LIQUID CRYSTAL DISPLAY PHASE LOCKED LOOP FM EXCITER

Broadcast Warehouse

FEATURES

1000 mwatt output min.
Broadband No-tune design
constant amplitude response.
out of lock power down
Harmonic Filter
LCD frequency readout
LCD lock status indication
PTH black oxide board
Rf ground plane double sided board
Audio (deviation) Adjust

The Broadcast Warehouse LCD PLL Exciter unit is the ideal choice for broadcasting professionals worldwide.
More cost effective than any other unit in its class or class above it, Economy with superb performance make this unit stand head and shoulders above the competition.
May be used as a stand alone transmitter for small budget radio stations, or as a driver/exciter for higher power amplifiers.
However the unit is used ease of use is guaranteed!

SPECIFICATIONS

Frequency Range	Selectable over 87.5-108MHz
Step Size	100 khz Steps
Frequency Generation	microprocessor controlled PLL vco.
Frequency Stability	Better than +/- 1 KHz max, typ +/-500Hz
Spurious Emissions	Better than -75dB reference to carrier
Harmonic emissions	Better than -60dB reference to carrier
RF Power Output	800mW min./ 1000 mW typ.
Power Supply	12-15v DC regulated
Audio Input Sensitivity	0.775 V rms (typ) for +/- 75 KHz dev (adjustable)
Signal To Noise Ratio	-75 dBu
audio Distortion	Better than 0.2 % THD
audio Frequency Response	Flat from 20 Hz to 100 KHz

SOLDERING

Always make sure the iron nib is clean before soldering a joint, a good idea is to have a small damp sponge to wipe the nib on after a few joints to keep the iron nib clean from dirt (clogging up). Always apply the iron to the joint first , this gives the joint a shiny and cone like appearance, which is correct. Do not put a blob of solder on to the iron and then to the joint, the solder will not bond to the cold joint. Heat the joint up first with the iron and then feed in solder to the heated joint.

ASSEMBLY INSTRUCTIONS

1.Empty the contents of the kit and proceed to check all of the components off against the component list, It is a good idea to tick off each component as you go through. When you have double checked all the parts proceed.
2. We always start with the lowest height components first which are resistors, Insert each resistor and solder one at a time taking care to make a good joint and not to short across any other pads/holes. Double check the component is the correct one before soldering.
3. Now insert VD1(SEE DIAGRAM). Move on next to insert the choke L3 and solder this in also.
4.Now insert IC1 and IC2 (see diagram)
5. Next its time to insert the capicators C1,2,5,6,7,8,13,14,15,16,17,18,21,22,23,24,25,26,27,28,29,30,31 and 32 These can be inserted any way round. they are not polarised. Now insert the polarised elecrolytic capacitors C3,4,9,10,11,12,and 20 MAKING 100% SURE they are soldered in correctly. (SEE DIAGRAM) The board has a positive symbol next to the positive hole of each polarised capacitor. Insert the negative stripe side away from the poitive (+) marking. the last fixed capacitor is C19 (this component may need to be omitted from the unit, see pre emphasis section overleaf to decide if you need to include it. If you do need to include it choose the correct value from component list / pre-emphasis)
6. Insert and solder T1,T2,T3 then move onto T4. Next IC3 observing the correct component orienation marked on the board (SEE DIAGRAM).
7. Insert the crystal and VC trimmer next to the crystal and then the metal canned coil L1 and moulded coil'sl L4 and L5.
8. Wind the toroid core with the supplied twisted enameld wire as shown in the diagram and insert and solder as shown in the diagram. Push the clip on (starshaped) heatsink onto T4.
9. By this stage you should have the main component side of the board fully assembled, before moving on to the parts on the other side of the pcb check all your solder joints and connections.
10. Solder in switches sw1 and sw2 then VR1 variable resistor. Then with the supplied standoff pillars mount the lcd display above the underside of the board making sure to line up the 14 way connecter above the 14 holes left on the pcb. Take the left over cut off resistor legs you have and pass them through the holes soldering on the component side of the pcb and the lcd screen side of the display pcb.

POWER SUPPLY.

This unit needs a regulated dc power supply between 12 and 15v. The only difference with using 12, 13.8 or 15 volts is the output power, You will get slightly more output power running the unit from 13.8 or 15v as opposed to 12. The unit needs a power supply that can deliver 500ma or higher.
You can connect the dc supply by either soldering to the board on the two pad's on the top or by soldering the leads through the holes onto the pads on the bottom of the pcb. TAKE CARE TO SOLDER THE POSITIVE LEAD TO THE TERMINAL MARKED +. REVERSE POLARITY OF THE LEADS WILL DAMAGE THE EXCITER. YOU HAVE BEEN WARNED.

RF OUT.

Before turning on the unit YOU MUST connect a 50 ohm load to the rf ouput connections. The two pads supplied are to enable you to connect a length of 50 ohm coaxial cable to an rf socket or rf amplifier board. The smaller pad is for the inner of the coax (the core) and the longer pad below the rf out pad is to connect the outer of the coax (the braid). **(SEE DIAGRAM)**
We recommend a dummy load is used when tuning up this unit. Or if you do not have access to one at least have an antenna connected to the output. FAILURE TO HAVE A CORRECT 50 OHM LOAD (dummy load or antenna) ON THE OUTPUT MAY RESULT IN DAMAGE OF THE OUTPUT TRANSISTOR (T4). **YOU HAVE BEEN WARNED.**

IMPORTANT INFORMATION : PLEASE NOTE

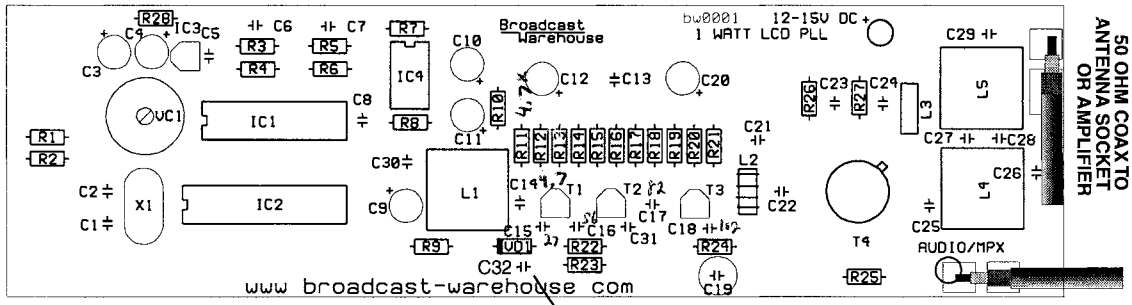
Operation of this equipment without an appropriate license is an offence. Please check your countries law's regarding operation of

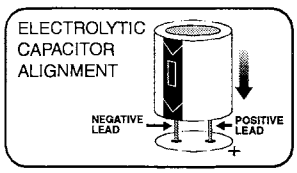
LIQUID CRYSTAL DISPLAY PHASE LOCKED LOOP FM EXCITER

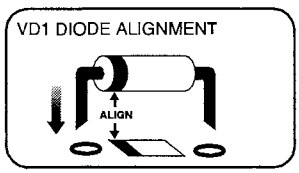
12-15V DC
POSITIVE MARKED +

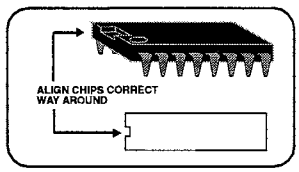
Broadcast Warehouse

MAIN COMPONENT SIDE.(SW1,SW2, LCD DIPLAY AND VR1 MOUNT OTHERSIDE)



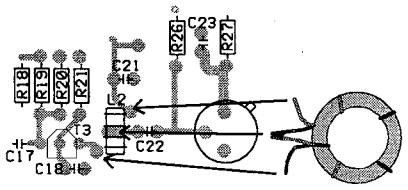






L2 (4 TO 1 TRANSFORMER) CONSTRUCTION

Take the supplied twisted enamel wires and pass FOUR turns through the supplied ferrite ring(see digaram below). Take a color from one end of the twisted pair and join with the opposite color from the other end of the twisted pair. These two wires solder to the two pads as shown below. The other wires of the twisted pair connect to the other pads as shown (which wire to which pad is not significant) N:B: Please make sure you melt the enamel of the ends of the wire prior to soldering to the pads, this ensures a REAL connection. Keep the wires as short as possible after coming off of the ferrite ring.



PART REFERENCE	PART VALUE	MARKING / IDENTIFICATION
R1,R2,R23	1k	BROWN,BLACK,RED,GOLD
R3,R4	68K	BLUE,GREY,ORANGE,GOLD
R5,R6	220K	RED,RED,YELLOWGOLD
R7,R8,R10,R14,R15	1K2	BROWN,RED,RED,GOLD
R16	180R	BROWN,GREY,BROWN,GOLD
R17,R28	68R	BLUE,GREY,BLACK,GOLD
R18,R9	10R	BROWN,BLACK,BLACK,GOLD
R19,R11	4K7	YELLOW,PURPLE,RED,GOLD
R20,R22,R25	470R	YELLOW,PURPLE,BROWN,GOLD
R21	NONE	N/A
R24,R12	12K	BROWN,RED,ORANGE,GOLD
R13,R26,	220R	RED,RED,BROWN,GOLD
R27	2R2	RED,RED,GOLD,GOLD
VR1 (other side of board)	1K POT	102 ADJUSTABLE MINIPOT
C1,C5,C13,C30	100N	104 OR 100N
C2	39PF	39 OR 39P
C3,C4,C9	2.2UF**	2.2U OR 2.2UF
C6,C7,C21	10N	103 OR 10N
C8,C17,C22	82PF	82 OR 82P
C10,C11,C12,C20	33UF**	33U OR 33UF
C14	4.7PF	4.7 OR 4P7
C15,C25	27PF	27 OR 27P
C16,C26	56PF	56 OR 56P
C18,C23,C24,C28	1N	102 OR 1N
C19 (PRE-EMPHASIS)	6.8N(U.S.A/JAP)	6N8 OR 6800
	4.7N(EUROPE/ROW)	4N7 OR 4700
C27	12PF	12 OR 12P
C29	33PF	33 OR 33P
C31	NONE	N/A
C32 (see diagram above)	220PF	220 OR N22
IC2	PIC16CXX*	PIC16CXX
IC1	MC145170*	MC145170
IC3	78L05*	78L05
IC4	LF351*	LF351 OR 351
L1	MC120 075	XXX075 METAL CAN COIL
L4	S18 2.5 TURNS	RED COIL
L5	S18 3.5 TURNS	ORANGE COIL
L2	4/1 TRANSFORMER*	FERRITE WITH TURNS OF WIRE(SEE BOX)
L3	.15UH CHOKE	BROWN,GREEN,SILVER,SILVER OR .15UH(YELLOW BODY)
T1,T2,T3	MPSH10*	MPSH10
T4	2N4427*	4427
VD1	BB909**	BLACK DIODE WITH GREEN/RED STRIPE
VC	5-65PF CAP	ADJUSTABLE TRIMMER, YELLOW
X1	8 MHZ CRYSTAL	8.000
SW1,SW2 (other side of board)	PCB PUSH SWITCH	YOU SHOULD GUESS THIS ONE
LCD DISPLAY	U KNOW THIS PART.	AND THIS ONE TOO.

PARTS MARKED * MEAN MAKE SURE YOU GET THE PART THE RIGHT WAY AROUND.
PARTS MARKED ** MEAN TAKE EVEN MORE CARE AS THE PARTS ARE POLARITY SENSITIVE.

SETUP INSTRUCTIONS.

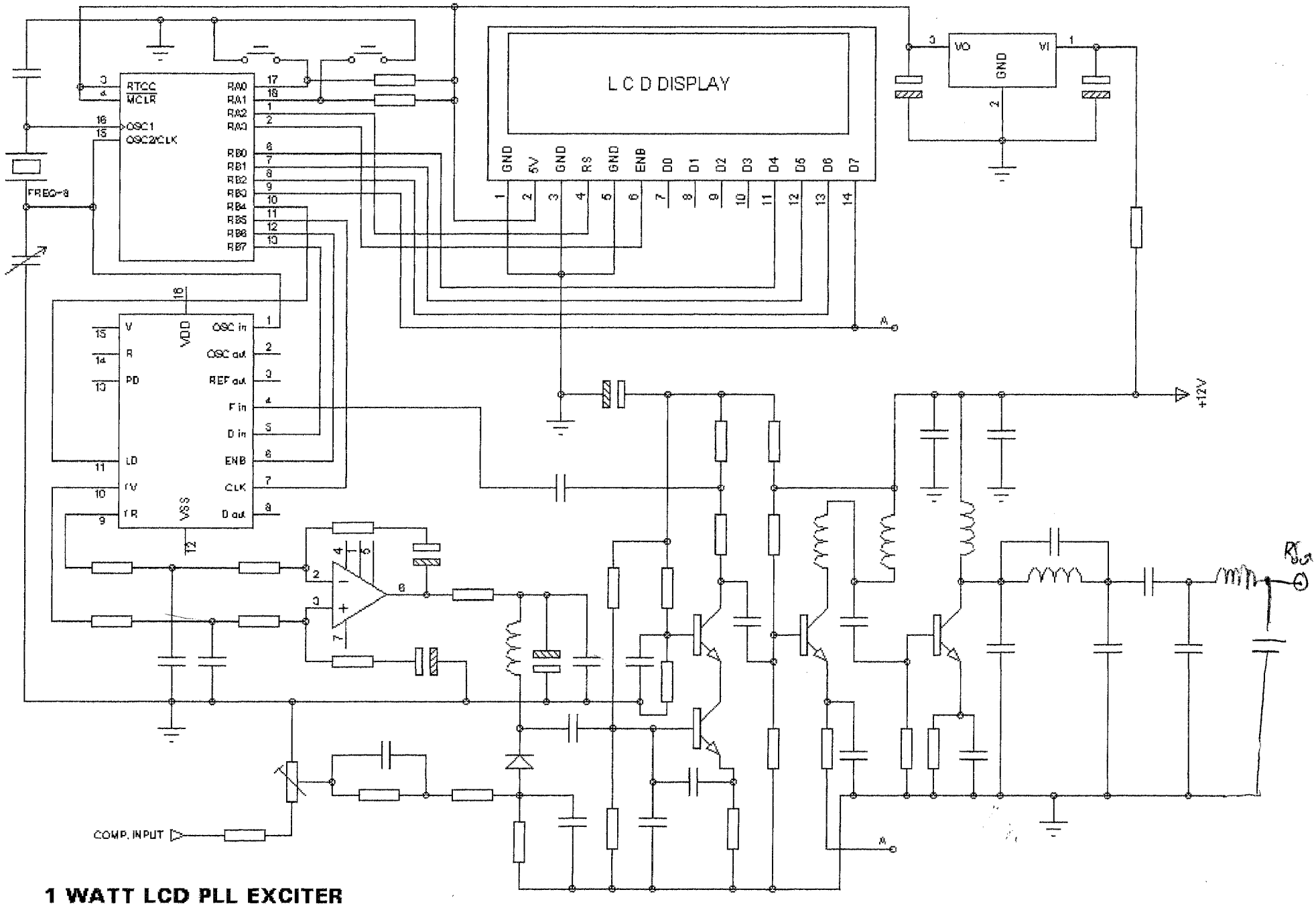
The setup procedure for the unit once assembled is very brief because the unit is so simplistic but clever in it's design. The unit once built will allow 87.5 to 108 mhz operation at 1 watt minimum output power without any adjustment at all, the only adjusting that is done is by you to select your frequency via the liquid crystal display.

HERE IS THE LIMITED SETUP PROCEDURE:

1. CONNECT YOUR ANTENNA OR DUMMY LOAD TO THE RF OUTPUT OF THE UNIT. (Never connect transmitter without an antenna or load)
2. CONNECT YOUR AUDIO SOUCE TO THE UNIT.
3. CONNECT 12-15V DC MAX TO THE UNIT (Make sure the supply can deliver 500ma minimum and IS regulated)
4. SWITCH ON THE UNIT AND SET YOUR FREQUENCY WITH THE UP/DOWN BUTTONS.
5. ADJUST VR1(modulation pot) FOR THE REQUIRED DEVIATION (tx deviation/volume). please note: The coils L1,L4 and L5 are factory set and do not need adjustment or tuning, Please do not adjust them.
6. HAPPY BROADCASTING!

PRE-EMPHASIS

Like all pro exciters this unit incorporates a pre-emphasis facility. If you need to remove or bypass the pre-emphasis you can achieve this by the removal of component C19.



1 WATT LCD PLL EXCITER