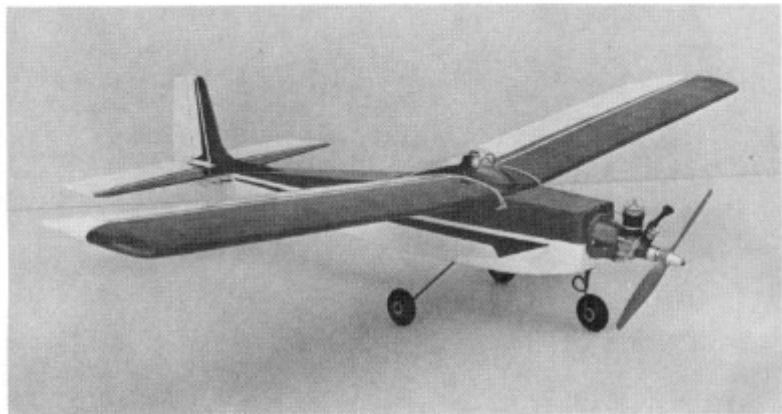


Mini Bell



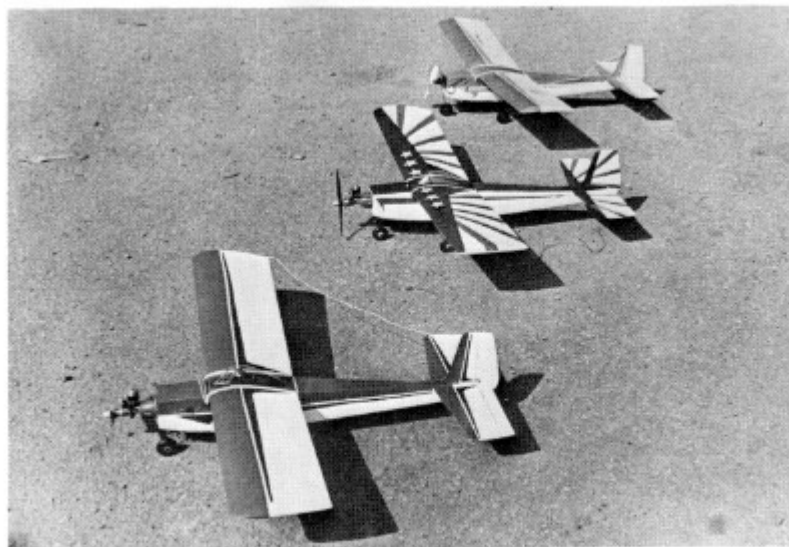
Building & Flying Instructions



Peck-Polymers

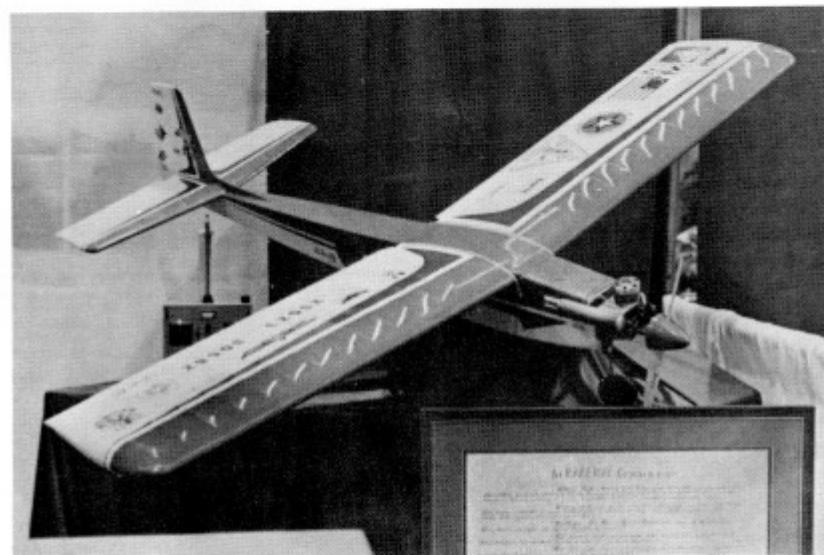
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ABOUT THE MINI BELL DESIGN

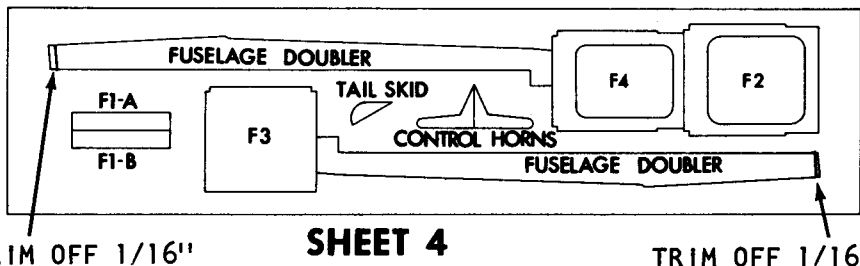
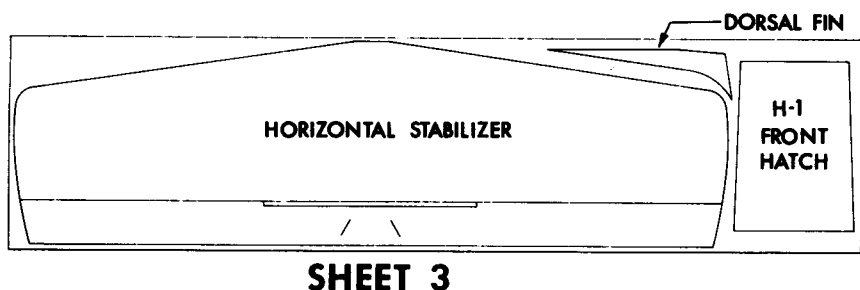
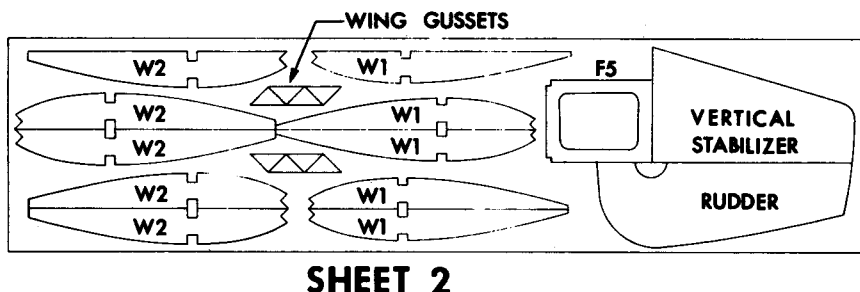
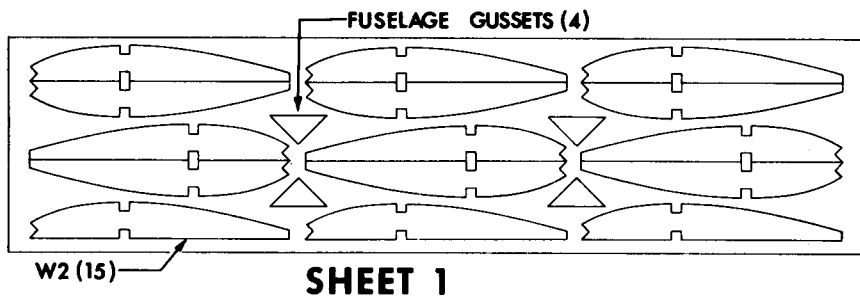
The Mini-Bell is a 1/3 size version of the famous Liberty Bell, which was flown across the United States by Bob and Doris Rich. The historic flight was made from Kitty Hawk, North Carolina to California, a distance of over 3,000 miles. Their flight was one of the historic events in model aviation. The full-size Liberty Bell is a Carl Goldberg Senior Falcon slightly modified, leaving the canopy and engine cowling off the model.



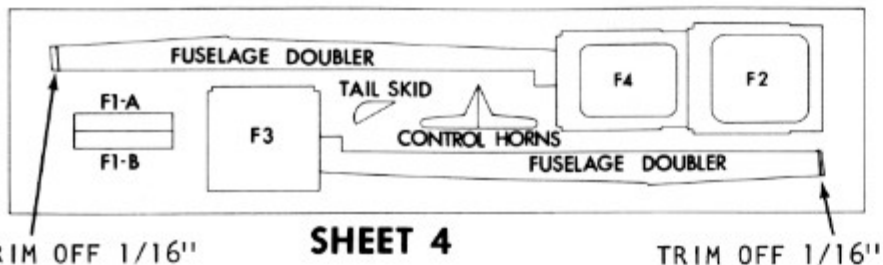
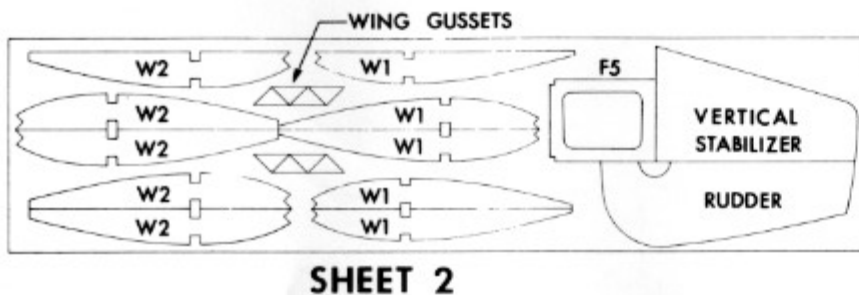
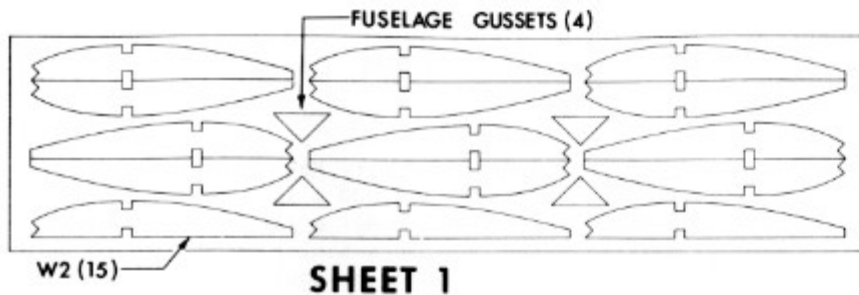
Full-size "Liberty Bell" model,
A Carl Goldberg Sr. Falcon flown by Bob and Doris Rich.

CONSTRUCTION

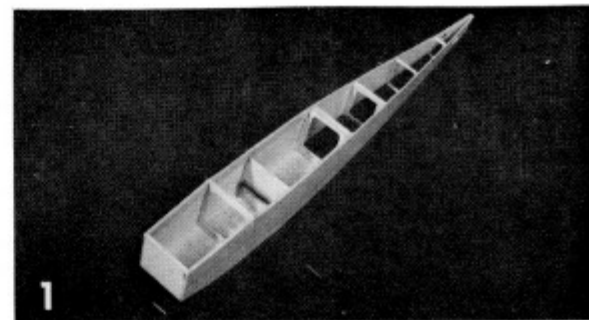
The model was designed to be flown with a .020 gasoline engine, but has also been successfully flown with a Brown twin CO₂ engine. The parts in the kit are for building the gas version. Some slight modifications are needed to lighten the model for CO₂. See CO₂ section for details. In reference to building the model there is a chart on page 4 showing the location of all the die cut parts. It will be necessary to use this as a reference to locate parts mentioned in the instructions.



PARTS LAYOUT FOR DIE CUT WOOD
NOTE CORRECTION TO SHEET 4



PARTS LAYOUT FOR DIE CUT WOOD
NOTE CORRECTION TO SHEET 4



FUSELAGE

Begin fuselage construction by cutting out fuselage sides from printed sheet. Next glue plywood doubler and 1/16 square balsa strut to fuselage side as indicated. Glue formers F2 and F3 in place over top view of drawing, being sure that all parts are square and perpendicular. Now add formers F1, 4, 5, 6, 7 and F8. Formers 6 and 7 are made from 1/16 square balsa as shown on plan. Also add 1/16 square doublers to former F5. Now epoxy front and main landing gears in place and add formers F1-A and F1-B, notching them for landing gear wire. Use epoxy glue for landing gears as they must take considerable force on landing. Epoxy main landing gear to former F3 and add (2) 1/16 balsa gussets on each side for extra strength.

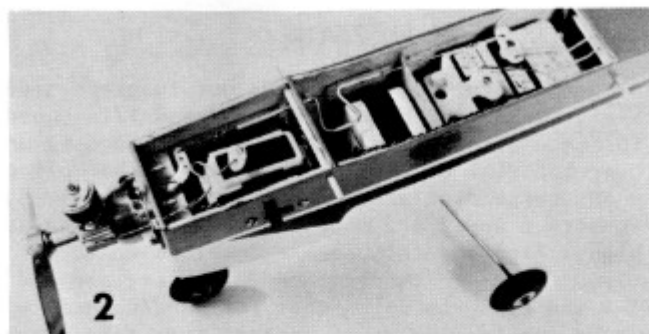
Cover bottom front of fuselage with 1/32 plywood notched to clear landing gears. Then add 1/20 sheet balsa to bottom rear section of fuselage. Drill 3/32 holes in fuselage sides for wood dowels that hold wings to model with rubber bands. Do not add top sheeting to rear of fuselage until radio and control rods are installed.

Servos are held in fuselage with 1/16 thick servo tape. Area in which servo tape is to be used should have a thin coat of epoxy on the wood for servo tape to hold servos securely. Fuselage construction will be finished later after stabilizer, rudder and controls have been assembled.

Make front hatch cover, see detail "A" on plan.

STABILIZER AND RUDDER

Vertical and horizontal stabilizer, rudder and elevator are punched from die cut sheets. The next step is to sand edges of parts with fine sandpaper and add hinges. The hinges are made from mylar sheet which is found in plastic bag. Cut mylar in $1/4 \times 1/2$ inch pieces as shown in plan. Cut small slits in the edges of the wood for hinges. Slip mylar pieces in place and a drop of hot stuff or equivalent will hold parts securely. When gluing leave a gap of about $1/32$ inch between parts to allow them to move easily. Now glue vertical and horizontal stabilizers to fuselage. Dorsal fin to be added later.



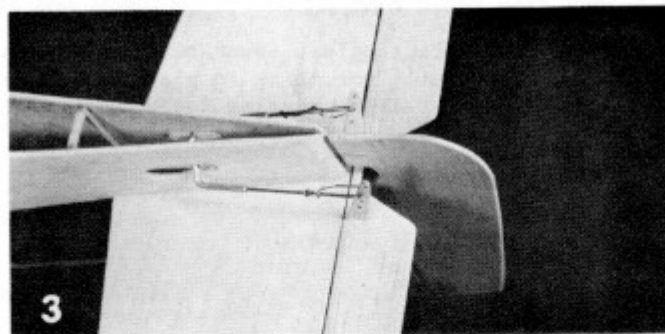
CONTROLS & RADIO INSTALLATION

Mount engine to fuselage. A Pee-Wee or Tee-Dee 020 Cox engine should be used. We have found that the addition of a throttle control adds considerably to the fun of flying the Mini-Bell. The Pee-Wee can be bought with the throttle control already on it. For the Tee-Dee it is necessary to buy the throttle, cylinder, piston assembly for a Pee-Wee and replace the ones that are presently on your Tee-Dee engine. The Tee-Dee engine will work very well with this throttle system. The photo No. 2 shows the installation of a Pee-Wee with the throttle control servo in the front fuselage section. Use a piece of flexible wire as a linkage between the servo and throttle sleeve.

Photo No. 2 also shows a linkage for steering the front wheel. A steerable front wheel has been found to be unnecessary and the airplane is really easier to fly for takeoffs and touch and go's with the front wheel securely glued in place.

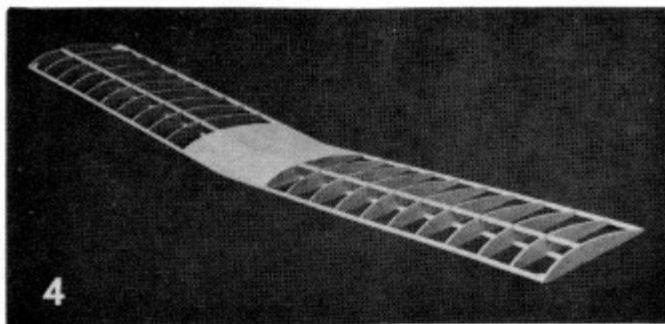
The radio shown in the photograph is a Cannon "Super Mini" block with a third servo and 100 MAH battery. Any of the new miniature radios such as "Ace" and "Kraft" will also work equally well in the Mini Bell.

If the throttle servo is not used, place the battery in the front fuselage compartment, the receiver in the second section and servos in the third section. When mounting servos with servo tape a strip across the bottom of the servo and one strip across the side will hold it securely. For additional safety, a piece of foam rubber squeezed between the two servos is also recommended.



Now that the engine and radio are installed, the control horns are installed. Control horns are $1/32$ plywood on die cut sheet 4. Drill $1/32$ diameter holes in control horns as shown in drawing. Glue control horns to rudder and elevator as shown in drawing and add $1/16$ square balsa pieces to strengthen the glue joint. Photo No. 3 shows control horns in place. The control horns have been modified since photo was taken for improved strength.

Next form control linkages from aluminum tubing, $1/32$ wire and .015 wire. See detail "D" on plan. Do not glue $1/32$ wire into tubing until control rods are installed on model. Adjust control linkages and rods for neutral position and then epoxy or hot stuff $1/32$ wire to tubing. This will give you a very light weight control system. For fine adjustments bend aluminum tubing in area that comes out at right angle to fuselage as shown in photo No. 3.

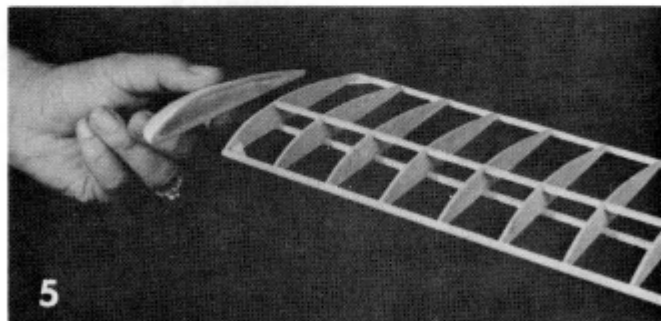


WING

Wing construction is quite simple. Cover plan with wax paper or Saran wrap so that glue will not stick to plan. Pin down trailing edge over plan and cut out 1/32 sheeting for bottom. Lay down the sheeting and 1/8 inch square wing spar. Glue in wing ribs and add front 3/16 square leading edge spar.

Now glue in dihedral by raising one of the wing tips 2 1/8 inches. Next glue in gussets and top 1/32 sheet covering.

Make wing tips from balsa blocks. Carve to shape and hollow out for lightness.



FINISHING

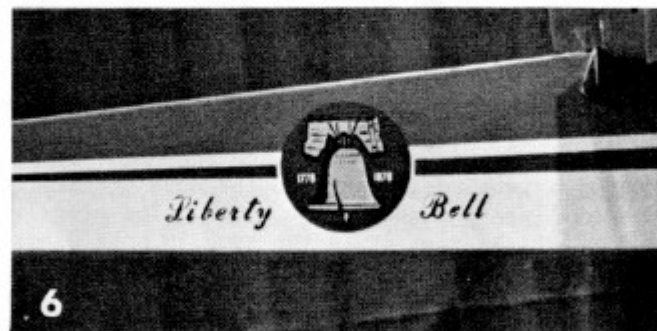
Cover wing with Monokote or Solar film. The fuselage can be either painted with fuel proof model airplane dope or covered with Solar film or Monokote. The original model is white with a red top and blue trim.

To install canopy, cut canopy from plastic sheet and put a thin strip of Monokote trim or trim tape inside for structure lines. For the best bond to wing, draw a line where canopy will fit on wing and remove covering material in this area. Paint this area black and glue canopy in place with model airplane cement such as Aero Gloss or equivalent.

The wheels are 1 inch diameter. The original models used the Williams Brothers streamlined wheels, although any 1 inch wheel will work fine.

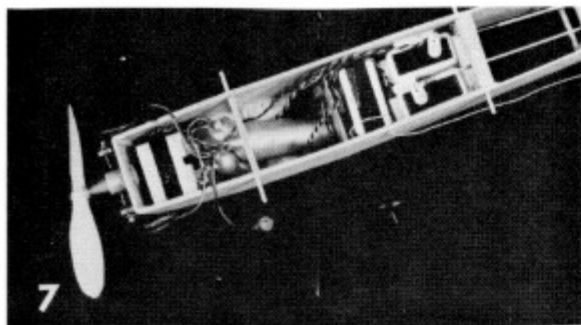
The wings and front hatch are held in place with rubber bands.

Photo No. 6 shows "Liberty Bell" emblem on full size model, shown for those who wish to make their Mini Bell exactly like it's full size counterpart.



CO-2 POWERED *Mini Bell*

When building a CO₂ powered Mini-Bell it is necessary to reduce the weight of the model as much as possible. This is done by bending a new landing gear out of .048 music wire, using lightweight plastic wheels and Japanese tissue to cover the wing. A throttle control is not possible with the CO₂ version and a Brown twin engine with a 10 c.c. tank should be used. The 10 c.c. tank will allow the engine to run for a longer time.



The standard Williams Brothers propeller should be heated over a soldering iron without touching the iron and the blades bent to half of their original pitch. An alternative would be to carve a wooden prop of lower pitch for your engine. Adjust the CO₂ engine to its very maximum speed. Detail "C" on the plan and photo No. 7 show CO₂ installation.

FLYING

Before flying check the balance point of the model. The model should balance at the 1/8 inch square spar in the wing as shown on plan. Usually you can balance the model by moving the radio battery, if not add weights to the nose or tail. Check the wing, stabilizer and rudder for warps. The wings should have 3/32 inch washout, be sure it is the same in both wings.

The Mini-Bell may be R.O.G. or hand launched. The control movement for the elevator should be approximately 10 degrees in each direction and the control movement for the rudder should be approximately 15 degrees in each direction. Of course the control movement can be reduced or increased depending on the type of flying you wish to do. The Mini-Bell is capable of loops, spins, touch and go landings, and any maneuver which a two or three channel airplane is capable of performing. When first learning to fly use caution and be sure to read the warnings at the end of this text.

We would like to thank Ed Sweeney, Bob and Doris Rich, Bill Cannon and Carl Goldberg for their help with this project. Also, our thanks to Carl Goldberg for his permission to use the Senior Falcon design scaled down for our Mini-Bell.

CAUTION, READ BEFORE FLYING

A radio controlled model has dangers that should be known before attempting to fly. A model can seriously hurt you or others.

Flying a radio controlled model requires considerable skill and if you are new to this type of flying it is best to get the

help of an experienced R/C flyer until you can safely fly the model.

Before flying check the following:

1. Is the model in safe flying condition? Are the rubber bands holding the wings in good condition? Sunlight and age will rot the rubber bands, so change them often.
2. Check engine mounting screws and propeller to be sure they are not loose or broken.
3. Check radio for proper operation and range check according to manufacturer's instructions. Be sure battery is fully charged and that no one else is on your radio frequency or you will lose control of your model, which could lead to very dangerous results.
4. Do not fly in crowded areas or over spectators. In case of malfunction or pilot error there could be a chance of injuring someone.
5. Do not fly model higher than 400 feet within 3 miles of an airport without notifying the airport operator. Give right of way to, and avoid flying in proximity of, full-scale aircraft. Where necessary an observer should be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.



JILL PECK AND THE MINI-BELL

Mini Bell

SPECIFICATIONS:

WINGSPAN 25 INCHES

WING AREA 100 SQ. IN.

POWER .020 PEE-WEE OR TD ENGINE

RADIO - MINIATURE 2-3 CHANNEL

FLYING WT. 8 TO 10 OZ.



Peck-Polymers