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DISSEMINATION CONTROL ABBREVIATIONS

NOFORN-	Not Releasable to Foreign Nationals
NOCONTRACT-	Not Releasable to Contractors or Contractor/Consultants
PROPIN-	Caution-Proprietary Information Involved
ORCON-	Dissemination and Extraction of Information Controlled by Originator
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13 August 1987

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MEMORANDUM FOR: Recipients of Imagery Analysis Memorandum
Tours of Five Space-Associated Manufacturing Facilities,
China (S), [redacted] 11 Aug 87.

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FROM : [redacted]
Chief, East Asia Division, IEG/NPIC

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SUBJECT : Transmittal of Imagery Analysis Memorandum

1. This IAM, disseminated using the normal distribution procedures for NPIC hard copy reports, discusses tours of five space-associated facilities in China. The tours provide a unique opportunity to visit facilities, [redacted] [redacted] It also provided us the opportunity to observe a new space launch vehicle in the final stages of assembly. (S)

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2. We hope that you will find this information useful. Any comments or queries may be directed to [redacted]

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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER



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13 August 1987

Tours of Five Space-Associated Manufacturing Facilities, China (S)

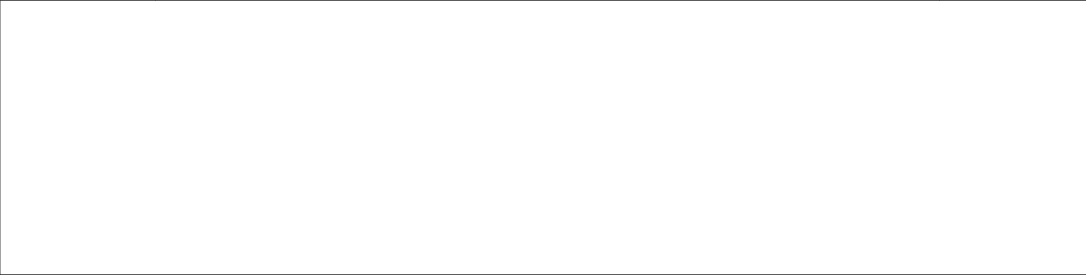
Summary

This report is based on the Pacific Basin International Symposium on Advances in Space Science Technology and its Applications the author attended in Beijing, China, from 7 to 10 June 1987. Between 12 and 18 June, a post-symposium tour was conducted to five space-associated manufacturing facilities that are members of the China Academy of Science and Technology. (U)

Visits to these factories reinforced the overall symposium theme that China is a reliable manufacturer and launcher of space vehicles and scientific satellites. The theme of each factory tour clearly was that China can and has achieved entry into the environment of space technology through its own research, development, and testing programs and its use of domestically-produced component parts. (U)

Intelligence, previously derived exclusively from imagery analysis, was confirmed during question and answer sessions during the symposium and the factory tours.

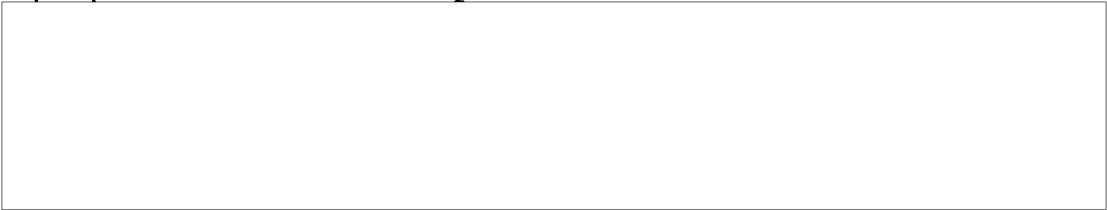
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All applicable satellite and small format imagery available as of [redacted] was used in the preparation of this report. (S/WN)

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Several new information/intelligence items were acquired during the symposium and the factory tours.

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Also, a better understanding of the operating procedures for satellite manufacturing/testing and orbital tracking/monitoring was achieved. Specific information concerning the configuration of future medium- and heavy-lift space-launch vehicles and their propulsion systems was also gained. (S/WN)

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Discussion

A discussion of each facility visited includes the name as recognized by NPIC, the name provided by symposium literature in parentheses, and information gained from the visit. (S/WN)

Beijing Guided Missile Plant Nanyuan
(Beijing Capital Machinery Factory)

The Beijing Guided Missile Plant Nanyuan (Figure 1) is one of 13 factories under the direction of the Beijing Wanyuan Industrial Corporation (BWYIC). BWYIC and the Nanyuan plant are collocated in Wanyuan, a southern Beijing suburb. This plant was visited on 9 June 1987, 1330-1500 local time. (S/WN)

This tour began with a videotape presentation of the BWYIC departmental organization and its associated products. A general question-and-answer session followed; key information acquired included the following items: (U)

- The LM-2D is a new medium-lift space-launch vehicle, which will be larger than the currently operational LM-3 and smaller than a new heavy-lift launch vehicle in the design stages, the LM-4L. (U)
- The LM-2D will consist of an elongated version of the first and second stage of the currently operational LM-2C. (U)

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- The LM-4L, a new heavy-lift space-launch vehicle being developed, will also use the elongated first stage of the LM-2C but with four additional strap-on booster rockets. The first-stage engine cluster will be the same as the cluster used on the LM-2C. Liquid fuel strap-on boosters will have a single engine of the same design used for the booster cluster. The second stage will be the same as is used on the LM-2C. (U)
- LM-4L specifications include a booster diameter of 3.35 meters, a strap-on booster diameter of 1.65 meters, a payload flaring diameter of 4.0 meters. The vehicle has an estimated flight date of 1990. (U)
- The tour group visited one final assembly hall and observed two LM-2C launch vehicles. One vehicle had a LM-3 third-stage engineering model placed forward of the second stage to simulate the LM-3 launch vehicle. The tour group was informed that one of the two LM-2C launch vehicles would soon be transshipped to one of China's space-launch sites for an autumn launch. NPIC has been reporting prelaunch indications at Shuangchengzi SSM Research and Development

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- When asked about the method used for airframe transshipment to the launch site, we were told that specialized missile- and satellite-handling railcars were used for transshipment, and the launch vehicle was shipped to the launch site approximately three months prior to a launch.

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- Officials said that the Nanyuan plant has the capability to produce five LM-2C first- and second-stage airframes per year.

[Redacted]

Questions concerning the production rate of LM-3 third stages were not answered. (S/WN)

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Weinan Probable SSM-Space Tracking Facility
(Xian Satellite Control Center)

The tour group met with Zhang Feng Xiang, chief engineer of the Weinan facility, on 13 June 1987, approximately 1100-1300 local time (Figure 2). Information gained from the tour included the following items: (U)

- The chief engineer said that a new facility that will replace the Weinan facility is under construction in the town of Xian. (U)
- The Weinan facility functions as a satellite monitoring site for all of China's satellites. Monitoring of two communications satellites (STW-1 and STW-2) occurs, but not on a daily or continuous basis. (U)
- All computer and tracking equipment shown to the group was manufactured by the Chinese and seemed very old. None of the equipment, including the air conditioning, was on or operating during the visit. When asked about the lack of air conditioning and why the computers were not on, the response was that equipment operates only when needed. (U)
- The director said that China has an agreement with France to build a new tracking center that will have the capability to receive S-band telemetry. This new tracking station is to be constructed near Nanning, China, and will be jointly operated by the Chinese and the French. (U)

Xian Institute of Radio Technology
(Same Name)

The Xian Institute of Radio Technology (Figure 3) was visited on 16 June 1987, approximately 1400-1500 local time. Information gained from the tour included the following items: (U)

- This facility manufactures communications hardware and onboard electronics hardware for all of China's satellites in addition to researching, designing, and manufacturing satellite communication antennas. The antennas used on the two currently operational communication satellites (STW-1 and STW-2) were designed and manufactured at this facility. (U)

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- All computer equipment observed was either from Hewlett Packard, IBM, or a West German firm. Unlike the Weinan tracking facility, all computer rooms were constantly air conditioned and very clean and dust free. (U)
- The computer center has the capability to process computer compatible tapes (CCTs) generated from their LANDSAT receiver station in Beijing in addition to performing research and testing on new antenna systems. (U)
- Testing of satellite antennas has been conducted on the roof of a multi-story building. A new antenna test range was under construction and completion is anticipated in the near future. (U)
- In addition to manufacturing electronic component parts for satellite communication systems, a civilian television receive-only antenna is produced at this institute. (U)
- This institute has a centrally located dish antenna that can receive what was said to be LANDSAT signals. [REDACTED]
[REDACTED]
- Research and testing of antennas is conducted in an anechoic test chamber measuring eight meters high by eight meters wide by 32 meters deep.

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Shanghai Missile and Space Systems Plant Minhang
(Xin Zhong Hua Machinery Plant)

The Shanghai Missile and Space Systems Plant Minhang (Figure 4), located in the southern suburbs of Shanghai, at Minhang, was visited on 16 June 1987, approximately 1400-1500 local time. Information gained from the plant tour included the following items: (S/WN)

- This plant employs approximately 2,000 workers, of which 300 are technicians directly involved in the manufacturing/assembly of the LM space-launch vehicle. The rest of the workers concentrate on producing refrigerators for civilian sale. (U)

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- Since 1977 Minhang has coordinated with BWYIC to manufacture the first and second stages of the LM-3 airframe. The factory director was very proud that all research, design, and manufacturing of the first and second stage of the LM-3 is conducted and carried out at this plant. The three LM-3's flown to date were produced at this facility. When asked where the third stage for the LM-3 is made, the answer was that the manufacturing plant is in Beijing at Wanyuan. [REDACTED]

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- There were two missile airframes in the assembly hall at this plant:

—The first airframe consisted of a first- and second-stage LM-2/3 with a payload shroud positioned at the forward end of the second stage. The configuration of the shroud was compatible with the external shape of the low earth orbit (LEO) meteorological satellites observed at Shanghai Satellite Engineering Institute. Although the stages were painted white, I do not recall any markings on the airframe. (U)

—The second airframe consisted of an elongated first stage, a second stage, a third stage, and a payload shroud of similar shape to the LEO meteorological satellite. The first stage was two steel panels longer than the first stage of the LM-2/3. The tour group was not permitted around the aft end of the booster, so I could not confirm if there were four booster engines like that used on the first stage of the LM-2/3. The second stage was the same length as the LM-2/3 second stage and had two engines. A transition collar was on the forward end of the second stage. The third stage was approximately half the length of the second stage and had the general appearance of the third stage of the LM-3. The stage was wide at the aft end to match the diameter of the transition stage, and then it narrowed at the forward end to a smaller diameter. The stage propulsion consisted of four hypergolic engines and several vernier engines. (U)

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● Airframe components for the assembly of two additional second stages for a LM-2/3 were in the assembly hall. A third-stage LM-3, covered with dust, was at the far end of the hall, suggesting that it was an engineering or simulator model. (U)

● Vehicles parked outside the entrance to the assembly hall included one prime mover with leveling jacks, one van-bodied electronics truck, and one cab-behind-engine (CBE) cargo truck with a canvas-covered vent/port centered over the cab. [redacted]

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● A new type of missile-associated ground-support vehicle was parked next to a subassembly building in the plant complex. The four-axle, cab-over-engine truck had a low profile van body unlike any previously identified. [redacted]

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(S/WN)

● A general question-and-answer session revealed the following items:

—Five first- and second-stage airframes can be produced annually at the plant. The civilian product produced at this plant is refrigerators. (U)

—Missile airframes are shipped via specialized railcars directly to the Xichang launch site. (U)

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Shanghai Satellite Test and Production Facility Minhang
(Shanghai Satellite Engineering Institute)

The Shanghai Satellite Test and Production Facility Minhang (Figure 5), located on the same road and a short distance from the Shanghai Missile and Space Systems Plant Minhang, was visited on 16 June 1987, approximately 1500-1600 local time. Information gained from the facility tour included the following items: (S/WN)

- Until a few years ago, this facility produced several types of satellites for China. The plant now produces two types of meteorological satellites, one for use in LEO and the second for use in geosynchronous orbit (GEO). (U)

—The tour group was told that the LEO satellite would be launched in 1988, and the GEO satellite launch was planned for the 1990-91 timeframe. The launch site for the GEO satellite was confirmed as the Xichang space-launch site in south central China, and no launch site for the LEO satellite was discussed. NPIC refers to the Xichang space-launch site as Songlin SSM Research and Development Space Launch Site [REDACTED]. NPIC

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- Satellite test facilities within the compound include a vibration test stand, centrifuge test, vacuum test chamber, and a sun and heat simulator. (U)
- The vacuum test chamber was only as large as the current GEO satellite. Sun and heat simulation tests were also conducted in the same multi-story building. Sun and heat tests were and are conducted to simulate a five-year space operation, although we were told the satellites fly for only a year. (U)
- In the satellite assembly building, three completed LEO satellites and one GEO satellite in the assembly process, were observed. (U)

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Attachments

Figure 1. Beijing Guided Missile Plant Nanyuan, 3 Jun 87 (TOP SECRET [Redacted]) 25X1

Figure 2. Weinan Probable SSM-Space Tracking Facility, 17 May 87 (TOP SECRET [Redacted]) 25X1

Figure 3. Xian Institute of Radio Technology, 15 Apr 87 (TOP SECRET [Redacted]) 25X1

Figure 4. Shanghai Missile and Space Systems Plant Minhang, 3 May 87 (TOP SECRET [Redacted]) 25X1
Inset Shows Cab-Behind-Engine Cargo Truck (UNCLASSIFIED)

Figure 5. Shanghai Satellite Test and Production Facility Minhang, 3 May 87 (TOP SECRET [Redacted]) 25X1
[Redacted] 25X1
Insets Show Models of LEO and GEO Meteorological Satellites (UNCLASSIFIED)

If additional copies or viewgraphs of the figures are desired please call the NPIC Customer Information and Support Center on [Redacted] (C)

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