

Dear PL-1 or PL-2 Builder:

I am enclosing PL-2 ECN # 4 and a transcription of the Spin Test Report prepared by the Nationalist Chinese Air Force. Aerobatics can be made with the PL-1 and PL-2, but just be careful with spins, mostly if you have more than 1/4 fuel in the tanks. By the way, the spinning characteristics of the PL-1 and PL-2 are similar to other airplanes which have concentrated loads in the wings, such as engines or wing tip tanks.

The changes shown in PL-2, ECN # 4 are of minor importance. A few will apply also to the PL-1.

The Electrical System Schematic drawing 2-70-001 was extensively updated. I suggest that if you are interested in the new issue of this drawing, send \$4.00 to me and I will mail you a copy.

I just published a new book — "PL-4 Construction Manual" — with 104 pages and illustrated with 394 figures. This book will guide you through every step in building a sheet metal aircraft. You will find a very detailed list of tools, including their Sears (or other supplier) catalog numbers. Also: Aluminum Handling. How to make ribs, frames, fittings, form blocks, jigs. Construction Tips. Forming of parts. Assemblies. "Pop" riveting techniques. Fitting and drilling of Plexiglas, etc.

This book is not a repetition of *Light Aircraft Construction for Amateur Builders*, but a supplement. Although it illustrates all phases of the PL-4 construction with hundreds of photos and many sketches, it will be useful not only to the PL-4 builder, but to the PL-1 and PL-2 builders also. The price (including postage within USA) is \$10.00. Add \$1.00 for surface postage to other countries. California buyers, add 60¢ for State Sales Tax.

I am looking for help: I need a volunteer to start the PL-1/PL-2 News Letter going again. A regular (at least bi-monthly) News Letter is extremely important for all builders. We had several editors in the past years who did an excellent work, but we do not have anyone now and haven't had for the last year more or less. It takes some work and dedication. I am more lucky with the PL-4 program. Major J. C. Treager (U.S.Army) publishes a really good News Letter, and it is unbelievable how it keeps up the morale and interest of the builders, besides the multitude of swap deals, materials sources, photos from the builders, construction tips, etc. If you feel qualified and you are willing to do some work, please contact me. Unfortunately, I just do not have the time to do it myself.

The latest addition to the flying fleet of PL-1 and PL-2s is the beautiful PL-2 built by Kenneth Arnold from Kansas City, Missouri. Kenneth is a lawyer and this was his first aircraft project. He, through his dedication and hard work, built a beautiful airplane which I was pleased to inspect and fly as a passenger during his recent visit to San Diego, after he flew-off the initial FAA restrictions. Kenneth and his wife, Mildred, are instrument-rated pilots. Don't miss this PL-2 at the next Oshkosh Fly-in.

By the way, I wonder if someone else has also recently completed a PL-1 or PL-2? If so, or if you are near to flying, please send me a note and if possible a photo of the completed airplane.

Between Christmas and New Year, I made a short trip to Indonesia to inspect the initiation of the production of the PL-2 as a military trainer by the Indonesian Air Force. Also recently, the Sri Lanka Air Force (Ceylon) purchased PL-2 plans for construction of a prototype for evaluation as a trainer.

Good news for PL-1 and PL-2 builders: Walter Bucher (Aero Machine & Plastics, Inc.) 160 West Westerly Way, San Marcos Calif. 92069 [714] 744-5987, now has in stock the following machined parts for PL-2. Items marked * can be used also on the PL-1.

Part No.	Designation	Unit Price Each
2-10-011-27	Rudder upper hinge bracket	\$ 14.50
2-10-011-37	Flap Lever ratchet doubler	8.50
2-10-011-41	Flap Lever shaft bushing	10.00
1-10-011-43 & 44	Seat Belt attach gusset	6.50
2-10-011-75	Filler	1.65
2-30-007-79	Tapered Filler	2.00
2-30-007-87	Tapered Filler	2.75
2-30-007-97	Stabilator Bearing Housing	7.25
*2-30-007-173	Canopy Slide Stop	3.00
2-30-007-105	Rudder — Bottom Hinge	25.00
*2-50-003-59	Elev. Trim Control — Worm Shaft	4.00
*2-50-003-63	Elev. Trim Control — Indicator	8.00
*2-50-003-73	Elev. Trim Control — Screw Jack Housing	25.00
*2-50-003-77	Elev. Trim Control — Fork	14.00
*2-60-003-25	L. Gear Shock Absorb. Bushing Housing	10.00
*2-60-003-39	Main L. Gear — Adapter for Axle	102.00
*2-60-003-107	Nose L. Gear — Adapter for Fork	45.00

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PREPARED	NAME L. Pazmany	4-30-74	PAZMANY AIRCRAFT CORPORATION — SAN DIEGO — CALIFORNIA —	MODEL NO.	PL-1 PL-2
			OPERATING LIMITATIONS		

SPINS : THE NATIONALIST CHINESE AIR FORCE (TAIWAN) CONDUCTED EXTENSIVE SPIN TESTS WITH ONE OF THE 58 PL-1 AIRPLANES ALREADY BUILT AND IN SERVICE. THIS AIRPLANE WAS SPECIALLY INSTRUMENTED AND PREPARED FOR THESE TESTS INCLUDING THE INSTALLATION OF A SPIN CHUTE ATTACHED TO THE TAIL CONE.

TEST RESULTS : (Direct translation from Chinese Air Force Report) —

AFTER REVIEWING AND STUDYING THE TEST REPORT, WE FOUND THAT EVEN WITH REDUCED FUEL, REMOVED BALLAST, ADDED VENTRAL FIN TO ACHIEVE BETTER IYMP (INERTIAL YAWING MOMENT PARAMETER), C.G. AND TDPF (TAIL DAMPING POWER FACTOR); THE SPIN CHARACTERISTICS OF PL-1 (AND PL-2) STILL DIFFERS GREATLY FROM OTHER AIRPLANES FOR THE FOLLOWING REASONS :

- 1) — SPIN IS DIFFICULT TO ENTER: THE PILOT MUST ACHIEVE COMPLETE STALL AND MAINTAIN BACK PRESSURE ON THE CONTROL STICK IN THE DIRECTION OF SPIN, UNTIL AUTO-ROTATION OCCURRED. OTHERWISE, THE AIRPLANE WILL RECOVER FROM SPIN AUTOMATICALLY. AT PARTIAL STALL, OR WITH LESS THAN 1/4 FUEL IN WING TIP TANKS, THE SPIN BECOMES A SPIRAL DIVE, NOT REAL SPIN.
- 2) — PARTICULAR SPIN PATTERN: FIRST, IT IS QUITE SLOW AND STARTS WITH A SIDE SLIP. WHEN THE NOSE IS DOWN 75° TO THE GROUND, THE SPIN BEGINS. AT THE END OF 2nd TURN, THE DIVE ANGLE INCREASES. THE RATE OF ROTATION IS UP TO 360°/SEC. RADIUS IS ABOUT 1/2 WING SPAN. AT 3rd TURN, THE NOSE STARTS TO RISE, AND THE SPIN FLATTENS. AT 8th TURN, THE SPIN IS COMPLETELY FLAT. INDICATED AIR SPEED IS AS LOW AS 25 MPH. THE SPIN TURNS INTO A SLIGHT YAWING SIDE TURN (SIMILAR TO TURNS WITH EXCESS RUDDER). SPIN RATE IS REDUCED TO LESS THAN 180°/SEC. AT THE 9th TURN, THE ENGINE CAN STOP. DURING THE FLAT SPIN THE "g" LOADS ARE NOT UNCOMFORTABLE.

SPIN RECOVERY:

- 1) — PUSH CONTROL STICK FORWARD QUICKLY, AILERONS NEUTRAL, AND THEN NEUTRAL STABILATOR.
- 2) — CONVENTIONAL RECOVERY OF "FIRST RUDDER AGAINST SPIN AND THEN CONTROL STICK FORWARD" — CAN RECOVER FROM SPIN IN THE 1st TURN, WHEN THE NOSE IS STILL DOWN. AFTER 3 TURNS WHEN ENTERING A FLAT SPIN, THIS RECOVERY PROCEDURE WOULD ADVERSELY INCREASE THE RISE OF THE NOSE AND GO INTO A FLAT SPIN.
- 3) — TENDENCY TO GO INTO A FLAT SPIN COULD BE NOTICED BY THE INCREASE IN CONTROL STICK PRESSURE, TIMELY CORRECTION CAN LEAD TO RECOVERY. WHEN FLAT SPIN IS FULLY DEVELOPED, THE CONTROLS ALONE WILL NOT RECOVER FROM THE SPIN.

CONCLUSIONS AND SUGGESTIONS :

- 1) — PROHIBIT SPINS WITH THE PL-1 and PL-2
- 2) — BECAUSE IT IS DIFFICULT TO ENTER SPINS, WHEN THE FUEL QUANTITIES IN BOTH WING TANKS ARE SAME, THERE SHOULD BE NO FEAR OF STALLS OR ENTERING SPINS WHILE PERFORMING AEROBATICS.
- 3) — FROM EXPERIENCE, WHEN THE AIRCRAFT IS STALLED IN AN INVERTED POSITION, IT WILL AUTOMATICALLY TURN TO A NORMAL POSITION (POSITIVE "g" LOADS).
- 4) — WHEN A SPIN IS STARTED ACCIDENTALLY, THE PILOT SHOULD REDUCE POWER, RELEASE BACK PRESSURE IN THE CONTROL STICK AND WITH NEUTRAL STABILATOR, THE AIRPLANE WILL AUTOMATICALLY DIVE OUT OF THE SPIN.

NOTICE —

- 1) — WHEN ENTERING A SPIN FROM INVERTED POSITION, A SUDDEN PUSH OF THE CONTROL STICK COULD LEAD TO AN "OUTSIDE SPIN". THIS SHOULD NEVER BE DONE. THE CONTROL STICK SHOULD BE LET LOOSE AND THE AIRPLANE WILL RECOVER BY ITSELF.
- 2) — THE PL-1 RUDDER, DUE TO THE FRICTION OF THE NOSE GEAR, CAN NOT RETURN TO A CENTERED POSITION BY ITSELF. MUST USE FOOT PRESSURE TO CENTER IT.

WHEN CONTINUING SPIN, AND IF THE PILOT DOES NOT FEEL NEGATIVE "g" LOADS, SHOULD PUSH THE CONTROL STICK ALL THE WAY FORWARD AND MAINTAIN AILERONS AND RUDDER NEUTRAL. WHEN A DIVE IS REACHED AND THE SPINNING HAS STOPPED, PULL THE STICK GENTLY.

IF IT IS NOT POSSIBLE TO OBTAIN A DIVE, AND SPIN CONTINUES, AND IF ALTITUDE PERMITS, THE PILOT SHOULD KEEP TRYING THE PREVIOUS PROCEDURE. IT MAY REQUIRE 10 TURNS TO RECOVER FROM THE SPIN.

3000 ft. IS THE LOWEST HEIGHT FOR PARACHUTE JUMPING. AFTER ENTERING A DEVELOPED FLAT SPIN, AND WHEN THE CANOPY IS LOCKED IN THE OPEN POSITION, THERE IS NO PROBLEM OF PARACHUTING.

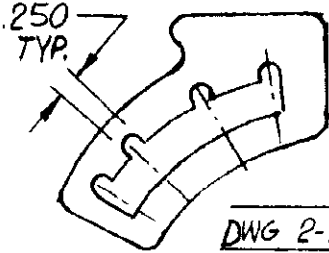
FUEL LEVEL IS NOT AN ABSOLUTE FACTOR, ALTHOUGH LOW FUEL CONDITION MAKES IT DIFFICULT TO ENTER A SPIN, SHOULD NOT BE TRIED. IF A SPIN HAS BEEN STARTED WITH FULL FUEL TANKS, THE AIRPLANE CAN BE RECOVERED IF CORRECTIVE MEASURES ARE APPLIED IN TIME.

ABOVE TEST RESULTS ARE NOW INCLUDED IN THE PILOT'S HANDBOOK.

PREPARED	NAME L. Pazmany	3-18-74	PAZMANY AIRCRAFT CORPORATION — SAN DIEGO — CALIFORNIA —	MODEL NO.	PL-2
CHECKED			ENGINEERING CHANGE NOTICE #4	REPORT NO.	
APPROVED				PAGE NO.	1

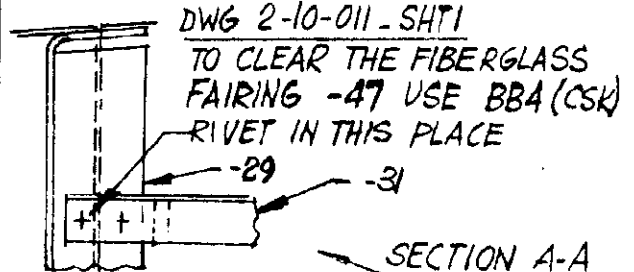
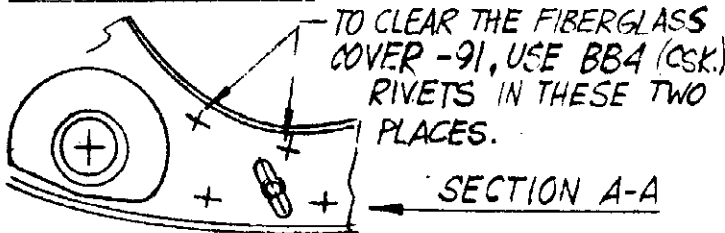
DWG 2-10-012 - PLAN VIEW OF -43 AT ATTACHMENT TO SPAR: RIVETS THROUGH SKINS AND SPAR CAPEXTRUSIONS SHOWN AS B14 SHOULD BE BB4. (DIMPLE SKIN).
IN VIEW C-C: SHOW SOLID LINE FOR RIB FLANGE.

DWG. 2-10-011 SHT.1 - DURING A STATIC TEST IT WAS FOUND THAT THE PLUNGER FOR THE FLAP CONTROL LEVER (2-50-003-39) WILL NOT TAKE THE MAXIMUM LOAD. THE PLUNGER THICKNESS SHOULD BE DOUBLED, TO .250 AND THE CORRESPONDING SLOTS IN 2-10-011-37 SHOULD BE INCREASED TO .250. CORRESPONDENTLY, THE SLOTS IN THE FLAP LEVER 2-50-003 -23, -25 AND -27 SHOULD ALSO BE INCREASED TO .250 WIDE.



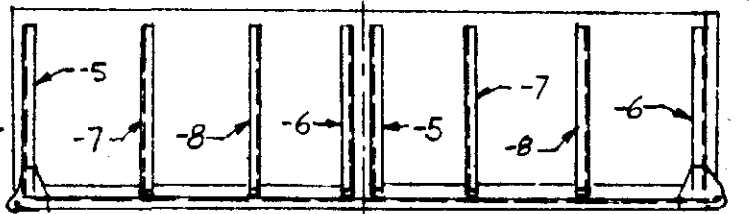
DWG 2-10-011 SHT.2 - AT THE UPPER LEFT CORNER: THE DRAWING SHOWS 13 RIVETS BB4 ATTACHING THE WING ROOT FAIRING, BUT THE CALLOUT INDICATES '12'. CHANGE IT TO '13'.

DWG 2-10-011 - SHT.1 -



DWG 2-10-009 - ADD TO B/M AND ALSO TO LIST OF STD. PARTS: TWO AN 316-4 CHECK NUT USED AS JAM NUT AT FLAP INTERCONNECT

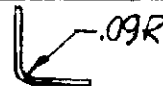
DWG 2-10-009 - THE CALL-OUT FOR ALL RIBS IN THE FLAP CENTER SECTION IS REVERSED. CHANGE THE DASH NUMBERS FOR ALL RIBS 2-10-005 AS SHOWN



DWG 2-10-001 - ERASE LINE CUTTING THROUGH DOUBLER -15



DWG. 2-10-002 - CHANGE THE BEND RADIUS FOR -13 TO .09".



DWG. 2-20-001 - IN SECTION B-B: ELIMINATE NOTE: "OPEN TO 90° IN THE AREA OVERLAPING -21."

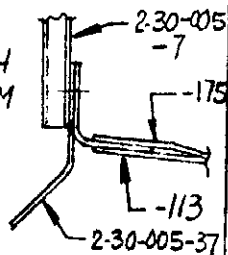
DWG. 2-20-002 - CHANGE THE NUMBER OF RIVETS SHOWN IN THE FLANGE OF RIB -7 TO 9. (SAME AS SHOWN IN THE ASSEMBLY).

DWG 2-20-003 - CHANGE STOCK SIZE OF -53 SKIN TO 45.0 x 36.0 x .016

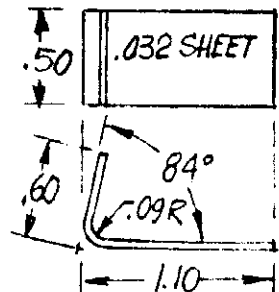
ADD -41 FILLER BETWEEN RIBS -19 AND -21 AND SPAR WEB. DELETE .050 JOG. IN RIB VERTICAL FLANGE. AGAINST SPAR WEB

DWG. 2-30-002 - AT THE FAR LEFT BORDER OF THE DRAWING "SECTION AT BL18.00. LOOKING OUTBD": NOTE UNDER (47) GROMMET (SHOULD SLIDE FREELY BETWEEN -45 AND -7).

DWG 2-30-001 - IN THE CROSS-SECTION THROUGH FORWARD EDGE OF BOTTOM SKIN -113: THE ANGLE 2-30-005-37 SHOULD BE BEHIND THE CORRUGATED SEAT BACK WEB 2-30-005-7

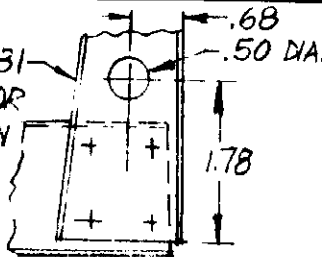


DWG. 2-30-006 - INDICATE NEW PART NUMBER -47 FOR CLIP JOINING -9 TO -7 (TWO CLIPS -47) AND SHOW CLIP DETAIL



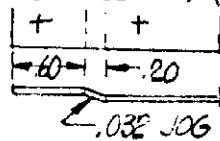
PREPARED	NAME Pazmany	PAZMANY AIRCRAFT CORPORATION SAN DIEGO CALIFORNIA	MODEL NO. PL-2
CHECKED		ENGINEERING CHANGE NOTICE # 4	REPORT NO.
APPROVED			PAGE NO. 2

DWG. 2-30-007 (SHT.1).
SECTION E-E. DETAIL-31
AND -32. AD HOLE FOR
BRAKE LINE AS SHOWN



DWG. 2-30-007 (SHT.2). DETAIL -99
BEND ANGLE FOR LOWER FLANGE SHOULD
BE 59° INSTEAD OF 31°.

DWG. 2-30-007 (SHT.2) - DETAIL -175
INDICATE .032 JOG IN
THE FWD EDGE OF GUSSET



DWG. 2-40-002. IN B/M: CHANGE MATERIAL
CALL-OUT FOR -49 TO: 16 MECH. BRASS SCREEN

DWG. 2-50-002 AND "LIST OF STANDARD PARTS"
PAGE 5: CHANGE P/N. OF FORK AN 161-32LS TO READ:
AN 161-22 LS.

DWG 2-60-002. IN SHIMMY DAMPER ASSY:
-97 AND -103 ARE SHOWN AS .125 THICK.
SHOULD BE .080. ALSO AD ONE MORE WASHER
AN 960-516 (TOTAL 4). CORRECT ALSO B/M).
NOTE: SEVERAL PL-2 BUILDERS DISCONNECTED
THE NOSE WHEEL STEERING AND ADDED TWO
CENTERING SPRINGS CONNECTING THE STEERING
ARM -85 TO THE FIREWALL. THIS REDUCED THE
FRICTION IN THE RUDDER CONTROL. GROUND
STEERING WITH DIFFERENTIAL BRAKES ONLY, IS
SATISFACTORY.

(63) MASTER CYLINDER ASSY. SHOULD BE (65)
(65) PISTON ASSY. SHOULD BE (67)

DWG. 2-10-002. AD ALTERNATE RIVETS FOR
ATTACHING -53 COVERS TO SPAR WEB:
5/32" MONEL "POP" MD 519 BS.

SUMMARY OF RAW MATERIAL:
AD THE FOLLOWING ITEMS:

PLATE. .125x1.5x6. ALLOY STEEL. 4130 N.
PLATE. .190x2.5x6. ALLOY STEEL. 4130 N.
PLATE. .250x2x10. ALLOY STEEL. 4130 N.
PLATE. .312x1.5x3. ALLOY STEEL. 4130 N

DWG. 2-40-003. SECTION C-C: AD DIMENSION
FOR HOLE IN UPPER SHELL CONCENTRIC WITH
PLATE -43: "1.25 DIA".

SECTION B-B: AD DIMENSION TO LOCATE THE
1.25 R. BEND IN TUBE -65. FROM Q OF BULKHD.
TO Q OF BEND: 1.50.

SECTION B-B: AD DIMENSION TO LOCATE CENTER
OF .1900 DIA. REAMED HOLE. * 4.05" TO Q TANK

SECTION N-N: AD DIAMETER OF HOLE THROUGH
-35. FOR FINGER STRAINER: .42 DIA.

VIEW "J": AD NOTE POINTING TO -57 HALF HNGE:
"CUTOUT -27 DOOR TO CLEAR HINGES".

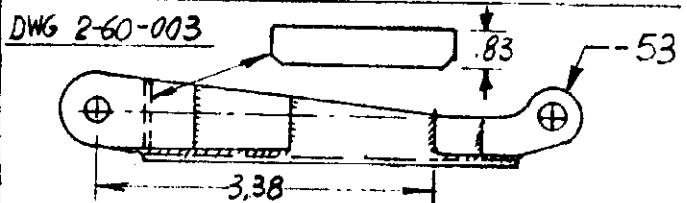
DWG. 2-40-010. CHANGE FUEL DRAIN P/N TO
CAV-160H-4

DWG. 2-50-003. IN B/M AND IN "LIST OF STD.
PARTS" PAGE 9: CHANGE QUANTITY FOR ROLL PIN
FROM 2 TO 3.

DWG. 2-50-003 (SEE PAGE 1 OF THIS ECN.
MODIFICATION IN DWG. 2-10-011. SHT.1

DWG. 2-50-003. FLAT PATTERN FOR -49.
DIMENSION .34 SHOULD BE .30. RADIUS .37
SHOULD BE .35.

DWG 2-60-003. IN B/M: CHANGE REQMT. FOR
-113 CUP TO '2'



CHANGE SHAPE OF FLANGE AS SHOWN TO PROVIDE
FOR A BEARING SURFACE AGAINST STOP -41 WHEN
GEAR IS FULLY EXTENDED.

LIST OF STANDARD PARTS. - AD ITEMS:

2 - CHECK NUT. AN 316-4. DWG 2-10-009
1 - WASHER - AN 960-816 - DWG. 2-30-004

AD GENERAL NOTE: ALUMINUM ALLOY QQ-A-355
IS NOW SUPERSEDED BY QQ-A-250/4
QQ-A-362 IS NOW QQ-A-250/5

QQ-A-267 IS NOW QQ-A-200/3
WW-T-785 IS NOW WW-T-700/3

THESE ARE ONLY CHANGES IN SPECIFICATIONS
BUT THE "OLD" SPECS. ARE INTERCHANGEABLE
WITH THE "NEW" SPECS.

PAGE 11. CHANGE: FUEL GAUGE: SW.D-301-CR12V.
MADE BY STEWART-WARNER

PAGE 12. CHANGE: FUEL TRANSMITTER:
SW 385-C(12V). MADE BY STEWART-WARNER