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REVERBERATION PLATE CONSTRUCTION DRAWINGS

The following drawings were copied from the original sketches of the prototype ECOPLATE™ I. The engineering blueprints that were made from these were too large to fit in any available scanner so they (the original sketches) were corrected per the engineering blueprints. The scans of the drawings are low resolution to save space but they will print fine.

The only details that are not revealed here are the voice coil-magnet combination and the pickups. There are still sold on the open market and are available from JCC & Assoc.

The miniboxes shown in Fig. 2 have two grommeted holes, one in each end of the box. Inside is a terminal strip where leads from the pickups join with the cable to the amplifier. The latter can be any good single conductor microphone cable. The pickup leads should be any small diameter single conductor cable that is flexible. A twisted pair of #28 wire will suffice if it is under 8" in length. All wire should be kept from touching the plate with tyraps, where possible.

The steel plate can be purchased from most steel companies precut to size. Stainless steel has more high frequency decay time (suitable for rock music) whereas cold rolled steel is more like a concert hall (suitable for classical music). The EMT 140 was cold rolled. Most of the other parts are available from local hardware stores, lumber yards, and electronic suppliers such as Mouser, Newark and Allied. Somewhat special items (such as the spade bolts and links) can be had at large hardware supplier such as McMaster-Carr.

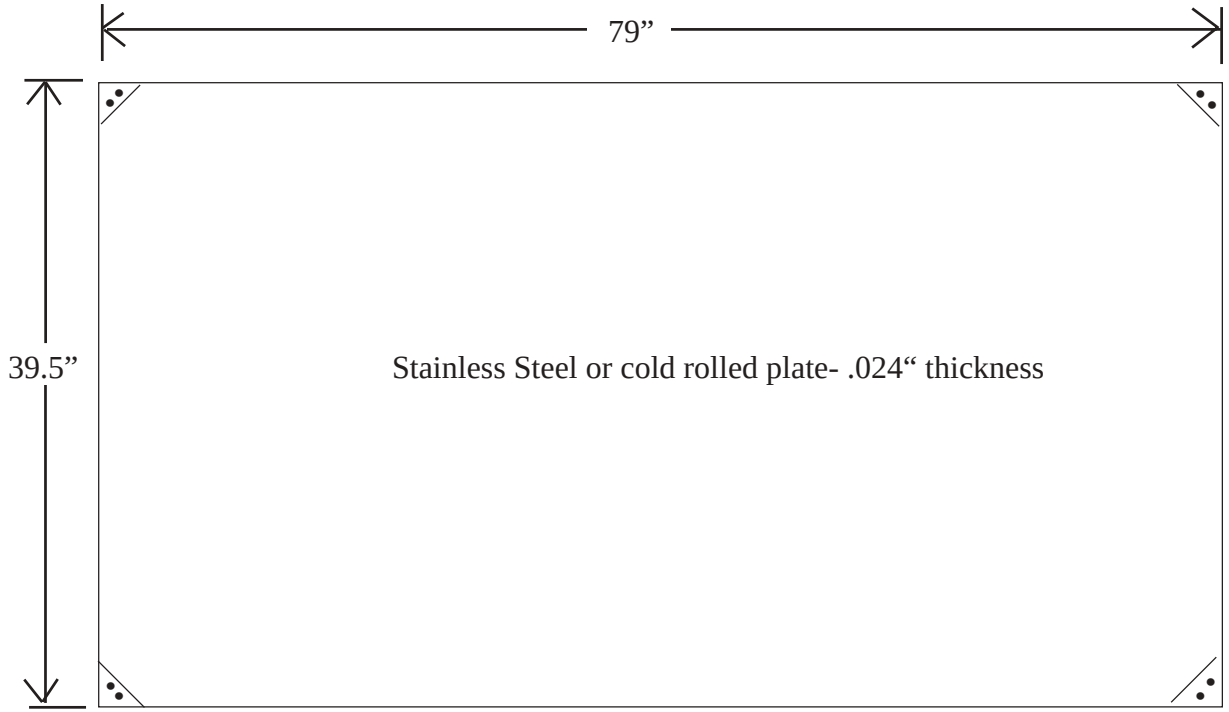
The amplifier schematics can be used as a guide or built as is. PC board layouts are available. Basically they are flat amps except for the Drive amp EQ noted in Fig. 11. Therefore it is possible to use any good power amp capable of the required EQ and at least 20 watts. The preamp stage needs to have a high impedance input.

The most important part in a Plate Reverb system is the damping plate. There are several requirements necessary to ensure that the sound of the reverb decay is realistic. The damping material must have "flow resustance". Armstrong Shasta Fiberglass ceiling tiles 2'x4' and about 5/8 inch thick, with a thin plastic backing that contains many tiny holes are ideal. Available at Home Depot. Mount as shown in the drawing. This is all explained in the EMT Patent, available from our website: platereverb.com Also a story on the developement of the ECOPLATE is available there as well as many other details concerning Plate Reverb. That address is platereverb.com An optional box to provide isolation will be posted there. Many studios, however, often put the reverb in the studio because it is often added during mixdowns. Oterwise the unit can be hung from chains if structure born noise is a problem.

Once constructed the plate must be properly tensioned so the reverb decay is smooth and even. This is accomplished by achieving even tension on all four sides of the steel plate. Tension affects, inversely, the low frequency reverb time. The more tension the less low frequency reverb time. Tensioning is usually a long, time consuming procedure and should be done several times a year. Also there is the risk of over tightening the plate and stretching it. If this happens it will not be possible to properly tension the plate again. To avoid this and to make tuning simple, a tuning gauge is also available from JCC & Assoc. for $50. A torque wrench does not measure plate tension due to the friction component in the threads.

A somewhat smaller and simpler version of the ECOPLATE™ I was the ECOPlATE™ II. Drawings of this plate can be made available in the future is there is sufficient interest.

STEEL PLATE
CONSTRUCTION



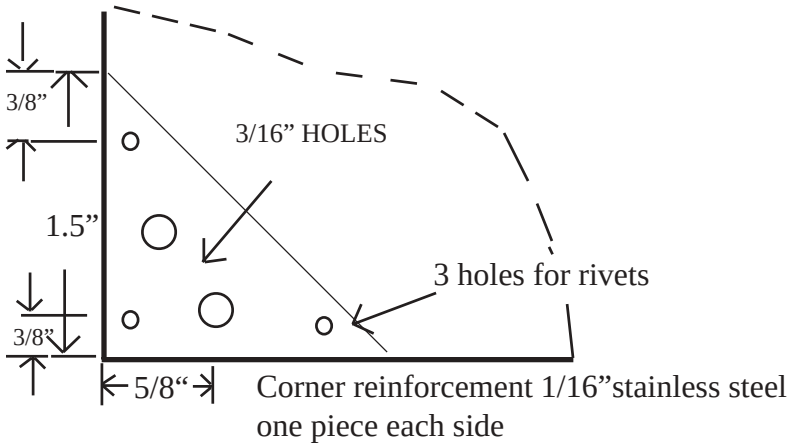
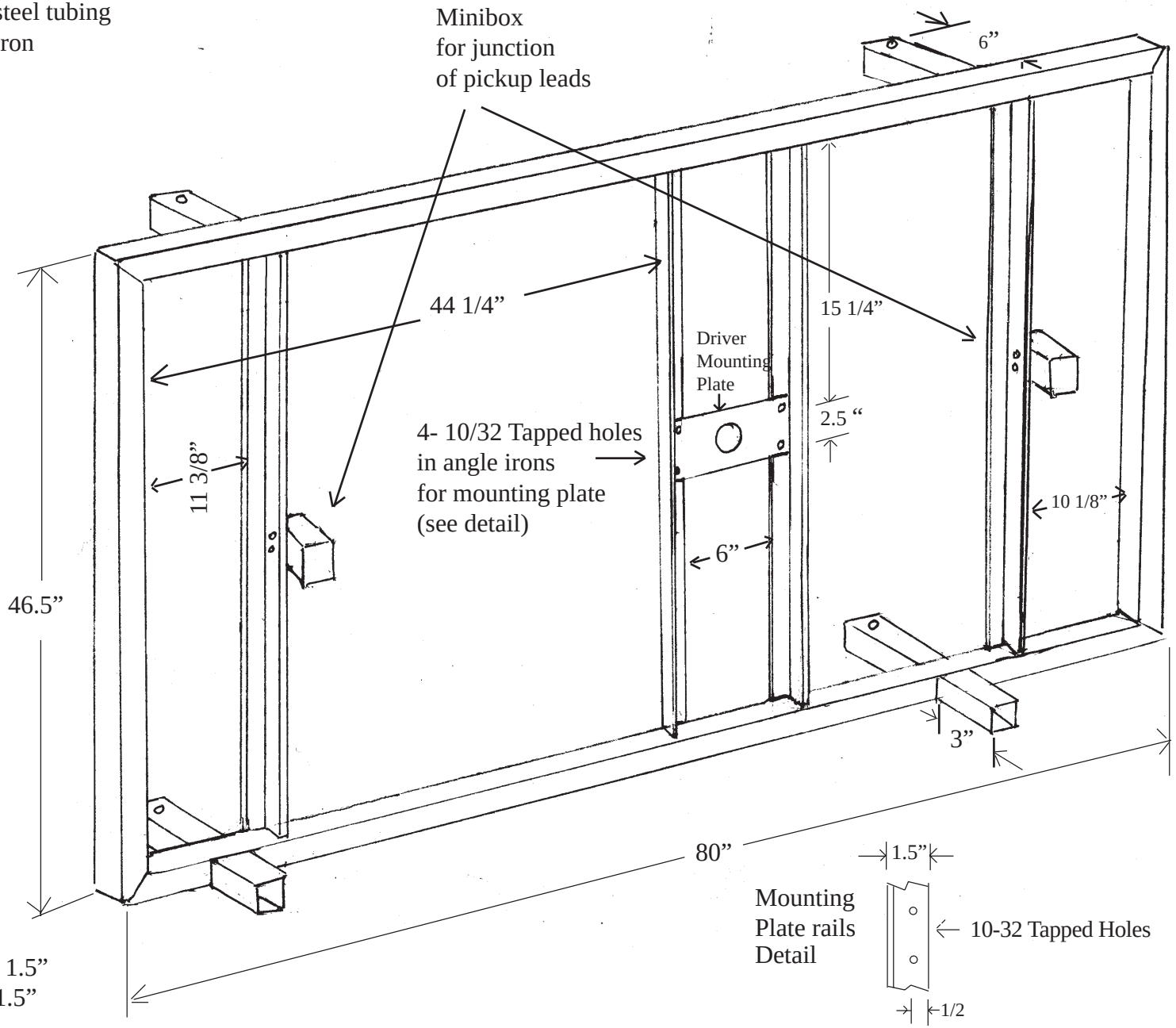


Fig. 1

DRIVER SIDE OF FRAME CONSTRUCTION

Using 1.5” steel tubing
1.5” Angle iron



ALL
Steel tubing 1.5”
Angle Iron 1.5”

Fig. 2

PLATE SIDE OF FRAME CONSTRUCTION

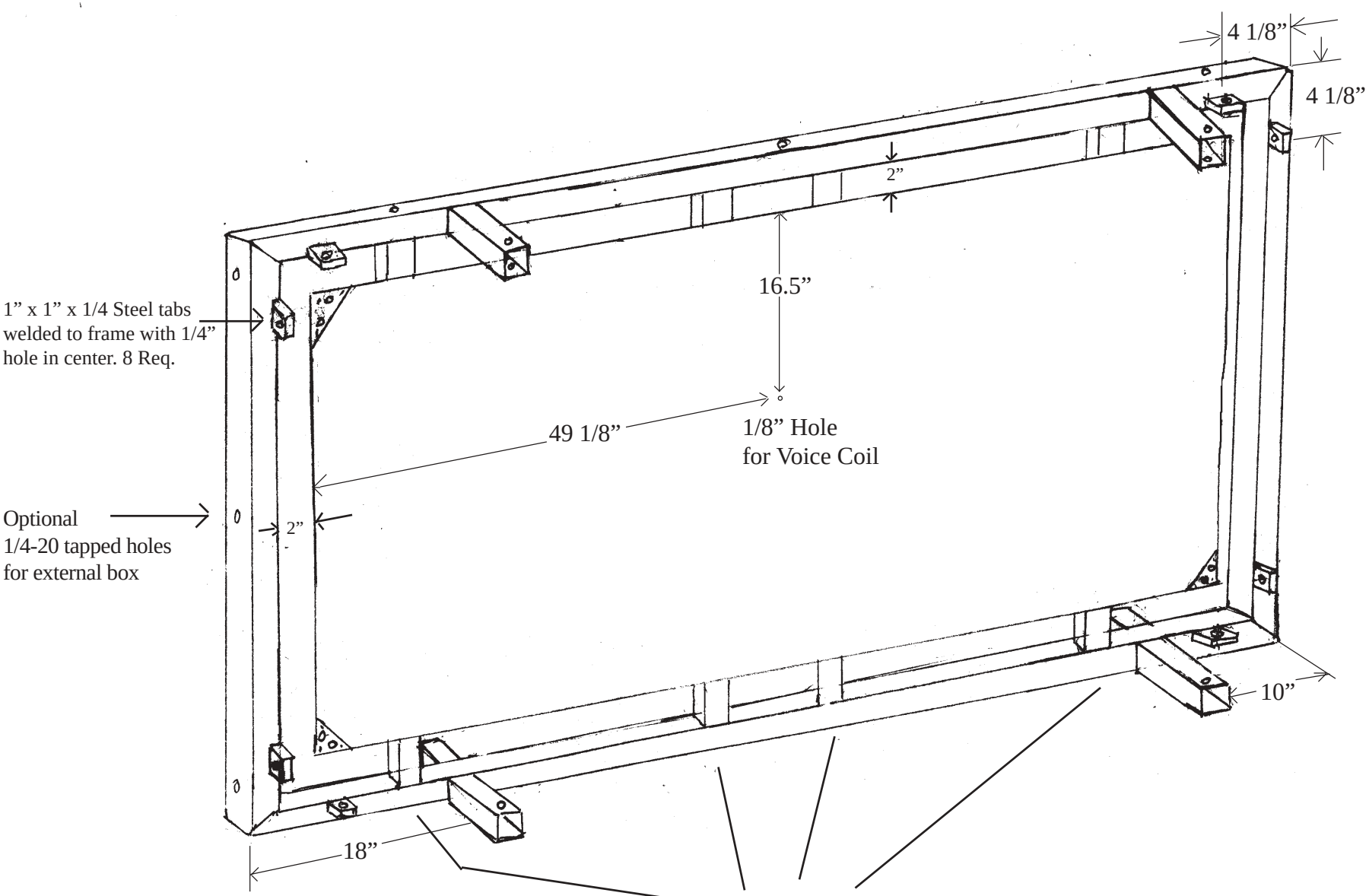


Fig. 3

DAMPING PLATE DETAILS

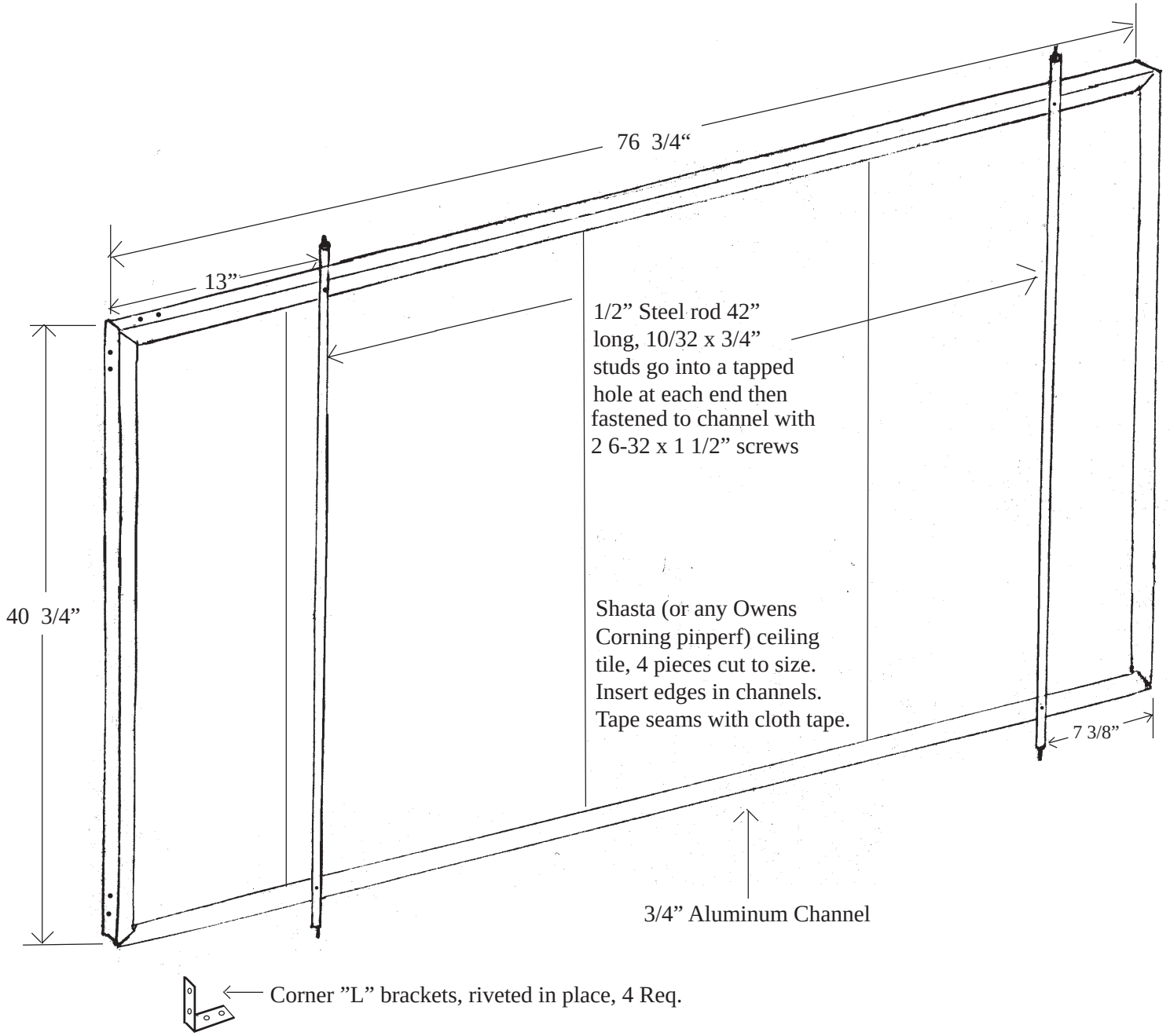


Fig. 4

FRAME SHOWING DAMPING PLATE MECHANISM

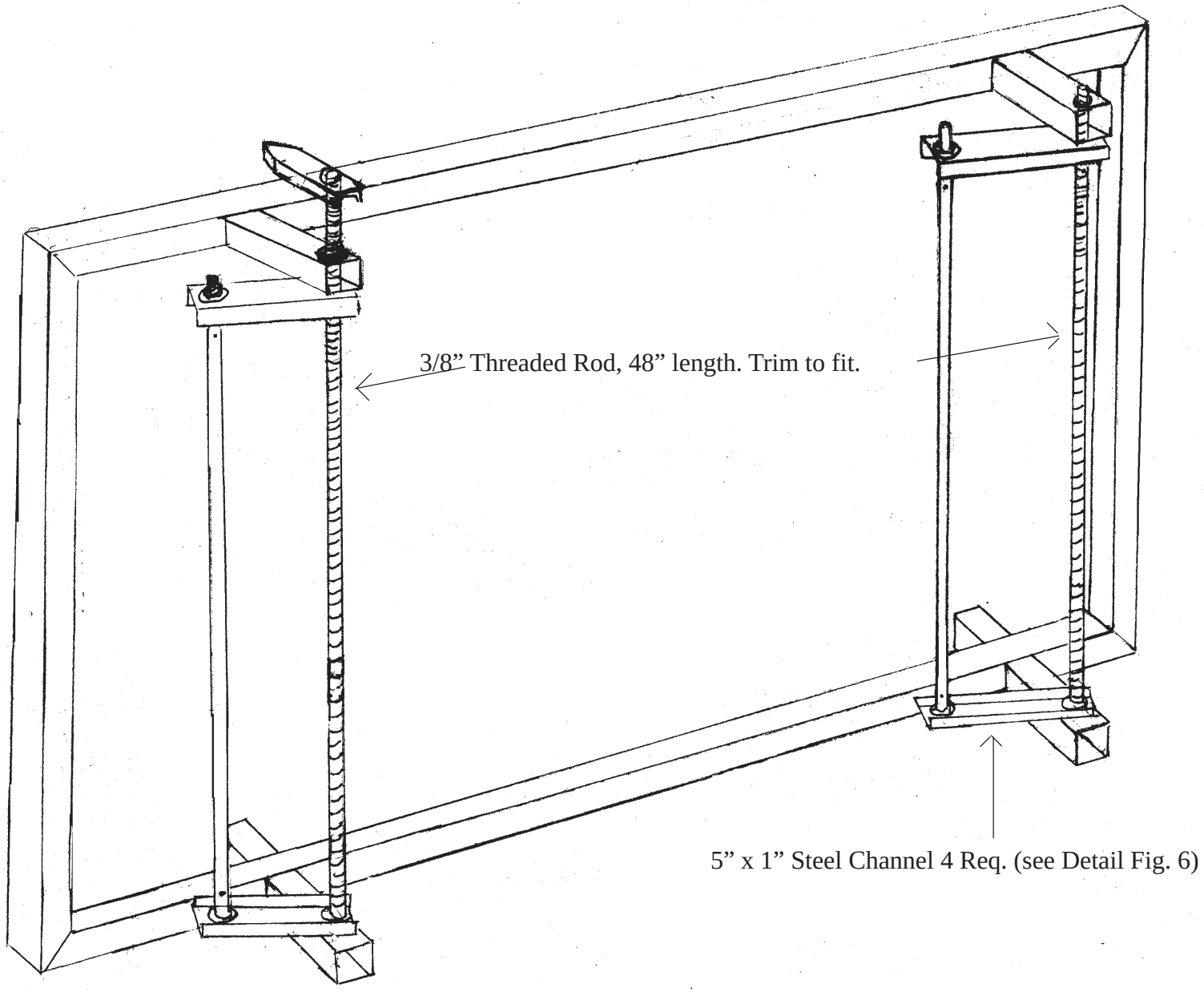


Fig. 5

FABRICATION DETAILS, ARM

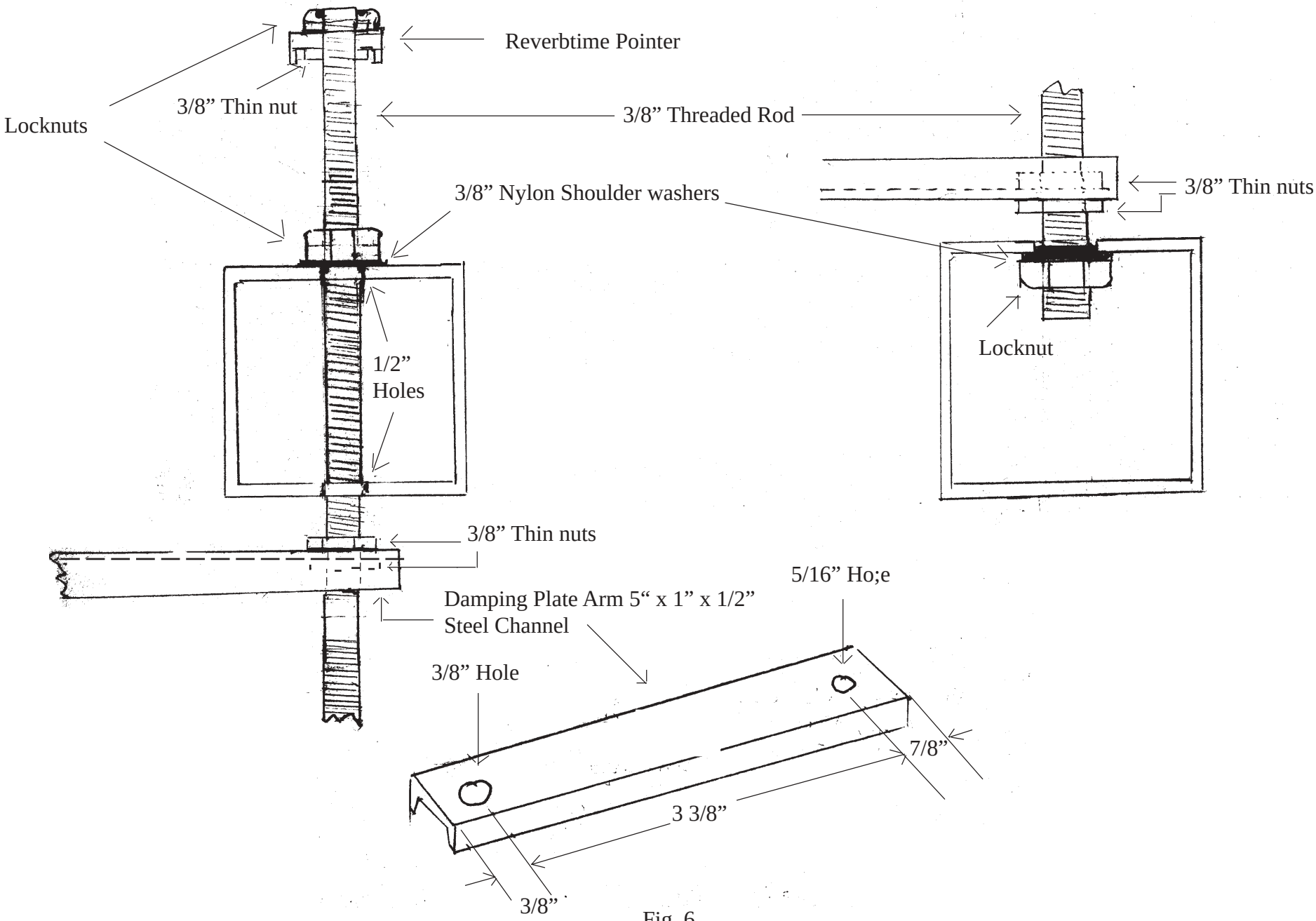
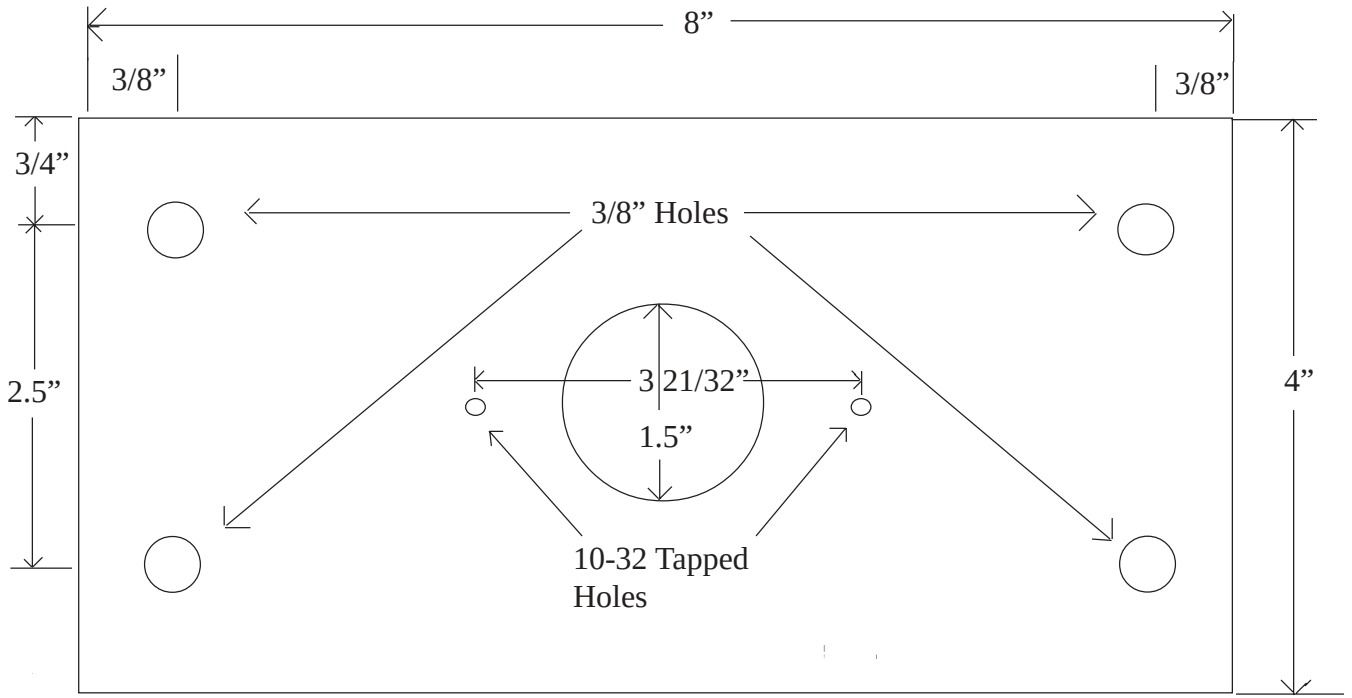
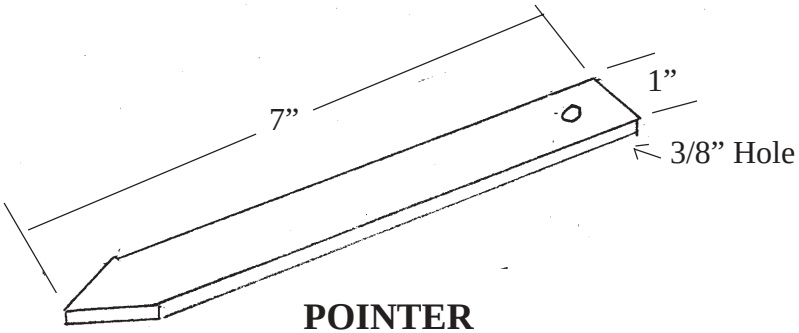


Fig. 6

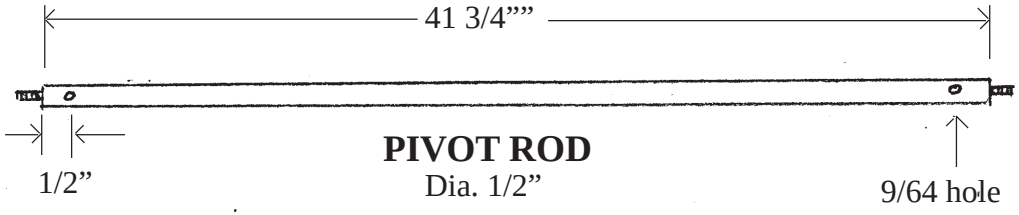


DRIVER MOUNTING PLATE

1/8” Aluminum



POINTER



PIVOT ROD

Dia. 1/2”

Fig. 7

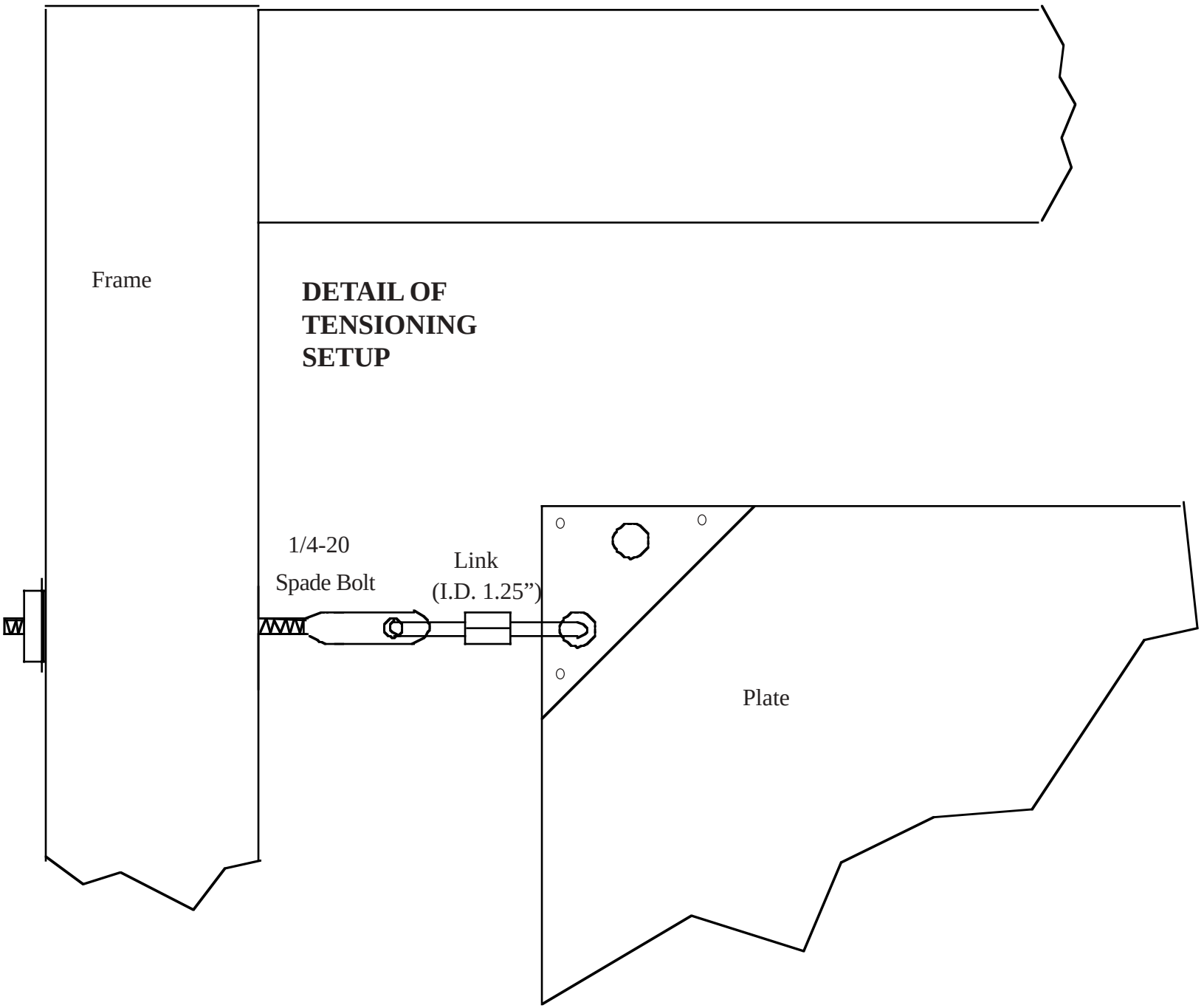
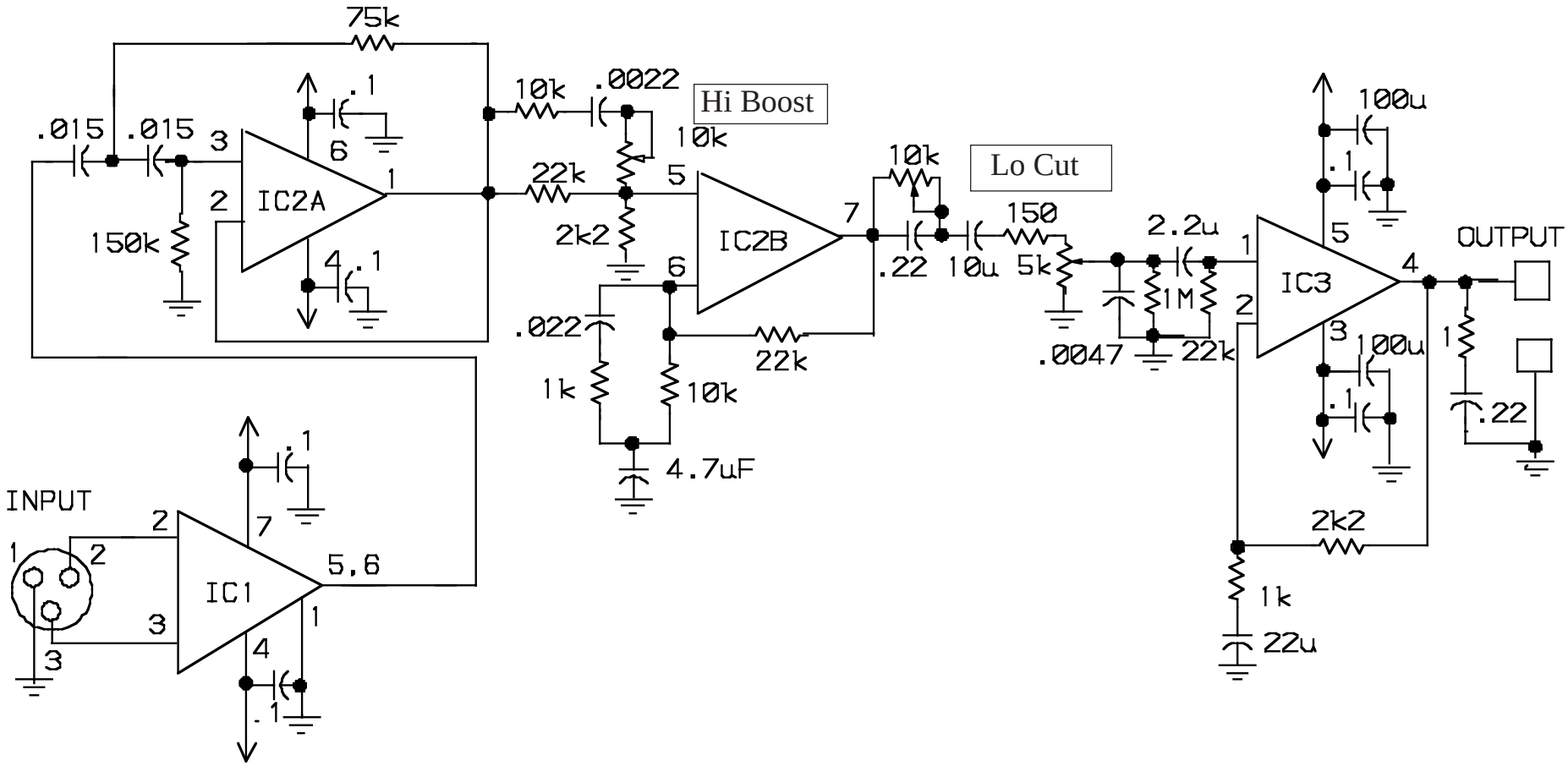

Frame
DETAIL OF
TENSIONING
SETUP
1/4-20
Spade Bolt
Link
(I.D. 1.25”)
Plate

Fig. 8



ECO POWER AMPLIFIER
SSM2143 (ANALOG DEVICES) OR IC 1 INA137PA (BURR BROWN) IC 2 NE5532 IC 3 LM 1875 12-20-99

Fig. 9

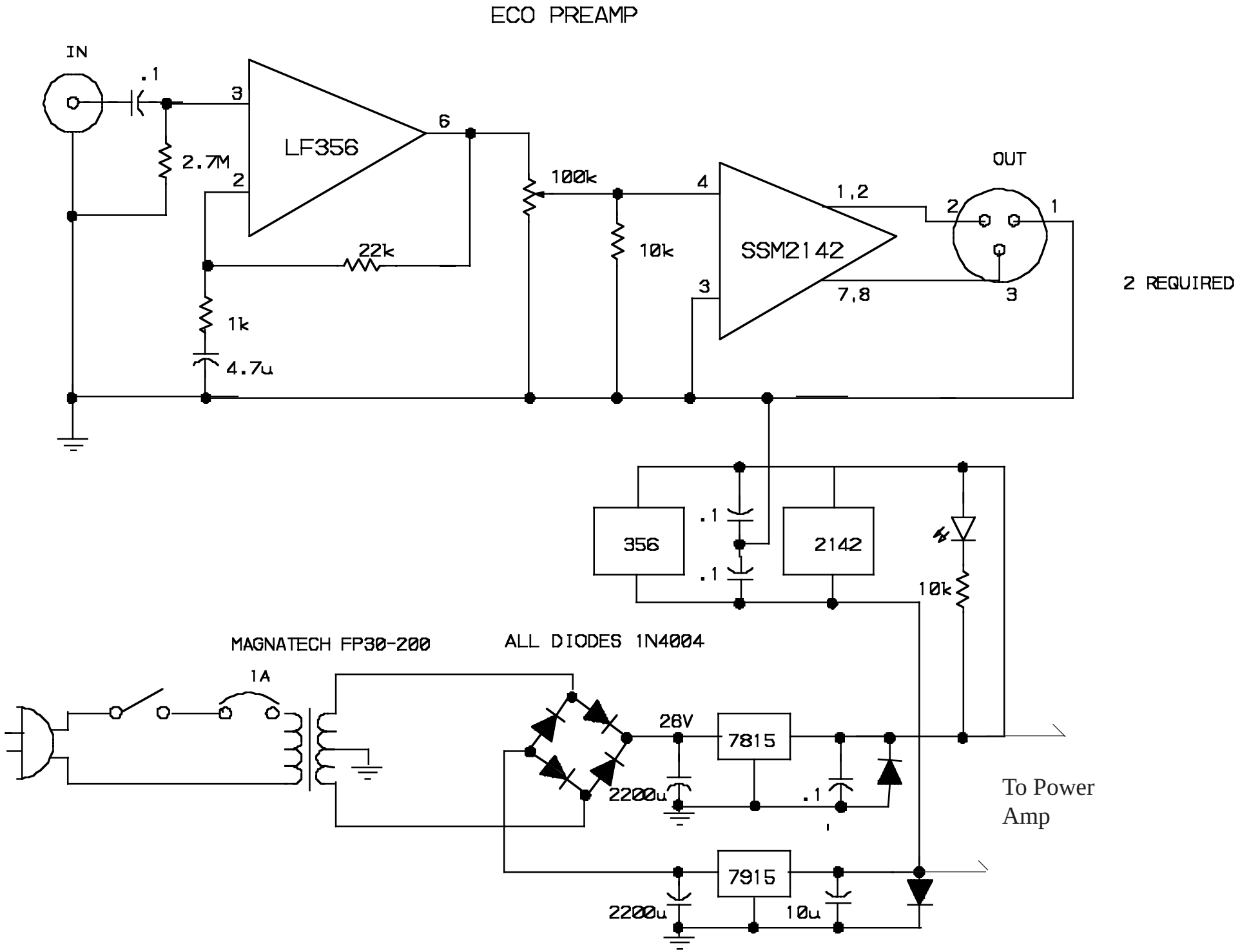

ECO PREAMP
IN
.1
3
2.7M
2
LF356
6
22k
100k
4
10k
SSM2142
1,2
OUT
2
1
3
7,8
3
2 REQUIRED
1k
4.7u
356
.1
.1
2142
10k
MAGNATECH FP30-200
ALL DIODES 1N4004
1A
26V
7815
2200u
.1
To Power Amp
7915
2200u
10u

Fig. 10

ECOPLATE III

DRIVER AMP EQ CURVE

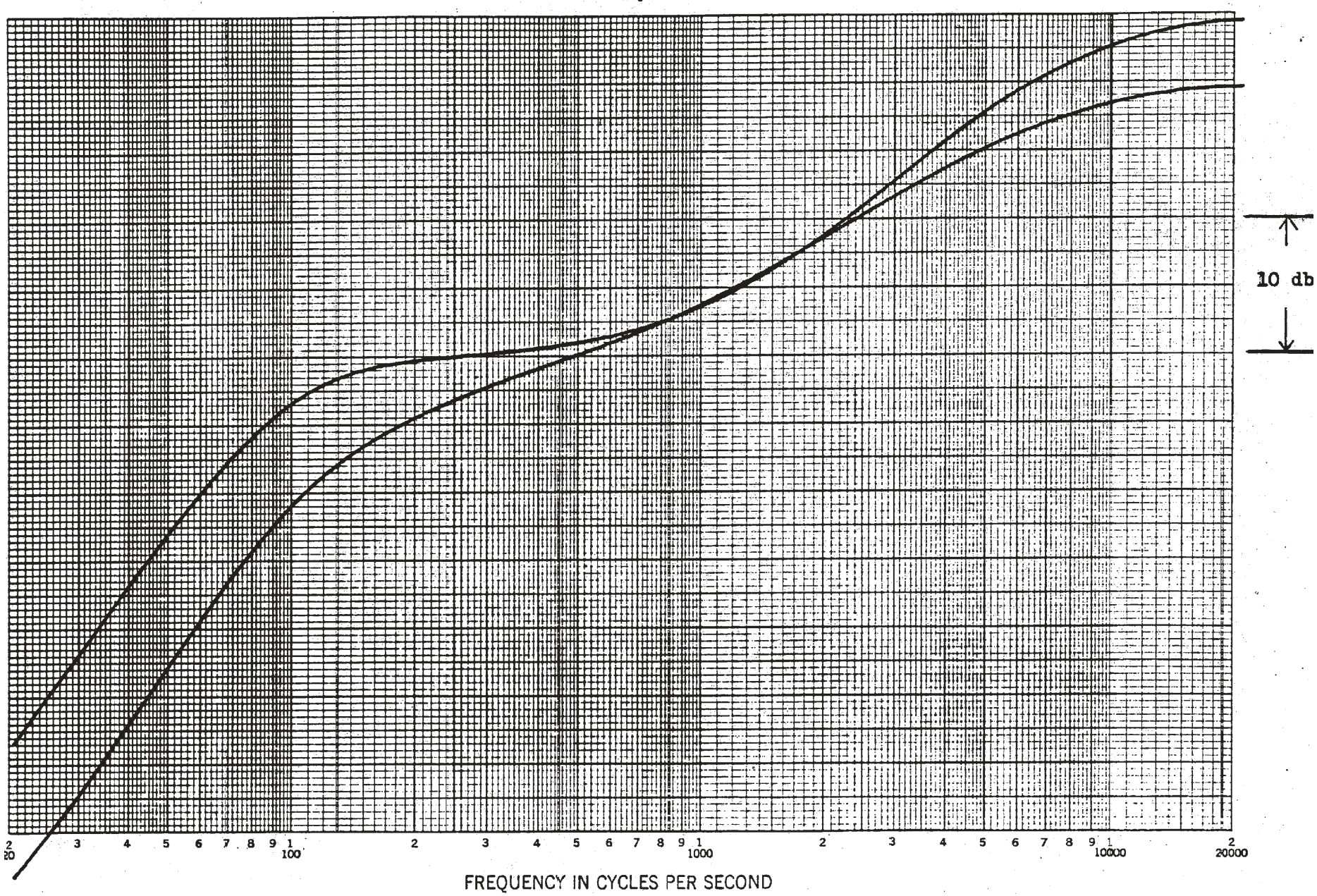
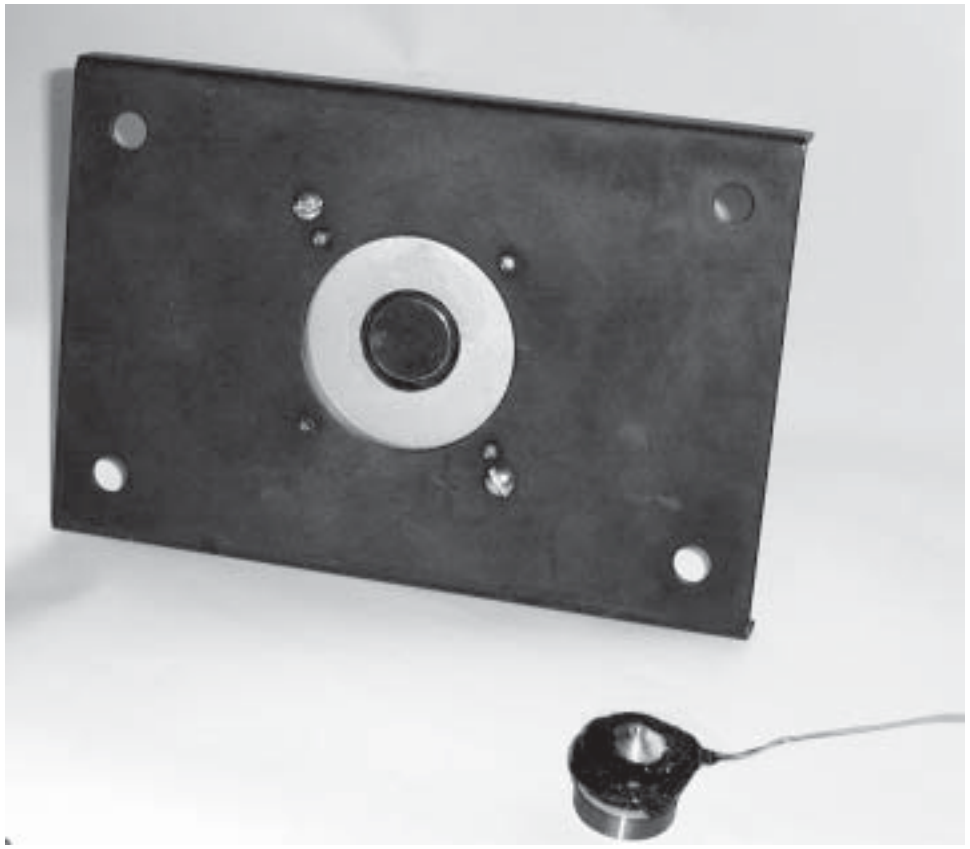


Fig. 11

Calibrated Tuning Gauge for proper plate tension
Price $50 USD



Magnet (showing wide gap) on user supplied mounting plate and Voice Coil.

Voice coil $75 USD
Magnet $85 USD

Special High Resonant Unimorph Pickup
Stereo Pair with special conductive adhesive $50 USD