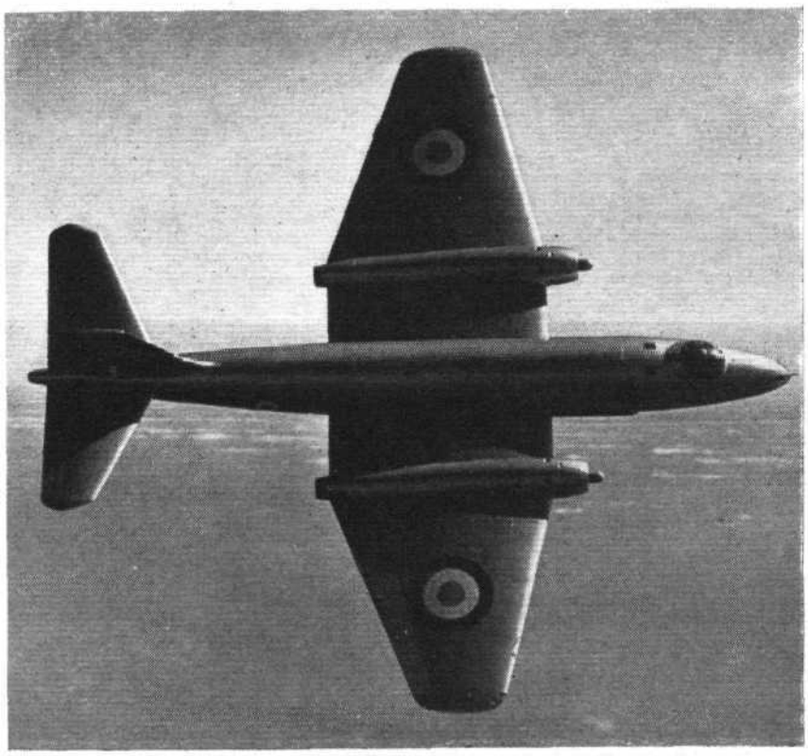
the navigation of the aircraft to its target and for the automatic control of the bombing run. Operational details are, understandably, restricted, but the weight is 1,457 lb, bulk 30 cu ft and cost $300,000 (over £107,000). During the development period of the present equipment computors and related items were installed in "environmental chambers," there to be attacked by fungi, shaken by explosions, exposed to sleet and heavy rains, whipped by dust and subjected to extreme altitude conditions—all in temperatures ranging from minus 65 deg to 180 deg F. The BRANE system is said to have been developed with a sharp eye to reliability in view of frequent unserviceability with the earlier K-bombing system in the B-36 and B-47.

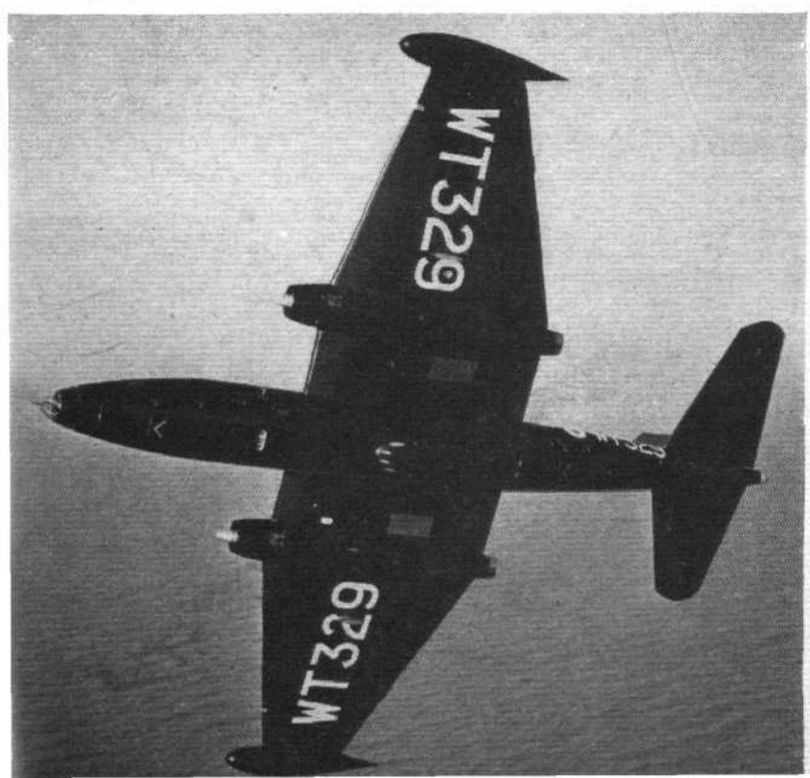
It would appear that BRANE is not the only bombing/navigation system used on the B-52, for the Sperry Gyroscope Company says that its MA-6A system and associated A-14 automatic flight control are likewise specified. (The MA-6A is described as a modified version of the K system.) It is further announced that the IBM system is scheduled to be adopted when suitable production models become available. This will be used on about half the B-52s now on order.

Provision is made, or is being made, in current B-52s for flight refuelling by the flying boom method, though "built-in" range is believed to be over 6,000 miles. For the present, however, the B-52 is handicapped by having to take its fuel from piston-engined KC-97s flying at some 25,000ft and 300 m.p.h. Thus, until the arrival of the jet-propelled Boeing KC-135s, which will be able to refuel up to 550 m.p.h. and 40,000ft, it must sacrifice some range in order to make contact with its piston-engined replenisher.



English Electric Canberra B.6.

English Electric Canberra B(I)8.



The B-52's take-off speed is lower than that of the B-47, acceleration is much the same, and the "52" cruises faster and higher. Accommodation is such that "short walks" are possible for relaxation. Control forces are slightly heavier on the "52," but considerably lighter than on other machines of comparable size. They are, in any case, light enough to be handled with one hand on the approach. The pilot has no aerodynamic indication of when the bomb doors are open. The undercarriage can be used as a speed brake at high Mach numbers, and the spoilers can be operated symmetrically for additional braking effect. Transitional crews, however, learn to apply the brakes with care, especially at high speed and high altitude, as sharp pitching moments can be inducted.

Boeing B-47E Stratojet The "E" model of the Stratojet continues in production at Tulsa (Douglas), Wichita (Boeing), and Marietta (Lockheed). It is expected, however, that the type will be phased out at the first two plants in December this year and at Marietta in March 1957. At the time of writing some 3,000 machines of the "E" and earlier sub-types must have been completed, and the requirements of Strategic Air Command were fulfilled several months ago. Surplus machines were then diverted to Tactical Air Command for the installation of "buddy system" air-refuelling kits.

"Built-in" range of the standard B-47E is considerably more than 3,000 miles, and this has been extended in recent months by the fitting of extremely large under-wing tanks, holding 1,870 U.S. gallons, which are jettisoned with the aid of 8ft parachutes. The conventional bomb load is about 20,000 lb and tests have been made from B-47s with Bell Rascal guided bombs. Defensive armament is two 20 mm guns installed in a remotely controlled tail turret developed by General Electric. In danger areas the turret radar is switched to "search" and if an attacking fighter shows on the screen it is automatically tracked until, having come within range, it is engaged by the B-47's guns. The B-47E is reported to have the Y-4 periscope bomb-sight, which device alone contains 3,433 parts.

For take-off the six General Electric J47-GE-25 turbojets give 7,200 lb thrust, with water injection, and this output can be augmented by the fitting of 33 assisted take-off rockets of 1,000 lb thrust each.

Span, 116ft; length, 106ft 8in; max. speed, about 630 m.p.h.; gross weight, about 202,000 lb.

Boeing TB-47J Stratojet A small number of these machines were built as crew-trainers for B-52s, having the MA-2 bombing system developed primarily for the larger machine.

Convair B-36J Nearly 400 B-36s of various models were built at Fort Worth before production ceased in 1954 and the type is expected to continue in service with Strategic Air Command until well into 1958. The "J" was the last of the "straight" bomber models and had a strengthened undercarriage permitting gross weights in excess of 400,000 lb. Powerplants are six Pratt and Whitney R-4360-53 piston engines and four General Electric J47-GE-19 turbojets, giving a top speed well over 400 m.p.h. and a service ceiling above 45,000ft. Range is officially quoted as 10,000 miles with 10,000 lb of bombs (dropped midway) and maximum bomb load is 84,000 lb. Sixteen 20 mm guns are installed in retractable turrets controlled by a General Electric central fire-control system. The crew numbers fifteen.

Span, 230ft; length, 162ft.

Convair B-58 Unofficially known as the Hustler, the B-58 is likely to be the world's first supersonic bomber. A delta, it has a wing of extreme thinness—probably of 4-4½ per cent thickness/chord ratio—and is powered with four General Electric J79 turbojets, each of about 15,000 lb thrust, podded two above and two below the wing. These are constant-speed engines and are said to give good acceleration and to provide full hydraulic power for the power-control system on the landing approach. Each pod has a central spike to force an inclined shock wave ahead of the automatically controlled air intake for efficient recovery of ram-air at supersonic speed. The fuselage is slender and houses a crew of two, the bomb load, fuel and the bogie undercarriage.

The original programme called for 30 B-58s, but this quantity is said to have been cut to 13 "because of anticipated performance difficulties." Of the 13 four are to have airborne electronic countermeasure equipment developed by Waltham Laboratories.

U.S.S.R.

"Bison" The Allied code-name Bison distinguishes a very large four-jet bomber, first observed in 1954 and now established in squadron service. Having a span of about 175ft, the wing is of high aspect ratio and carries in its inboard sections four staggered turbojets generally reckoned to be of some 15-18,000 lb thrust apiece. Gun armament appears to be carried in nose and tail stations. The main undercarriage is probably of the bogie type.

"Bear" A somewhat smaller machine than Bison, having a span of perhaps 145-150ft, the Bear distinctly resembles the Boeing B-52 in layout but is unique among bombers in having four turboprops, driving counter-rotating airscrews. Extensions of the inboard nacelles are thought to house the main undercarriage units.

"Badger" This counterpart of the Boeing B-47 is thought to have been in service since 1953 and a formation of over 50 was seen in public last July. The wing, powerplant installation and tail are essentially similar to those of the now-familiar Tu-104 transport.

Only two turbojets are fitted—snugly into the fuselage flanks—and they are thought to be rated at 15,000-18,000 lb thrust. The stalky, bogie undercarriage units retract rearwards into nacelles on the trailing edges of the wing, and provision is made on the Tu-104 for a braking parachute. Maximum speed of the Badger may be nearer 600 than 500 m.p.h. and range is probably in excess of 3,000 miles. Bombing radar is installed, and there is a manned tail turret, presumed to house 20 mm armament.

Span, about 120ft; gross weight, over 120,000 lb.