



החלפת מנועים במטוס קורנס (F-4) יום עיון מנועי סילון טכניון / פקולטה לאווירונאוטיקה

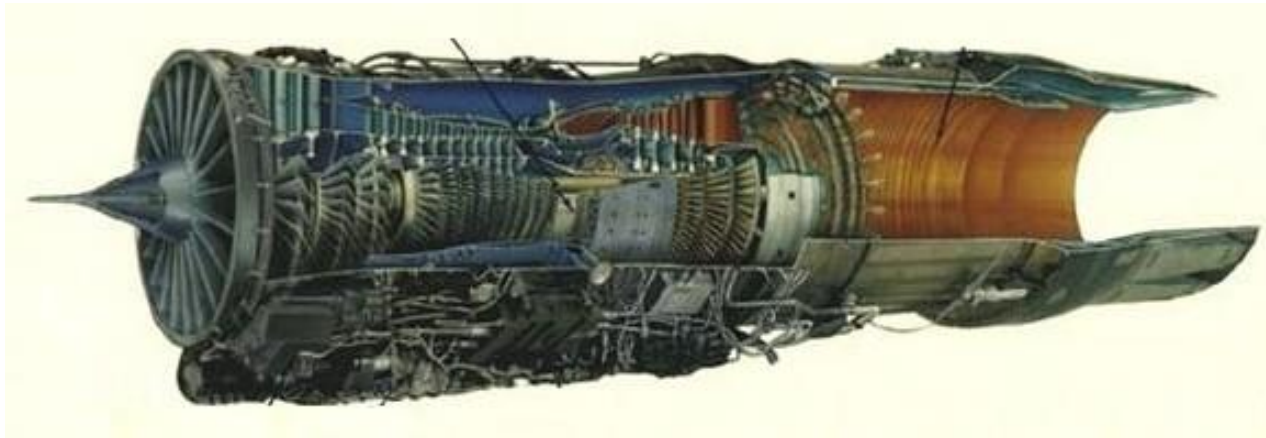
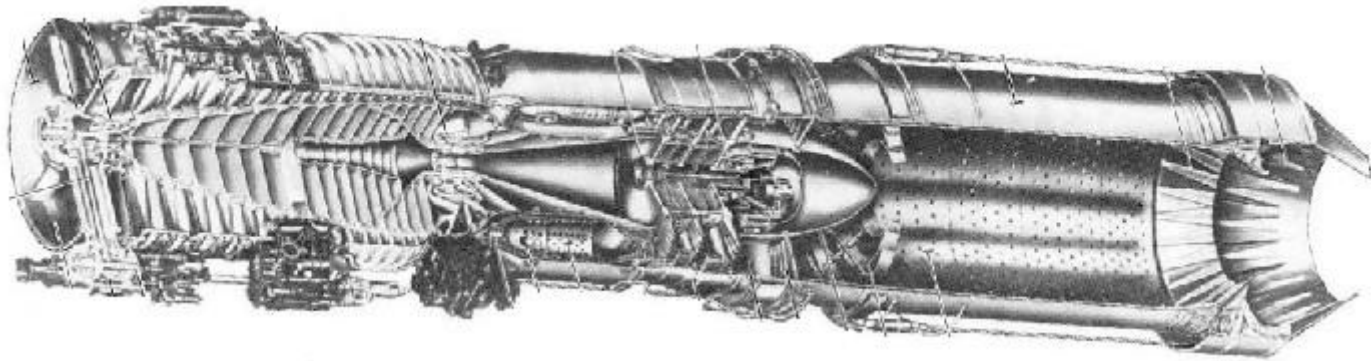
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7/11/2013

Reengineering of F-4 A/C Superphantom / Phantom 2000

Programs targets:

- Part of modernization program of F-4 A/C weapon system.
- Opportunity to use common engine with LAVI A/C.
- Improvements of performance, agility and survivability.
- Capability to perform low level high speed, long range strike.

Comparison between PW1120 and J-79-17 engines



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Feature	PW1120	G.E J-79-17
Type	Turbofan	Turbo-Jet
Design date	1970-1982	1955-1965
Length	4110 mm	5300 mm
Weight	1292 kg	1750 kg
Compressor Compression ratio By-pass	3 fan and 10 axial stages 1:30 "Leaky" T.F.-0.36	17 axial stages 1:13.5
Thrust Max Military Max after burner	6137 kgf 9337kgf	5290 kgf 7940 kgf
Thrust to weight ratio	7.22:1	4.6:1
S.F.C (Specific Fuel Consumption) Max Military Max after burner	0.76 kg/kgf 1.9 kg/kgf	0.87 kg/kgf 2.0 kg/kgf
Engines Control	"FADEC"	HYDRO-MECHANICAL

CHANGES / MODIFICATIONS

- Inlet compatibility to the new air-flow.
- New inlet duct extension and change of secondary air-flow (cooling) around the engine.
- Structure and new engine mounts.
- Modified A/C Bay-doors.
- New airframe mounted gearbox with integral generator and pumps.
- Modifications of hydraulic and electrical system of A/C.
- Bleed management and air-conditioning system.
- Cockpit instrumentation of engine parameters.
- “Automatic” throttle – interface between pilot throttle and FADEC.
- Flight instrumentation.

Main development milestones

- **A/C performance evaluation (1984).**
- **Design and manufacture of the modifications.**
- **Installation of PW1120 engine on the starboard side nacelle of the A/C.**
- **Ground tests.**
- **Flight test with both J-79-17 and PW1120 installed.**
- **Two PW1120 installed.**
- **Flight tests (1987).**



F-4 with PW1120 performance improvements

- **Speed: mach ≥ 1 without afterburner.**
- **Increase of low level speed with 18 bombs from 1046 km/n (605 kt) to 1120 km/n (650 kt)**
- **Combat thrust to weight ratio ≥ 1.04 (17% better).**
- **Sustained turn rate : 15% better.**
- **Climb rate : 36% better.**
- **Range increase : 12%-21%.**





עדמטק; עמנואל ליבן; יצחק הוכמן





Summary

- **F-4 engine conversion from G.E. J-79-17 to PW1120 was very successful and met the expectations of IAF.**
- **The program was terminated with the cancellation of LAVI A/C development.**
- **The prototype A/C is in the IAF museum near Beer-Sheva and is part of our aviation history.**