

Ultrasonic Pwr Line Arc Detector

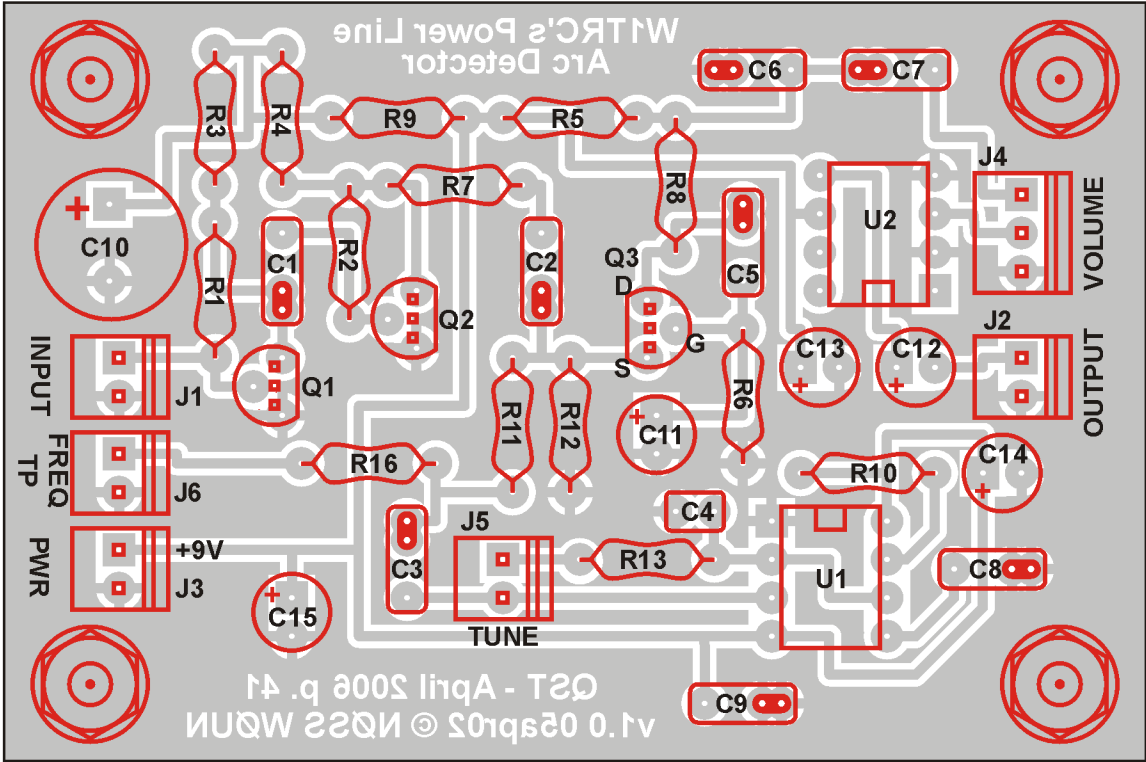
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W1TRC

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W1TRC's ULTRASONIC POWER LINE ARC DETECTOR



W1TRC's Ultrasonic Power Line Arc Detector

Suggested Parts List

The following parts are available from: www.mouser.com

Part#	Description	Mouser Pt #
C1-C3	0.01 uF, 100V Polyester Film cap.	140-PM2A103K
C4	180 pF COG (NPO) multilayer ceramic	80-C315C181J1G
C5	0.047 uF, 100V Polyester Film cap.	140-PM2A473K
C6-C9	0.1 uF, 100V Polyester film cap.	140-PM2A104K
C10	470 uF, 25 V capacitor	140-XRL25V470-RC
C11	10 uF, 25 V capacitor	140-XRL25V10
C12	47 uF, 25 V capacitor	140-XRL25V47
J1	Panel mount RCA jack	161-1002
J2	1/4 inch panel mount phone jack	161-1804
P1	Small RCA plug	17PP050
Q1, Q2	2N4401	610-2N4401
Q3	MPF102	512-MPF102
R1, R2	220k 1/4W	660-CF1/4C224J
R3-R6	2.2k 1/4W	660-CF1/4C222J
R7	1k 1/4W	660-CF1/4C102J
R8, R9	270 Ohms 1/4W	660-CF1/4C271J
R10, R11	10k 1/4W	660-CF1/4C103J
R12	100k 1/4W	660-CF1/4C104J
R13	82k, 1/4W	660-CF1/4C823J
R14	10k, audio control with SPST switch	31XP401
R15	50k, linear taper potentiometer	31VA405
S1	Part of R14	
UI	TLC555 CMOS 555 timer	511-TS555CN
U2	LM386 audio amplifier	513-NJM386BD
	Ultrasonic transducer, Kobitone	255-400ER18

NOTES:

The following JACKS were added to the PC board to allow ease of connection to the PC board. The J1 & J2 jacks in the list below are **NOT** the same as J1 & J2 in the original article. You should still order J1 & J2 from the article.

If you do not wish to install these 'access' jacks, you may solder your connecting wires directly to the pads which would have been used for the added jacks.

A jack (J6) and a resistor (R16) have been added to allow you to conveniently access the oscillator output, in order to allow you to connect a frequency counter (FREQ. TP) for setting oscillator frequency.

Part#	Description	Mouser Pt #
J1, J2, J3, J5 & J6	2-Pin Vert Hdr w/locking ramp	538-22-23-2021
J4	3-Pin Vert Hdr w/locking ramp	538-22-23-2031
R16	22k 1/4w (FREQ TP resistor)	660-CF1/4C223J

(continued on next page)

(Suggested UPLAD Parts List, continued)

The following plugs mate with the jacks (above) to allow the off-board components to be easily attached.

Part#	Description	Mouser Pt #
P1, P2, P3, P5 & P6	2-pin Crimp Term Hsg w/locking ramp	538-22-01-2027
P4	3-pin Crimp Term Hsg w/locking ramp	538-22-01-2037
	Crimp terms. for receptacles above (phosphor bronze, 13 req. suggest you order several spares, say 16 or so)	538-08-52-0123

The following capacitors were added subsequent to the original article as a result of feedback from a builder who experienced some distortion in the audio output when the volume was turned up all the way. These components are NOT REQUIRED, but you may add them if you wish. The PC board does include pads for their installation.

Part#	Description	Mouser Pt #
C13-C15	47 uF, 25 V capacitor	140-XRL25V47

Comments from Jim Hanson, W1TRC, the author:

- 1) I made a minor error in the parts list for C11 and C12. I listed these capacitors as having a 35V rating but the Mouser part number is for 25V capacitors. The list has now been corrected and lists 25V capacitors with the corresponding Mouser part numbers. As far as the functioning of the circuit is concerned, either will work. In fact C11, the 10ufd 35V capacitor, has the same footprint as the 25V capacitor. The case sizes for the two versions of C12 are different. To get around this problem with the new printed circuit card, the board has been designed with extra pads and enough clearance so either capacitor can be used on the board, so if you have already purchased the parts, there will be no problem.
- 2) You will notice a slightly different part number for some of the resistors. For example, R7 is listed in the original article as R7 1k, 1/4W (Mouser P/N 660-CF1/4L102J) and in the part list it is listed as R7 1k, 1/4W Mouser P/N 660-CF1/4C102J. Notice that the "L" in the original part number has changed to a "C". This is a change by Mouser since I generated the original parts list for the article. It came about because Mouser is converting over their parts to be RoHS: (Reduction of Hazardous Substances) Compliant. They are getting away from lead. The old part numbers are apparently still available but there is a huge minimum order, so order using the new number or equivalent 1/4W resistors from another source.
- 3) Notice that a new resistor R16, 22k 1/4w (FREQ TP resistor) 660-CF1/4C223J has been added. This has been added to provide isolation for a frequency test point that has been included in the PC board. It ties to the junction of R11 and C3 which can be used as a point to measure the oscillator frequency when you are setting up the frequency adjustment. Its value is not critical.
- 4) Regarding the PVC hardware: My local hardware and plumbing supply stores did not have all of the PVC fittings that I needed, particularly the 3/4" Combination T (Slip x Slip x FPT). I ended up buying the fittings at a "Home Depot". If you choose what strength PVC pipe to buy, schedule 40 is probably the best choice.

FINALLY... Mouser, as well as other vendors, are converting many of their parts to be RoHS: (Reduction of Hazardous Substances) compliant. For this reason, part numbers are in a state of flux and you may find that a part number on this list is either no longer available or has been replaced by a RoHS equivalent. This has already affected some of the parts on the QST parts list. The builder will have to use his own judgement when selecting final equivalent parts to use if a part on this list is no longer available or is only available in large quantities or long lead times. In general, since this is going to be a soldered circuit board, either compliant or non-compliant parts can be used.