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A SUBHUMAN PRIMATE RESTRAINT SYSTEM.(U)
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UNCLASSIFIED AMRL-TR-78-88 NL

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A SUBHUMAN PRIMATE RESTRAINT SYSTEM

CLARENCE M. OLOFF
WILLIAM L. FINCH

DECEMBER 1978

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AEROSPACE MEDICAL RESEARCH LABORATORY
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

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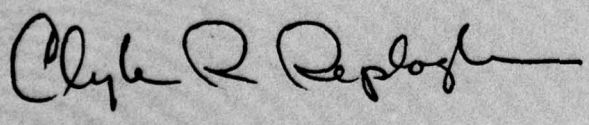
AMRL-TR-78-88

The experiments reported herein were conducted according to the "Guide for the Care and Use of Laboratory Animals," Institute of Laboratory Animal Resources, National Research Council.

This report has been reviewed by the Information Office (OI) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER



CLYDE R. REPLOGLE, PhD
Chief
Manned Systems Effectiveness Division
Aerospace Medical Research Laboratory

AIR FORCE/56780/11 January 1979 — 100

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Restraint System
Macca mulatta, Rhesus Monkeys
Papio papio, Baboon

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The illustrations presented here are of a subhuman primate restraint system that is a novel method of limiting conscious animal movement during experiments. This system is especially useful during acceleration and maintains its structural integrity and usefulness after exposure to high acceleration on a centrifuge.

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SUMMARY

This system satisfies the multiple requirements necessary to properly accomplish acceleration stress experiments where conscious subhuman primates are used as subjects. Although developed primarily for dynamic experiments, the PRS serves well for short term static use.

Devices exposed to acceleration of the magnitude generated by the Dynamic Environment Simulator (DES) generally require stringent measures to contend with the rigors of dynamic stresses. However, by using this system many high G experiments have been accomplished; many other experiments can be done that would require lesser physical demands.

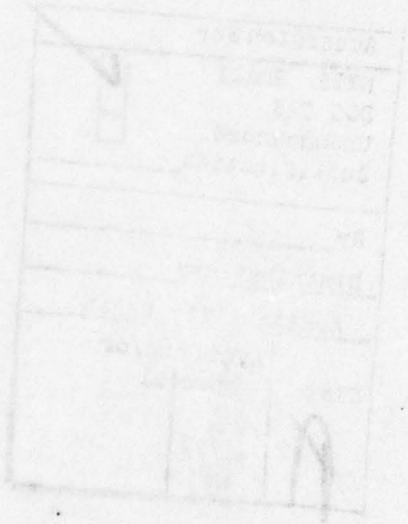
Due to the versatility many of the PRS diverse applications are readily achieved. Some specific examples of this system's versatility are use of different animal species, variability of animal size and body shape, dynamic and static use, a safe condition for investigators when the animal is conscious, but restrained to avoid injury, emphasis on a minimum restraint area allowing a large area of animal exposure for instrumentation of the animal. Uses other than those applications mentioned above can be made of the PRS as it is presented and illustrated in the Materials Section of this report.

The present PRS has been in use on the centrifuge in support of specific experiments in excess of 100 acceleration exposures and continues to function as required. Considering the repeated use of this system the initial cost and maintenance fees seem minimal. A larger version of this same chair is under consideration to satisfy experiments that will require very large animals in the 60-90 lb range.

PREFACE

This report was prepared by the Simulation Support Branch, Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio 45433.

The authors gratefully acknowledge Katherine C. Smith, Kevin J. Greenlees and Twyla J. Robinson for their assistance in preparing this report and Patricia M. Lewandowski for assistance in the final arrangement and preparation of this report.



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INTRODUCTION

The necessity to fabricate this Primate Restraint System (PRS) originated from a series of dynamic experiments whereby conscious subhuman primate subjects were exposed to acceleration stress. Several other restraint systems have been developed (1,2,3). The large size (10-40 lb) conscious animals used to satisfy our experimental design prevented the use of these other restraint systems. Conscious subhuman primates can become vicious, aggressive and difficult to manage. This is dangerous to the investigators and animal handlers when conventional restraints are used. Using the PRS illustrated here, (Fig. 1) the restrained animals do not remain excited or apprehensive, but become calm during the experiments, reducing the changes to compromise the data. This affords greater safety for the investigators and protects the animal from harm or injury, yielding valid experimental results and maximum data usage. This PRS (Fig. 2) was exposed to high acceleration (25G) using AMRL's Dynamic Environment Simulator (DES) with favorable results at all G levels.

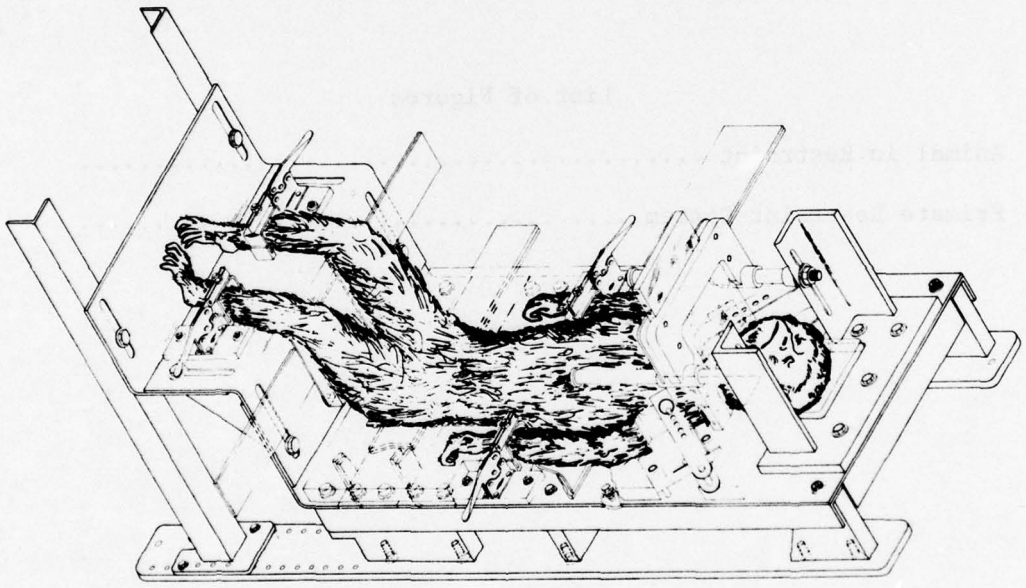


FIGURE 1. Animal In Restraint

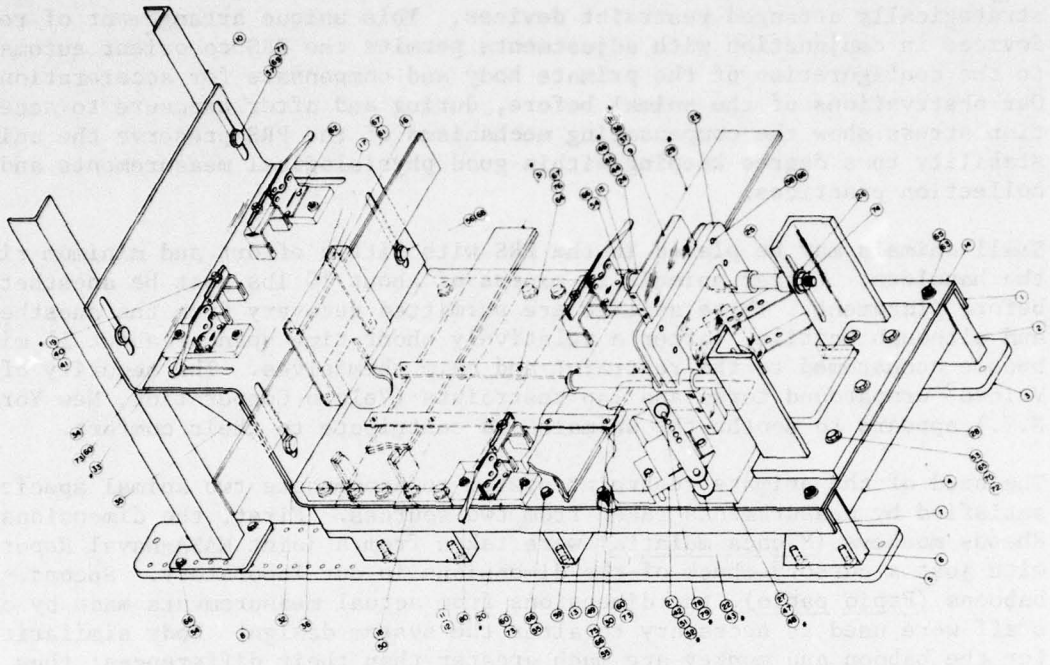


FIGURE 2. Primate Restraint System

OBJECTIVES

The basic objective of this system is to maintain, as much as possible, stable and practical conditions that contribute to a physiological norm for primates exposed to acceleration stress. There are some considerations within this basic objective that contribute to acceptable physiological conditions. The system must permit the use of conscious animals in a manner that is safe for the investigators and prevents undue harm to the animals. The system should accommodate a range of animals between 10-40 lb, and withstand high acceleration without any structural damage. Restraints should be arranged so simple that work in conjunction with each other should have maximal holding power, but cover just a small part of the body to permit easy access to the animal. Leads from physiological monitoring instruments must be accessible to the investigator, but out of the animal's reach. A small amount of removable absorbable material is preferred to contribute to an easily cleaned, sanitary system. Boney prominances should be protected and the contour of the primate body under G maintained to enhance animal comfort. A highly desirable feature would be a head-neck restraint that also prevents stragulation during acceleration stress.

RESULTS

Satisfactory solution of the objectives was achieved through the development of a system with multiple adjustments. The system was made more versatile by strategically arranged restraint devices. This unique arrangement of restraint devices in conjunction with adjustments permits the PRS to orient automatically to the configuration of the primate body and compensate for acceleration stress. Our observations of the animal before, during and after exposure to acceleration stress show the compensating mechanisms of the PRS preserve the animal's stability to a degree keeping within good physiological measurements and data collection practices.

Small animals may be placed in the PRS with little effort and minimum risk to the handlers. Larger animals in excess of about 10 lbs must be anesthetized before placement. These animals are permitted recovery from the anesthetic and although hostile, (after a relatively short time span of about 15 minutes), become accustomed to the restraint and calm themselves. The security of the Velcro^{R} wraparound torso and lap restraints (Velcro Corporation, New York, N.Y.) appears to soothe the animals and contribute to their comfort.

The need of the primate restraint system to accomodate two animal species was satisfied by measurements taken from two sources. First, the dimensions of Rhesus monkeys (Macaca mulatta) were taken from a joint NASA-Naval Report (4) with just a cursory check of the dimensions in our laboratory. Second, for baboons (Papio papio), the dimensions from actual measurements made by our staff were used as necessary to alter the system design. Body similarities for the baboon and monkey are much greater than their differences; thus, minor changes will permit use of the PRS for either species.

Figures and illustrations contained herein are adequate to derive all component functions of the system including some that may be necessary to satisfy experimental designs different from ours. Certain areas of the system will be expanded upon to show the intent of the total system. The materials used to fabricate this system are either physically strong enough to withstand the high gravitational forces generated by the 20 ft. radius centrifuge, or their arrangement in the system is such that up to 25 G can be withstood by this system without any structural damage.

The total restraint requires a series of lesser restraint devices that, of necessity, work in conjunction with each other to obtain maximum holding power. Restraint of 3 main body areas is sufficient to prevent escape and permit many large areas of the animal to be exposed for placement of instrumentation sensing detectors. The lower extremities are kept in place by over-the-center U clamps with an assist by a lap wraparound of Velcro on a nylon belt. The upper extremeties also use over-the-center U clamps, but the assist device to prevent the extraction of the lower arm or wrist from the U clamp is a special elbow restraint that swivels during animal movement or acceleration. The self compensating head-neck restraint is the most important part of the entire system. It restrains in a manner that permits exposure of animals to acceleration stress without strangulation or occulsion of major vessels to the head. Various sizes are available for either baboon or monkey and can be easily changed.

Those areas of the animals that are exposed to the PRS are padded with a small amount of reusable material that can be removed to sanitize the system between experimental animals.

The backplate of the system is adjustable to fit various animal sizes, and also allows ready access to leads from physiological monitoring instruments frequently used with this system. The hole in the backplate for these leads is out of the animals reach.

The system allows the animal to be properly restrained, with all four extremeties exposed, and the head, check and abdomen easily accessible for instrumentation. Essentially the same conditions are maintained, permitting data to be collected and reproduced if necessary and so enhance the validity of each experiment.

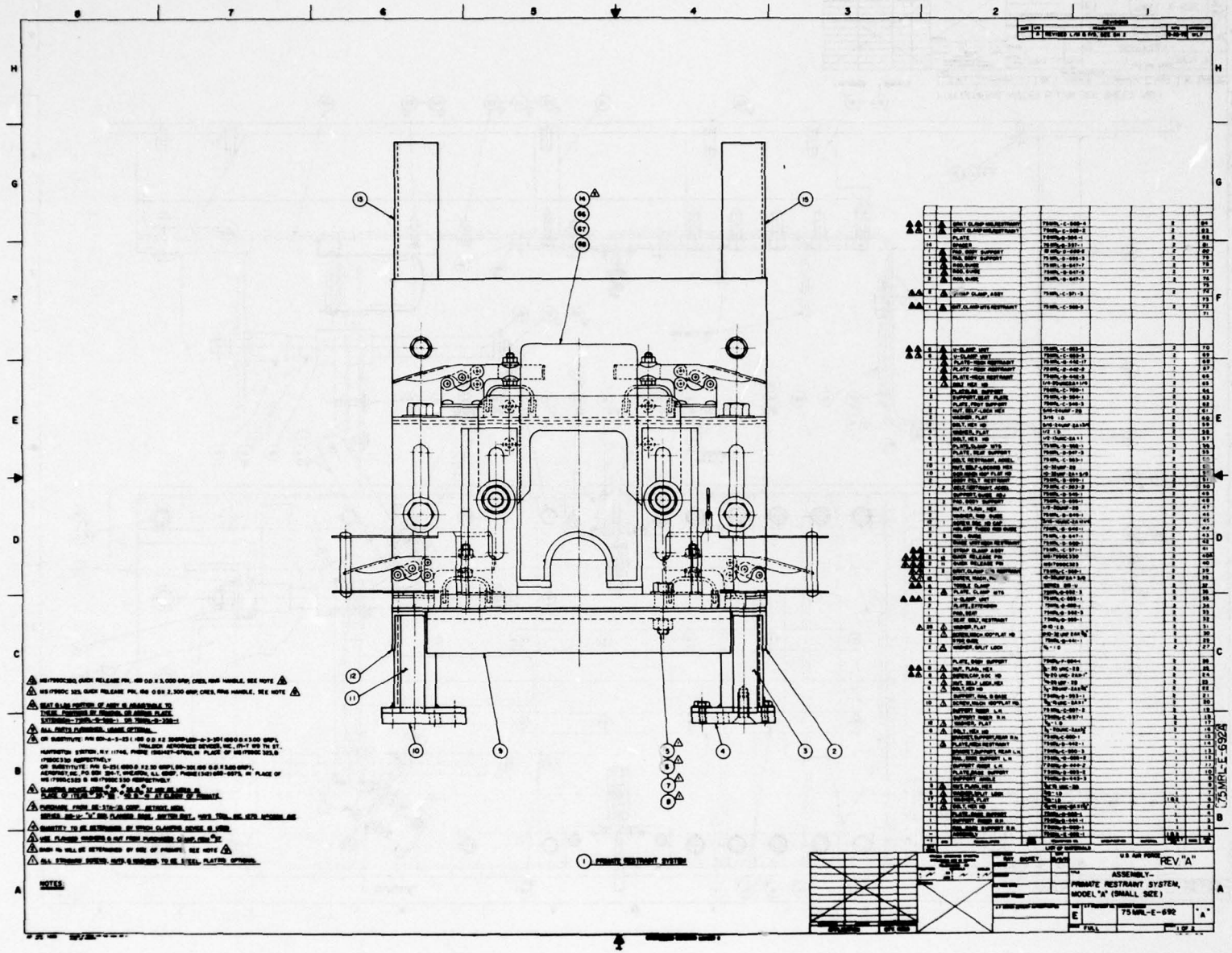
APPLICATIONS

The primary application of this system is to provide a tool for the restraint of subhuman primates while under acceleration stress. The system also provides restraint and protection for an animal recovering from the anesthesia used in surgical procedures (6).

A unique feature of the Primate Restraint System is adaptability to a wide range of invasive investigative procedures. Wide exposure of body surface area combined with immobilization of the animal provides an excellent platform for the use of various tissue and vascular probes and catheters. Vascular injection of microspheres may be used to determine regional perfusion and cardiac output (5,6). Cardiac output may also be monitored using thermal (6) and dye dilution techniques, or vascular flow probes. Standard transducers may be used to measure blood pressure (6). Tissue probes may be used to measure pH, or oxygen tension, including cerebral oxygen.

These are just a sample of the applications opened with the use of the PRS. These procedures have been successfully tested on the PRS where indicated by the reference citations. Modifications of these procedures, or the restraint system itself, limits application of this system to the imagination of the investigator.

MATERIALS

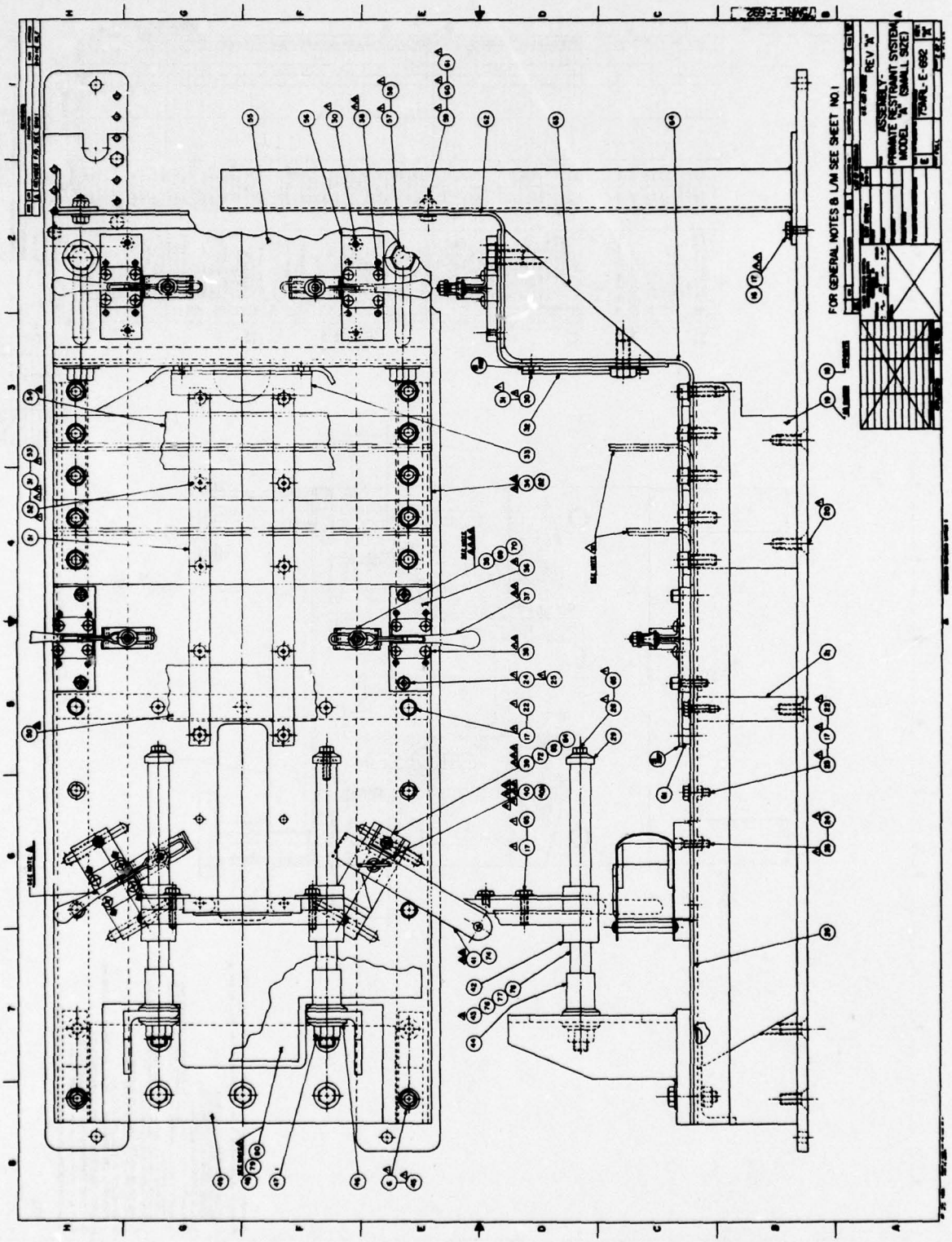


NOTES:

REV "A"

ASSEMBLY-
PRIMATE RESTRAINT SYSTEM,
MODEL "A" (SMALL SIZE)

75 MRL-E-6924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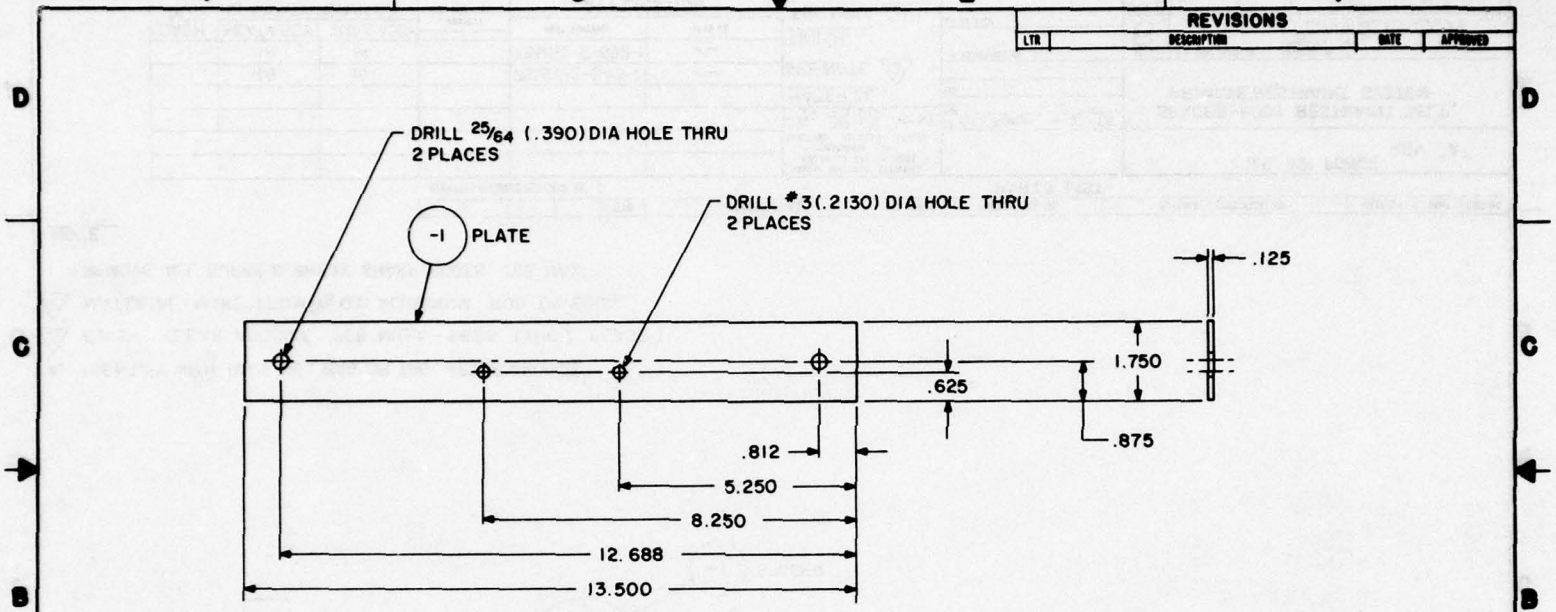
PRIMATE RESTRAINT SYSTEM
MODEL "A" (SMALL SIZE)
75WR-E-692
REV "A"



REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

3. IDENTIFY WITH PART NO., USE WATER-PROOF INK OR PAINT, AFTER ANODIZE.

2 FINISH: CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I.

1. REMOVE ALL BURRS & BREAK SHARP EDGES, .015 MAX

NOTE:

PARTS LIST

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DASH NO	NEXT ASSEMBLY	NEXT ASSY	FINAL ASSY
-1		1	1

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ±1/32, DECIMALS .XX ±.031, .XXX ±.015, ANGLES ±0°-30'

MATERIAL: 6061-T6 ALUM. OR EQ

FINISH: SEE NOTE 2

DR BILL FINCH 9-27-76

U.S. AIR FORCE

TITLE: PLATE-EXTENSION, 1.750 WIDE PRIMATE RESTRAINT SYSTEM

SIZE B | DRAWING NO. 76MRL-B-356

SCALE 1/2 | SHEET 1 OF 1

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED

GPO 1973 O-473-865

ENGINEERING DRAWING LAYOUT B

REVISIONS			
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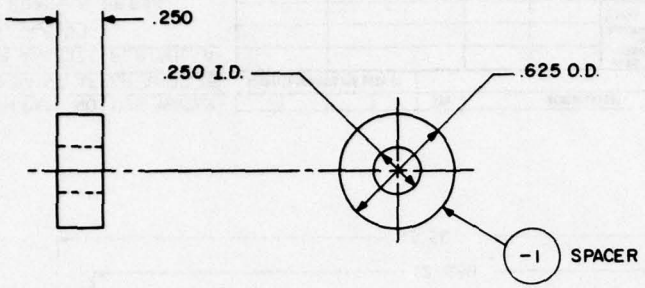

4. IDENTIFY WITH PART NO., BAG OR TAG, AFTER ANODIZE
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2. MATERIAL : MAKE FROM 5/8 O.D. ALUMINUM ROD OR EQUAL.
1. REMOVE ALL BURRS & BREAK SHARP EDGES, .015 MAX.

NOTE :

PARTS LIST

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-1	14	14		75MRL-E-692-1	~					
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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ±1/32, DECIMALS .XX ±.031, .XXX ±.015, ANGLES ±0°30'

MATERIAL : SEE NOTE 2

FINISH : SEE NOTE 3

DRAWN BILL FINCH 9-27-76

CHK

A.F. APPROVAL

A.F. RELEASE

U.S. AIR FORCE REV. "A"

TITLE SPACER-BODY RESTRAINT BELT, PRIMATE RESTRAINT SYSTEM

SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 76MRL-B-357

SCALE 2/1 | SHEET 1 OF 1

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GPO 1972 O-479-800

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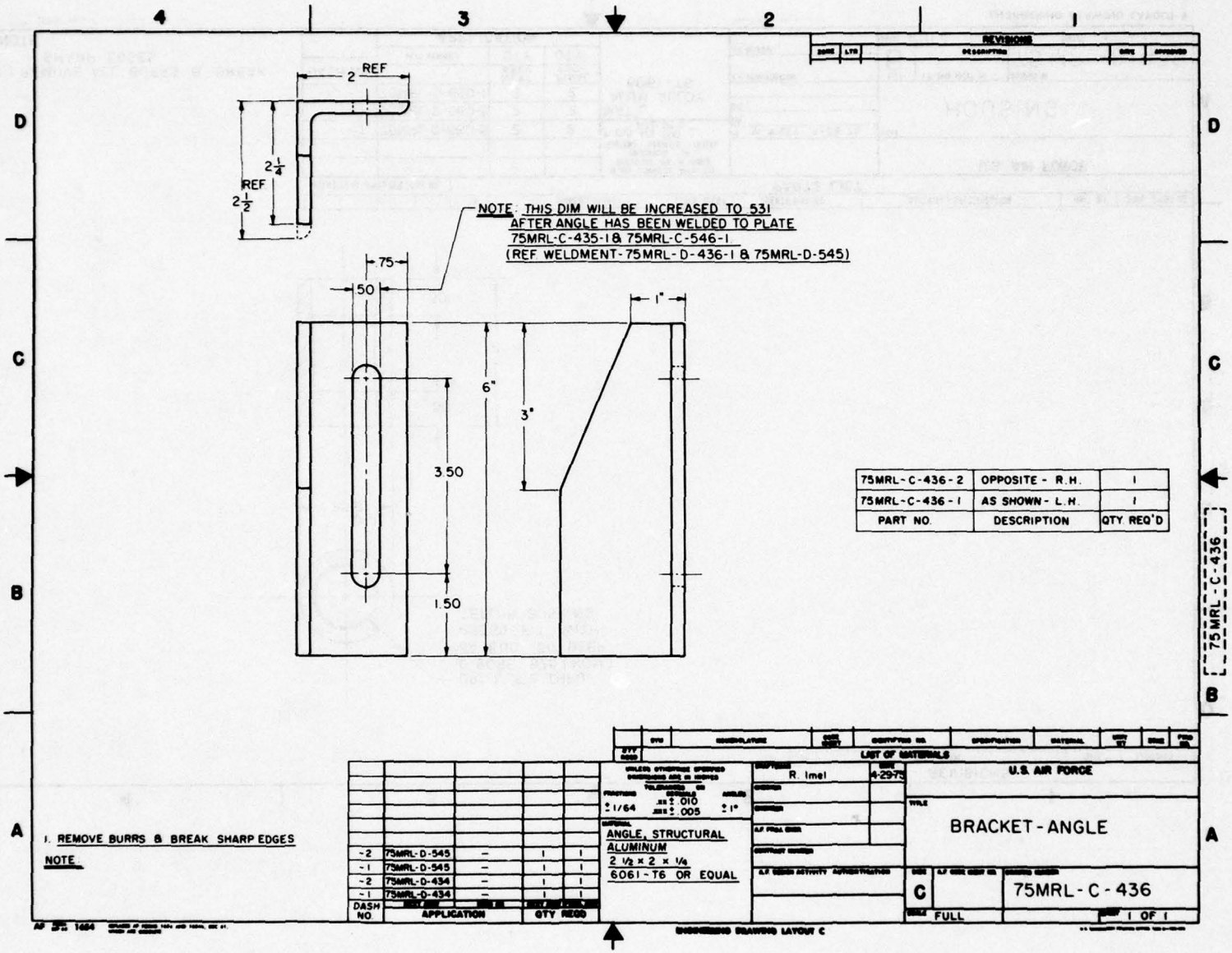
4
3
2
1
D
C
B
A
REVISIONS
2 REF
2 1/4
REF
2 1/2
NOTE: THIS DIM WILL BE INCREASED TO 531
AFTER ANGLE HAS BEEN WELDED TO PLATE
75MRL-C-435-1 & 75MRL-C-546-1
(REF WELDMENT-75MRL-D-436-1 & 75MRL-D-545)
.75
.50
1"
6"
3"
3.50
1.50
75MRL-C-436-2 OPPOSITE - R.H. 1
75MRL-C-436-1 AS SHOWN - L.H. 1
PART NO. DESCRIPTION QTY REQ'D
75MRL-C-436
LIST OF MATERIALS
-2 75MRL-D-545 - 1 1
-1 75MRL-D-545 - 1 1
-2 75MRL-D-434 - 1 1
-1 75MRL-D-434 - 1 1
DASH NO. APPLICATION QTY REQD
ANGLE, STRUCTURAL
ALUMINUM
2 1/2 x 2 x 1/4
6061-T6 OR EQUAL
R. Imel
4-2975
U.S. AIR FORCE
BRACKET-ANGLE
C
75MRL-C-436
FULL
1 OF 1
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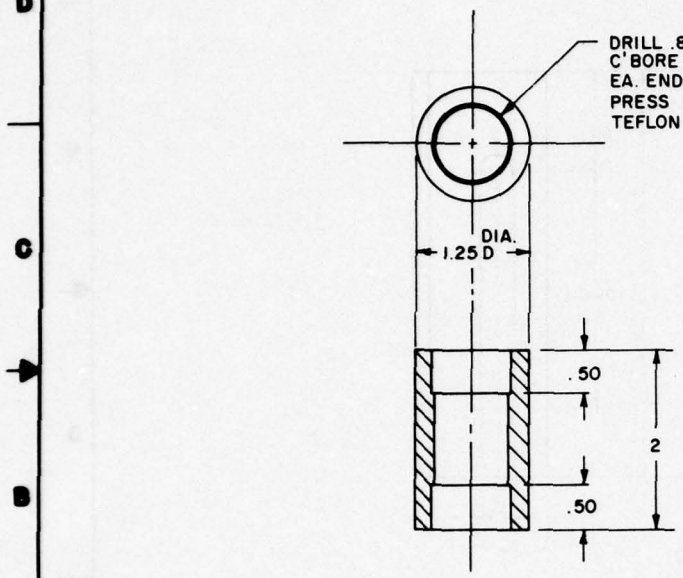
NOTE
ENGINEERING DRAWING LAYOUT C



REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

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PARTS LIST								
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- 1		75MRL-D-660-3	2	2				
- 1		75MRL-D-660-1	2	2				
DASH NO			NEXT ASSY	FINAL ASSY				
	NEXT ASSEMBLY		QTY	QTY				
APPLICATION								

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± .015 DECIMALS ± .010 ANGLES ± .005

1. REMOVE ALL BURRS & BREAK SHARP EDGES.

NOTE :

BY M. RILEY 4-29-75

U.S. AIR FORCE

TITLE: HOUSING

SIZE B | DRAWING NO. 75 MRL-B-439

SCALE FULL | SHEET 1 of 1

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED

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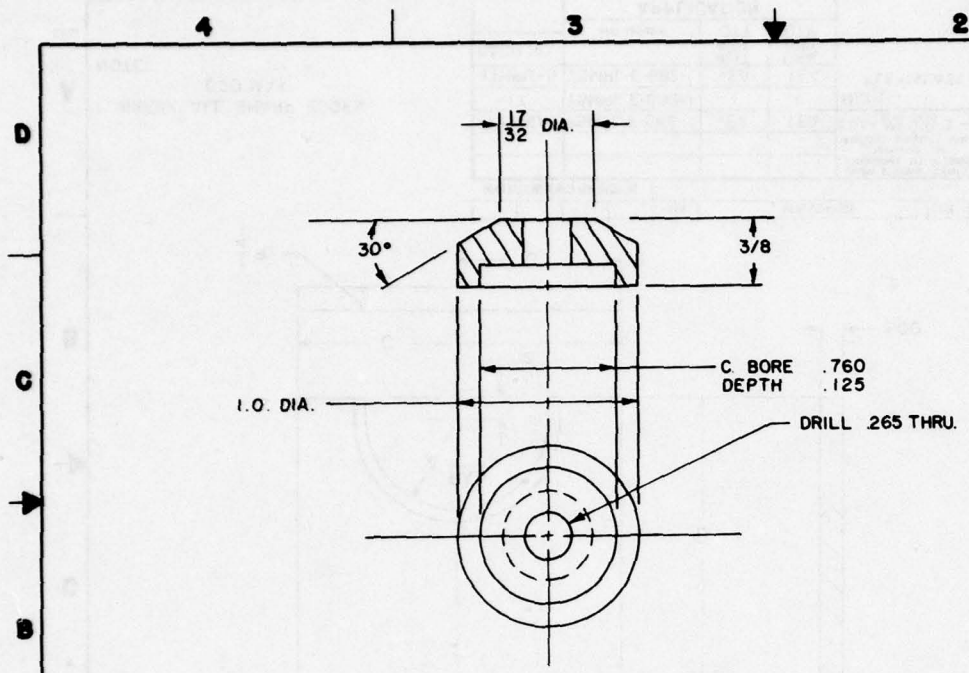

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

4) CAD PLATE FOR 1018 CRS.
3) IDENTIFY WITH P/N (75MRL-B-441-1) WITH WATERPROOF INK OR PAINT
2) CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I. (FOR ALUM.)
1) REMOVE ALL BURRS & BREAK SHARP EDGES.

NOTE:

PARTS LIST

DASH NO.	QUANTITY REQUIRED PER DASH NO.	SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO
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-1	2		75MRL-E-692-1						

NEXT ASSY QTY	FINAL ASSY QTY
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2	2

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ± 1/64 DECIMALS .XX ± .010 .XXX ± .005 ANGLES ±

DR M. RILEY 4-29-75
CH
ENG
A.F. APPROVAL
A.F. RELEASE

U.S. AIR FORCE

TITLE: STOP - GLIDE

SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-441

SCALE 2 = 1 | SHEET 1 OF 1

AF FORM 1653

ENGINEERING DRAWING LAYOUT B

REVISIONS			
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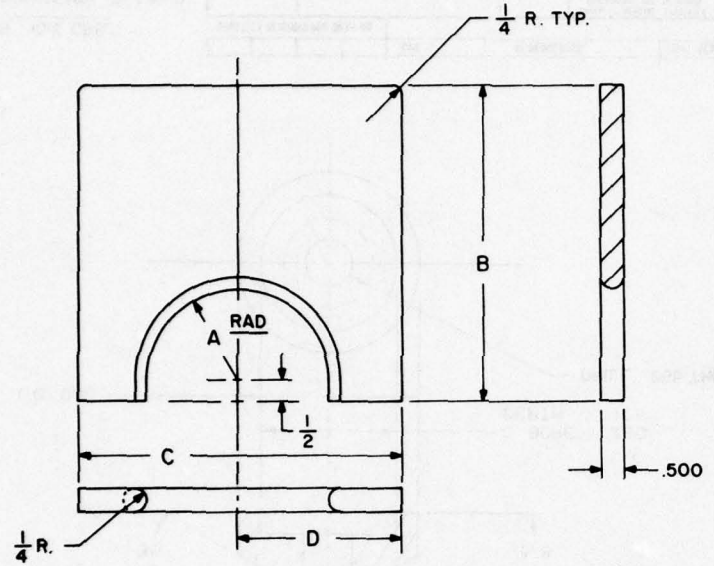

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-11	1	2.00	8.50	7.20	3.60
-9	1	1.50	8.50	7.20	3.60
-7	1	1.00	8.50	7.20	3.60
-5	1	1.75	8.50	4.20	2.10
-3	1	1.50	8.50	4.20	2.10
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PARTS LIST

DASH NO.	BEST ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
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-17	75MRL-E-692-1	1	1
-1 THRU -5	75MRL-E-692-1	1 EA	1 EA

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ±1/64, DECIMALS .X ±.010, .XX ±.005, ANGLES ± ~

MAT'L PLEXIGLASS

M. RIELEY APR. 30

U.S. AIR FORCE REV. "A"

TITLE: PLATE, NECK RESTRAINT

SIZE B | DRAWING NO. 75MRL-B-442

SCALE HALF | SHEET 1 OF 1

1. BREAK ALL SHARP EDGES .020 MAX

NOTE:

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

ENGINEERING DRAWING LAYOUT B

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
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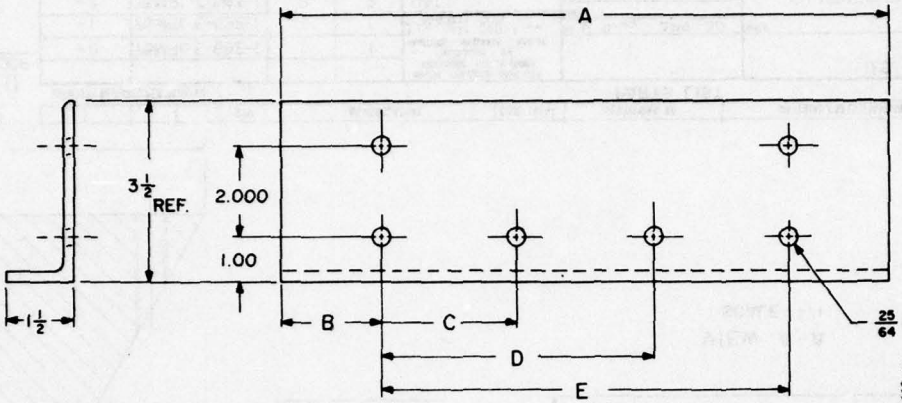

(5) FOR -1, HOLES MUST MATCH HOLES IN 75MRL-E-544-1
FOR -3, HOLES MUST MATCH HOLES IN 75MRL-D-694-1

4. IDENTIFY WITH P/N (75MRL-B-443-1, OR -3) WITH WATERPROOF INK OR PAINT.

3. CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I.

2. REMOVE ALL BURRS & BREAK SHARP EDGES.

1. MAT'L: ANGLE, STRUCTURAL ALUM. 3½ × 2½ × ½ 6061-T6 OR EQUAL

NOTE:

DASH NO.	A	B	C	D	E	F
-3	10 15/16	2.47	3.000	NOT USED	6.000	5
-1	13 7/16	2.22	3.000	6.000	9.000	6

PARTS LIST

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-1		75MRL-E-543-1						

APPLICATION

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
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-1		1	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± 1/64, DECIMALS .X ± .010, .XX ± .005, ANGLES ± ~

MAT'L: SEE NOTE #1

FINISH: SEE NOTE #2

DR R. Imel 4-30-75

U.S. AIR FORCE REV. "A"

TITLE: SUPPORT - ANGLE

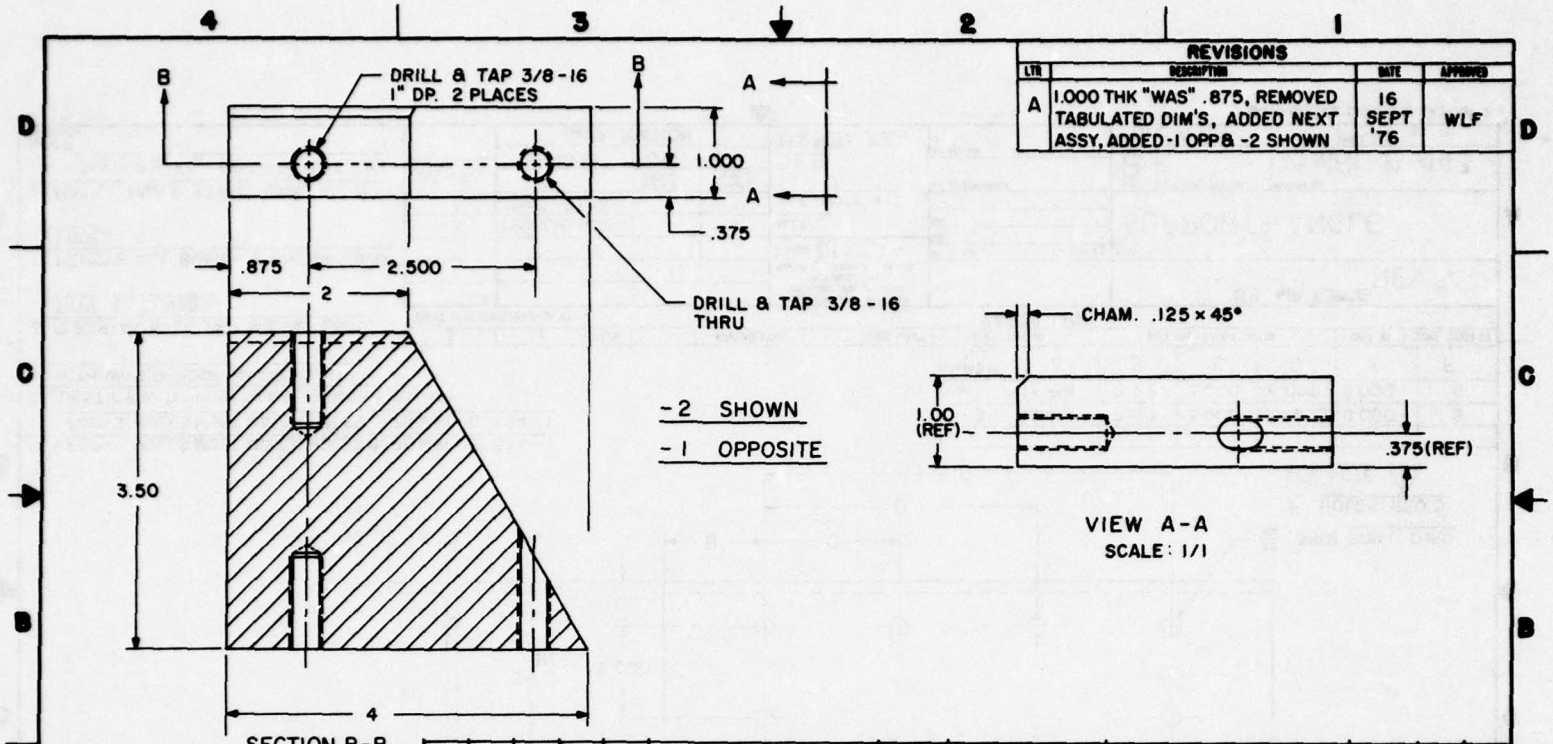
SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-443

SCALE 1/2" = 1" | SHEET 1 OF 1

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED

GPO 1972 O-473-802

ENGINEERING DRAWING LAYOUT B



REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	1.000 THK "WAS" .875, REMOVED TABULATED DIM'S, ADDED NEXT ASSY, ADDED -1 OPP & -2 SHOWN	16 SEPT '76	WLF

3. IDENTIFY WITH P/N (75MRL-B-444-1) OR (75MRL-B-444-2) WITH WATERPROOF INK OR PAINT.
2. CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I
1. REMOVE ALL BURRS & BREAK SHARP EDGES

NOTES:

PARTS LIST

DASH NO.	NEXT ASSY QTY	FINAL ASSY QTY	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FSCM NO
-2	1	1	75MRL-E-692-1						
-1	1	1	75MRL-E-692-1						
-2	2	2	75MRL-E-543-1						
-1	2	2	75MRL-E-543-1						

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ± 1/64, DECIMALS .XX ± .010, .XXX ± .005, ANGLES ± 1°

MAT'L ALUM ALLOY 2024-T6 OR 7075-T6

APPLICATION

M. Riley APR. 30

U.S. AIR FORCE REV. "A"

TITLE: SUPPORT-RISER

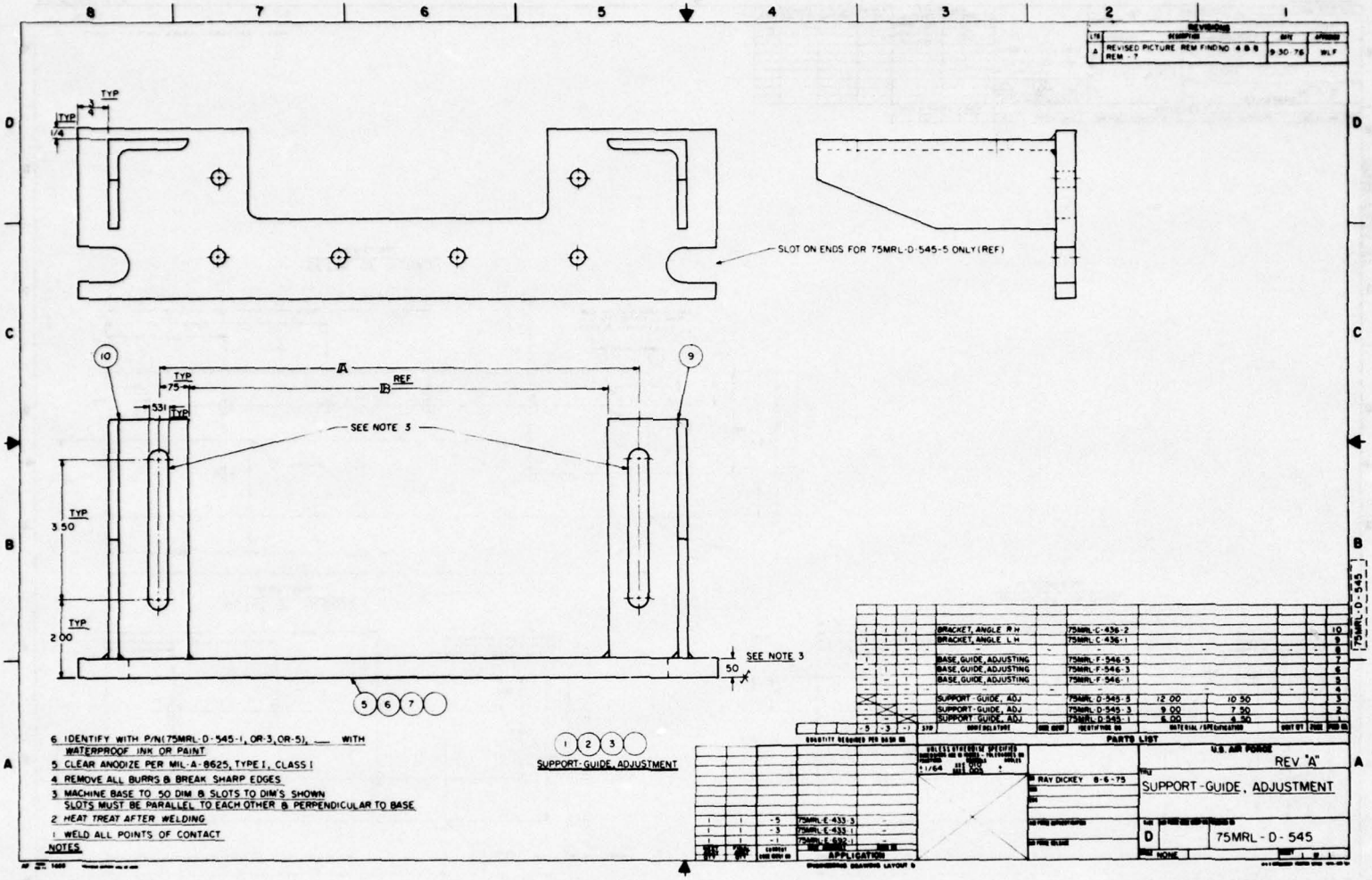
SIZE: B

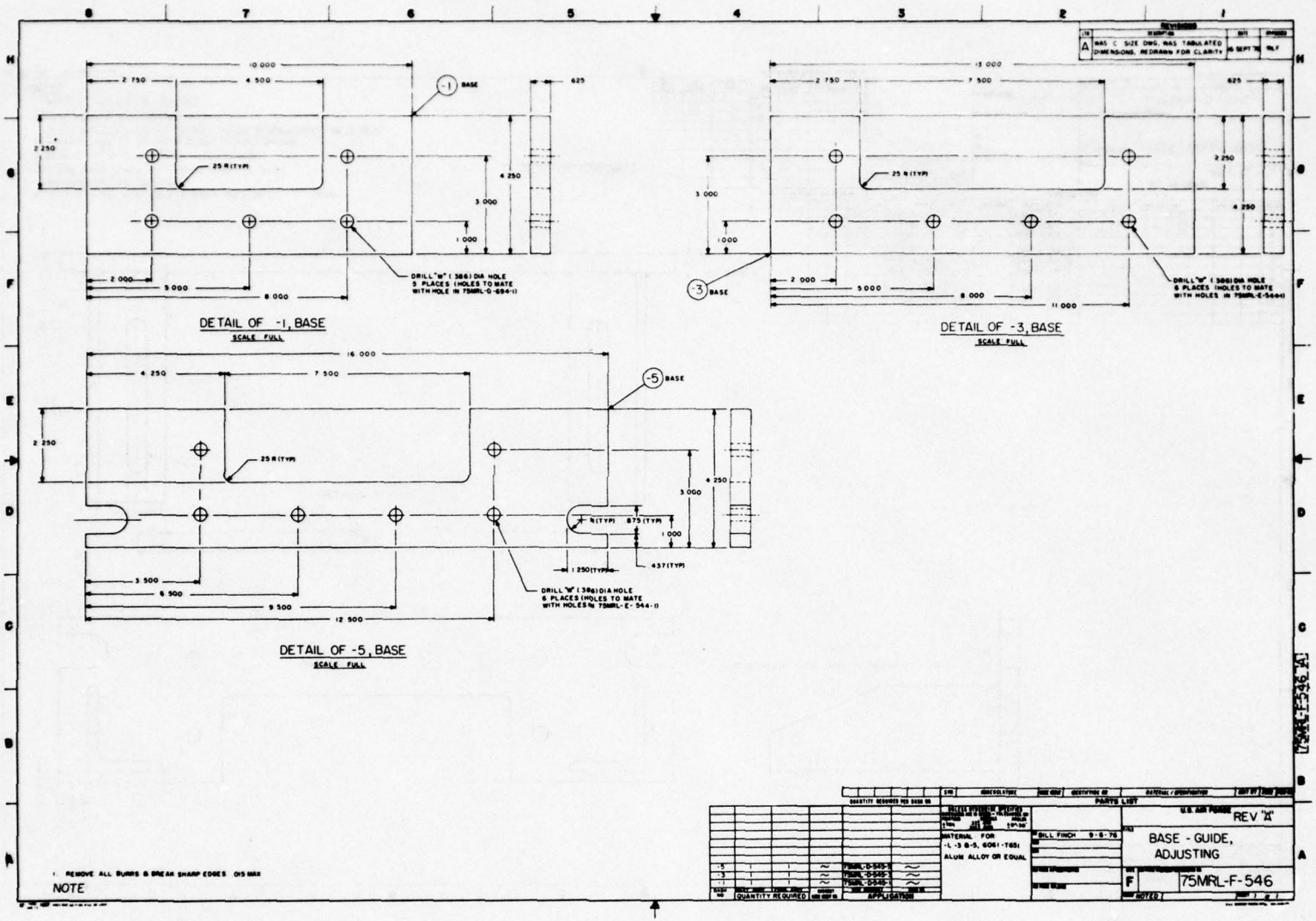
DRAWING NO. 75MRL-B-444

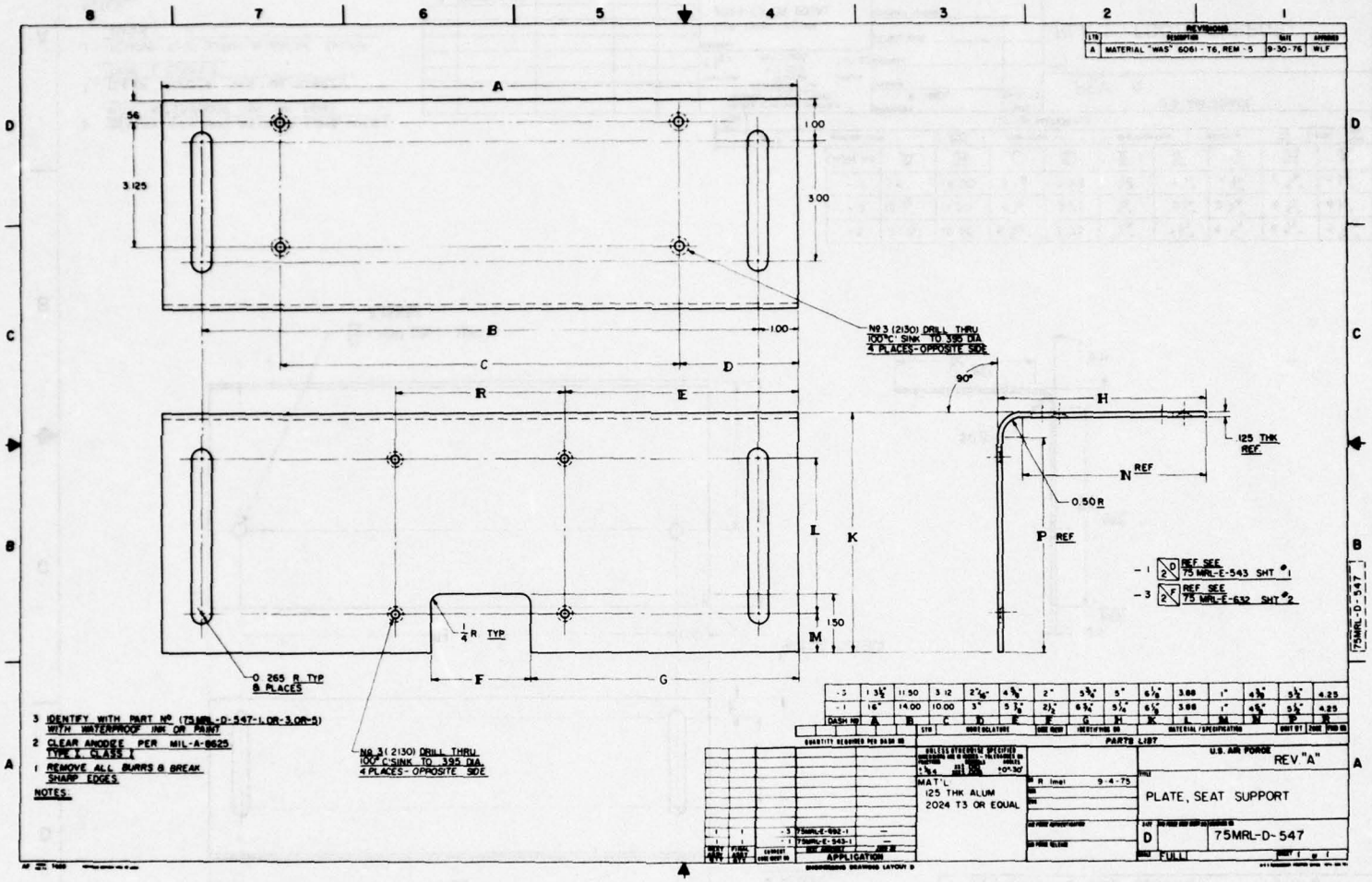
SHEET

ENGINEERING DRAWING LAYOUT B

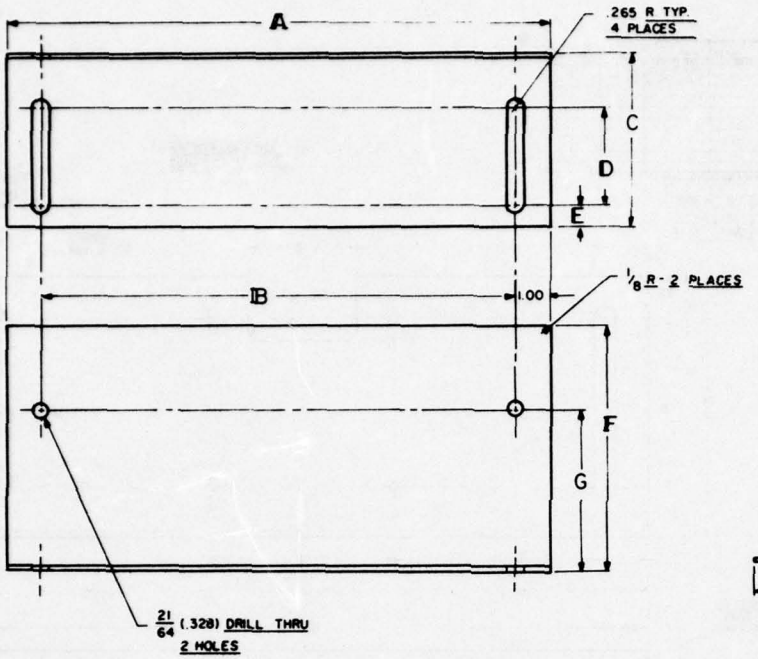
AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

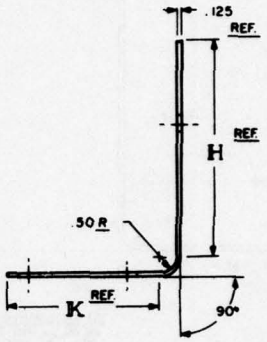

REVISIONS
A REVISED PICTURE REM FIND NO 4 & 8 9-30-76 WLF
TYP
1/4
SLOT ON ENDS FOR 75MRL-D-545-5 ONLY (REF)
A
B REF
.531
SEE NOTE 3
3.50
2.00
.50
SEE NOTE 3
SUPPORT-GUIDE, ADJUSTMENT
6 IDENTIFY WITH P/N(75MRL-D-545-1, OR-3, OR-5), ___ WITH WATERPROOF INK OR PAINT
5 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I
4 REMOVE ALL BURRS & BREAK SHARP EDGES
3 MACHINE BASE TO .50 DIM & SLOTS TO DIM'S SHOWN SLOTS MUST BE PARALLEL TO EACH OTHER & PERPENDICULAR TO BASE
2 HEAT TREAT AFTER WELDING
1 WELD ALL POINTS OF CONTACT
NOTES
BRACKET, ANGLE R.H 75MRL-C-436-2 10
BRACKET, ANGLE L.H 75MRL-C-436-1 9
BASE, GUIDE, ADJUSTING 75MRL-F-546-5 8
BASE, GUIDE, ADJUSTING 75MRL-F-546-3 6
BASE, GUIDE, ADJUSTING 75MRL-F-546-1 5
SUPPORT-GUIDE, ADJ 75MRL-D-545-5 12.00 10.50 3
SUPPORT-GUIDE, ADJ 75MRL-D-545-3 9.00 7.50 2
SUPPORT-GUIDE, ADJ 75MRL-D-545-1 6.00 4.50 1
PARTS LIST
U.S. AIR FORCE
REV "A"
RAY DICKEY 8-6-75
SUPPORT-GUIDE, ADJUSTMENT
D
75MRL-D-545
NONE
75MRL-D-545


REVISIONS
A WAS C SIZE DWG. WAS TABULATED DIMENSIONS REDRAWN FOR CLARITY 15 SEPT 76 WLF
10.000
2.750
4.500
-1 BASE
.625
2.250
25 R (TYP)
4.250
3.000
1.000
2.000
5.000
8.000
DRILL "W" (.386) DIA HOLE 5 PLACES (HOLES TO MATE WITH HOLE IN 75MRL-G-694-1)
DETAIL OF -1, BASE
SCALE FULL
13.000
7.500
-3 BASE
11.000
DRILL "W" (.386) DIA HOLE 6 PLACES (HOLES TO MATE WITH HOLES IN 75MRL-E-544-1)
DETAIL OF -3, BASE
SCALE FULL
16.000
4.250
-5 BASE
.875 (TYP)
.437 (TYP)
1.250 (TYP)
3.500
6.500
9.500
12.500
DETAIL OF -5, BASE
SCALE FULL
1. REMOVE ALL BURRS & BREAK SHARP EDGES .015 MAX
NOTE
PARTS LIST
MATERIAL FOR -1, -3 & -5, 6061-T651 ALUM ALLOY OR EQUAL
BILL FINCH 9-8-76
U.S. AIR FORCE
REV "A"
BASE - GUIDE, ADJUSTING
F
75MRL-F-546
75MRL-E546-A1


A
B
C
D
E
F
G
H
K
L
M
N REF
P REF
.56
3.125
1.00
3.00
.100
.150
.125 THK REF
0.50 R
90°
0.265 R TYP 8 PLACES
1/4 R TYP
NO 3 (.2130) DRILL THRU .100"C'SINK TO .395 DIA 4 PLACES-OPPOSITE SIDE
NO 3 (.2130) DRILL THRU .100"C'SINK TO .395 DIA 4 PLACES-OPPOSITE SIDE
-1 REF SEE 75 MRL-E-543 SHT #1
-3 REF SEE 75 MRL-E-632 SHT #2
75MRL-D-547-1
3 IDENTIFY WITH PART Nº (75MRL-D-547-1 OR-3 OR-5) WITH WATERPROOF INK OR PAINT
2 CLEAR ANODIZE PER MIL-A-8625 TYPE II, CLASS 1
1 REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES:
REVISIONS
LTR A
DESCRIPTION MATERIAL "WAS" 6061 - T6, REM - 5
DATE 9-30-76
APPROVED WLF
PARTS LIST
MAT'L 125 THK ALUM 2024 T3 OR EQUAL
9-4-75
U.S. AIR FORCE
REV "A"
PLATE, SEAT SUPPORT
D
75MRL-D-547
SCALE FULL

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	MATERIAL WAS 6061-T6	9-29-76	WLF





DASH NO	A	B	C	D	E	F	G	H	K
-5	21 1/2"	19.50	6 9/16"	3.75	11/16"	7 1/4"	4 3/4	6 9/16"	5 15/16"
-3	13 1/2"	11.50	4 7/8"	3.25	3/8"	5 1/4"	2 3/4"	4 9/16"	4 1/4"
-1	16"	14.00	5 1/8"	2.88	5/8"	7 1/4"	4 3/4"	6 9/16"	4 1/2"

3 IDENTIFY WITH PART NO.(75MRL-1,OR3, OR 5.) WITH WATERPROOF INK OR PAINT

2 CLEAR ANODIZE PER MIL-A-8625 TYPE I CLASS I

1 REMOVE ALL BURRS & BREAK SHARP EDGES

NOTES:

QTY REQD	NOMENCLATURE	SPECIFICATION	MATERIAL	PART NO.
	LIST OF MATERIALS			

DASH NO.	APPLICATION	QTY REQD
-5	75MRL-E-179	1
-3	75MRL-E-692	1
-1	75MRL-E-943-4	1

UNLESS OTHERWISE SPECIFIED
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS .XX ± .010 .XXX ± .005 ANGLES ± 0°-30'

MATERIAL
.125 THK ALUM.
2024-T3 OR EQUAL

DRAWN R. IMEL 9-4-75

U.S. AIR FORCE

REV. A

TITLE
PLATE FOOT SUPPORT

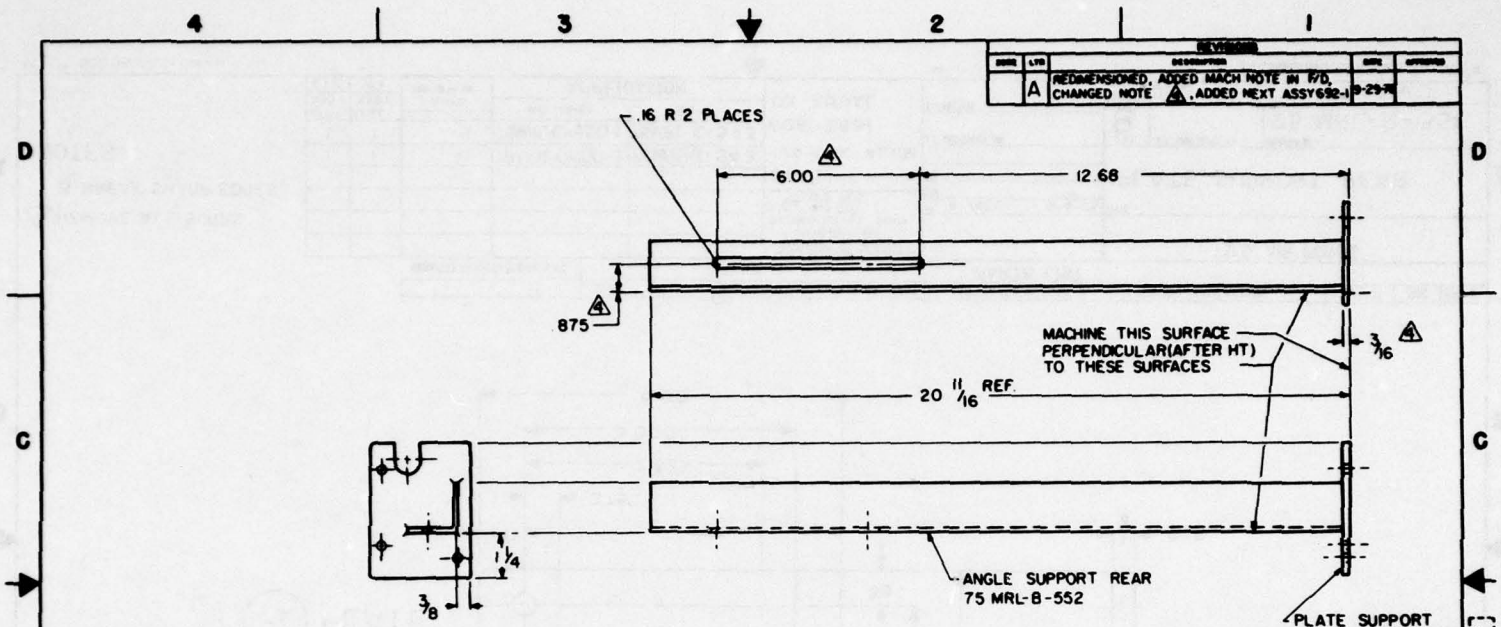
SIZE C

75 MRL-C-548

SCALE 1/2 = 1"

SHEET 1 OF 1

AF 3FC 1684 ENGINEERING DRAWING LAYOUT C



REVISIONS			
ZONE	LTR	DESCRIPTION	DATE
	A	REDIMENSIONED, ADDED MACH NOTE IN F/D, CHANGED NOTE 4, ADDED NEXT ASSY 692-1	9-29-75

4. IDENTIFY WITH PART NO (75MRL-6-550-1 R.H.) & (75 MRL-6-550-3 L.H.) WITH WATERPROOF INK OR PAINT
5. CLEAR ANODIZE PER MIL-A-8625 TYPE I CLASS I
6. MACHINE SLOT IN ANGLE TO 3/8 WIDTH, MACHINE BASE TO 3/16 THK. AFTER HEAT TREAT. SLOT TO BE PERPENDICULAR TO BASE
7. HEAT TREAT AFTER WELDING
8. WELDED CONSTRUCTION-WELD ALL POINTS OF CONTACT
9. REMOVE ALL BURRS & BREAK SHARP EDGES

NOTES:

75 MRL-C-550-1 AS SHOWN
75 MRL-C-550-3 MIRROR IMAGE (OR OPPOSITE)

[75MRL-C-550 REV "A"]

LIST OF MATERIALS

DASH NO.	APPLICATION	QTY REQD
-3	75MRL-E-692-3	1
-1	75MRL-E-692-1	1
-3	75MRL-E-543-3	1
-1	75MRL-E-543-1	1

DRAWN R. Imel 9-5-75

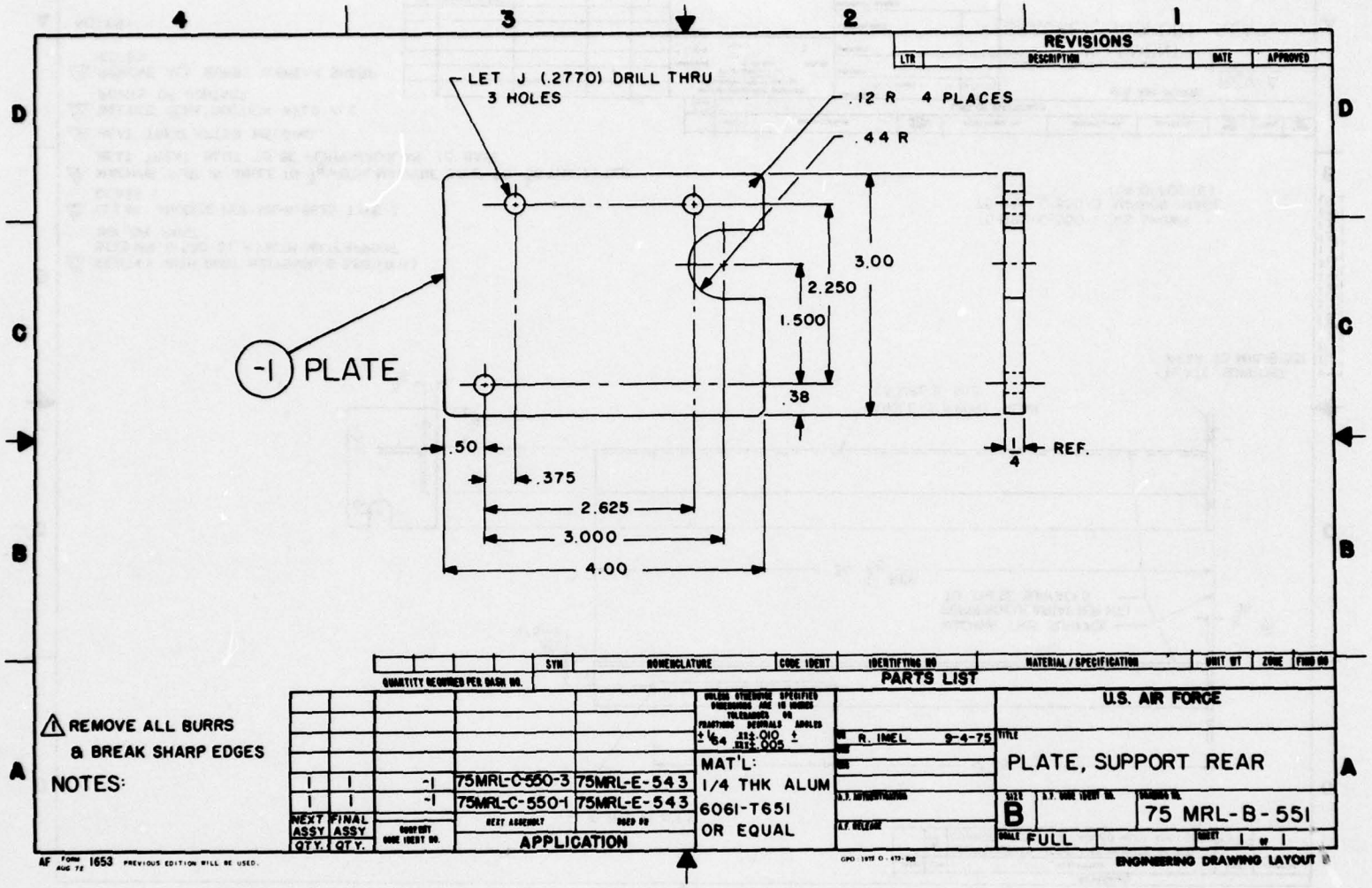
U.S. AIR FORCE REV. A

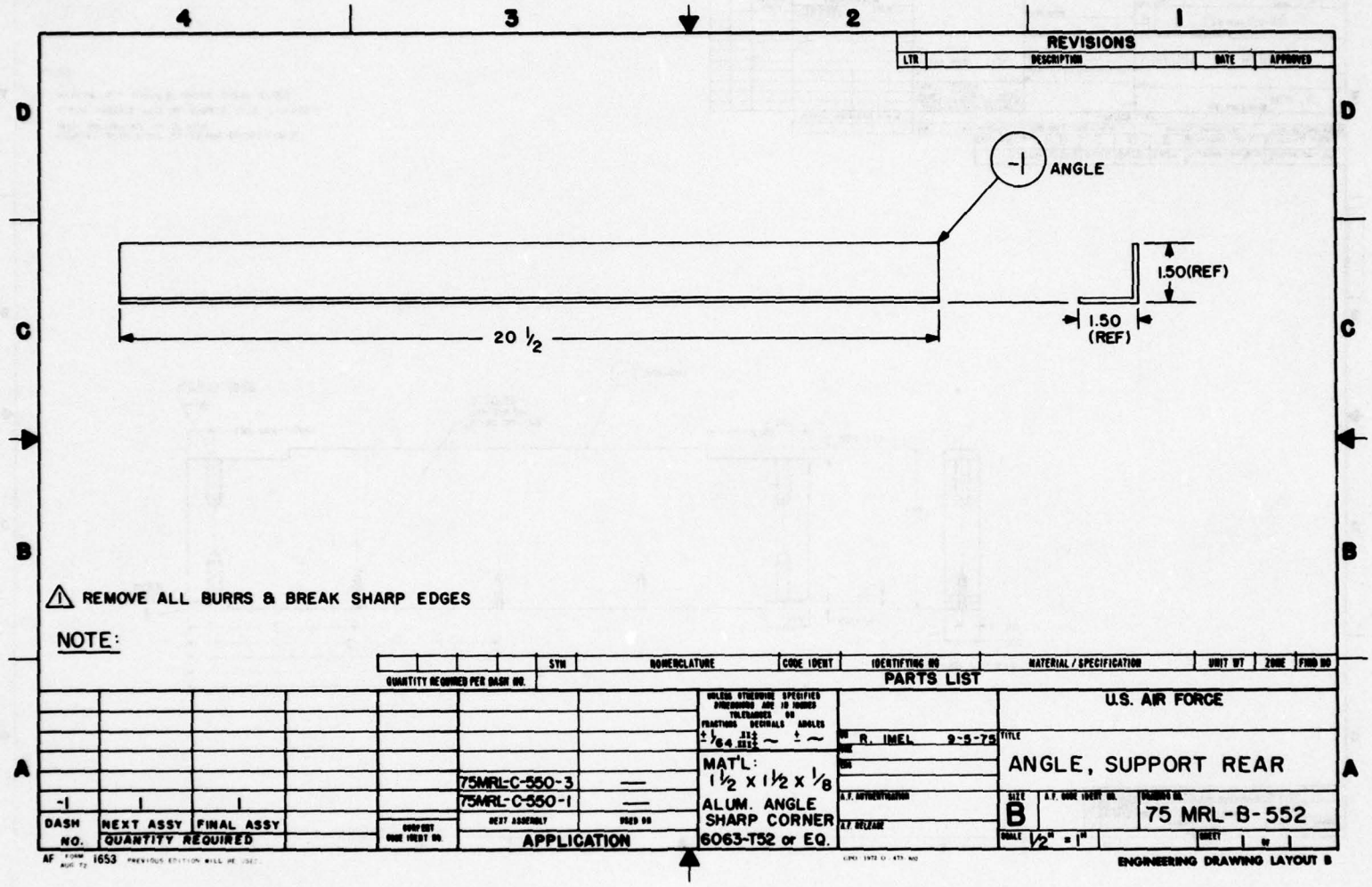
TITLE WELDMENT - BRACKET, SUPPORT REAR

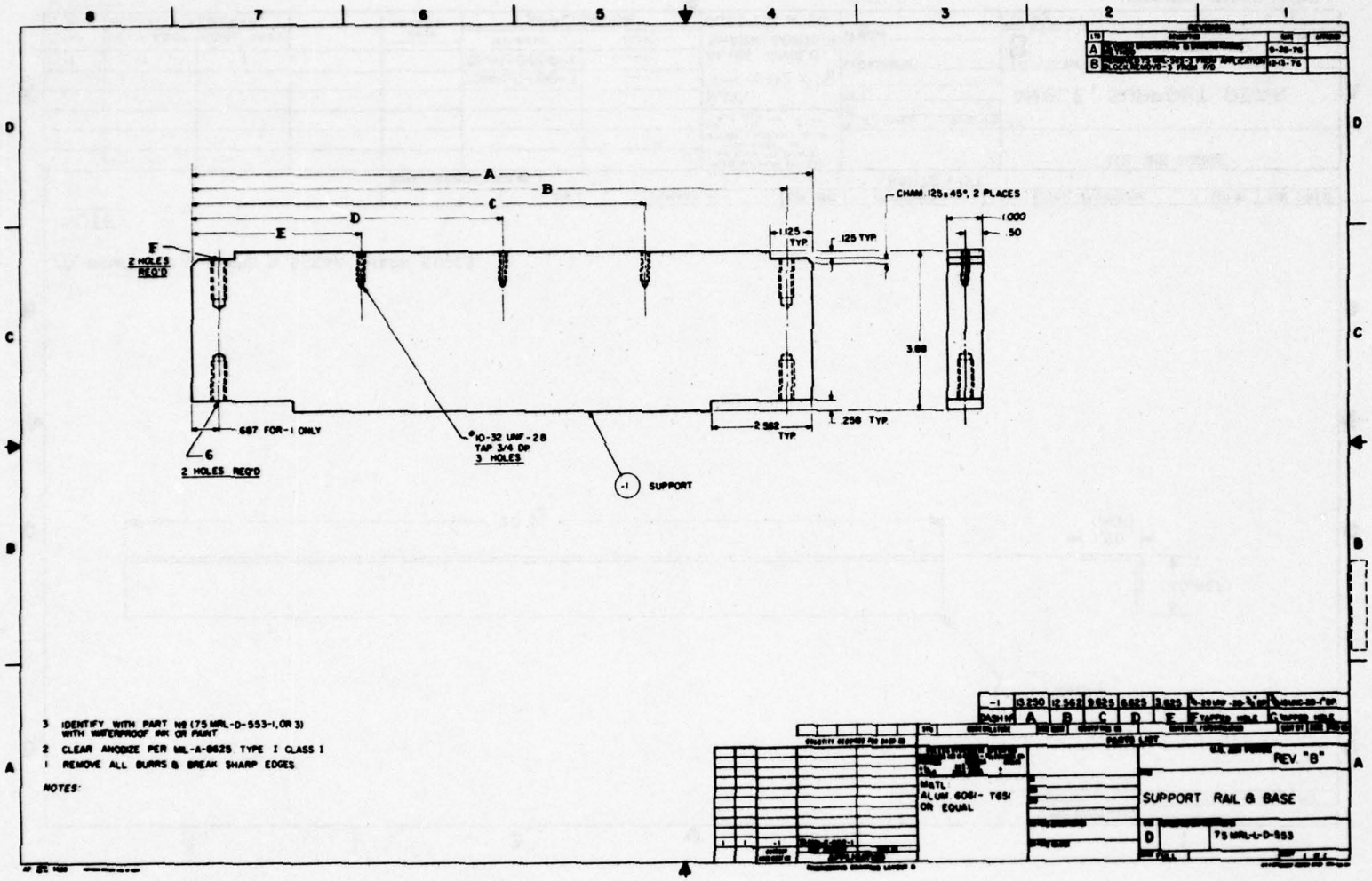
SIZE C | 75MRL-C-550

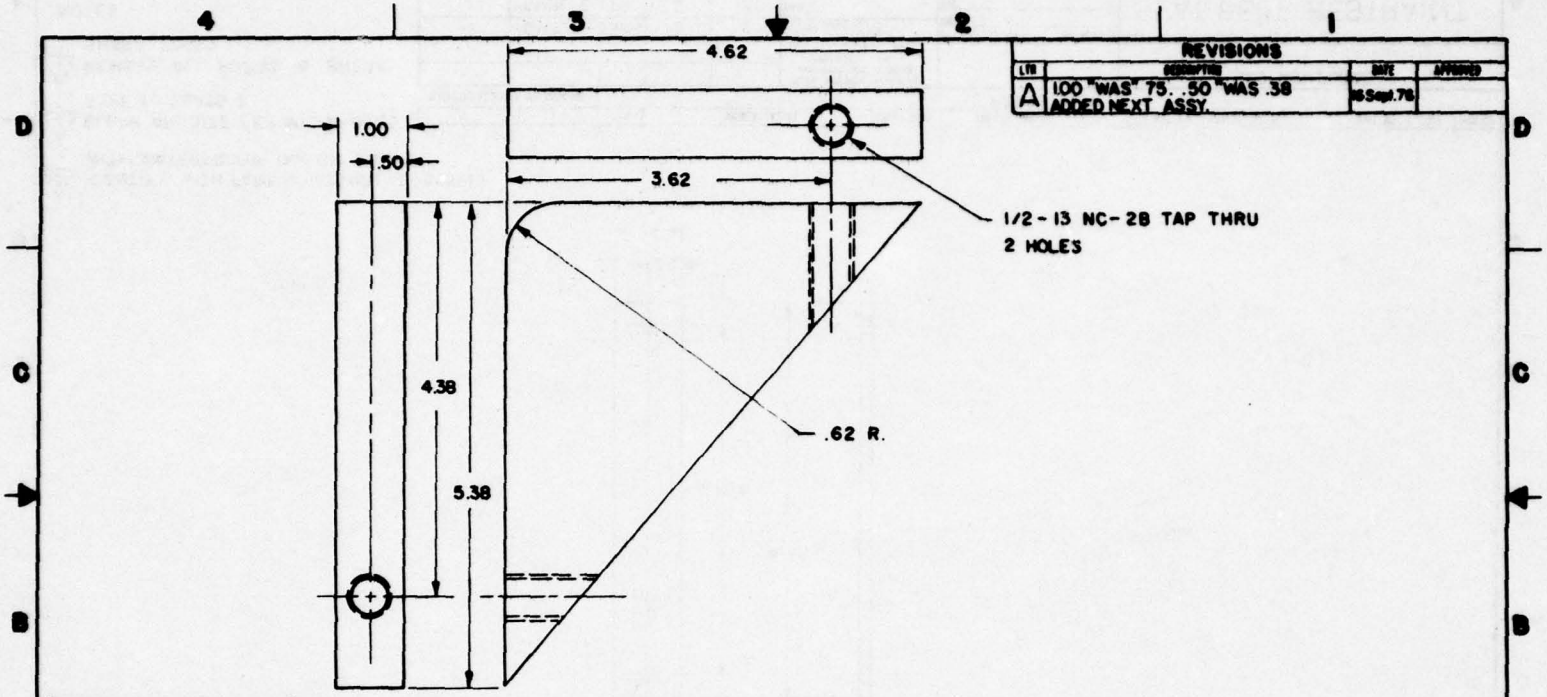
SCALE 1/2" = 1" | SHEET 1 OF 1

ENGINEERING DRAWING LAYOUT C


REVISIONS
LTR
DESCRIPTION
DATE
APPROVED
LET J (.2770) DRILL THRU
3 HOLES
.12 R 4 PLACES
.44 R
-1 PLATE
3.00
2.250
1.500
.38
.50
.375
2.625
3.000
4.00
1/4 REF.
REMOVE ALL BURRS
& BREAK SHARP EDGES
NOTES:
PARTS LIST
QUANTITY REQUIRED PER DASH NO.
SYM
NOMENCLATURE
CODE IDENT
IDENTIFYING NO
MATERIAL / SPECIFICATION
UNIT WT
ZONE
FSCM NO
NEXT ASSY QTY.
FINAL ASSY QTY.
GOVT/IND CODE IDENT NO.
NEXT ASSEMBLY
USED ON
APPLICATION
-1
75MRL-C-550-3
75MRL-E-543
-1
75MRL-C-5501
75MRL-E-543
MAT'L:
1/4 THK ALUM
6061-T651
OR EQUAL
R. IMEL 9-4-75
U.S. AIR FORCE
TITLE
PLATE, SUPPORT REAR
SIZE
B
DRAWING NO.
75 MRL-B-551
SCALE FULL
SHEET 1 OF 1
AF FORM 1653 PREVIOUS EDITION WILL BE USED.
ENGINEERING DRAWING LAYOUT


4
3
2
1
D
C
B
A
REVISIONS
LTR
DESCRIPTION
DATE
APPROVED
-1
ANGLE
1.50(REF)
1.50
(REF)
20 1/2
REMOVE ALL BURRS & BREAK SHARP EDGES
NOTE:
SYM
NOMENCLATURE
CODE IDENT
IDENTIFYING NO
MATERIAL / SPECIFICATION
UNIT WT
ZONE
FIND NO
QUANTITY REQUIRED PER DASH NO.
PARTS LIST
75MRL-C-550-3
75MRL-C-550-1
MAT'L:
1 1/2 x 1 1/2 x 1/8
ALUM. ANGLE
SHARP CORNER
6063-T52 or EQ.
-1
1
1
DASH NO.
NEXT ASSY
FINAL ASSY
QUANTITY REQUIRED
NEXT ASSEMBLY
USED ON
APPLICATION
R. IMEL 9-5-75
U.S. AIR FORCE
ANGLE, SUPPORT REAR
SIZE B
75 MRL-B-552
SCALE 1/2 = 1
SHEET 1 OF 1
AF FORM 1653
ENGINEERING DRAWING LAYOUT B


A
B
C
D
E
F
2 HOLES REQ'D
CHAM .125 x 45°, 2 PLACES
1.000
.50
1.125 TYP
.125 TYP
3.88
.687 FOR -1 ONLY
6
2 HOLES REQ'D
10-32 UNF-2B
TAP 3/4 DP
3 HOLES
2.562 TYP
.256 TYP
-1
SUPPORT
3 IDENTIFY WITH PART NO (75 MRL-D-553-1, OR 3) WITH WATERPROOF INK OR PAINT
2 CLEAR ANODIZE PER MIL-A-8625 TYPE I CLASS I
1 REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES:
MATL
ALUM 6061- T651
OR EQUAL
REV "B"
SUPPORT RAIL & BASE
D
75 MRL-L-D-553



REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	1.00 "WAS" 75. .50 "WAS .38 ADDED NEXT ASSY.	15Sept.75	

⚠ IDENTIFY WITH PART Nº (75 MRL-B-554-1) WITH WATER-PROOF INK OR PAINT.

⚠ CLEAR ANODIZE PER MIL-A-8625 TYPE I CLASS I.

⚠ REMOVE ALL BURRS & BREAK SHARP EDGES.

NOTES:

PARTS LIST

QUANTITY REQUIRED PER DASH NO.											
					STR	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO
THRU ASSY QTY	FRONT ASSY QTY	DASH Nº	NEXT ASSEMBLY	USED ON								
2	2	-1	75MRL-E-692-1	~								
2	2	-1	75MRL-E-543-1	~								

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ±1/64 DECIMALS .X ±.010 .XXX ±.005 ANGLES ± 30'

MAT'L: ALUM 6061-T651 OR EQUAL

DR R. ISSEL 9-5-75

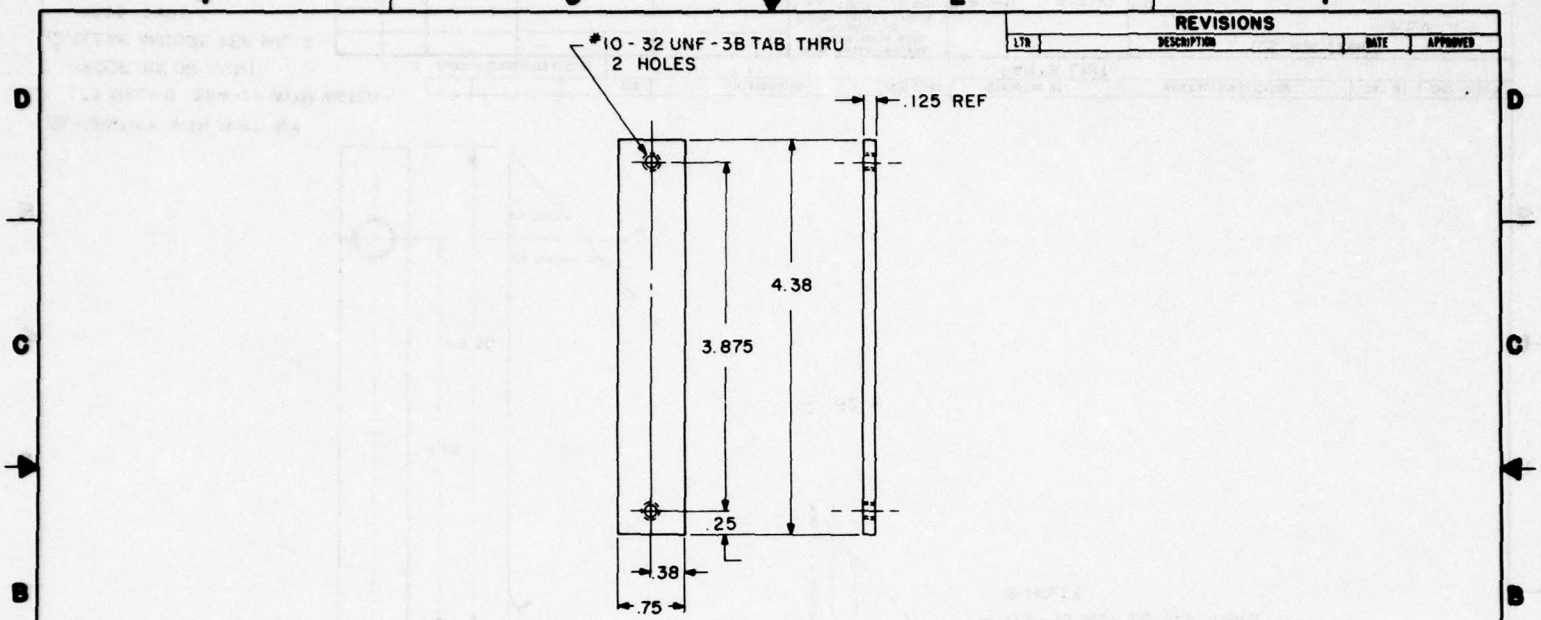
U.S. AIR FORCE REV."A"

TITLE: SUPPORT SEAT PLATE

SIZE B | CAGE CODE NO. | DRAWING NO. 75 MRL-B-554

SCALE FULL | SHEET 1 OF 1

ENGINEERING DRAWING LAYOUT B



REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

3 IDENTIFY WITH PART NO (75MRL-B-555-1) WITH WATERPROOF INK OR PAINT

2 CLEAR ANODIZE PER MIL-A-8625 TYPE I, CLASS I.

1 REMOVE ALL BURRS & BREAK SHARP EDGES.

NOTES:

PARTS LIST

QUANTITY REQUIRED PER DASH NO.	SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FSCM NO
-1		76MRL-E-692-1			MAT'L .125 THK ALUM 6061-T6 OR EQUAL			
-1		76MRL-E-179						
-1		75MRL-E-543						

DASH NO.	NEXT ASSY	FINAL ASSY
	QTY	QTY

NEXT ASSEMBLY

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± 1/64 DECIMALS .XX ± .010 .XXX ± .005 ANGLES ±

DR R. Imel 9-8-75

CH

APPD

A.F. AUTHENTICATION

A.F. RELEASE

U.S. AIR FORCE

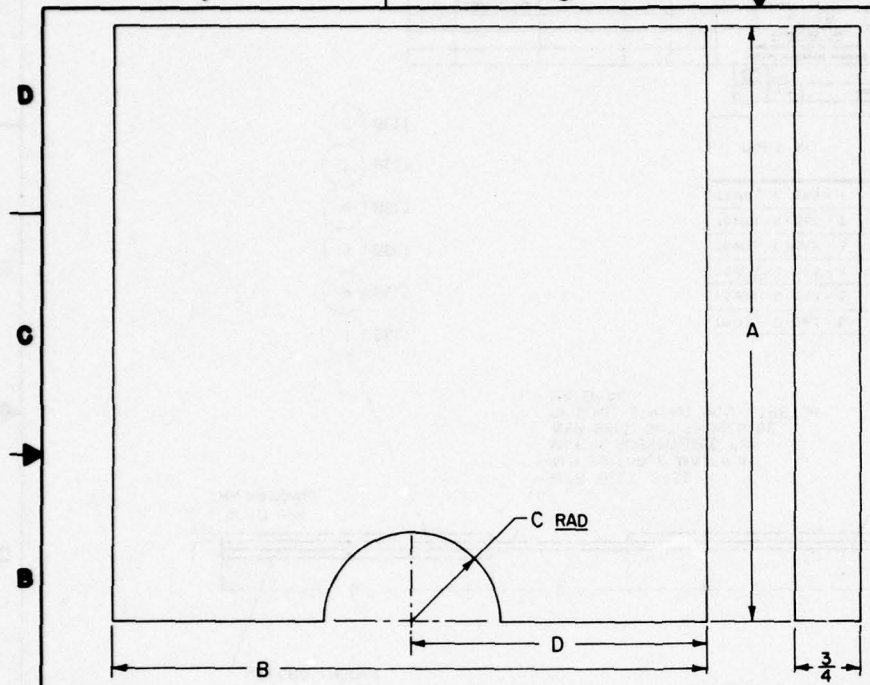
TITLE SEAT BELT RESTRAINT

SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-555

SCALE FULL | SHEET 1 OF 1

AF 1653

ENGINEERING DRAWING LAYOUT B



DASH Nº	A	B	C	D
-5				
-3	5 3/4	5 3/4	3/4	2 7/8
-1	6 3/4	6 3/4	1"	3 3/8

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

PARTS LIST

QUANTITY REQUIRED PER DASH NO.				SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FSCM NO
-3	76MRL-E-179	1	1		MAT'L: ENERGY ABSORBING PADDING CODE A.H. INSULITE UNIROYLE RUBBER CO.						
-3	75MRL-E-692	1	1								
-1	75MRL-E-543	1	1								
DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY								
*	APPLICATION										

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ± 1/8, DECIMALS ± —, ANGLES ± —

DR RAY DICKEY 10-10-75

U.S. AIR FORCE

TITLE PAD, SEAT SUPPORT

SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-562

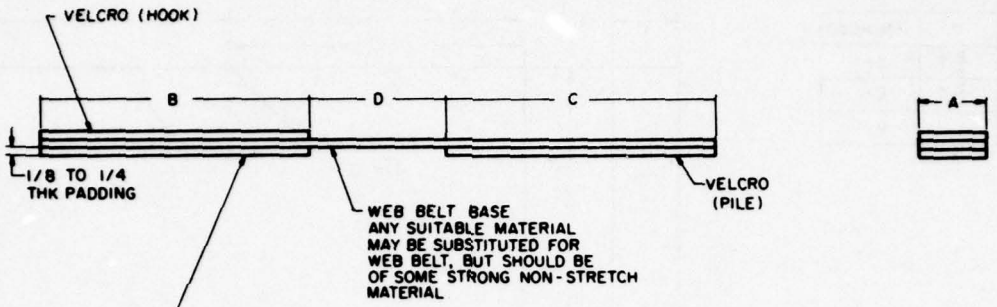
SCALE FULL | SHEET OF

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

GPO 1972 O - 473-007

ENGINEERING DRAWING LAYOUT 8

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ADDED -6 & REVISED APPLICATION BLOCK	12-16-76	WLF



(-1) BELT
(-2) BELT
(-3) BELT
(-4) BELT
(-5) BELT
(-6) BELT

PART NO.	TYPE	A	B	C	D
		DIMENSION			
75MRL-C-563-6	2	7.0	13.0	13.0	6.0
75MRL-C-563-5	2	6.0	13.0	13.0	6.0
75MRL-C-563-4	2	5.0	13.0	13.0	6.0
75MRL-C-563-3	2	4.0	13.0	13.0	6.0
75MRL-C-563-2	2	3.0	13.0	13.0	6.0
75MRL-C-563-1	1	2.0	8.0	8.0	4.0

75MRL-C-563 REV A

LIST OF MATERIALS

DASH NO.	APPLICATION	QTY REQD		
-6	75MRL-E-548-1	-	1	1
-4	75MRL-E-543-1	-	1	1
-2	75MRL-E-682-1	-	1	1
-1	75MRL-E-682-1	-	2	2
-5	75MRL-E-543-1	-	1	1
-3	75MRL-E-543-1	-	1	1
-1	75MRL-E-543-1	-	1	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON DECIMALS: .XX ± .031, .XXX ± .015
FRACTIONS ± 1/32, ANGLES ±0°-30'
MATERIAL: SEE F/D (FIELD OF DRAWING)

R. Imel 9-9-75

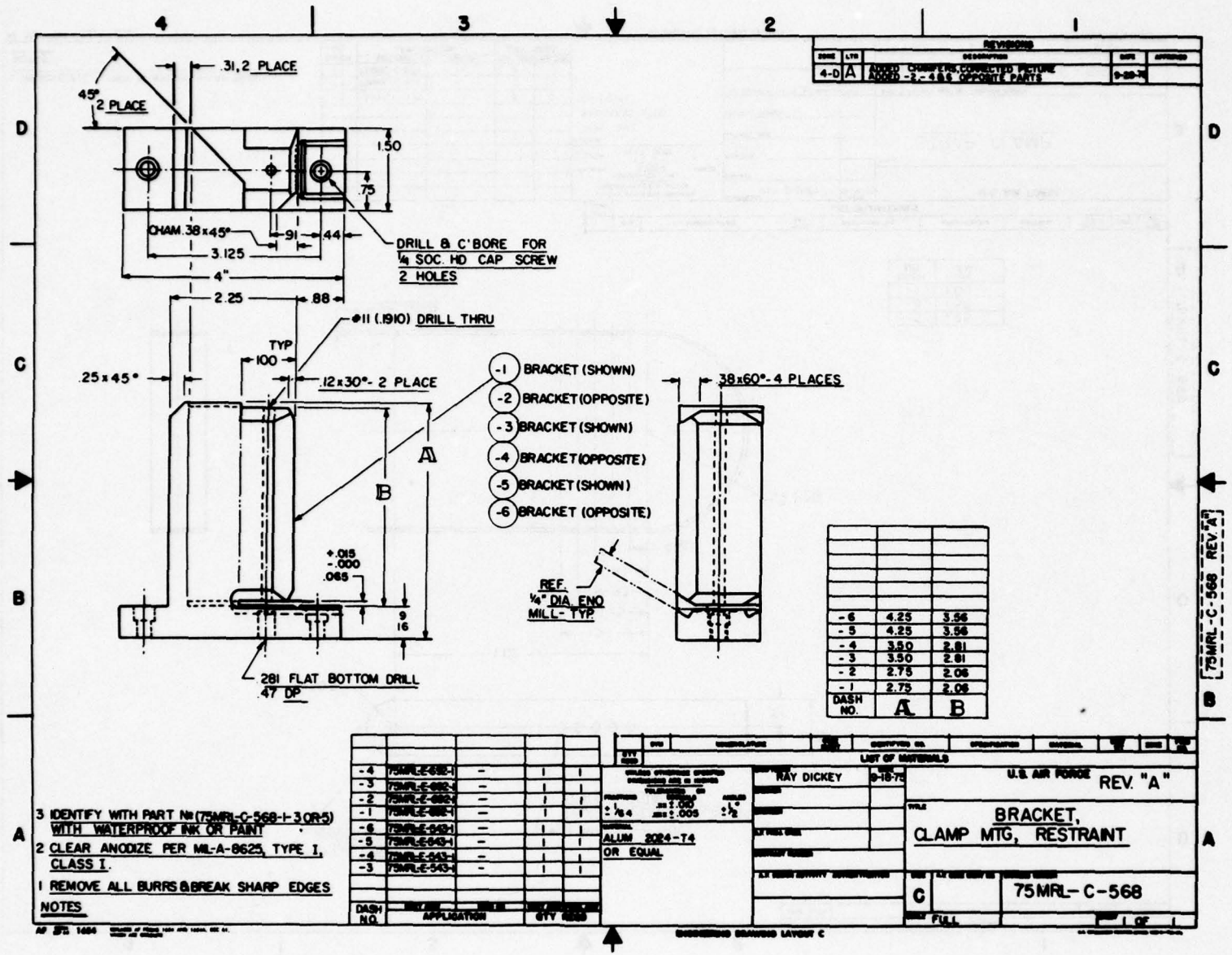
U.S. AIR FORCE REV "A"

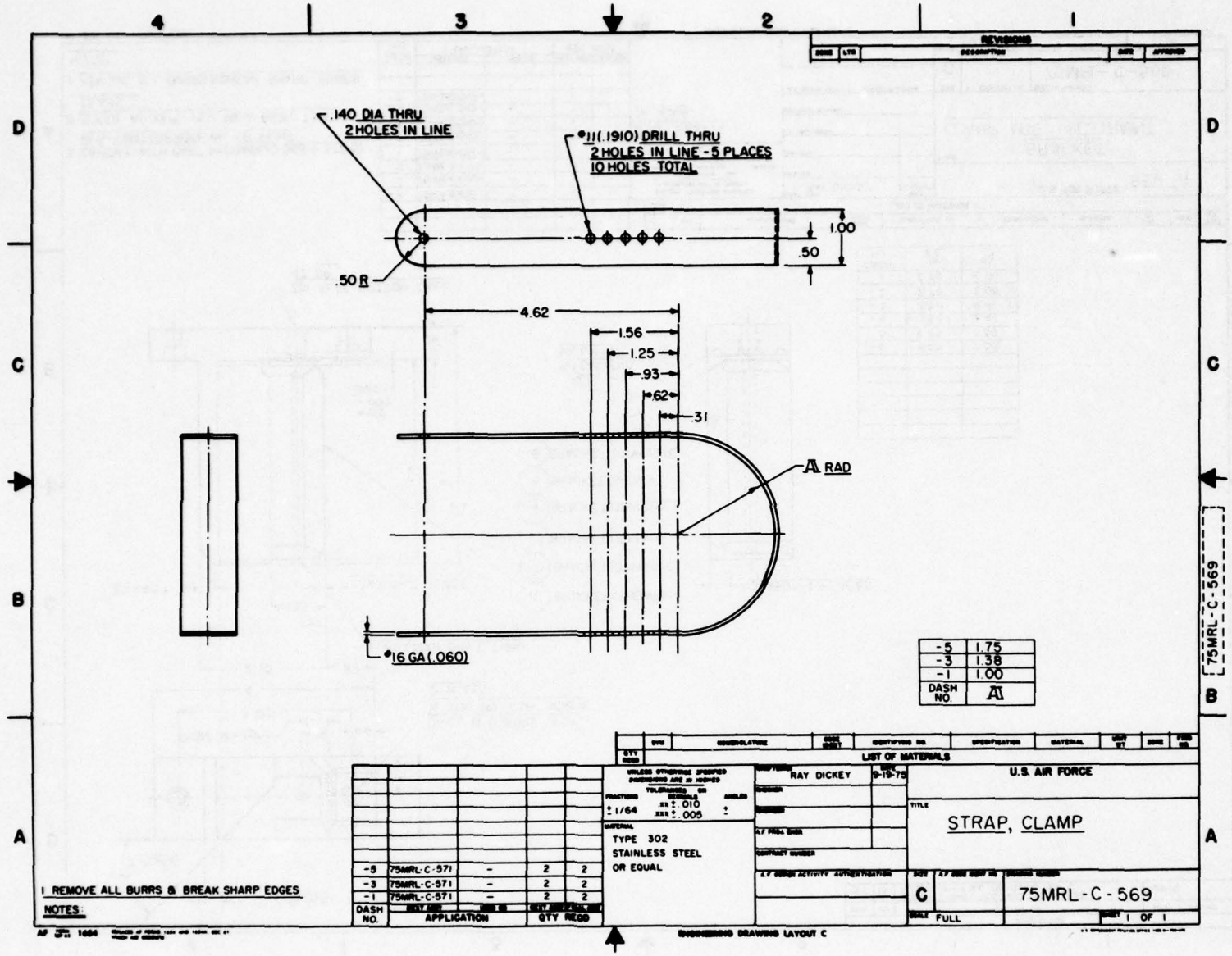
TITLE: BELT, RESTRAINT, ASSY-OF, ACCELERATION

SIZE C | DRAWING NUMBER 75MRL-C-563

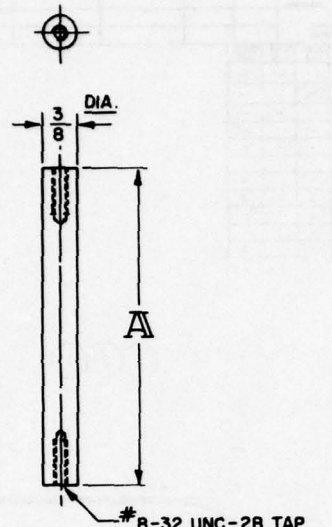
SCALE - | SHEET 1 OF 1

AF 3FC 1684 — ENGINEERING DRAWING LAYOUT C


.31, 2 PLACE
45° 2 PLACE
1.50
.75
CHAM. .38 x 45°
.91
.44
3.125
4"
DRILL & C'BORE FOR 1/4 SOC. HD CAP SCREW 2 HOLES
2.25
.88
#11 (.1910) DRILL THRU
TYP
.100
.25 x 45°
.12 x 30° - 2 PLACE
.38 x 60° - 4 PLACES
A
B
+.015 -.000 .065
9/16
.281 FLAT BOTTOM DRILL .47 DP
REF. 1/4" DIA. END MILL - TYP
-1 BRACKET (SHOWN)
-2 BRACKET (OPPOSITE)
-3 BRACKET (SHOWN)
-4 BRACKET (OPPOSITE)
-5 BRACKET (SHOWN)
-6 BRACKET (OPPOSITE)
REVISIONS
4-D A ADDED DIMENSIONS, CORRECTED PICTURE ADDED -2, -4 & 6 OPPOSITE PARTS 9-20-74
-6 4.25 3.56
-5 4.25 3.56
-4 3.50 2.81
-3 3.50 2.81
-2 2.75 2.06
-1 2.75 2.06
DASH NO. A B
3 IDENTIFY WITH PART No (75MRL-C-568-1-3 OR-5) WITH WATERPROOF INK OR PAINT
2 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I.
1 REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES
-4 75MRL-E-542-1
-3 75MRL-E-542-1
-2 75MRL-E-542-1
-1 75MRL-E-542-1
-6 75MRL-E-543-1
-5 75MRL-E-543-1
-4 75MRL-E-543-1
-3 75MRL-E-543-1
DASH NO. APPLICATION QTY REQD
LIST OF MATERIALS
RAY DICKEY 9-18-74
ALUM 2024-T4 OR EQUAL
U.S. AIR FORCE REV. "A"
BRACKET, CLAMP MTG, RESTRAINT
C 75MRL-C-568
SCALE FULL SHEET 1 OF 1
ENGINEERING DRAWING LAYOUT C
75MRL-C-568 REV. "A"


.140 DIA THRU
2 HOLES IN LINE
*11(.1910) DRILL THRU
2 HOLES IN LINE - 5 PLACES
10 HOLES TOTAL
1.00
.50
.50 R
4.62
1.56
1.25
.93
.62
.31
A RAD
*16 GA (.060)
-5 1.75
-3 1.38
-1 1.00
DASH NO. A
75MRL-C-569
REVISIONS
LIST OF MATERIALS
DASH NO.
APPLICATION
QTY REQD
-5 75MRL-C-571 - 2 2
-3 75MRL-C-571 - 2 2
-1 75MRL-C-571 - 2 2
UNLESS OTHERWISE SPECIFIED
FRACTIONS ± 1/64
DECIMALS .XX ± .010 .XXX ± .005
ANGLES ±
MATERIAL
TYPE 302
STAINLESS STEEL
OR EQUAL
RAY DICKEY
9-19-75
U.S. AIR FORCE
STRAP, CLAMP
C
75MRL-C-569
SCALE FULL
SHEET 1 OF 1
NOTES:
1 REMOVE ALL BURRS & BREAK SHARP EDGES
AF DRL 1484
ENGINEERING DRAWING LAYOUT C

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



-5	3.50
-3	2.75
-1	2.00
DASH NO	A

2 CLEAR ANODIZE PER MIL-A-8625 TYPE I, CLASS I

1 REMOVE ALL BURRS & BREAK SHARP EDGES.

NOTES:

PARTS LIST

QUANTITY REQUIRED PER DASH NO.				STK	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO
-5	75MRL-C-571	2	2								
-3	75MRL-C-571	2	2								
-1	75MRL-C-571	2	2								
DASH NO.	NEXT ASSY.	NEXT ASSY. QTY.	FINAL ASSY. QTY.								

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ±1/32, DECIMALS ±.XX ±.XXX, ANGLES ±

MAT'L. ALUM. 6061-T6 OR EQUAL

DRAWN RAY DICKEY 9-19-75

U.S. AIR FORCE

TITLE SPACER, CLAMP

SIZE B | DRAWING NO. 75MRL-B-570

SCALE FULL | SHEET 1 OF 1

APPLICATION

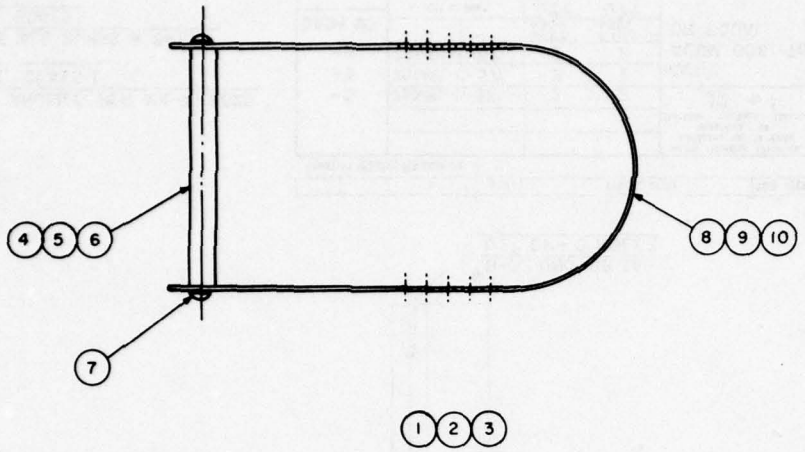
NEXT ASSEMBLY

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

GPO 1972 O-473-103

ENGINEERING DRAWING LAYOUT B

ZONE	LTR	REVISIONS DESCRIPTION	DATE	APPROVED
	A	REVISED APPLICATION BLOCK	10-1376	WLF



1	–	–		STRAP, CLAMP		75MRL-C-569-5						10
–	1	–		STRAP, CLAMP		75MRL-C-569-3						9
–	–	1		STRAP, CLAMP		75MRL-C-569-1						8
2	2	2	⚠	SCR. MACH PAN HD		MS51957-107						7
1	–	–		SPACER, CLAMP		75MRL-B-570-5						6
–	1	–		SPACER, CLAMP		75MRL-B-570-3						5
–	–	1		SPACER, CLAMP		75MRL-B-570-1						4
X	–	–		STRAP, CLAMP ASSY		75MRL-C-571-5						3
–	X	–		STRAP, CLAMP ASSY		75MRL-C-571-3						2
–	–	X		STRAP, CLAMP ASSY		75MRL-C-571-1						1
-5	-3	-1	DWG	NOMENCLATURE	CAGE CODE	DRAWING NO.	SPECIFICATION	MATERIAL	UNIT WT	SIZE	FIND NO.	
QTY REQD	QTY REQD	QTY REQD										

LIST OF MATERIALS

DASH NO.	APPLICATION			QTY REQD	
-3	75MRL-E-692-1	–		2	2
-1	75MRL-E-692-1	–		2	2
-5	75MRL-E-543	–		2	2
-3	75MRL-E-543	–		2	2

⚠ SCREW, MACH. PAN HD ⌀ 8-32 UNC-2A × .50 LG

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ± ; .XX ± ; .XXX ± ; ANGLES ± ; MATERIAL ; NEXT ASSY ; FINISH ; DRAWN RAY DICKEY 8-19-75 ; CHECKED ; ENGINEER ; A.F. PROJ. ENGR. ; CONTRACT NUMBER ; A.F. DESIGN ACTIVITY AUTHENTICATION

U.S. AIR FORCE

TITLE: STRAP, CLAMP ASSY

SIZE C | A.F. CAGE IDENT NO. | DRAWING NUMBER 75MRL-C-571 | REV "A"

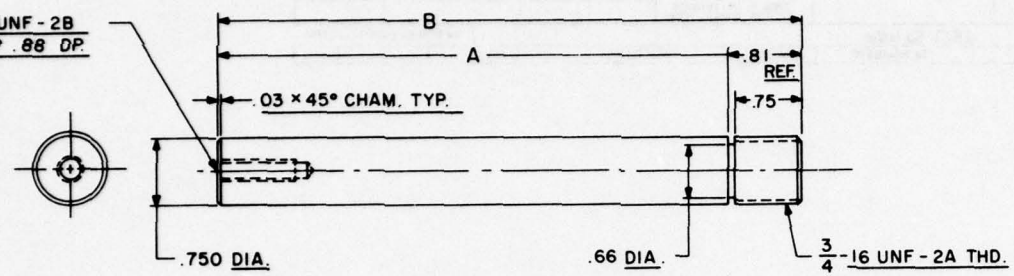
SCALE FULL | SHEET 1 OF 1

75MRL-C-571

AF FORM 1464 SUPERSEDES AF FORM 1464 WHICH MAY BE USED.

ENGINEERING DRAWING LAYOUT C

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



DASH NO	A	B
-7	8.50	9.31
-5	7.50	8.31
-3	6.50	7.31
-1	5.50	6.31

PARTS LIST

	SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO
-7		75MRL-E-692-1						
-5		75MRL-E-692-1						
-3		75MRL-E-692-1						
-1		75MRL-E-692-1						

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY REQUIRED	FINAL ASSY QTY REQUIRED
-7		2	2
-5		2	2
-3		2	2
-1		2	2

1 REMOVE ALL BURRS & BREAK SHARP EDGES

NOTES:

DASH NO.	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
-7	75MRL-E-433	2	2
-5	75MRL-E-433	2	2
-3	75MRL-E-433	2	2
-1	75MRL-E-433	2	2

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ±1/32, DECIMALS ±.010, ANGLES ±1°

MATL. COLD DRAWN LEDLOY

DR RAY DICKEY 10-20-75

U.S. AIR FORCE

TITLE: ROD, GUIDE

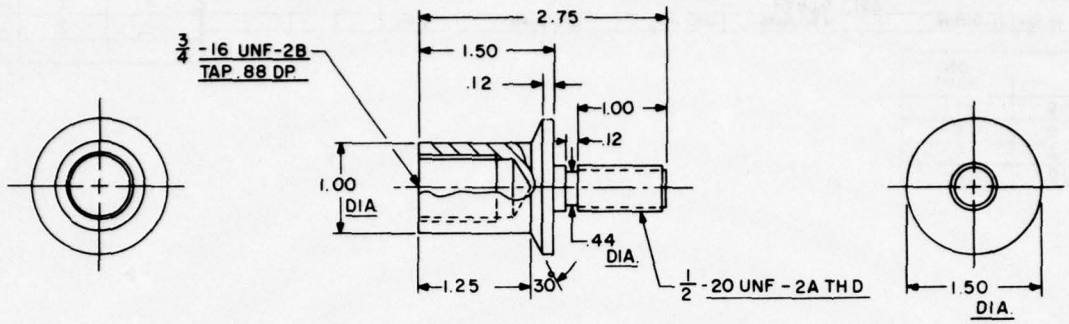
SIZE B | DRAWING NO. 75MRL-B-647

SCALE FULL | SHEET 1 OF 1

AF FORM 1653 AUG 72

ENGINEERING DRAWING LAYOUT B

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO

PARTS LIST

QUANTITY REQUIRED PER DASH NO.			
-1	76MRL-E-179	2	2
-1	75MRL-E-692	2	2
~~-1~~	~~75MRL-E-433~~	~~2~~	~~2~~
-1	75MRL-E-433	2	2
DASH NO		NEXT ASSY	FINAL ASSY
	NEXT ASSEMBLY	QTY	
	APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS .X ± .010 .XXX ± .005 ANGLES ± 30'

MAT'L, COLD DRAWN LEDLOY

DRN RAY DICKEY 10-20-75
CHK
ENG
A.F. AUTHENTICATION
A.F. RELEASE

U.S. AIR FORCE

TITLE HOLDER, THDED, ROD GUIDE

SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-648

SCALE FULL | SHEET 1 OF 1

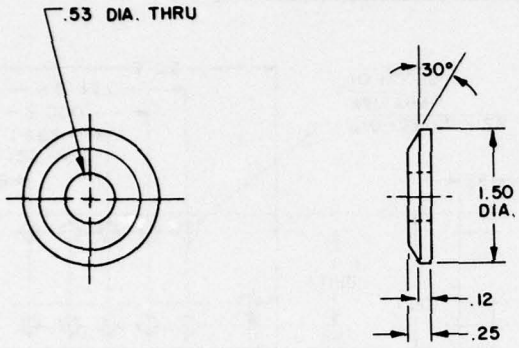
1. REMOVE ALL BURRS & BREAK ALL SHARP EDGES.

NOTES

AF FORM 1653 PREVIOUS EDITION WILL BE USED

ENGINEERING DRAWING LAYOUT B

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



NOTES:

1. REMOVE ALL BURRS & BREAK SHARP EDGES.

QUANTITY REQUIRED PER DASH NO.	SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO
		PARTS LIST						
-1		76MRL-E-179	2	2				
-1		75MRL-E-692	2	2				
-1		75MRL-E-433	2	2				
DASH NO.			NEXT ASSY	FINAL ASSY				
NEXT ASSEMBLY		APPLICATION	QTY	QTY				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE
FRACTIONS ± DECIMALS ± ANGLES ±
.XX ± .010 ± 1/2°
.XXX ± .005

MATL. 1018
C.R.S.

FINISH:
CAD PLATE

DR RAY DICKEY 10-21-75
CH
ENGR
A.F. AUTHENTICATION
A.F. RELEASE

U.S. AIR FORCE

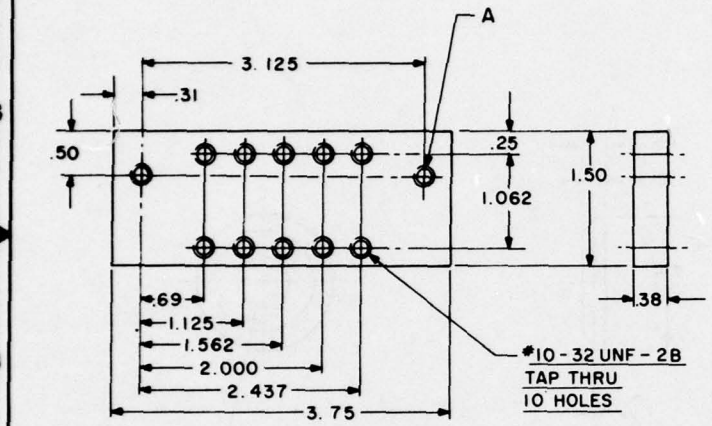
TITLE: WASHER, ROD GUIDE

SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-649

SCALE FULL | SHEET 1 OF 1

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

ENGINEERING DRAWING LAYOUT B



-3	.26 $^{+.010}_{-.00}$ DIA. THRU	2
-1	#10-32 UNF-2B TAP THRU	2
DASH NO.	A	NO. REQ'D

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED

PARTS LIST

QUANTITY REQUIRED PER DASH NO.		SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO.	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FSCM NO.
-1	75MRL-E-692-1	2	2						
-3	75MRL-E-692-1	4	4						
-3	75MRL-E-543	2	2			MAT'L ALUM. 6061-T651 OR EQUAL			
-1	75MRL-E-543	2	2						

DASH NO.	NEXT ASSY QTY	FINAL ASSY QTY
DEST ASSEMBLY	APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: FRACTIONS ±, DECIMALS .XX ±, .XXX ±, ANGLES ±

DR RAY DICKEY 10/30/75

A.F. AUTHENTICATION

A.F. RELEASE

U.S. AIR FORCE

TITLE: PLATE, CLAMP MOUNTING

SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-652

SCALE FULL | SHEET 1 of 1

ENGINEERING DRAWING LAYOUT B

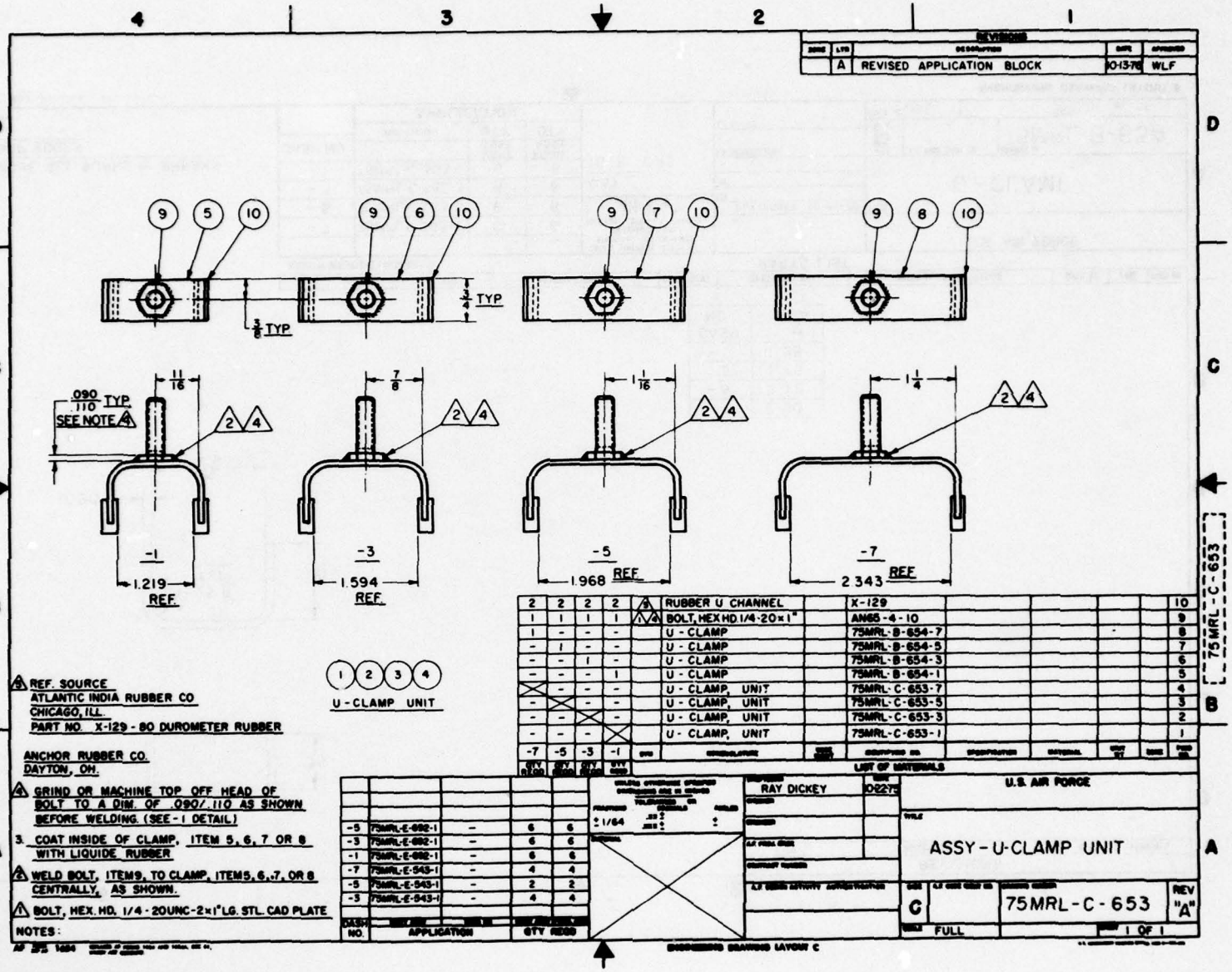
3. IDENTIFY WITH P/N (75MRL-E-B-652-1, OR -3) WITH WATERPROOF INK OR PAINT

2. CLEAR ANODIZE PER PER MIL-A-8625 TYPE I, CLASS I.

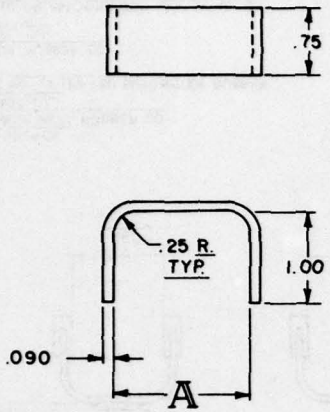
1. REMOVE ALL BURRS & BREAK SHARP EDGES.

NOTES:

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED


4
3
2
1
D
C
B
A
REVISIONS
ZONE | LTR | DESCRIPTION | DATE | APPROVED
A | REVISED APPLICATION BLOCK | 10-13-76 | WLF
9 5 10
9 6 10
9 7 10
9 8 10
3/8 TYP
3/4 TYP
.090/.110 TYP. SEE NOTE 4
11/16
7/8
1 1/16
1 1/4
2 4
-1
1.219 REF.
-3
1.594 REF.
-5
1.968 REF.
-7
2 343 REF.
75MRL-C-653
1 2 3 4
U-CLAMP UNIT
2 2 2 2 5 RUBBER U CHANNEL X-129 10
1 1 1 1 4 BOLT, HEX HD 1/4-20 x 1" AN65-4-10 9
1 - - - U-CLAMP 75MRL-B-654-7 8
- 1 - - U-CLAMP 75MRL-B-654-5 7
- - 1 - U-CLAMP 75MRL-B-654-3 6
- - - 1 U-CLAMP 75MRL-B-654-1 5
X - - - U-CLAMP, UNIT 75MRL-C-653-7 4
- X - - U-CLAMP, UNIT 75MRL-C-653-5 3
- - X - U-CLAMP, UNIT 75MRL-C-653-3 2
- - - X U-CLAMP, UNIT 75MRL-C-653-1 1
-7 -5 -3 -1 QTY
LIST OF MATERIALS
4 REF. SOURCE
ATLANTIC INDIA RUBBER CO
CHICAGO, ILL.
PART NO. X-129 - 80 DUROMETER RUBBER
ANCHOR RUBBER CO.
DAYTON, OH.
4 GRIND OR MACHINE TOP OFF HEAD OF BOLT TO A DIM. OF .090/.110 AS SHOWN BEFORE WELDING. (SEE - 1 DETAIL)
3. COAT INSIDE OF CLAMP, ITEM 5, 6, 7 OR 8 WITH LIQUIDE RUBBER
4 WELD BOLT, ITEM 9, TO CLAMP, ITEM 5, 6, 7, OR 8 CENTRALLY, AS SHOWN.
1 BOLT, HEX. HD. 1/4 - 20UNC-2 x 1" LG. STL. CAD PLATE
NOTES:
DASH NO. | APPLICATION | QTY REQD
-5 | 75MRL-E-682-1 | - | 6 | 6
-3 | 75MRL-E-682-1 | - | 6 | 6
-1 | 75MRL-E-682-1 | - | 6 | 6
-7 | 75MRL-E-543-1 | - | 4 | 4
-5 | 75MRL-E-543-1 | - | 2 | 2
-3 | 75MRL-E-543-1 | - | 4 | 4
± 1/64
DRAWN RAY DICKEY 10-22-75
U.S. AIR FORCE
TITLE ASSY - U-CLAMP UNIT
SIZE C
75MRL-C-653
REV "A"
SCALE FULL
SHEET 1 OF 1
ENGINEERING DRAWING LAYOUT C

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



-7	2.50
-5	2.12
-3	1.75
-1	1.38
DASH NO.	A

PARTS LIST

QUANTITY REQUIRED PER DASH NO.				SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO
-7	75MRL-C-563-7	6	6								
-5	75MRL-C-563-5	6	6								
-3	75MRL-C-563-3	6	6								
-1	75MRL-C-563-1	6	6								
DASH NO.		NEXT ASSY QTY	FINAL ASSY QTY								
	NEXT ASSEMBLY	APPLICATION									

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES
.XX ± .010 .XXX ± .005

MAT'L.
1018 CRS

DR RAY DICKEY 10-31-75
DES
ENG
A.F. AUTHENTICATION
A.F. RELEASE

U.S. AIR FORCE

TITLE
U - CLAMP

SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-654

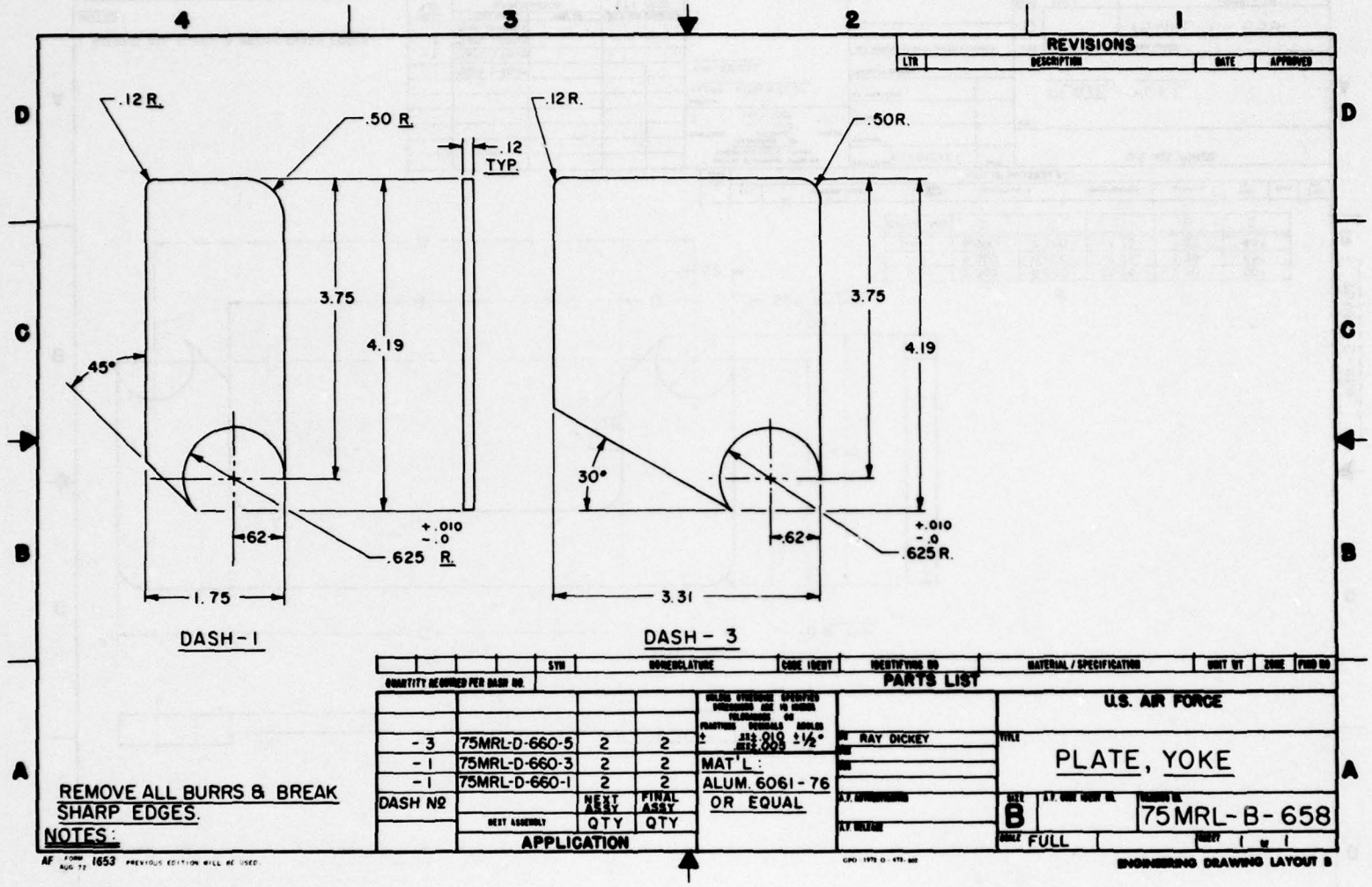
SCALE FULL | SHEET 1 OF 1

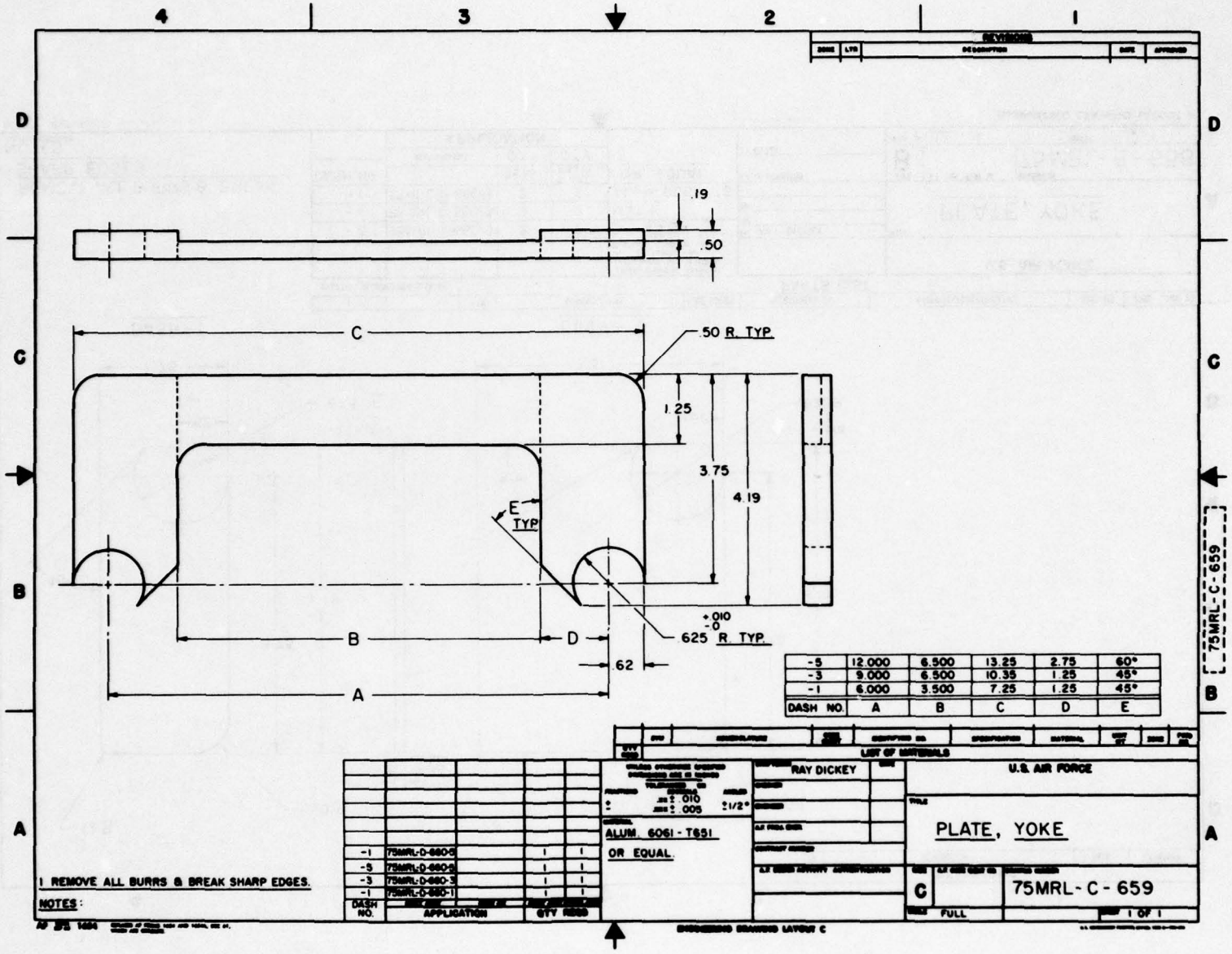
NOTES
1. REMOVE ALL BURRS & BREAKS SHARP EDGES

AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.

GPO 1972 O 473 462

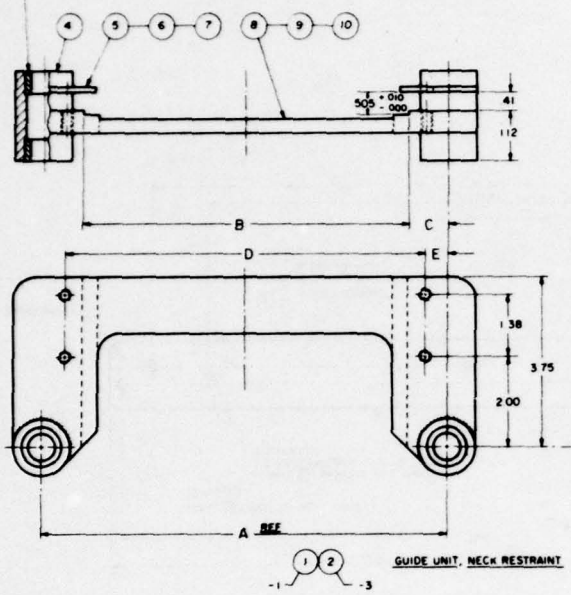
ENGINEERING DRAWING LAYOUT B

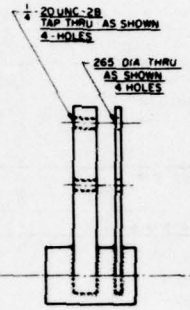

4
3
2
1
REVISIONS
LTR
DESCRIPTION
DATE
APPROVED
.12 R.
.50 R.
.12 TYP.
3.75
4.19
45°
.62
+.010 -.0
.625 R.
1.75
DASH-1
.12R.
.50R.
3.75
4.19
30°
.62
+.010 -.0
.625R.
3.31
DASH-3
PARTS LIST
QUANTITY REQUIRED PER DASH NO.
SYM
NOMENCLATURE
CODE IDENT
IDENTIFYING NO
MATERIAL / SPECIFICATION
UNIT QT
ZONE
FIND NO
- 3 75MRL-D-660-5 2 2
- 1 75MRL-D-660-3 2 2
- 1 75MRL-D-660-1 2 2
DASH NO
NEXT ASSY QTY
FINAL ASSY QTY
NEXT ASSEMBLY
APPLICATION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± .010 DECIMALS ± .005 ANGLES ± 1/2°
MAT'L: ALUM. 6061-76 OR EQUAL
DR RAY DICKEY
U.S. AIR FORCE
TITLE
PLATE, YOKE
SIZE B
DRAWING NO. 75MRL-B-658
SCALE FULL
SHEET 1 of 1
REMOVE ALL BURRS & BREAK SHARP EDGES.
NOTES:
AF FORM 1653 AUG 72 PREVIOUS EDITION WILL BE USED.
ENGINEERING DRAWING LAYOUT B

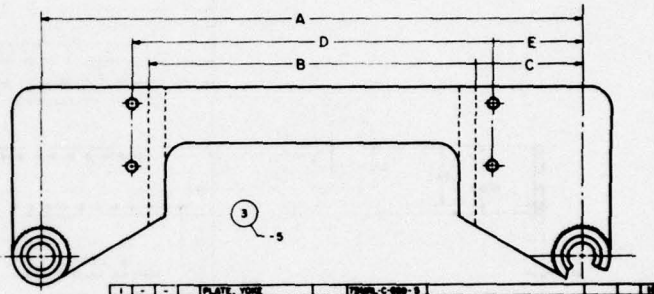

4
3
2
1
D
C
B
A
.19
.50
C
.50 R. TYP
1.25
3.75
4.19
E TYP
B
D
.62
A
+.010 -0
.625 R TYP
REVISIONS
ZONE
LTR
DESCRIPTION
DATE
APPROVED
75MRL-C-659
-5 12.000 6.500 13.25 2.75 60°
-3 9.000 6.500 10.35 1.25 45°
-1 6.000 3.500 7.25 1.25 45°
DASH NO. A B C D E
LIST OF MATERIALS
QTY
DESIGNATION
ZONE
IDENTIFYING NO.
SPECIFICATION
MATERIAL
UNIT WT.
ZONE
ITEM NO.
-1 75MRL-0-660-5
-5 75MRL-0-660-5
-3 75MRL-0-660-3
-1 75MRL-0-660-1
DASH NO.
APPLICATION
QTY REQD
ALUM. 6061 - T651
OR EQUAL
RAY DICKEY
U.S. AIR FORCE
PLATE, YOKE
C
75MRL-C-659
FULL
1 OF 1
1. REMOVE ALL BURRS & BREAK SHARP EDGES.
NOTES:
ENGINEERING DRAWING LAYOUT C

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REVISED APPLICATION BLOCK	9-30-76	WLF

BUSHING - MAT'L TEFLON
.875 O.D. (NOM) x .625 I.D. x .50 LONG - 4 REQ'D
PRESS FIT INTO HOUSING (FIND NO 4)
AFTER PRESSING INTO ENDS OF HOUSING, (FIND NO 4)
BORE I.D. TO .750 SLIP FIT ON ROD 75MRL-B-647-1, -3, -5, OR -7







DASH NO	QUANTITY REQUIRED PER ASSY ON			PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL OR SPECIFICATION	FINISH	NOTE
	-5	-3	-1					
-	1	-	-		PLATE, YOKE			
-	-	1	-		PLATE, YOKE			
-	-	-	1		PLATE, YOKE			
2	-	-	-		PLATE, YOKE			
-	2	-	-		PLATE, YOKE			
-	-	2	-		PLATE, YOKE			
2	2	2	-		HOUSING			
-	-	-	1		GUIDE UNIT, NECK REST			
-	-	-	1		GUIDE UNIT, RIGHT REST			
-	-	-	1		GUIDE UNIT, LEFT REST			

4 IDENTIFY WITH P/N (75MRL-D-660-1, -3, OR -5) WITH WATERPROOF INK OR PAINT
3 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I
2 REMOVE ALL BURRS & BREAK SHARP EDGES
1 WELD ALL POINTS OF CONTACT

NOTES:

-5		1	1
-3		1	1
-1		1	1

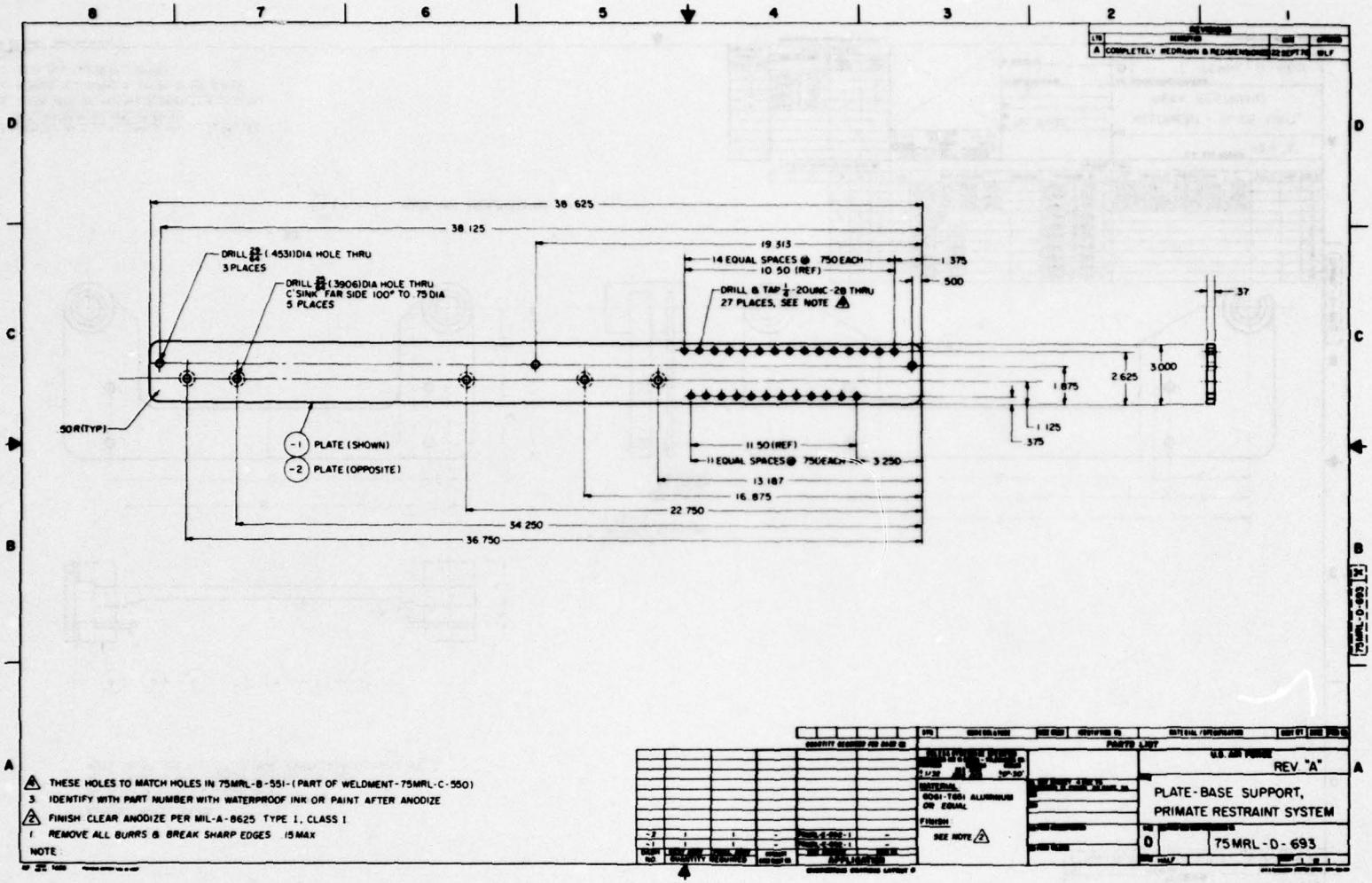
DASH NO

RAY DICKEY

REV "A"

WELDMENT - GUIDE UNIT, NECK RESTRAINT

D | 75MRL-D-660



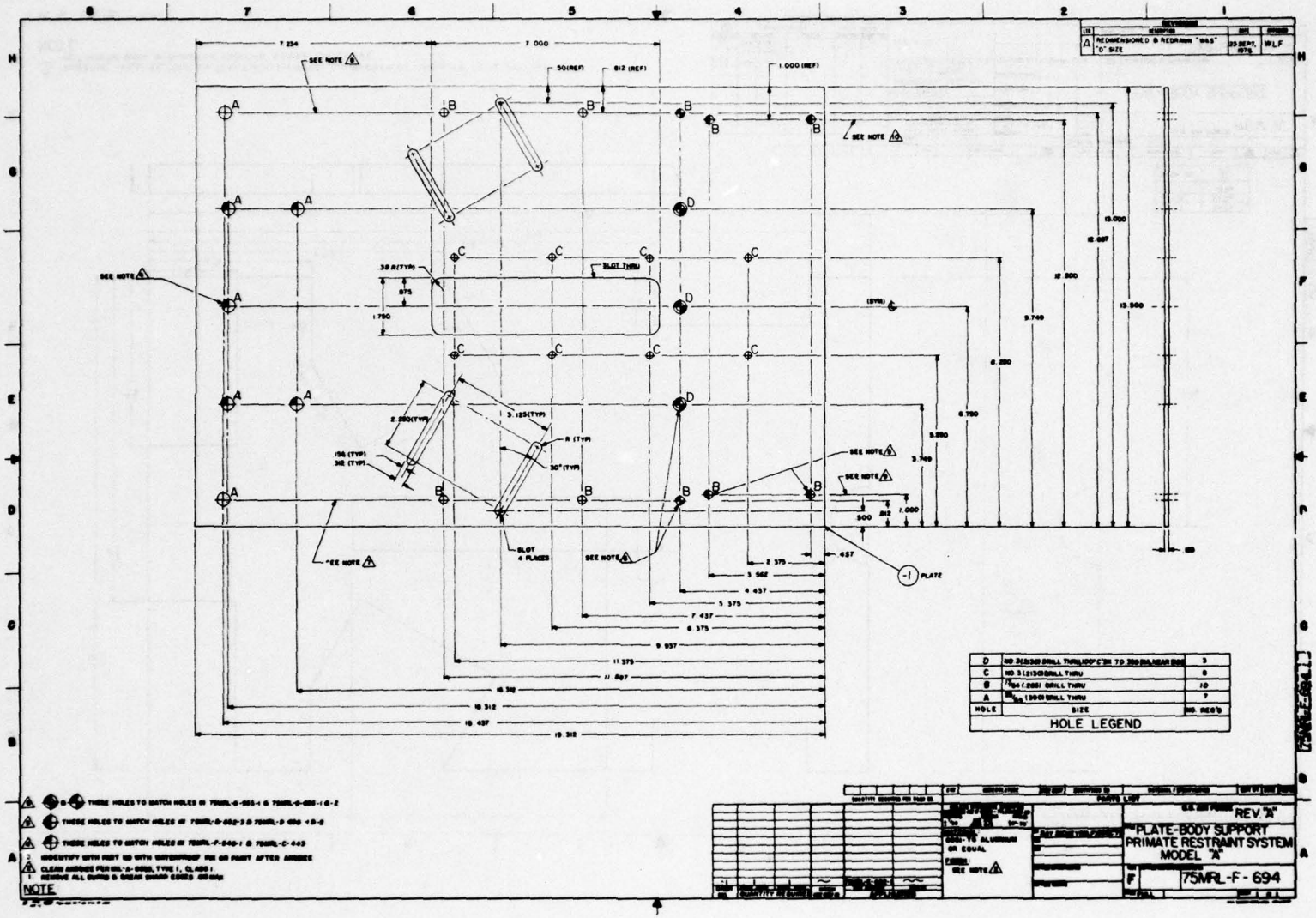
4 THESE HOLES TO MATCH HOLES IN 75MRL-B-551-(PART OF WELDMENT-75MRL-C-550)
3 IDENTIFY WITH PART NUMBER WITH WATERPROOF INK OR PAINT AFTER ANODIZE
2 FINISH CLEAR ANODIZE PER MIL-A-8625 TYPE I, CLASS I
1 REMOVE ALL BURRS & BREAK SHARP EDGES .15 MAX
NOTE

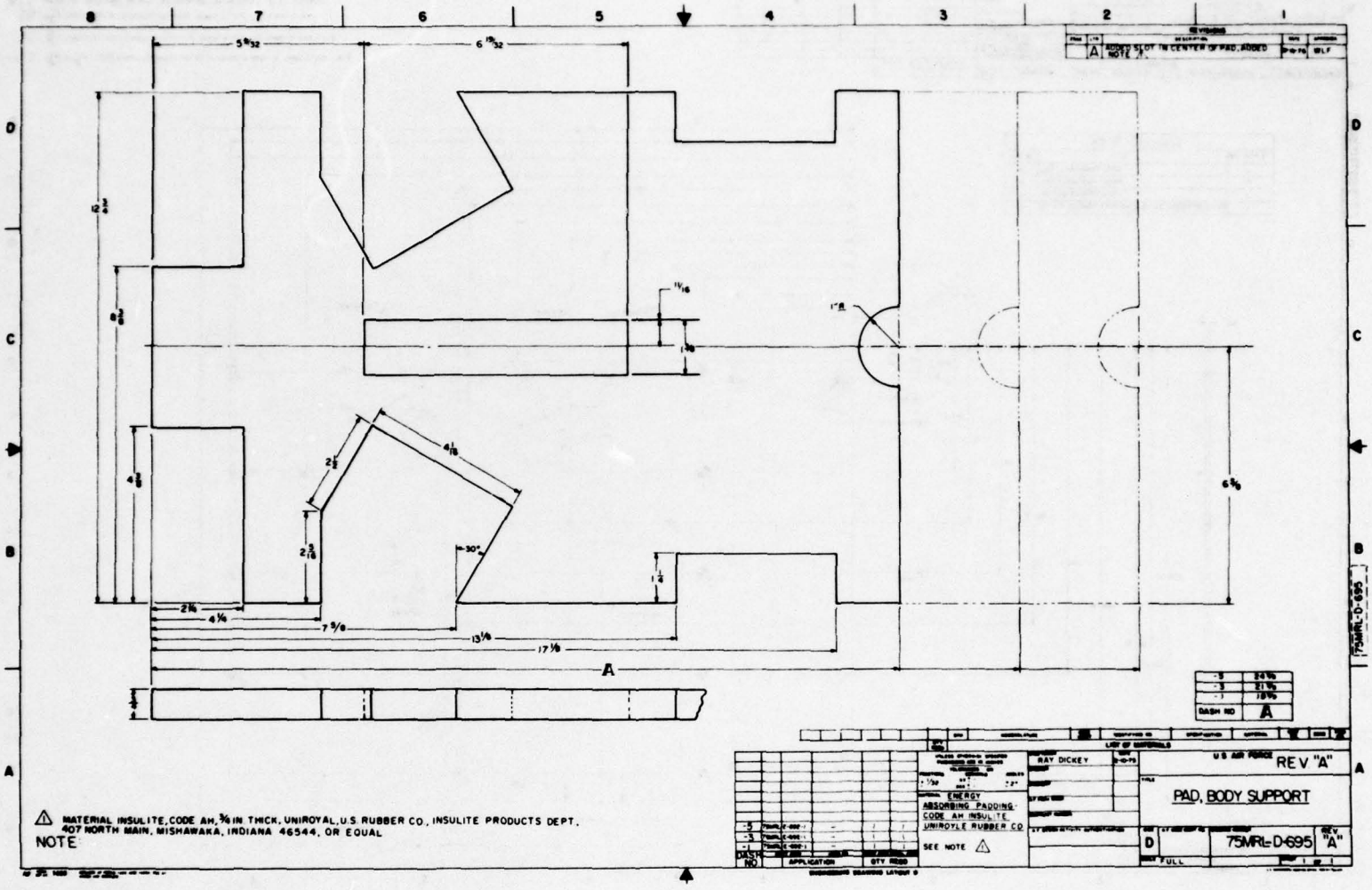
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	COMPLETELY REDRAWN & REDIMENSIONED	22 SEPT 76	WLF

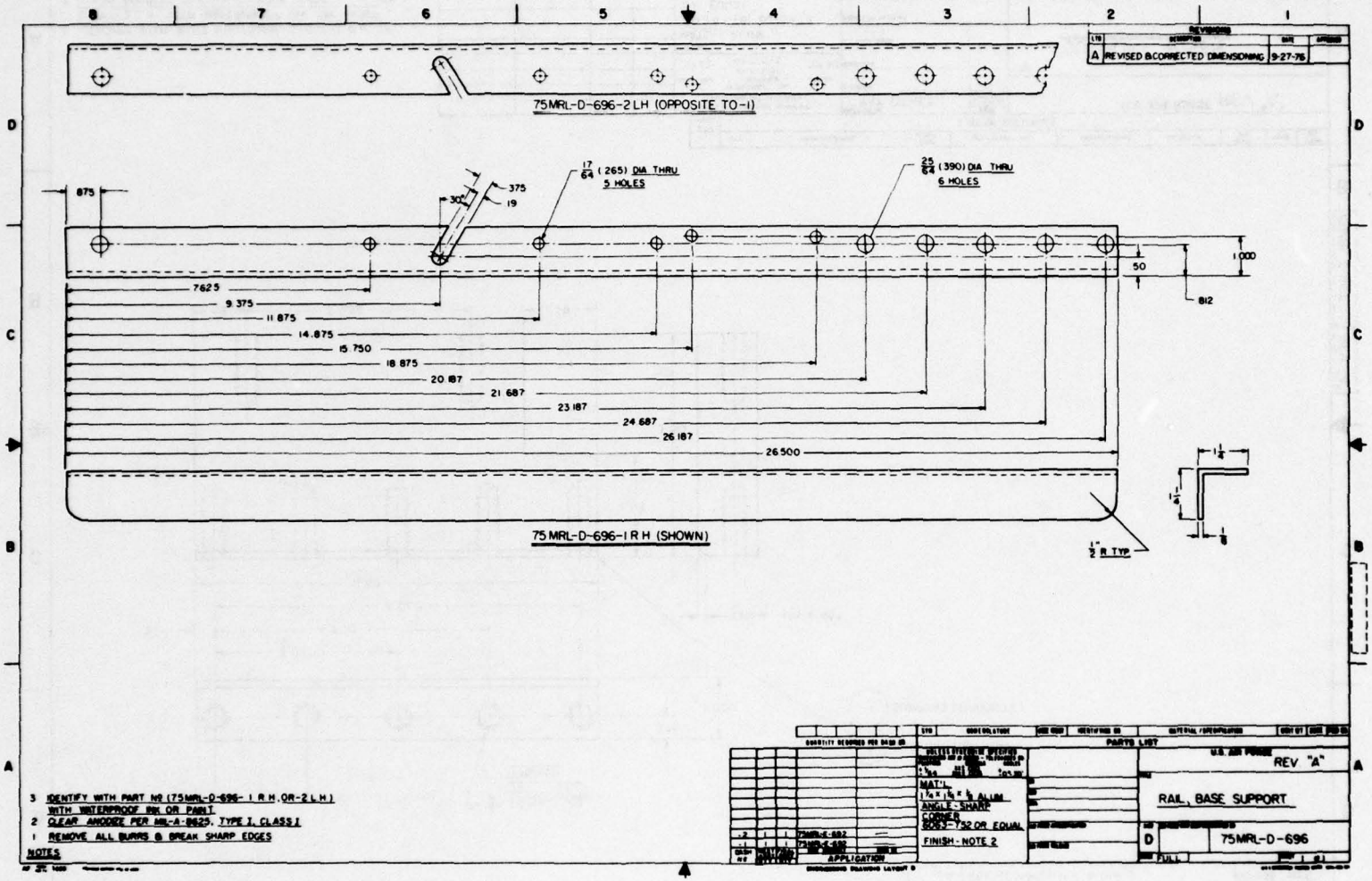
-2	1	1	-			-
-1	1	1	-			-

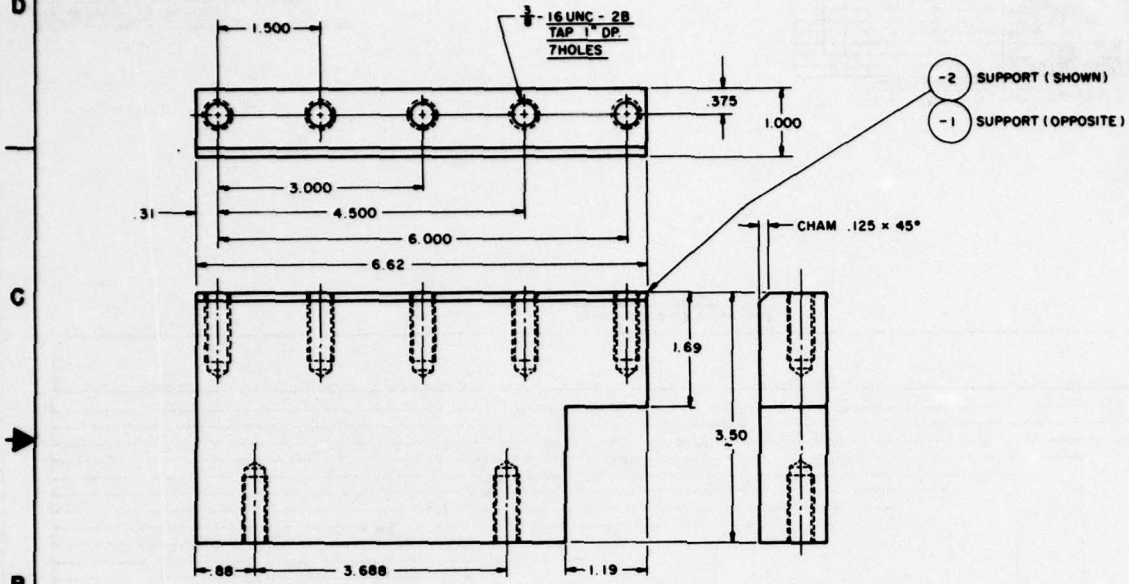
MATERIAL: 6061-T651 ALUMINUM OR EQUAL
FINISH: SEE NOTE 2

U.S. AIR FORCE
REV "A"
PLATE-BASE SUPPORT, PRIMATE RESTRAINT SYSTEM
0 75MRL-D-693


SEE NOTE
SLOT THRU
SLOT 4 PLACES
PLATE
HOLE LEGEND
NOTE
PLATE-BODY SUPPORT PRIMATE RESTRAINT SYSTEM MODEL "A"
75MRL-F-694
REV. "A"


8 7 6 5 4 3 2 1
D C B A
5 9/32
6 19/32
12 3/4
8 3/4
4 3/8
2 1/8
4 1/8
2 3/16
30°
1 1/4
2 1/16
4 1/16
7 5/16
13 1/16
17 1/16
A
1 11/16
1 3/8
1" R
6 5/16
75MRL-D-695
-5 24 lbs
-3 21 lbs
-1 18 lbs
DASH NO A
MATERIAL INSULITE, CODE AH, 3/8 IN THICK, UNIROYAL, U.S. RUBBER CO., INSULITE PRODUCTS DEPT. 407 NORTH MAIN, MISHAWAKA, INDIANA 46544, OR EQUAL
NOTE
ENERGY ABSORBING PADDING CODE AH INSULITE UNIROYLE RUBBER CO
SEE NOTE
RAY DICKEY
9-10-75
U S AIR FORCE
REV "A"
PAD, BODY SUPPORT
D
75MRL-D-695
REV "A"
SIZE FULL


75MRL-D-696-2 LH (OPPOSITE TO-1)
17/64 (.265) DIA THRU 5 HOLES
25/64 (.390) DIA THRU 6 HOLES
.875
.375
.19
.30
1.000
.50
.812
7.625
9.375
11.875
14.875
15.750
18.875
20.187
21.687
23.187
24.687
26.187
26.500
75MRL-D-696-1 R H (SHOWN)
1/2 R TYP
1 1/4
1 1/2
1/8
REVISIONS
A REVISED & CORRECTED DIMENSIONING 9-27-76
PARTS LIST
MAT'L
1/4 x 1 1/2 x 1 ALUM
ANGLE - SHARP CORNER
SOSS-752 OR EQUAL
FINISH - NOTE 2
APPLICATION
REV "A"
RAIL, BASE SUPPORT
75MRL-D-696
D
SCALE FULL
3 IDENTIFY WITH PART NO (75MRL-D-696-1 R H, OR-2 L H) WITH WATERPROOF INK OR PAINT
2 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I
1 REMOVE ALL BURRS & BREAK SHARP EDGES
NOTES:



REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	REVISED PICTURE & DIM'S	9-29-76	WLF

QTY REQD	APPLICATION
1	75MRL-E-692 -2 LH
1	75MRL-E-692 -1 RH

LIST OF MATERIALS

NOTES:
1. REMOVE ALL BURRS & BREAK SHARP EDGES.
2. CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I.
3. IDENTIFY WITH PART NO. (75MRL-C-697-1 R.H. OR C-697-2 L.H.) WITH WATERPROOF INK OR PAINT.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON DECIMALS .XX ± .031 .XXX ± .015
FRACTIONS ± 1/32 ANGLES ± 30'

MATL. ALUM. 2024-T6, 2075-T6 OR EQUAL
FINISH NOTE 2

RAY DICKEY

U.S. AIR FORCE REV. "A"

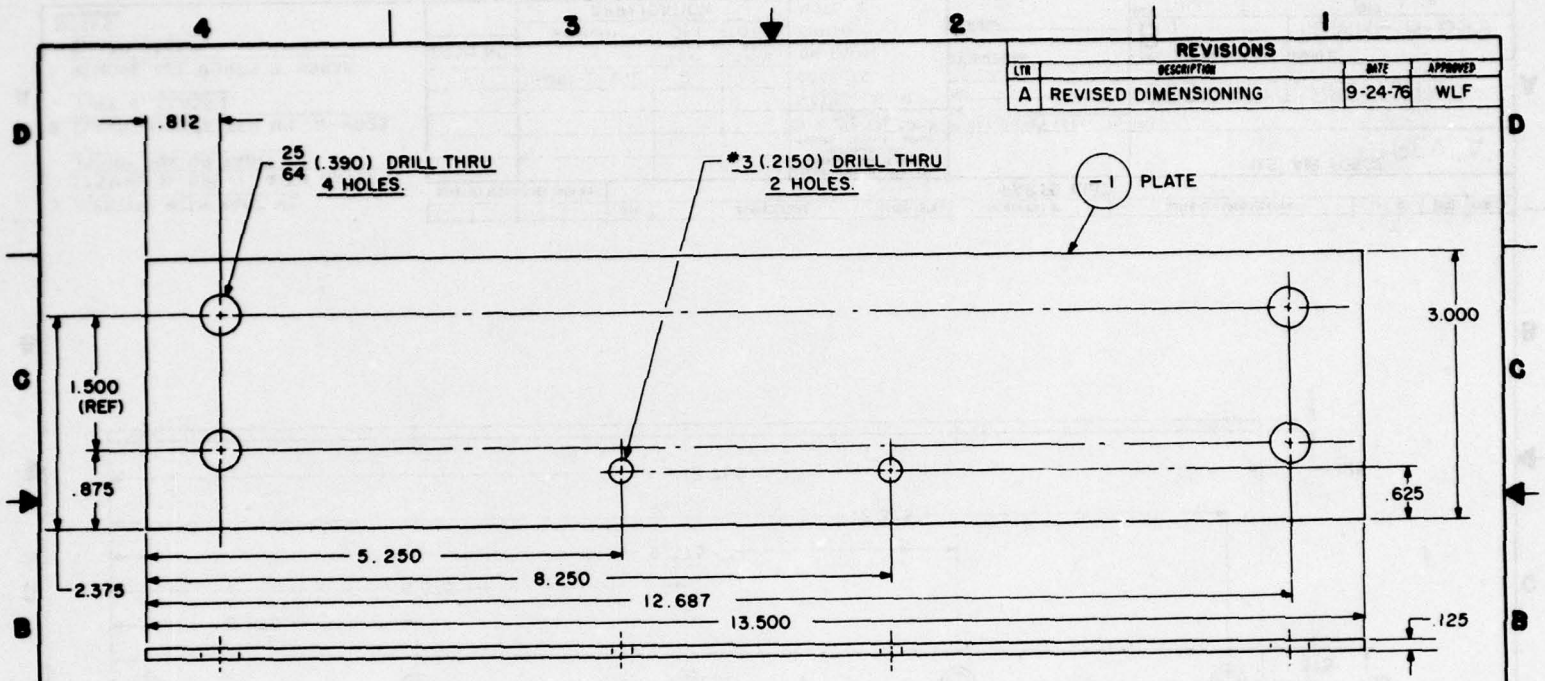
TITLE: SUPPORT RISER

SIZE C | DRAWING NUMBER 75MRL-C-697

SCALE FULL | SHEET 1 OF 1

ENGINEERING DRAWING LAYOUT C

75MRL-C-697 REV "A"



REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REVISED DIMENSIONING	9-24-76	WLF

3 IDENTIFY WITH PART NO. (75MRL-B-698-1) WITH WATER-PROOF INK OR PAINT.

2 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I

1 REMOVE ALL BURRS & BREAK SHARP EDGES

NOTES:

PARTS LIST

SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FIND NO
-1	75MRL-E-692			MAT'L. ALUM. 6061-T6 OR EQUAL			

DASH NO.	NEXT ASSEMBLY	QTY NEXT ASSY	QTY FINAL ASSY
-1	75MRL-E-692	2	2

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONS ±1/32 DECIMALS .XX ±.031 .XXX ±.015 ANGLES ±0°30'

FINISH. NOTE 2

DR RAY DICKEY 15 DEC 75

U.S. AIR FORCE REV. "A"

TITLE PLATE, EXTENSION

SIZE B

A.F. DRAWING NO. 75MRL-B-698

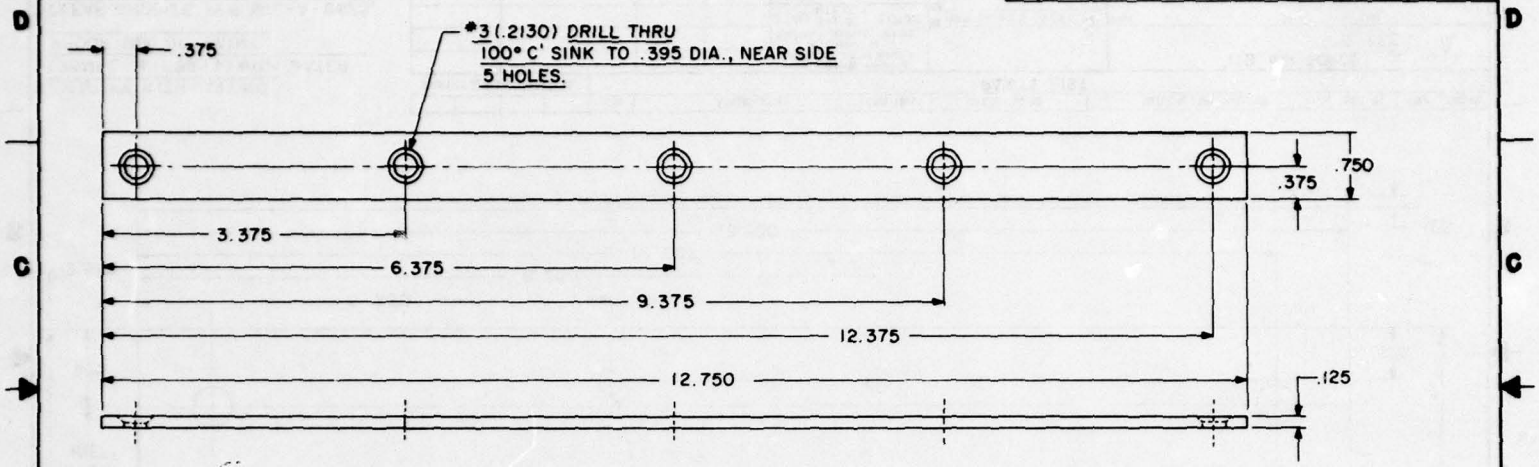
SCALE FULL

SHEET 1 of 1

AF FORM 1653 PREVIOUS EDITION WILL BE USED.

ENGINEERING DRAWING LAYOUT B

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REVISED DIMENSIONING	9-23-76	WLF



3 IDENTIFY WITH PART Nº (75MRL-B-699-1) WITH WATER-PROOF INK OR PAINT

2 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I

1 REMOVE ALL BURRS & BREAK SHARP EDGES

NOTES:

PARTS LIST

QUANTITY REQUIRED PER DASH NO.	SYM	NOMENCLATURE	CODE IDENT	IDENTIFYING NO	MATERIAL / SPECIFICATION	UNIT WT	ZONE	FSCM NO
- 1		75MRL-E-692						

DASH NO	NEXT ASSEMBLY	NEXT ASSY QTY	FINAL ASSY QTY
		2	2

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/32 DECIMALS .XX± .03 .XXX± .015 ANGLES ±0°-30'

MAT'L. ALUM 6061-T6 OR EQUAL
FINISH
NOTE-2

RAY DICKEY 15 DEC 75

U.S. AIR FORCE REV. "A"

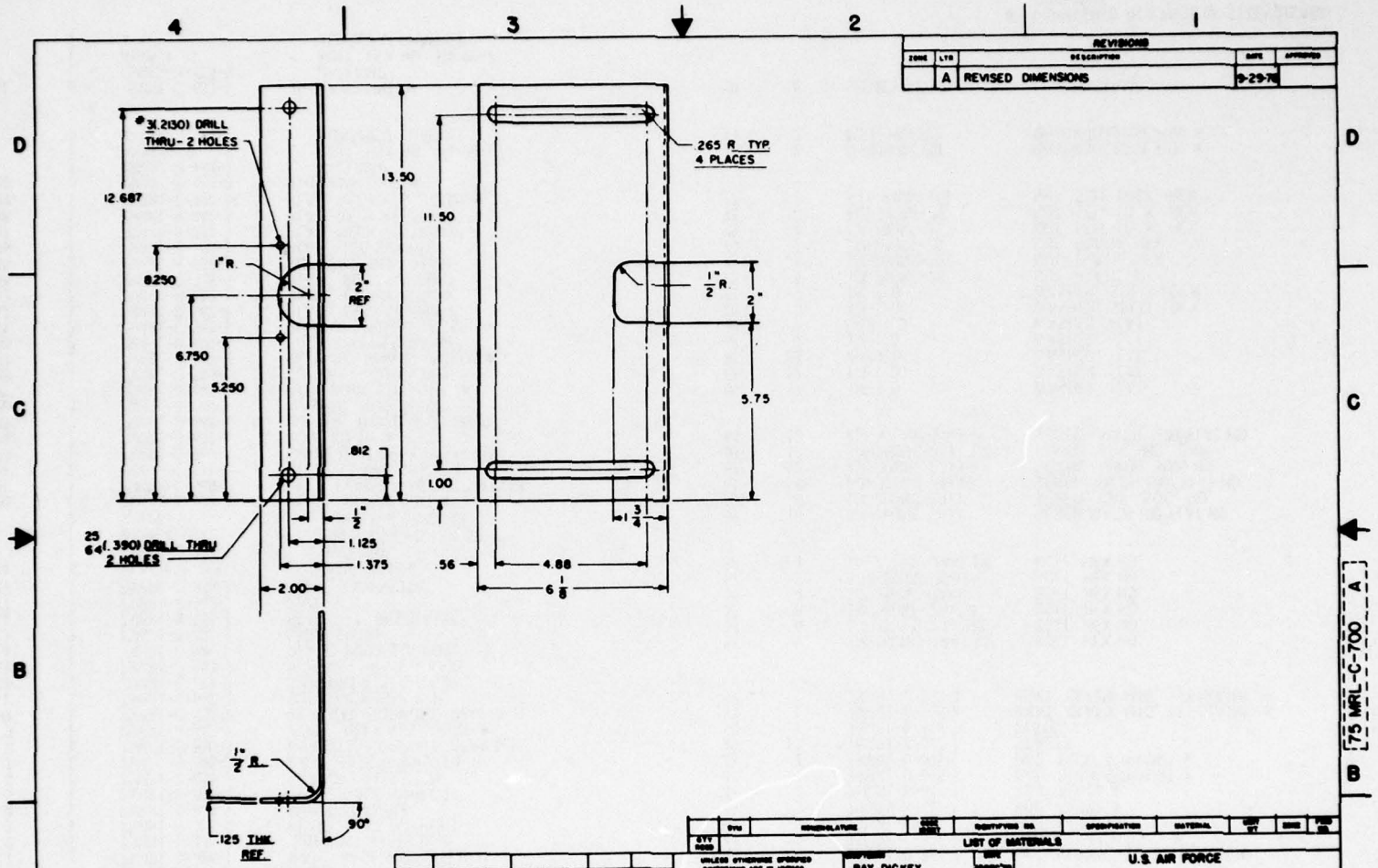
TITLE: BODY BELT, RESTRAINT

SIZE B | A.F. CODE IDENT NO. | DRAWING NO. 75MRL-B-699

SCALE FULL | SHEET 1 OF 1

AF 1653

ENGINEERING DRAWING LAYOUT B


4
3
2
1
D
C
B
A
REVISIONS
ZONE | LTR | DESCRIPTION | DATE | APPROVED
A | REVISED DIMENSIONS | 9-29-76
#31 (.2130) DRILL THRU - 2 HOLES
12.687
8.250
6.750
5.250
1" R.
2" REF
13.50
11.50
.265 R TYP 4 PLACES
1/2" R.
2"
5.75
.812
1.00
25/64 (.3906) DRILL THRU 2 HOLES
1/2"
1.125
1.375
2.00
.56
4.88
6 1/8
1 3/4
1/2" R.
.125 THK REF.
90°
3 IDENTIFY WITH PART Nº (75MRL-C-700-1) WITH WATERPROOF INK OR PAINT.
2 CLEAR ANODIZE PER MIL-A-8625, TYPE I, CLASS I.
1 REMOVE ALL BURRS & BREAK SHARP EDGES
LIST OF MATERIALS
QTY REQD | NOMENCLATURE | DRAWING SIZE/NUMBER | IDENTIFYING NO. | SPECIFICATION | MATERIAL | UNIT WT. | SCRAP | ITEM NO.
DASH Nº | APPLICATION | QTY REQD
-1 | 75MRL-C-002 | 1
ALUM 6061-T6 OR EQUAL
.125 THK
FINISH:
NOTES 2
RAY DICKEY
U.S. AIR FORCE
PLATE, LEG SUPPORT
SIZE C
75 MRL-C-700
HALF
SHEET 1 OF 1
75 MRL-C-700 A
ENGINEERING DRAWING LAYOUT C

INDEX NO.	QTY.	PART NO.	DESCRIPTION
		75MRL-E-692-1	ASSEMBLY
1	1	75MRL-D-696-1	. RAIL, BASE SUPPORT R.H.
2	1	75MRL-B-444-1	. SUPPORT RISER R.H.
3	1	75MRL-D-693-1	. PLATE, BASE SUPPORT
4	1	75MRL-B-443-3	. SUPPORT ANGLE
5	1	75MRL-D-693-2	. PLATE, BASE SUPPORT
6	1	75MRL-B-444-2	. SUPPORT RISER L.H.
7	1	75MRL-D-696-2	. RAIL, BASE SUPPORT L.H.
8	1	75MRL-C-550-3	. BRACKET, SUPPORT, REAR L.H.
9	1	75MRL-B-442-1	. PLATE, NECK RESTRAINT *
10	1	75MRL-C-550-1	. BRACKET, SUPPORT, REAR R.H.
11	1	75MRL-C-697-1	. SUPPORT RISER R.H.
12	1	75MRL-C-697-2	. SUPPORT RISER L.H
13	1	75MRL-D-553-1	. SUPPORT, RAIL & BASE
14	1	75MRL-F-694-1	. PLATE, BODY SUPPORT
15	2	75MRL-B-441-1	. STOP, GUIDE
16	2	75MRL-B-555-1	. SEAT BELT, RESTRAINT
17	1	75MRL-B-562-3	. PAD, SEAT
18	2	75MRL-B-698-1	. PLATE, EXTENSION
19	6	75 MRL-C-653-1	. U-CLAMP UNIT *
	1	75MRL-B-654-1	. . U-CLAMP
	1	AN65-4-10	. . BOLT, HEX HD. 1/4-20-1"
	2	X-129	. . RUBBER U CHANNEL
20	4	75MRL-B-652-3	. PLATE, CLAMP MTG *
21	1	75MRL-C-568-1	. BKT., CLAMP MTG RESTRAINT *
22	2	75MRL-C-571-1	. STRAP CLAMP ASSY. *
23	1	75MRL-D-660-1	. GUIDE UNIT NECK RESTRAINT
24	2	75MRL-B-647-1	. ROD, GUIDE *
25	2	75MRL-B-648-1	. HOLDER, THDED, ROD GUIDE
26	2	75MRL-B-649-1	. WASHER, ROD GUIDE
27	1	75MRL-D-695-1	. PAD, BODY SUPPORT *
28	1	75MRL-D-545-1	. SUPPORT, GUIDE ADJ
29	1	75MRL-C-563-2	. BELT, RESTRAINT, ACCEL. *
30	2	75MRL-B-699-1	. BODY BELT RESTRAINT
31	2	75MRL-C-563-1	. BELT, RESTRAINT, ACCEL. *
32	1	75MRL-D-547-3	. PLATE, SEAT SUPPORT
33	2	75MRL-B-652-1	. PLATE, CLAMP MTG *
34	1	75MRL-C-548-3	. PLATE, FOOT SUPPORT
35	2	75MRL-B-554-1	. SUPPORT, SEAT PLATE
36	1	75MRL-C-700-1	. PLATE, LEG SUPPORT
37	1	75MRL-B-442-3	. PLATE-NECK RESTRAINT *
38	1	75MRL-B-442-5	. PLATE-NECK RESTRAINT *
39	1	75MRL-B-442-17	. PLATE-NECK RESTRAINT *
40	6	75MRL-C-653-3	. U-CLAMP UNIT *
	1	75MRL-B-654-3	. . U-CLAMP
	1	AN65-4-10	. . BOLT, HEX HD. 1/4-20-1"
	2	X-129	. . RUBBER U CHANNEL
41	6	75MRL-C-653-5	. U-CLAMP UNIT *
	1	75MRL-B-654-5	. . U-CLAMP
	1	AN65-4-10	. . BOLT, HEX HD. 1/4-20-1"
	2	X-129	. . RUBBER U CHANNEL
42	1	75MRL-C-568-3	. BKT, CLAMP MTG RESTRAINT *
43	2	75MRL-C-571-3	. STRAP CLAMP ASSY *
44	2	75MRL-B-647-3	. ROD, GUIDE *
45	2	75MRL-B-647-5	. ROD, GUIDE *
46	2	75MRL-B-647-7	. ROD, GUIDE *
47	1	75MRL-D-695-3	. PAD, BODY SUPPORT *
48	1	75MRL-D-695-5	. PAD, BODY SUPPORT *
49	14	76MRL-B-357-1	. SPACER
50	1	76MRL-B-356-1	. PLATE
51	1	75MRL-C-568-2	. BRKT, CLAMP MTG, RESTRAINT *
52	1	75MRL-C-568-4	. BRKT, CLAMP MTG, RESTRAINT *
53	5	3/8-16UNC-2Ax1 1/2	BOLT, HEX HD.
54	6	1/4-20UNC-2Ax 1/2	BOLT, HEX HD.
55	6	1/4-28UNF-2Ax3/4	BOLT, HEX HD.
56	4	1/2-13UNC-2Ax1"	BOLT, HEX HD.
57	2	5/16-24UNF-2Ax1"	BOLT, HEX HD.
58	4	1/4-20UNC-2A-1 1/4	BOLT, HEX HD.
59	10	3/8-16UNC-2Ax1"	SCREW MACH 100°FLAT HD.
60	8	1/4-20UNC-2Ax1"	SCREW, CAP, SOC. HD.
61	8	#10-32UNF-2Ax3/8	SCREW, MACH 100° FLAT HD.
62	12	#10-32UNF-2Ax3/8	SCREW, MACH. PAN HD.
63	12	3/8-16UNC-2Ax1 1/4"	SCREW, SOC. HD. CAP
64	10	#10-32UNC-2Ax5/8"	SCREW, MACH, 100°FLAT HD.
65	17	3/8-I.D.	WASHER, FLAT
66	12	1/4-I.D.	WASHER, FLAT
67	28	#10-I.D.	WASHER, FLAT
68	4	1/2-I.D.	WASHER, FLAT
69	2	5/16-I.D.	WASHER, FLAT
70	5	3/8-I.D.	WASHER, SPLIT-LOCK
71	2	1/4-I.D.	WASHER, SPLIT-LOCK
72	5	3/8-16UNC-2B	NUT, PLAIN, HEX
73	8	1/4-20UNC-2B	NUT, PLAIN, HEX
74	2	1/2-20UNF-2B	NUT, PLAIN, HEX
75	4	1/4-28UNF-2B	NUT, SELF-LOCK, HEX
76	10	#10-32UNF-2B	NUT, SELF-LOCK, HEX
77	2	5/16-24UNF-2B	NUT, SELF-LOCK, HEX
78	2	MS17990C330	QUICK RELEASE PIN *
79	2	MS17990C323	QUICK RELEASE PIN *
80	6	SERIES 215-U	TOGGLE CLAMP

* FURNISHED IN RANGE OF SIZES, USAGE OPTIONAL

REFERENCES

1. Eisen, L. and R.S. Zeigen, "A Supine Seat for High-Stress Testing of Primates," WADC-TR-59-165, April 1959.

2. Dost, F.N., D.E. Johnson, and C.H. Wang, "A Restraint System for Squirrel Monkeys," AMRL-TR-71-126, May 1972.

3. Kazarian, L.E., and H.E. von Gierke, "Bone Loss as a Result of Immobilization and Chelation. Preliminary Results in Macaca mulatta," AMRL-TR-68-69, 1969.

4. Clark, K.A. and A.E. New, "Anthropometric Determinations of American Born Macaca mulatta," Naval Aerospace Medical Institute, Naval Aerospace Medical Center, Pensacola, Florida, NAMI-1078, July 1969.

5. Sostre, S., J.A. Kennealy, J. Kirkland, C.M. Oloff, A.A. Karl, and M.A. Franey, "Cerebral Blood Flow in Baboons Under Positive Acceleration," 1977 Annual Scientific Meeting, Las Vegas Hilton, Las Vegas, Nevada, May 9-12 1977.

6. Yoder, J.E., A.A. Karl, C.M. Oloff and K.J. Greenlees, "A Comparison of Invasive Techniques for Assessment of Cardiac Output Under Acceleration Stress," 1978 Annual Scientific Meeting, New Orleans Hilton, New Orleans, LA., May 8-11 1978.

7. Karl, A.A., A.T. Kissen, C.M. Oloff and S.L. Ward, "Validation of Suscutaneous Tissue PO_2 Determination as Indirect Assessments of Cerebral Tissue PO_2 in Rhesus," Federation Proceedings, 62nd Annual Meeting, Atlantic City, New Jersey, April 9-14 1978.

*U.S.Government Printing Office: 1979 — 657-002/328