Industrial Electronics N2 July 2013 Memorundum

This book presents an earth science-based overview of the challenges to sustainability. It provides a detailed study of climate change, as well as energy, food, and water security across different regions. The author uncovers the problems caused by current social and environmental practices, and offers potential solutions. Focusing on systems theory, footprint analysis, risk, and resilience, many examples are given of how to use resources sustainably, especially common pool resources such as the atmosphere, oceans, and groundwater. The book develops its ideas from an array of practical case studies, centering on communal objectives and shared responsibilities.

This volume responds to the growing interest in adopting aerial robots (UAVs, or drones) for agricultural crop production, which are revolutionizing farming methods worldwide. The book provides a detailed review of 250 UAVs that examines their usefulness in enhancing profitability, yield, and quality of crop production. Recent trends indicate an increase in agricultural drone production and use. Millions of dollars have been invested in start-ups that produce agro-drones in the past several years. North America, Europe, China, and the Far East have excelled in offering a large number of UAV models. Some of them are versatile, a few are specific, and many of them are low cost. With so many drone models (over 1200) available, how do farmers and agricultural specialists choose the models best for them? This compendium examines the most useful drones and provides the pertinent details about each drone, its producer, cost incurred, and its pros and cons. It covers their technical specifications, suitability for various purposes, previous performances in farms, and possible benefits to farmers. It covers fixed-wing drones, fixed-winged (hybrid) VTOL helicopters, multi-copters, tilted-wing drones, etc. The book includes a few drones meant more for military or other purposes (e.g. recreation/fun) but that could be easily modified and adapted for the farming sector. The reviews compare activities among the UAVs, such aerial imagery of crops, ability to provide spectral analyses to collect useful data about a crop’s growth patterns, and how they can be used to gauge crop canopy temperature (i.e. water stress index), determine grain maturity, and much more.

The second International Conference on Trends in Quantum Electron ics (TQE'85) was held in Bucharest at the National Centre for Physics in September 1985, and brought together more than 350 scientists from 22 countries. In accordance with the objectives established at the first conference, which was held in 1982 in conjunction with the third International Summer School in Coherent Optics, the second conference con centrated upon the central topics and chief directions of development in quantum electronics - which stands out as an area of science and technology that is currently expanding vigorously. On the other hand, it was also apparent that TQE'85 was primarily influenced by the worldwide celebration, in 1985, of the 25th anniversary of the laser - a moment of prime importance in the development of many frontline fields, including communications, chemistry, biology, health care and materials processing. A special session was devoted to this anniversary. In keeping with the dynamic spirit of the conference, the fine quality of the invited lectures and the other contributions set a high scientific standard for the proceedings. Mention should be made of the posters that were presented throughout the conference. These, together with the exhibition of books and journals and a display of specialized scientific equipment, did much to create a framework for effective communication and stimulating interaction, to the benefit of all the participants. Of invaluable help in the preparation of the conference was the collaboration of the International Scientific Advisory Committee.

Composed of selected research papers, this book brings together new developments and processes for managing complexity. The included works originate from renowned complexity thinkers, well established practitioners and new researchers in the area of complexity and

detail issues of common interest.

The book contains the materials on the fundamental and applied problems of pulsed lasers. May be interesting for researches and engineers working in the sphere of quantum electronics, spectroscopy, plasma physics, medicine, remote sensing and laser technologies.

III-Nitride Electronic Devices, Volume 102, emphasizes two major technical areas advanced by this technology: radio frequency (RF) and power electronics applications. The range of topics covered by this book provides a basic understanding of materials, devices, circuits and applications while showing the future directions of this technology. Specific chapters cover Electronic properties of III-nitride materials and basics of III-nitride HEMT, Epitaxial growth of III-nitride electronic devices, III-nitride microwave power transistors, III-nitride millimeter wave transistors, III-nitride lateral transistor power switch, III-nitride vertical devices, Physics-Based Modeling, Thermal management in III-nitride HEMT, RF/Microwave applications of III-nitride transistor/wireless power transfer, and more. Presents a complete review of III-Nitride electronic devices, from fundamental physics, to applications in two key technical areas – RF and power electronics Outlines fundamentals, reviews state-of-the-art circuits and applications, and introduces current and emerging technologies Written by a panel of academic and industry experts in each field

The mangrove, seagrass and coral reef ecosystems are of paramount ecological importance but have already undergone great degradation, which is advancing at an alarming rate. If present trends continue, the natural resource basis of the economy and ecology of tropical coastal regions will soon be ruined. This was the unanimous conclusion of the 110 scientists from 23 countries who gathered in Mombasa, Kenya, for a Symposium on the ecology of these ecosystems. Mangrove forest systems yield large amounts of fish, crabs, prawns and oysters. They are also valuable sources of fuelwood, timber, tannin and other natural products. Their non-marketable value is of equal importance: stabilization of the coastline, an indispensable nursery ground for numerous marine species with commercial value, a natural filter maintaining the clarity of nearshore water, a home for resident and migratory birds and other wildlife. Many of the true mangrove flora and fauna are now endangered by the clearing of the mangroves. It has been shown that in many countries between 25 and 100% of the mangrove forest has been destroyed alraedy in the last twenty years. The international scientific assembly concluded that much can be done to stop the degradation of these damaged ecosystems and to rehabilitate them. But new techniques must be found to use them on a sustainable basis for long-term economic return and for the well-being of coastal human settlements and a healthy environment.

This book focusses on III-V high electron mobility transistors (HEMTs) including basic physics, material used, fabrications details, modeling, simulation, and other important aspects. It initiates by describing principle of operation, material systems and material technologies followed by description of the structure, I-V characteristics, modeling of DC and RF parameters of AlGaN/GaN HEMTs. The book also provides information about source/drain engineering, gate engineering and channel engineering techniques used to improve the DC-RF and breakdown performance of HEMTs. Finally, the book also highlights the importance of metal oxide semiconductor high electron mobility transistors (MOS-HEMT). Key Features Combines III-As/P/N HEMTs with reliability and current status in single volume Includes AC/DC modelling and (sub)millimeter wave devices with reliability analysis Covers all theoretical and experimental aspects of HEMTs Discusses AlGaN/GaN transistors Presents DC, RF and breakdown characteristics of HEMTs on various material systems using graphs and plots

This book gathers a collection of papers by international experts presented at the International Conference on NextGen Electronic Technologies (ICNETS2-2017), which

cover key developments in the field of electronics and communication engineering. ICNETS2 encompassed six symposia covering all aspects of the electronics and communications domains, including relevant nano/micro materials and devices. This book showcases the latest research in very-large-scale integration (VLSI) Design: Circuits, Systems and Applications, making it a valuable resource for all researchers, professionals, and students working in the core areas of electronics and their applications, especially in digital and analog VLSI circuits and systems.

The aim of this book is to compile some of the green technologies applied to improve the environment on Earth. The success of these technologies is built from humility; from this ethical principle, the concept of honest broker is defined in this work. Some of the biggest environmental problems, such as soil pollution by heavy metals and pollution from the mining industry and massive coal plants, are also addressed. Additional subjects depicted here include geothermal energy, plasma technology, and the correct use of electric vehicles, and demonstrate a promising scenario to diminish greenhouse gases. Likewise, caring for wildlife is essential; the correct use of certain technologies depicted here can contribute to their conservation.

Frontiers in Electronics is divided into four sections: advanced terahertz and photonics devices; silicon and germanium on insulator and advanced CMOS and MOSHFETs; nanomaterials and nanodevices; and wide band gap technology for high power and UV photonics. This book will be useful for nano-microelectronics scientists, engineers, and visionary research leaders. It is also recommended to graduate students working at the frontiers of the nanoelectronics and microscience.

Fundamentals of Power ElectronicsSpringer Science & Business Media

Focusing from the perspective of the user, Urban Mobility Design investigates how designed mobility and design processes can respond to and drive the emerging social and technological disruptions in the passenger transport sector. Profound technological advances are changing the mobility expectations of city populations around the world. Transportation design is an under represented research area of urban transportation planning. Urban Mobility Design addresses this gap, providing research-based analysis on current and future needs of urban transportation passengers. The book examines mobility from a uniquely multidisciplinary perspective, involving a variety of innovative design and transportation planning approaches. Examines urban mobility from a new perspective Coherently combines current research and practice in transport design, technology, mobility, user behaviour experience, and cultural analysis Utilizes hands-on experiences with transportation manufacturers, transit operators and engineers to bring a practical view on today’s mobility challenges Shows how design approaches to problem solving can influence travel behaviour and improve passenger experience photoacoustic and Photothermal Phenomena contains reviews and a large numberof selected contributed papers reporting progress in the application of new photoacoustic and photo- thermal techniques in physics, chemistry, biology, medicine and materials science. Theoretical and experimental work is presented on spectroscopy, kinetics and relaxation, trace analysis, mass and heat transport, surfaces and thin films, nondestructive evaluation,ultrasonics and semiconductors.

This Conference on biomedical applications of. lasers ~Ias organized by the Quantum Electronics Divisional Board of the European Physical Society (E.P.S.) and held at the Villa of Poggio Imperiale in Florence, September 3-6, 1979. As

kno~m, laser surgery (especially microsurgery and endoscopic photo coagulation) has recently made important progress, and the field is expand i ng rapidly. Very significant applications of lasers have also been achieved in Bi ology during recent years (cell microsurgery, cell counting and sorting, cytofluorimeter devices, etc.) and the potential of laser techniques in this field is nO~1 sufficiently well establ ished. A new class of applications of laserradiJtion in Medicine has recently been made possible by important results obtained with low intensity (non coagulative) visible lasers, such as photodynamic therapy of tumors. At the same time important branches of Medicine, where light effects are studied and optical techniques are presently used for a certain number of clinical applications, such as dermatology and pediatry, appear to be still in their infancy as far as the proper use of optical radiation and techniques, and the understanding of fundamental photoinduced biological processes are con cerned. Moreover, laser photobiology appears a very promising field for the investigation of fundamental processes at the biomolecular level.

Quantum Electronics is the English edition of the Russian journal Kvantova Elektronika, a leading journal in all aspects of laser research founded in 1971. Published research papers are on topics which include Laser; Active Media; Interaction of Laser Radiation with Matter; Laser Plasma; Non- linear Optical Phenomena; Quantum-Electronic Devices; Optical Processing of Information; Laser Applications and Other Topics in Quantum Electronics.

This book is about power in a changing world economy. Though power is ubiquitous in the study of International Political Economy, the concept is underdeveloped in formal theoretical terms. This collection of essays analyses recent experience in East Asia to advance our theoretic understanding of state power in IPE. Over the last quarter century, no other region of the world has had a greater impact on the global distribution of economic resources and capabilities. China, with its "peaceful rise," now stands as the second largest national economy on the face of the earth; South Korea and Taiwan have become industrial powerhouses; Hong Kong and Singapore are among the world’s most important financial centres; and new poles of growth have emerged in several southeast Asian countries – all while Japan, long the region’s dominant market, has slipped into seemingly irreversible decline. The volume’s nine essays, contributed by leading scholars in the United States, Britain and Taiwan, aim to extract relevant inferences and insights from these developments for the study of state power. All are framed by a core agenda encompassing four key clusters of questions concerning the meaning, sources, uses, and limits of power. These essays ask: What new lessons are offered for power analysis in International Political Economy?

The general theme of MEDICON 2013 is "Research and Development of Technology for Sustainable Healthcare". This decade is being characterized by the appearance and use of emergent technologies under development. This situation has produced a tremendous impact on Medicine and Biology from which

it is expected an unparalleled evolution in these disciplines towards novel concept and practices. The consequence will be a significant improvement in health care and well-fare, i.e. the shift from a reactive medicine to a preventive medicine. This shift implies that the citizen will play an important role in the healthcare delivery process, what requires a comprehensive and personalized assistance. In this context, society will meet emerging media, incorporated to all objects, capable of providing a seamless, adaptive, anticipatory, unobtrusive and pervasive assistance. The challenge will be to remove current barriers related to the lack of knowledge required to produce new opportunities for all the society, while new paradigms are created for this inclusive society to be socially and economically sustainable, and respectful with the environment. In this way, these proceedings focus on the convergence of biomedical engineering topics ranging from formalized theory through experimental science and technological development to practical clinical applications.

An Introduction to Electrooptic Devices aims to present an introduction to the electrooptic effect and to summarize work on devices employing the electrooptic effect. The book provides the necessary background in classical crystal optics. The text then discusses topics including crystal symmetry, the tensor description of linear dielectric properties, propagation in anisotropic media, and passive crystal optic devices. The book also describes the phenomenological description of tensor nonlinear dielectric properties of crystals, with emphasis on the electrooptic effect; device design and application; and a listing of linear electrooptic coefficients for various substances. People involved in the study of electrooptic devices will find the text invaluable.

In many university curricula, the power electronics field has evolved beyond the status of comprising one or two special-topics courses. Often there are several courses dealing with the power electronics field, covering the topics of converters, motor drives, and power devices, with possibly additional advanced courses in these areas as well. There may also be more traditional power-area courses in energy conversion, machines, and power systems. In the breadth vs. depth tradeoff, it no longer makes sense for one textbook to attempt to cover all of these courses; indeed, each course should ideally employ a dedicated textbook. This text is intended for use in introductory power electronics courses on converters, taught at the senior or first-year graduate level. There is sufficient material for a one year course or, at a faster pace with some material omitted, for two quarters or one semester. The first class on converters has been called a way of enticing control and electronics students into the power area via the "back door". The power electronics field is quite broad, and includes fundamentals in the areas of • Converter circuits and electronics • Control systems • Magnetics • Power applications • Design-oriented analysis This wide variety of areas is one of the things which makes the field so interesting and appealing to newcomers. This breadth also makes teaching the field a challenging undertaking, because one cannot assume that all students enrolled in the class have solid prerequisite

knowledge in so many areas.

This volume is based on papers presented at the International Symposium on X-Ray Microscopy held at Brookhaven National Laboratory, Upton NY, August 31-September 4, 1987. Previous recent symposia on the sub ject were held in New York in 1979, Gottingen in 1983 and Taipei in 1986. Developments in x-ray microscopy continue at a rapid pace, with im portant advances in all major areas: x-ray sources, optics and components, and microscopes and imaging systems. Taken as a whole, the work pre sented here emphasizes three major directions: (a) improvements in the capability and image-quality of x-ray microscopy, expressed principally in systems attached to large, high-brightness x-ray sources; (b) greater access to x-ray microscopy, expressed chiefly in systems employing small, often pulsed, x-ray sources; and (c) increased rate of exploration of applications of x-ray microscopy. The number of papers presented at the symposium has roughly dou bled compared with that of its predecessors. While we are delighted at this growth as a manifestation of vitality and rapid growth of the field, we did have to ask the authors to limit the length of their papers and to submit them in camera-ready form. We thank the authors for their con tributions and for their efforts in adhering to the guidelines on manuscript preparation.

The aim of the biennial series of symposia on Fusion Technology organized by the European Fusion Laboratories, is the exchange of information on the design, construction and operation of fusion experiments and on the technology being developed for the next-step devices and fusion reactors. The coverage of the volume includes the technological aspects of fusion reactors in relation to new developments, thus forming a guideline for the definition of future work. These proceedings comprise three volumes and contain both the invited lectures and contributed papers presented at the symposium, which was attended by 569 participants from around the globe. The 343 papers, including 12 invited papers, characterise the increasing interest of industry in the fusion programme, giving a broad and current overview on the progress and trends fusion technology is experiencing now, as well as indicating the future for fusion devices.

219 8. 2 Sensors 221 8. 3 Physical Sensors 222 8. 3. 1 Electrical Sensing Means 223 8. 3. 2 Magnetic Field Methods 231 8. 3. 3 Optical Methods 232 8. 4 Chemical Sensors 241 8. 4. 1 Electrical Gas and Chemical Sensors 243 8. 4. 2 Guided-Optics Intrinsic Chemical Sensors 246 8. 4. 3 Extrinsic Chemical Sensors 250 8. 4. 4 Polymer Waveguide Chemical Sensors 251 8. 4. 5 Surface Plasmon Chemical Sensors 252 8. 4. 6 Indicator-Mediated Extrinsic Sensing 253 8. 4. 7 Optical Biosensors 256 8. 4. 8 Ultrasonic Gas and Chemical Sensors 257 8. 4. 9 Intelligent Sensors 258 8. 5 Connections/Links and Wiring 258 8. 5. 1 Optical Links 260 8. 5. 2 Requirement on the Processing Unit/Intelligence 262 8. 6 Actuators 263 8. 7 Signal Processing/Computing 264 8. 7. 1 Implicit Computation 266 8. 7. 2 Explicit Computation 267 8. 8 References 274 Subject Index 279 Micro-Actuators (Electrical, Magnetic, Thermal, Optical, Mechanical, and Chemical) It has become quite apparent that sensors and actuators are the main bottleneck of the modem information processing and control systems. Microprocessors and computers used to be the main limiting element in most information processing systems. But thanks to the enonnous progress in the

microelectronics industry, most information analysis tasks can be processed in real time. The data has to be acquired by the processor in some form and processed and used to produce some useful function in the real world.

British Special Quality Valves and Electron Tube Devices Data Annual: 1964-65 presents data on various special quality valves. The selection also presents information in different types of special electron tubes and devices. The text discloses information such as heater, capacitance, characteristics, operating conditions, and range values. As for electron tubes and devices, the selection presents the characteristics, cathodes, typical operation, and maximum ratings. The book will be of great use to electronics designers, engineers, and technicians. Electronics hobbyists and end-users will also benefit from the text.

Computational Science and Engineering contains peer-reviewed research presented at the International Conference on Computational Science and Engineering (RCC Institute of Information Technology, Kolkata, India, 4-6 October 2016). The contributions cover a wide range of topics: - electronic devices - photonics - electromagnetics - soft computing - artificial intelligence - modern communication systems Focussing on strong theoretical and methodological approaches and applications, Computational Science and Engineering will be of interest to academia and professionals involved or interested in the above mentioned domains.

Festkorper Probleme XIII: Advances in Solid State Physics is a collection of papers from plenary lectures of the solid states division of the German Physical Society in Munster, on March 19-24, 1973. This collection deals with semiconductor physics, surface phenomena, and surface physics. One paper reviews the findings on experiments on the magnetic, optical, electrical, and structural properties of layer type crystals, particularly metal dichalcogenides. This book then discusses the van der Waals attraction using semi-classical methods to explain the correlation in different atoms. This discussion explains the application of the Schrodinger formalism and the Maxwell equations. One paper also reviews the energy distribution of electrons emitted from solids after ultraviolet radiation or monochromatic X-ray exposure. Another paper reviews the use of clean silicon surfaces associated with electron emitters showing ""negative electron affinity."" A paper then reviews the mechanism of charge-transfer devices, with emphasis on the physics of the transfer processes that happen in surface charge-coupled devices or bulk-charge-couple devices. This compendium will prove useful for materials physicists, scientists, and academicians in the field of advanced physics.

This book introduces modern directed-energy beam weaponry and emerging technical concepts based on unclassified and declassified information. The book covers laser systems, analyzing the interaction between high-power laser beams and matter, and examines penetration of high power beams such as microwave and scalar wave. It also covers the use of particle and high-power radar beams and scalar wave as weapons of the future. In-depth coverage of the relevant mathematical and engineering topics and concepts are included. The book will provide scientists and engineers with valuable guidance on the fundamentals needed to understand state-of-the-art directed energy weaponry technology research and applications. Provides guidance on the fundamentals of state-of-the-art directed-energy weaponry technology; Introduces the physics behind directed-energy weapons; Offers in-depth coverage of mathematical

and engineering topics.

Title: The Vacuum Interrupter: Theory, Design, and Application Shelving guide: Electrical Engineering Dr. Paul Slade draws from his nearly six decades of active experience to develop this second edition of The Vacuum Interrupter: Theory, Design, and Application. This book begins by discussing the design requirements for high voltage vacuum interrupters and then the contact requirements to interrupt the vacuum arc. It then continues by describing the various applications in which the vacuum interrupter is generally utilized. Part 1 of this book begins with a detailed review of the vacuum breakdown process. It continues by covering the steps necessary for the design and the manufacture of a successful vacuum interrupter. The vacuum arc is then discussed, including how it is affected as a function of current. An overview of the development and use of practical contact materials, along with their advantages and disadvantages, follows. Contact designs that are introduced to control the high current vacuum arc are also analyzed. Part 2, on application, begins with a discussion of the arc interruption process for low current and high current vacuum arcs. It examines the voltage escalation phenomenon that can occur when interrupting inductive circuits. The occurrence of contact welding for closed contacts subjected to the passage of high currents, and for contacts when closing on high currents, is explored. The general requirements for the successful manufacture and testing of vacuum circuit breakers is then presented. The general application of vacuum interrupters to switch load currents, especially when applied to capacitor circuits, is also given. The interruption of high short circuit currents is presented along with the expected performance of the two major contact designs. Owing to the ever-increasing need for environmentally friendly circuit protection devices, the development and application of the vacuum interrupter will only increase in the future. At present the vacuum circuit breaker is the technology of choice for distribution circuits (5kV to 40.5kV). It is increasingly being applied to transmission circuits (72.5kV to 242kV). In the future, its application for protecting high voltage DC networks is assured. Audience This is a practical source book for engineers and scientists interested in studying the development and application of the vacuum interrupter Research scientists in industry and universities Graduate students beginning their study of vacuum interrupter phenomena Design engineers applying vacuum interrupters in vacuum switches, vacuum contactors, vacuum circuit breakers, and vacuum contactors It provides a unique and comprehensive review of all aspects of vacuum interrupter technology for those new to the subject and for those who wish to obtain a deeper understanding of its science and application Scientists and engineers, who are beginning their research into vacuum breakdown and aspects of the vacuum arc, will find the extensive bibliography and phenomenological descriptions to be a useful introduction

Abstract Due to precision, flexibility, simplicity in construction, easy control, higher speed and lower energy consumptions, servo presses have recently become popular in metal forming applications. Servo press technology combines the advantages of hydraulic and conventional mechanical presses without their drawbacks. This study presents design, construction and demonstration of a servo crank press system for metal forming operations. The research involves kinematics and motion optimization, dynamic modeling, structural design and

analysis, servo motor selection, automation and control, and operational performances of the servo press. The press used in this work has a load capacity of 50 ton and stroke capacity of 200 mm. Firstly, optimized trajectories of ram scenarios are generated. Then dynamic modeling using Lagrange approach is presented. Next structural model is constructed, and Finite Element Analysis (FEA) of press parts are performed within safety limits. A servo motor with a reduction unit is selected based on dynamic model. After that a new automation system is developed, and Cascade Feed-Forward (CasFF) control is applied. Moreover, four motion scenarios (crank, dwell, link, and soft motion) are employed for the performance assessment of press. Finally, the dynamic model is verified by the experimental results. The research study is carried out under support and grant of an industrial project, aiming to provide know-how to industry and researchers. Key Words: Servo crank press, metal forming, motion design, dynamic modeling, system control

Gaseous Dielectrics III is a collection of papers presented at the Third International Symposium on Gaseous Dielectrics, held in Knoxville, Tennessee on March 7-11, 1982. This book is divided into 12 chapters, and begins with the elastic scattering of electrons in gases, particularly the measurements of differential cross sections at low energies for electrons in electron-attaching gases. The next chapters deal with the basic mechanism of gaseous dielectrics, particularly the spark formation, corona attenuation and distortion, and examples of gaseous dielectric systems. These topics are followed by discussions on the practical problems of impulse breakdown, as well as the influence of gas pressure, gap distance, field distribution, and overvoltage on the formative time lag for approximately uniform field distribution. Other chapters examine the concept of surface flashover and the decomposition, aging, and bioenvironmental effects of gaseous dielectrics. The final chapters look into their analysis, gas-insulated equipment, and the properties of hexafluorosulfide. This book will prove useful to basic scientists, engineers, and users of gaseous dielectrics.

Popular Science gives our readers the information and tools to improve their technology and their world. The core belief that Popular Science and our readers share: The future is going to be better, and science and technology are the driving forces that will help make it better.

Often described as a "miracle material", graphene's potential applications are extraordinary, ranging from nanoscale 'green' technologies, to sensors and future conductive coatings. This book covers the topic of 'graphene' – the history, fundamental properties, methods of production and applications of this exciting new material. The style of the book is both scientific and technical – it is accessible to an audience that has a general, undergraduate-level background in the sciences or engineering, and is aimed at industries considering graphene applications. As the graphene topic is a broad-reaching and rapidly moving field of research, the aim of this book is therefore to provide information about graphene and its current and future applications that are immediately

implementable, relevant and concise. After reading this book, the reader will have sufficient knowledge and background to move forward independently into graphene R&D and to apply the knowledge therein. Although the book will be self-contained, each chapter has copious references to enable further reading, research and exploration of the chapter topics.
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