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Central Intelligence Agency



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Washington, D. C. 20505

DIRECTORATE OF INTELLIGENCE

20 February 1986

Chinese Fiber Optics -- An Update

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Summary

[Redacted]

[Redacted] A review of developments in Chinese fiber optics during the past 15 months reaffirms [Redacted]

[Redacted] China has made progress in research, but the development of a fiber optics industry in China is very slow. China has considerable problems in translating research results into quantity production, and negotiations with foreign suppliers for fiber optics production technology, while extensive, have been slow in coming to fruition. Acquisition of foreign fiber optics production technology remains a key element of China's strategy for developing a fiber optics network. The Chinese military is the driving force behind research in fiber optics and will be a key beneficiary of a fiber optics network. [Redacted]

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This memorandum was prepared by [Redacted] Office of East Asian Analysis. Information available as of 20 February 1986 was used in its preparation. Comments and queries are welcome and may be directed to the Chief, Development Issues, China Division, OEA, [Redacted]

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[Redacted]

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Chinese Fiber Optics Networks

[Redacted] there are at least 100 fiber optics systems installed in a dozen cities throughout China. They range from 1.8 km to 30 km, and were imported or built by pilot plants. At a conference in Beijing last fall, MPT officials said the majority of these experimental systems are 8448 kilobits/second. [Redacted]

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China is beginning work on several long distance fiber optics lines, and eventually plans to install a fiber optics network paralleling the current microwave network. In December 1985 China announced it will begin construction of a 2400 km fiber optic trunkline connecting Nanjing, Wuhan, and Chongqing in 1986, with service to begin in three years. Chinese telecommunications personnel apparently decided to use fiber optics instead of a coaxial cable system for this route in 1984. [Redacted]

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[Redacted]

Indigenous R&D

Chinese officials report additional research results by Chinese facilities. For example, Chinese press reports claim that tests of domestically produced longwave semiconductor lasers in January 1986 showed technical standards and reliability close to those of similar products manufactured abroad. (Development of longwave semiconductor lasers was a major scientific research project under the Sixth Five Year Plan--1980-85). Two Shanghai institutes were noted for development of a "device for checking worn-out parts of optical fibers and locating the position of communication problems." Press reports of awards for achievements in fiber optics research have also been noted. [Redacted]

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Not all reports are positive, however. [Redacted]

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[Redacted] Chinese research on single mode fiber optics continues to lag. The Minister of Post and Telecommunications has ordered more research on fiber optics, with emphasis on long wavelengths and single mode fiber optics. He reportedly is also seeking more funds to finance additional fiber optics research and to buy foreign fiber optic equipment. [Redacted]

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It might also be worth noting that China has often exaggerated the performance characteristics of their domestically produced systems (sometimes after producing only a prototype) in order to obtain state-of-the-art foreign technology. Examples are supercomputers and military weapons systems. [Redacted]

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Production

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China traditionally has had major problems in translating research results into large-scale production. Obstacles include poor management, shortage of skilled workers and mid-level technicians, and lack of familiarity with sophisticated production processes. Even with foreign assistance, progress can be slow. [Redacted]

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[Redacted] While China's fiber optics strategy of joint ventures or importing complete production lines would eliminate this difficulty, other problems will remain. Despite considerable effort in the last several years by the S&T leadership to link research and production, we have seen no evidence that China has improved its abilities to bring fiber optics research results to production. [Redacted]

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Shanghai claims to produce 4,000 km of optical fiber annually, in addition to lasers and components. Chinese press articles report the installation of a "batch" of semiconductor lasers and the installation of new fiber optic production lines in several Shanghai factories. [Redacted]

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[Redacted]

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Foreign Assistance

China's weak indigenous production capabilities are reflected in its considerable effort to acquire foreign fiber optics production technology. China has continued to approach nearly every major foreign producer of fiber optics related equipment. Within the past year and a half, China has signed agreements to acquire a range of production technology including multimode and singlemode optical fiber, and transmission equipment with not only the UK but with US, Japanese, and European suppliers. For example:

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- August 1985: NTT, (Japan) won a contract for consulting services associated with the construction of the 660 km Ministry of Railroads network. NTT will be responsible for selecting optical fibers and connectors, designing the communications network as a whole and supervising operations. [Redacted]

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[Redacted]

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CIA's earlier assessment concluded that with foreign assistance, China could have a fiber optics communications network in operation by 1991, based on the following assumptions: startup production could begin within two years after procurement, with deployment completed within two to three years thereafter. The delay in completing foreign negotiations may have pushed back the date for an operational system, but we believe this timetable continues to be appropriate. If China were forced to acquire systems covertly or to develop them without foreign assistance, it could have a system operating in 1995. [Redacted]

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Illegal Acquisition

[Redacted] China has acquired a substantial amount of fiber optic technology and equipment in the past from Japanese and Western companies by circumventing COCOM controls. Most of this equipment has been for use in China's R&D effort and primarily involves test instrumentation that can be acquired easily through third country intermediaries. [Redacted]

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Military Involvement

The military is the driving force behind fiber optics development in China, with all research, development and production activity placed under the unified direction of the National Defense Science, Technology and Industry Commission in 1979. MPT officials frankly admit the commonality between civilian and military needs. In late 1984, the Chinese press reported that Shanghai's military industrial departments had selected optical fibers as one area for expanded cooperation with civilian departments--part of Beijing's program to more closely link military and civilian research and production enterprises. [Redacted]

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