



RX-250-LPN

Indonesia's RX-250-LPN Sounding Rocket

Photos courtesy LAPAN

by Peter Alway

Indonesia's space program dates back to the early 1960s after the US and USSR launched the first satellites, moon probes, and humans into space. In 1963, Indonesia's Astronautics Committee, composed of military, scientific, and educational leaders, found that the world's fourth most populous nation lagged far behind not only the developed world, but even behind other third world countries. Much to the committee's consternation, Indonesia had been a blank spot on the map during the International Geophysical year of 1957-1958. By November, the committee had sparked two significant results. First, the military, working with the Bandung Institute of Technology, began work on the PRIMA rocket project. Second, a presidential decree created the National Institute of Aeronautics and Space, abbreviated LAPAN.

On August 14, 1964, the PRIMA project bore fruit with the launch of the Kartika-1 research rocket. In the following years, Indonesia worked with Japan to launch sci-

entific payloads on Japanese Kappa rockets from Indonesian soil.

By the late 1960s, LAPAN embarked on an effort to use space for practical applications. On July 8, 1976, an American Delta rocket launched Indonesia's first satellite, Palapa A, into orbit. This Hughes-built communications satellite linked the scattered islands of Indonesia with 12 radio transponders capable of carrying more than 5000 phone channels or 12 television channels. More Palapa satellites followed.

LAPAN resumed sounding rocket work in the 1980s, creating the RX- series of rockets. The smallest Indonesian rocket is the RX-75—the number indicating the diameter in millimeters. Next is the two-stage RX-150/150-LPN, lofting 15-30 kg (33-66 lb) to 60 km (35 mi). The largest, the two-stage RX-250/250-LPN can carry 30-60 kg (66-130 lb) payload to an altitude of 120 km (70 mi). Between these is RX-250-LPN, a single-stage rocket capable of lifting 30-60 kg (66-130 lb) of scientific instruments to an altitude of 70 km (40 mi).

LAPAN's Space Technology Division began work on the RX-250-LPN in 1984. The

solid propellant rocket burns HTBP composite propellant (a propellant also favored by American rocketeers) configured for a dual-thrust burn. The motor provides an initial high-thrust blast to kick the rocket off the pad, followed by a gentle burn to maximize performance. The first RX-250-LPN lifted off in 1987. The rocket has carried flight dynamics instruments to monitor the rocket's performance, meteorological instruments, and radio equipment for a band piping-digipeater experiment—the basis of a proposed Indonesian microsatellite. The rockets depicted here bear insignia commemorating the 50th anniversary of Indonesia's independence, in August of 1995. Another RX-250-LPN, carrying a digipeater flew in October of 2000.

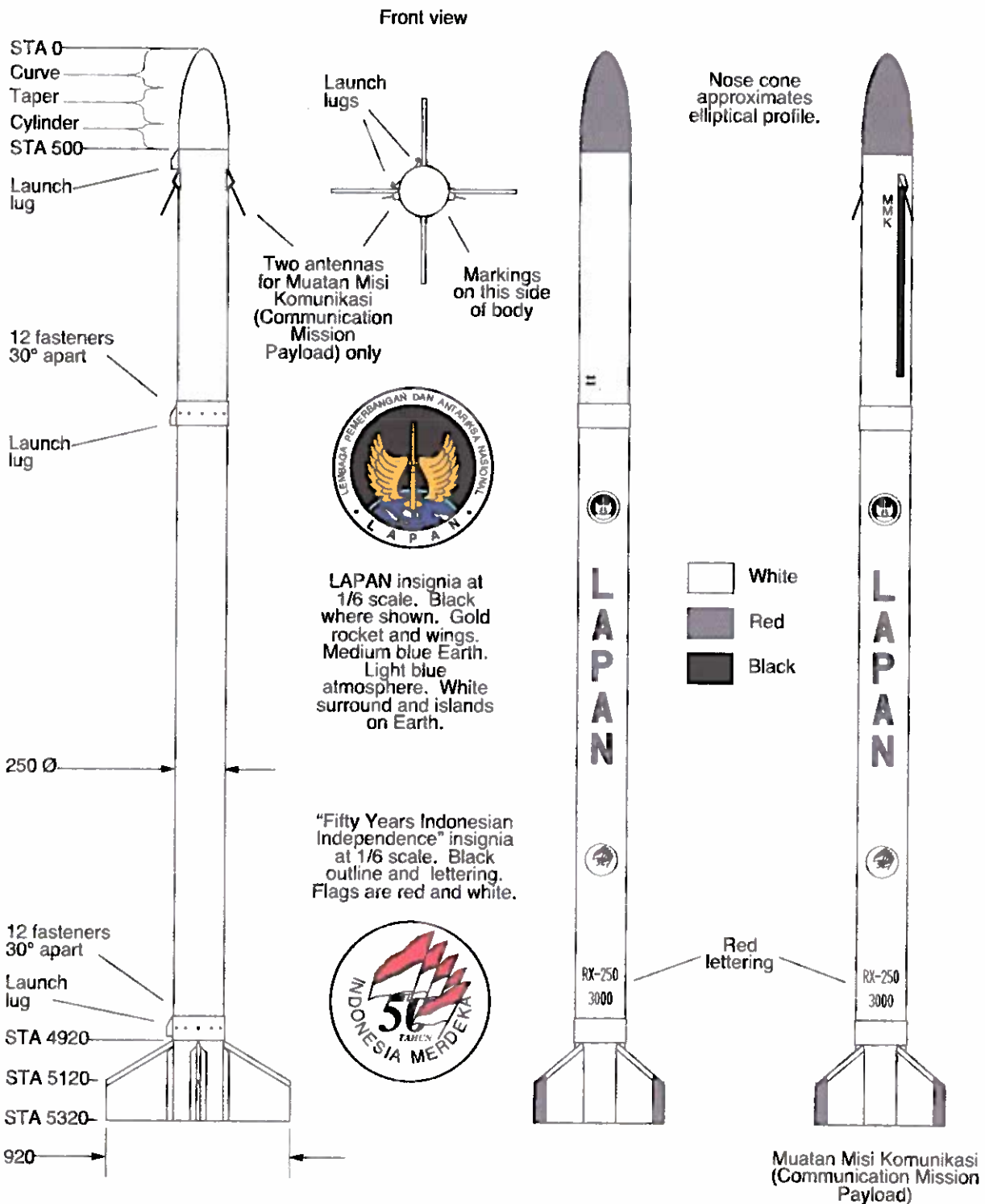
In 1999, the situation in East Timor led the US to embargo exports of military equipment to Indonesia (relations have improved since—the US lifted the ban late in 2005). In response, Indonesia began efforts to create its own missiles. Advances in sounding rocket propulsion and missile propulsion are often interchangeable, so LAPAN set about to move Indonesian rocket technology forward in general.

In late May and early June of 2005 this work came to fruition with a series of rocket launches from Garut, West Java. Local fishermen, ordered off the waters for a couple days for the trials, treated the launch campaign as a festive occasion, fascinated by the preparations and taking pride in their country's advances in rocketry. LAPAN trucked in nine rockets for the occasion, including two new larger-diameter rockets. Also among these rockets was an improved version of the RX-250.

The new RX-250 featured a thinner, lighter casing for better performance. LAPAN launched two of these in June to evaluate their performance and to compare it to computer predictions. Another RX-250 flew in December of 2005. Photos of the 2005 rockets show a conical nose replacing the roughly elliptical nosecone of the 1995 rockets shown here.

RX-250-LPN SPECS.

Launch weight	300 kg (660 lb)
Payload weight	30-60 kg (66-132 lb)
Thrust	52,000 N (11,700 lb)
Duration	6 sec
Total impulse	310,000 N-sec (70,000 lb-sec)
NAR designation	R 52,000
Length	5.32 m (17 ft 5 1/2 in)
Diameter	25 cm (9.8 in)



RX-250-LPN
 1/30 scale
 Dimensions in millimeters
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Sources:
 "RX-250-LPN" LAPAN data sheet.
 "RX-250/250" LAPAN data sheet.
 Photographs provided by Laurens Samosir of LAPAN
 LAPAN web site <http://www.lapan.go.id>