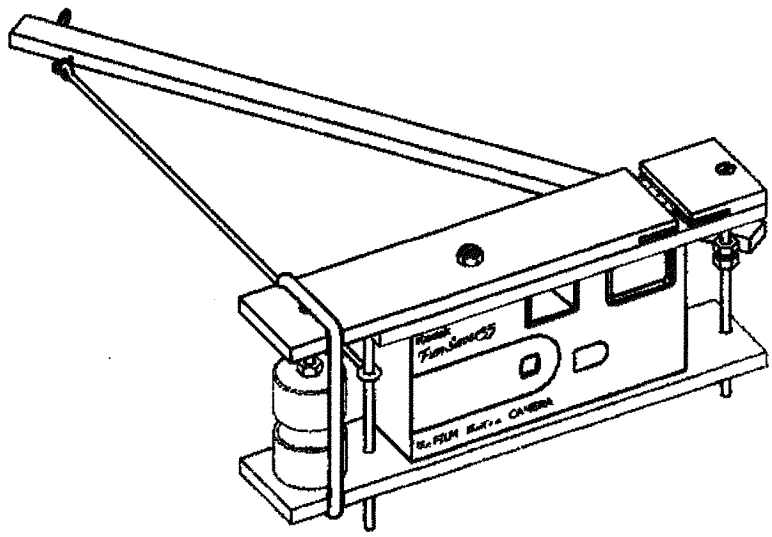
KAP CAMERA PLANS

Kite Aerial Photography is KAP!



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P.O. Box 522 Clinton, MI 49236

http://www.mtmscientific.com

Construction Details: Kite Aerial Camera Rig

MTM Scientific, Inc. P.O. Box 522 Clinton, MI 49236

Getting Started: Collecting Materials & Tools

The kite aerial camera rig can be built in a few hours. The most difficult task is collecting the individual piece parts! In that regard, you may decide to substitute items depending on your "parts" box. Collect these items:

Parts List: Kite Aerial Camera

1) A 2 foot length of Poplar wood, .25" thick by 1.5" wide. (Found at Home Improvement stores such as Lowes or Home Depot)
2) A 12" length of Spruce wood, .25" thick by .375" wide. (Found at a hobby store, you may have to purchase a 24" piece.)
3) 2 Plastic Caps from soda bottles.
4) A 12" length of stout nylon string.
5) A nylon hinge, preferably a Klett brand RK-9. (Found at a hobby store selling Model Airplane supplies, look for "wing hinges".)
6) An elastic hair band approximately 1.5" diameter, in the free state. (Simple rubber bands can be substituted.)
7) Four small eyelets with the screw type shanks.
8) Obtain the following hardware, all of which has #6-32 threads:
    a. 10 pieces steel hex nuts with the nylon locking insert
    b. 2 pieces steel flat head screws 4" long
    c. 1 piece steel flat head screw, 1.5" long
    d. 1 piece steel flat head screw, .50" long
    e. 1 piece steel round head screw, .75" long
    f. 2 pieces steel wing nuts

You will also need '5 minute' epoxy for installing the hinge, and wood stain (if desired) for finishing the wood. With regard to special tools… you will need a 5/32" drill bit, 1/16" drill bit, a counter sinking bit, a blade saw and some sandpaper. Of course you will also need a disposable camera! We suggest the Kodak FunSaver 35 Flash, but other cameras can be substituted.

Construction Begins!

Construct the kite aerial camera as follows:

1) Cut the 5 wood pieces to length. Make the cuts square using a miter box. The finished pieces should match the template page.
2) Use your blade saw to make notches for installing the nylon hinge flaps. The notches should be parallel with wood's edge.
3) Epoxy the hinge flaps into the two wood pieces to create the Top Camera Bracket ("Flapper"). The overall length of the Flapper is 8" after assembly. Before the epoxy cures use a straight edge to check the flapper is straight!
4) Make a photocopy of the wood drilling templates, cut them out and tape them to the individual wood pieces. Drill the holes and countersink the holes as specified. (Optionally, you can sandwich and drill the wood pieces together to improve hole alignment.)
5) While sandwiched together, use a round file to create the bungee cord notches. The exact size is not critical.
6) Drill 5/32" holes in the centers of the two soda bottle caps.
7) Drill 1/16" pilot holes in the kite line stick per the drawing.
8) Sand all the wood pieces lightly, and apply wood stain if desired.
9) Install the eyelets in the kite line stick, epoxy is optional.

The final steps are the assembly of the component pieces. The 3D drawing views of the camera rig are helpful in this regard. The locking nuts can be tedious to turn, a small wrench is very useful.

Final Tweaks

The length of the nylon string (to the kite line stick) is nominally 9" after assembly. This can be adjusted depending on your picture taking goals. Singe the ends of the nylon string with a match to prevent unraveling.

When installing the camera, make sure the shutter button is aligned with the shutter hole in the middle camera bracket. Don't use excessive force tightening the wing nuts! It is possible to crush the camera's plastic case.

Note: The kite line stick is attached offset. This is important to allow the camera to hang from the kite string balanced, without tilting to the side.

After construction is complete, refer to the Instruction Manal for operating details.

Instructions: KAP Camera Rig

MTM Scientific, Inc. P.O. Box 522 Clinton, MI 49236

Introduction

Kite Aerial Photography (KAP) is an exciting and enjoyable hobby. This KAP Camera Rig will snap clear and detailed photographs from the high altitude perspective of your kite. The most important part of the KAP hobby is making sure to fly your kite in a safe and responsible manner!

How the KAP Camera Works

The KAP camera takes airborne pictures using a disposable flash camera. The camera is housed inside the KAP rig. The purpose of the KAP rig is to carry the camera, aim the camera and to trip the shutter. A melting ice cube timer trips the shutter. In use, the ice cube is inserted between the black caps on the rig. The cube holds the shutter trigger away from the camera's trip button. When the cube melts, the shutter is tripped and the photograph is taken.

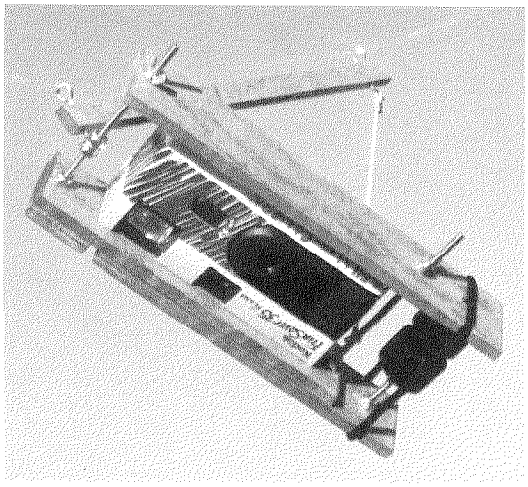

Photo 1: View of the KAP Camera in action.

On an average 70F day, and with an average size ice cube, the picture is snapped after about 10 minutes of flight.

A flash disposable camera is especially convenient for KAP because the flash signal is visible from the ground.

How to use the KAP Camera Rig

The KAP Camera Rig weighs about 10 ounces. A kite with good payload capacity is required for lifting the rig, such as a large box kite. The KAP Rig is not attached to the kite, but rather to the line which leads up to the kite. In practice, you first get your kite airborne, and then attach the KAP Rig to the line.

You will notice the 2 eyelets on the line stick are slightly open. Attaching the KAP Rig is a simple

matter of winding the kite line around the eyes. You will find this can readily be done in the field.

Here is the action sequence for taking a KAP picture:

1. Get your kite safely airborne, with about 50 feet of line in play.
2. Select and insert an ice cube between the two black caps on the KAP Rig.
3. Advance the film in the camera using the winder.
4. Hold down the button on the front of the camera to arm the flash, watch for the lighted dot.
5. Attach the KAP rig to the kite line by looping the line 3 times around each of the two eyelets.
6. Spool out kite line and fly the kite to desired altitude.
7. Watch for the camera flash to indicate a picture has been taken.
8. Haul in the line, and repeat!

The procedure for taking a picture is simple, but there are several tips and tricks to get the best results…

The picture will blur if the camera is swinging violently when the shutter is tripped. Try to keep the kite on a smooth and steady flight path until you see the flash.

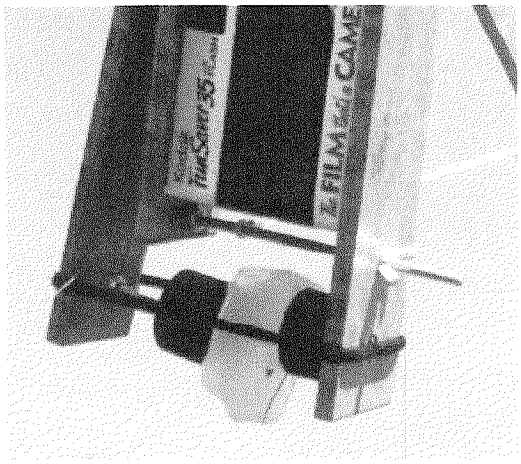

Photo 2. A melting ice cube trips the camera shutter. This is a 'large' cube!

Small ice cubes melt quickly, and larger cubes give you more time. Select according to your needs.

The aim of the camera can be adjusted for different shot angles. Try shortening the support string to the line stick, or mounting the KAP rig on the kite line backwards.

Avoid taking pictures with the camera aimed at the sun. The best pictures are taken with the sun providing light from behind or to the side.

If there is insufficient wind, don't try to take pictures! It is very disappointing to launch a camera, and then watch it bounce along the ground (at best), or smack against the ground and break (at worst).

Don't take one or two KAP shots and expect a masterpiece. Fly at different times of the day, change your location, change the lighting, change the altitude, etc. Keep good records to improve your technique.

Installing Disposable Cameras

The disposable camera initially provided with the KAP Rig will take 27 pictures. It is a simple matter to replace the camera with another. When installing the new camera make sure the camera's shutter button lines up with the hole in the KAP rig.

HINT: Other makes and models of disposable cameras can be used. It is also fairly easy to move the shutter tripper by drilling two holes for a new location.

When installing a new camera, tighten the wing nuts until the camera is held snugly. Do not over tighten the wing nuts, or the camera will be damaged.

Specifications: KAP Camera Rig

Model..... KAP
Weight..... 10 oz + Cube
Frame..... Poplar
Camera.....Kodak Funsaver

KITE SAFETY RULES

- ✓ Never fly near power lines.
- ✓ Never fly in stormy weather.
- ✓ Use gloves to prevent rope burns.
- ✓ Never use metal flying line.
- ✓ Don't fly near airports.
- ✓ Never fly near or over people.
- ✓ Never release a kite.
- ✓ Don't fly near trees.

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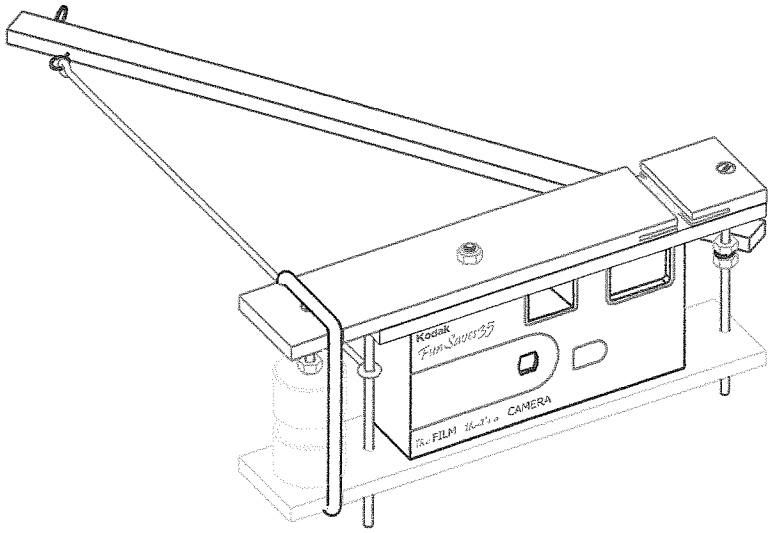

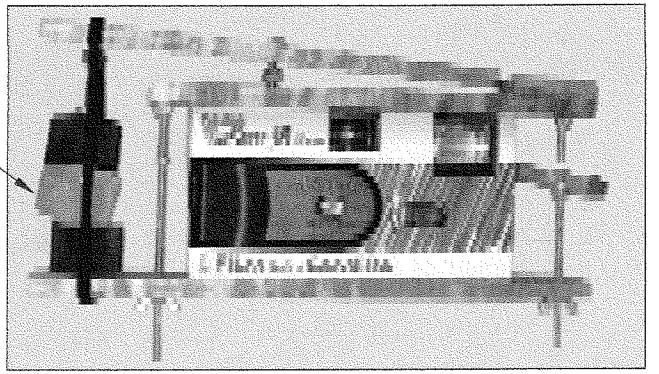

12" LG. NYLON STRING

KITE LINE STICK

4X SMALL EYELET
W/ SCREW TYPE SHANK

NYLON HINGE (WINGED HINGE)
"KLETT" RK-9 OR EQUIVALENT

#6-32 x 1-3/8" LG.
STEEL FLAT HEAD SCREW

ELASTIC BAND

#6-32 x 1-1/2" LG"
STEEL PAN HEAD SCREW

.03"

SECTION B-B

2X PLASTIC CAP
FROM SODA BOTTLE

#6-32 x 1/2" LG.
STEEL FLAT HEAD SCREW

SECTION A-A

5 MINUTE
EPOXY

TOP CAMERA BRACKET

MIDDLE CAMERA BRACKET

A

B

Kodak
FunSaver35

FLASH

1"

The FILM that's a CAMERA

10X #6-32 STEEL HEXT NUT
W/ NYLON INSERT

BOTTOM CAMERA BRACKET

DISPOSABLE
CAMERA

2X #6-32 x 4" LG.
STEEL FLAT HEAD SCREW

2X #6-32
STEEL WING NUT

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ASSEMBLY, KAP CAMERA RIG

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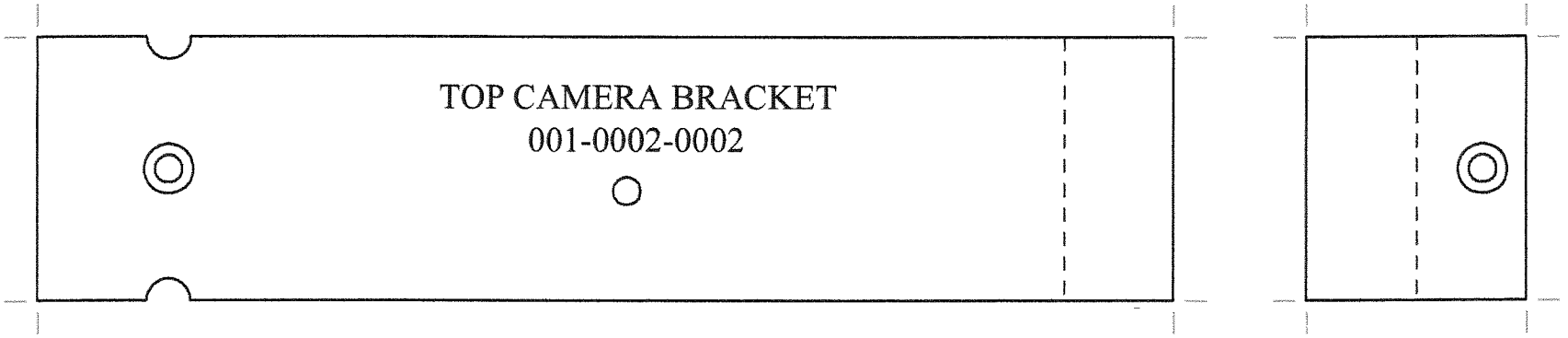

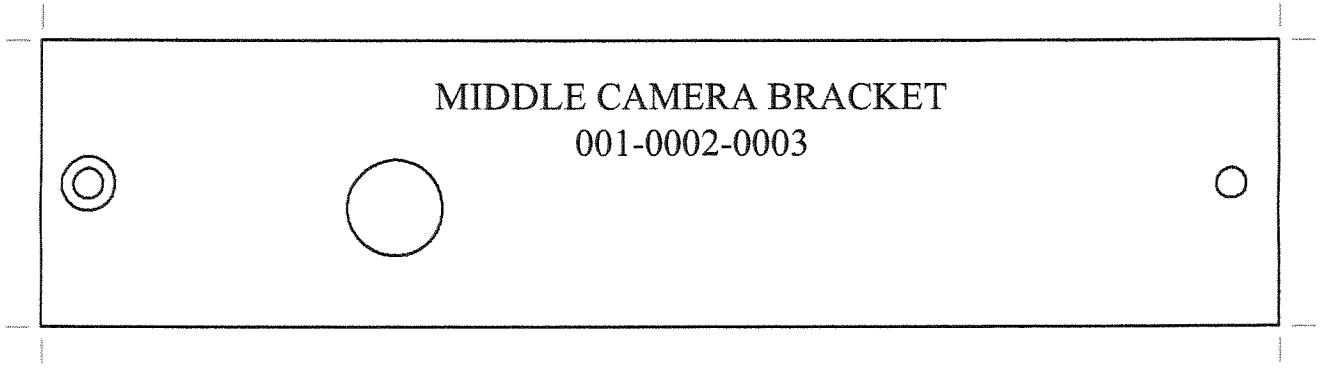

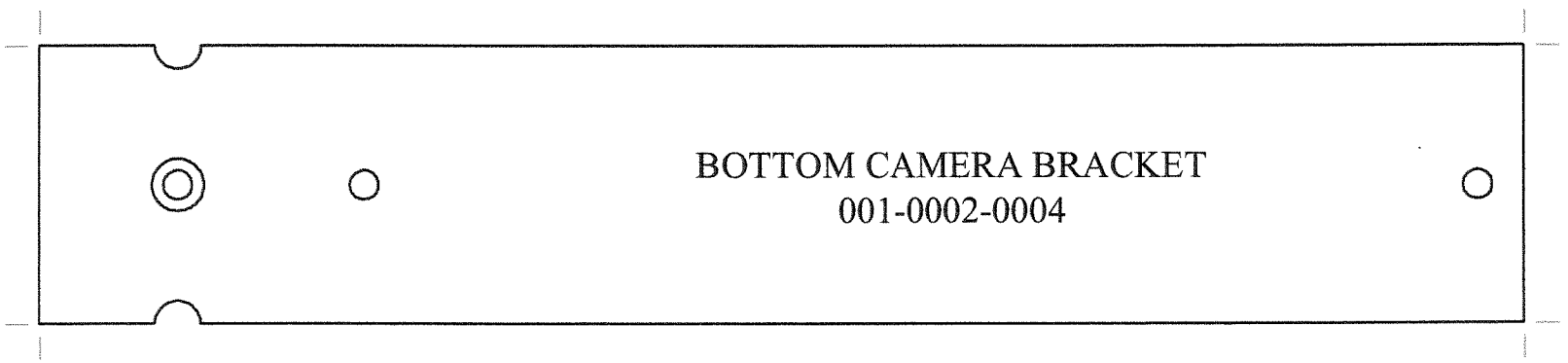

Actual Size

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TEMPLETE,
KAP CAMERA RIG

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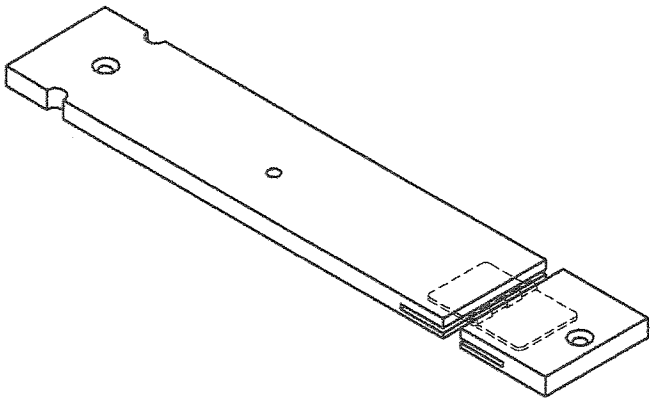

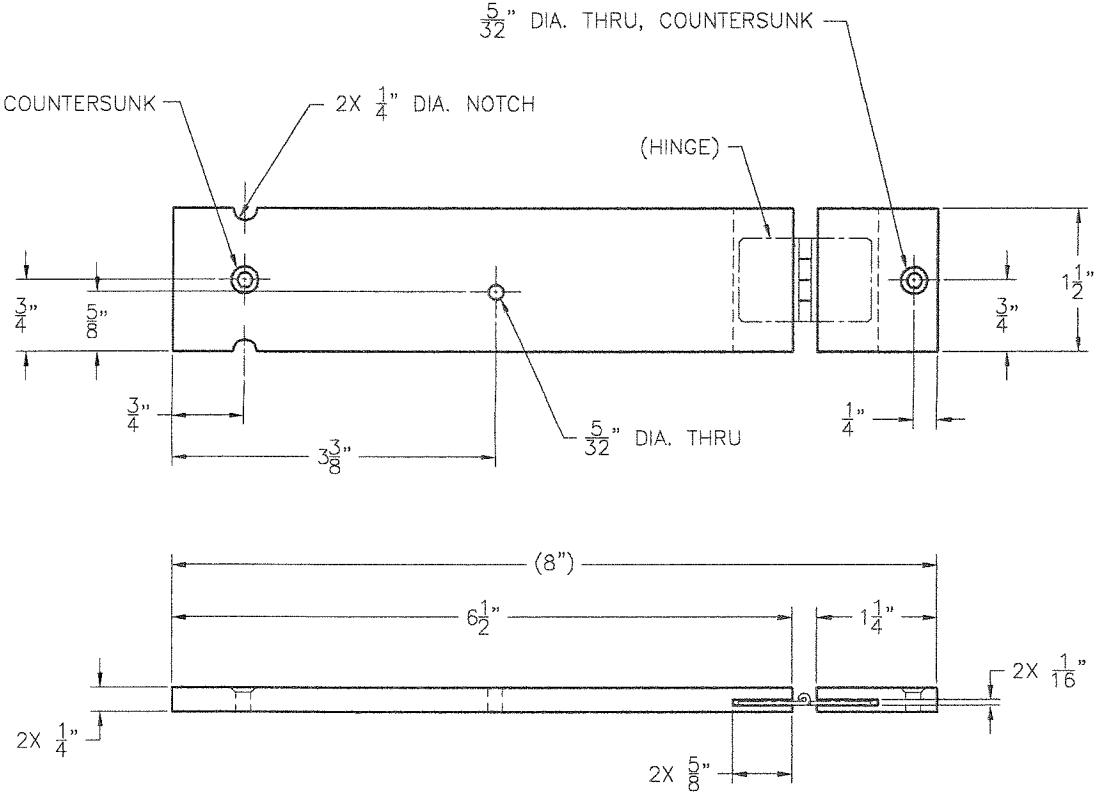

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TOP CAMERA BRACKET, KAP CAMERA RIG

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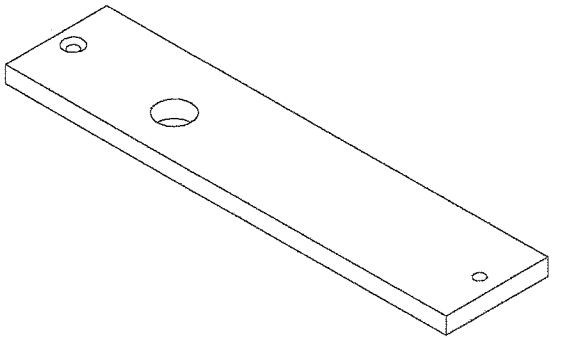

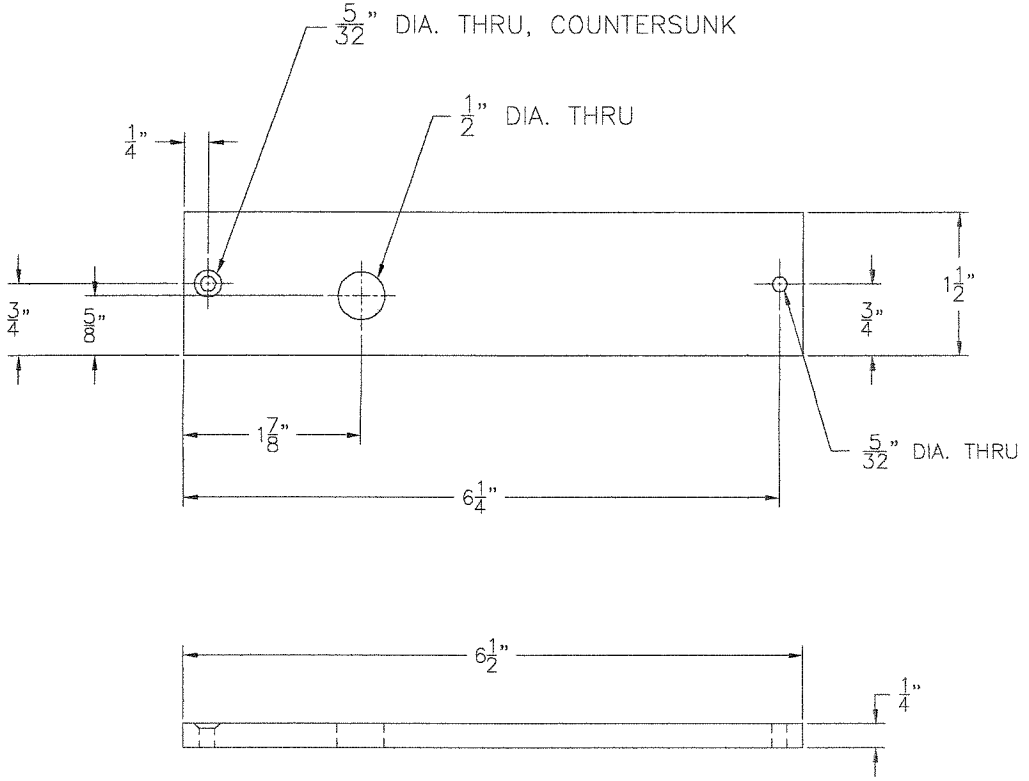

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MATERIAL: POPLAR		MIDDLE CAMERA BRACKET, KAP CAMERA RIG	
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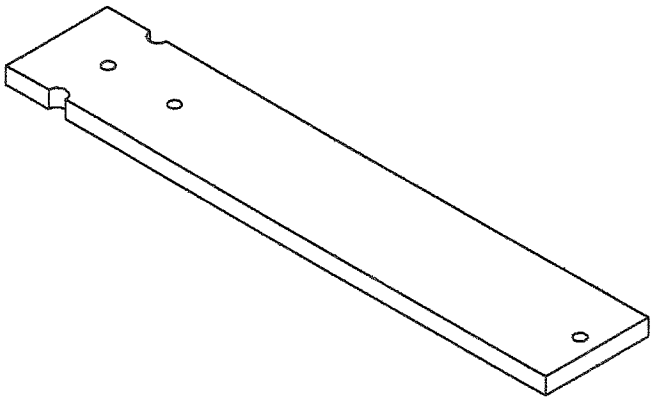

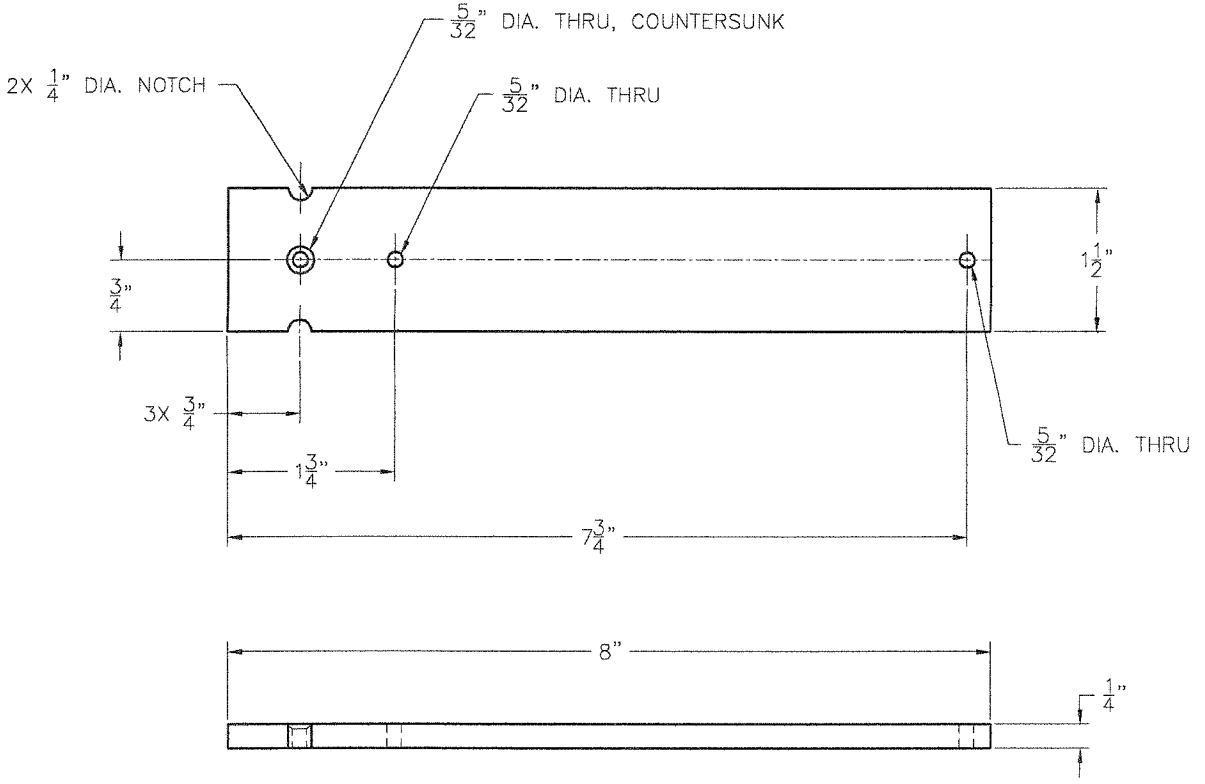

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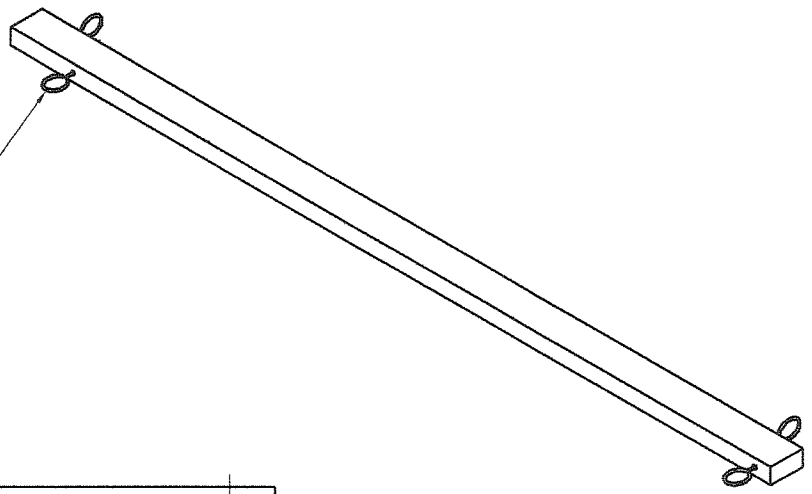

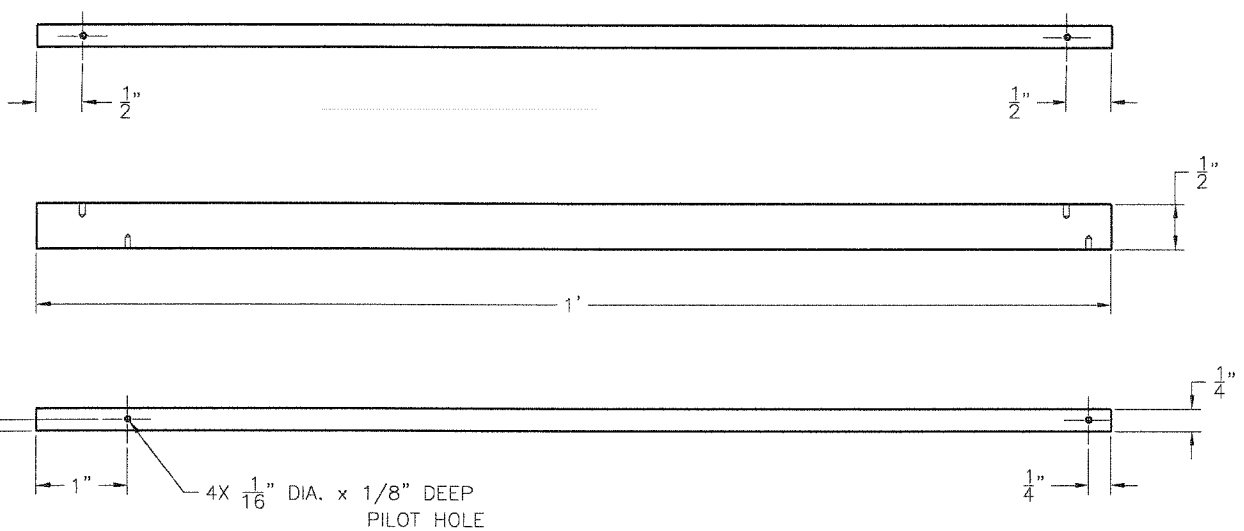

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