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Seventh 5-Year Plan Statistics, Eighth 5-Year Plan Targets

91FE0569A Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 4, Apr 91 pp 2-3

[Unattributed article: "10-Year Program and Eighth 5-Year Plan for Telecommunications - Extract from Yang Taifang's [2799 3141 5364] Report in the 28th National Posts and Telecommunications (P&T) Workshop"]

[Text]

I. Accomplishments in Telecommunications in the Seventh 5-Year Plan. Rapid progress was made in P&T during the Seventh 5-Year Plan. During this 5-year period, our first strategic objective to triple the output of P&T was accomplished ahead of schedule. The fixed assets, business volume and revenue are increasing at 15, 20 and 30 percent per year, respectively, in a steady and sustained manner. Regardless of geographic location, P&T have made profound changes in urban areas as well as in rural countryside. Significant progress has been made in every aspect.

Communications capability is drastically enhanced.

Investment in fixed assets was significantly increased in the Seventh 5-Year Plan. A total of 20.014 billion yuan was spent, which is 3.4 times that spent in the Sixth 5-Year Plan. It also exceeds the sum of our investments in P&T over the past 36 years combined. In this 5-year period, we added 70,000 long distance lines, bringing the total to 108,000 lines. Compared to 1985, this is an increase by a factor of 1.87. This corresponds to a net increase of 154,000 terminals in long distance automatic switching capacity which brings the total to 165,000 terminals, an increase of 13.4 times. The overall telephone switching capacity of the country has reached 20,450,000 units. There is an increase of 4,880,000 units of urban switching capacity, which brings its total to 8,250,000 units. As for rural telephone switching capacity, it was increased by 1,234,000 units which brings its total to over 4,000,000 units. Compared to 1985, the increases are 145 and 45 percent, respectively. There are now over 12,600,000 telephones in China: a dissemination rate of 1.1 percent, double the value of 5 years ago.

Equipment standard is significantly improved.

In the Seventh 5-Year Plan, the focus was technological reform. Advanced equipment was imported. A transition from a manual switching to automatic switching network, from analog to analog/digital compatible and then to digital technology, was made in telecommunications. Automation of urban telephone network is 96 percent complete. The capacity for stored-program-controlled (SPC) switching is over 3,500,000 units, approximately 46.8 percent of the automatic switching capacity for urban telephones. A skeleton automatic long distance telephone network is essentially completed; 767 cities and counties are on the national automatic long distance telephone network. Direct dialing to over 180 countries and regions in the world is possible from 296 cities and counties. There are 1,300,000 users authorized to dial directly. A national public automatic telegraph switching network is essentially established. Over 80 percent of the counties are on the automatic exchange network.

Telecommunications business is booming.

In 1990, 1.17 billion long distance calls were made. Compared to 1985, this is a two-fold [i.e.200 percent] increase. Urban telephone customers increased to 5,380,000, corresponding to a growth rate of 145 percent. International telecommunications is rising at an average rate of 50 percent a year. International telephone business, including calls to Hong Kong and Macao, grew 7-fold in the 5 year period. In addition to promoting conventional business, new services such as cellular phone, magnetic card telephone, facsimile, data transmission, video phone, etiquette telegram, electronic mail and multi-function telephone are also growing rapidly. Paging service has been expanded to more than 160 cities with 436,000 customers.

In conclusion, there has been a tremendous increase in our P&T capability in the Seventh 5-Year Plan compared to other 5-Year Plan periods. Business is growing rapidly which results in the best social and economic benefits. As an important turning point, P&T is growing at a faster pace than the overall economy. These accomplishments not only alleviated the desperate shortage of telecommunication capacity to satisfy the public needs, but also laid a solid foundation for the Eighth 5-Year Plan as well as for the more ambitious program for the next decade. A great deal of experience has been accumulated and a lot of confidence has been built.

II. 10-Year Program in Telecommunications

In order to meet the objectives of the 12th Plenum of the Chinese Communist Party to double our GNP by the end of this century, the Party organization at MPT presented a plan in 1984 to octuple the capacity and business of telecommunications by the year 2000 based on 1980 statistics. The outcome of the Seventh 5-Year Plan has demonstrated that this target is feasible. Therefore, the Ministry does not plan to change this overall goal. By the end of this century, fiber-optic cable and digital microwave (DMW)-based long distance networks and SPC telephone switching networks will be constructed. More than 98 percent of the urban telephone systems in over 2,300 cities and counties will be automated, 80 percent of the telephone users will be able to make direct-dial long distance calls, 60 percent of them will be able to make direct-dial international calls, every village will have telephones and the dissemination rate of telephones will be above 3 percent.

III. Major Targets in the Eighth 5-Year Plan

The Eighth 5-Year Plan is an important stage in octupling the P&T output. Even more progress in every aspect is required compared to the Seventh 5-Year Plan. Major targets for the Eighth 5-Year Plan include:

The revenue from P&T is expected to grow from 8.15 billion yuan in 1990 to 16.4 billion yuan. In constant 1990 yuan, the total revenue target is 31 billion yuan, or an average annual increase of approximately 15 percent.

The capacity of telephone exchanges will be increased from 20,450,000 units to 35,000,000 units, corresponding to an increase of 15,000,000 units. This accounts for an increase of 10,000,000 units for urban telephone users, 4,000,000 units for user internal switching and 1,000,000 units for rural users. The number of telephones will increase from 12,600,000 to 23,800,000 and the dissemination rate will go up to 2 percent.

Long distance telephone lines will increase from 106,000 to 256,000, an increase of 150,000 lines. The capacity of automatic long distance exchange equipment will be increased from 150,000 to 500,000-550,000 terminals, an addition of 350,000-400,000 new terminals, in order to include all the counties in eastern China and all the cities and some of the counties in the mid-west in the national automatic long distance network.

A fiber-optic-cable-based high capacity digital telecommunications network will be constructed to link Beijing with all major regions and along the coastline; total length of the optical cable will be approximately 20,000 kilometers. Also, 14,500 kilometers of microwave trunklines will be constructed, modified or expanded. Twelve satellite earth stations will be built for public communications. Effort will be devoted to developing VSATs in order to establish a domestic satellite communications system.

We plan to fully utilize INTELSAT satellites and build an underwater fiber-optic-cable system between China and Japan. Based on demand, capacity expansion and technological reform will take place at Beijing, Shanghai and Guangzhou to increase the number of lines extending from these major ports to other parts of the country in order to permit a smoother flow of international telecommunications.

Construction and modification of rural stations will be emphasized. Rural business will be expanded based on local demand. Technological reform in rural telephone service will be accelerated to raise the level of automation.

Successful completion of the above targets will substantially improve the image of P&T in China. The network structure will be more rational and business will grow at an even faster pace. The supply-demand dilemma will be alleviated to some extent. Employee welfare and working conditions will also be improved. All employees must adhere to the basic Party principle of "People's posts and telecommunications is for the people" and take advantage of the excellent opportunity and bright future presented by the Eighth 5-Year Plan to devote their efforts towards the successful completion of the targets set in the Eighth 5-Year Plan and the goal of octupling the output by the year 2000.

Key Targets for 1991 Specified

91FE0569B Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 4, Apr 91 pp 3-5

[Article by [an official from the] Telecommunications Overall Bureau, MPT: "Key Targets for 1991 in Telecommunications"]

[Text] 1991 is the first year in the Eighth 5-Year Plan. It is highly important to have a good start in every aspect this year. The mission this year is to execute the resolutions of the 7th Plenum of the 13th Congress and the 28th National P&T Workshop to focus on quality and efficiency in developing business, to strengthen network management and organization to construct a standardized system, to repair and upgrade equipment across the board and stress maintenance in order to further improve network quality, and to increase capability in order to provide better services.

I. Projected Total Amount of Business, Business Volume, Business Income and Communications Capability

1. Planned Total Amount of Business

Central-government-run business revenue of 5.857 billion yuan (based on constant 1980 yuan), a 15 percent increase compared to 1990. Local-government-run business revenue of 896 milion yuan, a 4.5 percent increase compared to 1990.

2. Planned Business Volume

1.23 billion domestic long distance calls will be completed, a growth rate of 15 percent; 25 million international calls will be completed, for a growth rate of 35 percent; 101.08 million calls to Hong Kong and Macao will be completed, a growth rate of 24 percent; 241 million telegrams will be delivered, a growth rate of -5 percent; there will be 6.18 million urban telephone customers, a growth rate of 15 percent; there will be 600,000 pager customers, corresponding to a 40 percent growth rate; local-government-operated rural telephone service will have 1.583 million customers, an 8 percent growth rate.

3. Planned Business Income

Central-government-run units will have a business income of 10.4 billion yuan, or a 20 percent growth rate; local-government-operated and rural telephone service will have a business income of 1.54 billion yuan, or a growth rate of 10 percent.

4. Planned Development of Communications Capability

Long distance lines will be increased to 138,000, an increase of 30,000 lines or a 27.8 percent growth rate compared to 1990. Automatic long distance exchange capacity will be expanded to 220,000 terminals, an increase of 70,000 terminals, or 46 percent, compared to 1990. Urban telephone exchange capacity will be expanded to 9.85 million lines, an increase of 1.6 million lines, or a growth rate of 19 percent, compared to 1990. Ten new cities will get mobile telephone service, bringing the total to 20 cities. Beeper service will be expanded to 56 new cities, bringing the total to 300. Local-government-operated rural telephone exchange capacity will be increased to 3.128 million lines, for a growth rate of 8 percent.

II. Specific Areas of Focus

1. Focus on operation to develop and expand various services.

In 1991, as the national economy grows, the demand for telecommunications will go up further and the market is expanding. Therefore, it is necessary to grasp the concept that business is market driven to aggressively to meet the growing demand. We must insist on the operating policy of using telephones as the core business to open up new business opportunities. We must stay with the principle of using domestic calls to protect international calls, using branches to protect trunklines, and using urban calls to protect long distance calls, in handling various conflicts in our operations. We have to exercise more active management and focus on the development of key business in order to improve both the quality and efficiency of telecommunication services.

2. Continue strengthening network organization and management in order to further improve operating profit.

A comprehensive and perfect management system must be established for networks. It is necessary to establish a comprehensive provincial network management system and speed up the progress in the control of microwave circuits. The network organization must be smoothed out. In long distance networks, the routing of trunklines and high efficiency lines must remain in check. Control and inspection of station data and routing must be strengthened. In the management of urban networks, we must first address congestion of local calls which spills over into long distance calls. Next, urban calls must be upgraded and improvements to local exchanges must be controlled. We must keep strengthening and improving the control of manual long distance networks. Non-voice terminal management must be strengthened, communications specifications must be standardized, and radio control procedures must be smoothed out.

3. Complete overhaul of equipment, strengthen maintenance, and solidify results.

Presently, the overhaul of telecommunications equipment is entering a critical stage. We must keep our focus on this issue. The objectives are to ensure the quality and stability specifications of 50 class-1 exposed carrier trunk lines to overcome overload oscillation and to ensure the quality and basic stability of 20 class-1 long distance carrier cable systems in wired telecommunications. In radio communications, the objectives are to ensure all microwave equipment is in working order and to meet microwave modulation and circuit stability specifications in order to improve transmission quality. In the area of switching and exchange, we shall continue eliminating faults in the network in order to improve congestion of local and long distance calls. Circuit utilization rate and call connection rate are to be improved and the quality and efficiency of manual switching will be improved. In the area of non-voice business, we shall continue solving problems left behind from automatic switching of telex to improve its operation. The connection rate of telex will be improved. The transmitting voltage of non-voice terminal equipment will 100 percent be qualified and all terminals and transmission equipment will be repaired. In rural telephone service, relay lines and transmission equipment will meet specifications. Hazardous equipment and unsafe factors will be eliminated. Critical rural telephone equipment associated with earthquake and flood prevention will be overhauled. Switches and transmission equipment connected to the national automatic networks will meet network specifications.

From the third quarter on, MPT will begin inspecting and reviewing the equipment overhaul work.

III. Accelerate the Trunkline Expansion Project to Enhance the Overall Communications Capability

To locate the missing accessories and expand the capacity of networks is an important means to increase our communications capability. Priority should be given to this project despite the fact that funding is tight now. This makes it more favorable to create a system with more comprehensive capability. First, we should arrange to acquire circuits and equipment necessary for communications with Hong Kong, Macao and other countries and increase circuits and long distance switching equipment needed between C1 stations and skeleton networks. Next, we have to make sure we have the additional terminal equipment required by the high capacity lines. Suitable arrangements are also needed for non-voice services.

In 1991, the national long distance network expansion program primarily includes the continuation of the 60,000 SPC long distance terminals and the completion of 30,000 terminals in provincial capitals. The expansion project for the coaxial cable line from Beijing through Wuhan to Guangzhou has been under construction since early this year. Arrangements will be made for the expansion of the fiber-optic cables between Hong Kong and Guangzhou and between Nanjing and Nanchang, as well as the small 960-channel coaxial cable line between

Taiyuan and Datong. IDR [intermediate data rate] equipment will be installed in the Shanghai Pacific-Ocean [satellite] earth station some time this year and an Indian-Ocean international earth station will be built. Preliminary work for a Guangzhou-based Pacific International [satellite] Earth Station will be completed. Digital microwave (DMW) projects between Nanchang and Guangzhou, Nanchang and Fuzhou, and Tianjin and Shenyang, as well expansion work on the 214 DMW system between Beijing and Shanghai, will be arranged. In the area of second hand microwave equipment, the Xian-Lanzhou and Wuhan-Changsha-Guangzhou expansion projects will be in service by the end of June. The expansion work for the trunkline between Chongqing, Guiyang and Kunming will be in service by the end of October. We will make every effort to put the expansion projects for the trunklines from Harbin to Yongji, Guiyang to Nanning, Beihai to Zhanjiang, and Beijing to Shijiazhuang and Taiyuan in service this year. Most of the expansion work for the trunklines from Xian to Xiangfan, and from Shijiazhuang to Zhengzhou and Wuchang will be finished by the end of the year. They will be in service in the first half of next year. Accessories will be installed for the telex and telegraph automatic exchange network by the end of this year. Furthermore, we will install and test the Kunming telex exchange and imported TM203 (telex and telegraph automatic switching network) exchange in Jinan.

IV. Step Up Construction and Management of Rural Telephone Service to Improve Quality

Rural telephones are a part of the overall network. They cover 90 percent of the area and serve 80 percent of the population. Hence, it is necessary to promote the development of rural telephony based on the characteristics of the rural economy by sticking to a persistent, steady, coordinated and multi-level approach. Automation of county (city) telephone networks must be well planned in a well balanced approach by taking rural telephony into consideration. When the conditions are right, all the systems should be managed in a unified manner. We should speed up technology reform to enhance our telecommunications capability in order to make a bigger contribution toward the growth of our rural economy.

Nation's First Independently Designed Aircraft-Engine High-Altitude-Simulation Test Station

91P60196A Beijing KEJI RIBAO [SCIENCE AND TECHNOLOGY DAILY] in Chinese 29 May 91 p 2

[Unattributed XINHUA photoreport, photo by Chen Xie; cf. FBIS-CHI-91-120, 21 Jun 91 pp 28-29]

[Text] Initial construction of an aircraft-engine high-altitude-simulation test station—a product of independent high-tech systems engineering—has been completed at the China Aircraft Gas Turbine Institute, and part of the station is now in operation. China thus becomes the

fifth nation—after Britain, the United States, France, and the USSR—to have a "high-altitude station." The photo depicts engineers at the facility testing high-altitude performance characteristics of a new domestically developed aircraft engine.

Plans for Spaceship Launched

40100056A Beijing CHINA DAILY (Shanghai Focus) in English 10 Jun 91 p 4

[Article by Li Huahong, CD staff reporter]

[Text] China's first spaceship has just appeared—on a computer screen at Zhejiang University's Rong-Hang Mold High Technology Institute.

The spaceship's design, looking like a bee with two antennas on its round head and two solar cells wrapped around the sides of its round body, was recently revealed by the Shanghai Aeronautic Bureau, which is ready to bid for the rocket's construction contract.

The institute has strong experience with computer-aided design (CAD) and helped the Shanghai Aeronautic Bureau to put the ship's plans on the computer screen and create three-dimensional views from different angles so as to check the design, according to Ying Daoning, director of the institute.

Industrial modeling is a small part of the institute's business. A co-operative venture between Zhejiang University and China Chengdu Electronic Mould Centre, Zhejiang University provided scientists and building space and the centre invested $400,000.

The Electronic Mould Centre, a project aided by the Federal Republic of Germany, was set up so that China would not have to rely so heavily on imported plastics moulds for its fast growing household electronic appliances industry. Lack of high-tech and advanced equipment for designing and manufacturing plastic moulds makes the country spend at least $200 million on imports every year, according to Ying.

Founded in May 1989, the high-tech institute helped the Electronic Mould Centre to develop a CIM (computer-integrated machine) network, where the designing and manufacturing of the moulds are all aided by computers. With the development of the CIM network, which Ying said is the first of its kind in China and is quite close to the world state of the art, the centre went into operation in March last year.

NDSTIC Unit's Outstanding Record in Nuclear Testing

91P60206 Beijing RENMIN RIBAO in Chinese
14 Jun 91 p 3

[Article by Liu Cheng [0491 4453]: "Control Group of Institute Under National Defense Science, Technology & Industry Commission Has Continuous Record of Meritorious Services to Nuclear Testing Operations"]

[Summary] Firmly rooted for over 20 years in the great Northwest desert, the control group of the 4th Laboratory at a certain research base under the National Defense Science, Technology & Industry Commission (NDSTIC) has independently developed a series of control systems for nuclear testing, and over several dozen tests has not had a technical fault—a success rate of 100 percent, and an outstanding contribution to national defense research.

Established in 1962, this group has developed as many as 1000 test instruments for instantaneous control of nuclear testing operations, including enormous system(s) for measuring data on parameters and effects, and the nation's first nuclear-test automatic control system. In 1967, the group perfected a high-reliability second-generation control system, and in 1969 followed this up with a digitally encoded wireless control system and a pseudo-random-code control system successfully used for nuclear tests. In the 1980s, the group introduced microcomputer technology into control systems, and developed the first domestic nuclear-test-bed microcomputer real-time control system, which according to experts has successfully resolved problems involving high reliability of computer control systems under nuclear environmental conditions and has matched the state-of-the-art.

Projects of Microbiology Science Supported by National Natural Science Foundation of China in 1990

40091012F Beijing WEISHENGWU XUEBAO [ACTA MICROBIOLOGICA SINICA] in Chinese Vol 31 No 2, Apr 91 pp 163-168

[English excerpt from article by Qi Shuying [7871 2579 3853] and Gao Wenshu [7559 2429 3219] of the Department of Biological Science, National Natural Science Foundation of China, Beijing]

[Text]

Seventy-Two Projects Supported by National Science Foundation of China

Projects	Name	Organization
Taxonomic Studies on the Genus Bacillus	Cai Miaoying	Institute of Microbiology, Academia Sinica
Taxonomic and Floristic Studies on Macro-lichens from Yunnan, China	Chen Jianbin	Institute of Microbiology, Academia Sinica
Studies on New Taxonomic Methods and the Chinese Species of the Genus Alternaria	Zhang Tianyu	Northwestern Agricultural University
Contraction of Genomic Library in Obligate Autotrophic, Acidophilic Thiobacillus	Yan Wangming	Shangdong University
A Study on Mechanisms of the Chitinase in Cultures of the Beauveria bassiana	Huang Xiuli	Beijing Normal University
Characteristics and Regulation of the Second Nitrogen Fixation System in Cyanobacteria	Dai Lingfen	Institute of Hydrobiology, Academia Sinica
Studies on the Mutagenic Effect of Ion Implantation on Microorganism	Huang Wencai	Zhejiang Academy of Agricultural Sciences
Screening for Mutant of Luminous Bacteria and Function of Identification of Potential Mutagen in Environment by It	Xie Siqin	Institute of Soil Science, Academia Sinica Nanjing
Genetic Study and Breeding of High-Yield Strains on H. halobium Producing BR.	Shen Ping	Wuhan University
Studies on Taxonomic and Survey of Gymnomycota Sources in Northern Forest	Li Yu	Jilin Agricultural University
A Study on the Resources of Beneficial Rhizospheric Microorganism of Some Important Plants in Xinjiang Arid Area	Guan Guilan	Xinjiang Institute of Biology, Pedology and Desert Research, Academia Sinica
A Study on Biological Characterization of a Magnetotactic Bacteria	Wei Yangbao	Wuhan University
Studies on DNA Gyrase Model for Screening Antibacterial Antibiotics	Yao Tianjue	Institute of Medicinal Biotechnology, Chinese Academy of Medical Sciences
Resource and Application Prospects of Entomogenous Fungi in China	Li Zengzhi	Anhui Agricultural College
A Germplasm Gene Bank of Wild Shiitake in the Yangtse Valley and Microcomputer Control System	Pan Yingjie	Edible Fungi Institute, Shanghai Academy of Agricultural Science
A Study of Super-High Concentration Fermentation Method of Poly-β-hydroxy-buxyric acid	Wang Shuqi	Jilin University
A Study on Multiple Enzyme Sensor for Determination of Fermentable Sugar	Zhang Xianen	Wuhan Institute of Virology, Academia Sinica
Kinetics Research in the Bacterial Leaching of a Refractory Gold-Bearing Arsenopyrite in Xinjiang	Wang Weiguo	Institute of Microbiology, Xinjiang Academy of Agricultural Sciences
A Study of Biocatalysis by Microbial Lipase	Li Zuyi	Shanghai Institute of Organic Chemistry, Academia Sinica
The Coalescence of Gas Bubbles and the Oxygen Transfer Rate in Fermentation Broth	Zhou Zhaoyi	Chengdu University of Science and Technology
Studies on Selection of Ethyl Caproate Synthesizing Microorganism and Its Keiatiwe Enzymology	Lu Shihang	Chengdu Institute of Biology, Academia Sinica
Creation of Selection of Fast Growing Nitrogen Fixing Actinomycete by Protoplast Fusion of Frankia and Streptomyces	Ding Jian	Shenyang Institute of Applied Ecology, Academia Sinica
Influence of Vesicular-arbuscular Micorrhiza on Effective Compounds in Chinese Medicinal Herbs	Li Huiquan	Institute of Soil and Fertilizer, Chinese Academy of Agricultural Sciences
A Study of Naturally Occurring Fusarium Mycotoxins in Corn of Northern Region	Zhu Tongxia	Beijing Agricultural University
Degradation of Chlorobenzene and Nitrophenol by Anaerobes in Soil	Li Shunpeng	Nanjing Agricultural University

Seventy-Two Projects Supported by National Science Foundation of China (Continued)

Projects	Name	Organization
Studies on Biology and Food Antiseptic Effect of Sarcodon imbricatus	Feng Ying	Research Institute of Economic Insects, Chinese Academy of Forestry
The Study of Toxicity of Thuringiensin to Insects and the Safety to People	Lin Kaichun	Huazhong Agricultural University
A Study of the Interaction Between VAMF and Soil-borne Patnagenes of Cotton Wilt	Hu Zhengjia	Huazhong Agricultural University
Investigation on Competition Between Species of VA Mycorrhizal Fungi	Hao Wenying	The Institute of Soil Science, Academia Sinica Nanjing
A Study on a New Insect Virus—Philosamia Cynthia Ricini Donovan Polyhedrosis Virus	Luo Jing	Wuhan Institute of Virology, Academia Sinica
Studies on the Synergistic Factor of Baculovirus	Ding Cui	Institute of Zoology, Academia Sinica
Construction of Insect Baculovirus Transfer Vector With P10 Gene and Study of Control Army Worm by It	Qi Yipeng	Wuhan University
Genetic Isolation and Cloning for Mareks Disease Virus in Chickens	Cui Zhizong	Jiangsu Agricultural College
Studies on the Properties of Cucumber Mosaic Virus Strains Using New Techniques	Zhang Chengliang	Plant Quarantine Institute, Ministry of Agriculture, People's Republic of China
Specification of Aphid Transmissible Plant Viruses	Wei Ningsheng	Northwestern Agricultural University
A Study and Preparation of Standard Antisera Against 42 Adenovirus Serotypes	Li Quangen	Institute of Infectious Diseases, PLA
A Study of Cell Receptors for Bovine Leukemia Virus	Yu Li	Harbin Veterinary Research Institute CAAS
Studies on the Rapid Identification of Enterovirus Genome	Feng Shuyi	Beijing Medical University
A Study on Persistent Infection of Foot-and-Mouth Disease Virus	Duan Xiaobo	Lanzhou Veterinary Research Institute, Chinese Academy of Agricultural Science
Construction of Vaccinia Virus Decombinants Expressing Parvovirus and Pseudo-rabies Genes	Jin Ningyi	The Research Institute of Veterinary College of PLA
Construction of a Transgenic Mouse Model of the Hepatitis B Virus	Luo Qinghua	Institute of Infectious Diseases, PLA
Studies on the Difference Between Wild Strain and Vaccine Strain of Poliovirus by Genetic Diagnosis	Zhang Libi	Institute of Virology, Chinese Academy of Preventive Medicine
Investigation of Arboiruses in North China's Area	Liang Guodong	Institute of Virology, Chinese Academy of Preventive Medicine
Studies on the Reverse Transcription and Subsequent Virus DNA Amplification of Dengue Virus RNA	Qin Ede	Institute of Microbiology and Epidemiology, Academy of Military and Medical Sciences
A Study on Characterization and Taxonomy of Enterically Transmitted Virus Related to Non-A, Non-B Hepatitis in China	Huang Rutong	Institute of Microbiology and Epidemiology, Academy of Military and Medical Sciences
Studies on Cell Growth Factor (s) for Enhancing the Proliferation of Hybridoma Cells	Liu Lehe	Sun Yat-Sen University of Medical Sciences
A Study of Characterization in PHSA-γ on Haman Hepatocyte Membrane	Cai Meiying	West China University of Medical Sciences, Chengdu
Pathogenic Role of Enteric Adenoviruses in Diarrhea	Zhao Jinming	Capital Institute of Pediatrics
A Study on Enhancer of Antiviral Drugs	Zheng Fanji	Wuhan University
Super-rapid Diagnosis and Distinguishment Technique of Pigling Diarrhea Caused by Three Types of Virus	Hou Jibo	Jiangsu Academy of Agricultural Sciences
The Microecological System of Intestinal Tract and the Host Defense in Cancer	Cai Fangqin	Henan Medical University
A Study on the Taxonomy and Its Ecology Microecology of Vibrios	Hong Limin	Fudan University
Studies on Pathogenicity of Kanagawa Phenomenon Negative Vibrio parahaemolyticus	Ni Yuxing	Shanghai Second Medical University
Isolation of Invasive Outer Membrane Protein of Shigella	Chen Enlin	Tianjin Medical College
A Research for the Capsule of Clostridium difficile	Fan Ziwen	Nanjing Railway Medical College
Studies on the Unknown Virulent Determinants of Yersinia pestis	Fan Zhenya	Institute of Epidemiology and Microbiology, Chinese Academy of Preventive Medicine
A Study on Mechanism of Bacterial Resistance to Quinolones	Zhang Yongxin	Shanghai Medical University

Seventy-Two Projects Supported by National Science Foundation of China (Continued)

Projects	Name	Organization
The Pathogenic Mechanism and Virulence of INH Resistant Tubercle Bacillus	Wang Guozhi	National Institute for the Control of Pharmaceutical and Biological Products
Studies on Adherence of Candida albicans to Host Cells and Approach of Restraining Them From Adhesion	Guo Ningru	Institute of Dermatology, Chinese Academy of Medical Sciences
The Species Composition and Economic Significance of Rust Fungi in the Coniferous and Broadleaf Mixed Forests of Northern China	Shao Liping	Northeast Forestry University
Studies on Microbial Removal of Organic Sulfur from Coal	Zhong Huifang	Institute of Microbiology, Academia Sinica
The Survey of Microbial Source of Salt and Alkaline Lakes in Tibet	Tian Xinyu	Institute of Microbiology, Academia Sinica
Gene Analysis of JEV Live Vaccine Strain	Rao Chunming	National Institute for the Control of Pharmaceutical and Biological Products
Studies on Inhibitor of Virus Replication	An Derong	Northwestern Agricultural University
Cloning and Characterization of Human Trophoblast Interferon Gene	Li Yan	Chinese Academy of Preventive Medicine, Institute of Virology
Gene Expression of the Human Cytomegalovirus Phosphoprotein 150 Kilodalton	Wu Jun	West China University of Medical Sciences, Chengdu
A Study of Replication Mechanism of Hepadnaviridae by Directed DNA Mutation	Yang Wengang	Institute of Medicinal Biotechnology, Chinese Academy of Medical Sciences
Analysis on Genetic of Cross-ditype and on Compatibility of Different Varieties for Flammulina Velutipes	Qiu Guigen	Jiangxi Academy of Agricultural Sciences
A Study on Powdery Mildew of Main Tropical Plant and Their Host Ranges	Yu Zhuotong	South China Academy of Tropical Crops
Studies on the Microecology of Root and Root Round of Hami-melon	Wang Zhenlan	Institute of Microbiology, Xinjiang Academy of Agricultural Sciences
A Study on the Biocontrol of Root-knot Nematodiasis Using Cabnivorous Fungi	Zhou Guangquan	Guangxi Institute of Botany
The Investigation of Plant Virus and Data Base Management System with Computer	Xie Hao	Plant Protection of Academy of Agricultural Sciences of Xinjiang

Isolation and Characteristics of *Borrelia burgdorferi* From *Ixodes persulcatus*

40091012E Beijing WEISHENGWU XUEBAO [ACTA MICROBIOLOGICA SINICA] in Chinese Vol 31 No 2, Apr 91 pp 151-155

[English abstract of article by Zhang Xitan [1728 5045 0982], Kong Weiwei [1313 1919 1919], et al., of the Institute of Microbiology and Epidemiology, Academy of Military Medical Science, Beijing]

[Text] This article reports the detailed characteristics of Lyme disease spirochetes (*Borrelia burgdorferi*), strain H7, isolated from *Ixodes persulcatus* in Heilongjiang. Cells of strain H7 were 9.8-26.5 μm long and 0.13-0.35 μm wide. There were 1-11 waves with a wavelength of 1.2-3.0 μm and an amplitude of 0.59-1.13 μm. Direction of spires was left. Seven flagella were inserted subterminally at each end of the cell and ends were pointed. 31°C was the optimum cultural temperature in vitro. The major constitutional and antigenic proteins were 21k, 32k and 34k proteins. H7 could react on the patient sera of Xinjiang and Heilongjiang with IFA and western blot. These findings demonstrated that strain H7 belonged to species *Borrelia burgdorferi*, but was a new "subtype" which differed from the strains isolated from other areas and vectors.

Antimalarial Activity of Deoxoqinghaosu

40091012K Beijing YAOXUE XUEBAO [ACTA PHARMACEUTICA SINICA] in Chinese Vol 26 No 3, Mar 91 pp 228-230

[English abstract of article by Ye Bin [0673 2430] and Wu Yulin [0702 3022 2651] of the Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Shanghai, and Li Guofu [2621 0948 4395] and Jiao Xiuqing [3542 1485 0615] of the Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing]

[Text] Compound 3 (deoxoqinghaosu) and compound 4 (deoxocarbaqinghaosu) were synthesized from arteannuic acid (2). Primary exploration of their antimalarial effect against K_{173} strain of *Plasmodium berghei* shows that compound 3 is somewhat more effective than the natural compound—qinghaosu. However, the carba-analogue compound 4 is almost ineffective. The enhanced activity of compound 3 is supposedly ascribed to its higher lipophilicity and, hence, higher affinity for plasmodial membrance. Further studies are in progress.

Study on Cloning and Expression of Recombination pUR222 Carrier With Partial Digested DNA Fragment of *M. Pneumoniae* in *E. coli*

40091012C Beijing ZHONGHUA WEISHENGWUXUE HE MIANYIXUE ZAZHI [CHINESE JOURNAL OF MICROBIOLOGY AND IMMUNOLOGY] in Chinese Vol 11 No 2, Apr 91 pp 128-131

[English abstract of article by Wang Guizhen [3769 2710 3791], Guo Muhua [6753 1970 5478], et al., of the Department of Microbiology, Chinese Medical University, Shenyang]

[Text] Partial digested DNA of *M. pneumoniae* were recombined with carrier pUR222 and transformed into *E. coli* k12 BMH 71-18. Forty-nine white ampicillin resistant colonies were obtained. Nineteen of them hybridized with (α-^{32}P) dATP labeled *M. pneumonia* DNA prob. 0.7 percent agarose gel electrophoresis showed that colony 6 and 8 contains plasmid of 5.9 and 9.1 kb respectively.

Colony enzyme-linked immunosorbent assay showed that two of them can react with *M. pneumonia* DNA fragments were cloned and expressed in *E. coli.*

Studies of Effects of Edema Factor of Anthrax Toxin on Intracellular cAMP Level of Contents CHO

40091012B Beijing ZHONGHUA WEISHENGWUXUE HE MIANYIXUE ZAZHI [CHINESE JOURNAL OF MICROBIOLOGY AND IMMUNOLOGY] in Chinese Vol 11 No 2, Apr 91 pp 93-96

[English abstract of article by Nan Li [0589 7787], Zhuang Hanlan [8369 3352 3482], et al., of the Institute of Biotechnology, Academy of Military Medical Sciences, Beijing]

[Text] Chinese Hamster Ovary (CHO) cells were exposed to edema factor (EF) or protective antigen (PA) of anthrax toxin separately at 37°C for 1-10 hours, then the intracellular cyclic adenosine monophosphate (cAMP) level were measured by radioimmunoassay. It was found that there was no remarkable difference from normal ($P > 0.05$). In contrast, CHO cells which were treated with EF along with PA showed a rapid increase in cAMP concentrations, 30.3 times higher than that of normal at 37°C for 10 min, 897 times for 7 hours, and 476 times for 10 hours. Washing of cells to remove unbound toxin led to a rapid decrease in cAMP level. If the quantity of PA did not change, cAMP elevated with the increasing EF concentrations. In cell free experiment, it showed that EF might be a camodulin-dependent adenylate cyclase, and is not PA-dependent. As to the mechanism of action of EF and PA, we found that EF and PA seems to be able to bind to cell surface separately, so CHO cells treated with EF first, washed, then PA or reversed both gave a limited increase of cAMP. But if cells were exposed to EF + PA, cAMP elevated greatly.

Studies on the Proliferation Responses and IL-2 Production of Thymocytes in HFRSV Infected Suckling BALB/c Mice

40091012A Beijing ZHONGHUA WEISHENGWUXUE HE MIANYIXUE ZAZHI [CHINESE JOURNAL OF MICROBIOLOGY AND IMMUNOLOGY] in Chinese Vol 11 No 2, Apr 91 pp 69-72

[English abstract of article by Huang Chuanshu [7806 0278 2579], Jin Boquan [6855 0130 3123], et al., of the Department of Immunology, the Fourth Military Medical University, Xian]

[Text] The proliferation responses of thymocytes to Con A and/or cytokines and its IL-2 production in HFRSV infected suckling BALB/c mice were compared with those of thymocytes from normal BALB/c suckling mice. The results demonstrate that HFRSV infection, (a) induced a significant decrease in the number of thymocytes and thymus atrophy of suckling BALB/c mice; (b) induced the increase in the ^{3}H-TdR incorporation of thymocytes cultured without any mitogen and cytokines; (c) promoted proliferation responses of thymocytes to Con A, Con A + rHuTNF-α, Con A + rHuIL-2, Con A + rHuTNF-ga + rHuIL-2 and increased IL-2 production of thymocytes by Con A. These results would be very useful for understanding the role and pathological changes of thymus and the relationship between the central and peripheral lymphoid organs during the course of HFRSV infection.

Molecular Cloning of α-Amylase Gene From *Bacillus megaterium* and Its Expression in *Bacillus subtilis*

40091012J Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese Vol 18 No 2, Apr 91 pp 185-192

[English abstract of article by Lu Liangyang [0712 0686 7122], Jiang Ruzhang [5592 1172 3864], and Wang Guifen [3769 2710 5358] of the Laboratory for Biotechnology, Department of Biology, Nankai University, Tianjin 300071]

[Text] Using Bacteriophage λ and plasmid pAT153 and pNQ122 as vectors, α-Amylase gene from *B. megaterium* has been cloned into both hosts of *E. coli* and *B. subtilis.* Expression level of the gene is 250 times higher than *B. megaterium* when it resides in *B. subtilis.*

The enzyme produced by *B. subtilis* harboring the hybrid plasmid can digest amylase into maltose and maltotriose at first, then turn them to maltose and glucose, as incubation time extended. It also can digest maltotriose to maltose and glucose. As a control, the extracts from the broth of recipient strain have no detectable amylase activities. Therefore the enzyme coded by this gene is defined as saccharifying type α-amylase. Its molecular weight is about 58,000 daltons.

The Effects of Upstream Region of SUC2 Gene on Its Expression

40091012I Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese Vol 18 No 2, Apr 91 pp 175-184

[English abstract of article by Xie Kewei [6200 0344 0251], Feng Bo [7458 0590], and Li Yuyang [2621 5148 7122] of the Institute of Genetics, Fudan University, Shanghai 200433]

[Text] A series of deletions were made at upstream region of SUC2 gene with the direction from about -900 bp to the initiation codon. The DNA fragments, which contain SUC2 gene and its deleted upstream region, were inserted into multicopy plasmid. After transforming resulted plasmid into SUC strain, the invertase activities produced by the transformants were determined.

Under glucose repressing condition, the glycosylated invertase produced by transformants with deletion from -636 bp to -179 bp of SUC2 gene were gradually increased. The transformants with deletion down to -223 bp and -179 bp could produce about 100 times higher glycosylated invertase activity as compared to wild type.

Under glucose derepressing condition, the glycosylated invertase produced by transformants with deletion from -395 bp to -179 bp of SUC2 gene were only slightly more than that produced under glucose repressing condition.

Under either glucose repressing or derepressing condition, the transformants with deletion at -89 bp and -41 bp produced only a little of glycosylated invertase, while they produced remarkably higher nonglycosylated invertase activity.

Construction of Cosmid Library and Detailed Physical Map of Rice Chloroplast

40091012H Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese Vol 18 No 2, Apr 91 pp 149-160

[English abstract of article by Zhao Yan [6392 5888], Weng Xinghua [5040 6821 5478], et al., of the Department of Biology, Hangzhou University, Hangzhou 310029, and Chai Jianhua [2693 1696 5478] and Wang Xunming [3076 6064 2494] of the Institute of Genetics, Fudan University, Shanghai. The subject supported by National Nature Science Foundation of China, and Science and Technology Commission of Zhejiang Province and Genetic Engineering Open Laboratory of Fudan University of National Education Commission.]

[Text] The intact rice chloroplast was isolated by homogenizing rice leaves in a buffer containing ascorbic acid of high concentration and centrifuging. The obtained rice chloroplast DNA (ctDNA) is in high yield (100 μg/100 g leaves) and pure enough for restriction endonuclease analysis.

The ctDNA fragments generated by partial digestion with suitable restriction endonucleases were inserted into the vector pcos2 EMBL, and the recombinant DNAs were packaged in vitro and transfected the host bacteria cells. The tetracycline-sensitive and kanamycine-resistant recombinants were screened and the cloning efficiency approached over 10,000/μg inserted DNA. The recombinant DNAs were linearized, digested by lambda-terminase at cos site, partially digested by restriction endonucleases and hybridized with [γ-^{32}P] ATP-labeled oligonucleotide lambda mapping probes. Then the recombinant DNAs were separated by electrophoresis and a detailed restriction endonuclease map has been constructed from the autoradiograms. The rice ctDNA has a length of 129.5 kb and 11, 12, 17, 37, 67 and 44 recognition sites of *Pvu* II, *Sal* I, *Pst* I, *Hind* III, *Eco*R I and *Bam*H I, respectively. The inserted repeat (IR) sequence has a length of 21.7 kb, the large single copy (LSC) is 73.7 kb and small single copy (SSC), 12.4 kb.

Types of Male Sterile Mutants in Somaclones From Somatic Cell Culture of Indica Rice

40091012G Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese Vol 18 No 2, Apr 91 pp 132-139

[English abstract of article by Ling Dinghou [0407 1353 0624], Ma Zhenrong [7456 6966 2837], et al., of the South China Institute of Botany, Academia Sinica, Guangzhou 510650]

[Text] During the five years of 1984-1988, 48 cases of male sterile (ms) mutants in nine varieties were found, in which 20 cases belonged to R_1 generation and 28 R_2 generation. The frequency of ms variations in R_1 generation was around 1 percent and the one in R_2 generation, 2 percent.

According to the characters of ms-mutants and their genetic expression, they could be classified into pollen free (nuclear sterile) and pollen abortive (cytoplasmic and genetically controlled). In IR 54, two cases of pollen free ms-mutant appeared in different generations (R_1 and R_2 generations) in different years (1985 and 1986) were found to be exactly the same. In other words, an identical ms-mutant was repeatedly induced in different years and different generations by somatic cell culture in rice.

Among ms-mutants of the abortive pollen type, one (code "54257") was found to be the cytoplasmic and genetically controlled male sterile mutant. Zhengshan 97, Erjiuai and 162-5 (a stable somaclone from IR 52) could maintain the male sterility of 54257. And IR 24, IR 36, IR 54, Shuangerzhan and so on could restore the fertility. According to the results of continuously backcrossing (BC) for 4 times, the capacity of Zhengshan 97, Erjiuai and 162-5 for maintaining the ms of 54257 was stable. The BC hybrids were completely male sterile. This result showed that the mutant 54257 was ms-mutant controlled by cytoplasmic gene. This is the first report of this kind of mutant derived from somaclones of crops in the world.

The ms-line derived from the mutant 54257 showed that different characters depended upon the maintainer.

When Zhengshan 97B used as the maintainer was backcrossed with 54257, the BC hybrid (54257 - Zhengshan 97A) expressed as the CMS line with WA cytoplasm. But when 162-5 as the maintainer was backcrossed to 54257, the BC hybrid (54257 - 162-5 A) showed quite different from the CMS line with WA cytoplasm.

Gas Chromatograms of Fatty Acids From *Rickettsia* and Their Similarities

40091012D Beijing WEISHENGWU XUEBAO [ACTA MICROBIOLOGICA SINICA] in Chinese Vol 31 No 2, Apr 91 pp 145-150

[English abstract of article by Zhou Fang [0719 2455], Xu Zhaoping [5171 3564 1627], et al., of the Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing]

[Text] Fatty acid compositions of 7 strains of *Rickettsia* were analyzed by an on-line GC/MS system. These strains were *R. prowazekii* E, *R. conorii* Simko, *R. rickettsii* R., *R. sibirica* Barbash and 246, *R. sinkiangensis* Jinghe, and *R. heilungkiangenis* 54. The samples were purified by means of the concentrated salt-ether method. There were about 50 peaks in the fatty acid profiles, and 16 of these peaks were determined, i.e., $C_{22:0}$, $C_{19:0}$, $C_{18:0}$, $C_{18:1}$, $C_{18:2}$, $C_{17:0}$, $C_{16:0}$, $C_{16:1}$, 3-OH-$C_{14:0}$, $C_{15:0}$, $C_{14:0}$, $C_{13:0}$, 2-OH-$C_{12:0}$, 2-OH-$C_{10:0}$, and $C_{11:0}$. The major fatty acids were the saturated straight chain acids (e.g., $C_{16:0}$, $C_{18:0}$, $C_{14:0}$) and the unsaturated straight chain acids (e.g., $C_{18:0}$, $C_{18:2}$, $C_{16:1}$).

Similarities of fatty acid profiles of tested strains were discriminated by the improved Kulik-Vincent method. The result showed that the KV's coefficient of strains Jinghe and 246 was 97.0 percent, and the KV's coefficient of strains 54 and the others was 81.6-94.6 percent.

Feature on Domestically Made Advanced Microcomputer Systems

New GW Features Include Chinese-Made 10k-Gate VLSI ASICs

91FE0586A Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 14, 10 Apr 91 p 3

[Article by Professor Li Sanli [2621 0005 4539] of the Computer Department, Qinghua University: "China's Microcomputer Technology Continues To Advance"]

[Text] I had the pleasure of participating in the technical appraisal conference on "32-bit Microcomputer System Development", a China Great Wall Computer Group project to attack key S&T problems during the Seventh 5-Year Plan, where I gained a rather concrete understanding of the Great Wall Computer Group's technology in the area of developing 32-bit microcomputers and felt deeply gratified of China's substantial progress in the area of microcomputer technology.

The Great Wall Computer Company's tasks in projects to attack key S&T problems during the Seventh 5-Year Plan included six projects: developing the GW386/25C/33C high-grade microcomputer system, GW386SX high-grade microcomputer system, GW-CVGA/24 display card, GW-HGA1 graphics card, GW500 display, and disk controller card.

These two high-grade microcomputers, the GW386/25C/33C and GW386SX, use, respectively, a 32-bit INTEL 386DX and 386SX as their CPU. The former is used in rather high-level microcomputer applications and employs a Cache memory with an 82385 controller. The maximum Cache capacity that can be controlled by the 82385 is 32 KB, however. The Great Wall [GW] uses a dual circuit group associative architecture that increases the Cache capacity to 64 KB. This effectively increases the Cache hit rate and takes full advantage of CPU efficiency, which also greatly increases system speed. As everyone knows, Cache and memory system design is a very key question in 80386 high-grade microcomputer systems. The Cache design capacity of the Great Wall GW386/25C/33C is equivalent to the highest grade microcomputer systems internationally at present. It also employs a page interleaved technology in its main memory design. Comprehensive use of this technology greatly improves the system performance of the GW386/25C/33C. The 386SX is a new type of CPU that is 32-bit internally and has a 16-bit external bus. Because it is less expensive, the international trend at present is using 386SX systems to replace 80286 systems.

The GW386/25C/33C and GW386SX system designs also employ these advanced technologies: three LSI chips are used on the motherboards to achieve a tighter integration level in the assembly, and they also improve system reliability. SHADOW RAM technology is used to enable part of the BIOS capacity to be mapped in RAM for execution, which increases execution speed and flexibility. The onboard RAM capacity can be expanded on-site to a maximum of 32 MB. The system bus uses asynchronous control. It supports LIM EMS4.0, and so on. These advanced technologies show that China's own design technology for 32-bit microcomputer systems has entered a more mature stage and that it can compare favorably to the design technology of similar products internationally.

Another outstanding characteristic of this GW computer product is the design of its graphic display system. The Great Wall company used a 10,000-gate [10k-gate] gate-array application-specific integrated circuit [ASIC] of its own design on the GW-CVGA/24 display card. It has a 24-point array high-quality Chinese character display that has multiple character styles and a rather high capacity character database. It is also fully compatible with IBM VGA and GW CEGA displays. The Chinese characters I saw on the display screen in the system demonstration were indeed rather beautiful, which was not the case in the past on Chinese-made and imported foreign microcomputers, and their resolution and colors have already attained international levels. It should be mentioned that the 10k-gate ASIC chip designed by Great Wall is one of the highest-integration-level VLSI chips so far designed and successfully developed domestically. This shows that China has made substantial advances in the area of VLSI design technology. The GW-500 display developed by Great Wall has multi-frequency shared-frequency high-resolution properties and its line frequency adjustment range is superior to similar products in foreign countries. This has also laid a very good foundation for China's high-quality Chinese character displays. These two achievements have put China in a vanguard position internationally in microcomputer Chinese character displays and they have provided a very good environment for subsequent development of microcomputer Chinese character displays.

The overall impression I received from participating in the Great Wall Company's technical appraisal meeting was that the China Great Wall Computer Group has done a great deal of arduous work in the area of developing China's computer systems and that it has assumed major responsibility for a shift to domestic production of microcomputers in China. The Great Wall Company was only established 4 or 5 years ago and the microcomputer technology staff at Great Wall has gradually grown and is becoming increasingly mature. They are already capable of competing with foreign microcomputer system companies.

Applications of GW0520EM

91FE0586B Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 14, 10 Apr 91 p 3

[Article compiled by Cao [2580]: "List of Applications of Popular GW0520EM"]

[Text] The Great Wall GW0520EM microcomputer structure is a popular microcomputer in the Great Wall

microcomputer series. It has high speed, powerful Chinese character functions, high compatibility, easy expandability, low price, abundant software, a wide range of applications, and flexible integration, can be used as a general-purpose or special-purpose system, and is being used in a wide range of applications. A brief introduction to its applications is provided here to illustrate the range of applications for the Great Wall computer series.

1. The GW0520EM microcomputer as a word processor.

This computer can use the several dozen Chinese character input methods now popular in China and it has full-screen editing software and character printing databases of various precision.

Configuration: A diskless GW0520EM combined with a Chinese character printing card containing a high dot-matrix hard character database can be used as a word processor. Beside being used as a word processor, a GW0520EM with a belt hard disk can be used for office processing and scientific computing. When reconfigured with a CMGA expanded graphic display arrangement and GWART, GW bit 100/200, GWSTAR or GWDP, or other editing and composing software, it can attain a light printing level. In addition, many users have done a great deal of secondary development work on GW0520EM word processor applications. For example, the Tianjin Optoelectronic Communications Company has developed a precision character database board, program board, and word processing system software which are configured on the GW0520EM to make a "multi-user word processor". The Ministry of Energy Resources' Electronic Technology Development Department and the Huaxing Software Institute have jointly developed OFFISTAR office automation software for the GW0520EM which has been further perfected by the Great Wall (Shenzhen) Company to produce commercial integrated GWSTAR software.

2. The GW0520EM microcomputer as a light desktop publishing system.

This is composed of a GW0520EM with GW-ART light printing software combined with a common dot matrix or laser printer, graphics plotter, and so on.

3. The GW0520EM microcomputer used for on-line communications, intelligent emulation terminal, or intelligent workstation.

A GW0520EM with on-line communications or emulation software including PC-PLEX and configured with a CMGA high-precision Chinese language enhanced monochrome multiple-gray-level display system can be used for effective on-line communications with large, medium-sized, and small computers as a "mainframe".

4. The GW0520EM microcomputer as a telex terminal.

The GW0520EM with a PC-TELEX card inserted can serve as a telex terminal. If a PC-TELETEX card is inserted, it can be used as an intelligent TELETEX terminal and connected into the Ministry of Posts and Telecommunications' packet data switching network.

5. The GW0520EM microcomputer used to make a language/data transmission microcomputer wireless remote network.

6. The GW0520EM used as a diskless network workstation.

7. The GW0520EM used as an intelligent data log-in workstation.

8. The GW0520EM microcomputer used to perform computer graphics PC FAX functions.

9. The GW0520EM to make a microcomputer financial-desk dual-seat workstation system. A GW0520EM used as the main computer and configured with two keyboards and two monitors so that two people can use a mainframe computer simultaneously is called a GW0520EM2 dual-user system and is suitable for use in the financial industry.

10. The GW0520EM displayed its valiance at the Asian Games.

The Great Wall Group assisted the Beijing Asian Games with 706 GW microcomputer systems that provided full coverage of the 33 fields and gymnasia and 28 non-competition fields. The GW0520EM microcomputer accounted for 513 units. Practice has proven that these machines completed their tasks splendidly.

Specifications of GW0520, 286, 386, 386SX, 486 Models

91FE0586C Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 14, 10 Apr 91 p 5

[Article: "Great Wall Microcomputer Picks a Flower"]

[Text]

I. Great Wall [GW] 0520 Series

A. The GW-0520HM home computer is an IBM PC/XT compatible microcomputer. The system has an Intel 8088 quasi-16-bit microprocessor as a CPU and very-large- scale integrated circuit (VLSI/ASIC) chip technology. It is small in volume, inexpensive, and suitable for home use.

1. IBM PC/XT compatible

2. 8088 CPU, 10MHz system clock speed

3. Uses VLSI ASIC chipset

4. Basic system supports IBM CGA/MDA/Hercules display standards

5. Can be configured with a television, CGA color monitor, or MDA monochrome monitor

B. The GW-0520DH/10 microcomputer system is an IBM PC/XT compatible microcomputer system. This

system uses an Intel 8088 quasi-16-bit microprocessor as a CPU and VLSI/ASIC chip technology. It has superior Chinese and English dual compatibility processing functions that increase system performance.

1. IBM PC/XT compatible

2. 8088 CPU, 10MHz system clock speed

3. Uses VLSI ASIC chipset

4. Great Wall GW-CEGA Chinese and English display system

II. Great Wall 286 Series

A. The GW-286BH/12 microcomputer system is an IBM PC/AT compatible microcomputer system. This system uses an Intel 80286 16-bit microprocessor as a CPU and VLSI/ASIC chip technology. It has superior Chinese and English dual compatibility processing functions that increase system performance.

1. IBM PC/AT compatible

2. 80286 CPU, 12MHz system clock speed

3. VLSI ASIC chipset

4. Great Wall GW-CVGA/24 high-grade Chinese and English display system

B. The GW-286EX/16/20 microcomputer system is an IBM PC/AT compatible microcomputer system. This system uses an Intel 80286 16-bit microprocessor as a CPU and VLSI/ASIC chip technology. It has superior Chinese and English dual compatibility processing functions that increase system performance.

1. IBM PC/AT compatible

2. 80286 CPU, 16MHz/10MHz dual system clock speeds

3. Shadow RAM and LIM EMS 4.0 hardware support

4. Internal memory on the CPU motherboard can be expanded to 32 MB

5. Great Wall GW-CVGA/24 high-grade Chinese and English display system

III. Great Wall 386 Series

A. The GW-386SX/LP microcomputer system is an IBM PC/AT compatible microcomputer system. This system uses an Intel 80386SX quasi-32-bit microprocessor as a CPU and VLSI/ASIC chip technology. It is lightweight, small, and portable.

1. IBM PC/AT compatible; runs MS-DOS, CCDOS, OS/2, and XENIX

2. 80386SX CPU, 16MHz system clock speed

3. Shadow RAM and LIM EMS 4.0 hardware support

4. 1 MB internal system memory, expandable to 4 MB

5. VGA compatible 640x480x16 gray-scale backlit LCD display screen

6. Standard 15-pin VGA analog signal port for external connection to a VGA analog display

7. Has internal 12VDC rechargeable internal Ni-Cd-battery power supply that can provide for system operation in excess of 2 hours

8. 15VDC power supply jack that can be connected via an AC/DC adapter to a 220VAC power supply

9. Intelligent power supply management functions that conserve power consumption

B. The GW-386SX/16/20 microcomputer system is an IBM PC/AT compatible microcomputer system. This system uses an Intel 80386SX quasi-32-bit microprocessor as a CPU and VLSI/ASIC chip technology. It has superior Chinese and English dual compatibility processing functions that increase system performance.

1. IBM PC/AT compatible

2. 80386SX CPU, 16MHz/20MHz dual system clock speeds

3. Compatible with Intel 80386 instruction system

4. Shadow RAM and LIM EMS 4.0 hardware support

5. Internal memory on CPU motherboard expandable to 32 MB

6. Great Wall GW-CVGA/24 high-grade Chinese and English display system

C. The GW-386/25 microcomputer system is an IBM PC/AT compatible microcomputer system. This system uses an Intel 80386DX-25 32-bit microprocessor as a CPU and VLSI/ASIC chip technology. It has superior Chinese and English dual compatibility processing functions that increase system performance.

1. IBM PC/AT compatible

2. 80386DX CPU, 25MHz system clock speed

3. Shadow RAM and LIM EMS 4.0 hardware support

4. Internal memory on CPU motherboard expandable to 32 MB

5. Great Wall GW-CVGA/24 high-grade Chinese and English display system

D. The GW-386/33C microcomputer system is an IBM PC/AT compatible microcomputer system. This system uses an Intel 80386DX[-25] 32-bit microprocessor as a CPU and VLSI/ASIC chip and cache memory technology. It has superior Chinese and English dual compatibility processing functions that increase system performance.

1. IBM PC/AT compatible

2. Intel 80386DX CPU, 33MHz system clock speed

3. Intel 82385 Cache Controller

4. 64 KB/0 WS [zero wait state] dual circuit group associative cache memory

5. Shadow RAM and LIM EMS 4.0 hardware support

6. Internal memory on CPU motherboard expandable to 32 MB

7. Great Wall GW-CVGA/24 high-grade Chinese and English display system

E. The GW-386/25C microcomputer system is an IBM PC/AT compatible microcomputer system. This system uses an Intel 80386DX-25 32-bit microprocessor as a CPU, VLSI/ASIC chip technology, and cache memory technology. It has superior Chinese and English dual compatibility processing functions that increase system performance.

1. IBM PC/AT compatible

2. Intel 80386DX CPU, 25MHz system clock speed

3. Intel 82385 Cache Controller

4. 64 KB/0 WS dual circuit group associative cache memory

5. Shadow RAM and LIM EMS 4.0 hardware support

6. Internal memory on CPU motherboard expandable to 32 MB

7. Great Wall GW-CVGA/24 high-grade Chinese and English display system

IV. Great Wall 486 Series

A. The GW-486/25 microcomputer system is an IBM PC/AT compatible microcomputer system. This system uses an Intel 80486-25 32-bit microprocessor as a CPU and VLSI/ASIC chip and cache memory technologies. It has superior Chinese and English dual compatibility processing functions that increase system performance.

1. IBM PC/AT compatible

2. Intel 80486 CPU, 25MHz system clock speed

3. CPU contains 80387 coprocessor and 8 KB Cache

4. OPTI-481/482 chipset

5. Shadow RAM functions

6. Internal memory on CPU motherboard expandable to 32 MB

7. Coprocessor WTL4167 optional

8. 128 KB second-level Cache optional

9. Great Wall GW-CVGA/24 high-grade Chinese and English display system or GW- HGA1 high-grade graphics processing system

Specifications of Legend 286, 386, 386SX, 486 Models, Other Products

91FE0586D Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 14, 10 Apr 91 p 7

[Unattributed article: "Continual Innovations in Products and Technology, Legend Famous in China and Foreign Countries"]

[Text]

I. Legend (Lianxiang, abbreviated LX) 286 Microcomputer

This product is now being exported to European countries and the United States at a rate of more than 10,000 units per month. It has also found favor at the same time with users in China since domestic sales began in April 1990. The main properties of this computer are:

1. 80286 CPU; 16MHz, 0 WS (measured speed Landmark = 21MHz)

2. 80287 coprocessor: optional

3. RAM: 512 KB/1 MB/2 MB/2.5 MB/4 MB

4. Display: MONO, CGA, EGA, VGA compatible, can also support 800x600 and 1024x768 high resolution displays

5. Chinese character system support: LX Chinese card

6. Hard disk: 20 MB/40 MB/90 MB

7. Software: 1.2 MB/360 KB

8. Keyboard: 101/102 key

9. Two serial ports, 1 parallel port

10. TURBO switch: switchable 16MHz/8MHz CPU clock, seven expansion slots

11. Solidified Disk Cache: can increase document storage and retrieval speeds by a factor of about 10, clock automatic switching circuit guarantees bus clock is 8MHz industry standard

12. EMS drive program provided

13. High-level special diagnostic disk, technical handbook, and operating handbook provided

14. Tested and proven to be completely AT compatible in different operating system and network environments

15. The LX286 can be configured with an LX Chinese card and LX Chinese character environment software to turn the system into a dual Chinese and English compatible high-performance microcomputer.

II. Legend 386SX Microcomputer

The LX 386SX uses NEAT SX support chips developed by the C&T Company in 1989. This group of chips has a high

speed, up to 20MHz, with a measured speed of 25MHz. It has high performance and can support EMS4.0, SHADOW RAM, and OS/2 optimization. It has page interleaved memory management functions, a high degree of integration, and uses a group of four chips to replace most of the TTL and PAL [circuitry], giving this system high reliability and a high performance/price ratio.

The LX 386SX undoubtedly is the best choice for users hoping to gain all the advantages of 32-bit computers at the lowest cost.

III. Legend 386/33 Microcomputer

The LX 386/33 uses 386 TIGER chips which appeared in the early 1990's. It has a fast speed and can operate at up to 33MHz. It has a high degree of integration, with a total of four chips that replace nearly all the TTL and PAL, resulting in substantial improvements in reliability, price, and other indices. It has a large memory. The board can hold 1 to 32 MB in RAM capacity (choice of 1/2/4/8/32 MB) and can be increased to 64 MB by the addition of an expansion card. It uses an 82385 high-speed temporary memory controller and dual-circuit LX high-speed temporary memory with a hit rate in excess of 95 percent, and it achieves true zero wait state. A choice of 80387 or W3167 coprocessor is available and it has eight expansion slots (one 32-bit high-speed slot, five AT slots, two XT slots) and it has special hardware support for EMS4.0 and Shadow RAM for even better overall computer performance.

The LX 386 has a fast speed, large RAM capacity, small motherboard, small number of components, low price, and high reliability, and it is the best choice for multiuser systems, networks, and CAD/CAM/CAE users.

IV. Legend 486 Microcomputer

The LX 486 microcomputer uses an 80486 microprocessor, which has the highest performance at present, that integrates the CPU, floating-point processor, and 8 KB high-speed temporary memory on the chip, and it can execute common instructions in one clock cycle, giving the 486 microcomputer a performance comparable to a workstation.

The LX 486 uses highly-integrated support chips. The motherboard capacity can be 1 to 32 MB of RAM (choice of 1/2/4/8/32 MB) and can be expanded to 64 MB by the addition of an expansion card. A W4167 coprocessor is optional and it has eight AT expansion slots. It has optional 128 KB burst-type [?flash] second-level high-speed temporary memory that can further improve system performance. The fast speed, large RAM capacity, low price, and high reliability of the LX 486 make it the best choice for a high-grade microcomputer and workstation.

V. Chinese and Foreign Language Compatible Legend Soft Chinese Character System

(DAS906B) This is a new Legend soft Chinese character card recently successfully developed by the Legend Group that is called the DAS906B Chinese card. The matching Chinese character system is the CCS4.0B. This Chinese character system functions like hard Chinese characters and is similar in price to soft Chinese characters. It is a soft Chinese character system with the most ideal performance/price ratio.

Main characteristics:

1. Supports an 8-page "direct-write screen" and flexible definition of function keys, and Chinese character processing does not take up interrupt vectors, so most foreign-language software can be used without conversion to Chinese.

2. It provides users with extremely large internal memory space. Under DOS 3.3, the system only takes up 37 KB and it provides the user with 550 KB of useable space.

3. Batch information display and printing speeds are obviously higher than other soft Chinese character systems.

4. It employs a multi-level menu-type organization and the source driver and target driver can both be allocated as desired.

5. It has powerful Chinese character processing functions.

6. The Chinese card is small in volume, low in power consumption, easy to install, highly reliable, requires no modification of address configuration, and can easily coexist with other cards.

7. The edition is easily updated, requiring only ROM rewrite and recopying of the disc.

8. Encryption measures provided.

VI. LX-DTP Legend Composing System

The LX composing system uses the internationally popular Window operating customs and provides an interchangeable operating pattern integrated with batch processing. It is based on the LX Chinese character system, supports document and regular book and periodical composing, and meets office automation requirements.

VII. County (City) Level Local Management Information System

This system is based on graphic database principles. Interconnection of database management systems and graphic systems and interchangeable processing of data and graphics are implemented rather well in this microcomputer. The whole system has a full range of functions, user-friendly interface, and powerful expandability, and can satisfy the requirements of county (city) level local records and information management.

VIII. Multiuser Legend Chinese Character System (MCCS)

MCCS is suitable for SCO XENIX™ System V2.3.2 and is suitable for all types of 386 microcomputers.

MCCS uses the same Chinese card as the LX single-user Chinese character operating system CCS with no change in model. Both systems can be entered simultaneously on the hard disk for use by users as needed.

It has multi-screen LX intelligent Chinese character input capabilities.

There is only a single code character (word) dictionary in the internal memory. The character database and characters

(words) not in current use take up no internal memory space.The full-screen editing tool VI and line editing tool ED both have Chinese character functions.

It maintains full SCO XENIX™ system V2.3.2 functions.

IX. Legend Chinese Card (ASIC Type)

1. High degree of integration: composed of ASIC (application-specific VLSI chip DLX9000) employing 1.5μ CMOS technology.

2. High speed: display speed >2,500 Chinese characters/second (via BIOS), direct screen write time <2μs/Chinese character, 8-bit or 16-bit operation, the fastest Chinese card.

3. High compatibility: hardware supports direct screen write, foreign language documents do not require conversion to Chinese characters, and it can maintain the same speed as Chinese characters in direct display, so it is a highly compatible Chinese card.

4. 1 MB RAM card can hold 1 MB RAM, can accept any Chinese character input program desired, maximum number of code words 60,000 (30,000 LX word strings), can also serve as printer buffer memory to increase printing speed, basically without disk adjustment, can support 16,000 Chinese character groups.

5. Adaptability: can be used for XT, AT, 286, 386, 486, PS-2/30, and 30-286 computer models, can be connected to all types of displays including EGA, VGA, enhanced EGA and VGA, and other high-resolution graphics cards including microcomputers with display cards on the motherboard, can use TTL or ANALOG monitors, monochrome or color monitors.

6. Has LX Chinese character system 3.0 support.

7. Supports the widest range of applications.

8. Downward compatibility throughout with all models of LX Chinese cards.

Resistive Network Synthesis for Neural Memory

40100059 Beijing DIANZI KEXUE XUEKAN [JOURNAL OF ELECTRONICS] in Chinese Vol 13 No 3, May 91 pp 225-231

[English abstract of article by Wang Baiyong and Yu Juebang of the University of Electronic Science and Technology of China, Chengdu. MS received 9 May 90]

[Abstract] Study of neural networks in view of neural functions is suggested. The memory function of a network is studied and its mathematical model is given. The model is synthesized by a piecewise-linear resistive network. The network has many properties of an artificial network such as parallelism, real-time processing, distributivity and adaptability; in addition, the parameters of the network are expressed analytically by the patterns and features which are memorized in the network.

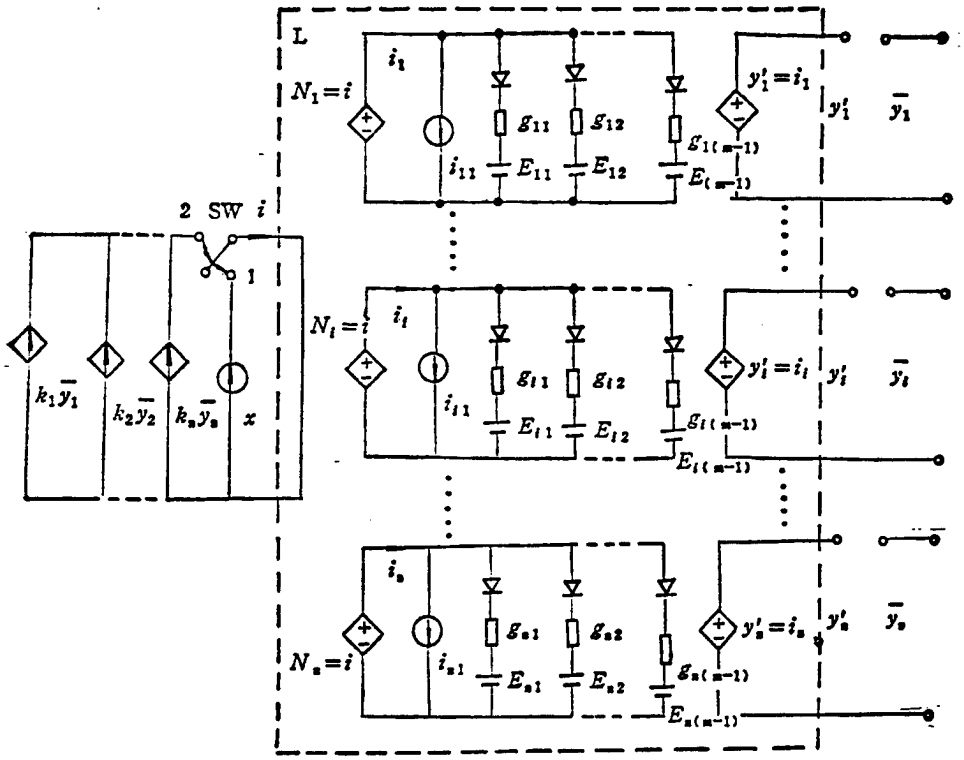


Figure 2. Piecewise-Linear Resistive Network Model for Neural Memory

Quasi-FMS, Automated Materials-Transport Cart Pass Appraisal

91P60192A Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 15, 17 Apr 91 p 1

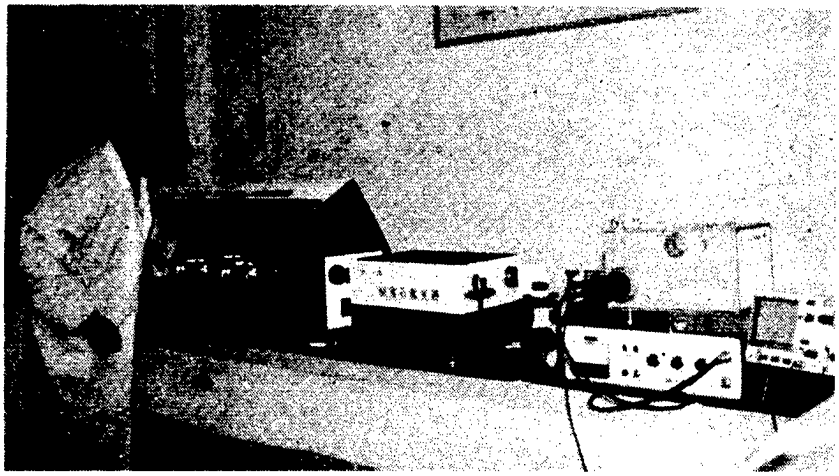
[Article by Chang Sheng [2490 5110]: "Quasi-Flexible Manufacturing System Unveiled in Hunan"]

[Summary] The "quasi-flexible manufacturing system" (quasi-FMS) and "automated materials-transport cart" jointly developed by Hunan University and the Puyuan [3184 3104] Engineering Machinery General Plant as a State Seventh Five-Year Plan priority project passed appraisal recently at Changde. This mid-eighties-level system consists of two machining centers, three general-purpose machine tools, one automated materials-transport cart, and a computer-controlled supervisory system. The system, which has two-way-vertical and two-way-horizontal abilities, has a positioning accuracy of 1-2 mm, and includes fault-alarm, safety-protection, and critical-braking functions. Use of this new system in a 3200-parts-per-year production line reduces machine-tool wear by 50 percent, reduces the product-rejection rate from 0.15 or 0.20 percent down to 0.05 percent, reduces number of operators from 34 to 11, and generates over 800,000 yuan in direct economic benefits.

State-of-the-Art Slab Laser Developed

91P60198E Beijing ZHONGGUO DIANZI BAO [CHINA ELECTRONICS NEWS] in Chinese 29 May 91 p 1

[Article by Yao Hongzhang [1202 7703 4545]: "Slab Laser Developed; At International State-of-the-Art"]



The photo shows a scientist observing operation of the new Ti-gem laser.

[Summary] A state-of-the-art high-average-power Nd:YAG slab laser complete with high-quality large-size laser crystal, developed by MMEI's Research Institute 11, passed technical appraisal on 15 May. With its fiber- optic transmission compatibility and other features, this type of laser has recently been a "hot" topic worldwide; it is especially suitable for use in tactical laser weapons, optoelectronic countermeasures, and laser precision machining. The new laser's average output power is 336 watts, repetition rate is 20 Hz, and maximum device efficiency is 3 percent; it can also be employed in continuous-wave operation. The high-quality 65 mm x 190 mm Nd:YAG crystal supplied with this laser system is fabricated with domestically made equipment, instruments, and raw materials; its main performance indicators are superior to those of the top-quality product made by the U.S. firm Union Carbide.

First Domestically Developed Titanium-Gem Tunable Laser Unveiled

91P60198A Beijing ZHONGGUO KEXUE BAO [CHINESE SCIENCE NEWS] in Chinese 23 Apr 91 p 2

[Photoreport by Zhang Jianping [1728 1696 1627]: "Titanium-Gem Tunable Laser Unveiled in Anhui"]

[Summary] The nation's first titanium-gem (Ti-gem) tunable laser—whose development has been a major CAS project—was recently unveiled at the CAS Anhui Institute of Optics & Fine Mechanics (AIOFM), and passed CAS-level technical appraisal on 28 March. AIOFM began its study of the Ti-doped gem laser—a type invented in the United States in the early eighties and rapidly investigated worldwide—in 1987 in a priority CAS research project entitled "High-Power Broad-Tuning Ti-Gem laser and Its Frequency-Doubling Technology." Professor Qian Lizhao [6929 5259 3564] and other Chinese laser experts have certified that the AIOFM-developed Ti-gem laser system's main technical indicators meet or approach the international state-of-the-art. Applications of this system include laser radar, laser spectroscopy, atmospheric optics, laser remote sensing, and underwater communications.

960-Circuit CO_2 Laser Atmospheric Communications System Developed

91P60198B Beijing ZHONGGUO DIANZI BAO [CHINA ELECTRONICS NEWS] in Chinese 24 Apr 91 p 1

[Article by Sheng Tao [4141 3447]: "960-Circuit Laser Atmospheric Communications System Developed"]

[Summary] A 960-circuit CO_2 laser atmospheric communications system developed over a four-year period by the University of Electronic Science & Technology [in Chengdu] as a State Seventh 5-Year Plan priority S&T project will be an important tool for modernizing the nation's secure communications and electronic countermeasures technologies. This mid-to-late- eighties-level system has a key component (its mid-IR broadband acousto-optic modulator) that matches the international state-of-the-art. The system, which can transmit 960 telephone circuits or one analog color TV signal, employs "electrical FM/optical FM-single-tube coherent optical communications" technology, an important part of coherent imaging laser radar and other high- tech systems. In addition to secure voice and digital-information transmission, the system can be used for near-harbor optical-communications navigation for warships and commercial vessels.

Laser Fluorescence Remote-Sensing System Developed

91P60198D Beijing ZHONGGUO KEXUE BAO [CHINESE SCIENCE NEWS] in Chinese 21 May 91 p 2

[Photoreport by Peng Dejian [1756 1795 1696], photo by An Guang]

[Summary] In a three-year effort, scientists at the CAS Anhui Institute of Optics & Fine Mechanics Remote-Sensing Division have completed a packaged laser-fluorescence remote-sensing system suitable for field use, and have obtained much valuable data on surface features for crude-oil and petroleum exploration and for monitoring of vegetation, soil, and similar features.

The photo depicts an exterior view of this new laser-fluorescence remote-sensing system.

Nation's Adaptive Optics Technology in World's Front Ranks

91P60198C Beijing ZHONGGUO KEXUE BAO [CHINESE SCIENCE NEWS] in Chinese 21 May 91 p 1

[Article by Deng Xianchun [6772 6343 2504]: "Nation's Adaptive Optics Technology in World's Front Ranks"]

[Summary] In its 10-year study of adaptive optics, a several-dozen- member CAS Institute of Optoelectronic Technology (IOT) research group led by Jiang Wenhan [1203 2429 3352] has made significant progress, including development of the optical-path error correction system for the Shen Guang ["Magic Light"] laser fusion facility. Some of the elements developed by the group surpass comparable West European and Soviet devices and are second only to the United States. Researchers from the Adaptive Optics Laboratory, built in 1980 at the CAS's IOT, have published over 40 scholarly papers in domestic and international journals; under contract to the European Large Solar Telescope Foundation, they completed a demonstration of the overall scheme for the telescopes adaptive optical system.

Some of the institute's specific breakthroughs include development of 37- element and 69-element deformation reflectors, high-speed tilting reflectors, a 40 MHz special-purpose wavefront-control high-speed digital processor, and a 37-element all-digital high-speed wavefront-control system.

Fiber-Grating Optical Pulse Compression

40100057A Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese Vol 11 No 5, May 91 pp 385-389

[English abstract of article by Fan Liming, Li Shiying, Wang Shijie, Chen Shishen, and Xu Zhizhan of the Shanghai Institute of Optics and Fine Mechanics, CAS, Shanghai 201800; MS received 20 Sep 90]

[Text] Results of less than 10 ps optical pulses compressed from 40 ps pulses using a fiber-grating pair optical pulse compressor are reported, and some factors affecting the compressed pulse quality are analyzed. The results fit the expection very well.

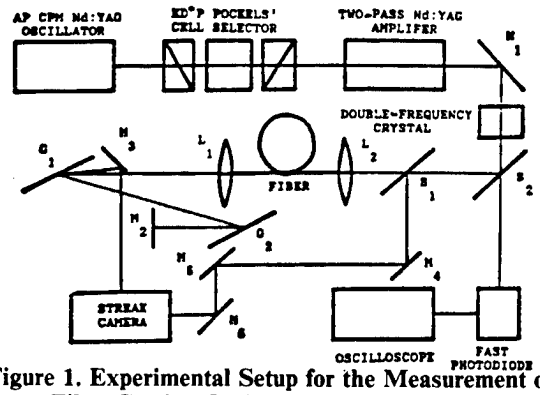


Figure 1. Experimental Setup for the Measurement of Fiber-Grating Optical Pulse Compression

Broad Tunable BBO Optical Parametric Oscillator With High Conversion Efficiency

40100057C Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese Vol 11 No 5, May 91 pp 396-401

[English abstract of article by Fan Qikang and Ye Jianhua of the Department of Optical Engineering, Zhejiang University, Hangzhou 310027; MS received 24 Sep 90; revised 31 Oct 90]

[Text] A pulsed single resonant BBO optical parametric oscillator (OPO) is demonstrated. With a pump laser at 354.7 nm, the OPO has output of wavelength from 413 nm to 661 nm and from 2.51 μm to 0.765 μm with maximum energy conversion efficiency as high as 52 percent. The output performance of the OPO is discussed.

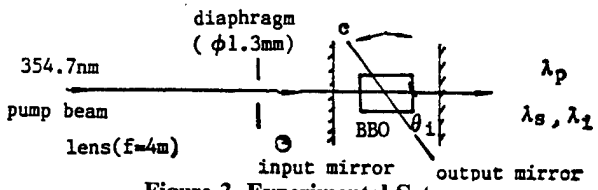


Figure 3. Experimental Setup

Time-Resolved Soft X-Ray Spectra Measurement of Laser-Produced Plasmas

40100057D Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese Vol 11 No 5, May 91 pp 438-443

[English abstract of article by Tang Yongjian, Zheng Zhijian, He Haien, Feng Jie, and Ding Yaonan of the Southwest Institute of Nuclear Physics and Chemistry, Chengdu 610003; Su Yonggang, Fu Shaojun, Hong Yilin, and Tao Xiaoming of the Hefei National Synchrotron Radiation Laboratory (HESYRL) University of Science and Technology of China, Hefei 230026; MS received 27 Mar 90; revised 14 Nov 90]

[Text] Time-resolved soft-X-ray spectra measurement has been developed for studying laser-produced plasmas by using a gold transmission grating (TG) coupled to a soft-X-ray streak camera. Recently we fabricated the TG with a line density of about 853 l/mm on a substrate of a 0.5-micron-thick polyimide membrane. Time-resolved spectra of gold (20 μm in thickness) planar targets were obtained. The planar targets were irradiated with 680 ps laser pulses (λ = 0.53 μm) from the LF11# Nd: glass laser system. The emission intensity with temporal variation for O band from gold plasmas was observed.

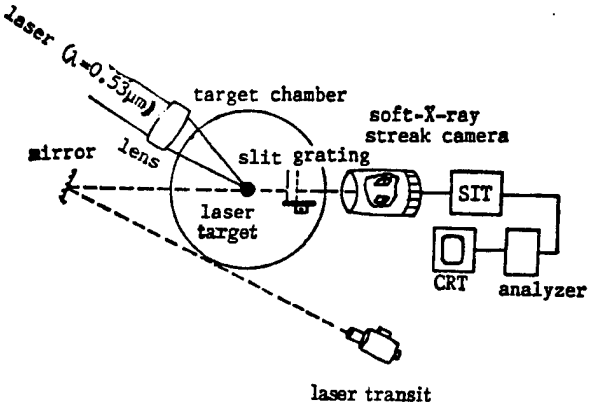


Figure 2. Schematic of the Experimental Setup

Optical Compression of Ultrashort ps Pulses

40100057B Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese Vol 11 No 5, May 91 pp 390-395

[English abstract of article by Duan Chunli, Zhao Qingchun, Lu Yutian, Dong Jingyuan, Guo Jinhua, and He Huijuan of the Shanghai Institute of Optics and Fine Mechanics, CAS, Shanghai 201800; MS received 20 Jul 90; revised 14 Nov 90]

[Text] Pulse compression experiment was conducted by studying the clamping effect of stokes pulses in SRS of short optical fiber ($L \approx L_w$) on pulse energy of fundamental wave. With the high pumping power (P = 1600 W) injected into a 8.95-m-long single-mode optical fiber for green light, a mode-locked and frequency-doubled Nd:YAG laser pulse of 40 ps was compressed to have a duration of less than 5 ps (due to the limitation of temporal resolution of the streak camera) by employing the configuration of a pair of gratings with double optical path length, and filtering out the portion of nonlinear chirp of SPM spectrum with the spatial frequency window.

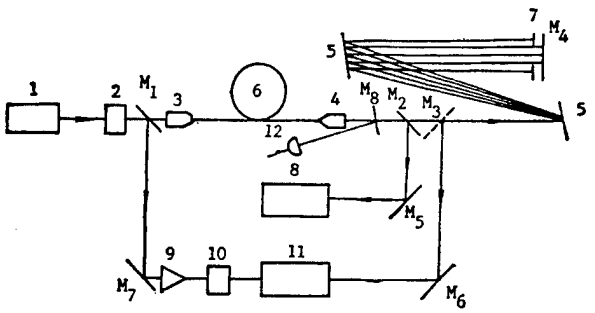


Figure 1. Experimental Setup

1. Mode-locked Nd:YAG laser; 2. KTP crystal for SHG; 3, 4. Microscope objectives; 5. A pair of gratings; 6. Single-mode fiber; 7. Spatial frequency window; 8. Spectrograph; 9. Opto-electronic transducer; 10. Time-delayer; 11. Streak camera; 12. Silicon photodetector; M_1, M_2, M_8—Beam splitters; M_3, M_4, M_5, M_6, M_7—Mirrors

Superconducting Y-Ba-Cu-O Thin Films Deposited With Excimer Laser Sputtering

40091013A Shanghai ZHONGGUO JIGUANG [CHINESE JOURNAL OF LASERS] in Chinese Vol 18 No 4, Apr 91 pp 267-270

[English abstract of article by An Chengwu, Fan Yongchang, Zhou Fengqing, Lu Dongsheng, and Li

Zaiguang of the National Lab. of Laser Technology, Huazhong University of Science and Technology, Wuhan]

[Text] An excimer laser beam was used to irradiate superconducting Y-Ba Cu oxide pellet to make the elements of the target sputter and deposit as films on the substrates placed parallelly to the pellet. With appropriate post-annealing, the deposited films were of superconducting transition above 77 K, and the films with zero resistance temperature of 85 K were prepared. The effects of deposition conditions and post-annealing procedure on the properties of the thin film were discussed.

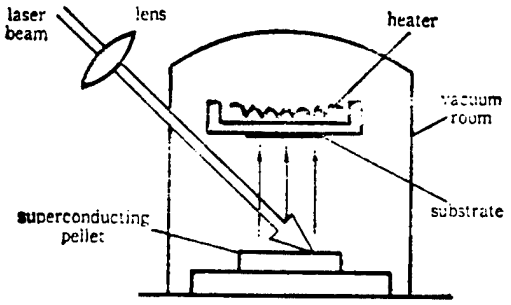


Figure 1. Sketch of the Experiment

Key Words: laser deposition, high T_c superconducting film

Absorption and Response of Cs Atomic Resonance Filter to the XeCl/Pb Blue Laser Pulses

40091013B Shanghai ZHONGGUO JIGUANG [CHINESE JOURNAL OF LASERS] in Chinese Vol 18 No 4, Apr 91 pp 298-302

[English abstract of article by Gu Hongping, Lou Qihong, and Huo Yunsheng of the Shanghai Institute of Optics and Fine Mechanics, Academia Sinica, Shanghai]

[Text] The absorption characteristics and the response time of the Cs atomic resonance filter (ARF) filled with 5 Torr Ar buffer gas have been investigated theoretically and experimentally when ARF was irradiated with the free-run XeCl/Pb blue laser (pulse width: 40 ns). The near infrared fluorescence pulse with 40 ns and 150 ns (FWHM) pulse duration have been detected at the side of and behind the ARF respectively.

Key words: XeCl laser, stimulated Raman scattering, atomic resonance filter

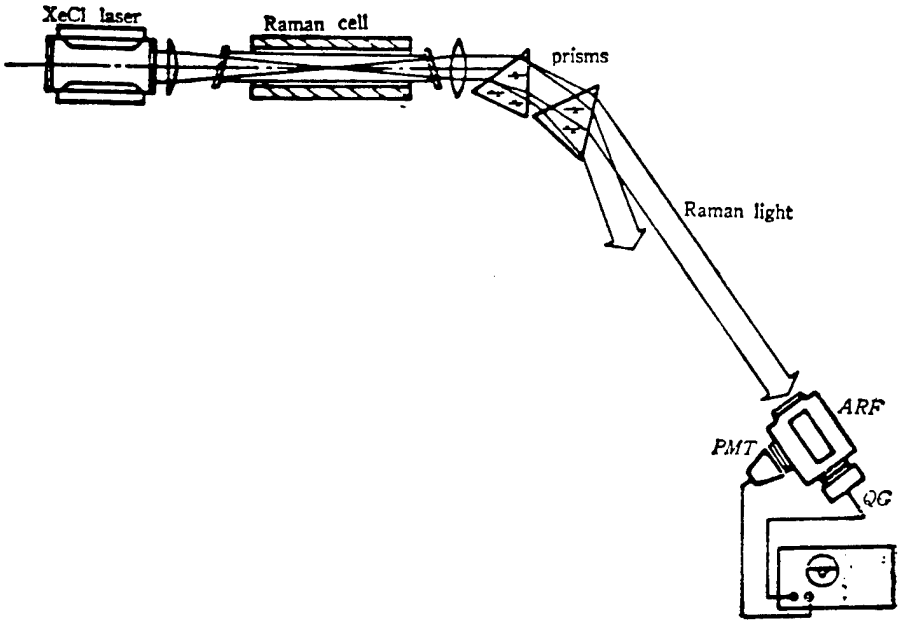


Figure 2. Experimental Setup for the Detection of Blue Light. ARF: Cs atomic resonance filter, PMT: photomultiplier, QG: vacuum photocell

Reports on New Integrated Circuits

10,000-Switch Program-Controlled Switchboard IC

91P60201A Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 15, 17 Apr 91 p 1

[Article by Ke [2688]: "10,000-Switch Program-Controlled-Switchboard Integrated Circuit Developed by Fudan University, Huajing Group"]

[Summary] A 10,000-switch stored-program-controlled (SPC) [telephone] switchboard IC, jointly developed by Fudan University and the Huajing Group as a State Seventh 5-Year Plan key S&T project, passed ministry-level technical appraisal on 22 March in Shanghai. The entire process, from design through chip fabrication, consumed only 10 months. Utilizing semi-custom and full-custom techniques and CAD technology, Fudan University designed the chip via a three-mask, single-plate scheme. Fabrication of the chips on the nation's most advanced 3-micron silicon-gate CMOS production line is being handled by the Huajing Group in cooperation with Shanghai P&T Institute 1, the Beiling Co., and Shanghai Radio Plant 14. Initial results of several batches indicate a yield of 50 percent.

Specific newly developed subcircuits include the following: 1) a clock- generator consisting of a clock frequency divider and a generator; 2) a time- slot compander [i.e. compressor-expander], or serial group-selector-stage synchronization subcircuit; 3) a shifter for converting the serial input of the multiplexer into an 8-bit time-division parallel output; 4) an inverse multiplexer, or demultiplexer; and 5) a group shunt (or drop-insert) subcircuit, whose main function resembles that of a demultiplexer.

Specifications of the new IC include: threshold current = 4 mA, minimum operating frequency = 4 MHz-8 MHz, number of gates = several hundred-1,100, and number of pins = 20-40. The time-slot compander, multiplexer, and demultiplexer have 1,000-gate gate-array designs; the group shunt subcircuit has a 1,200-gate sea-of-gates design. Testing within SPC switchboards demonstrates that the new IC has a performance matching that of foreign-made CMOS gate-array devices, and that it can completely replace the 74LSTTL [low-power Schottky transistor-transistor logic] MSI-SSI product series.

Fudan University and the Huajing Group simultaneously announced their development of the nation's first A/D hybrid pulse codec [i.e. code/decode] modulator, the 145503 circuit, which has sophisticated filtering functions. This new IC forms the "heart" of digital telephone communications systems.

HDTV/Digital-TV-Oriented Digital Integrated Processor

91P60201B Beijing ZHONGGUO DIANZI BAO [CHINA ELECTRONICS NEWS] in Chinese 5 May 91 p 1

[Article by Gao Ju [7559 3515]: "Color TV With Picture-in-a-Picture Functions To Debut Soon"]

[Summary] On commission from the China High-Definition Television & Digital Television Club, researchers from Qinghua University's Department of Electronic Engineering have developed the "QHPIP-1 color TV digital integrated picture-in-a-picture (PIP) processor," which passed the MMEI- organized technical appraisal in Beijing on 16 April. Experts from the government, research institutes, and over 30 TV production plants unanimously agreed that this new processor, when added to an ordinary color TV, permits various part-screen and multi-screen display functions; imagery is clear and stable. Several domestic TV manufacturers have already expressed formal interest in the new IC, which will significantly add to market potential, and a small batch of PIP-capable color TVs should be on the market sometime this year.

1024-Bit CCD Shift Register for Radar Signal Processing

91P60201C Beijing WUXIANDIAN [RADIO] in Chinese No 5, May 91 p 29

[Article by Wang Bingshi [3769 4426 2514]: "1024-Bit CCD Shift Register"]

[Text] MMEI's Institute 44 recently developed a 1024-bit CCD [charge-coupled device] shift register. This register incorporates such advanced fabrication technologies as trichloroethylene for the chlorine-dopant source in high-quality oxide films, LPCVD [low-pressure chemical vapor deposition] for polycrystalline silicon, and plasma etching. The new IC's main technical indicators are as follows: operating temperature = -10°C to +55°C, transfer efficiency $\geq$ 99.99 percent, clock frequency $\leq$ 2.5MHz, and dark-current peaking voltage $<$ 10mV. Its special features include small volume, low power consumption, high reliability, and ease of signal processing. This device is widely used in radar signal processing systems.

Reports on LSI, VLSI Fabrication, Design Equipment

8 New Kinds of LSI Equipment Developed

91P60202A Changchun JILIN RIBAO in Chinese 20 Apr 91 p 3

[Unattributed article: "Series of Major Achievements Realized in Domestic LSI Equipment"]

[Summary] Chengdu, 19 Apr (XINHUA)—A series of eight new varieties of LSI special-purpose equipment has

been developed in a 10-year effort by the CAS Chengdu Institute of Optoelectronics Technology. The series includes a machine for etching a 100-million-line circuit pattern onto a 100 mm x 100 mm reticule; an apparatus for measuring 1-micron-or-smaller defects in ICs; and a photolithography machine with a limiting resolution of 0.8 micron, a capability of photoetching 1.25-micron-wide lines in a 10 mm x 10 mm full- field-of-view range, a coaxial alignment precision of 0.24 micron, and a capacity of 39 3-inch silicon wafers per hour.

First Medium-Beam-Current Ion Implanter Passes Acceptance Check

91P60202B Beijing ZHONGGUO DIANZI BAO [CHINA ELECTRONICS NEWS] in Chinese 21 Apr 91 p 1

[Article by Yang Yusong [2799 3768 2646]: "Medium-Beam-Current Ion Implanter Passes State Acceptance Check"]

[Summary] The nation's first domestically made medium-beam-current ion implanter, developed in a 3-year effort by MMEI's Institute 48 as a State Seventh 5-Year Plan key S&T project, passed state acceptance check a few days ago. The apparatus's overall performance and technical indicators match those of the NV-3204 machine manufactured by the U.S. firm Eaton Corp. The Eighth 5-Year Plan calls for 10 such machines for fabrication of semiconductor devices, and the domestic manufacture of the units can save the state US$5 million in foreign exchange that would otherwise go for imports, as well as provide impetus to the development of the domestic microelectronics industry.

9 Types of VLSI Fabrication Equipment Accredited

91P60202C Beijing ZHONGGUO DIANZI BAO [CHINA ELECTRONICS NEWS] in Chinese 24 Apr 91 p 1

[Article by Zuo Shangming [1563 1424 2494]: "New Advances Realized in Nation's VLSI Fabrication Technology"]

[Summary] Nine types of LSI/VLSI special-purpose equipment developed by MMEI's Institute 45 recently passed ministry-level technical appraisal in Pingliang, Gansu Province. The new equipment, meeting mid-to-late-eighties international standards, was developed despite the difficulties of an embargo of such items imposed by developed nations on China, and will be a powerful force in promoting the domestic electronic information industry in the Eighth 5-Year Plan and current 10-year plan [1991-2000]. The newly accredited equipment includes key components for large-diameter-of-cut electrical machines, an optical image processing and automatic alignment system, a liquid static-pressure main-shaft/guideway system, and an apparatus for plating hard multi-layer-dielectric films with large area, high uniformity, and high reflectance.

VLSI-Oriented RHT, Annealing Equipment Developed

91P60202D Beijing RENMIN RIBAO in Chinese 26 Apr 91 p 3

[Article by Jin Dongming [7246 2639 2494]: "Qinghua [University] Microelectronics Institute Seizes the Day To Overcome Successively Problems in Original Creation of Automatic Infrared Rapid Heat Treatment Technology"; cf. earlier report in JPRS-CST-91-013, 20 Jun 91 pp 15-16]

[Summary] The model RHT-5005 fully automated infrared (IR) rapid heat treatment (RHT) and annealing unit developed in a two-year effort by Qinghua University's Microelectronics Institute (QUMI) is oriented toward production of sub-micron-level VLSI chips prepared from 7.62-cm (3-inch) to 15.24-cm (6- inch) silicon and GaAs wafers. The main performance indicators of the unit- -which has a totally new heating-cavity structural design—are superior to those of internationally available lamplight-based annealing machines (made by almost 20 firms worldwide); this and the fact that the unit sells for one- tenth the cost of the comparable foreign-made lamp-based products and consumes one-fifth the energy will make it extremely competitive on the international market. The new QUMI invention utilizes two high-frequency induction-heating graphite plates—between which the semiconductor sample is placed—as the IR-radiation heating source.

In addition to a second-class national invention award in 1990, the new QUMI- developed apparatus, eight of which have so far been made for research institutes and universities, has received [two] Chinese patents and a U.S. patent. The first computer-controlled unit was completed at the end of 1989, and the first exported unit was shipped to Hong Kong in early 1991. In late 1990, QUMI entered into a joint venture with Hong Kong's Xinghua [5281 5478] Semiconductors, Ltd., under the name Huaxing [5478 5281] Microelectronics, Ltd., to explore further expansion of the international market for fully automated IR RHT machines.

New MBE Core Components Developed

91P60202E Beijing RENMIN RIBAO in Chinese 13 May 91 p 3

[Article by Huang Xingzhang [7806 5281 4545]: "Molecular-Beam-Epitaxy Technical Equipment Core Components Developed, Demonstrating Yet Again the Overall Development Potential of Domestic Scientific Experiment Instruments"]

[Summary] Beijing, 9 May (XINHUA)—The shutter, molecular-beam furnace, and other molecular beam epitaxy (MBE) equipment core components recently developed by the CAS Institute of Physics have already been sold to Europe, further demonstrating the overall development potential of the nation's scientific experiment instruments industry. This equipment, which can

deposit a multi-layer ultra-thin film with a thickness 1/300,000 the diameter of a human hair, is used for fabricating very-high-speed, very-high-frequency electronic devices and ICs. Five types of late-eighties-level semiconductor devices have already been domestically developed with the aid of Chinese-made MBE equipment.

VHSIC/VLSI Statistical Optimization Technology Accredited

91P60202F Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 19, 15 May 91 p 1

[Article by Chen Chunmei [7115 2504 2734] : "New Advances in VLSI Statistical Optimization Technology"]

[Summary] A State "863" Plan project entitled "Very-High-Speed and Very- Large-Scale Integrated Circuit Statistical Optimization Technology," completed at Qinghua University's Department of Electronic Engineering, has passed expert appraisal. IC optimized design techniques are an important factor in ensuring compliance with specifications, and the newly certified technology brings statistical optimization algorithms to bear on various layers—IC design, IC production, components and devices, etc.—of the overall process. The technology essentially consists of an IC statistical optimization design and verification system that runs on a 386 PC under the UNIX operating environment.

Nankai University Develops VLSI CAD System

91P60202G Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 19, 15 May 91 p 1

[Article by Wu Baoyuan [0702 1405 3293]: "Nankai University Strides Forward in VLSI Design"]

[Summary] By integrating several processing elements onto one chip, Nankai University has been able to improve real-time data processing power in systems falling within the automation and information-processing areas of the nation's high-tech development plan [i.e. the "863" Plan]. Since 1987, Tianjin's Nankai University VLSI Design Center (NUVDC) has been active in R&D of ASICs, and now it has put out an integrated VLSI CAD system called CRANE, which runs on a Sun 3 workstation. CRANE, which can automatically generate logic master drawings, is a multi-level (algorithm-analysis-level, logic- level, and circuit-level) simulation and optimization tool.

In the Seventh 5-Year Plan, NUVDC undertook an "863" Plan (Intelligent Robotics Area)/NSFC-funded project to develop a VLSI ASIC called ROCO, which effectively shortens a robot's control cycle; this project was awarded a Seventh 5-Year Plan second prize. NUVDC is currently continuing its research on ASICs, especially a study and simulation of the relationship between algorithms and [robot] structures.

More on 8 New Types of LSI Equipment

91P60202H Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 21, 29 May 91 p 1

[Article by Zhen Hua [3914 5478]: "Chengdu Develops Eight Types of LSI Special-Purpose Equipment"; cf. 91P60202A, above]

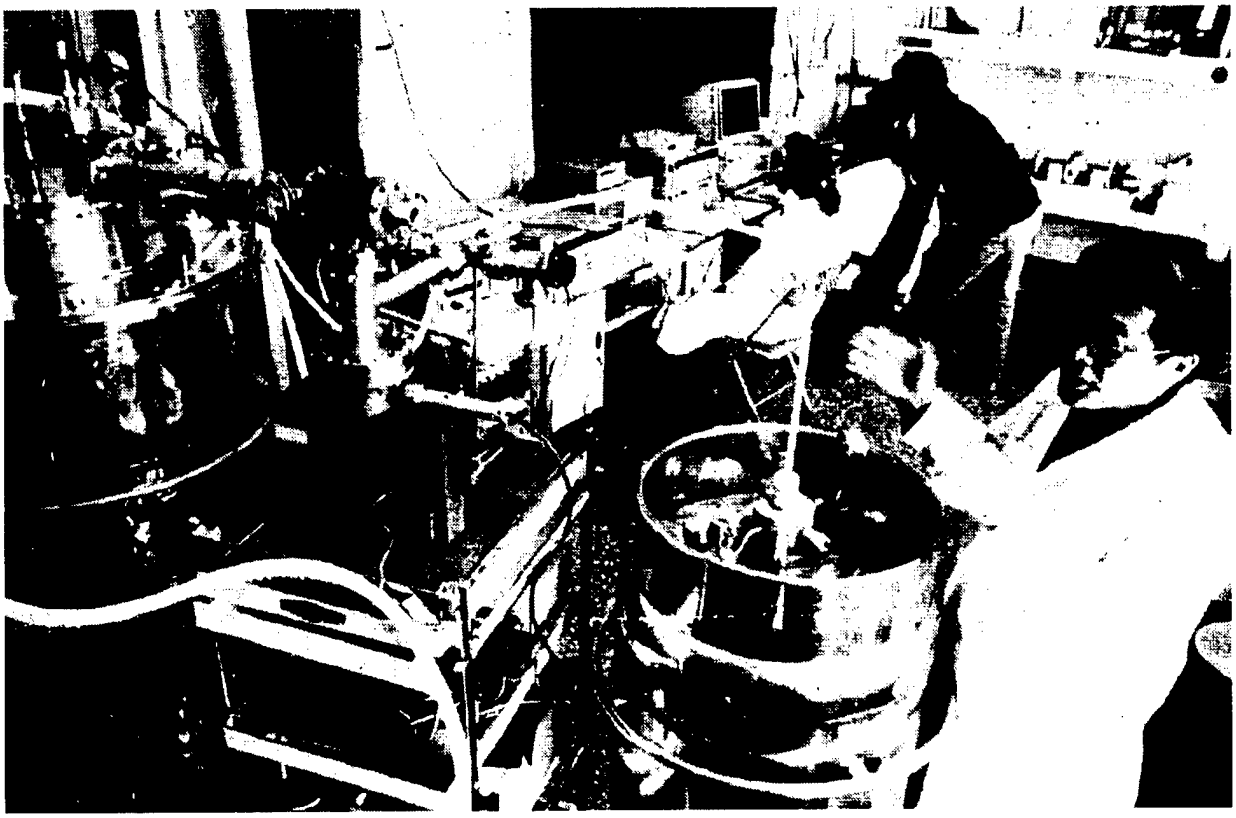
[Summary] It was recently learned from the CAS Chengdu Institute of Optoelectronics Technology that institute researchers have recently developed eight new types of special-purpose equipment for production of LSI chips. The new equipment includes a two-element platform laser positioning system for a circular electron-beam exposure machine, a direct step-and-repeat projection photolithography machine, a silicon-wafer surface inspection instrument, a mask-defect-inspection laser correction instrument, a synchrotron-radiation X-ray photolithography machine, and the AMDIS-1 automated mask-defect inspection system. Among the equipment is an apparatus that can etch a 100-million-line circuit pattern on a 10 cm x 10 cm reticule, a machine that can measure IC surface defects at or below the 1-micron level, and a [photolithography] unit with a limiting resolution of 0.8 micron. A panel of experts has certified that this equipment's main technical indicators meet mid-eighties international standards.

Beijing University Researchers Study Superconducting Cavity Resonators

91P60197A Beijing KEJI RIBAO [SCIENCE AND TECHNOLOGY DAILY] in Chinese 25 Apr 91 p 1

[Unattributed photoreport; photo by Peng Hong]

[Text] After three years of research into superconducting cavity resonators, one of the priority laser topics in the State High-Tech Plan ["863" Plan], scientists at Beijing University's Heavy-Ion Physics Institute recently conducted low-temperature experiments in which they obtained stable, repeatable results for a 1.5 GHz niobium resonator—data matching the international state-of-the-art. The new breakthrough will provide critical experience for further development of RF [radio frequency] superconducting cavities and superconducting high-brightness [ion] implanters.



High-Temperature Superconducting Tape Jointly Developed by Chinese, German Scientists

91P60197B Shanghai JIEFANG RIBAO in Chinese 6 May 91 p 1

[Article by Hua Kangcheng [5478 1660 2052] and Jiang Jishen [3068 3444 3947]: "High-Temperature Superconducting Tape Jointly Developed by Shanghai, German Research Organization(s)"]

[Summary] In a joint effort with colleagues from German scientific research organization(s), scientists at the Shanghai Non-Ferrous Metals Institute recently developed high-temperature superconducting (HTS) tape with a critical current density of 20,000 amperes [per square centimeter]. After testing by international authoritative organization(s), this achievement is among the candidates for fourth place among current international HTS materials research awards. The Shanghai institute's success, realized after a one-year-plus effort, is critical to the development of applied HTS products, as opposed to their low-temperature superconducting cousins, which require expensive liquid-helium supplies.

Chinese Scholar at Australian University Sets World Record

91P60197C Beijing GUANGMING RIBAO in Chinese 26 May 91 p 4

[Article by Xue Fukang [5641 4395 1660]: "Chinese Scholar in Australia Sets World Superconductivity Record"]

[Summary] Canberra, 24 May—Chinese scholar Dou Shixue [4535 1102 1331], a scientist from Northeast Engineering Institute now doing research at New South Wales University here in Australia, announced a few days ago that he had made two major breakthroughs in research on high-temperature superconducting (HTS) wire materials. Using a newly developed technique, Prof. Dou and his research group have prepared a metallic-silver/bismuth-lead-strontium-calcium-copper oxide (metallic-Ag/BiPbSrCaCuO) HTS composite wire material with a

liquid-N-temperature 1,000-Gauss-magnetic-field critical current density of 14,000 A/cm^2, and of 6,200 A/cm^2 with a 10,000-Gauss field. The former value basically satisfies requirements for practical applications of the material, and the latter value breaks the previous world record—held by Sumitomo Corp. for the past three years—of 1,900 A/cm^2 for a 10,000-Gauss field.

Also, Prof. Dou and his group have significantly improved the bending performance of this metallic-Ag/BiPbSrCaCuO wire; after almost 10 bends, with a radius of curvature up to 4 mm, the wire's current density remained unchanged. This indicates that this type of wire can be wound into 8-mm-diameter coils without heat treatment.

Prof. Dou's research group consists of over 20 graduate fellows and graduate assistants, 80 percent of them from China, and constitutes the largest superconductivity research group in Australia. Prof. Dou has recommended that the appropriate Chinese authorities concentrate their support on Bi-based composite materials, which have exhibited the greatest potential for near-term commercialization.

Preparation of Large-Area TEM Specimens of High-J_c $YBa_2Cu_3O_y$ Superconductor by Melt-Textured Growth and Their Microstructure

40100055B Beijing DIWEN WULI XUEBAO [CHINESE JOURNAL OF LOW TEMPERATURE PHYSICS] in Chinese Vol 13 No 3, May 91 pp 191-196

[English abstract of article by Zhang Jinlong and Lin Tianxiao of the Department of Physics, Beijing University, Beijing, 100871; Ren Hongtao, Xiao Ling, and He Qing of the General Research Institute for Non-Ferrous Metals, Beijing, 100088; Wei Chongde and Yin Daole of the Department of Physics, Beijing University, Beijing 100871; and Fan Chenggao of the Structure Analysis Research Laboratory, University of Science and Technology of China, Hefei, 230026; MS received 24 Aug 90]

[Text] By using MTG [melt-textured growth], $YBa_2Cu_3O_y$ bulk-material large-area specimens were prepared and their microstructures were investigated by transmission electron microscopy (TEM). The specimens have a fully continuous structure in the large area of the a-b face. The electron diffraction pattern shows that the relational angles of a or b are 20°-5°. We have made a TEM study of the MTG samples and obtained some interesting results. The possible causative factors for high-J_c [high critical current density] (T, H) in these materials are discussed.

Low-Temperature Internal Friction and Phase Transition in Low Temperature for $Bi_2Sr_2Ca_2Cu_3O_x$ Superconductor

40100055A Beijing DIWEN WULI XUEBAO [CHINESE JOURNAL OF LOW TEMPERATURE PHYSICS] in Chinese Vol 13 No 3, May 91 pp 182-185

[English abstract of article by He Siming, Lin Tianshi, and Tang Linchang of the Department of Material Science, Sichuan University, Chengdu, 610064; and Chen Zhixue and Ji Xiaoyang of the Central Laboratory of Sichuan University, Chengdu, 610064; MS received 24 Jul 90]

[Text] Internal friction and phase transition processes in the $Bi_2Sr_2Ca_2Cu_3O_x$ superconductor have been investigated from 100K to 300K by an inverted torsion pendulum and DSC [differential scanning calorimetry]. There are five internal friction peaks near 110K, 130K, 180K, 190K and 210K, respectively. These peaks, except for the 190K one, are accompanied by the softening of the shear modules. The 180K and 210K internal friction peaks obviously correspond to the exothermic peaks in DSC analysis. These internal friction peaks are considered to be related to different lattice parameters owing to the stress-induced motion of interfaces between phases.

Magnetic Properties of High-Temperature Superconductor $Tl_2Ba_2Ca_2Cu_3O_y$

40100055C Beijing DIWEN WULI XUEBAO [CHINESE JOURNAL OF LOW TEMPERATURE PHYSICS] in Chinese Vol 13 No 3, May 91 pp 205-209

[English abstract of article by Ding Shiying and Yu Zheng of the Department of Physics, Nanjing University, Nanjing, 210008; MS received 15 Jul 90]

[Text] Dependence of magnetization on temperature and applied field for $Tl_2Ba_2Ca_2Cu_3O_y$ has been measured. It has been found that there is paramagnetic susceptibility $\chi_n$of 10^{-4} for the sample at least in temperatures between 90K and 200K. The χ_n increases very slowly with decreasing temperature and field. Diamagnetism occurs on temperatures lower than 116K. The two kinds of magnetism can co-exist in fields smaller than 2 Tesla and the sample's magnetization becomes unstable in fields larger than 2 Tesla. The causative factors of the paramagnetism, as well as the possibility of interdicting ferromagnetic impurities artificially into the Tl system-high temperature superconductors as a flux pinning center, are also discussed.

Bi(Pb)SrCaCuO Superconducting Fibers Without Post-Growth Heat Treatment

40100055D Beijing DIWEN WULI XUEBAO [CHINESE JOURNAL OF LOW TEMPERATURE PHYSICS] in Chinese Vol 13 No 3, May 91 pp 210-215

[English abstract of article by Zhang Jincang, He Aisheng, Huo Yujing, Wang Jinsong, and He Yusheng of the Department of Physics, Qinghua University, Beijing, 100084; Henan Normal University, Xinxiang, 453002; North University of Technology, Beijing, 100041; Electronic Engineering Department, Qinghua University, Beijing, 100084; MS received 24 May 90]

[Text] The recent results of Bi-based superconducting fibers fabricated by the laser-heated pedestal growth (LHPG) method are reported. By using a new technical process, these superconducting fibers were successfully fabricated without post-growth heat treatments which were indispensable in the previously used technical processes. It was evident that the superconducting fibers so grown had stronger textured structure and higher critical current density J_c (77K, OT) = 4200 A/cm^2 than those after post-growth heat treatments. The composition of the source materials, the growth techniques and the effect of post-growth heat treatments are also discussed.

Latest Reports on Fiber Optic Communications

Statistics on Completed, Future Projects

91P60199A Beijing ZHONGGUO DIANZI BAO [CHINA ELECTRONICS NEWS] in Chinese 26 Apr 91 p 3

[Article by Wang Hualong [3769 0553 7127]: "Informal Discussion of Telecommunications in the P&T [System]; Part 7: China's Fiber Optic Communications"; cf. JPRS-CST-91-013, 20 Jun 91 p 26]

[Summary] To the end of 1990, the nation had 16 provinces and regions that had laid long-haul fiber-optic-cable lines. Also at the end of 1990, China completed the first east-west transprovincial (Jiangsu, Anhui, Jiangxi, and Hubei) fiber-optic cable, the 979-km-long Nanjing-Wuhan trunkline, which provides 2,340 terminus circuits and 4,500 switching circuits.

The nation is committed to the development of fiber optic telecommunications; and authorities have already announced that—barring exceptional situations—no more coaxial-cable trunklines will be built. In the current Eighth 5-Year Plan and the 10-Year Plan [for the 1990's], authorities are constructing a major fiber-optic-cable network consisting of the following trunklines: 1) Shanghai-Hangzhou-Fuzhou-Guangzhou, 2) Beijing-Shijiazhuang-Zhengzhou-Wuhan-Changsha-Guangzhou, 3) Tianjin-Jinan-Xuzhou-Nanjing, 4) Nanjing-Shanghai, 5) Beijing-Shenyang-Harbin (with Beijing-Chengde-Qiqihar-Harbin as a back-up line), and 6) Xian-Chengdu-Zhengzhou. These six lines, totaling 12,000 km of fiber-optic cable, do not include the locally funded secondary trunklines being constructed and totaling over 10,000 km of fiber-optic cable.

Long-Wavelength Zero-Dispersion Single-Mode Fiber Developed

91P60199B Beijing KEJI RIBAO [SCIENCE AND TECHNOLOGY DAILY] in Chinese 26 Apr 91 p 2

[Article by Cheng Renyi [2110 0088 5030]: "New Advances in Optical-Fiber Development Reach International State-of-the-Art"]

[Summary] A study entitled "Fabrication Technology for, Research on Long-Wavelength Double-Window Zero-Dispersion Single-Mode Optical Fiber," undertaken by a Northern Jiaotong University (NJU) Lightwave Technology Institute research team led by institute director Prof. Jian Shuisheng [4675 3055 3932] as a State Seventh 5-Year Plan priority S&T project, recently passed appraisal at NJU. This type of fiber, first invented in the mid-eighties and now used extensively in optical frequency-division multiplexing systems, was developed with the cooperation of Beijing Plant 605 and other units, and is fabricated via domestically produced equipment and raw materials. Some of the problems overcome by the NJU group include the design of the four-cladding structure, design of software for imported equipment and computer programs for achieving zero dispersion, and the mastery of freon doping technology and of fabrication technology for tolerances of Δl [variation in length] = 0.45-0.50 percent.

Nanjing Institute Develops Broadband Transmission Switching Systems

91P60199C Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 18, 8 May 91 p 1

[Article by unnamed XINHUA reporter: "Nanjing Institute Develops Fiber-Optic Broadband Transmission Switching Technology"]

[Summary] Nanjing Institute of Posts & Telecommunications has successfully developed fiber-optic broadband transmission switching technologies across the nation, thereby improving integrated services for existing commercial microcomputer LANs and fiber-optic TV transmission systems. Experts describe these achievements as providing a major boost to the development of the nation's electronic information technology. The realization of high-capacity, long-range broadband integrated services—transmission of data, documents, real-time color imagery, audio, telephone, etc.—for microcomputer LANs via fiber-optic transmission media has meant the overcoming of such difficulties as the simultaneous transmission of five TV programs over one multimode fiber.

Hefei-Wuhu DS4 Single-Mode Optical-Cable Line Operational

91P60199D Hefei ANHUI RIBAO in Chinese 29 May 91 p 1

[Article by Ma Biling [7456 3880 3781]: "Newly Completed Hefei-Wuhu Fiber-Optic Cable Project Technology Is Advanced"]

[Summary] The Hefei-Wuhu [Anhui Province] 140 Mb/s [DS4] single-mode fiber-optic cable communications system experimental project passed state acceptance check on 26 May in Hefei and is thus formally operational. This is the nation's first domestically developed, manufactured, and installed directly-buried long-haul fiber-optic-cable communications trunkline meeting mid-to-late-eighties international standards. This State Seventh 5-Year Plan priority S&T project will eventually consist of four 140 Mb/s systems comprising a total capacity of 7,680 circuits; one system, or 1,920 circuits, is now completed. From its northwest terminus of Hefei, the line runs through Feidong, Chaohu [i.e., Chao Xian], Hanshan, He Xian, and Wuwei, among other towns and counties, to the southeast terminus of Wuhu: a total length of 146.5 km. The entire system consists of two digital segments: Hefei-Chaohu and Chaohu-Wuhu. Stations include the two termini, the switching station at Chaohu, and three unattended stations (Feidong, Houqiao, and Zhegao); maximum unrepeatered transmission range is over 50 km. The Hefei-Wuhu line has been linked up with the Beijing-Shanghai DMW line and with the Nanjing-Wuhan fiber-optic-cable trunkline. Organizations responsible for the four-year development and construction of the project include the Wuhan Institute of Posts & Telecommunications (P&T) Science, MPT's Institute 5, MPT's Design Institute, the Shanghai P&T Design Institute, the China Communications Construction Wuhan Engineering Co., and the Anhui Province P&T Management Office.

Vice Minister Delivers Keynote Address at National Conference

91P60199E Beijing ZHONGGUO DIANZI BAO [CHINA ELECTRONICS NEWS] in Chinese 29 May 91 p 1

[Unattributed article: "Zeng Peiyan Delivers Speech on Development of Fiber-Optic Communications"]

[Summary] At the Fifth National Fiber-Optic Communications Conference, convened 17 May in Tianjin, Vice Minister of Machine-Building and Electronics Industry Zeng Peiyan delivered the keynote address, in which he remarked how the new-technology revolution, led by microelectronics and information technologies, has driven international economies and technical industries. The Party Central Committee and the State Council, having observed developmental trends in world economics and technologies, have decided to earmark the electronics industry as a breakthrough area for further development of high-tech as a whole, the minister observed, and fiber-optic communications is a critical area in the development of the electronics industry. Through absorption of imported technology, a domestic fiber-optic communications industry centered on three cities—Shanghai, Tianjin, and Wuhan—has grown up, and has mastered production technology for DS4 [140 Mb/s, 1,920 voice circuits] fiber-optic communications equipment, with DS5 [565 or 622 Mb/s, 7,680 voice circuits] equipment now in the laboratory-testing stage. Compared to developed nations, however, China is still significantly behind.

In the Eighth 5-Year Plan, he stressed, the nation needs to break down the barriers between government and industry, regulate the industrial structure, and adjust the product mix. Also, the requisite manpower, material resources, and finances must be concentrated—according to market demand—on the technological transformation of industrial and research units and on the organization of production economies of scale.

While emphasizing that the further development of China's fiber-optic communications industry must be founded on self-reliance, he added that the nation must simultaneously continue to import, absorb, apply, and recreate the best of advanced foreign technology. In terms of funding, he urged that the nation set aside a fixed percentage of its assets to cover importing of foreign technology.

Finally, the vice minister discussed how other industries—those involved in manufacturing of telephones, teletypes (telexes), FAX machines, radio transceivers, pagers, digital program-controlled [telephone] exchanges, TVs, and VCRs, for example—and consequent economic benefits have resulted from the application of microelectronics technology in developed nations.

Shanghai-Guangzhou Trunkline Construction Started

91P60199F Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 5, May 91 p 47

[News brief by Jia Ju [1367 7467]: "Information Window"]

[Text] The Shanghai-Guangzhou fiber-optic-cable trunkline construction is about to begin. This trunkline, which will connect Shanghai to four provinces—Jiangsu, Zhejiang, Fujian, and Guangdong—is 1,800 km long and uses 24-fiber cable; each pair of fibers [i.e., each system] can carry 1,920 voice circuits. Project completion is scheduled for 1993; first-phase capacity will be 11,520 circuits in six main systems, with an additional system as back-up.

Beijing-Gu'an Petroleum-Use Unrepeatered Line Operational

91P60199G Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 5, May 91 p 48

[Unattributed news brief: "Information Window"]

[Text] The Beijing-Gu'an dedicated-petroleum-use 70-km-long unrepeatered fiber-optic-cable communications line is formally operational. The line's domestically made 34 Mb/s [DS3] digital fiber-optic communications equipment transmits over a 70 km range without a relay—the longest unrepeatered transmission range in the nation. The technical level has entered advanced international ranks.

Analysis of 4x4 Single-Mode Fiber Fused Biconical Coupler

91P60199H Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese Vol 11 No 5, May 91 pp 460-464

[Article by Yao Shouquan [1202 1108 6898], Huang Yong [7806 0516], and Xie Guoping [6200 0948 1627] of the Shanghai Fiber-Optic Technology and Modern Communication Institute, Shanghai University of Science and Technology, Shanghai, 201800: "Analysis of Coupling Characteristics of 4x4 Single-Mode Optical-Fiber Fused-Biconical-Taper Coupler With Square Distribution"; MS received 6 Aug 90, revised 31 Oct 90]

[Abstract] Based on linear coupled wave equations, the scattering-matrix method is employed to analyze the coupling characteristics of a square-distribution 4x4 single-mode optical-fiber fused-biconical-taper coupler—a critical component in coherent fiber-optic communications and interferometric fiber-optic sensor systems—and data from this method are compared to experimental results from a trial-manufactured coupler fabricated with highly doped quartz capillary tubes. Good agreement is found between the predicted data and experimental results.

Six figures depict the cross section of a 4x4 type-1 coupler, the cross section of a 4x4 type-2 coupler, coupling characteristics of a 4x4 coupler (two graphs), a photo of the cross section at the coupler waist, and the measured wavelength response of the coupler between 1.0 μm and 1.6 μm.

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