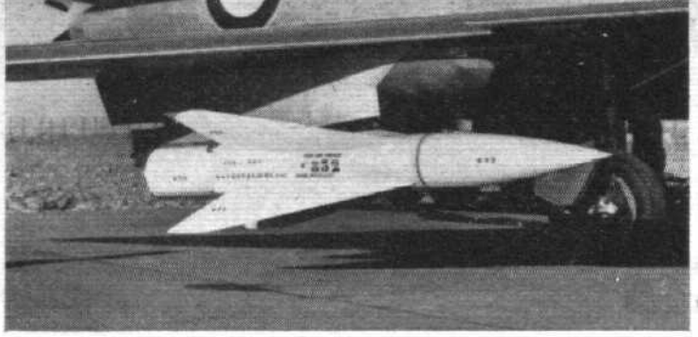
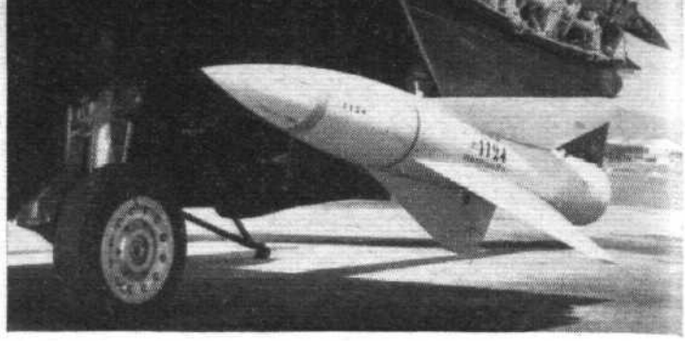


An AS.20 on a Super Mystère B.2; body, forebody (warhead) and each of the four wings bear the missile serial number (832 in this case)



An AA.20 on an Aquilon (Sea Venom derivative) of the Aéronavale, showing the proximity-fuze ring peculiar to the air-to-air weapons

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that nearly all NATO countries will use it, and it is already deployed with Fiat G.91s of the Italian Air Force and Luftwaffe. Flight trials with the AA.20 were chiefly based at Colomb-Bechar (Sahara) with Mystère IVs and SMB.2s; but the G.91 and AS.20 combination has been evaluated at Cazaux, near Bordeaux. Nord have also developed the AS.25, a radar-guided version paralleling the AA.25, but no information on its progress is available. Both the AS.20 and AS.25 are also named as part of the Northrop Rapiere weapon system.

Nord's first essay into the surface-to-air field originated around 1956, when almost every missile firm in France competed for the chance of a production contract for a weapon system in this category. Nord had plenty of business already, and entered merely because they felt—probably correctly—that they could develop a suitable weapon more quickly and cheaply than their competitors. Their missile, the ACAM 5301, bears a close family resemblance to the air-to-air weapons. In principle it is similar to the AA.25, the only superficial change being the fact that the sustainer charge, like the boost motor, has twin nozzles, both equipped with jet-deflectors for steering purposes. The 5301 was intended for use against aircraft flying at heights between 40,000ft and below 1,000ft, at up to 870 m.p.h. The sustainer burns for 24sec, and during this time guidance is effected Nike-fashion by signals transmitted from a ground radio aerial working in conjunction with a computer and a target-tracking radar. In the event, the 5301 did not achieve production; but then neither did any other French surface-to-air missile. (Photograph, *Flight*, October 23, 1959).

Nord's new air-to-surface weapon is the AS.30. It is subject to strict security classification, and the only official reference that has been made to it was the inclusion of a scale model among a display of stores which can be carried by the Mirage IIIE. The exhibit, which was displayed at the recent Hanover Air Show, suggested that the AS.30, while retaining the basic configuration of the other members of the family, has—in one form at least—wings of very low aspect ratio and square axial tips. The data given in the table are those published by Northrop and the Italian magazine *Alata;* they have not been confirmed by the manufacturer. The AS.30 is certainly large enough to have a nuclear warhead, and it seems to be interesting many countries.

To conclude the story, brief reference may be made to Nord's new surface-to-surface (and, eventually, air-to-surface) weapon designated SS.12. Although the wings are unswept, flight performance is even higher than that of the SS.11. Its size is such that if it were American it could carry a number of types of nuclear warhead, but even in the absence of such devices its blast effect is high enough for it to be highly effective against all forms of battlefield target, including the heaviest pillboxes and armoured vehicles. Too heavy to be carried by infantry, it is fired from a zero-length launcher mounted on any vehicle of Jeep size and upwards. Wire guidance is retained, and it has been found possible to employ the same type of control unit as that used in the earlier weapons. Trials with SS.12s began in the winter 1958-9, and a year ago the French Army had already obtained some experience with the weapon and found it to show extreme promise. Much may be heard of it in the future.

BLUE STEEL Mk 1

Although he was careful to say nothing specific about its development schedule, the Minister of Defence—in a written reply in the Commons on July 6—said that progress with the Avro Blue Steel Mk 1 was "going well" and that launching trials were currently taking place. Since full-scale test vehicles and a variety of smaller powered prototypes have long since been flown at Aberporth—*Flight*, March 11, 1960—Mr Watkinson doubtless was referring to tests with genuine Mk 1 missiles, complete with propulsion (in the first version, a D.H. Double Spectre rocket engine), guidance (Elliott inertial) and control systems, flown from Valiants and/or Vulcans at WRE Woomera.

The Mk I weapon, he said, will give "several years" of useful service before Sky Bolt is available. Blue Steel Mk 2, which was obviously to have been a completely new device and not just a modification, would not have been in service with Bomber Command until after the mid-1960s, "when it might well have been outmoded." Accordingly, it was cancelled "at a very early stage" last year. Instead, said the Minister, "the possibility of improving the performance of the present Mk 1 is being investigated." One London daily has suggested that the improved Mk 1 will be designated Mk 1*, and that it is really only the resuscitated Mk 2 smuggled in under a new name; but this seems an unwarranted, and most unlikely, allegation. It would only be logical commonsense to explore all avenues by which the operational effectiveness of Blue Steel Mk 1 can be improved without introducing any fundamental redesign.

SOVIET PACIFIC ROCKET

Late on July 5, Moscow Radio reported that tests of new types of "powerful multi-stage carrier rockets for space exploration" would be carried out in the Soviet Union between July 5 and 31. The statement continued:

"In accordance with this plan, one of these rockets was launched on July 5. The rocket was launched strictly on schedule. The flight of this rocket proceeded in exact accordance with the preset flight programme.

"The dummy of the last stage of the rocket, adapted for passage through dense layers of the atmosphere, reached the surface of the water in close proximity to the target, 13,000km (approximately 8,000 miles) away from the launching site. Special vessels took measurements envisaged by the programme and obtained valuable results.

"To accumulate further experimental data, the testing of powerful ballistic rockets will be continued. The rockets will fall within the boundaries of the zone indicated in the Tass announcement dated June 29, 1960."

Then on July 7 Tass announced that a second multi-stage ballistic outer-space rocket had that day been fired "precisely on time. It followed the preset course exactly and, according to special vessels in the area, the dummy nosecone hit the water right at target point. With the successful launchings . . . on Tusday and today . . . the need for continuing tests . . . no longer exists. All the necessary data has been obtained for the completion of the carrier rocket intended for the further conquest of cosmic space."

NO MORE PICTURES

The US meteorological satellite Tiros 1, after transmitting 22,952 pictures since its launch on April 1 this year, has "reached the end of its operating lifetime." The experiment demonstrated the feasibility of observing the mechanics of the atmosphere from a satellite and, although Tiros data will be the subject of detailed analysis for many months to come, the data processed to date has already made important contributions to meteorological research.

Among the most striking cloud patterns transmitted by Tiros are the large-scale cyclonic storms or vortices whose spiral bands sometimes reach over 1,000 miles in diameter. The frequency and extent of highly organized cloud systems associated with these vortices was not previously fully realized. Other pictures have indicated the presence of jet streams, regions of moist and dry air, thunderstorms, fronts and other meteorological occurrences. The experimental use of Tiros pictures in meteorological analysis is said to have resulted in increased accuracy, particularly in regions (such as over the oceans) where data is sparse.

The Tiros satellite weighs 270lb and was operating in an orbit at an average altitude of 450 miles. Of the 22,952 picture frames transmitted by it, 4,698 from the narrow-angle camera and 12,751 from the wide-angle camera were received at Fort Monmouth, New Jersey; while Kaena Point, Hawaii, received 1,117 narrow-angle and 4,386 wide-angle pictures. Of the total number received, it is estimated that over 60 per cent represent good-quality cloud-cover photographs useful to meteorological research.

A NASA statement giving this information continued:

"The decision to discontinue attempts at interrogating Tiros 1 was made after orbit 1,302 over Fort Monmouth about midnight Wednesday, June 29. The wide-angle camera system and all telemetry had ceased to function (the 108Mc/s tracking beacon continues to operate).