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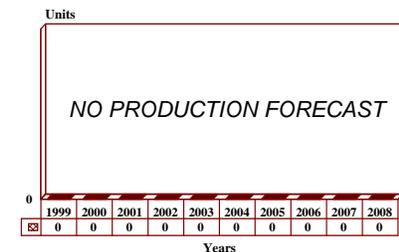
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CEIEC JY-8 - Archive 6/2000

Outlook

- Reportedly still in service
- Additional production is unexpected but possible
- **Barring any new, unexpected information, this report will be archived next year (2000)**

10 Year Unit Production Forecast
1999-2008



Orientation

Description. G/H-band stacked-beam, mobile, short-range 3-D radar tasked with air surveillance, target acquisition and interception control either as a stand-alone system or as an information source within an automated tactical air defense system.

Sponsor

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Contractors

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Licensee. No information on production licenses is available.

Status. In service; production status uncertain.

Total Produced. An estimated 1,650 JY-8/JY-8A radars have been built.

Application. The JY-8 radar is intended for the air defense mission, capable of air surveillance, target acquisition, tracking and interception control. It can function either as either a stand-alone system or as the main information sensor in an automated air defense command and control system. As for the JY-8A, it acts as the prime surveillance sensor for air defense battalions equipped with 57 mm guns. The radar is mounted on a trailer and towed by truck.

Price Range. The 1993 sale to Thailand suggests a unit price of US\$1.2 million per JY-8 radar.

Technical Data

	<u>Metric</u>	<u>US</u>
Characteristics		
<u>JY-8</u>		
Maximum range:	350 km	220 miles
Maximum altitude:	25 km	82,025 ft
Range accuracy:	500 m	550 yd
Altitude accuracy:	500 m	550 yd
Azimuth accuracy:	0.3°	
Elevation:	20°	
Target capacity:	36 tracks	
Target resolution:	1,000 m (range)	
	0.6° (azimuth)	
Mean time between failures:	>150 hr	
Mean time to repair:	<30 min	
Temperature range:	-40° to +50° C	
Wind tolerance:	25 m/s	80 fps
Horizontal beamwidth:	0.55°	
Vertical beamwidth:	0.9°	
Rotation speed:	3-6 rpm	
Peak power:	800 kW	
<u>JY-8A</u>		
Maximum range:	150 km	95 miles
Maximum altitude:	12 km	39,750 ft
Range accuracy:	500 m	550 yd
Altitude accuracy:	700 m	840 yd
Azimuth accuracy:	0.3°	
Elevation:	30°	
Target capacity:	36 tracks	
Mean time between failure:	>150 hr	
Mean time to repair:	<30 min	
Temperature range:	-40° to +50° C	
Wind tolerance:	25 m/s	80 fps
Horizontal beamwidth:	0.55°	
Vertical beamwidth:	0.9°	
Peak power:	800 kW	

Design Features. The JY-8 is a G/H-band, lightweight, mobile 3-D radar. It is claimed to use advanced data processing techniques and to be fully solid state except for the magnetrons and thyratrons in the transmitters. The radar can be fitted with a Wales-function image transmission facility to transfer pictures on the PPI to a command post up to 50 km away. The JY-8 is composed of four transportable units: the antenna/transceiver shelter (ATS), the operation/reporting shelter (ORS) truck, the maintenance shelter (MS) truck, and the optional microwave image transmission unit (MITU). A circular polarization radome reduces weather interference by 12 to 15 dB.

Operational Characteristics. The JY-8 uses frequency diversity to increase detection probability and to

enhance ECCM capability. To improve performance in active and passive interference environments, manual frequency changes can be conducted, and numerous filtering and analytical circuits are included.

The ATS includes the antenna/feed assembly, the transmission and reception subsystem and the remote control equipment. JY-8 uses stacked-beam amplitude comparison for height finding. Computer assistance provides automatic and precise real-time 3-D data on targets within its coverage. The stacked-beam antenna assembly rotates at a speed of 3-6 rpm to provide 360-

degree coverage in azimuth. The RF power generated by the two transmitters is fed to a power-dividing network where frequency diversity combination and power division are performed. The paraboloid reflector is then illuminated via the feed array, creating a group of individual beams in a wide, approximately cosecant-shaped pattern.

The ORS houses facilities for the reception and processing of the radar data. In reception, both separate and combined beams are employed. Those formed by the receiving network are sent to frequency diversity receivers which perform the necessary mixing, amplification and detection of the received signals. The signals are then further processed by A/D converters, a clutter-map controller, slow threshold circuits, automatic detectors, plot filters and digital cancelers. The processed signals are then sent to the computer analysis center for evaluation, correlation and tracking. Capability for expansion to meet user requirements is

built into the system. The ORS has full environmental control.

The MS is used for the daily maintenance of the plug-in cards used in the system. First-level maintenance instrumentation and replacement components are supplied. The status information on each unit under test is displayed on indication panels during on-line test procedures. The information is analyzed and displayed on a central information console using a numeric code to indicate the nature of the fault and its position. A specific "multi-fault" indicator is provided to cope with situations where large numbers of faults occur simultaneously, i.e., being hit by an anti-radiation missile.

The MITU is an optional unit which includes a set of image data transmission equipment, a microwave communication transceiver and a PPI. The unit can either be specified as a component within the system or be obtained separately as a subsequent upgrade.

Variants/Upgrades

JY-8A. The JY-8A is a simplified and lighter variant of the JY-8. One transmitter is used, reducing detection coverage and height-finding accuracy. Frequency diversity is also reduced. Twelve reception beams are employed, giving an elevation range from 0.5 to 30 degrees. Also, the ATS shelter is lighter and more mobile.

Aside from these differences, the two radars are physically and operationally similar. The JY-8A is deployed as the primary surveillance and target acquisition sensor for 57 mm anti-aircraft gun battalions.

Program Review

Background. The JY-8 radar first appeared at the 1985 Defendory exhibition, accompanied by a number of other Chinese systems. No information is available on its previous history; however, during the mid- to late 1970s, the Chinese purchased a number of French TIGER radars. It possible that some of the technology from these systems was incorporated within the JY-8 family prior to the JY-8 and JY-8A being made available for export. The JY-8A derivative first appeared in mid-1987.

In November 1988, Jordan was reported to have purchased a number of JY-8 radars, possibly five, for air surveillance using Jordanian funding. The radars were likely for installation in lower threat areas to reinforce the coverage provided by the recently installed

Marconi S-711s. The purchase was reported to have been funded by the Saudi Arabians, for whom it would provide added early warning coverage.

In December 1988, the Royal Thai Navy ordered a package of radars and anti-aircraft guns from the Chinese for protection of the Songkhla naval base. This purchase included two JY-8A surveillance and target acquisition radars, four MW-5 fire-control radars and 24, 57 mm anti-aircraft guns. In mid-1993, the Thai armed forces purchased two JY-8 radars for deployment in the northern provinces of the country. The role of the equipment would be to serve as gap-fillers for the RTADS air defense system, providing mobile coverage of sparsely populated areas of low strategic importance.

Funding

Information concerning the value and source of funding for these radars is not disclosed.

Recent Contracts

None identified since the following:

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
CEIEC	2.4	Jun 1993 – Thai order for two CEIEC JY-8 radars for the RTADS Phase 1 area.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1985	JY-8 initially announced
	1987	JY-8A initially announced
Nov	1988	JY-8 radars ordered by Jordan
Dec	1988	JY-8A radars ordered by Royal Thai Navy
Jun	1993	JY-8 radars ordered by Thailand

Worldwide Distribution

Confirmed customers of these radars include **China** (perhaps 1,400 between JY-8 and JY-8A), **Jordan** (perhaps five JY-8s) and **Thailand** (two JY-8s and two JY-8As), though there have probably been several more in Asia, Africa and the Middle East.

Forecast Rationale

The CEIEC JY-8 mobile, short-range, 3-D radar has reportedly been produced approximately 1,650 times. Reporting known production numbers is impossible due to the unavailability of information surrounding this system. However, the system has proved marketable due to the 1993 sale to Thailand.

The two radars forming the JY-8 family are sound, workable systems, but they utilize dated technology and

lack the peripheral features expected from new-production Western radars. Future sales may occur, but the likelihood of receiving information about them is unlikely.

A forecast is withheld on the basis of no known and/or new information. Barring any new and unexpected changes, this report will be archived next year (2000).

Ten-Year Outlook

No further production is forecast. **Barring any new, unexpected information, this report will be archived next year (2000).**

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