

All-American Pan-Am Plane

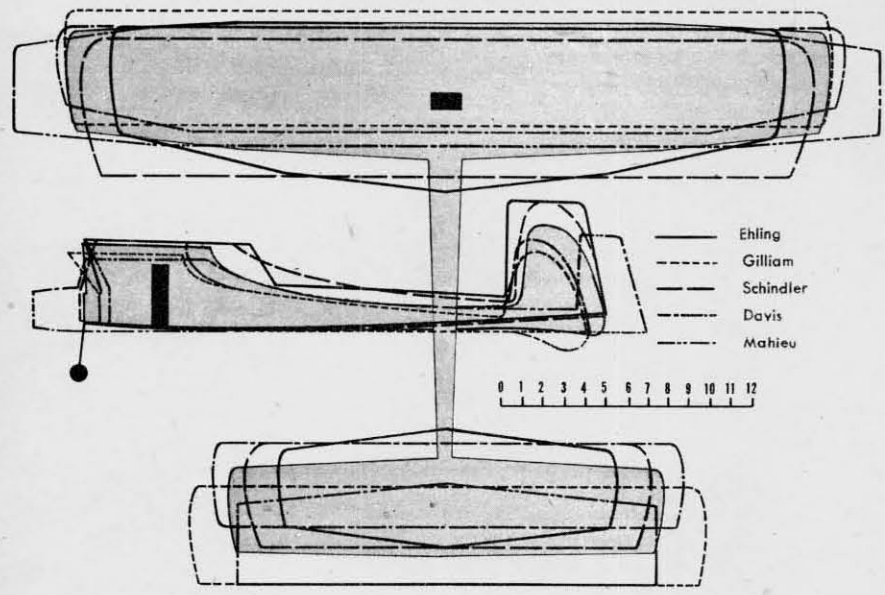
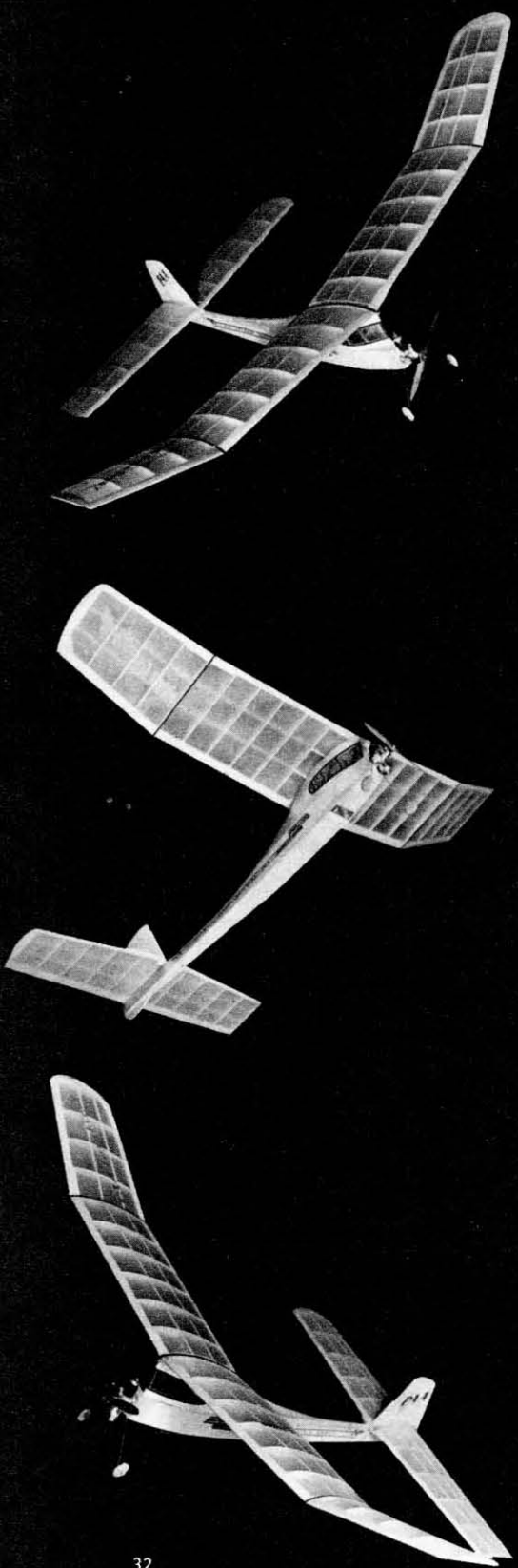
AT's Air-Model Design Board reviews some outstanding PAA-Load planes and shows you what the "average" load-lifting free flight looks like. Use this as a guide for '52 competitions

■ When five men work independently on the same design problem, normally we could expect five different results as each man will design according to his experience and local flying conditions. And if we were to look at the Pan American PAA-Load entries on the flying line we would say that the above statement is true. However, when these same models are drawn to a common scale and superimposed one on another we wonder if there is so

much of a difference between them.

To illustrate the above point, we took five payload models, by different designers who specialize in the field, and superimposed their outlines as shown on the drawing. What would you say to their respective differences? It would seem that the five men came pretty close to the basic design.

The similarity does change some on closer inspection by taking the extremes for an example.



Five Equals One

Analysis of five outstanding payload designs which participated at the last National Contest in Dallas, Texas, produced this interesting pattern. Configurations studied consisted of those designed and flown by Lew Mahieu, Denny Davis, Wayne A. Schindler, Paul Gilliam and Frank Ehling—all noted contest flyers. The "All-American" design resulting has been projected in somewhat larger size in a thoroughly tested model shown at left in photo form and at the right in detailed plans. Purpose of this presentation is to serve as a guide for original designing in the Pan American World Airways' 1952 PAA-Load events which again will be run off all over the country. These events will culminate in the big Nats competition scheduled for Los Alamitos Naval Air Station in California which will be the site of the '52 American Championships during late July. Pan-Am is offering cash and watch awards this year.

Frank Ehling's model has the shortest moment arm and also lowest aspect ratio wing. While Paul Gilliam, on other hand, uses a model which has a longer moment arm and higher aspect ratio wing. To make the contrast more pronounced, note that Ehling uses only about 35% stab on a short moment arm whereas Gilliam has 45% on a long moment arm.

Lew Mahieu's model was not specifically designed for payload. He also uses it, with success, for free flight. By having a long nose he was able to locate the C.G. so that it would not change if the passenger is removed or added. On the "composite" outline we minimized this feature as it would have undue influence on the "average."

The side views of the models varied considerably, especially the rudder areas. Compare Mahieu with Ehling on a similar moment arm. The fact that both models perform well, despite their difference in rudder areas, makes one wonder just how much tolerance one can have

and still be safe. But, as most of us know, the design differences will cause different flight patterns, although in the end the duration may be identical. So on many occasions it may be the type of flight that may determine the actual layout of the design.

The main purpose of this comparison was to show the variations that can be had with one formula. And this may also be a good place to remind you that a winning model is not necessarily the ideal design to follow implicitly. Frequently a model may win because of local circumstances.

If the 1952 passenger had remained at a 3 oz. minimum, the average outline shown would have been used to construct the "All-American" prototype. However, since the passenger weight was increased to 4 oz., the wing area was increased from 183 sq. in. to 233 sq. in. The stabilizer area was also increased from 76 sq. in. to 90 sq. in.— so the model shown can be used to good advantage for the 1952 season.

It was found that the increase of passenger weight decreased the climb ability slightly, but because of increased wing area, the glide remained unchanged. Performance should not drop even though there is increase of passenger's weight. However, be sure to use a two-wheel landing gear as the model will require a bit longer take-off distance.

The construction of the model also followed the average of the five models with leanings toward sturdier side—basic framework covered with balsa sheet. The drawing shows the construction details. The portion behind the cabin is covered with tissue to form a triangular fairing.

The flying characteristics of this model are similar to the standard pylon type: right power and left glide.

	Wing Area	Stab Area
Ehling	180	65
Gilliam	170	78
Schindler	198	85
Davis	175	87
Mahieu	190	76
The Average	182	78
The 1952 Design	233	90

