

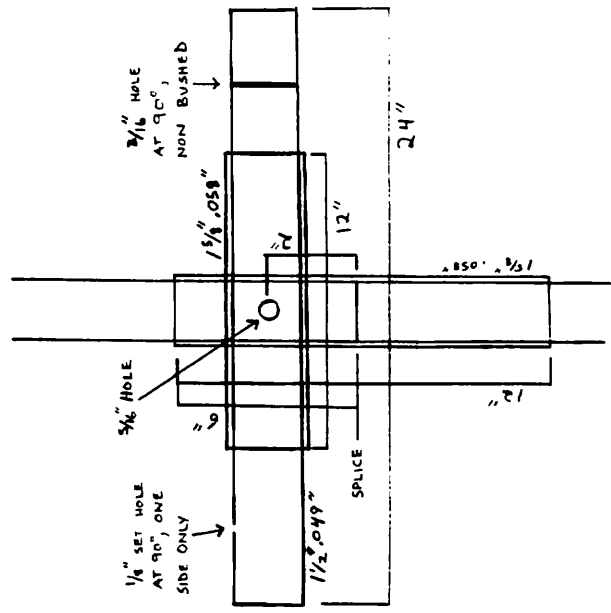
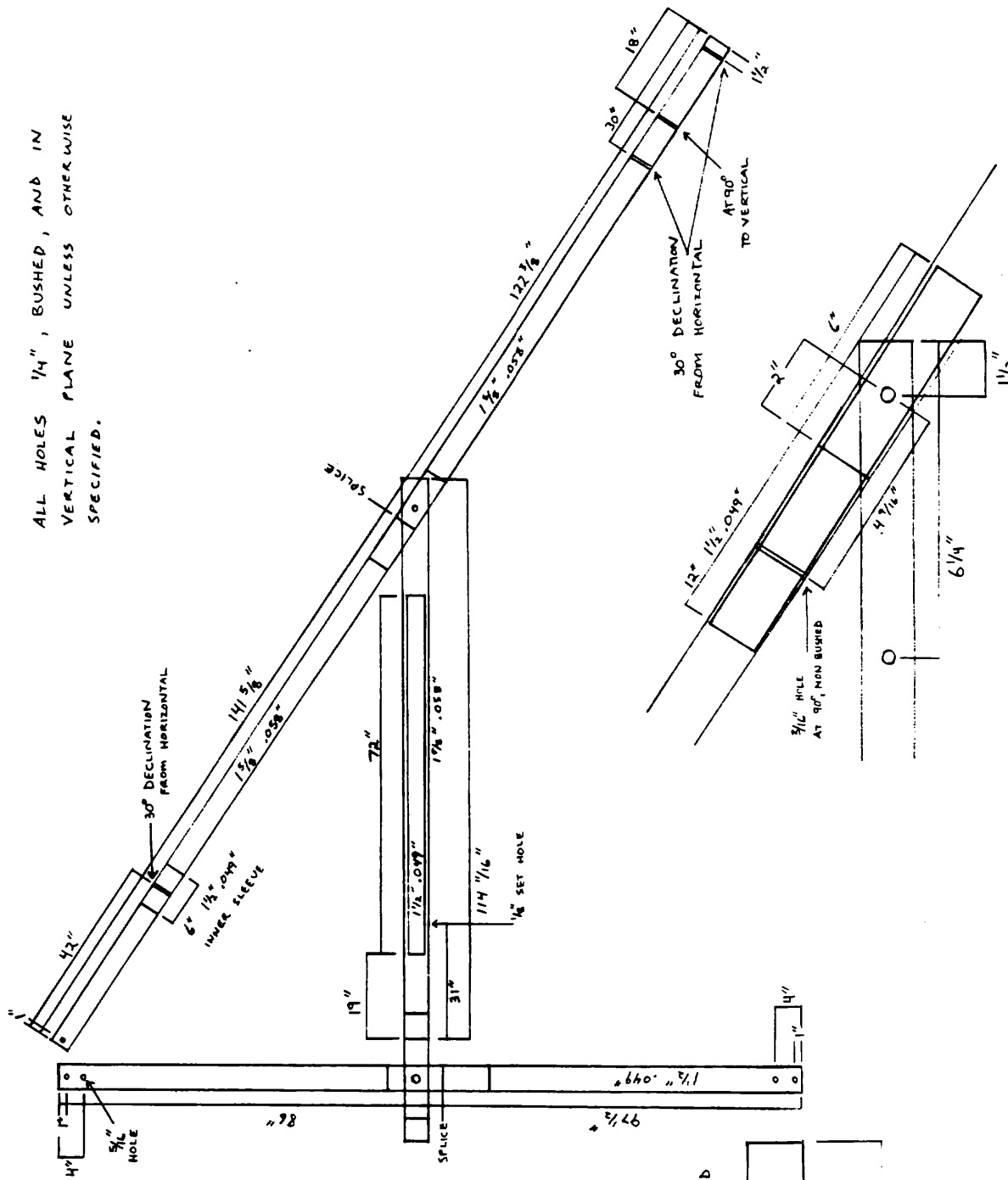
5/17/80

WILLS WING

110 G

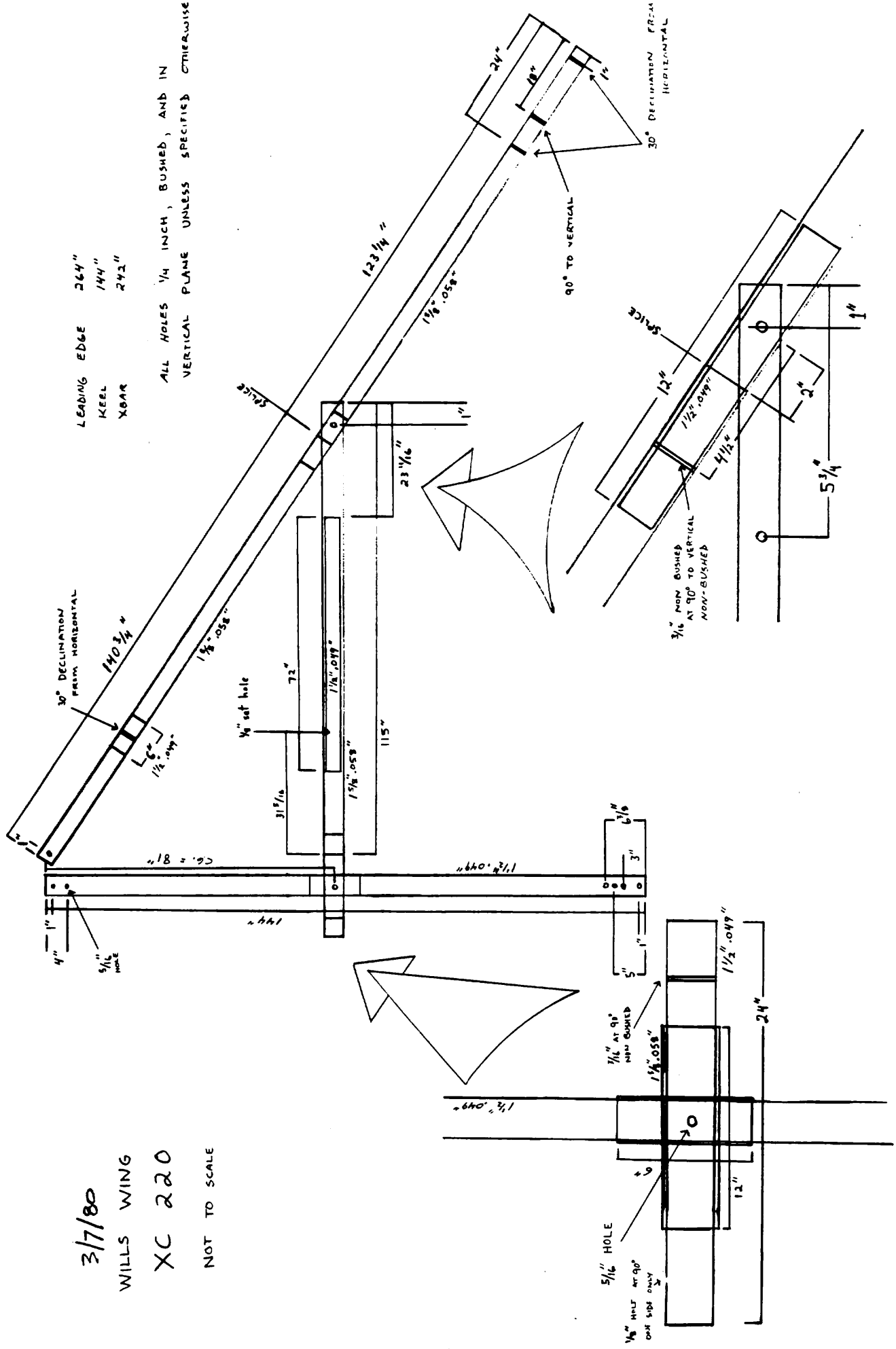
NOT TO SCALE

ALL HOLES 1/4" BUSHED, AND IN VERTICAL PLANE UNLESS OTHERWISE SPECIFIED.



LEADING EDGE 264"  
 KEEL 144"  
 XBAR 242"

ALL HOLES 1/4 INCH, BUSHED, AND IN VERTICAL PLANE UNLESS SPECIFIED OTHERWISE.



3/7/80  
 WILLS WING  
 XC 220  
 NOT TO SCALE



3/7/80

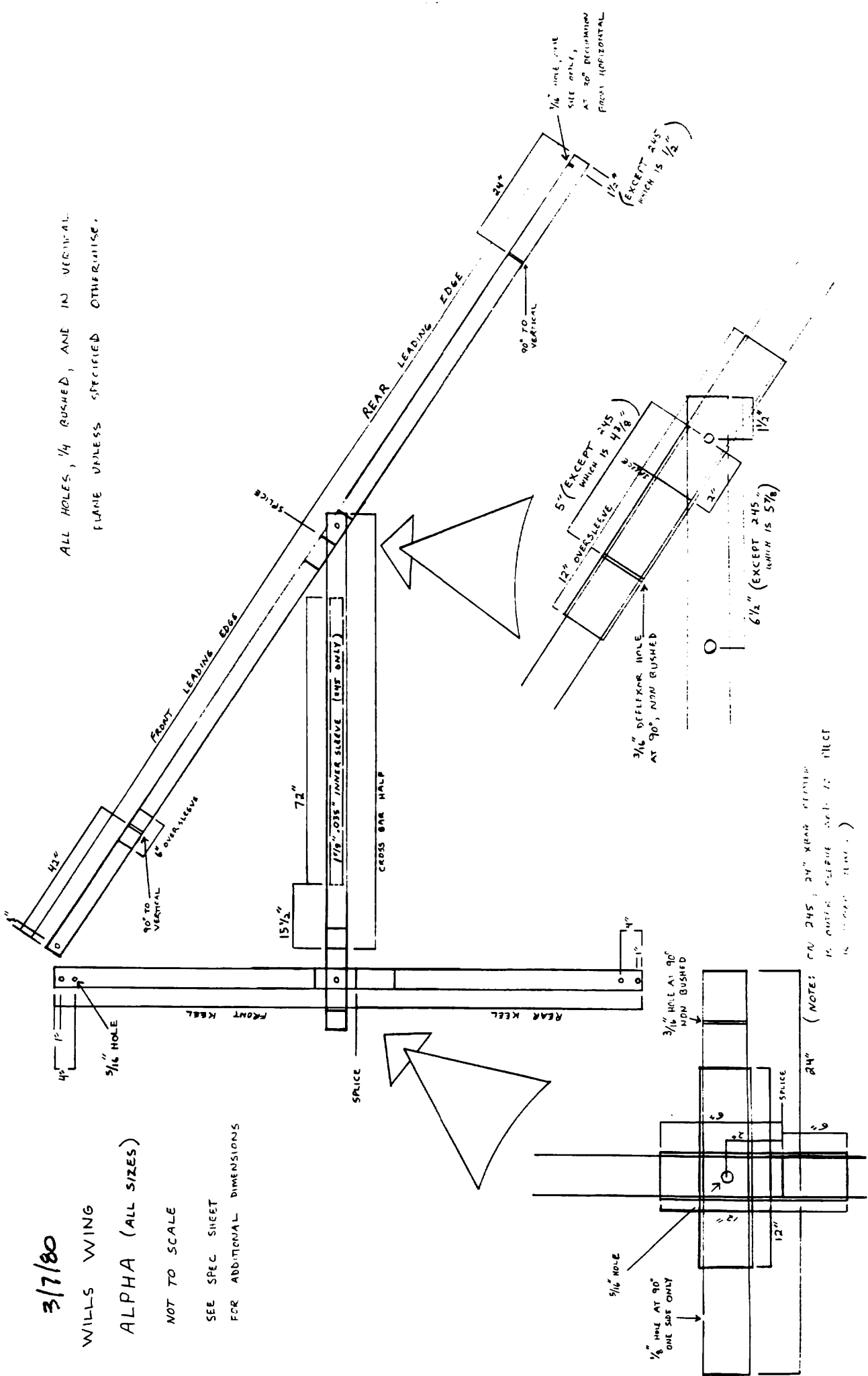
WILLS WING

ALPHA (ALL SIZES)

NOT TO SCALE

SEE SPEC SHEET  
FOR ADDITIONAL DIMENSIONS

ALL HOLES, 1/4 RUSHED, AND IN VERTICAL  
PLANE UNLESS SPECIFIED OTHERWISE.



3/17/80

WILLS WING

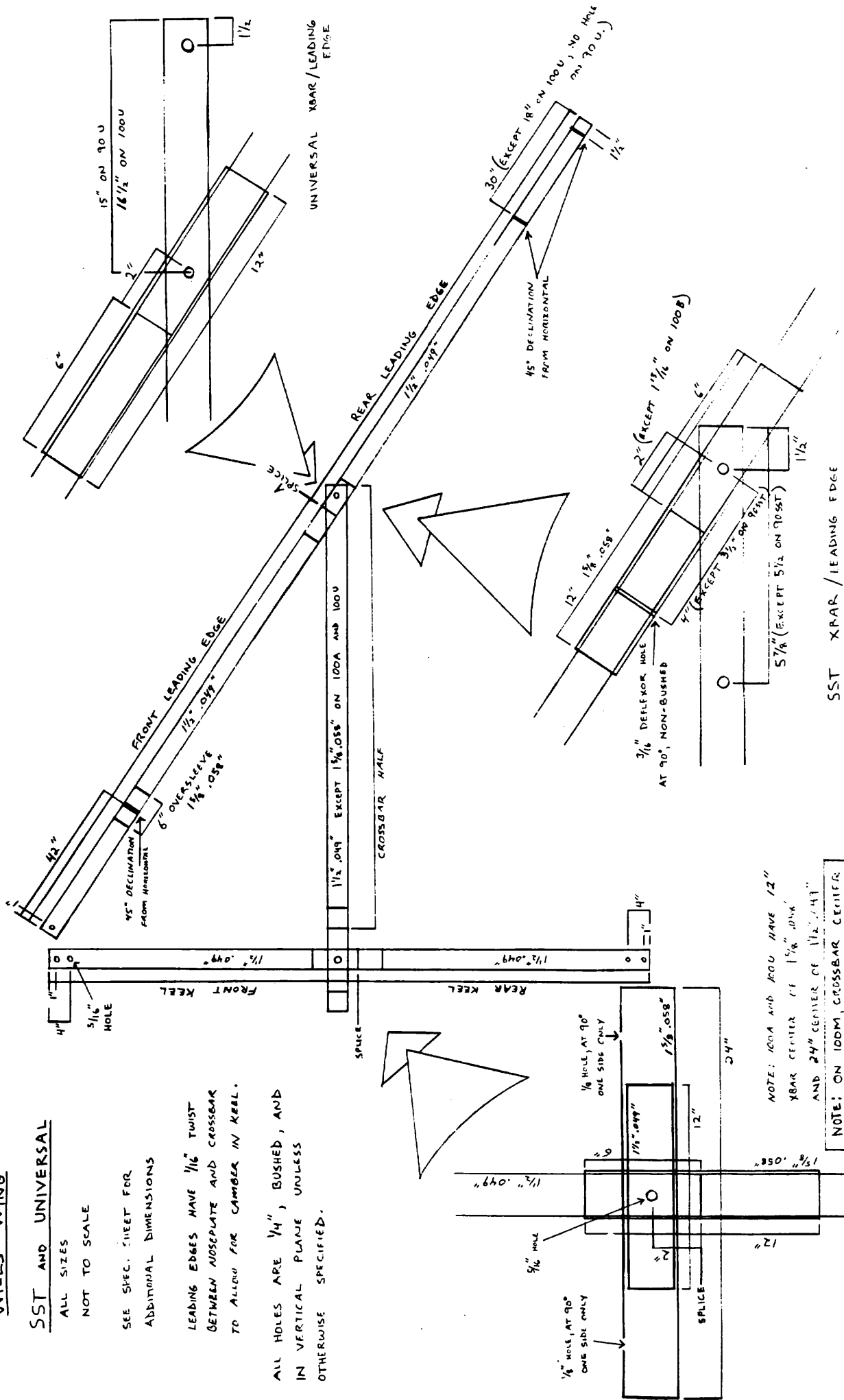
SST AND UNIVERSAL

ALL SIZES  
NOT TO SCALE

SEE SPEC. SHEET FOR  
ADDITIONAL DIMENSIONS

LEADING EDGES HAVE  $1/16$ " TWIST  
BETWEEN NOSEPLATE AND CROSSBAR  
TO ALLOW FOR CAMBER IN KEEL.

ALL HOLES ARE  $1/4$ ", BUSHED, AND  
IN VERTICAL PLANE UNLESS  
OTHERWISE SPECIFIED.



NOTE: 100A AND 100U HAVE 12" XBAR CENTER OF  $1 1/8$ " DIA. AND 24" CENTER OF  $1 1/2$ " DIA.

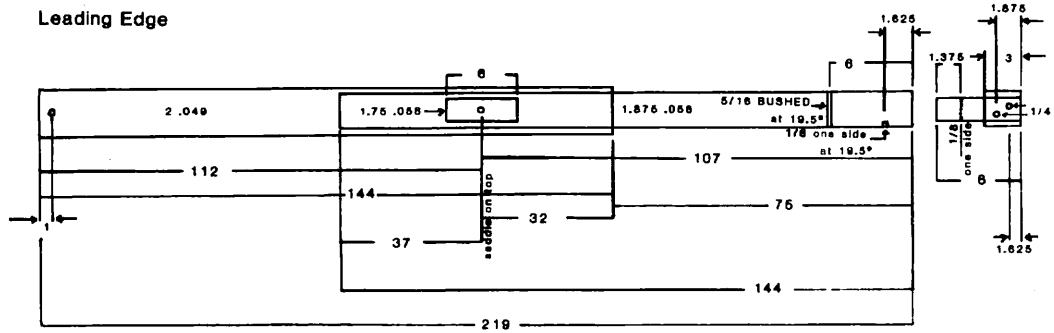
NOTE: ON 100M, CROSSBAR CENTER PIECES ARE 6" AND 18".

# HARRIER 177 I

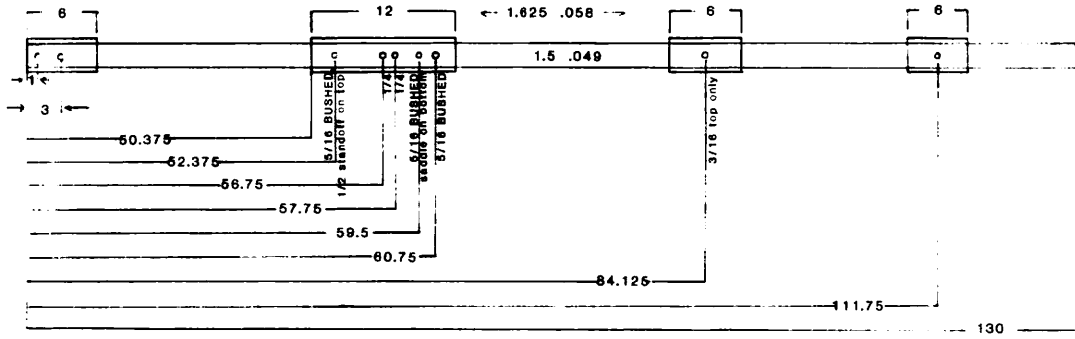
Not to Scale  
 All holes 3/8, bushed to 1/4,  
 unless otherwise specified  
 All dimensions in inches

**Wills Wing, Inc.**

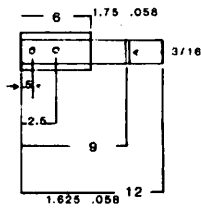
## Leading Edge



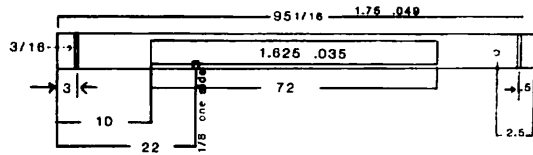
## Keel



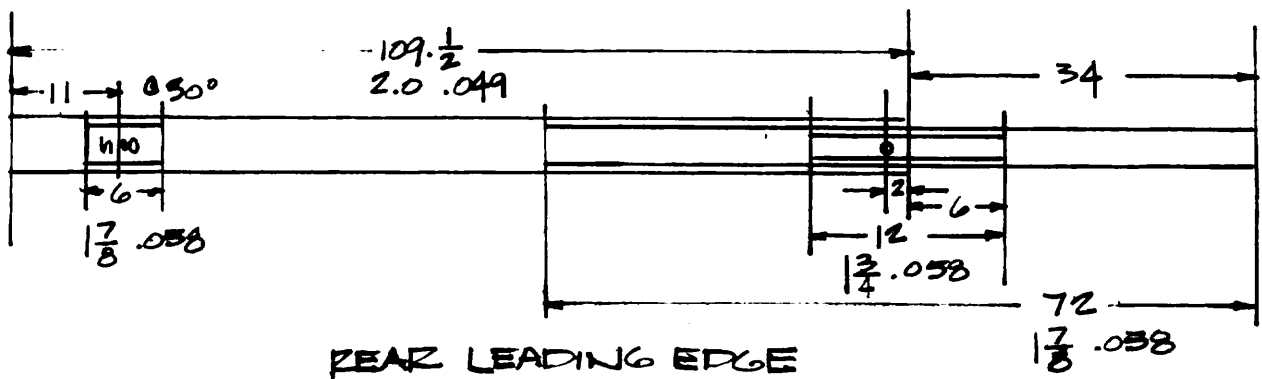
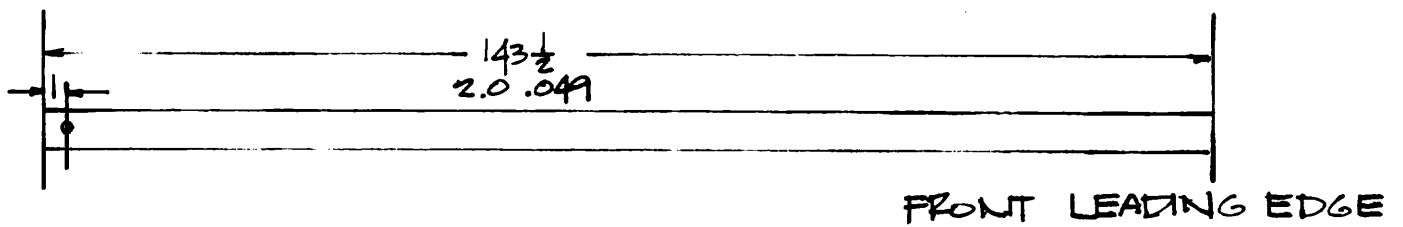
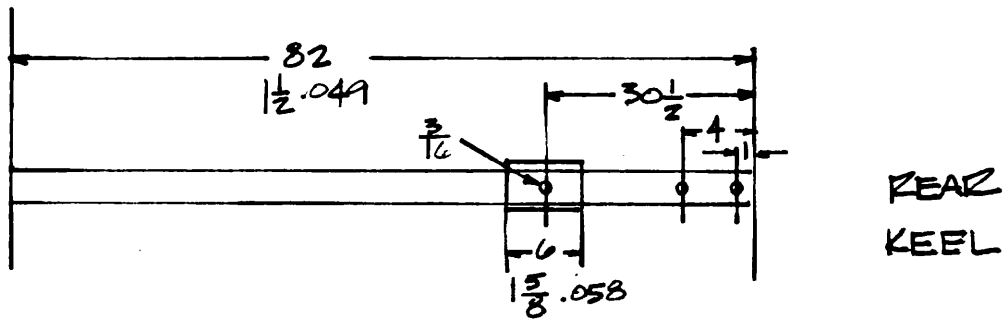
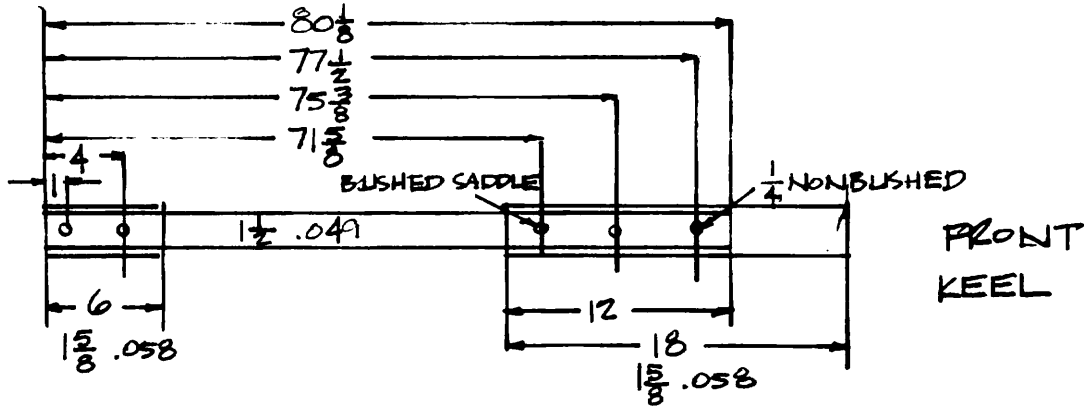
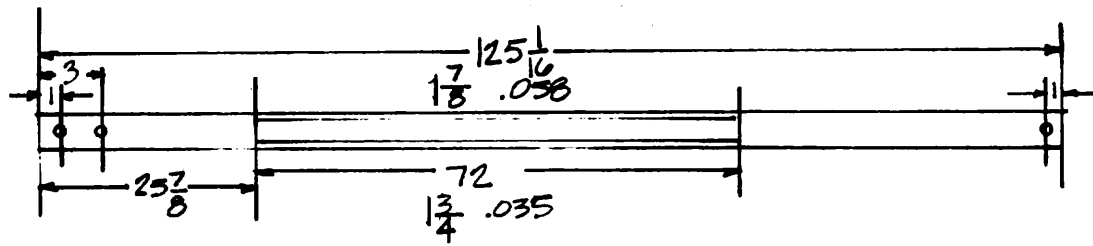
## XBar Center



## XBar



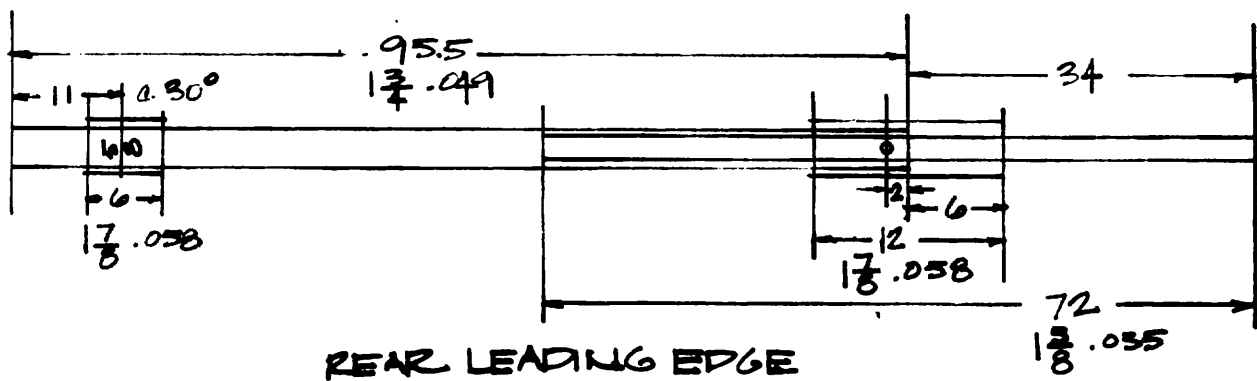
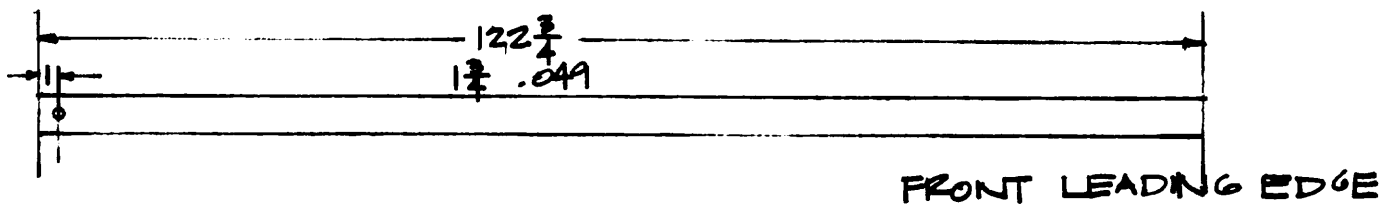
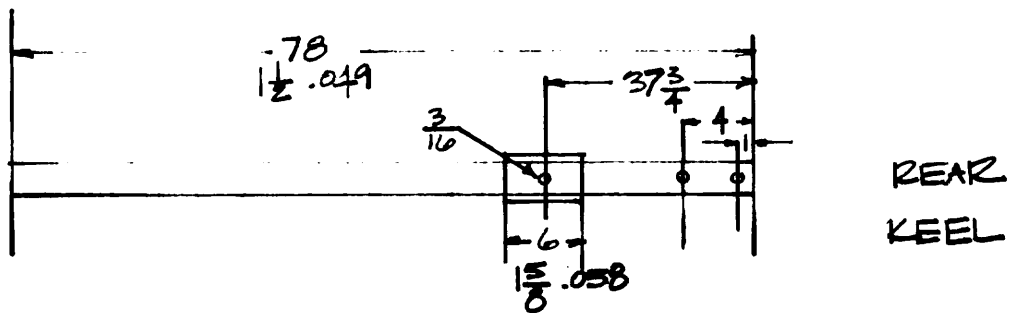
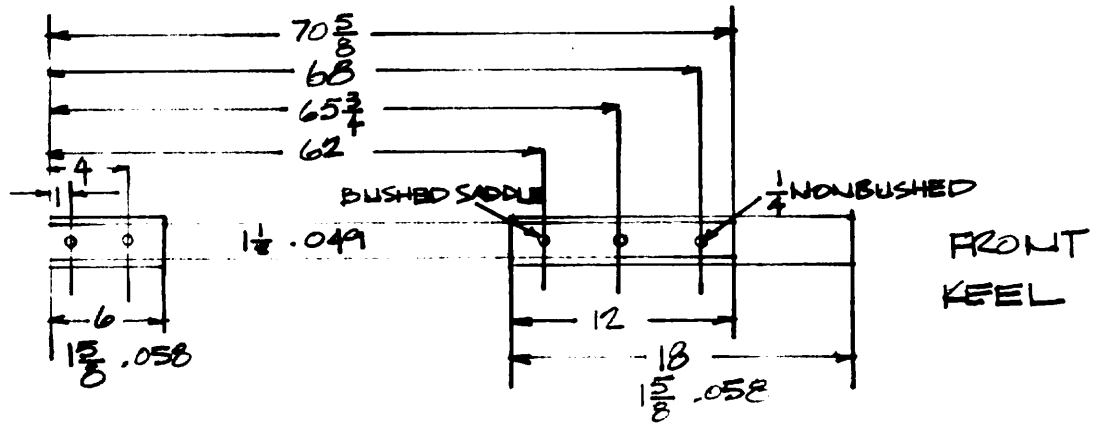
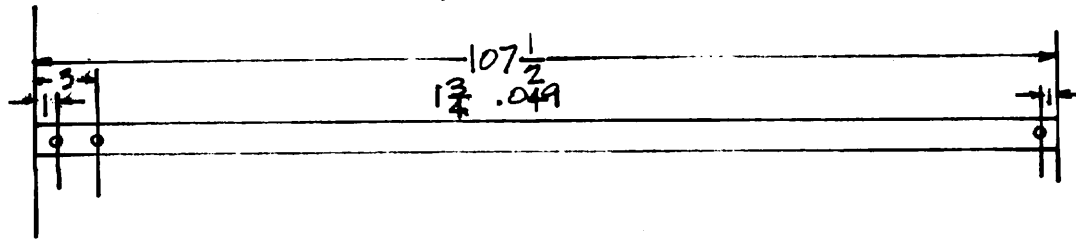
CROSSBAR



# 179 RAVEN

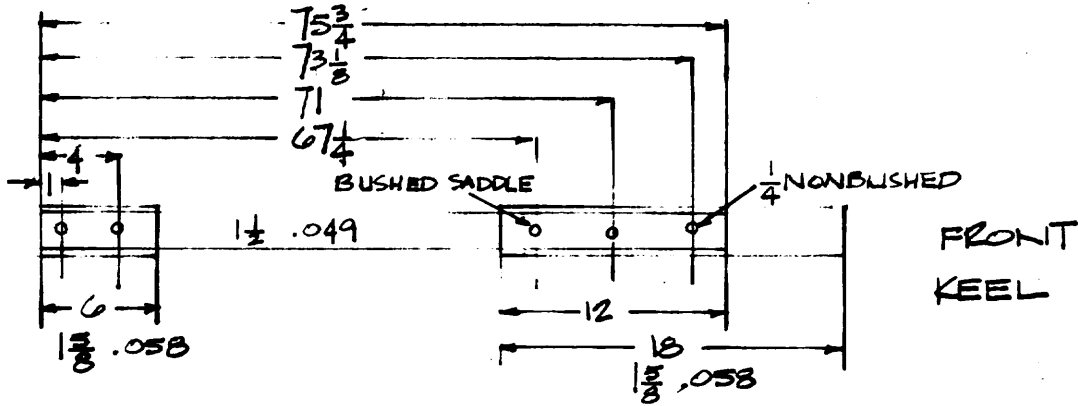
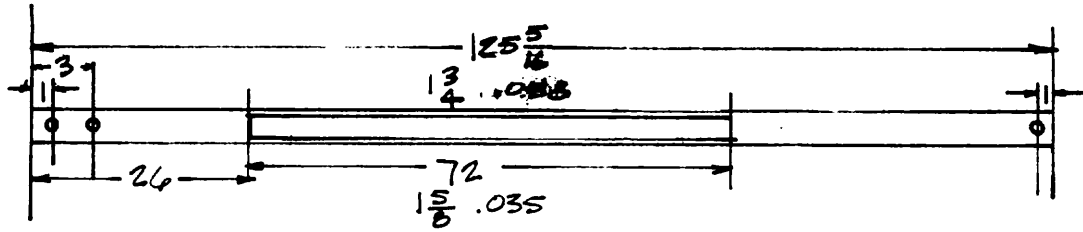
3-7-80 SP

## CROSSBAR

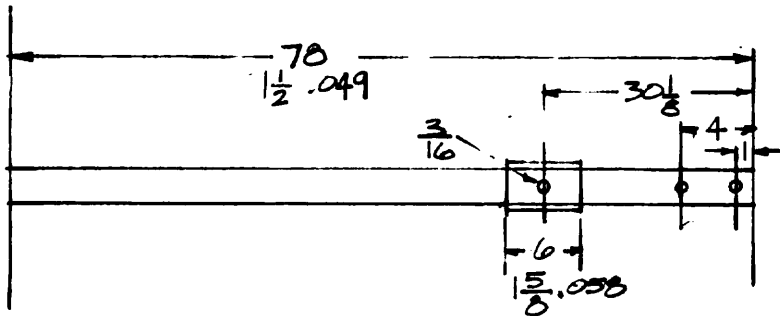




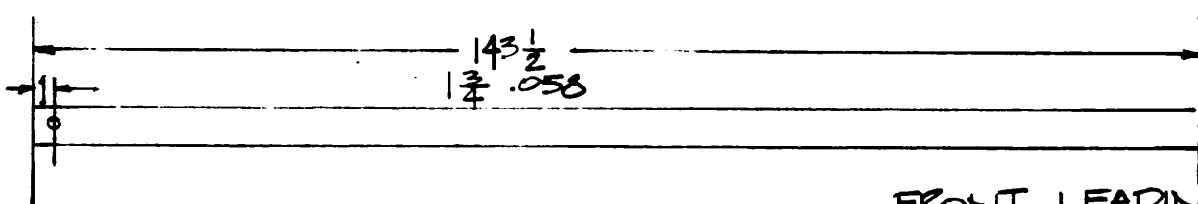
## CROSSBAR



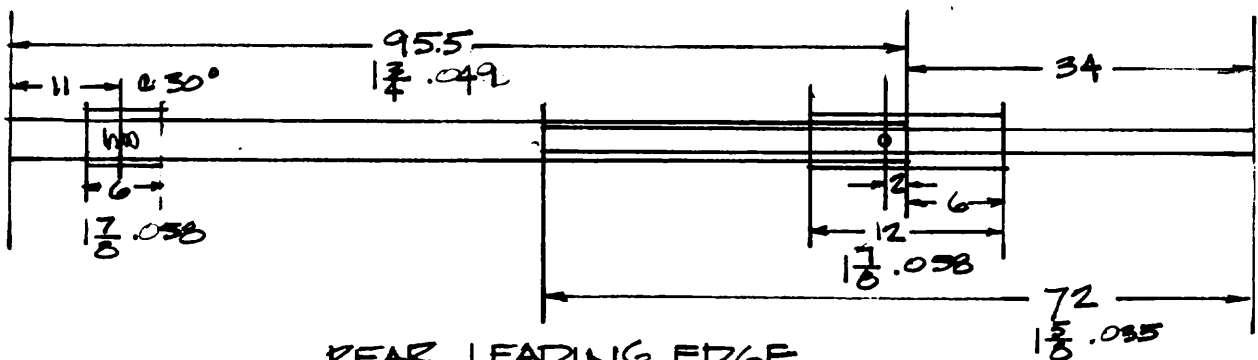
FRONT KEEL



REAR KEEL



FRONT LEADING EDGE

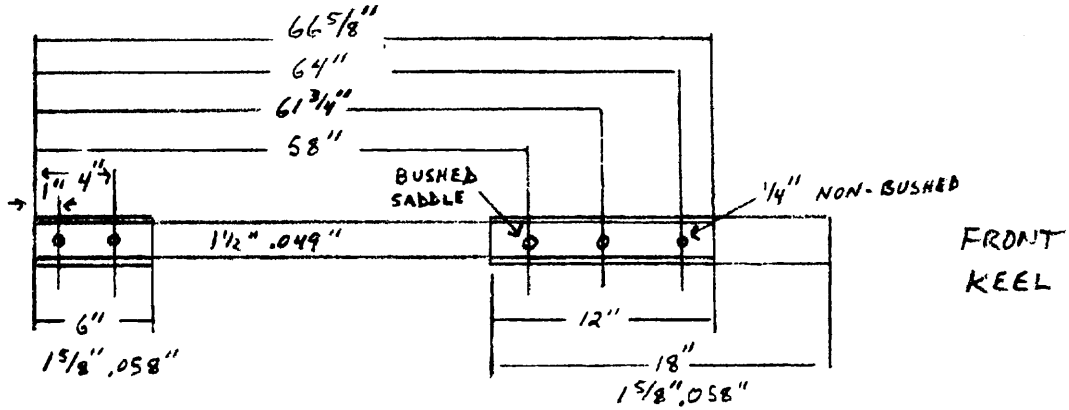
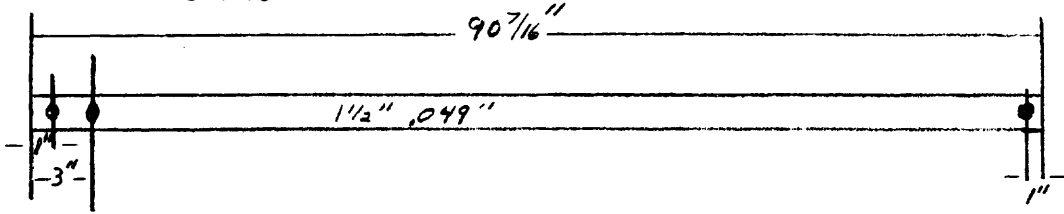


REAR LEADING EDGE

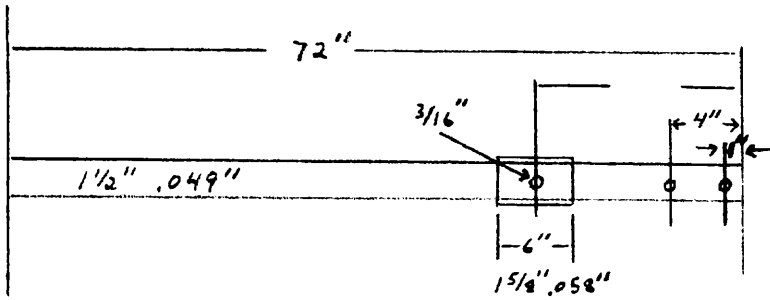
149 RAVEN

4-10-80

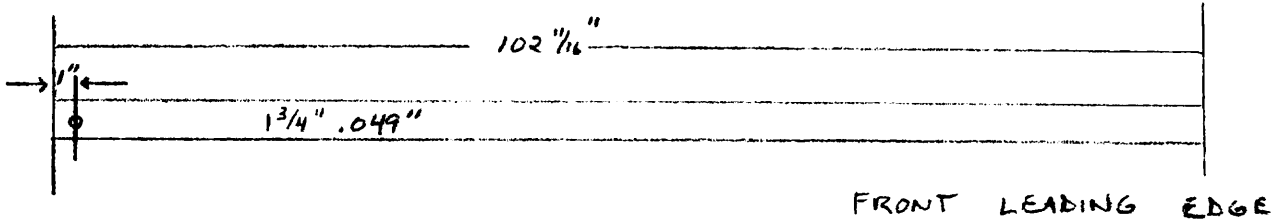
CROSSBAR



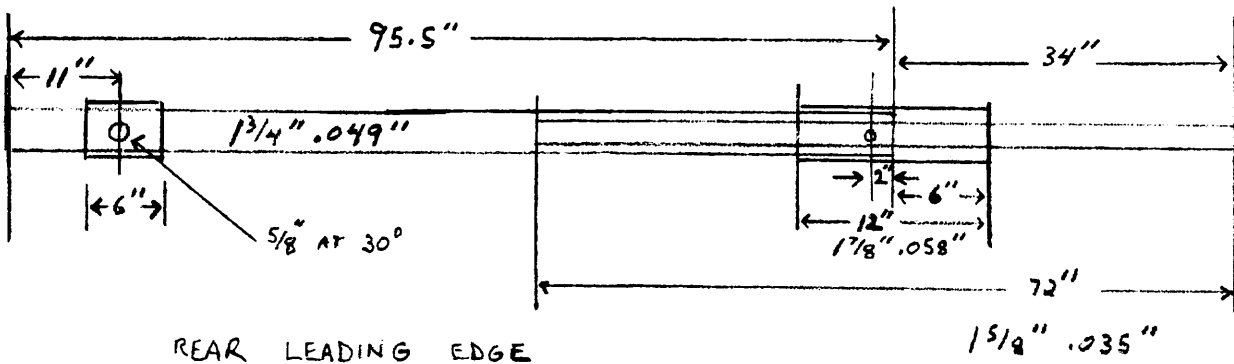
FRONT  
KEEL



REAR  
KEEL



FRONT LEADING EDGE



REAR LEADING EDGE

$15 \frac{1}{8}$ " .035"

## ALPHA FRAME DIMENSIONS AND TUBING SIZES

	245	215	185	155	
FRONT KEEL	81 $\frac{1}{2}$ " 1 $\frac{1}{2}$ ".049"	77 $\frac{1}{2}$ " 1 $\frac{1}{2}$ ".049"	74 $\frac{1}{4}$ " 1 $\frac{1}{2}$ ".049"	68" 1 $\frac{1}{2}$ ".049"	
REAR KEEL	86" 1 $\frac{1}{2}$ ".049"	78 $\frac{1}{4}$ " 1 $\frac{1}{2}$ ".049"	70 $\frac{1}{4}$ " 1 $\frac{1}{2}$ ".049"	64 $\frac{3}{8}$ " 1 $\frac{1}{2}$ ".049"	
CROSSBAR HALF	110 $\frac{5}{8}$ " 1 $\frac{3}{4}$ ".049"	104 $\frac{7}{8}$ " 1 $\frac{5}{8}$ ".058"	100 $\frac{1}{8}$ " 1 $\frac{5}{8}$ ".058"	90 $\frac{3}{4}$ " 1 $\frac{5}{8}$ ".058"	NEW
		106"	101 $\frac{1}{4}$ "	92"	OLD
FRONT LEADING EDGE	135 $\frac{5}{8}$ " 1 $\frac{3}{4}$ ".049"	128 $\frac{5}{8}$ " 1 $\frac{1}{2}$ ".049"	122 $\frac{7}{8}$ " 1 $\frac{1}{2}$ ".049"	111 $\frac{5}{8}$ " 1 $\frac{1}{2}$ ".049"	NEW
		129 $\frac{9}{16}$ "	123 $\frac{15}{16}$ "	112 $\frac{1}{16}$ "	OLD
REAR LEADING EDGE	123 $\frac{3}{8}$ " 1 $\frac{3}{4}$ ".049"	113 $\frac{3}{8}$ " 1 $\frac{1}{2}$ ".049"	101 $\frac{5}{8}$ " 1 $\frac{1}{2}$ ".049"	93 $\frac{7}{8}$ " 1 $\frac{1}{2}$ ".049"	NEW
		112 $\frac{7}{16}$ "	100 $\frac{9}{16}$ "	92 $\frac{13}{16}$ "	OLD
LEADING EDGE OVER-SLEEVES	1 $\frac{7}{8}$ ".058"	1 $\frac{5}{8}$ ".058"	1 $\frac{5}{8}$ ".058"	1 $\frac{5}{8}$ ".058"	
KEEL OVER-SLEEVE	1 $\frac{5}{8}$ ".058"	1 $\frac{5}{8}$ ".058"	1 $\frac{5}{8}$ ".058"	1 $\frac{5}{8}$ ".058"	
12" CROSSBAR CENTER	1 $\frac{3}{4}$ ".049"	1 $\frac{5}{8}$ ".058"	1 $\frac{5}{8}$ ".058"	1 $\frac{5}{8}$ ".058"	
24" CROSSBAR CENTER	1 $\frac{7}{8}$ ".058"	1 $\frac{1}{2}$ ".049"	1 $\frac{1}{2}$ ".049"	1 $\frac{1}{2}$ ".049"	

NOTE: ALPHA 155'S  
NUMBERED 2892,  
2904, 2927, 3055 +  
3059 HAVE CUSTOM  
FRAMES. CALL WW FOR  
SPECIFICATIONS.

3-7-80

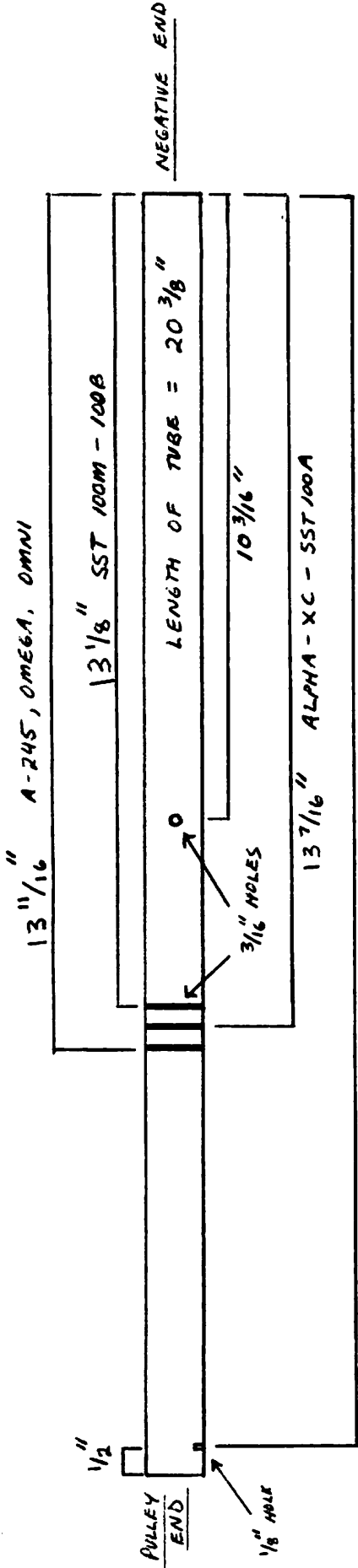
WILLS WING SST AND UNIVERSAL FRAME SPECS

	100A	100B	100C	90	100M	90U	100U
FRONT KEEL	89"	86 1/2"	82"	93"	79"	93"	89"
REAR KEEL	102"	104 1/2"	98"	98"	101"	98"	102"
CROSSBAR HALF	100"	97 7/8"	91 1/16"	88.5"	91"	100"	115"
FRONT LEADING EDGE	131 1/4"	127 7/8"	120 1/16"	125 3/4"	116 1/16"	123 7/8"	131 1/4"
REAR LEADING EDGE	132 3/4"	136 5/8"	131 5/16"	138 1/4"	123 15/16"	128 3/8"	120 3/4"
CROSSBAR TUBING	1 5/8" .058"	1 1/2" .049"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 5/8"
LEADING EDGE TUBING	1 1/2" .049"						→
Keel Tubing	1 1/2" .049"						→
CROSSBAR CENTERS	12" + 24"	12" + 24"	12" + 24"	12" + 24"	6" + 18" <u><u><u>        </u></u></u>	12" + 24"	12" + 24"

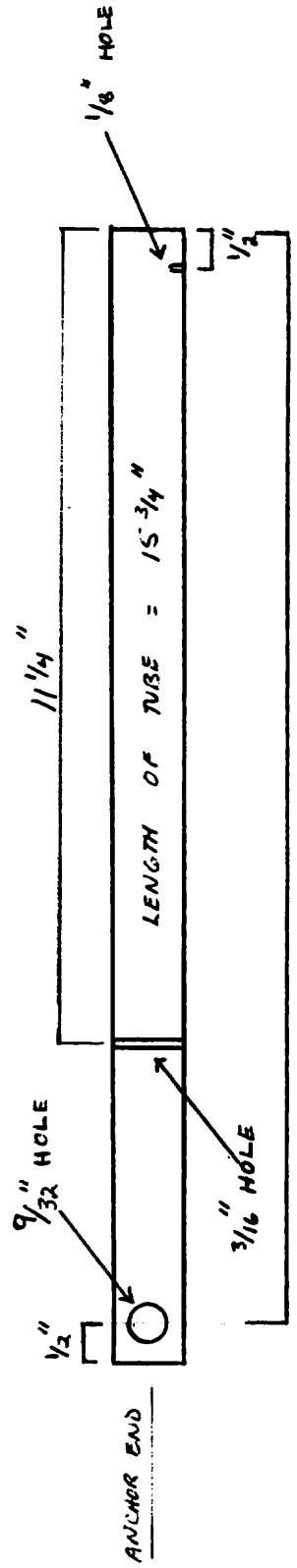
3-7-80  
 WINGPOST TUBING 5/8" .058"  
 INNER SLEEVING 1/2" .065"

**WILLS WING, INC.**

1208-H E. WALNUT - SANTA ANA, CALIFORNIA 92701  
 (714) 547-1344



DOWN DEFLEXOR



OUT DEFLEXOR - ALL MODELS

SST + ALPHA-XC DOWN POST HAS 13" INTERNAL SLEEVE

SET 1 1/2" IN FROM NEGATIVE END, SST DOWN (OLD)

POST HAS 5" INTERNAL SLEEVE SET 6 1/4" IN FROM

PULLEY END, OUT POST HAS 2" INTERNAL SLEEVE

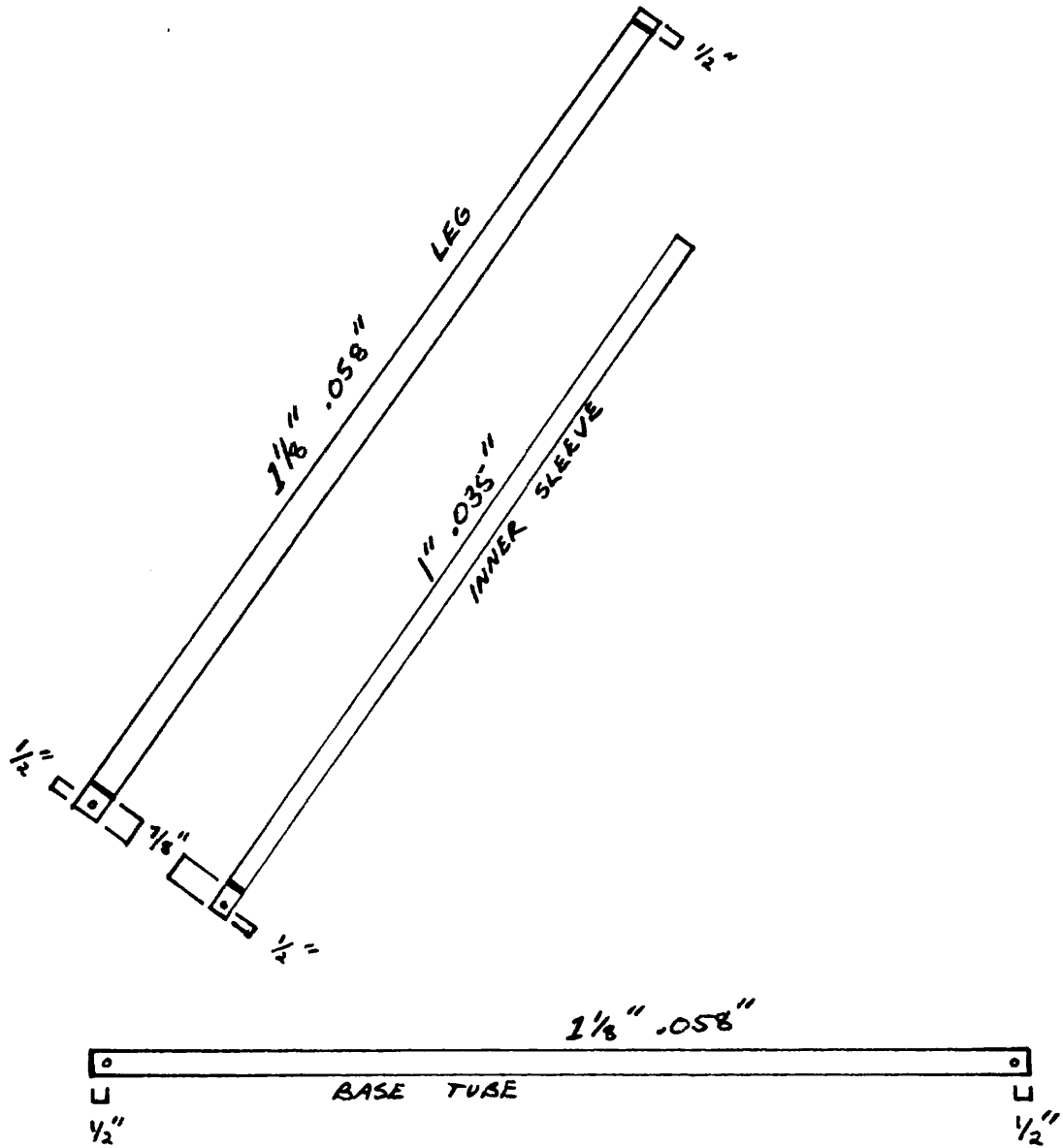
SET 3 1/2" IN FROM ANCHOR END.

PULLEY ADDS 7/8"

NEG. PLUG ADDS 1/4"

3-7-80

TUBE LENGTHS AND  
HOLE LOCATIONS FOR  
BRACKET BREAKDOWN  
CONTROL BAR

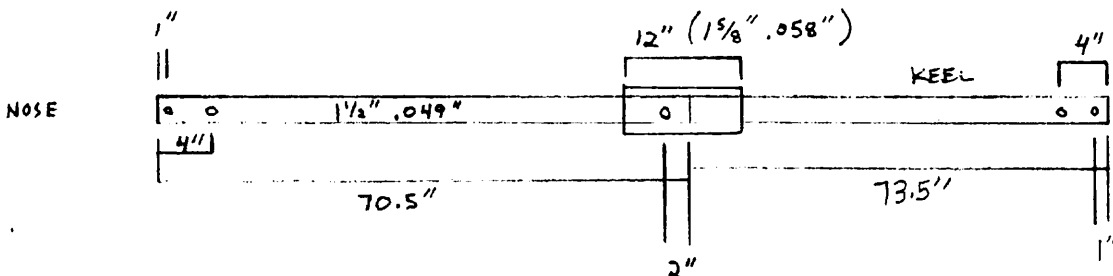
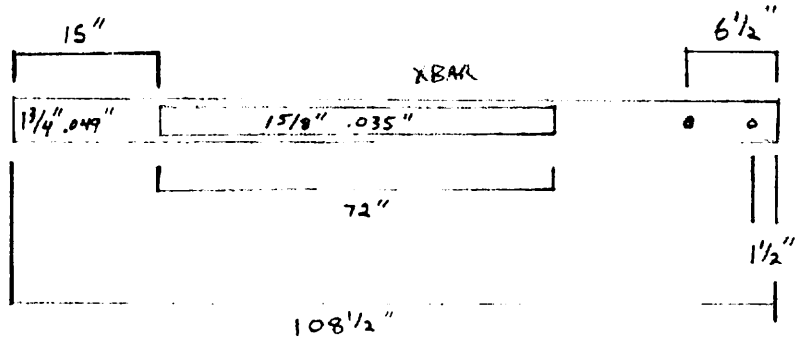
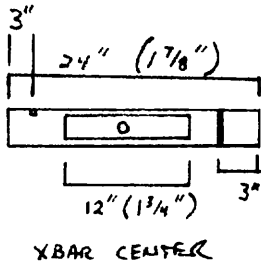
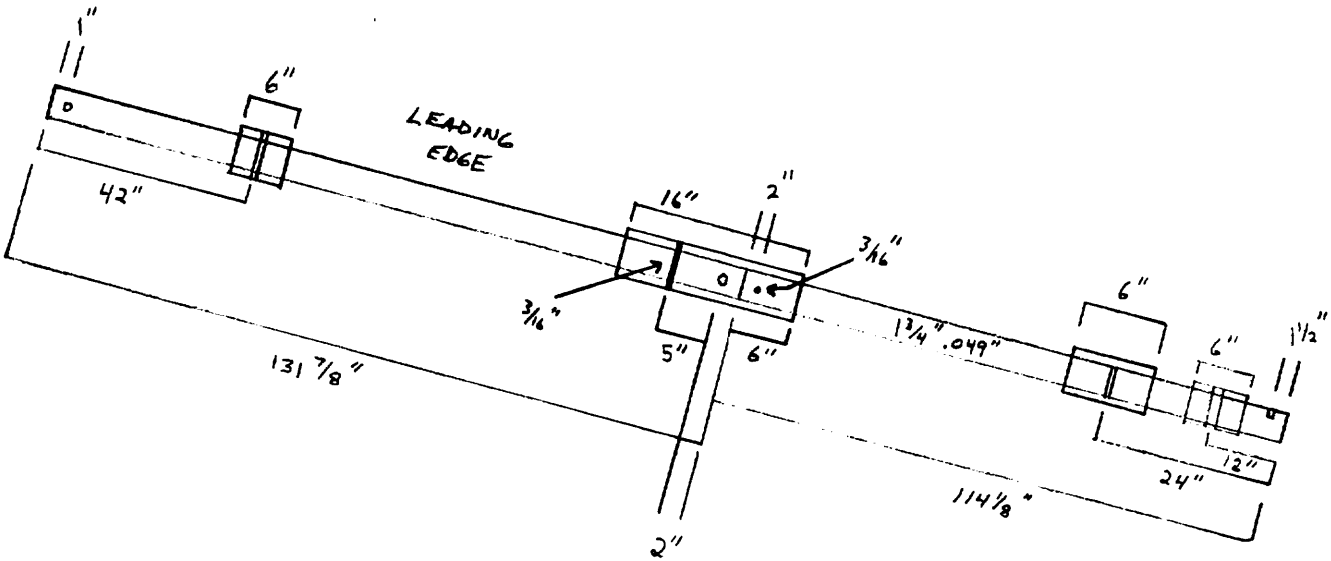


BAR SIZE	LEG	INNER SLEEVE	BASE TUBE
245	60 1/8"	57"	66 13/16"
155	51 7/8"	6"	61 1/2"
JAN CASE	49 3/16"	6"	50 5/16"

3-7-80  
OMNI 187 (200)

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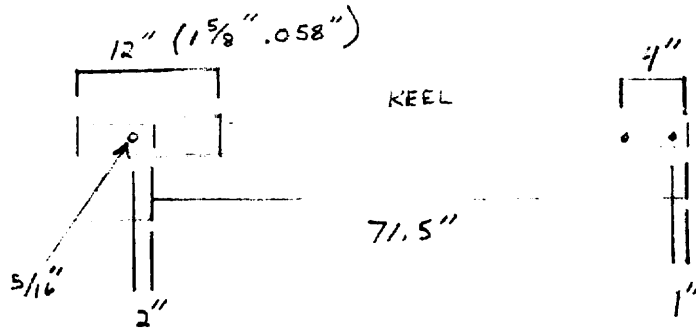
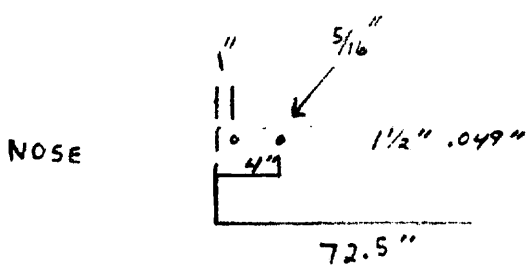
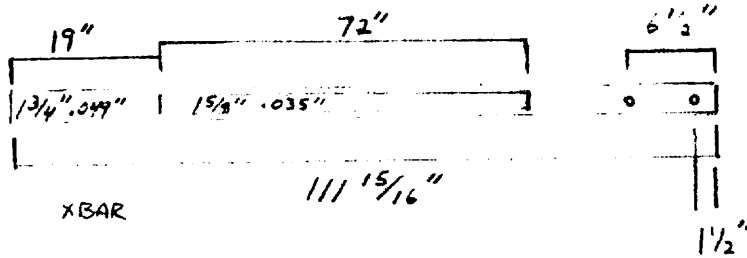
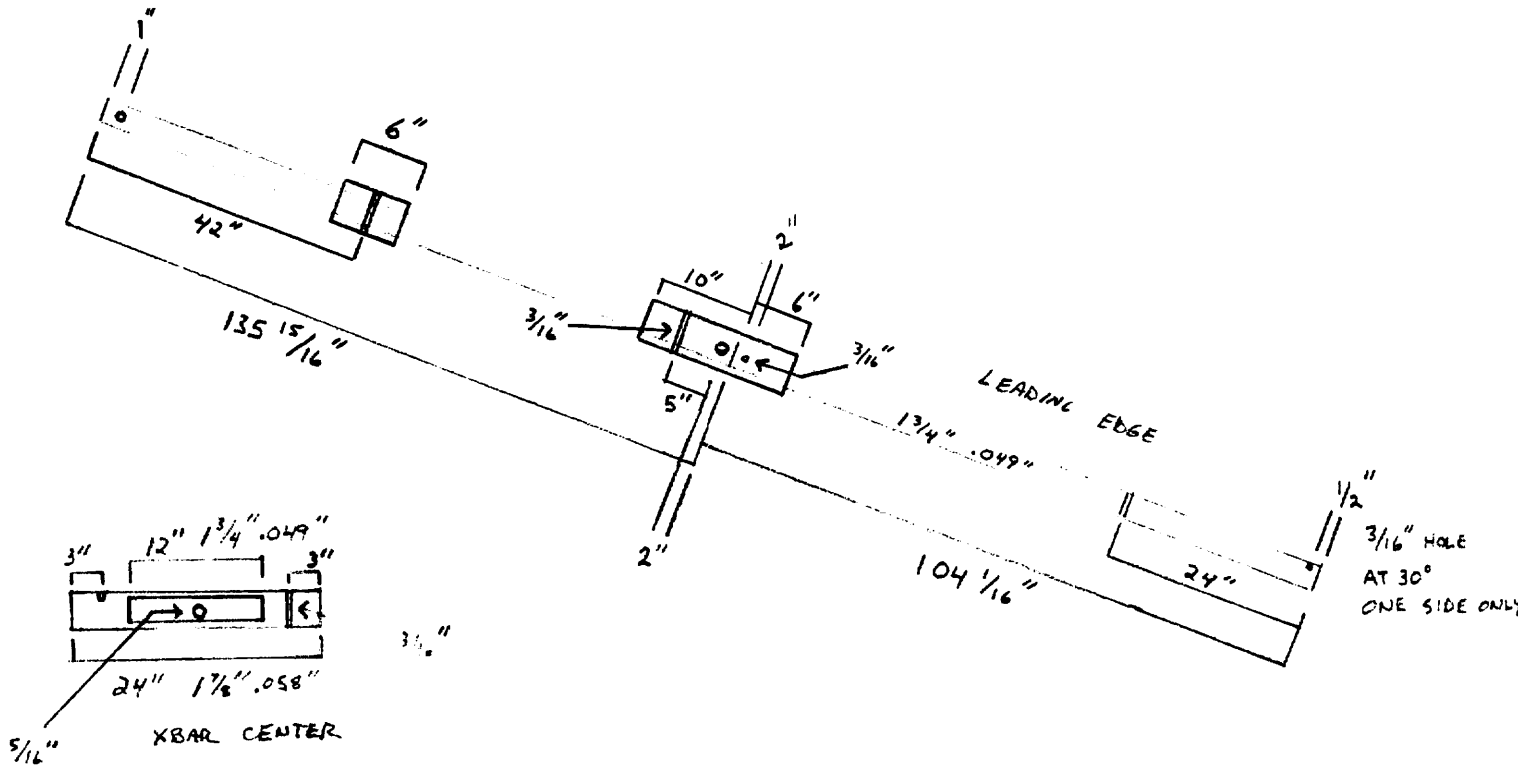
# WILLS WING, INC.



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3-7-80

OMEGA 180



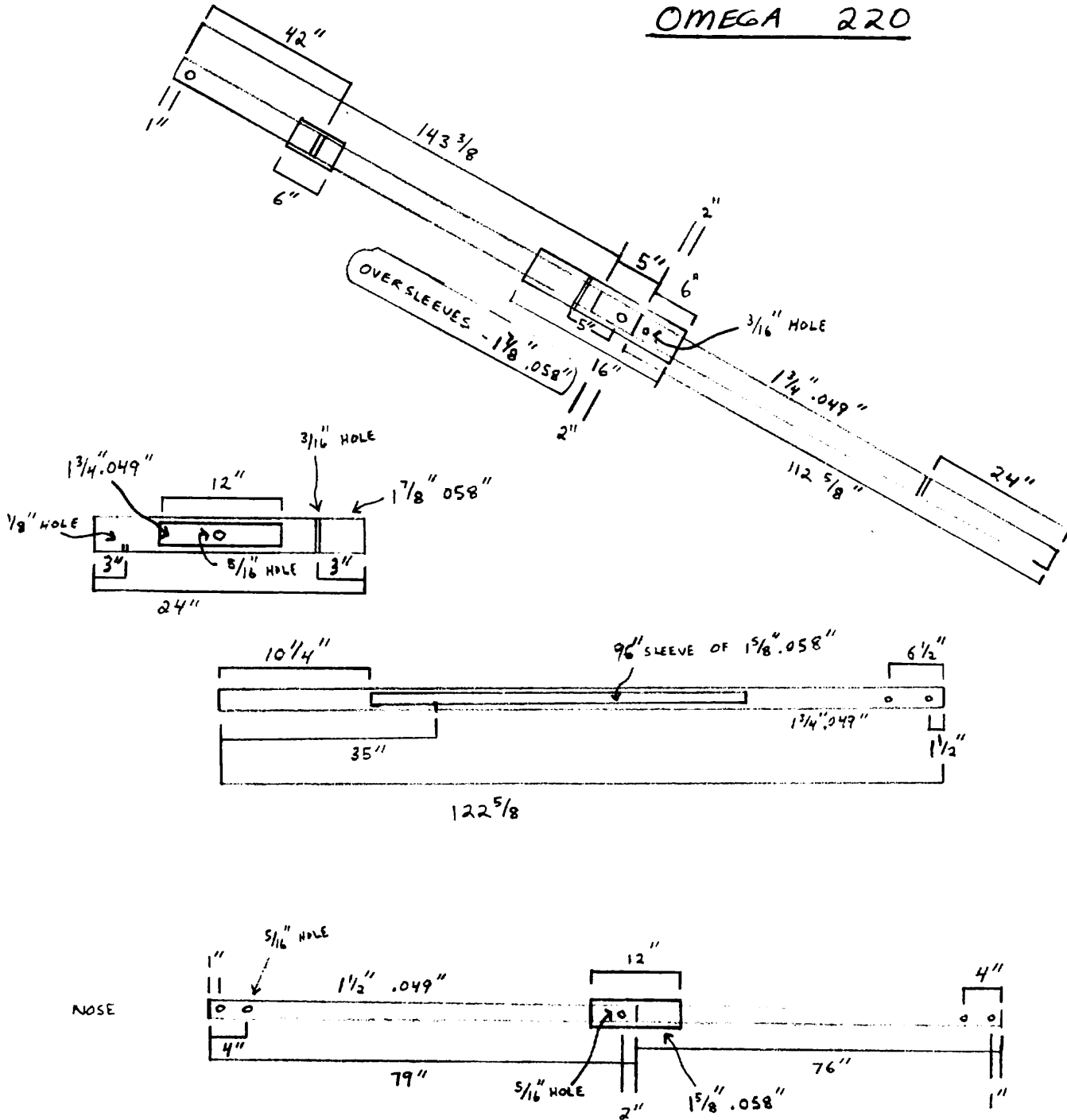


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3-7-80

OMEGA 220



7-7-80

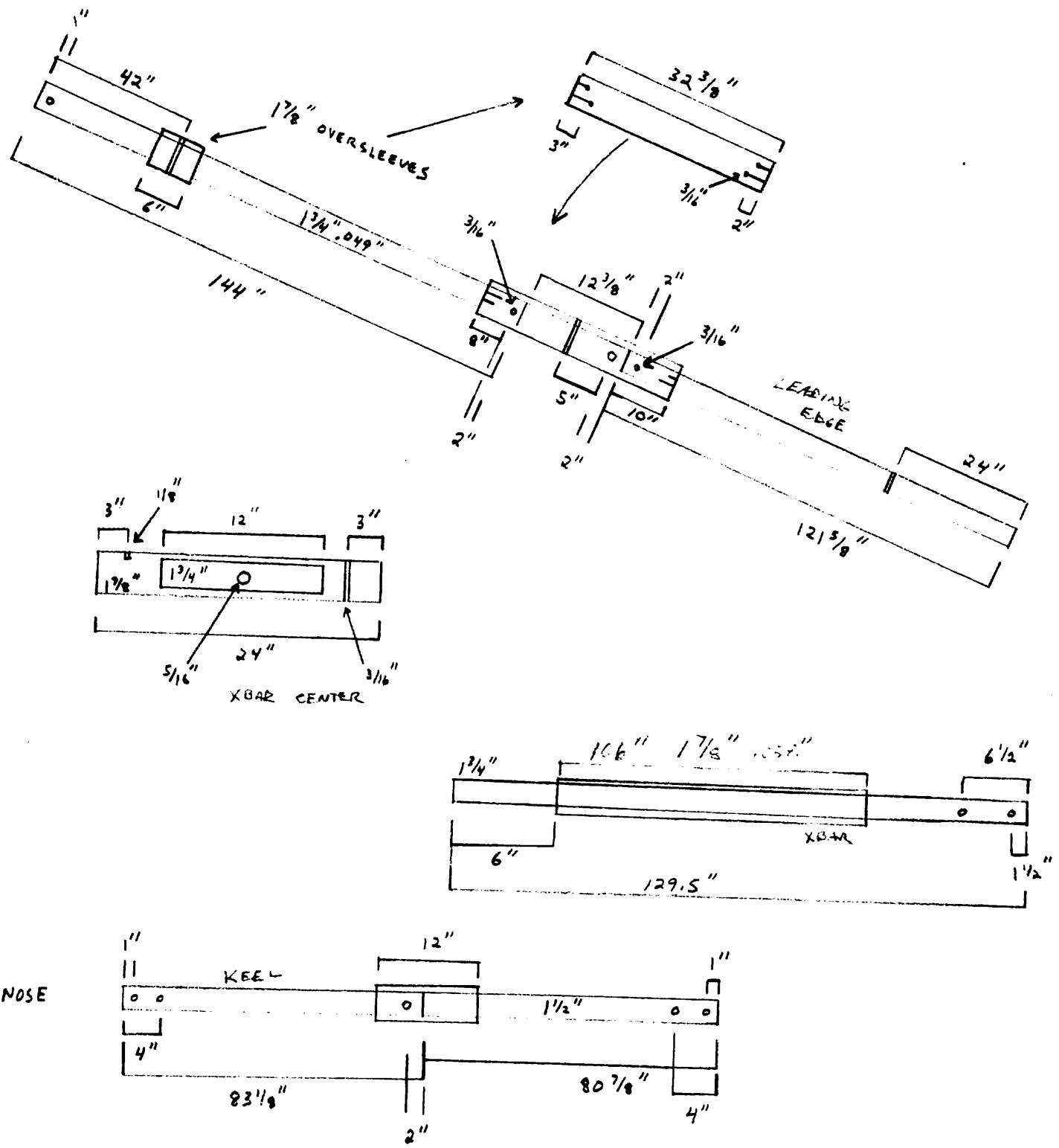
OMEGA 260

# FRAME PLANS

# WILLS WING, INC.



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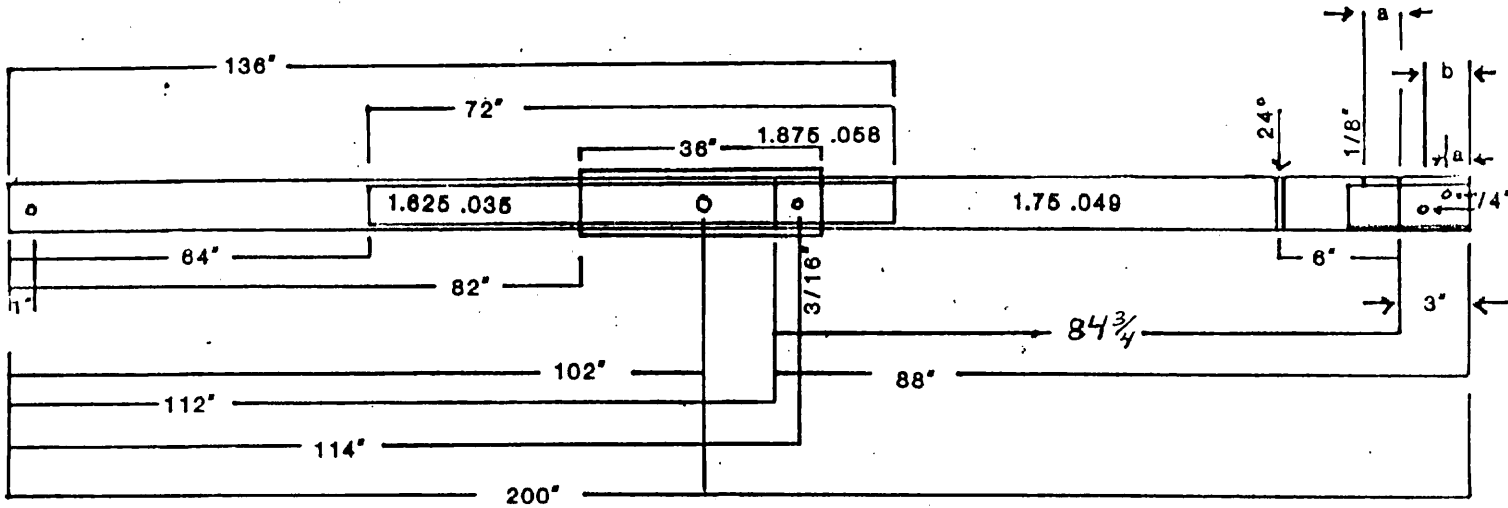


Not to scale

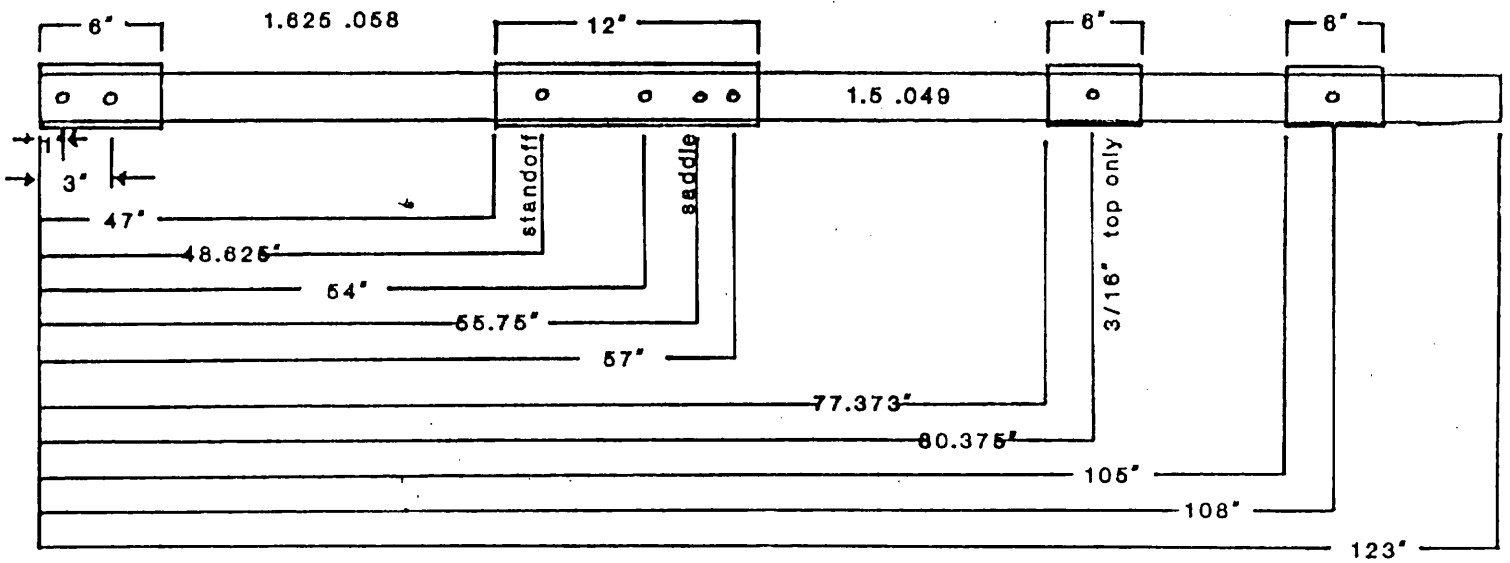
All holes 3/8" bushed unless otherwise specified

a:1.625

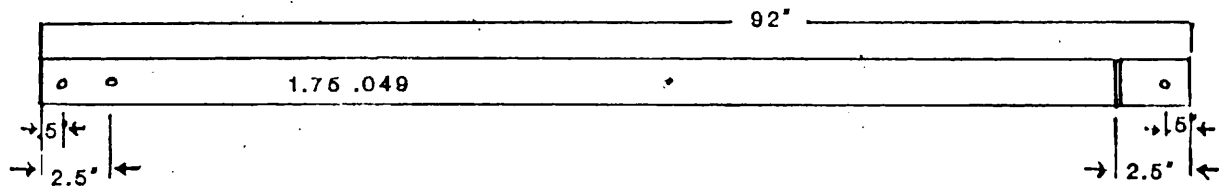
b:1.875



LEADING EDGE



KEEL

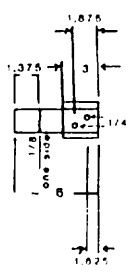
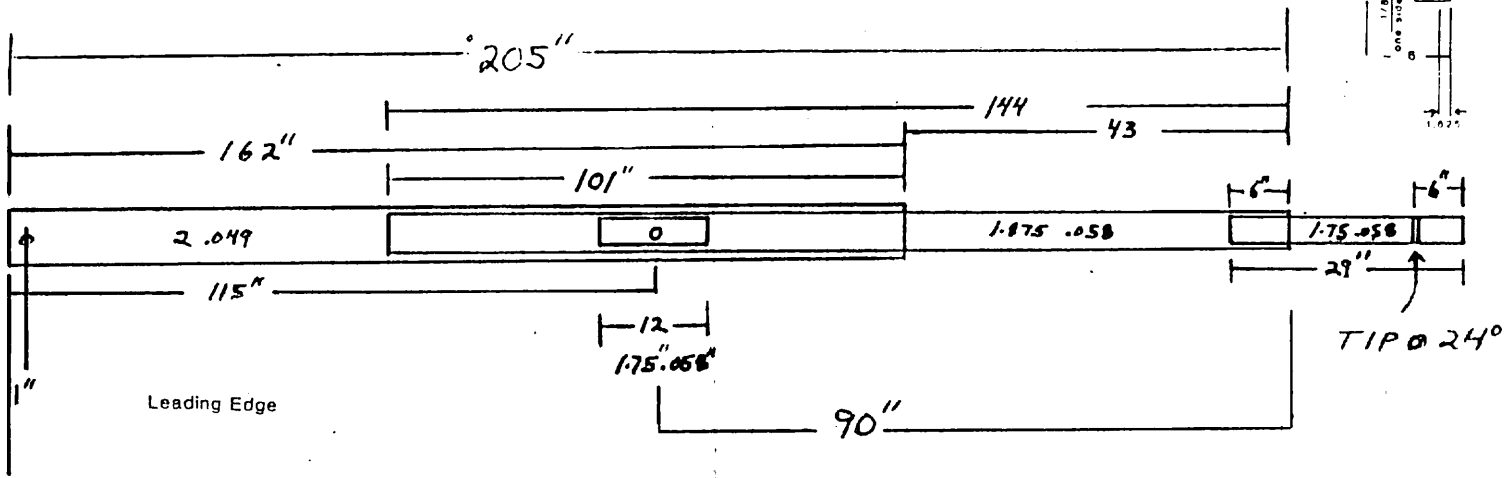


CROSSBAR

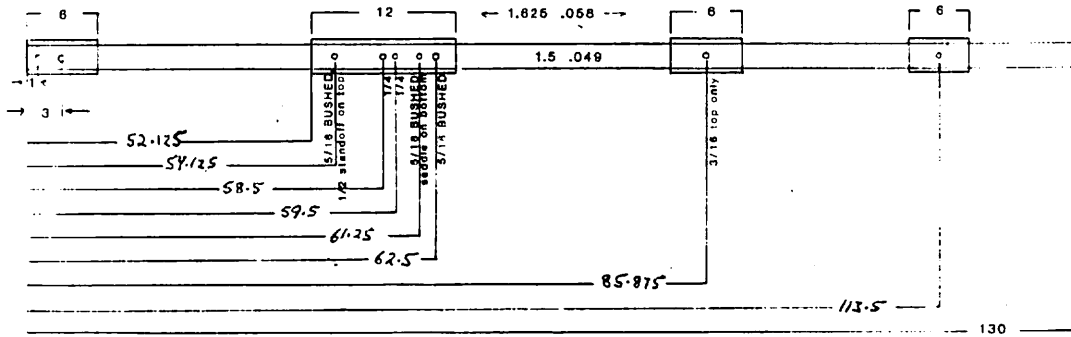
187 HARRIER I

Not to Scale  
 All holes 3/8, bushed to 1/4,  
 unless otherwise specified  
 All dimensions in inches

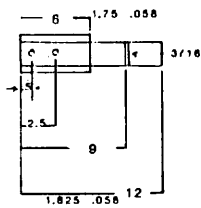
Wills Wing, Inc. 11-20-81



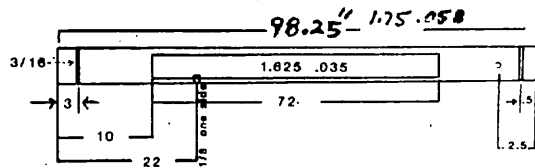
Keel

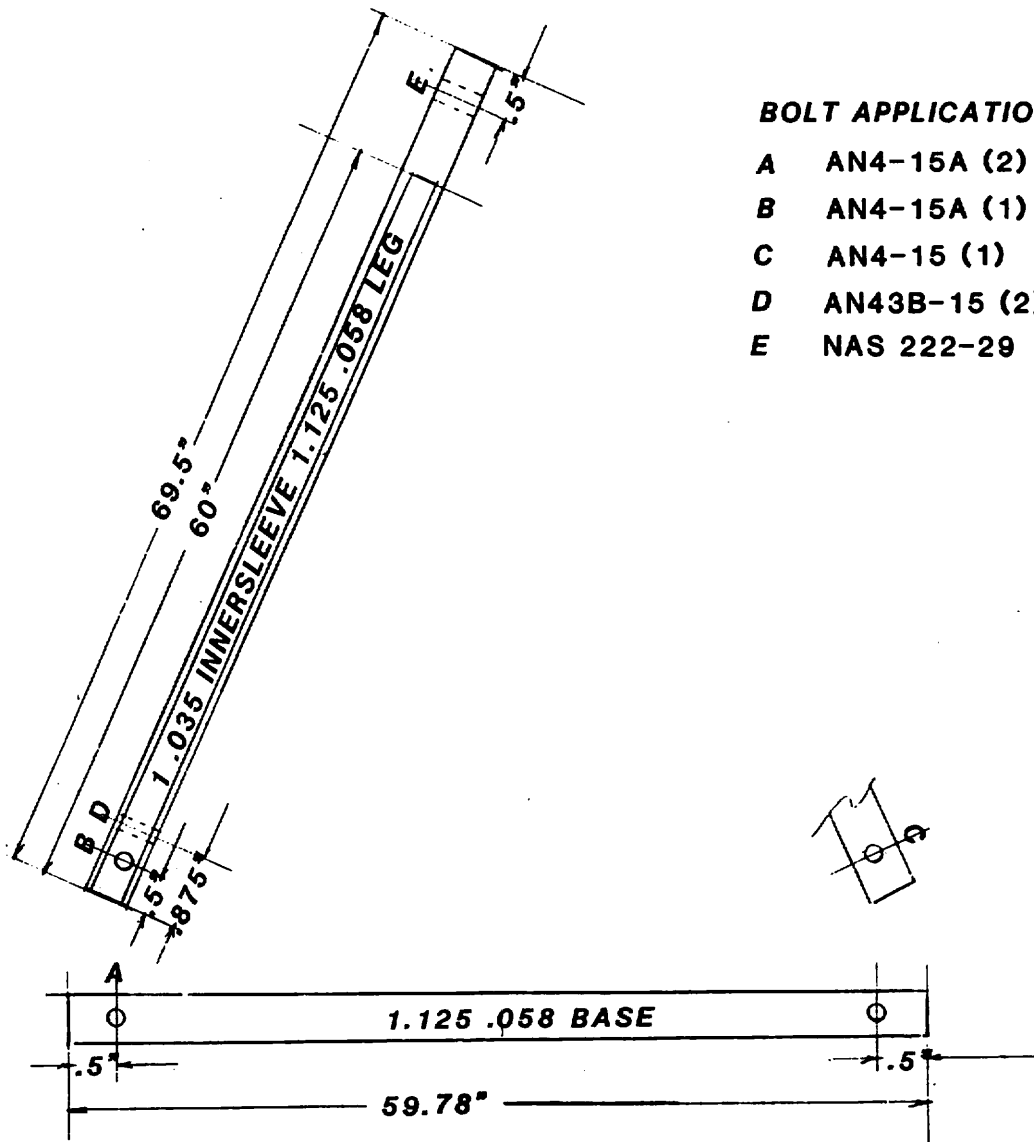


XBar Center



XBar





**BOLT APPLICATION**

- A AN4-15A (2)
- B AN4-15A (1)
- C AN4-15 (1)
- D AN43B-15 (2)
- E NAS 222-29

**HARRIER 177 control bar**

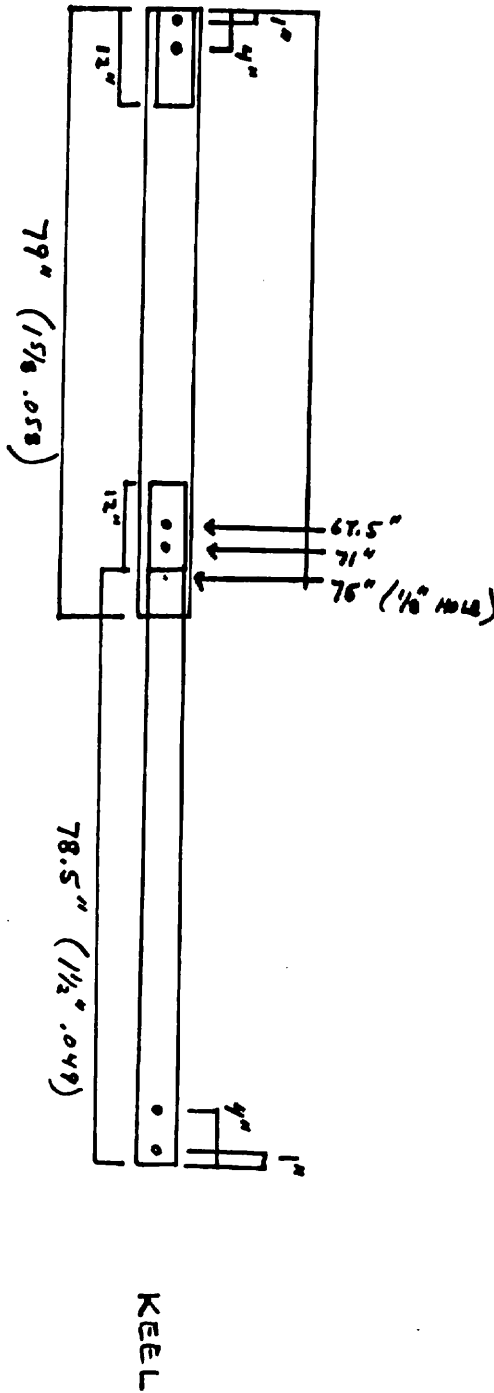
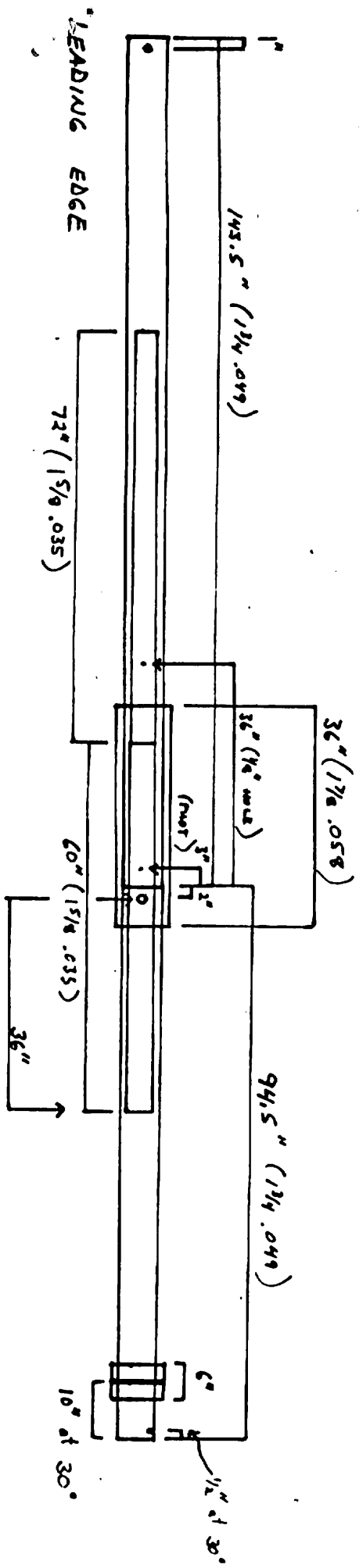
**Supine Bar**

- Base 54.5"
- Leg 63"
- Sleeve 56"

# WILLS WING, INC.



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(714) 547-1344



RAVEN 209 FRAME PLANS  
EARLY MODEL ONLY