Falconar Avia Inc 7739 - 31 Avenue, EDMONTON, Alberta, CANADA T6C 0V4
Tel: (403)465-2024 SHIPPING ONLY
Fax: (403)465-2029 24 Hour ORDERS - SHIPPING Fax - Enquiries
Technical: (403)479-3515 - Chris B. Falconar, Dipl AE Eng, AME Cat"B", CET EAA 2083 Designee 266

Bulletin 960615

Subject: Fauvel AV36 & 361

GLUE: Jacquemin specifies casein glue. If the builder elects to use this glue, he must take great care in its freshness, method of mixing, shop temperature, pressure control and shop relative humidity. In service, good casein joints will last only if water is kept out of the aircraft. With the advent of synthetic resin glues with easy mixing and complete waterproofness, we strongly recommend their use rather than casein. Use either epoxy glue for wood or Resorcinol type. The Resorcinol is non gap filling whereas epoxy has excellent gap filling capability. Resorcinol is non toxic. Epoxy can be very toxic.

PLYWOOD SPECS:
10/10 means 1 mm Plywood
12/10 means 1.2mm Plywood
15/10 means 1.5mm Plywood 1/16"
16/10 means 1.6mm Plywood 1/16"
20/10 means 2mm Plywood 3/32"
Birch Plywood should meet spec GL-1, MIL-P-6070 or British Spec. 6V.3

STEEL SPECS:
4130 steel sheets
for .049 use .050
for .065 use .063
for .083 use .080

1020 steel
for .083 use .080

ALUM.ALLOYS
for 24 ST3 use 2024T3
for .051 use .050
for .064 use .063
for .081 use .080
for .156 use .160
for 3S or 2S use 3003-0, 3003-H14 or 1100-0 or 1100-H14.

TUBING: For tubes that must fit into a larger tube, the larger tube must have a wall thickness of .058". Note that tubing is available in diameters of 1/8" increments, not si teenths. For 24 ST use 2024T3.

CONTROL CABLE: for 7/64" use 1/8"
for 5/64" use 3/32"

FABRIC:

Use 2.7 oz/sq.yd. polyester fabric (Ceconite, Polyfiber, Superflyte, etc) and Hipec Finishing System. Do not use varnish for wood. Use a synthetic sealer such as Hipec 1 Clear

WOOD:

Sitka spruce of 10 to 12 rings per inch could be used for primary structure. It should in addition meet spec MIL-S-6072.

SAILPLANE - FLYING WING - FAUVEL A.V.36

BILL OF MATERIALS

A. SAILPLANE

1. Woods and Plywoods

Spruce (aviation quality) minimum compression strength 5000 psi

White Ash - for skid - one board 20 x 100 m/m 2 m. long or better 5 m/m laminates to the same thickness.

2. Plywood

108	ft. sq.	Birch	1 mm.	3 ply - or 1.6 mm Okoume (Khaya-african mahogany or gaboon)
183	"	"	1.2 "	3 "
215	"	"	1.5 or 1.6 mm	3 ply
65	"	"	1.5 or 1.6 mm	5 ply
65	"	"	2 mm	3 ply
11	"	"	2 mm	5 ply
5.5	"	"	3 mm	
7.5	"	"	4 mm	

For the plywood use, see drawing and Construction Notice.

3.

Wood - Spruce	Equiv. English Size	Length	Part
mm. 35 x 5	1.38 x .197	436' 00"	Spar booms
30 x 7	1.18 x .276	23' 00"	
25 x 12	.984 x .472	13' 02"	Fuselage boom 2 x 6' 07"
15 x 10	.59 x .394	100' 00"	
15 x 7	.59 x .276	60' 00"	
15 x 5	.59 x .197	66' 00"	
10 x 10	.394 x .394	20' 00"	
10 x 7	.394 x .276	33' 00"	
10 x 5	.394 x .197	164' 00"	includes trailing edges
9 x 7	.354 x .276	148' 00"	
7 x 7	.276 x .276	50' 00"	
7 x 6	.276 x .236	755' 00"	
6 x 6	.236 x .236	66' 00"	
6 x 4	.236 x .158	328' 00"	
15 x 12	.59 x .472	13' 02"	Fuselage boom 2 x 6' 07"

METALS

1. Steels - SAE X 4130 or SAE 4130 Chrome Molybdenum Steel in normalized condition.

Sheets: .049" thick - 1' 8" x 2' 8"
.065" " - 1' 8" x 2' 0"
.083" " - 1' 8" x 2.0'
.095" " - 10" x 10"

2 strips 1" x 5'7" - .083" thick - SAE 1020.

2. Aluminum Alloys

24 ST 3 - Sheet:	.051" thick	10" x 10"	
	.064" "	10" x 5"	
	.081" "	10" x 12"	
- Plate:	.156" thick	10" x 1' 9"	
	.25" "	10" x 1' 6"	

3 SO or 3 SH 14 (3 S - ½ Hard) or 2 SO

1 sheet .040" thick 3' 4" x 3' 4"
for nose cover

TUBING

Steel - SAE 4130 - normalized condition

Seamless tubing - chrome molybdenum steel AND 10102

Size OD Dia. & Wall	Length	Part	Alternates
2-3/8 - .125	0' 1.3"	Control: Stick Torsion tube end	
1-3/16 - .042	2' 6"	- : " " " "	- 1-3/16 x .049
1-1/8 - .058	0' 6"	- : " lower part	- 1-1/8 x .065
13/16 - .042	1' 5"	Nose pylone	- 13/16 x .049
3/4 - .042	1" 3"	Support and pedal articulations	- 11/16 x .049
9/16 - .058	4' 8"	Lifting bar - release torque tube	
9/16 - .042	2' 8"	Pylone and V towline parts	- 1/2 x .058

24 ST Tubing - AND - 10107

Size OD & Wall	Length	Part
1.0 x .049	1' 6"	Control stick
7/8 x .049	2 x 1' 10"	Ailerons control rods
7/8 x .049	2 x 2' 8"	Elevator control rods
9/16 x .065	2 x 2' 0"	Rudder control rods
5/16 x .058	0' x 4"	Spacer rings.

Fiber or Hard Plastic Tubing OD: .16 ID .08
Guide for piano wire controlling elevator tab. Length - 1'4"

MISCELLANEOUS

- 24 ST round bar - control rods ends - dia. 1.00" length 3'0"
  " " " - base plates " 1-5/8" " 0'6"
- 24 ST angle - 5/8 x 13/16 x .083 - 1' 02"
- Control flexible cable: (Wickwire cables - Air Associates)

MISCELLANEOUS (continued)

-	Dia.	Length	Controls
	7/64"	90' 00"	Ailerons & direction
	3/32"	30' 00"	Airbrakes
	5/64"	23' 00"	Hook release

- Bowden cable and casing - 1/8" (motorcycle type) 4' 06" AN-8016 could be used.
  - 5/64 (bicycle type) 5' 03"

- Piano wire - Dia. .10" - Length: 0' 08"
  - " 1/16" - " 6' 00"

- Tension spring - music wire 1/16" dia.

  - spring OD 5/8 Length: 2'

- Steel bar - round stock - SAE 4130
  Dia. 3/16" Length: 6' 08" - axis for shock absorbers
  - belt fittings.

  Dia. 5/16" Length: 2' 10" - rings and skid hook.

  Dia. 1/4" Length: 0' 6"
  Dia. 5/16" " : 0' 4"

- Brass bar - round stock - Dia. 1/4" Length: 1' 8" - hook release

- Axis with castel nuts - Dia. 1/4" - 6 off
  - " 5/16" -1 off

- Extruded 24 ST hinges for controls - AN 252-4 with pin AN-253-2
  - Total length - 15'

  for tab - AN 252-2 with pin AN-253-2 - 1' 06"
  or AN-252-1 " " AN-253-1

- Pulleys - Ball bearing type with non-metallic sheaves.
  Fixed ball bearing with contact seal.

  AN-219-4 - 17 off - Aileron, rudder, airbrake and hook release control
  or AN-220-2 -

  AN-220-3 - 1 off - Airbrake control
  acceptable AN-210-4B if AN-220-3 not available

- Control rod ends - on ball bearings - 4 off - 2 off each.

  Fafnir RE-4-M6
  RE-4-ML-6 - See dwg. No. 11

- Flanged ball bearings - 1 off - Fafnir No. D-P-4 Heavy Duty
  A/C Type - double row (See dwg. No. 11)

- Oilite bearings

OD	ID	Length	Number
1/2"	1/4"	.355	2
1/2"	5/16"	.50	1
1/2"	5/16"	.63	1

- Turnbuckles

AN 130-8S - 4 off
AN 130-16S - 5 off
AN 140-8S - 2 off

- Shock Absorbers

Dia. - 3.5" Length: 3.5"

Rear rubber shock absorber to be cut from solid or laminated rubber.

- Belt with shoulder straps.

- Hooks - Schweizer hooks can be adapted. (See dwg. No. 11)

- Miscellaneous blocks and fillings - Spruce

BOLTS - All high tensile bolts, preferably

Size	Head	Steel	Length "	No.	Spec.
#6	Ct. sk.	HT	.788	300	AN 507 or #8 AN 509 or #6 AN-21
"	"	HT	.63	20	AN 507 or #8 AN 509 or #6 AN-21
"	Ex.	HT	.71	6	AN-21
#8	Ex.	CS or HT	.55	8	AN 22
"		HT	.63	16	
"		"	.71	2	
"		"	.788	4	
"		"	1.0	10	
"		"	1.38	1	
		HT	1.575	8	
			.63	4	
			2.0	6	
"		"	1.775	8	or 2 $\frac{1}{4}$" bolts
			1.575	8	

Size	Head	Steel	Length	No.	Spec.
#10 or 3/16	Ex.	HT	.40	16	AN-3
			.788	13	
			.866	4	
			1.10	14	
			1.18	4	
			1.775	22	
	Ct.Sk		2.56	4	
	Ct.Sk		.788	2	AN-509
			.866	8	
			1.10	6	
1/4"	Ex.	HT	3.15	1	AN-4
			1.775	12	
			1.18	4	
			1.0	2	
			.788	20	
5/16	Ex.	HT	2.0	2	AN-5
			2.75	1	with wing nut
			1.18	1	with castel nut

NUTS - AN-345 - 365 - 310 and AN-320 and 364 with clevis bolts.

WASHERS - AN-960 or 940 - on wood - AN-970 - Locking AN-935 or 936

EYE BOLTS - 2 AN-43-4 Airbrakes control
2 AN-43-7

FABRIC

Linen Fabric - 4' wide. Length 73'. Grade "A" Linen DTD-540
Grade "A" Cotton MIL-C-5646

Pinked Tape or Strip
- 1-1/4" wide. Length 150'
- 1-5/8" " " 200'

Strip of fabric for skid fairing as required.

DOPE AND PAINT		IG	USG	U.S. Spec.	English Specs.
Dopes -	Clear primer dope	6	6.5	MIL-D-5549	1-GP-31
	Clear glossy dope	2.2	2.6	MIL-D-5554A	DTD-751-
	Pigmented dope - ivory color	2.2	2.6	MIL-D-5555	2 or 3
	Dope thinner				
Paint -	Wood primer	2.2	2.6		
	Ivory enamel or lacquer	2.2	2.6	MIL-E-7729	
				MIL-L-7178	DTD-63
	Paint thinner	.5	.5		
	Protective varnish for wood	1.5	1.6		

- Plastic Wood - (cellulosic mastic) - 1 lb.
- Glue - Casein - C-G-456 - 14 lb.
- Resin - MIL-G-6803

PLASTIC

Plexiglass for built canopy. Thickness: 1/16"

1 panel - 30" x 22"
1 panel - 30" x 16"
1 panel - 12" x 24"

B. ACCESSORIES - BILL OF MATERIALS

WING SPAR JIG

Minimum thickness: 1.5" - Width: 11" min.
2 lengths: 15' 00" 1 length: 10' 00"

TRAILER-CARRIAGE & V TOW LINE

All steel is of commercial grade.

Sheet: .083" - carriage: 2 panels: 31.5" x 12" & 6" x 7"
- trailer: 24" x 10"

Tubing: Carriage: Seamless tubing for wheel axle 1" OD 14" long
Wall thickness .080 minimum.

Trailer: Use seamless tubing .040 min. wall thickness in the two OD: 1-3/16 and 13/16 length as required.

Good quality tubing should be used in order to make a light structure.

Channel

3" or 4" Std. structural channel for trailer false wheel axle. Length: 5' 09".

Round Bar - Dia. 9/16. Length: 1' for skid brooch
Dia. 5/16 or 3/8. Length: 10" for wing clamp brooch.

Wood - 1-1/4" boards for floor, etc. as required.

Wheels - Carriage: Approx. size 10" x 2". 2 wheels or wheelbarrow wheels.
Std. carrier wheels on roller bearings are O.K.
1 Castor wheel (similar to above) if available. If not, can be made up from a modified bicycle fork.

Trailer: 2 car trailer wheels with axle or old airplane wheels on ball bearings and with low pressure tires.

Miscellaneous

- Strip of foam rubber ½" thick 2" to 3" wide for wing clamp about 8' long.

- Trailer coupler, ball and socket type.

V Tow Line

5/16" or 3/8" swivel (free and smooth) - 2 off

5/16" or 3/8" shackle - 1 off

5/16 Manilla rope or ¼ to 5/16 Nylon rope 56' length

2 rope thimbles to suit
2 foam rubber balls 2 or 3" dia.

KITS AND MATERIALS AVAILABLE FROM

FALCONAR AIRCRAFT
Municipal Airport
EDMONTON, Alta.
Canada

A.V. 36 GLIDER - CH & J. FAUVEL

June 2 - 1964

MATERIAL SUBSTITUTIONS

Steel tubes - cont'd.

metric sizes mm	equivalents inches	Sectional Areas in^2	Moments of Inertia	AN Standards	Sectional Area in^2	Moments of Inertia in^4
18 x 1.0	.708 x .039	.153	.00452	$\frac{3}{4}$ x .042	.094	.00589
				$\frac{11}{16}$ x .049	.098	.0050
1H x 1.5	.552 x .059	.0915	.002835	$\frac{3}{16}$ x .058	.092	.00297
14 x 1.0	.552 x .039	.064	.00211	$\frac{9}{16}$ x .042	.068	.00234
				$\frac{1}{2}$ x .058	.0805	.001935

NOTE. - Alternate sizes have been quoted in order to facilitate procurement.

- For use of these tubes see bill of material at the end of this section and page 5-14 to 5-19.

SKID RUBBING STRIPS

MILD STEEL - commercial grade - 2 mm thk. (.0787)

Replaced by SAE 1020 steel .083" thk.

NOTE. These strips are required only if the glider is to be normally flown from a rocky ground or landed on concrete runways. If flown from grass runway, they are not necessary.

3 - ALUMINUM ALLOYS

Dural sheet, plate, tube & rod.

French Specs.: AU-4-G X-78
heat treated: 495°C and aged.
UTS: 56900 PSI YTS: 37000 PSI
Elongation: 16%.

A.V. 36 GLIDER - CH & J. FAUVEL

June 2 - 1954

G. Jacquemin

MATERIAL SUBSTITUTIONS

ALUMINUM ALLOYS - cont'd

This alloy is equivalent to 24S cond T4.

UTS : 62000 PSI YTS : 40000 PSI

Elongation : 12%

(Ref. AN-C-5)

Sizes :

	metric	gauge size	exact equiv.
Sheets.	1.2 m/m	.051"	.0472"
	1.6 m/m	.064"	.0629"
	2.0 m/m	.081"	.0787"
Plates	4.0 m/m	.156"	.1575"
	6.0 m/m	.25"	.2362"

24 ST Tubes . Sizes as per AN-D-10107

Selection is made by comparing sectional areas and moments of inertia.

metric sizes m/m	Equivalents inches	Sectional Areas in²	Moments of Inertia in⁴	A.N. Standards	Sectional Area in²	Moments of Inertia in⁴
25 x 1.2	.984 x .0473	.114	.0152	1.0 x .049	.146	.0166
20 x 1.0	.787 x .039	.0842	.00643	7/8 x .042	.110	.00352
				3/4 x .058	.1265	.00762
20 x 1.2	.787 x .0473	.1115	.00756	7/8 x .049	.1270	.01085
				3/4 x .058	.1265	.00762
14 x 1.6	.552 x .063	.074	.002945	9/16 x .065	.10	.002935
				~~1/2 x .065~~	~~.088~~	~~.00243~~ *
7.0 x 1.5	.276 x .0592	.0493	.00252	5/16 x .058	.0462	.000333

* see page 5-2a stressing for this tube.

A-V. 36 GLIDER - CH & J FAUVEL

MATERIAL SUBSTITUTIONS

This section covers the replacement of the French materials by materials available in CANADA & U.S.A.

1 - WOOD.

Spruce - strength required : Compression 3.5 $\frac{Kg}{mm^2}$ (4970 PSI) this is the max. crushing strength. f_{cu}

From AN-C-18 - Table 2-6 -
Red spruce : f_{cu} = 4990 PSI
Sitka spruce : f_{cu} = 4700 PSI

Red spruce is OK.
Sitka spruce can be used for secondary structure.

Plywood - Aircraft quality -
Main structure is made off birch plywood.
Secondary structure is called with gaboon plywood of heavier thickness as an alternative - This plywood is not available in this country and will therefore be deleted.

Miscellaneous
The skid is to be made of white ash (frêne in French).

2 - STEEL

Steel sheets, tubes, bars & rods.

French specs.: class 53 bis - symbol: 25 CD 4 S.
chrome molybdenum - weldable -
condition : Normalized.
UTS : 88 $\frac{Kg}{mm^2}$ (125000 PSI)

A.V. 36 GLIDER - CH & J. FAUVEL

June 1 - 1954

G. Jacquy

MATERIAL SUBSTITUTIONS

steel - class 53 bis - cont'd.

YTS : 70 $\frac{Kg}{mm^2}$ (99500 PSI)
elongation : 12 %

Corresponding steel available : S.A.E-X 4130
AN-QQ-S-685 or : S.A.E - 4130
chrome molybdenum - weldable.
Cond N.-
UTS - 125000 PSI YTS 100000 PSI
elongation 17% measured on 2"-
(Ref. AN-C-5)

NOTE- STRESS RELIEVE AFTER WELDING IS NOT CONSIDERED AS MANDATORY

Sizes.

	metric	gauge size	exact equiv
steel sheets :	1.2 m/m	.049"	.0472"
	1.6 m/m	.065"	.0629"
	2.0 m/m	.083"	.0787"
	2.5 m/m	.095"	.0953"

steel tubes : Sizes as per AN-D-1602
Selection is made by comparing sectional areas and moments of inertia.

metric sizes m/m	Equivalent inches	Sectional Area in^2	Moments of Inertia in^4	A.N. Standards	Sectional Area in^2	Moments of Inertia in^4
30 x 1.0	1.18 x .039	.146	.02325	$1\frac{3}{16}$ x .042	.150	.0255
				$1\frac{3}{16}$ x .049	OK	OK
28 x 1.5	1.10 x .059	.190	.0258	$1\frac{1}{8}$ x .058	.194	.0276
				$1\frac{1}{8}$ x .065	OK	OK
20 x 1.0	.787 x .039	.091	.00645	$\frac{12}{16}$ x .042	.102	.0076
				$\frac{3}{4}$ x .049	.109	.00665

A.V. 36 GLIDER - CH & J. FAUVEL

June 2-1965

G. Jacquier

MATERIAL SUBSTITUTIONS

ALUMINUM ALLOYS - CONT'D

DURAL RODS - for machined parts:

AU-4-G replaced by 24 ST

DIA. 25 m/m (.984") use 1.0"

DIA. 40 m/m (1.575") use 1 5/8"

DURAL ANGLE - AU-4-G replaced by 24 ST

metric size : 16 x 20 x 2 m/m -

replaced by 5/8 x 13/16 x .083".

HINGES -

The hinges used for the control surfaces are called made of sheet metal AU-4-G - open width 32 m/m. pitch 15 m/m - pin dia. 2.2 m/m.

They are replaced by structural extruded hinges AN-252-4 with pin AN-253-2

The hinges used for the tab are of the same type as for control surfaces but smaller - Open width 20 m/m Pin dia. 1 m/m.

They are replaced by hinges AN-252-2 with pin AN-253-2 or by AN-252-1 with pin AN-253-1

These hinges are obviously OK.

NOSE.

Aluminum sheet 1 m/m thk.

replaced by 3-S0 or 2-S0 Aluminum .040" thk.

4 - CONTROL CABLES

Flexible cables for control as per French specs.

DIA. 2.7 m/m - for ailerons & rudder - Ult. strength : 450 Kg.

DIA. 2.4 m/m - for airbrake - " " : Kg

DIA. 2.0 m/m - for Hook release - " " : 315 Kg

A.V. 36 GLIDER - CH & J FAUVEL

June 3-1954
G. Jacquemin

MATERIAL SUBSTITUTIONS

CONTROL CABLES - cont'd.

The cables will be replaced by cables as per specification MIL-C-1511

metric size	equivalent inches	strength of metric size	MIL-C-1511	strength.
2.70 m/m	.1062	1012 lb	7/64"	1260 lb
2.40 m/m	.0945		3/32"	920 lb
2.00 m/m	.0787	694 lb	5/64"	650 lb

5 - TURNBUCKLES

As per French Specification BNAE - 176-851
their reference N° is : nominal diameter in m/m and a letter: A, B or C
Type A: turnbuckle with 2 eyes for cable
Type B: turnbuckle with 1 eye for cable and 1 fork
Type C: turnbuckle with 2 forks.

metric Type	strength Kg.	Strength lb	AN-155 Barrel	AN-161 fork	AN-170 eyes	strength lb
4 - B	351	774 lb	8S	8-RS	8-LS	800 lb
4 - A	351	774 lb	8S		8LS & 8RS	800 lb
5 - B	640	1410 lb	16S	16RS	16LS	1600 lb

TURNBUCKLES' ASSEMBLY AN - N°

METRIC	AN
4 - B	AN - 130 - 8S
4 - A	AN - 140 - 8S
5 - B	AN - 130 - 16S

A.V. 36 GLIDER - CH & J FAUVEL

June 3 - 1954

G. Jacquemin

MATERIAL SUBSTITUTIONS

6 - PULLEYS

French pulleys are ADR - PN - 50 & ADR - PN - 80 they both are non metallic sheave type, mounted on ball bearing.

Strength : ADR - PN - 50 : 500 kg - radial 1100 lb
ADR - PN - 80 : 850 kg - radial 1870 lb

Diameter : ADR - PN - 50 : 50 m/m 1.967"
ADR - PN - 80 : 80 m/m 3.15"

They are replaced by pulleys AN - 220
Pulleys AN 214, 219 & 210 could be used as alternate in case of procurement difficulties

METRIC PULLEYS			REPLACEMENT			ALTERNATES		
ADR	*DIA.	STRENGTH	AN-	*DIA.	STRENGTH	AN-	*DIA.	STRENGTH
PN-50	1.967"	1100 lb	220-2	2.505"	1650 lb	219-4	2.317"	920 lb
PN-80	3.15"	1870 lb	220-3	3.755"	2500 lb	214-4	3.50"	1200 lb
						210-4B or A	3.01"	1200 lb

*above dia. are dia at bottom of groove.

NOTE. Although pulleys AN-219-4 are 180 lb weaker than PN-50, they have been accepted by M. FAUVEL. If found necessary a stressing will be added at the end of this section in order to cover this change.

Since there is only one pulley PN-80 used on the glider for the air brakes control and since this pulley is in the cockpit easily accessible for lubrication, pulley AN-214 & 210 can be used as alternates. See page-5-14 to 19 stressing covering these pulleys.

Although obsolete, pulleys AN-210 A - (on ball bearing) are acceptable as covered by stressing - see page: 5-14 to 5-19

AN-210-2A - DIA 2.222" strength : 500 lb
AN-210-4A - DIA 3.01" strength : 1200 lb

A-V-36 GLIDER - CH & J FAUVEL

June 5-1954

G. Jaquier

MATERIAL SUBSTITUTIONS

7 - SELF LUBRICATING BEARINGS

"METAFRAM" BEARINGS ARE SIMILAR TO "OILITE" BEARINGS
English sizes are given in the Bill of Material. Drawings are altered to suit.

8 - CONTROL ROD END & FLANGED BALL BEARING

CONTROL ROD END. ADR-CN-6

Male rod end -	shank dia :	10 m/m	.394"
	bearing axis :	6 m/m	.236"
	strength :	600 Kg	1320 lb

Replaced by FAFNIR RE-4-M6 or RE-4-ML6

shank dia :	.375"
bearing axis :	.25"
strength :	1300 lb

- see page 5-21 design change for FAFNIR ROD-ENDS.

FLANGED BALL BEARING. - ADR-S6

NO SUITABLE FLANGED BEARING IS AVAILABLE - THIS PART IS REDESIGNED USING A FAFNIR D-P-4 BEARING - SEE PAGE 5-

ADR-S6 - DOUBLE ROW BEARING MOUNTED IN A LIGHT ALLOY FLANGE - see page 5-

RADIAL STRENGTH :	1200 Kg -	2650 lb
AXIAL STRENGTH :	Kg -	lb

FAFNIR D-P-4 - HEAVY DUTY - DOUBLE ROW BEARING

RADIAL STRENGTH :	3000 lb
AXIAL STRENGTH :	1800 lb

A.V. 36 - GLIDER - CH & J FAUVEL — June 5 - 1954

MATERIAL SUBSTITUTIONS — G. Jauquin

9 - BOLTS - NUTS - WASHERS

5 metric sizes are used : 3 m/m, 4 m/m, 5 m/m, 6 m/m & 8 m/m.

BOLTS -

STEEL. — some size 3 m/m & some size 4 m/m are made of ½ hard steel at 60 $\frac{Kg}{m/m^2}$: 85300 PSI

— All the other are made of Chrome-nickel ½ hard steel at 85 $\frac{Kg}{m/m^2}$: 121000 PSI

SIZES.

3 m/m - .118" — 4 m/m - .1575"

5 m/m - .1968" — 6 m/m - .236"

8 m/m - .315"

3 m/m - COUNTERSUNK & HEX. HEAD

— 3 m/m would be replaced by #5 (.125") which is not a current size. Therefore, they will be replaced by #6 (.138") this is an increase of sectional area in shear of:

$$100\left(1 - \frac{.138^2}{.118^2}\right) = 36.5\ \%$$

Using AN-507 Bolts - Carbon steel at 55000 PSI - Hence a reduction in strength of: $100\left(1 - \frac{85300}{55000}\right) = 55\ \%$

Then the net loss of strength is : 55 - 36.5 = 18.5 %

This loss of strength is acceptable for the countersunk screws attaching fittings to the wood structure.

As alternates : countersunk screws #8 AN 509 can be used : DIA : .164" - STEEL @ 125000 PSI

They are obviously OK

Also, AN-24 #6 Clevis bolts can be used

DIA .138" - STEEL @ 125000 PSI

— ALL 3 m/m HEX. HEAD BOLTS WILL BE REPLACED BY #6 - AN - 21 CLEVIS BOLTS.

NOTE. #6 AN-507 will be used for elevator tab hinge attachments only.

All other will be #8 AN-509.

A.V. 36 GLIDER - CH & J FAUVEL

June 5 - 1954

J. Fauvel

MATERIAL SUBSTITUTIONS

BOLTS - NUTS - WASHERS - cont'd.

4 m/m HEX. BOLTS.

DIA: .1575" STEEL @ 121000 PSI

They will all be replaced by: AN-22. #8 CLEVIS BOLTS

DIA: .162 STEEL @ 125000 PSI.

5 m/m HEX. BOLTS

DIA: .1968" STEEL @ 121000 PSI

They will be replaced by AN-3. #10 HEX. BOLTS

DIA: .190 STEEL @ 125000 PSI

Ratio of areas: - 7%

" " UTS : + 3.5%

The reduction in strength is 3.5% which can be neglected.

6 m/m HEX. BOLTS

DIA: .236" STEEL @ 121000 PSI

They will be replaced by AN-4 $\frac{1}{4}$" HEX. BOLTS

DIA: .250" STEEL @ 125000 PSI

8 m/m HEX. BOLTS

DIA: .315" STEEL @ 121000 PSI

They will be replaced by AN-5 $\frac{5}{16}$" HEX. BOLTS.

DIA: .3125 STEEL @ 125000 PSI

Ratio of areas: - 1.5%

" " UTS : + 3.5%

The increase in strength is 2%.

NOTE. ABOVE COMPARISON HAS BEEN MADE ON THE BASIS OF ULTIMATE TENSILE STRENGTH BECAUSE SPECS. FOR FRENCH STEELS DO NOT QUOTE SHEAR STRENGTH.

A.V. 36 GLIDER - CH & J FAUVEL June 5-1954

MATERIAL SUBSTITUTIONS G. Faigner

BOLTS - NUTS - WASHERS - cont'd

NUTS -

PLAIN HEX NUTS .	AN - 345
SELF LOCKING NUTS .	AN - 365
CASTELLATED NUTS .	AN - 310

WITH AN - 21 & AN - 22 CLEVIS BOLTS:

SHEAR NUT .	AN - 320	
THIN NUT .	AN - 364	self locking

WASHERS

PLAIN .	AN - 960	OR AN - 940
PLAIN LARGE .	AN - 970	
LOCKING .	AN - 935	OR AN - 936 - B

10 - PIANO WIRE & BOWDEN CABLE CASING

PIANO WIRE

size	2.5 m/m	.0984"
	1.5 m/m	.0591"

Replaced by music wire gage #12 .104"
MIL - W - 6101 gage #16 .064"

BOWDEN CABLE CASING -

I.D. size	3 m/m	.118"
	2 m/m	.0866"

Commercial Bowden cable casing used for motorcycle & bicycle are satisfactory - AN - 8016 casing could be used.

Size will be selected to suit :

$\frac{5}{64}$" cable
and .064" piano wire

NOTE - The casings are not used to carry loads but to prevent the secondary control cables from hanging loosely

A.V. 36 GLIDER - CH & J FAUVEL June 8-51

MATERIAL SUBSTITUTIONS

11 - TOWING HOOKS -

TYPE ½ OPEN WITH SAFETY DEVICE -

French hooks are not available. Hooks made by Schweizer Aircraft Corp. Elmira - New-York will be used. Design and stressing covering this adaptation : see page 5-

12 - FABRIC COVERING.

French fabric is called only for its strength in kg per m² 1000, 1400 or 2000 $\frac{kg}{m^2}$

It will be replaced by grade "A" linen to spec. : DTD 540 or by grade "A" "Flightex" MIL-C-5646

2.7 or 3.5 oz./sq.yd. Polyester fabric. Lincoln A578

13 - GLUE - DOPE & PAINT -

GLUE - CASEIN glue as per specs: C-G-456

or synthetic resin glue MIL-G-6803

Resorcinol or Epoxy

DOPE & PAINT -

Clear dope	MIL-D-5549 A	1-GP-31
Clear dope gloss	MIL-D-5554 A	DTD-751-2 or -
Pigmented dope gloss	MIL-D-5555	
Enamel	MIL-E-7729	
Lacquer	MIL-L-7178	DTD-63

or Hipec finishing system