"THE darn thing will never work." This is the challenge which I heard back in November, 1949, during a discussion of model airplane types. And with this began a balsa chopping escapade that led to the first jet powered Autogyro. Success started early in that the first model was flown during December of 1949. It has taken five models, including the mock-up used during the early stages, to build up to the present degree of success.

It had been assumed that the torque free operation of the Jetex would simplify the flight pattern. Early flights showed this to be a fallacy. The gyro vanes develop a tremendous amount of torque and it would be desirable to have powerplant torque as a counteracting agent. In lieu of this, it was necessary to increase the span of one wing panel to account for the lift displacement. Rotor vanes are on piano wire struts which allow them to change coning angle and add to the stability.

Construction

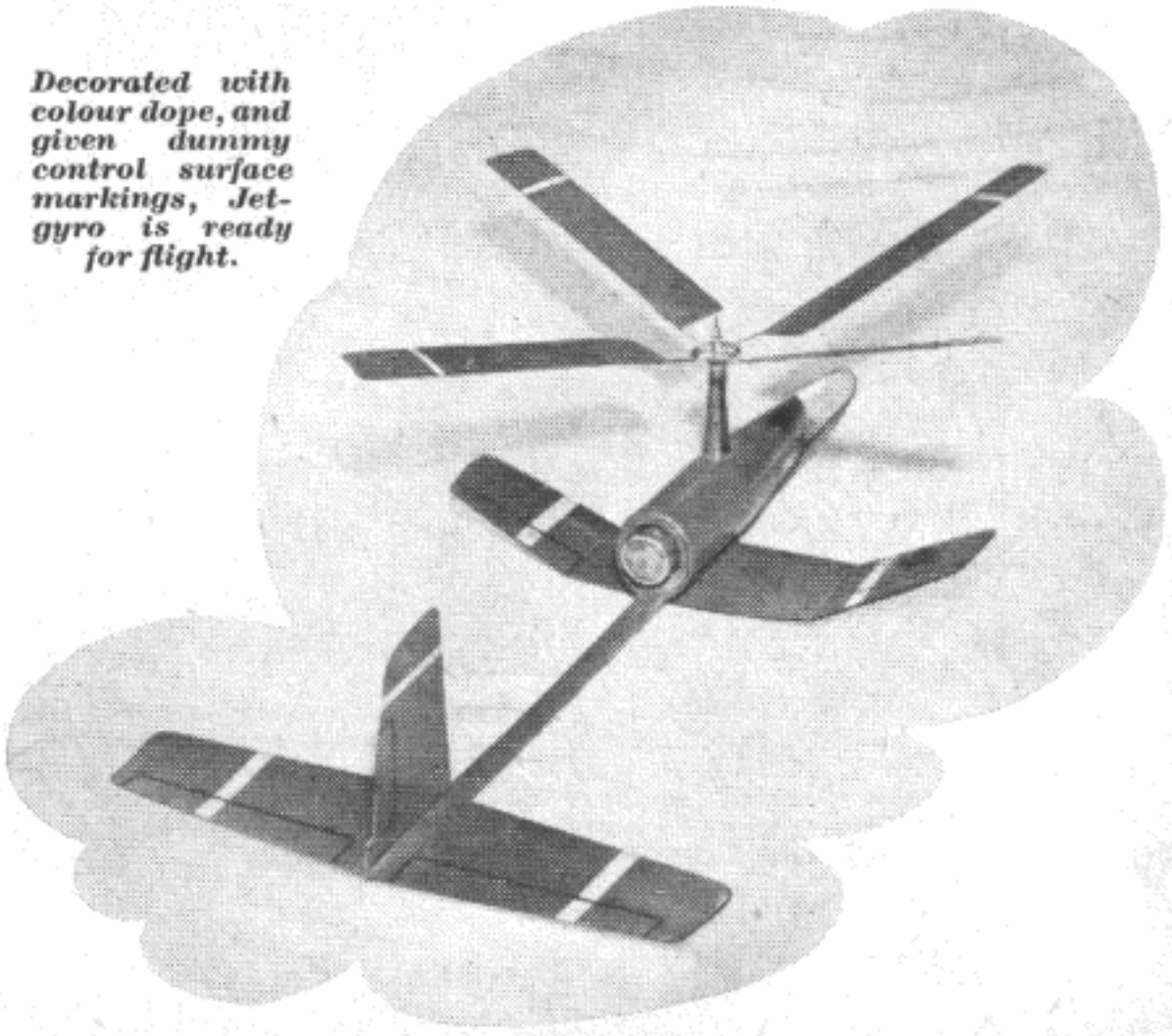
The basic fuselage construction consists of a sheet balsa frame, a pylon and two formers. Note that the motor mounting former, or firewall, is made of $\frac{1}{8}$ plywood and is made to accommodate the motor mounting screw. Mount these parts as shown in the fuselage assembly drawing. Having done this, two soft blocks are added forward of the firewall and then the rear section is planked with $\frac{1}{16} \times \frac{1}{4}$ strip balsa. Minimize weight by thoroughly sanding all of the parts and use light weight stock on the entire superstructure.

Wing and tail panels are cut from soft, quarter-grained sheet. The airfoil is sanded into the wing before it is cut at the dihedral breaks. Note that the tailplane airfoil will be mounted inverted.

Rotor vanes are cut from $\frac{1}{16}$ sheet stock and are sanded to an airfoil shape. Cloth patches are cemented over the rotor vane struts to reinforce the assembly. A large face bushing was used for the rotor hub but a disc of sheet brass, or other solderable material, may be substituted. Drill four small holes to accommodate the rotor struts and then use a liberal amount of solder to assemble this unit. After assembly add $1\frac{1}{4}$ inches of dihedral to each rotor vane. Use a piano wire shaft and a ball bearing washer to provide free-rotation.

First flight tests should be made during calm weather. It is easier to analyse flight under these conditions. Warp the rudder for a slight right turn and test glide the model over a soft, grassy area. The glide should be a near vertical descent. Trim the balance of the model until this occurs. A stalled condition will appear as a tendency to drift back toward you. Reaching satisfaction on this point you are ready for a power flight. Insert a loaded unit and light the fuse. After letting the thrust build up, start running slowly holding the nose of the model up at a slight angle. This is done to get the vanes rotating. Release the model—do not throw it. With proper trim the model will bank rather tightly and spiral up in a right hand climb. If the model tends to "gallop", or stall, under power it will be necessary to add weight to the nose. Do not add more turn than is necessary to produce a right climbing turn. At the end of a power run the model will go into a gyro descent with a slight forward glide. Maximum duration occurs when the model is gliding in a near vertical descent. The rotors will whip up to a very high speed in a short space and the descent will be slow.

The rotor blades are set at minus three degrees and are mounted on the pylon at an angle of plus three degrees. If the rotor vanes should stop during flight the model will continue flying. The use of four rotor blades had made this possible. In this condition the flight is very poor but very safe. Every effort has been made to develop a safe, successful model that will be operating for many hours of enjoyable flying.



Decorated with colour dope, and given dummy control surface markings, Jet-gyro is ready for flight.

PLAN IS HALF FULL SIZE EXCEPT WHERE OTHERWISE STATED.

Jetgyro

DESIGNED BY
BOB BURAGAS

PROJECTED WING SPAN 9-3/8"
ROOT CHORD 2-1/2"

ROTOR DIHEDRAL 1-1/4"

1 1/2"

DIHEDRAL DETAIL
3/8 FULL SIZE

1/4" 1 1/2" 1/8"

2 3/4"

2 5/8"

2 1/8"

2 3/8"

3/8"

5/8"

2 1/2"

5 1/2"

1 7/8"

LARGE FACE BUSHING

DRILL 4 HOLES ON 7/16" P.C.D TO TAKE 20 S.W.G. ROTOR BLADE SHAFT

GROMMET

16 S.W.G. ROTOR SHAFT

THRUST RACE

20 S.W.G. BLADE SHAFT SOLDER TO BUSH

HUB ASSEMBLY
FULL SIZE

ROTOR BLADE ASSEMBLY

20 S.W.G. SHAFTS ARE LET INTO L.E. OF BLADES & CLOTH PATCHES ARE ADDED OVER THEM.

NOTE: BEND ROTOR BLADES TO -3°
SET ROTOR TO +3°

6 7/8"

2 BALSA BLOCKS 9/16" x 1-1/2" x 3-3/4"

FUSELAGE FROM MED 3/8" SHEET 17-1/2" LONG

PLANK WITH 1/16" SHEET

1/8" SHEET

F1 ASSEMBLY
CEMENT BOLT SECURELY TO F1

TAILPLANE SPAN 10"
ROOT CHORD 2-1/2"
1/16" SHEET

1/4" 1 1/2" 1/8"

7/8" 1/16"

1/16" SHEET

3/16"

1"

1 7/16"

1/8"

3 3/16"

BEND HERE TO TRIM

CUT

1/16" SHEET FIN

ROTOR SPAN 6-1/2" PER BLADE LESS SHAFT. 4 BLADES REQUIRED.

STAGES IN FUSELAGE CONSTRUCTION

BIND WITH THREAD

OUTLINE OF BALSA BLOCKS

F1

F2

SCREW JETEX 100 TO BOLT

F1
1/8" PLY

F2
1/8" BALSA

FULL SIZE FORMERS