

## DEFENCE

## A Hole in Skynet

from a Correspondent

AN inquiry is now going on at Cape Kennedy as to the cause of the disappearance of the Skynet 1 defence communications standby satellite built under contract for the British Ministry of Defence by Philco-Ford. The successful launch by a US Air Force Delta rocket took place on August 19, but a week later when the satellite was due to be "kicked" into its 30,000 kilometre geostationary orbit above the Indian Ocean, telemetry signals failed during firing of the apogee motor (which performs the final orbital manoeuvre). The result is that the satellite may well be in its correct orbital position without anyone being the wiser. No contact has been obtained since, although hopes of tracing the satellite (presumably by radar) have not entirely faded. If traced, it is possible that the satellite could still perform its purpose—acting as a high-speed voice link for the armed services between England and the Far East if its predecessor, launched last year, ever becomes out of action. At present, the first Skynet 1 satellite is still fully active and there is a contractual bonus for each additional year in which it keeps working, up to 5 years.

Specifications for a revised, second generation satellite link for the Ministry of Defence, called Skynet 2, have already been drawn up, this time with British contractors in view. The first replacement by Skynet 2 is called for in 1973. Hawker-Siddeley Dynamics and GEC are preparing preliminary design studies, one of which is expected to be chosen later this month.

Various questions now arise. If the second Skynet 1 proves irretrievably lost, will the Ministry of Defence be able to soldier on for up to three years without a standby until Skynet 2 is ready? (It has managed without for nine months so far.) Is any compensation payable in the form perhaps of a free replacement launch by the Americans? An apogee motor is integral with the satellite, though it may be considered part of the launch. Is western security considered at risk? Upon this, as much as upon the results of the current inquiry, may depend the terms on which a further Skynet 1 is, or is not, speedily in orbit.

## BRITISH SPACE

## Dead-end Rocket

THIS week Britain has been shamefacedly and unsuccessfully trying to enter space with a rocket for which there is no future. Even the space hawks have been showing embarrassment, not joy. A satellite could have been launched by a British rocket as much as ten years ago, they were saying before the firing. Seen from Britain, the preparations of the Black Arrow rocket on the launch pad at Woomera seemed more like a wake than a step through a new frontier, and the delays, first of all because of a fault in the tracking station at Gove, northern Australia, only prolonged the agony.

Black Arrow's genealogy begins with the Black Knight research rocket that was first fired twelve years ago, with an injection of engine technology from the Blue Steel stand-off bomb. On average one Black Arrow rocket is being made each year in a programme that is costing about £3 million per year but is expected

to rise to about £5 million during the next five years. The cost of this week's rocket and its payload is believed to be in the region of £1 million. This expenditure, the Ministry of Technology would say, will buy prestige that will help the electronics industry, even though satellites have already been launched by five other countries including the arch-competitor, Japan. Later Black Arrow launchings of technological satellites to test new solar cells and the like, Mintech says, "will represent a major step in the development of application satellites". Yet it is inconceivable that Black Arrow could ever launch a satellite into a geostationary orbit, and this is where communications satellites have to be. Even with four Skylark rockets strapped to the first stage, a scheme being considered to double the payload to about 400 lb., Black Arrow could not carry a geostationary satellite and the additional motor to get it there.

What then will Black Arrow achieve? At best it has kept Britain's hand in, an insurance policy to mature when British space policy extricates itself from the two stools between which it has fallen. Either Britain will have to go in with the Europeans, in a more full-blooded scheme than has existed so far, to exploit the technology that is available for scientific and commercial use, or remain at the present level, launching satellites that belong to the first decade of space research. Space technology has gone beyond the Black Arrow stage to heavy communications satellites and the observatory type of scientific satellite.

## URANIUM

## How Much Ore in Scotland?

IT would be premature at this stage to see the makings of a new "uranium rush" in the disclosure last week that deposits of uranium ore in northern Scotland are substantially more widespread than had hitherto been considered. Although a survey for uranium, being carried out for the Atomic Energy Authority by the Institute for Geological Sciences, has shown indications of significant quantities of uranium minerals around Ousdale, Helmsdale and Brawlbin in Caithness there is still no hint of commercially viable deposits on the evidence so far.

In one area near Ousdale, however, a zone of something over a kilometre in length was located containing quantities of uranium ore. Anomalies in surface and below-surface radioactivity were detected in several other neighbouring areas and in their first report of the findings Dr S. H. U. Bowie, Mr D. Ostle and Dr M. J. Gallagher point out that there is certainly enough evidence to warrant further investigation of these areas.

The Atomic Energy Authority are looking to established mining interests to follow up this challenge. Although the British nuclear power industry spends at present only about £7.5 million a year on uranium concentrate this figure is increasing all the time, and the AEA are obviously conscious of the long-term saving which a substantial uranium find would offer.

The survey reported by Dr Bowie and his colleagues was the first part of a five-year reconnaissance announced by the Minister of Technology in March 1968. It is being carried out by a team of twelve qualified staff on a grant of £250,000. One of the interesting features is the amalgam of techniques