My Circuit Collections

I started to write a book on the 29th of Oct 1968, with very useful electrical & electronics circuits. It is updating in my life time. Some are copied from various books and web pages some are designed by me and tested. I started to write in the computer on 1st March 2011.

J.T.Wijeratne (4S7VJ)

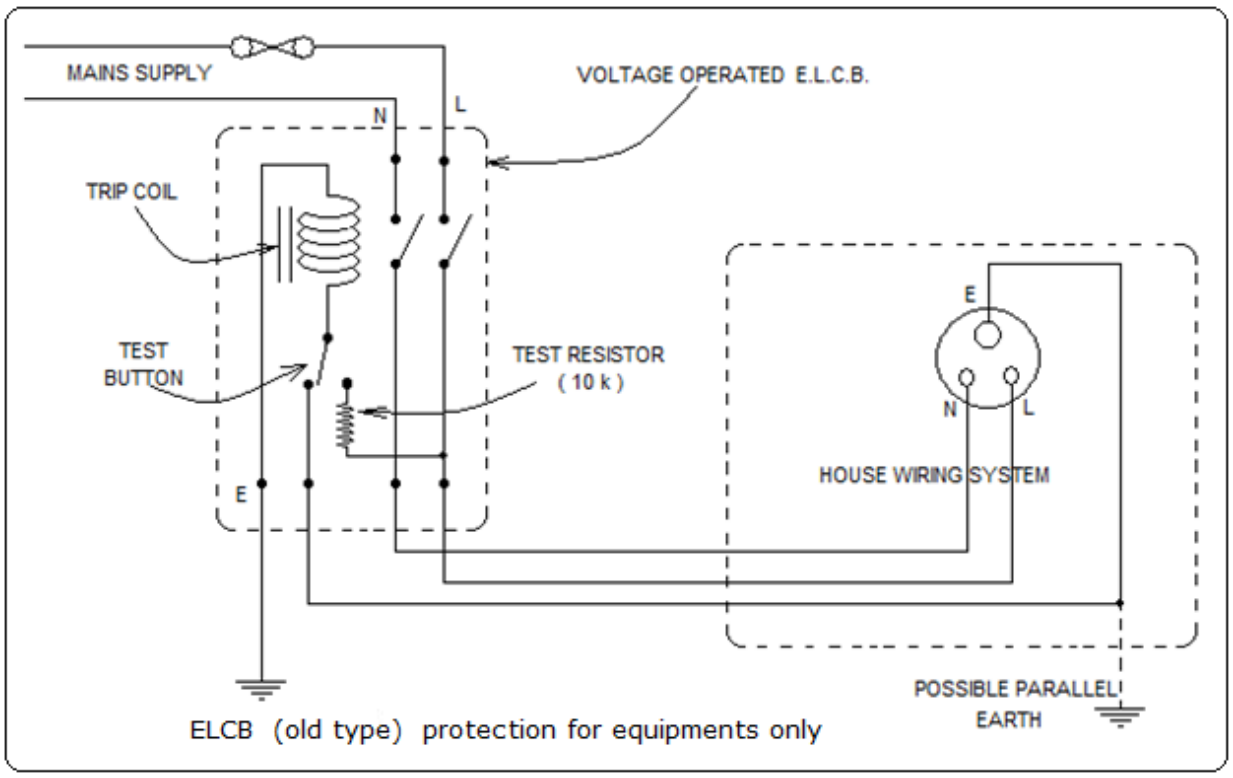
Contents

page

House wiring

ELCB – Earth leakage circuit breaker:-

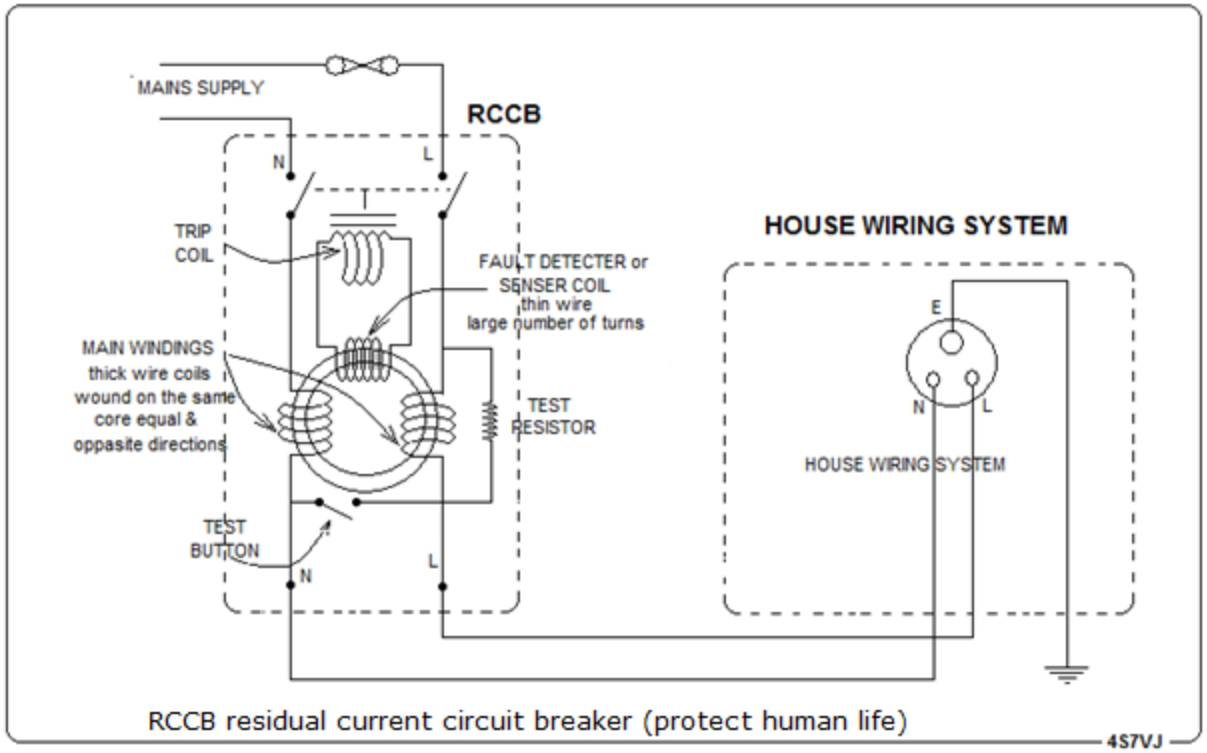
This was hardly used in Sri Lanka, before comes RCCB. This will be trip-off, while a current leakage in an equipment connected to the house wiring circuit, but it will never trip-off for a current leakage through human body to the earth.

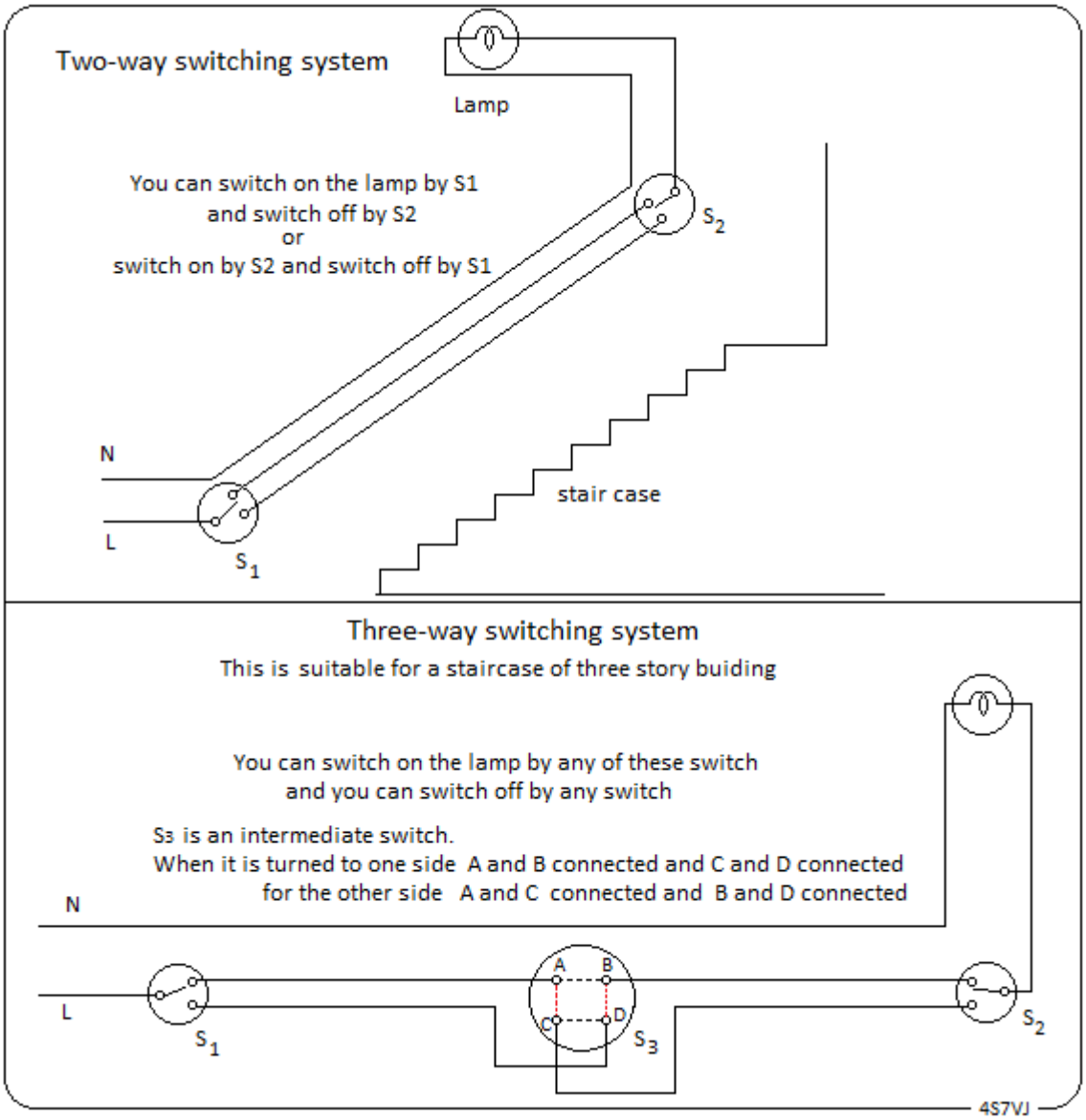


Residual Current Circuit Breaker (R.C.C.B.)

(Current operated Trip switch)

I copied this from "REGULATIONS FOR THE ELECTRICAL EQUIPMENTS OF BUILDINGS" book borrowed from British Council Library (621.3282/37132) in 1973 and this is not to be seen in Sri Lanka at that time. Around 1985 this RCCB trip switch came to the market. The main purpose of this is the safety of the human life.

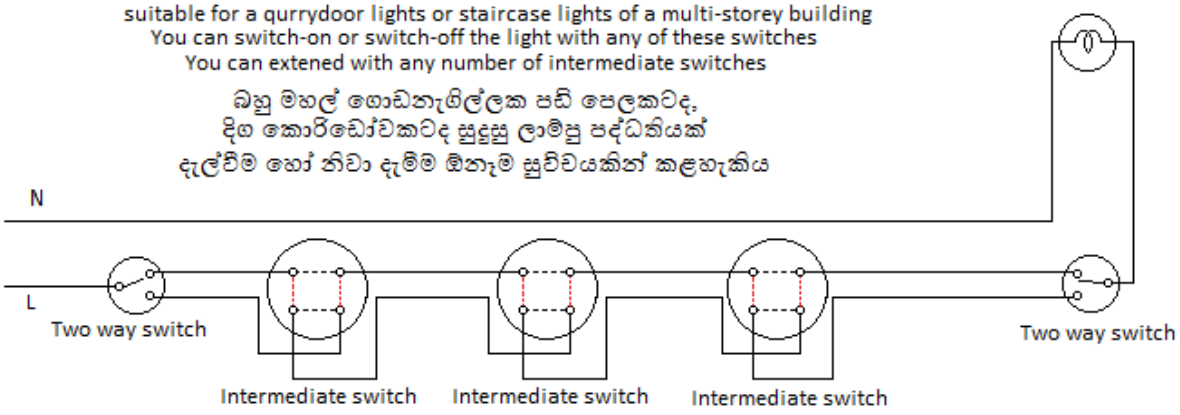



Two-way switching system
Lamp
You can switch on the lamp by S1
and switch off by S2
or
switch on by S2 and switch off by S1
S2
N
L
S1
stair case
Three-way switching system
This is suitable for a staircase of three story buiding
You can switch on the lamp by any of these switch
and you can switch off by any switch
S3 is an intermediate switch.
When it is turned to one side A and B connected and C and D connected
for the other side A and C connected and B and D connected
N
L
S1
A
B
C
D
S3
S2
4S7VJ

Multi-way switching system

suitable for a qurrydoor lights or staircase lights of a multi-storey building
You can switch-on or switch-off the light with any of these switches
You can extened with any number of intermediate switches

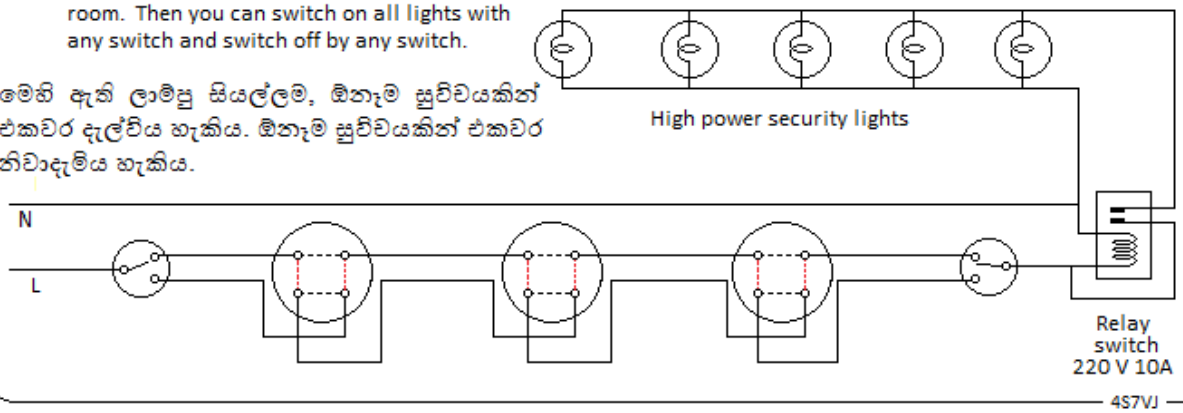
බහු මහල් ගොඩනැගිල්ලක පඩි පෙලකටද,
දිග කොරිඩෝවකටද සුදුසු ලාම්පු පද්ධතියක්
දැල්වීම හෝ නිවා දැමීම ඕනෑම සුවිචයකින් කළහැකිය



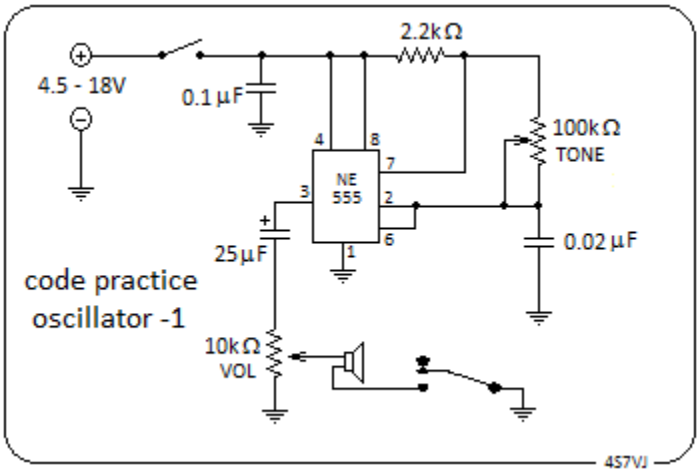
Multi-way switching system for security lights

You can install any number of security lights around the house and each switch in each room. Then you can switch on all lights with any switch and switch off by any switch.

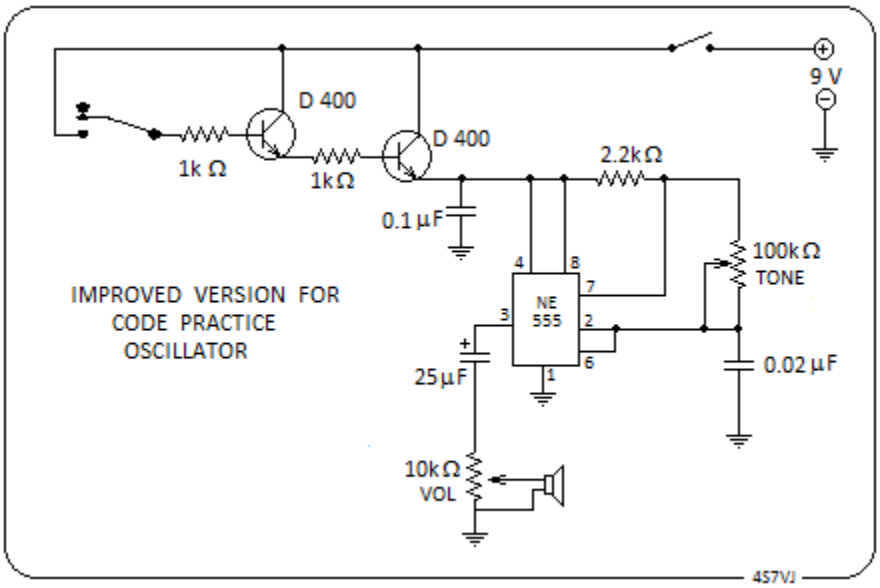
මෙහි ඇති ලාම්පු සියල්ලම, ඕනෑම සුවිචයකින් එකවර දැල්විය හැකිය. ඕනෑම සුවිචයකින් එකවර නිවාදැමිය හැකිය.

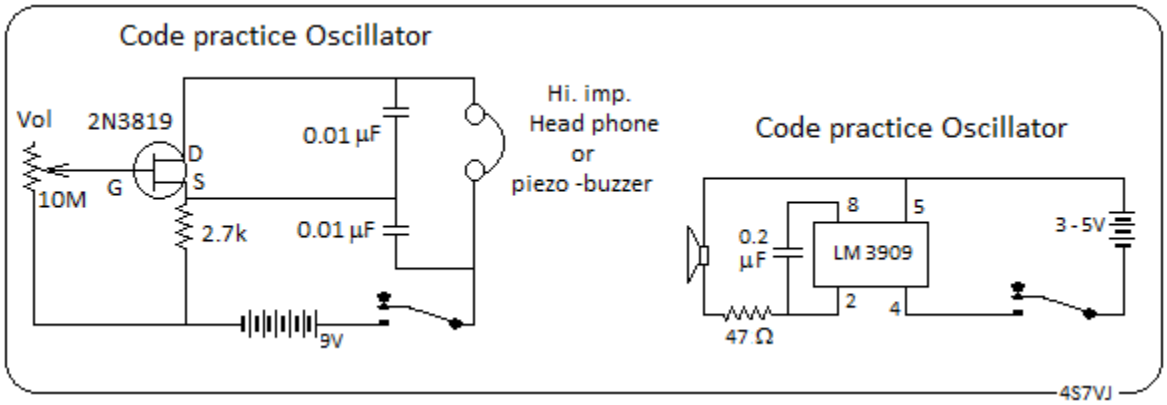


4S7VJ

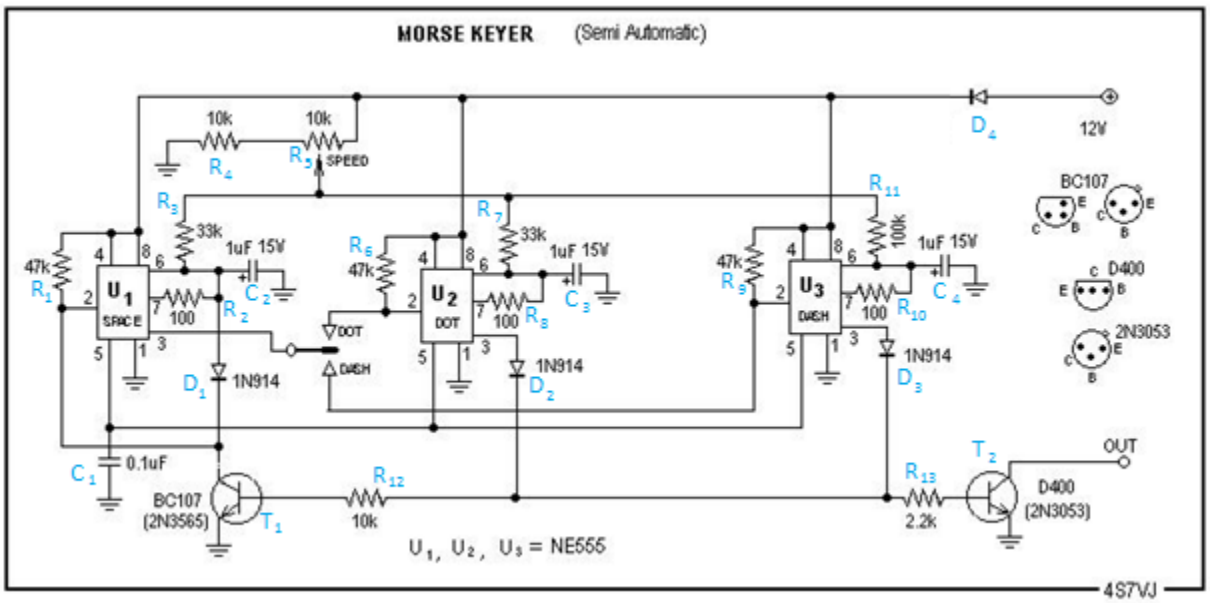


These circuits are very useful for practice of Morse code sending





Automatic Morse key

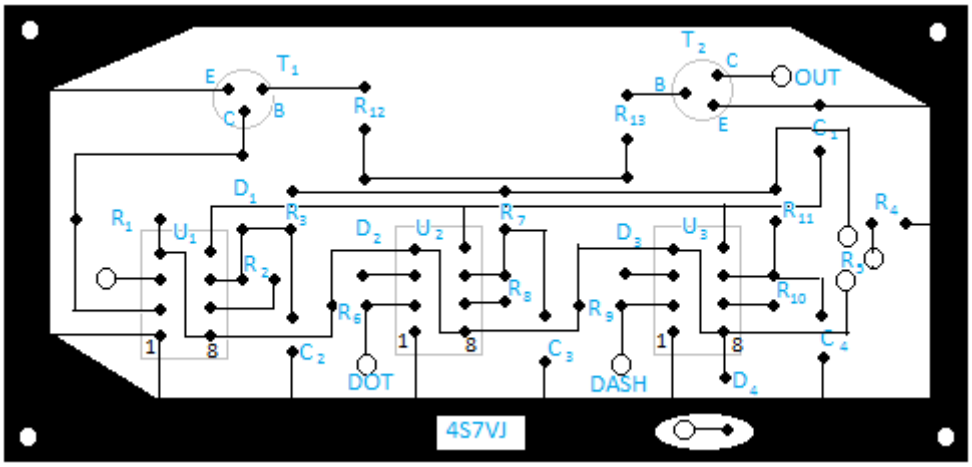


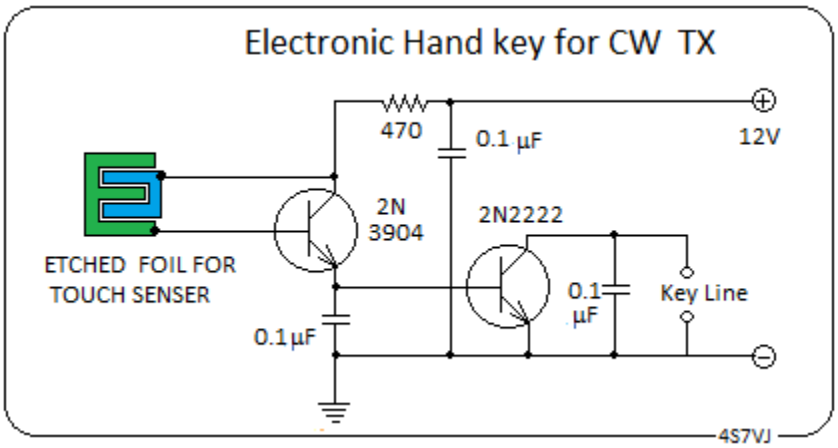
I received this Semi-Automatic Key circuit from 4S7GW, Wickey (expired on the 2nd July-2012) at about 1987. This is received through 145.625MHz – Yatiyantota repeater.

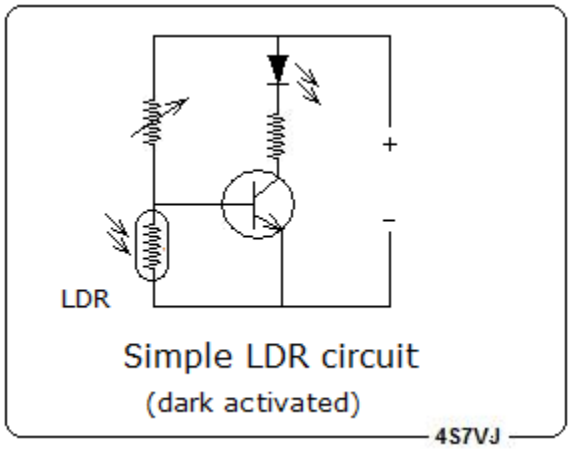
Since then I use this (made by me) with my HF TRX without any problem,

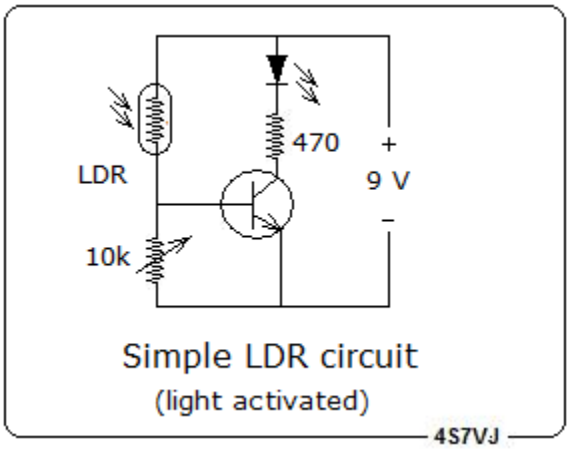
it is working very well. Speed range is 5 W.P.M to 25 W.P.M.

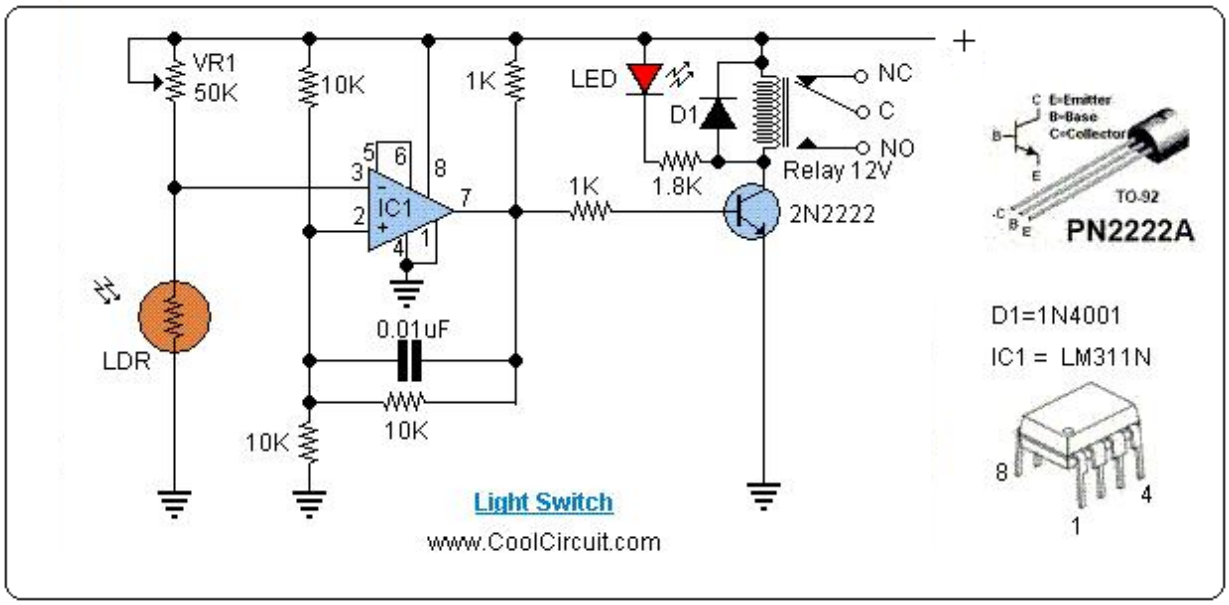
PCB layout for Morse keyer

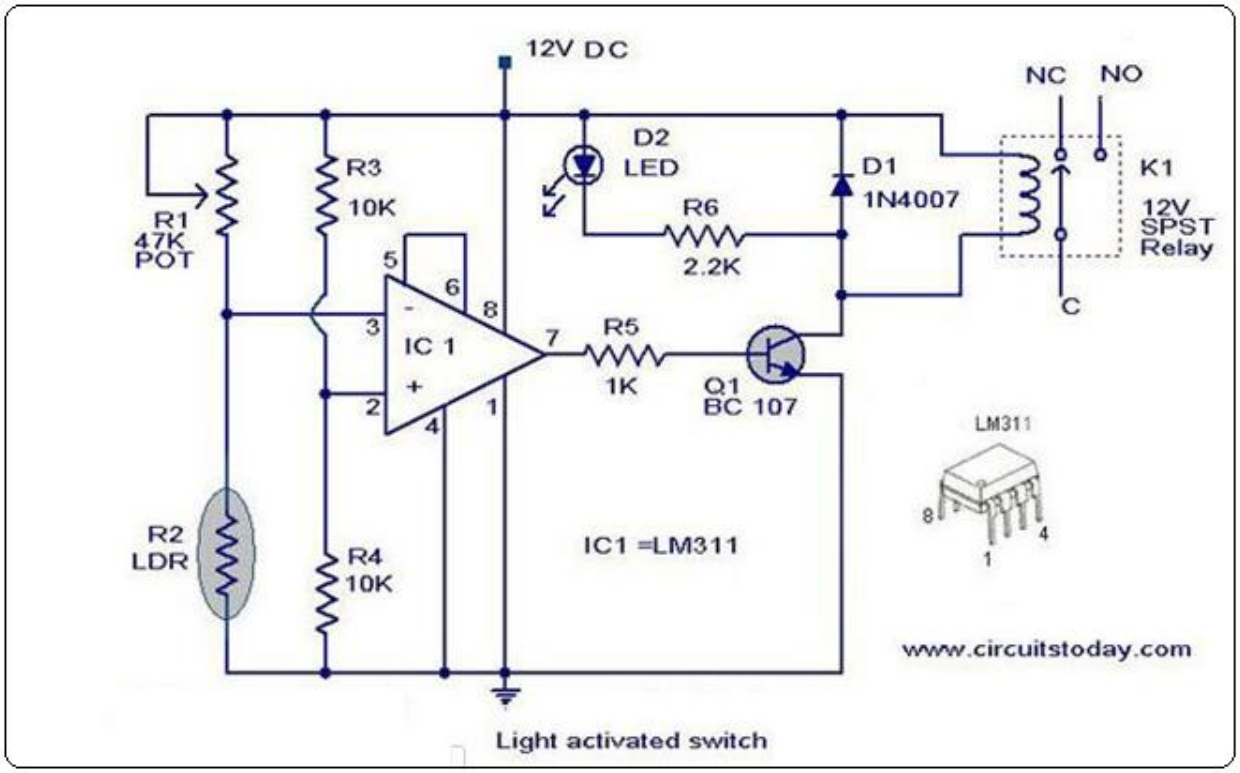


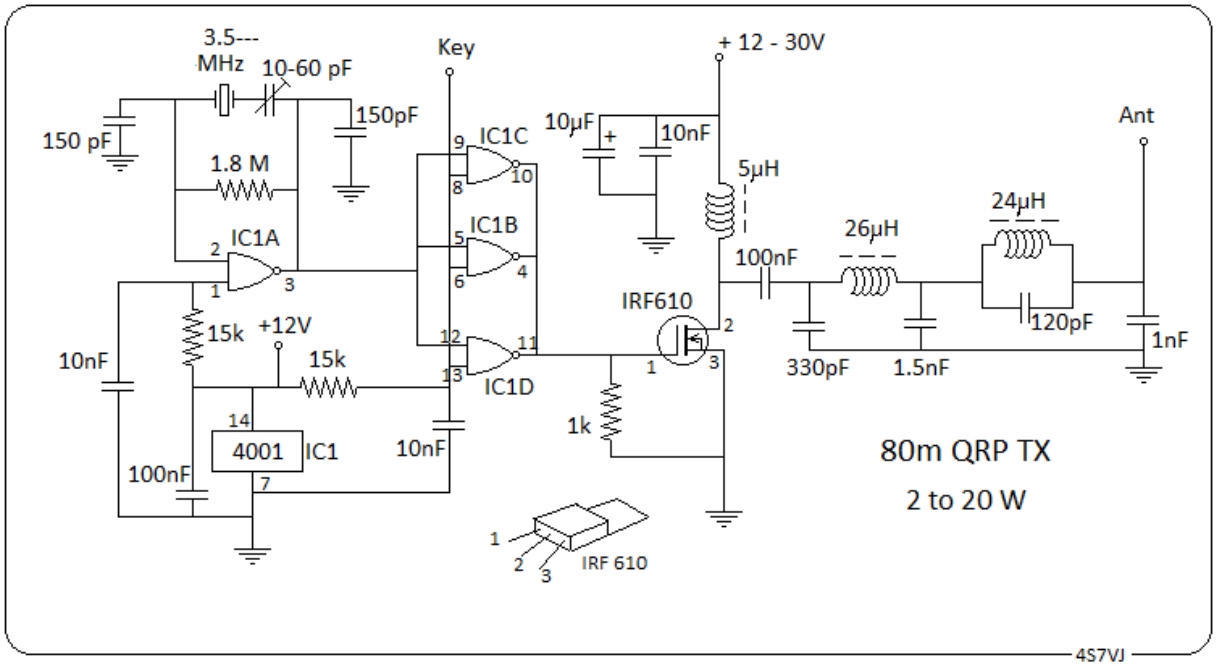

Electronic Hand key for CW TX
470
0.1 µF
12V
2N
3904
2N2222
ETCHED FOIL FOR
TOUCH SENSER
0.1
µF
Key Line
0.1µF
4S7VJ

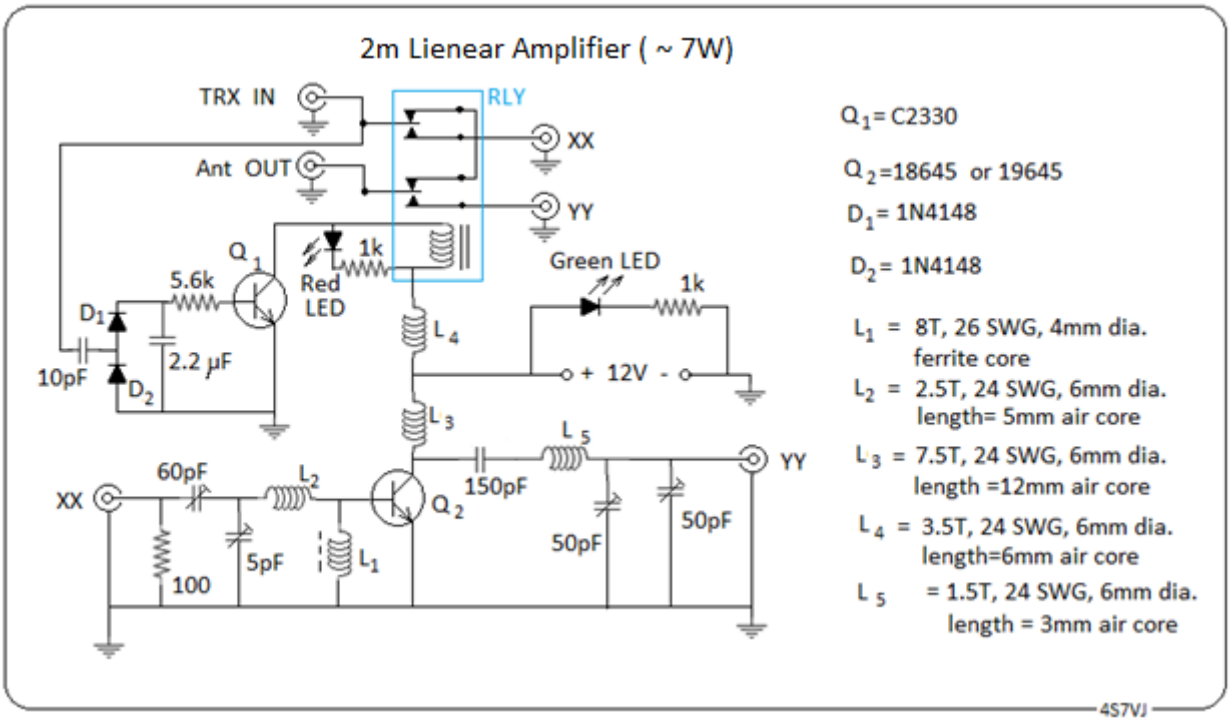

+
–
LDR
Simple LDR circuit
(dark activated)
4S7VJ


470
+
LDR
9 V
–
10k
Simple LDR circuit
(light activated)
4S7VJ

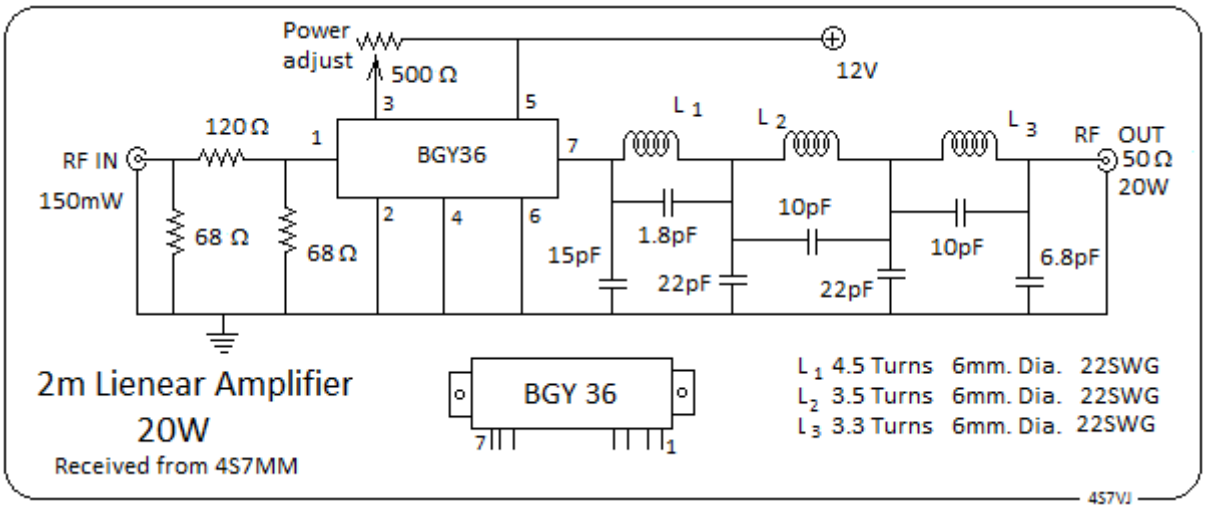

VR1
50K
10K
1K
LED
D1
NC
C
NO
Relay 12V
1K
1.8K
2N2222
IC1
LDR
0.01uF
10K
10K
Light Switch
www.CoolCircuit.com
B=Emitter
B=Base
C=Collector
TO-92
PN2222A
D1=1N4001
IC1 = LM311N
8
4
1

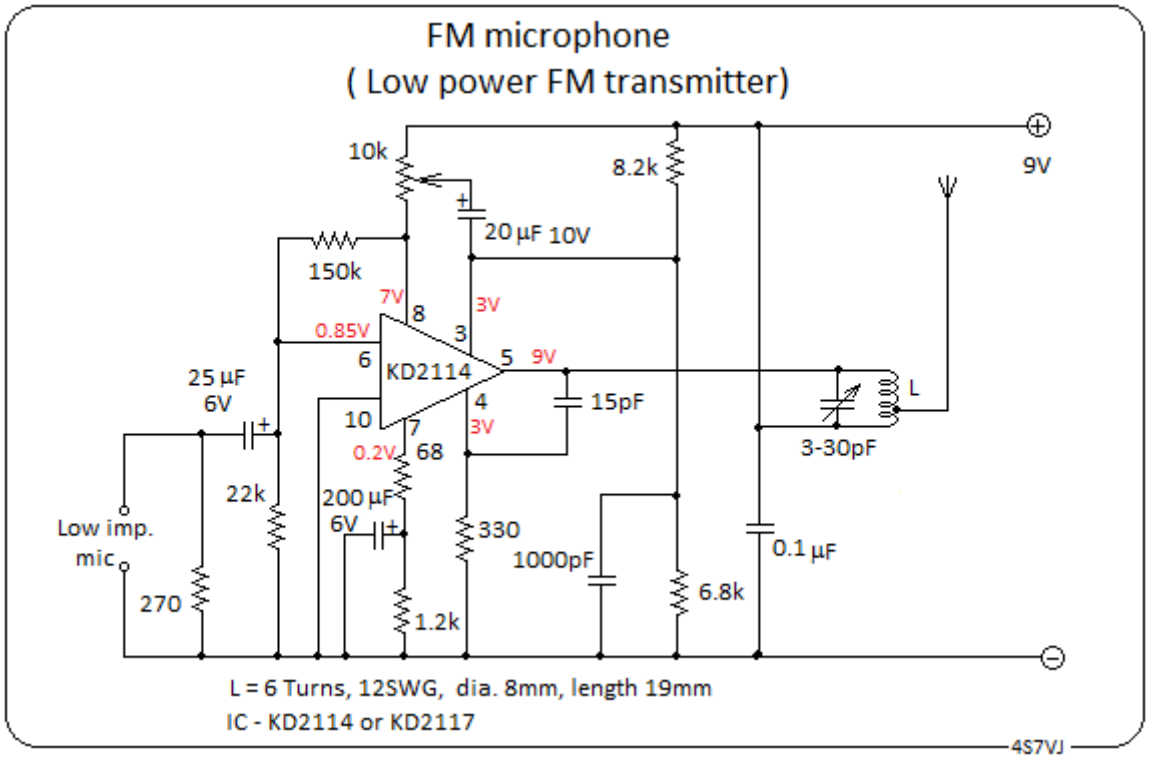

12V DC
NC
NO
D2
LED
D1
1N4007
K1
12V
SPST
Relay
R1
47K
POT
R3
10K
R6
2.2K
C
IC 1
R5
1K
Q1
BC 107
LM311
R2
LDR
R4
10K
IC1 =LM311
www.circuitstoday.com
Light activated switch

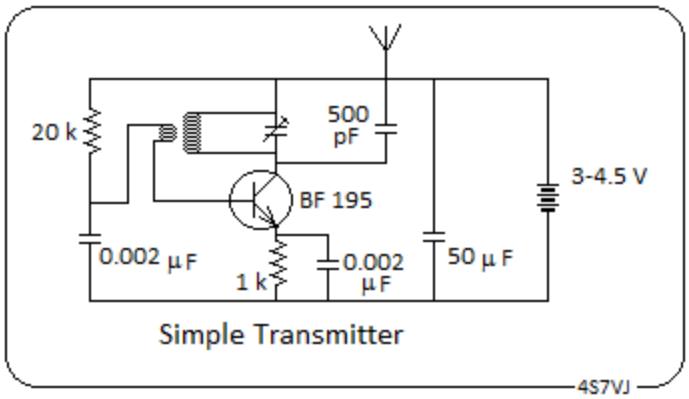

3.5---
MHz
10-60 pF
Key
+ 12 - 30V
150 pF
150pF
IC1C
10µF
10nF
Ant
1.8 M
5µH
IC1A
IC1B
24µH
26µH
100nF
IRF610
15k
+12V
15k
120pF
10nF
330pF
1.5nF
1nF
IC1D
1k
14
4001
IC1
10nF
100nF
80m QRP TX
2 to 20 W
IRF 610
4S7VJ

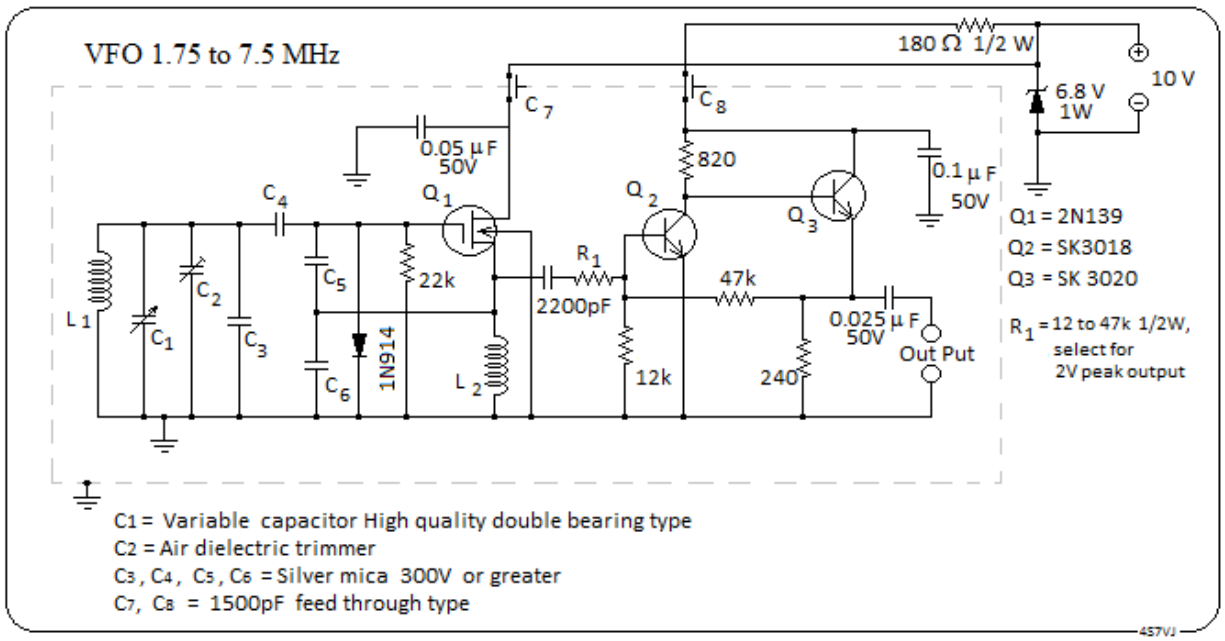


I constructed for 4S7OV and he used more than 15 years




FM microphone
(Low power FM transmitter)
10k
8.2k
9V
20 µF 10V
150k
7V
3V
0.85V
8
3
6
KD2114
5
9V
25 µF
6V
10
7
4
3V
15pF
L
3-30pF
0.2V
68
22k
200 µF
6V
330
1000pF
0.1 µF
Low imp.
mic
270
1.2k
6.8k
L = 6 Turns, 12SWG, dia. 8mm, length 19mm
IC - KD2114 or KD2117
4S7VJ


20 k
500
pF
3-4.5 V
BF 195
0.002 µ F
1 k
0.002
µ F
50 µ F
Simple Transmitter
4S7VJ



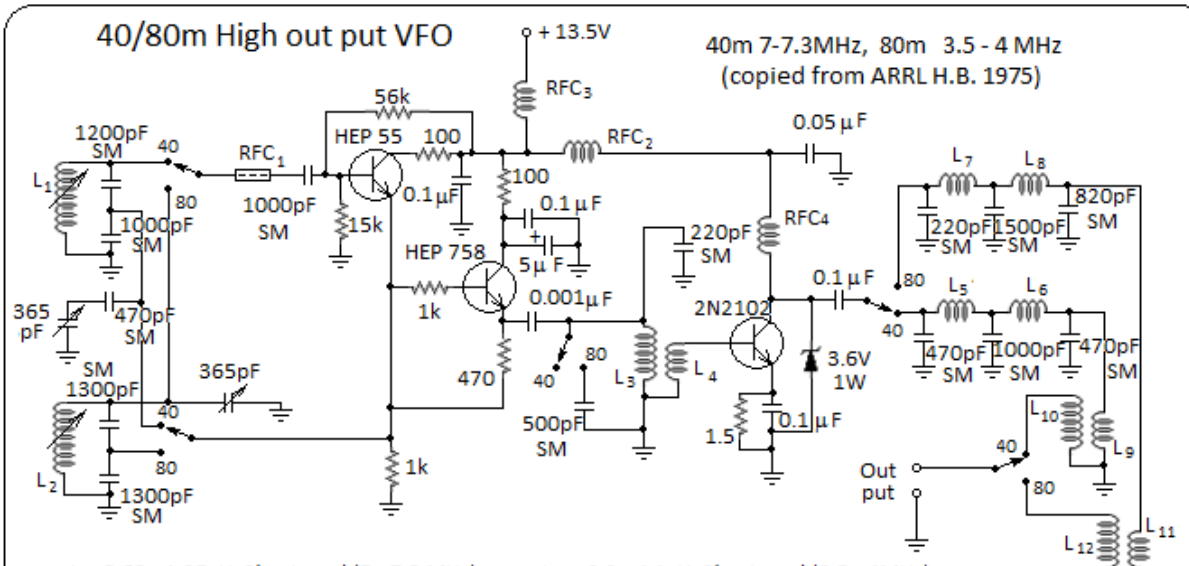
Tuned circuit data for L_1, and $C_{1\ to\ 6}$ (VFO 1.75 to 7.5 MHz)

Frequency range(MHz)	1.75 -1.9	2.5 – 2.7	3.5 – 4.0	5.0 – 5.5		7.0 – 7.5
Inductance (µH)	18.3	9.6	5.4	4.4	2.2	1.4
No of turns	32	19	17	14.75	11.5	8
S.W.G	24	24	20	20	18	18
Turns /inch	32	32	16	16	8	8
Dia. (inch)	1	1	1	1	1	1
B & W No.	3016	3016	3015	3015	3014	3014
C_1 (pF)	75	75	100	100	50	50
C_2 (pF)	50	50	25	25	25	25
C_3 (pF)	100	120	100	None	None	120
C_4 (pF)	470	470	390	390	270	390
C_5 (pF)	1000	1000	680	680	560	680
C_6 (pF)	1000	1000	680	680	560	680

(Copied from RCA hobby circuit manual)

40/80m High out put VFO

40m 7-7.3MHz, 80m 3.5 - 4 MHz
(copied from ARRL H.B. 1975)

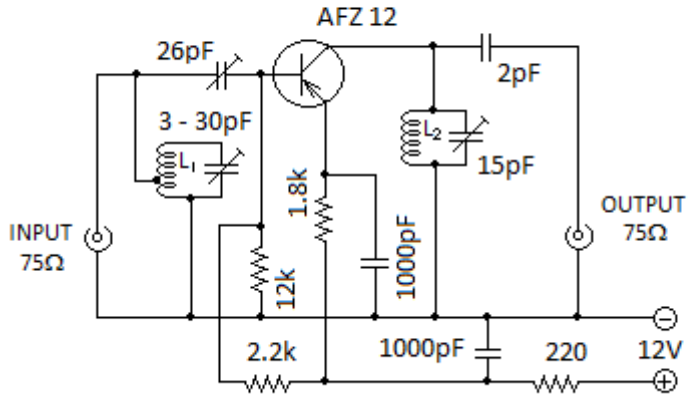


L1 - 0.68 - 1.25µH Slug tuned (7 - 7.3 MHz) L2 - 2.2 - 4.1µH Slug tuned (3.5 - 4MHz)
L3 - 2µH, 25 turns, 24 SWG enemalled wire on Amidon T-50-2 toroid core
L4 - 12 turns, 22SWG hookup wire over L3
L5, L6 - 13 turns of 22SWG enemelled wire on Amidon T-68-2 core
L7, L8 - 18 turns of 22 SWG enemelled wire on Amidon T-68-2 core
L9 - 7 turns of 26 SWG enemelled wire on over L10, L10 - 3µH Miller 4405 with slug and 4 turns removed
L11 - 7 turns of 22SWG enemelled wire over L12, L12 - 23µH (Miller 4407)
RFC1 - 3 Amidon ferrite beads on a 1/2 inch length of 22SWG wire (a 15 Ohm resistor may serve as a sustitude.)
RFC2 - Miniature choke (Miller J-300-360), RFC3 - Miniature choke (Miller 34300)
RFC4 - 2.5µH Miniature Choke (Miller J 300-25)

4S7VJ

VHF Amplifier

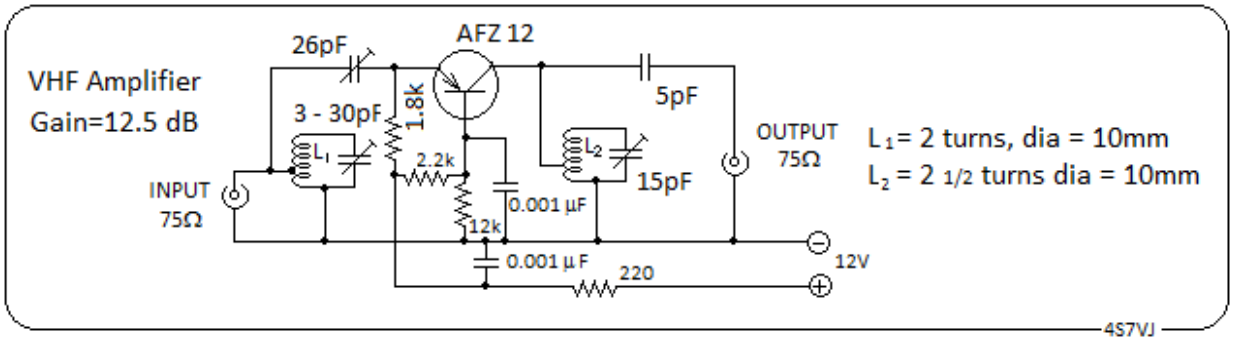
(gain = 11dB, noise = 3.9dB at 200MHz)

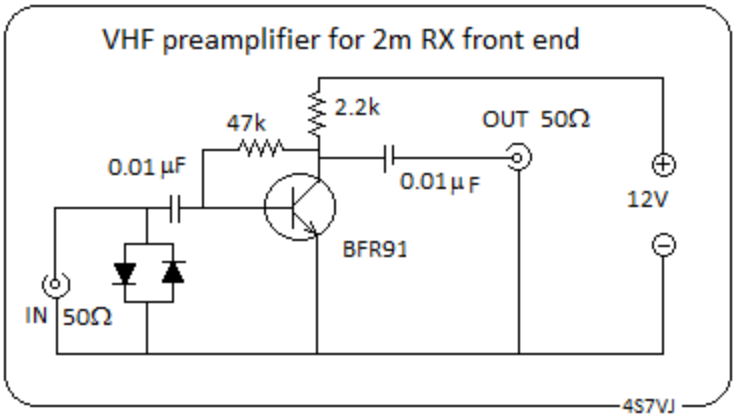


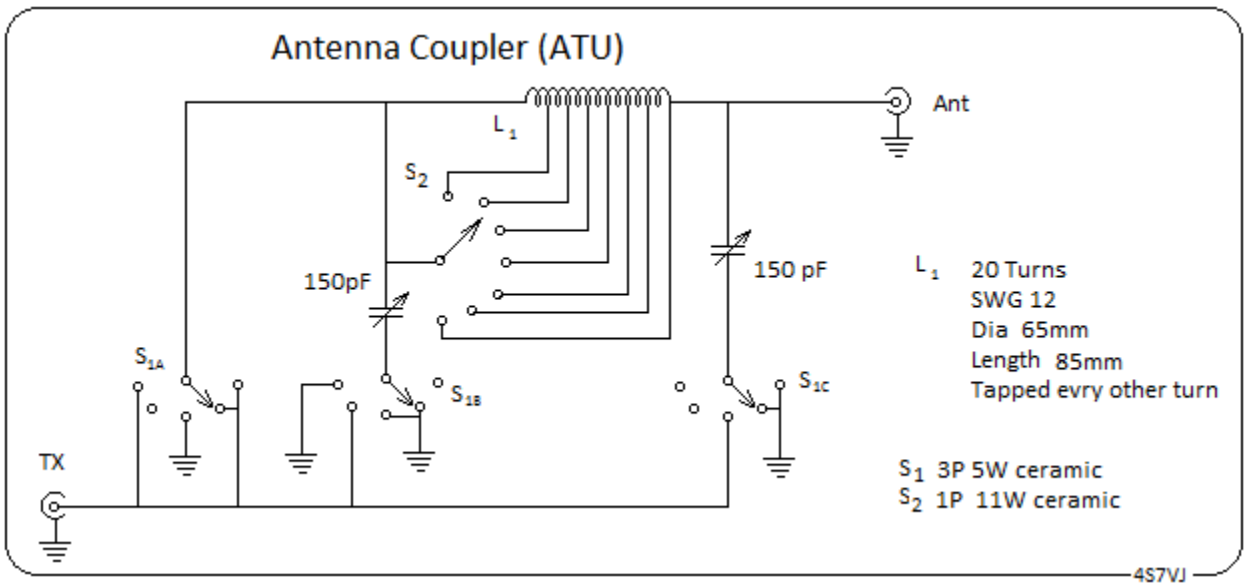
L - 2 turns, 18SWG, dia 10mm the tap is half a turn from the lower end.

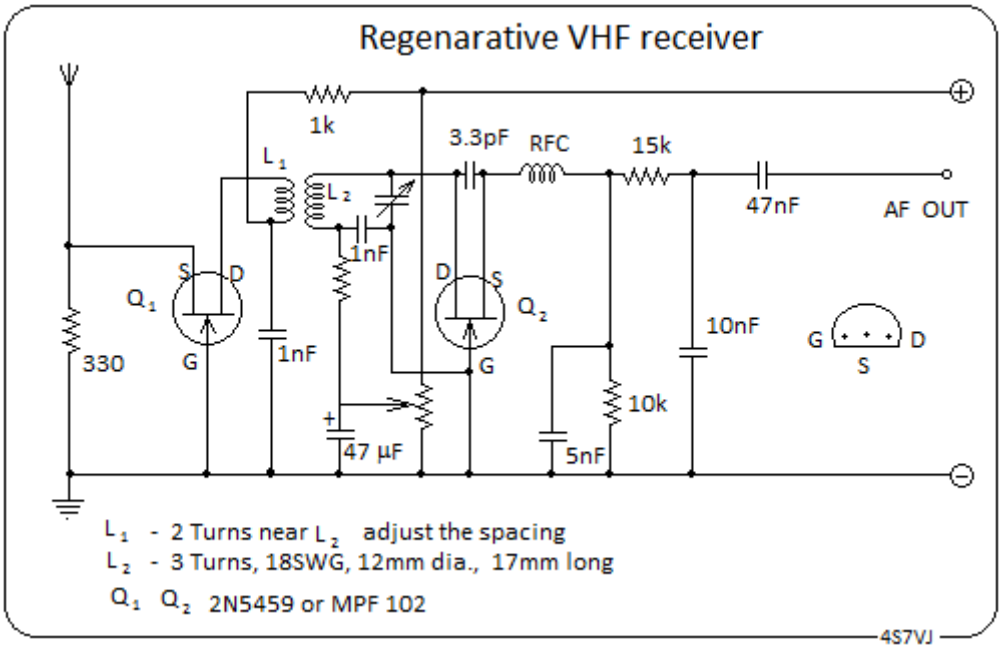
L - 2 1/2 turns , 18SWG, dia 10mm

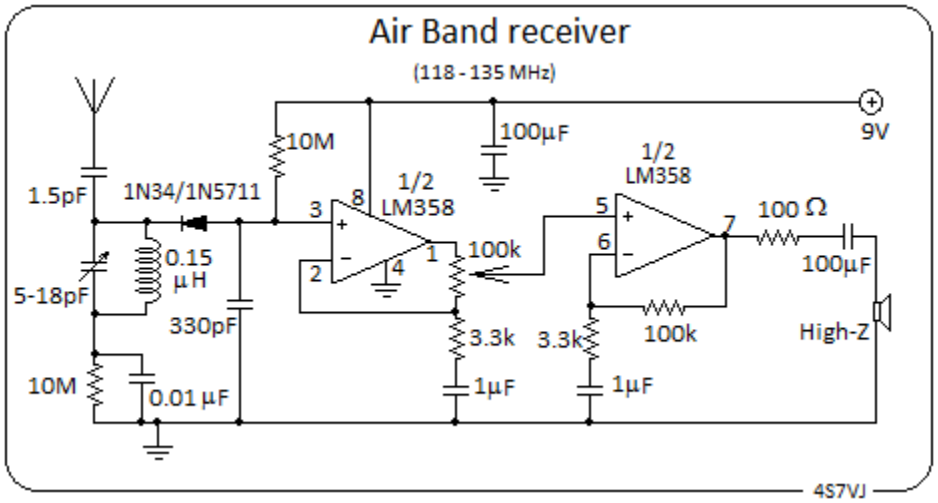
4S7VJ

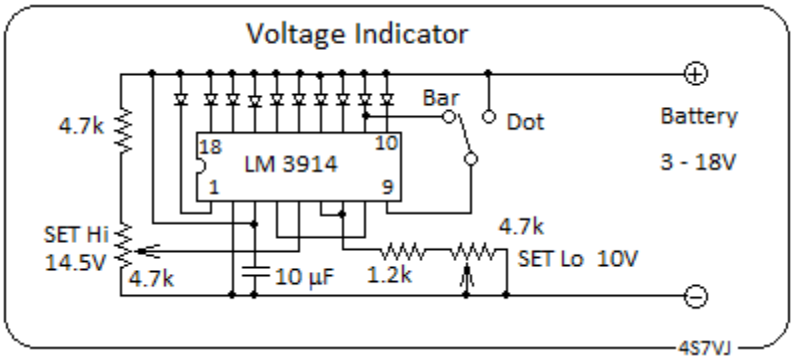

VHF Amplifier
Gain=12.5 dB
26pF
AFZ 12
3 - 30pF
1.8k
5pF
L1
2.2k
L2
15pF
OUTPUT
75Ω
INPUT
75Ω
0.001 µF
12k
0.001 µ F
220
12V
L1 = 2 turns, dia = 10mm
L2 = 2 1/2 turns dia = 10mm
4S7VJ

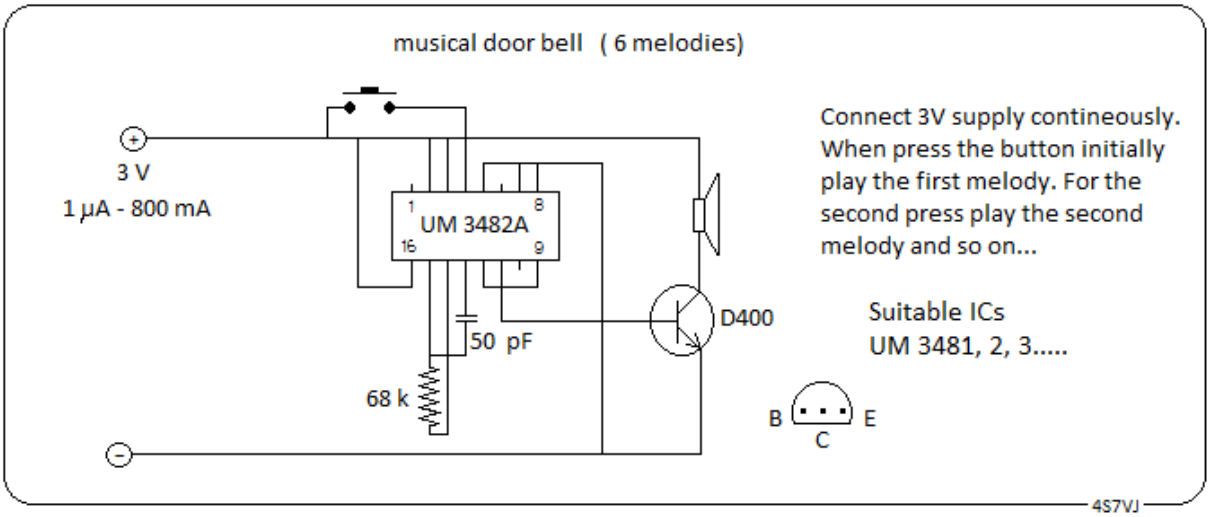

VHF preamplifier for 2m RX front end
47k
2.2k
OUT 50Ω
0.01 µF
0.01 µ F
12V
BFR91
IN 50Ω
4S7VJ


Antenna Coupler (ATU)
L1
Ant
S2
150pF
150 pF
S1A
S1B
S1C
TX
L1 20 Turns
SWG 12
Dia 65mm
Length 85mm
Tapped evry other turn
S1 3P 5W ceramic
S2 1P 11W ceramic
4S7VJ

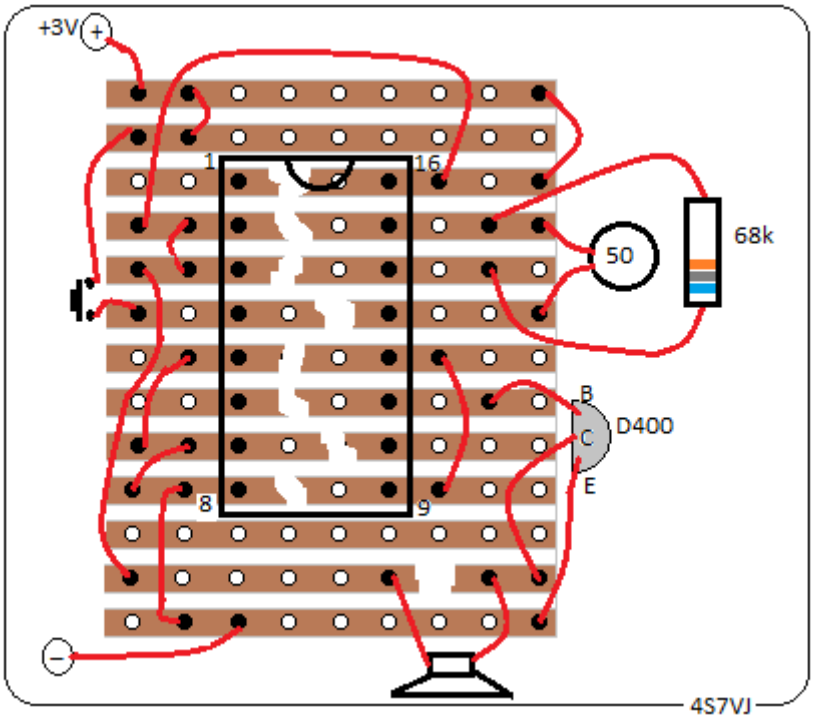

Regenarative VHF receiver
1k
3.3pF
RFC
15k
47nF
AF OUT
L1
L2
1nF
Q1
S
D
G
330
1nF
D
S
Q2
G
10nF
G
D
S
10k
47 µF
5nF
L1 - 2 Turns near L2 adjust the spacing
L2 - 3 Turns, 18SWG, 12mm dia., 17mm long
Q1 Q2 2N5459 or MPF 102
4S7VJ

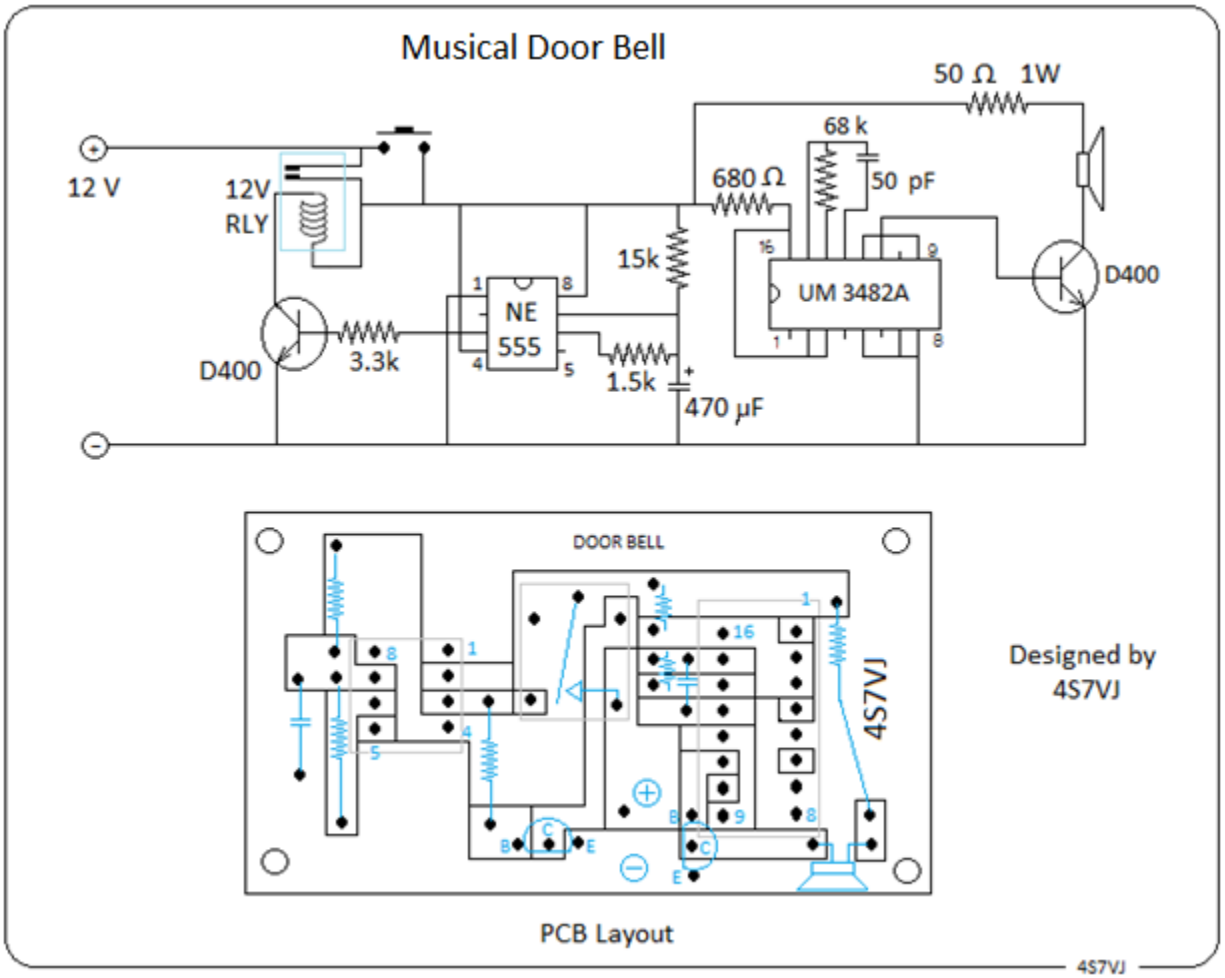

Air Band receiver
(118 - 135 MHz)
9V
10M
100µF
1/2
LM358
1/2
LM358
1.5pF
1N34/1N5711
100 Ω
0.15
µH
100µF
5-18pF
100k
330pF
3.3k
3.3k
100k
High-Z
10M
0.01 µF
1µF
1µF
4S7VJ


Voltage Indicator
Bar
Dot
Battery
3 - 18V
4.7k
LM 3914
18
10
1
9
4.7k
SET Hi
14.5V
4.7k
10 µF
1.2k
SET Lo 10V
4S7VJ

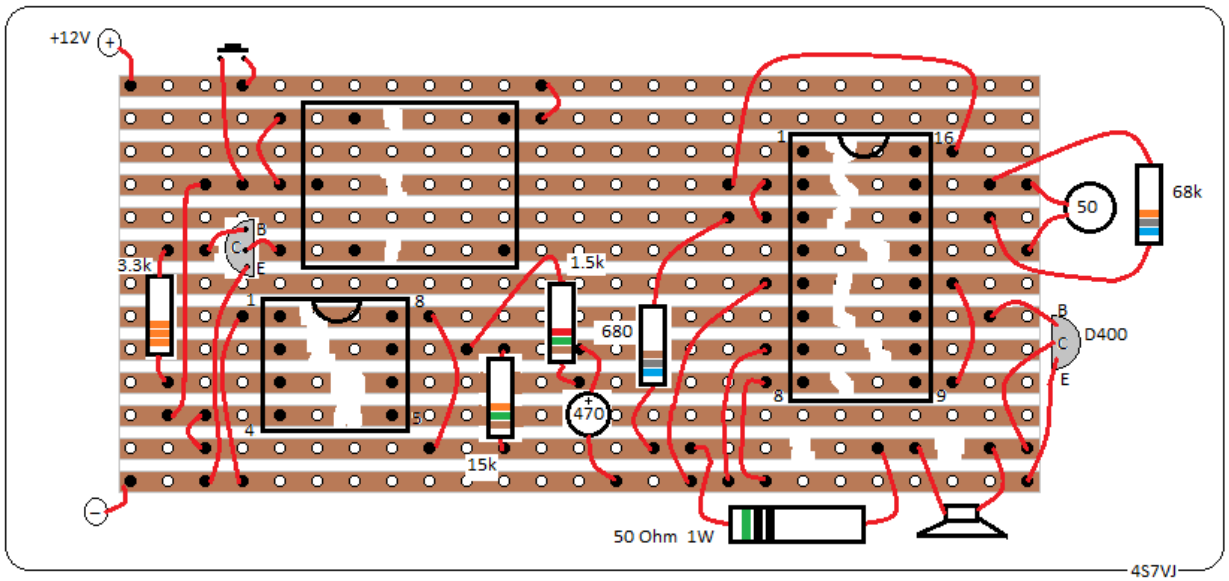


Vero board layout for the above circuit



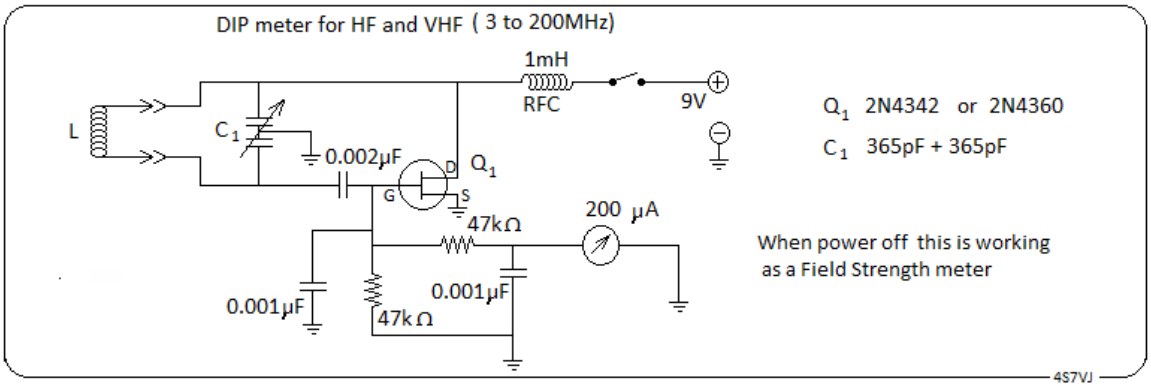


Once you press the push button Door bell activated for one melody and automatically switched off after about 10 seconds. For different melodies use UM3481A ....3489 ICs.

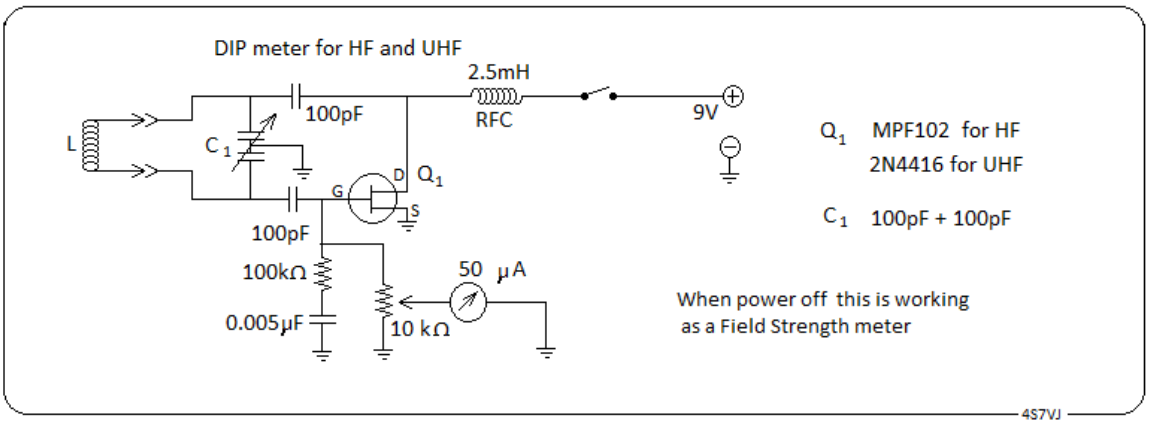


Vero board layout for the above circuit

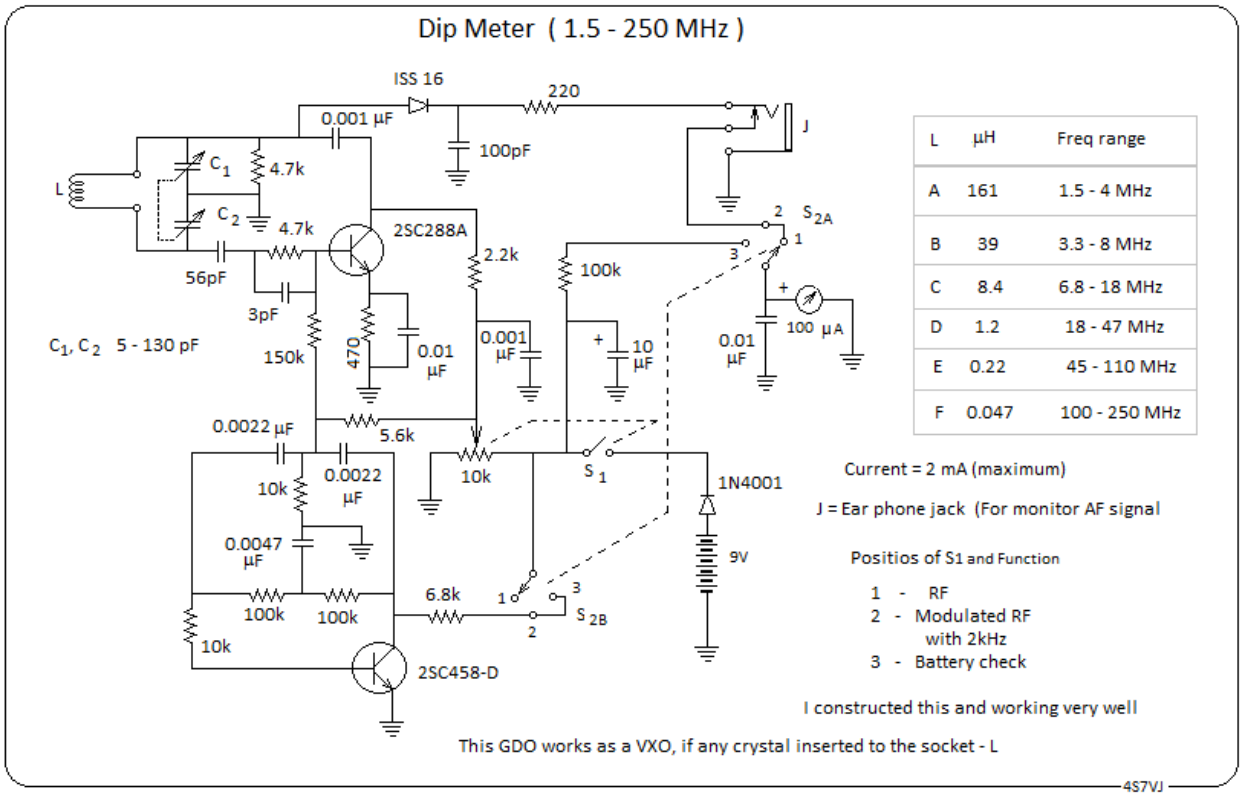
DIP meter-1



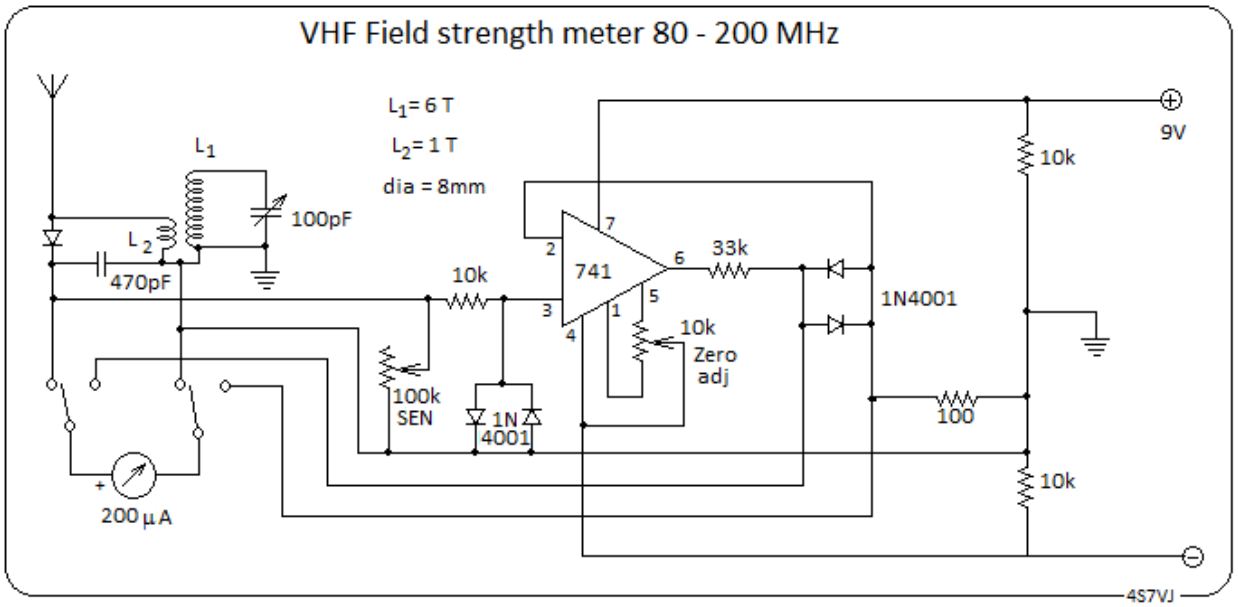
DIP meter-2



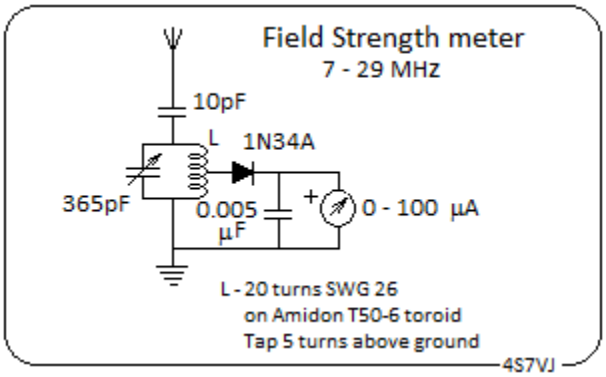
DIP Meter - 3



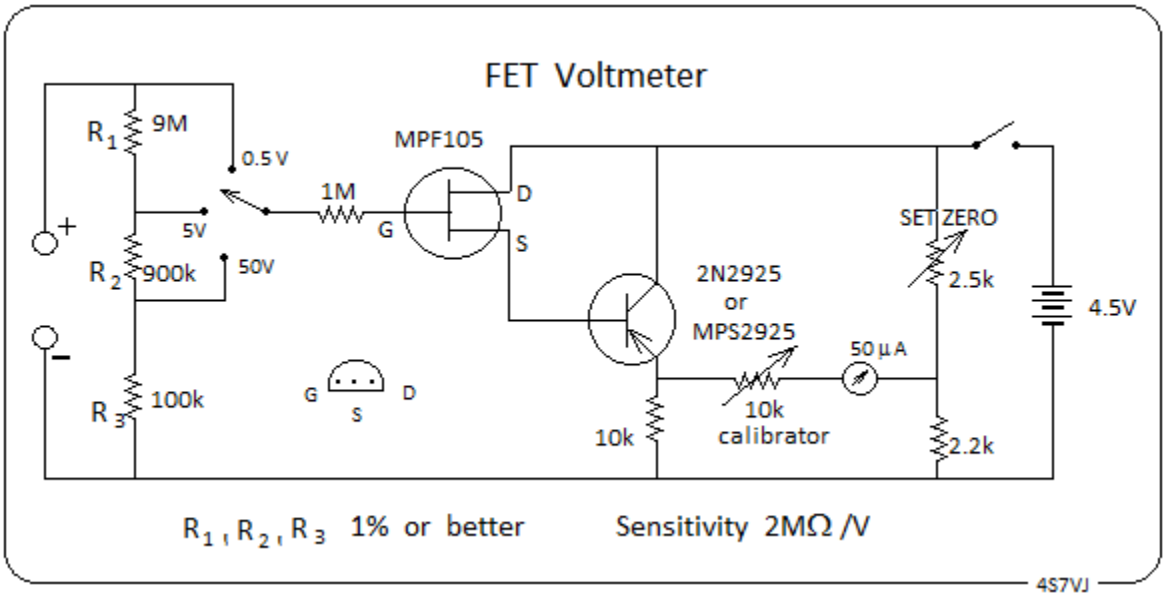
L	µH	Freq range
A	161	1.5 - 4 MHz
B	39	3.3 - 8 MHz
C	8.4	6.8 - 18 MHz
D	1.2	18 - 47 MHz
E	0.22	45 - 110 MHz
F	0.047	100 - 250 MHz



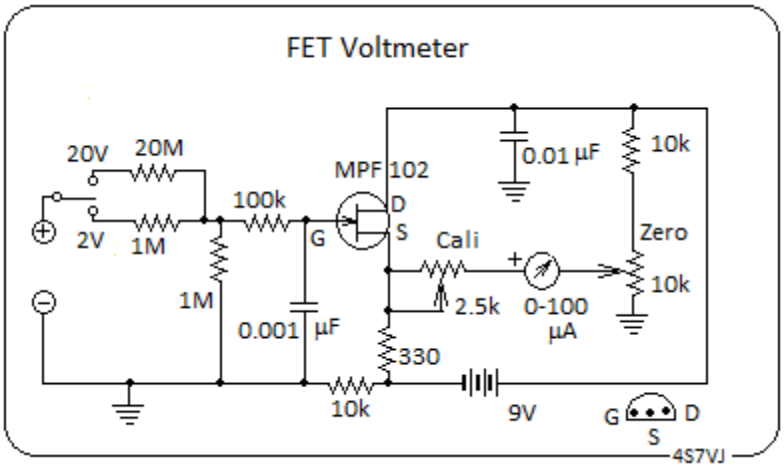
I constructed this, working very well.

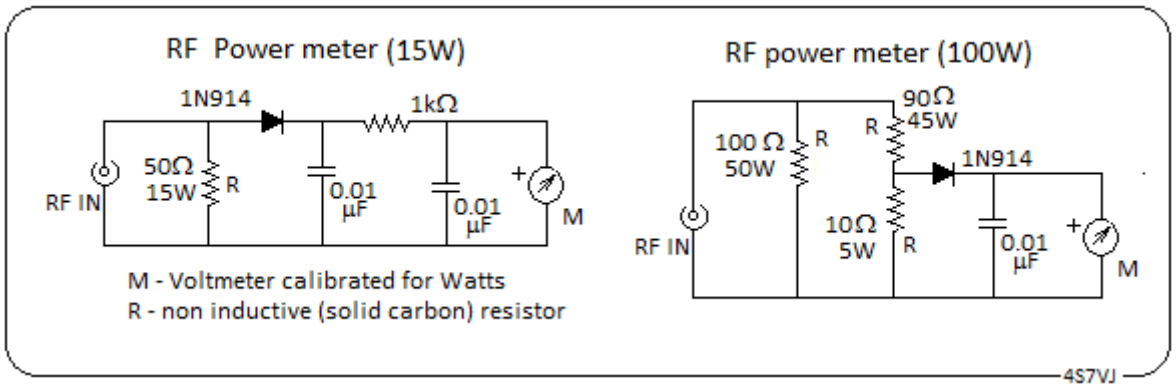


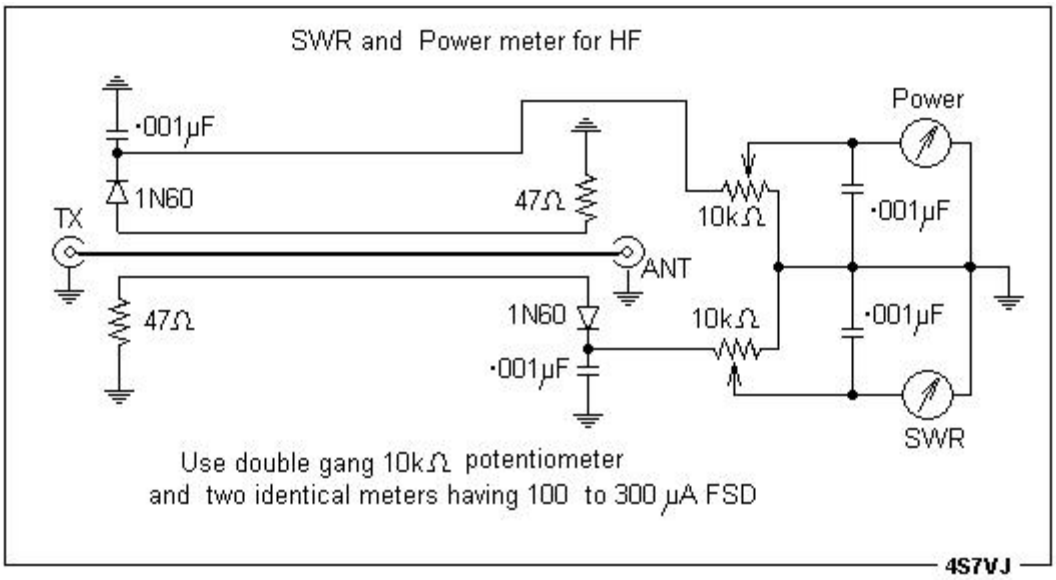
High impedance voltmeter

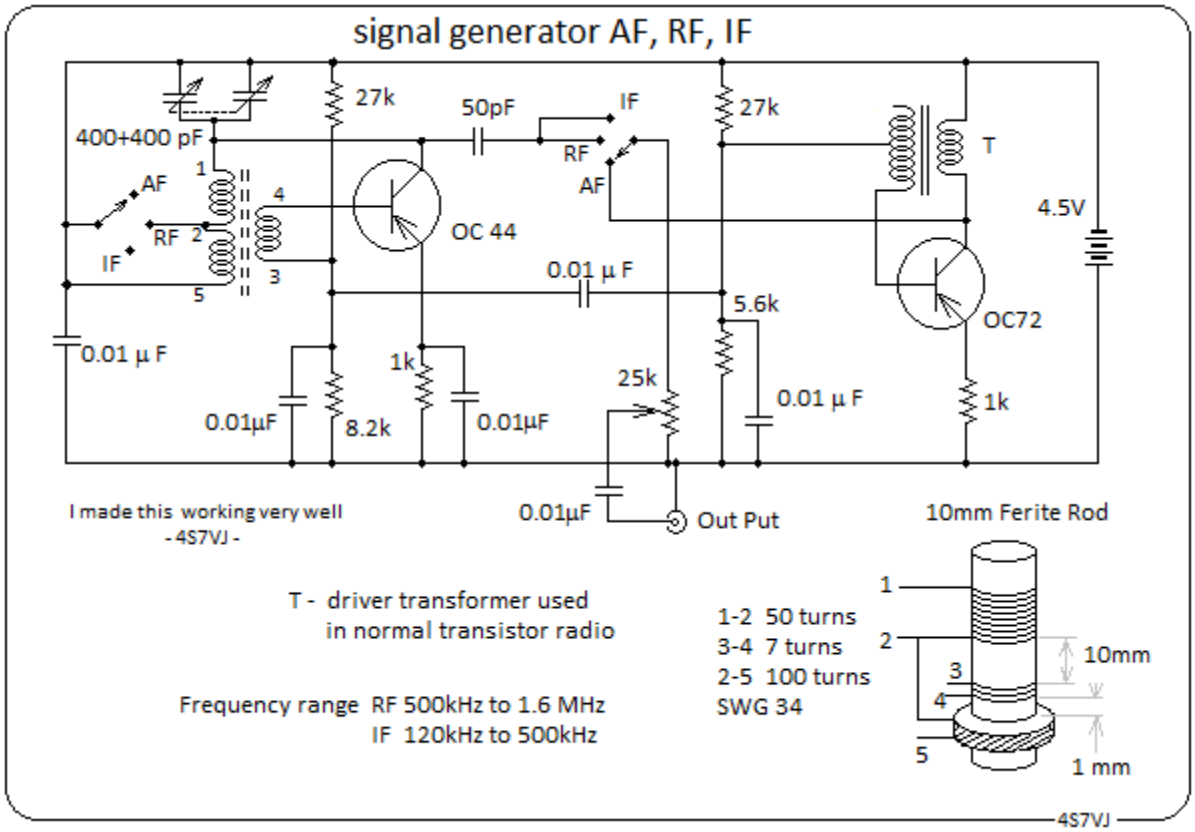


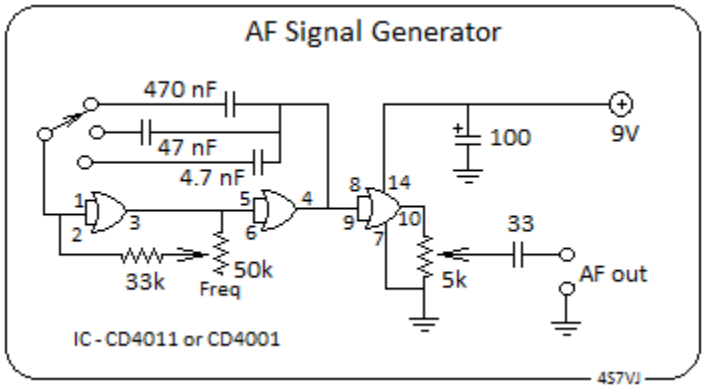
High impedance voltmeter

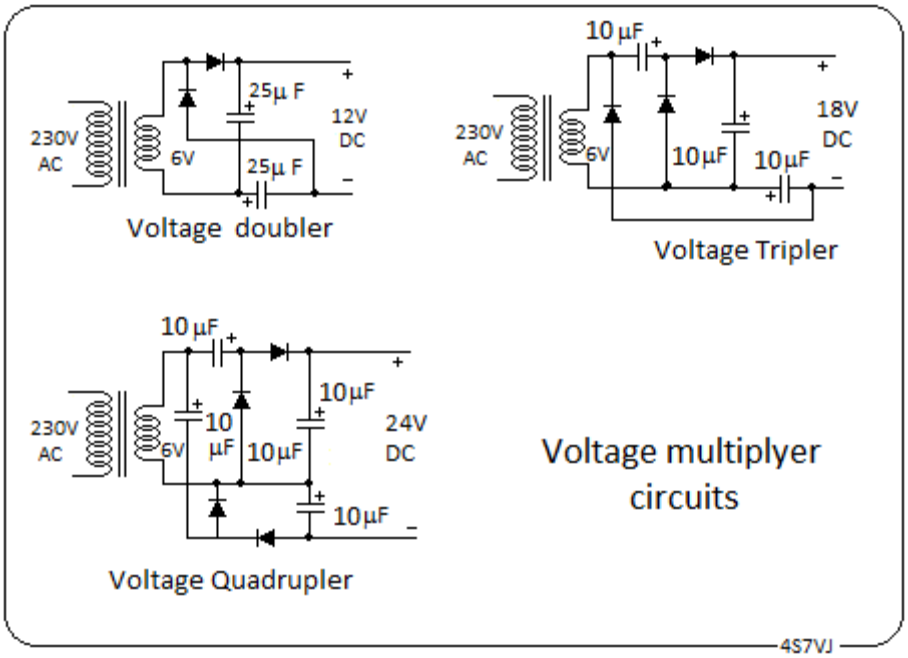


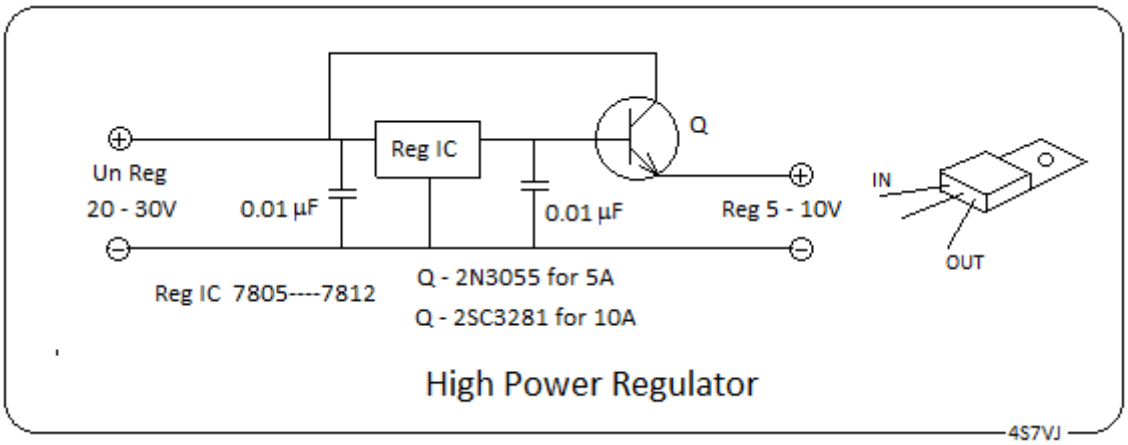

RF Power meter (15W)
1N914
1kΩ
50Ω
15W
R
RF IN
0.01
µF
0.01
µF
+
M
M - Voltmeter calibrated for Watts
R - non inductive (solid carbon) resistor
RF power meter (100W)
90Ω
45W
R
100 Ω
50W
R
1N914
RF IN
10Ω
5W
R
0.01
µF
+
M
4S7VJ

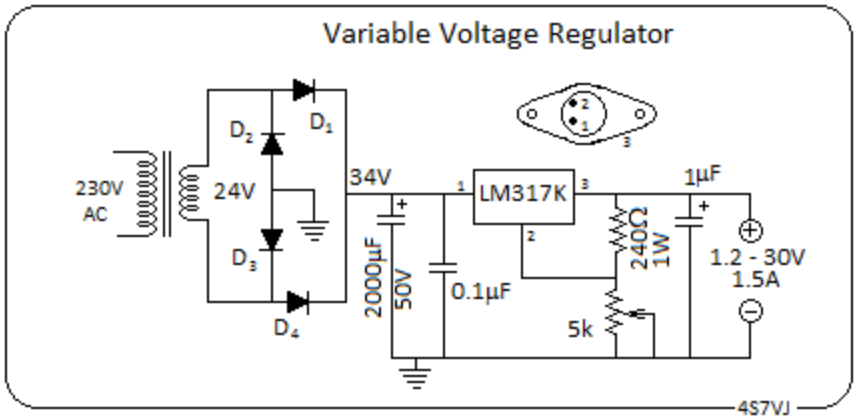

SWR and Power meter for HF
·001µF
1N60
47Ω
Power
10kΩ
·001µF
TX
ANT
47Ω
1N60
10kΩ
·001µF
·001µF
SWR
Use double gang 10kΩ potentiometer
and two identical meters having 100 to 300 µA FSD
4S7VJ

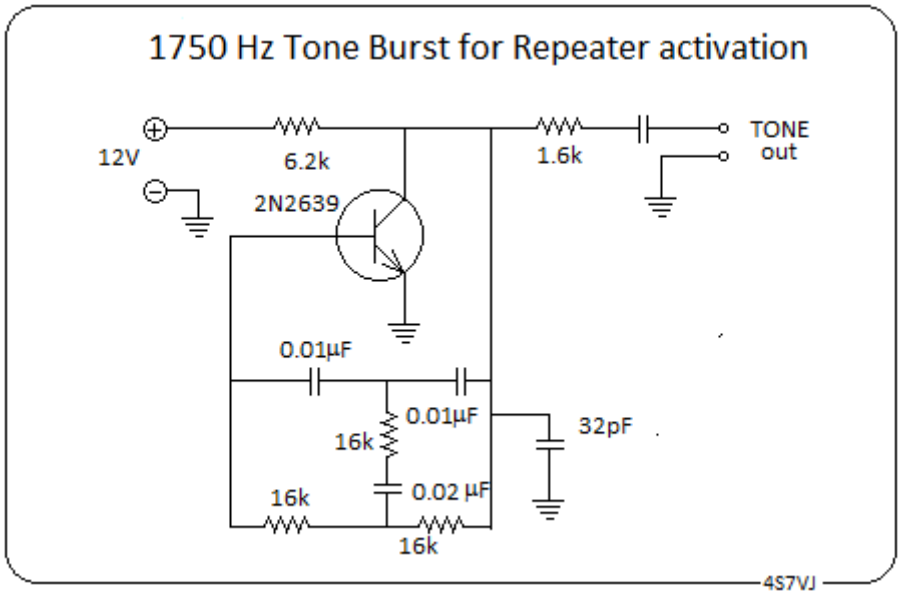

signal generator AF, RF, IF
400+400 pF
AF
RF
IF
1
2
3
4
5
27k
50pF
IF
RF
AF
OC 44
0.01 µ F
0.01 µ F
0.01µF
8.2k
1k
0.01µF
25k
0.01µF
Out Put
27k
T
4.5V
5.6k
OC72
0.01 µ F
1k
I made this working very well
- 4S7VJ -
T - driver transformer used
in normal transistor radio
Frequency range RF 500kHz to 1.6 MHz
IF 120kHz to 500kHz
10mm Ferite Rod
1-2 50 turns
3-4 7 turns
2-5 100 turns
SWG 34
10mm
1 mm
4S7VJ

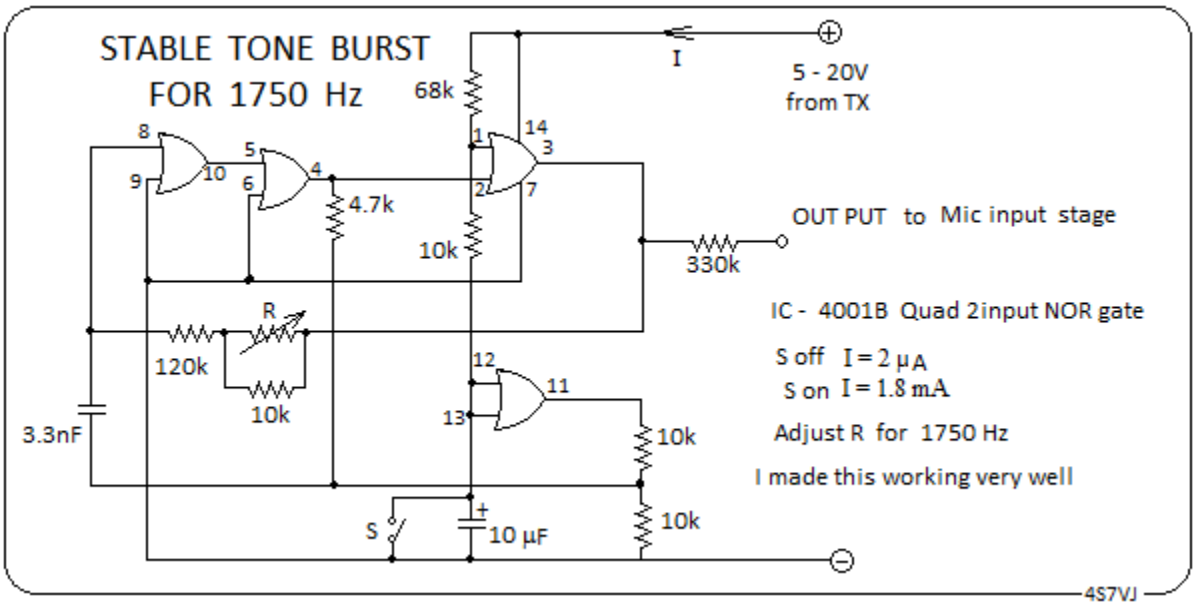

AF Signal Generator
470 nF
47 nF
4.7 nF
33k
50k
Freq
100
9V
33
5k
AF out
IC - CD4011 or CD4001
4S7VJ


230V
AC
6V
25µ F
25µ F
12V
DC
Voltage doubler
10 µF
230V
AC
6V
10µF
10µF
18V
DC
Voltage Tripler
10 µF
230V
AC
6V
10
µF
10µF
10µF
10µF
24V
DC
Voltage Quadrupler
Voltage multiplyer
circuits
4S7VJ

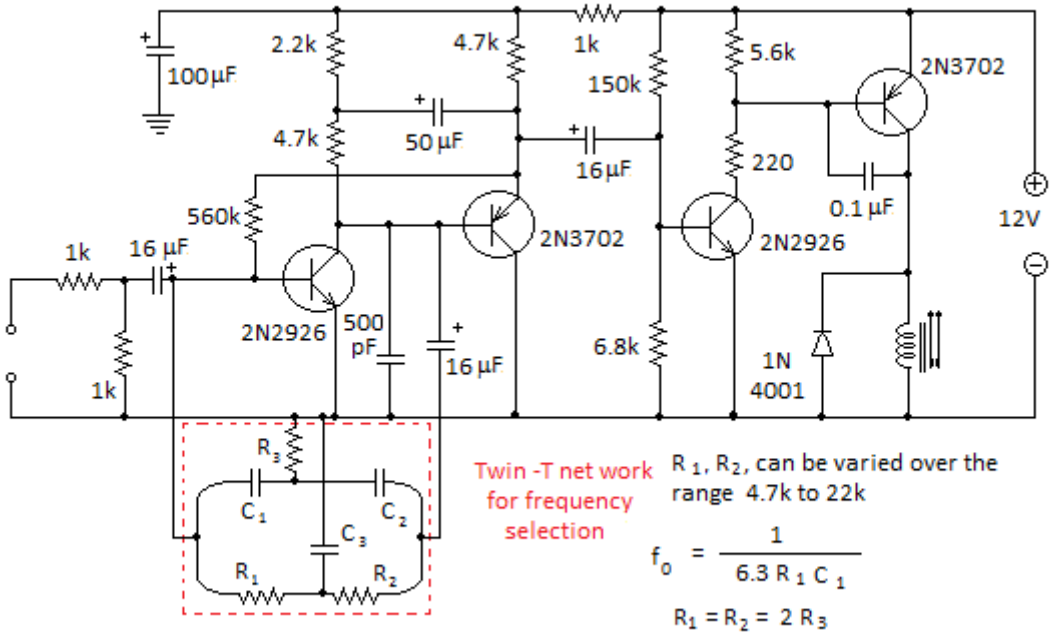

Un Reg
20 - 30V
0.01 µF
Reg IC
Q
0.01 µF
Reg 5 - 10V
IN
OUT
Reg IC 7805----7812
Q - 2N3055 for 5A
Q - 2SC3281 for 10A
High Power Regulator
4S7VJ


Variable Voltage Regulator
230V
AC
24V
D1
D2
D3
D4
34V
2000µF
50V
0.1µF
LM317K
240Ω
1W
5k
1µF
1.2 - 30V
1.5A
4S7VJ


1750 Hz Tone Burst for Repeater activation
12V
6.2k
1.6k
TONE
out
2N2639
0.01µF
0.01µF
16k
32pF
16k
0.02 µF
16k
4S7VJ

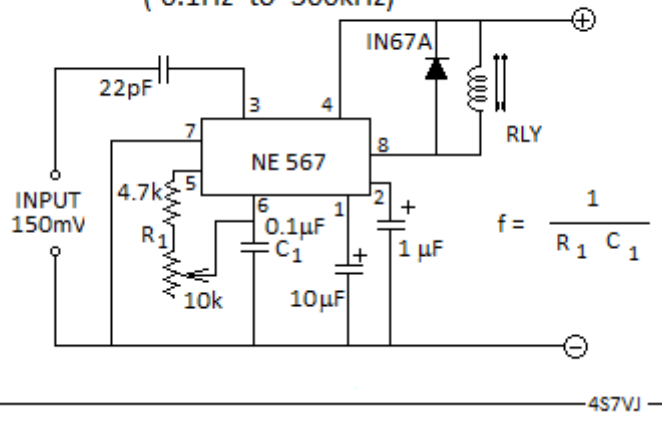

STABLE TONE BURST
FOR 1750 Hz
I
5 - 20V
from TX
68k
4.7k
10k
330k
OUT PUT to Mic input stage
IC - 4001B Quad 2input NOR gate
S off I = 2 µA
S on I = 1.8 mA
Adjust R for 1750 Hz
I made this working very well
R
120k
10k
3.3nF
10k
10k
S
10 µF
4S7VJ

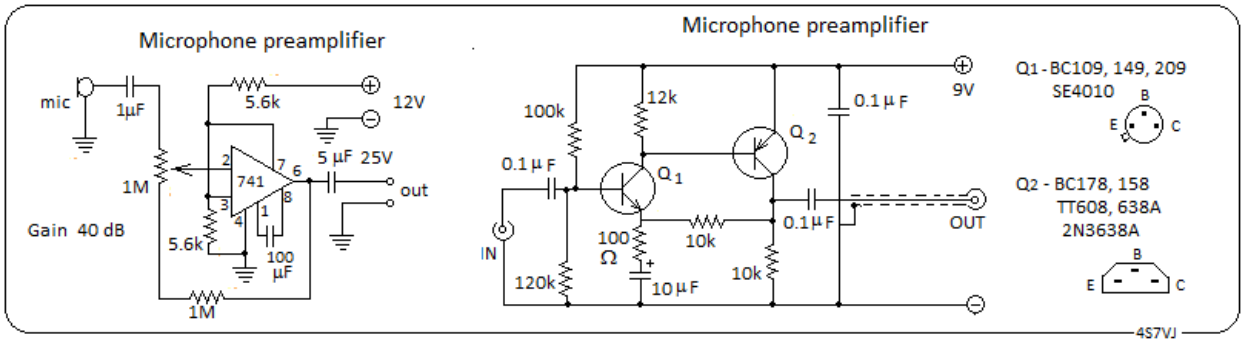
Tone operated switch

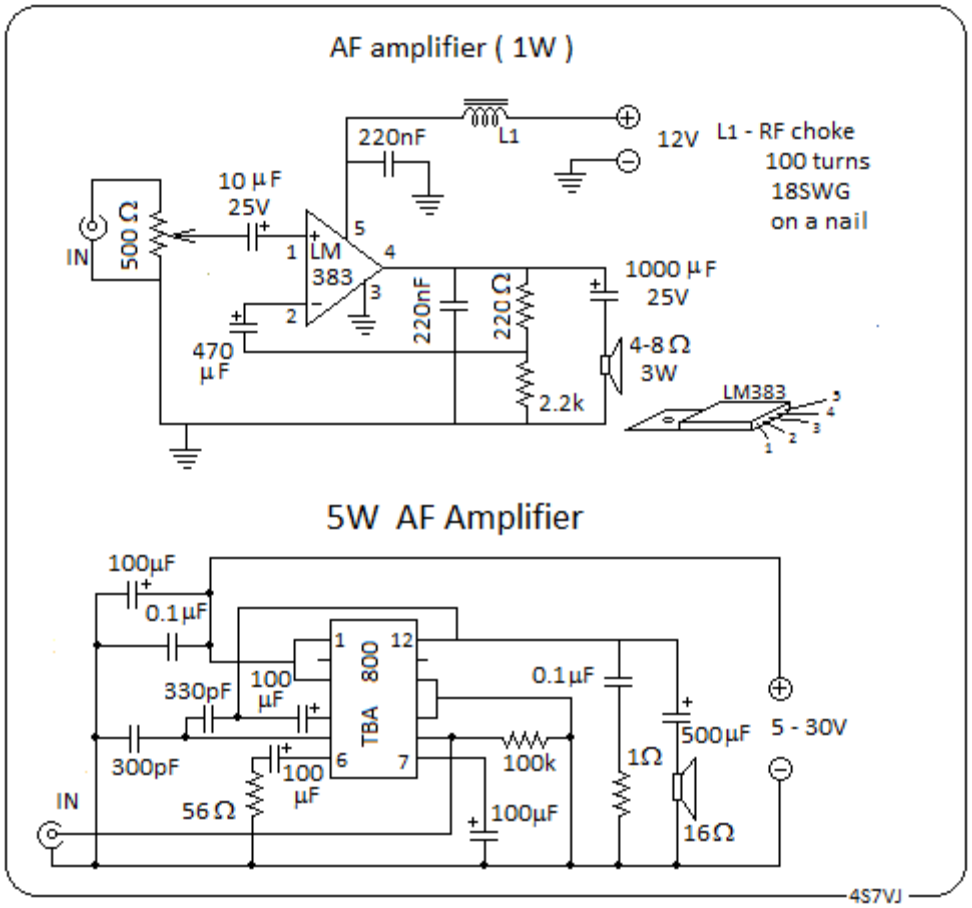


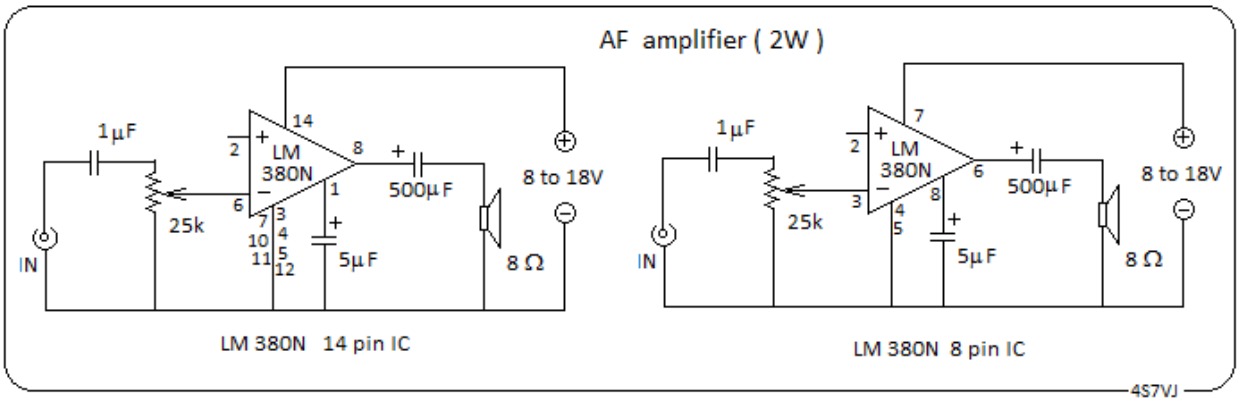
Tone Decoder

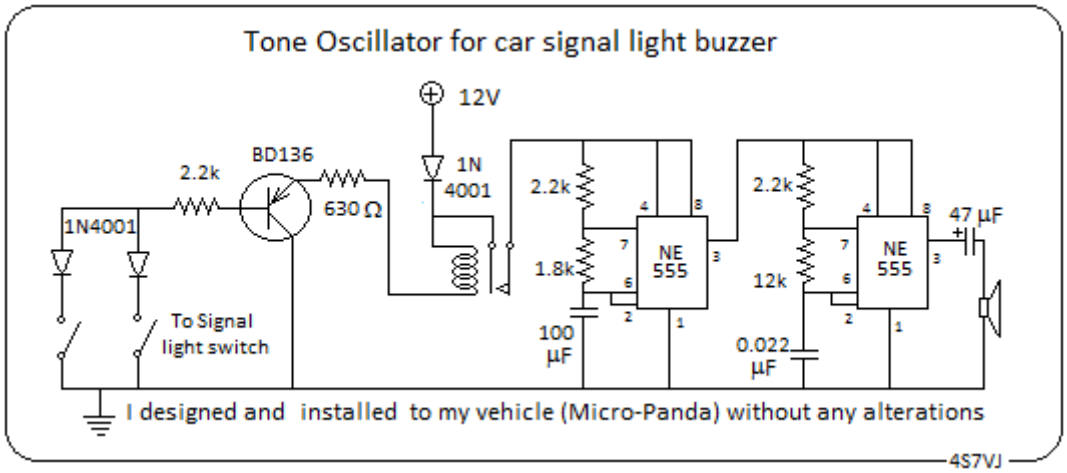
(0.1Hz to 500kHz)

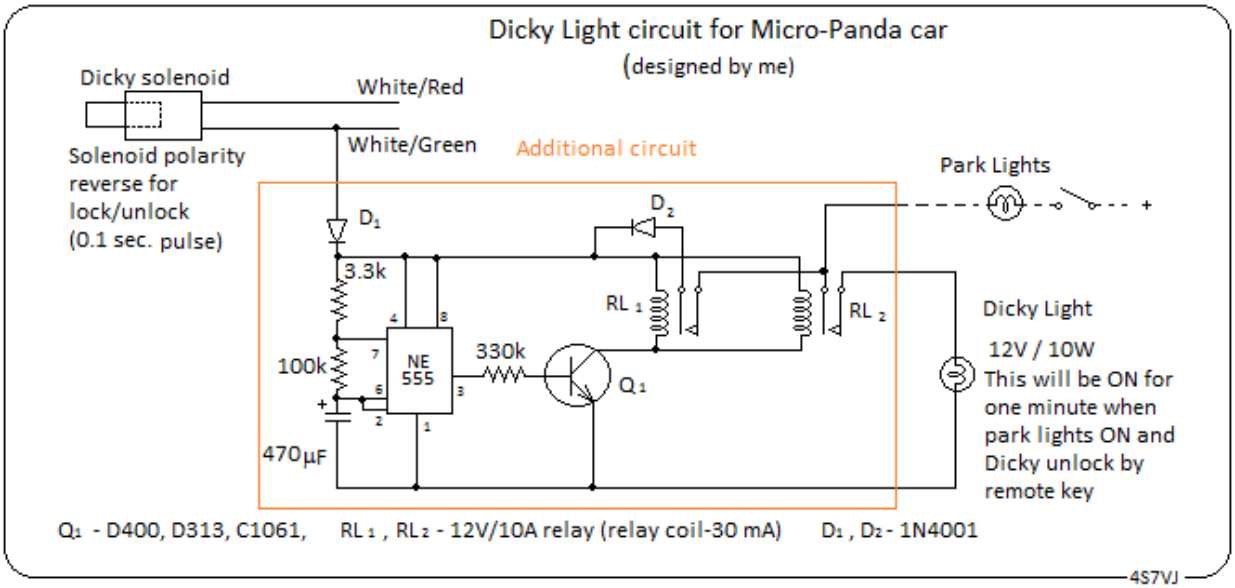


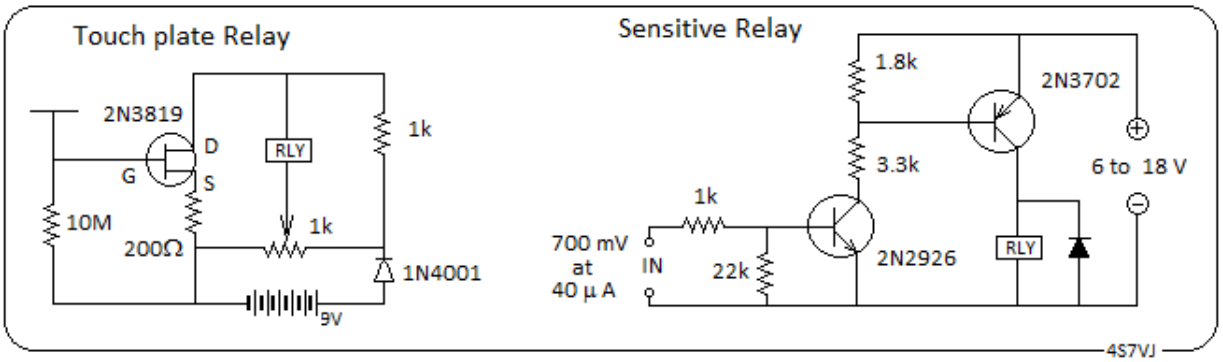

Microphone preamplifier
mic
1µF
5.6k
12V
5 µF 25V
1M
741
out
Gain 40 dB
5.6k
100 µF
1M
Microphone preamplifier
100k
12k
0.1 µ F
9V
Q 2
0.1 µ F
Q 1
IN
100 Ω
10k
0.1 µ F
OUT
120k
10 µ F
10k
Q1 - BC109, 149, 209
SE4010
B
E
C
Q2 - BC178, 158
TT608, 638A
2N3638A
B
E
C
4S7VJ

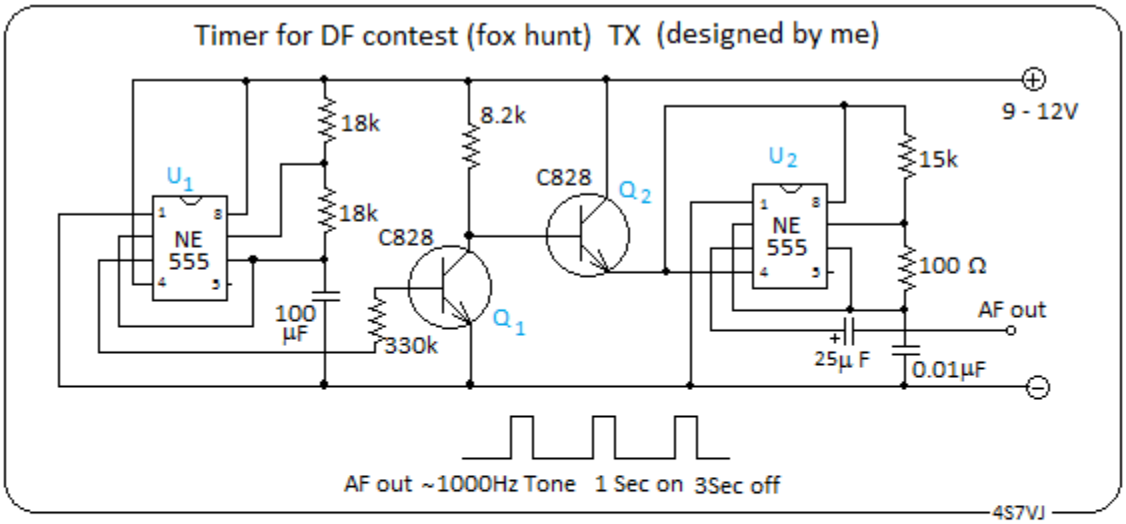

AF amplifier (1W)
220nF
L1
12V
L1 - RF choke
100 turns
18SWG
on a nail
10 µ F
25V
IN
500 Ω
LM
383
1000 µ F
25V
220nF
220 Ω
470
µ F
4-8 Ω
3W
2.2k
LM383
5W AF Amplifier
100µF
0.1µF
330pF
100
µF
TBA 800
0.1µF
500µF
5 - 30V
300pF
100
µF
100k
1Ω
IN
56 Ω
100µF
16Ω
4S7VJ

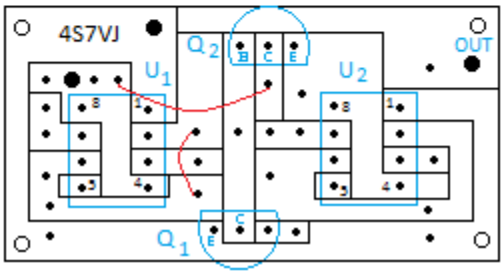

AF amplifier (2W)
1µF
LM 380N
25k
500µF
8 to 18V
IN
5µF
8 Ω
LM 380N 14 pin IC
LM 380N 8 pin IC
4S7VJ


Tone Oscillator for car signal light buzzer
12V
1N 4001
BD136
2.2k
630 Ω
1N4001
To Signal light switch
1.8k
100 µF
NE 555
12k
0.022 µF
47 µF
I designed and installed to my vehicle (Micro-Panda) without any alterations
4S7VJ


Dicky Light circuit for Micro-Panda car
(designed by me)
Dicky solenoid
White/Red
White/Green
Solenoid polarity reverse for lock/unlock (0.1 sec. pulse)
Additional circuit
Park Lights
D1
D2
3.3k
100k
NE 555
330k
Q1
RL 1
RL 2
470µF
Dicky Light
12V / 10W
This will be ON for one minute when park lights ON and Dicky unlock by remote key
Q1 - D400, D313, C1061, RL 1 , RL 2 - 12V/10A relay (relay coil-30 mA) D1 , D2 - 1N4001
4S7VJ

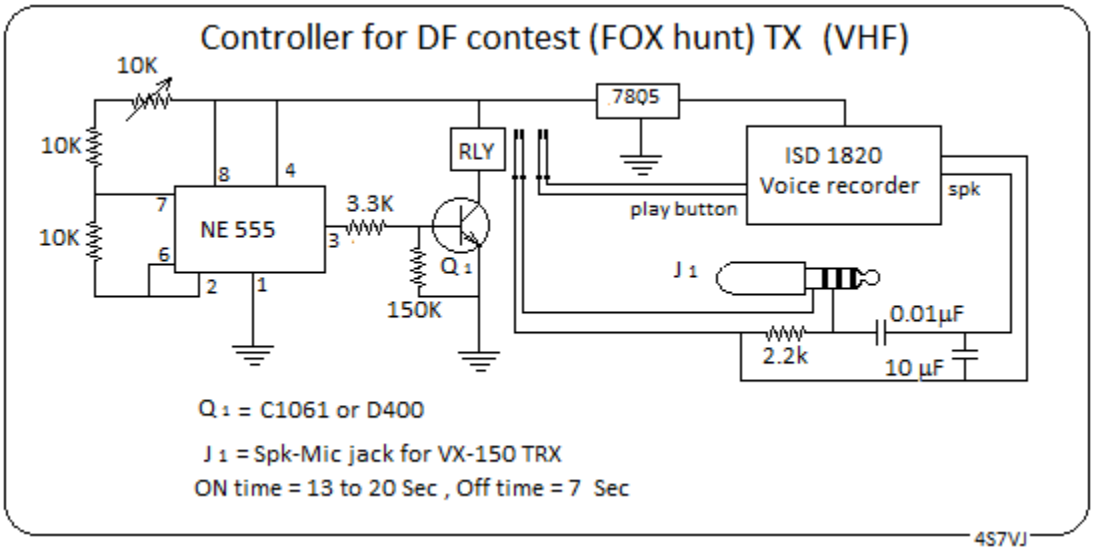


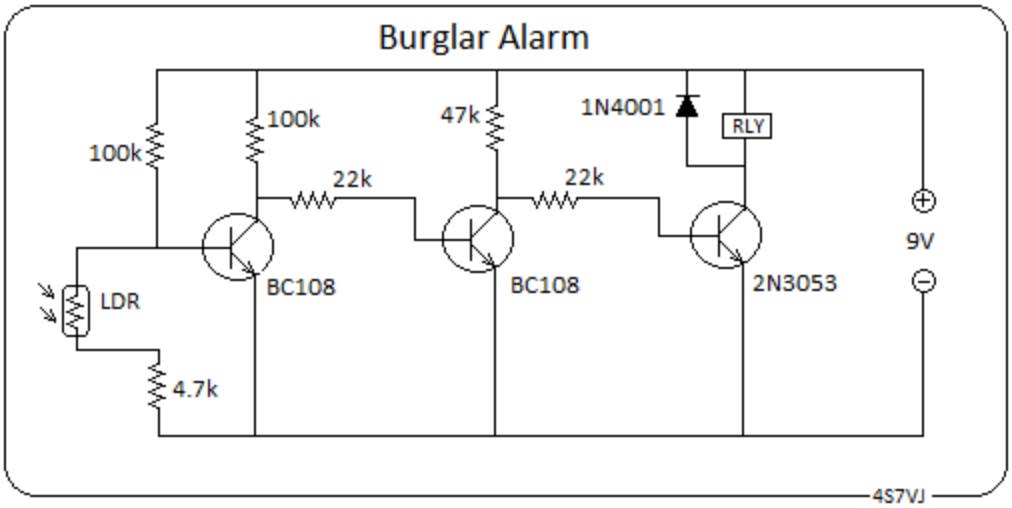


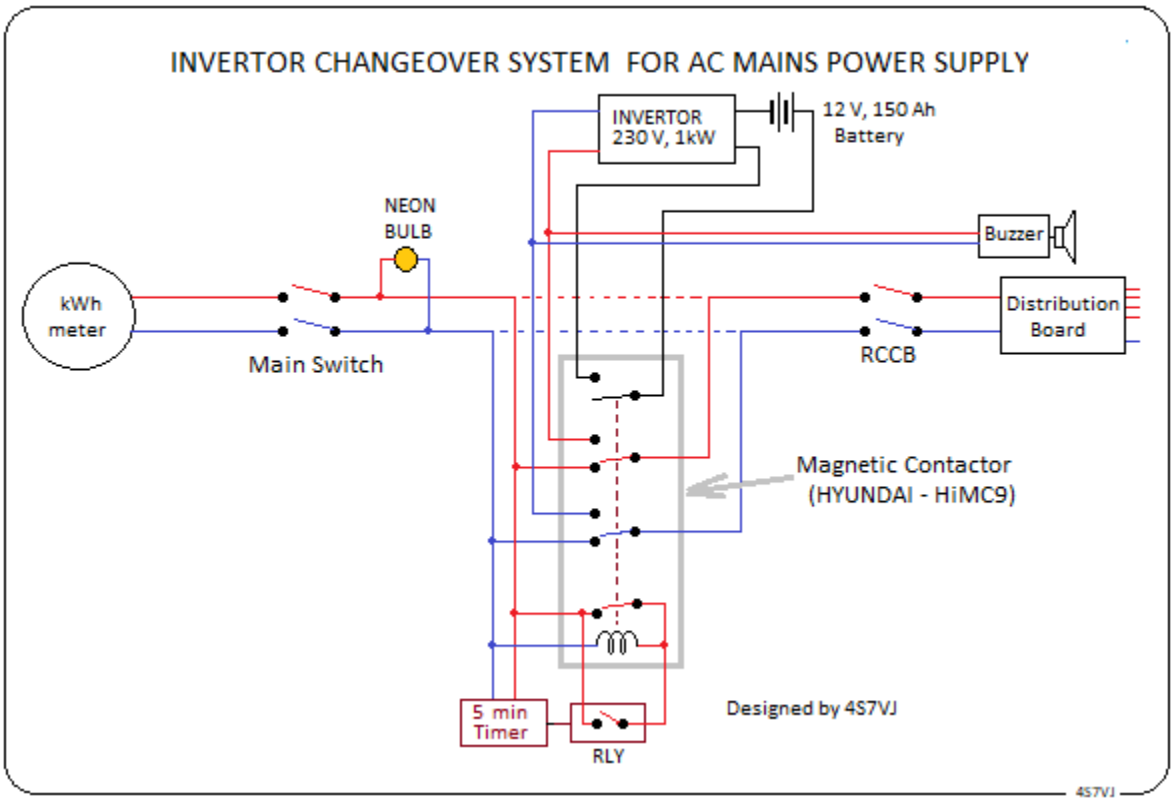


PCB Lay out

Jumpers shown with red color


Controller for DF contest (FOX hunt) TX (VHF)
10K
10K
10K
10K
NE 555
8
4
7
6
3
2
1
3.3K
RLY
Q 1
150K
7805
ISD 1820
Voice recorder
play button
spk
J 1
0.01µF
2.2k
10 µF
Q 1 = C1061 or D400
J 1 = Spk-Mic jack for VX-150 TRX
ON time = 13 to 20 Sec , Off time = 7 Sec
4S7VJ


Burglar Alarm
100k
100k
22k
47k
22k
1N4001
RLY
9V
LDR
BC108
BC108
2N3053
4.7k
4S7VJ



Last updated on 13th July 2020