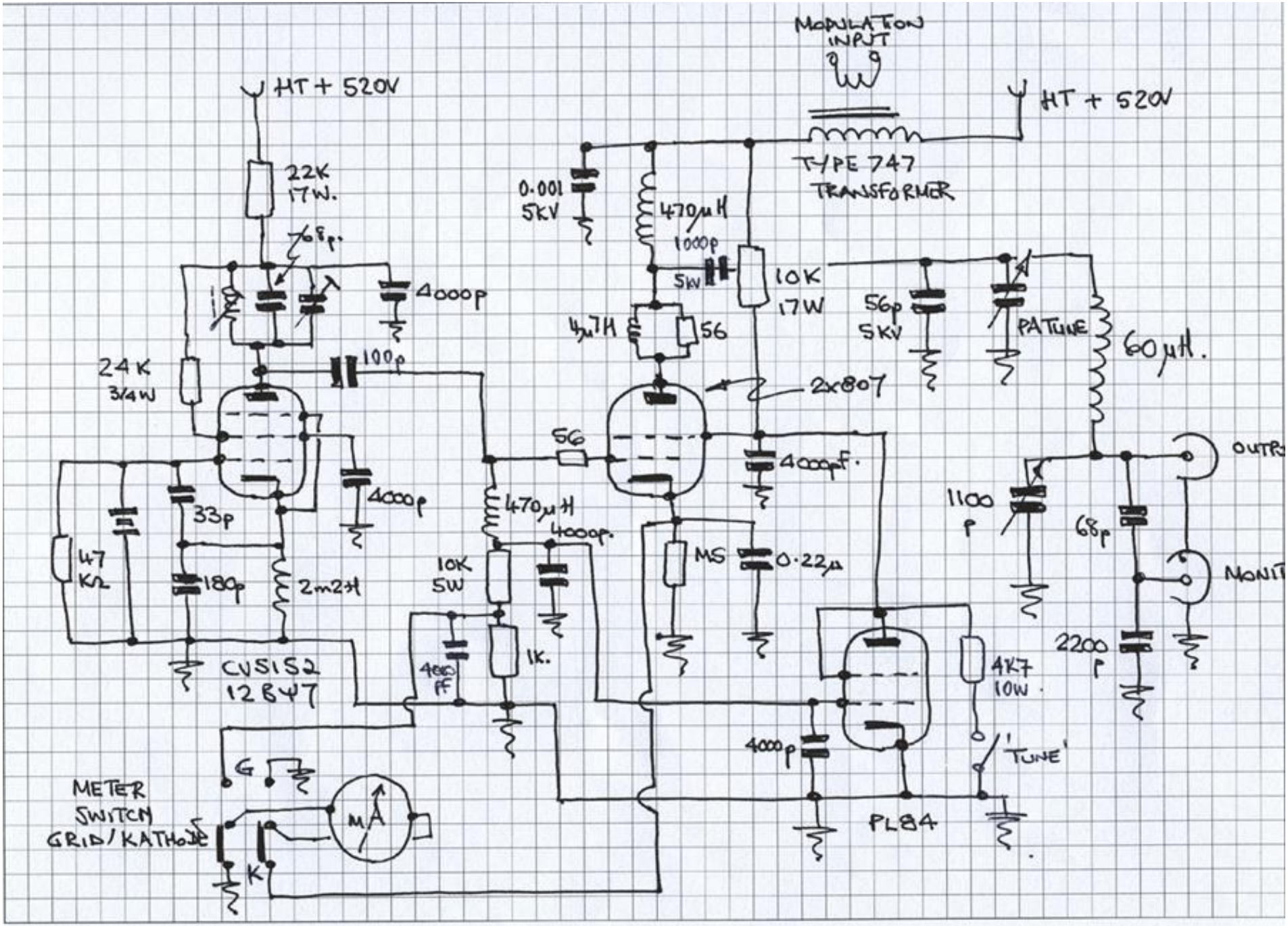
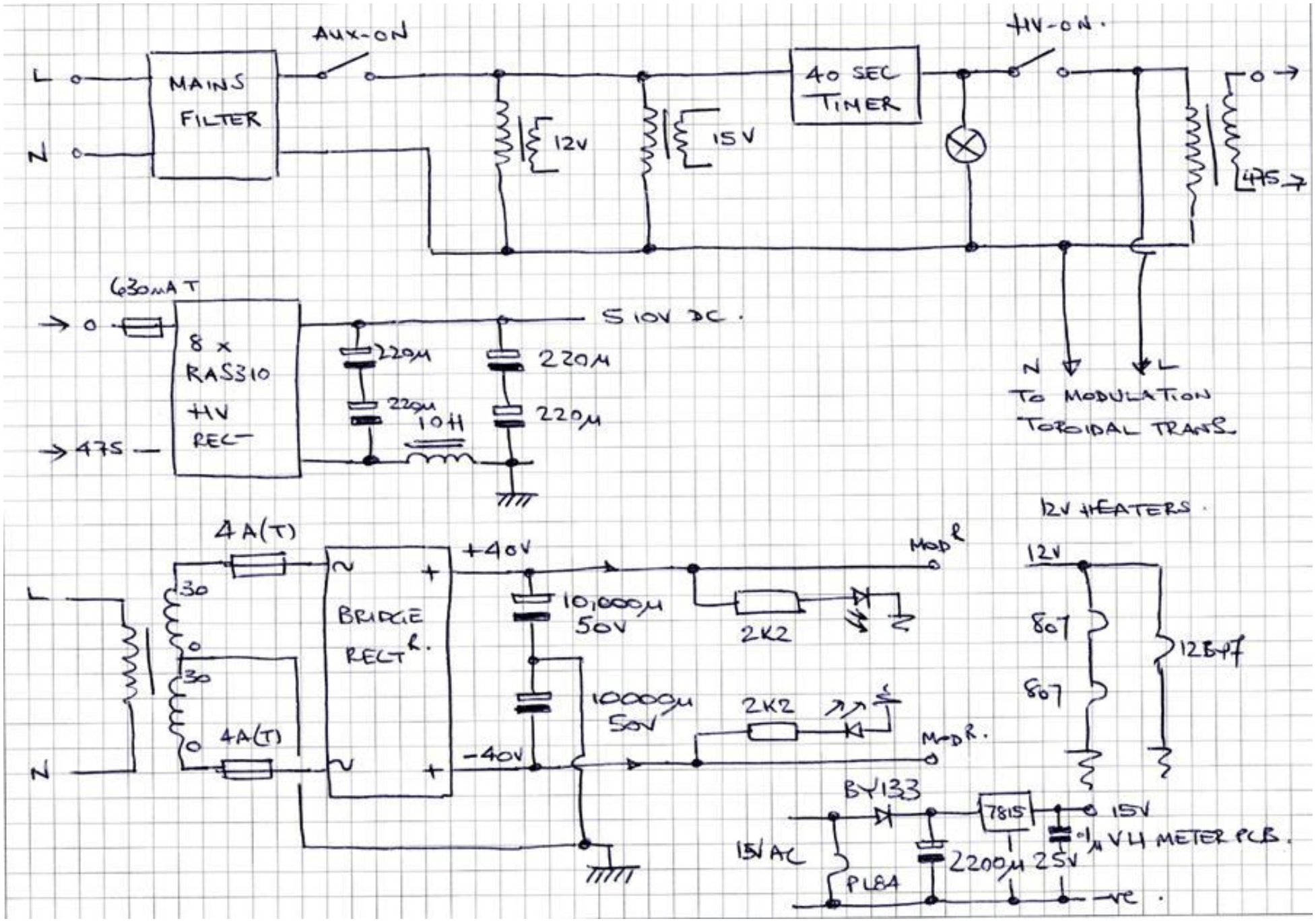
70 Watt AM Shortwave Transmitter Circuit

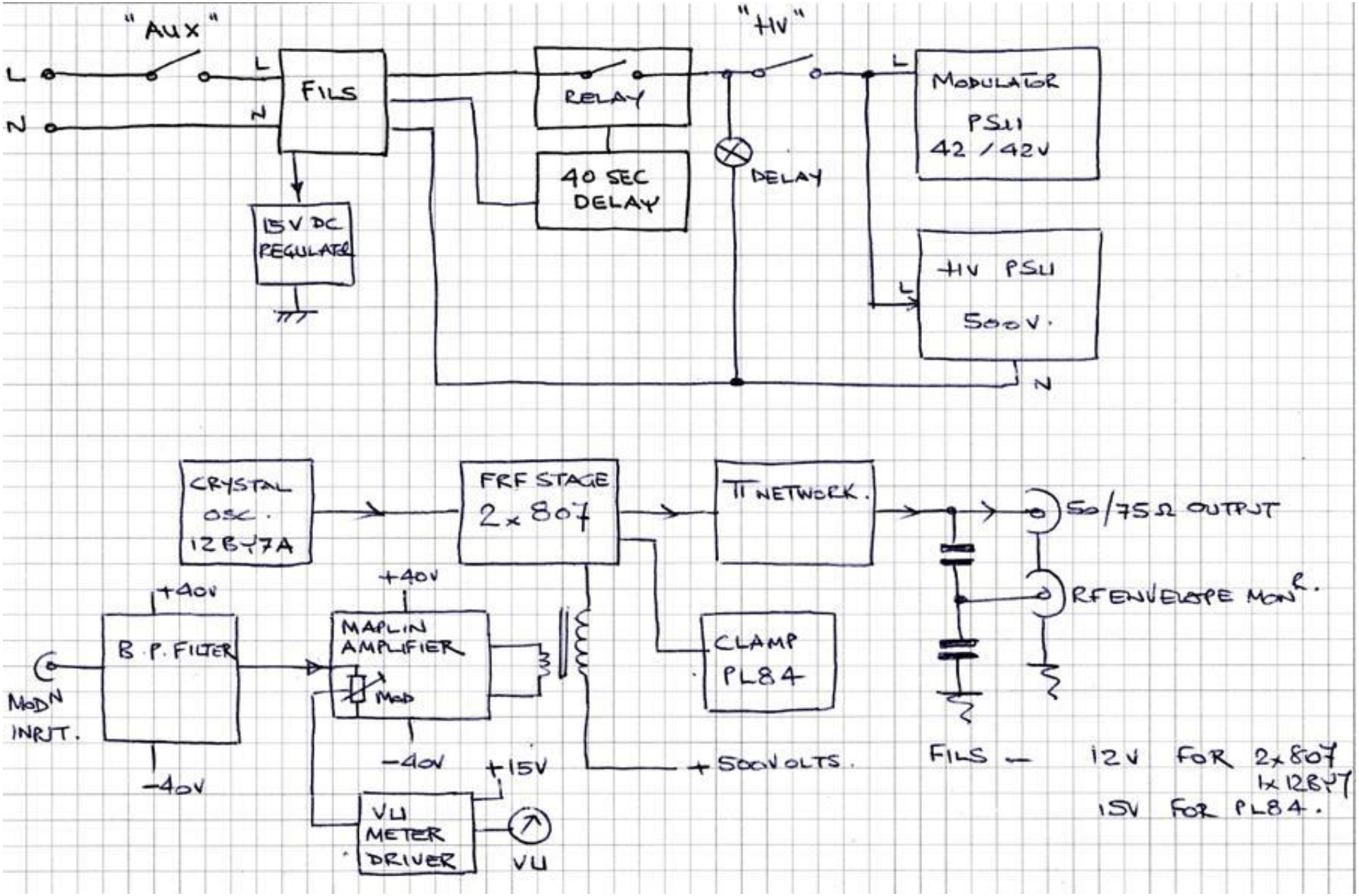
The published diagrams of Station QRP are for educational purposes only. These are offered for the furtherance of one's knowledge regarding radio frequency design and principles

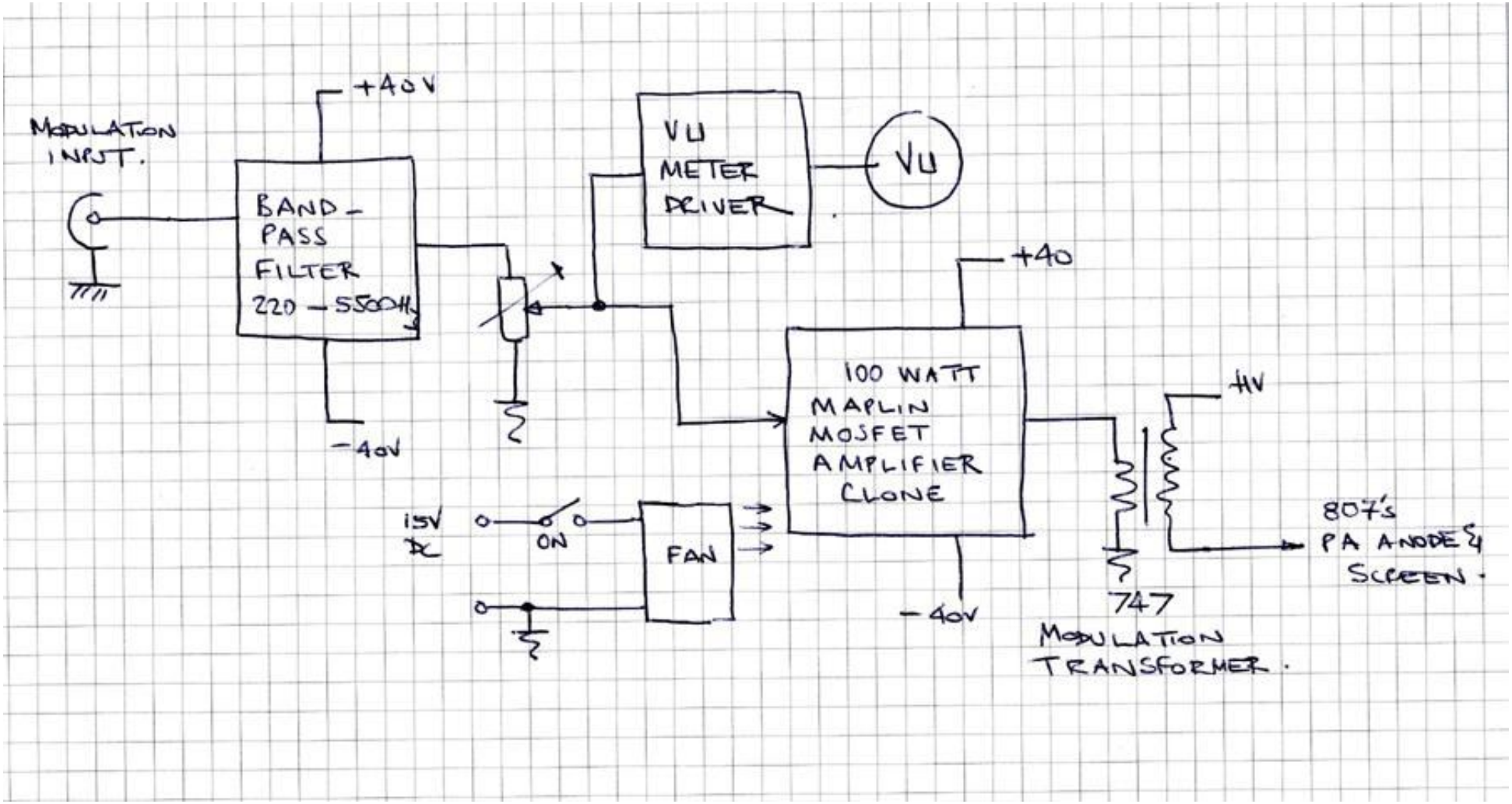
Transmitter: Tube (CV5152 & PL84 & 2 x 807)
Voltage: 525 volt / 300 mA
Frequency: 3.9x kHz
Modulation: AM (High Level Anode and Screen); 100% Mod
Amplifier: Internal 100W/4 Ohms R.M.S. MOSFET amplifier (BUZ900/905)
Audio filter: low pass (<220 Hz) & high pass (>5.5 Khz)
Audio impedance: 47 KOhm
Output Power: 70 Watt carrier (AM PEP well over 100 Watts)

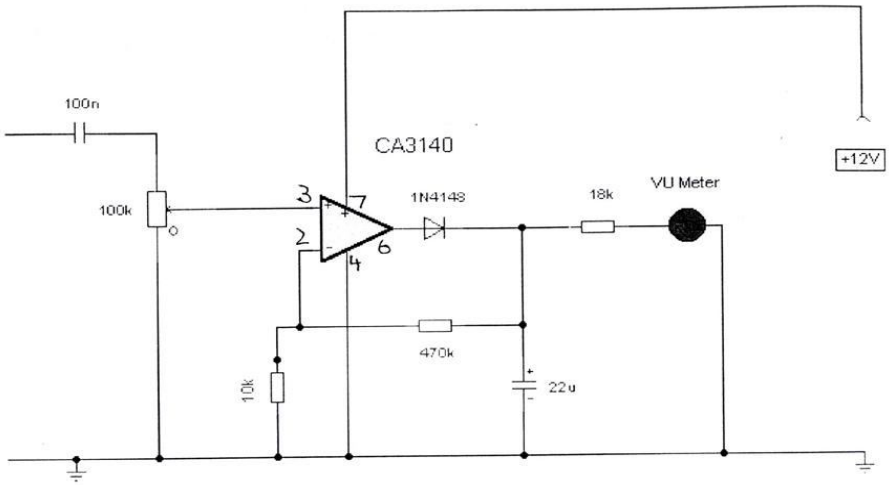
This transmitter was tested to comply with Ofcom standards! *(Independent regulator and competition authority for the UK communications industries)*

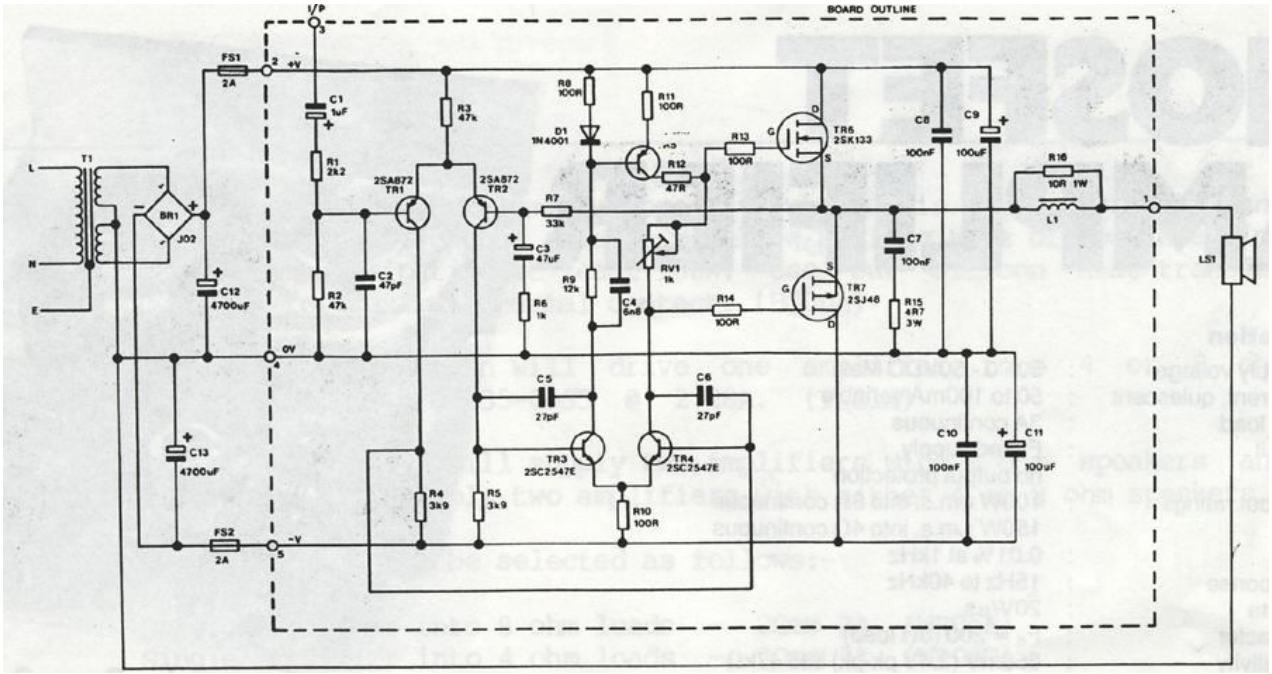

MODULATION INPUT
HT + 520V
HT + 520V
TYPE 747 TRANSFORMER
22K 17W.
68p.
4000p
0.001 5KV
470μH
1000p
5KV
10K 17W
56p 5KV
PATUNE
60μH.
24K 3/4W
100p
4μ7H
56
2x807
56
4000pF.
OUTP
33p
4000p
470μH
4000p.
1100 p
68p
47 KΩ
180p
2m2H
10K 5W
MS
0·22μ
MONIT
2200 p
4000 pF
1K.
4K7 10W.
CV5152 12B47
'TUNE'
4000p
METER SWITCH GRID/KATHODE
G
MA
K
PL84


L
N
MAINS FILTER
AUX-ON
12V
15V
40 SEC TIMER
HV-ON.
0
475
630mA T
8 x RAS310 HV REC
220µ
10H
510V DC.
N
L
To MODULATION TOROIDAL TRANS.
4A(T)
BRIDGE RECT.
+40V
-40V
10,000µ 50V
2K2
MOD
12V HEATERS.
12V
807
12BH7
BY133
7815
15V
0.1µ
VU METER PCB.
15V AC
PL84
2200µ 25V
-VE


"AUX"
"HV"
L
N
FILS
RELAY
40 SEC DELAY
DELAY
15V DC REGULATOR
MODULATOR PSU 42/42V
HV PSU 500V.
CRYSTAL OSC. 12BY7A
FRF STAGE 2×807
TT NETWORK.
50/75Ω OUTPUT
RF ENVELOPE MONR.
+40V
B.P. FILTER
MAPLIN AMPLIFIER
MOD
MODN INPUT.
-40V
CLAMP PL84
+500VOLTS.
+15V
VU METER DRIVER
VU
FILS — 12V FOR 2×807 1×12BY7
15V FOR PL84.

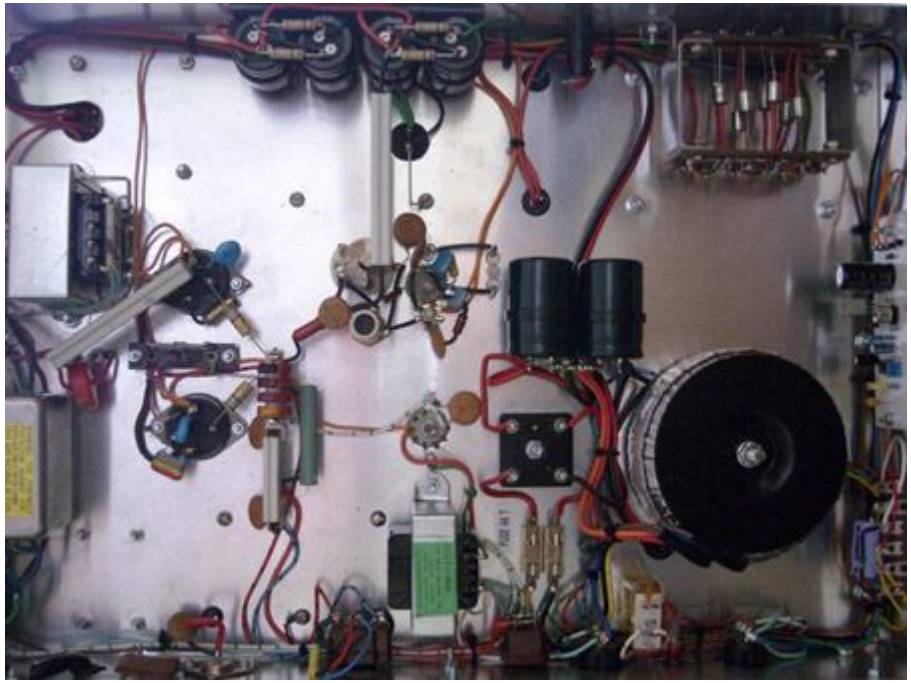

MODULATION INPUT.
+40V
BAND-PASS FILTER 220 – 5500Hz
-40V
VU METER DRIVER
VU
+40
100 WATT MAPLIN MOSFET AMPLIFIER CLONE
-40V
HV
807's PA ANODE & SCREEN.
747 MODULATION TRANSFORMER.
15V DC
ON
FAN


100n
CA3140
+12V
100k
3
7
1N4148
18k
VU Meter
2
6
4
470k
10k
22u

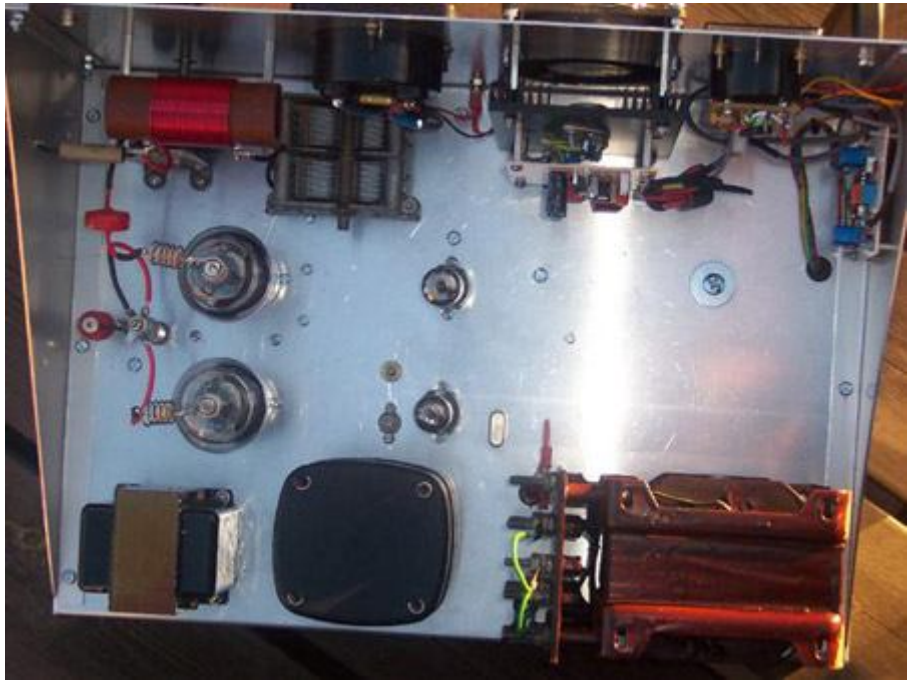

BOARD OUTLINE
V/P
FS1
2A
+V
C1
1uF
R3
47k
R8
100R
R11
100R
D1
1N4001
R13
100R
TR6
2SK133
C8
100nF
C9
100uF
R16
10R 1W
L1
T1
L
N
E
BR1
J02
2SA872
TR1
2SA872
TR2
R7
33k
C3
47uF
R12
47R
RV1
1k
C7
100nF
LS1
R1
2k2
R2
47k
C2
47pF
R9
12k
C4
6n8
R6
1k
R14
100R
TR7
2SJ48
R15
4R7
3W
C12
4700uF
0V
C5
27pF
C6
27pF
C10
100nF
C11
100uF
C13
4700uF
TR3
2SC2547E
TR4
2SC2547E
R4
3k9
R5
3k9
R10
100R
FS2
2A
-V

This is truly a 'Rig-in-the-Box'! The rig itself is placed in a well rugged cabinet for field operations. The VU meter (left) is available on the chassis that shows the peak modulation. (0VU = 100% modulation) On the right metering is provided for Grid current and Kathode current on the 807s, I really do like the ex-Marconi front panel meter, very 1960's I thought!

Inside the tube rig; CV5152 Crystal Oscillator, 2 x 807 Power Amplifier, PL84 clamp tube to protect the 807s in case of drive failure. Crystal on the right is the standard HC-6/U type



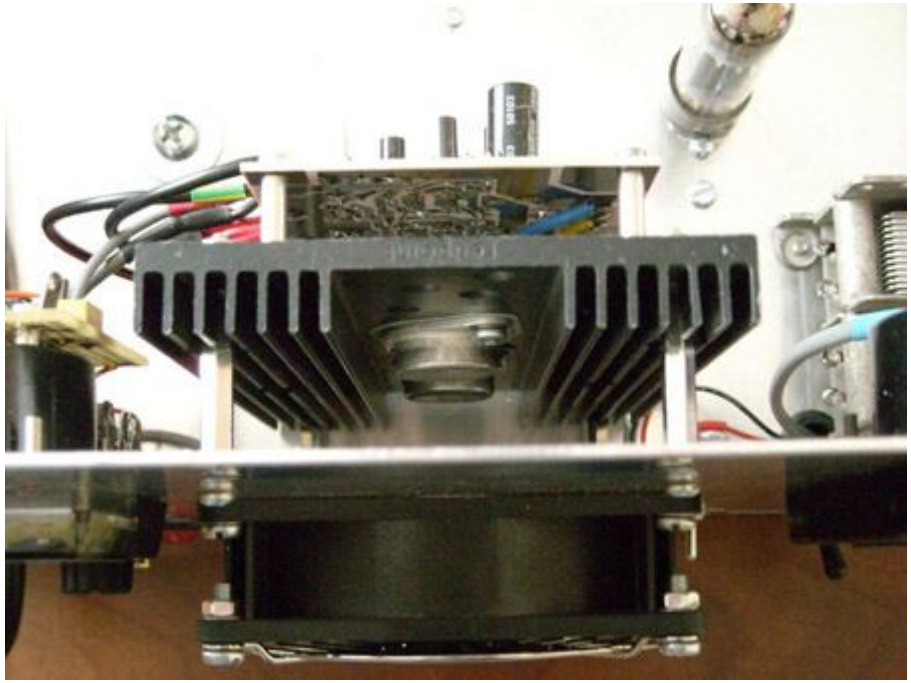
Seen from the bottom.....



Seen from above.....

Tank circuit and 2 x 807 Power Amplifier, HT Power Supply is 525 volt / 300 mA

35 Watts minimum if desired... maximum 70 Watt carrier and with Anode and Screen AM PEP will be well over 100 Watts



Part of the audio section; the Internal MOSFET (BUZ900/905) 100W RMS into 4 Ohms solid-state Maplin modulator/amplifier. Audio driven by a Band Pass filter; bass cut at 6dB per octave below 200Hz and then flat till 2kHz then rising at 6dB per octave to 5.5kHz then cuts to -40dB by 9 kHz. Of course High Level Anode and Screen Amplitude Modulation with 100% positive and negative peaks available