TECHNICAL LETTER NUMBER 18

COMPILATION OF SEISMIC-REFRACTION CRUSTAL DATA
IN THE SOVIET UNION*

by

Robert Rodriguez**, William P. Durbin, Jr.,***
J. H. Healy**, and David H. Warren**

DENVER, COLORADO
Dr. Charles C. Bates  
Chief, VELA UNIFORM Branch  
Advanced Research Projects Agency  
Department of Defense  
Pentagon  
Washington 25, D. C.  

Dear Dr. Bates:  

Transmitted herewith are 10 copies of:  

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Sincerely,  

L. C. Pakiser, Chief  
Branch of Crustal Studies  

* Work performed under ARPA Order No. 485.  
*** United States Air Force Aeronautical Chart and Information Center,  
St. Louis, Missouri.
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INTRODUCTION

The U. S. Geological Survey is preparing a series of terrain atlases of the Sino-Soviet bloc of nations for use in a possible nuclear-test detection program. Part of this project is concerned with the compilation and evaluation of crustal-structure data. To date, a compilation has been made of data from Russian publications that discuss seismic-refraction and gravity studies of crustal structure. Although this compilation deals mainly with explosion seismic-refraction measurements, some results from earthquake studies are also included. None of the data have been evaluated.

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DESCRIPTION OF THE COMPILATION

The compilation of crustal-structure data is presented on a series of 4 maps which can be used as overlays on Army Map Service Series 1106 base maps that cover land areas in the eastern hemisphere. Major land and water areas have been outlined to facilitate the identification of locations without resorting to the parent map.

Major emphasis of the compilation has been on crustal thickness. Profile-line locations are generally replaced by lines along which crustal thickness values have been compiled from seismic-refraction data, gravity data, or a combination of both. Depths to the M discontinuity are sometimes scaled from published sections and do not necessarily represent the original measurements presented in the text. Upper-mantle velocities are listed when these data are available from seismic studies.

Although the legend on each map is intended to be self-explanatory, it is also explained here. Location of data is represented by either an X or a line. Crustal-thickness values are listed either separately or as the numerator of a fraction. Velocities in the upper mantle appear as the denominator of the fraction or to the side of the line location. If a number follows, it is an index to a reference listed in reference E-1, Demenitskaya (1961).

A keyed list of references follows the section of this report entitled REFERENCES. All references are available in English translation.
REFERENCES

Three references are of particular value because of the large amount of data they contain: McConnell and McTaggart-Cowan (1963), Demenitskaya (1961), and the collection "Deep Seismic Sounding of the Earth's Crust in the U.S.S.R." (1962).

References are listed in English translation in arbitrarily separated lists. Lists A to D are defined by geographic region. List E contains comprehensive compilations, and List F contains papers from the collection "Deep Seismic Sounding of the Earth's Crust in the U.S.S.R." (1962). The abbreviation of the translating agency is listed in parentheses following the reference. They are:

ACIC U. S. Air Force Aeronautical Chart and Information Center.
AGI American Geological Institute.
AGU American Geophysical Union.
List A - Baltic Shield - Caucasus


List B - Caspian Sea - Turkmenia


List C - Lake Balkhash


List D - Lake Baykal - Pacific Ocean


D-2 Shaposhnikov, K. K., 1962, Structure of the earth's crust in the northeastern region of the USSR, as obtained from the geophysical data: Jour. Geol. and Geoph., no. 9, p. 100-105. (ACIC).


List E - Additional Sources


F-10 Egorkin, A., The structure of the terrestrial crust in the Southeast of the Russian Platform, p. 171-212.

F-11 Pomerantseva, I. V., and Margot'yeva, M. V., On the question concerning the nature of waves recorded during the deep seismic sounding, p. 213-247.


F-13 Trebukova, B. D., Results in connection with the application of the deep seismic sounding method on the dry land in Azerbaydzhan SSR, p. 277-290.

F-15 Gal'perin, Ye., The fundamental characteristic of plutonic waves recorded during deep seismic sounding in the Central part of the Caspian Sea, p. 305-342.

F-16 Donabedov, A. T., and others, Study of the structure of terrestrial crust in Eastern coast line of Caspian Sea with application of deep seismic sounding method, p. 343-381.

F-17 Neprochnov, Yu. N., Results of abyssal seismic sounding in the Black Sea, p. 382, 396.