Vertical Takeoff Aircraft Needed To Aid Travelers

New York, N.Y.—(Scientific American Feature)— With jetliners approaching supersonic speeds and airports moving even farther from urban centers, the traveler now frequently spends more time getting to and from the air terminal than in making the intercity portion of his flight.

This situation is bound to get worse, according to John P. Campbell, head of the Dynamic Stability Branch of the Langley Research Center, National Aeronautics and Space Administration, as technology continues to accelerate the pace of the jet age.

"In some places," says Campbell, "helicopters are helping to bridge the gap between downtown and the local airport. The use of these air taxis will doubtless increase. For journeys up to a few hundred miles, however, a relay of three aircraft is hardly the ideal situation. What we need is an aircraft capable of taking off vertically and then flying to the desired destination. To meet this problem active research on vertical takeoff and landing (VTOL) aircraft is in progress both here and abroad.

Problem Simple Enough

"The engineering problem is simple enough in its essentials. A VTOL aircraft must push a mass of air downward to produce the upward lift or thrust required for hovering flight. The amount of thrust is proportional both to the mass of air that is moved and the speed with which it is moved. In other words, the upward thrust is proportional to the mass of the air moved multiplied by the velocity of that movement. Thus the same thrust can be attained by moving a large mass at low speed, or a small mass at high speed. The power consumed, however, varies as the mass multiplied by the square of the speed. The logical approach of the early VTOL aircraft designer was therefore the large, slow spinning rotor of the helicopter — that engaged a large volume of air. Unfortunately, the very feature which makes the helicopter efficient in hovering flight — the large, slow moving air mass—militates against efficiency when the vehicle is required to fly horizontally at high speed. Thus, the requirements for vertical and horizontal flight appear to be contradictory. A machine designed to do one most efficiently is not very good at the other. Why not use both wing and rotor to obtain the advantages of each?

Design Investigated

"In effect, this is just what several designers are doing. Some years ago an American company successfully demonstrated an aircraft equipped with rotors for takeoff and landing that employed propellers and a conventional wing for horizontal flight. This design is still being investigated together with a number of alternatives. In some of these the blast of a jet is deflected downward by flaps for takeoff and directed backward for horizontal flight. Other designs feature propellers on the leading edge of a wing that rotates into the vertical for takeoff and is leveled for cross-country flight. In another and relatively new propulsion unit, the so-called 'ducted-fan,' propellers are surrounded by a ring or duct that alters the shape of the slip stream so as to increase the mass of air engaged and thus achieve the essential lift with reasonable fuel economy.

"It is too early to predict accurately which of these variations will be most successful. The helicopter will probably remain the first choice for short-range, low-speed operation and for applications that involve a large proportion of hovering time. But the need for a machine intermediate between the time-honored helicopter and the ultra-modern jet is so urgent that we may confidently look forward to the early development of the VTOL. When perfected the new craft is certain to bring about revolutionary developments in both military and civil aviation."

Puzzles of Solar System May Yield To Probe of Radar

New York, N. Y. — (Scientific American Feature) — Are the "canals" of Mars long marshes or simply the scars of planetary evolution? Do the heavy clouds surrounding Jupiter mask the solar system's mightiest volcano? How far does the sun's atmosphere extend into space?

These and many related puzzles of the solar system, that have long eluded scientists, may soon yield to the penetrating eye of radar, according to Von R. Eshleman and Allen M. Peterson, associate professors of electrical engineering at the Radioscience Laboratory of Stanford University.

Preliminary tests have recently demonstrated that radar, developed primarily for detecting close objects, can outstrip the optical telescope in revealing the surface details of objects within the solar system.

"It may well be," say Drs. Eshleman and Peterson, "that before fully instrumented space observatories make their journeys, many of the questions they are designed to answer will be resolved by the use of radar in astronomy; that is, by the use of radio signals that man himself chooses to transmit. Such signals make direct contact with the objects of study and return to the sender.

"It is as though the astronomer could reach out and touch the objects as well as see and hear them. When the radar pulses encounter a solid body or a gaseous region, they are distorted in significant ways. Depending on the nature of the object they meet, they are in varying degrees scattered, absorbed, retarded, polarized, refracted and reflected. The minute fraction of the pulse energy that returns to the antenna can then be compared to the original signal, revealing new information about the body or region that distorted them.

"The use of radar to detect distant objects has progressed rapidly in recent decades. The pulses were first used 35 years ago to probe the ionized layers in the upper atmosphere. In 1946 radio contact was first established with the moon. Twelve years later a radar system 10 million times more sensitive sent a round-trip signal to Venus. Last year, radar echoes were detected from the sun. Refinements currently under way will enable us to determine surface details; whether specific regions of a planet consist of sand, boulders, mountains or water waves and to determine the presence or absence of features of uniform orientation and length such as vegetation.

"With this equipment it should be possible to map in some detail the size and shape of optically faint markings and to determine something about their electrical and physical characteristics. Radar waves will penetrate the fog that envelopes Venus and will return with information about that planet's surface. It should be possible to investigate the large-scale surface features and to see if there are oceans, continents, polar ice caps or mountain ranges. The same measurements would also show the length of the Venusian day and the inclination of the planet's axis. Similar facts should be revealed concerning the other planets. Simultaneously, we will be able to refine the present rough measurements of the solar system's geometry and the nature of the interplanetary gases.

"Radar astronomy cannot solve all of the riddles, of course. Answers to many questions about the solar system will come only from highly sophisticated satellite probes. But radar astronomy will enhance the design and the planning of these enterprises by providing advance insights and will augment their results by continuity of observation.

"The radar installations will also play an important part in maintaining communications with far-traveling vehicles. Using only 5 per cent of the national expenditure for space exploration, very large-scale advances in the facilities for radar astronomy would be possible. One other fundamental ingredient is also badly needed, namely, young scientists of imagination and ability to work in this new discipline."

Murder Trial Opens In Marion County

Salem-(UPI)-The first degree murder trial of James Bird Borden, 35, opened in Marion County Circuit Court Wednesday, the first in Salem in more than five years.

Borden is accused of the strangulation murder July 4 of Mrs. Maxine Spratt. He was on parole from the State Hospital at the time.

The man has pleaded innocent by reason of insanity.

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Soup Mix	Lipton's Tomato Vegetable	2 oz. pkg.	31c
Del Monte Corn	Cream Style or Kernel	5 303 tins	$1
Pineapple	Enchanted Isle Crushed & Tidbit	5 15 oz. tins	$1
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Instant Coffe	Safeway Top Quality	10 oz. jar	$1.49
Rolled Oats	and Minit Peacock	9-lb. pkg.	98c
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Spencer Steak	Boneless "USDA CHOICE" Beef	lb.	$1.49
Ground Beef	Perfect for meat loaf	lb.	49c
Pork Sausage	Safeway; lightly seasoned	lb.	49c
Sea Scallops	Capt. Choice Quick-Frozen	7-oz.	45c
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Rump Roast "USDA CHOICE" Beef, bone-in lb. 79¢

Rib Roast Standing Cut "USDA CHOICE" Beef lb. 79¢

Round Steak & Swiss "USDA CHOICE" Beef lb. 79¢

Corned Beef Safeway Boneless Brisket lb. 69¢

Sliced Bacon Del Monte "Sweetheart" Lean streaked 1-lb. pkg. 59¢

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Model Airplane Cement Ingredients Can Be Dangerous

Washington — (Science Service) — The Food and Drug Administration is getting letters from different parts of the United States concerning dangerous ingredients of model airplane cement.

A typical case is that of a 13-year-old boy recently arrested in El Paso, Texas, who was "high" from sniffing a cloth soaked in model airplane "glue."

The FDA expects that the new Federal Hazardous Substances Labeling Act, passed by Congress this year, will be a help in protecting innocent youngsters from the dangers of inhaling solvents that could cause kidney, liver or blood damage. The Act provides that court action to enforce the law will begin in February, 1961.

Depressive Effect

Any effective solvent for plastics is likely to have a depressive effect on the central nervous system. Therefore, parents are warned to tell their children not to inhale fumes from cements used in making model planes.

One of the solvents used is Methyl Cellosolve (ethylene glycol monomethyl ether) which is rated as poisonous.

Gasoline or benzine were formerly used as solvents for these cements, but even these older solvents were hazardous. Not only can gasoline cause a jag, as youngsters have discovered from uncapping and sniffing the gasoline tanks of parked cars, but there is an explosion and fire hazard.

Information on Labels

When FDA starts to administer the new labeling law, the following information must be put on the labels of hazardous products:

1. Name and place of business of the manufacturer, packer or seller.
2. The common or usual name of each component that is toxic.
3. The signal word "Danger" must appear on substances extremely flammable, corrosive or highly toxic as defined in the Labeling Act.
4. The signal words "Warning" or "Caution" on all other hazardous substances.
5. An affirmative statement of the hazard, such as "flammable, vapor harmful, causes burns, absorbed through the skin," or similar wording that describes the hazard.
6. Instruction when appropriate or necessary for first aid.
7. The word "Poison" if the substance is highly toxic.
8. Instruction for handling or storage of packages, which require special care.
9. "Keep out of reach of children" or the practical equivalent of this statement.
10. All must be in English and prominent on the label, made conspicuous by typography, layout and color.

Hazardous substances which do not meet the labeling requirements are deemed misbranded under law may not be shipped in interstate commerce.

Capsules Seen as Crop Fertilizer

Madison, Wis. — (Science Service) — Plastic-coated fertilizer capsules may be used in some crops in the future to provide controlled release of plant nutrients, according to University of Wisconsin researchers.

University soil specialists O. J. Attoe, L. E. Engelbert and W. C. Dahnke said that such controlled release of nutrients could be highly valuable in fertilizing grass for pastures, lawns and golf courses. The fertilizer effects would be spread over a longer time, supplying nutrients as they are needed throughout the growing season, rather than providing a surplus right after fertilizing and a shortage later in the season.

In experiments, the three researchers found that plastic coated fertilizer capsules gave a much more uniform growth of grass throughout the growing season. In regular fertilizing, the part of the fertilizer which is not used in the first crop is only partly available to succeeding crops, because water, soil bacteria and minerals in the soil remove some of the nutrients or make them unavailable to plants. A slow release of the nutrients would help overcome this.

Mechanical details will have to be worked out and tested before the process of plastic coating can be practical for fertilizer manufacturers, the researchers said.

Yakima Valley Strike Spreads

Yakima, Wash. — (UPI) — Members of Fruit and Vegetable Packers Local 760 of the Teamsters Union have extended their strike to five more Yakima warehouses.

That brought to 18 the number of warehouses being picketed by the strikers.

James Farrington, secretary-treasurer of the local, estimated that 1,000 members of the union have been affected by the strike.

He said the union has advised the Federal Mediation Service that it was available to resume contract negotiations with warehouse operators "at any reasonable time."

The warehouses have been operating with full crews despite the pickets.

DAV FOUNDER DIES

Charlevoix, Mich.-(UPI)-Robert S. Marx, 71, founder and first national commander of the Disabled American Veterans, died Tuesday.

What Is The Law?

This column is prepared as a public service by the College of Law, Willamette University, Salem, to explain basic legal principles, not to provide legal advice. The reader is cautioned not to apply these cases to his own problems without an attorney's advice, for differing facts may change the outcome.

Recovery of Damages from Emotional Suffering Difficult

Maude, suffering from bursitis in her right shoulder, was given X-ray treatments by Dr. Breckman. Sometime later her shoulder began to itch, scab, and blister. Then she went to Dr. Johnson, a dermatologist, who diagnosed her condition as chronic radiodermatitis caused by the X-ray treatment. Dr. Johnson told Maude she should have her shoulder checked every six months because it might become cancerous.

Maude then became terribly afraid that she would finally develop cancer from the radiation burn. She sued Dr. Breckman not only for the actual injury to her shoulder, but also for the mental and emotional distress caused by her fear of possible cancer. Can she recover damages?

More Difficult Question

Assuming that Dr. Breckman did not use reasonable care in X-raying Maude's shoulder, she can recover for the physical injury. Whether she can recover for her emotional suffering is a much more difficult question. One can generally recover damages for emotional distress when it is the direct and immediate result of negligent physical injury.

Some courts have denied recovery for mental distress where the defendant did not touch or hit the plaintiff or cause any physical "impact" on the plaintiff's body. Other courts have allowed recovery even where there was no "impact." In any event, almost all courts agree that if the defendant's negligence does not cause some physical injury, such as a broken bone, a heart attack, or other illness, that the plaintiff cannot recover for more mental distress.

Where there is physical injury, the injured person can recover all mental distress accompanying mental suffering. (However, if the infliction of mental distress is intentional, rather than merely careless, in some cases the plaintiff may be able to recover for mental suffering unaccompanied by any physical injury.)

Damages Allowed

Dr. Breckman did inflict direct physical injury on Maude and her mental suffering was a result of the injury. However, she did not start to worry until two years later when a third person to whom she had gone for treatment, Dr. Johnson, informed her that the X-ray burn might lead to cancer. Nonetheless, the New York court allowed her to recover damages for her mental suffering as well as the physical injury to her shoulder.

It must be remembered, however, that in any law suit for damages for mental distress the court will be very strict in requiring the plaintiff to prove the mental distress and harmful effect on him. No one can recover damages just because he is slightly disturbed about something the defendant did or said to him.