RAF Air Support Command Lockheed C-SA model being shown by Col Kenneth Beckman, USAF systems project officer on the aircraft, to Wg Cdr John Scambler (centre), air secre-tary to Mr John Morris, Minister of Defence for Equipment, and Wg Cdr Peter Austin of
the British Defence Staff in Washington.
The photograph was taken during Mr Morris's recent visit to Lockheed-Georgia

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complement of only eight strike and 12 fighter aircraft. On the other hand, the functional cost of maintaining one carrier on station in this way during the next decade would have been around £170 million per year at current prices.
"It was obviously necessary to see whether it was really essential to spend these enormous sums on so limited a capability. It emerged rapidly that the role of the carrier in support of land operations could, in most places which concerned us, be carried out more cheaply and effectively by land-based aircraft: and that if we renounced the strategic option of landing or withdrawing troops against sophisticated air opposition outside the range of friendly land-based aircraft, this would have little important effect on our commitments. So the case for maintaining the carrier force depended critically on its role in maritime operations—a requirement which had been regarded up to then as simply a convenient by-product of the carriers' main role.
"This turned out to be a difficult nut to crack if one envisaged high-intensity mari-time operations against a • sophisticated enemy in the Indian Ocean in the next decade. On the other hand the value of a single carrier on station in such operations was also open to doubt. While it was a difficult judgment to decide against the carrier force for maritime operations East of Suez, once we had decided to withdraw from major military responsibilities in that area in the middle seventies I do not believe that the decision was easy to contest.
"I know that some of you still feel strongly that the decision not to continue the carrier force was a wrong one. What I ask you to recognise is that we could only have continued a carrier force through the seventies if we had been prepared to spend what could well have been over £170 million
a year less on other parts of the Royal Navy or on the Army and Air Force. Once again
it was a question of priorities, and not

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only in financial terms but also in terms of manpower. Few responsible Naval officers think it would have been possible to man more than a three-carrier force through the 1970s. All will be grateful at least for the release to other parts of the Fleet of many thousands of extra sailors when the carrier force is finally phased out.
"I have spent a little time on the carrier problem, partly because it was the most diffi-cult equipment problem on which I have had to take a decision, but also because it may serve to throw light on the way in which a Minister of Defence under inevitable finan-cial pressure has to approach this type of problem—the problem of cost-effectiveness. But I would be the first to admit that cost-effectiveness techniques as so far developed, while they are immensely valuable tools of analysis, still leave much room for personal judgments in decision-making.

"We are now fairly good at assessing the cost of any military option; to judge its effectiveness is far more difficult, since this can rarely be done in purely numerical terms, e.g., the tonnage of bombs dropped on a given target in a given time for a given rate of losses. Indeed, in strictly numerical terms by far the most cost effec-tive weapon is the bayonet if not the fist. The difficult problems of judgment arise— and they are sometimes appallingly difficult —when you have to guess the circumstances in which a particular equipment might have to be used, the nature of the opposition it would have to overcome, and the way in which each side would use its equipment and fight the war. There is no simple standard of effectiveness in military policy like, for example, the profit criterion in busi-ness. And often the best practical proof of a weapon's effectiveness is that it never needs to be used at all. But if the British Services have one area of expertise compared with some of our Allies it is in the extent to which they are able to relate small parts of the picture to the total context and to judge the effectiveness of weapons in a concrete military situation rather than an abstract
one.

"I know that many of my equipment decisions have been controversial and some may be proved mistaken. But at least we can take some credit for the fact that our three Services are now better equipped overall than those of any of our allies of similar size and wealth. In particular, the Royal Navy in the seventies will have, apart from the Polaris submarines, three new classes of surface ships—new type frigates, cruisers and destroyers as well as a nuclear attack submarine fleet superior to any other in Western Europe. Rhine Army has by far the best tank in the Western world, will have in Rapier the best air defence weapon possessed by any army and a superb range of new artillery and anti-tank weapons. After many years of reliance on two types of tactical aircraft—the Canberra and Hunter (excellent though they were)—the RAF now has a completely new range of tactical aircraft in prospect; the Phantom, Buccaneer and Harriers are already coming into service, and the Jaguar and MRCA will follow on. (Lightnings have, of course, been fully deployed in the last five years)."

Brazil's MB.326G Order

AN ORDER FOR 112 MB.326G jet trainers has been placed by the Brazilian Minis-try of Defence with Aeronautica Macchi. The aircraft are to be assembled in

Brazil under the supervision of Macchi technicians. Side by side with their manufacture, the development of another type—designed jointly by Macchi and

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the Empresa Brasiliera Aeronautica—is to take place.
The Brazilian Air Force is meanwhile

transporting an MB.326G to Brazil in a C-130 so that the type can take part in the Brazilian Air Festival taking place in Rio de Janeiro at the end of this month.

Australian Mirage Gs?
POSSIBLE ROYAL AUSTRALIAN AIR FORCE

use of the Dassault Mirage G as a variable-geometry strike/trainer aircraft and of the assembly of this type in Australia was indicated by reports recently of negotiations to this end between the RAAF and the manufac-turers. Talks have been held in France

and an Australian test pilot has flown the aircraft. In the strike/trainer role, the Mirage G would be in competition with the proposed joint British Aircraft Corporation-Commonwealth Aircraf t Corporation VG project study, the AA-107. which is proceeding. The Australians have apparently stipulated that any agreement on the Mirage G must include assembly and component manufacture in Australia.

Lockheed's Quiet Observer
DETAILS HAVE BEEN GIVEN by Lockheed Missiles and Space Company of the YO-3A "quiet observation aeroplane" (photograph, Flight last week, page 647) developed for the US Army Systems Command.

Adapted from the Schweizer SGS 2-32 sailplane, the YO-3A is powered by a 210 h.p. air-cooled six-cylinder engine which turns a six-bladed wooden pro-peller. Because the 30ft long sailplane has an unusually wide wing span of 57ft, relatively little power is necessary to keep the YO-3A airborne on powered flights of long duration.

In adapting the sailplane, Lockheed designers strengthened the wings to carry extra weight and reconfigured the air-craft from a high- to a low-wing design. They also added a conventional three-wheel landing gear with retractable main wheels. The Schweizer sailplane has a single wheel. Streamlined fibreglass fairings and cowlings have enabled the designers to keep an efficient aero-dynamic shape and also to restrict addi-tional weight to a minimum.

For more than three years Lockheed have been conducting studies and independent developmen t work in acoustic measuring techniques and quiet aircraft technology.
The YO-3A is an outcome of Lock-

heed's independently developed Q-Star, a "silent" aircraft which was designed, built and tested before Lockheed received

a US Army contract for the YO-3A.
In recent tests, the Q-Star became the first aircraft in the United States to fly using a Wankel-type rotary combustion engine developed by Curtiss-Wright. Flight test engineers report that this revolutionary engine has the potential to give more power from less weight than standard reciprocating engines and that it is inherently quieter.