

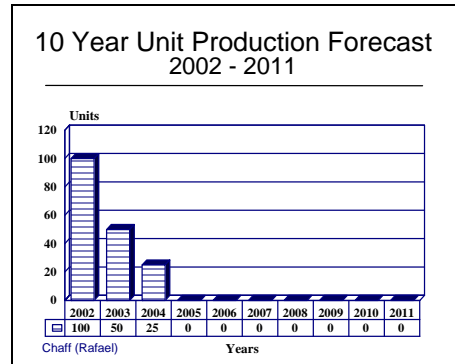
ARCHIVED REPORT

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Chaff (Rafael) - Archived 09/2003

Outlook

- Very limited production forecast
- Barring any significant future activity, this report will be archived in September 2003



Orientation

Description. SRCR (short-range chaff rockets) and LRCR (long-range chaff rockets) are used for warship protection by decoying and deflecting inbound radar-guided missiles and by decoying search radars.

Sponsor

Israeli Ministry of Defense
 Kaplan Street
 Hakiryia 67659
 Tel Aviv
 Israel

Contractors

Rafael Armament Development Authority
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 IS-31021 Haifa
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 Tel: +972 4 706965
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 Web site: <http://www.rafael.co.il>

Licensee. These systems were believed to be under licensed production by an unknown company in Taiwan. The LRCR was built in Taiwan under the designation AV-2.

Status. Believed to be in moderate production; in service.

Total Produced. Approximately 25,100 Rafael chaff rockets have been produced through 2001.

Application. The Rafael SRCR is a self-protection chaff rocket designed to provide close-in passive defenses against anti-ship missiles (ASMs). The Rafael LRCR is designed to provide long-range passive defenses against naval search radars.

Price Range. It is estimated that these systems cost US\$3,000 for the SRCR and US\$10,000 in FY00 dollars for the LRCR, based on the prices of similar equipment. No concrete pricing data are available for this system.

Technical Data

	<u>Metric</u>	<u>US</u>
Dimensions		
<u>SRCR</u>		
Rocket weight	3.2 kg	7 lb

	<u>Metric</u>	<u>US</u>
Rocket length	640 mm	25.4 in
Rocket diameter	90 mm	3.5 in
Rocket chaff content	1.75 kg	3.86 lb
Launcher weight	22 kg	48.4 lb
Launcher length	800 mm	31.7 in
<u>LRCR</u>		
Rocket weight	9.4 kg	20.7 lb
Rocket length	922 mm	36.6 in
Rocket diameter	89 mm	3.5 in
Rocket chaff content	1.3 kg	2.86 lb
Launcher weight	12.5 kg	27.5 lb
Launcher length	1,250 mm	49.6 in
Launcher diameter	216 mm	8.6 in
<u>Beamtrap</u>		
Rocket weight	6.6 kg	14.5 lb
Rocket length	804 mm	31.6 in
Rocket diameter	115 mm	4.5 in
Launcher weight	13.0 kg	28.6 lb
Launcher length	1,020 mm	40.2 in
Launcher diameter	365 mm	14.4 in

Design Features. The basic SRCR launcher is a triple-barreled unit, mounted in pairs on the IMI standard 12.7 mm MG mounting. These launchers can be operated by a remote firing box, which is capable of controlling a maximum of four units. The standard LRCR installation consists of up to four tubes per

vessel, mounted on the ship's superstructure. A remote firing box controls rocket launch. After launch, a two-stage rocket motor carries the LRCR to the point at which an altitude-activated fuse initiates the chaff bloom.



Israeli SAAR Corvette

Source: JJMA

Variants/Upgrades

Beamtrap. Developed as a replacement for the SRCR. Beamtrap can be fired from a six-tube launcher mounted on the superstructure or from the standard 24-, 48-, and 72-round launchers mounted on all Israeli fast attack craft (FAC). In the latter application it is controlled by the Elbit ACDS (advanced combat direction system). The Beamtrap rocket has a greater diameter than the SRCR it is supposed to replace.

C-Pearl. A lightweight and compact electronic support measures (ESM) system for aircraft, ships, and submarines. The antenna/direction finding unit includes both instantaneous frequency measurement and instantaneous direction finding capability. In surface warship applications, it is probably used as a set-on receiver for the ACDS system and the chaff rocket launchers.

Program Review

Background. Rafael's chaff rockets were developed in response to an Israeli requirement, initiated by lessons of the 1973 Yom Kippur war. During that conflict, the Syrian and Egyptian navies were largely equipped with the obsolete P-15 Termit (SSN-2 Styx) missile, for which existing countermeasures were adequate. The Israeli Gabriel is a short-range missile, and the certainty that missiles more advanced than the P-15 would find their way to Israel's enemies made the development of improved electronic warfare systems and decoys crucial. The double-layered LRCR and SRCR system was the result. It entered production during the late 1970s and was extensively fitted to Israeli new construction.

The system is in production for the Israeli Navy and has been widely fitted to all Israeli warships. These fits include three Lahav class corvettes (four 72-round and two 24-round launchers), five SAAR-4.5 class (one 48-round and four 24-round launchers), six SAAR-4 class

(one 48-round and four 24-round launchers), 14 Improved Dvora class (two six-round launchers), and 22 Dabur class (two six-round launchers).

Although the Dvora and Improved Dabur class small craft carry simple chaff launchers in Israeli service, the small numbers of these exported from 1992 to the present (to Eritrea and Sri Lanka) have apparently not been so equipped. Ongoing sales appear to be restricted to the Israeli Navy. No recent contracts for this equipment have been identified; however, it is assumed that production primarily for Israel is ongoing.

It was reported in early 2000 that the Royal Australian Navy may have started using the C-Pearl ESM system for its Adelaide class frigates. This would imply that the same ships may be utilizing Rafael chaff rockets which are designed for use with C-Pearl.

Through 2001 and early 2002 it is likely that the line saw only limited production.

Funding

Development was funded by the Israeli government.

Recent Contracts

As with all Israeli equipment, no contractual information has been made publicly available.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1977	Minister class FAC enters service
	1979	SAAR-4 FAC transferred to Chile
	1980	SAAR-4.5 FAC enters service
	1986	Dvora class FAC ordered by Sri Lanka
	1987	Super-Dvora class FAC ordered
	1988	Beamtrap rockets introduced

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Dec	1989	Two SAAR-4 FAC delivered to Chile
Feb	1990	Eilat class ordered
Oct	1993	First Eilat class completed
	2000	Possible installation on Royal Australian Navy frigates

Worldwide Distribution

Chaff (Rafael) rockets are reportedly in use by the **Israeli Navy** and may possibly have been procured by **Australia, Chile, and Taiwan.**

Forecast Rationale

The dearth of new information on contracts and production suggests that manufacture of the Israeli-made Rafael chaff rocket line is drawing to a close. The rockets have been widely distributed among vessels of the Israeli Navy as well as those of several other nations. The system's advanced age (over 20 years) appears to be working against it as newer, more advanced self-protection systems are being introduced.

The rockets are composed of two primary variants: the LRCR, designed to provide long-range passive defenses against naval search radars; and the SRCR, a self-

protection rocket designed for close-in passive defense against anti-ship missiles (ASMs).

Apparently, since the mid-1990s sales for both variants have dropped off significantly. Any possible production at this point may only be for spares and replacements of previous orders. Production is therefore expected to be very limited over the next few years, as shown in the **Ten-Year Outlook** below, and will most likely cease altogether well before the end of the forecast period. Barring future activity, this report will probably be archived next year.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Designation	Application	Thru 01	High Confidence Level			Good Confidence Level			Speculative			Total 02-11	
			02	03	04	05	06	07	08	09	10		11
BEAMTRAP (RAFAEL)	FAC (VARIOUS)	2900	100	50	25	0	0	0	0	0	0	0	175
LRCR	Prior Prod'n:	12550	0	0	0	0	0	0	0	0	0	0	0
SRCR	Prior Prod'n:	9650	0	0	0	0	0	0	0	0	0	0	0
Total Production		25100	100	50	25	0	0	0	0	0	0	0	175