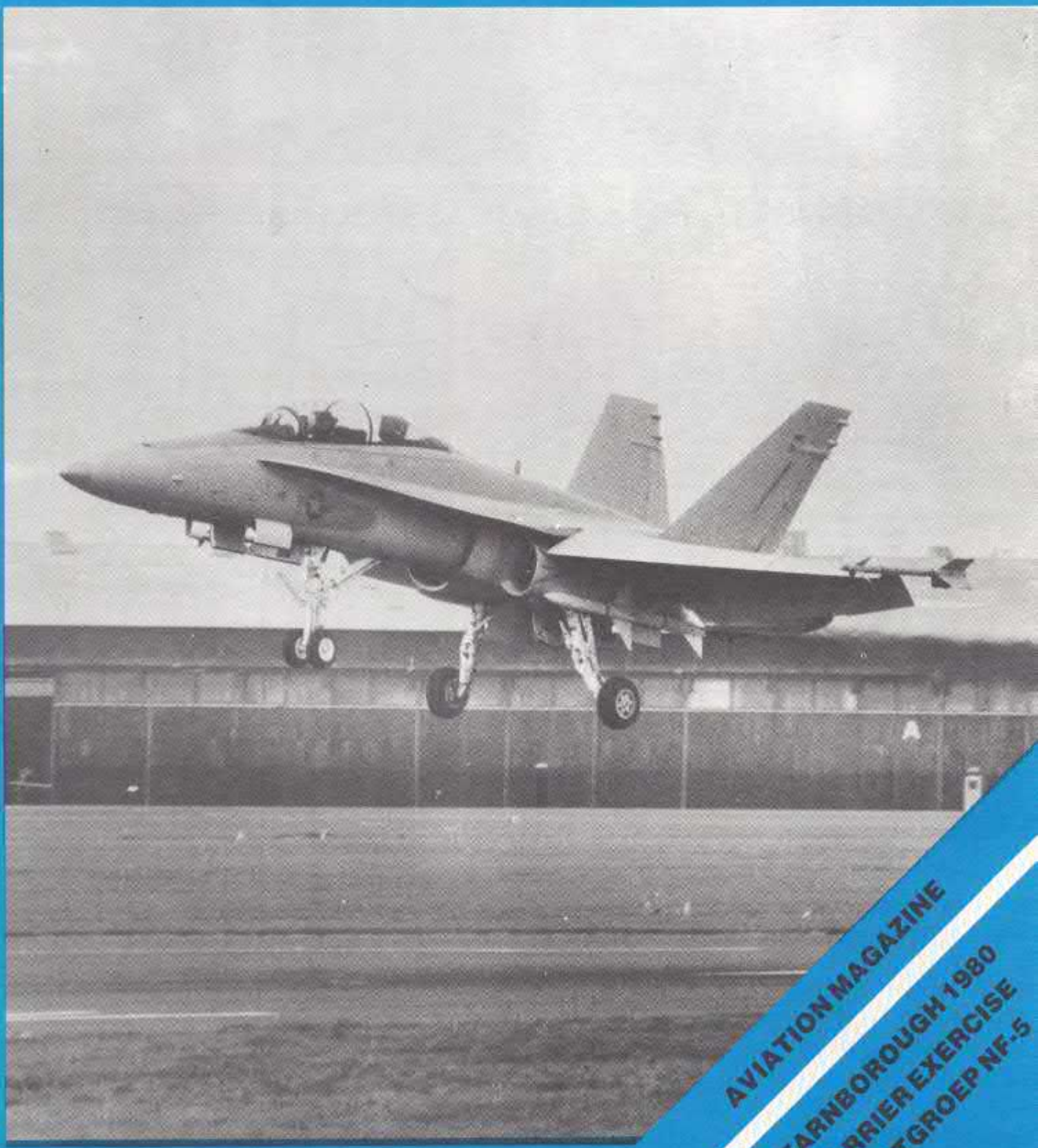
SEPTEMBER 1980

FLASH



AVIATION MAGAZINE

FARNBOROUGH 1980

HARRIER EXERCISE

TESTGROEP NF-5

MILDENHALL AIR SHOW 1980, 23 & 24 AUGUST

MILDENHALL, U.K. This year's two day show was curious, both in what was there and what was missing. Surprises in the form of a Spanish air force CASA 101 and Canadian air force DHC-5 Buffalo were balanced by the strange lack of Belgian and Danish participation.
Normally Mildenhall plays host to numerous display teams, and this year was no exception. The KARO AS, Grasshoppers and Canadian F-104s were there, with the Red Arrows making an appearance on Sunday only. The normal surfeit of Pitts Specials were there too, with the Jordanian Royal Falcons and the Rothmans Team. Being obviously based towards military participation, I do realise the need for such displays, after-all no one minds admiring superb airmanship.... ... but twice? Well, I guess it gives time to buy a hamburger and stock up the beer supply. Pièce de Résistance for a good many dedicated air show followers of course, was the display by six C-130 Hercules. Split into two flights of three, they spent a very enjoyable twenty minutes trundling backwards and forwards, dropping troops and various loads of cargo. Acouple of fast passes ending in fighter style 'breaks' impressed me by showing the agility of such large planes. To end it all, a stream landing, and a runway full of Hercs. Barry Bailey-Hickman

Aircraft on display included:

115460	DHC-5 Buffalo	CA
2-LH/412	Mirage IIIE	FA
2-HC/220	Magister	FA
ZA947	Dakota	RA
12-MP/227	Mirage F.1C (from EC.3/12)	FA
263	TF-104G	RNoA
906	F-5B	RNoA
376	F-5A	RNoA
D-8138	RF-104G	RNethA
K-3041	NF-5A	RNethA
60195	C-141B	USA
793-08	CASA.101	Span.A
50-93	C-160D	Luftwaff
61-17	Atlantic	Marin
XL233	Victor K.2	RA
XV154	Buccaneer	RA
158918	P-3C (LF-8)	US
141009	C-131F	US
17019	OV-1D	US Arm

COVER PHOTO: *The unfortunate TF-18A Hornet 160784 seen landing at Farnborough, ending its air display on 31 August. This tenth Hornet development aircraft crashed some time after taking off from RAE Farnborough on Monday 8 September, for a ferry flight to Spain.* *(Barry Bailey-Hickman)*

FLASH

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EDITORIAL

The price of democracy and aircraft

The introduction of the new generation aircraft, like the F-14 Tomcat, F-15 Eagle, F-16 Viper, Tornado and Mirage 2000, is often compared to the introduction of the Gloster Meteor. Just like today's new aircraft technology, the jet engines of the Meteor were a revolutionary step forward but proved only to be the beginning of a new era. A look into today's future shows a similar prospect whereas new aircraft technology is concerned. Analog computer systems in fighter aircraft provide a not yet determined amount of new possibilities and the automatisation by means of new avionics has only just started. The use of composite materials will grow and wings have already been tested to withstand 12 G-forces. New engine technology will eventually result in even better weight-to-thrust ratios. And all this with the 'age of the chips' still ahead.
Air crews will be computer operators, ground support equipment will be highly sophisticated, the potential of new air tactics will be endless. In short, the future generation fighter aircraft is likely to be exciting but also expensive, dramatically expensive.

The status of today's fighter aircraft might be comparable to the status at the end of WWII with the introduction of the Gloster Meteor, the status of today's world economy can only be compared to the recession of the 1930s. World-wide unemployment, bankrupt governments, inflation, defence cuts, all symptoms identical to those of the early 1930s. A valuable lesson learned from those days is to be careful with defence cuts. The economical recession of the 1930s resulted in unequal expenditures of defence money amongst world's leading nations. On the eve of WWII most European armed forces were under-equipped compared to the modern and voluminous forces of Hitler. Only by a thorough revision of the defence expenditures by the American and British governments restored the armament balance with the three axis powers and a start could be made to liberate the occupied European continent.
A much heard conclusion from this historical lesson, advises us to keep up the highest possible defence standard at all times and by all means. This policy was discussed much at the time of the oil-crisis of 1974 as defence cuts led to the suggestion that history was about to repeat itself.

Recent developments in West Germany indicated that if this policy will be maintained by all means, it will put an enormous burden on society and economy. As a result of an extensive modernisation programme, the German ministry of defence has to reserve funds for three costly aircraft programmes, being AWACS, Tornado and Alpha Jet, resp. DM 1.08 billion, DM 12 billion and DM 4 billion. On top of this, German's share in the research and development costs of the Eurofighter have been estimated at DM 3.4 billion.
At a recent meeting of Luftwaffe Chief Gen.Obleser and German government officials during a presentation of the Tornado, it was announced that both Luftwaffe and Marine will freeze expenditures on procurement programmes until 1984. This announcement was mentioned to be mainly a result of a 135% increase of the costs of the Tornado programme.

It is not unlikely a next generation fighter aircraft developed to include the latest technology, might cost DM 100 million/$ 200 million per aircraft system. The advanced avionics of these aircraft might reduce the number required, but taking in account the inflation and development costs, the question rises whether such aircraft are morally still acceptable? Is this way to keep up a high standard of defence not doomed to be rejected by a society that is asked to give up some of its luxury? Isn't time for defence specialists to look for other ways to keep up a high standard of defence?
In a period of economical recession, the costs of expensive fighter aircraft will certainly draw the public's attention. Defence spokesmen will have a hell of a job to convince an average factory worker of the need for DM 100 million aircraft.

Jac van Tuyn

MILITARY AVIATION NEWS

FROM A FACILE PEN

DEPLOYMENTS CANCELLED
The USAF cancelled the F-15 Eagle deployments to Gilze-Rijen, Holland and CFB Lahr, West Germany. At Gilze-Rijen 12 F-15 Eagles of 1 TFW would have arrived on 3 September. However, a recent inspection revealed that 1 TFW could not meet its operational status, and subsequently could not deploy to Europe.

HMS INVINCIBLE
World's first ship with V/STOL launch ramp, HMS Invincible, was commissioned by Her Majesty Queen Elizabeth on 11 July in Portsmouth Harbour. Part of the ceremony was the inspection of a Sea Harrier parked on the ship's ski-jump ramp. This Sea Harrier, XZ459/N252, had been flown in by Lt.Comm.Tim Gedge, the day prior to the ceremony. It is believed that this is the first fixed-wing aircraft to have landed on a Royal Navy ship in harbour.

FOL NORVENICH
The last Forward Operating Location of the 81TFW at Norvenich, W.Germany, is expected to be operational soon. A-10 Warthogs had arrived by August to form the wing's Detachment No.4.

LYBIAN MIG-23 CRASHED IN ITALY
On 18 July a Lybian MIG-23 crashed in Southern Italy. According to the official Lybian press agency, the pilot had suffered a heart-attack. The Italian Minister of Defence, however, said that the pilot had tried to defect.

BELGIUM

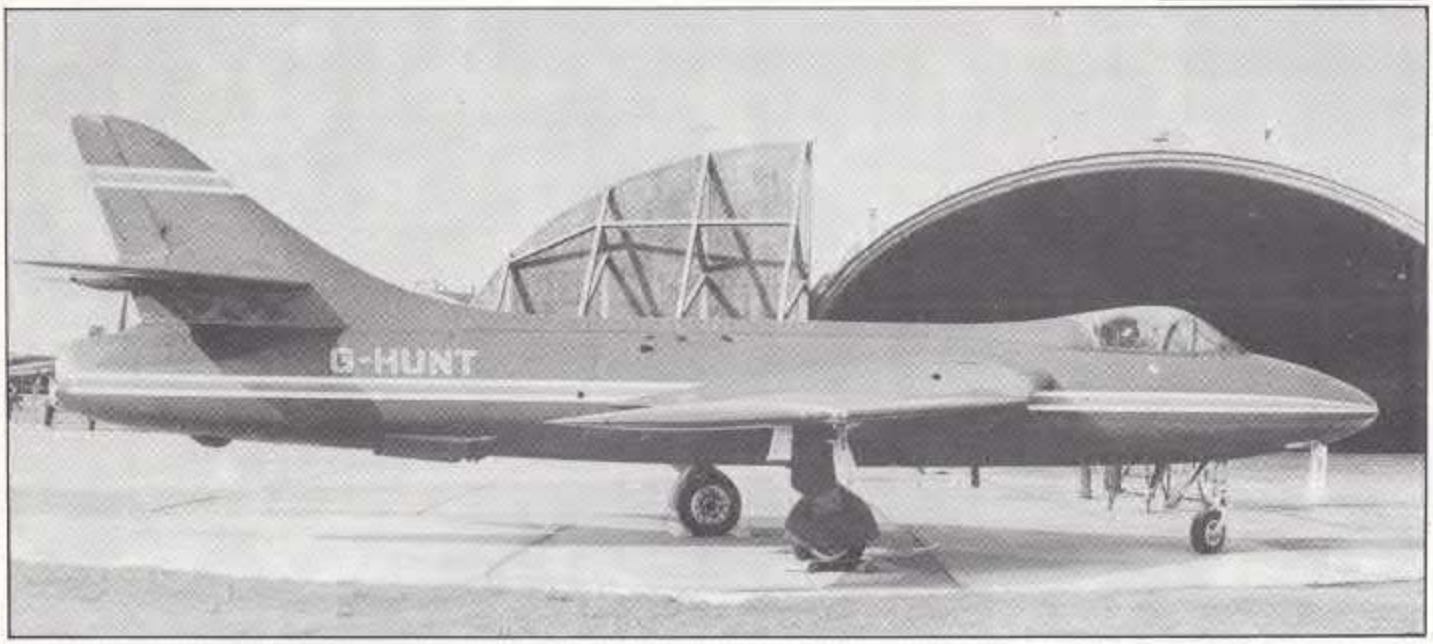
• The Belgian air force lost her first Alpha Jet on 30 July, when AT-04 crashed near Malinnes, Gosselies. The pilot was killed in the accident.
An TF-104G crashed in W.Germany near Neunkirchen on 12 May. Both pilots of FC-05 ejected safely but the aircraft came down on a factory, killing 3 people on impact.
The F-16A to have crashed on 28 July was FA-18 (see FLASH Nr.118/119 p.4).

HOLLAND

• Five days after Dutch Minister of Defence Scholten and Turkish ambassador Benler signed a contract for the delivery of 25 F-104G Starfighters, the first batch of 12 aircraft left Leeuwarden for Turkey.
On 25 August F-104Gs D-8058, 8082, 8089, 8109, 8110 D-8115, 8272, 8304, 8319, 8342 and TF-104Gs D-5702 D-5816 flew to Grossetto, Gioia del Colle, Balikasir to Murted, to be used by the Turkish air force in the air defence role, replacing the F-102 Delta Dagger.
The aircraft were handed over on a non-commercial basis, and are considered as defence material assistance to a NATO ally with less financial resources. The delivery of 25 F-104s is a Dutch contribution to strengthen NATO's south flank in a reaction to the Soviet invasion in Afghanistan.
The F-104s left Leeuwarden provided with Turkish roundels but still with the Dutch registrations on tail and nose. Both Dutch and Turkish pilots flew the aircraft to Murted. The overall delivery programme will take some two years including Dutch assistance in training of Turkish flying and ground personnel.

• The last operations of MOT&E at Leeuwarden involved airfield attacks on De Peel. Optimum use of the F-16's capabilities in attacks on the SHORAD airfield defence system at De Peel, might enable the Multi-national Operational Test & Evaluation team to improve the standard NATO fighter tactics once the F-16 enters operational service. Earlier the F-16s had flown similar kind of mission in the air defence role against F-15 Eagles and F-5E Agressors, in the air-to-ground role in combination with OV-10 Broncos and A-10 Warthogs, and in the maritime role attacking vessels.

On exchange at Volkel from 3 till 11 July were four Greek air force Starfighters 32278, 32317, 32715 and 33720. All aircraft were 'zapped' by a Dutch T-0-4 crewchief with a drawing of 'Dusty'. Since bad weather is a very unfamiliar thing for Greek pilots, the aircraft flew only one mission during their stay at Volkel. The exchange was between Mira 335 and 312 sqn.(B.Ullings/Aviation Photos International)



In addition to three Sea Furies, Sir Spencer Flack enlarged his fleet earlier this year with the purchase of an ex-Danish air force Hunter F.51 (E-418). Registered G-HUNT Sir Flack demonstrated the aircraft at many air shows already. *(Barry Bailey-Hickman)*

The MOT&E team left Leeuwarden on 5 August for Skrydstrup, Denmark, to continue the programme as an integrated part of NATO's amphibious exercise Oskböl. On 28 October the MOT&E team will arrive at Beauvechain.

INTERNATIONAL

• The annual series of NATO exercises, under the code-name AUTUMN FORGE 80, started on 1 September. The first elements of Autumn Forge 80 were ReForGer the deployment of U.S. forces to Germany via Dutch and Belgian harbours, and Crusader 80, the deployment of British forces to Germany also via Dutch and Belgian harbours.
Air force exercises within Autumn Forge 80 are the traditional ones as Crested Cap and Cold Fire.
Crested Cap 80 involved 48 F-4E Phantoms of 4TFW from Seymour Johnson, which deployed to Ramstein, W.Germany on 27 & 29 August. Initially it was intended that 24 aircraft would deploy to Turkey, but possibly of the political situation in this country, all 48 aircraft remained at Ramstein. Crested Cap wil last till 6 October.
Cold Fire 80 took place from 15 till 26 September and involved 600 aircraft based in Central Europe operating from 21 air bases.
Other major exercises within Autumn Forge requiring air support are:

- o BILLY GOAT: Amphibious exercise in the Danish Straits involving Danish and German forces
- o CONCORDANT JOURNEY: Multi-national exercise to deploy reinforcements to Central Europe
- o SANKT GEORGE: Field training exercise in Central Germany involving German and U.S. forces
- o EENHOORN EM: Field training exercise in Lower Saxony (W.Germany) involving Dutch forces.
- o SPEARPOINT: Multi-national field exercise in Northern Germany
- o DISPLAY DETERMINATION: Multi-national exercise in the Mediteranean area.

• Westland and Agusta set up European Helicopters Industry (EHI), a British company with its headquarters in London. EHI will develop the EH.101,a helicopter to meet the requirements by the Royal Navy and Italian navy to replace the Sea King.
The EH.101 will be gross about 10,000 kg and will initially be developped according to the demanding and specialized requirements for a possible production of 70 aircraft for the Royal Navy and 30 for the Italian navy.
EHI also intends to develop a civil version of the EH.101 since Sikorsky stopped the production of the S-61, and no direct replacement in view. Ac-

OPEN DAY AT ALCONBURY, ON 16 AUGUST

ALCONBURY, U.K. Although property of the Royal Air Force, this airfield is being used by USAF's 10th Tact. Reconnaissance Wing. Responsible for all activities at Alconbury, the 10TRW comprises 1TRS with RF-4C Phantoms and 527TFTAS with F-5E Tigers. The latter is better known as the 'Agressors'.
Aircraft on display on 16 August included:

312-BH/123	N-2501 Noratlas		Armee de l'Air
'7A-WN'	MS.500 Criquet		(reg. G-AZMH)
G-HUNT	Hunter F.51 (private a/c of S.Flack)		
21-21,&21-24	and 26-81 F-104G		Bundesmarine
AT-153	TF.35 Draken		R. Danish AF
37-28	F-4F Phantom	JG-74	Luftwaffe
WR79-094, 79-103	A-10A	81TFW	USAF

cording to Westland Chairman Lord Aldington, there's believed to be a market for about 750 helicopters over 15 years.
First flight of the EH.101 is planned for the mid-1980s, and deliveries to take place by the end oof this decade.

SWEDEN

• The Swedish government intends to replace all attack, reconnaissance and fighter versions of the Viggen as of the late 1980s, by one standard aircraft, known as JAS (initials for fighter, attack reconniassance). The philosophy of JAS is to develop a low cost fighter aircraft with the Viggen's straight-line performance together with combat agility as good or better than the F-16 generation.
Use of the fly-by-wire technology, carbon-fibre composite materials and a much more efficient engine both in weight and fuel consumption, should reduce the size of JAS considerably compared to the Viggen.
The canard configuration of the Viggen is likely to be retained and complemented with advanced control systems which would allow the aircraft to perform pitch and yaw characteristics. These characteristics enable the aircraft to point its gun at a potential target without changing its flight-path.
It is interesting to note that JAS will enter service in the late 1980s, compared to the Eurofighter in 1992. Besides JAS will be half the empty weight of the Eurofighter and much cheaper.

UNITED KINGDOM

• The committee of the International Air Tattoo has announced that IAT81 will have as a special theme: 'Sea search 81'. Subsequently the event will be the world's first maritime patrol and search & rescue meet.
Traditionally IAT81 will include a 7 hours international flying display, a competition for the premier military air show trophies and over 100 aircraft on static display.
IAT81 will take place at RAF Greenham Common (near Newbury, Berks) on 27 & 28 June 1981.

• Half the fleet of 65 Buccaneers restarted operation again in August, when the outcomes of technical investigations were known. It has been established that the accident of the Buccaneer in the U.S. on 7 February, was caused by the failure of the aircraft's startboard wing when subjected to loadings which its fatigued state was unable to withstand.
Stringent inspection of the Buccaneer fleet learned over a half to be intact or with minor cracks which had been repaired by July. The remaining aircraft, where more substantial cracks were found, can be recovered to front-line flying with more extensive repairs, but the economics of this are still being considered.

QF-100 Super Sabres as f

GOODYEAR, USA. Sperry Flight Systems is presently re-fitting 9QF-100 Super Sabres for the Full-scale Aerial Target (FSAT) programme in four different versions for specialized missions. The QF-100 FSAT was selected as a likely candidate for replacement ofthe PQM-102 Delta Dagger aerial target. Just like the PQM-102, the QF-100 will be used as a full-scale target for U.S.Army, U.S.Air Force and U.S.Navy services in air-to-air and ground-to-air missile evaluations and combat crew training. To continue availability of targets, the QF-100 FSAT is intended to enter service when the last PQM-102 target is expended.

Quantity conversion of QF-100s expected in December 1981

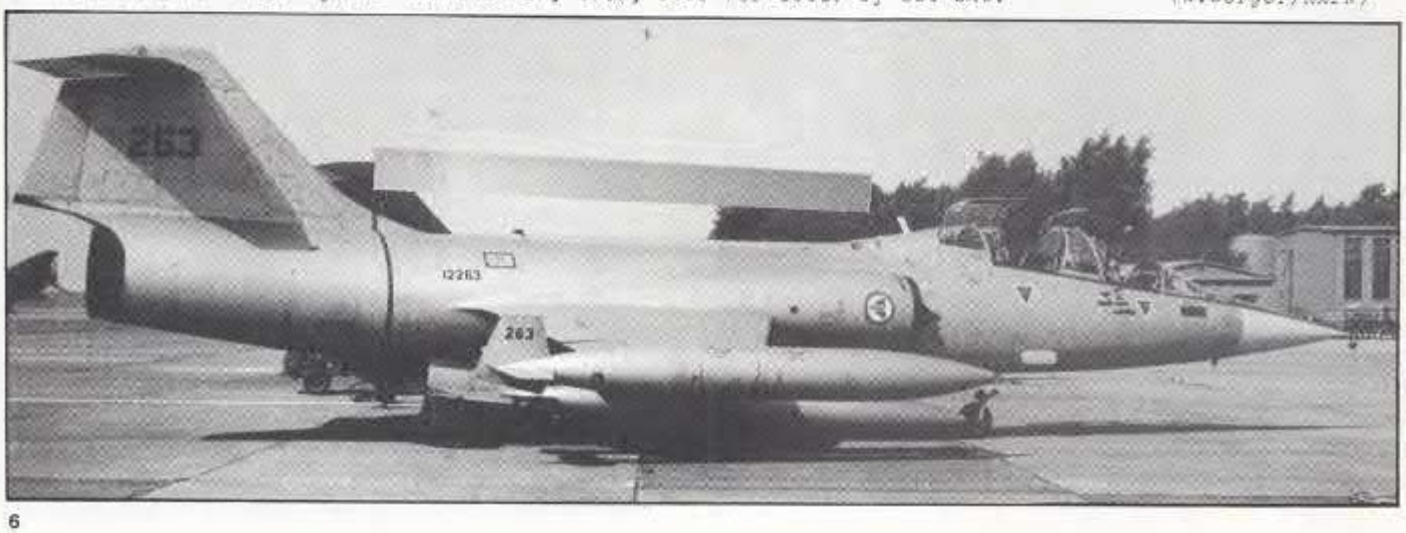
Currently Sperry Flight Systems is re-fitting 208 PQM-102s of which the last one will be delivered in November 81. To make up for the attrition of PQM-102 targets, Sperry Flight Systems was awarded a contract for the QF-100 FSAT programme in August 1979. The programme required a thorough test and evaluation phase prior the production of 72 QF-100s.
Nine QF-100s are presently being 'de-man-rated' for the test and evaluation phase. The aircraft formerly stored at MASDC/Davis Monthan, are being stripped of pilot's seat, life-support equipment, control column and landing gear handle and provided with control equipment on a pallet bolted to the ejection-seat rails.
For the full-scale engineering development phase the nine QF-100 aircraft are converted in four different configurations:

- 2 YQF-100Ds -prototype- with additional cockpit controls to allow evaluation of system performance from within the cockpit.
- 3 QF-100Ds according to standard Air Force target configuration.
- 1 QF-100F dual version.
- 3 QF-100Ds according to standard Army target configuration, and containing Drone Formation Control Equipment (DFCS) for multiple target mission.

All nine aircraft will be tested and evaluated by Sperry Flight Systems for 16 months. Afterwards the aircraft will be tested over a 14-month period in a Development & Test Evaluation (D&TE) at Holloman AFB and an Initial Operational Test & Evaluation (IOT&E) at Tyndall AFB.

More realistic target for combat crew training due to the F-100's size and afterburner

On exchange at RAF Brüggen from 4 till 14 August were Norwegian Starfighters 12263 (TF-104G) and 12785, 12833 (F-104G) of 331 skv and 717, 4769, 4850 (CF-104G) of 334 skv. (H.Berger/MAPN)



l-scale aerial target

Like the PQM-102, the QF-100 will be used at the White Sands range near Holloman AFB, New Mexico and over the Gulf of Mexico near Tyndall AFB, Florida. At the White Sands range the QF-100 will primarily be used as a realistic full-scale target for U.S.Army elements to practise anti-aircraft defence with ground-to-air missiles. Over the Gulf of Mexico the QF-100 will primarily be used in the same role, for U.S.Air Force aircraft to practise air defence with air-to-air missiles.

Basically the QF-100 will be similar to the PQM-102. Existing ground control equipment can be used for the command/telemetry link. The Drone Formation Control System (DFCS) will be used to make formation flights of at least two QF-100s possible which provide a realistic challenge for a missile seeker. Electronic counter-measures (ECM) in the form of a BLQ-3B pod and infrared/chaff counter-measures in the form of an ALE-40 pod are incorporated to provide realistic evaluation of missile performance against anticipated counter-measures.

An important concept previously proven is the capability to perform high 'G' evasive manoeuvres. Because the target is unmanned, manoeuvres far in excess of the pilot rated maximum 'G' envelope are possible. The PQM-102 has demonstrated 8g manoeuvres compared to the 5.6g maximum for manned flight. The highly manoeuvrable full-scale afterburner targets have proven to be a real test of missile intercept capability. Of the total delivered 139 PQM-102s between September 1974 and July 1980, 84 have been shot down. □

Photos Sperry Flight Systems

SPERRY FLIGHT SYSTEMS PROGRAMMES

As of 1 July 1980.

PQM-102 'Pave Deuce' Delta Dagger

Total delivered : 139
Shot down : 84
Total on order : 208

QF-100 Super Sabre

Development a/c : 9
YQF-100Ds
092/56-3414, 093/55-3610
QF-100F
097/56-3984
QF-100Ds
094/56-3048, 095/55-3669
098/56-2912, 099/56-2978
100/56-3324

Ex-French air force T-33A #1581 repainted in USAF markings as it is now parked at Sembach AB, West Germany and to be used for battle damage repair aid. (B.Berkemeier/MAPN)

AIRLINE NEWS

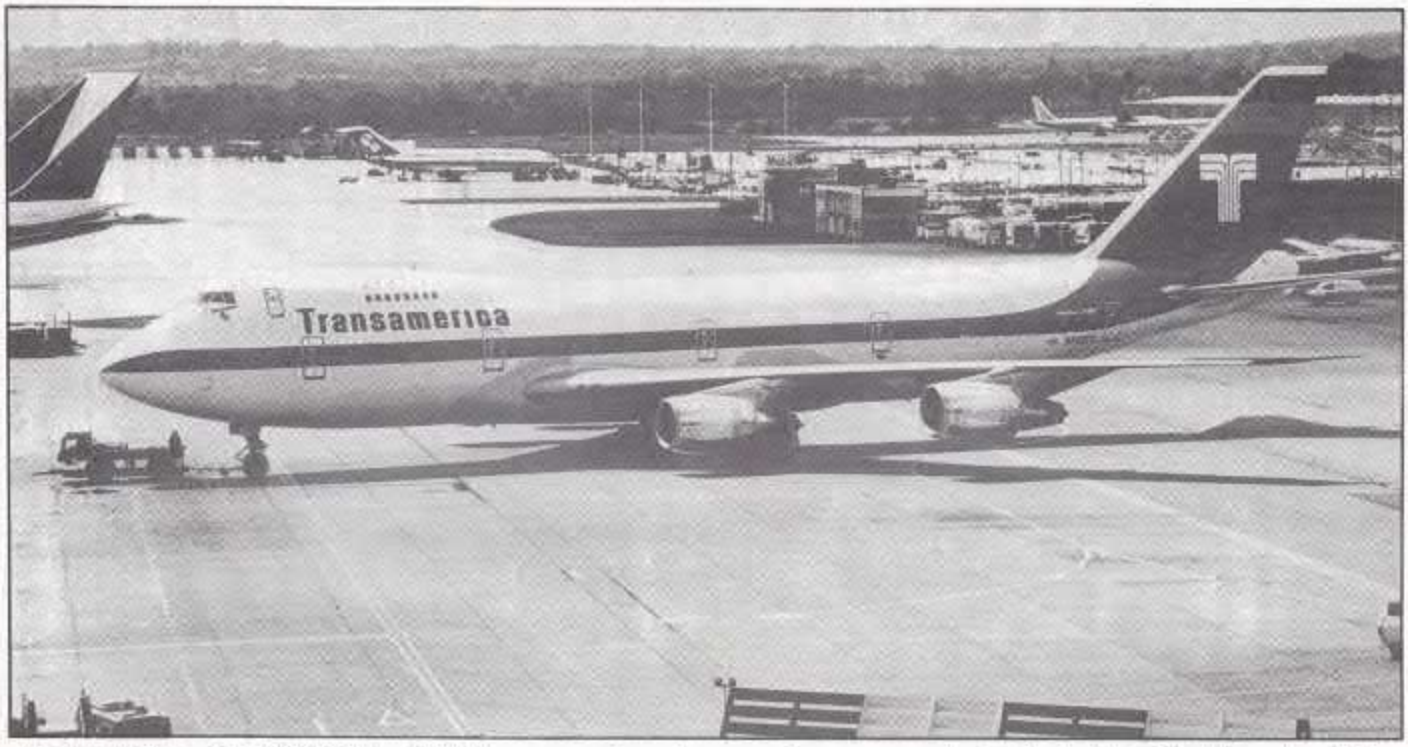
AIRLINER MARKET

• Air Inter has bought six Caravelle 12s from Sterling Airways, who are also offering six Caravelle 10Bs for sale.
• Air Portugal's order for five L.1011-500s still hasn't been placed. Continuing strikes mean the airline will lose more than the 1979 loss of £ 20 million this year, and it is unlikely that Air Portugal will be able to pay for the aircraft.
• Allegheny Commuter group members have ordered four Shorts 330s and four Shorts 360s. Crown Airways will get one 330, their second. Pennsylvania Commuter Airlines ordered one 330 their first. Suburban ordered two 330s, their fifth and sixth, and placed the launch order for the 360, buying four.
• Egyptair have decided not to buy four DC-10-30s. This follows a Egyptian government decision that the airline is losing too much money to be able to repay the loans it would need to buy the aircraft
• Fairflight Charters Ltd offer five PA-31s and one Aztec for sale.
• Finnair have bought three DC-9-41s from Toa Domestic Airlines, to be delivered after TDA take delivery of their DC-9-30s, probably early 1981.
• LAPA of Argentina have placed the launch order for the BAe 146, ordering two Srs.100 and one Srs.200. They have also bought two Shorts 330s.
• Monarch have ordered two long-range Boeing 737s, which will be based in Berlin. The aircraft will be used to fly as far as Berlin-Las Palmas de Gran Canaria.
• Redcoat Air Cargo have taken delivery of a Cl.44 (ex British Cargo A/l) and ordered four Airship Industries R40 airships. The Cl.44 replaces the Britannia which crashed near Boston last winter, and the airships will eventually replace the Cl.44 and the remaining Britannia. Redcoat will use the former AD500 prototype (now designated NR2) for pilot training from next year.
• Spantax offer their entire fleet of twelve CV.990As for sale. They have become too expensive to operate due to their high fuel consumption, They may be replaced by Boeing 737s or DC-9-80s.
• Swissair are launching two more new versions of existing types. After the DC-9-51 and -80, they have ordered two DC-10-30ERs (Extended Range), which will have a range of 10.650 km (1280 km more than the standard -30), and four Boeing 747SUDs (Stretched Upper Deck).

AIRLINER INCIDENTS

• British Airways Helicopters' Sikorsky S.61N G-BEID ditched 20 miles off Aberdeen on July 31st. The aircraft was returning to Aberdeen from the Atlantic 2 drilling platform when it developed a fault and the crew decided to make a landing on the calm sea surface. The thirteen passengers and two pilots were winched aboard two other British Airways Helicopters aircraft fairly soon after the unscheduled landing. The ditched S.61N was towed back to Aberdeen harbour by the Aberdeen lifeboat. Damage was minimal and no-one was hurt.
• TARUM Tu.154B-1 YR-TPH crashed into a lagoon off the Mauritanian coast while making an ILS approach to Nouadhibou Airport on August 7th. Reports vary as to the circumstances and casualties, but the weather was said to be reasonably good, and casualties were reported to be between one dead and a few wounded, and 160 dead out of 170 aboard. The passengers were all Romanian fishermen on their way to relieve crews of Romanian vessels operating of the Mauritanian coast.
• A Saudia TriStar made an emergency landing at Riyadh Airport after a cabin fire broke out shortly after take-off from Riyadh on August 19th. Airport emergency services were unable to open any doors or exits and the aircraft burned out, killing all people on board, believed to number more than 300. The fire was believed to have been caused by passengers' gas stoves. One gas stove bottle may have leaked, and the gas ignited by a cigarette. The failure of the airport firemen to open the aircraft's exits may have been caused by their high temperature and/or by deformation caused by heat expansion.

British Airways is currently changing the titling on its aircraft from 'British airways' to just 'British' (in larger letters) to emphasise that they are the British national airline. This move comes at a time when the airline is losing the last remains of its monopolies. (British Airways)

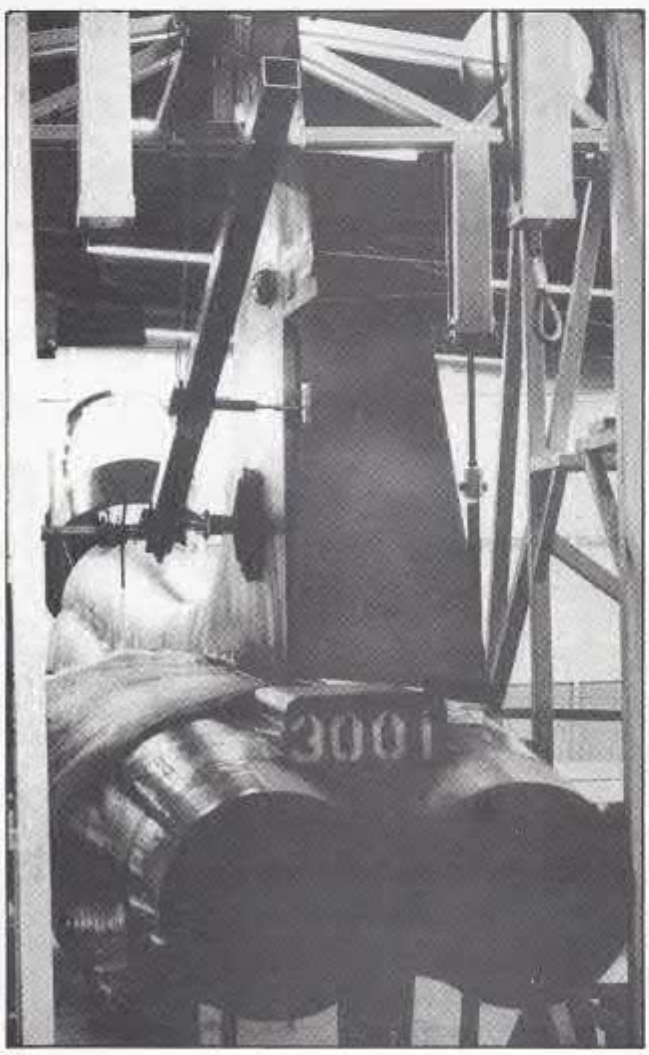


Transamerica 747-371C(SCD) N743TV was among the new shapes seen at London's Gatwick Airport this summer. The airline's two 747s operated flights from Los Angeles every Saturday. Most new services at Gatwick were to the United States, offering flights to various destinations at fares close to Laker's Skytrain fares. These included daily World Airways DC-10 flights to Boston and Newark, daily PanAm L.1011-500s to Houston (and Mexico City), and daily Northwest Orient 747s to Minneapolis-St.Paul and Los Angeles. Furthermore a few new services by Asian airlines terminate at Gatwick, e.g. Garuda DC-10s (to be replaced by 747 later this year) from Djakarta, PAL 747s from Manila and Cathay Pacific 747s from Hong Kong (where British Airways had a monopoly).

ONE HUNDERD A.300s DELIVERED

On 30 May 1980 an important milestone in the life of the A.300 was passed with the delivery of c/n 106 to Alitalia. The aircraft, registered I-BUSC, was the second aircraft for the Italian national carrier and the 100th A.300 to be delivered.
Alitalia have eight A.300B4-203s on order, which will all be in service by February 1982. Alitalia services with this longest range version (up to 3621 km) started 11 June 1980 on the Rome-Jeddah route, replacing DC-8-62s. The type also operates on routes to Tel Aviv, Cairo, Paris and London. The length of some of these routes has prompted Alitalia to have in-flight entertainment systems installed in the aircraft. The delivery of the 100th Airbus passed by with little publicity, but six years after the first delivery (of c/n 5 F-BVGA to Air France) a small cheer is not out of place.

Protean NF-5A K-3001 of Klu's Testgroep



TWENTE, HOLLAND. During the final part of the development of the NF-5, it became apparent that this version of the F-5 fighter bomber differed considerably from the then flying versions. Especially the manoeuvring flaps, the doppler/rollermap navigation system and the strengthened wing, necessary to carry 275 gallon tanks, made this Canadair-built version for the Koninklijke Luchtmacht 'something else'.
All this required a lot more testing, mainly involving combinations of the aircraft with varying weaponary. In order to make sure that allthe required testing as well as the preparations and postflight analyses would not interfere with operational needs (which is yet another interesting story, Who knows, maybe some other time?), it was decided to use one aircraft for this sole purpose. This would also have as an advantage that general equipment could be built in while the aircraft was still on the production line. The aircraft would be permanently available and the non-operational equipment could remain installed.

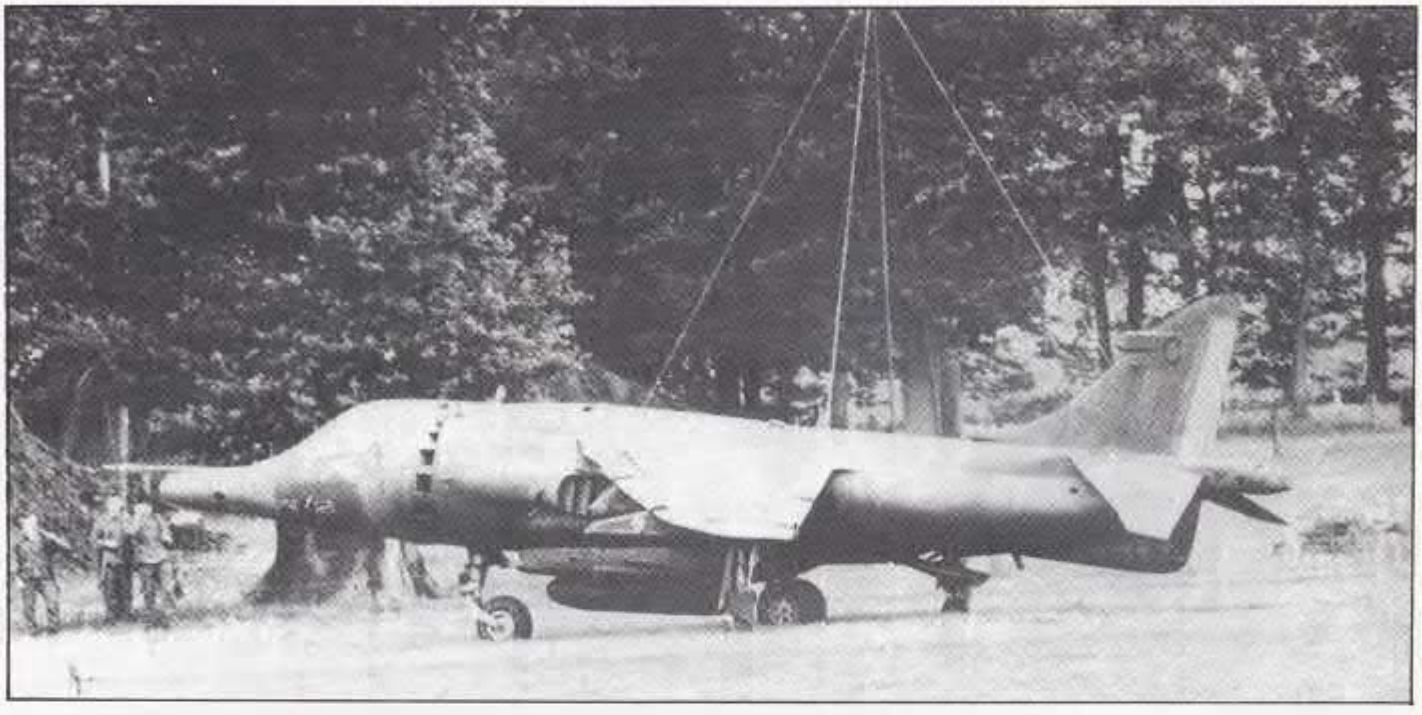
The decision on which aircraft to choose was not really too difficult. NF-5A K-3001 already had special equipment built in needed for the initial tests, such as getting a certificate of airworthyness for the new F-5 version. Around K-3001 the 'Testgroep Vliegbeproevingen NF-5' (Test and Evaluation Force NF-5) was formed. The Testgroep takes care of just about anything involving the aircraft including maintenance, flying and, in close cooperation with the Dutch National Aerospace Laboratory, preparing and carrying out the various tests.

Up to now, among many others, the following tests and operational evaluations have been completed:

- Certification and operational testing of the rocket/bomb dispenser. The RBD is in use with the Klu only and carries 4 rockets and 4 practise bombs for range work only.
- Qualification and flying with the chaff/flare dispenser.
- Many seperation tests, both airborne and on the ground, with N-containers, 150 and 275 gallon tanks, and LAU-3 containers.
- Certification for the GBU-12B laser-guided bomb earlier this year.

At the moment K-3001's tiptanks have been replaced by rocket launchers that have been borrowed from the RNoAF. Maj. Ten Hove flew the first Dutch NF-5 with the AIM-9J Sidewinder installed on 10 June 1980 and this project is still underway. □

(All photos: Fotosektie Vlb.Twente)



Harrier field exercise Hill Foil got stuck in the mud

A report by Gerd Lammers and Georg Büning

RAESFELD, W.GERMANY. The summer deployment of RAF Germany's Harrier Force out in the field, had to be stoppped two days prior the exercise's official end. The heavy rainfall during early July had turned the areas around Raesfeld into complete mud-pools. However, it proved possible to operate Harriers even from those muddy fields. But because of the supporting ground personnel, who were floating around in their tents at night, it was decided to break off exercise Hill Foil.

Harrier Force exercised under code-name Hill Foil around Raesfeld from 12 till 22 July

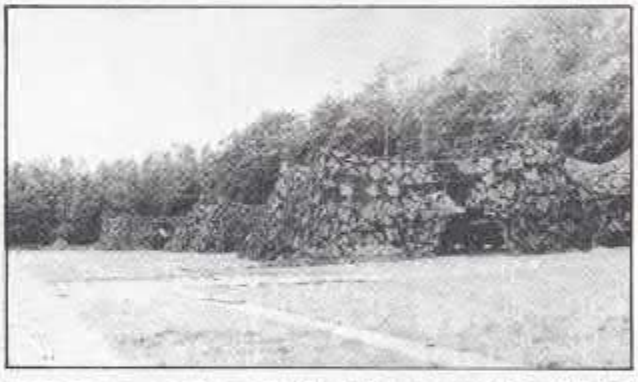
Every year the Harrier Force of RAF Germany sets out to operate out in the field. Normally this takes place around Paderborn but once in a while the Harriers of No.3 and 4 Squadrons from RAF Gütersloh settle at sites around Raesfeld, 30km north of Essen.

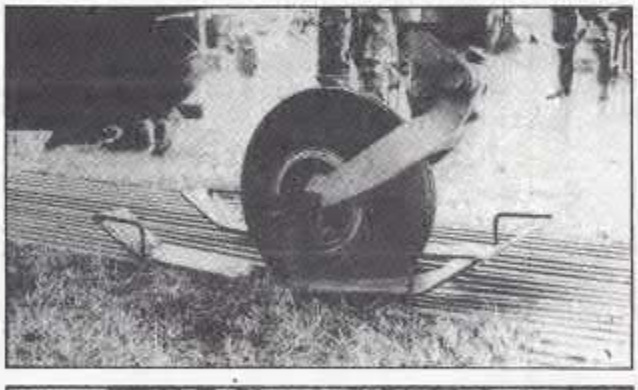
The true enemy to the Harrier Force during Hill Foil was ordinary mud. Upon arrival of a formation of Harriers, one made a precautionary landing, but upon touching down its wheels sank away in the mud. The other three Harriers witnessed the fate of their collegue and decided to return to Gütersloh. The heavy rainfall had made the ground too soft to hold the 5,000kg weight of the Harrier.

One of the six operation sites was even completely flooded and a diversion site had to be used.
Exercise Hill Foil started on 14 July when air force and army personnel arrived in the Raesfeld area to install the supporting equipment in order to prepare for the arrival of 30 Harriers to be spread over six sites. The barracks and supporting equipment were built up amongst the trees at the edge of a wood. Shelters for the Harriers were constructed from nets and situated just outside the wood.
Because of the muddy ground taxi-tracks were constructed from metal strips. A wide track for the main undercarriage and two small tracks for the wing tip undercarriage. For taxying purposes the Harriers were provided with skis. Initially the Harriers could develop enough thrust to take off from the muddy ground, but many take-offs and landings ruined the grass, turning the runway into a mud-pool. After an enormous cloud-burst over the weekend, it was decided to construct the 238mtrs x 15 mtrs standard runway, also made of metal strips. Using the strips the Harriers could fly their missions according to schedule. For the ground personnel, however, it became more difficult every day to service the operations. The trucks had turned the sites into big mud-pools and got stuck frequently. Although the weather improved towards the end of the exercise, it was decided to end Hill Foil two days earlier.

Harriers operated from 6 sites in a 10kms circle

Hill Foil involved 30 Harrier GR.3s & T.4s divided over 6 sites in a circle of 10kms around the town of Raesfeld. Additionally two sites were equipped to handle possible diversions of Harriers. The jet fuel was supplied from four fuel locations, which in their turn received fuel via the nearest railway station. The first week of the exercise contained a MINEVAL during which the Harriers made some 30-40 missions a day per site. At one site the MINEVAL also included an air raid attack by an airborne regiment to test the ground defence forces of the site.
Bad weather during the first days of the second week limited the Harrier operations during a TACEVAL to 8 per day per site.
Again the unique concept of the Harrier was proven to be succesful. During Hill Foil it was the supporting aspects of field operations that need to be optimized, not the aircraft. □





FARNBOROUGH INTERNATIONAL 80

1-7 SEPTEMBER, 1980
(TRADE DAYS SEPT 1-4
PRESS DAY AUG 31)

FARNBOROUGH 1980: bigger and better

SBAC display from 1 till 7 September

A report by Jacob Struben and Barry Bailey-Hickman

During the first week of September, the Royal Aircraft Establishment at Farnborough, Hampshire, England, was the scene of the twenty-fourth SBAC Aerospace Exhibition and Flying Display to be held there. This year the organizers had everything going for them. The support from industry was greater than ever, with over 500 firms and organizations participating, more than 100 aircraft on show, and the return of a large US presence. Industry's customers' interest in and support for the show, too, seemed to be increased. And, most importantly for everybody, organizer, exhibitor, pilot, trade visitor, reporter and member of the public alike, the weather was absolutely glorious throughout the week, unlike many times before. Farnborough International 1980 (or FI 80, as its briefer designation was) would have been a complete success, had it not been merred by the (fortunately non-fatal) crash of the TF-18A development aircraft on the day after the show ended. However, untill more is known about the cause of the accident, one may disregard such an unfortunate incident when one assesses the success of such an event. What must be taken in account, though, is the fact that the complexity of the event means that is can't be perfect for every participant and visitor.

The trade fair

The indoors exhibition and the aircraft static park (where trade fair and air show overlapped) mirrored the current pre-occupations of the industry and its customers, the aircraft operators. Among the military the heavy fighter aircraft dominated the proceedings. In spite of continuing efforts to reduce the size and weight, but not, if at all possible, the

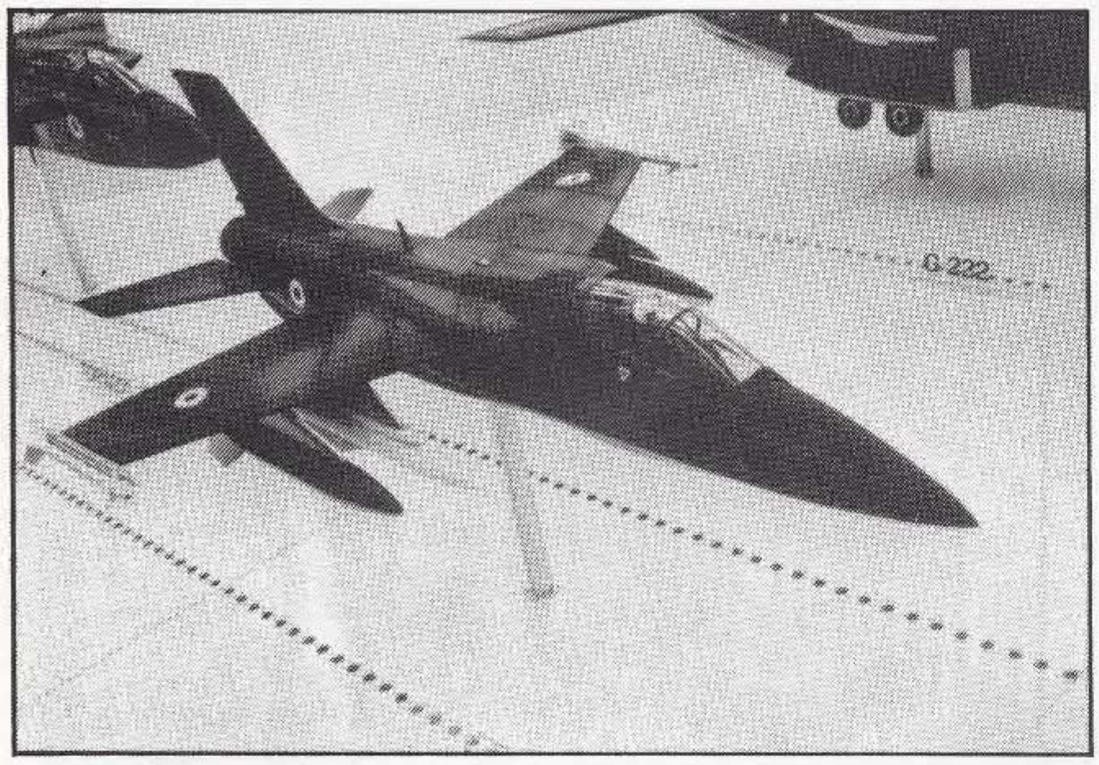
performance,of fighters, the upward spiral seems unstoppable. The best example of this was provided by McDonnell/Douglas. Their Hornet, making its European debut, was shown in its TF-18A form in a light blue/grey colour scheme and joint USNavy/ USMC markings. The F/A-18 is a much heavier development of the Northrop F-17 light-weight fighter project which lost out against the F-16 in a USAF fly-off.

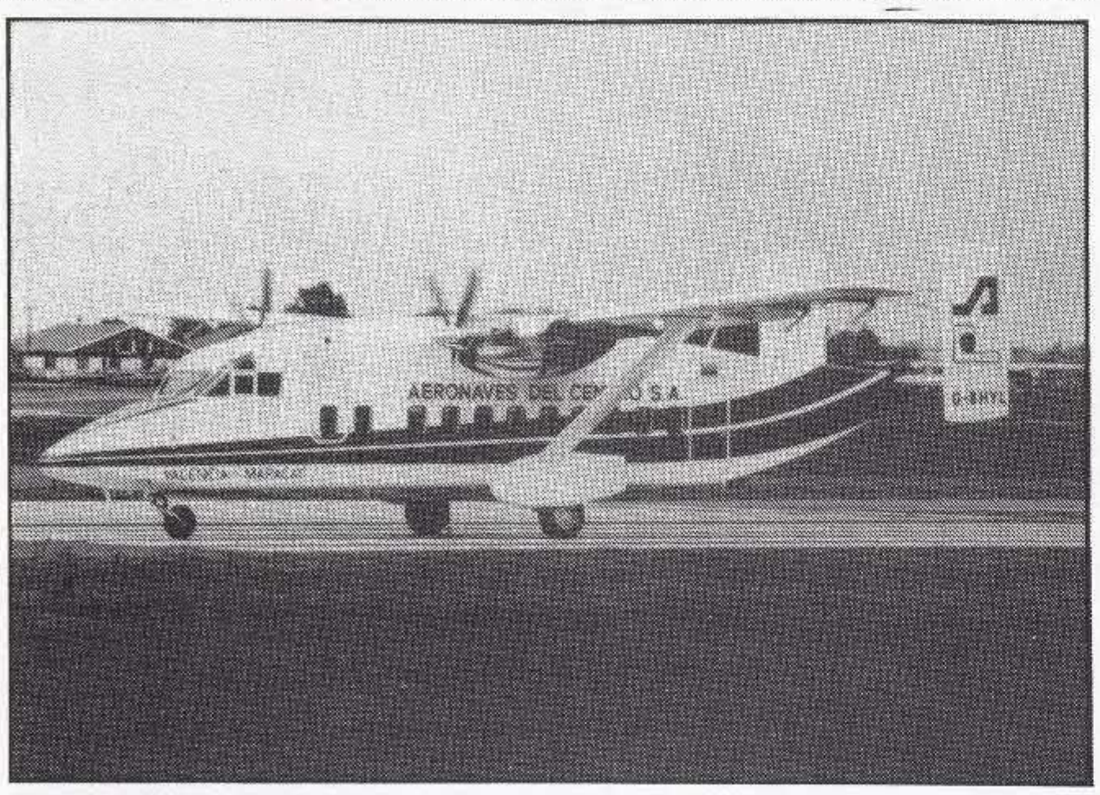
Strike Eagle led heavy fighter onslaught

The other McDonnell-Douglas 'heavy' present was the Strike Eagle prototype, a conversion of 71-291, the original second TF-15A/F-15B pre-production and factory demonstrator aircraft. In this version the aircraft made its first flight on 8 July this year. It flew to Britain only the week before FI 80 from Loring AFB, Maine to RAF Mildenhall without refuelling and non-stop, demonstrating the type's capability of being deployed rapidly to Europe from the US without tanker support - a feat made possible by its use of fuel carrying FAST Packs. 71-291's appearance at the Mildenhall Open Day was its public debut in this configuration.

All the current European heavy fighters were present at FI 80. The largest contingent came from Dassault-Breguet. The current Mirage fleet consisted of a French air force Mirage F.1C (from EC5 at BA Orange), two prototype Mirage 2000s and, making its debut at Farnborough, the enormous Mirage 4000, which only stayed till Thursday, reportedly returning to France to demonstrate for a potential export customer. The three Mirage types also provided a dramatic illustration of weight and size inflation.

The host country presented two versions of the Tornado, a British-built prototype of the basic international IDS version, and, seen for the first time in public, the all-British Tornado F.2 Air Defence Variant first prototype. Of note was a BAe Jaguar International which sported a strange 'thimble' nose housing the Thomson-CSF Agave radar. Mounted underwing were McDonnell-Douglas Harpoon missiles, emphasizing yet again the maritime possibilities of the Jaguar.





TOP: Aeritalia's mock-up of the AMX
MIDDLE: Microjet F-WZJF ending its flying display
MIDDLE: Finnish air force Vinka VN-2
BOTTOM: Shorts 330 G-BHYL to be delivered to an Venezuelan airline

Much interest in jet trainers and light attack

Down the weight scale, among the advanced and basic trainers, enough interesting things are happening to keep everybody busy. Interest focuses on the VTX-TS program of the USNavy. A German Alpha Jet is currently touring the USA in an effort to secure the large USNavy order which will undoubtedly spark off other orders for the selected type. The USNavy is only one of many potential customers for the new generation of advanced jet trainers, and their adaptability to the light attack role, or indeed airfield defence (e.g. the RAF Hawk T.1s), is an important factor, especially with smaller air forces.

The current types were all present, and Argentina's FMA showed a model of their IA-63 project. The two VTX-TS contenders were represented by a Luftwaffe and a French Alpha Jet, and a camoulfaged RAF Hawk on the ground and the company demonstrator G-FAWK/ ZA101 (in USNavy grey and white) in the air. The French Alpha Jet was in desert camouflage and carried Armée de l'Air roundels and the military call-sign F-ZJTI. A Dassault-Breguet representative told FLASH that this was the first aircraft for 'an African customer'.

The potential of these trainers was demonstrated by Aermacchi's MB.339K Veltro (Greyhound) 2 single-seat ground attack aircraft. Derived from the MB.339A, its registration marks I-BITE were all the more appropriate considering its new nose houses two 30mm DEFA cannons. The Veltro 2 is a private venture and was shown publicly for the first time at Farnborough.

But the search for cheaper, lighter and smaller aircraft hasn't yet reached its end. Two tiny jet aircraft, the Caproni C.22J and the Microjet 200, the former camouflaged, the latter sporting AdA roundels, clearly aimed at the military market. There has been interest in this sort of mini-trainer for a number of years now, but no sales have yet been made. The most promising basic trainer with jet-like handling characteristics is still the RFB Fantrainer, an example of which was scheduled to appear at FI 80. However, its participation had to be cancelled because the aircraft had followed the German Alpha Jet across the Atlantic, in this case to be evaluated by the USAF.

Shapes of the future glimpsed indoors

Finally mention must be made of a few projects which were illustrated in various ways inside the exhibition halls, where the range of evil military hardware was enormous. Westland and Agusta showed plans of their Sea King replacement, the EH.101, which they will develop jointly through EH (European Helicopters) Industries. Front fuselage mock-ups were shown of the EMBRAER 312/T-27 and Repair AS.32T turboprop trainers. The former type flew for the first time shortly before the show, and the latter is a new Swiss project which uses the wing of the smaller Bravo, but is otherwise an entirely new design. Both types have enormous bubble canopies and a stepped cockpit. A model was shown for the first time of the Aeritalia/Aermacchi AMX tactical fighter, which will replace the AMI's FIAT G.91Rs, G-91Ys and Lockheed/FIAT F-104G/Ss from 1986 onwards, leaving the Tornado as the only other combat aircraft of the AMI. The most popular indoor exhibit was that of the USAF, which showed its defence development work. One particular film showed the use of a high energy laser beam to shoot down an unmanned drone aircraft; perhaps the science fiction 'death ray' has now become reality. The airborne test vehicle for the laser weapon is a C-135, a cutaway model of which was shown.

The air show

Back in the open, after the heavy atmosphere of future projects in the exhibition halls, the Farnborough visitor was reminded what FI 80 was all about, i.e. aircraft. More than 100 were on display, most of them in the static park in the mornings.

In the afternoon, a large proportion of these aircraft were put on show in their true element. The air show, which on the public days was expanded to include such crowd-pullers such as the Royal Navy and RAF historical aircraft and the Red Arrows, was one of the best ever seen in Europe. In the space of some three hours more than sixty aircraft each type a three-minute burst of aerobatics, short-field operations, or whatever they were good at. The limited time alloted to each aircraft and the tight scheduling meant that the public wasn't bored a single minute. Photography all along the main runway was excellent for those who had conquered a spot along the safety fence.

In the air show, too, the heavy fighter dominated. The US machines blasted their way into everyone's lives each afternoon. Ear defenders should have been issued to everyone as they entered the airfield!

Spectacular aerobatics F-16 set example

General Dynamics had brought along a USAF F-16B, which was displayed (by GD pilot Neil Anderson) with such agility that for many it must have been the highlight of the show. Fitted with wingtips smoke generators, it twisted and turned its way through an incredible routine, managing the whole time to stay within the airfield boundaries.

Very impressive too were the low-speed, nose-up passes by the Mirage 2000 and 4000, whose big delta wings transform them into flying airbrakes.

The largest military aircraft in the air show were the two NATO Airborne Early Warning (AEW) aircraft. The Nimrod AEW.3 prototype was operating from its base at Woodford, making three hours test flights daily, but taking time off to appear at Farnborough before returning to Woodford. To balance this all-British program, Boeing brought an E-3A Centry to show what NATO is getting for its money. This USAF example was using RAF Mildenhall as its operational base.

Outstanding air displays were given by some of the civilian registered aircraft too. The Skyvan, on order by the Malawi Police Air Wing, certianly did the most startling take-off. After the usual very short take-off run a loud US-style siren bleeped across the field while the aircraft,it was mounted on, made a corkscrew-like climb-out which, one assumes, makes the aircraft less vulnerable to small arms fire and SAM attack. The Skyvan also demonstrated a curved approach, presumably with the same hostile environment in mind. The aircraft's loudhailer was not demonstrated, as a ground test at the Shorts airfield near Belfast was audible two and a half kilometers away.

The other STOL types tried to outdo the Skyvan and each other, which resulted in the occasional overheated tyre, but nobody could beat the Turboporter, which did a 'formation' take-off with its stablemate the PC-7, but was long since airborne while the PC-7 was still trundling down the runway.

Of the larger aircraft, the Airbus, looking splendid in the beautiful SIA colour scheme, gave a very spirited show on the press preview day, but didn't take to the air again until the weekend. This lack of big airliner was compensated for to a certain extent by the British Airways Tristar 500, flown by a joint BA/Lockheed crew. The Tristar illustrated very well how quiet modern airliners are these days.

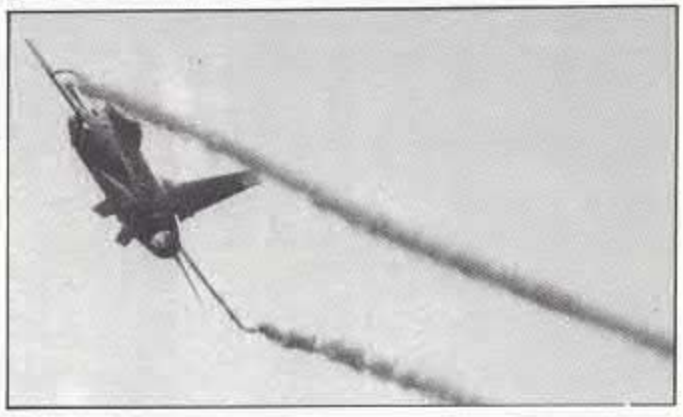
Modern business jets, too, are a lot quieter than before. BAe demonstrated their successful HS.125-700, earlier models of which are notorious for their piercing howl when taxying. The newest bizjet in the air show was the recently certificated Challenger, in the shape of the first aircraft for TAG International, the Saudi/Swiss company who have been appointed sole distributor for the type in a large number of Arab and Middle Eastern countries. The aircraft, flown by Canadair pilots, didn't spend much time at Farnborough, as it wasn't on show in the static park in the mornings, but operated from nearby RAF Odiham.

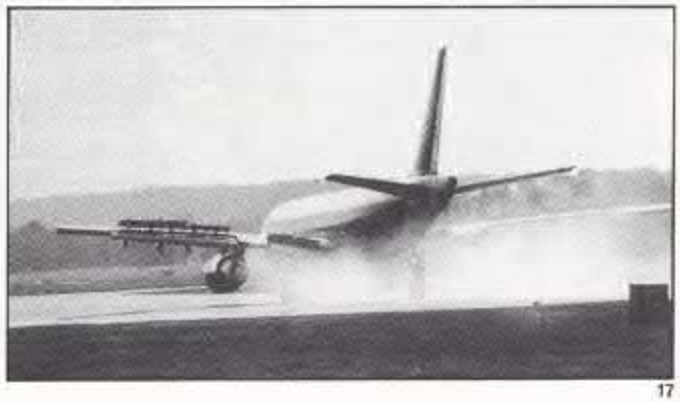
The show by the EMBRAER trio (Bandeirante, EMB.111, and Xingu) was perhaps more spectacular than intended, at least on 1 September, Xingu G-BGIE, UK distributor CSE Aviation's demonstrator, landed rather closely behind the Bandeirante and punctured the left main tyre, coming to an abrupt halt off the right hand side of the runway. Damage was minimal, but the next day G-XING, another Xingu, took over its spot in the air show. Incidentally, G-BGIE had been making a bit of Farnborough history before it came to such an ungraceful halt, in that the pilot was the first member of the House of Lords to fly an aircraft in the air show of an SBAC Display.

FI 80 was aviation in a nutshell, perhaps not in the correct proportions, but certainly comprehensive. The mass of details makes it impossible to sum up FI 80 in one sentence. Perhaps it is easier for the trade visitor who only has eye for the kind of aircraft or equipment he is after. But one overriding concern dominates everyhting: there is increasingly little money, fuel, and space left for operators to fly their aircraft in. The manufacturers are aware of this, and are doing something about it. If that is the message of FI 80, the Display was well worth it. □

Aircraft on display included:

F-WZER	(9V-STA) A.300B4	SIA
70-16019	Bell YAH-1S (model 249)	
I-CAVJ	Caproni C.22J	
G-BGMW	Edgley Optica	
PH-FTU	F.27 Maritime	Angola AF
PH-ZBW	(PK-GKC) F.28-4000	Garuda
LN70-412	(70-2412) F-111F	48TFW
78-089	F-16B	USAF
160784	TF-18A Hornet	USN/USMC
F-WZJF	Microjet 200	
SP-PKD	PZL Mewa (PA-34 Seneca)	
N442PC	PA-42 Cheyenne III	
XX979	Jaguar International	(maritime)
ZA296/VF	Sea King HC.4	RNFAA
ZA297/VG	Sea King HC.4	RNFAA
C-GBKC	(HZ-TAG) Challenger	TAG Int.
XZ286	Nimrod AEW.3	RAF
EI-BHU	Beech 77 Skipper	Avair Ltd.





Government and Schiphol disagree on future runways

Noise nuissance main reason for changing the current runway system at Schiphol

The runway system of Holland's national airport is under discussion at the moment. These discussions will expose the difference in opinions of the Dutch Ministry of Transport and the NV Luchthaven Schiphol, the company which owns the airport, and KLM who agree with the latter, concerning noise nuisance and the development of air traffic in the near future. These discussions have been sparked off by the SBL (Structuurschema Burgerluchtvaart-terreinen/Structural Plan for Civil Airfields) in which the government views on the infrastructure of Holland's future air transport are stated. One of these views is to rearrange the runway system of Schiphol through a slight change of heading of runway 01L/19R, which would relieve certain areas from noise nuisance. However, with this change of heading capacity of Schiphol will remain the same, capacity which KLM and other airlines might need badly in the 21st century.

In principle, noise nuisance is the main reason for changing the current runway system at Schiphol. Since 1967, when Schiphol's modernization program finished, construction of housing areas in the neighbourhood of Schiphol just continued, and so did air traffic continue to grow, using the noisy first and second generation jet airliners. These two factors have grown to such an extent that the current situation is being described as 'unbearable' for nearly 13,600 houses and 'nearly unbearable' for as many as 40,000 houses near Schiphol.

'Unbearable' and 'nearly unbearable' are defined by the Dutch 'Kosteneenheden' system, and respectively start at 40 Ke and 35 Ke. Ke are 'cost units' which take into account air movements, time of movement, the noise produced (in Db) and the nuisance caused to people. After compiling the figures zones can be drawn on a map and the numbers of houses in each area counted.

Of the four alternatives, only 'SPL5' means increased capacity of movements

To relieve the houses from noise nuisance, four possibilities by which the zones receive other, less disturbing shapes are available:

- o SPL4 The current runway system
- o SPL4v In which runway 01L/19R has been replaced by a runway parallel to the original one.
- o SPL4g In which runway 01L/19R receives a change of heading
- o SPL5 The current runway system plus an extra runway parallel to 01L/19R

Alternative 'SPL4'

The capacity of this runway system will be around 300,000 movements per year in the 1990s, according to the SBL. This number can be reached if the Alternative Runway system is modernized, the Vortex Advisory and Computer Assisted Approach Sequencing systems are introduced, and the current minimum separation of 5.4 to 10.8 km between flying aircraft and the time the runway is occupied by each aircraft (on average) remain the same.

Noise nuisance will increase until 1985, which is the year the SBL's calculations have been based on in this case, after which it should remain the same or decrease slightly because of the introduction of 'silent' aircraft.

Insulation of houses will be the only possibility in reducing the noise. However, out of doors the situation won't change. To insulate all houses in the affected areas will cost DFL 140 million. In spite of this, SPL4 will be the cheapest alternative, while the runway system will stay completely balanced.

Alternative 'SPL4v'

The capacity of SPL4v will be identical to the above alternative, as the available number of runways will be the same. However, less houses will be affected by noise, due to which insulation costs will decline to DFL 90 million. Construction of the runway, etc. is to cost DFL 140 million. A second control tower would also be needed.

SPL4v will see an unbalanced runway system, as there will be different taxying times to the different runways. This will mean extra operational costs, mainly in fuel.

The new runway will be positioned on land not currently owned by Schiphol, so it will disturb the infrastructure of the whole area. This will result in a large administration time loss, and completion is expected to be two years after SPL4g would be in service.

Alternative 'SPL4g'

This change of runway heading won't see an increase of the 300,000 movements/year either. The overall situation of the noise nuisance differs little from SPL4v, so insulation costs will be the same. Construction costs will be less, as less land has to be bought. In total DFL 275 million will be needed for this alternative.

Due to the only minor (20°) heading change, balance of the runway system is alomst equal to the current situation. More use can be made of the preference system by which the optimum runway (the one causing least noise nuisance) will be used by the airlines.

Disturbance of the infrastructure is minimal, in contrast to alternative SPL4v and SPL5. The construction will see a minor period of disruption of the traffic pattern, and will be finished in 1985.

Alternative 'SPL5'

When two runways can be used at the same time for landings (or take-offs), SPL5 will be capable of handling 350,000 movements/year. Only problems could occur on the traffic control side, as it's not yet known if it is technically possible for them to handle two landing runways (as well as a take-off runway). If not, movements could still go up to 320,000.

However, the sound nuisance zones are less favourable, compared with SPL4v and SPL4g, but will exclude some built up areas completely in 1990.

Total costs, including insulation of houses and construction of runway and taxi tracks, are projected to be DFL 335 million, making it the most expensive alternative. This five runway system will be unbalanced i- so far that in the north-south axis three, and in the east-west axis only two runways can be used at the same time.

The infrastructure will be disturbed to the same extent as with alternative SPL4v. SPL5, too, will take a longer time to complete.

Ministry of Transport considers 'SPL4g' to be the optimal runway system

As mentioned before, the Ministry of Transport came to the conclusion that construction of a runway with changed heading (SPL4g) leads to the optimum form of Schiphol's runway system. Noise nuisance will be less, capacity should remain the same, while it should be cheaper and better for the area's infrastructure than construction of SPL5.

KLM and Schiphol prefer 'SPL5' because reduction of noise nuissance is combined with a possible increase of capacity

Some of the data which SBL used in its calculations are, according to the NV Luchthaven Schiphol, of doubtful value. Firstly, none of the alternatives to SPL4 can be expected to be operational before 1988, due to which 1990 should be used as the year on which the calculations should be based, by which time only low noise certificated airliners will be operational. Secondly, the SBL added a 'safety margin' to the figures on average runway use, which influenced all alternatives in a negative way and makes the results of the calculations unreliable. Thirdly, the SBL uses housing areas instead of the exact number of houses of all areas together. Therefore Schiphol's conclusion is that through the introduction of low noise certificated airliners alone a decrease in 80% in noise nuisance can be expected. Besides this, changing of the runway system will mean a further reduction (see table 1) and, in this way, alternative SPL5 is the most effective solution.

TABLE 1

noise nuisance (Ke)	houses affected			
	current (1978)	SPL4 (1990)	SPL4g (1990)	SPL5 (1990)
35	40,600	7,800	5,500	3,900
40	13,600	3,700	2,300	1,500
45	7,000	900	770	580

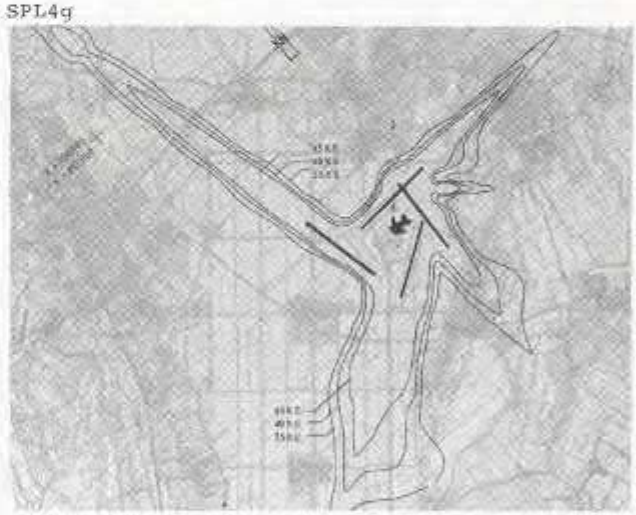
The KLM, who is the largest airline user of Schiphol, stresses the opinion that a healthy expansion of air traffic can only be possible if one takes note of the noise nuisance problem and, at the same time, that increases of capacity are needed in the future. Studies of the Dutch National Aerospace Laboratory (used by the SBL, Schiphol and KLM) foresee a shortfall in capacity by 1995. From the same studies it can be concluded that the capacity of SPL5 will be 350,000 movements. Conclusion of KLM is that alternative SPL4g will be irrevocable when, later on, a fifth runway should be necessary after all.

Making reliable predictions of figures spread out over twenty years is nearly impossible. Recessions caused by oil shortages, devaluation of money, changes of markets and new technologies which may or may not materialize, are all factors which could influence the figures. It was predicted that Schiphol would have 6 to 7 million passengers and 250,000 to 300,000 tons of freight during 1975. In fact 7½ million passengers and only 225,000 tons of freight were handled.

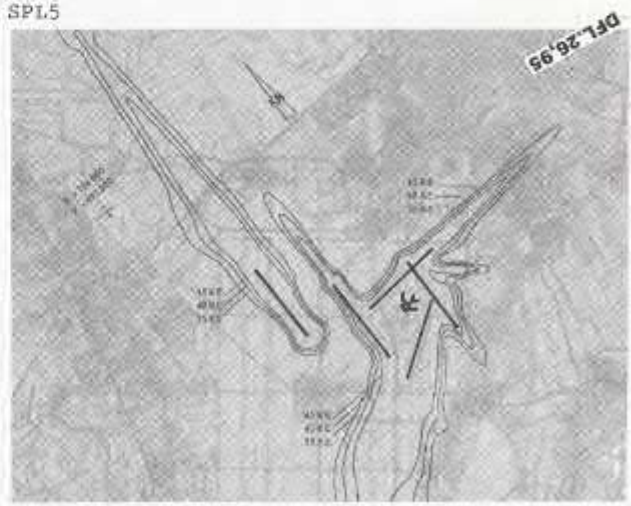
The SBL depends on the surface measurement of living areas. A better criterium would have been the exact number of houses of all affected areas together. It would be better still to forget all this and just decide what is needed. What gets priority, decrease in noise nuisance, capacity increase, or the money involved? These are the points about which discussions should be held by all people involved, from the people living nearby to the people using Schiphol. And once the priorities have been established one should try to create the best situation possible wihtin those priorities.

30Ke, 40Ke, and 45Ke ZONES 1990

SPL4g



SPL5



1980: a crucial year for Airbus

Airbus has run out of European customers

Sales of the Airbus A.300 and A.310 in 1980 will be well down on 1979's figures. There will have to be a flood of orders in the last months of this year just to bring the figures to the 50% mark. Does this mean that 1980 is going to be a disastrous year for Airbus Industries, Western Europa's largest airliner manufacturers?

In the 50-week period up to 1 August 1980 Airbus sold 41 aircraft, 22 of which were A.300s and 19 A.310s. This compares with 118 in the 50 weeks up to 10 August 1979. Sixty-six of these were A.300s and fifty-two were A.310s. Most of the slow-down in sales was during this year, for in the first eight months of 1980 only sixteen aircraft were sold, four A.300s and eight A.310s. It is of course not yet known how many will be sold later this year, but on the surface it would seem that these figures spell disaster for Airbus Industries, the most successful example of European collaboration in commercial aircraft manufacture.

TOP: BIA's first A.300B4-203 was on show at this year's SBAC Display, registered F-WBER.
BELOW: Hapag-Lloyd's A.300B4-201 D-AHAP, seen landing at Frankfurt/Main, is one of several used by IT charter operators.

The main reason why Airbus sales have dropped, most dramatically for the A.300, is simply that all easy sales have been made. The A.300 and A.310, being European products, would seem a logical choice for the large European airlines. By mid 1980 the only national European airline requiring aircraft of A.300 and A.310 size which didn't select either type is British Airways, who use the Tristar 1 and have the Boeing 757 on order.

Airbus Industries have established the following priorities for their marketing efforts in 1980/81:
1) new customers in Middle East and South America,
2) existing customers
The new customers require most of the effort, but the existing customers will buy the most aircraft. Airbus project that the current customers of A.300 and A.310 will eventually need 900 to 950 aircraft of the two types. They expect to sell at least another 100 and at most 300 A.300s and A.310s to airlines who haven't bought from Airbus yet. The total figure of 1000 to 1200 aircraft represents 30 to 50% of the total market as estimated by Airbus.

So much for the plans. How do the sales figures of 1980 fit into this? If one looks at the orders placed so far, one sees that three aircraft (all A.300s) were ordered by existing customers and the other nine (eight A.310s and one A.300) were ordered by three new customers: Tunis Air, Austrian Airlines and, most importantly, Kuwait Airways.

Marketing efforts paying off in the Middle East

The lack of repeat orders is explained by the fact that most A.300 customers are waiting for delivery of aircraft ordered during 1978, which in some cases will bring them up to the number of aircraft they require for the next two to five years. When traffic expands they will place repeat orders.

The efforts aimed at new customers in the Middle East have already paid off. Kuwait Airways is the first customer in the area to order the A.310 having bought six for delivery from autumn 1983. It is hoped that this order will have a domino effect, and that other airlines in the area, such as MEA and Saudia, who need an aircraft like the A.310, will indeed turn to Toulouse, and not to Seattle or, should the DC-XX get off the ground, Long Beach.

That this will not happen overnight is clear. There is still only one customer in the USA, three years after the A.300 entered service with Eastern Airlines. In South America Cruzeiro do Sul is the only current A.300 operator (Aerocondor of Colombia did operate one A.300 for just over a year, but the aircraft was repossessed by Airbus in April 1979). Cruzeiro's order was placed more than ayear ago. In the Middle East there are several A.300 customers, although neither Egyptair nor Iran Air are likely to buy the A.310 in the near future.

There is no reason to suppose that Airbus's projections are grossly incorrect. It seems pretty certain (barring a calamitous collapse of world airline business) that the A.300 and A.310 programs taken together will pass the joint break-even point of 800 aircraft. It is becoming clear that 1980 is going to be a year of consolidation and much activity behind the scenes,

Airbus is working for the future

Finally, in the design offices work is progressing on three projects which will enable Airbus to diversify within the airliner market. The TA9 and SA1/SA2 will be short to medium range aircraft like the A.300 and A.310, while the TA11 will give Airbus a foothold in the longhauler market. The TA9 is a straightforward stretch of the A.300, seating 310 to 350 people. The TA9 will offer a more fuel-efficient two-engine alternative to the L.1011-1 and DC-10-10 medium range aircraft.

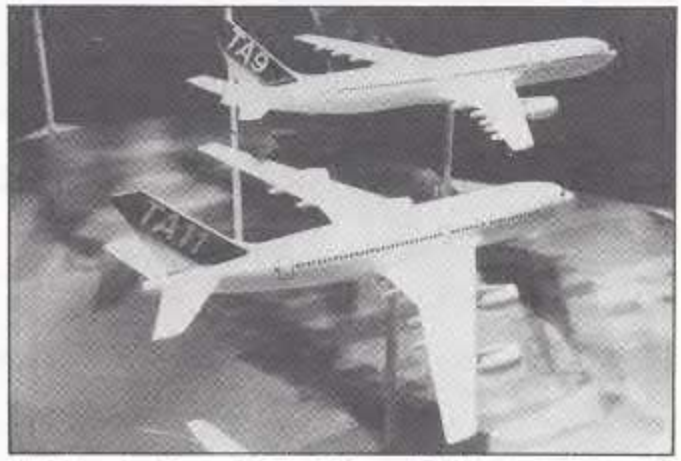
The TA11 is also a development of the A.300, but incorporates rather more changes. It combines the fuselage of the A.310 with a new centre-section and larger wing to accomodate more fuel and four engines (e.g. CFM56s). The TA11 will carry 210 to 220 passengers over routes up to 10.800 km long, and will be supplementary to the larger wide-bodies and replace some Boeing 707s. DC-8s and older long-range DC-10s and L.1011s.

The SA1 is an entirely new design, a narrow-body single-aisle 132-seat twin, which will replace DC-9s, Boeing 737s and BAC 1-11s. A 162-seater stretched version is designated SA2. Different engine/airframe combinations will be offered to adjust the basic aircraft to individual airline's needs as far as capacity and range are concerned. The fuselage diameter will be 3.92mtr, which is 40 cm wider than the 737's.

These three projects are being studied both by Airbus and by possible customers, and it may take some time before any decisions are made whether or not to go ahead with production. □

RECENT AND UPCOMING DELIVERIES

111	VT-EFW	Indian Airlines	B2-100	July 80
112	F-	Air Inter	B2-203	Nov. 80
113	VT-EFX	Indian Airlines	B2-100	Aug. 80
114	AP-BBA	PIA	B4-203	Aug. 80
115	SU-	Egyptair	B4-203	Sep. 80
116	SU-	Egyptair	B4-203	Sep. 80
117	9V-STA	SIA	B4-203	Nov. 80
118	N216EA	Eastern Airlines	B4-103	Oct. 80
119	N217EA	Eastern Airlines	B4-103	Oct. 80
120	N219EA	Eastern Airlines	B4-103	Nov. 80



TOP: Models of the TA9 and TA11 were shown at Farnborough International 1980.
BELOW: SAS A.300B2-320 SE-DFK, seen at Heathrow SAS is the first customer of JT9D-powered A.300s

Jetstream 31 awaits launch order

Improvement of a basically sound aircraft

FARNBOROUGH, ENGLAND. When Handley-Page Ltd went out of business in 1970 their last design, the HP.137 Jetstream, was threatened with extinction as well. Fourty-three aircraft had been completed (fourty of which sold) by Handley-Page in two years, so there was obviously a market for the type. The manufacturing rights and hardware were taken over by Jetstream Aircraft Ltd in an attempt to rescue the type, but although they contributed to the type by developing the Srs.200, no civilian sales were made.

The RAF, however, ordered twenty-six Jetstream T.1s in February 1972, to replace their Varsity multi-engine pilot trainers. The future of the type seemed assured. The RAF aircraft were delivered between December 1973 and early 1976, the later ones straight into storage at RAF St.Athans.

In the meantime Jetstream Aircraft Ltd had ceased to exist, and all their assets had passed on to Scottish Aviation Ltd at Prestwick. Still no civilian sales were made, and the Jetstream program only remained alive thanks to the Ministry of Defence (Mod) decision, in October 1976, to convert sixteen of the stored aircraft to Jetstream T.2 observer trainers for the Royal Navy, to replace their Sea Prince T.1s. The other eight were taken on charge by the RAF's CFS and 2 FTS in their original form. Scottish Aviation got the contract for the conversion work of the sixteen T.1s, and later for two former civilian aircraft. They started delivering the T.2s to No.750 squadron at Culdrose in October 1978.

Nevertheless, no new production took place, although BAe's Scottish Division, as Scottish Aviation Ltd had become, were repeatedly told by Jetstream Mk.1/Srs.200 operators that they'd like to buy some more. The cost of re-starting production was such that there had to be prospects for a large enough production run to repay that cost. Scottish Division projected that to reach a large enough amount of sales, an improved version of the Jetstream Srs.200 would have to be offered. On 5 December 1978 it was announced that such an improved aircraft, the Jetstream 31, would be developed and produced.

Unfortunately for the Jetstream and BAe Scottish Division, the world economic situation has deteriorated enough to make selling an aircraft just that bit more difficult. This means that Scottish Division will not be able to take the risk of launching production without having received firm orders. Once again it looked likely that MoD would have to save the type.

An order for fourteen aircraft from the RAF to replace the ageing Devon and Pembroke fleet seemed certain earlier this summer, the British government having chosen the Jetstream over the cheaper and earlier available King Air 200. The order, which would have been worth £16 million, was not placed however, because on 8 August a three-month moratorium was announced on new defence contracts. Moreover, it was announced that, to make up for defence overspending during 1979 and 1980, £ 100 million would be cut from the 1980/81 budget and £ 700 million from the 1981/82 budget. More recently MoD said that the RAF's Devons and Pembrokes would remain in service indefinitely (i.e. until a further decision is taken).

BAe Scottish had counted on RAF launch order

This not only leaves BAe Scottish Division in uncertainty about this particular order, but also means that they will have to convince somebody else to place the launching order which will enable them to start production at a reasonable rate (the faster the production rate the shorter the delivery time, an important factor in the decision making process of other potential customers) and will inspire condifence in the type. In the meantime the program is continuing with certification scheduled for next year (1981) and manufacture of parts for the first new production aircraft under way. □

DUTCH REGISTER JULY 1980

Reg.		Type	C/n	Remarks	
PH-ADB	2872	Cessna 152	152-79592	Air Service Holland BV	to INCAA BV
PH-AIG	3056	Robin R.1180 TD	270	J. Mastenbroek	(new)
PH-BET	2513	Reims Cessna F.172M	1380	Airborne Air Services	to St.Vliegsch.Schiphol
PH-BYL	2843	Reims Cessna F.172N	1809	Airborne Air Services	to St.Vliegsch.Schiphol
PH-CAG	3053	Socota TB.9	131	Aviation Francaise BV	dd 16-7-80 (new)
PH-DOB	3045	Douglas DC-9-32	48133	Koninklijke Luchtvaart Mij NV	dd 22-7-80 (new)
PH-FCS	2999	Fokker F.27-600	10178	Fokker-VFW BV	to PT-LAH (out)
PH-HBS	2911	Cameron V-77	423	Holland Balloon Service	to Caseys Internat. BV
PH-HHE	2600	Reims Cessna F.172N	1617	Airborne Air Services	to St.Vliegsch.Schiphol
PH-IET	2799	Piper PA-44-180	4417995098	Furigas BV	to Netherlands E.A.S.BV
PH-ILR	3058	Dassault Mystere 50	15	Philips' Gloeilampenfabrieken	ex F-W... (new)
PH-JBC	2023	Reims Cessna F.172M	0960	Air Service Holland BV	to P.N.J. Jaumann
PH-JPO	3033	Reims Cessna F.172N	2010	Air Service Holland BV	to Pro Air Group BV
PH-NOA	2574	Piper PA-23-250	27-7305142	Schreiner Airways BV	(out)
PH-OTJ	3049	Cessna T.207A	20700590	Air Service Holland BV	to K.L.M. Aerocarto BV
PH-RAM	3050	Reims Cessna F.172N	2007	Air Service Holland BV	to R.A. Macovich
PH-RBR	2390	Reims Cessna F .172 M	1366	Airborne Air Services	to St.Vliegsch.Schiphol
PH-SIX	2287	Fokker F.28-4000	11092	Fokker-VFW BV	to Pars Air (out)
PH-SMD	2764	Piper PA-32-300	32-7840196	G. Kuiters	to M. vander Spek
PH-SRG	2031	Robin DR.400/160	807	J. Muilwijk e.v. G.E. van dePlas	to W.J. Muilwijk/vdPlas
PH-SRY	2869	Robin DR400/120A	1403	Stichting Vliegmat. Rotterdam	cr 15-6-80 M.Zeeland
PH-SSE	3057	De Havilland Can.DHC-6	697	Luchtvaartmij Schreiner Aws BV_	dd 2-8-80 (new)
PH-SVE	3055	Robin DR.400/120	1499	J. Mastenbroek	(new)
PH-TAX	3052	Piper PA-31T	31T-8020055	Netherlands European A.S. BV	ex N2373V dd 1/7 (new)
PH-TGB	3034	Reims Cessna F.152	1742	Air Service Holland BV	to N.N. Aero Club
PH-VSF	1971	Reims Cessna F.172L	0877	A.A. van Amerongen	to Air Service Holland
PH-XYZ	2175	Robin CEA DR.400/125	964	Stichting Vliegmat. Rotterdam	cr 15-5-80 (out)
PH-248	565	Rhönlerche II	166	Zweefvliegclub Texel	to L.H.M.P. Goossens
PH-688	3051	ASK 21	21020	Venlose Zweefvliegclub	(new)

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B-17 Flying Fortress
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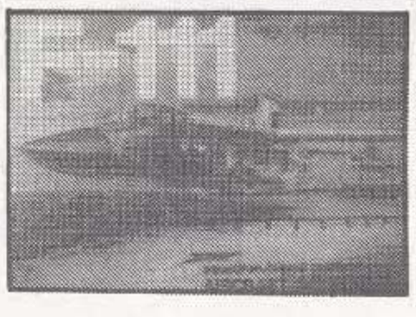

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