

Two Stage Preamp for 432 EME

Jan Bruinier, DL9KR, Jakob-Wittmannstr. 29, D-6272 Niedernhausen, FRG

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1. Introduction

The following contains some notes on a 432 MHz preamp, which was presented at the EME conference at Thorn, Netherlands, in September 1988.

2. Design Objectives and Results

1. Possibility to exchange transistor without the necessity of using solder connections.

This was achieved by the use of a "yoke" device for the two source leads plus clamps for gate and drain. The mounting device is insulated from the cavity well by means of a very thin Mica sheet resulting in a capacitor of approx. 300 pF. Ordinary Mica can be split by using a sharp razor blade. Double clad circuit board material eliminates insulating bushings because metal surrounding the screw can be resolved by drilling or etching.

2. Highest possible Q unloaded for input cavity with a given size.

As small screws had been available for this project, all connections within the input cavity were done without the use of any solder. This proved to be a matter of "elegance", i.e. the possible improvement of circuit Q has not been verified by measurement yet.

C_2 was tapped down the input coaxial line to reduce its influence on the overall circuit Q. The main advantage, however, is the very comfortable tuning.

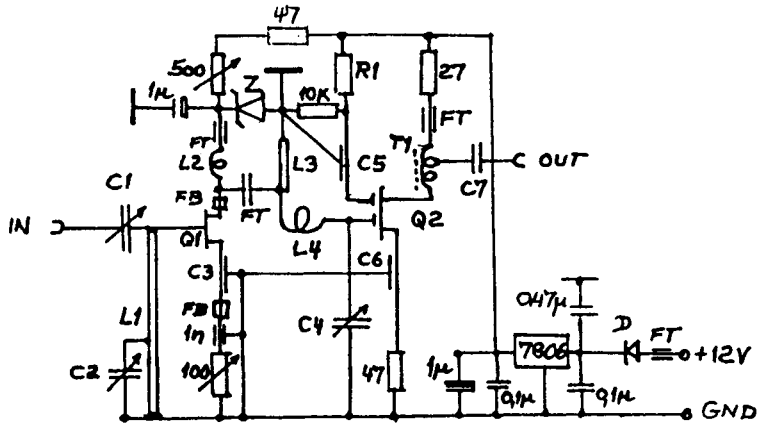
3. Optimal interstage coupling

This portion of the circuit puts first's stage output impedance into the area of stability in the Smith chart, provides low loss and offers some selectivity.

4. Large signal capability is achieved by the use of a tetrode second stage running at high drain current.
5. High gain (in excess of 40 dB) allows this preamp to be run directly into a passive high level mixer via more than 10 dB cable loss.

For more improvements as the use of chip caps, tuning flappers etc. there should be certainly left room for the experienced builder.

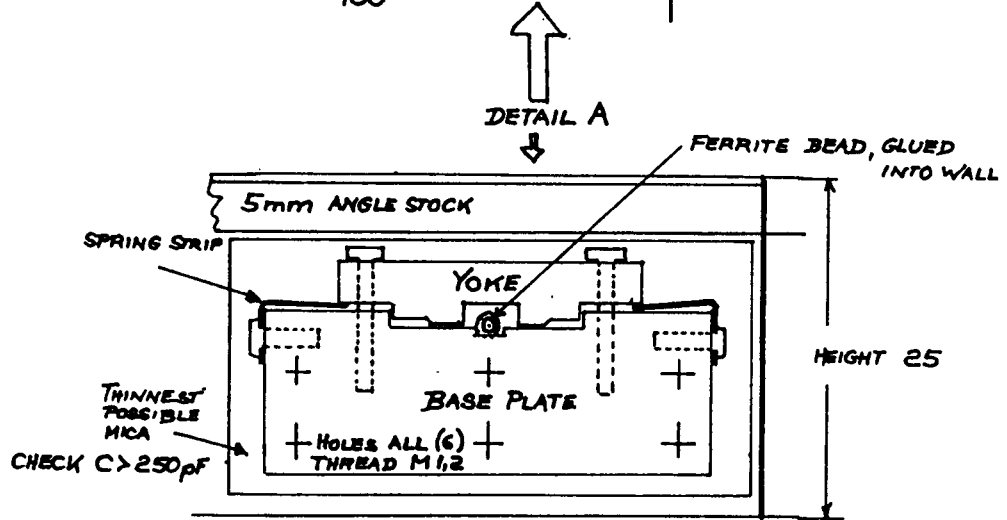
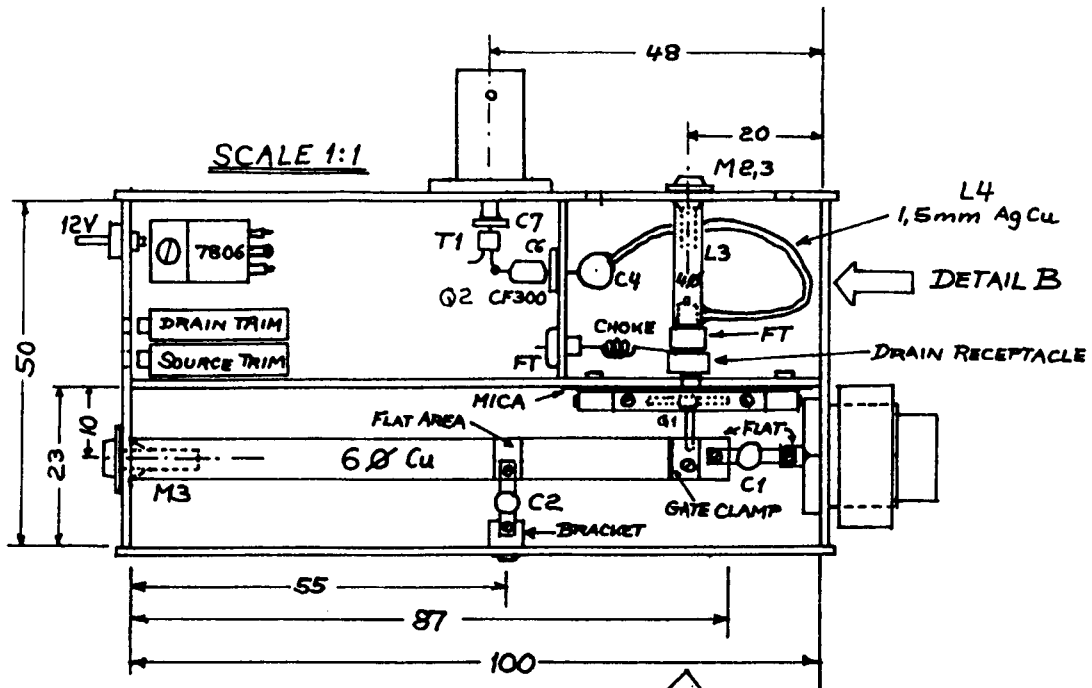
DL9KR TWO STAGE PREAMP '88



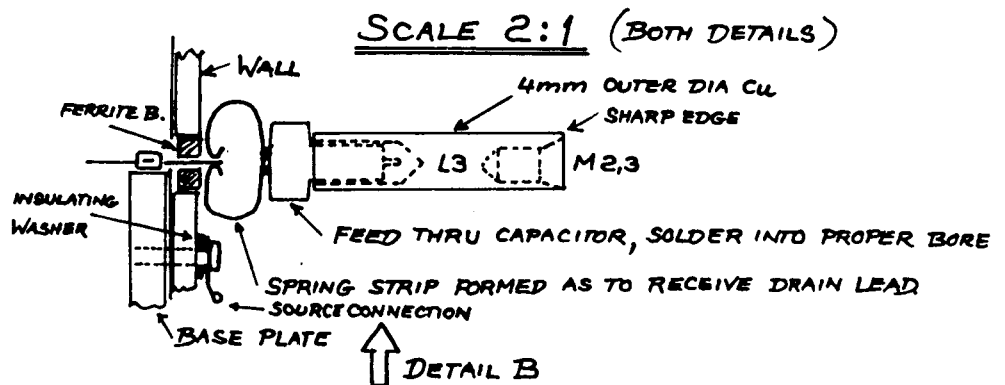
- C1, C2 0,4 - 2,8 pF quartz glass or sapphire trimmers
 C3 GaAsFET mounting plate/very thin mica sheet/wall, about 300 pF
 C4 10 pF Johanson
 C5, C6, C7 470 pF disc ceramic
 D "Idiode"
 FB small ferrite bead, about 2 mm outer dia.
 FT feed-thru, about 470 pF
 L2 5 turns AWG 28, 3 mm dia.
 L1 see drawing
 L3, L4 see drawing. Important: L4 about twice the length of L3,
 in order to obtain 1:9 (or more) impedance
 transformation from drain Q1 to gate 1 of Q2.
 R1 start with about 10k and adjust for 30 mA drain current of Q2
 Z Zener 5,6 V for "normal" GaAsFETs , T1 transformer 9:1, ferrite
 3,6 V for Hetero Junction FETs (3:1 turns ratio) core
 Q2 CF300, 3SK97 or similar dual gate.

Note:

This preamp is conditionally stable.
 A cover must be installed, at least over the input cavity.
 Gain is greater than 40 dB.
 All data given as suggestions rather than a "cookbook recipe"
 All mechanical dimensions in millimeters.
 M3 means metric thread, 3 mm outer dia.
 Small screws such as the M1,2 used in this preamp usually can be
 obtained through model railway supply houses.
 In F.R.G.: Hans-H. Honig, Holser Heide 32, D-4796 Salzkotten 7.



SCREWS M1,2. PLATE & YOKER 3mm Cu.
 PHOSPHOROUS BRONZE SPRING STRIPS TO LIFT YOKER
 WHEN INSERTING DEVICE.



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