THE AMERICAN INDUSTRY . . .

Monte-Copter Inc, *Box 67, Boeing Field, Seattle 8, Washington.* Smallest amphibious helicopter yet built, Monte-Copter's Model 15 Triphibian stems from a seven-year research programme. It is an extremely neat and simple three-seater with a cold-jet rotor, the air for which is supplied by a Continental Model 141 turbo-generator. The hull is of glass-fibre, and small delta wings off-load the rotor in flight and carry combined fuel tank/floats at the tips. Testing of the prototype began in February this year.

Mooney Aircraft Inc, *Louis Schreiner Field, Kerrville, Texas.* Current production version of the Mooney lightplane is the four-seat Mark 20A, of which 211 were sold in 1959. It has a 180 b.h.p. Lycoming O-360 and will be joined soon by the Mark 21 with a 250 b.h.p. engine. A twin-engined version, designated Mark 22, is in the project stage.

Morrisey Aviation Inc, *Orange County Airport, Santa Ana, California.* Bill Morrisey, who test flew the big C-124 Globemaster as chief test pilot to Douglas at Long Beach, formed this company to build a diminutive tandem two-seat utility monoplane with 150 b.h.p. Lycoming engine, which he calls the Morrisey 2150. Dual controls are standard; optional equipment includes radio, full blind-flying panel and anti-collision beacon, making it a very useful trainer or light executive runabout. Deliveries began in June 1958.

Nelson Specialty Corp, *440 Peralta Avenue, San Leandro, California.* This company manufactures the 43 b.h.p. Nelson H-63C four-cylinder horizontally-opposed two-stroke engine, which is certificated by the FAA for helicopter applications. It is a slightly modified development of the H-63B fitted in the Hiller YROE-1 Rotorcycle.

Norair Division of Northrop Corp, *1001 East Broadway, Hawthorne, California.* Norair is concentrating most of its efforts at present on developing and trying to sell its N-156 family of lightweight supersonic aircraft. The idea of using one brilliantly engineered basic design to produce a number of variants has been vindicated in the case of the two N-156 series aircraft now flying. The first of them—the T-38A Talon tandem two-seat basic trainer powered by two 3,850lb s.t. afterburning J85-GE-5 turbojets—has M1.3+ performance and handles so well that the USAF has had no hesitation in ordering it as standard training equipment to replace the T-33. Initial orders received to date are for 69, and the T-38 will become operational next January, only 21 months after the first flight of the prototype.

No production orders have yet been received for the single-seat N-156F Freedom Fighter, with the same basic airframe and powerplant as the T-38, but its heavy armament and promise of eventual M2 performance make it a very attractive proposition.

Norair continues to manufacture the Snark air-breathing intercontinental guided weapon on a small scale, to maintain SAC's only full-strength and fully-effective long-range missile attack unit.

North American Aviation Inc, *International Airport, Los Angeles 45, California.* A year ago, North American was working on two M3 military aeroplanes, the F-108 Rapier and B-70 Valkyrie, under the biggest and most costly piloted-aircraft development programmes ever undertaken. The F-108 was cancelled; and the B-70 was cut back to a "hollow" prototype airframe, gutted of all its highly advanced operational equipment except for the IBM stellar/inertial bomb-nav system.

Even a company with 63,000 employees and an annual income of over $1,000m could not fail to feel the effects of such a blow. One result is that its Los Angeles Division now has only a single type of aircraft in production—the T-39 Sabreliner twin-jet utility trainer (two P & W JT12s), of which 42 have been ordered to date. The first production T-39 flew last month.

Another Los Angeles product in the news recently was the first of the three X-15 research aircraft. Released from a B-52 near Edwards AFB, it attained a peak speed of 2,196 m.p.h. during a flight programme that should carry it to nearly twice that speed when it gets its definitive 57,000lb Reaction Motors XLR99 rocket engine instead of the two 6,000lb LR11s now fitted.

Columbus, Ohio, Division is not badly placed, with contracts for the A3J Vigilante and T2J Buckeye, which will become respectively the standard attack bomber and standard basic trainer of the US Navy. The Buckeye has been in service for some months. About 15 of the beautiful M2 Vigilantes have flown, and these are being used to develop operational systems and techniques such as the linear weapon delivery, under which nuclear bombs are ejected through a tunnel between the jetpipes of the J79-GE-2 engines.

NAA's Missile Division at Downey, California, began delivery of GAM-77 Hound Dog stand-off bombs to SAC last December, and the first launch of a production missile from a B-52G Stratofortress was made on March 1 this year.

Other Divisions include Autonetics at Downey, producing equipment such as NASARR search and range radar for the F-104G and inertial guidance systems for the Hound Dog and Minuteman ICBM; Atomics International, which is responsible for the company's nuclear engineering activities at Canoga Park, California; and Rocketdyne, which is dealt with separately in this survey.

Oakland Airmotive Company, *Oakland International Airport, Oakland, California.* Oakland offers to Bonanza owners a modification service under which their aircraft can be converted quickly into a light-twin known as the Super-V. The work is confined to those portions of the airframe forward of the firewall and main wing spar and does not involve removal of the wing or undercarriage. With two 170 b.h.p. Lycoming O-360 engines, the Super-V has a full payload range of 1,400 miles at 190 m.p.h. A version with 208 b.h.p. Lycoming IO-360 engines is under development.

Another Oakland conversion is the Centaurus, an 8/14-passenger executive transport based on the Lockheed Harpoon airframe.

Omega Aircraft Corp, *Municipal Airport, New Bedford, Massachusetts.* Omega flew the first production model of its BS-12D utility helicopter, with two 235 b.h.p. Lycoming O-540 engines, in August 1959. It was one of three ordered by Aero-Copters Aero-Boeing; others have been sold to Okanagan Helicopters and unspecified operators. Specially designed for flying crane duties, the BS-12D carries either 1,000lb of freight or four passengers in addition to the pilot.

PacAero Engineering Corp *(Subsidiary of Pacific Airmotive Corp), 3021 Airport Avenue, Santa Monica, California.* Under subcontract to Allison, PacAero is converting Convair 340/440 transports to Super Convair standard, by replacement of the original piston-engines with two 3,750 e.s.h.p. Allison 501-D13 turboprops, driving Aeroproducts airscrews. Sixteen conversions are reported to be under way—five for Lake Central Airlines and the other for corporate operators. PacAero is also responsible for conversion of Lodestar aircraft into Learstar executive transports and has the licence to convert ex-USAF North American T-28A trainers to Nomad standard for civil or military use.

Philco Corp, *Government & Industrial Group, 4700 Wissahickon Avenue, Philadelphia 44, Pennsylvania.* Philco is responsible for production of the infra-red homing Sidewinder, most widely used air-to-air missile in the world. Many thousands of the AAM-N-7/GAR-8 version have been supplied to the US Navy, USAF and foreign air forces, and the Chinese Nationalists have used Sidewinders in action against Communist MiG fighters over Formosa Straits with considerable success. Improved versions are being developed and built under USN Bureau of Ordnance contract.

Other guided weapon work by Philco includes the design and manufacture of infra-red guidance for the Convair Redeye and of fuzes for a large proportion of the operational US missiles.

Piasecki Aircraft Corp, *Island Road, International Airport, Philadelphia 42, Pennsylvania.* Piasecki's success with its single-turbine Model 59K (VZ-8P) VTOL research "flying jeep" has been rewarded with a US Army contract for the improved Model PA59H, with two 425 s.h.p. Artouste shaft-turbines and powered wheels for improved mobility on the ground. A four-seat commercial version is projected under the name Sky Car.

These Piasecki machines are true VTOL aircraft, capable of flying high, as opposed to ground-effect vehicles. Other VTOL prototypes are under development, including the 260 b.h.p. Lycoming-powered PA-4A Sea Bat radio-controlled drone, which has been flying since November 1957, Piasecki has a technical interchange and licensing agreement with the French Breguet company and the two companies are collaborating closely in the development of the Breguet 941 deflected-slipstream STOL transport. Piasecki's extensive electronic interests are handled by its Mayfield Division.

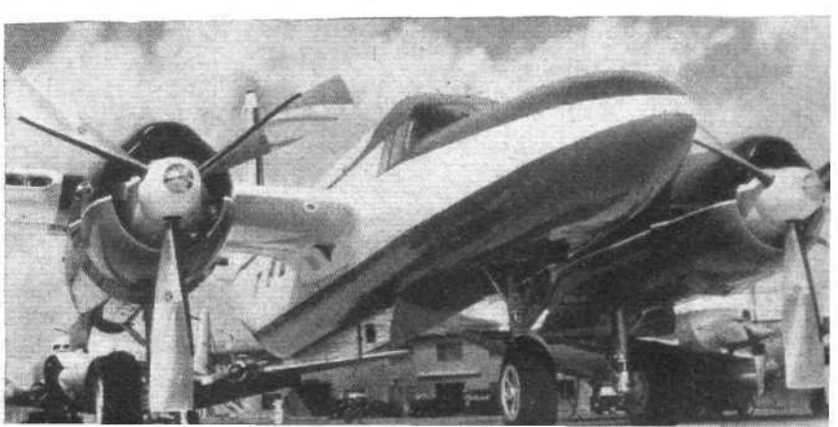
The Piper Aircraft Corp, *Lock Haven, Pennsylvania.* Piper delivered its 50,000th aircraft last November and can claim to have built more commercial aeroplanes than any other manufacturer in the world. Its sales in 1959 included 311 twin-engined 4/5-seat Apaches, 995 four-seat Comanches, 676 four-seat Tri-Pacers and Caribbeans, 470 two-seat Super Cubs and 78 Pawnee agricultural aircraft. These types have been joined in production by the five-seat Aztec, which uses many components of the Apache but has 250 b.h.p. Lycomings instead of the latter's 160 b.h.p. engines. Its qualities are underlined by a US Navy off-the-shelf order for 20, which will be used for general utility and administrative duties under the designation UO-1. The Apache itself has appeared recently in much-improved guise as the Apache G.

All current models except the Super Cub and Pawnee can be fitted with Piper's AutoControl lightweight automatic flight system, which played a big part in enabling Max Conrad to set up his remarkable distance and endurance records in a Comanche.

The Pratt & Whitney Aircraft Division of United Aircraft Corp, *East Hartford 8, Connecticut.* Whilst extending its range of gas-turbine engines over the past year, Pratt & Whitney has also recorded considerable success with other forms of propulsion. According to the USAF, the company has made such strides in the development of an indirect-cycle system for a manned nuclear-powered aircraft, at the Air Force-owned Connecticut Aircraft Nuclear Engine Laboratory (CANEL), that such an aircraft is now entirely practicable.

At its Florida Research and Development Center, Pratt & Whitney has made full-scale tests of America's first liquid hydrogen/liquid oxygen rocket engine—the 15,000lb s.t. LR115 which will power upper stages of both the Centaur and Saturn space vehicles. Another engine tested at the Center is the advanced single-spool J58 turbojet, in the 30,000lb s.t. class, which has demonstrated its ability to operate at a speed of M3.

The company's major production engine continues to be the J57 turbojet in its various military and civil variants, including new JT3D



Typical of the complete rebuilds for the business flying market is the Tempo II, by LB Smith of Miami, out of Douglas Invader