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Note: Unless indicated otherwise, the quoted data, documents or codes are available *costfree upon request*. - When requesting data on magnetic tape, kindly specify the acceptable density (1600 or 6250 bpi), maximum block size, and whether the data should be in EBCDIC or ASCII code. Only 9 track tapes are used. Data files or computer codes that are not too large can also be sent on DOS standard diskettes (either 5.25 inch, 1.2 Mb or 3.5 inch, 1.44 Mb).

Personal item

Dr. J.J. Schmidt has retired. He was the head of the IAEA Nuclear Data Section for more than 22 years from 1969 to 1992. More than anyone else he promoted international cooperation in the field of nuclear data. The International Nuclear Data Committee, data centre networks, specialists meetings to assess data needs, training courses, and research contracts are some of the keywords of his activities, which were notably successful due to his broad knowledge, initiative, and exceptionally friendly personality. - The staff of the IAEA Nuclear Data Section wishes to express its deep gratitude for his guidance throughout the years.

NDIS - on-line access

We are happy to announce that some of the major nuclear data libraries can now be accessed on-line via the INTERNET computer network. "NDIS", the IAEA Nuclear Data Information System includes presently the following data libraries: ENDF/B-6, BROND-2, CENDL-2, JENDL3.1; EXFOR (CSISRS); ENSDF, NUDAT; GAM-ATOM (photo-atomic interactions); and the bibliographic files CINDA and NSR. See the earlier issues of the Nuclear Data Newsletter for more detailed information on these acronyms.

How to access "NDIS" via INTERNET:

1. enter "TELNET d5100.IAEA.or.at" - this is the TCP/IP address of the IAEA's gateway.
2. at the "login:" prompt, enter "M4300::"
3. at the "username:" prompt, enter "IAEANDS"
4. when prompted "Enter NDS assigned authorization code":
 - either enter "QUEST": you will have 30 seconds of CPU time allocated
 - or enter your assigned authorization code if you have one (see below)

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5. specify the appropriate type of your CRT terminal-whether ANSI standard or not.

Then you should see the NDIS-Menu which should be self explanatory. After logging out from NDIS you can

6. - either exit (at the prompt "Telnet command:" enter "QUIT" or
- register for an authorization code if you do not have one yet; this code still needs to be activated by the NDIS manager before you can use it for future on-line access.

In the initial phase technical difficulties cannot be excluded. Kindly send us your comments on any difficulty encountered to our e-mail address.

Notes: On a non-ANSI terminal (e.g. IBM computer) NDIS will be available in line mode only which is less comfortable than the full-screen mode obtained on ANSI terminals. When, in line mode, the message HOLDING appears at the bottom-right corner of your screen, press CLEAR (or PAUSE if PC keyboard) to scroll. If your screen becomes corrupted, press F4 to exit.

Data indexes and bibliographies

CINDA-92, the 1992 edition of the bibliography and data index for microscopic neutron data is now available for a sales price of 240.- Austrian Schillings. It covers the period from 1988 to 1992 and supplements the issue CINDA-91, which was announced in the previous issue of this newsletter.

BROND-2, CENDL-2, ENDF/B-6, JEF-1, JENDL-3.1

A compact joint index to these recently released neutron reaction data libraries is available as document IAEA-NDS-107 Rev. 6. It also includes a joint index to the available fission-product yield data libraries.

IAEA-NDS-7 (Rev. 92/7): Index of nuclear data libraries available on magnetic tape or PC diskettes from the IAEA Nuclear Data Section. H.D. Lemmel (ed.).

IAEA-NDS-0 (Rev. 92/5): Index to the IAEA-NDS-Documentation Series for available nuclear data libraries.

Nuclear data processing computer codes

A new version of the ENDF Pre-Processing Codes by D.E. Cullen has been released. This 1992 version is documented in the report IAEA-NDS-39 Rev. 7. These codes are required for processing evaluated nuclear data coded in the format ENDF-6, ENDF-5, or ENDF-4. Included are the codes CONVERT, MERGER, LINEAR, RECENT, SIGNAL, LEGEND, FIXUP, GROUPIE, DICTION, MIXER, VIRGIN, COMPILOT, EVALPLOT, RELABLE. These "pre-processing codes" supplement the "utility codes" that were announced in the previous issue of this newsletter.

For the ENDF Utility Codes Version 6.7 by C.L. Dunford, NNDC, which were announced in the previous issue of this newsletter, the documentation by P.K. McLaughlin (ed.) is now available as IAEA-NDS-29 Rev. 4.

New data libraries received

ENDF/B-6. For the neutron data sublibrary of ENDF/B-6 (the U.S. Evaluated Nuclear Data Library) revisions have been received

- for the following light elements: 1-H-1, 2-He-3, 3-Li-6, 5-B-10, 6-C, 11-Na-23;
- for the isotopic files of the structural materials Cr, Fe, Ni;
- for the medium element files 40-Zr-nat, 41-Nb-93, 50-Sn-112,114, 57-La-139, 60-Nd-147, 61-Pm-147, 62-Sm-151, 63-Eu-155, 72-Hf-180, 74-W-nat, 79-Au-197, 82-Pb-207;
- and for the actinides 92-U-235,238, 93-Np-237, 94-Pu-240,241, 95-Am-242,242m, 98-Cf-252.

The revisions are partly small (such as updating a Q value) and partly extensive (such as revised resonance parameters for U-235).

Available upon request are the following data files:

- the 40 materials revised in 1991, basic file with resonance parameters (200.000 records);
- the entire ENDF/B-6 library
 - basic file with resonance parameters (600.000 records)
 - point data where resonance parameters have been converted to cross-sections;
 - or selective retrievals for specified materials.

The "ENDF/B-VI Summary Documentation" edited by P.F. Rose has been issued as report ENDF-201 4th ed. (Oct. 1991) [same as report BNL-NCS-17541 4th ed.].

BROND-2, the Russian Evaluated Nuclear Data Library for neutron reaction data. This data library containing evaluations for 121 elements or isotopes from 1-H-1 to 96-Cm-244 was released in 1992. It has a size of 266,000 records in ENDF-6 format. In addition to the standard version (with resonance parameters) a "point data version" (where the resonances have been converted to cross-section data) is also available.

A brief summary documentation is available as document IAEA-NDS-90 Rev. 5. A more detailed documentation has been published in *Yadernye Konstanty* 1991, issues 2 and 3 (limited number of copies available).

CENDL-2, the Chinese Evaluated Nuclear Data Library for neutron reaction data. This data library containing evaluations for 49 elements or isotopes from 1-H-1 to 98-Cf-249 was released in 1991/1992. It has a size of 270,000 records. The format is partly ENDF-5, partly ENDF-6. Available on magnetic tape. A brief summary documentation is available as document IAEA-NDS-61 Rev. 1. A more detailed summary documentation has been published in "Communication of Nuclear Data Progress No. 6 (1991)" [same as report CNIC-596; CNDC-8; INDC(CPR)-25; limited number of copies available.]

ENDF/B-6 charged-particle sublibraries for hydrogen and helium isotopes, 4100 records in ENDF-6 format. It includes complete (double differential) evaluations for the interaction of protons with H-1 and He-3, and evaluated cross-sections for five fusion reactions between d, t, and He3 particles. Summary documentation: IAEA-NDS-105.

ENDF/B-6 decay data library, by the U.S. National Nuclear Data Center. It includes all pertinent decay data for all fission-product nuclei, radionuclides resulting from neutron activation, and actinides, that occur in the ENDF/B-6 main library. 64,000 records in ENDF-6 format.

ENDF/B-6 sublibraries for fission-product yield data, consisting of two parts, one for neutron induced fission, another for spontaneous fission, together 84,000 records. A table of contents is given in the document IAEA-NDS-106.

Fission-product yield and fission neutron data, files on two PC diskettes by M.C. Brady, R.Q. Wright and T.R. England, 1989/1991. The evaluation methodology has been described in the report ORNL/CSD/TM-266 (1991). For a brief description of the contents of the two PC diskettes see the document IAEA-NDS-102.

Note: Above two fission-product yield data libraries supplement each other and overlap only partly. The authors advise that in the areas of overlap the ENDF/B-6 data should be preferable although no serious discrepancies are expected.

JENDL-3 dosimetry library, evaluated data for selected reactions used for neutron dosimetry by foil activation. Most but not all of the data were taken from JENDL-3 supplemented with covariance data. Brief documentation see IAEA-NDS-140.

JENDL-3 gas production library, evaluated data for selected hydrogen- and helium-isotopes producing neutron reactions extracted from JENDL-3. Detailed documentation by T. Nakagawa and T. Narita (eds.) in report JAERI-M-92-076. Brief documentation see IAEA-NDS-139.

Strong gamma-rays emitted from radionuclides. A tabulation of 100 pages by T. Narita and K. Kitao, JAERI, Japan, published in the report JAERI-M-92-051 (1992). The tabulation includes the columns: energy, intensity, parent nuclide, decay mode, half-life, no. of G, energies and intensities of two other intense gamma-rays. The data were taken from the ENSDF database as of Feb. 1991. The list has also been prepared on a floppy diskette "Narita Gammas" which is available upon request.

Multigroup nuclear data

The WIMS code and its data libraries have been widely used for thermal reactor application calculations. Attention is drawn to a recent paper by M.J. Halsall, reviewing briefly the considerations that led to the structure

and content of the original WIMS library, looking at some of the deficiencies in the current library and at the steps that are being taken at Winfrith to overcome them. Reference: Nucl. Energy 30 (1991), no. 5, Oct. 1991, 285-290.

FENDL Multigroup Libraries by S. Ganesan and D.W. Muir. Coupled neutron-gamma data files in MATXS multigroup format have been generated for a large number of elements and isotopes selected from the libraries ENDF/B-6, JENDL-3.1, or BROND-2. The materials were selected according to the data needs in the International Thermonuclear Experimental Reactor (ITER) project. The files are in Vitamin-J structure and include 175 energy groups and P-5 Legendre order for describing all the neutron interaction cross-sections, and 42 energy groups for describing photon production and photon-atomic interaction (P-8 Legendre order) cross-sections. For a list of files presently available including specification of weight functions, temperatures, background dilutions, and other parameters, kindly request the document IAEA-NDS-129 from which the requestor then may wish to select the multigroup data files of his interest.

Selected new publications on nuclear data

Handbooks

The Nuclear Fission Process, a comprehensive monograph with contributions from eleven leading experts, by C. Wagemans (ed.). Following the series of conferences in 1988/89 on the occasion of the 50th anniversary of the discovery of nuclear fission, this book gives a thorough survey on the present knowledge and understanding of the fission process. The twelve chapters include: Historical introduction. Fission barriers. Spontaneous fission. Neutron-induced fission. Photon- and electron-induced fission. Charged-particle induced fission. Theoretical models of mass distribution. Mass, charge, and kinetic energy of fission fragments. Fission fragment angular momentum and angular distributions. Neutron and gamma emission in fission. Ternary fission. While the book was written at a level to introduce graduate students to the physics of nuclear fission, it concentrates on the recent results that could be obtained with improved nuclear technology and new powerful measurement devices, so that also advanced scientists will read it with pleasure. Each chapter is followed by a carefully selected list of references (up to 1990) for in-depth studies. - The book was published by CRC Press Inc., 200 Corporate Blvd., N.W., Boca Raton, Florida 33431, USA. The sales price is 230.- US\$ plus 10.- \$ for shipping.

Nuclear Radiation Detectors, a monograph by S.S. Kapoor and V.S. Ramamurthy of the Bhabha Atomic Research Centre, Trombay, India. The book of 240 pages gives a clear and compact survey of the large variety of modern nuclear radiation detectors used in pure and applied nuclear sciences. It is organized in eight chapters which include: General introduction. Basic physical processes in radiation detection. Gas-filled ionization detectors. Semiconductor detectors. Scintillation detectors. Neutron detection and spectrometry. Electronics for detector signal processing. Track etch detectors. The book has been written for post-graduate students and those beginning to work with radiation detectors. Lists of references (up to 1983) that follow each chapter, make the book useful also for advanced studies. - The book can be ordered from S.K. Gupta, Indian Physics Association, BARC, Bombay 400 085, India. Scientists from outside India may obtain it at a reduced rate of 20.- US\$.

Conference proceedings

Nuclear Data for Science and Technology, international conference in Jülich, Germany, 13-17 May 1991. Proceedings, S.M. Qaim (ed.). The book of more than 1000 pages contains 285 papers grouped under the following headings: Nuclear Data Relevant to Fission Reactors and some Fundamental Studies with Slow Neutrons; Data Testing and Validation for Reactors; Nuclear Data for Fusion Reactor Technology; Experimental Facilities and Techniques; Nuclear Data Relevant to Standards; Nuclear Structure and Decay Data; Nuclear Data for Medical Applications; Nuclear Data Relevant to Astrophysics, Geology, Neutron Dosimetry and some other Applications; Medium Energy Data; Nuclear Models and Evaluation Methodology. It is thus a most complete and up-to-date interdisciplinary handbook on theory, experiment, and application of nuclear data. The book can be ordered from: Springer-Verlag, Heidelberger Platz 3, D-1 Berlin 33, Germany, at a sales price of 296.- DM. Payment by credit card is possible.

Nuclear Spectroscopy and Structure of the Atomic Nucleus, international conference Alma-Ata, 21-24 April 1992. Book of abstracts, about 400 papers, almost all abstracts in Russian.

This is the continuation of the previous "All-Union Conferences" of which the last and 41st was in Minsk in 1991. The 1992 Conference was organized by the Russian and the Kazakhian Academies of Sciences.

Nuclear Reaction Mechanism, proceedings of an International Conference on this topic which was held at the Saha Institute of Nuclear Physics, Variable Energy Cyclotron Centre, Calcutta, India, 3-9 Jan. 1989. The book, which was edited by Suproakash Mukherjee, contains 60 invited papers by experts from 14 countries reviewing the latest situation in the theoretical and experimental advances made towards the understanding of different mechanisms of nuclear reactions. A Supplementary Volume contains 10 contributed papers. The proceedings can be ordered from the World Scientific Publishing Co, P.O. Box 128, Farrer Road, Singapore 9128. USA office: 687 Hartwell Street, Teaneck, NJ 07666. UK office: 73 Lynton Mead, Totteridge, London N20 8DH. - Not available from IAEA.

Fast Neutron Physics, proceedings of an international symposium in Beijing, China, 9-13 Sept. 1991, Sun Zuxun et al. (ed.). The book contains 35 invited papers (20 by Chinese authors, 15 by foreign authors) reviewing the current status of the following topics: 1. Scattering and energy spectrum; 2. nuclear fission; 3. γ -ray spectroscopy and (n,γ) reaction mechanism; 4. nuclear theory; 5. activation cross-sections; 6. nuclear reactions; 7. intermediate energy. The book can be ordered from the World Scientific Publishing Co (see the preceding item for the address).

1991 Symposium on Nuclear Data, JAERI, Tokai, Japan, 28-29 Nov. 1991. M. Baba and T. Nakagawa (ed.). Topics (among others): JENDL-3: status, special purpose files, benchmarks; nuclear models and advanced methods for nuclear data evaluation; nuclear data measurements. Proceedings including all of the 38 papers published as report JAERI-M-92-27. (Limited number of copies available.)

7th ASTM-Euratom Symposium on Reactor Dosimetry, Strasbourg, France, 27-31 Aug. 1990. Proceedings edited by G. Tsotridis, R. Dierckx, P. d'Hondt. Kluwer Academic Publishers. The book of 950 pages includes chapters on reactor life assessment (5 papers), light water reactor surveillance (18), computer codes and methods (15), nuclear data (9), fusion (6), radiation fields characteristics (18), benchmarks (7), damage correlations (6), techniques (16), and several papers of general interest and summaries of workshop meetings. - Not available from IAEA.

Second Asian Symposium on Research Reactors, Jakarta, 23-25 May 1989. 69 papers on various uses of research reactors were presented. Proceedings in 2 vols. issued by the Indonesian National Atomic Energy Agency. (Not available from IAEA Nuclear Data Section.)

Nuclear data for neutron emission in the fission process, proceedings of an IAEA consultants' meeting, Vienna, 23-24 Oct. 1990. S. Ganesan, ed. Report INDC(NDS)-251, costfree.

High-energy nuclear data, proceedings of a specialists' meeting at JAERI, Tokai, Japan, 2-4 Oct. 1991. T. Fukahori (ed.). Report JAERI-M-92-039. (Limited number of copies available.)

Thorium utilization, proceedings of an Indo-Japan Seminar, 10-13 Dec. 1990, Bhabha Atomic Research Centre, Bombay, India. M. Srinivasan, I. Kimura (ed.) - Not available from IAEA.

Selected reports and documents on nuclear data

- * = documents available costfree from IAEA/NDS upon request.
- = available from originator or from the INIS Microfiche Service (IAEA, P.O. Box 100, A-1400 Vienna, Austria).

Data center networks

- * INDC(NDS)-250. Co-ordination of the international network of nuclear structure and decay data evaluation. Summary of a meeting in Kuwait, 10-14 March 1990. H.D. Lemmel (ed.)

- * INDC(NDS)-262. 11th IAEA Consultants' Meeting of the nuclear reaction data centers. Summary of a meeting in Obninsk, 7-11 Oct. 1991. H.D. Lemmel (ed.)

Progress reports

- * INDC(CPR)-19. Communication of nucl. data progress, China, No. 4 (1990).
- * INDC(CPR)-22. Communication of nucl. data progress, China, No. 5 (1991).
- * INDC(CPR)-25. Communication of nucl. data progress, China, No. 6 (1991).
- * NEANDC(J)-164. Japan Progress reports to the Japanese Nuclear Data Committee 1990/1991. S. Kikuchi, ed.
- Annual Report 1991, PTB Braunschweig, Div. 7 - Neutron Physics, R. Jahn, O. Hecker (ed.).

Neutron cross-sections

- * INDC(CUB)-5. Accuracy of neutron cross-section calculation at low energies. R. Cabezas et al.
- * INDC(CUB)-6. Combined method of deformed nuclei level density calculation code (DENCOM). S.N. Egorov et al.
- * INDC(NDS)-260. FENDL-2 and associated benchmark calculations. Summary of an IAEA Meeting, Vienna, 18-22 Nov. 1991. A.B. Pashchenko, D.W. Muir, ed.
- * JAERI-1325. JENDL dosimetry file. (Based on JENDL-3). M. Nakazawa et al.
- * JAERI-M-92-053. Double-differential neutron-emission cross-sections calculated from evaluated nuclear data libraries, compared with experimental data. T. Fukahori et al.
- * JAERI-M-92-020. Measurement of formation cross-sections short-lived nuclei by 14 MeV neutrons (F, Mg, Si, Ti, Cr, Ni, Ga, Rb, Sr, Ag). K. Kawade et al.

Actinides fission yields

- ORNL/CSD/TM-266. Actinide Nuclear Data for Reactor Physics Calculations. M.C. Brady, R.Q. Wright, T.R. England, July 1991.
- * INDC(NDS)-261. Compilation and evaluation of fission yield nuclear data. Summary of an IAEA Consultants' Meeting, Vienna, 27-29 Sept. 1989. M. Lammer (ed.)

Charged-particle reactions

- * JAERI-M-92-029. Polarized proton induced breakup of C-12 at 16 MeV. N. Koori et al.
- UCRL-50400 Vol. 30. Tables and graphs of atomic subshell and relaxation data derived from the LLNL Evaluated Atomic Data Library (EADL), Z=1-100. S.T. Perkins, D.E. Cullen, M.H. Chen, J.H. Hubbell, J. Rathkopf, J. Scofield, 1991.
- UCRL-50400 Vol. 31. Tables and graphs of electron-interaction cross-sections from 10 eV to 100 GeV derived from the LLNL Evaluated Electron Data Library (EEDL), Z=1-100. S.T. Perkins, D.E. Cullen, S.M. Seltzer, 1991.

Decay data

- AEA-RS-5219. Heavy element and actinide decay data: UKHEDD-2 Data Files. A.L. Nichols.

Electron interaction and atomic data

- UCRL-50400 Vol. 30. Tables and graphs of atomic subshell and relaxation data derived from the LLNL Evaluated Atomic Data Library (EADL), Z=1-100. S.T. Perkins, D.E. Cullen, M.H. Chen, J.H. Hubbell, J. Rathkopf, J. Scofield, 1991.
- UCRL-50400 Vol. 31. Tables and graphs of electron-interaction cross-sections from 10 eV to 100 GeV derived from the LLNL Evaluated Electron Data Library (EEDL), Z=1-100. S.T. Perkins, D.E. Cullen, S.M. Seltzer. 1991.

Yadernye Konstanty

- * Yadernye Konstanty 1991 (issues 2+3), in English: Documentation of the BROND-2 library. Compare on p. 3 of this Newsletter.
- * Yadernye Konstanty 1991(4), in Russian with abstracts in English. Contents: Neutron spectra from 14 MeV neutrons on structural materials (Saukov). Measurement and analysis of the resonance structure of the total and radiative capture cross-sections of U-238 for neutrons from 0.4 to 200 keV (Grigorev). Absolute measurement of the neutron capture cross-section of Cr for neutrons from 1 to 20 keV (Voskanjan). Multichannel coupling method for Ti-48 neutron cross-sections (Kabasas). Evaluated neutron cross-sections of U-234 in the thermal energy region (Morogovskij, Minsk). Co-60 production in power reactor (Golubev). Testing of some actinide neutron data in integral experiments (Bednjakov; many figures including comparisons with ENDF/B-5 and JENDL-3). U-238 and Pu Doppler effect in critical assemblies (Tambovcev). The cross-section library "BISERM" for calculation of gas production and damage rate in structural materials irradiated with nucleons at energies up to 800 MeV (Konobeev). Analytical presentation of (γ ,2n) reaction cross-sections for the γ -activation analysis (Davydov, Rostov Univ.).
- * INDC(CCP)-333. Measurement of neutron leakage spectra from an iron sphere with a 14 MeV neutron source in the centre. B.V. Devkin et al. Translation from Yad. Konst. 1990(2).

The network of nuclear data service centers

New address

The NEA Data Bank has moved closer to the center of Paris. The new address is: OECD Nuclear Energy Agency, Le Seine Saint-Germain, 12 blvd des Iles, F-92130 Issy-les-Moulineaux, France. Tel. +33 (1)4524 (plus extension). Fax +33(1)45241110. Telex OCDE 620160 F. BITNET/EARN (name)@FRNEAB51. INTERNET (name)@130.84.216.5. The NEA Data Bank continues to offer nuclear data services to OECD countries (C. Nordborg, ext. 1092), and computer program services to all countries (E. Sartori, ext. 1072; there may be release restrictions).

The other nuclear data service centers remain unchanged:

For services to customers in USA and Canada:

US National Nuclear Data Center, Bldg. 197D, Brookhaven National Laboratory, Upton, NY 11973, USA. Tel. 516-282-2902. Fax 516-282-2806. INTERNET nndc@bnl.gov; HEPNET bn1:nndc; BITNET nndc@bnl. For information on online services and requests contact V. McLane.

For services to the countries of the former USSR:

Neutron data: Russian Nuclear Data Center, Centr po Jadernym Dannym (CJD), Fiziko-Energeticheskiy Institut, Ploshchad Bondarenko, 249020 Obninsk, Kaluga Region, Russia. Fax 0952552209. Telex 411509 naf su. INTERNET POA@CJD.FEI.OBNINSK.SU

Charged-particle data: Institut Atomnoi Energii I.V. Kurchatova (CAJaD), Ploshchad Kurchatova, Moscow D-182, 123182, Russia. Fax 0959430073. Telex 411594 shu su.

Photonuclear data: Centr Dannyykh Fotojad. Eksp. (CDFE), Nauchno-Issl. Inst. Jad. Fiz., Moskovskij Gos Universitet, Leninskiye Gory, Moscow V-234, Russia. Fax 0959395034. Telex 411483 mgu su. INTERNET CDFE@COMPNET.NPIMSU.HSK.SU

For services to customers in China:

Chinese Nuclear Data Center, Institute of Atomic Energy, P.O. Box 275(41), Beijing, China. Telex 222373 iae cn.

Computer codes of US origin to all countries:

Radiation Shielding Information Center (RSIC), Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6362, USA. Tel. 615-574-6176. Fax 6155746182. (There may be charges and release restrictions.)

The IAEA Nuclear Data Section offers data center services primarily to non-OECD countries (except Russia and China, see above). However, certain products advertised in this Newsletter, specifically INDC reports, IAEA-NDS-documents, etc., are provided, upon request to customers in all countries.

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