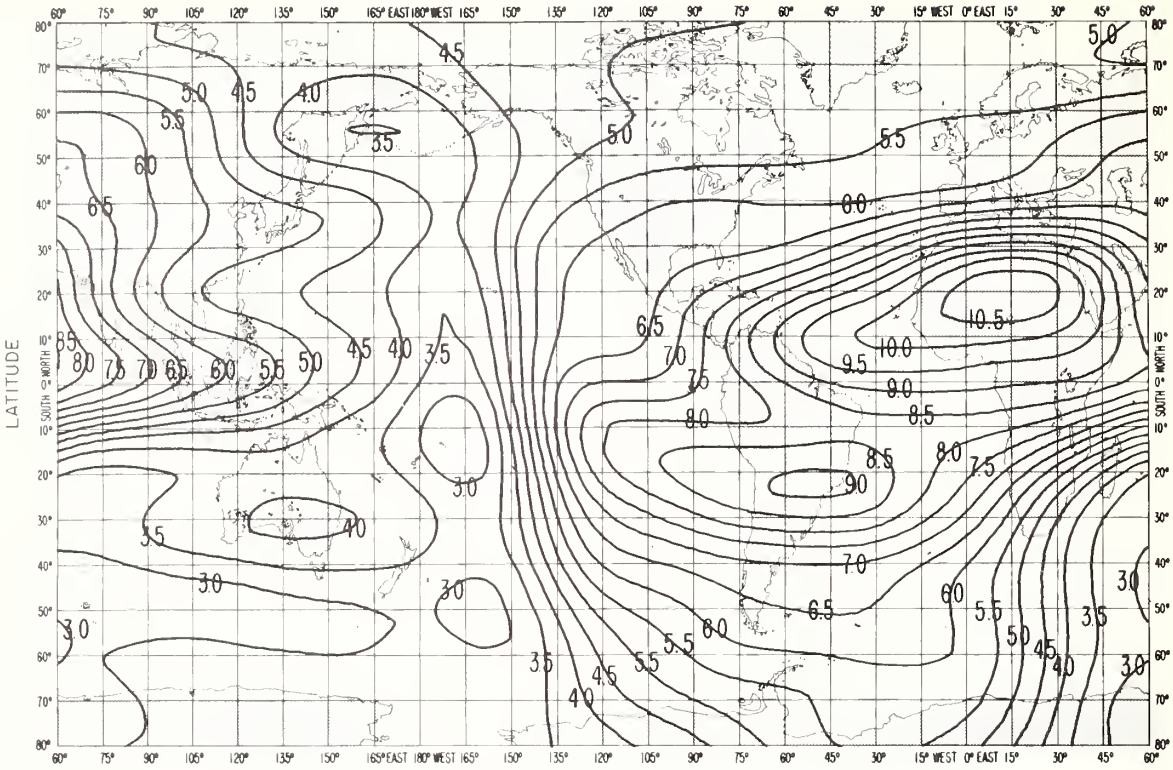


FIG. 9 A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

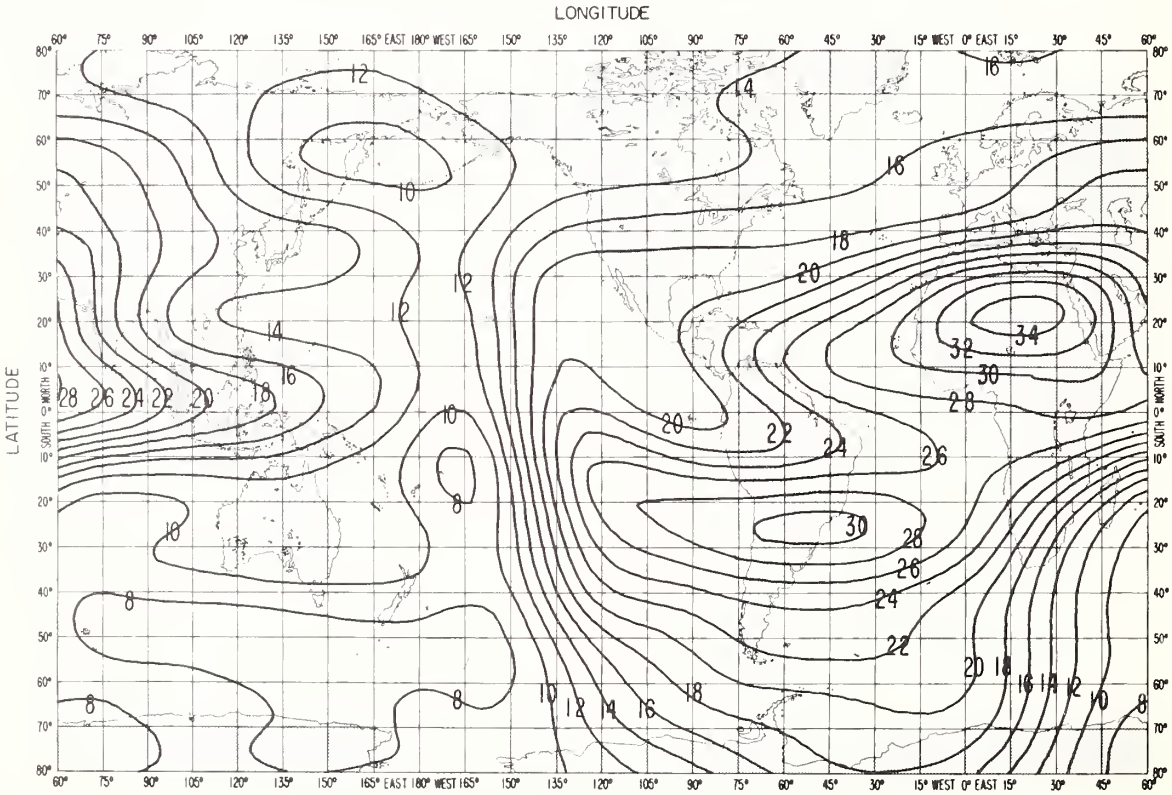


FIG. 9 B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

AUGUST 1965 UT = 18

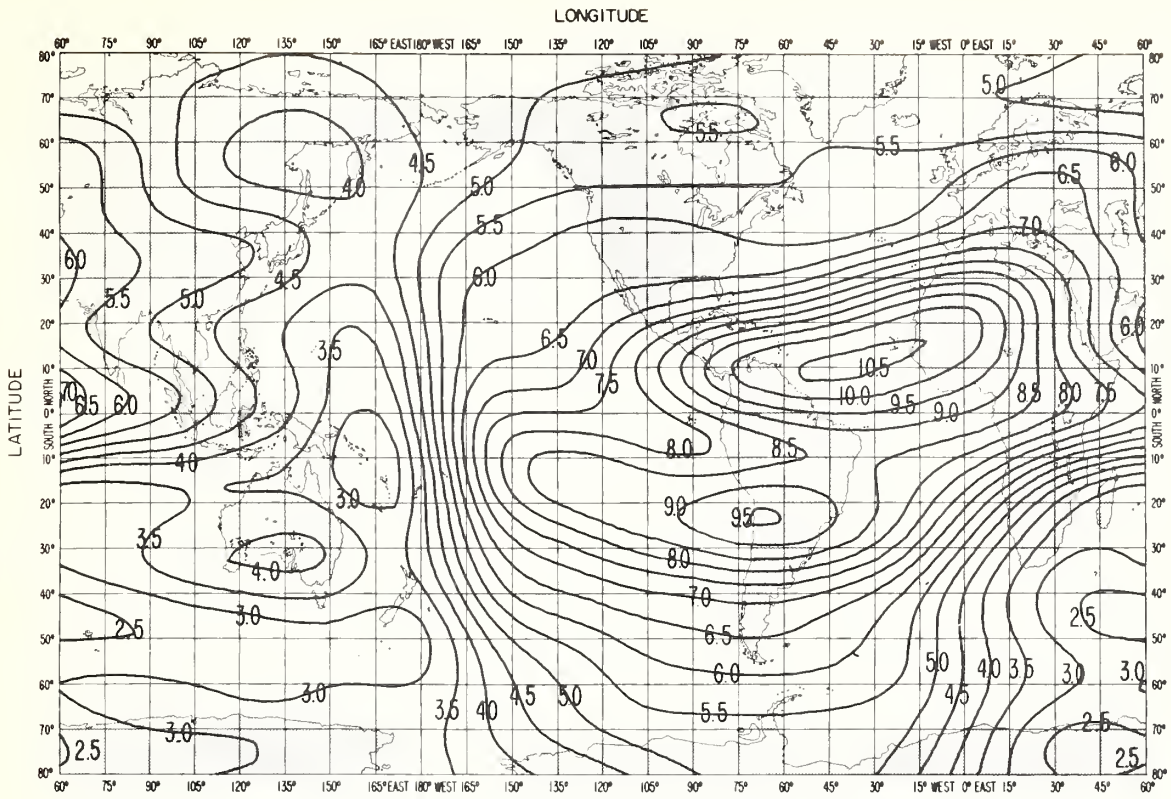


FIG.10A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

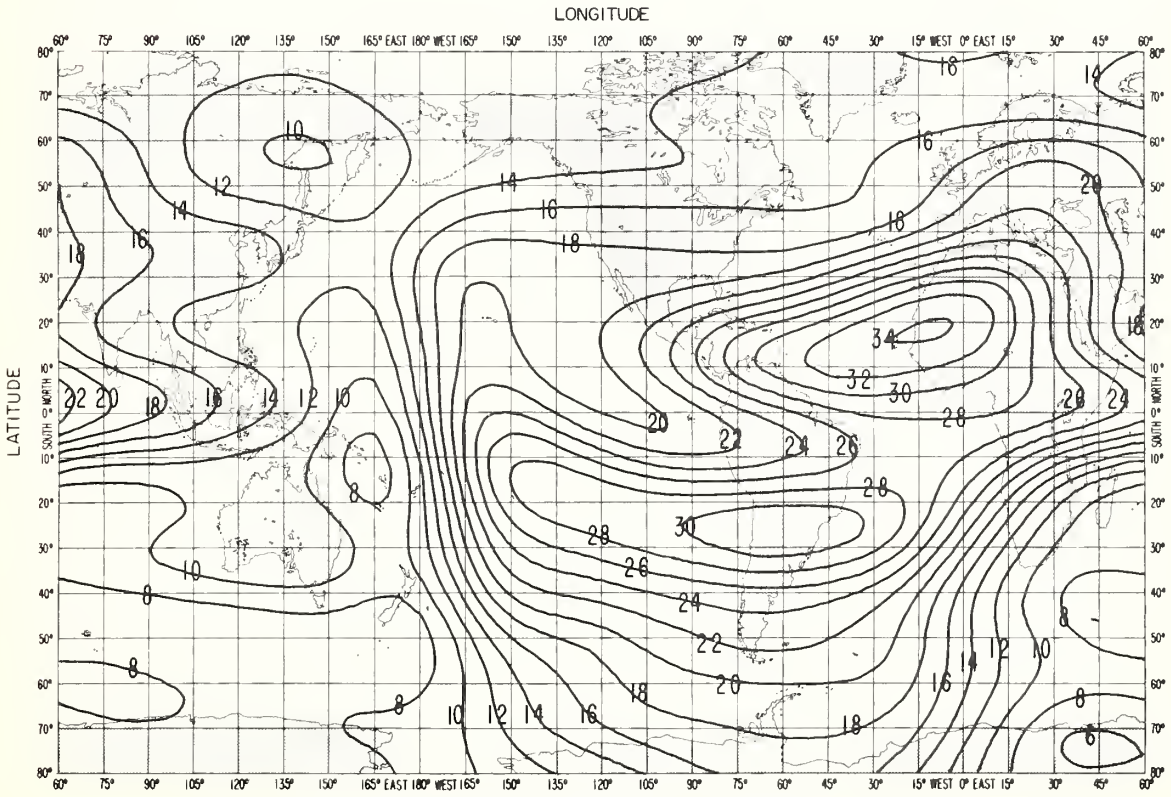


FIG.10B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

AUGUST 1965 UT = 20

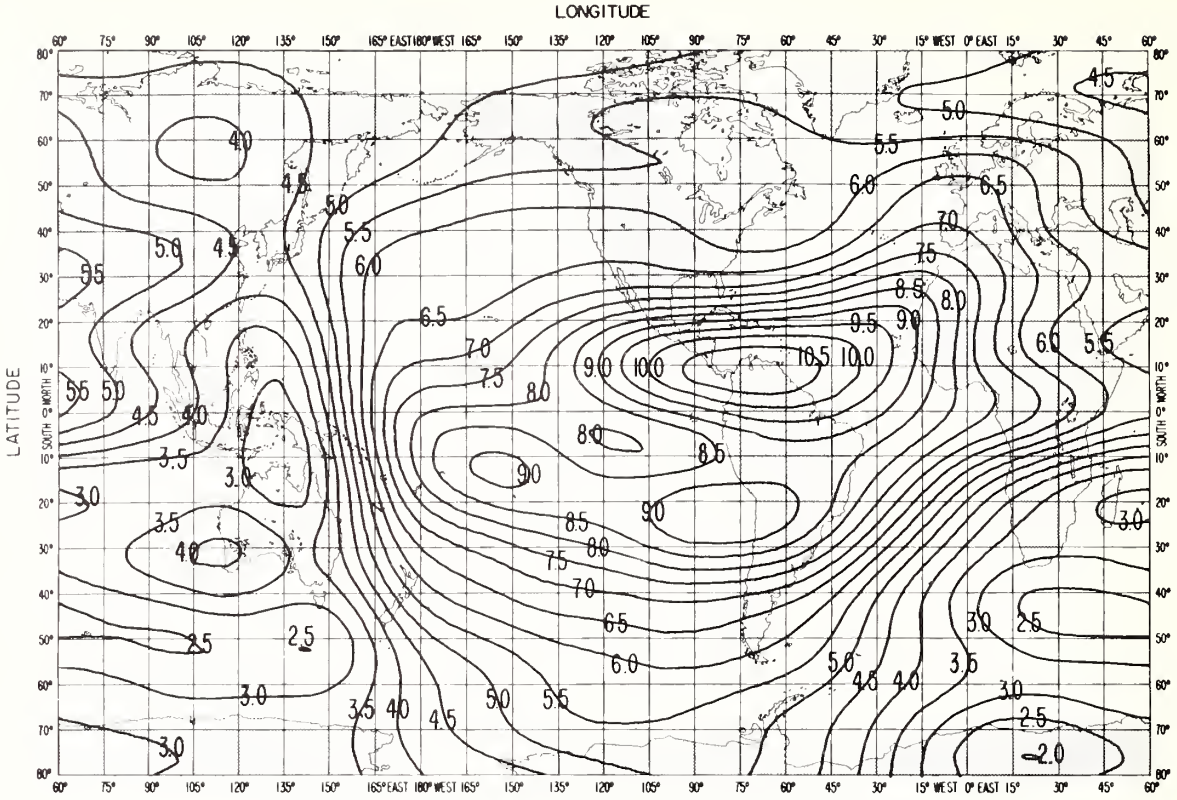


FIG. 11A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

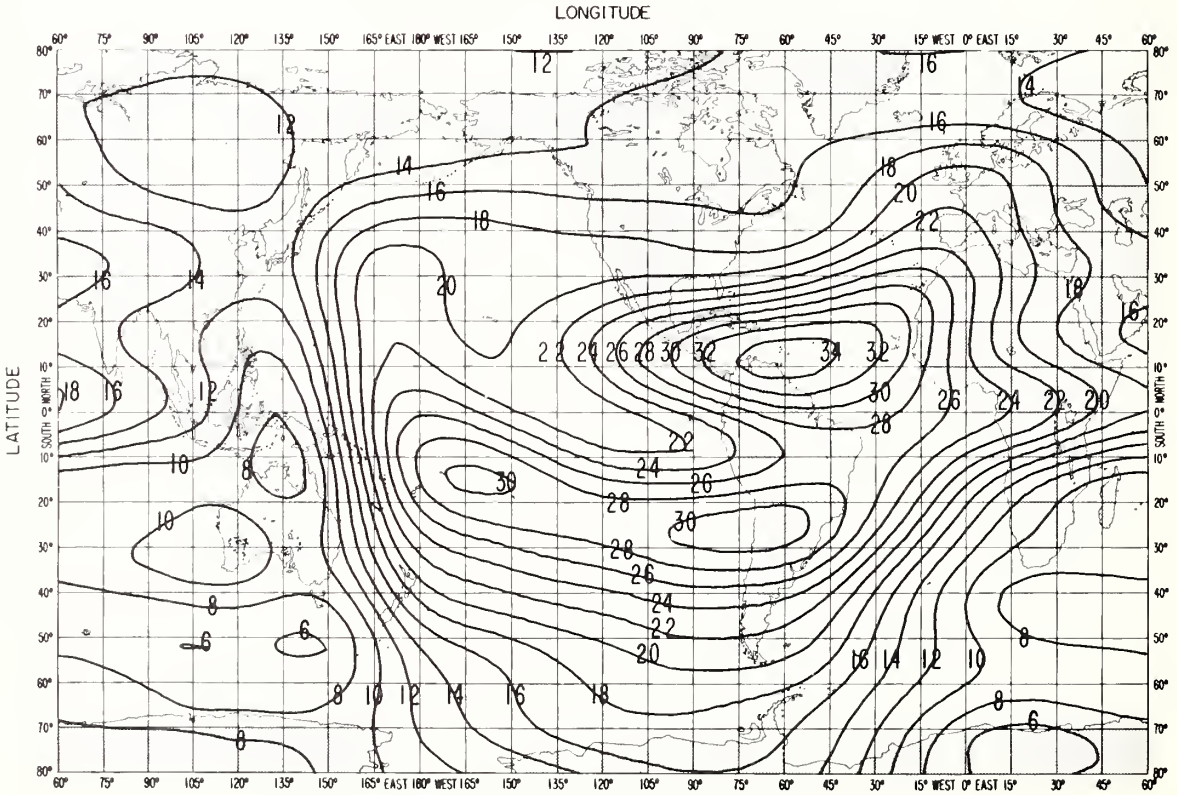


FIG. 11B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

AUGUST 1965 UT = 22

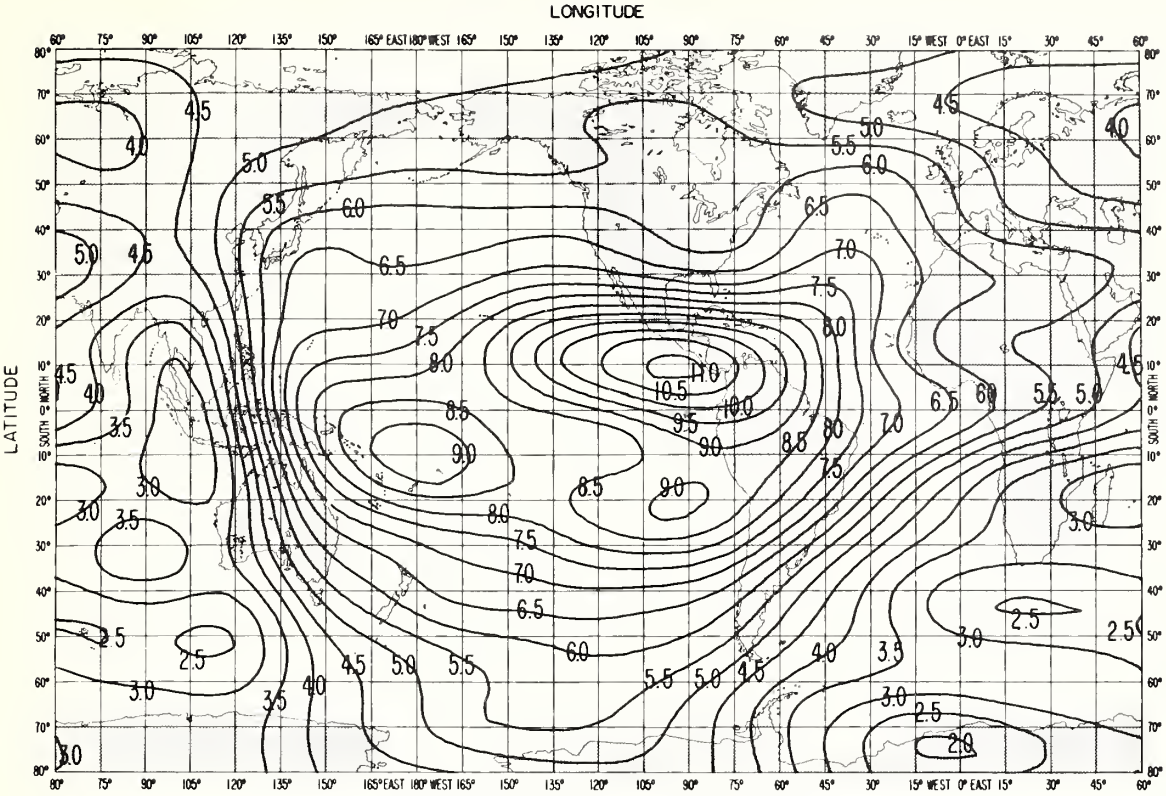


FIG. 12A. PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

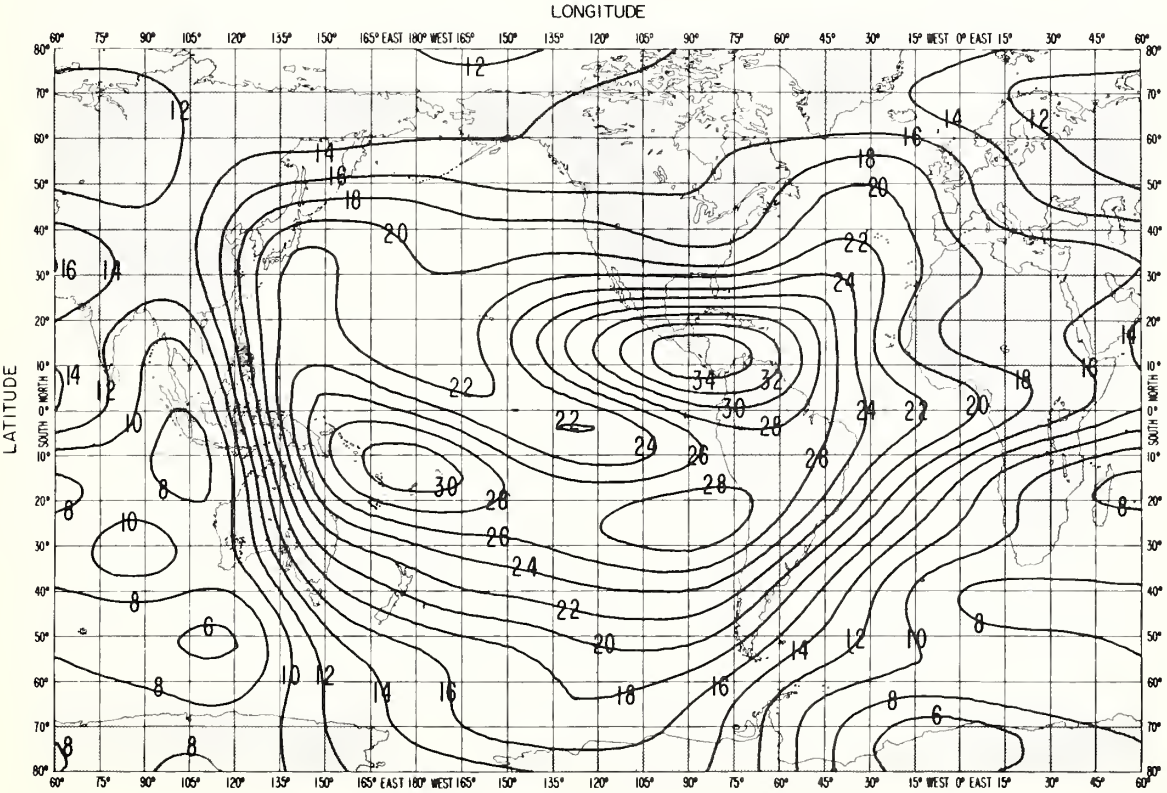


FIG. 12B. PREDICTED MEDIAN MUF(4000)F2 (Mc/s)

AUGUST 1965 UT=00

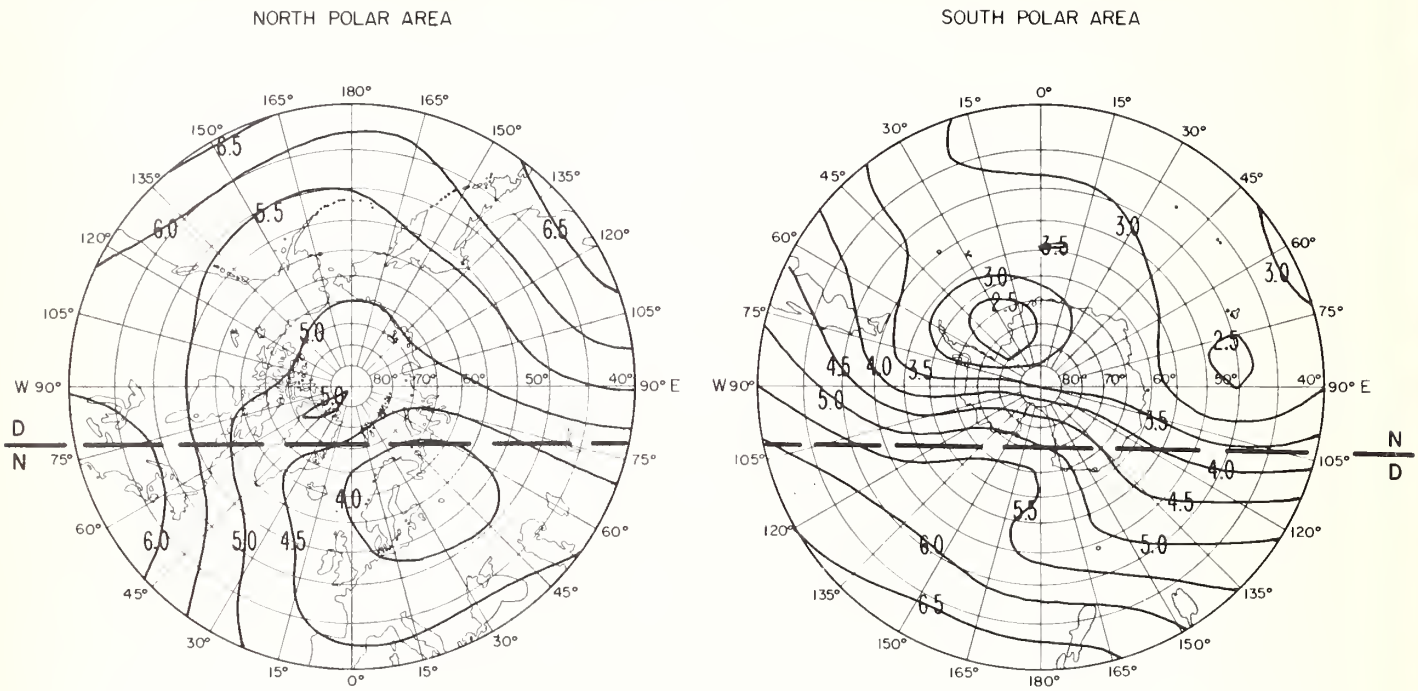


FIG. 13 A PREDICTED MEDIAN MUF (ZERO) F2 (Mc/s)

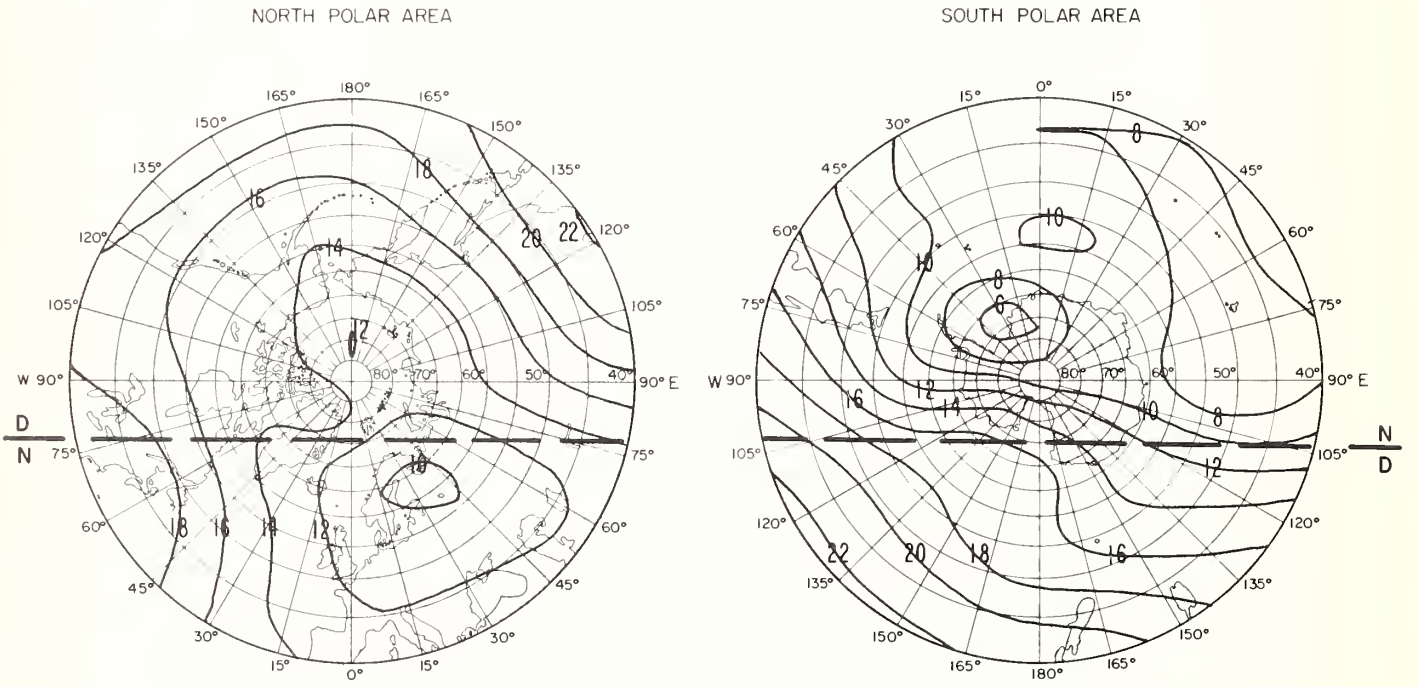


FIG. 13 B PREDICTED MEDIAN MUF (4000) F2 (Mc/s)

AUGUST 1965 UT=02

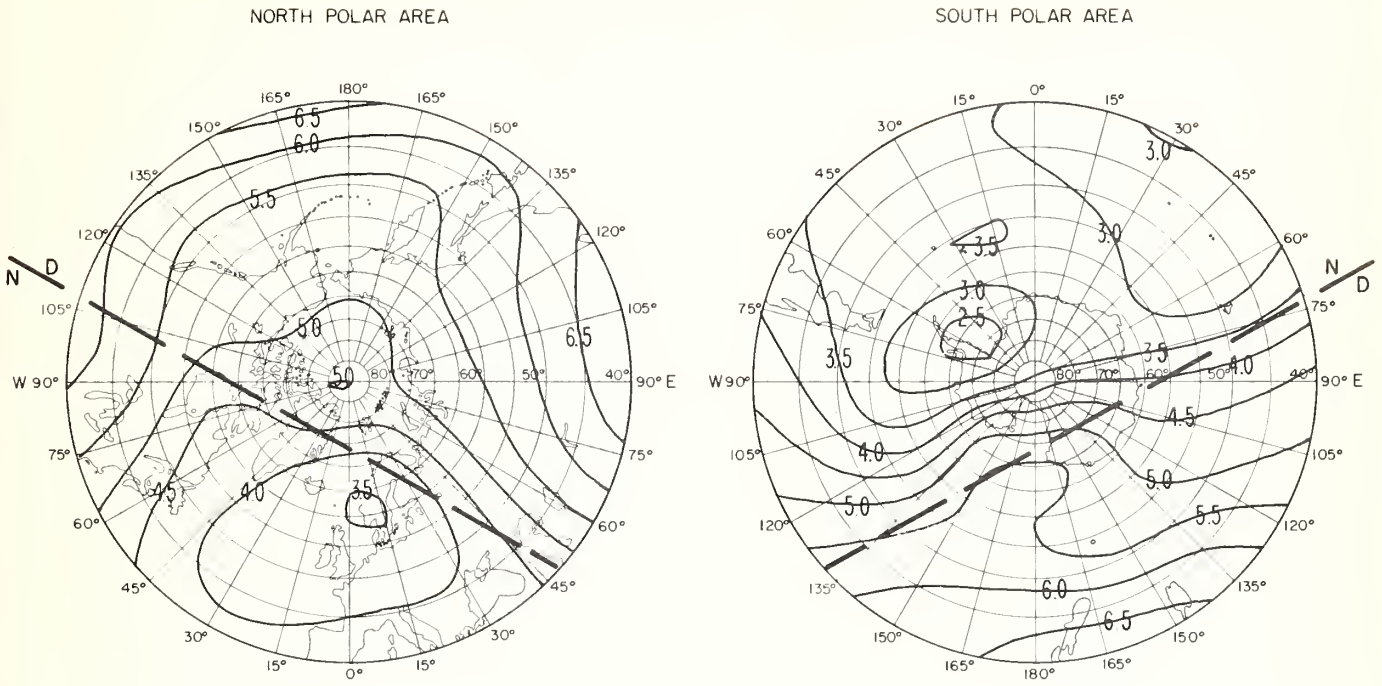


FIG. 14 A PREDICTED MEDIAN MUF (ZERO) F2 (MC/S)

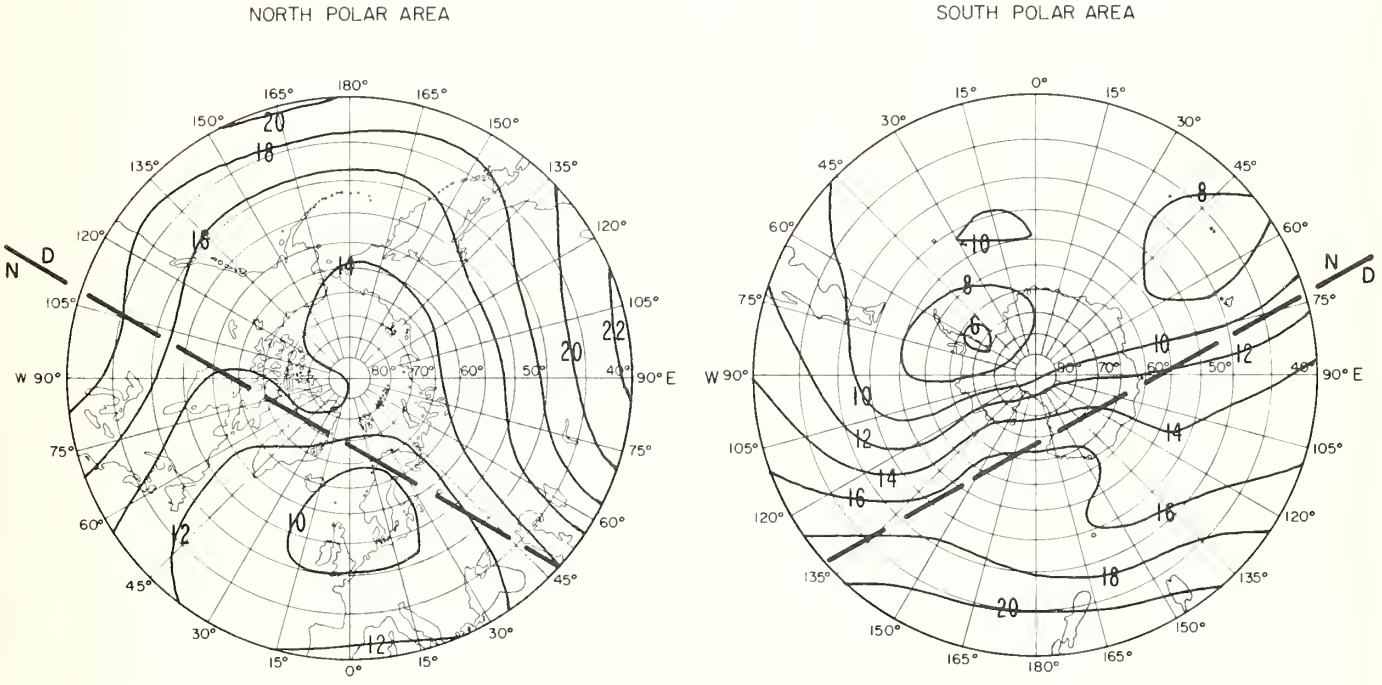


FIG. 14 B PREDICTED MEDIAN MUF (4000) F2 (MC/S)

AUGUST 1965 UT=04

NORTH POLAR AREA

SOUTH POLAR AREA

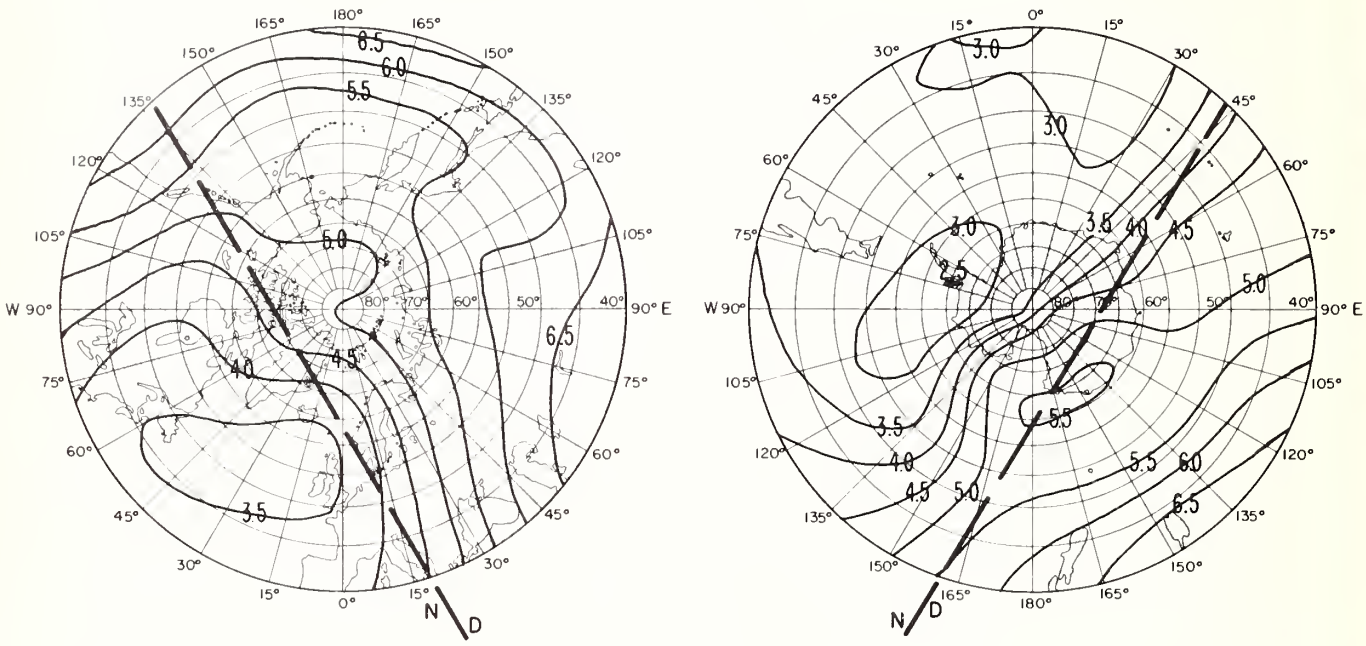


FIG 15 A PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

NORTH POLAR AREA

SOUTH POLAR AREA

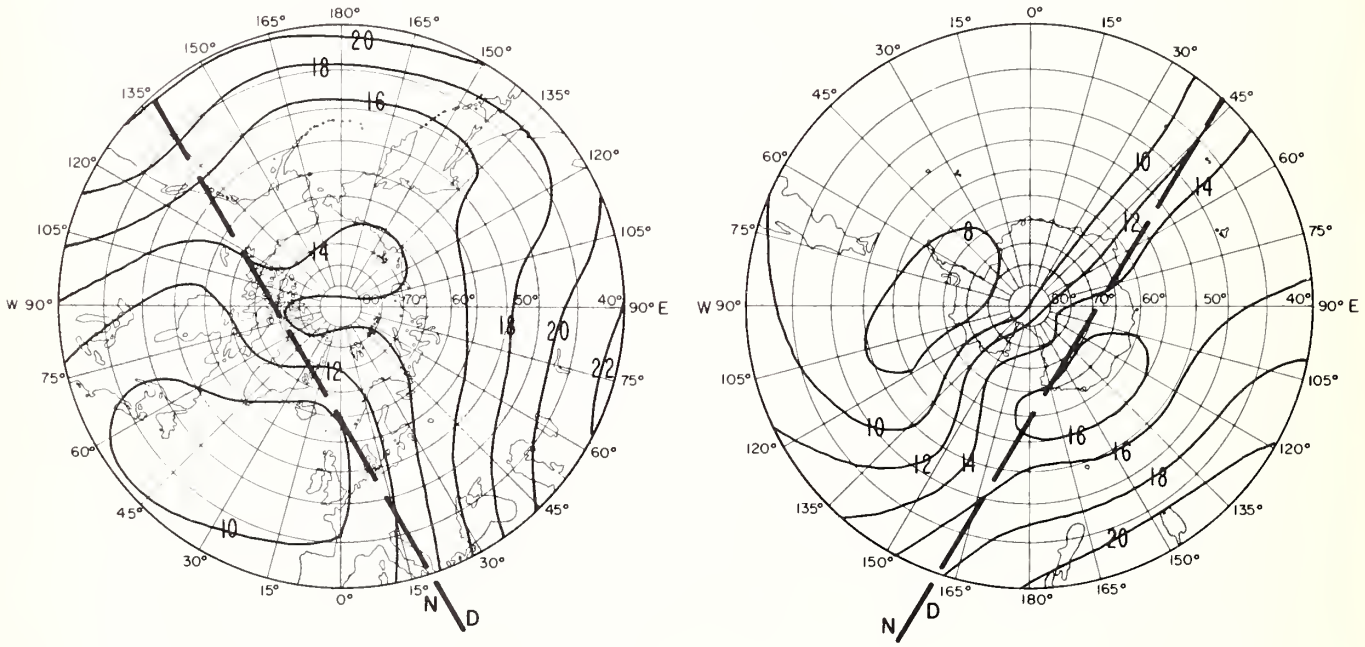


FIG. 15 B PREDICTED MEDIAN MUF (4000) F2 (Mc/s)

AUGUST 1965 UT=06

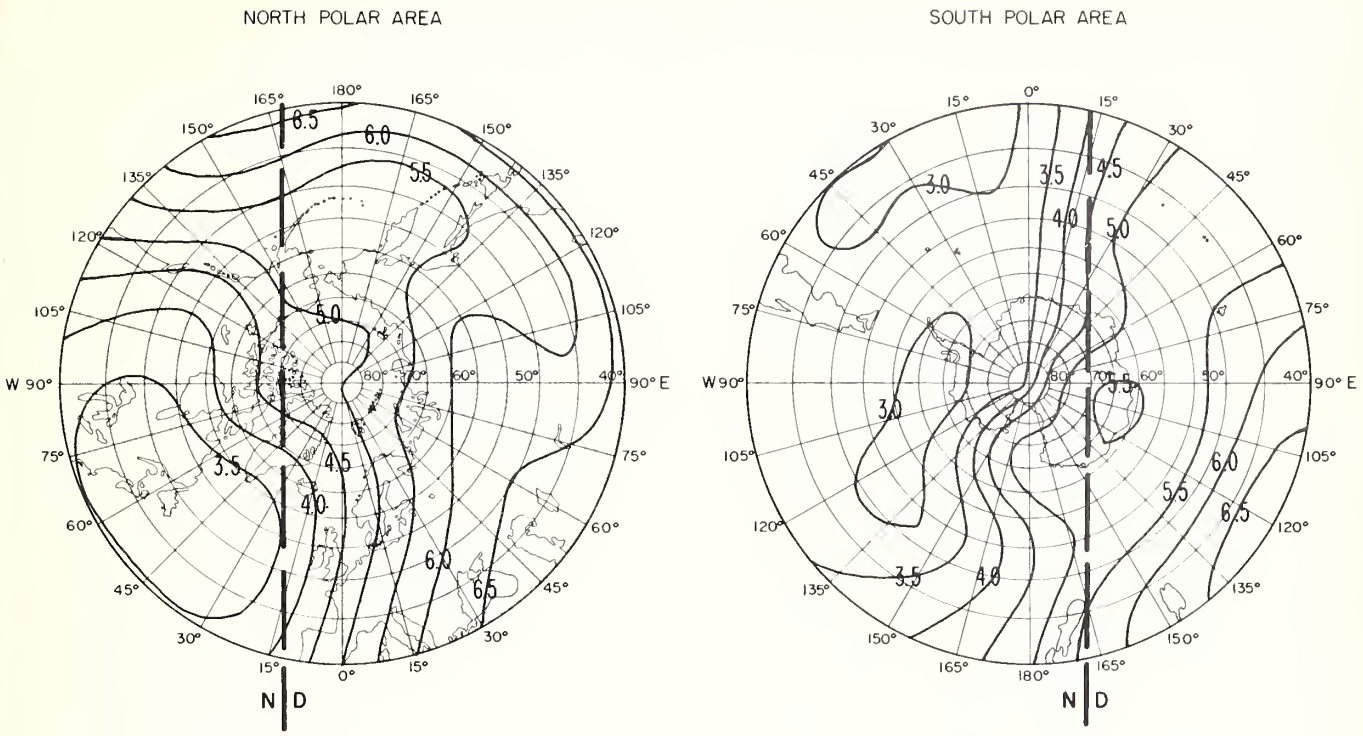


FIG. 16 A PREDICTED MEDIAN MUF (ZERO) F2 (Mc/s)

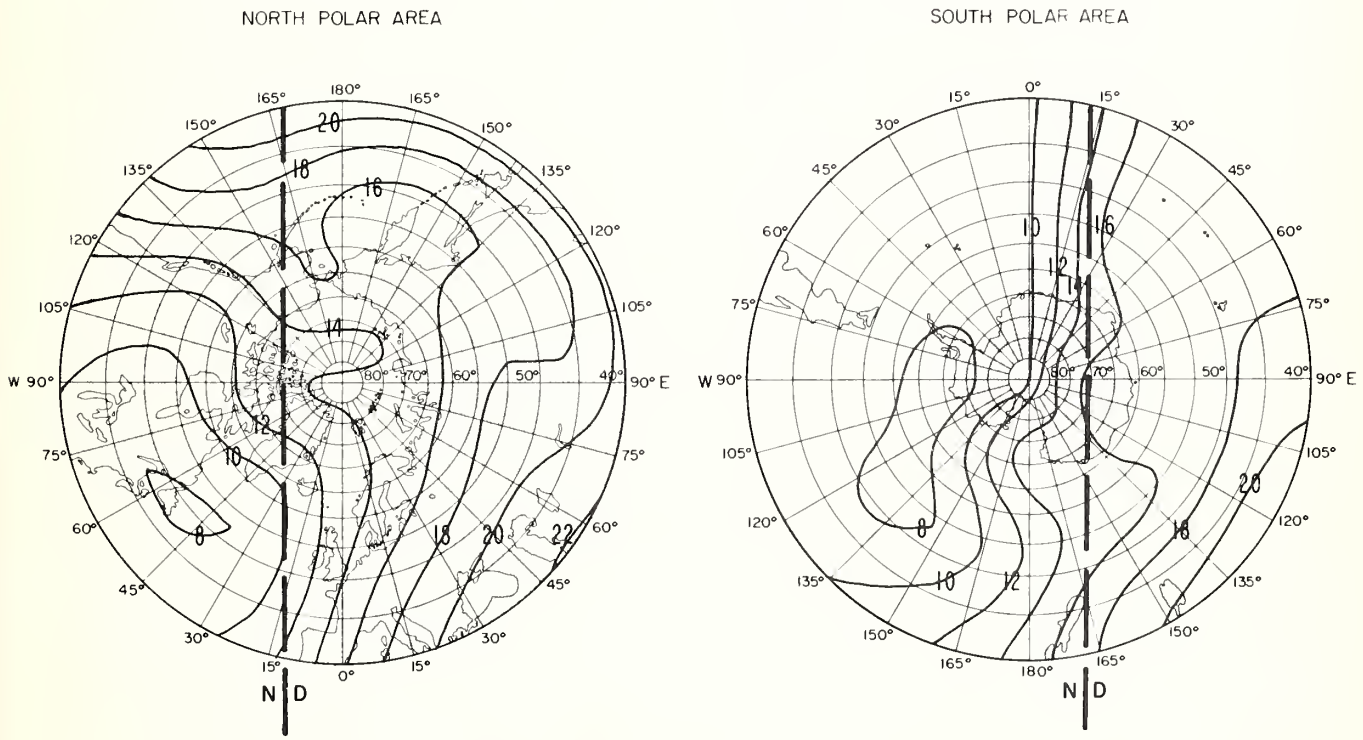
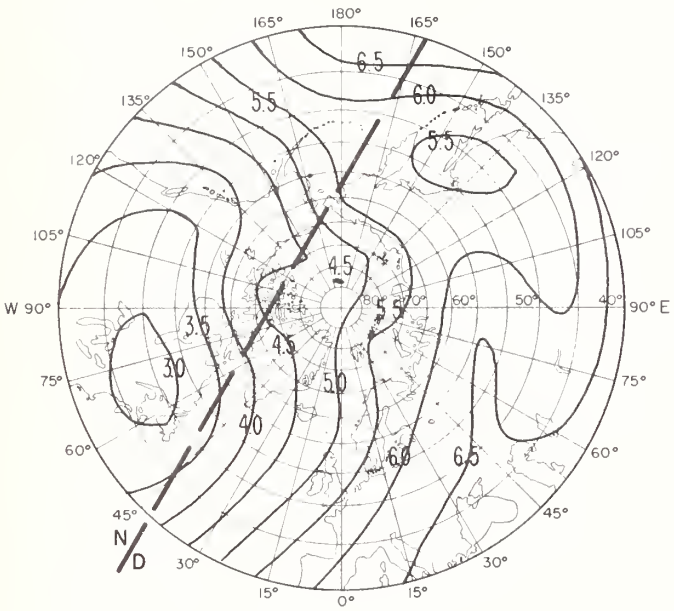


FIG. 16 B PREDICTED MEDIAN MUF (4000) F2 (Mc/s)

AUGUST 1965 UT=08

NORTH POLAR AREA



SOUTH POLAR AREA

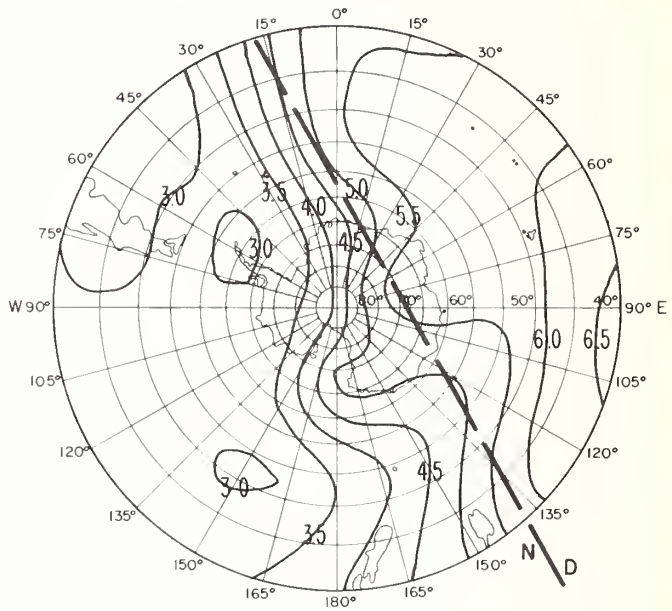
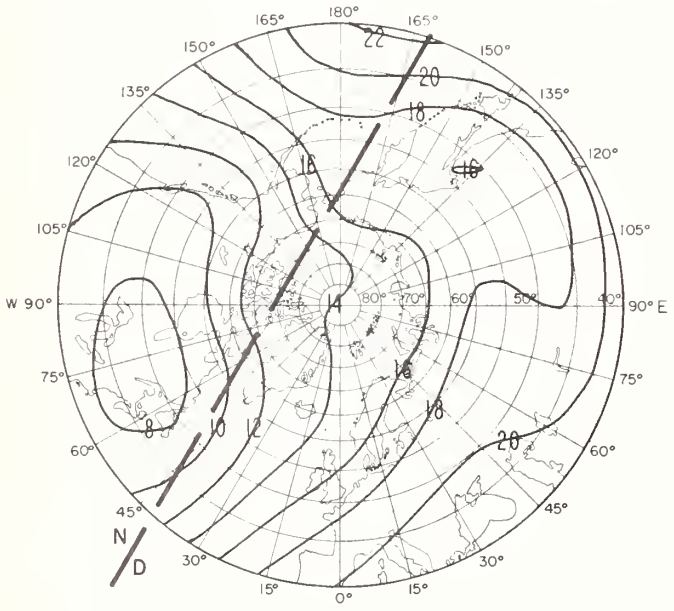


FIG 17A PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

NORTH POLAR AREA



SOUTH POLAR AREA

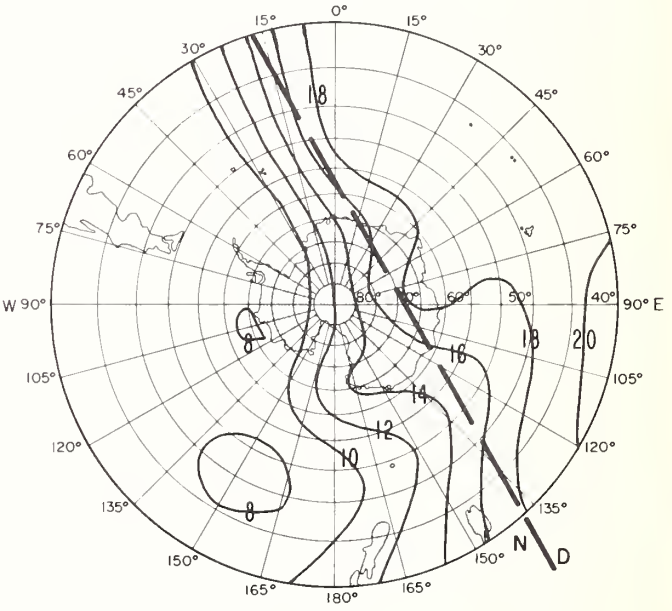
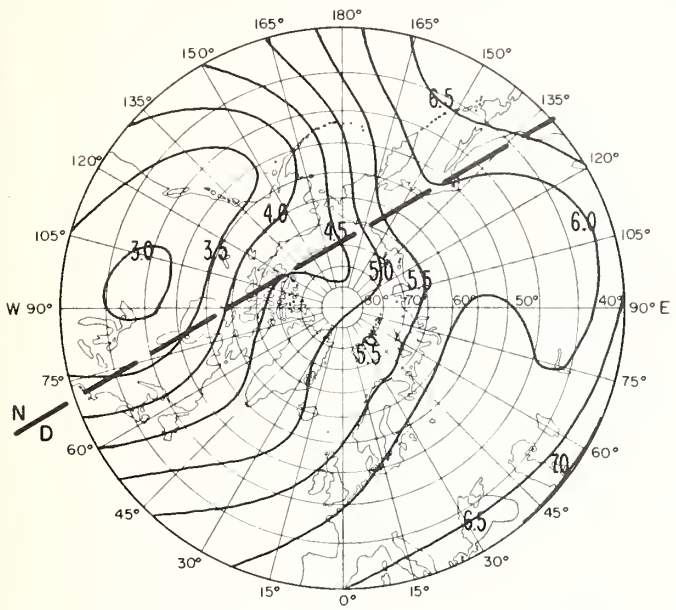


FIG. 17 B PREDICTED MEDIAN MUF (4000) F2 (Mc/s)

AUGUST 1965 UT = 10

NORTH POLAR AREA



SOUTH POLAR AREA

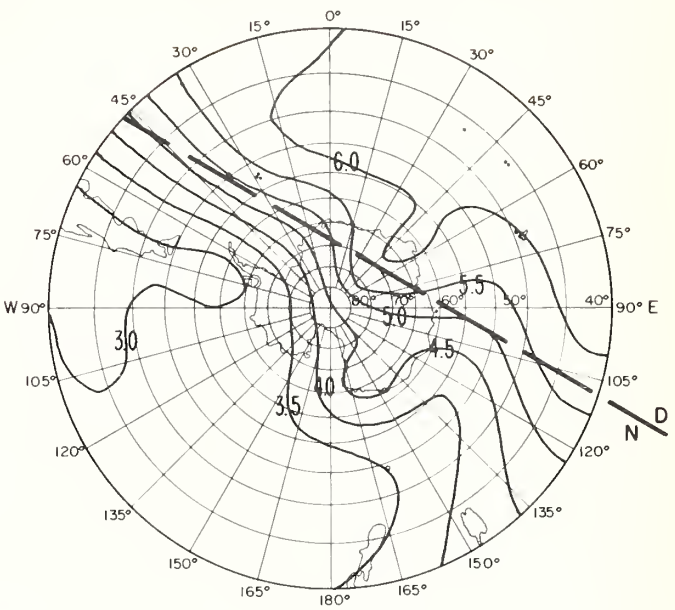
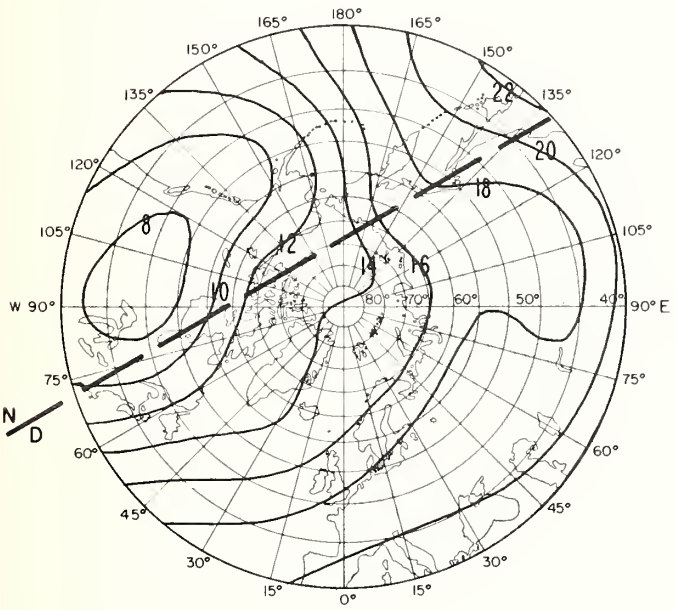


FIG. 18A PREDICTED MEDIAN MUF (ZERO) F2 (Mc/s)

NORTH POLAR AREA



SOUTH POLAR AREA

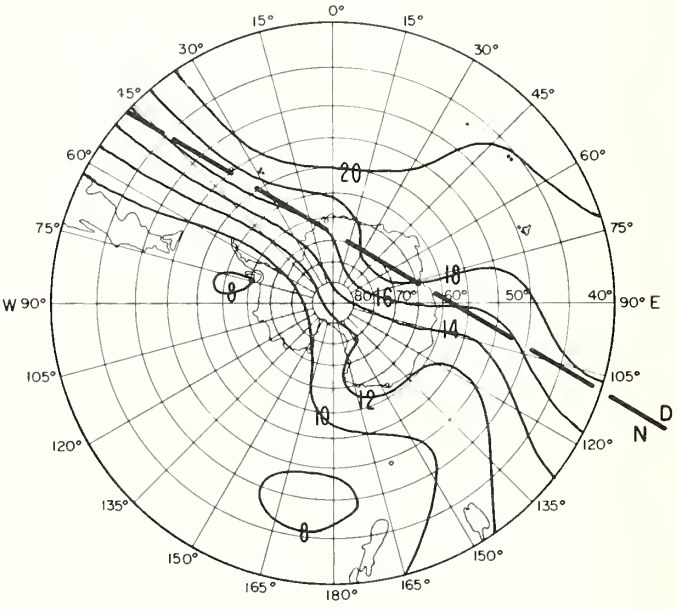
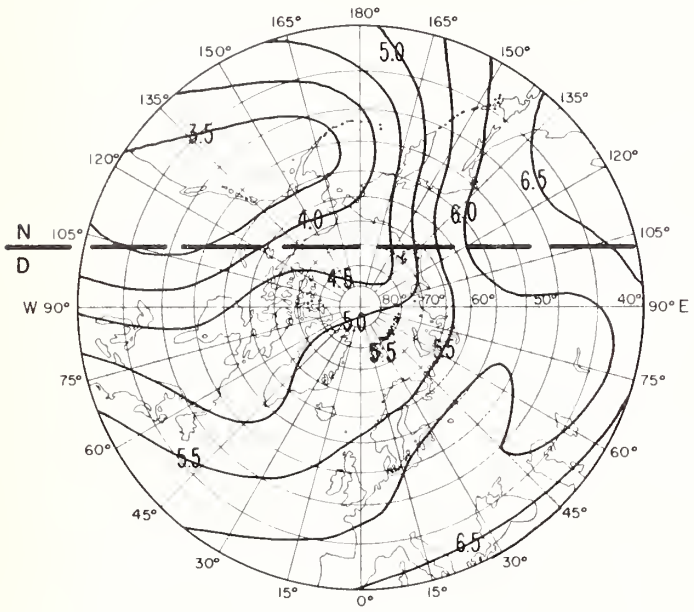


FIG. 18B PREDICTED MEDIAN MUF (4000) F2 (Mc/s)

AUGUST 1965 UT=12

NORTH POLAR AREA



SOUTH POLAR AREA

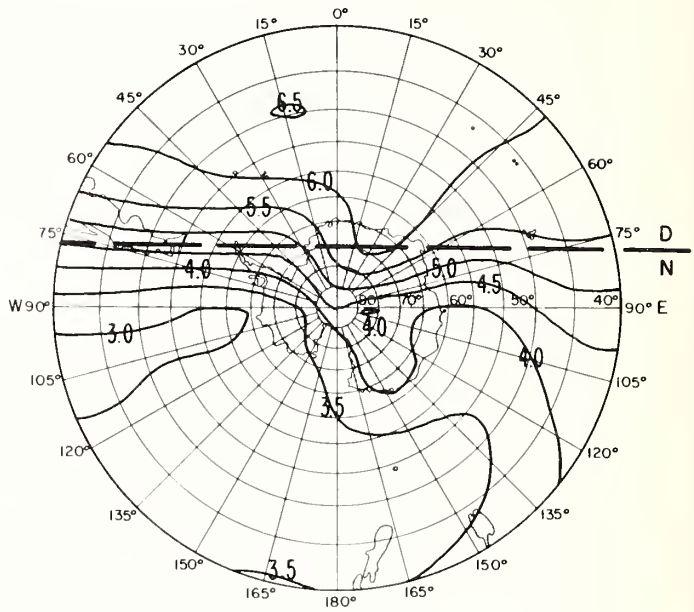
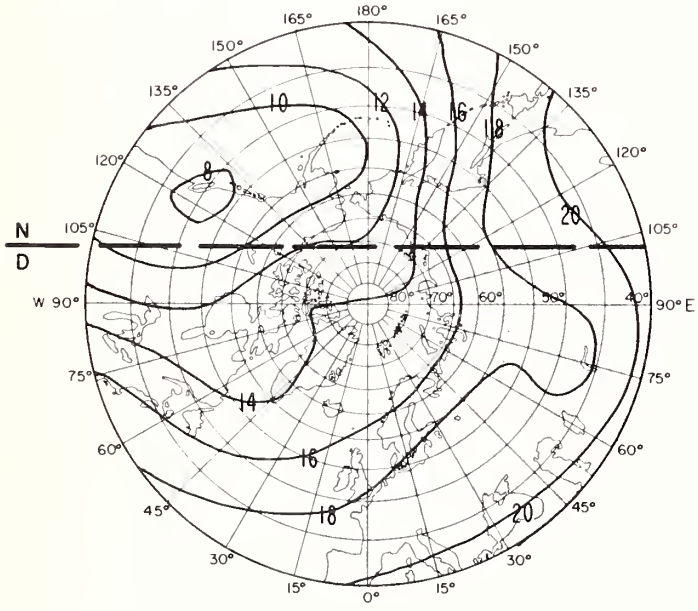


FIG 19A PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

NORTH POLAR AREA



SOUTH POLAR AREA

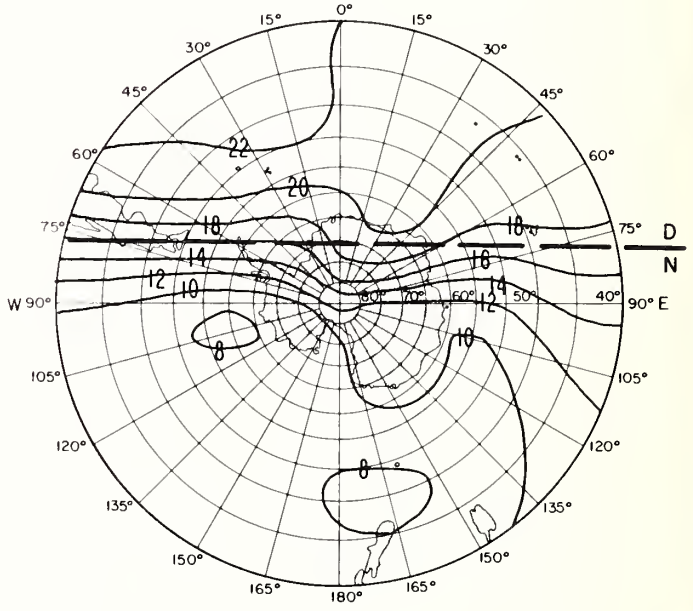
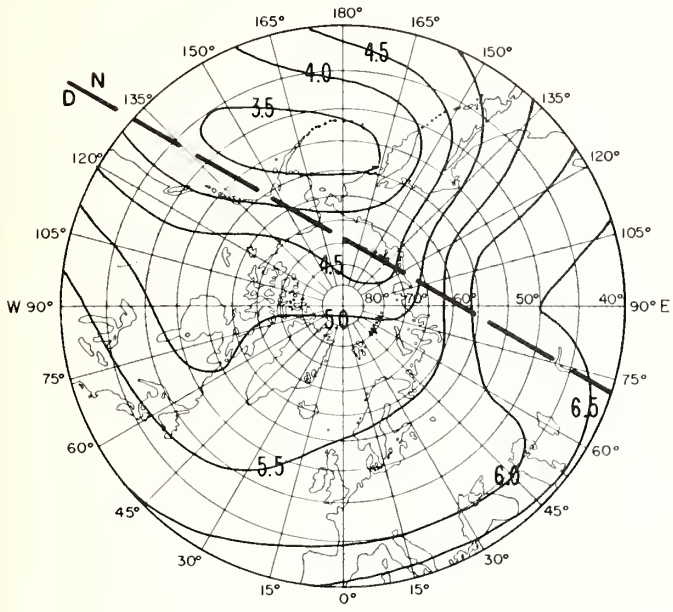


FIG. 19B PREDICTED MEDIAN MUF (4000) F2 (Mc/s)

AUGUST 1965 UT= 14

NORTH POLAR AREA



SOUTH POLAR AREA

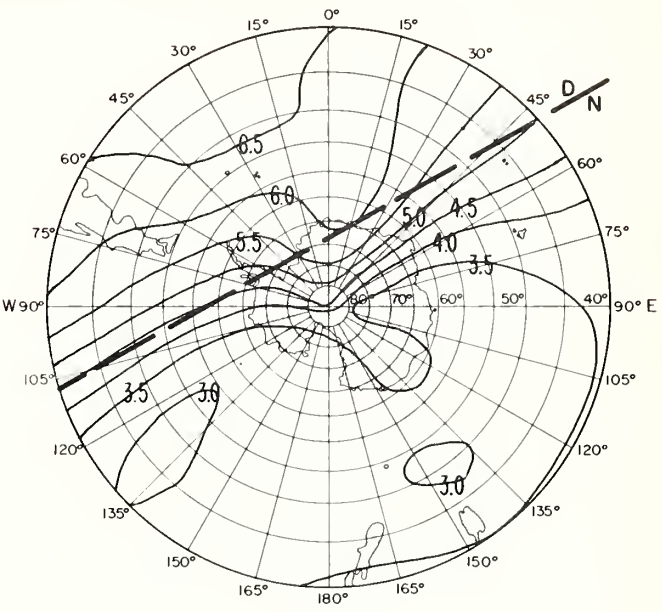
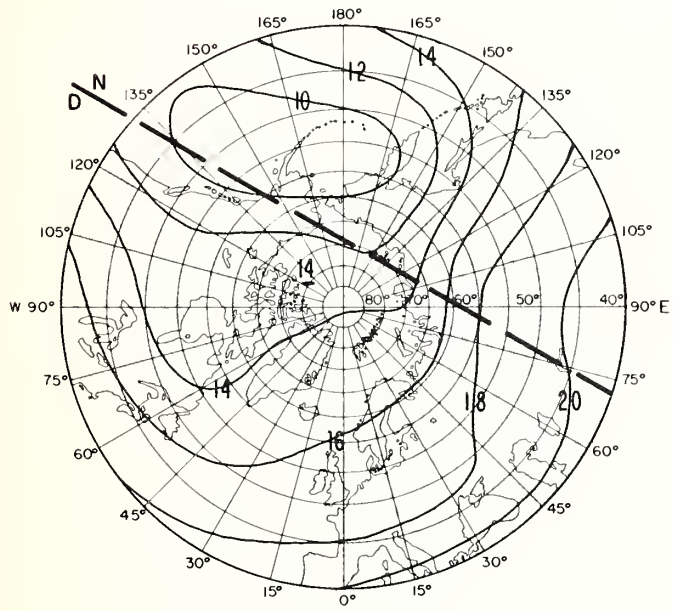


FIG 20A PREDICTED MEDIAN MUF (ZERO) F2 (Mc/s)

NORTH POLAR AREA



SOUTH POLAR AREA

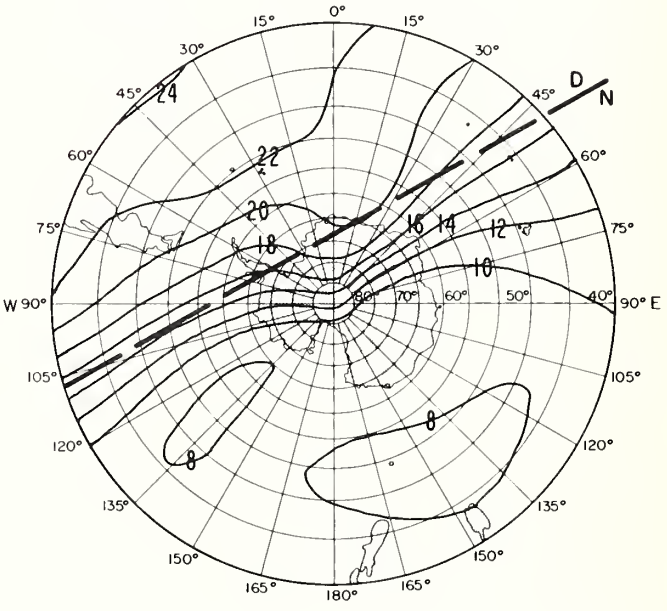
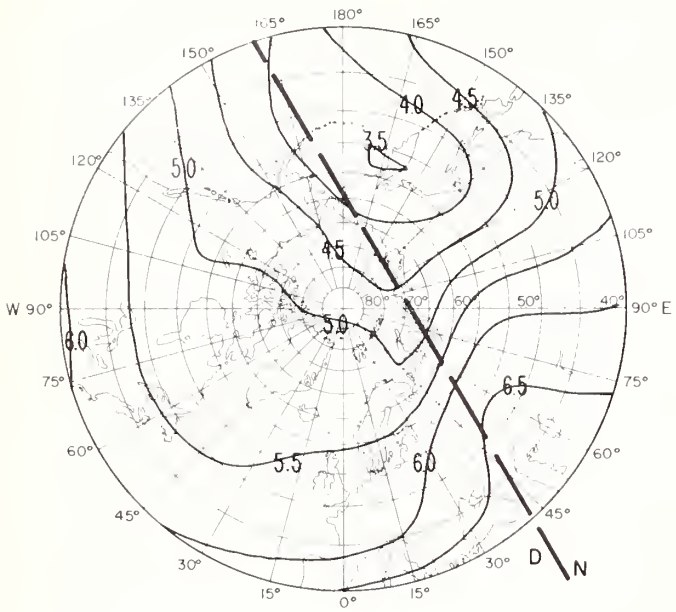


FIG. 20B PREDICTED MEDIAN MUF (4000) F2 (Mc/s)

AUGUST 1965 UT= 16

NORTH POLAR AREA



SOUTH POLAR AREA

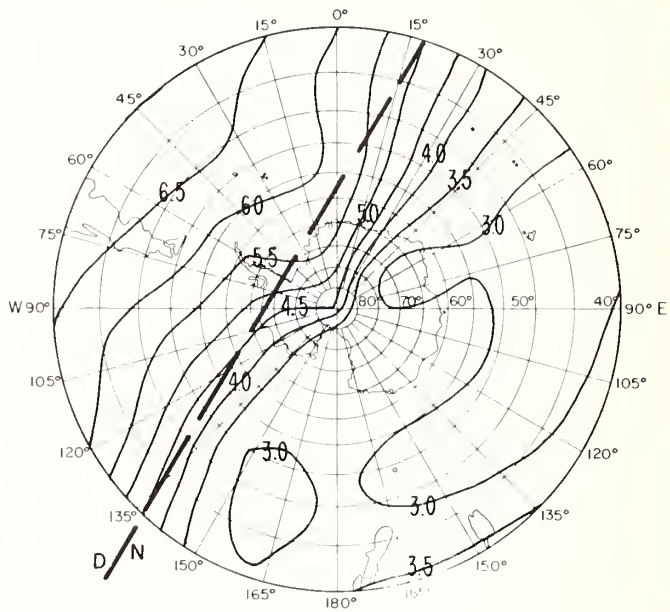
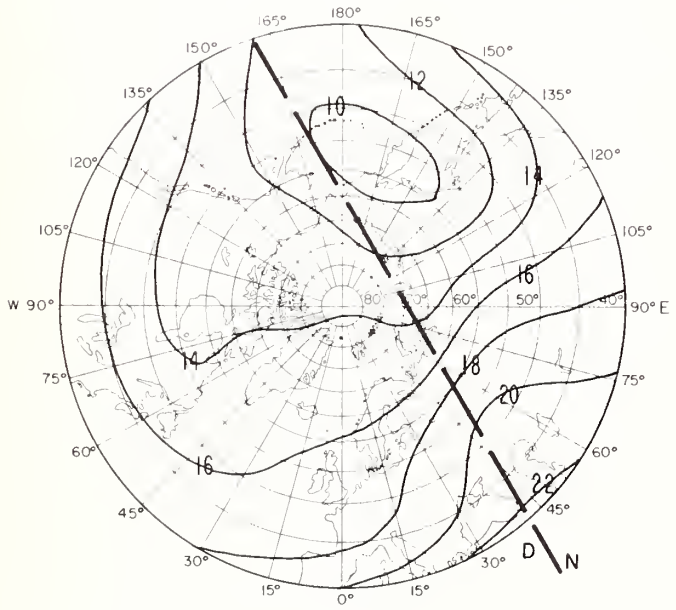


FIG. 21A PREDICTED MEDIAN MUF(ZERO)F2 (Mc/s)

NORTH POLAR AREA



SOUTH POLAR AREA

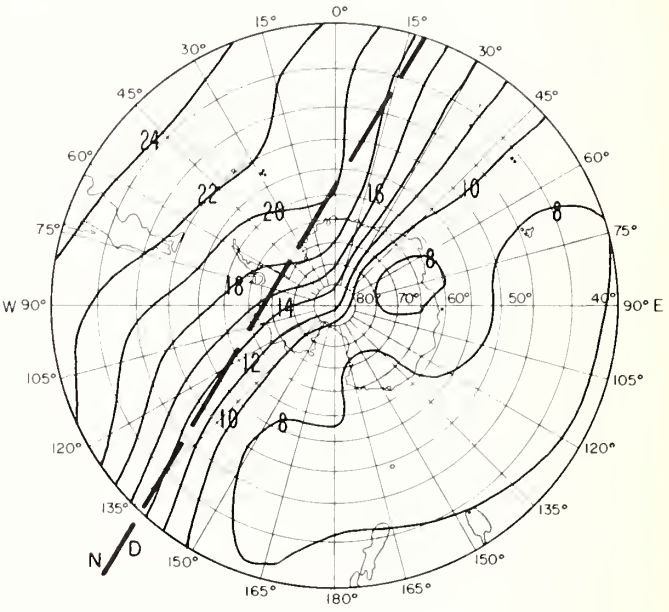
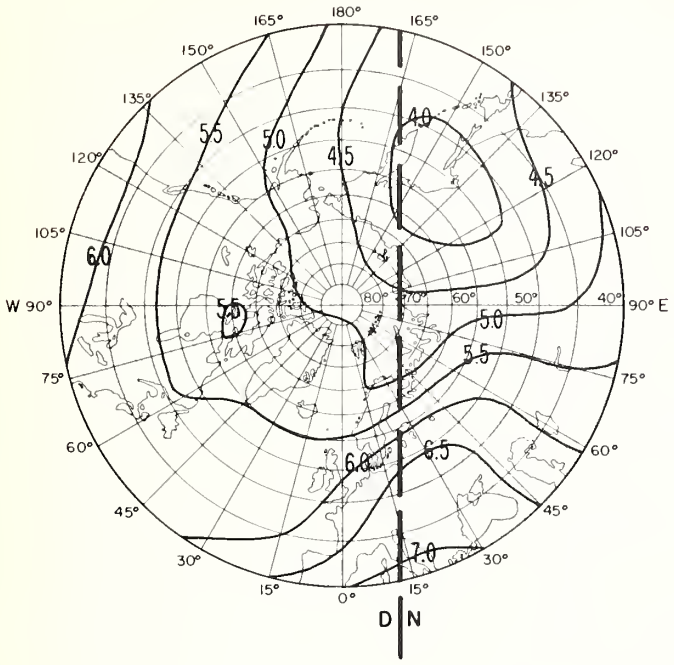


FIG. 21B PREDICTED MEDIAN MUF (4000) F2 (Mc/s)

AUGUST 1965 UT= 18

NORTH POLAR AREA



SOUTH POLAR AREA

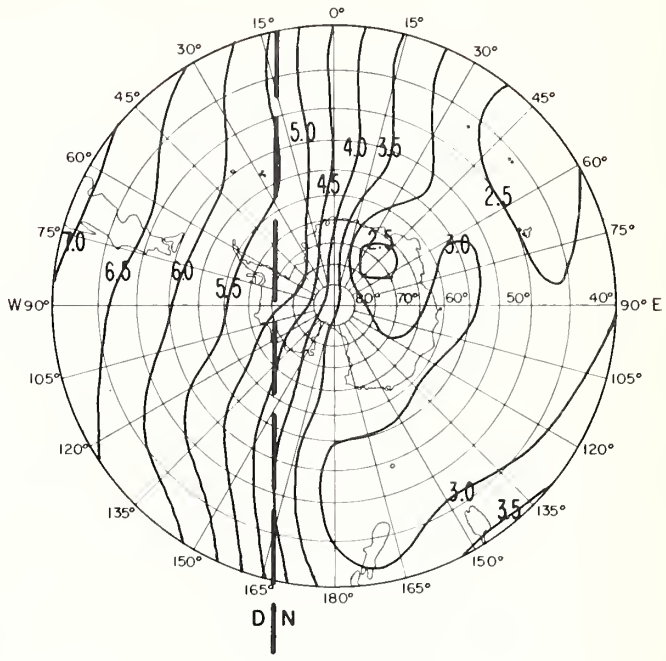
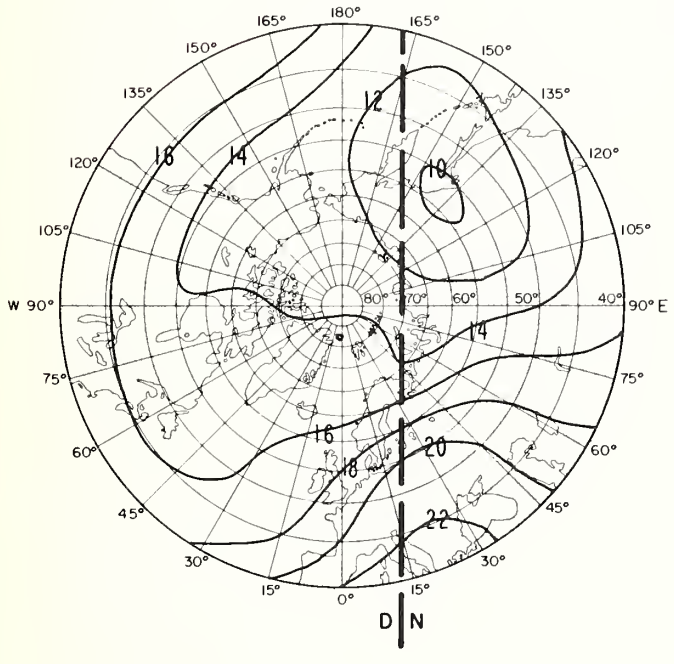


FIG. 22 A PREDICTED MEDIAN MUF (ZERO) F2 (Mc/s)

NORTH POLAR AREA



SOUTH POLAR AREA

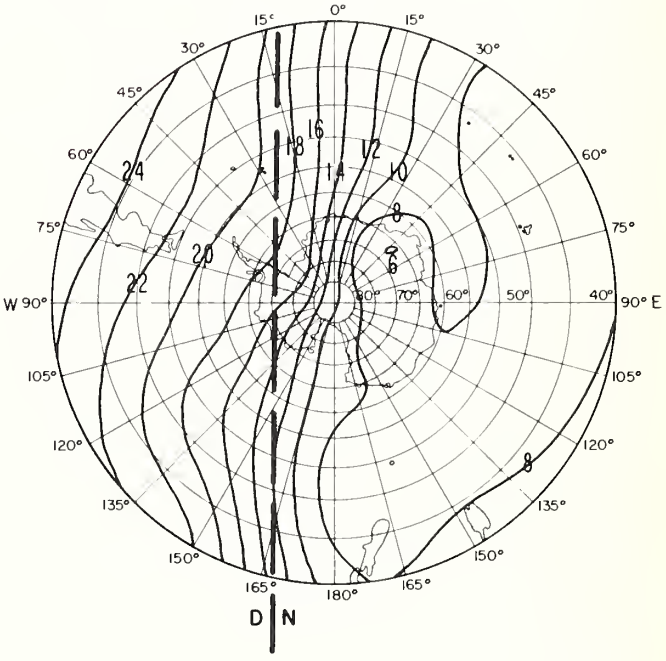
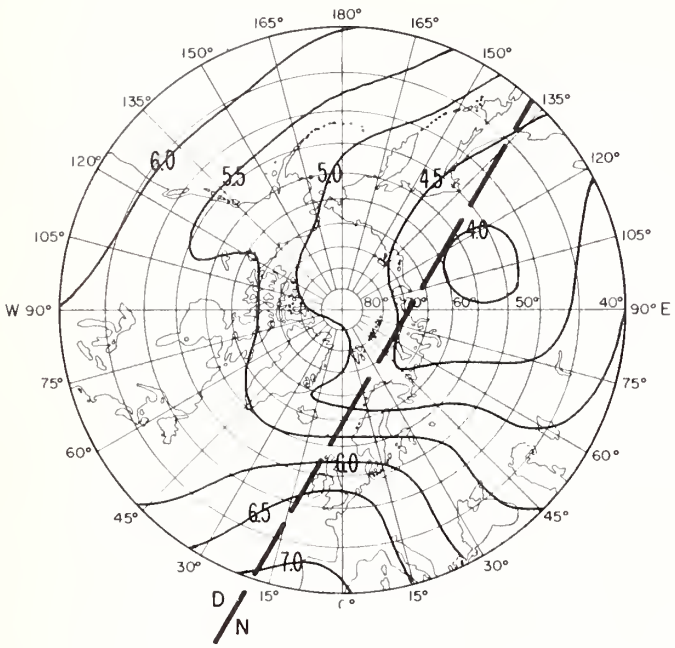


FIG. 22 B PREDICTED MEDIAN MUF (4000) F2 (Mc/s)

AUGUST 1965 UT= 20

NORTH POLAR AREA



SOUTH POLAR AREA

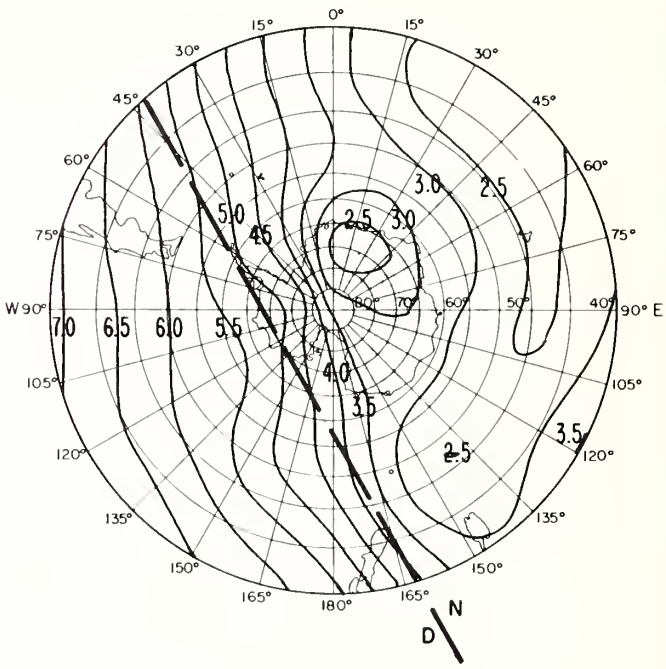
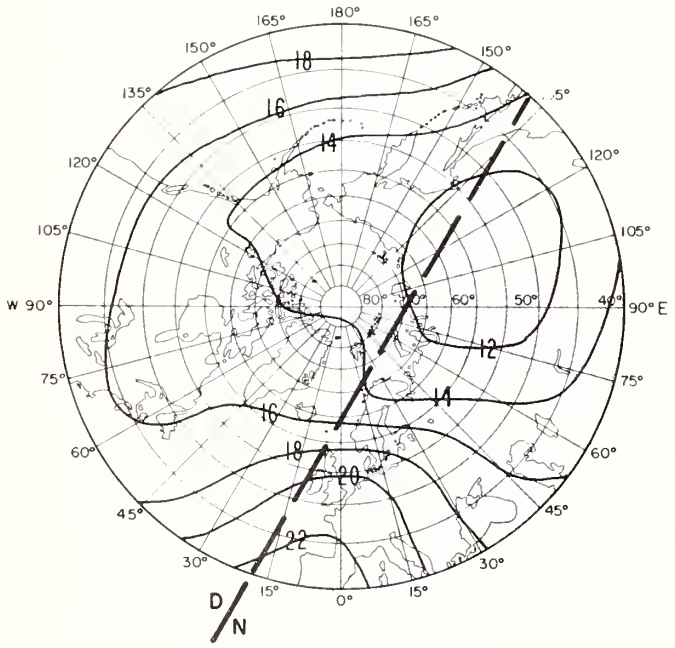


FIG. 23 A PREDICTED MEDIAN MUF (ZERO) F2 (Mc/s)

NORTH POLAR AREA



SOUTH POLAR AREA

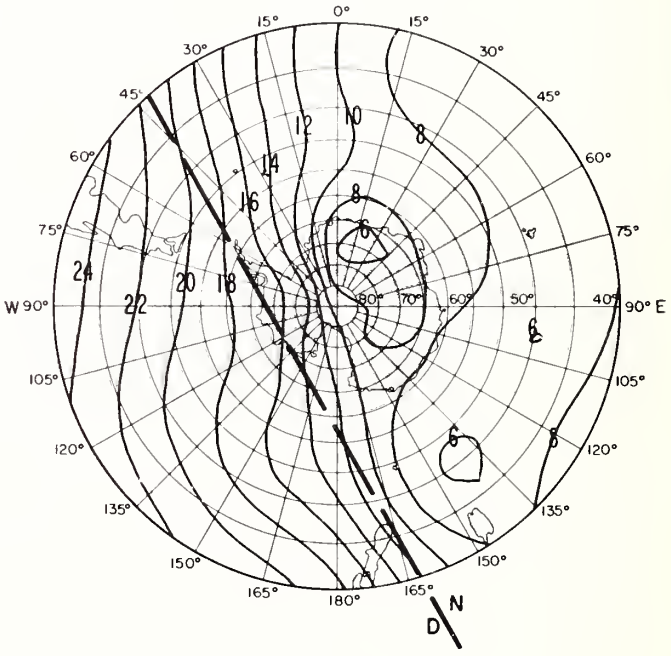
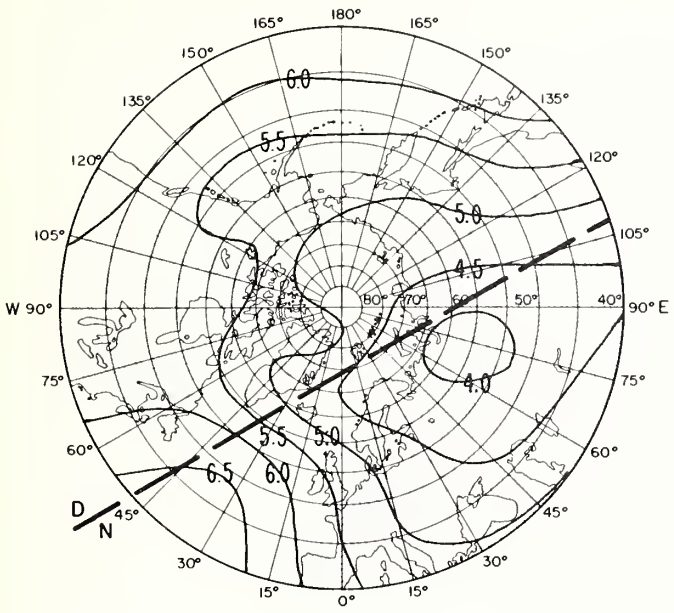


FIG. 23 B PREDICTED MEDIAN MUF (4000) F2 (Mc/s)

AUGUST 1965 UT=22

NORTH POLAR AREA



SOUTH POLAR AREA

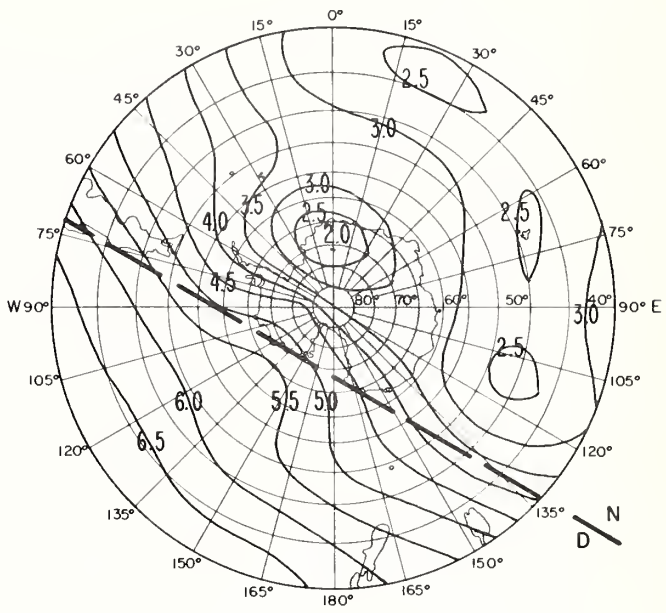
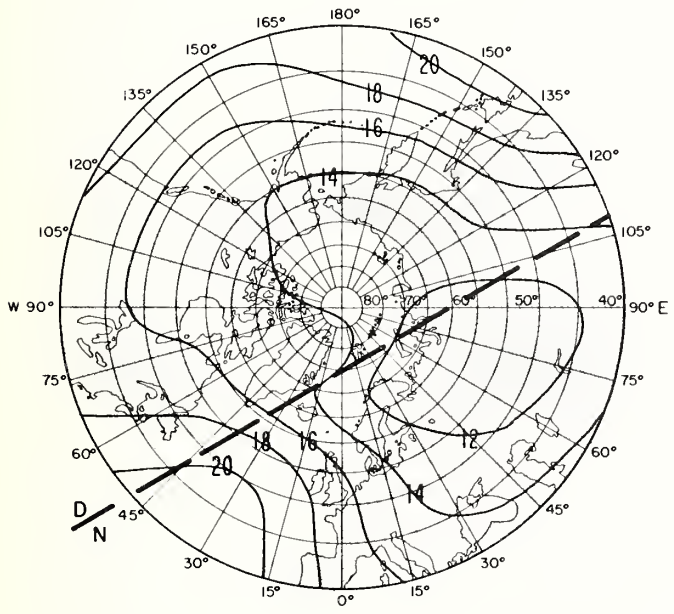


FIG. 24 A PREDICTED MEDIAN MUF (ZERO) F2 (Mc/s)

NORTH POLAR AREA



SOUTH POLAR AREA

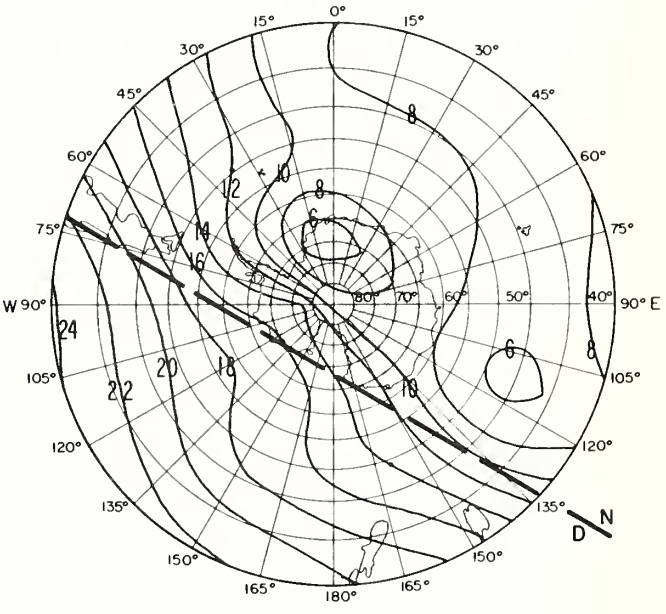


FIG. 24B PREDICTED MEDIAN MUF (4000) F2 (Mc/s)

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NG: None.
USAR: None.
For explanation of abbreviations used, see AR 320-50.

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