F-111s mark 25 years service

by Richard Hogan

In this special issue, Air Force News commemorates the 25th anniversary of the F-111 fleet in RAAF service.

Although the F-111s were purchased more than 30 years ago in the 1960s, 1 June 1998 marks the 25th anniversary of the first aircraft arriving at RAAF Base Amberley in Queensland.

Conceived in the early 1960s as the TFX (Tactical Fighter Experimental), the aircraft known today as the F-111 was developed by the true believers at the General Dynamics plant at Fort Worth in Texas.

The original specifications called for a multi-role fighter – a tactical fighter-bomber for the US Air Force Tactical Air Command, an air superiority fighter for the US Navy and a nuclear strike aircraft for Strategic Air Command. Although the development of the US Navy model was later curtailed in favour of the F-14, subsequent versions of the aircraft proved that the F-111 can be used in many ways and this is reflected in the diverse roles assigned to the F-111s serving the RAAF today.

Needing to replace Australia's Canberra bombers, the Menzies Government ordered 24 TFX aircraft while whey were still in the design phase.

The first prototype F-111 flew on 21 December 1964 but development problems and escalating costs plagued the production program. As shown on the front page, the first F-111 was handed over to the RAAF in Texas on 4 September 1968, but problems with the advanced swing-wing mechanism delayed delivery to Australia for almost another five years. In the interim 24 F-4E Phantoms were leased to Australia.

The long awaited F-111s arrived at Amberley in four delivery flights, the first on 1 June 1973 and the last on 4 December that year.

Originally intended for interdiction and maritime/land strike roles, the F-111s multi-role capabilities have been recognised and today's F-111 squadrons are trained in air control, reconnaissance (both strategic and tactical) and air support to ground and naval forces.

To enable the F-111 to carry out these tasks, a number of major updates have been carried out to the original aircraft, progressively modifying the airframe and its weapon system.

The first of these was completed in 1979 with the installation of a reconnaissance package designed by General Dynamics. Four aircraft were modified and redesigned as RF-111C, giving No 6 Squadron a long range, all weather day/night reconnaissance capability.

The second major development was the Pave Tack target detection and laser designation system which was installed in the 1980s.

This system enhanced the F-111s already potent reputation as a precision bomber and was graphically demonstrated by USAF F-111s during the Gulf War.

The Pave Pack system allows the F-111C to use laser-guided bombs, a TV-guided bomb called the GBU-15 and the Harpoon anti-shipping missile.

However its weapon systems are only part of the F-111 success story. Its speed, range and ability to fly very low and fast are other attributes.

With its wings swept back to reduce drag, the F-111 can travel supersonic at sea level and Mach 2.5 (2500 km/h) at altitude.

The swing-wing design also allows slow flight with the wings fully extended to increase lift.

Another significant feature is the Terrain Following Radar which automatically guides the aircraft over the terrain, allowing the F-111 to travel fast and low in any weather, day or night.

This type of flying and the high performance characteristics of the F-111 require skill, concentration and dedication. Although the fleet has a good safety record, fast, low level flight is always dangerous as the crews will testify and tragically there have been some accidents.

This commemorative issue is a tribute to the F-111s and those who fly and maintain them, but is also a salute to the eight pilots and navigators who have lost their lives in F-111 accidents.

One wonders if the original designers of the F-111 ever imagined in the 1960s that their aircraft would still be flying in the 21st Century. Indeed some of the current F-111 crews weren't even born when their aircraft were built. There is also the possibility that those who will be flying the aircraft when the fleet is eventually replaced have not even been born.

Afterall, two generations of the same family have flown the F-111 in RAAF service. Air Commodore Trevor Owen (now retired) was the navigator in the first F-111 to arrive from the United States in 1973 and 20 years later, his son Rick was the navigator in the first of the F-111G models to arrive in Australia.

Wing Commander Rick Owen was 17 when his father and Air Marshal John Newham, a retired former Chief of the Air Staff, touched down at Amberley with Australia's first F-111 on 1 June 1973.

And set for another 20 years

The F-111 has been the RAAF's front-line strike aircraft for 25 years and with its advanced weapon system and low-level capability the swing-wing wonder remains one of the most potent combat aircraft in the world.

And now, coupled with the acquisition of an additional 15 G model aircraft to supplement the fleet, there are a significant number of projects either underway or planned to ensure that Australia's F-111s remain an effective and capable strike force for another 20 years.

These include major upgrades of avionics, weapons, sensors and communication equipment. Although some upgrades are relevant to other Australian Defence Force systems, the F-111 upgrades are being integrated under the F-111 Block Upgrade Program and managed by the F-111 Project Office within the Defence Acquisition Organisation. The Block Upgrade Program will ensure the needs of the F-111 system as a whole are addressed, particularly for projects being implemented across the ADF.

The Block Upgrade Program is also responsible for ensuring that all weapon support elements are adequately addressed during the upgrades (for example, upgrades to the F-111C simulator) and that as many aircraft as possible remain on line during the upgrades.

The additional F-111G aircraft, purchased in 1993, form an integral part of managing the F-111 fleet. Rotated through the operational fleet they will help 'spread' the flying hours thus extending the overall life-span of the F-111s to 2020. To date, eight of the G models have entered operational service.

However, some modifications have been approved to give the G models more flexibility in an operational role and increase their commonality with the C models. The move towards common systems is based on increased operational safety and ability to maintain the fleet to its planned withdrawal date of 2020.

Funded under the New Government Initiative which emphasises the sharp end of Defence, the new package for the G models includes updating the Digital Flight Control Systems, updating all technical and aircrew publications and procuring some new instrumentation.

The G models are currently scheduled for a major upgrade to provide it with a similar level of capability as the upgraded C models. The upgrade will be based on the same avionics architecture being installed in the C model under the Avionics Update Program (AUP).

After the upgrade the F-111G will have an autonomous laser designation capability and the ability to employ the range of stand-off weapons planned for the RAAF inventory. In addition to the planned upgrade, the F-111G is currently undergoing a flight control upgrade which will incorporate a digital flight control system similar to that installed in the F-111C.

The most significant upgrade for the F-111C aircraft is the current Avionics Update Program which involves replacing the dated analogue systems on the original C models with modern digital avionics. The avionics update package includes the Attack and Terrain Following Radar systems, flight controls and communications/navigation systems. Incorporating multi-function displays, the communication/navigation package will provide better integration of control over the communication, navigation and aircraft identification equipment.

Rockwell Systems Australasia won the AUP contract in August 1990 and its parent company, Rockwell International (now Boeing North America), was responsible for the initial design and development work at Anaheim near Los Angeles in California.

Boeing Australia Limited is modifying the aircraft on-site at RAAF Base Amberley. To date a total of 10 modified aircraft have returned to service at 82WG with another two currently going through ground and flight testing. The remaining aircraft are expected to be modified by late 1999.

The AUP production line is also being used as an opportunity to fit the ALE-40 Counter Measures Dispenser Set (CMDS) in preparation for the eventual upgrade of the F-111C electronic warfare suite. A trial aircraft (A8-112) which went through the AUP and ALE-40 modifications concurrently, is undergoing contractor ground tests at the F-111 Project production facility.

The avionics upgrade is coupled with two other projects to upgrade F-111 maintenance and training equipment.

Harris Government Aerospace Division in Florida, through an Australian sub-contractor (Harris Aust Pty Ltd - HAPL), is replacing the existing F-111 Automatic Test Equipment which was designed in the 1960s and in service since the aircraft were delivered in 1973. Designed to test specific avionics components, the new equipment will reduce future maintenance costs.

The three new test stations have already been delivered to Amberley, along with approximately 70 percent of the test program sets required to test individual F-111 items. HAPL has been contracted to provide Total Contractor Support for the next five years.

F-111 crews will also have the benefit of realistically simulated mission training to coincide with the updated aircraft coming on line.

A new simulator is currently under development by Wormald Technology to replace the original simulator introduced at Amberley in 1969. The new simulator will cover an impressive array of training tasks, ranging from initial crew training to air weapons range operations as well as Pave Tack employments against land and sea targets and automatic terrain following operations.

The system consists of a trainee station (with a 150 x 40 degree visual surround), an instructor operator station and peripheral computing equipment such as a host computer and Silicone Graphics visual scene generator. The land mass and visual displays system will include RAAF airfields at Amberley and Curtin and many targets, such as aircraft, ships, power stations, radar sites, command and control centres, fuel farms/depots and bridges.

Designed to parallel the projected life span of the F-111 fleet, the simulator will provide a cost effective and safe means of maintaining crew proficiency and enhancing tactical mission training conducted in the air.

Aircrews will also have a mission data preparation system which allows them to plan missions on a computer screen. Manufactured by Horizon Technologies in the United States, the system calculates details such as the effects of diminishing fuel loads and variations with different weapon configurations. The crews can then, in fast time, program the on-board computers with mission details.

The F-111's weapons systems make it one of the most potent strike aircraft in the world but what about protecting itself from equally sophisticated air-to-air and surface-to-air threats?

In addition to modern avionics, the RAAF also plans to fit its F-111s with updated electronic warfare measures to ensure their own self-protection.

The proposed package comprises a radar warning receiver, missile approach warner, radar electronic counter measures system and a counter measures dispenser system.

The new radar warning receiver and electronic counter measures system will allow the aircraft to avoid or deceive potentially hostile radar systems.

The Missile Approach Warner will alert the crew of approaching missiles, including non-radar-guided weapons such as heat-seeking or laser beam-riding missiles. Once alerted, the crew can then dispense expendable flares and chaff, which, combined with manoeuvring and tactics, offer better survival odds against missile attacks.

As an interim solution, new radar warning receivers will be installed and the existing counter measures dispenser system upgraded.

In summary the ADF is making a significant investment in the F-111 to ensure it remains a potent weapon system until 2020.

WIN Your Chance to Read the Story of the Pig

Celebrate the F-111's 25 years of aviation excellence with a chance to win your own copy of The Flight of the Pig, a full colour publication depicting the aircraft in all its glory. All you need do to enter is answer one question:

How many seats does an F-111 have?

Send your entry to:
Australian Defence Force Journal
B-4-26
Department of Defence
CANBERRA ACT 2600

NAME: .....

ADDRESS: .....

.....

.....

PHONE: .....

ANSWER: .....

Entries close June 22, 1998.

RAAF NEWS

Vol 10, *No* 8 *September*, 1968

HERE IT IS!

First F-111C Flight

MAGAZINE

The September, 1968, issue of "Aircraft" magazine is devoted to a special report on the Royal Australian Air Force to coincide with the delivery to the RAAF of the first F-111C aircraft in the United States.

● Pictured above is the front cover of the special edition featuring the Air Board.

Members of the Board are (from left) AVMs E. Hey, C. G. Cleary, C. D. Candy; Air Mshl Sir Alister Murdoch (seated) The Secretary, Department of Air (Mr F. Green). On the extreme right is AVM W. E. Townsend, Deputy Chief of the Air Staff.

The special edition of "Aircraft" includes the following articles:

● The Minister for Defence (Mr Fairhall) on "The RAAF in Australia's Defence Structure".

● The Minister for Air (Mr Gordon Freeth) on "Airpower — Today and Tomorrow".

● The Chief of the Air Staff on "RAAF Capability".

● AVM Hey on "Keeping the RAAF in the Air".

● AVM Candy on "A Place in the RAAF".

● AVM Townsend on "The F-111C in the RAAF".

● Air Cdre R. T. Susans on "Operational Requirements" and

● The RAAF in Vietnam.

RAAF TAKES DELIVERY

THE FIRST of the RAAF's new strike-reconnaissance aircraft, the F111C was formally handed over to the Minister for Defence, Mr Fairhall at a ceremony at Fort Worth, Texas, on September 4.

Among those who also attended the handing-over ceremony was the Secretary, Department of Defence, Sir Henry Bland; the Chief of the Air Staff, Air Mshl Sir Alister Murdoch; the Head of the Australian Joint Services Staff, in the United States, Maj-Gen D. Vincent; the Australian Air Attache to the United States, Air Cdre F. S. Robey; and the Australian Manager for the F-111C project in the United States, Gp Capt S. W. Dallywater.

Tributes to the capabilities of the F-111 aircraft in combat have been paid by high officials in the United States.

Air Force Secretary, Harold Brown, said that the F-111s range, together with its low altitude penetration capability and weapons carrying capacity make it a formidable attack aircraft in hostile environments. Compared with the F-105 and F-4 generation of aircraft, it had much more range at maximum speed, and an increased combat range, weapons load and radar bombing accuracy.

USAF Chief of Staff, Gen John P. McConnell, said that although three of the planes had been lost in South-East Asia, the USAF was confident that the F-111 would fill its requirements for a night-adverse weather attack aircraft.

USAF Deputy Chief of Staff, Lt-Gen Robert D. Ruegg, said the USAF believed that the F-111 represented the most advanced weapons system for putting bombs on target under all weather conditions that industry and technology was capable of producing.

The aircraft, he said, was better than anything else in the field.

Operating at altitudes in excess of 60,000 feet, the F-111C can fly at two-and-a-half times the speed of sound. At sea level it can fly supersonically, and perform in any weather, day or night.

Actual range figures are classified, but one version of the F-111 family, the F-111A, has flown the Atlantic without being refuelled and without using external tanks. Weapons capability is also classified, but it will be able to carry a variety of conventional weapons. Bombing accuracy with the aircraft's radar system exceeds expectations.

Fully extended to 16 degrees of sweep, the F-111C wings create maximum lift during short take-offs and landings. As speed increases and lift turns into drag, the span and surface area are reduced by sweeping the wings up to 72.5 degrees until the tips rest close to the tail.

In the picture above, RAAF markings are clearly visible on the revolutionary "swing wing" jet, one of 24 to be delivered to the RAAF this year.

How To Say F-111C

Confusion has arisen as to the correct words to use for F-111C. To end the confusion it has been decided officially to refer to the new aircraft as the "F-one hundred and eleven C". The alternates "F-triple-one C" and "F-one-one-one C" no longer apply.

No nickname has so far been given to the aircraft. At one stage the name "Taipan" was proposed, together with such aboriginal names as Galawindi (firestick) and Arkana (boomerang).

However it is now unlikely that a name other than F-111C will be adopted.

STRENGTH NOW 21,564

The total strength of the RAAF increased by 1,434 to 21,564 in the year ended June 30, 1968, according to figures published by the Department of Defence.

Total strength of Australia's armed forces increased by 3,475 men to 80,962 in the same period.

Army strength increased by 1,480 to 42,944, of which 27,152 were regulars and 15,792 national servicemen.

Navy strength increased by 561 to 16,454.

● **An important part of the week's work for the RAAF airfield defence guards at Vung Tau airfield, South Vietnam, is familiarization with the numerous weapons they use. Here AC Alan Giltrap, of Perth, WA, settles down behind an M60 machine-gun on the firing range at Vung Tau. His job is to protect RAAF installations on the base.**

4 YEARS IN VIETNAM

Thursday, August 8, 1968, marked the fourth anniversary of the RAAF's commitment to the Vietnam conflict.

Four years ago a RAAF Caribou Transport Flight of three aircraft was deployed to South Vietnam to assist South Vietnamese and United States transport squadrons maintain urgently needed supplies to isolated outposts.

Since then the flight has grown into a squadron, carrying out many more tasks, and carrying many more loads.

In the four years that they have been operating in South Vietnam, the RAAF Caribou crews of No 35 Sqn have moved well over 48-million pounds of freight, over four million pounds of mail and carried a quarter of a million passengers. The Caribou have flown many thousands of miles in all kinds of weather on their varied transport tasks, ranging from medical evacuation of Army personnel, passenger, freight and mail delivery flights, flare-dropping operations and the dropping of paratroops.

Build-Up

The Caribou transport squadron had been operating in South Vietnam for nearly two years before it was joined by an Iroquois helicopter squadron (No 9) and, about a year later, by No 2 Canberra jet bomber squadron.

There are now more than 700 RAAF personnel serving in Vietnam.

The Caribou transport squadron and the Iroquois helicopter squadron are based at Vung Tau, while the Canberra jet bomber squadron operates out of Phan Rang, about 165-miles north-east of Saigon.

RAAF losses in Vietnam during the past four years have been two Caribou transport aircraft and an Iroquois helicopter lost in flying accidents, but not to enemy action.

THE 'SWING-WINGS' FLY IN

HISTORIC DAY AT AMBERLEY

June 1, 1973 — "F-111 Day" — is likely to go down in the history of the RAAF as one of Australia's most memorable arrival dates on record.

RAAF NEWS

Volume 15, No. 4 *June, 1973*

From GERALD THURLOW

It was an occasion which captured the imagination of the nation and attracted an army of press, radio and television newsmen to RAAF Base Amberley.

In ideal Queensland winter conditions 3,000 people — mainly servicemen and their families — thronged No. 82 Wing's reception area for the landing of the first six strike aircraft to arrive from the United States.

Led by the Officer Commanding the Wing, Group Captain J. ("Jake") W. Newham, the revolutionary "swing-wing" strike aircraft made an impressive low-level pass over the area in formation before breaking off for six faultless landings.

Four days earlier the ferry flight had begun when the sleek aircraft were launched from McClellan Air Force Base, California.

The first leg of the journey took them to Hickham Air Force Base, Hawaii, and the other stop-over was at Pago Pago in American Samoa.

Following health and customs formalities Group Captain Newham and his team were congratulated on the delivery flight by the Deputy Prime Minister and Minister for Defence, Mr. Lance Barnard.

Together with the Chief of the Air Staff, Air Marshal C. F. Read, and others in the official party Mr. Barnard had flown from Canberra to Amberley aboard a BAC-111 of No. 34 Squadron.

The Minister was welcomed to the Base by the Officer Commanding, Air Commodore C. H. Spurgeon. As ferry commander, Group Captain Newham responded to Mr. Barnard's address on behalf of the flight crews and praised the efficiency of the maintenance men.

Group Captain Newham was accompanied in the lead aircraft by Wing Commander T. C. Owen. In the second F-111 the Commanding Officer of No. 6 Squadron, Wing Commander R. G. Funnell, flew with Squadron Leader N. McM. Pollock.

The other crews were: No. 3, Squadron Leader I. M. Westmore and Flight Lieutenant J. A. Bushell; No. 4, Squadron Leader W. J. Emery and Flight Lieutenant R. D. Hardcastle; No. 5, Squadron Leader W. F. Walters and Flying Officer P. J. McDonald; and No. 6, Flight Lieutenant R. T. Sivyer and Flight Lieutenant P. W. Growder.

The ferry mission, which involved about 18 hours' flying time, was the first of a series of four designed to deliver Australia's 24 F-111Cs to Amberley by November, 1973.

Music for the occasion was provided by the RAAF Amberley Band conducted by Flight Sergeant Jim Marriner.

● **The fine air-to-air picture of three of the F-111Cs coming in to Amberley was taken from the back seat of a Phantom by RAAF PR photographer Mal Lancaster.**

● **More photos, p. 5.**

. . . and the Phantoms fly out

Following the arrival of the first six F-111C aircraft in Australia, all twelve remaining Phantom F-4E aircraft on lease to the Royal Australian Air Force from the United States have been returned to the United States.

The first six left RAAF Base, Amberley, Queensland for the United States on 6 June. The remaining six flew out on 20 June.

The Phantoms flew to the United States via Guam and Honolulu. The trans-Pacific ferry flight was carried out by USAF crews. Air-to-air refuelling of the aircraft was undertaken by KC135 aerial tankers of the USAF.

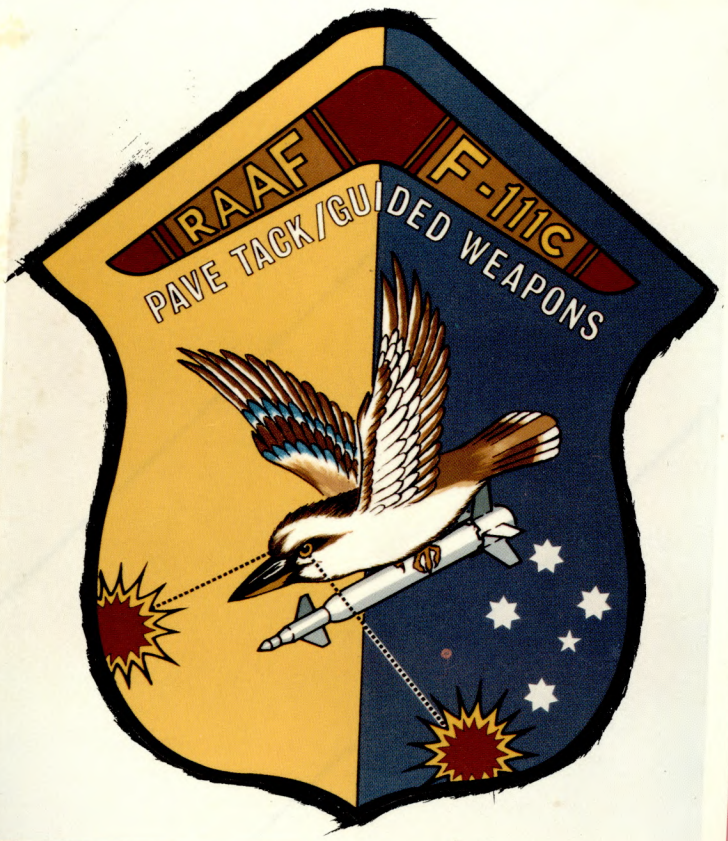
A total of 24 Phantom F-4E aircraft were leased from the United States by the RAAF in 1970.

The lease was arranged to provide the RAAF with an interim strike capability pending the introduction of the F-111C aircraft, the first six of which were flown across the Pacific to RAAF Base Amberley by RAAF crews, arriving on 1 June.

Eleven Phantoms were flown back to the United States late last year. The remaining aircraft was lost off northern New South Wales in 1971 during a training exercise.

The Phantoms equiped Nos 1 and 6 Squadrons with aircraft. These squadrons will now re-equip with F-111cs.

● **Phantoms prepare for take-off from Amberley on 6 June, with supporting USAF KCI35 tanker in the background. Six Phantoms returned to the United States via Guam and Honolulu, on 1 June. The remaining six departed on 20 June.**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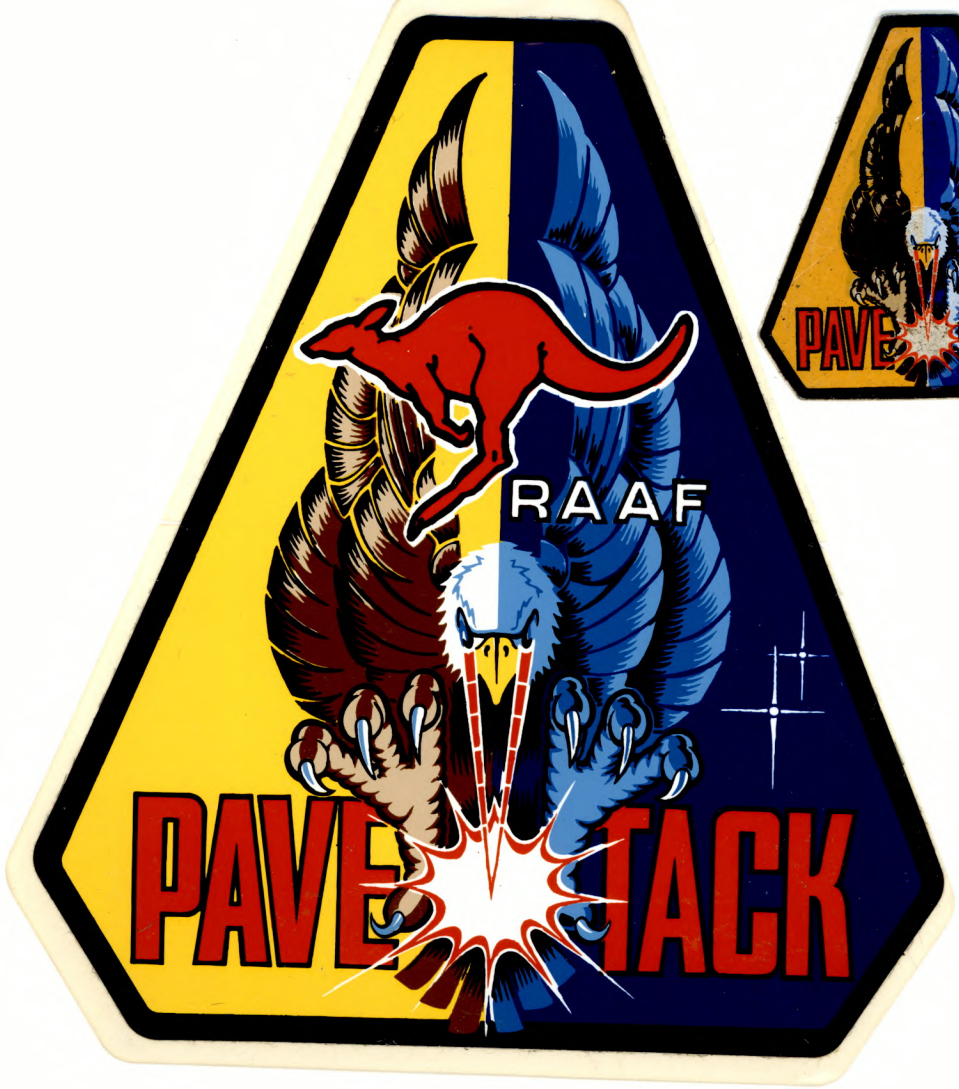
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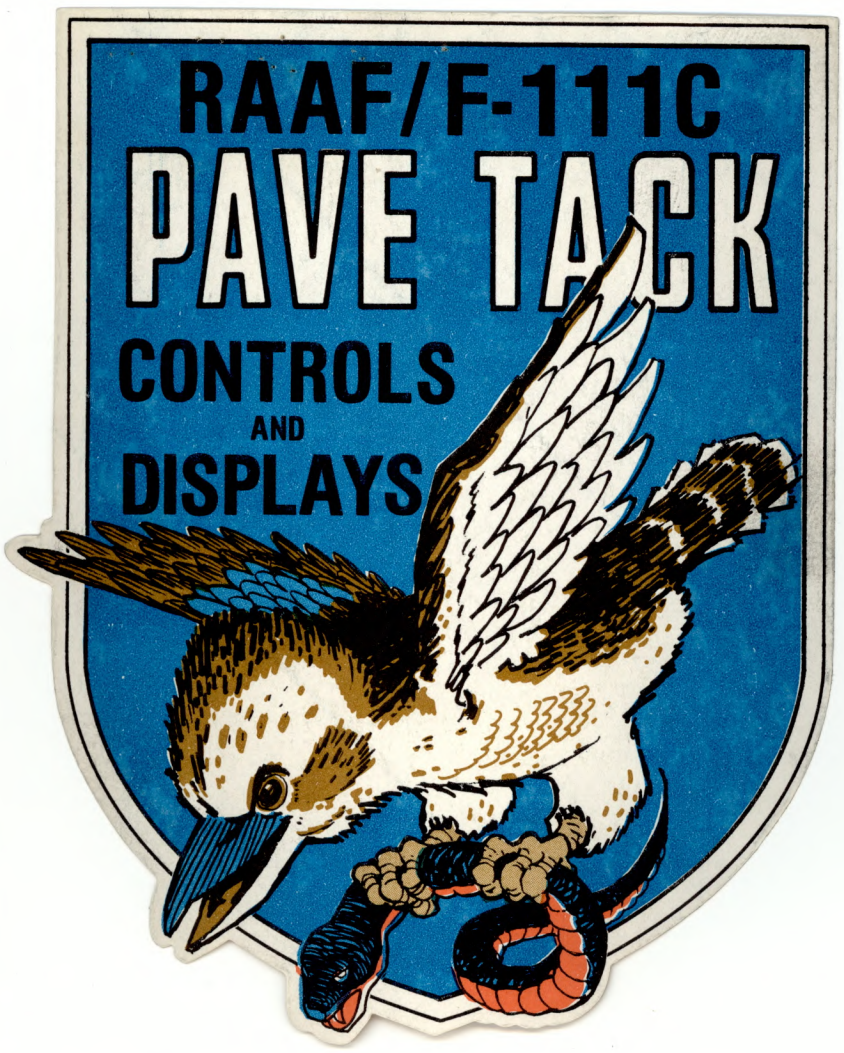
PAVE TACK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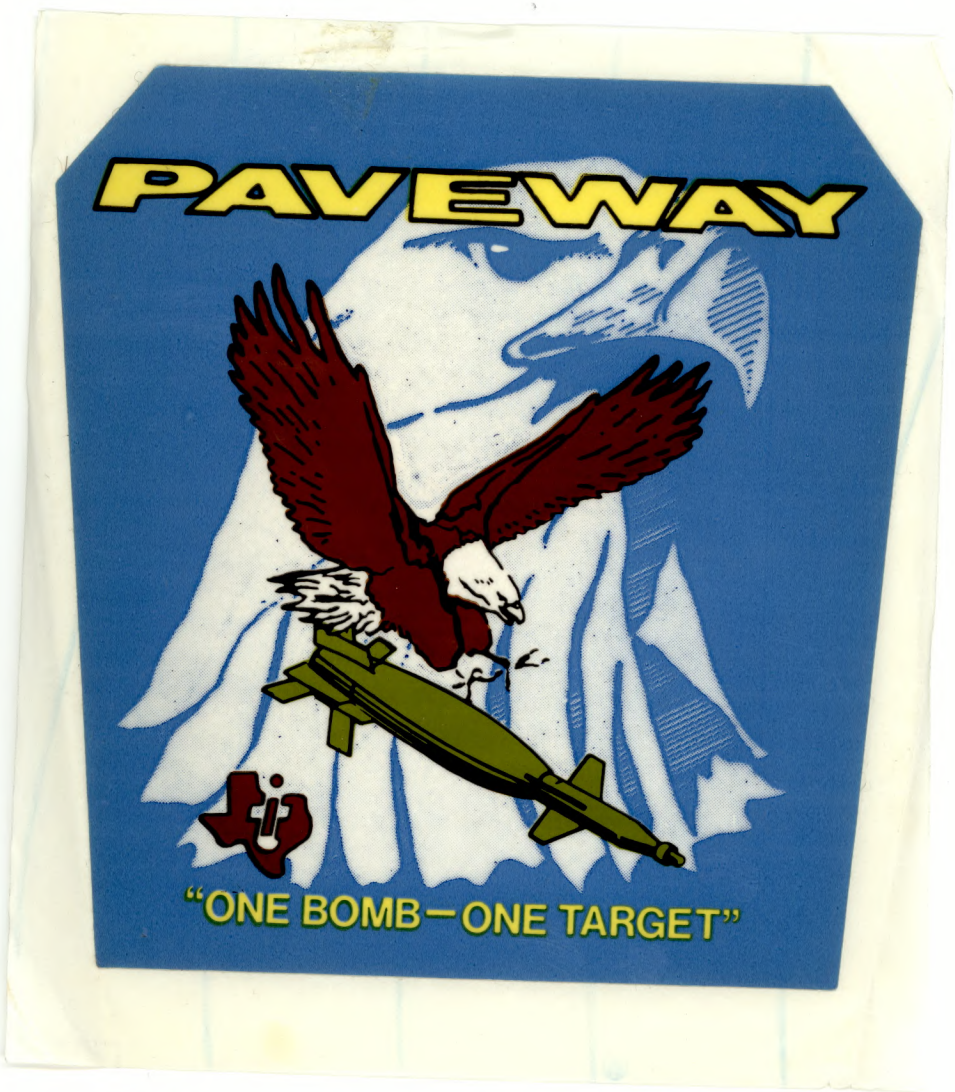
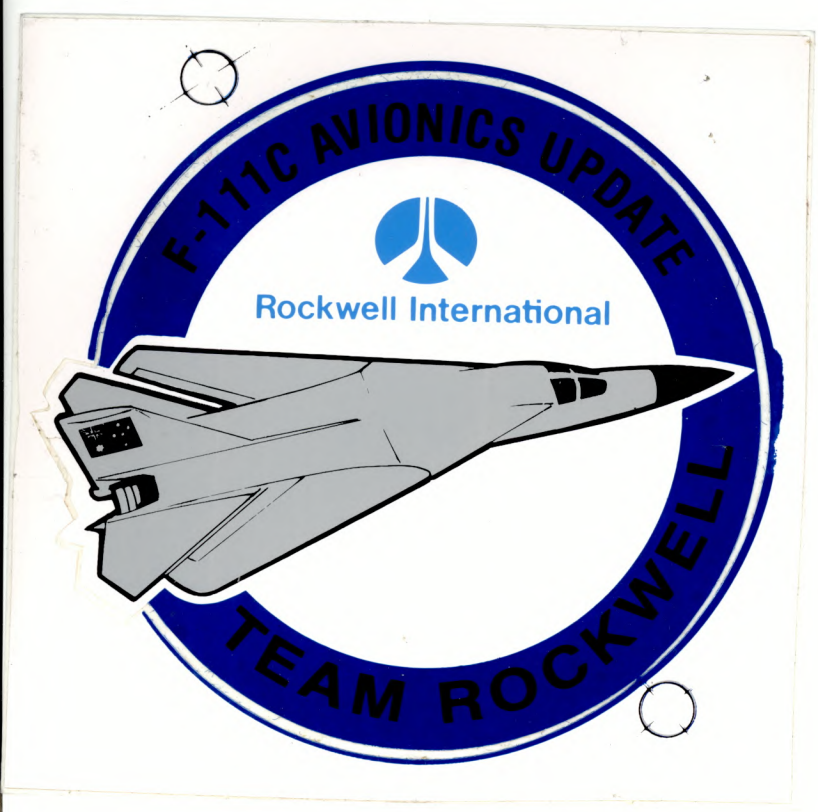

PAVEWAY
"ONE BOMB—ONE TARGET"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