

DELAMINATION DETECTOR
CONSTRUCTION DATA

Study No. 2-8-68-130

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CONSTRUCTION DATA

This data comprises bills of materials, photographs and drawings describing the Delamination Detector developed in Research Study Number 2-18-68-130 by the Texas Transportation Institute, Texas A&M University in cooperation with the Texas Highway Department. This study was sponsored jointly by the Texas Highway Department and the Department of Transportation, Federal Highway Administration.

The information is presented in eight sections, each related to a separate portion of the apparatus. The drawings comprise assembly and detail-part shop sketches which will aid technicians experienced in the construction of mechanical and electronic instruments to duplicate the Delamination Detector. The materials indicated on the individual drawings are summarized and specified in the bills of materials to facilitate procurement.

The Delamination Detector is covered by a pending United States patent application. By virtue of the Cooperative Research Agreement between Texas A&M University and the Texas Highway Department the following are granted an irrevocable, non-exclusive, non-transferable and royalty free license:

Texas A&M University
All State Highway Departments
U. S. Government

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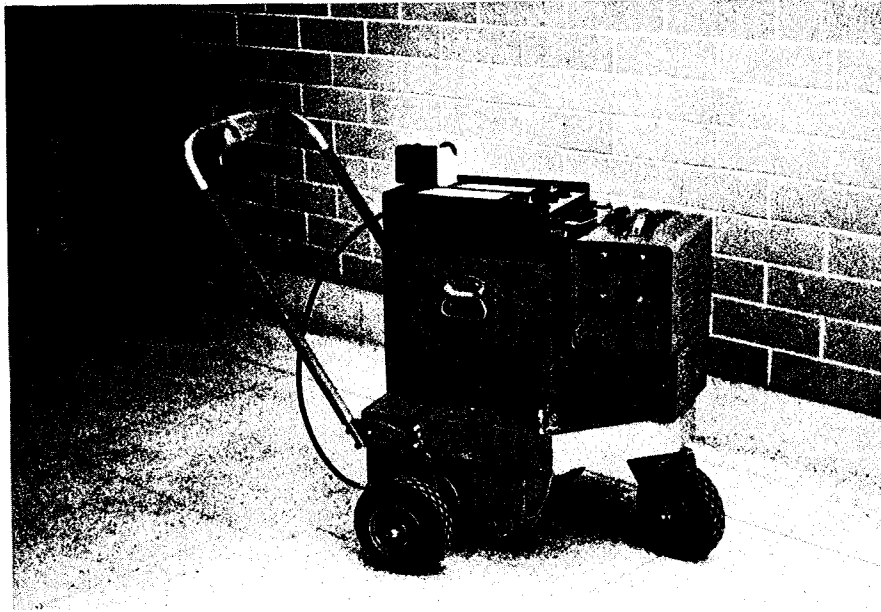


FIGURE 1

Delamination Detector

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Delamination Detector
Bills of Materials
and Drawings

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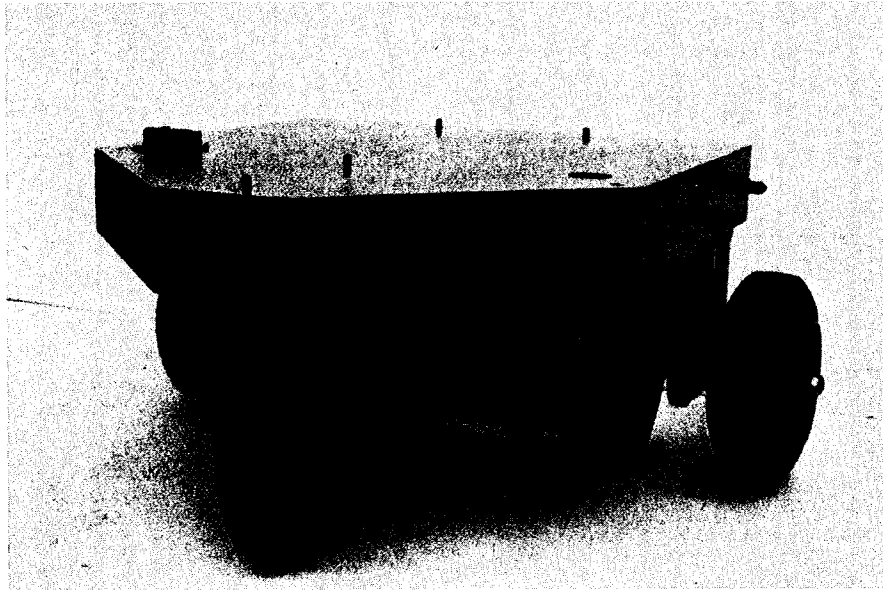


FIGURE 2

Delamination Detector

Cart Assembly

Front View

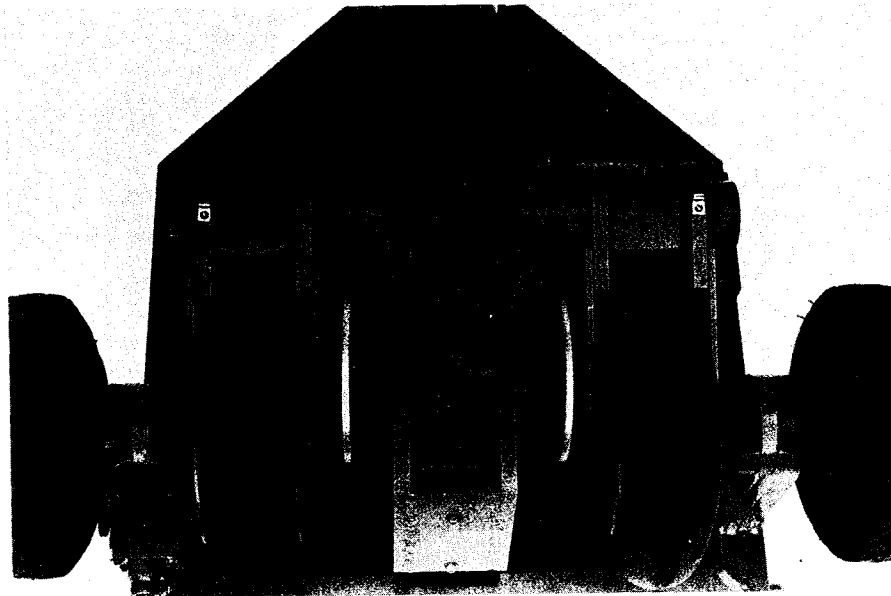


FIGURE 3

Delamination Detector

Cart Assembly

Bottom View

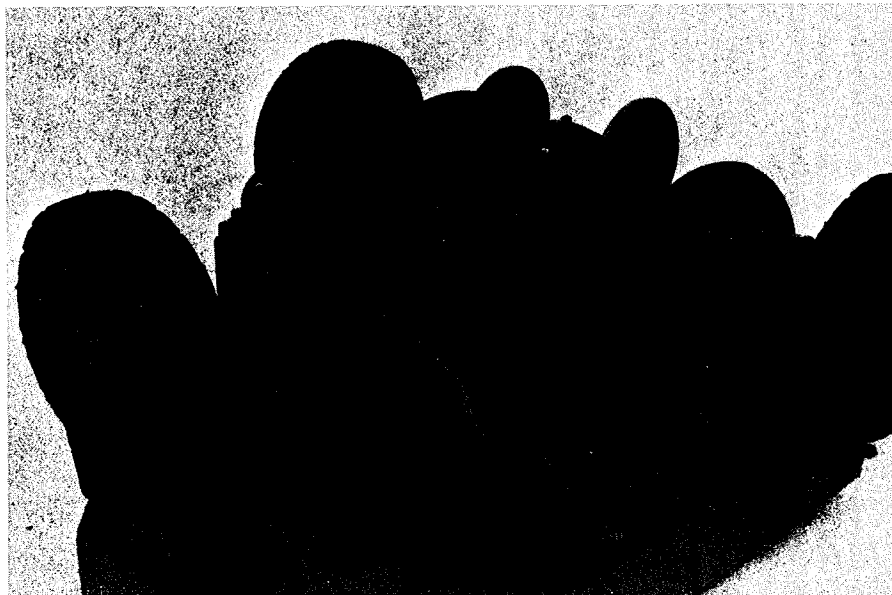


FIGURE 4
Cart Assembly
Details

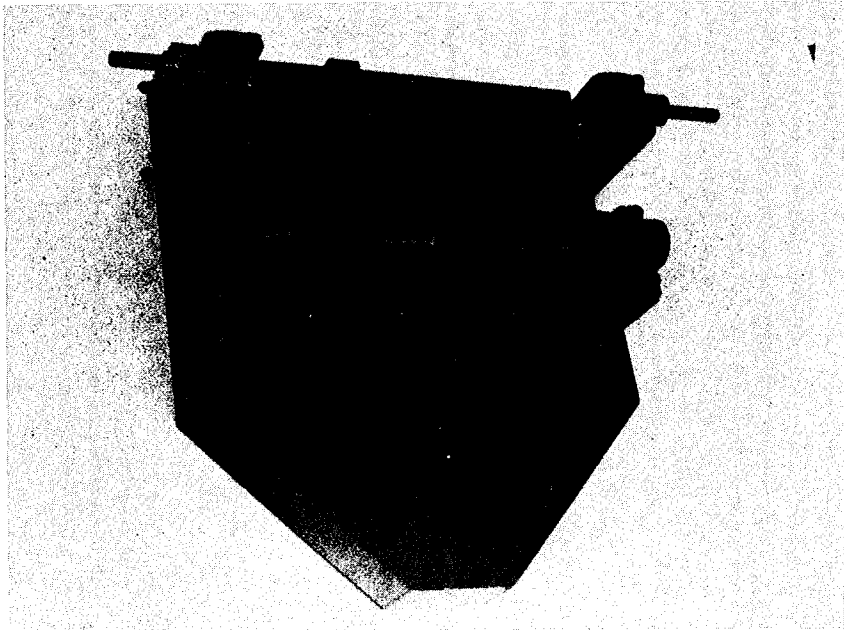


FIGURE 5

Cart Frame

Bottom View

SECTION I - A

SUB ASSEMBLY: FRAME

Purchased Items

<u>QUANTITY</u>	<u>DESIGNATION</u>	<u>WHERE USED</u>
2	Pneumatic wheels, United Service Equipment Co. #8-00-151	
1	Swivel front wheel, United Service Equipment Co. #8-50-151-1	
2	BNC Connectors, Amphenol, Type 31-003	
1	Electrical Plug, Amphenol, Type 160-5	
2	Acorn Nuts, 5/8" N.C. Stainless Steel	
6	Pillow Blocks, Fafnir Type RBGU-5/8	
1	Shock Mount, Lord Type #HT1 15	
4	1/4-20 x 3/4", Flat Head Machine Screws	Front Wheel
4	1/4" Lock Washer	Front Wheel
4	1/4-20 Hex Nuts	Front Wheel
2	4 connection terminal blocks, Cinch type #4-541	Terminal Block
4	8-32 x 1/2" Round Head Machine Screws	Terminal Block
8	4-40 x 1/2" Round Head Machine Screws	BNC Protector Plate
8	4-40 Hex Nuts	BNC Protector Plate
8	#4 Lock Washer	BNC Protector Plate
5	1/4-20 x 1/2" Flat Head Allen Bolts	Top Plate
12	7/16 NC x 1 1/4" Hex Machine Bolts	Pillow blocks
12	7/16 Lock Washers	Pillow blocks
12	7/16 Flat Washers	Pillow blocks
2	3/8" Diameter screen door springs cut to length	
2	1/4-20 x 2" Hex Bolts	Spring holder to Shock Mounts
2	1/4-20 (1/4" x 20) Hex Nuts	Spring Holder to Shock Mounts
2	1/2-13 Hex Nuts	Handles studs

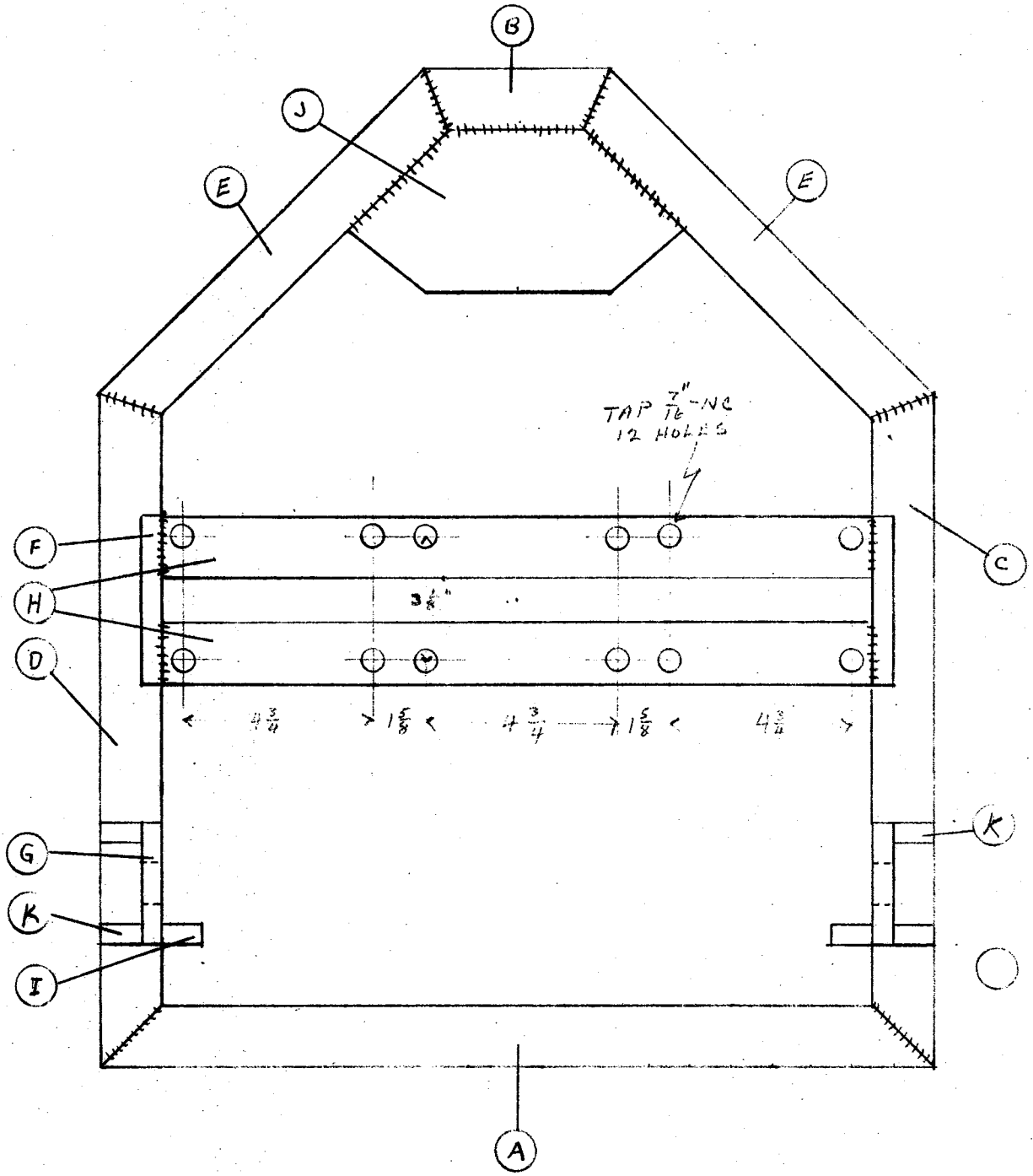
SUB ASSEMBLY: FRAME (continued)

-2-

2	1/4-20 Hex Nuts	Battery Box Post
2	1/4 flat washers	Battery Box Post
4	10-32 x 3/8" Flat Head Machine Screws	Wheel sprocket
3	8-32 x 1/2" Flat Head Machine Screws	Wheel sprocket
4	6-32 x 1/4" Round Head Machine Screw	Wire Hold downs
4	1/4" cable clamps, Waldom, Type #KC-203	
4	8-32 X 3/4" Round Head Machine Screws	Transmission Mount
1	Chain sprocket, PIC type #EM13-54	
4	10-32 x 3/4" Flat Head Machine Screw	Panel Bracket
1	Chain, PIC Type # EL-9, 13.275 in. long	
4	10-32 x 3/8" Round Head Machine Screws	Shock Mount
2	8-32 x 1/4" Round Head Machine Screws	Elec. outlet
1	Chain Connecting Link, PIC Model # EL-C	
	24" Coaxial cable, Rex type # 71124	
	15" Hook-up wire, 18 gage, Dearborn #171819	
1 box of		
100	Solder lugs, H. H. Smith, type # 920-1495	

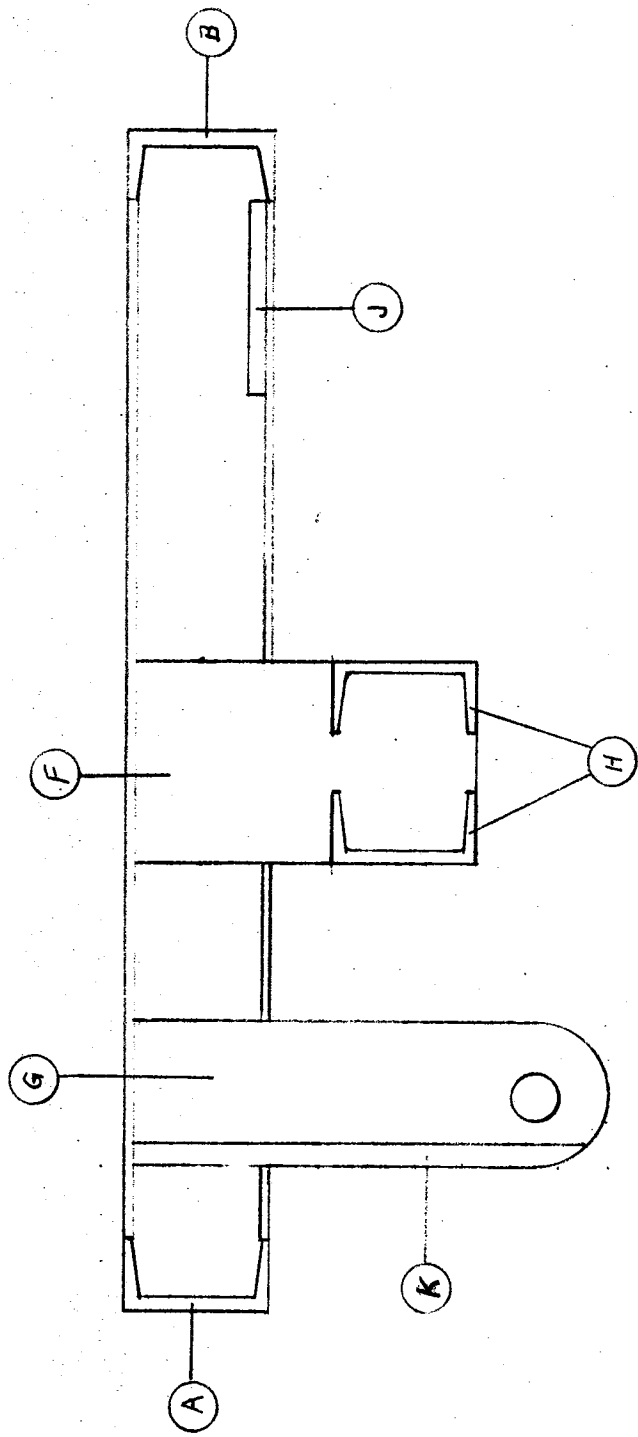
Materials

<u>AMOUNT</u>	<u>DESCRIPTION</u>	<u>WHERE USED</u>
24x30 inches	3/16" Aluminum Sheet	Top Plate
12 ft.	3" Aluminum Channel 1/4" Web	Frame
24x12 inches	1/2" Aluminum Plate	Frame
12x12 inches	1/4" Aluminum Plate	Frame & Sprocket Mount
26 inches	1 1/4" Diameter Steel Rod	Axles & Handle Stops
2 inches	3" Diameter Aluminum Rod	Sprocket Mount
2 inches	3/4" x 3/4" Aluminum Angle	BNC Protector
10 inches	5/8" Diameter Steel Rod	Paint Marker Hangers of Positioning Stud



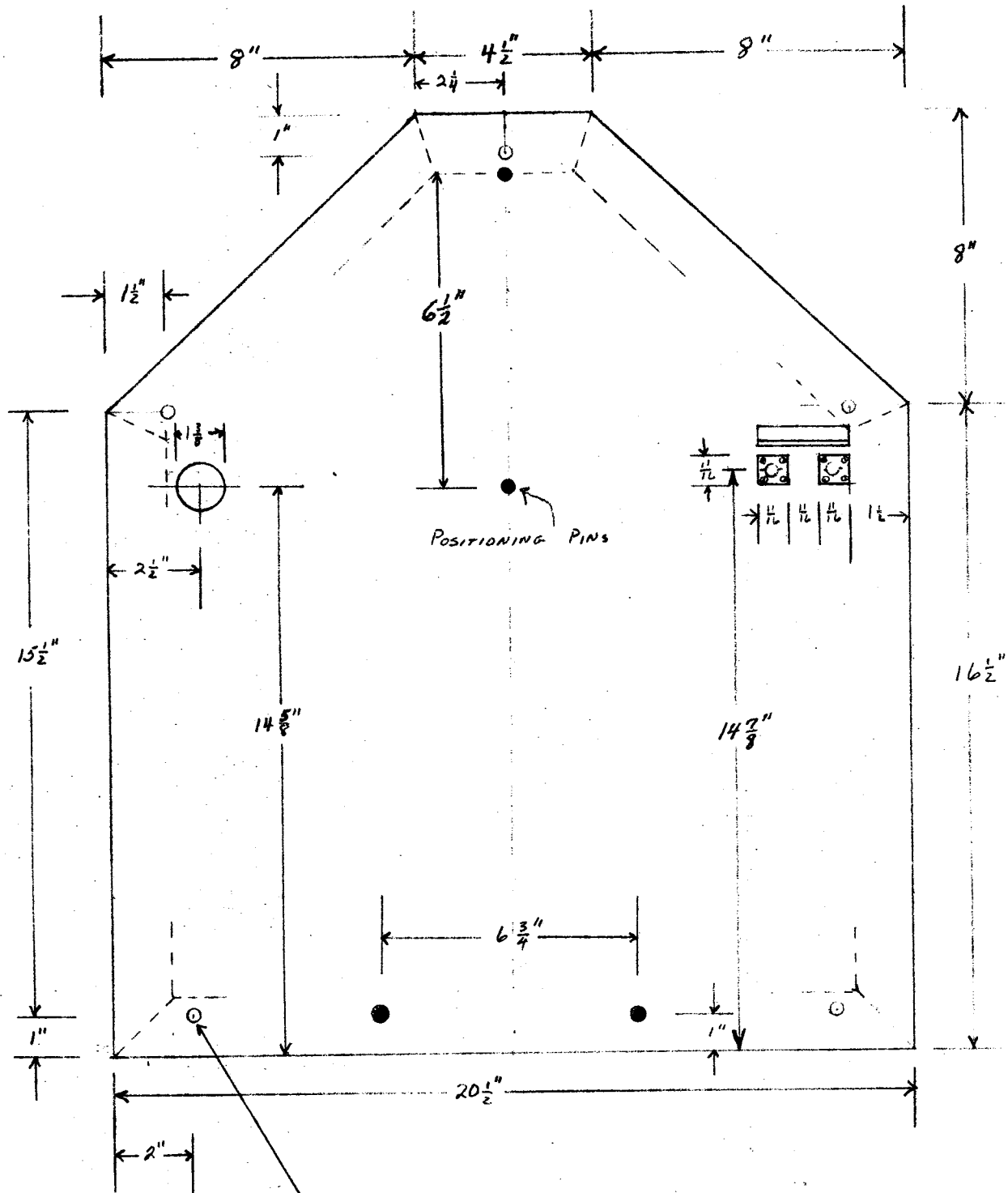
BOTTOM VIEW

FRAME ASSEMBLY



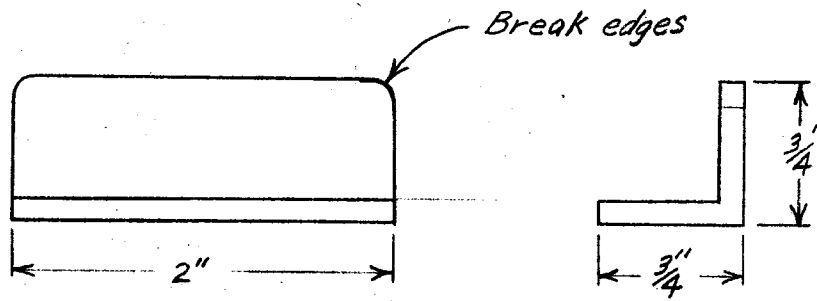
SIDE VIEW

FRAME ASSEMBLY

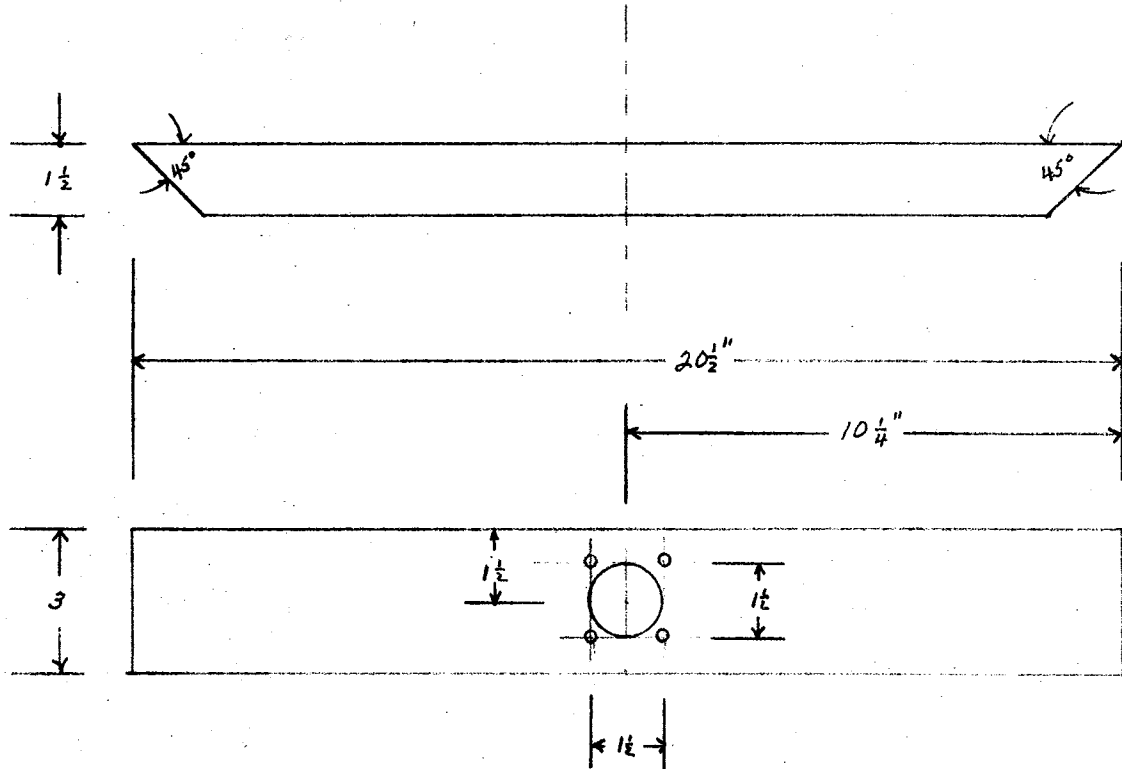


DRILL CLEARANCE
AND COUNTER SINK
FOR 1/4" FLAT HEAD
SCREWS.
(5" HOLES)

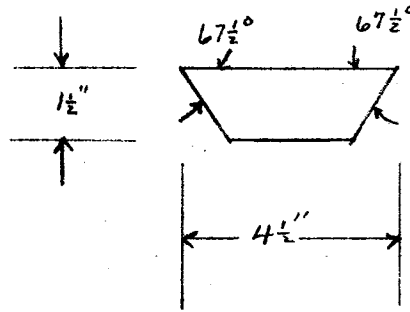
FRAME
TOP PLATE
1 REQ'D
3/16" ALUM



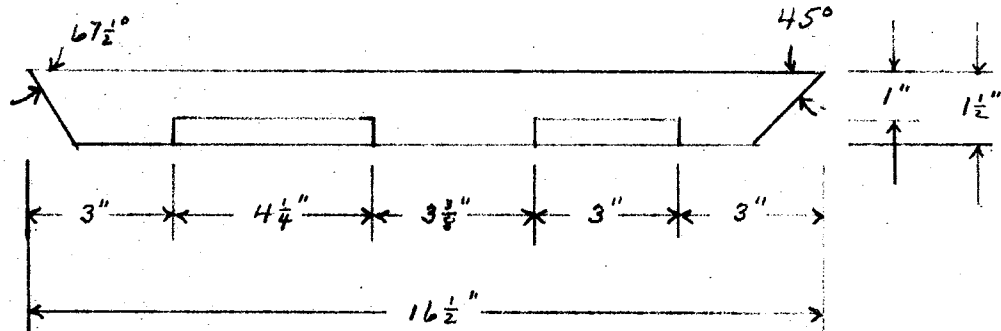
BNC PROTECTOR PLATE
1 REQ'D
 $\frac{3}{4}$ " x $\frac{3}{4}$ " ALUM ANGLE



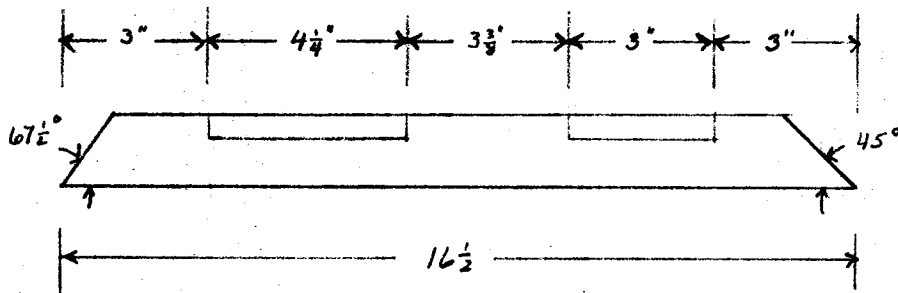
FRAME PART A
 1 REQ'D
 3" ALUMI. CHANNEL



FRAME
PART B
1 REQ'D
3" ALUM CHAN.

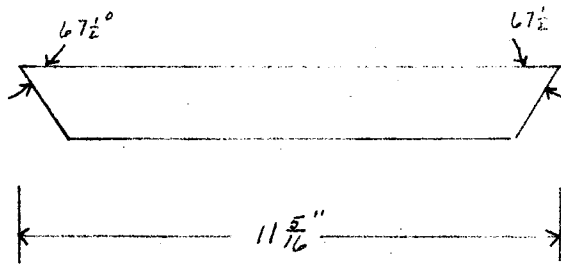


FRAME
PART C*
1 REQ'D
3" ALUM CHANNEL

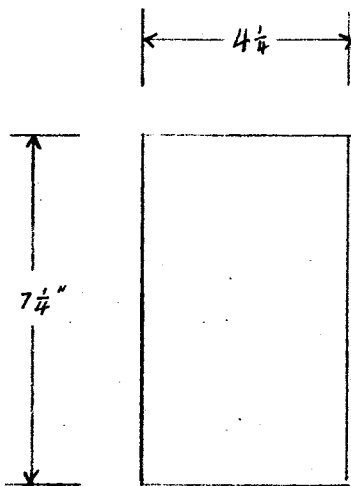


FRAME
PART D*
1 REQ'D
3" ALUM CHANNEL

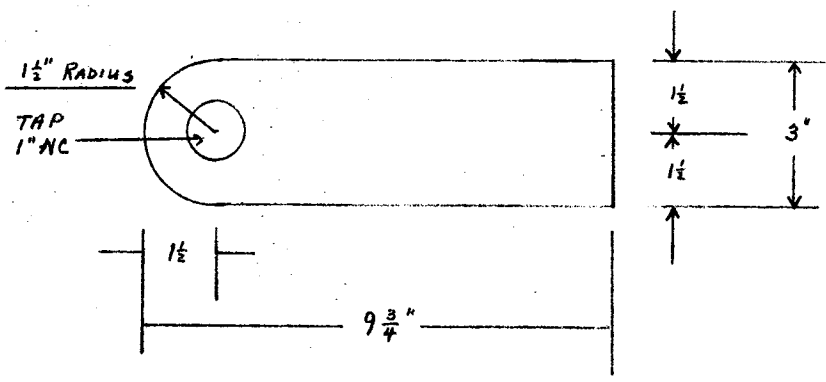
*NOTE: PARTS C & D
ARE INVERSE
OF EACH OTHER



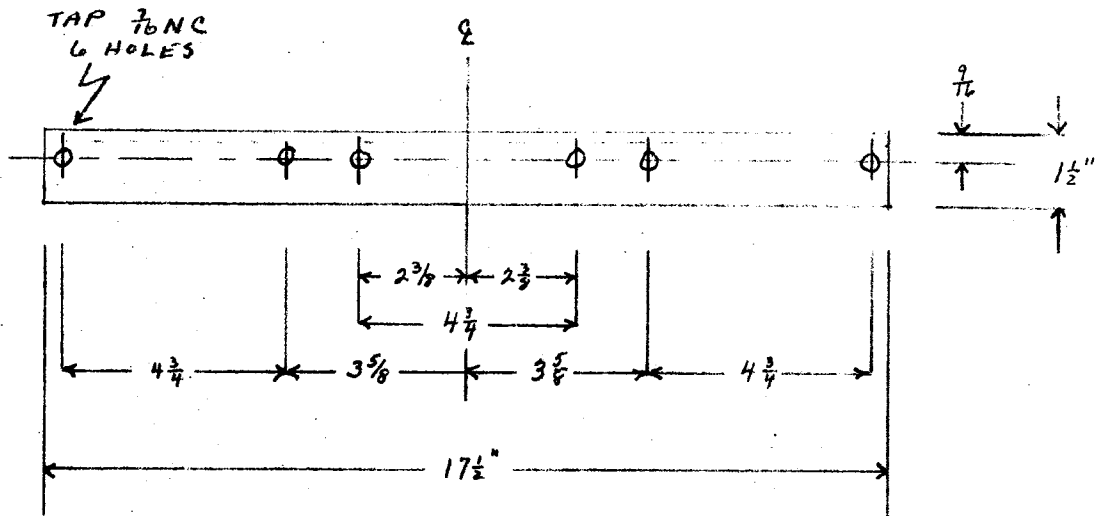
FRAME
PART E
2 REQ'D
3" CHANNEL



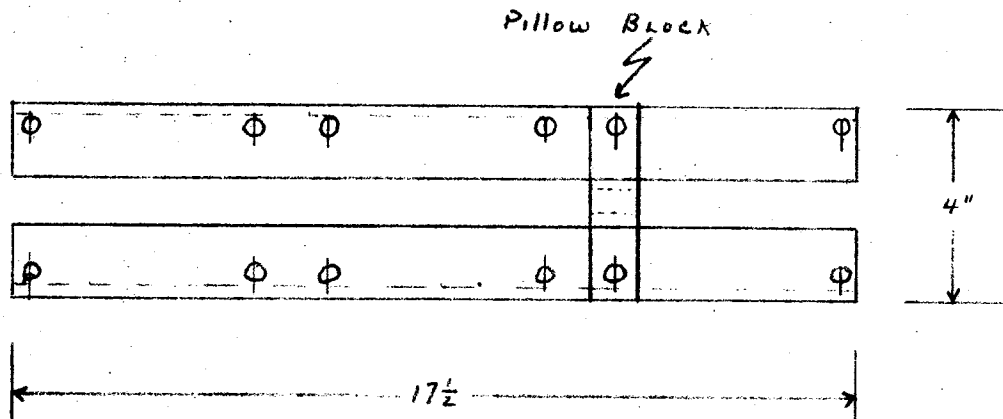
FRAME
PART F
2 REQ'D
1/2" ALUM



FRAME
PART G
2 REQ'D
1/2" ALUM

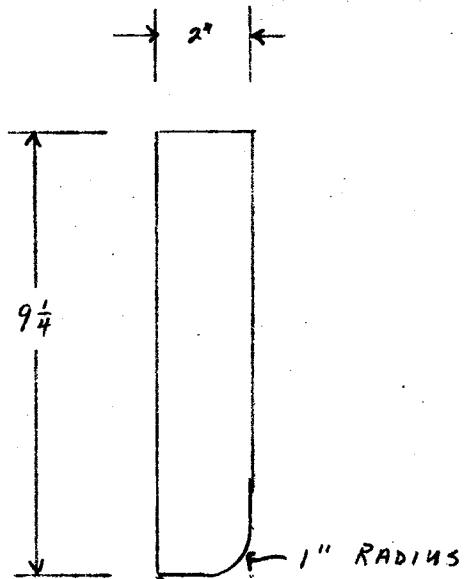


FRAME
PART H
2 REQ'D
3" CHANNEL

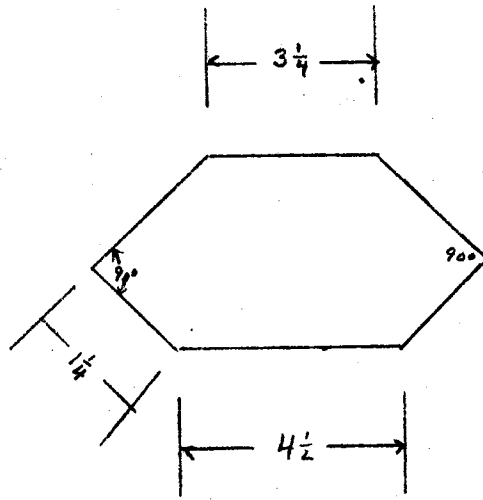


TWO PART H
PLACED IN
POSITION

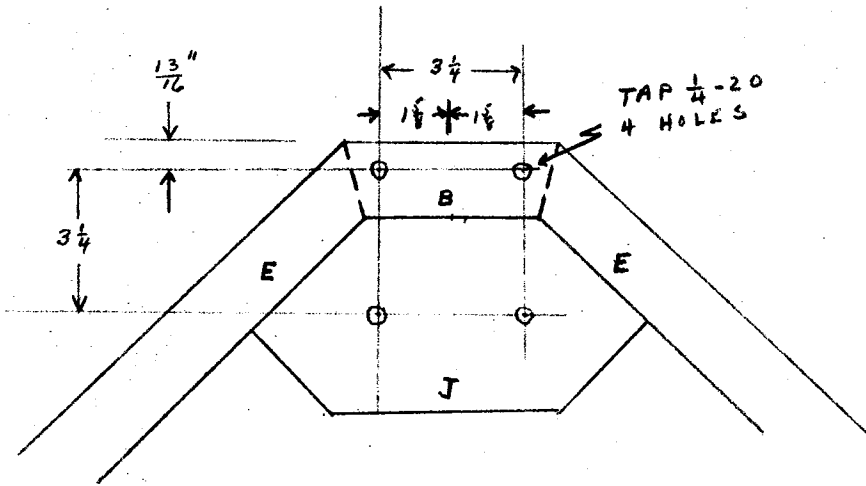
FRAME
PART H



FRAME
PART I
2 REQ'D
1/2 ALUM

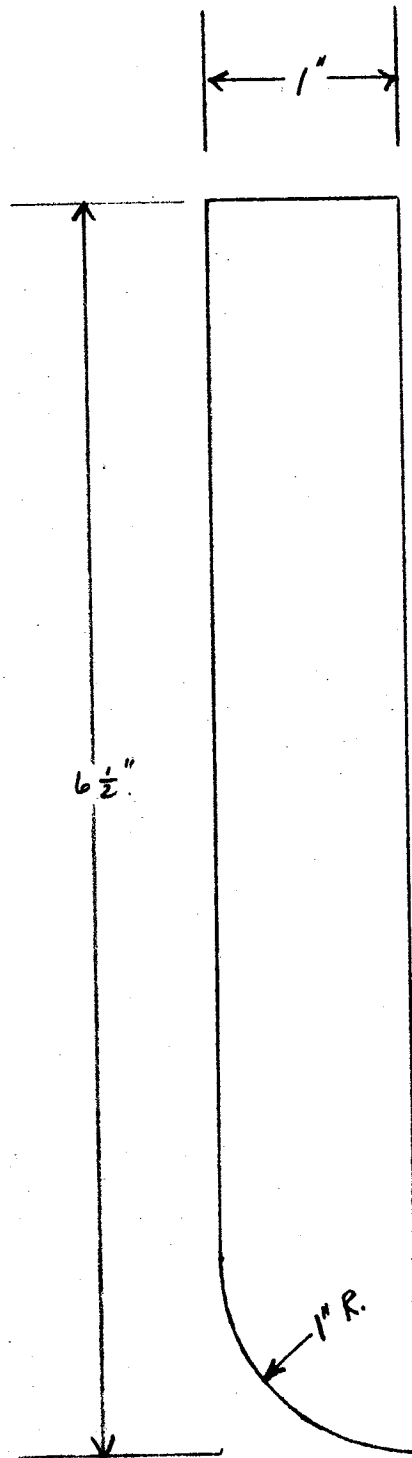


FRAME
PART J
1 REQ'D
 $\frac{1}{4}$ " ALUM

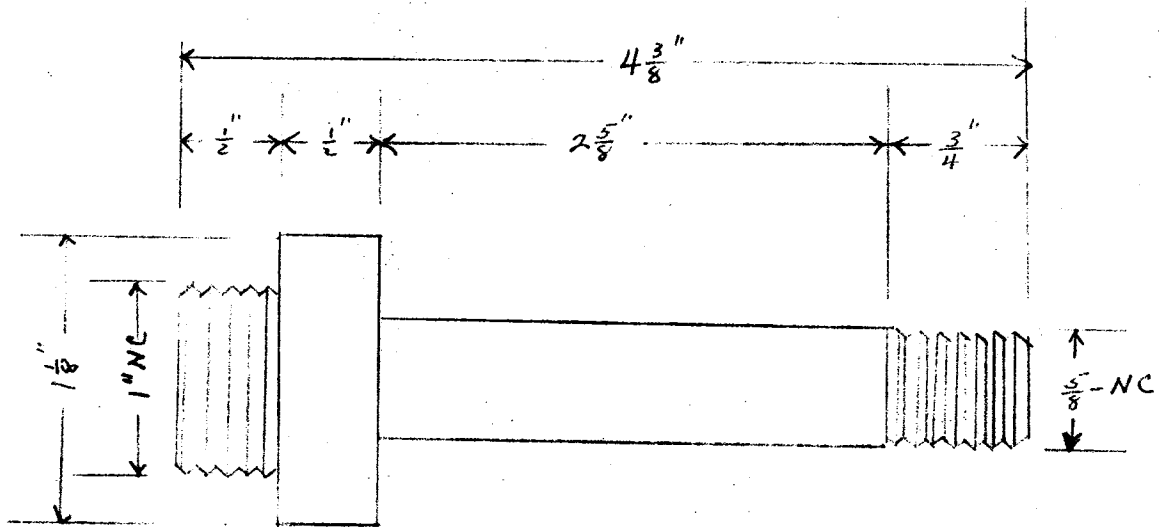


ASSEMBLED PARTS
SWIVEL WHEEL
HOLE LAYOUT

FRAME
PART J

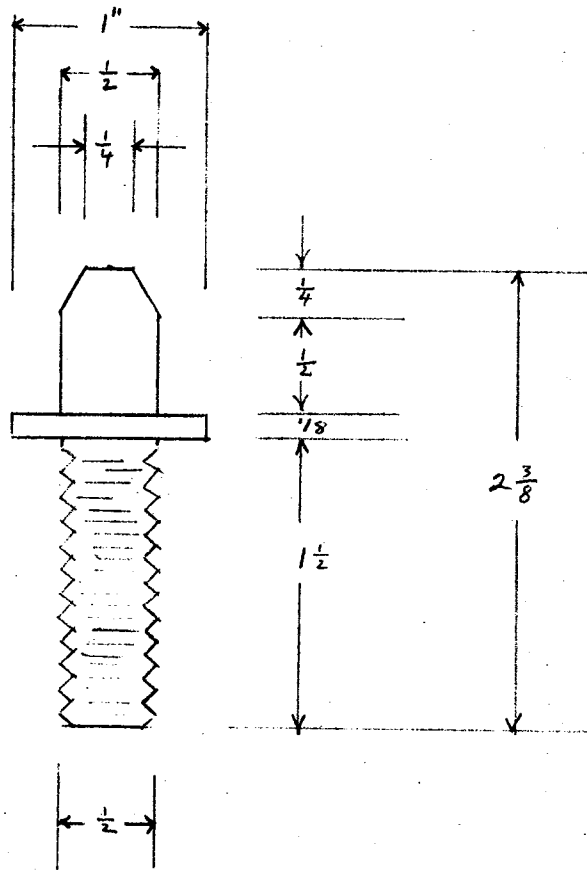


FRAME
PART 1K
4 REQ'D
1/2 ALUM.

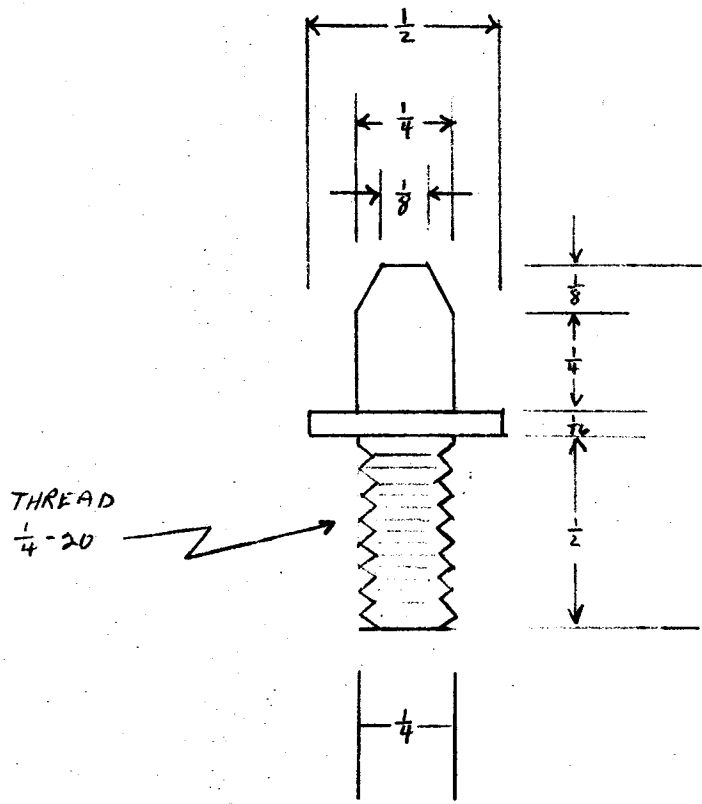


CART
 REAR AXLE
 2 REQ'D
 STEP 1

THREAD
 $\frac{1}{2}$ "-13



HANDLE STOP
6 REG'D
STEEL

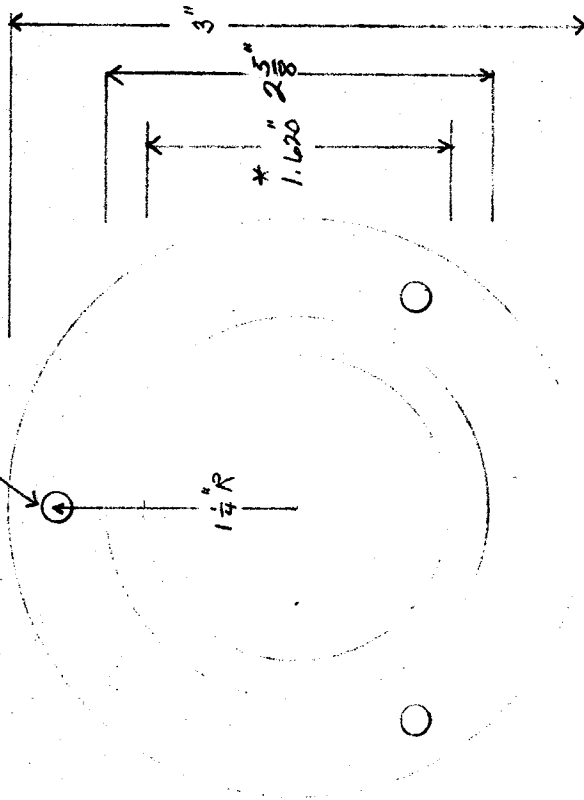


NOTE: Two Studs for Recorder

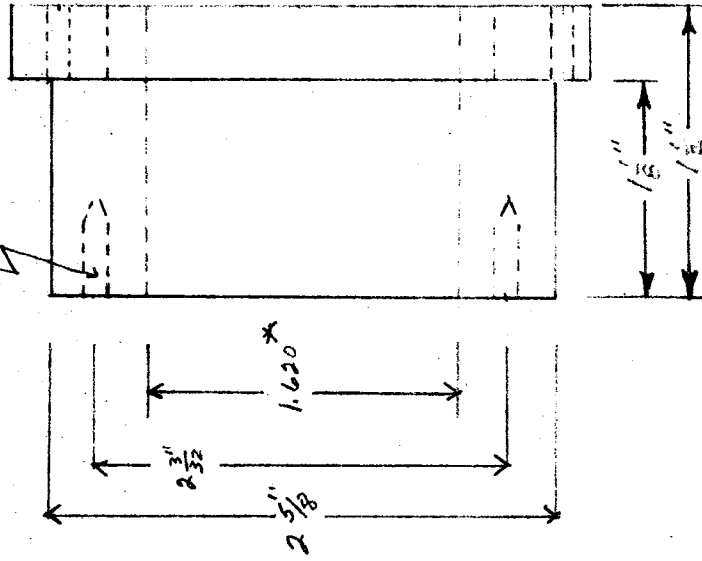
POSITIONING STUDS

6 REQ'D
STEEL

TAP 10-32
180° APART
3 HOLES

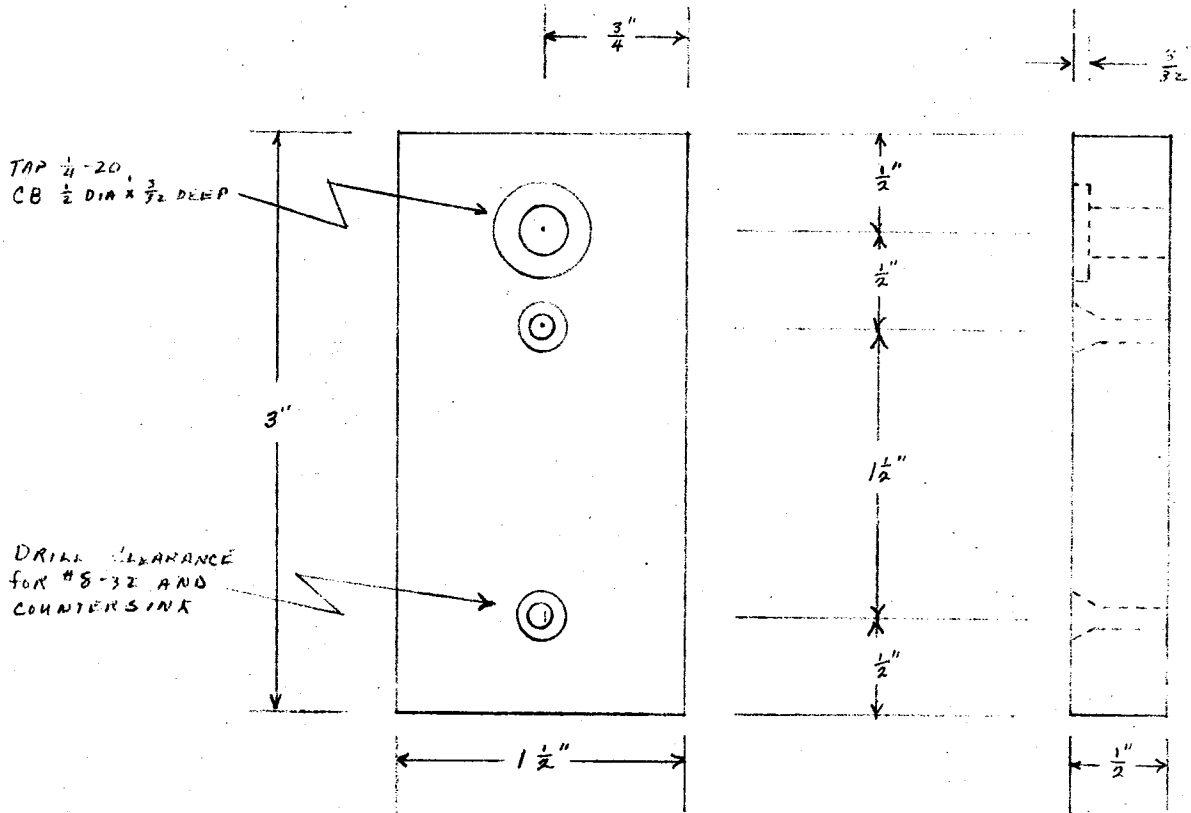


TAP 1/4-20 x 1 1/2 DEEP
4 HOLES 90° APART

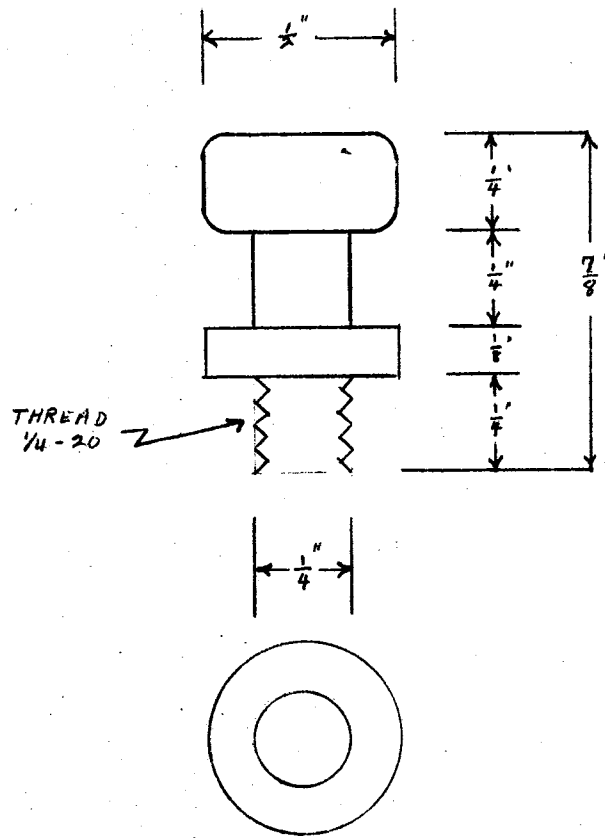


* SNUG FIT OVER BEARING
HOUSING ON TAPERED
WHEEL

WHEEL SPROCKET MOUNT
FOR DRIVE WHEEL
1 REQ'D
ALUM

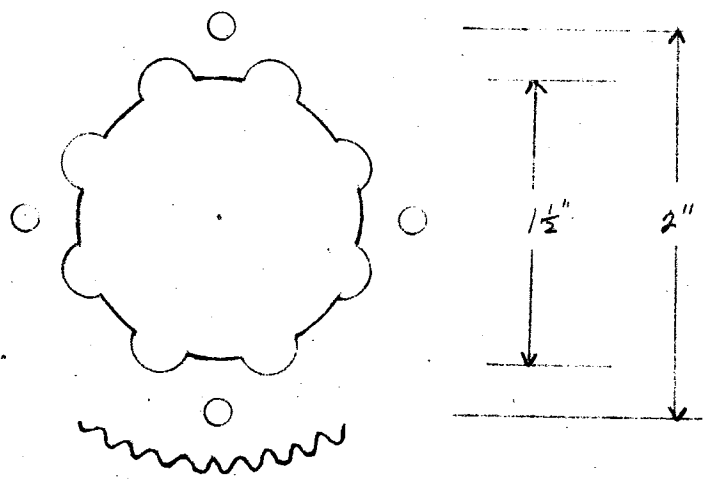


PAINT MARKER
 HANGING BRACKETS
 2 REQ'D
 11/11/11



PAIN'T MARKER
HANGING BOLTS
2 REQ'D
STEEL

DRILL CLEARANCE
FOR #10 & COUNTERSINK
4 HOLES 90° APART



MAKE FROM PIC EM 13-54 SPROCKET

WHEEL SPROCKET
MODIFICATION

PIC EM 13-54

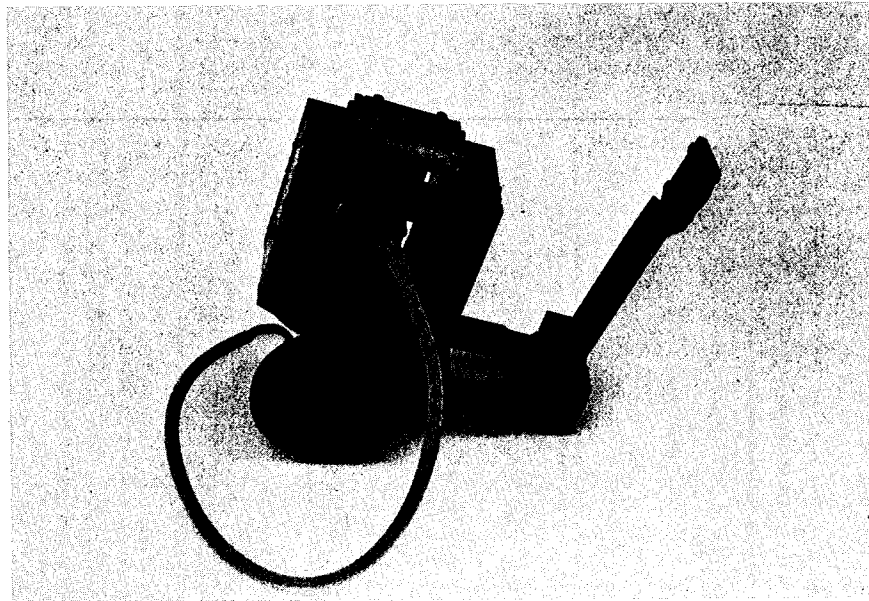


FIGURE 6

Delamination Detector
Knocker Wheel Assembly

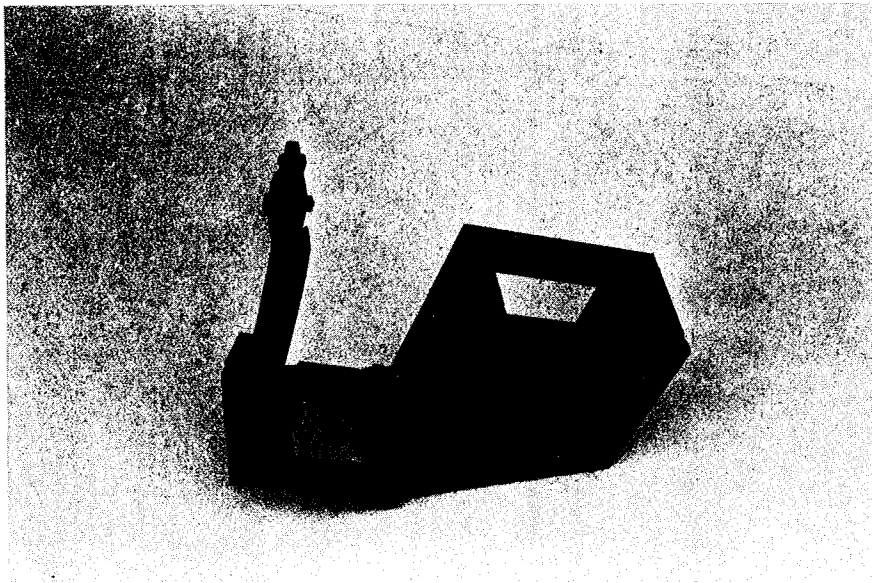


FIGURE 7

Knocker Wheel Frame

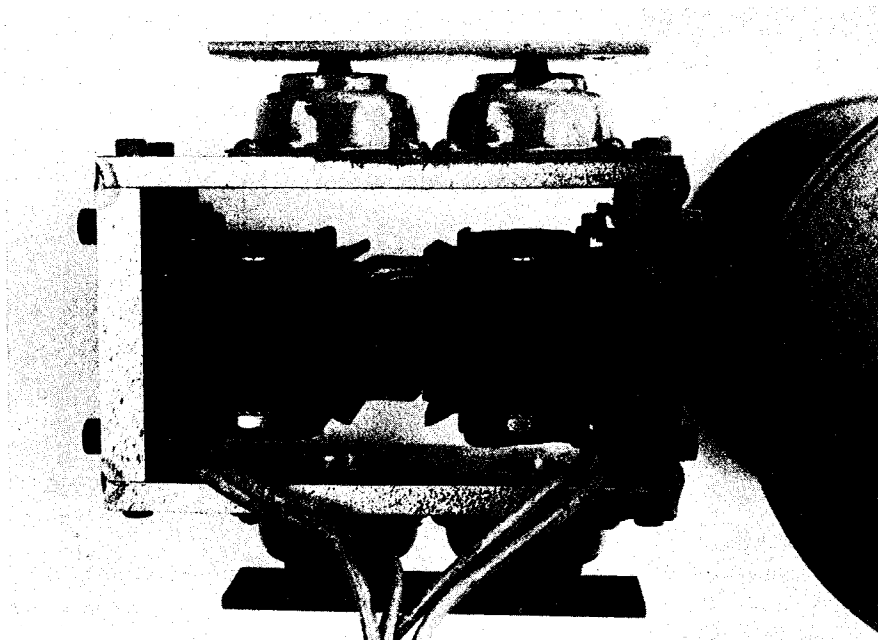


FIGURE 8

Knocker Mechanism

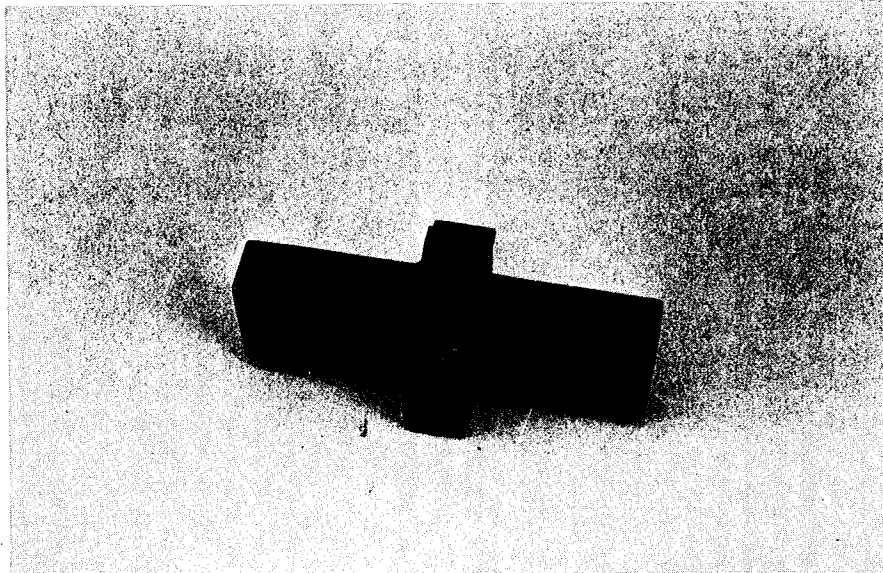


FIGURE 9

Knocker Assembly Detail
Solenoid Plunger Assembly

SECTION I - B

SUB ASSEMBLY: KNOCKER WHEELS AND
MOUNTING BRACKETS FOR PICKUP WHEELS

Purchased Item

<u>QUANTITY</u>	<u>DESIGNATION</u>
4	#8-32 x 3/8 in. long, Round Head Machine Screw
1	Shock Mount, Lord P/N Model #150P-18
2	1/4"-20 x 1/4 in. long, Allen Head Set Screw
2	#8-32 x 3/8 in. long, Allen Head Cap Screw
2	#8-32 x 5/8 in. long, Allen Head Cap Screw
8	#10-32 x 3/4 in. long, Allen Head Cap Screw
8	#10-32, Steel Hex Nut
1	1/4"-28 x 2 in. long, Allen Head Cap Screw
4	#8-32 x 5/8 in. long, Allen Head Cap Screw
4	#8-32 x 7/8 in. long, Allen Head Cap Screw
16	#6-32 x 1/4 in. long, Round Head Machine Screw
2	1/4"-20 x 1 1/4 in. long, Allen Head Cap Screw
16	#6 lock washer
16	#8 lock washer
8	#10 lock washer
5	1/4" lock washer
4	Bearings, PIC Model #E2-9
2	Solenoids, Racine Replacement Part #400 991

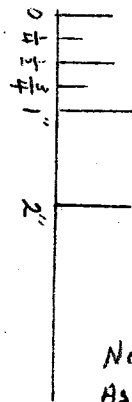
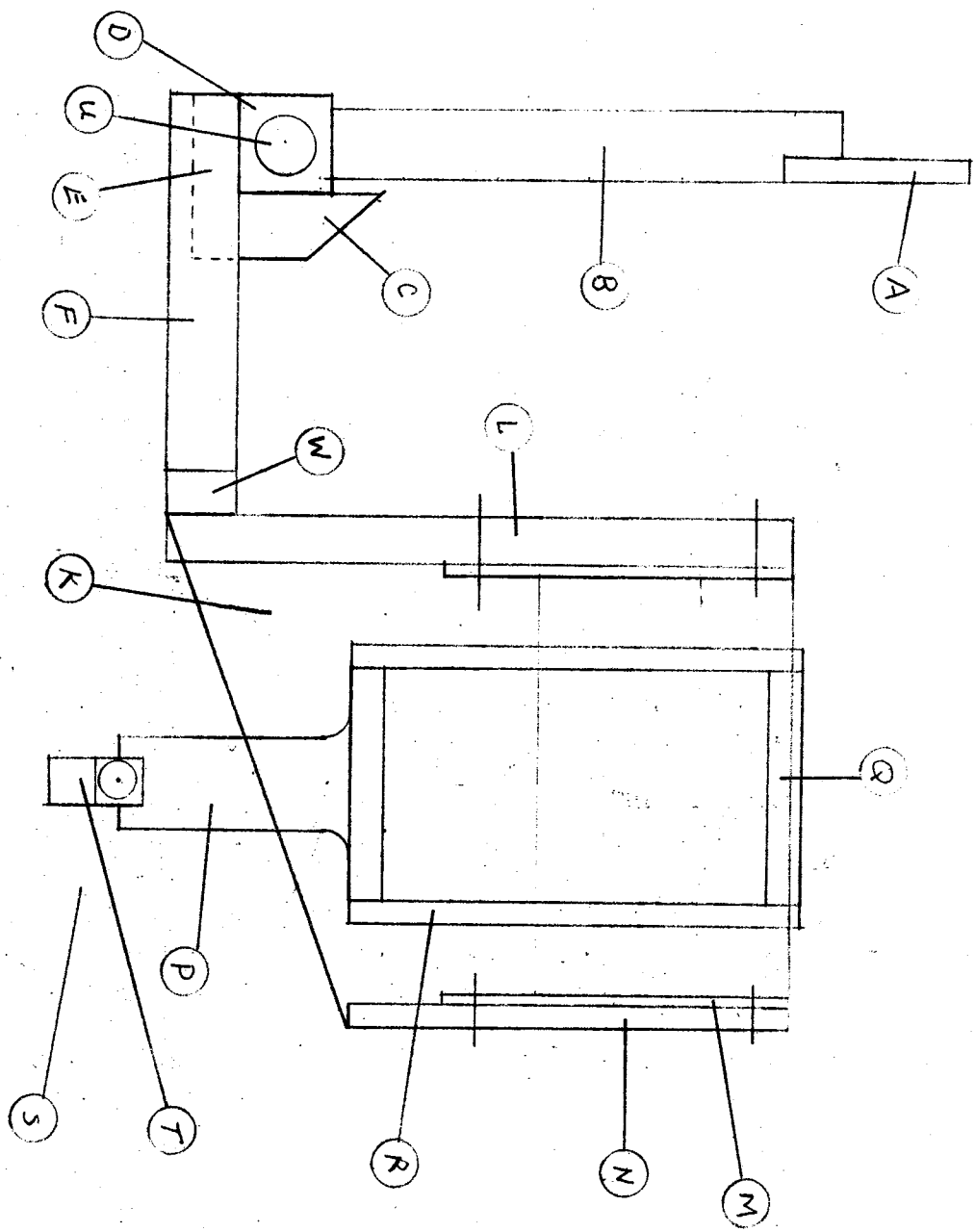
Materials

<u>AMOUNT</u>	<u>DESCRIPTION</u>
12 x 6 inches	1/4" Aluminum Plate

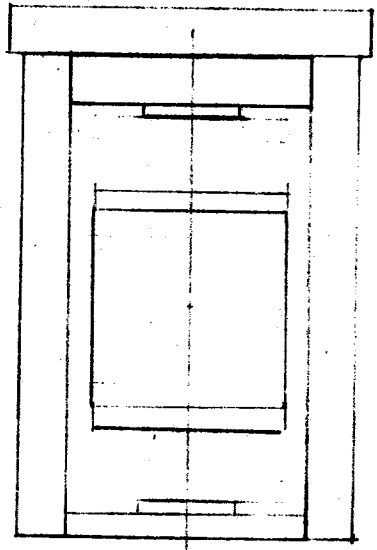
SUB ASSEMBLY: KNOCKER WHEEL AND MOUNTING
BRACKETS FOR PICKUP WHEELS (continued)

-2-

<u>AMOUNT</u>	<u>DESCRIPTION</u>
24 inches	3/4" x 3/4" Aluminum Bar
12 inches	1" x 1" Aluminum Bar
12 x 18 inches	1/2" Aluminum Plate
8 x 1 inch	1/8" Steel Plate
2 x 1 inch	18 Gage Steel Plate
3 inches	3" x 3" Aluminum Bar
3 x 3 inches	3/8" Aluminum Plate
5 x 10 inches	3/8" Magnesium Tooling Plate
6 x 1 inches	1/2" Steel Plate
18 inches	3/4" Diameter Steel Rod
1 inch	5" Diameter 4140 Steel Bar

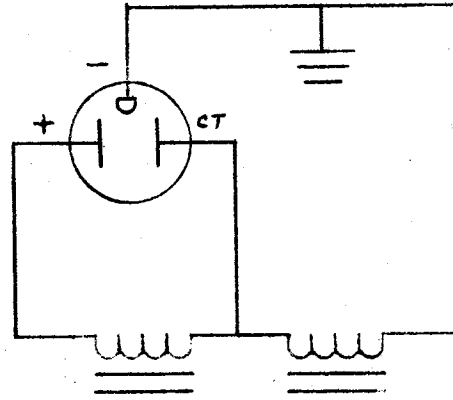


NOTE: ALL SCREWS
ASSEMBLED WITH
LOC-TITE.



KNOCKOVER WHEEL
ASSEMBLY VIEW

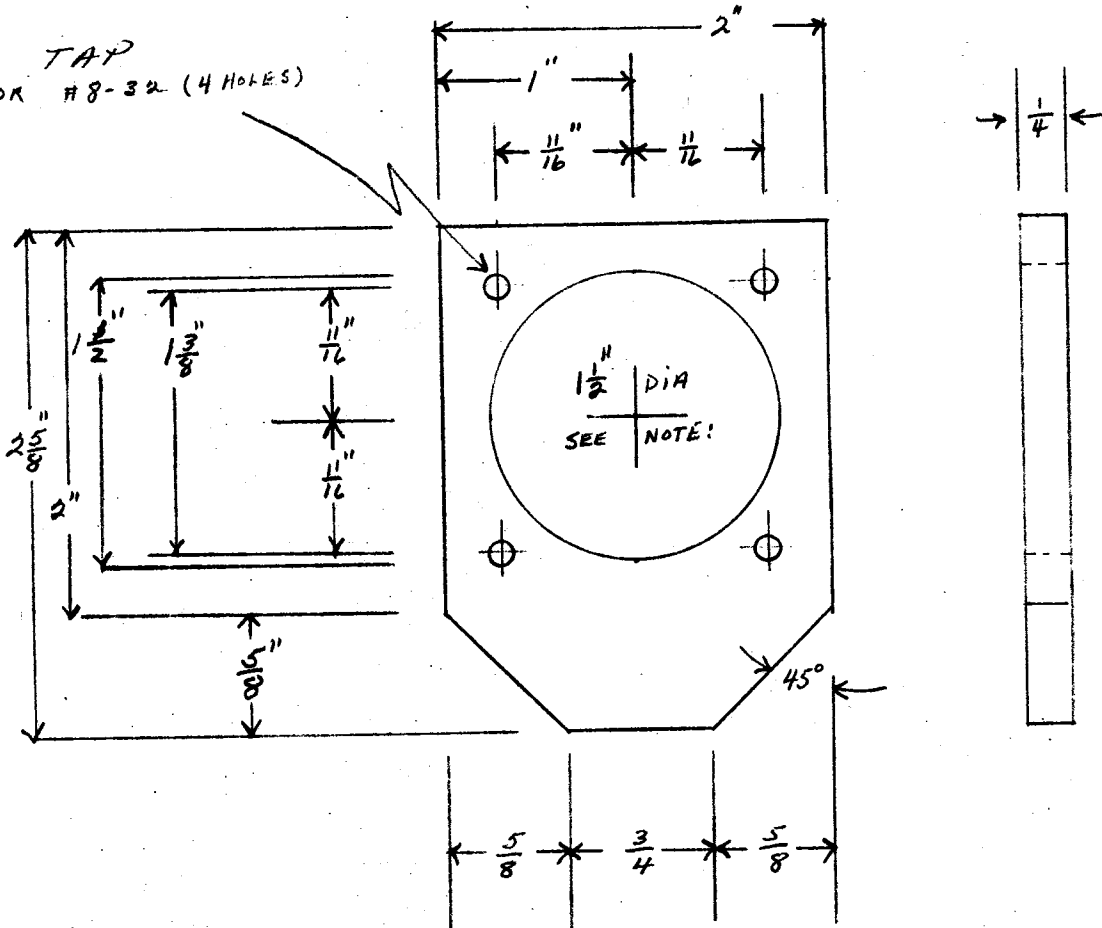
A.C. PLUG
VIEWED FROM
PIN END



SOLENOIDS

KNOCKER WHEEL
SOLENOID SCHEMATIC

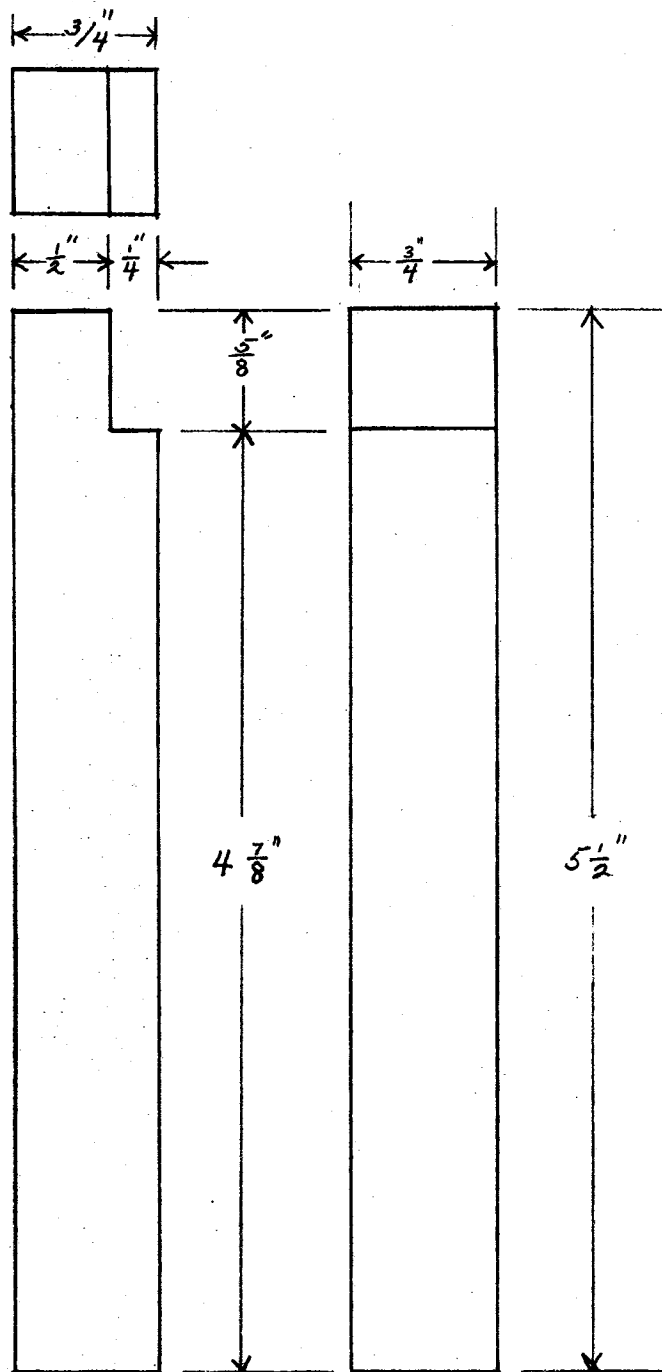
TAP
FOR #8-32 (4 HOLES)



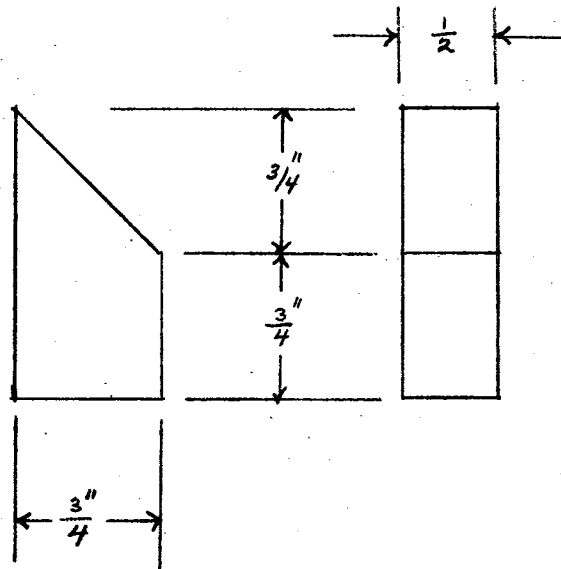
NOTE: 1 1/2" DIA. HOLE FOR
LORD # P/N 150 P-18
SHOCK MOUNT

SHOCK MOUNT HOLDER
KNOCKER WHEEL SUB ASSEMBLY
1 REQ'D ALUM.

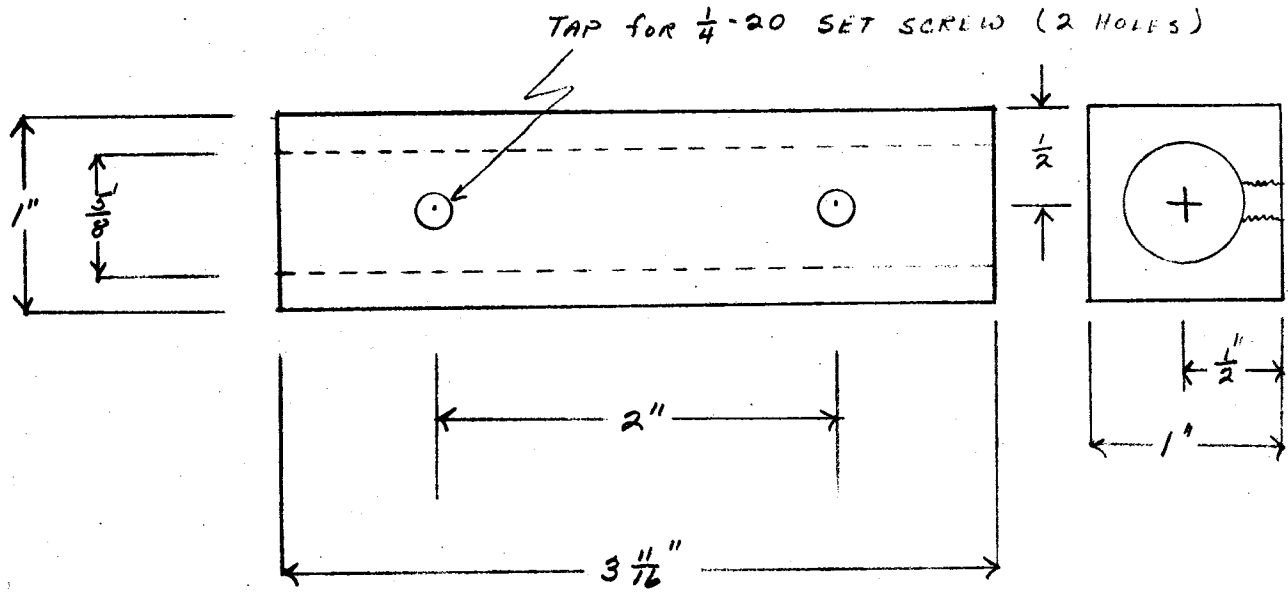
PROJECT 2130
JUNE 1969



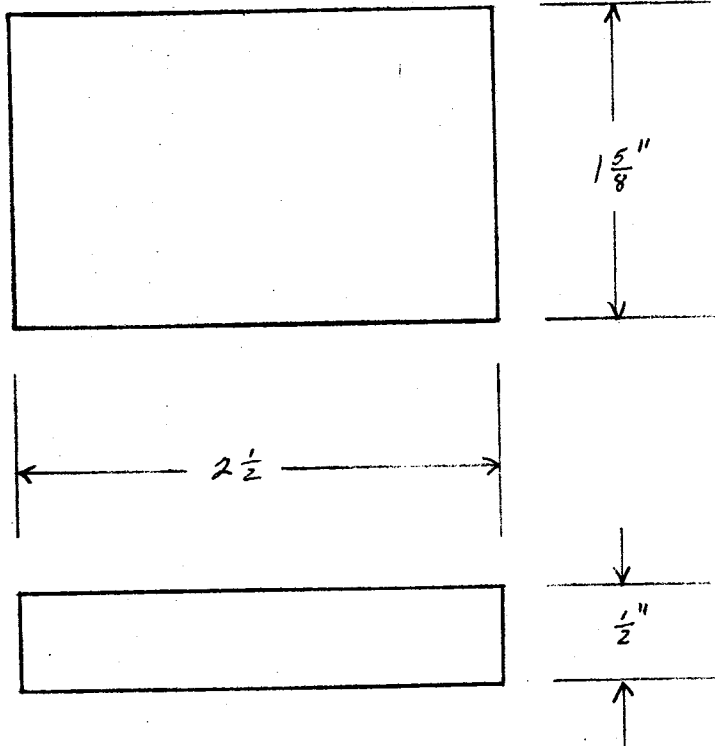
KNOCKER WHEEL
 SUB ASSEMBLY
 1 REQ'D
 ALUM



CENTER BRACE
KNOCKER WHEEL SUB-ASSEMBLY
3 REQ'D (includes 2 for
pickup wheels)
ALUM

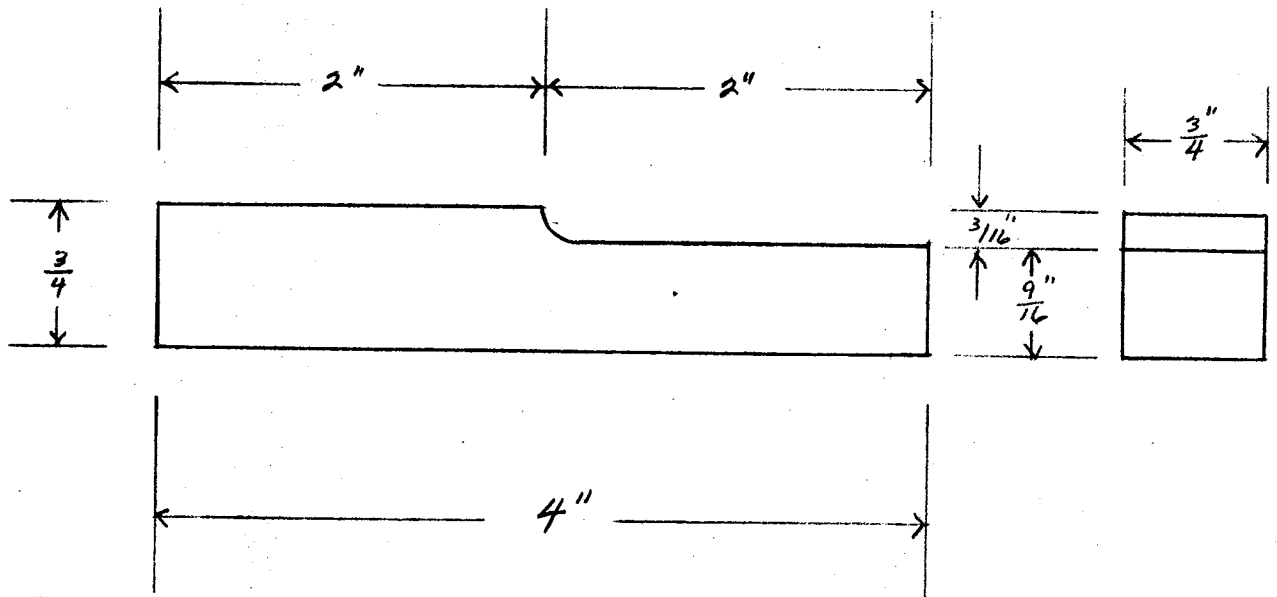


WHEEL SWIVELS
 3 REQ'D (includes 2 for
 pickup wheels)
 ALUM



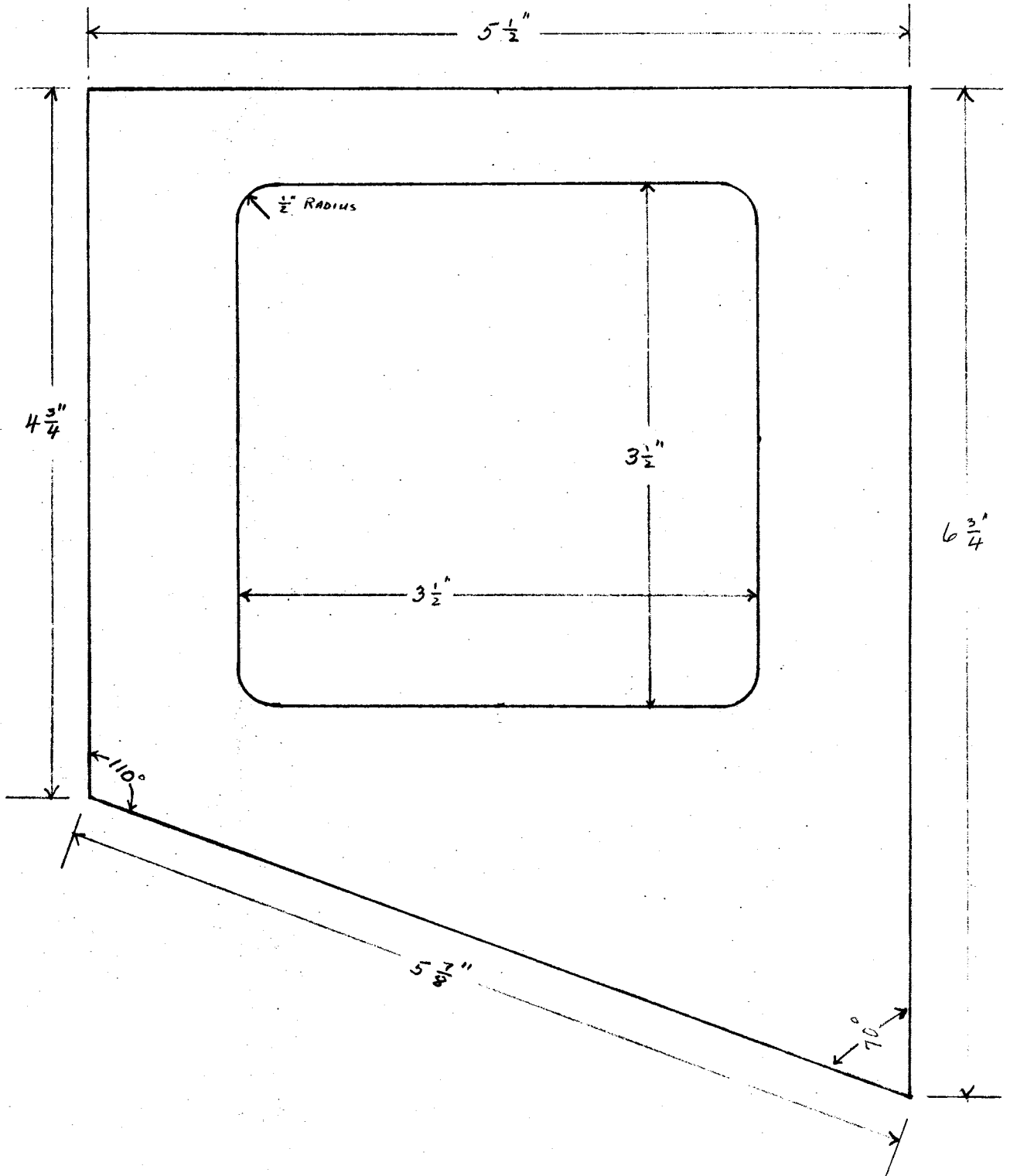
KNOCKER WHEEL
3 REQD (Includes 2 for
pickup wheels)

ALUM



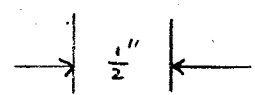
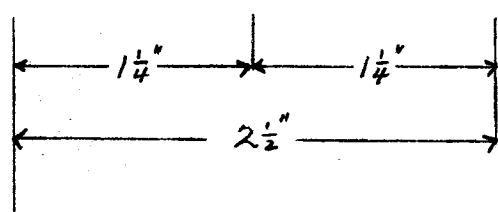
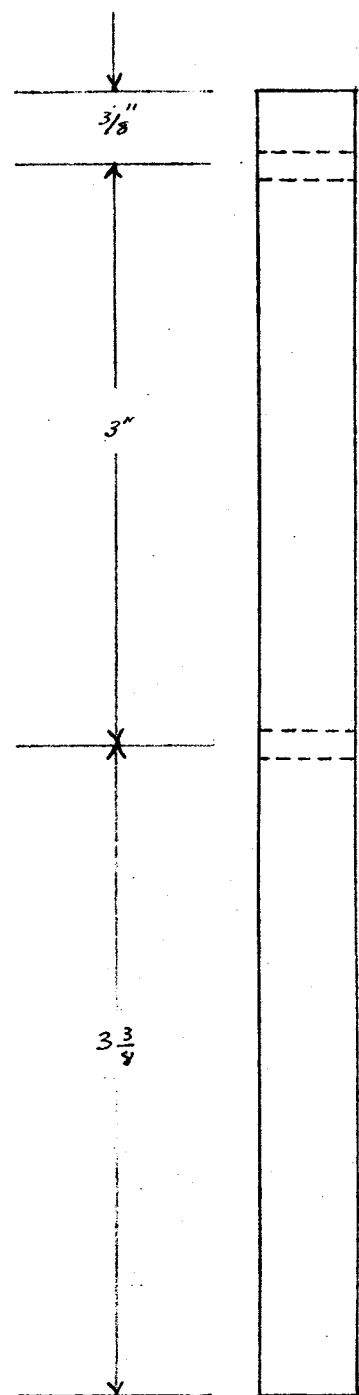
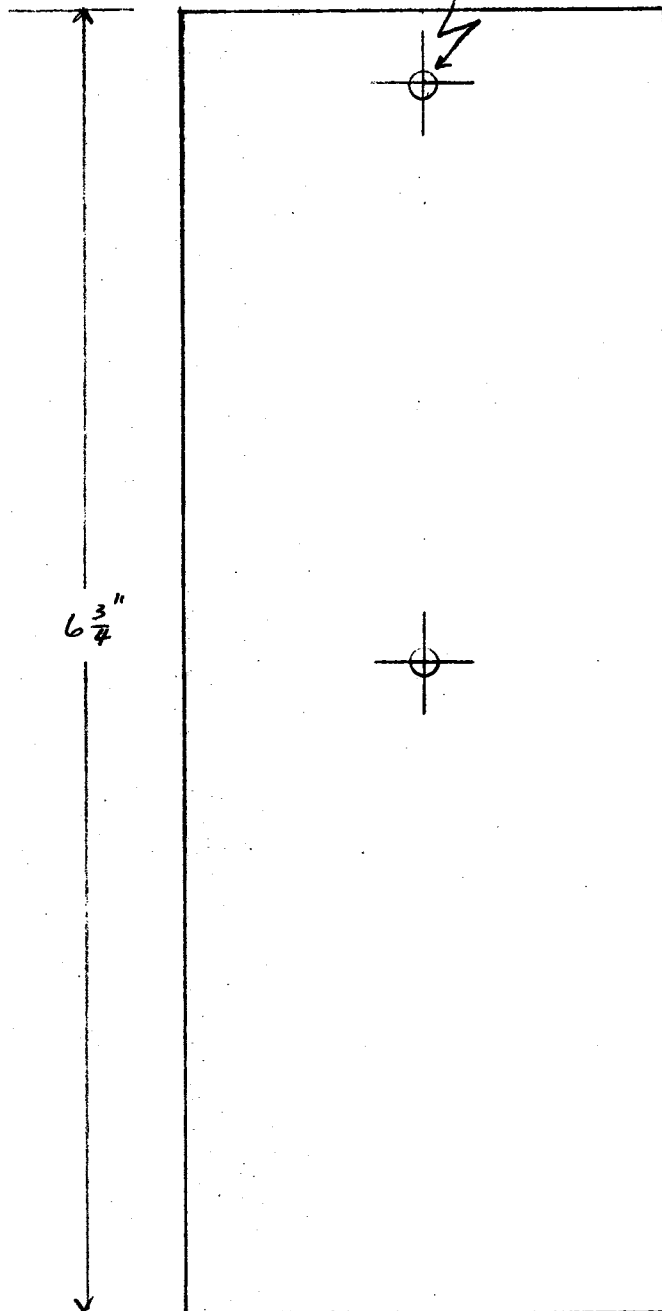
KNOCKER WHEEL

2 REQ'D
ALUM



KNOCKER WHEEL
 SIDE PLATE
 2 REQ'D
 $\frac{1}{2}$ ALUM

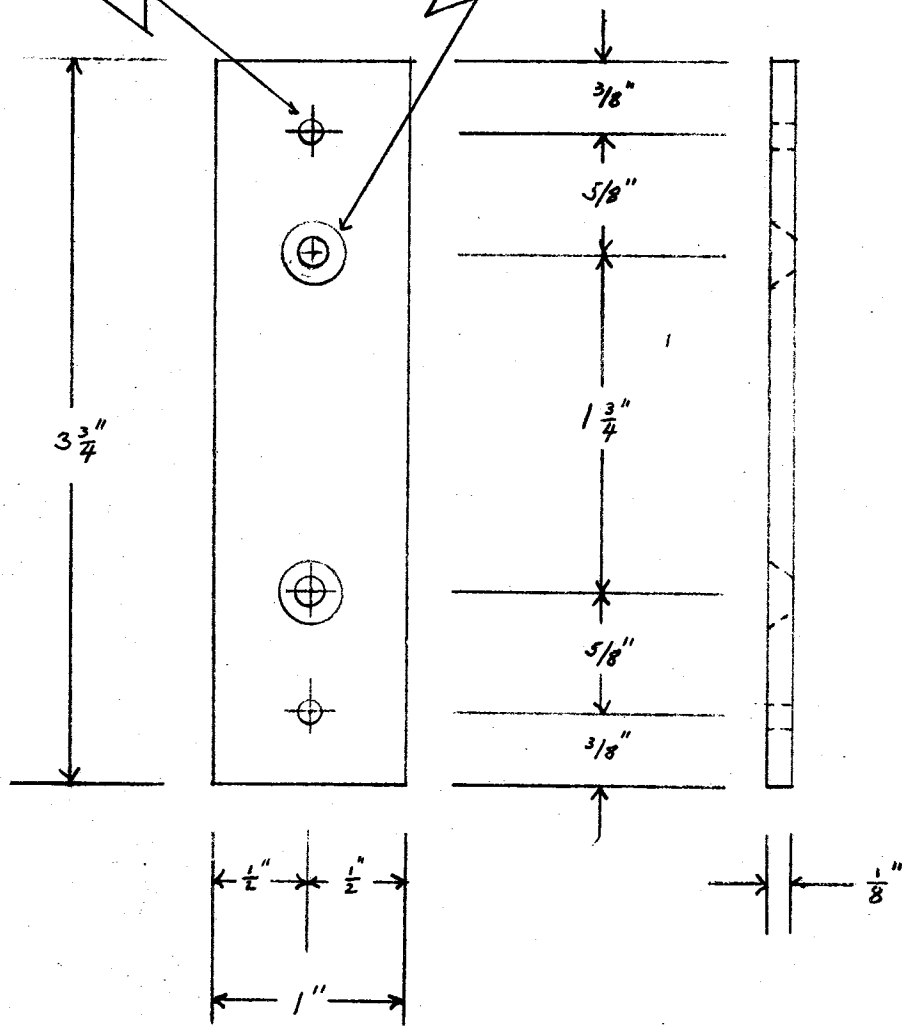
DRILL CLEARANCE
8-32 2 HOLES



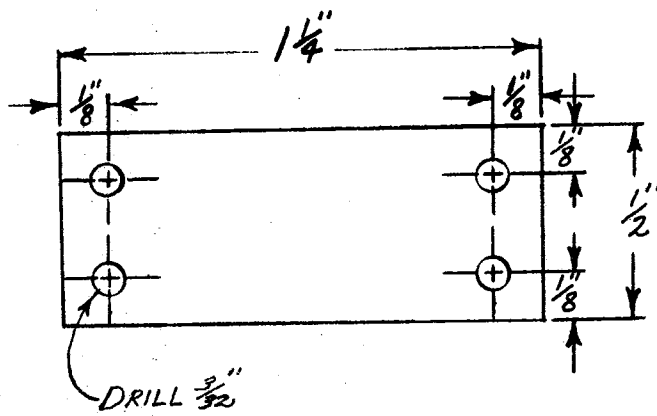
KNOCKER WHEEL
END PLATE
1 REQ'D
ALUM

TAP 8-32
2 HOLES

DRILL CLEARANCE 8-32
& COUNTER SINK (2 HOLES)

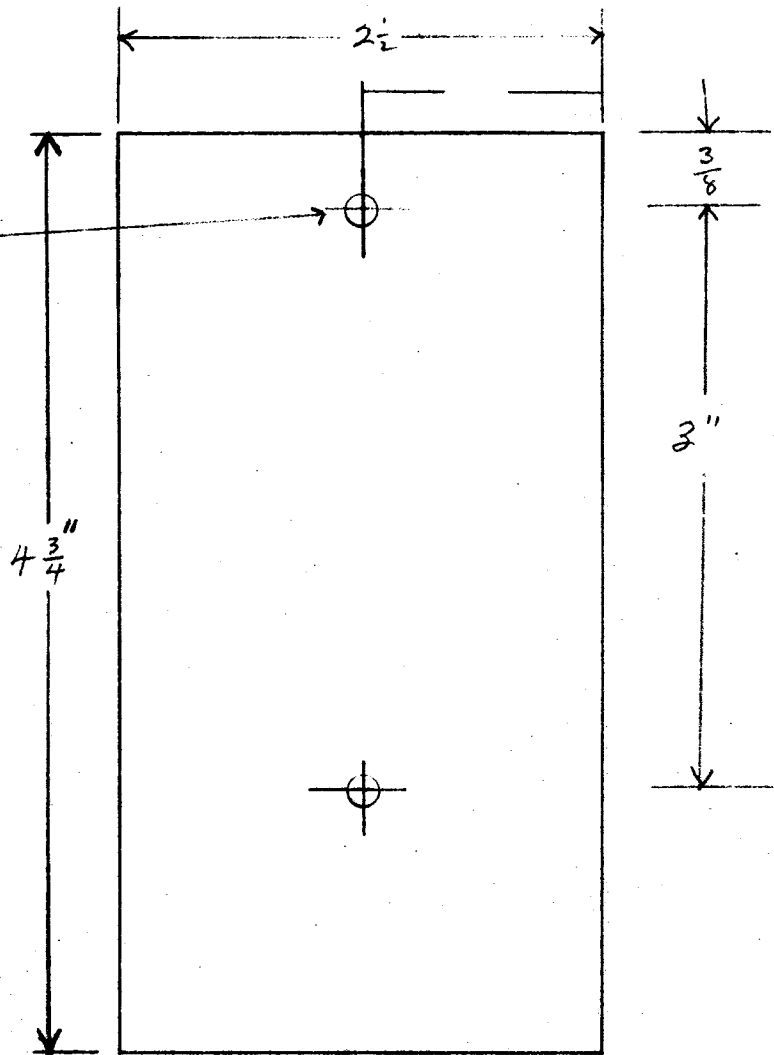


KNOCKER WHEEL
MOUNTING STRAPS
2 REQ'D
STEEL



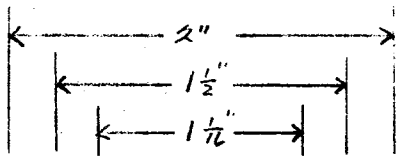
JOINING PLATE
 FOR SOLENOID ARMATURE
 2 REQ'D
 18 GAGE STEEL

DRILL
CLEARANCE
#8-32
2 HOLES

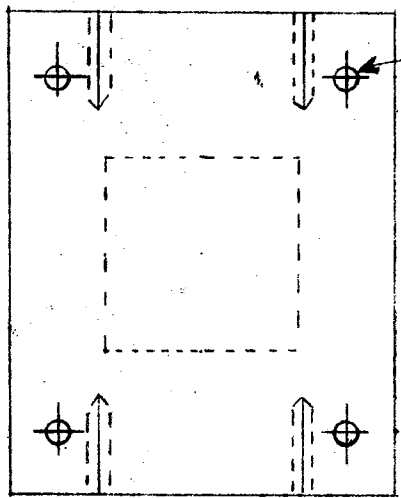


KNOCKER WHEEL

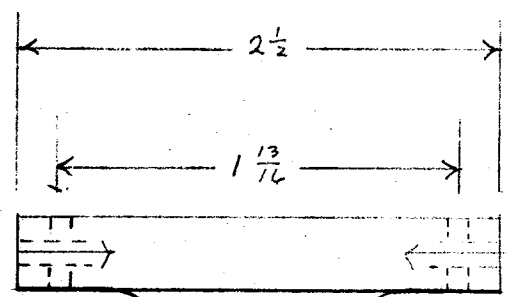
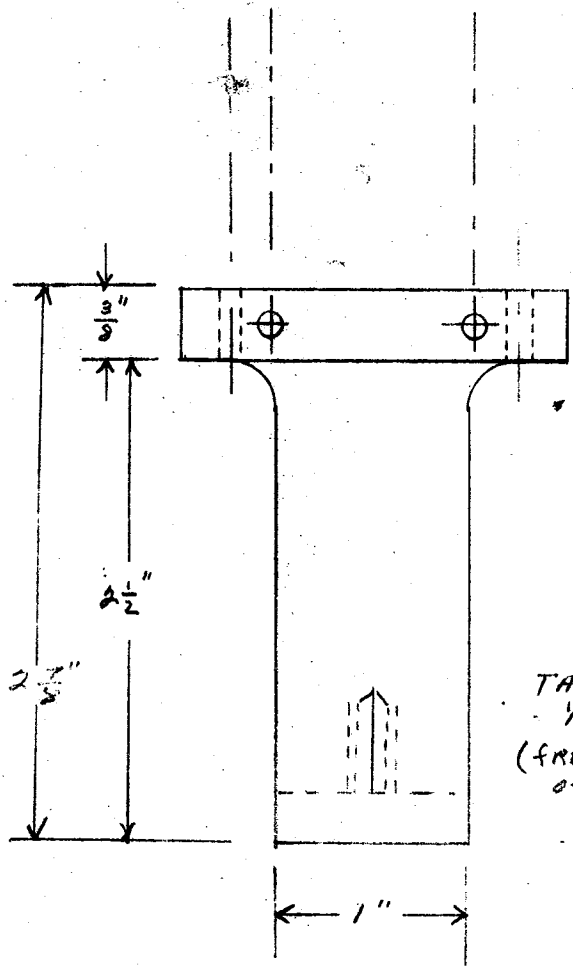
1 REQ'D
 $\frac{1}{4}$ ALUMI



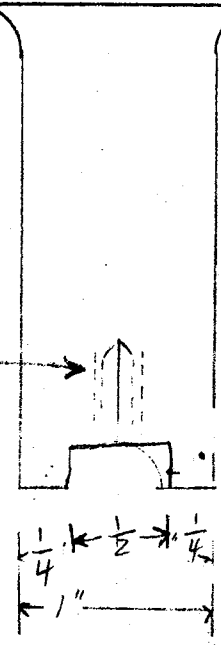
TAP 8-32 X 1/2 deep
4 Holes



TAP 10-32
4 holes



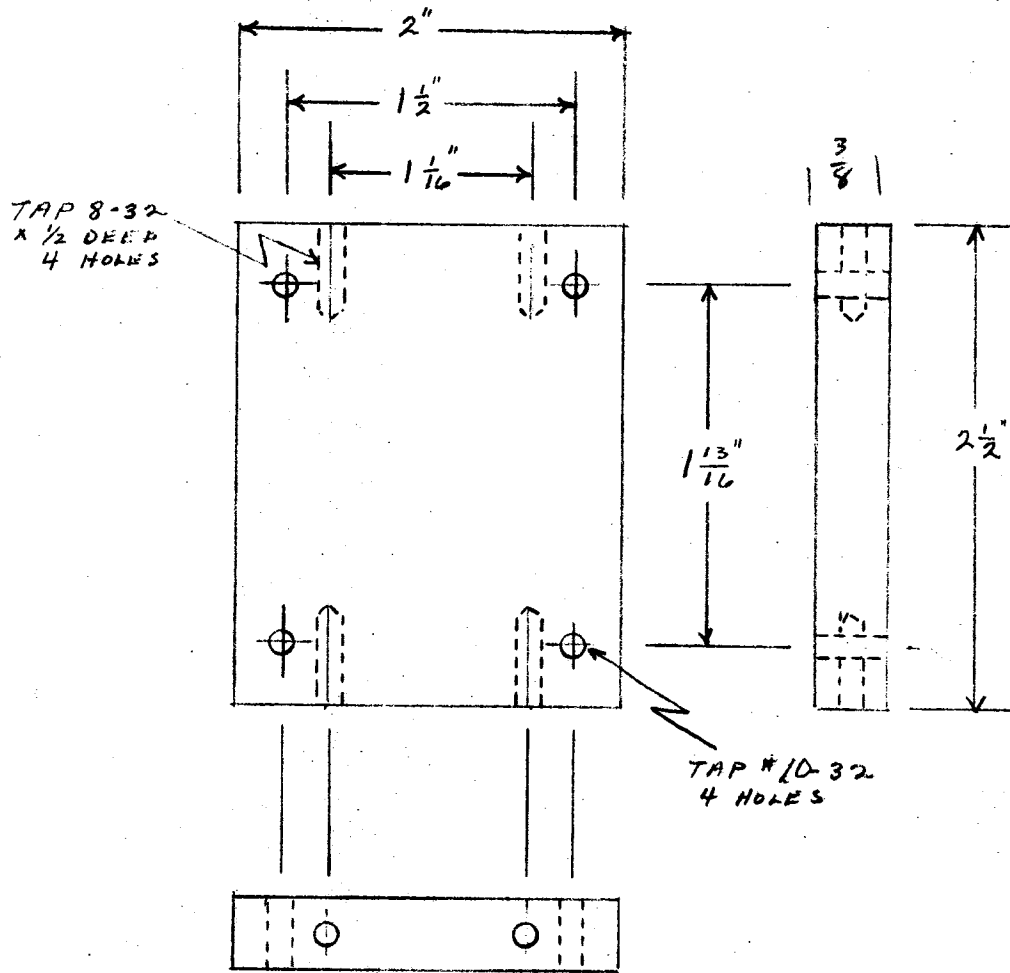
TAP 1/4"-28
1/2 DEEP
(from Bottom
of GROOVE)



1/4" DEEP

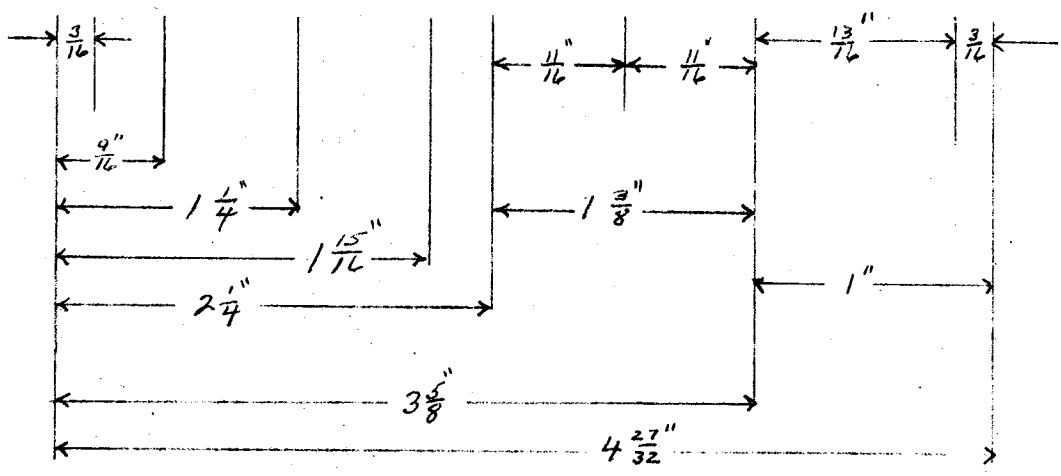
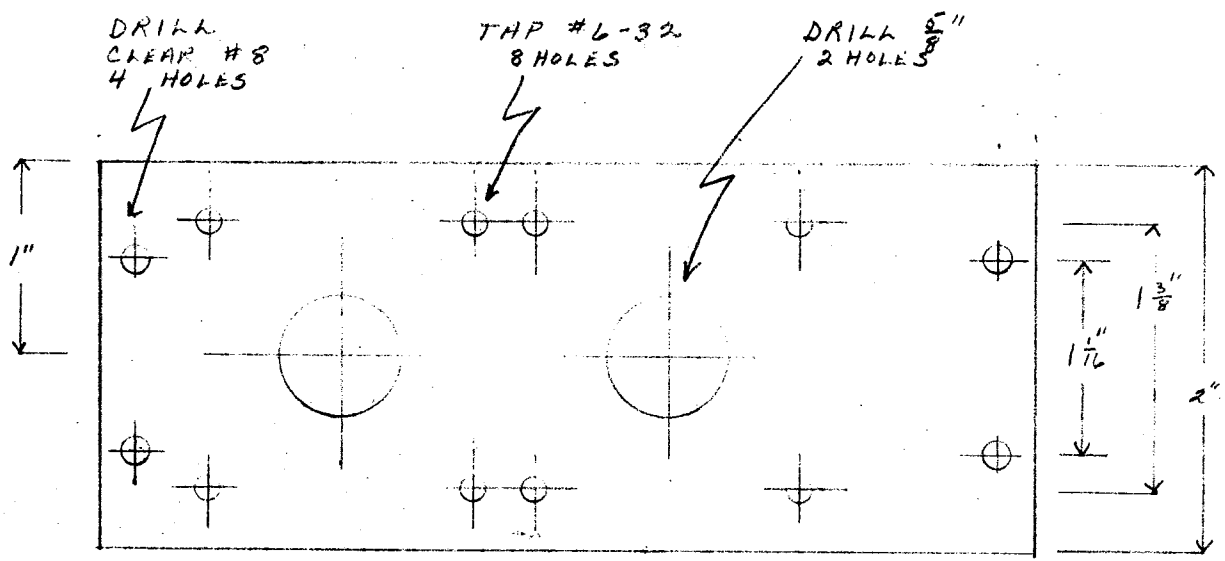
KNOCKER WHEEL

1 REQ'D
ALUM



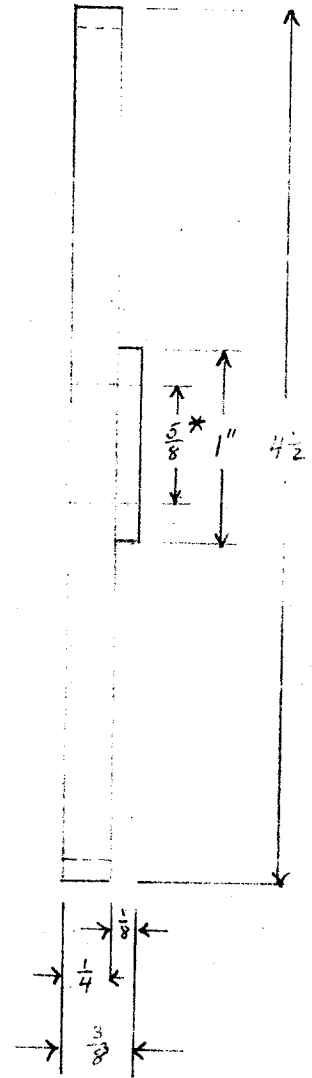
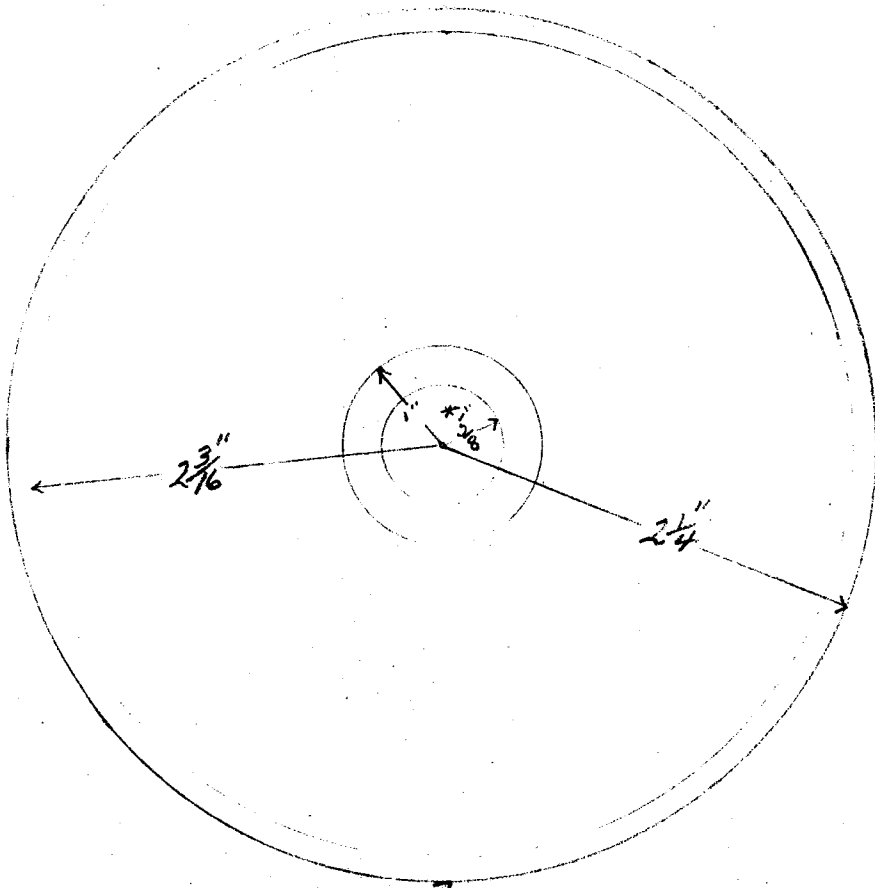
KNOCKER WHEEL

1 REQ'D
ALUM



USE 4 SHOCK MOUNTS
 LORD # R/N 100 PHL-10

KNOCKER WHEEL
 SHOCK MOUNT BRACKET
 2 REQ'D
 1/4" ALUMIN



‡ $\frac{1}{16}$ " STEEL RIM PRESSED ON
MAGNESIUM WHEEL.

* PRESS FIT REQUIRED ON
CENTER BEARINGS (2 FLANGE
TYPE REQUIRED FOR EACH
WHEEL.

‡ STEEL RIM IS 4140
STEEL MACHINED $\frac{1}{4}$ " WIDE X
 $\frac{1}{16}$ " THICK X $4\frac{1}{2}$ " O.D. HARDENED TO
ROCKWELL 55C.

KNOCKER WHEEL

2 REQ'D
MAG

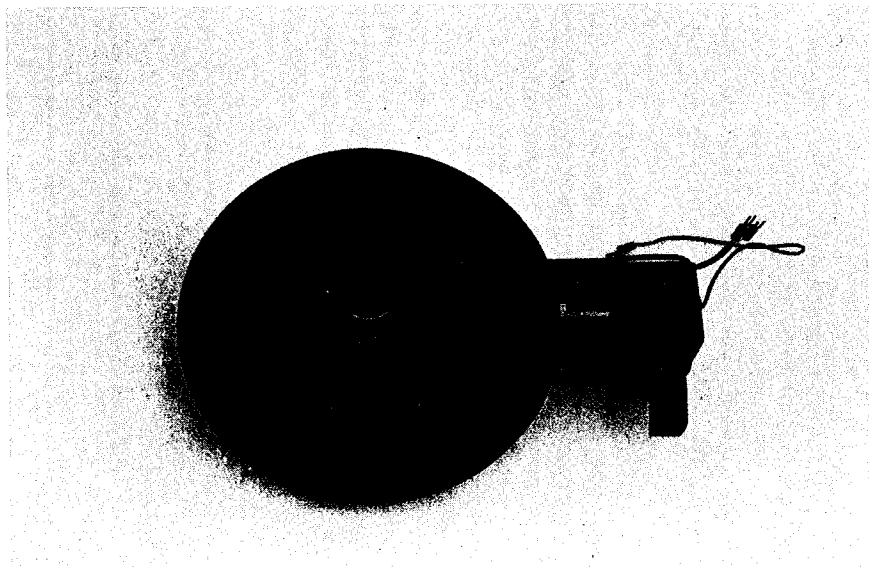


FIGURE 10

Delamination Detector
Pickup Wheel Assembly

SECTION I - C

SUB ASSEMBLY: SET OF 2 PICKUP WHEELS &
MOUNTING BRACKETS

Purchased Items

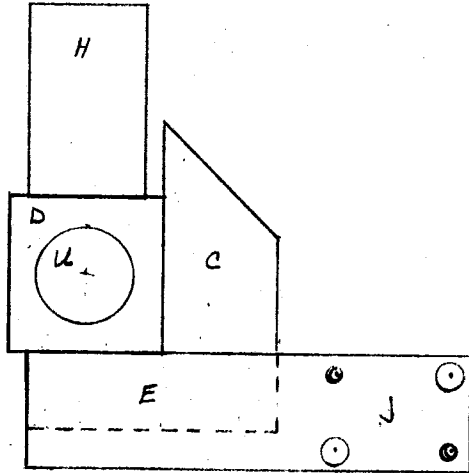
<u>QUANTITY</u>	<u>DESIGNATION</u>
4	1/4-20 x 1/4 in. long Allen Head Set Screw
8	1/8 " x 3/8 in. long, Roll pin
8	10-32 x 3/4" Flat Head Machine Screw
8	8-32 x 1" Round Head Machine Screw
8	Bearings, Federal #1203L
4	Seals, National Seal type #240731
2	Tubes, Goodyear #3.50/4.10 - 4
4	8-32 x 1/2 " Flat Head Machine Screws
4	8-32 x 1 1/2" Round Head Machine Screws
4	5/8I.D. Snap Ring
32	8-32 x 5/8" Flat Head Machine Screw
32	8-32 Hex Nuts
2	"O" Rings, International Harvester #363226RI
2	6-32 x 1/4" Round Head Machine Screws
2	1/4" Cable clamps, Waldom type #KC-203
2	Hydrophone, Edo—Western Model # 6042

Materials

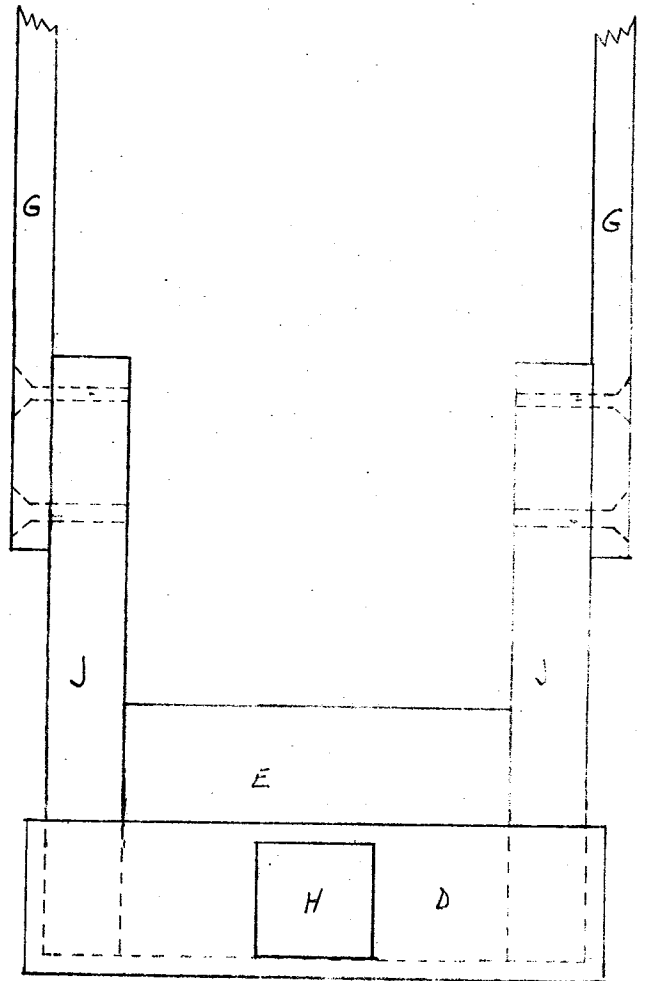
<u>AMOUNT</u>	<u>DESCRIPTION</u>
11x6 inches	1/4" Aluminum Plate
16 inches	3/4" x 3/4" Aluminum Bar
9 inches	1 1/8" Diameter Brass Rod
8 inches	6 1/2" Diameter Aluminum Rod
1 inch	1/2" Diameter Brass Rod
4 inch	1" Diameter Plastic Rod

NOTE:

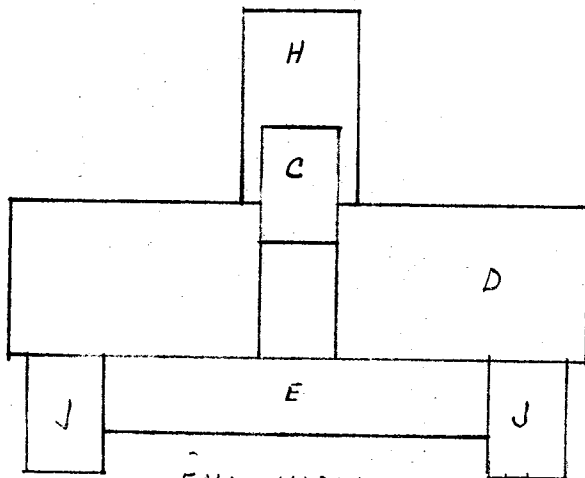
PARTS C, D, E, U
ARE SAME AS IN
KNOCKIN WHEEL



SIDE VIEW



TOP VIEW



END VIEW

PICK UP WHEEL
FRAME ASSEMBLY

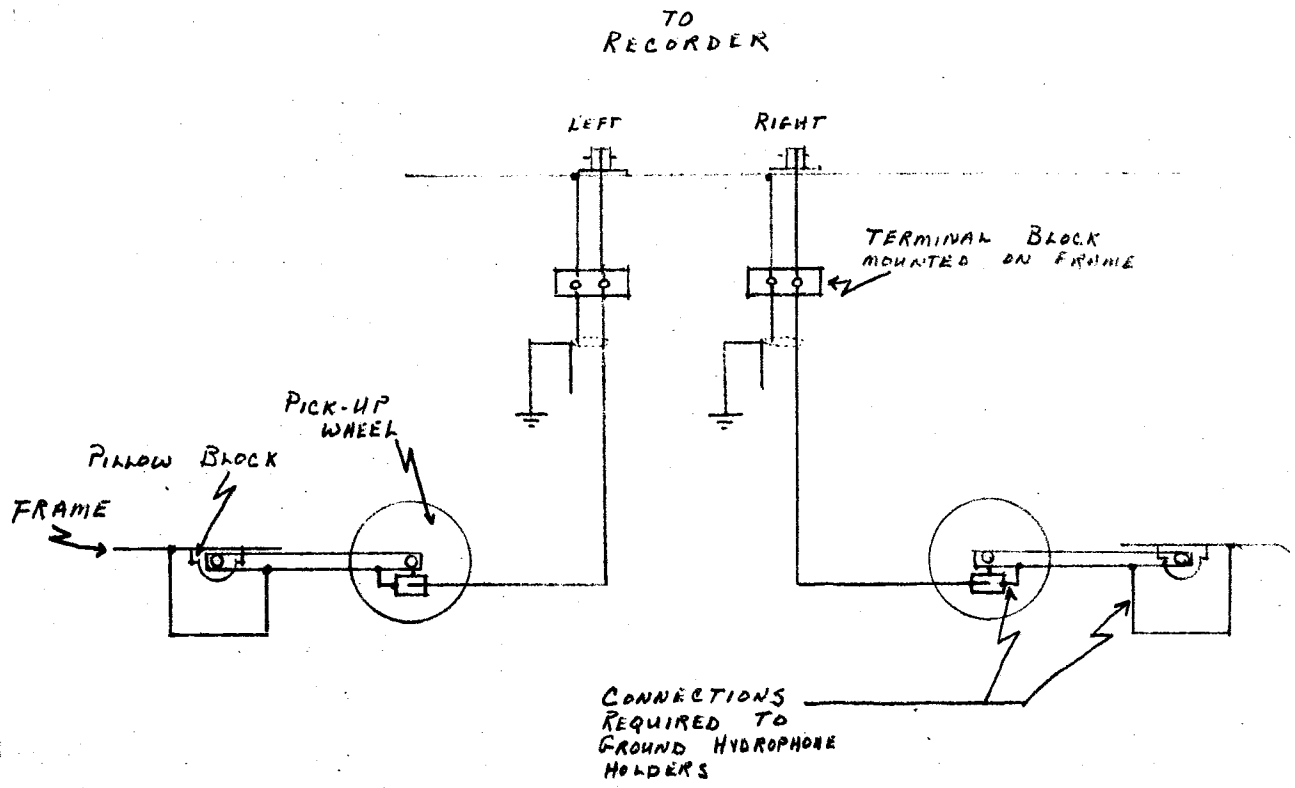
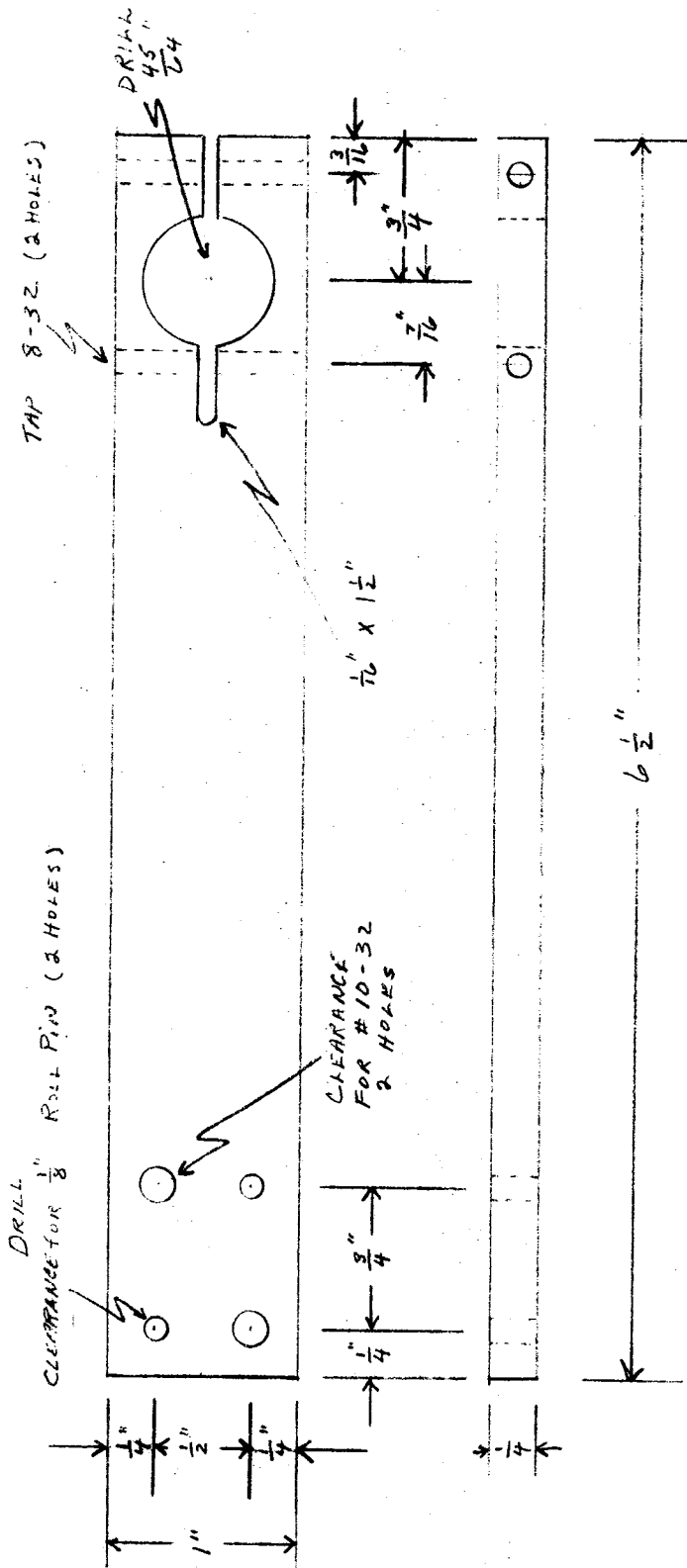
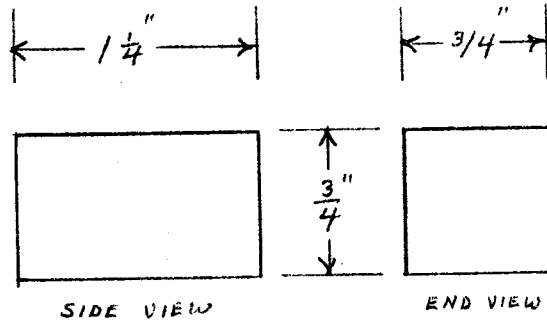


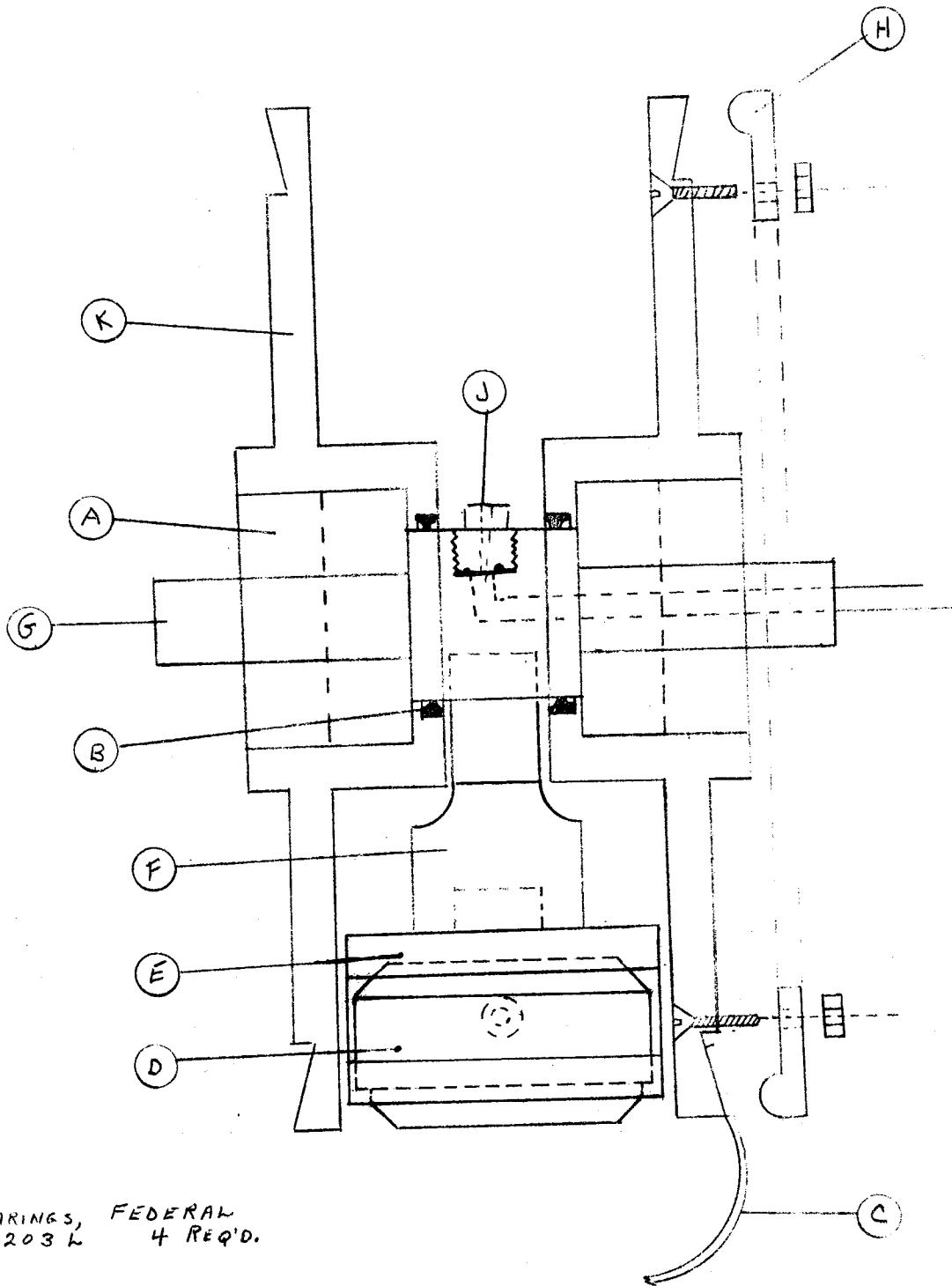
CHART
SCHEMATIC DIAGRAM



PICK UP WHEEL
 REMOVABLE ARMS
 4 REQ'D
 ALUM



PICK UP WHEEL
SUB ASSEMBLY
2 REQ'D
AKUM

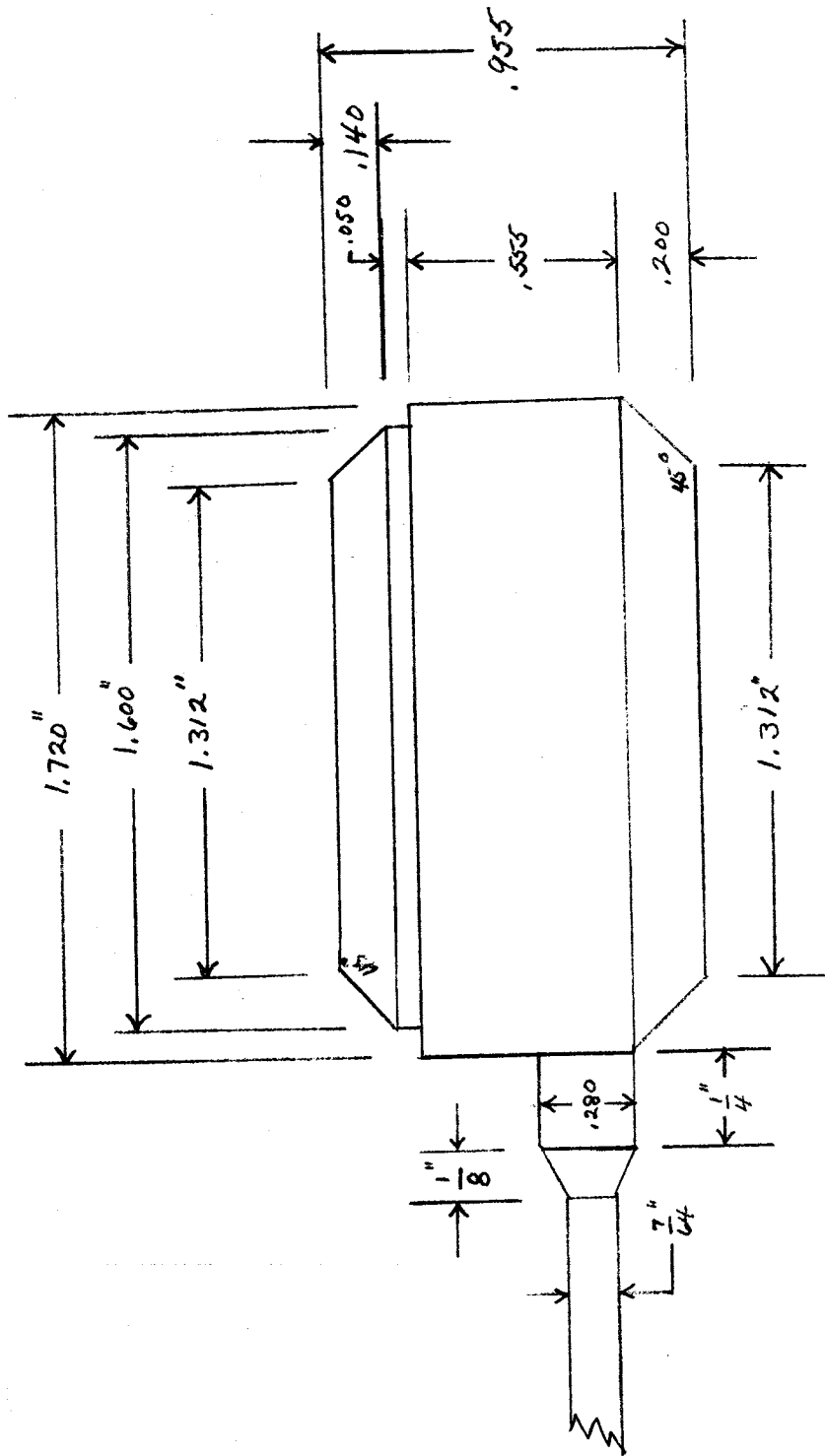


(A) BEARINGS, FEDERAL # 1203 L 4 REQ'D.

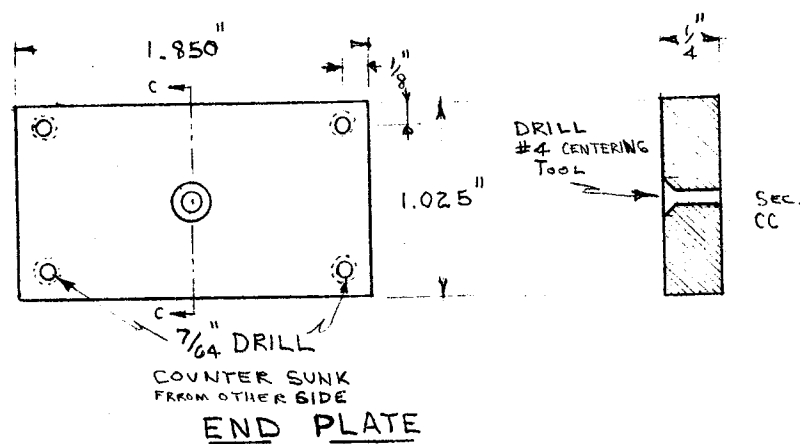
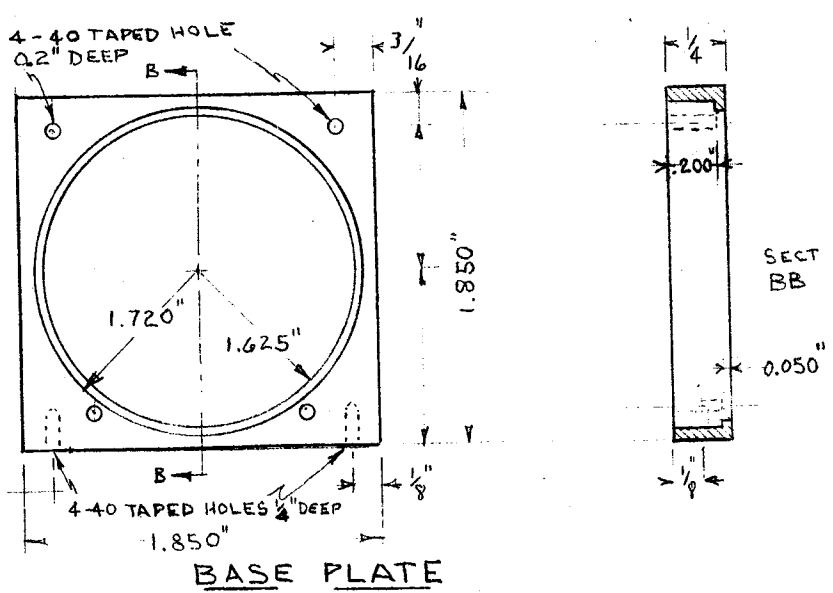
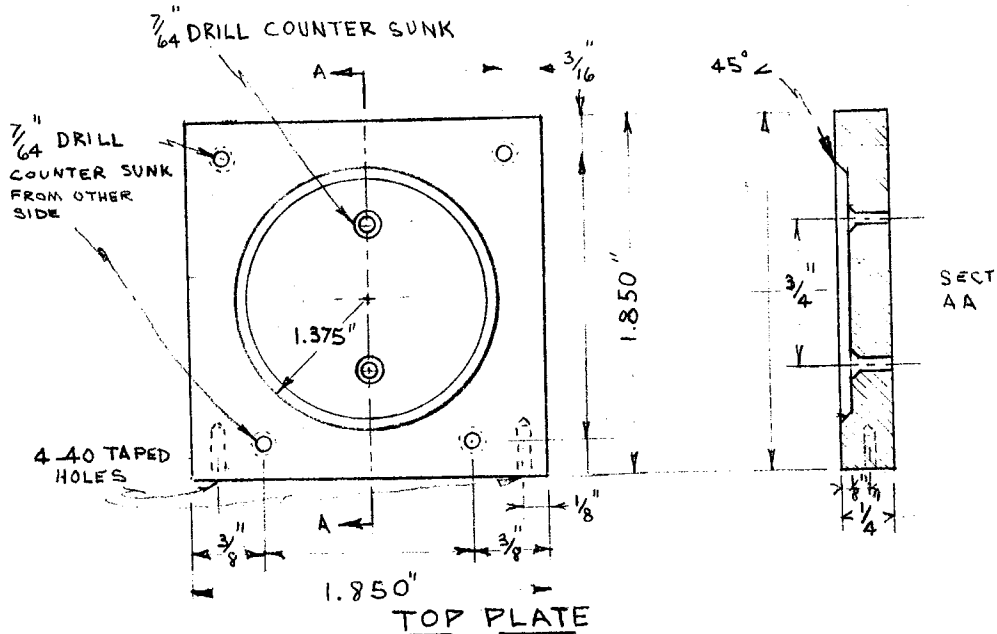
(B) SEALS, NATIONAL # 240731 2 REQ'D.

(C) TIRE, GOODYEAR 4.10/3.50-4 1 REQ'D.

PICK UP WHEEL ASSEMBLY



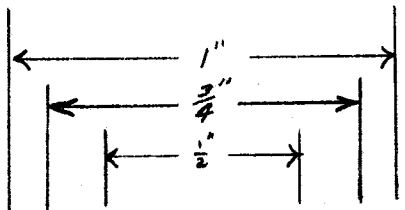
HYDROPHONE
 EDO-WESTERN CO. MODEL # 6042
 SENSITIVITY 82.0 DB.



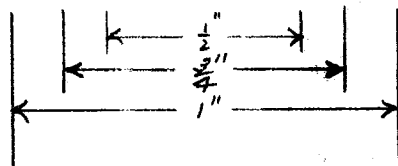
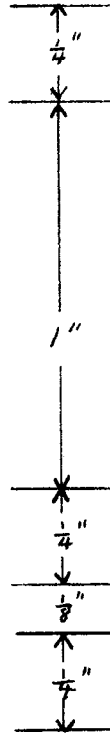
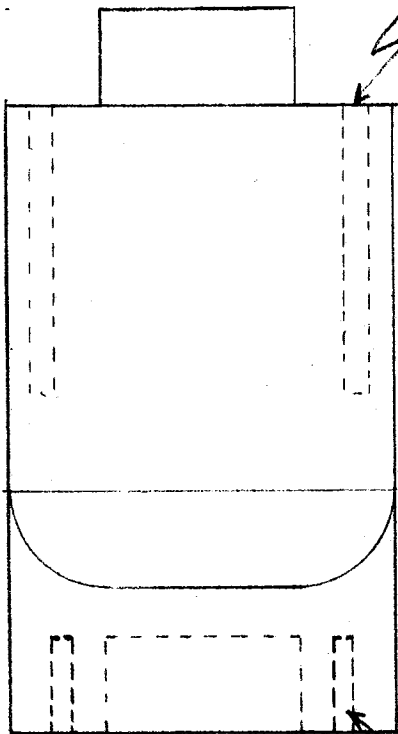
NOTE: ALL PARTS 1/4 ALUM. PLATE

3 REQ'D
(Includes spares)

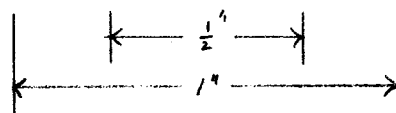
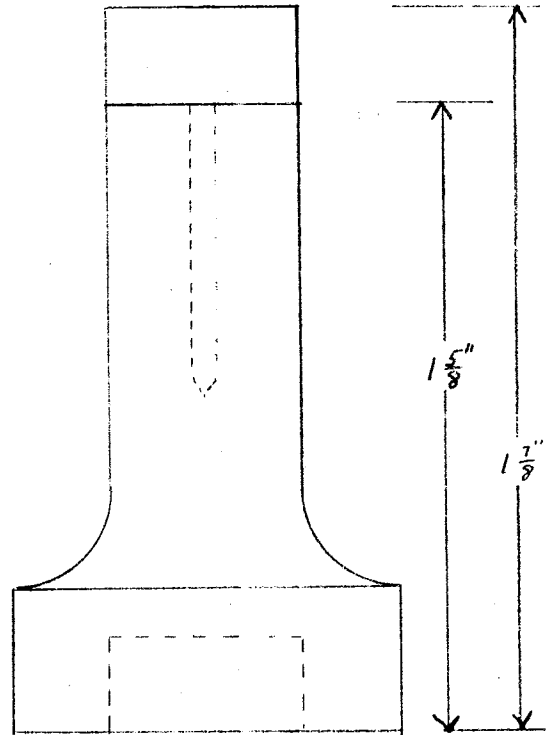
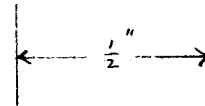
HYDROPHONE MOUNTING BLOCK



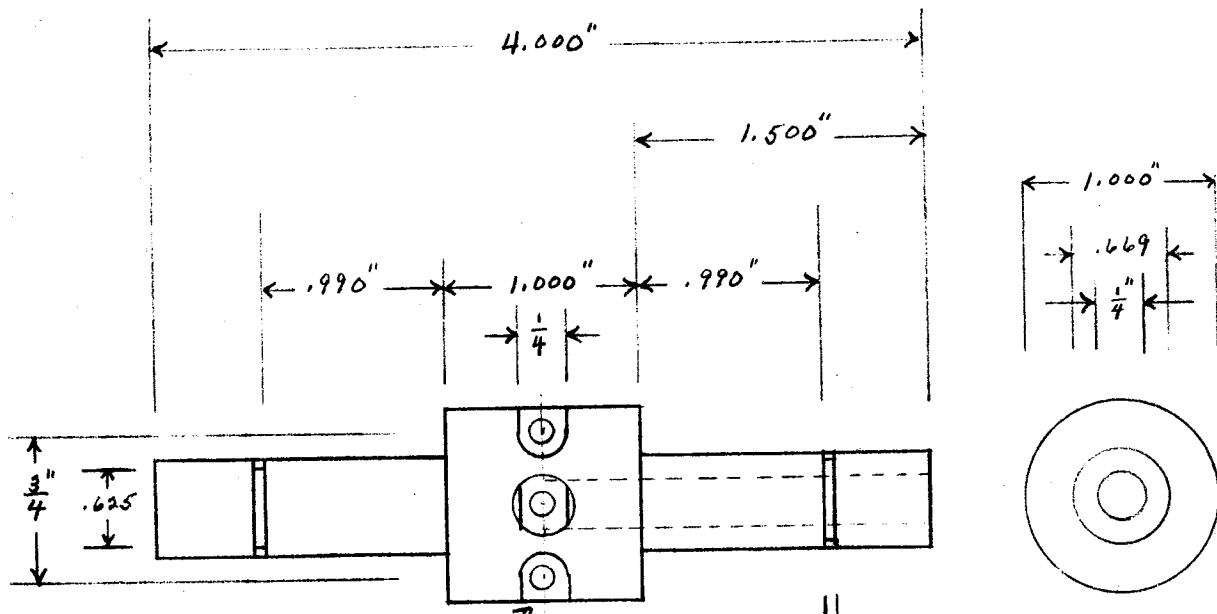
DRILL #38
3/4" DEEP
2 HOLES



DRILL #38
3/8" DEEP
2 HOLES

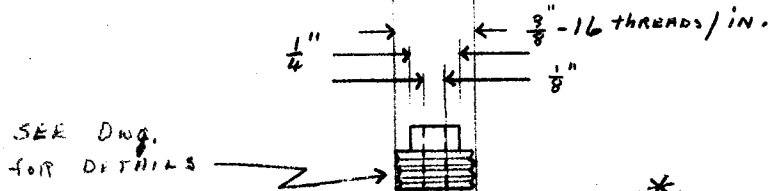


HYDROPHONE
TRANSDUCER STAND OFF
3 REQ'D
(Includes spare)
PLASTIC

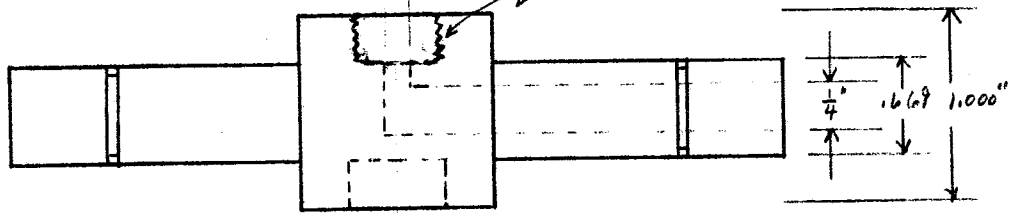


CLEARANCE
8 - 2 Holes

.040"



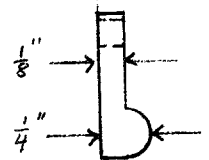
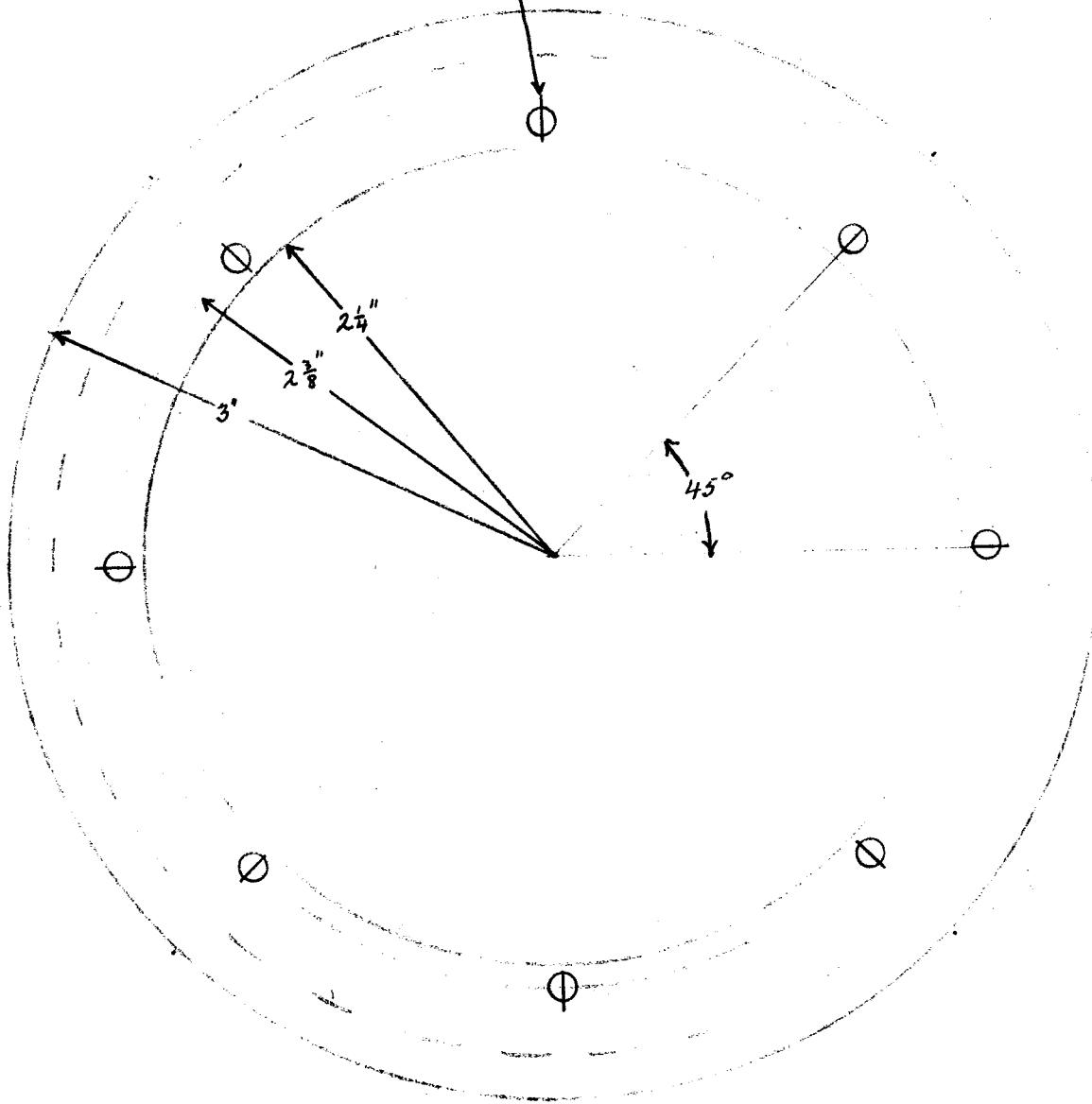
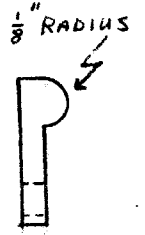
SEE Dwg.
FOR DETAILS



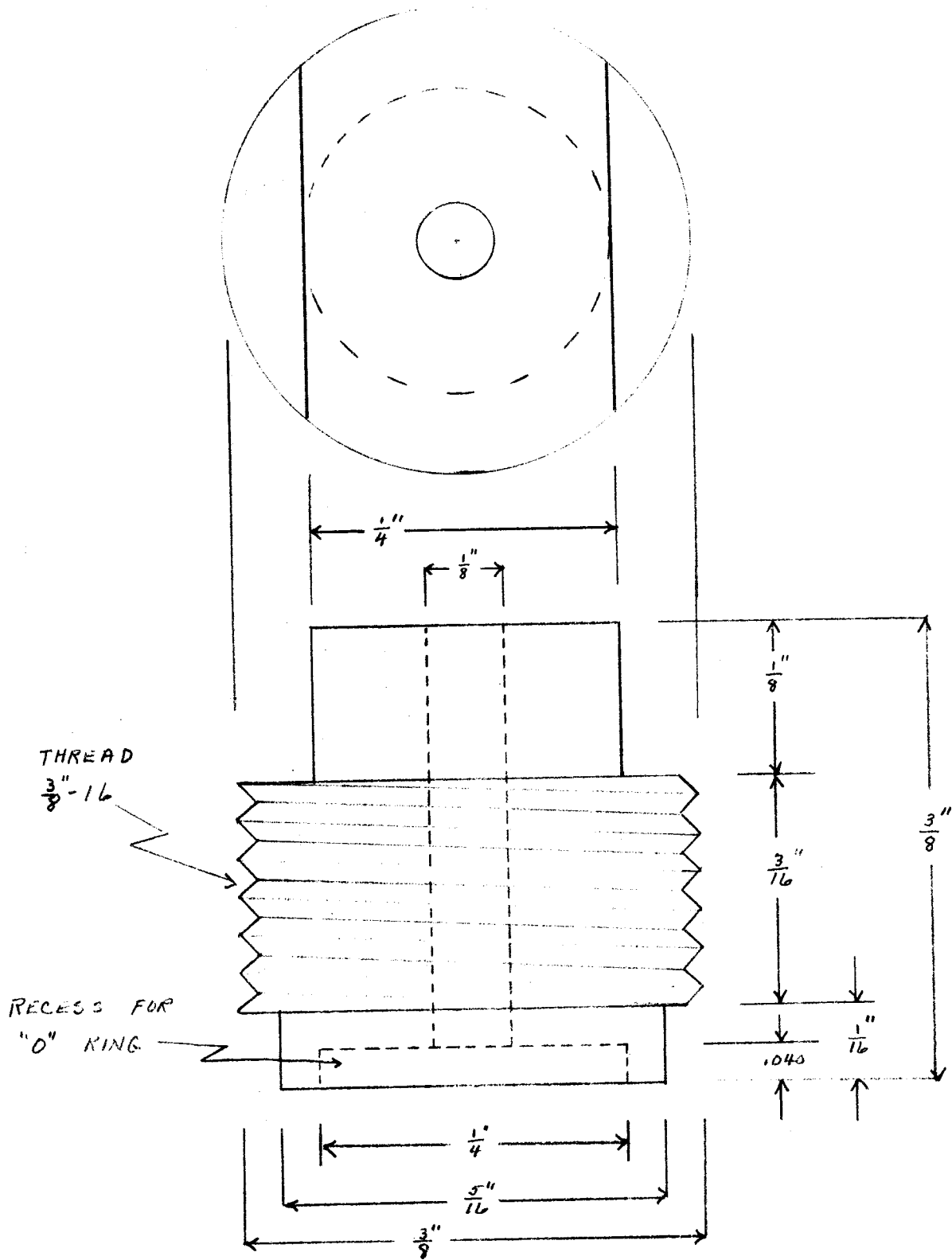
* NOTE: Bottom of hole
MUST BE FLAT AND
SMOOTH. DRILL 1/4" WITH
5/16" END WITH AND TAP.
3/8" - 16.

HYDROPHONE
AXLE
3 REQ'D
(Includes spare)
BRSS

DRILL
CLEARANCE HOLES
#8-32 SCREWS
(8 HOLES)

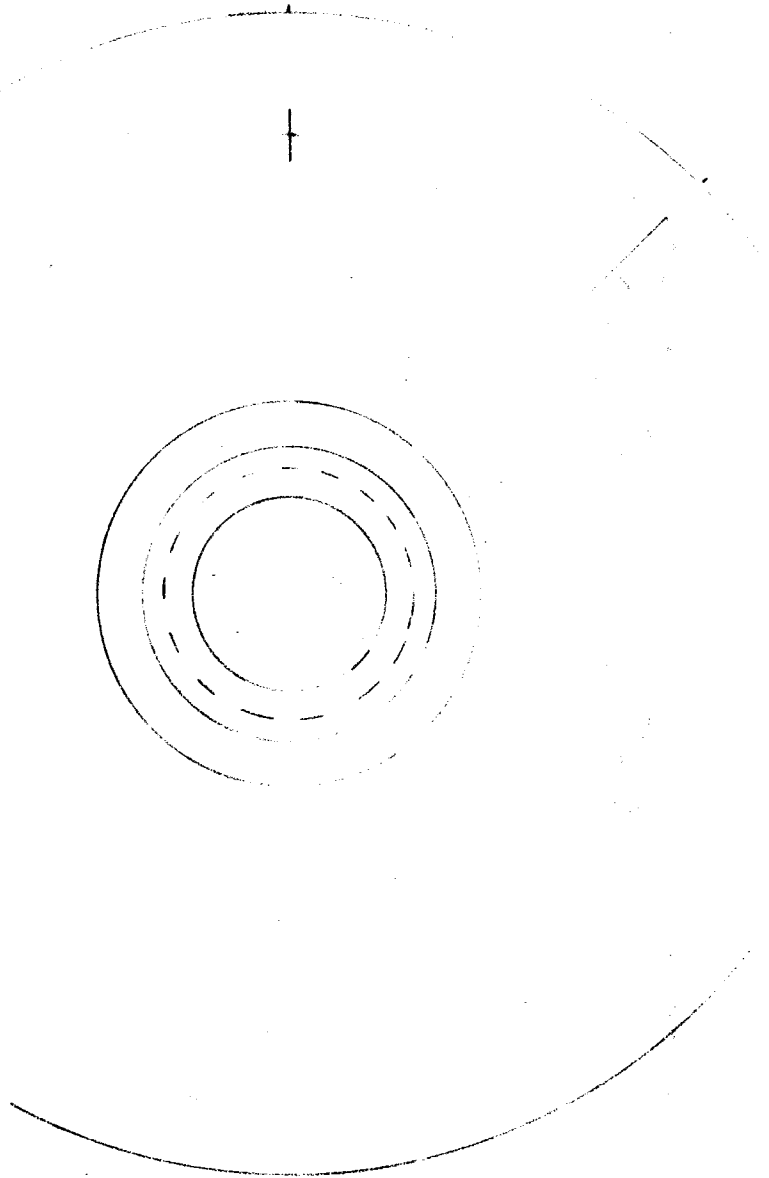
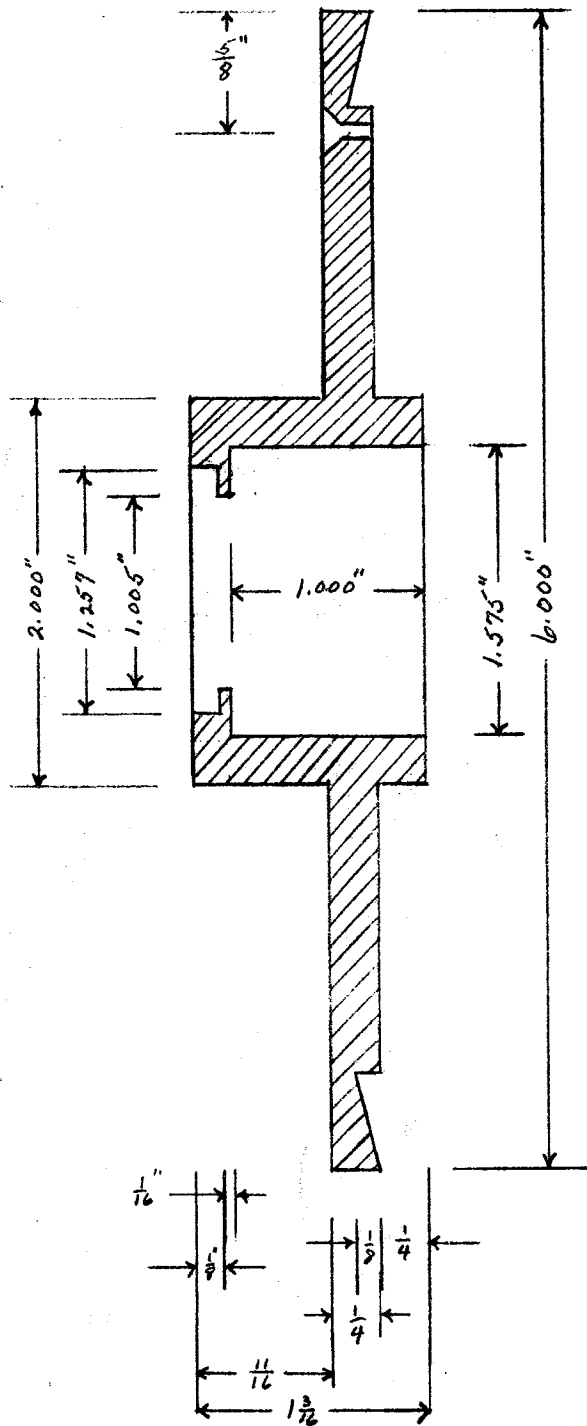


PICK UP WHEEL
TIRE RETAINING RING
6 REQ'D
(Includes spare)
AWUM



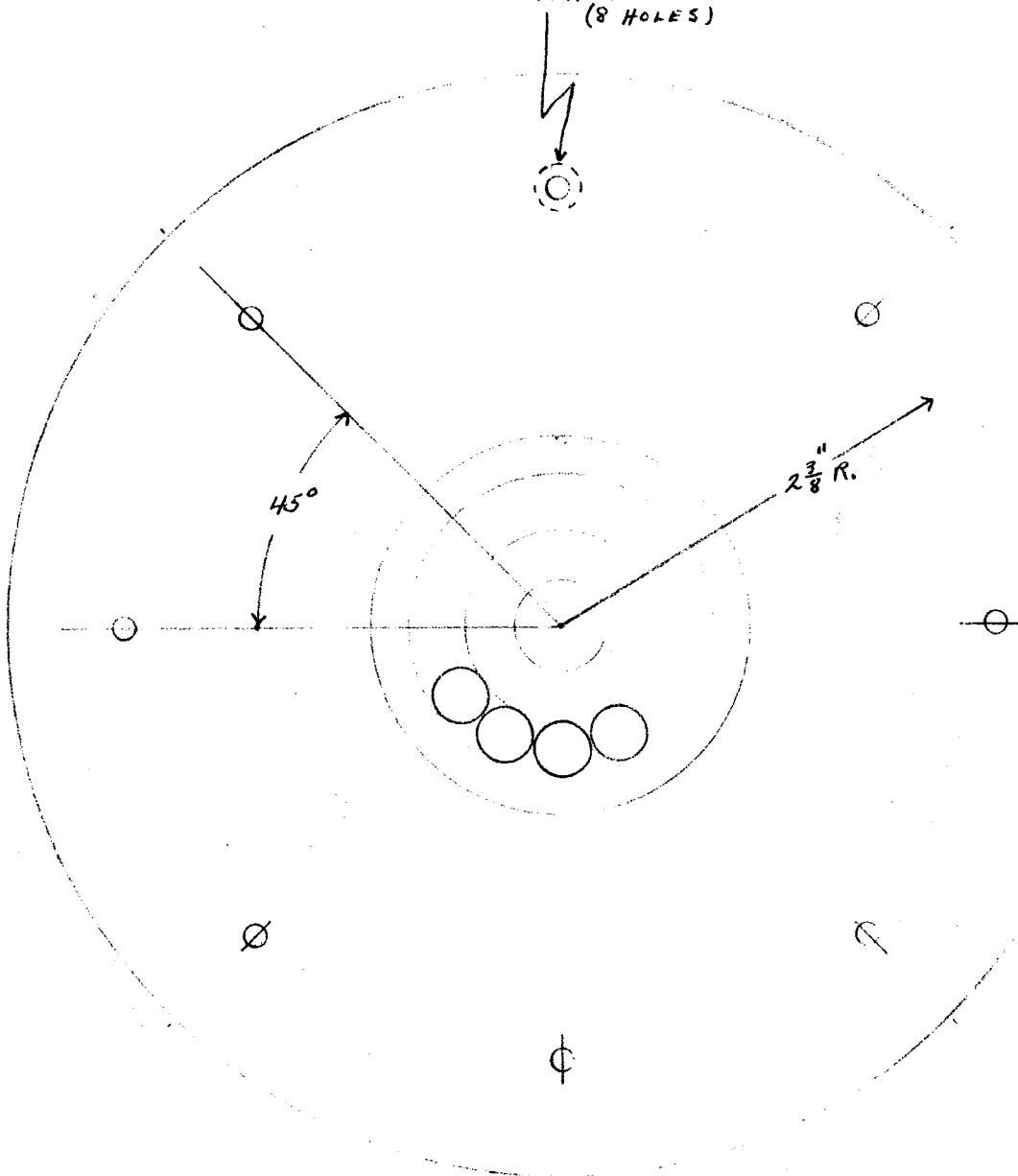
"O" RING - INTERNATIONAL
 HARVESTER * 263226 R1
 $\frac{1}{8}$ " I.D., $\frac{1}{4}$ " O.D., $\frac{1}{16}$ " CROSS SECT.

HYDROPHONE AXLE
 WIRE SEAL
 3 REQ'D.
 (Includes spare)
 BRASS



PICK UP WHEEL
 WHEEL HUB
 6 REQ'D
 (Includes spare)
 AKUM

DRILL & TAP 8-32
COUNTER SINK INSIDE
FOR FLAT HEAD SCREWS
(8 HOLES)



PICK UP WHEEL
WHEEL HUB
SCREW LAYOUT FOR
RETAINING RING

SECTION I - D

SUB ASSEMBLY: SPARE PICKUP WHEEL

Purchased Items

<u>QUANTITY</u>	<u>DESIGNATION</u>
4	Bearings, Federal #1203L
2	Seals, National 240731
1	Tube, Goodyear #3.504.10-4
2	8-32x 1/2", Flat Head Machine Screws
2	8-32 x 1/2" Round Head Machine Screws
2	5/8" I.D. Snap Ring
16	8-32 x 5/8" Flat Head Machine Screws
16	8-32 Hex Nuts
1	O-Ring, International Harvester #363226RI
1	6-32 x 1/4" Round Head Machine Screws
1	1/4 inch Cable Clamp, Waldom Type # KC 203
1	Hydrophone, Edo Western Model # 6042

Materials

<u>AMOUNT</u>	<u>DESCRIPTION</u>
2 x 6 inches	1/4" Aluminum Plate
4 1/2 inches	1 1/8" Diameter Brass Rod
4 inches	6 1/2 Diameter Aluminum Rod
1/2 inch	1/2 Diameter Brass Rod
2 inches	1 Diameter Plastic Rod

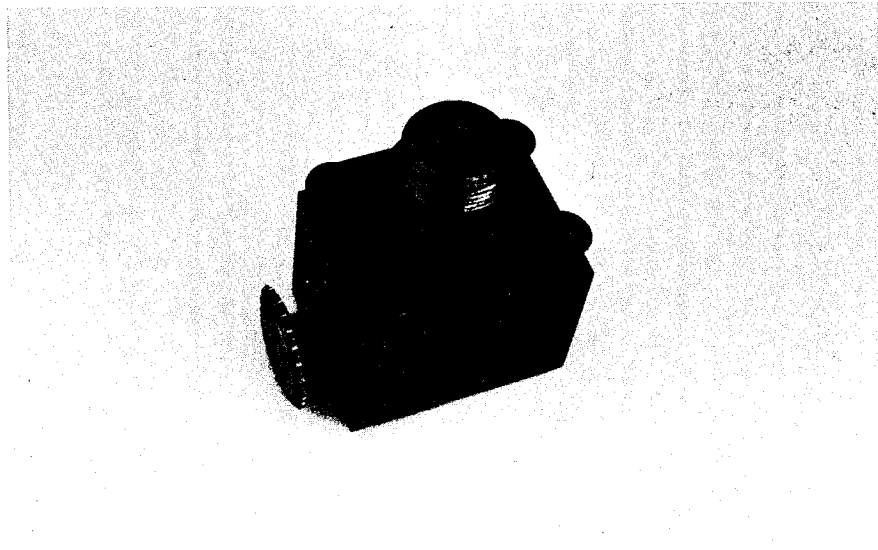


FIGURE 11

Delamination Detector
Transmission Gear Box

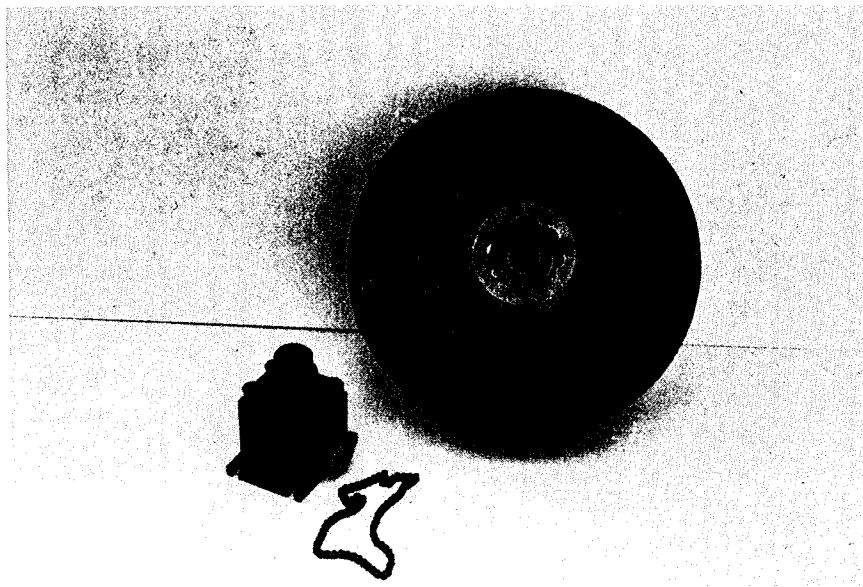


FIGURE 12

Transmission Gear Box
Drive Chain and Sprocket

SECTION I - E

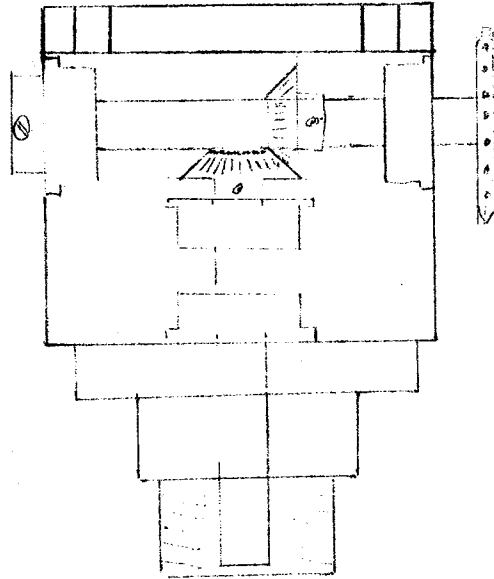
SUB ASSEMBLY: TRANSMISSION

Purchased Items

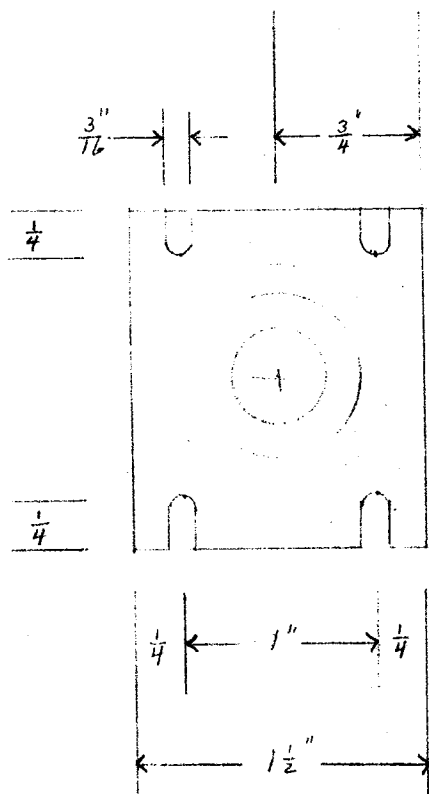
<u>QUANTITY</u>	<u>DESIGNATION</u>
1	Chain Sprocket, PIC type # EM 5-22
2	Bevel Gears, PIC type # N3-1-S
4	8-32 x 1/2 in. Round Head Machine Screw
4	#8 Flat Washers
4	#8-32 x 1/2" Flat Head machine Screws
1	1/4" x 3" Shaft, PIC type #A3-30
1	1/4" Collar, PIC type # C 1-6
1	1/4 x 2" Shaft Modified PIC type #A 3-20
4	Bearings, Barden #SFR-4SS

Materials

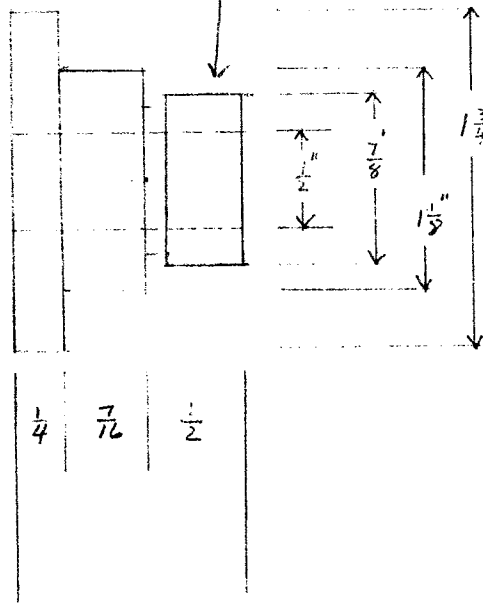
<u>AMOUNT</u>	<u>DESCRIPTION</u>
4 inches	2" x 2" Aluminum Brass Bar
3 x 3 inches	1/4" Aluminum Plate



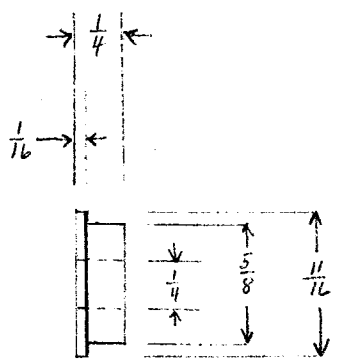
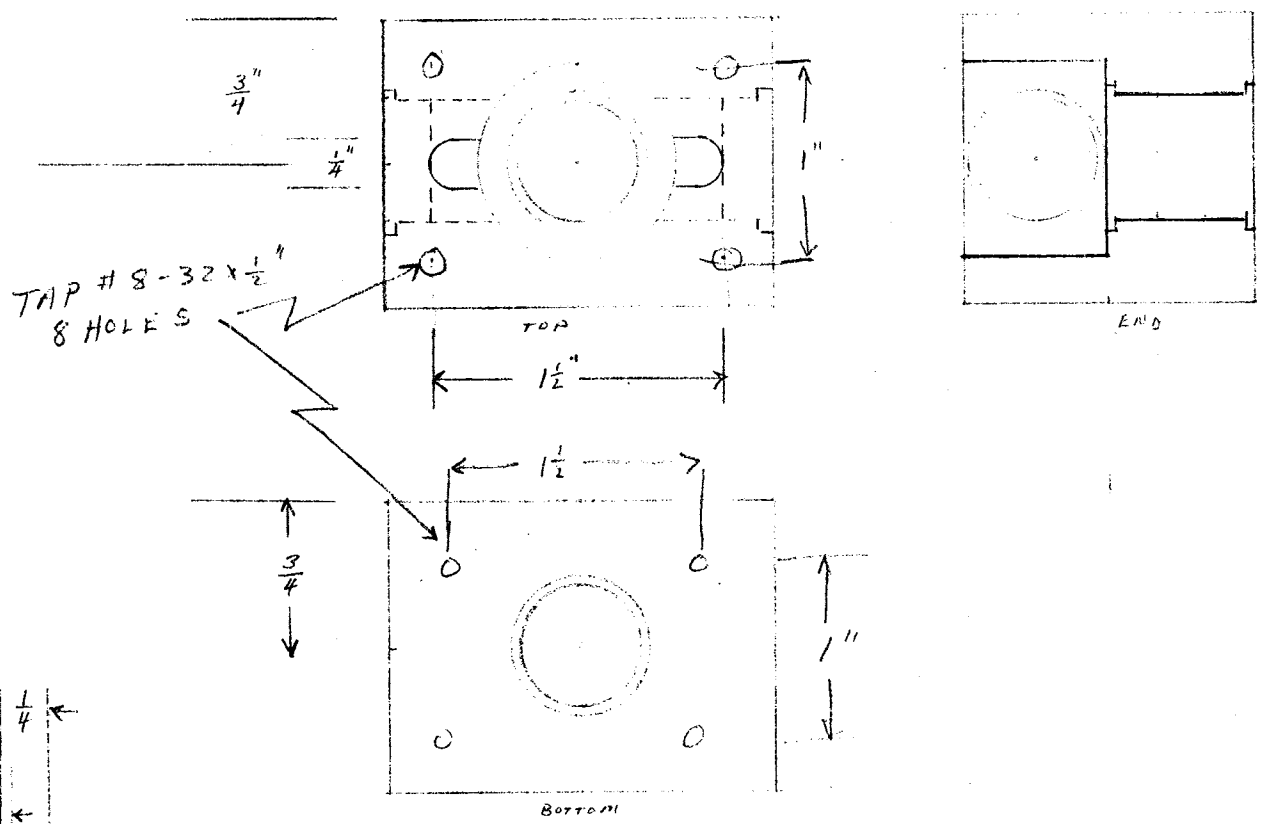
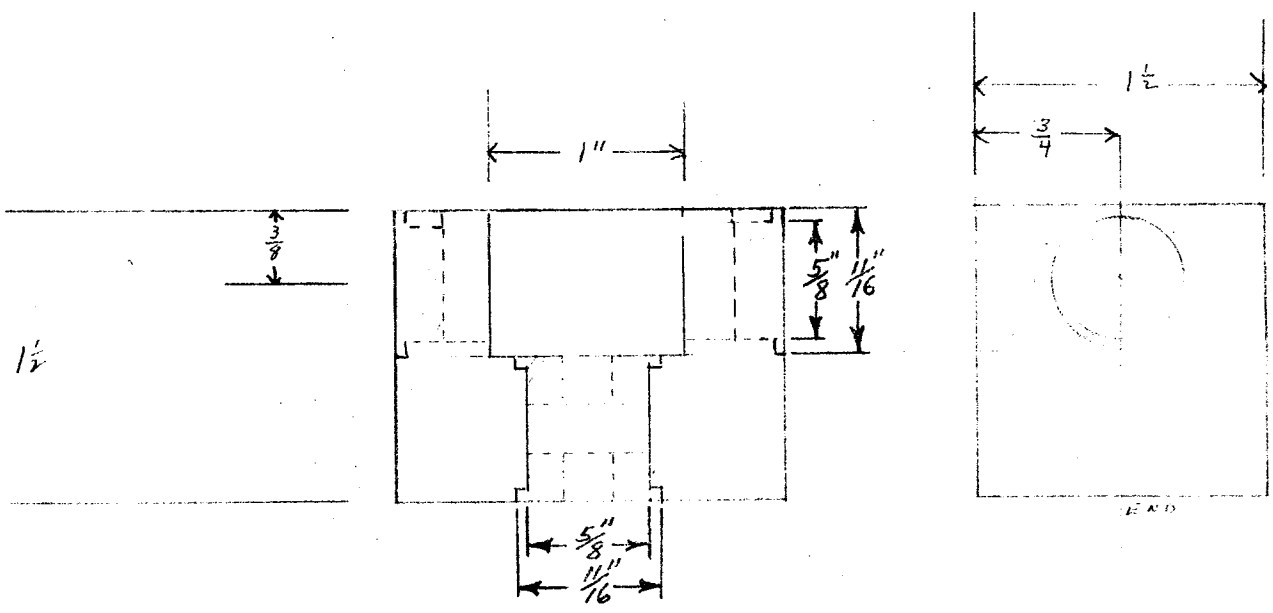
TRANSMISSION
ASSEMBLED
VIEW



THREAD $\frac{7}{8}" - 18$
 & UNDERCUT THREADS



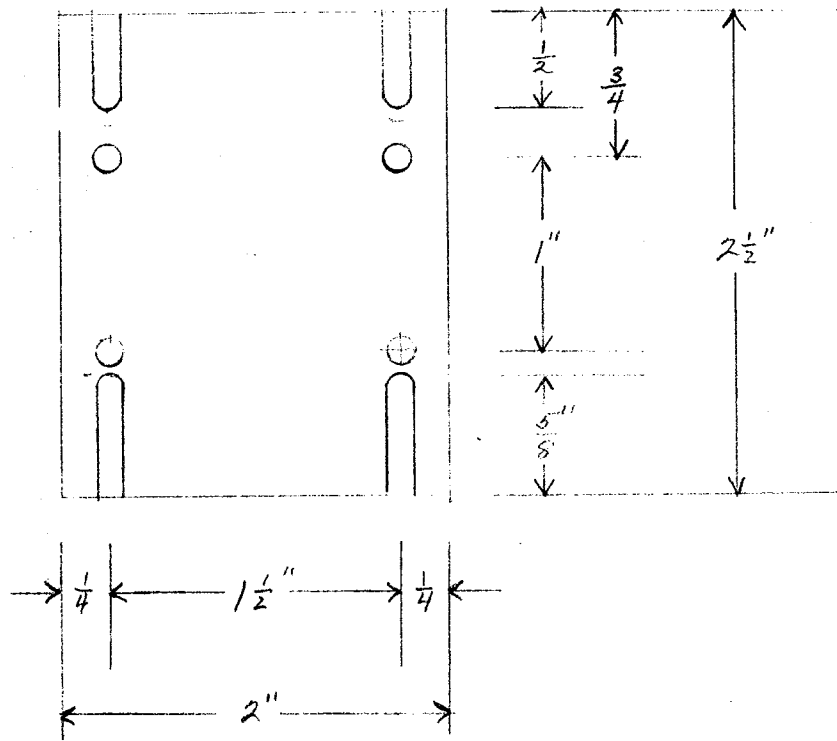
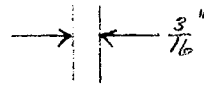
TRANSMISSION
 CABLE COUPLER
 1 REQ'D
 BRASS



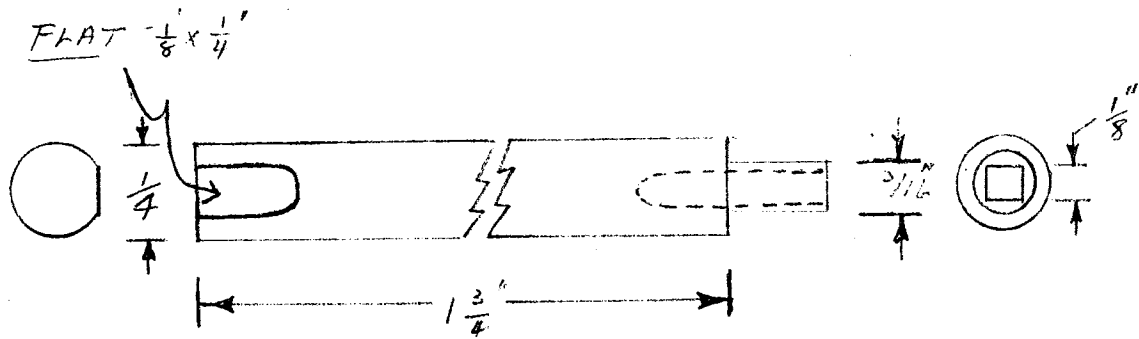
BEARING
 BARDEN # SFR 455
 4 REQ'D

TRANSMISSION
 HOUSING
 1 REQ'D
 BRASS

CLEARANCE
 8-32 &
 Counter sink
 4 Holes



TRANSMISSION BASE PLATE
 1 REQ'D
 1/4" ALUM



TURNS
 SHAFT
 1 REQ'D
 STEEL

SECTION II

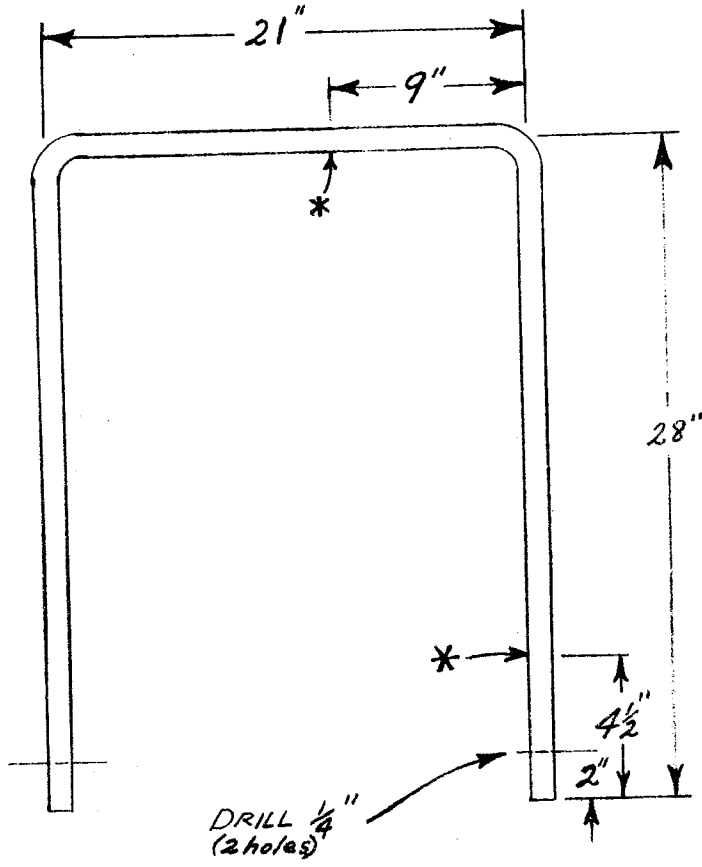
SUB ASSEMBLY: HANDLE

Purchased Items

<u>QUANTITY</u>	<u>DESIGNATION</u>
1	Bicycle Brake Cable, 46" long with hand grip actuator
2	10-32 x 7/8" Flat Head Machine Screws
4	1/4"-20 x 1 1/4" Hex Machine Bolt
2	10-32 x 1 1/4" Allen Head Cap Screws
1	Grommet, 1/4" I.D.

Materials

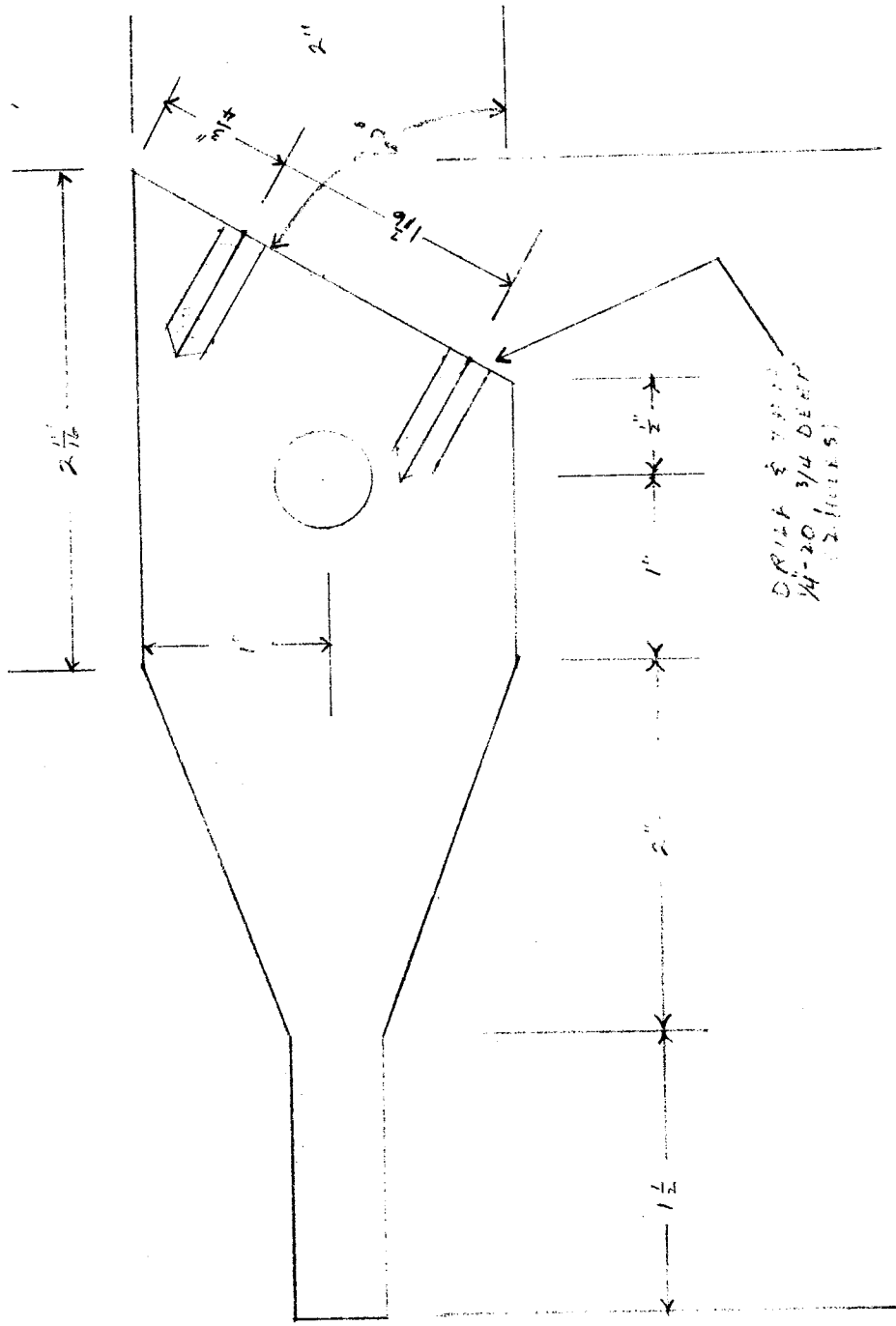
<u>AMOUNT</u>	<u>DESCRIPTION</u>
80 inches	Aluminum Tubing 1 inch O.D. x 1/8 in. wall thickness 6061-T6
14 x 2 1/2 inches	1/2 in. Aluminum Plate
4 x 6 inches	3/4 in. Aluminum Plate
13 inches	3/4 in. Diameter Aluminum Bar
1 inch	1/2 in. Diameter Brass Bar



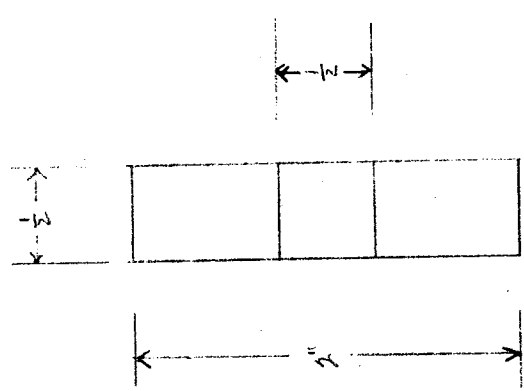
MATERIAL: 30" of
 1" O.D., 3/4 I.D.
 ALUM. TUBING
 6061-T6

* DRILL 1/4" HOLE
 for SPRAY CABLE
 TO PASS THROUGH
 HANDLE. LOWER
 HOLE TAKES IN
 CABLE

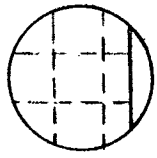
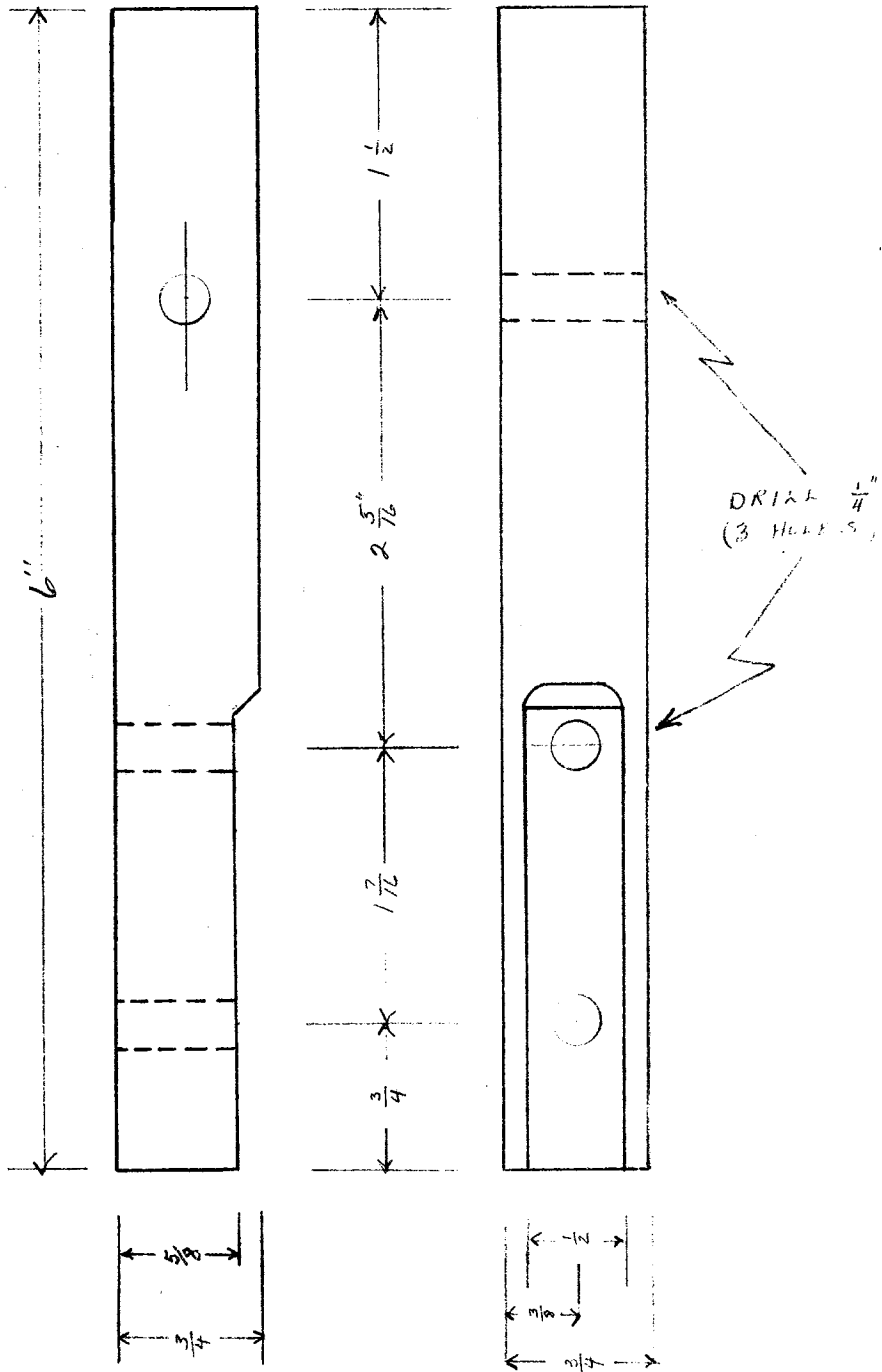
CART HANDLE
 1 REQ'D
 ALUM TUBING



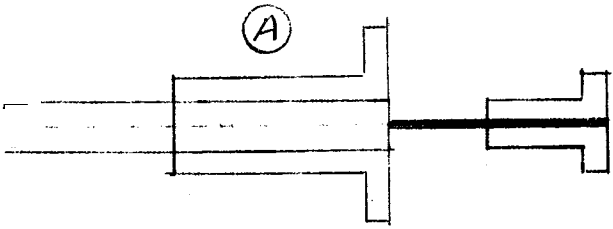
DRILL 8 THRU
1/4-20 3/4 DEEP
(2 PLACES)



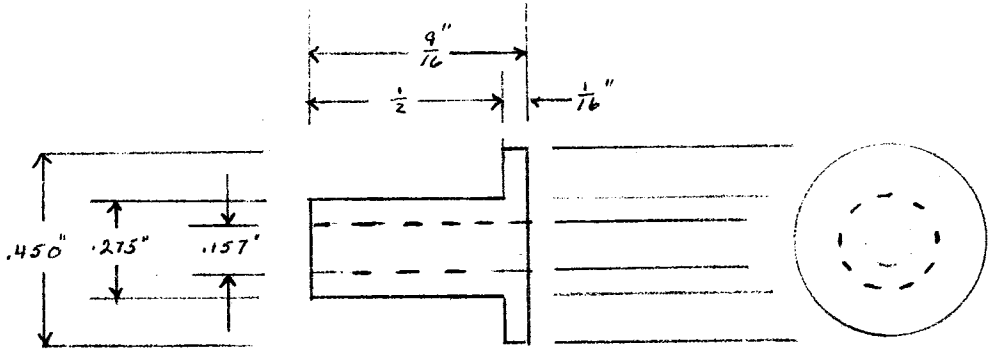
CART HANDLE PIVOT
2 REQ'D
ALUM



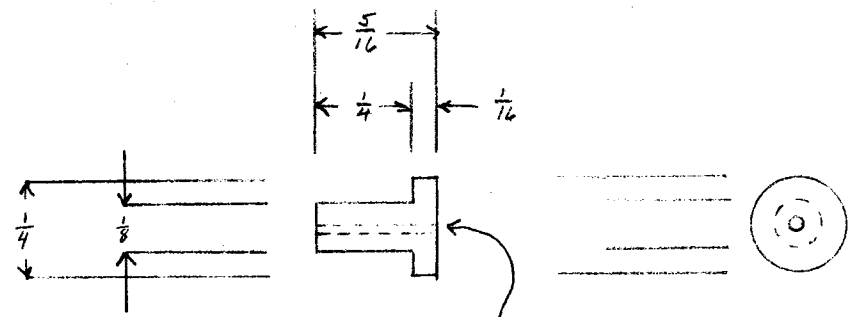
CART HANDLE
 ADAPTER
 2 REQ'D
 PLUM



(B)



(A)



(B)

DRILL HOLE FOR
SNUG FIT ON WIRE

PAINT MARKER
BICYCLE HAMB SPARE
MODIFICATION
LEAD PENCIL
BRASS

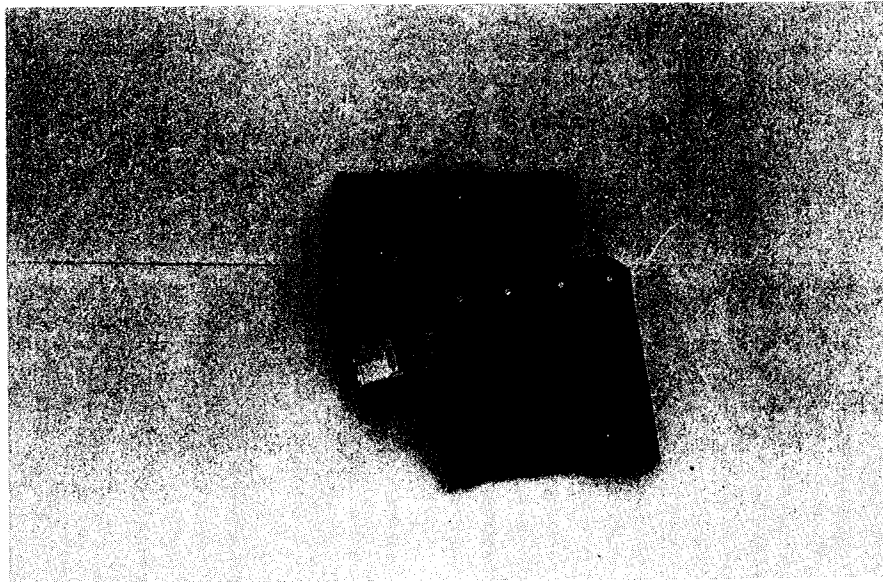


FIGURE 13

Delamination Detector
Paint Marker Assembly

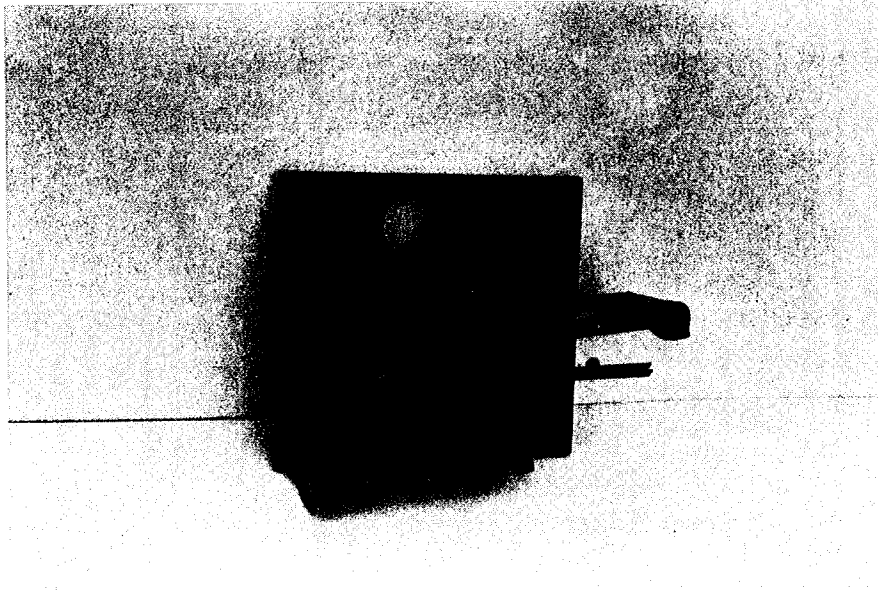


FIGURE 14

Delamination Detector

Paint Marker Detail

SECTION III

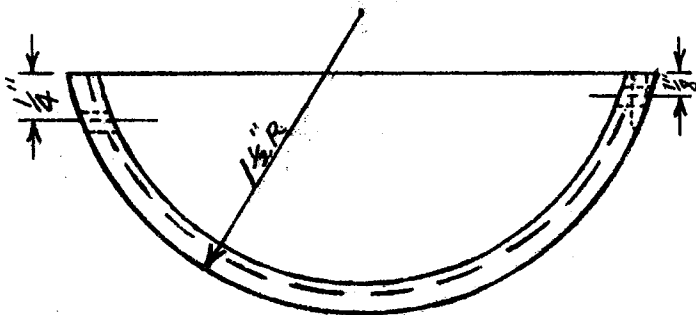
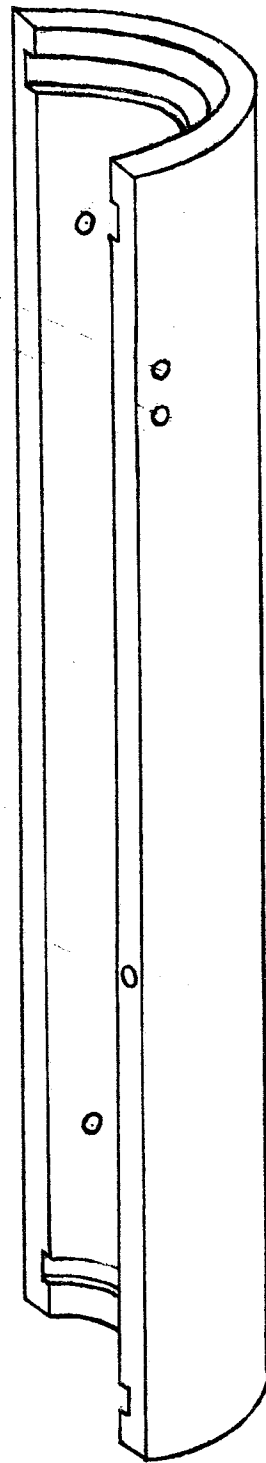
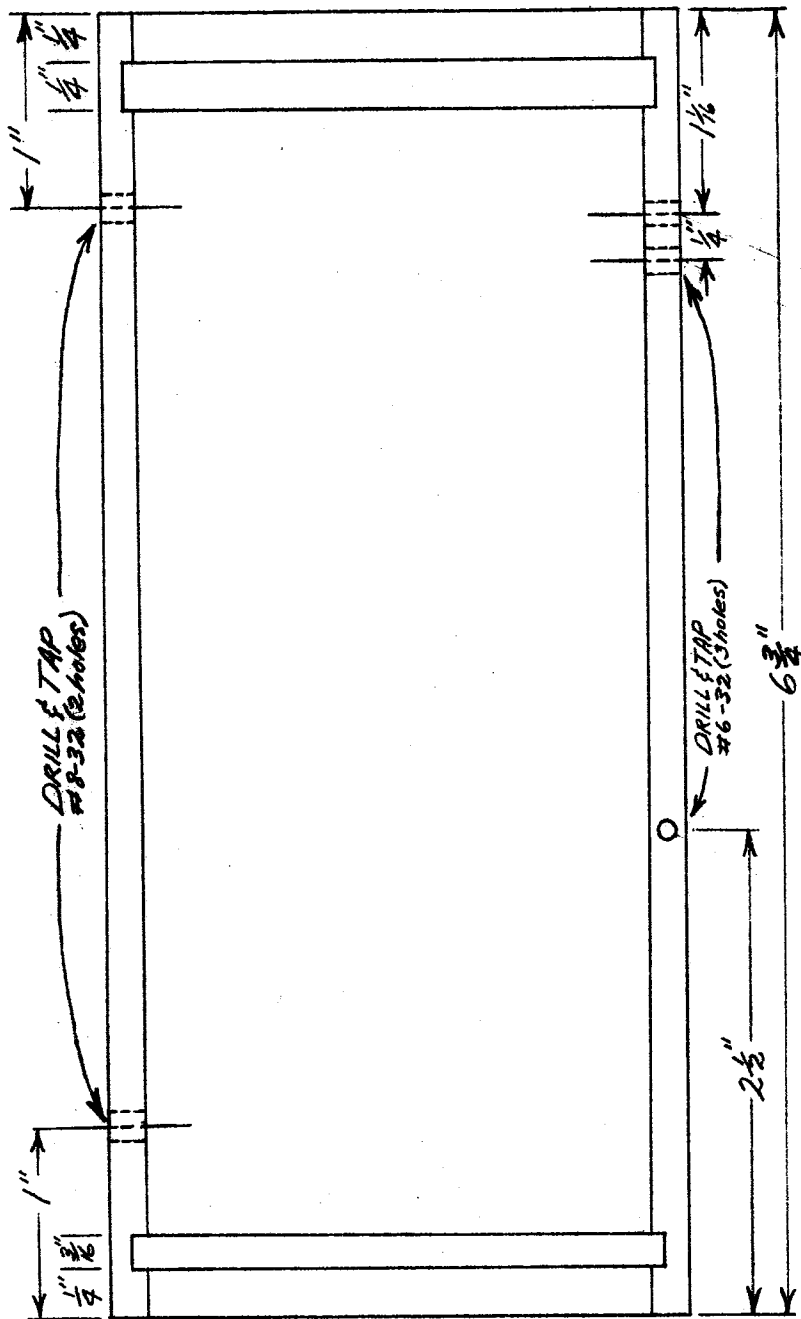
SUB ASSEMBLY: PAINT MARKER

Purchased Items

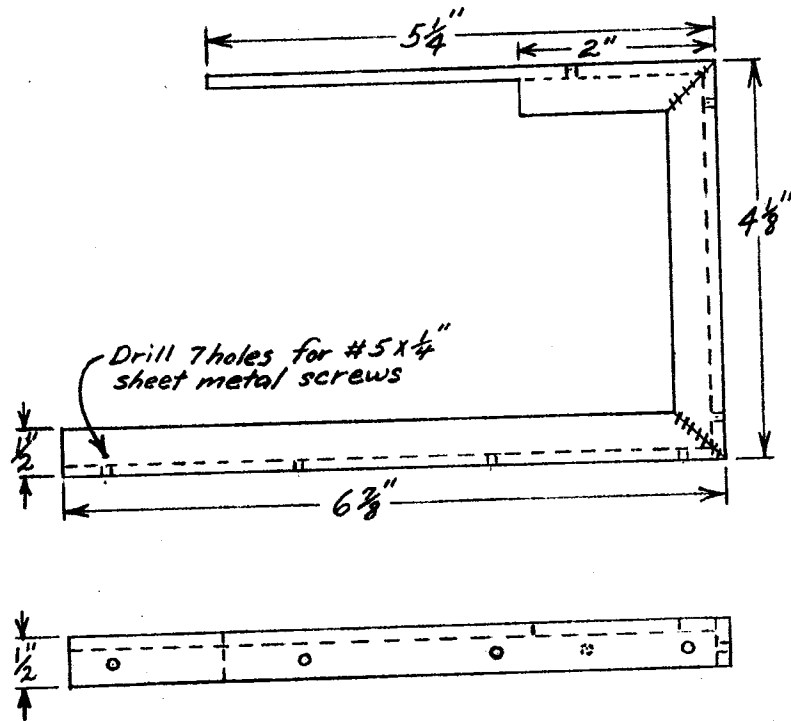
<u>QUANTITY</u>	<u>DESIGNATION</u>
2	#8-32 x 1/2" Round Head Machine Screws
1	#6-32 x 1/4" Round Head Machine Screws
2	#6-32 x 3/4" Round Head Machine Screws
1	1/8" x 1/4" Long Roll pin
1	1/4" O.D. x 1 1/8" long, Tension spring
1	#6-32 x 1 1/4", Round Head Machine Screws
1	1/4" O.D. x 3/4" long, Compression spring
1	Handle, Bud, Type H-9168
2	#6-32 x 1/2" Round Head Machine Screws
8	#4 x 1/4" Sheet metal screws
4	#8-32 x 3/4" Flat Head Machine Screws

Materials

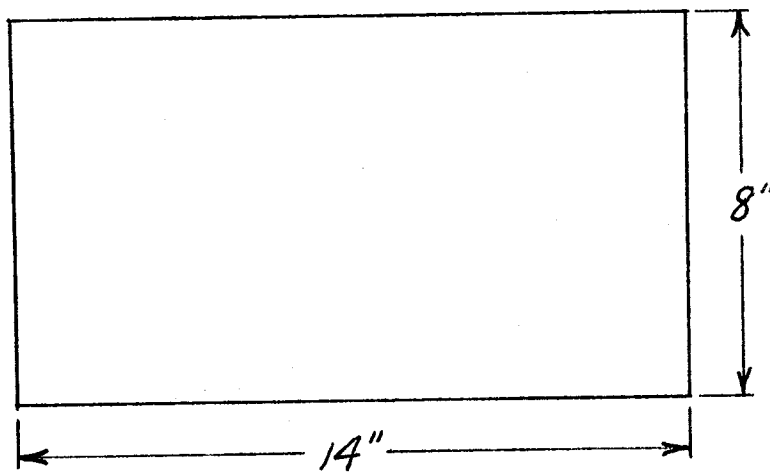
<u>AMOUNT</u>	<u>DESCRIPTION</u>
12 x 12 inches	1/4 in. Aluminum Plate
7 inches	3 in. Diameter x 3/16 in. wall thickness Aluminum Tubing
1 x 1 inches	5/8 in. Aluminum Plate
2 1/2 inches	1/2 x 1/2 in. Aluminum Bar
12 x 16 inches	Sheet Rubber 1/16 in. thick
18 inches	Aluminum Angle 1/2 x 1/2 inch



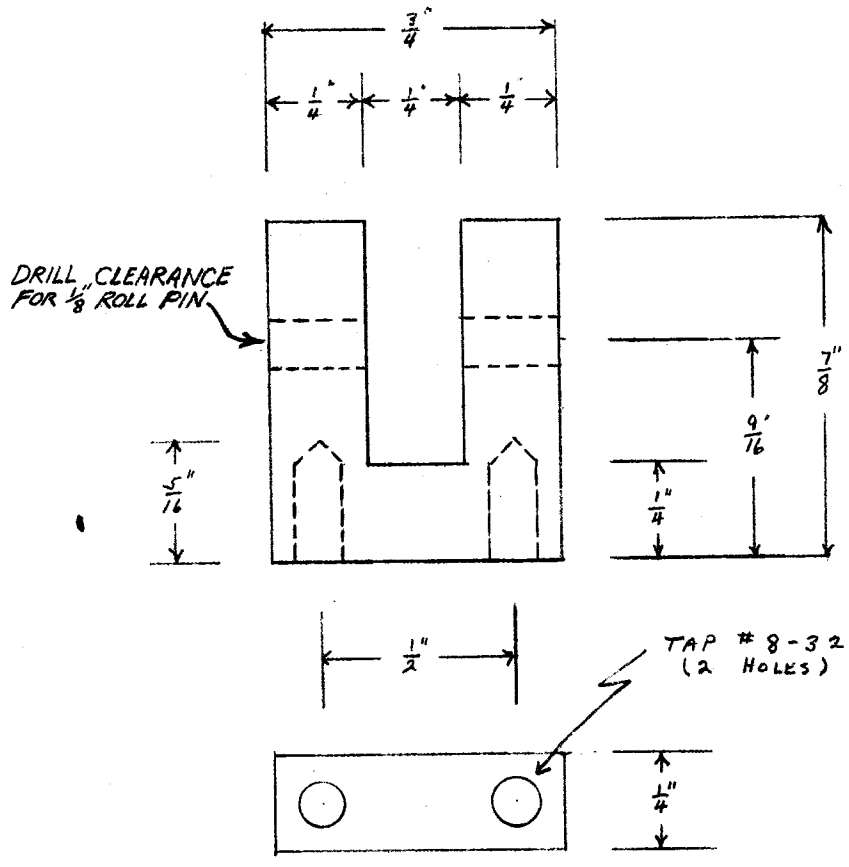
PRINT AREA
 CAN BE
 USED
 HERE



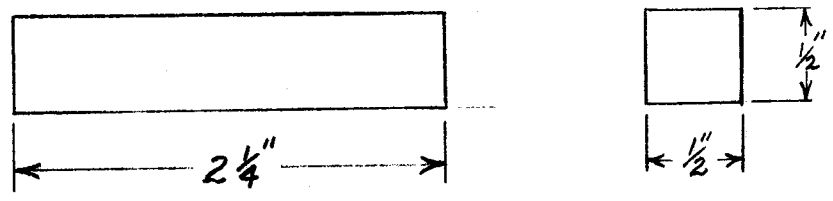
PAINT MARKER
 SKIRT HOLDER
 1 REQ'D
 1/2" x 1/2" ALUM ANGLE



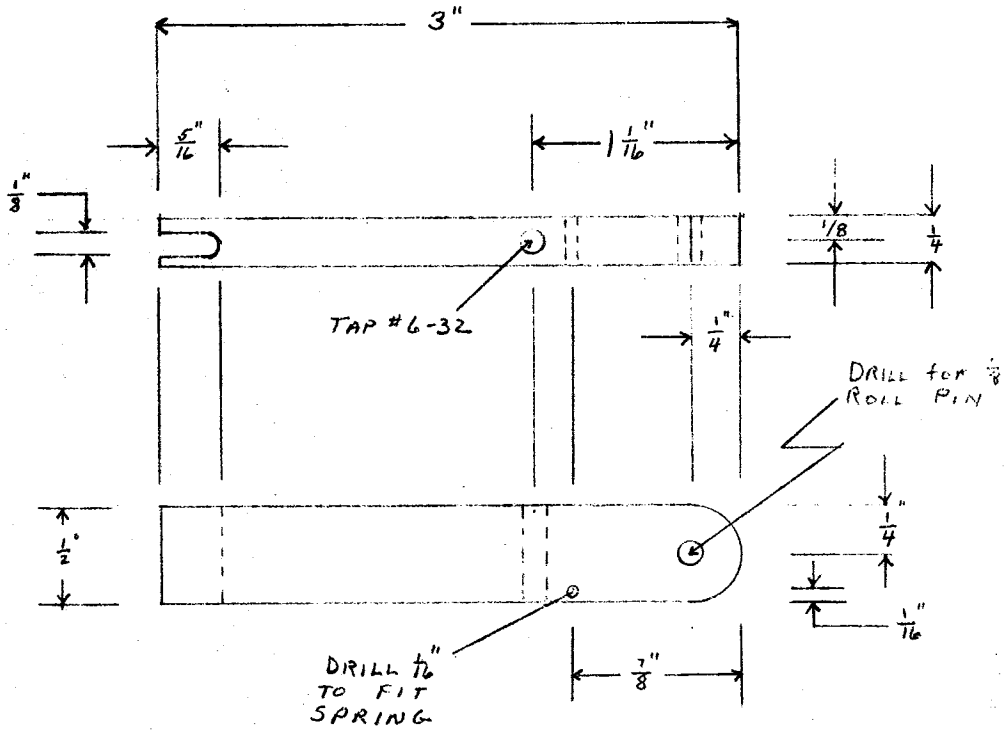
PAINT MARKER SKIRT
 1 REQ'D
 1/8" RUBBER



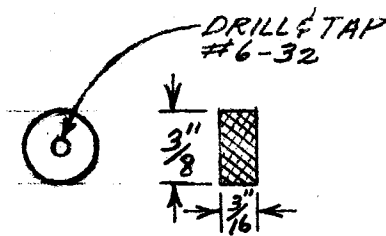
PAINT MARKER
 SPRAY BRACKET
 1 REQ'D
 ALUM



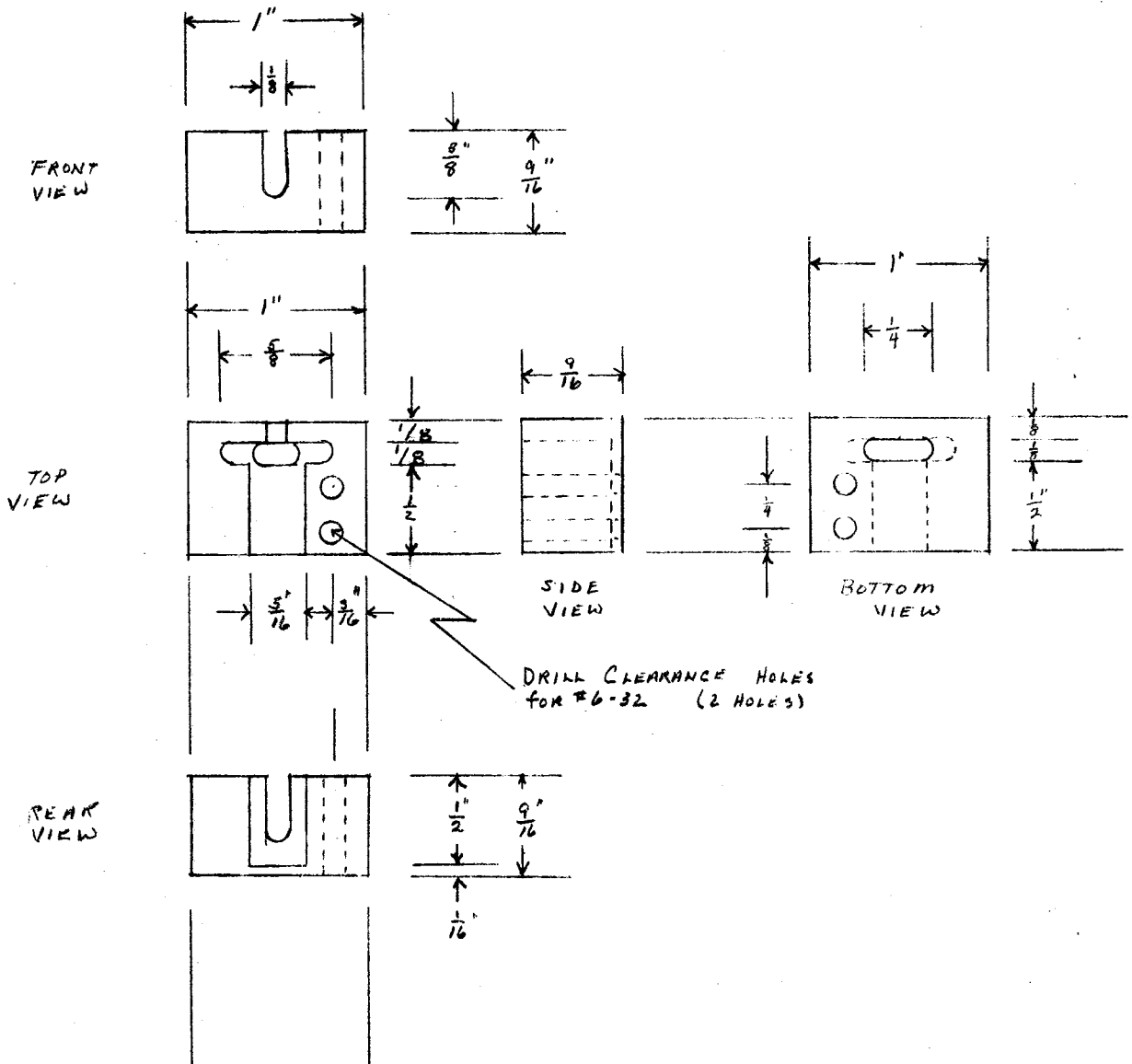
PAINT MARKER
 CAN HOLDER BRACE
 1 REQ'D
 ALUM



PAINT MARKER
 SPRAY ARM
 1 REQ'D
 ALUM



PAINT MARKER
 SPRAY ARM
 KNURLED KNOB
 1 REQ'D
 ALUM



PAINT MARKER
 CABLE END RETAINER
 1 REQ'D
 ALUM

SECTION IV

SUB ASSEMBLY: RECORDER DRIVE CABLE

Purchased Items

QUANTITY

DESIGNATION

1

Drive cable, 1969 Plymouth Speedometer Cable (cut to
34 1/2 inch length and modify one end)

Materials

AMOUNT

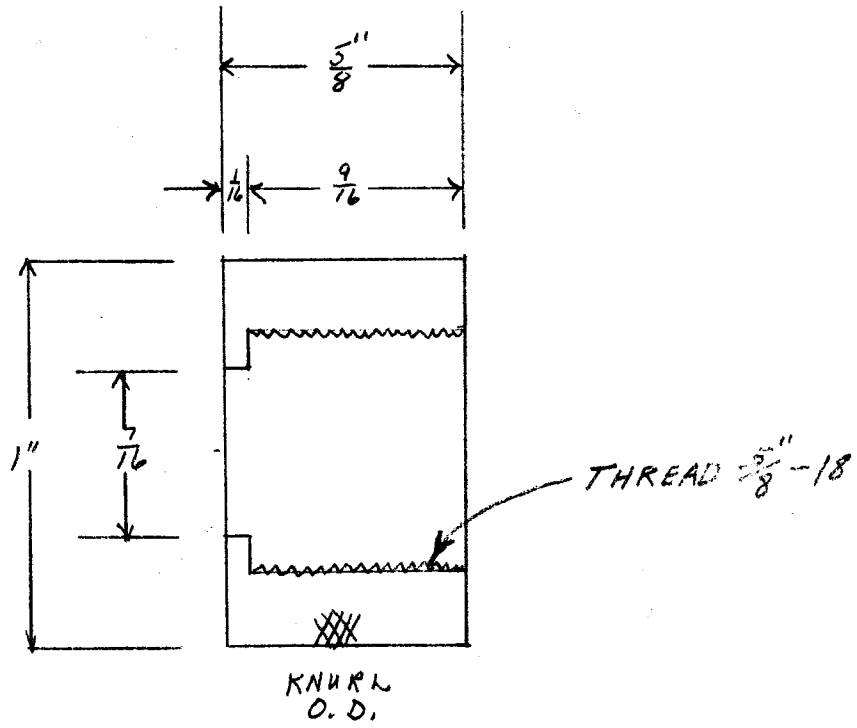
DESCRIPTION

1 inch

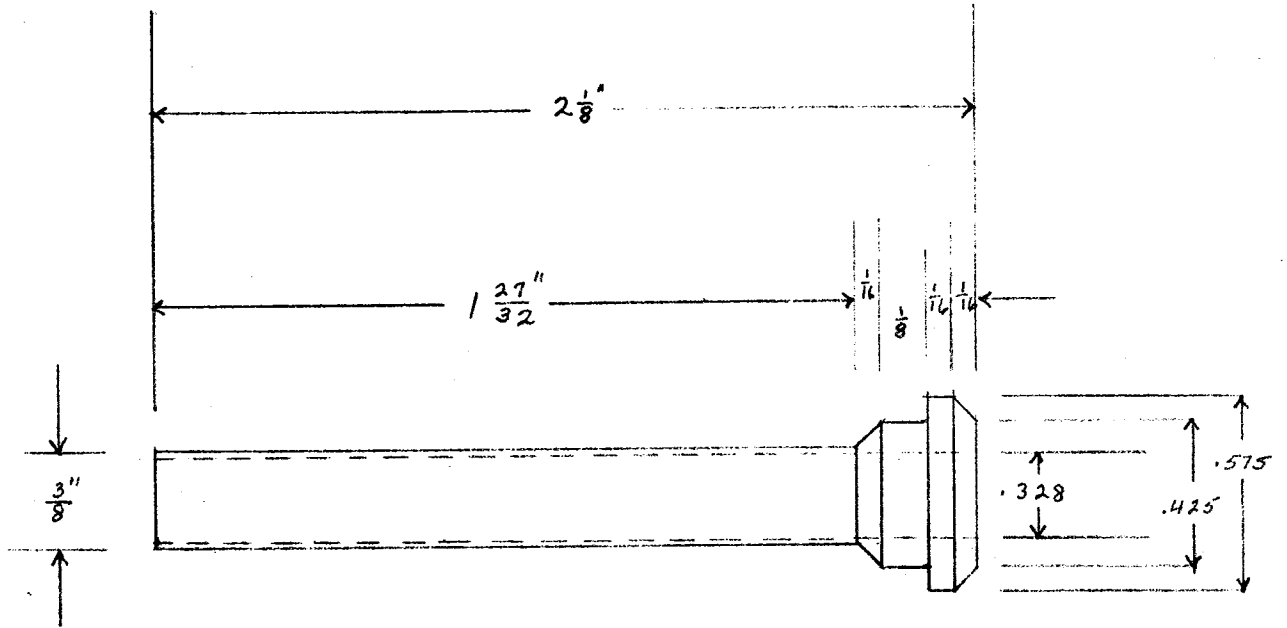
1 inch Diameter Brass Rod

4 inches

5/8 inch Diameter Brass Rod



RECORDER DRIVE
 CABLE NUT
 1 REQ'D
 BRASS

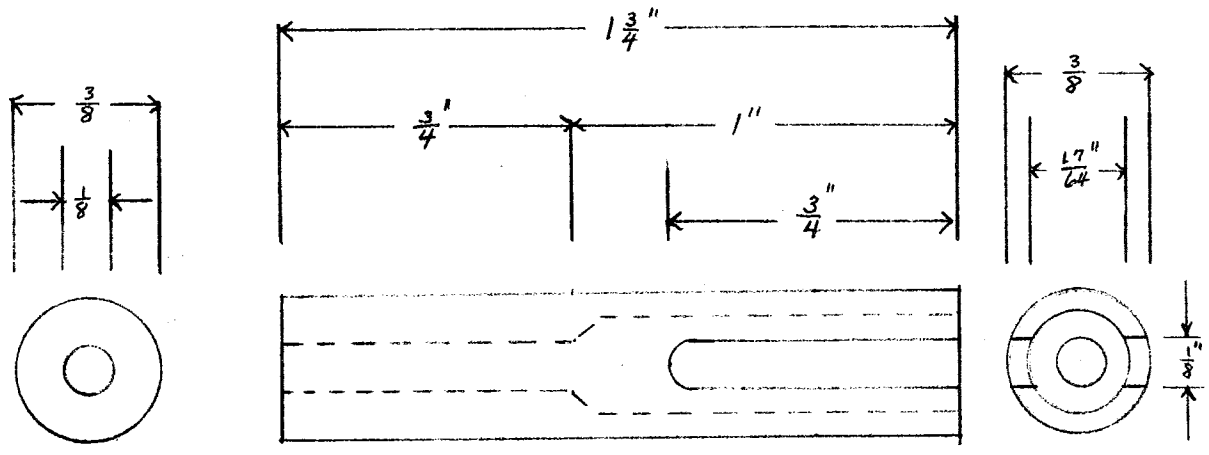


NOTE:

$\frac{3}{8}$ " HOUSING FITS
 CUT-OFF END OF
 SPEEDOMETER CABLE
 HOUSING.

RECORDER DRIVE HOUSING END

1 REQ'D
 BRASS



NOTE:
 1/8" BORE FITS ON
 SPEEDOMETER CABLE
 INSIDE SHAFT.

RECORDER DRIVE CABLE END
 1 REQ'D
 BRASS

SECTION V

SUB ASSEMBLY: RECORDER (MODIFIED)

Purchased Items

<u>QUANTITY</u>	<u>DESIGNATION</u>
1	Recorder, Techni-Rite Model TR-722
2	Helical Gears (Rt. Drive), W. M. Berg type #H32S28-R24
1	1/8" x 1/2 in. long, roll pin
1	1/4-20 Hex Nut
4	Elonged Bearings, PIC Type # E2-9
4	8-32 x 1/2 in. Round Head Machine Screws
2	6-32 x 1/2" Flat Head Machine Screws
1	4-40 x 1/8" Allen Head Set Screw
1	Bushing 1/4 I.D. x 5/8 O.D. x 1/16" Thick, Oilrite type #AA 710-3
1	10-32 x 1/2" Round Head Machine Screws
1	Chart Rewinder, Techni-Rite Model TAC-96
2	Roll Pin 1/8" Diameter x 1/2 in. long
3	2-56 x 3/8" Round Head Machine Screws

Materials

<u>AMOUNT</u>	<u>DESCRIPTION</u>
1 inch	1 inch Hex Brass
6 inches	1/4" Diameter Steel Rod
2 1/4" x 1 1/4"	1/2" Aluminum Plate
3 inches	1 x 1 1/2" Aluminum Bar
6 inches	1/2 Diameter Steel Rod

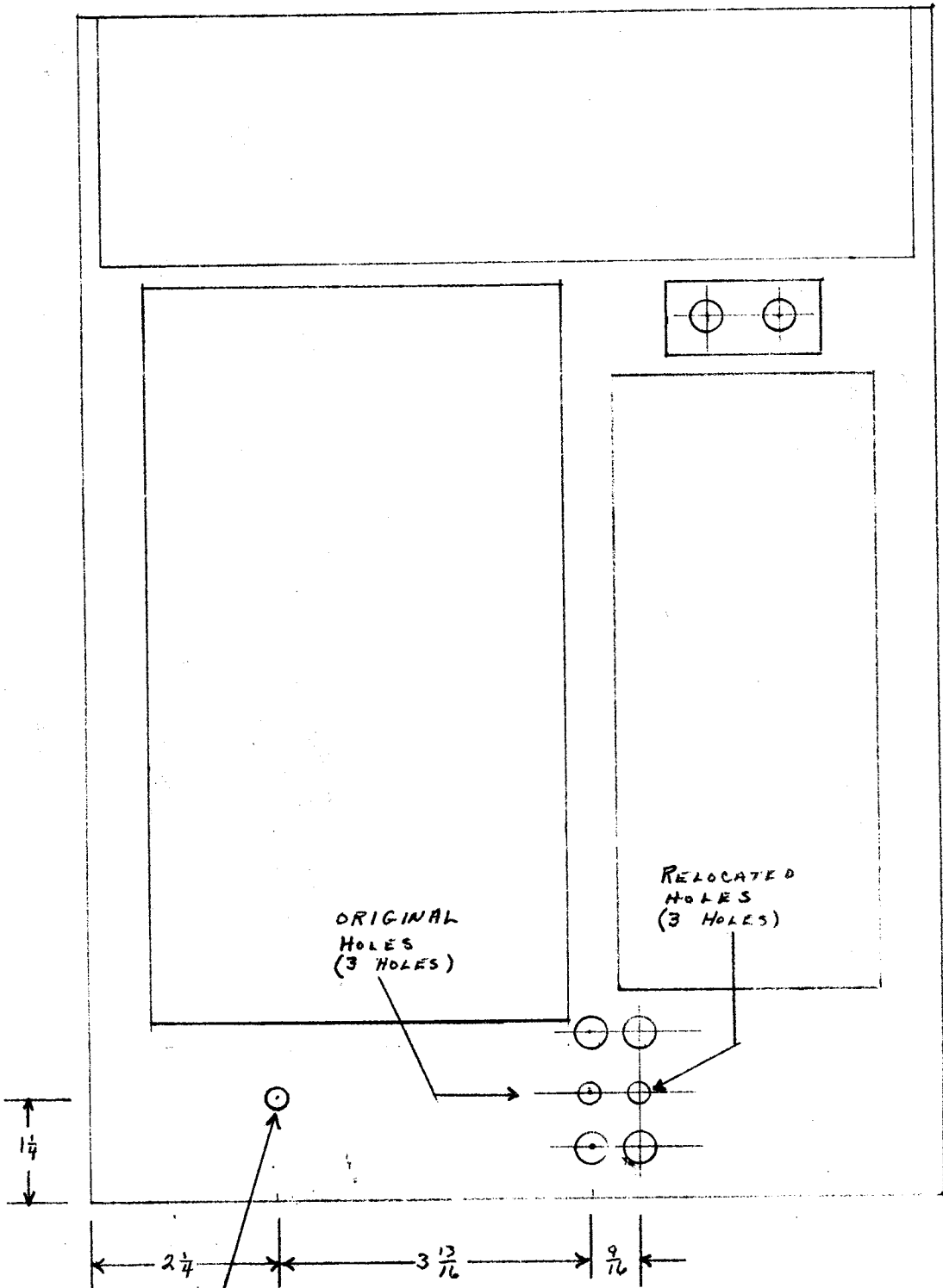
SUB ASSEMBLY: RECORDER (continued)

-2-

2 1/2 inches 1 5/8" Diameter Aluminum Rod

1 1/2 inches 5/8" Diameter Brass Rod

6 inches 1/4" Diameter Brass Rod



ORIGINAL
HOLES
(3 HOLES)

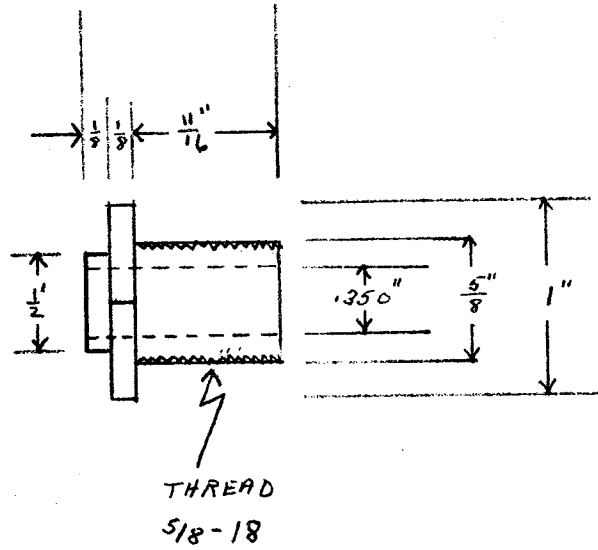
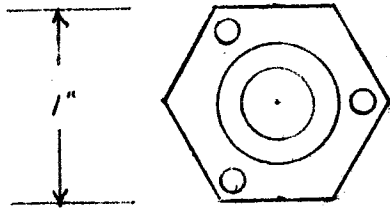
RELOCATED
HOLES
(3 HOLES)

DRILL CLEARANCE
FOR # 10-32

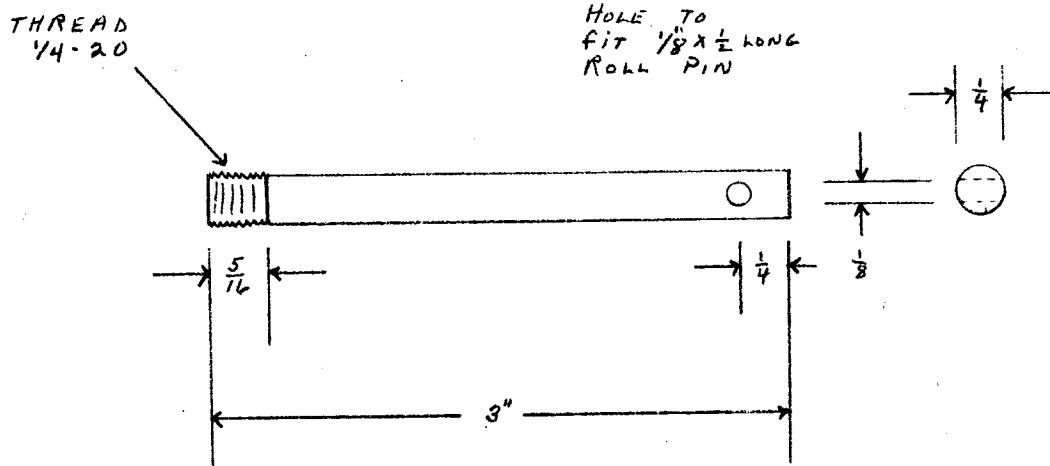
DUPLICATE
ORIGINAL HOLES
 $9/16$ " TO RIGHT

RECORDER
CASE MODIFICATION

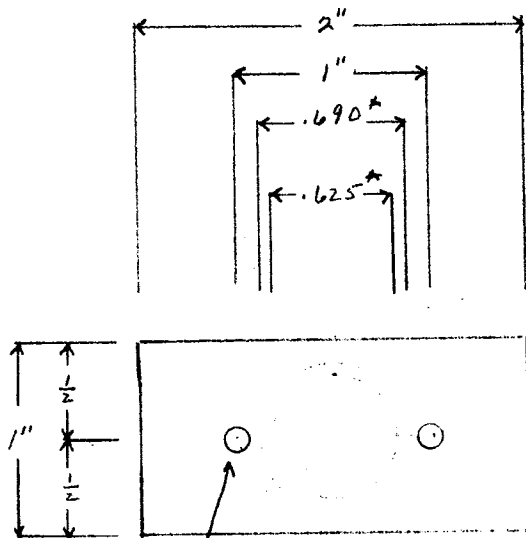
DRILL $\frac{1}{8}$ " (120°)
3 HOLES



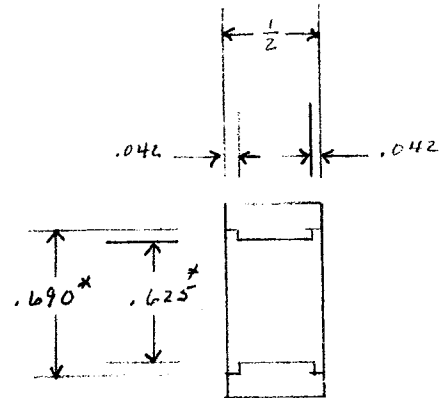
RECORDER DRIVE CABLE
CONNECTOR
1 REQ'D
HEX BRASS



RECORDER
 DRIVE MODIFICATION
 1 REQ'D
 STEEL



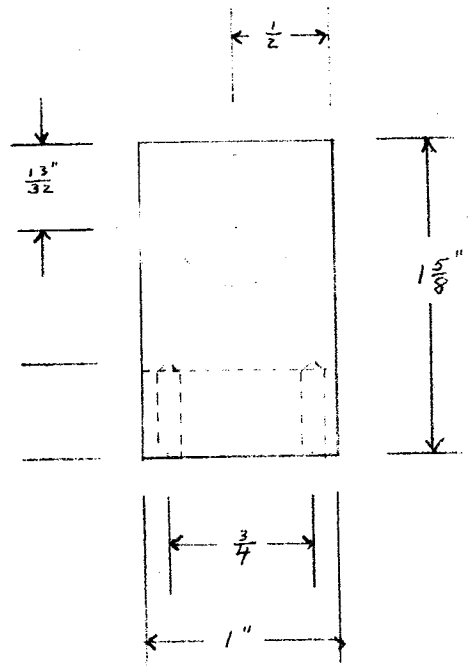
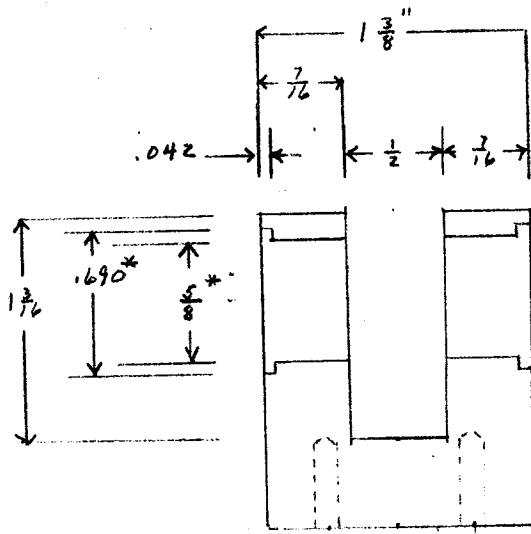
TAP 6-32
THRU
2 HOLES



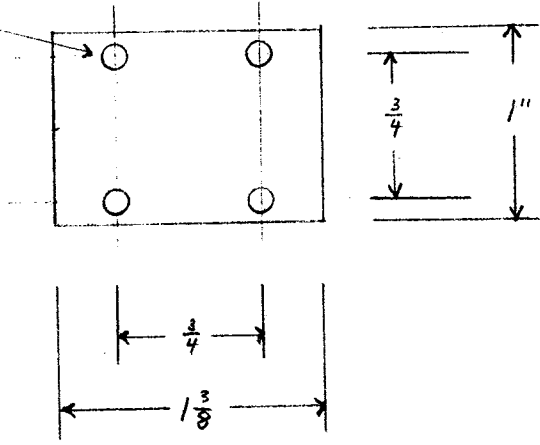
* NOTE:

DESIGNED TO
FIT PIC E2-9
BEARINGS

RECORDER
DRIVE MODIFICATION
1 REQ'D
ALWIN

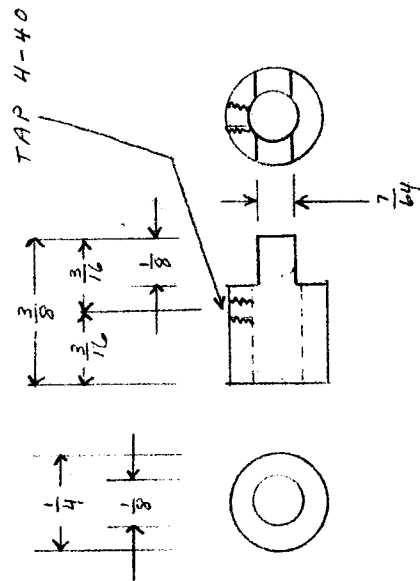
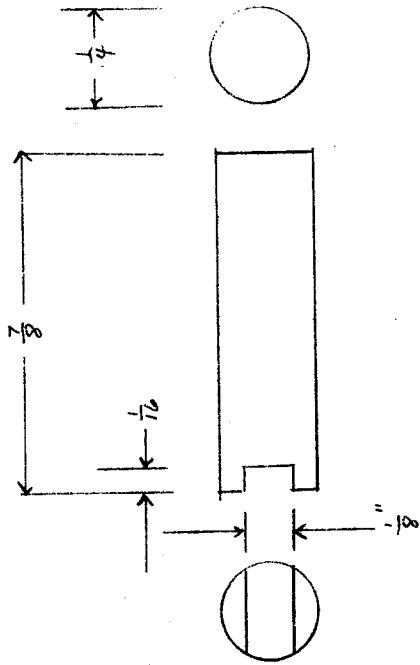


TAP 8-32
1/2 DEEP
4 HOLES

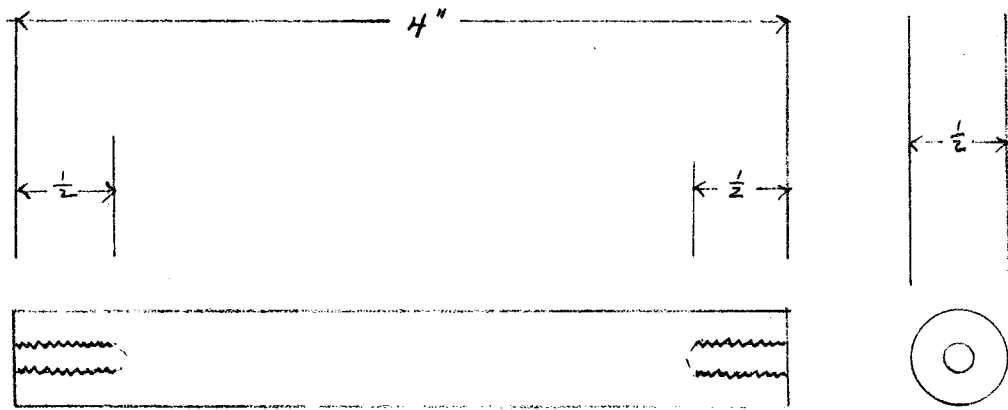


* NOTE:
DESIGNED TO
FIT PIC ER-9
BEARINGS

RECCORDED
DRIVE MODIFICATION
I REQ'D
ALUM

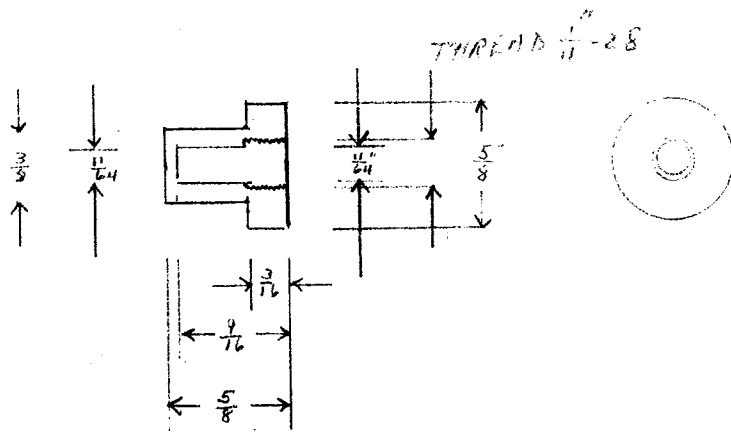


RECORDED
 DRIVE MODIFICATION
 1 EACH REQ'D
 STEEL



TAP 10-32
BOTH ENDS

RECORDER
LOCK MODIFICATIONS
1 REQ'D
STEEL



RECOMMEND
 GWIN SET COVER
 2 REQ'D
 BRASS

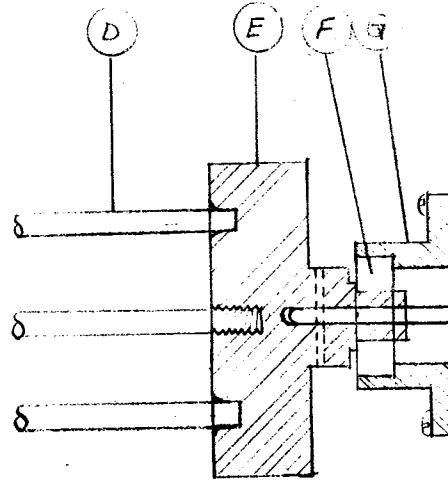
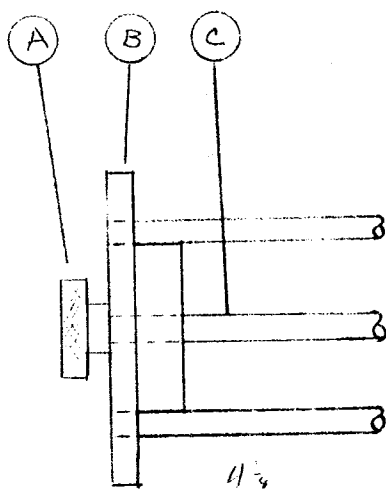


CHART
PAPER
TAKE UP
MECHANISM

TECHNI-RITE
MOD. TAC 96

(A) KNOB

(B) ORIGINAL EQUIPMENT FROM TECHNI-RITE TAC-96

(C) 1/4" BRASS ROD, 5" LONG

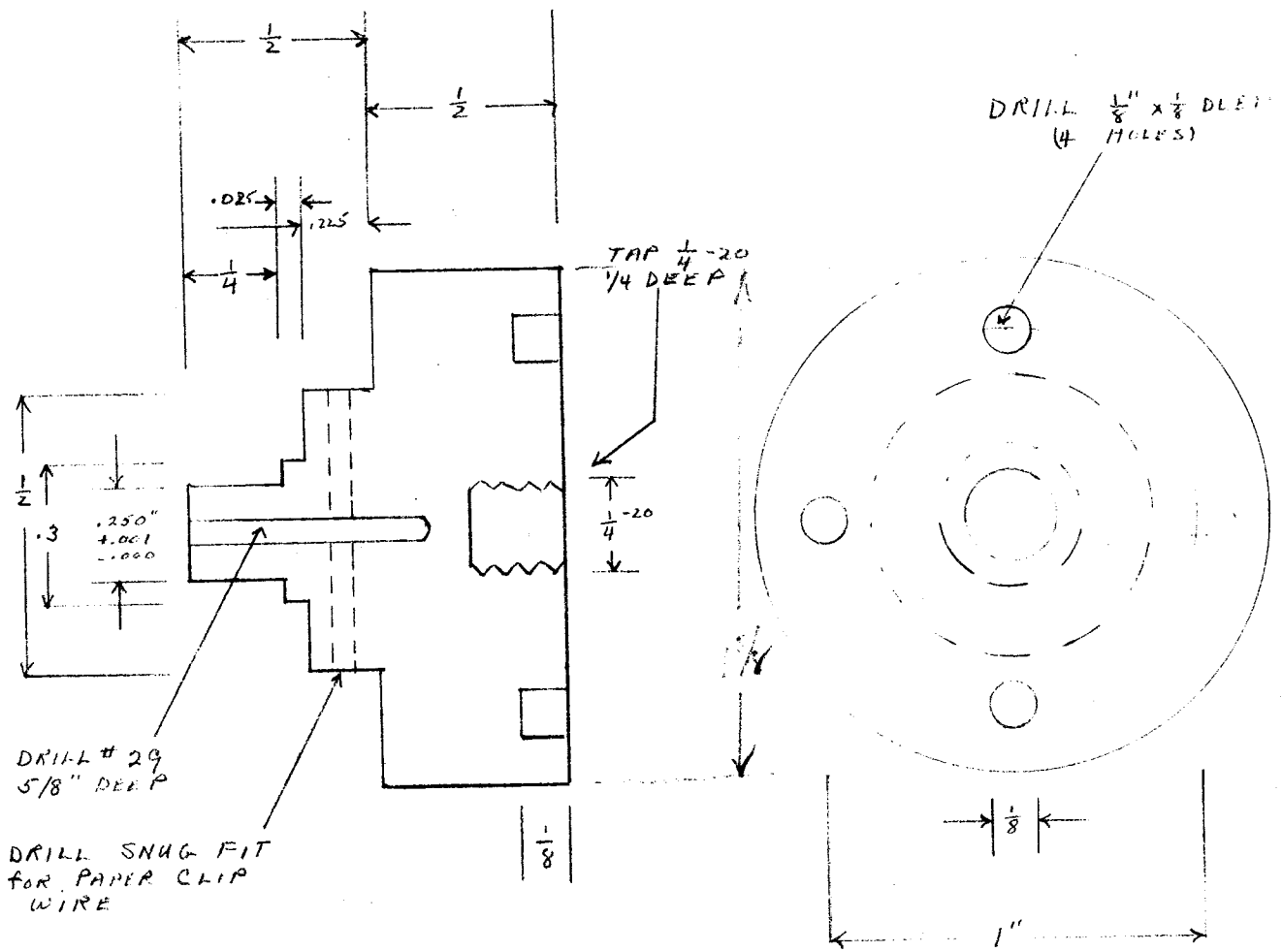
(D) 1/8" STEEL RODS, 4 3/8" LONG FROM TECHNI-RITE TAC-96

(E) SEE SEPARATE DRAWING

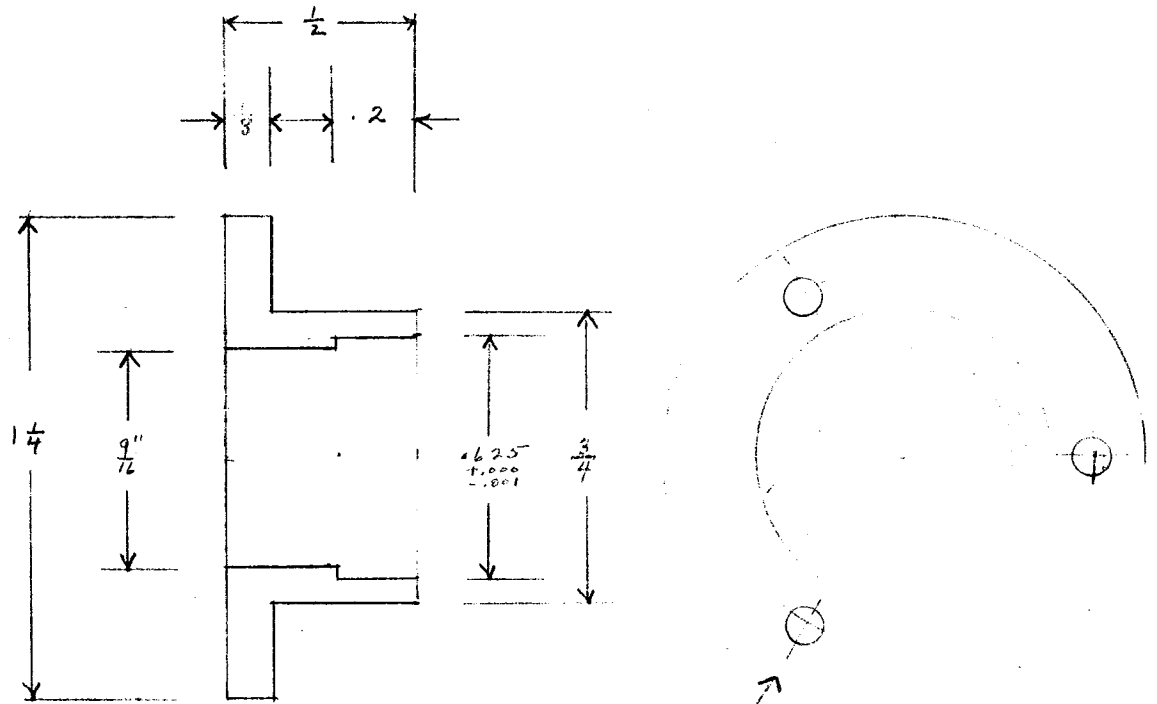
(F) BEARING

(G) SEE SEPARATE DRAWING

RECORDER
CHART PAPER TAKE-UP MECHANISM
ASSEMBLY

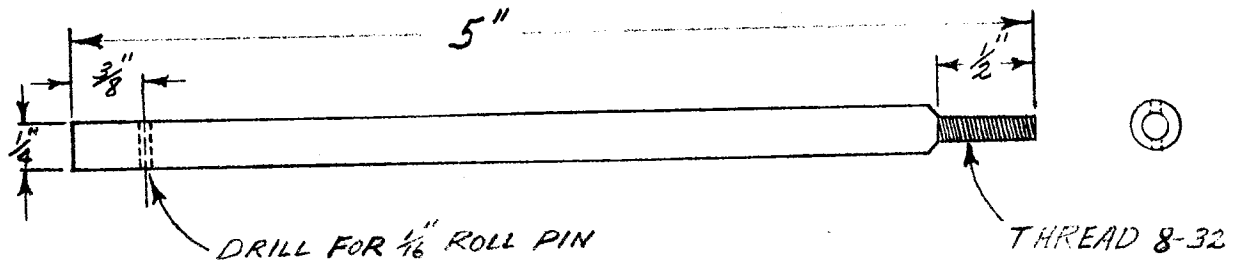


RECORDER
 CHART PAPER RE-WINDER
 1 REQ'D
 ALUM
 PART (E) ON ASSEMBLY

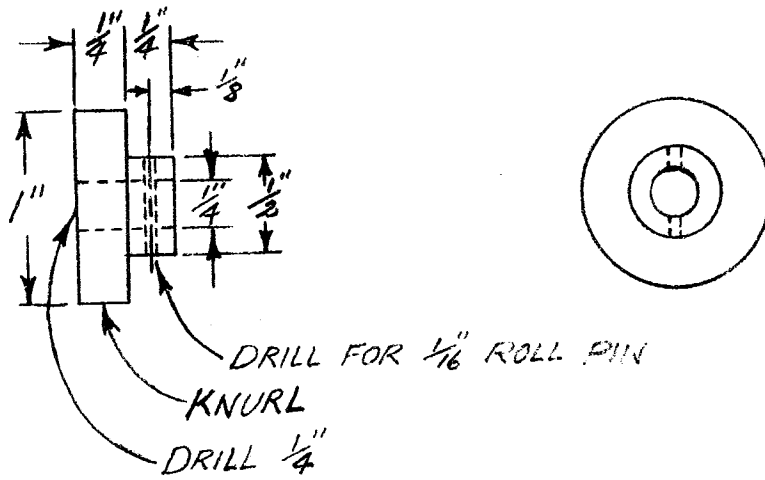


DRILL CLEARANCE HOLES
FOR #5-40 (3 HOLES)

RECORDIA
 CHART PAPER REVIEWED
 BERNING HOUSE
 1 REQ'D
 ALUM
 PART (E) IN ASSEMBLY



PAPER RETAINING ROD
 1 REQ'D
 BRASS



PAPER RETAINING
 ROD KNOB
 1 REQ'D
 ALUM

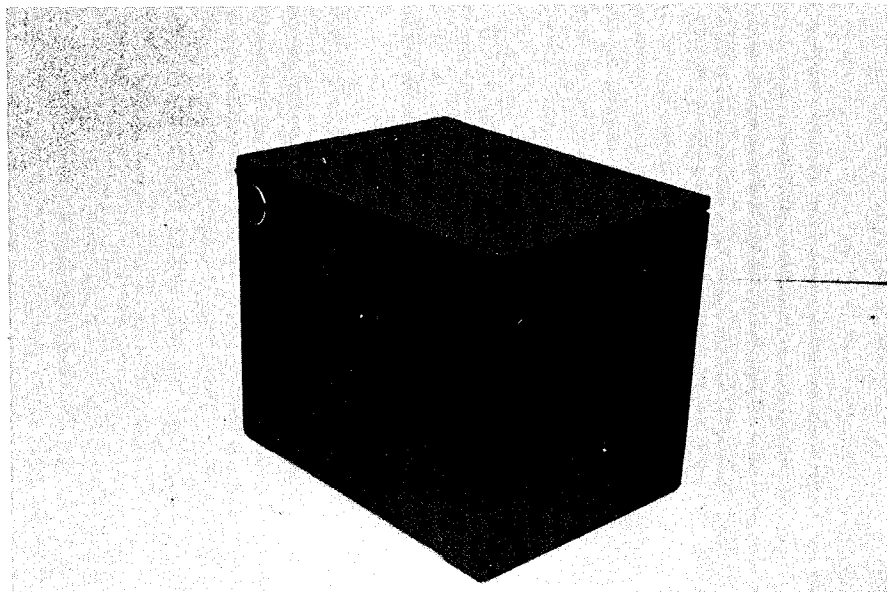


FIGURE 15

Delamination Detector

Battery Box

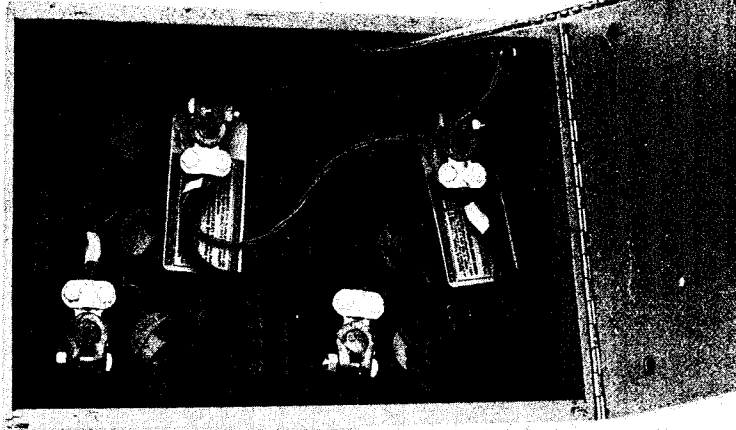


FIGURE 16

Battery Box Interior

SECTION VI

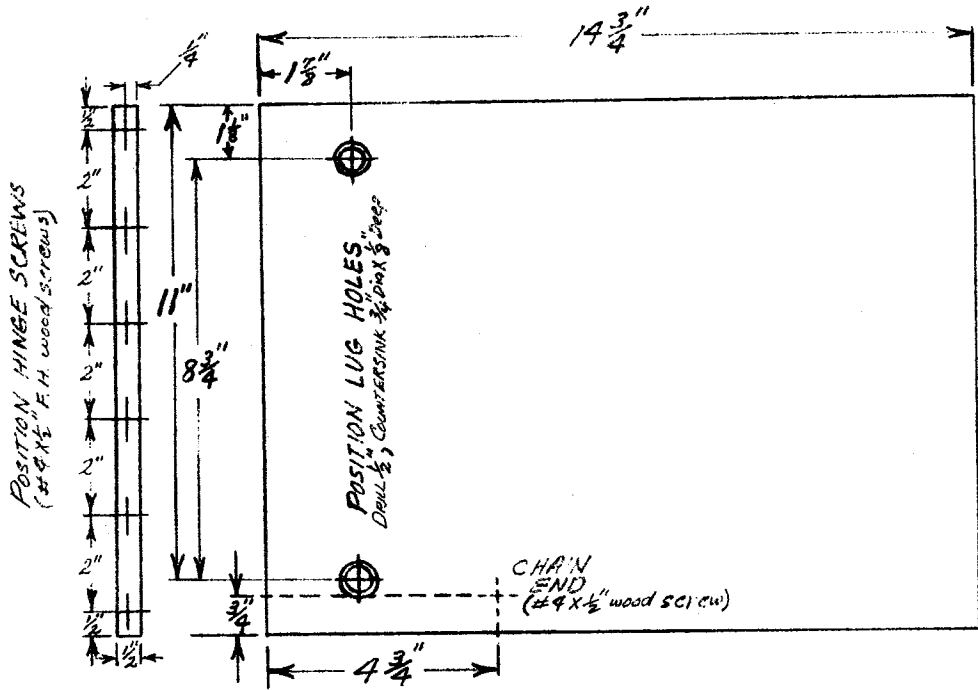
SUB ASSEMBLY: BATTERY BOX

Purchased Items

<u>QUANTITY</u>	<u>DESIGNATION</u>
1	1/2" x 11" Piano Hinge
14	#4 x 1/2" Flat Head Wood Screw
4	Terminals, Sears #28-7118
2	Trunk Handles, Bud, Type UH-70A
8	#12-1/2" Wood Screws
2	#6-32 x 1" Flat Head Machine Screws
2	#6 Flat washers
2	6-32 Hex Nuts
1	8 pin socket, Amphenol type # 77MIP-8
2	6V Battery, Sears #4311
6	#6 x 3/4" Flat head wood screw
8	#6 x 5/8" Flat head wood screw
1	12" Coil Chain, #4
1	12" Tygon Tubing, 3/8" O.D. 1/16" Wall
	20" Test-Prod. Wire, 3 Assorted Colors Beldon #8899

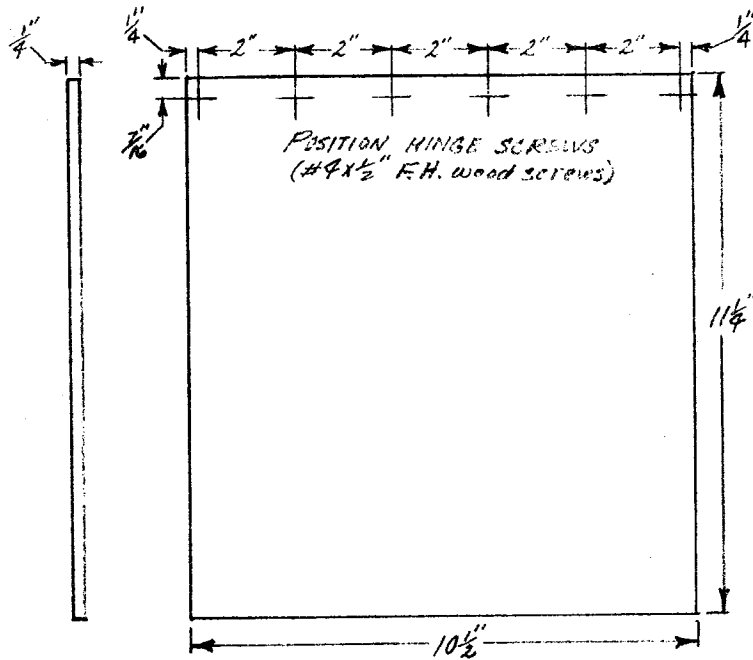
Materials

<u>AMOUNT</u>	<u>DESCRIPTION</u>
4 x 8 ft.	1/2" Plywood A. B. Exterior
4 x 8 ft.	1/4" Plywood A. B. Exterior
5 x 12 in.	1/4" Aluminum Plate
2 x 2 in.	1/8" Aluminum Plate
2 inches	3/4" Aluminum Rod



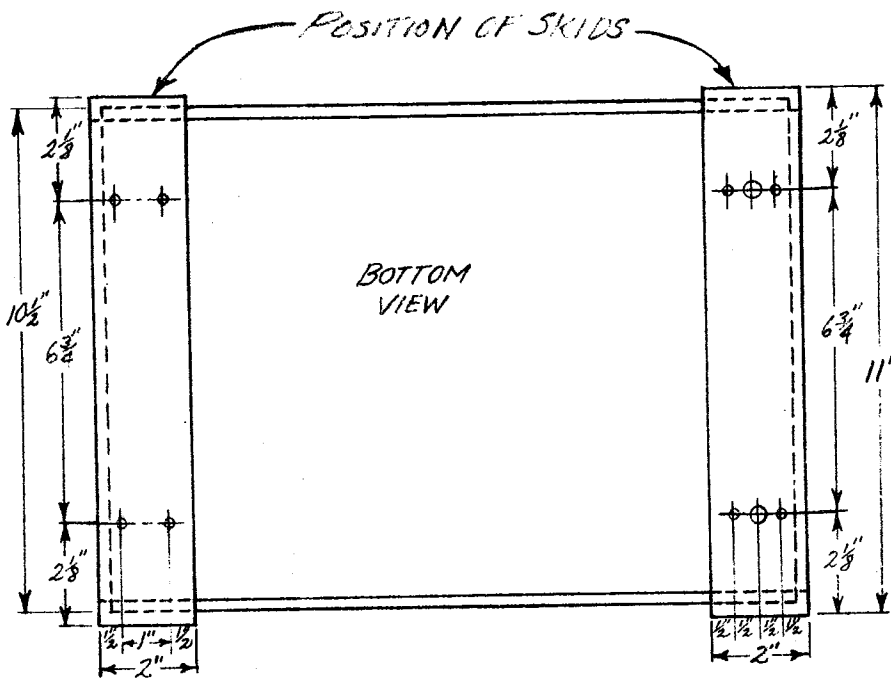
NOTE: DOTTED CROSS SHOWS POSITIONING ON BOTTOM OF LID.

BATTERY BOX LID
PART D (1 REQ'D)
 $\frac{1}{2}$ " PLYWOOD

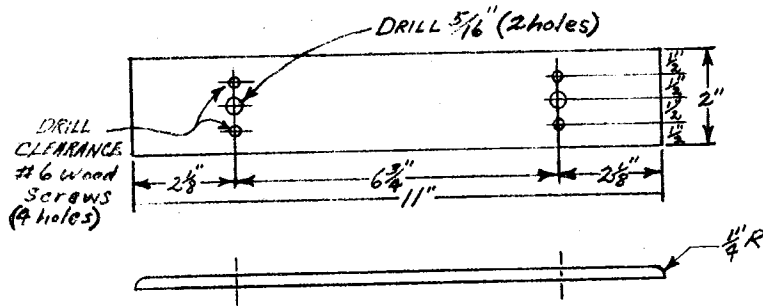


NOTE: OTHER END (PART F) DOES NOT HAVE HINGE SCREWS.

BATTERY BOX END
PART E (1 REQ'D)
 $\frac{1}{4}$ " PLYWOOD
PART F (1 REQ'D)



BATTERY BOX BOTTOM
PART A (1 REQ'D)
1/2" PLYWOOD

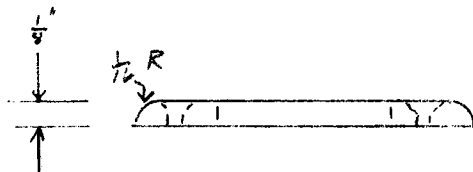
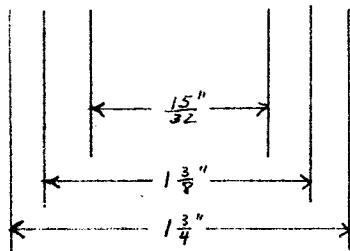
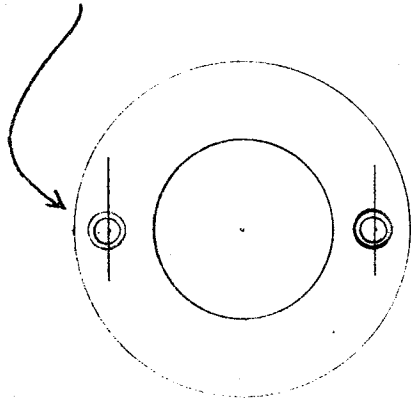


NOTE: 5/16" HOLES NOT DRILLED IN ONE SKID (PART H)

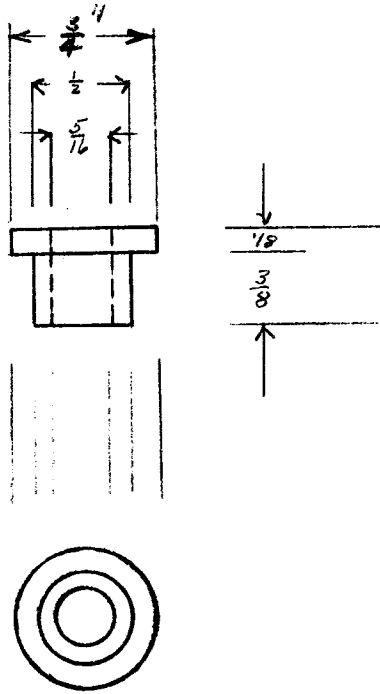
BATTERY BOX SKID
PART G (1 REQ'D)
1/4" ALUM

PART H (1 REQ'D)

DRILL $\frac{1}{8}$ " COUNTERSINK
FOR 8-32 FLATHEAD



BATTERY BOX
CONNECTOR
PROTECTION RING
1 REQ'D
ALUMI



POSITION LUGS
 FOR ATTACHING
 RECORDER TO
 BATTERY BOX

2 REQ'D
 ALUM

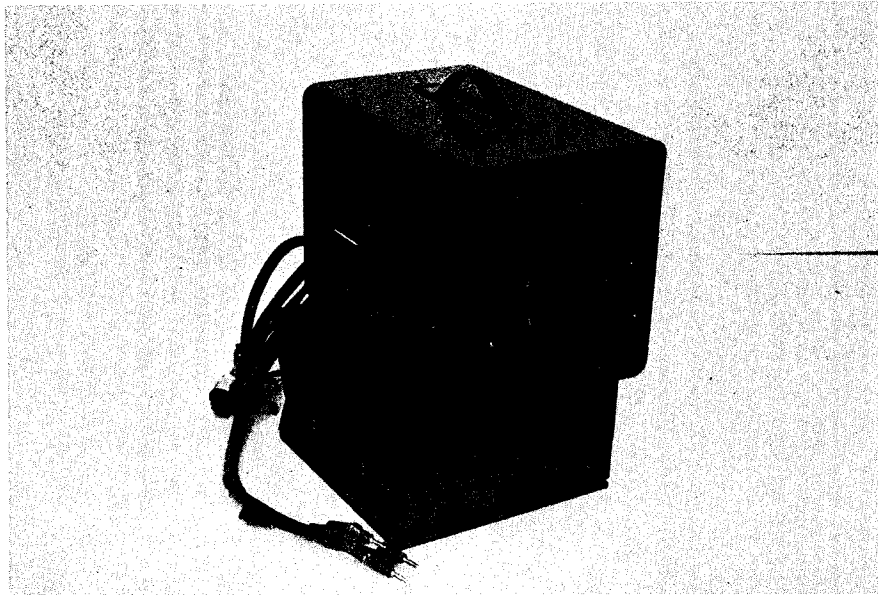


FIGURE 17
Delamination Detector
Electronics Package
Inverter and Amplifier Units
Front View

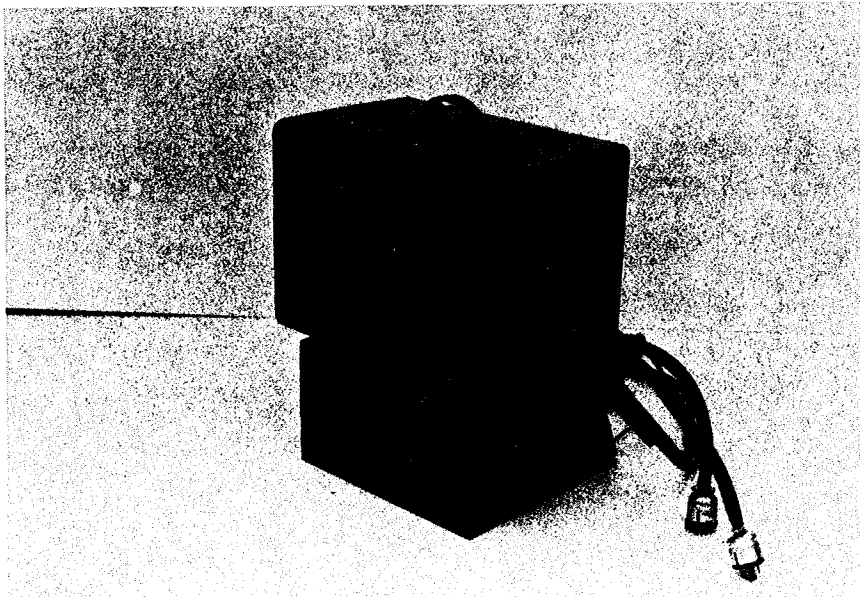


FIGURE 18

Amplifier and Inverter

Rear View

SECTION VII - A

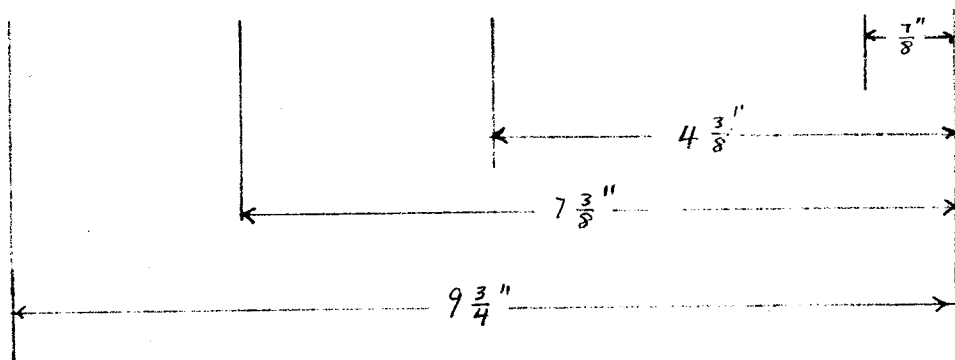
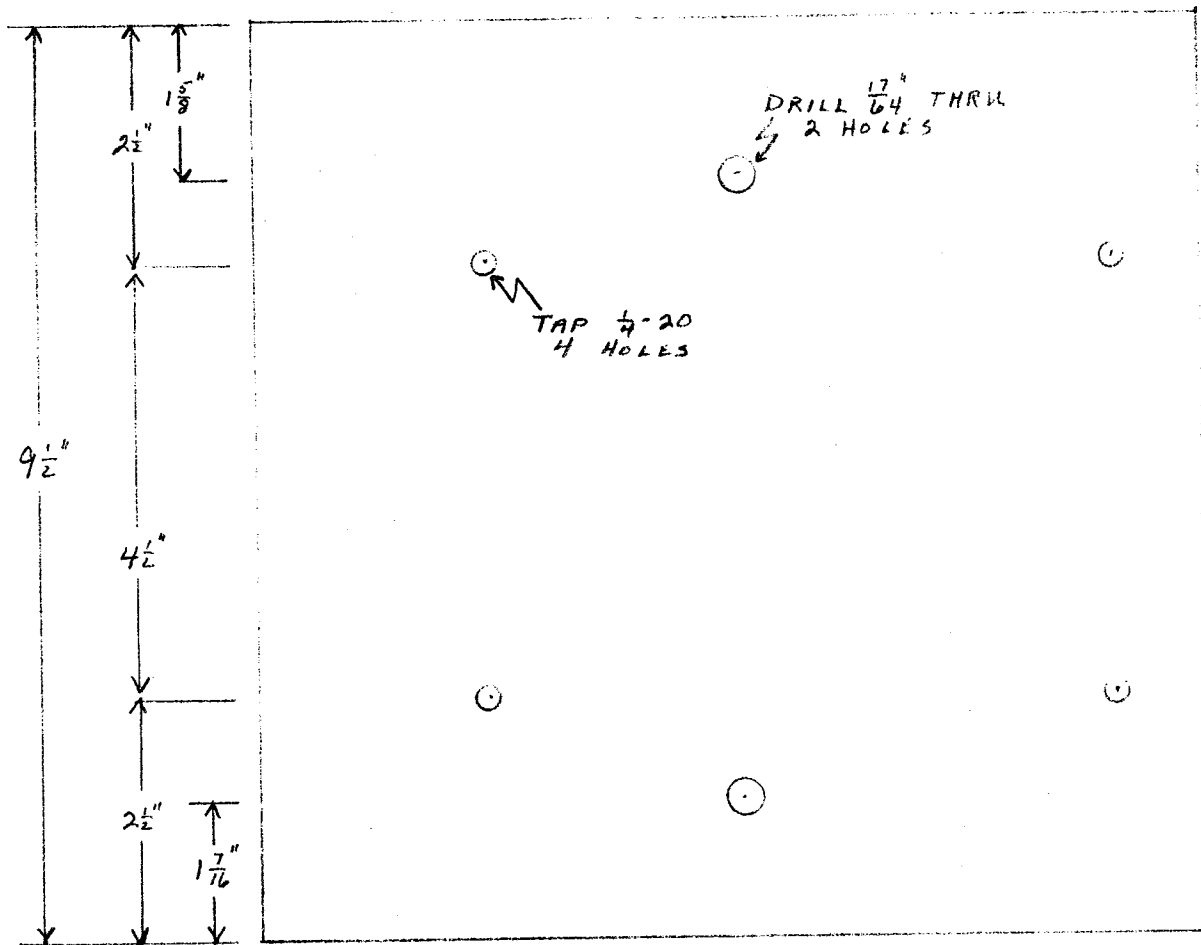
SUB ASSEMBLY: INVERTER

Purchased Items

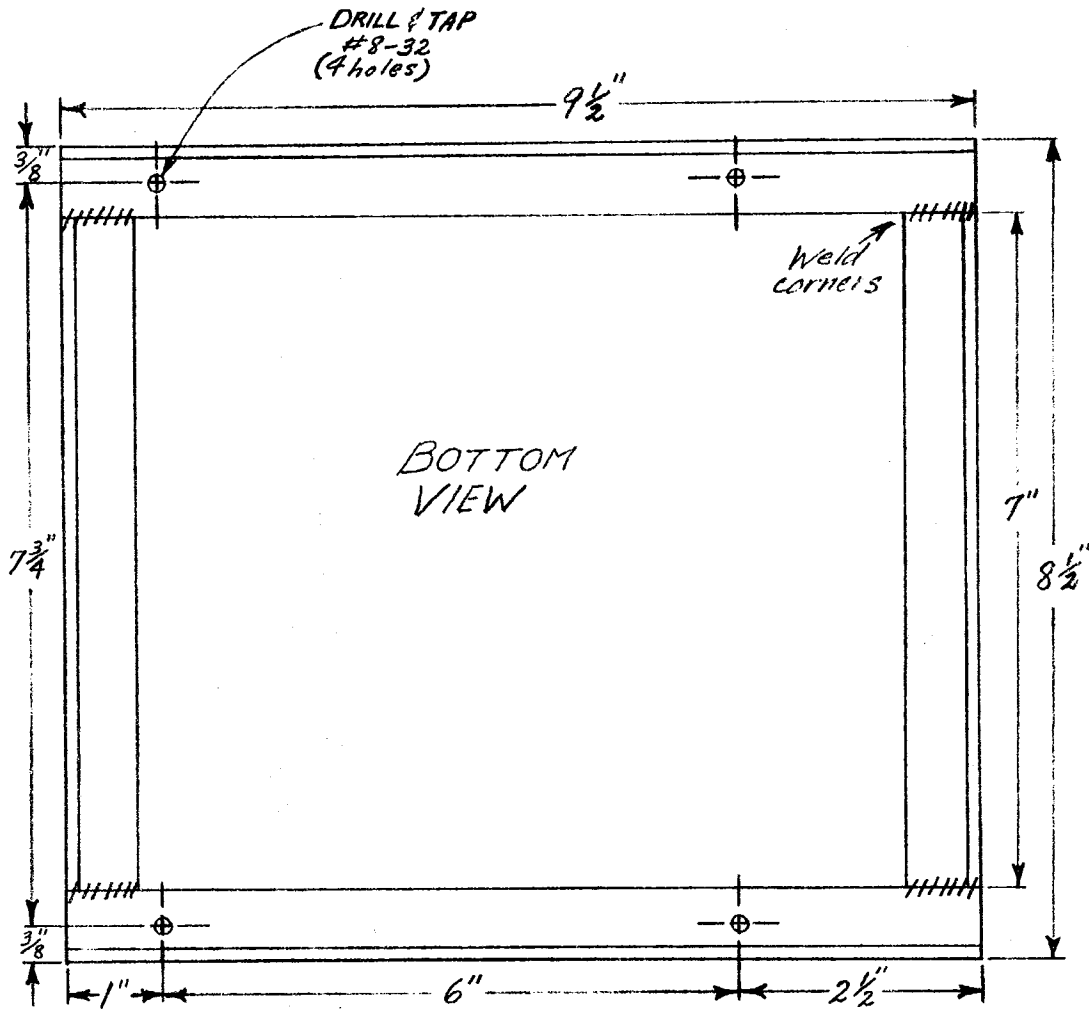
<u>QUANTITY</u>	<u>DESIGNATION</u>
1	Inverter, Cornell Dubilier Powercon model # 12 DSW-10
1	Electrical Cube tap (comercial)
6	#6-32 x 1/4" Flat Head Machine Screws
4	1/4" -20 x 3/8" Round Head Machine Screws
4	#8-32 x 1/2" Flat Head Machine Screws

Material

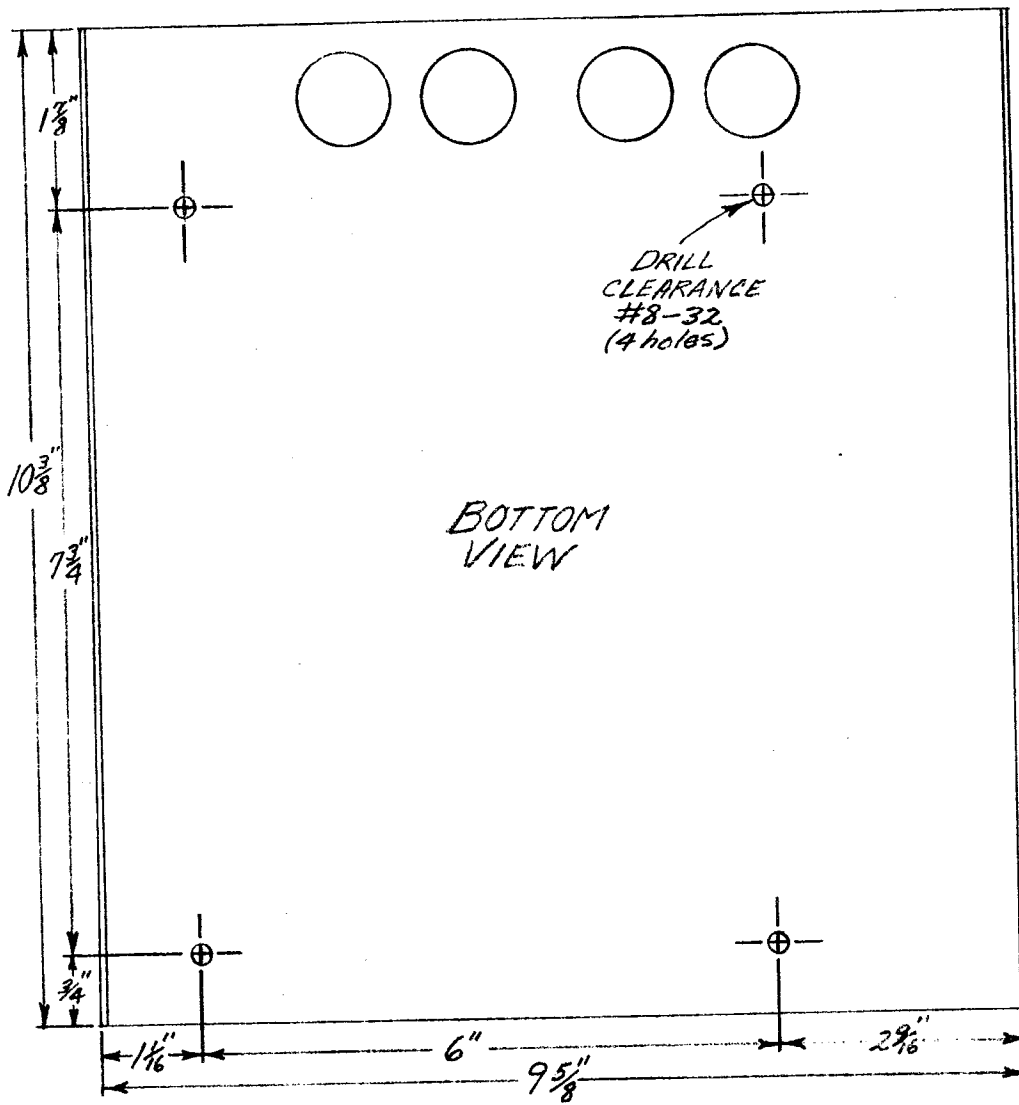
<u>AMOUNT</u>	<u>DESCRIPTION</u>
35"	3/4" x 3/4" Angle Iron
10" x 10"	1/4" Aluminum Plate
2"	1/4" Aluminum Rod



INVERTER MOUNTING PLATE
 1 REQ'D
 $\frac{1}{4}''$ ALUM.



INVERTER BRACE
 1 REQ'D
 $\frac{3}{4}" \times \frac{3}{4}"$ ANGLE IRON



INVERTER TOP
 HOLE SPACING LAYOUT
 FOR BRACE

SECTION VII - B

SUB ASSEMBLY: AMPLIFIER UNIT

Purchased Items

QUANTITYDESIGNATION

1	Cabinet, Bud type # WA 1549
2	Chassis, Bud type #AC 407
6	Amplifiers, Fairchild Part #U6E 7741393
2	Gates, Teledyne-Philbrick-Nexus, type #SPG-1 (complete with sockets)
1	Regulated Power Supply, Semiinductor Circuits type # 2-15-50
8	Inductors, Adjustable, UTC, Type #HVC 7
6	Inductors, Adjustable, UTC, Type #HVC 5
8	Diodes, Sylvania type #1N914
2	Patch Cords Banana type, Pomona type # 2BB-36
2	Patch Cords, BNC type, HH Smith, type # 1589-12
1	Plug, 8 pin, Amphenol type # 86PM-8
1	Receptacle, female 3 wire AC, Amphenol type #160-8
1	Connector, Cinch type # 250-10-36-170
2	Connectors, BNC type, Amphenol type #31-003
1	Jack, banana type, E. F. Johnson type # 108-9XX
1	Transformer, 6.3 volt, 0.6 amp, Stancor type # P 6465
1	Transformer, 80 volt, 1.2 amp, Stancor type # P8196
1	Switch, toggle DPST, Cutler Hammer type # 7561K5
1	Switch, toggle SPST, Cutler Hammer type #7580K7
10	Mounting Strips, 9 Terminal, Scientific Research Co. type #MS-1-PP-9
1	Connector, Amphenol type #126-220 9 pin Hexagon with hood
1	Connector, Amphenol type # 126-221 9 socket Hexagon
2	Potentiometer, 500 ohm Ohmite Type #CMU 5011

SUB ASSEMBLY: AMPLIFIER UNIT (continued)

-2-

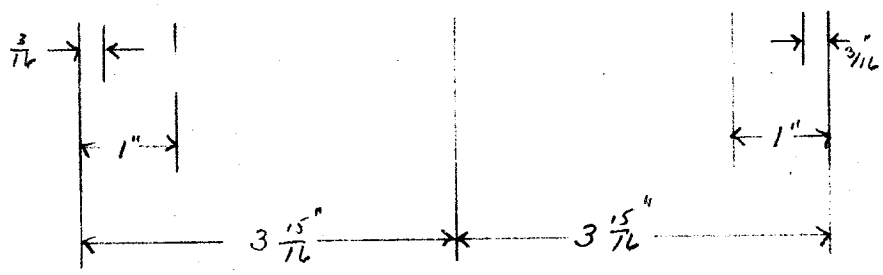
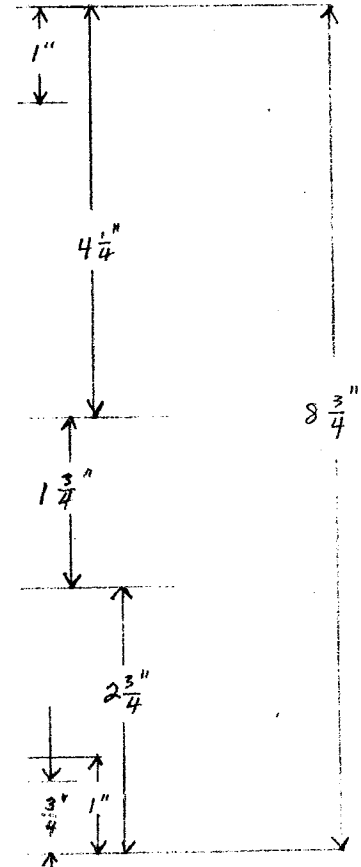
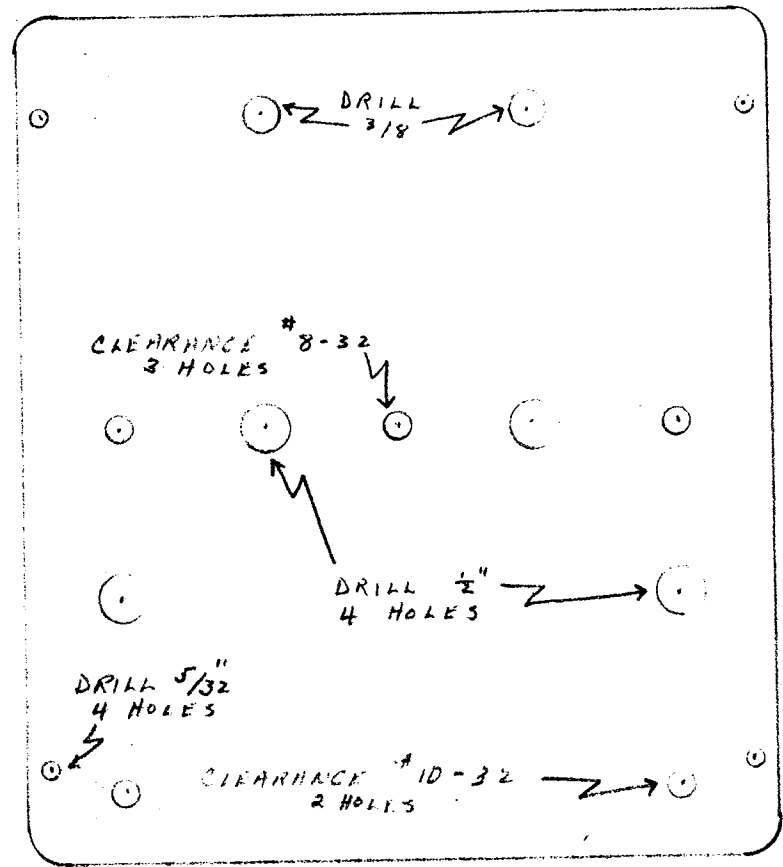
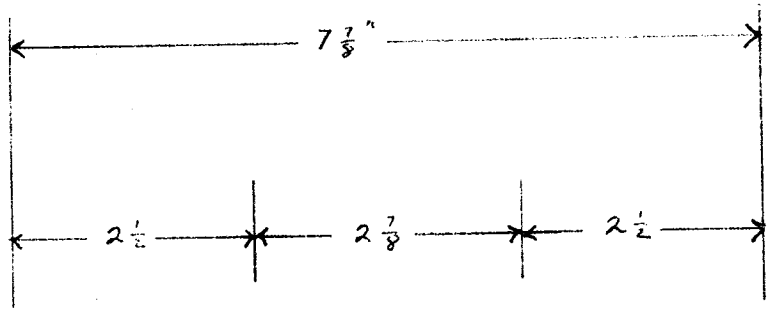
4	Resistor, 1/2 watt, 5%, 1.0K ohms
1	Resistor, 1/2 watt, 5%, 1.5K ohms
2	Resistor, 1/2 watt, 5%, 3.3K ohms
3	Resistor, 1/2 watt, 5%, 4.7K ohms
9	Resistor, 1/2 watt, 5%,
6	Resistor, 1/2 watt, 5%, 10K ohms
2	Resistor, 1/2 watt, 5%, 49K ohms
4	Resistor, 1/2 watt, 5%, 100K ohms
6	Resistor, 1/2 watt, 5%, 220K ohms
2	Resistor, 1/2 watt, 5%, 1 megohm
2	Resistor, 1/2 watt, 5%, 4.7 mehoHms
2	Capacitor, 1000 pf, Sprague, 100 volt rating
1	Capacitor, .001 mfd, Sprague, 100 volt rating
1	Capacitor, .0047 mfd, Sprague, 100 volt rating
4	Capacitor, .01 mfd, Sprague, 100 volt rating
2	Capacitor, .02 mfd, Sprague, 100 volt rating
4	Capacitor, .03 mfd, Sprague, 100 volt rating
4	Capacitor, .1 mfd, Sprague, 100 volt rating
4	Capacitor, .18 mfd, Sprague, 100 volt rating
2	Capacitor, 8.2 mfd, 35 volt, Mallory Type TAC 825K034P04
100 ft.	Hook-up wire Belden #8503, 22 gage Assorted colors
1	6 ft. Power Cord (2 pin) Belden #20250
100 ft.	Wire Belden #8919 20 gage Assorted colors
100 ft.	Spiral wrap, Newman Heli-tube #HT- 1/2C

SUB ASSEMBLY: AMPLIFIER UNIT (continued)

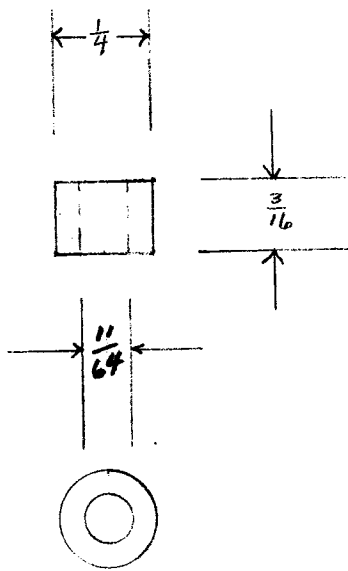
-3-

Materials

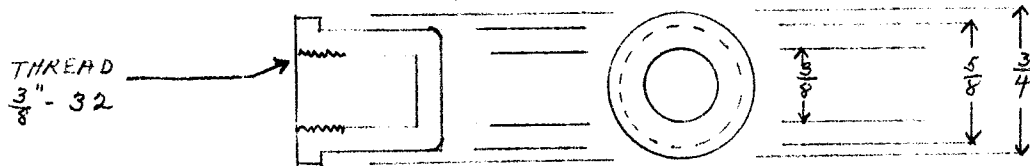
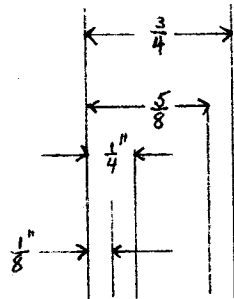
<u>AMOUNT</u>	<u>DESCRIPTION</u>
31 inches	1 inch Diameter Aluminum Rod
12 x 8 inches	Steel Plate 18 gage



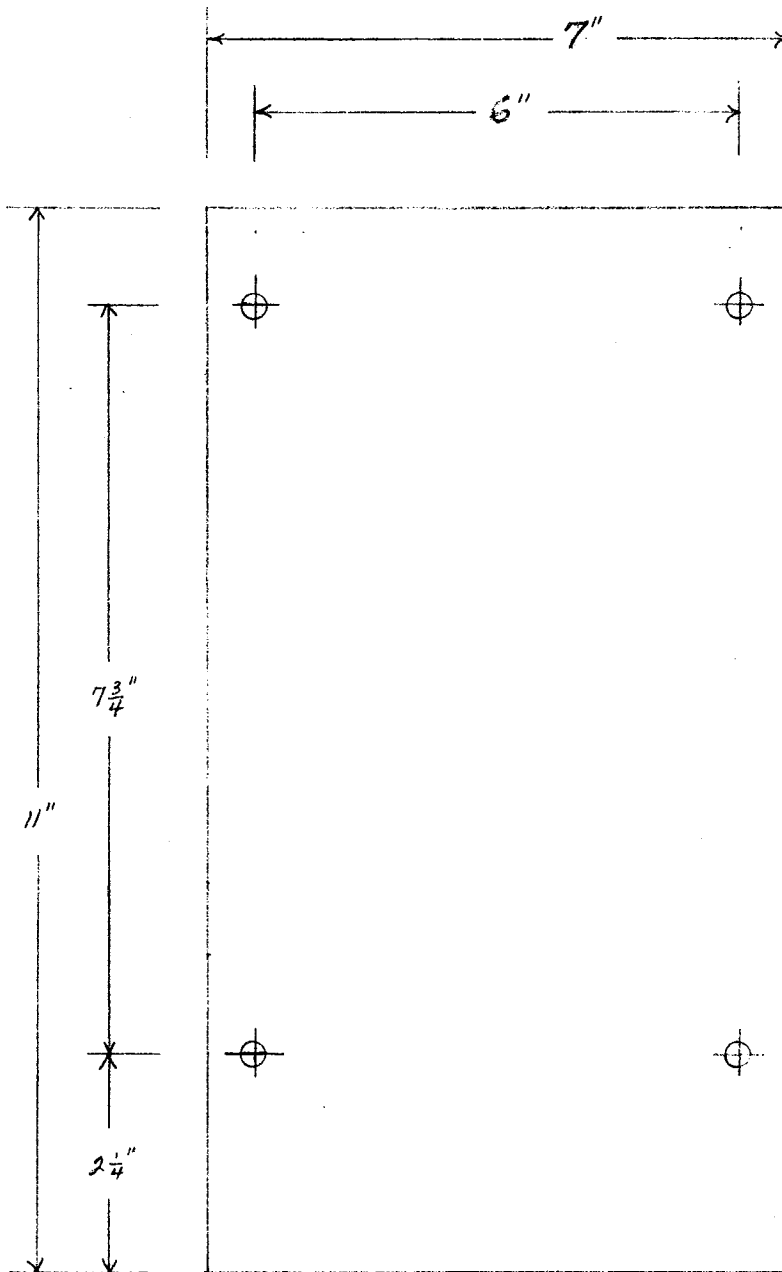
AD-10000 UNIT
FRONT PANEL LAYOUT



AMPLIFIER UNIT
SPACERS
4 REQ'D
ALUM



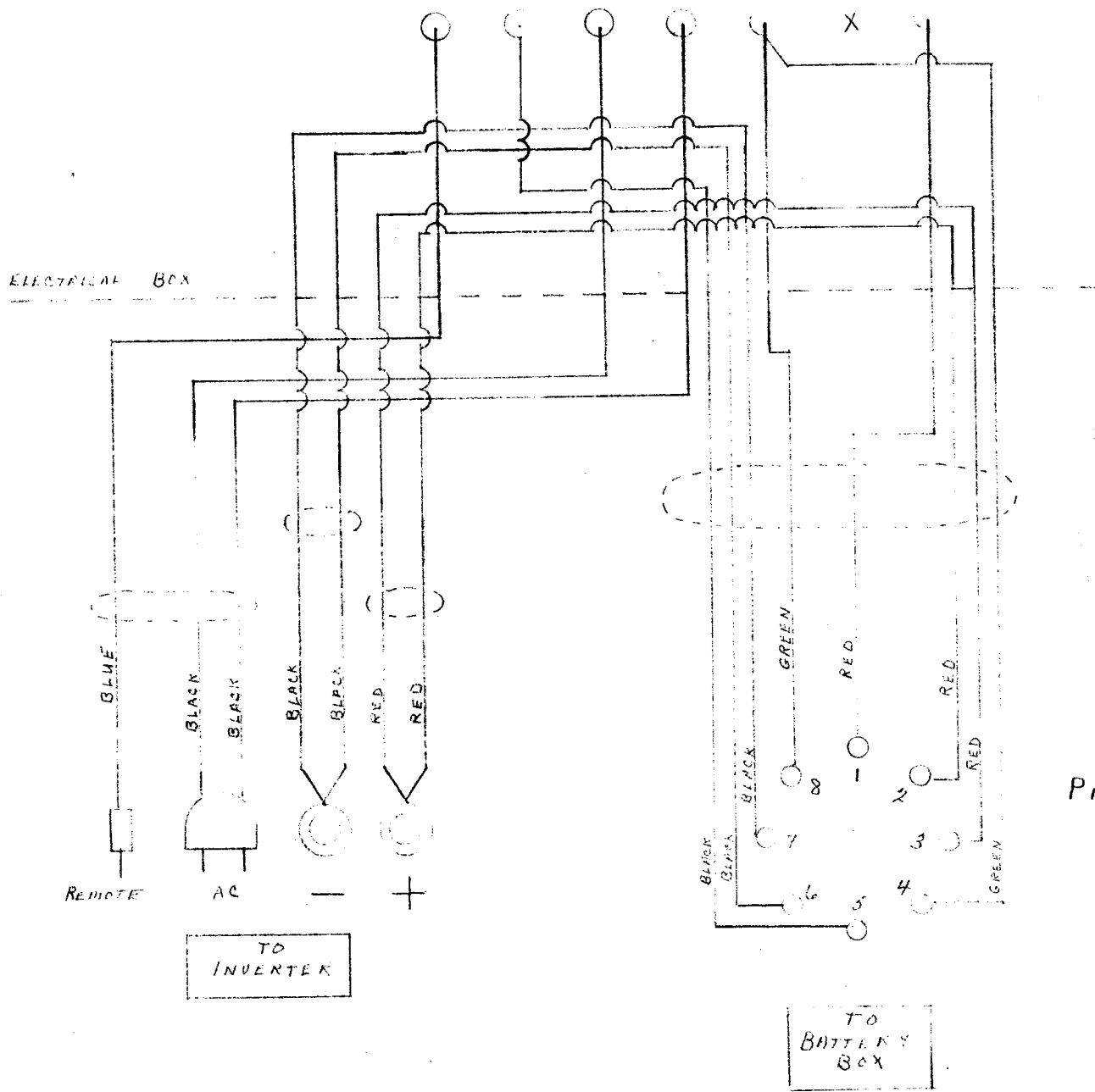
AMPLIFIER UNIT
 POT COVERS
 2 REQ'D
 ALUM



DRILL & COUNTERSINK
 FOR #8 - 32 FLAT HEAD
 (4 HOLES)

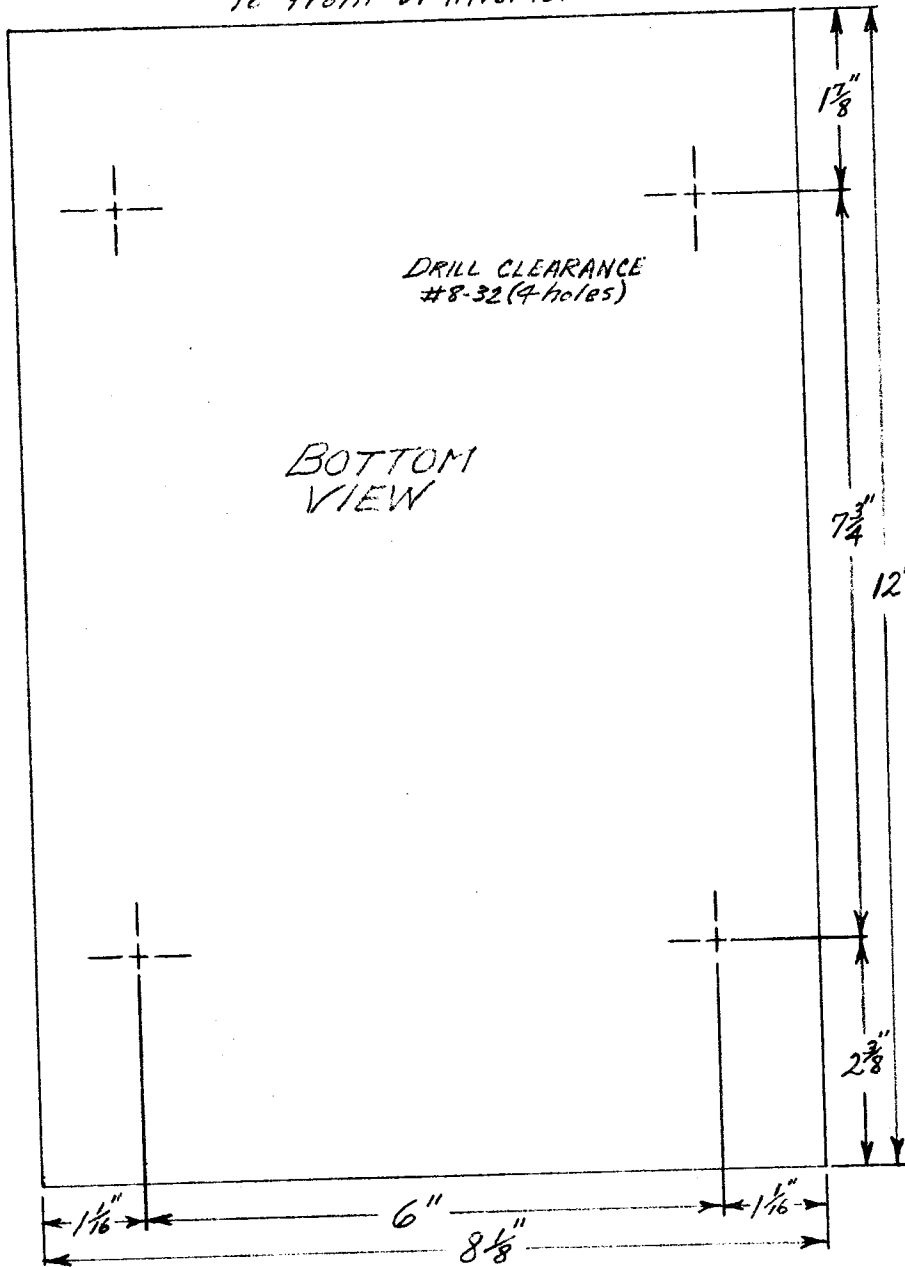
REINFORCING PLATE
 1 REQ'D
 .050" STEEL

TERMINAL STRIP IN ELECTRICAL BOX

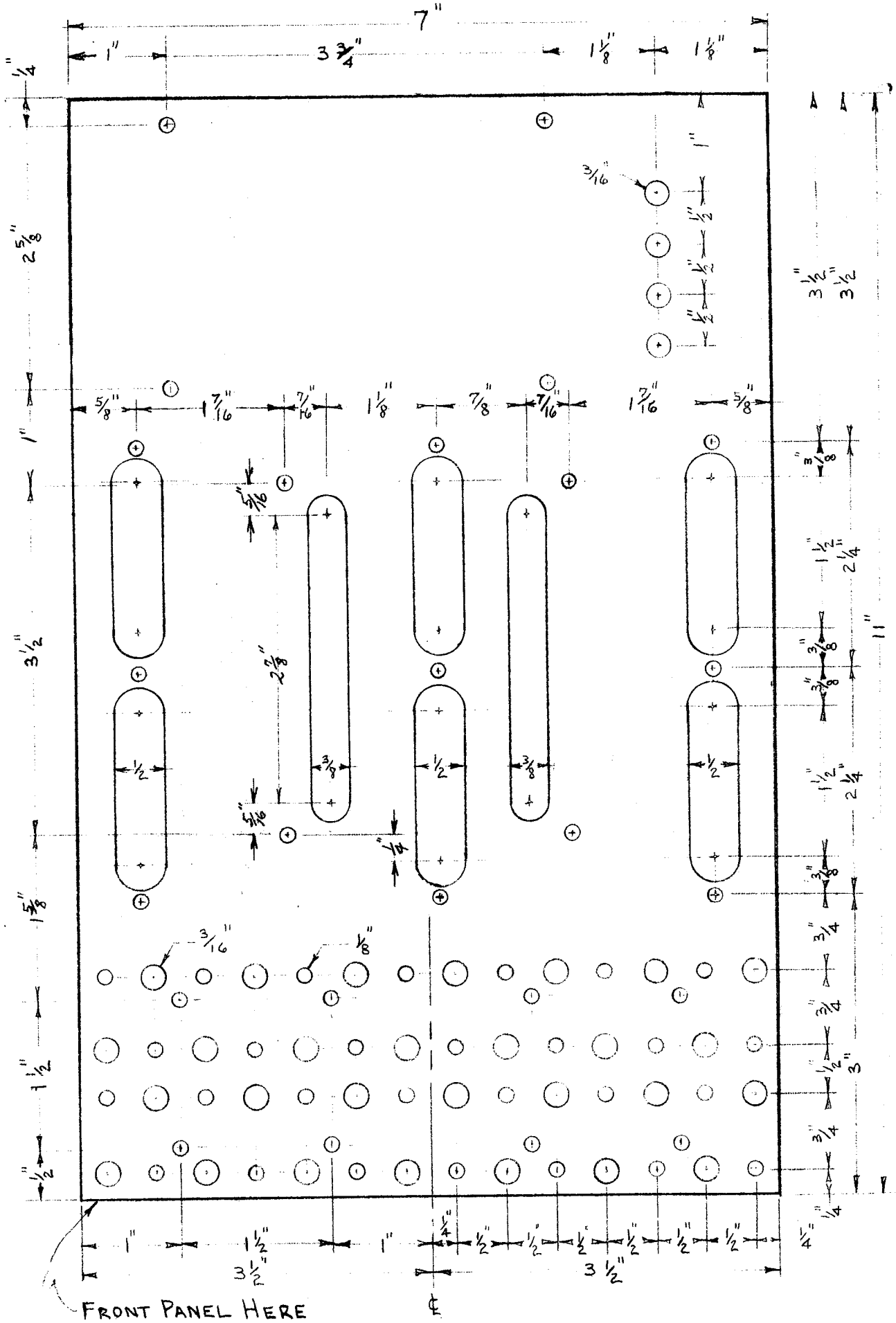


AMPLIFIER UNIT
CONNECTING CABLES

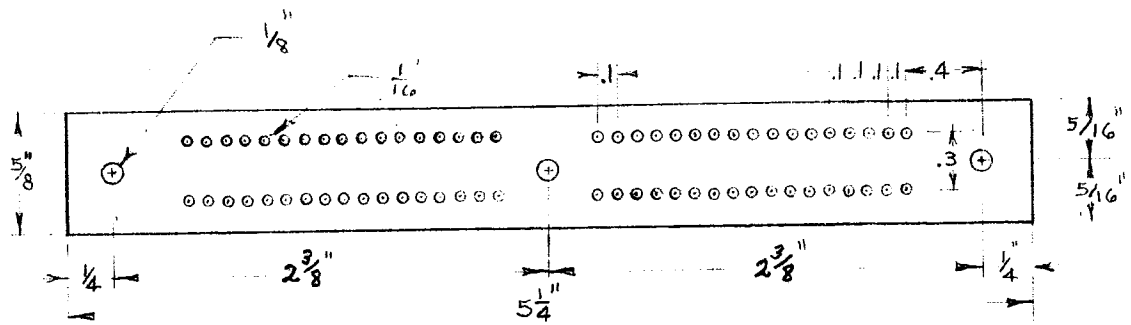
To front of inverter



APPLICABLE
CABINET
HOLE LAYOUT
FOR MOUNTING TO
INVERTOR



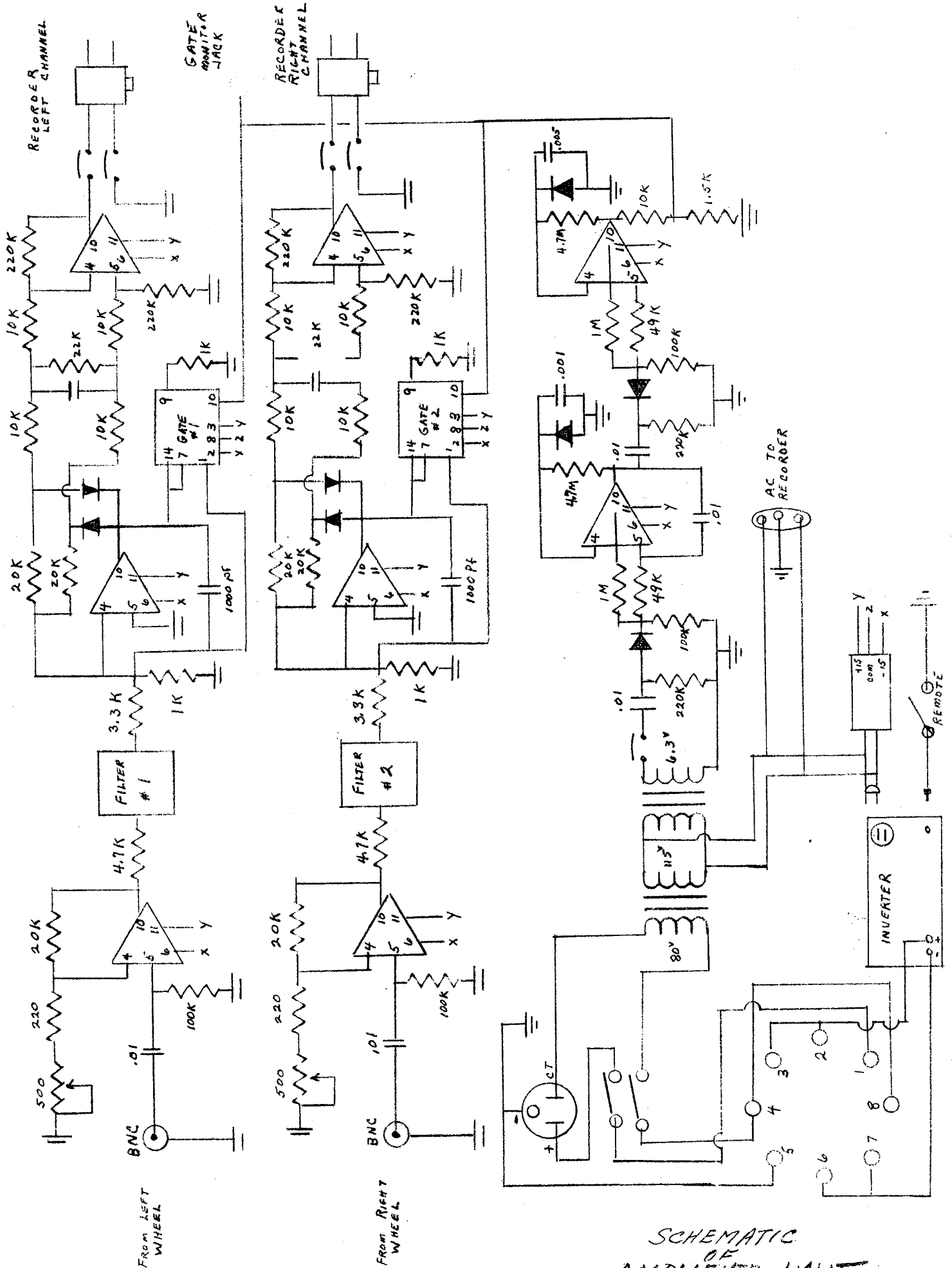
TOP VIEW OF UPPER CHASSIS SCALE: $\frac{3}{4}'' = 1''$



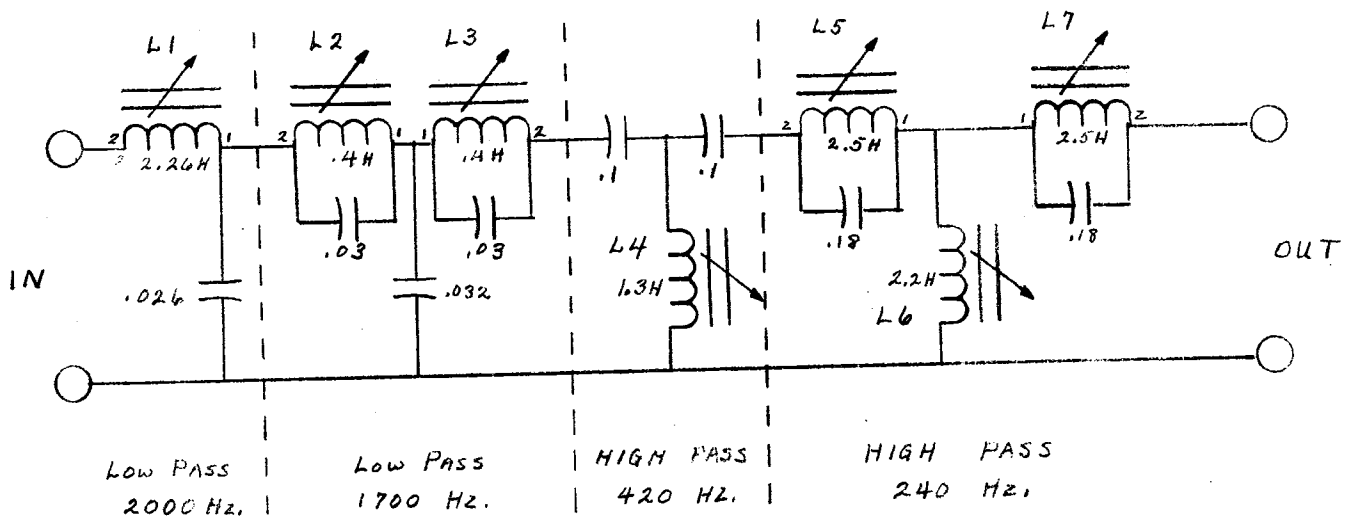
TYPICAL AMPLIFIER BOARD LAYOUT
FULL SCALE

3 REQUIRED

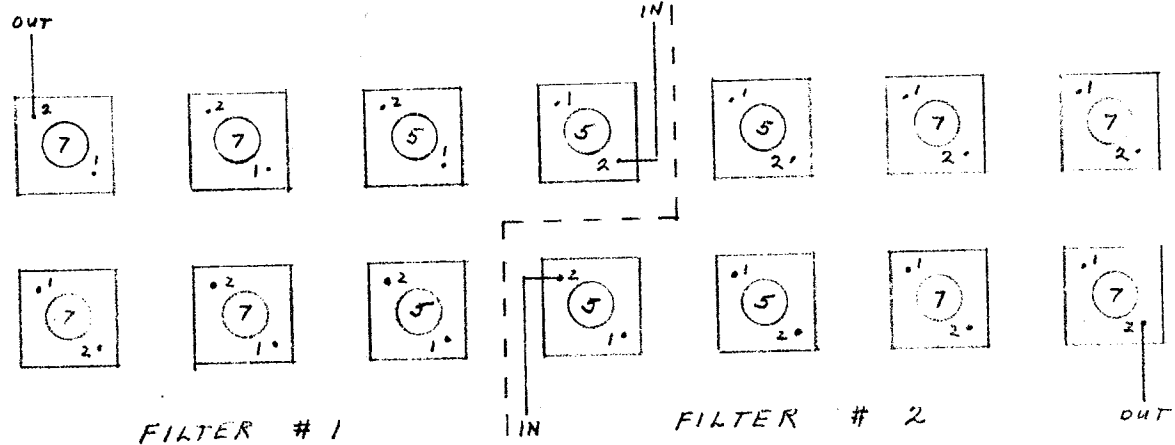
MATL G-10 1/8" Thick



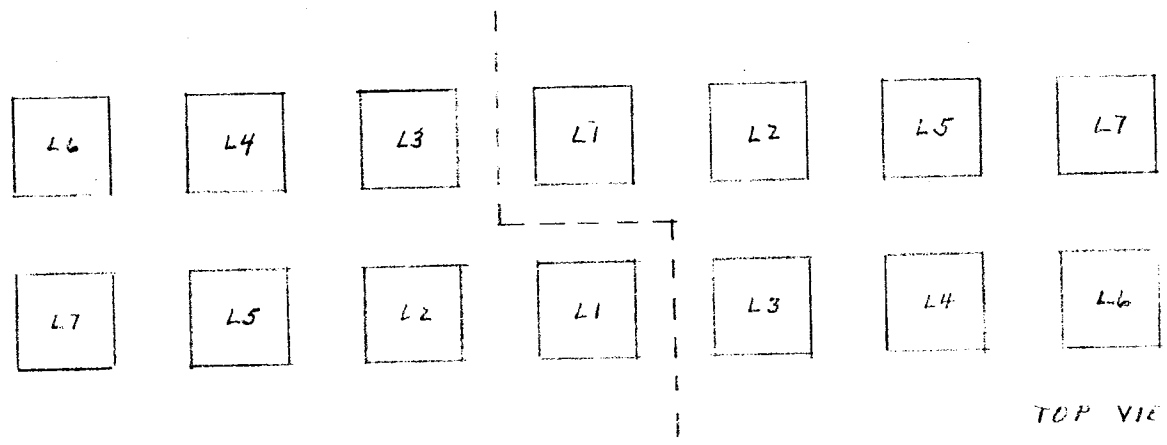
SCHMATIC OF AMPLIFIER UNIT



FILTER SCHEMATIC



BOTTOM VIEW CHASSIS LAYOUT



TOP VIEW CHASSIS LAYOUT

NOTE:

⑤ UTC TYPE HVC-5 Adj. INDUCTORS

⑦ UTC TYPE HVC-7 Adj. INDUCTORS

SCHEMATIC AND LAYOUT OF FILTERS

SECTION VIII - A

SUB ASSEMBLY: BATTERY CHARGER

Purchased Items

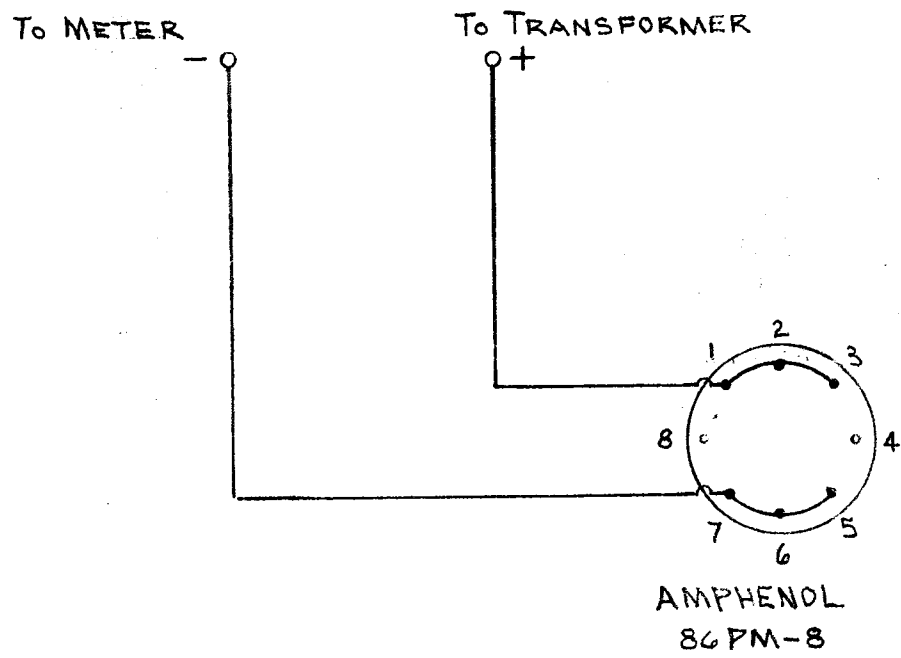
QUANTITY

DESIGNATION

1	Battery Charger, Schauer Model C6612
6 ft.	Wire cable, Belden #8473
1	8 pin Connector, Amphenol, Type #86 PM-8

Materials

NONE



BATTERY CHARGER CABLE

SECTION VIII - B

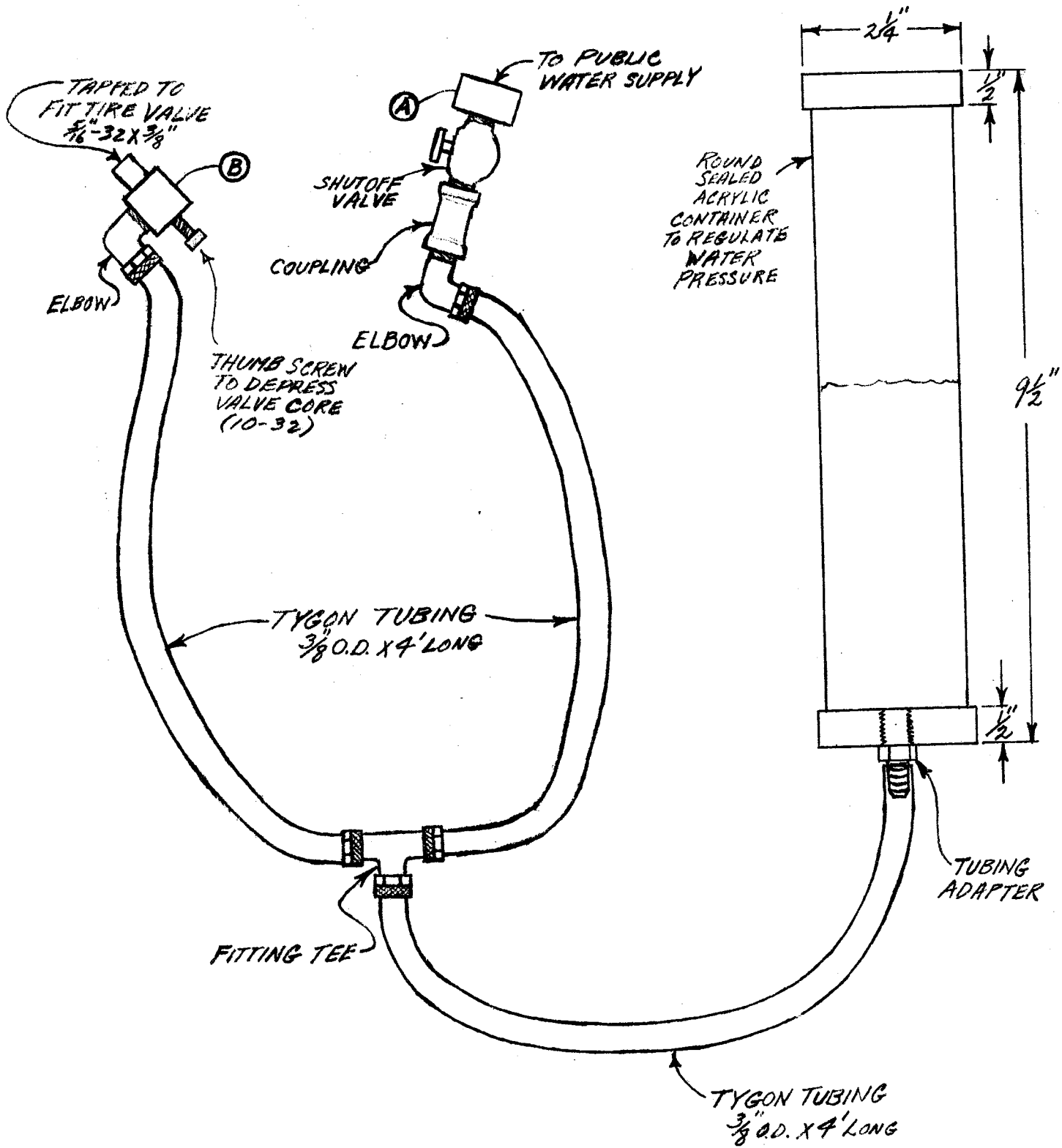
SUB ASSEMBLY: PICKUP WHEEL FLUID FILLER

Purchased Items

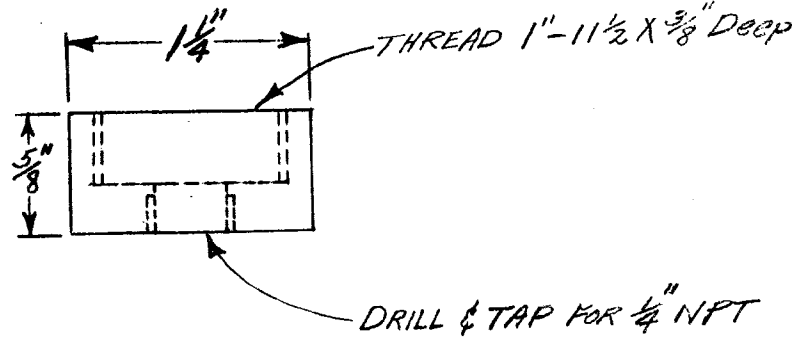
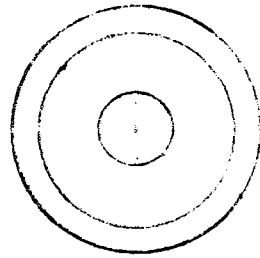
<u>QUANTITY</u>	<u>DESIGNATION</u>
1	3/8" Fitting Tee, Impirical Eastman Polyflo
2	1/4" NPT elbow, Impirical Eastman Polyflo
1	1/4" NPT both ends needle shut off valve, Hoke
1	1/4" NPT coupling, brass
1	1/4" NPT Male x 1/4" Tubing Male adapter, brass
1	Garden hose washer

Materials

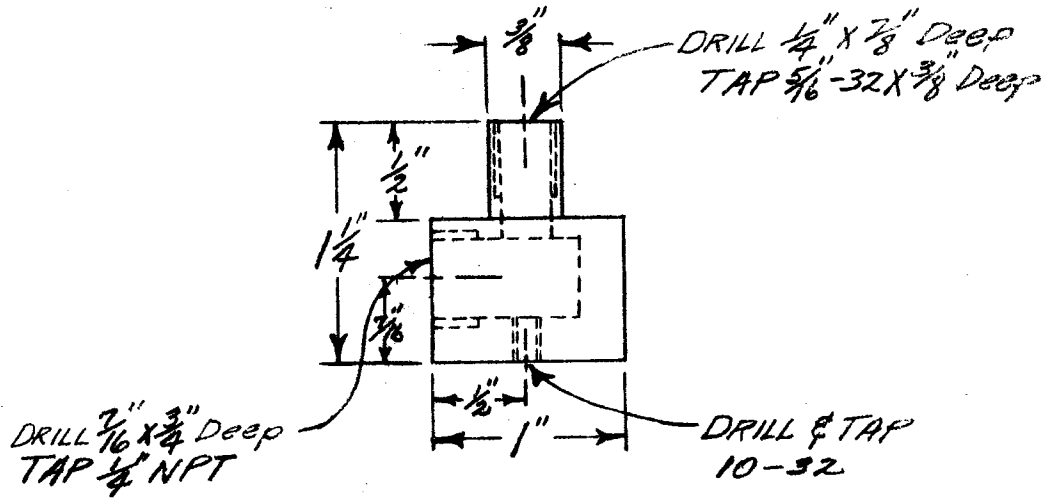
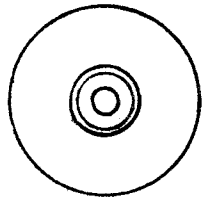
<u>AMOUNT</u>	<u>DESCRIPTION</u>
12 feet	Tygon Tubing 3/8" O.D., 1/16" wall
12 inches	Acrylic Tubing 2" O.D., 1/4" wall
2 1/2 x 5 in.	Acrylic sheet 1/2"
2 1/2 inches	1 1/2" Diameter Brass Rod



PICKUP WHEEL
 FLUID FILLER
 ASSEMBLY VIEW



FASTENER TO
WATER SUPPLY
1 REQ'D
BRASS



FASTENER TO
TIRE VALVE
1 REQ'D
BRASS

SECTION VIII - C

SUB ASSEMBLY: WHEEL HEIGHT GAGE

Purchased Items

QUANTITY

DESIGNATION

1 Lutz file handle

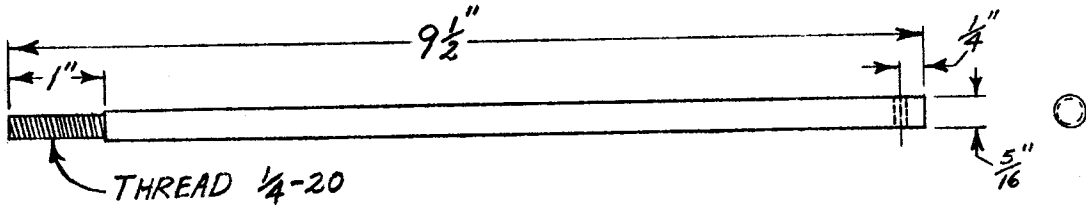
Materials

AMOUNT

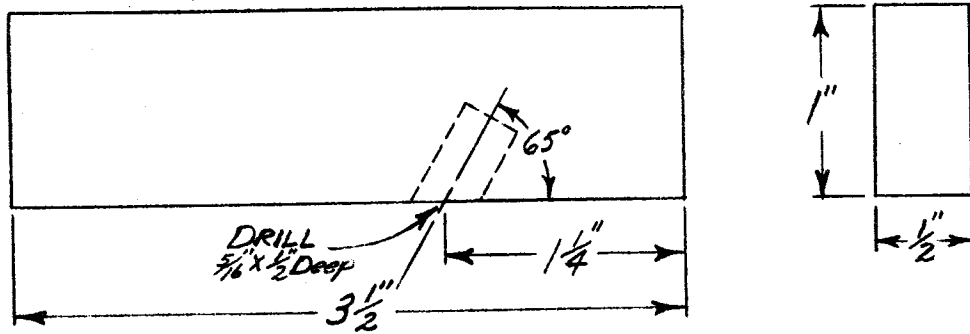
DESCRIPTION

10" 5/16" Steel Rod

1 1/4 x 4 in. 1/2" Aluminum



HEIGHT GAGE
HANDLE
1 REQ'D
STEEL



HEIGHT GAGE IND
1 REQ'D
ALUM

SECTION VIII - D

SUB ASSEMBLY: CALIBRATOR

Purchased Items

<u>QUANTITY</u>	<u>DESIGNATION</u>
2	Reentrant Drivers, Electro-Voice Model #1828R
2	Transistors, Motorola, HEP#232
2	Transistor, Motorola, HEP#247
1	Transistor, Motorola, HEP#242
1	Wafer Switch, Philmore #18863
4	Diodes, Motorola, HEP #154
2	Transformer, Triad#F-45X
8	#4-40 x 3/4 Round Head Machine Screws, Waldom #KF-471
1	Meter, 0-1 MA, D.C., Midland #23-310
2	Capacitors 1,000 M.F. 50v, Arcolytic #CME-J-1000
1	Capactor, 1000 MF Non-Polar, Mallory Type N.P.
2	Voltage Regulator, Fairchild U5R7723393
2	Operational Amplifiers, Fairchild #U6A7741393
8	Nylon Insulators, Workman Electronic #TMN
8	#4-40 Hex Nuts
8	#4 Flat Washers, Waldom #KMW-401
1	10 K ohm Potentiometer, Clarostat type 380C1-10K-S
1	Power Cord, Hamilton-Avnet 13237-13
1	Cabinet, Bud, #CR-1739
4	Fuse Holders, Littelfuse type #342014
4	Fuse, 1 amp Fast Blow, Littelfuse Type #3AG-1 amp.
1	Power switch, Cutler-Hammer type 7580K5
1	Panel Light, Dialco #249-7841-0931-574

1 Transistor Heat Sink, Sylvania, Type ECG-400

1 Transistor Heat Sink, 4 5/8 in. long x 4 1/2" wide x 1 inch. thick
for mtg. 4 TD-66

2 Material

2 4 1/2" x 5" G-10 Circuit Board Plastic 1/8" thick

2 1/2 x 1/2 x 5" Aluminum angle

2 1/2 x 1/2 x 3/4" Aluminum angle

6 #6 x 1/4" Sheet Metal Screws

60' Hookup wire, Belden #8503, 22 gage, assorted colors

15' cable, Belden #8403

5 Rubber grommets 1/4" I.D. I.D.

100 Push in terminals, USECO #2500-C-1

1 7 pin Terminal Strip, H. H. Smith Type #879

2 4 pin Terminal Strip H. H. Smith Type #855

4 8-32 x 1/2 Flat Head Machine Screws

4 8-32 Hex Nuts

4 #8 Flat Washers

1 Chassis Base, Bud, Type # AC402

1 Connector, 5 pin Female Amphenol #MS3106A14S

1 Connector, 5 pin Male Amphenol #MS3105A14F

1 Cable Clamp Carmon # AN3052

2 Rectifier, Motorola. HEP#176

1 Capacitors, 500 pf, Sprague Type 5GA-T50

1 Resistors, 1/2 Flat Head Machine Screws

4 8-32, Hex Nuts

4 #8 Flat washers

1 Chassis Base, Bud, Type # AC402

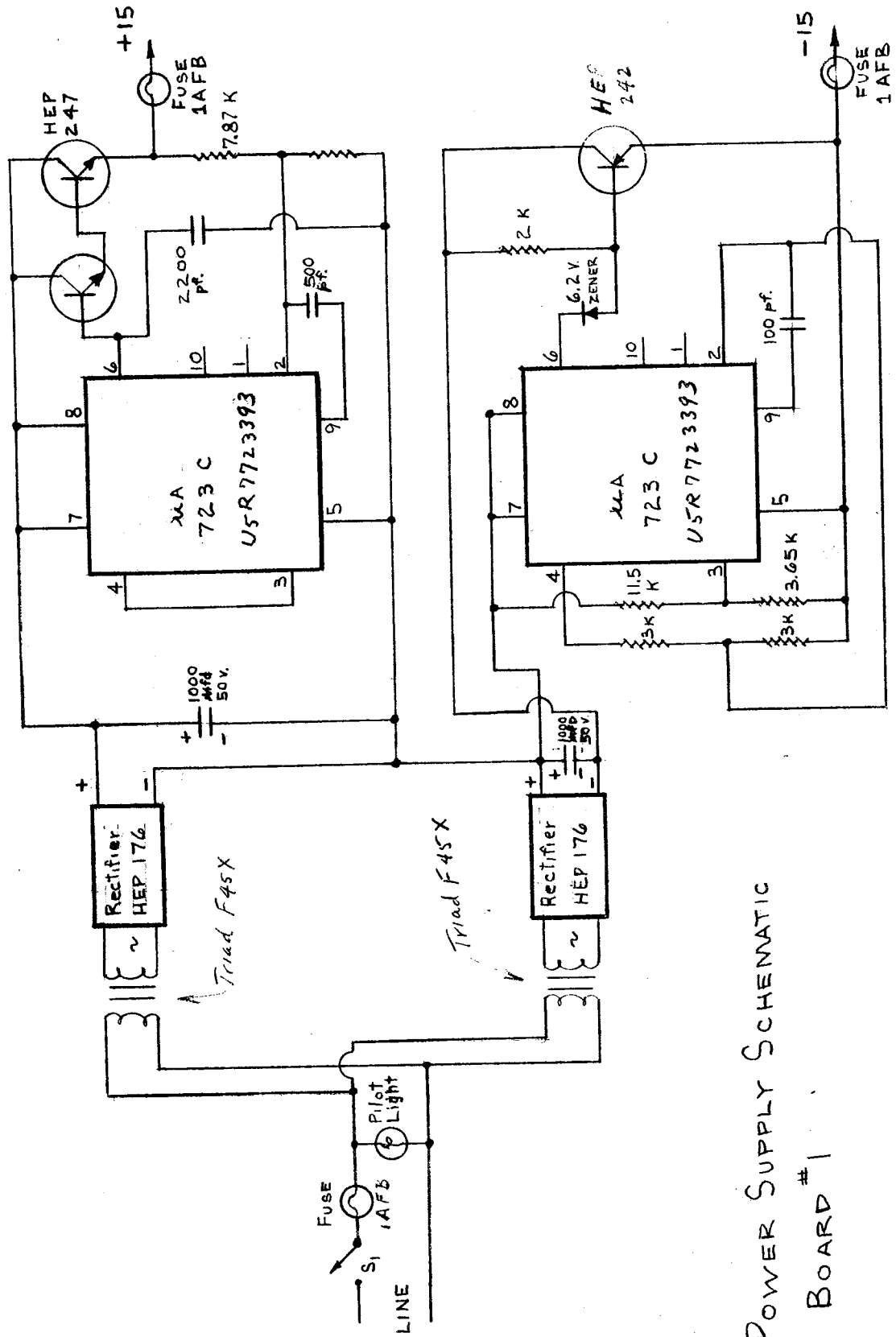
1 Connector, 5 pin female, Amphenol #MS3105A14S

1 Connector 5 pin male, Amphenol #MS3106A14F

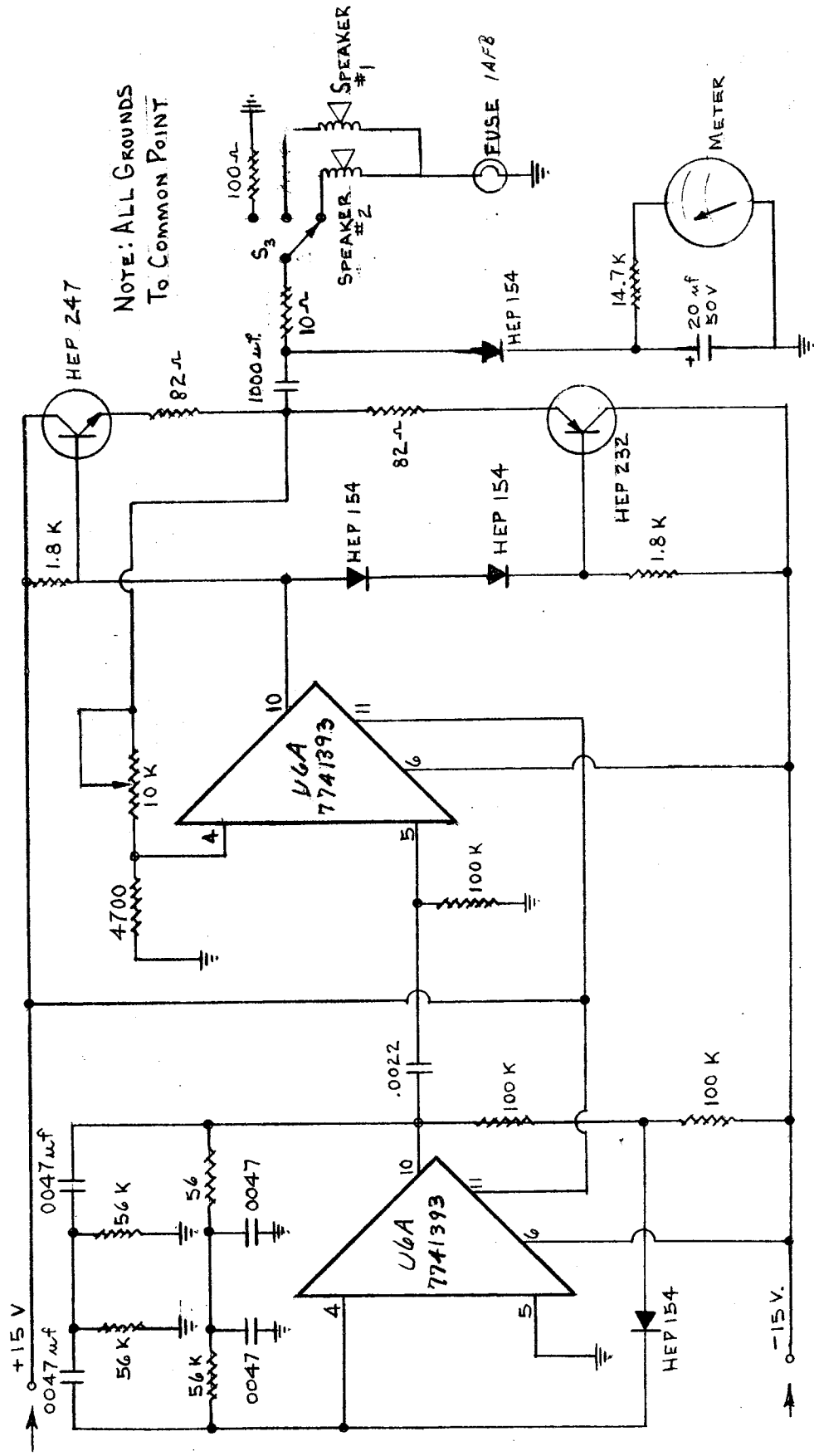
1 Cable Clamp Cannon #AN3052
2 Rectifier, Motorola, HEP#176
1 Capacitors, 500 pf, Sprague Type #5GA-T50
1 Resistors 1/2 watt 7.15K ohms 1.%
1 Resistor, 1/2 watt 7.87K ohms 1.%
2 Resistor, 1/2 watt 3K ohms 1.%
1 Resistor, 3.65 K ohms 1.%
1 Resistor, 11.5 K ohms 1.%
1 Capacitor, 100 pf Sprague Type 5GA-T10
1 Zener Diode, 5.2V RCA #SK3058
1 Resistor, 2K ohms 1.%
2 Resistor, 4.7K ohms 1.%
4 Diodes, Motorola, HEP #154
1 Resistor, 1.8 K ohms 1%
2 Resistor, .82 K ohms 1%
1 Resistor, 14.7K ohms 1%
2 Latch Part, Camloc #69L4-1-3BA
2 Latch Part, Camloc #69L19-1-1AA
1 Capacitor, 20 uF 50v, Cornell Dublier Type NLW
4 Capacitor, .0047 uF, Sprague Type 47292
5 Resistor, 1/2 watt 56 K ohms 5%
1 Capacitor, .0022 uF, Sprague Type 22292
1 Resistor, 1/2 watt 100 K ohms 5%
4 Soldering lugs, WALSCO #H1112-F
6 #6-32 x 1/4" Round Head Machine Screws
2 Handles 1/4 x 3 inch, BUD, Type #H9168
3 ft. Piano Hinge, Brass, 3/4 In. wide

Material

<u>AMOUNT</u>	<u>DESCRIPTION</u>
3' x 6'	.080" Aluminum Sheet 6061 T6
5" x 2 1/2"	1/8" Aluminum Plate
5" x 10"	1/4" Acrylic Sheet
24"	3/4" x 3/4" x 1/8" Aluminum Angle
1'	1/2" Aluminum Rod
6	#8-32 x 1/2" with nuts & washers Flat Head Machine Screws
22	#5-40 x 1/2" with nuts & washers Flat Head Machine Screws
4	#2-56 x 3/8" with nuts and washers Flat Head Machine Screws
8	#2-56 x 3/8" with nuts & washers Round Head Machine Screws
1	1/4 10 x 3/8 O.D. Rubber gromet
16	1/4-20 x 3/8" AllenHead cap screws
4	6-32 x 3/8" Round Head Machine Screws (no nuts)
8	1/4 - 20 Hex nuts
8	1/4 Lock washers

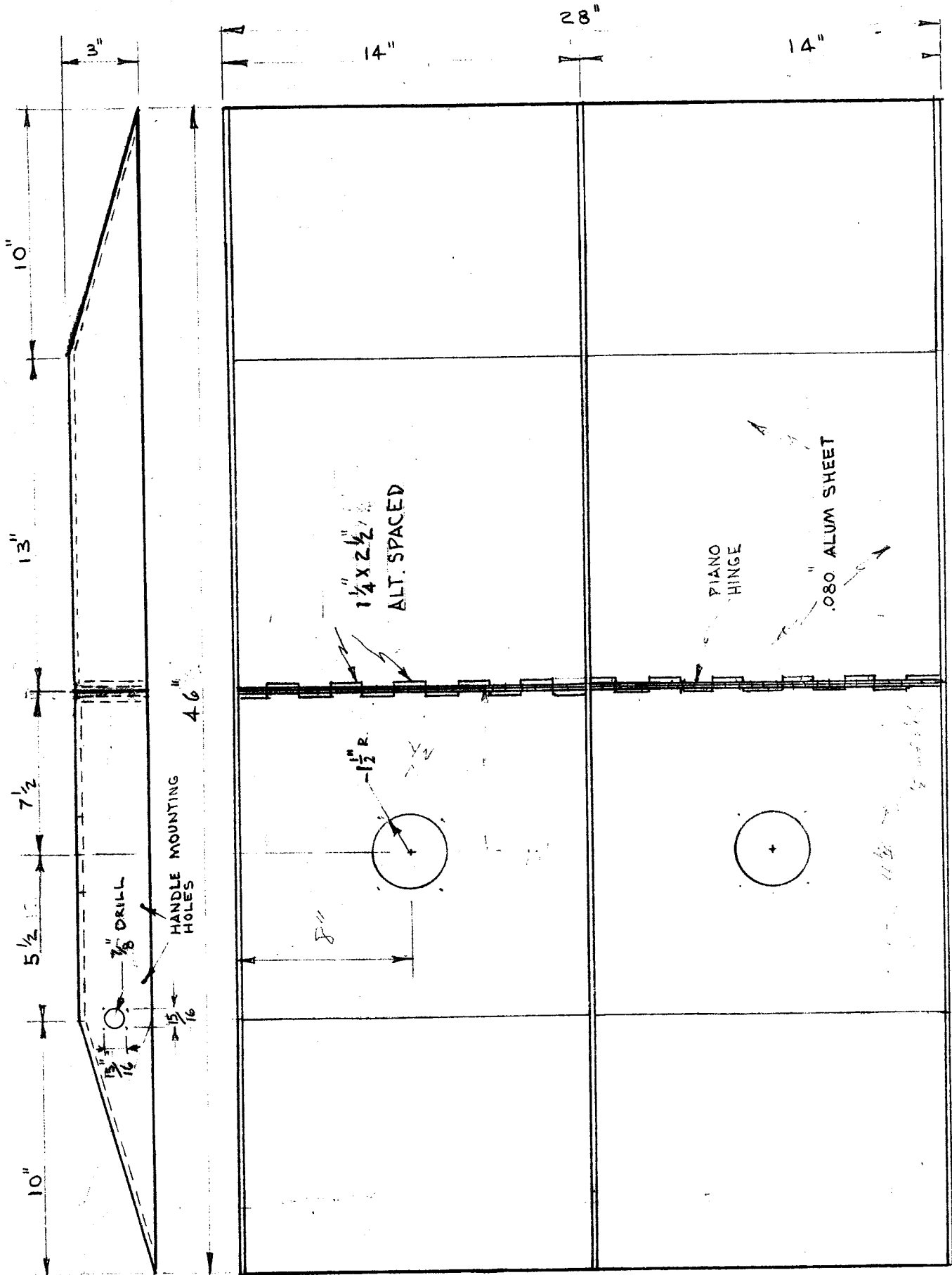


POWER SUPPLY SCHEMATIC
BOARD #1

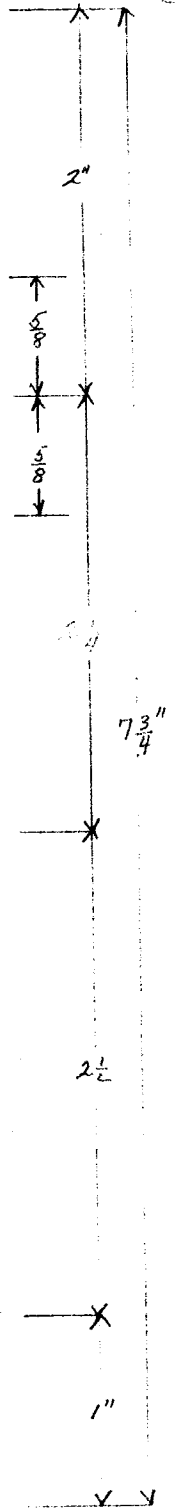
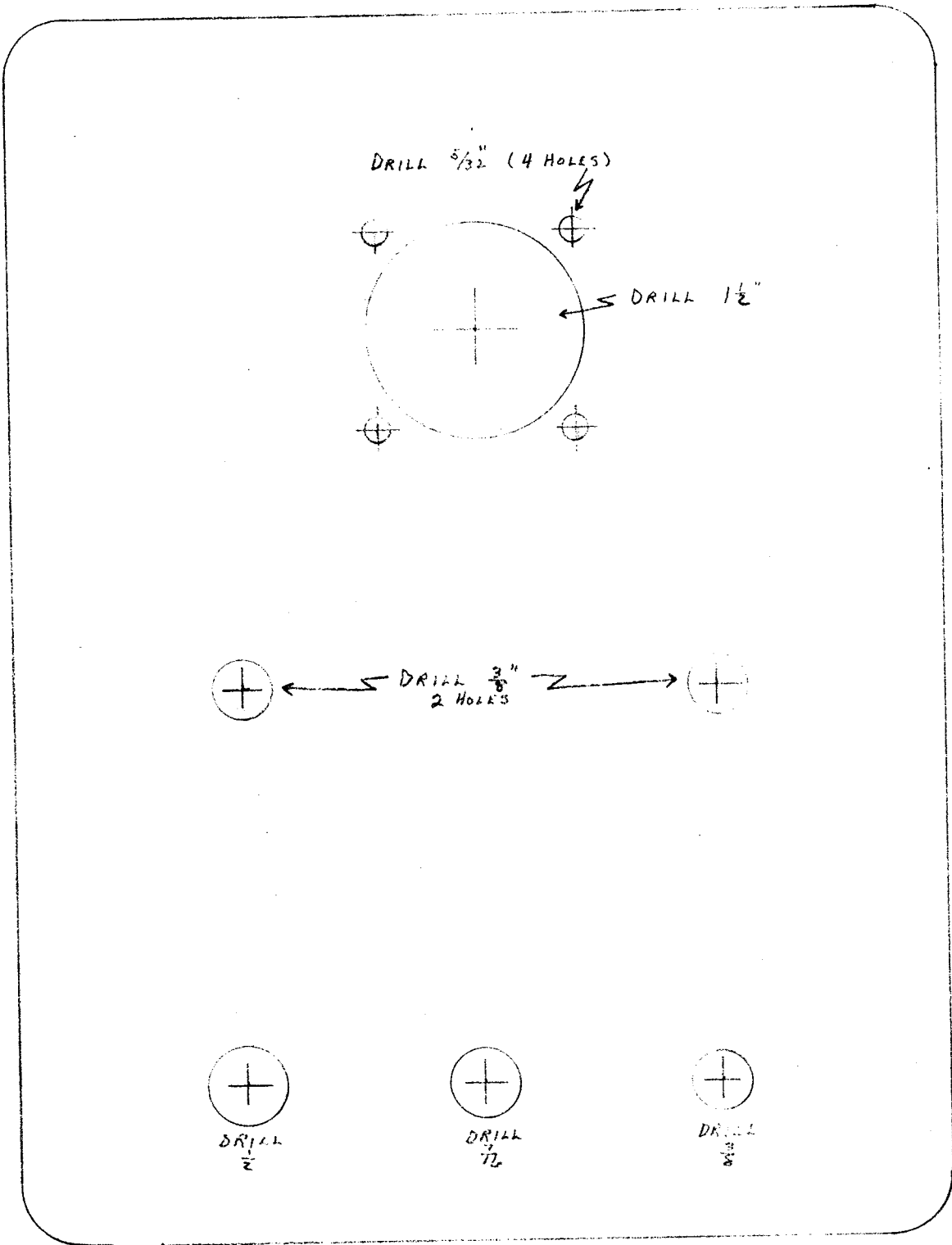


NOTE: ALL GROUNDS
TO COMMON POINT.

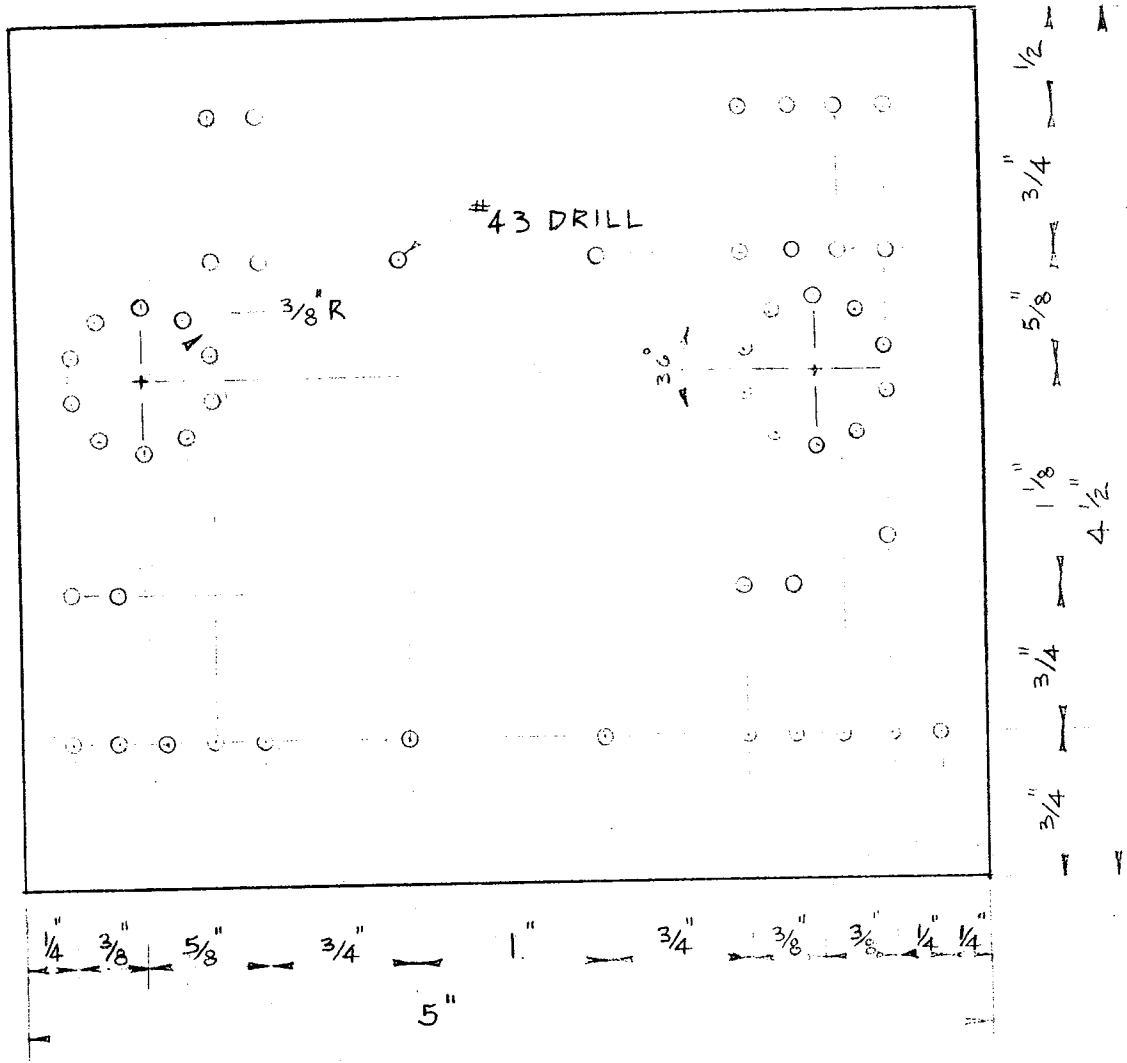
OSCILLATOR POWER OUTPUT STAGE SCHEMATIC
BOARD #2



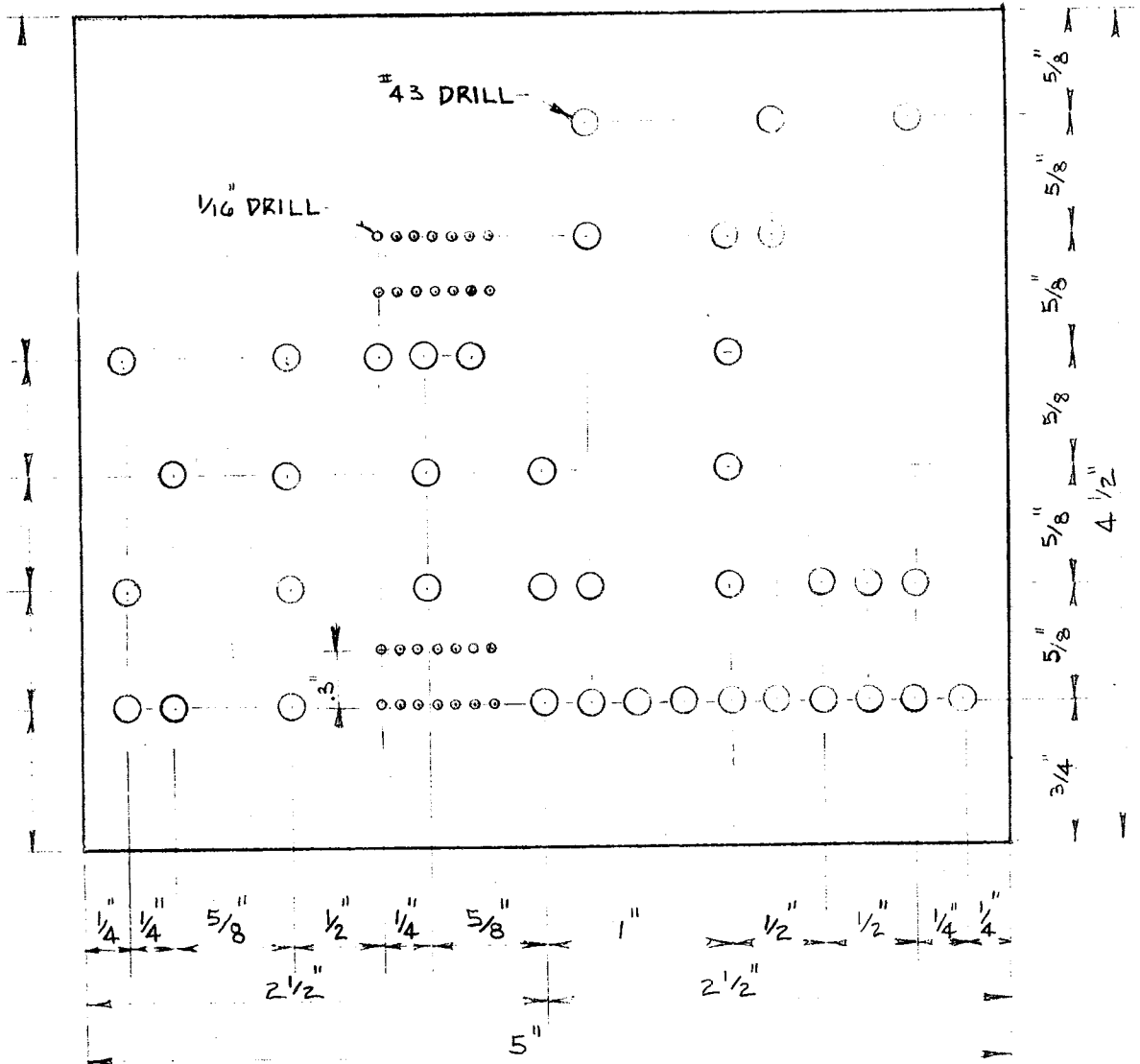
CALIBRATOR PLATFORM



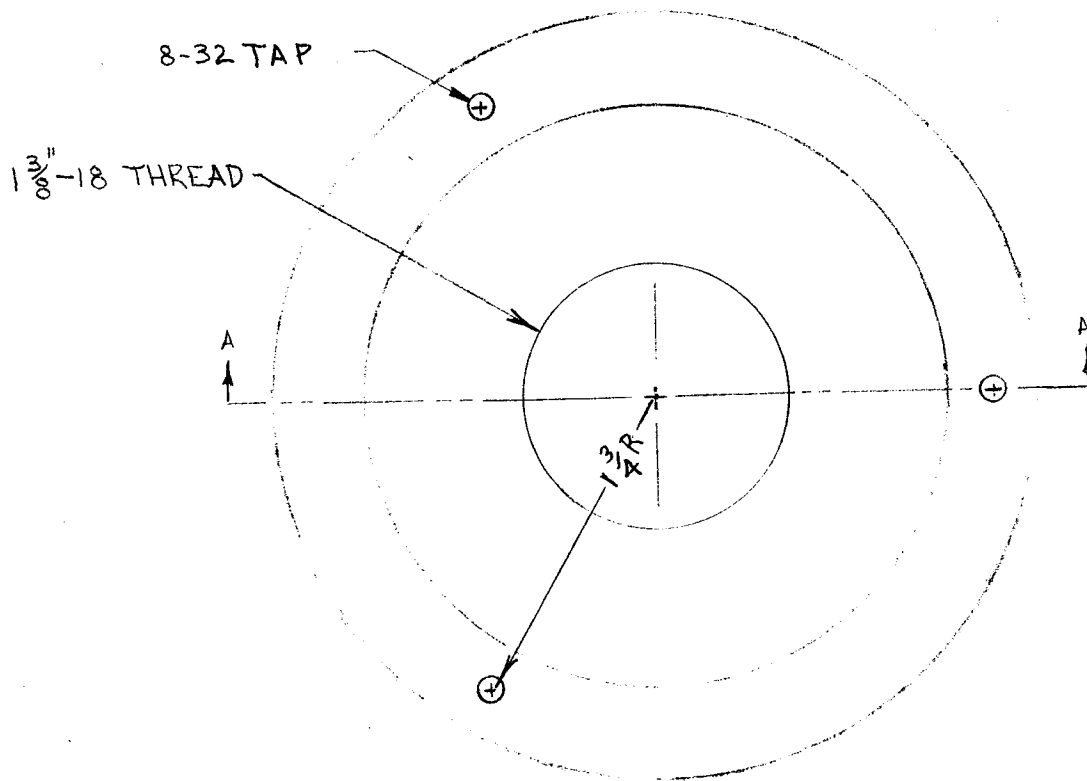
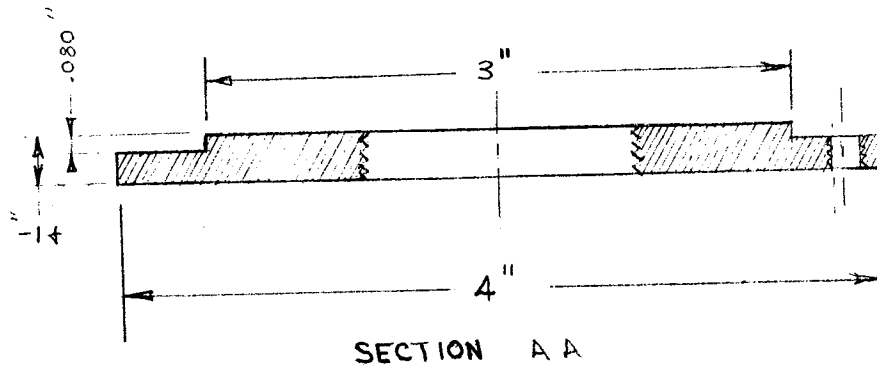
CALIBRATOR FRONT PANEL



BOARD #1 LAYOUT
FULL SCALE

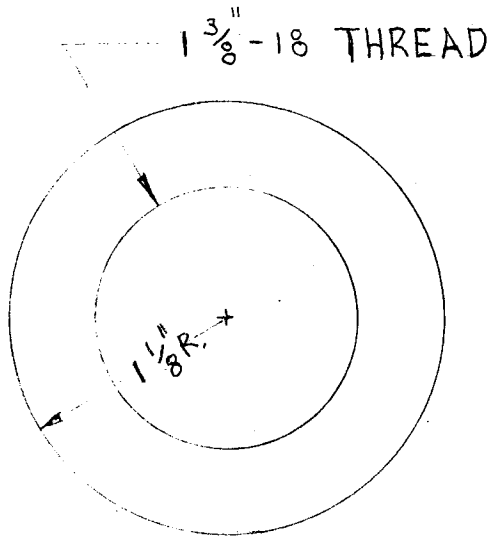


BOARD #2 LAYOUT
FULL SCALE

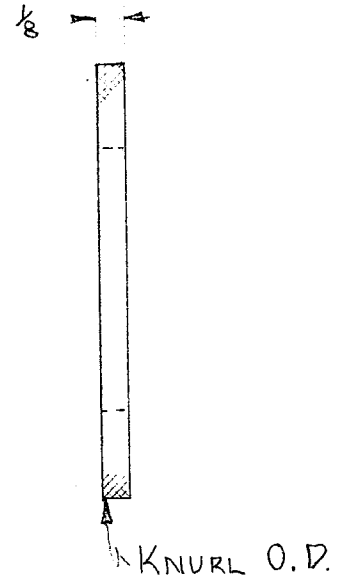


PLAN VIEW FULL SCALE

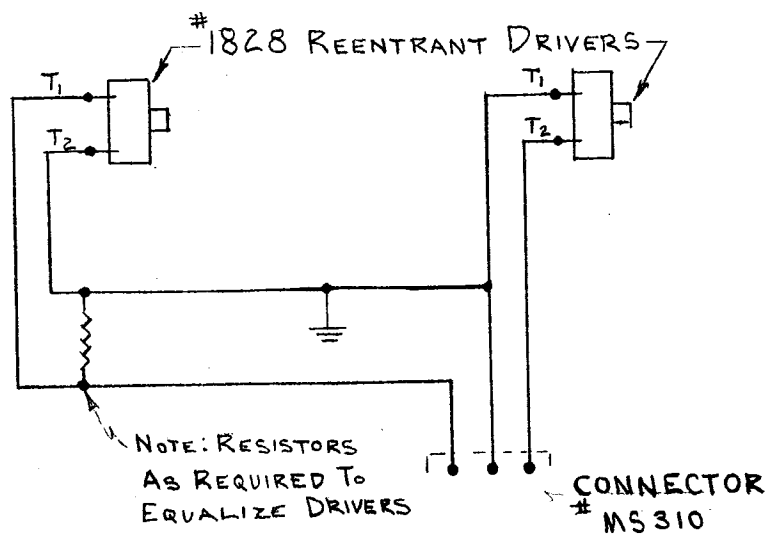
CALIB. DRIVER PLATE - PLASTIC (2 REQD)



$\frac{1}{8}$ ALUM. (2 REQD)



CALIB. DRIVER PLATE LOCK RING : FULL SCALE



CALB. SPEAKER WIRING