



THE JOINT STRIKE FIGHTER PROGRAM

WHAT IS IT?

THE JOINT STRIKE FIGHTER (JSF) PROGRAM IS AN INTERNATIONAL DEFENCE PROGRAM LED BY THE UNITED STATES TO DEVELOP, PRODUCE, AND SUPPORT THE F-35 LIGHTNING II, A FAMILY OF ADVANCED MULTIRÔLE FIGHTER AIRCRAFT. IT INVOLVES THE US AND SEVERAL PARTNER COUNTRIES THAT CONTRIBUTE FUNDING, TECHNOLOGY, MANUFACTURING, TRAINING, AND MAINTENANCE TO THE PROGRAM.

THE JSF PROGRAM CONNECTS COUNTRIES THROUGH SHARED PRODUCTION, TRAINING AND MAINTENANCE OF THE F-35. COUNTRIES SUCH AS AUSTRALIA, THE UK, ITALY, DENMARK, NORWAY, NETHERLANDS AND WORK WITH AMERICAN COMPANIES AND OTHER INTERNATIONAL PARTNERS. THIS COOPERATION CREATES A GLOBAL NETWORK OF INDUSTRIES, WHERE AIRCRAFT PARTS CAN BE DESIGNED, PRODUCED AND ASSEMBLED IN DIFFERENT COUNTRIES, SHOWING HOW GLOBALISATION SHAPES MODERN DEFENCE PROJECTS.

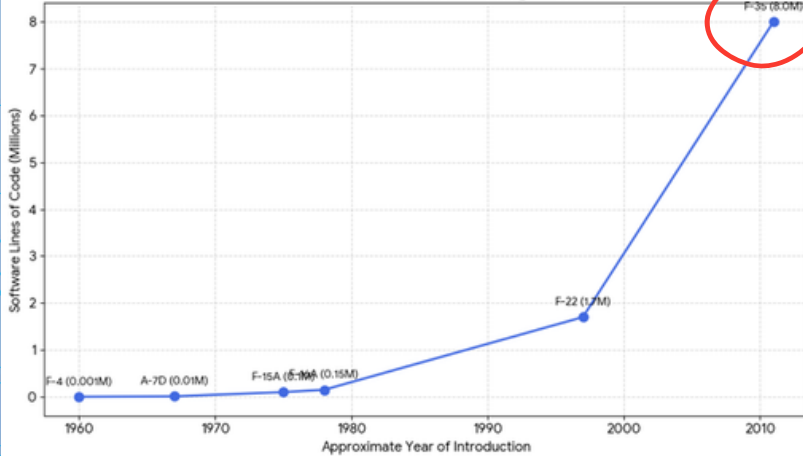
ADVANTAGES OF THE JSF PROGRAM

- INTERNATIONAL COOPERATION: COUNTRIES SHARE TECHNOLOGY, EXPERTISE AND RESOURCES.
- LOWER PRODUCTION COSTS: PRODUCING PARTS ACROSS DIFFERENT COUNTRIES CAN REDUCE COSTS THROUGH A LARGE GLOBAL SUPPLY CHAIN.
- INDUSTRIAL BENEFITS: PARTICIPATING COUNTRIES CAN GAIN CONTRACTS, JOBS AND EXPERIENCE FOR THEIR AEROSPACE INDUSTRIES.
- INTEROPERABILITY: ALLIED COUNTRIES CAN TRAIN AND OPERATE TOGETHER MORE EASILY.
- ADVANCED TECHNOLOGY: COUNTRIES GAIN ACCESS TO A HIGHLY ADVANCED FIGHTER AND RELATED TECHNOLOGIES.

CHALLENGES

- DEPENDENCE ON THE US: THE PROGRAM IS US-LED, SO PARTNERS DEPEND ON AMERICAN TECHNOLOGY, SOFTWARE AND DECISIONS.
- COMPLEX SUPPLY CHAIN: PROBLEMS IN ONE COUNTRY CAN AFFECT PRODUCTION OR MAINTENANCE ELSEWHERE.
- HIGH COSTS: PURCHASING AND MAINTAINING F-35S REQUIRES SIGNIFICANT LONG-TERM INVESTMENT.
- LIMITED INDEPENDENCE: PARTNER COUNTRIES CANNOT FREELY MANUFACTURE OR MODIFY EVERY PART OF THE AIRCRAFT.
- POLITICAL DEPENDENCE: CHANGES IN RELATIONSHIPS BETWEEN PARTICIPATING COUNTRIES CAN AFFECT COOPERATION.

Growth of Software Lines of Code in Fighter Aircraft

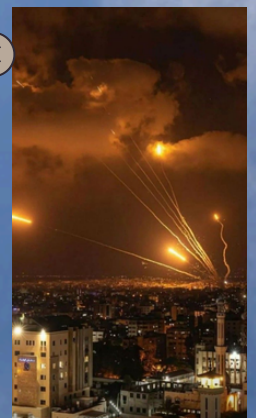


PARTNER: JAYSON MOYLE



AUSTRALIAN AEROSPACE AND DEFENCE PROFESSIONAL WITH EXPERIENCE IN ENGINEERING, AIRCRAFT ACQUISITION AND DEFENCE PROGRAMS. HE HAS WORKED ACROSS COMPLEX AEROSPACE AND DEFENCE PROJECTS, INCLUDING AREAS RELATED TO THE F-35 PROGRAM.

THE F-35 IS USED BY SEVERAL COUNTRIES THAT HAVE PURCHASED IT, INCLUDING THE UNITED STATES, UNITED KINGDOM, AUSTRALIA, ISRAEL, JAPAN, SOUTH KOREA, ITALY, THE NETHERLANDS AND OTHERS. SOME F-35S HAVE BEEN USED IN REAL MILITARY CONFLICTS. FOR EXAMPLE, ISRAEL HAS USED ITS F-35 "ADIR" AIRCRAFT IN MILITARY OPERATIONS IN THE MIDDLE EAST, WHILE THE UNITED STATES HAS USED F-35S IN COMBAT OPERATIONS, INCLUDING AGAINST ISIS IN IRAQ AND SYRIA. ISRAEL BECAME THE FIRST FOREIGN CUSTOMER TO RECEIVE THE F-35, AND ITS AIRCRAFT BECAME OPERATIONAL IN 2017.



AUSTRALIA'S CONTRIBUTION AND THE QUESTION OF INDEPENDENCE

AUSTRALIA JOINED THE JSF PROGRAM IN 2002 AS ONE OF ITS ORIGINAL INTERNATIONAL PARTNERS.



CONTRIBUTES TO THE F-35 PROGRAM THROUGH ITS INDUSTRY, MAINTENANCE, TRAINING AND MILITARY OPERATIONS. AUSTRALIAN COMPANIES MANUFACTURE PARTS FOR THE GLOBAL FLEET, WHILE AUSTRALIA ALSO PROVIDES REGIONAL MAINTENANCE AND SUPPORT. IT ALSO TRAINS F-35 PILOTS AND OPERATES 72 F-35A AIRCRAFT. THIS MAKES AUSTRALIA BOTH A CUSTOMER AND AN ACTIVE CONTRIBUTOR TO THE GLOBAL F-35 PROGRAM.



Quickstep



AUSTRALIA'S F-35 CONTRIBUTION ALSO INVOLVES BRANCHES OF MAJOR INTERNATIONAL DEFENCE COMPANIES. COMPANIES SUCH AS LOCKHEED MARTIN, BAE SYSTEMS AND NORTHROP GRUMMAN OPERATE IN AUSTRALIA AND WORK WITH AUSTRALIAN COMPANIES AND DEFENCE.

BAE Systems Australia	Aircraft components, structures and maintenance/support
Marand	Vertical tails and specialised aircraft production equipment
Quickstep Holdings	Advanced composite aircraft components
TAE Aerospace	F-35 engine maintenance and sustainment
Chemring Australia	F-35 countermeasure flares
AW Bell	Cast metal components
Cablex	Aircraft cables and wiring
Ferra Engineering	Components for engines, avionics and weapons systems
Levett Engineering	Airframe, avionics and electronic components
WASA	Specialised metal alloys, including titanium and nickel
Varley Group	Ground-support and maintenance equipment
RAAF Australia	Training materials for F-35 pilots and maintainers

AUSTRALIA ALSO TRAINS WITH OTHER F-35 PARTNER AND OPERATOR NATIONS THROUGH MULTINATIONAL EXERCISES AND TRAINING ACTIVITIES. THESE EXCHANGES IMPROVE INTEROPERABILITY, ALLOW COUNTRIES TO SHARE EXPERIENCE, AND STRENGTHEN DEFENCE COOPERATION AND ALLIANCES.



EXERCISE PITCH BLACK
EXERCISE RED FLAG NELLIS
EXERCISE RED FLAG ALASKA
EXERCISE COPE NORTH
EXERCISE BAMBOO EAGLE
EXERCISE ROGUE AMBUSH

CAN AUSTRALIA INDEPENDENTLY PRODUCE THE F-35?

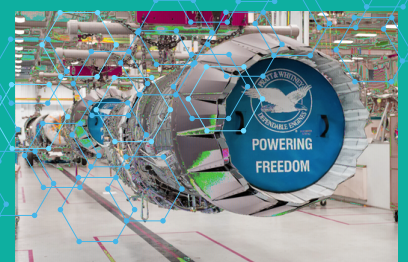
AUSTRALIA HAS ACQUIRED 72 F-35A LIGHTNING II AIRCRAFT. THEY ARE ORGANISED INTO FOUR SQUADRONS: THREE OPERATIONAL SQUADRONS —NO. 3 SQUADRON, NO. 75 SQUADRON AND NO. 77 SQUADRON —AND ONE TRAINING SQUADRON, NO. 2 OPERATIONAL CONVERSION UNIT (2OCU). NO. 3 AND NO. 77 SQUADRONS ARE BASED AT WILLIAMTOWN, WHILE NO. 75 SQUADRON IS BASED AT TINDAL.



THE F-35 INVOLVES HIGHLY SPECIALISED TECHNOLOGIES, ADVANCED SOFTWARE, SENSITIVE ENGINEERING DATA, COMPLEX SYSTEMS AND COMPONENTS THAT ARE CONTROLLED BY DIFFERENT COMPANIES AND COUNTRIES INSIDE THE PROGRAM. AUSTRALIA DOES NOT HAVE FULL ACCESS OR CONTROL OVER ALL OF THESE TECHNOLOGIES AND THEREFORE CANNOT REPRODUCE THE ENTIRE AIRCRAFT FROM SCRATCH.

THE F-35'S PROPULSION SYSTEM IS A GOOD EXAMPLE. THE AIRCRAFT USES THE F135 ENGINE, WHICH REQUIRES HIGHLY SPECIALISED ENGINEERING AND MANUFACTURING CAPABILITIES. AUSTRALIA HAS DEVELOPED EXPERTISE IN THIS AREA THROUGH MAINTENANCE AND THE PRODUCTION OF SOME COMPONENTS, BUT IT DOES NOT MANUFACTURE THE COMPLETE ENGINE OR EVERY ONE OF ITS SPECIALISED PARTS. FOR EXAMPLE, COMPONENTS SUCH AS TURBINE BLADES REQUIRE ADVANCED MATERIALS, PRECISION MANUFACTURING AND SPECIALISED KNOWLEDGE.

ANOTHER LIMITATION IS THE LEGAL CONTROL OVER THE F-35'S TECHNOLOGY AND TECHNICAL INFORMATION. BECAUSE MUCH OF THE TECHNOLOGY IS SUBJECT TO US EXPORT-CONTROL RULES, AUSTRALIA CANNOT SIMPLY OBTAIN ALL THE TECHNICAL DATA, DESIGNS OR SOFTWARE NEEDED TO REPRODUCE OR MODIFY THE AIRCRAFT INDEPENDENTLY. THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS (ITAR) RESTRICT THE TRANSFER OF US DEFENCE TECHNOLOGY AND CAN REQUIRE US APPROVAL BEFORE CERTAIN INFORMATION OR TECHNOLOGY IS TRANSFERRED TO ANOTHER PARTY.



THE ENGINE